

2025-1616

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**United States Court of Appeals  
for the Federal Circuit**

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VICOR CORPORATION,

*Appellant,*

– v. –

INTERNATIONAL TRADE COMMISSION,

*Appellee,*

FII USA INC., INGRASYS TECHNOLOGY INC.,

*Intervenors.*

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*On Appeal from the United States International  
Trade Commission in No. 337-TA-1370*

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**CORRECTED NON-CONFIDENTIAL BRIEF FOR APPELLANT**

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**CONFIDENTIAL MATERIAL OMITTED**

The material omitted from pages 19, 20, 22, and 23 contains descriptions of confidential price terms from the parties’ commercial transactions, namely: the quantity and the per-unit price.

The materials that are redacted in the Addendum are confidential versions of the Initial Determination, Final Determination, Cease and Desist Orders, and Limited Exclusion Order, which were filed with redactions pursuant to the Protective Order entered in the proceeding before the International Trade Commission. The redacted information constitutes the parties’ Confidential Business Information (CBI) as defined under that Protective Order and includes, e.g., confidential licensing terms, confidential transaction details, confidential part and product numbers, and confidential source code and technical documentation relating to the products at issue in the case, including those of both Vicor and the Respondents.

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### **STATEMENT OF RELATED CASES**

No other appeal in or from the same proceeding in the United States International Trade Commission (“ITC”) is or was previously before this Court or any other appellate court. The following pending case is directly related to the issue on appeal, is stayed pending the completion of the ITC proceedings on appeal, and may be affected by the decision in this appeal: *Vicor Corp. v. FII USA Inc., Ingrasys Tech. Inc., & Ingrasys Tech. USA Inc.*, No. 1:24-cv-10060-LTS (D. Mass.).

### **JURISDICTIONAL STATEMENT**

The ITC had jurisdiction pursuant to 19 U.S.C. § 1337. The ITC issued its Final Determination on February 13, 2025. Appx4. Vicor timely noticed its appeal on April 2, 2025. Appx7689. This Court has jurisdiction pursuant to 28 U.S.C. § 1295(a)(6).

## INTRODUCTION

Vicor Corporation (“Vicor”) is a publicly traded, Massachusetts company that develops, designs, manufactures, and sells efficient, high-density power converters. Vicor’s sophisticated products power some of the world’s most advanced technologies, including artificial intelligence and hyperscale computing systems. Vicor learned that foreign competitors were making copycat versions of certain Vicor patented power converters and selling them to contract manufacturers, including the Intervenors in this appeal, to make computing systems that were then imported into the United States. Vicor filed a complaint with the U.S. International Trade Commission (“ITC” or “Commission”) under Section 337 of the Tariff Act of 1930 and obtained a finding of infringement, a limited exclusion order banning infringing power converters from being imported into the United States, and cease and desist orders prohibiting certain conduct by the named Respondents.

The ITC’s decision largely favored Vicor. But it erred on one critical issue: It found that the Intervenors in this appeal, both affiliates of the contract manufacturing giant Foxconn, obtained a license to Vicor’s patents, and thus were not subject to the exclusion order. Foxconn’s license defense is the sole issue on appeal.

To summarize Foxconn’s license defense: long after the start of the ITC Investigation, the Foxconn Respondents—including Intervenors FII USA Inc. (“FII”) and Ingrasys Technology, Inc. (“Ingrasys”) (together, “Foxconn”)—argued

that Foxconn could not infringe Vicor's patents because Foxconn had obtained, for free, a license to Vicor's valuable patent rights. To be clear, Foxconn did not argue that Foxconn and Vicor had negotiated at arm's length and executed a patent license agreement. Instead, Foxconn argued that it had secured a license by way of boilerplate terms and conditions that Foxconn incorporated into purchase orders for Vicor's power converters.

More specifically: Foxconn and Vicor had engaged in 700+ transactions over many years, in which Vicor sold power converters to Foxconn. At the beginning of every project, Vicor would send Foxconn a price quote which detailed the price for a Vicor component to be used in the project. When Foxconn wanted to purchase Vicor components, it would send Vicor a purchase order ("PO") containing boilerplate terms and conditions favorable to Foxconn (the "Foxconn Terms"). One of the Foxconn Terms purported to grant a royalty-free license to all intellectual property rights embodied in any goods Foxconn bought (the "free-license" clause). In response to every Foxconn PO, Vicor responded with a sales form (called a "Sales Order Acknowledgement," or "SOA") that expressly rejected the Foxconn Terms. Vicor's SOAs also stated that every sale was made subject to Foxconn's assent to *Vicor's* terms and conditions (the "Vicor Terms"); that Vicor could accept a PO only by sending an SOA; and that Vicor granted no license to its intellectual property rights by selling its goods to a buyer like Foxconn.

Despite Vicor’s consistent practice of responding to every PO with an SOA rejecting the Foxconn Terms, Foxconn argued that there were two transactions in which Vicor nevertheless “accepted” the Foxconn Terms contained in the PO—including the free-license clause—via email *before* sending a responsive SOA.

According to Foxconn, one “acceptance” (of FII PO No. 4600000176 or “PO 176”) occurred when a Foxconn representative asked for an “ETA” and an “update” on shipment dates, and a Vicor sales representative responded with estimated shipment dates that differed from Foxconn’s requested delivery date by over six months. The other “acceptance” (of Ingrasys PO No. 4500273265 or “PO 265”) purportedly occurred after a Foxconn representative asked for the “latest delivery date,” and a Vicor sales representative responded with a “scheduled” shipment date that diverged from the delivery date by over seven weeks. By these emails, Foxconn argued that Vicor bound itself to all of the Foxconn Terms, including the one that gave Foxconn a free license to Vicor’s patents. As a result, Foxconn could not infringe Vicor’s patents and thus could not violate Section 337 of the Tariff Act of 1930.<sup>1</sup>

Foxconn’s license defense was so outlandish that, at the close of the 5-day evidentiary hearing, the Administrative Law Judge (“ALJ”) stated:

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<sup>1</sup> The Commission Office of Unfair Import Investigations (“OUII”) Investigative Staff consistently agreed with Vicor that Foxconn never obtained a license to Vicor’s Patents. Appx1314; Appx5354; Appx6024.

The only thing I have to comment on is that *I am less impressed now, having heard the evidence, regarding the license by purchase order defense than I was even before the hearing.* I'm really -- I was struck by the fact that, after 700 purchase orders, suddenly the Foxconn group decides that it's going to assert a license, that seems a bit of a stretch.

Appx10976:10-16. Following the hearing, the ALJ rejected Foxconn's license defense in the Initial Determination ("ID"), holding that Vicor had not "accepted" the Foxconn Terms and had not granted Foxconn a license to Vicor's patents.

But, upon review of the ID, the Commission fell prey to Foxconn's erroneous theory of contract formation and reversed the ID. Applying an interpretation of the Uniform Commercial Code ("UCC") that no court has ever adopted, the Commission incorrectly concluded that Vicor *had* given away its patent rights to Foxconn.

The Commission reversibly erred for three reasons. *First*, its decision rests on a fundamental misunderstanding and misapplication of the law of contract formation in "battle of the forms" transactions like this one, where a buyer and a seller each send competing terms that conflict with one another. The applicable provision of the Massachusetts UCC (Mass. Gen. Laws Ann. ch. 106, § 2-207), and Massachusetts precedent interpreting it, allow sellers like Vicor to protect against a buyer's one-sided terms by sending their own responsive form and making the seller's "acceptance" of a buyer's purchase order "expressly conditional" on the buyer's assent to the seller's terms. That is exactly what Vicor did. And although no contract

was formed by the parties' writings, the parties proceeded to exchange the goods. Under UCC § 2-207(3), the resulting contract thus consists of those terms on which the parties' writings agree, while the conflicting terms (including Foxconn's free-license clause) are excluded.

*Second*, the Commission's theory that Vicor could "accept" FII's PO 176 and thus all the Foxconn Terms by email was legally and factually defective for at least five independent reasons:

1. the email relied on by the Commission was not a "definite and seasonable expression of acceptance" as required under UCC § 2-207 because it provided only *estimated* shipping dates and contained no language of acceptance;
2. the Commission failed to properly consider the parties' course of dealing, which confirmed that Vicor did not accept POs by email (only by an SOA);
3. the Commission failed to properly consider that the estimated shipping dates in the Vicor emails differed substantially from the Foxconn-specified delivery dates, confirming the emails could not have constituted an acceptance;
4. the Commission ignored that the Foxconn POs expressly disavow that they are binding offers that any seller can accept; and
5. the Commission erroneously concluded that Vicor's email was a "written confirmation[s]" under UCC § 2-207(1) because a "written confirmation"

exists only when there is prior agreement to confirm—and there indisputably was no prior agreement here.

*Third*, the Commission also erred in extending the free license to Ingrasys based on Ingrasys’s PO 265 because the correspondence upon which Foxconn relied demonstrates no acceptance by Vicor occurred, and no license was granted, for the same reasons as stated above regarding PO 176.<sup>2</sup>

Rules of contract formation under the UCC are long settled. And under these long-settled rules, the undisputed facts here permit only one conclusion: Vicor never gave Foxconn a free license to Vicor patents. The Commission’s ruling ignored these rules. And in so doing, it transformed the UCC into an economically devastating weapon—one in which a seller might inadvertently bind itself to commercially nonsensical one-sided terms merely because one of its sales representatives responded to a contract manufacturer’s inquiry by email providing estimated shipping dates. The Commission’s ruling on Foxconn’s license defense is erroneous and must be reversed.

### **STATEMENT OF THE ISSUES**

In every sales transaction, Foxconn and Vicor exchanged competing forms, each expressly conditional on the other party’s assent to its terms.

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<sup>2</sup> The Commission further erred by failing to identify what Vicor communication constituted the purported “acceptance” of PO 265.

1. Did the Commission err in holding that Vicor had given Foxconn a royalty-free license to Vicor's patents, where Mass. Gen. Laws Ann. ch. 106, § 2-207 requires that all conflicting terms in contracting parties' competing forms be excluded from the resulting contract?

2. Did the Commission err in holding that Vicor accepted Foxconn's royalty-free license term by email?

## STATEMENT OF THE CASE

### **I. Vicor is an innovator in power-conversion technology, with valuable patents on its non-isolated bus converter module (NBM).**

Vicor is an American innovator, designer, and manufacturer of power converters. From its founding in 1981, Vicor has relentlessly focused on improving power density and efficiency in power-conversion technology. Appx11563, Appx11564-67, Appx11618-19. Vicor is headquartered in Andover, Massachusetts, where its 320,000 square-foot, automated manufacturing facility and approximately 1,000 employees are also located. Appx11563.

Vicor is at the forefront of high-density power systems that fuel the cutting edge of recent innovations: artificial intelligence and cloud computing systems, artificial intelligence accelerators, tensor processing units, and data center servers, among other technical applications. Appx17, Appx11563, Appx11566-70, Appx11584. Vicor is publicly traded on NASDAQ, and, in addition to its headquarters in Massachusetts, has offices throughout the United States, including in California, Illinois, Texas, Rhode Island, and Oregon. Appx11563.

One of Vicor's significant contributions to power-conversion technology is its development of high-density, high-efficiency power converters called non-isolated bus converter modules, or "NBMs." Appx11568-60. Vicor's NBMs achieved a 10-fold increase in power density relative to Vicor's earlier generation products. Appx11571. Leading technology companies took notice of Vicor's

technological advances and began incorporating NBMs into their high-performance computing systems starting in 2017. Appx11584-86.

To meet these companies' demands, Vicor sells its power converters directly to certain contract manufacturers that procure parts (like Vicor's NBMs) and assemble them into a final computing system that is delivered to end-customers. As relevant here, Foxconn affiliates FII and Ingrasys—Respondents in the ITC Investigation and Intervenors on appeal—are among the contract manufacturers that purchased NBMs for incorporation into high-performance computing systems for leading American technology companies. Appx12183-84, Appx11610-11.

To support its end-customers, Vicor commenced and maintained a five-year commercial relationship with Foxconn that involved over 700 transactions in which Foxconn purchased NBMs from Vicor (approximately 400 of which preceded the transactions at issue on appeal). Appx12193. Foxconn then incorporated Vicor's NBMs into end-customers' computing systems. Appx12231, Appx11603, Appx12193.

Because Vicor's competitive edge comes from its innovation, Vicor protects its intellectual property with patents. Vicor has secured over 200 patents, some of which are embodied in Vicor's NBMs. Appx11567. In the ITC Investigation, Vicor asserted three such patents: U.S. Patent Nos. 9,516,761 (the "'761 Patent");

9,166,481 (the “’481 Patent”), and 10,199,950 (the “’950 Patent”) (collectively, the “Asserted Patents”). Appx453.

Vicor’s patents are valuable. As one example, one licensee to Vicor’s patents has paid Vicor a royalty per unit of current or power that its licensed power converters provide, resulting in substantial payments under the license. Appx12001, Appx11604-05; Appx279; Appx11607. In fact, Vicor’s total licensing royalty revenue went from \$2.8 million in 2022, to \$15.8 million in 2023, to \$46.6 million in 2024.<sup>3</sup> And in the second quarter of 2025 alone, Vicor’s revenue from licensing income and a patent litigation settlement exceeded \$55 million.<sup>4</sup>

## **II. Vicor initiates the ITC Investigation, and Foxconn belatedly asserts a royalty-free right to Vicor’s patents.**

Vicor learned that one of Vicor’s competitors, Delta Electronics, Inc. (“Delta”), was manufacturing infringing NBMs and selling them to contract manufacturers like Foxconn. Appx11623. To stop that infringement, Vicor filed an ITC complaint in July 2023, alleging that Delta, Foxconn, and other entities violated

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<sup>3</sup> Vicor Corp, Form 10-K at 35 (Dec. 31, 2024), available at <https://vicorcorporation.gcs-web.com/static-files/be0ef742-794b-4f37-a3eb-fca4db900625>. Vicor’s Form 10-K from December 2024 is not part of the record because it was not available at the time of the April 2024 hearing. But Vicor’s “Form 10-K is readily verifiable and thus the proper subject of judicial notice.” *Cyntec Co., Ltd. v. Chilisin Elecs. Corp.*, 84 F.4th 979, 989 n.6 (Fed. Cir. 2023).

<sup>4</sup> Vicor Corp, Form 10-Q at 4 (June 30, 2025), available at <https://vicorcorporation.gcs-web.com/sec-filings/sec-filing/10-q/0000950170-25-101161>.

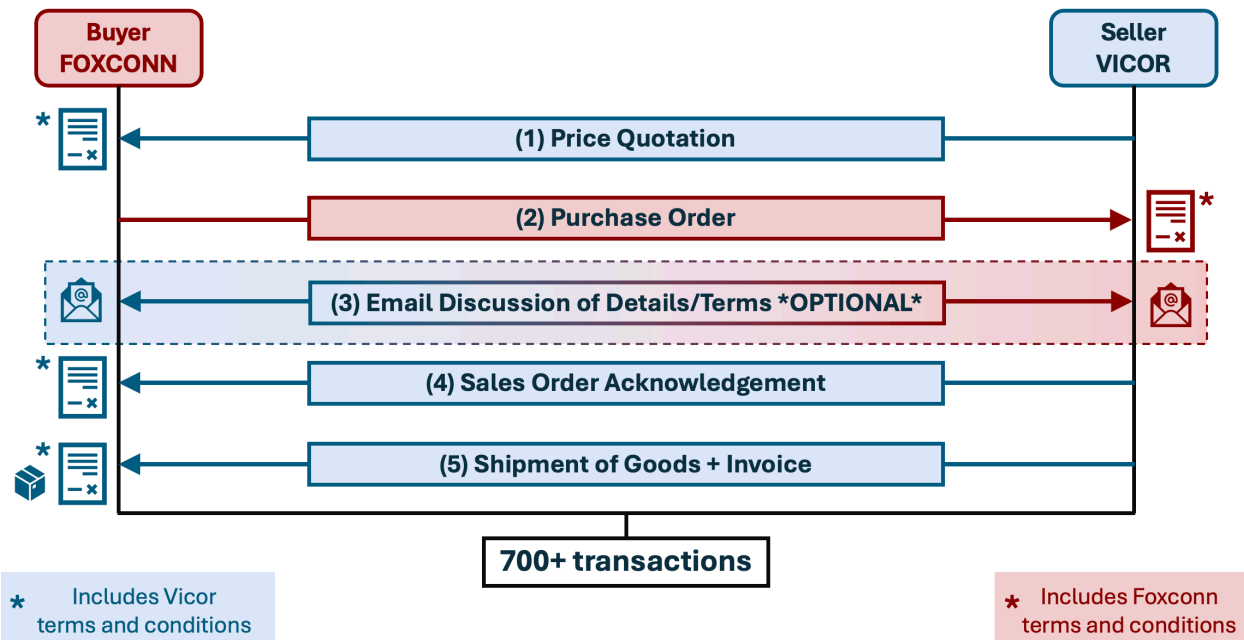
Section 337 of the Tariff Act of 1930 by importing NBMs that infringe Vicor’s Asserted Patents. The Commission instituted the Investigation on August 14, 2023.

Foxconn did not raise its license defense until five months after Vicor filed its complaint. Foxconn did so through a Motion to Terminate the Investigation in favor of Chinese arbitration, relying on a provision in the Foxconn Terms. Appx750-51. As detailed in Section IV below, the ALJ rejected Foxconn’s Motion to Terminate in favor of arbitration but allowed Foxconn to present its novel free-license defense on the merits. Appx1441; Appx5121.

To explain Foxconn’s peculiar theory by which it purportedly obtained a free license to Vicor patents, Vicor in this Section (A) provides a summary of how Foxconn and Vicor engaged in transactions for Vicor goods; (B) details the two transactions on which Foxconn relied to assert a free license to Vicor patents; and (C) explains Foxconn’s “email acceptance” theory.

**A. The Vicor-Foxconn sales process.**

Vicor and Foxconn engaged in 700+ sales transactions—and over 400 prior to the two at issue in this appeal. The basic process was invariably the same and is illustrated in the diagram below, followed by an explanation of each step.



**Step 1: Price Quotation.** At the beginning of any project (and whenever pricing of the goods change), Vicor sends buyers, including Foxconn, a price quotation for the Vicor parts the contract manufacturer wants to purchase. Appx12191-92. The price quotation includes as a “condition[] of quotation” a hyperlink to the Vicor Terms.<sup>5</sup> Appx12191. Three sections of the Vicor Terms are relevant here:

Section 1: Scope. This section makes clear that (i) the Vicor Terms are the only terms that apply to Vicor sales, (ii) Vicor’s acceptance of any PO is *expressly conditioned* on a buyer’s assent to the Vicor Terms; (iii) a binding

<sup>5</sup> Vicor Terms are incorporated into every form that Vicor sends to buyers like Foxconn, including (1) in datasheets advertising Vicor’s products; (2) price quotations; (3) Sales Order Acknowledgements; and (4) invoices. Appx12191.

agreement can be formed only by Vicor's delivery of an SOA to the buyer; and (iv) no party is authorized to make representations inconsistent with the Vicor Terms:

[i] These Terms and Conditions of Sale ("Terms") shall be the sole terms and conditions governing the sale of products and services ("Goods") by Vicor Corporation . . . ("Vicor") to the commercial party listed on the order form or other documentation ("Purchase Order") provided to Vicor by that party ("Buyer") . . . .

[ii] Vicor's express acceptance of a Purchase Order under these Terms is evidenced by its delivery of a Sales Order Acknowledgement ("SOA"), and *such acceptance of a Purchase Order is expressly conditioned on Buyer's assent* to these Terms, as described in Section 2.

[iii] *Only upon delivery by Vicor of a SOA* to Buyer shall these Terms and the associated Purchase Order together become a binding, bilateral contract between Vicor and Buyer, with enforceable rights and performance obligations (the "Sales Agreement"). A Sales Agreement will not exist, and Vicor will not be obligated to fulfill a Purchase Order, unless Vicor affirmatively acknowledges the respective responsibilities of Vicor and Buyer through delivery of a SOA to Buyer. [iv] *No party has been authorized by Vicor to make any statement or representation as to the sale of Goods inconsistent with these Terms, and no such statements, if made, will be binding upon Vicor* or be grounds for any claim.

Appx12106 (emphases and brackets added).

Section 7: Delivery. This section states that "Delivery dates set forth in the SOA are approximate" and that "Buyer acknowledges [that] Vicor is not bound by any such date(s) set forth in the SOA."

Section 25: Intellectual Property. This section makes explicit that Vicor does not license any intellectual property right simply by selling its products:

Nothing in the Sales Agreement is to be construed as a grant or assignment of any license or other right to Buyer of any of Vicor's intellectual property rights, whether patent, trademark, trade secret, copyright or otherwise.

Appx12109, Appx12119-20.

**Step 2: Purchase Order (PO).** Once pricing is established, Foxconn (buyer) sends Vicor (seller) POs for a specific quantity of Vicor NBMs. Foxconn POs comprise a two-page form that incorporates specific "Notes" along with the unilateral set of Foxconn Terms. Appx12335-36. Three aspects of Foxconn's standard POs are worth noting here:

Note 1: expressly limits a seller's acceptance of the PO to Foxconn's terms: "Any different or additional provision provided by Seller in any acceptance, confirmation, or acknowledgement to this Purchase Order ('PO') is null and void unless accepted by authorized person of Buyer in writing." Appx12335.

Note 6: disavows any obligation by Foxconn to purchase goods unless Foxconn issues a subsequent "Delivery Notice": "This PO shall not constitute Buyer's purchase obligation without DN or other delivery requests. Final quantity and/or delivery date shall be subject to the provisions of the most

current DN or other delivery requests. Seller agrees to deliver Products according to such particular DN or delivery request.” Appx12335.

General Term No. 10. Intellectual Property Right: broadly asserts that any seller “agrees to grant Buyer [Foxconn] and its customer(s) a perpetual, irrevocable, non-transferable, and royalty-free license under all intellectual property rights included in the Products supplied to Buyer by Seller, so that Buyer and its customer(s) have the right to make, use, sell, offer to sell or import similar products or other products which contain the aforesaid intellectual property rights worldwide.” Appx12336.

POs are received at Vicor by non-managerial employees who enter the orders into Vicor’s computerized tracking system. Appx12192.

**Step 3 (\*Optional\*): Emails.** Foxconn and Vicor *sometimes* exchange emails about, *e.g.*, errors in POs, shipment schedules, payment or warranty terms, and other administrative issues. Appx12192.

**Step 4: Sales Order Acknowledgement (SOA).** Anticipated shipment dates—which are “approximate” according to the Vicor Terms, Appx12109 [CX-3328.0004]—are entered into a sales-order tracking system, which then automatically generates and emails an SOA to Foxconn. Appx12192. The SOA is a one-page form that identifies the product, quantity, price, shipment date, and total amounts due for the order. Appx12188, *see also* Appx12134, Appx12135,



**Step 5: Shipment & Invoice.** After sending the SOA, Vicor ships the goods and electronically submits an invoice. Appx12193. Vicor's invoices also reference and incorporate the Vicor Terms. Appx12191.

\* \* \*

Foxconn and Vicor engaged in over 700 transactions. Appx12193. All followed this same practice. Appx12193. Vicor responded to each PO with an SOA and/or invoice, making clear that Vicor's acceptance of any PO is conditioned on Foxconn's assent to the Vicor Terms. *See, e.g.,* Appx12128, Appx12130, Appx12132, Appx12134, Appx12135, Appx12136, Appx12137, Appx12138, Appx12139, Appx12140.

**B. Foxconn's two transactions for its free-license defense: PO 176 (FII) and PO 265 (Ingrasys).**

Of the 700+ transactions, Foxconn's license defense relies on only two: FII PO No. 4600000176 ("PO 176") and Ingrasys PO No. 4500273265 ("PO 265"). Both transactions followed the same sales process described above: after Foxconn receives Vicor's price quotation with the Vicor Terms (Step 1), Foxconn sends a PO containing the Foxconn Terms (Step 2); Foxconn and Vicor sometimes exchange emails about problematic terms, such as delivery or payment terms or requested ship dates that clash with factory lead time (\*optional\* Step 3); Vicor sends Foxconn a responsive SOA subject to the Vicor Terms (Step 4); and Vicor ships the goods with an invoice subject to the Vicor Terms (Step 5).

Vicor sets forth the details of each transaction below starting with Foxconn sending Vicor a PO. An asterisk (\*) identifies the specific email the Commission relied on to find that Vicor “accepted” PO 176. As to PO 265, although *Foxconn* presented a theory of acceptance for this transaction, identified with a double-asterisk (\*\*) below, the Commission never specified in its decision how and by what email Vicor “accepted” PO 265.

#### **PO 176 (Foxconn)**

- September 26, 2021: Anita Wang (Foxconn) emails Peter Goodwin (Vicor) attaching PO 176. Appx12340-41.
  - The PO requests [redacted] **qty.** units at [redacted] **price** with a “delivery date” of October 15, 2021. Appx12335. In her cover email, Foxconn’s Wang states: “Please find attached new POs and confirm ETA [*estimated* time of arrival] asap.” Appx12340.
- September 27, 2021: Goodwin (Vicor) responds with three emails to Foxconn:
  - Goodwin (Vicor) first emails Wang (Foxconn) asking Foxconn to revise PO 176’s delivery term: “Please send a revised order for EXW – Factory.” Appx11334. “EXW” means the buyer pays transportation costs and assumes the risk at the point of shipment from Vicor’s facility. Appx11237.

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- Later that day, Goodwin (Vicor) responds to his own email and asks Foxconn to also revise payment terms: “Also payment terms are NET 30 for the attached orders, please send revised PO’s.” Appx11334.
- Goodwin (Vicor) forwards Wang’s September 26 email to a Foxconn procurement specialist, Carolyn Lee. Appx12339.
- September 30, 2021: Lee (Foxconn) responds to Goodwin’s forwarded email:

Hi Peter – Sorry for my late response, eventually the buying will come from the Wisconsin location but we are not quite set up for that yet. We recently underwent a systems change with our SAP system and as IT works through it with us, our Asia team will continue to send PO’s.

Hope that answers your question.

Do you have an update on the docking status of PO [176]?

Appx11353.

- October 1, 2021:\* Goodwin (Vicor) responds to Lee (Foxconn), stating in full:

PO [176] ..... [redacted] qty. ship date 5-13-22, [redacted] qty. 5-20, [redacted] qty. 5-27 and [redacted] qty. 6-3.

Appx11353.

The “ship date[s]” differ from PO 176’s “Delivery Date” of October 15, 2021 by 210 days (6 months, 28 days) for the earliest shipment, to 231 days (7 months, 19 days) for the latest shipment.

\* This email is the email that the Commission held was Vicor’s “acceptance” of PO 176. Appx112, Appx119.

- October 4, 2021: Lee (Foxconn) responds to Goodwin (Vicor), stating:

Can you tell me when the next delivery is coming and verify that it is coming direct here from MA? I thought you mentioned that last time we spoke.

Appx11357.

- October 5, 2021:

- Lee (Foxconn) sends another email to Goodwin (Vicor), stating: “Hi Peter – Do you have an update on the status of the PO’s [in my prior email]?” Appx11357.
- Goodwin (Vicor) responds to Lee (Foxconn) stating: “I will provide an update tomorrow....” *Id.*

- October 5, 2021: Lee (Foxconn) sends another email to Goodwin (Vicor), stating: “Hi Peter – Do you have an update on the status of the PO’s?” Appx11367.

- October 5, 2021:

- Goodwin (Vicor) responds to Lee (Foxconn), stating: “[PO] 176 ..... Ship date 5-13-22.” Appx11367.
- The next day, Vicor’s computer system sends an email to Wang (Foxconn) attaching Vicor’s SOA for PO 176, rejecting the Foxconn Terms and making Vicor’s acceptance of PO 176 subject to the Vicor Terms. Appx11251.

**PO 265 (Ingrasys)**

- May 31, 2023: Foxconn<sup>6</sup> sends Vicor PO 265 by email, requesting [redacted] qty. units with a delivery date of August 9, 2023. Appx12335, Appx11402. PO 265 was not an original PO. Instead, Foxconn issued PO 265 on May 31, 2023, after Foxconn attempted to cancel prior PO 991. Appx110. (Original PO 991 had been confirmed by SOA and therefore was not cancellable under the Vicor Terms, but Vicor agreed to modify it to accommodate its customer, Foxconn). Appx110 (citing *Vicor Corp. v. FII USA, Inc.*, No. CV 24-10060-LTS, 2024 WL 3548786, at \*8 (D. Mass. June 24, 2024)).
- May 31, 2023: Mandy Jungjohann (Vicor) responds that Vicor was confirming the availability of certain parts but that Vicor “should be able to support partial[] [shipments] earlier than the August and September backlog dates.” Appx11407.
- June 1, 2023: Liz Liu (Foxconn) emails Vicor asking for a delivery date. Appx11412.
- June 6, 2023:
  - Liz Liu (Foxconn) emails Vicor stating: “Please confirm the latest delivery date for Taiwan orders.” Appx11419.

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<sup>6</sup> Even though PO 265 is an “Ingrasys PO,” the email communications relating to it are between Vicor and FII employees. Appx12335.

- Alice Salamanca (Vicor) emails Liz Liu (Foxconn) asking Foxconn to revise PO 265's "delivery terms" and "warranty period." Appx11425.
- June 13, 2023:
  - \*\*Salamanca (Vicor) emails Foxconn stating that "Qty [redacted] [units] scheduled for 9/29/23 ship." Appx11499.

\*\* Foxconn argued that this email constituted Vicor's acceptance of PO 265, Appx7579, even though the "scheduled" shipment date differed from Foxconn's "delivery date." *The Commission*, however, never identified which Vicor communication, if any, constituted an "acceptance" of PO 265. See Appx119-124.
  - Salamanca (Vicor) emails Foxconn with a screenshot of PO 265, states "[t]hank you for revising the delivery terms," and asks "[p]lease revise the warranty period from 48 months to 24 months." Appx11506-07.
- June 14, 2023:
  - Foxconn sends a revised PO 265. Appx11506 (attachment 4500273265.pdf); Appx11514, Appx12199.
  - Foxconn asks to cancel PO 265. Appx11517.
  - Jungjohann (Vicor) responds to Foxconn explaining "[t]his product and PO is NCNR [non-cancellable non-returnable]," and that "[t]he overall quantity of this part on order is not cancellable and will ship . . . on 9/29 or sooner." Appx11525.

- Vicor sends Foxconn Vicor’s SOA for PO 265, containing the Vicor Terms. Appx11265-66 (dated June 13, 2023 eastern standard time / GMT -5).

**C. Foxconn’s “email acceptance” theory.**

Foxconn’s “email acceptance” theory is that, in the two transactions described above, Foxconn’s POs were offers, and Vicor “accepted” each offer in the two emails identified with asterisks (\*, \*\*). Appx7579-80. Foxconn also argues that these emails, rather than each SOA that Vicor sent thereafter, constituted Vicor’s “definite and seasonable expression of acceptance or a written confirmation” under § 2-207(1). Appx7578. Foxconn appears to have focused on these two transactions because Vicor *first* corresponded by email with Foxconn, and only *later* sent an SOA incorporating the Vicor Terms. According to Foxconn, those later-sent SOAs are irrelevant, as Vicor had already bound itself to the Foxconn Terms. In the ITC proceedings, Vicor argued, and Foxconn did not dispute, that Massachusetts law governed the issue of contract formation. Appx7407, Appx7577-78.

**III. Foxconn attempts an end-run around the ITC Investigation by initiating arbitration in China.**

Foxconn first presented its “free license” defense in a Motion to Terminate in the ITC Investigation, where it argued that Vicor granted it a license and had agreed to arbitrate any dispute arising from the sale of its goods before the China International Economic and Trade Arbitration Commission (CIETAC), both by way

of the Foxconn Terms. Appx762. The ALJ denied Foxconn’s Motion to Terminate, holding that Foxconn had forfeited any right to arbitration (assuming it had one), and deferred ruling on the merits of Foxconn’s license defense until after the evidentiary hearing. Appx1441.

Foxconn also sought to outflank the ITC by initiating arbitration proceedings before CIETAC, asserting the same free-license theory. Foxconn filed these arbitrations on December 20, 2023, in parallel with its Motion to Terminate. To stop the CIETAC proceedings, Vicor sued Foxconn in the United States District Court for the District of Massachusetts, seeking to enjoin the CIETAC arbitrations with a ruling that Vicor never agreed to the Foxconn Terms, including the arbitration provision. The district court issued a temporary restraining order and then a preliminary injunction, ruling, based on three independent grounds, that Vicor had not “accepted” Foxconn’s POs by email and thus had not formed binding contracts in which it agreed to the Foxconn Terms. *See Vicor*, 2024 WL 3548786, at \*2-16.<sup>7</sup>

*First*, the district court held that PO 176 and PO 265 were not “offers” that Vicor could accept, because PO “Note 6 . . . explicitly states that the PO alone does

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<sup>7</sup> The First Circuit vacated the district court’s order on procedural grounds. It held that, under the broad stay provision for proceedings that parallel ITC investigations, 28 U.S.C. § 1659(a), the district court was required to stay Vicor’s case pending the final resolution of the 1370 Investigation. *Vicor Corp. v. FII USA Inc.*, 132 F.4th 1, 9-10 (1st Cir. 2025). Although the First Circuit vacated the district court’s order, it did not address or disagree with the district court’s conclusion that Vicor never accepted Foxconn’s POs nor agreed to the Foxconn Terms.

not obligate Defendants to buy anything, even should Vicor ‘accept’ the PO.” *Id.* at \*10. Thus, “the POs are not ‘offers’ within the meaning of Massachusetts law, which, if ‘accepted,’ would become binding contracts.” *Id.* at \*11.

*Second*, the district court rejected Foxconn’s “email acceptance” theory. It explained that, under Massachusetts law, “the email exchanges provided by the parties do not establish a contract based on the terms of [Foxconn’s] POs.” *Id.* at \*11. This is because Foxconn was “aware that Vicor did not authorize its [sales representatives] to negotiate contract terms with its buyers;” that “SOAs were Vicor’s only method of acceptance of a PO;” and “that agreements were formed only upon Vicor’s terms and conditions—terms which the [sales representatives] could not alter.” *Id.* at \*13. Thus, “Vicor’s [staff] were not ‘accepting’ the POs (even assuming the POs were ‘offers,’ which they were not), and [Foxconn] could not and did not reasonably understand the email exchanges to constitute agreement to the terms set out in the POs.” *Id.* Further, the court explained, the purported email “acceptances” could not have been acceptances because their estimated shipping dates differed materially from the “delivery dates” Foxconn specified in its POs. *Id.* at \*12. As such, Vicor’s emails were at most counteroffers—not acceptances—under Massachusetts law. *Id.* at \*11.

*Third*, the district court also ruled that Vicor did not “accept” the Foxconn Terms when Vicor transmitted its SOAs because the SOAs “expressly reject[ed] the terms of the PO within the meaning of Massachusetts law.” *Id.* at \*11.

**IV. The ALJ rejects Foxconn’s free-license defense.**

Like the Massachusetts district court, the ALJ also rejected Foxconn’s theory that Vicor had “accepted” Foxconn’s POs. Referring to the district court’s order granting Vicor’s motion for a preliminary injunction, the ALJ observed that the “order explains, with much greater clarity than Foxconn makes in its own scattershot case for a license, the multiple reasons why Vicor is likely to succeed on the merits of its claim for injunctive relief.” Appx336-58. The ALJ found “especially pertinent” the Massachusetts district court’s conclusion that “‘Vicor’s [staff members] were not ‘accepting’ the [purchase orders] . . . [and Foxconn] could not and did not reasonably understand the email exchanges to constitute agreement to the terms set out in’ the purchase orders.” Appx337 (brackets in original). The ALJ’s bottom line was that “neither [PO] Foxconn relies on as evidence of a license was ever enforceable because there was no valid acceptance of an offer . . . Foxconn has no license to any asserted patent.” Appx338-39.

**V. The Commission reverses the ALJ on Foxconn’s free-license defense.**

In its Final Determination (“FD”), the Commission reversed the ALJ and concluded that, in the context of PO 176, Vicor’s sales representative, Peter

Goodwin, “accepted” Foxconn’s offer (PO 176) when he “provided shipment dates for the requested products via the email dated October 1, 2021.” Appx119. As a result, according to the Commission, Vicor bound itself to all of the unilateral Foxconn Terms, including the free-license clause. *Id.* The Commission acknowledged that the Goodwin email provided shipment dates that were inconsistent with PO 176’s requested delivery dates. Appx121. And it did not find any facts to question Vicor’s uncontroverted evidence showing that in the 700+ transactions completed by the parties, “Vicor always sent an SOA” subject to the Vicor Terms. Appx120. But the Commission ruled that providing shipment dates by email was a reasonable way to accept Foxconn’s PO. Appx119.

The Commission also held that Vicor granted Ingrasys a free license to Vicor patents in the PO 265 transaction, even though the Commission never identified or explained how Vicor “accepted” PO 265 or otherwise agreed to be bound by its terms. *See* Appx119-24.

This appeal followed.

### **SUMMARY OF ARGUMENT**

1. Under settled Massachusetts law, where parties to a sales transaction exchange competing preprinted forms, each made expressly conditional on the other party’s assent to its terms, § 2-207 provides that the resulting contract includes only

those terms on which the parties' writings agree, along with any off-the-rack "gap fillers" provided by other parts of the UCC.

The undisputed facts of this case demonstrate that, in every sales transaction, both parties exchanged preprinted forms, each made expressly conditional on the other party's assent to its terms. Vicor expressly rejected the Foxconn Terms by sending a responsive SOA that made Vicor's acceptance of any PO expressly conditional on Foxconn's assent to the Vicor Terms, including a clause disclaiming any transfer of Vicor's intellectual property rights to any buyer. But because the parties acted as if there were a contract—with Vicor shipping the goods and Foxconn paying for them—the terms of the resulting contract include only those terms on which the parties' writings agree, together with any Uniform Commercial Code "gap fillers" supplied by default. Foxconn's free-license term is excluded ("knocked out") of the contract.

2. For five independent reasons, the Commission reversibly erred when it ignored Massachusetts law and concluded that Vicor bound itself to Foxconn's unilateral free-license term because a Vicor sales representative, Peter Goodwin, provided estimated shipment dates by email *before* sending an SOA.

*First*, Peter Goodwin's October 1 email was not a "definite and seasonable expression of acceptance" under § 2-207(1) because nothing in the email, nor in its surrounding context, suggests that Vicor manifested assent to the Foxconn PO or to

any of its terms. Even Foxconn's lone witness on this issue at the evidentiary hearing repeatedly admitted that the October 1 Goodwin email *was not an acceptance*:

“Looks like they are still trying to get some confirmation.”

“It doesn't look like it's final yet.”

“I think there's still some back and forth thing that's actually going to confirm, right? The ship dates and the receiving dates and all of those things.”

“Q. ... It's apparent that there were still questions, right?  
A. Right.”

*Second*, the Commission impermissibly ignored the parties' uncontroverted course of dealing, in which Vicor notified Foxconn on at least 400 prior occasions that Vicor would *only* accept a PO from Foxconn by delivering to Foxconn a Vicor SOA.

*Third*, Goodwin's October 1 email cannot be an acceptance (i.e., an objective manifestation of mutual assent) because the email's four different “ship date[s]” differ from the “delivery date” specified in the Foxconn PO by over six months, a material difference from what Foxconn proposed.

*Fourth*, Foxconn's POs were not “offers” that could be accepted, as their plain language states that Foxconn is not bound by the PO unless and until it issues a “DN” or “delivery request” that is separate and distinct from the PO itself, something the PO did not obligate it to do.

*Fifth*, the Commission erred in concluding that “confirmation” could constitute an “acceptance” under § 2-207(1), appearing to improperly conflate the two distinct concepts of a “definite and seasonable expression of acceptance” and a “written confirmation sent within a reasonable time” in § 2-207(1).

3. The Commission separately erred in concluding that Vicor “accepted” the Ingrasys PO 265. The Commission did not explain how and by what means Vicor “accepted” that PO. Regardless, no such acceptance occurred for the same reasons as with PO 176.

Vicor never agreed, directly or indirectly, to give Foxconn a free license to Vicor patents. The Commission’s decision holding that Vicor licensed Foxconn must be reversed.

### **STANDARD OF REVIEW**

This Court “review[s] the Commission’s final determinations under the standards of the Administrative Procedure Act.” *Guangdong Alison Hi-Tech Co. v. Int’l Trade Comm’n*, 936 F.3d 1353, 1358 (Fed. Cir. 2019). It “review[s] the Commission’s factual findings for substantial evidence and its legal determinations de novo.” *Id.*

The party asserting a license defense to patent infringement bears the burden of proving the existence of a license and its scope. *Intel Corp. v. Int’l Trade Comm’n*, 946 F.2d 821, 828 (Fed. Cir. 1991). Questions of contract formation and

interpretation are reviewed according to the law of the state, in this case, Massachusetts. Appx111, Appx116, Appx117, Appx120; *see Immunex Corp. v. Sandoz Inc.*, 964 F.3d 1049, 1060 (Fed. Cir. 2020); *Alfred E. Mann Found. for Sci. Rsch. v. Cochlear Corp.*, 604 F.3d 1354, 1359 (Fed. Cir. 2010).

Under Massachusetts law, where “the evidence consists only of writings, or is uncontradicted,” as is the case here, “the question [of] whether a contract has been made . . . is for the court” and thus is reviewed *de novo*. *Bresky v. Rosenberg*, 152 N.E. 347, 351 (Mass. 1926); *see Schwanbeck v. Fed.-Mogul Corp.*, 592 N.E.2d 1289, 1293 (Mass. 1992) (whether a writing “was a firm offer is a question of law”); *Cook v. Baldwin*, 120 Mass. 317, 318 (1876) (where there is no factual dispute, “it is a question of law for the court whether [those facts] prove an acceptance”); *accord Step-Saver Data Sys., Inc. v. Wyse Tech.*, 939 F.2d 91, 97 (3d Cir. 1991) (reviewing *de novo* questions of contract formation under the UCC).

The “grounds upon which an administrative order must be judged are those upon which the record discloses that its action was based.” *Vizio, Inc. v. Int’l Trade Comm’n*, 605 F.3d 1330, 1343 n.11 (Fed. Cir. 2010) (quoting *Sec. & Exch. Comm’n v. Chenery Corp.*, 318 U.S. 80, 87 (1943)). Each agency decision “must make the necessary findings and have an adequate evidentiary basis for its findings.” *In re Nuvasive, Inc.*, 842 F.3d 1376, 1382 (Fed. Cir. 2016) (cleaned up). Vacatur of an agency’s decision is required when an agency fails to articulate an adequate

evidentiary basis for its decision, or its reasoning cannot be reasonably discerned. *Id.* at 1382-85 (cleaned up); *see Palo Alto Networks, Inc. v. Centripetal Networks, LLC*, 122 F.4th 1378, 1385 (Fed. Cir. 2024).

## ARGUMENT

### **I. Under Massachusetts law, UCC § 2-207 governs these “battle of the forms” transactions, and Foxconn’s unilateral free-license clause is knocked out.**

Before addressing the Commission’s error in adopting Foxconn’s “email acceptance” theory, it is helpful to review how contract formation occurs in circumstances like those here. Under Massachusetts’ application of § 2-207,<sup>8</sup> where a buyer and seller exchange competing preprinted forms (each requiring the other party’s assent to their own unilateral terms), no contract is formed by the exchange of writings. In such scenarios, despite the competing forms, parties often *act* like there is a contract—the seller ships the goods; and the buyer accepts and pays for them. In these scenarios, § 2-207(3) provides that a contract *is* formed, and its terms consist of those terms on which the parties’ competing forms agree, along with any applicable UCC “gap fillers” (default terms).

In every sales transaction—including the two upon which Foxconn relies—Foxconn and Vicor exchanged competing forms (Foxconn’s PO and Vicor’s SOA),

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<sup>8</sup> All citations to the UCC and any drafters’ comments are to Massachusetts’ codification of the UCC at Mass. Gen. Laws Ann. ch. 106.

each made expressly conditional on the other party's assent to their own unilateral terms. It is also undisputed that Foxconn and Vicor acted as if there were a contract: Vicor shipped the goods; Foxconn accepted and paid for them. As a result, the contract consists of the terms on which the parties' competing writings agree, while the unassented to terms—like Foxconn's free-license clause—are excluded.

**A. UCC § 2-207 applies when a buyer and seller exchange divergent preprinted forms.**

“This case presents a dispute arising from what has been styled a typical ‘battle of the forms’ sale, in which a buyer and a seller each attempt to consummate a commercial transaction through the exchange of self-serving preprinted forms that clash, and contradict each other, on both material and minor terms.” *Commerce & Industry Ins. Co. v. Bayer Corp.*, 742 N.E.2d 567, 571 (Mass. 2001). In Massachusetts, where parties transact for the sale of goods using preprinted forms, § 2-207 “sets forth rules and principles concerning contract formation and the procedures for determining the terms of a contract.” *Id.*; see 1 White, *et al.*, Uniform Commercial Code § 2:26 (6th ed.) (“[UCC] Code drafters formulated § 2-207 to deal with th[e] problem” of “battle of the forms”).

“[U]nder § 2-207, there are essentially three ways by which a contract may be formed,” *Comm. & Indus.*, 742 N.E.2d at 571:

*First*, if the parties exchange forms with divergent terms, yet the seller's [form] does not state that its acceptance is made ‘expressly conditional’

on the buyer's assent to any additional or different terms in the [seller's form], a contract is formed under subsection (1) of § 2-207.

*Second*, if the seller does make its acceptance 'expressly conditional' on the buyer's assent to any additional or divergent terms in the seller's [form], the [form] is merely a counteroffer, and a contract is formed under subsection (1) of § 2-207 only when the buyer expresses its affirmative acceptance of the seller's counteroffer.

*Third*, where for any reason the exchange of forms does not result in contract formation (e.g., the buyer 'expressly limits acceptance to the terms of [its offer]' under § 2-207(2)(a), or the buyer does not accept the seller's counteroffer under the second clause of § 2-207[1]), a contract nonetheless is formed under subsection (3) of § 2-207 if their subsequent conduct—for instance, the seller ships and the buyer accepts the goods—demonstrates that the parties believed that a binding agreement had been formed.

*Id.* (cleaned up & emphasis added); see *JOM, Inc. v. Adell Plastics, Inc.*, 193 F.3d 47, 53-54 & n.5 (1st Cir. 1999) (adopting identical interpretation of § 2-207); accord 14D Mass. Prac., Summary of Basic Law § 15:6 (5th ed.) (same rules).

**B. Foxconn's free-license clause is knocked out of the parties' contract under § 2-207(3).**

As Foxconn agrees, this case presents a "battle of the forms" analysis under "UCC § 2-207." Appx773-74. And under *Commerce & Industry's* three routes of contract formation under § 2-207, the undisputed facts demonstrate that the "third" avenue of contract formation under § 2-207(3) applies here.

No contract was formed under *Commerce & Industry's* "first" avenue of contract formation. Vicor's SOA "made [acceptance] 'expressly conditional' on the buyer's assent to any additional or different terms," just as the seller's form did in

*Commerce & Industry*.<sup>9</sup> Vicor’s SOAs thus never functioned as an acceptance under § 2-207(1), because they required as a predicate to contract formation that Foxconn expressly assent to the Vicor Terms. No assent occurred and as such, no contract was formed under § 2-207(1). *Comm. & Indus.*, 742 N.E.2d at 570-71.

Nor was any contract formed under the “second” avenue of contract formation. Vicor’s SOA “ma[d]e its acceptance ‘expressly conditional’ on the buyer’s assent to any additional or divergent terms in the [SOA].” *Id.* at 571–72; *see* Appx12106, Appx12134, Appx12136. As a result, each SOA was “merely a counteroffer, and a contract is formed [under subsection (1) of § 2–207] only when the buyer expresses its affirmative acceptance of the seller’s counteroffer.” 742 N.E.2d at 571–72. The record here, however, contains no indication that Foxconn “expresse[d] its affirmative acceptance of [Vicor’s] counteroffer.” *Id.*; *see PCS Nitrogen Fertilizer, L.P. v. Christy Refractories, L.L.C.*, 225 F.3d 974, 980 (8th Cir. 2000) (explaining that “specific and affirmative assent to the seller’s counter-offer is necessary to create a contract”).

Instead, in each transaction between the parties, a contract was formed by the “third” avenue of contract formation under *Commerce & Industry*. Although the

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<sup>9</sup> *Compare* 742 N.E.2d at 571 (“The acceptance of any order entered by [buyer] is expressly conditioned on [buyer’s] assent to any additional or conflicting terms contained herein.”), *with* Appx12106 (“Vicor’s express acceptance . . . of a Purchase Order is expressly conditioned on Buyer’s assent to these Terms.”).

parties' writings do not and cannot create a contract, the parties' conduct demonstrated the existence of a contract: after sending an SOA, Vicor shipped the goods, and Foxconn paid for them. *See* Appx12198, Appx12202, Appx12216, Appx12234. The parties' "conduct . . . demonstrate[d] that the parties believed that a binding agreement had been formed." 742 N.E.2d at 572; *accord Transwestern Pipeline Co. v. Monsanto Co.*, 46 Cal. App. 4th 502, 516 (1996) (applying § 2-207(3) to resolve dispute over conflicting limitation-of-liability clauses, where parties repeatedly bought and sold goods with conflicting preprinted forms over 12-year relationship).

"In such [a] case the terms of the particular contract consist of those terms on which the writings of the parties agree, together with any supplementary terms incorporated under any other provisions of [Chapter 106 of the Massachusetts UCC]." § 2-207(3). The "writings of the parties" do not "agree" on any aspect of IP licensing; they are diametrically opposed. *See infra*, at Section II. Foxconn's free-license clause is thus excluded from the contract, and none of UCC's "gap-fillers" provide for a transfer of intellectual property rights from one party to another. *See, e.g., JOM, Inc.*, 193 F.3d at 56 (identifying standard UCC "gap fillers").

Section 2-207(3) "addresses the precise situation we have here: 'In many cases, as where goods are shipped, accepted and paid for before any dispute arises, there is no question whether a contract has been made . . . . The only question is what

terms are included in the contract, and subsection (3) furnishes the governing rule.” *Transwestern*, 46 Cal. App. 4th at 515 (quoting § 2-207, cmt. 7).<sup>10</sup> And the result is precisely what the UCC drafters intended: “to put aside the formal and academic stereotypes of traditional doctrine of offer and acceptance and to analyze instead what really happens,” and in so doing, avoid “the imposition of harsh terms upon a party merely as a result of his or her accepting a price quotation of a purchase order form.” 2 Lawrence’s Anderson on the Uniform Commercial Code § 2-207:5 (3d ed.).

**II. The Commission erred in relying on Foxconn’s “email acceptance” theory to find that Vicor had “accepted” PO 176 by Peter Goodwin’s October 1 email.**

The Commission reversibly erred when it adopted Foxconn’s “email acceptance” theory and concluded that the October 1 Goodwin email “[p]roviding

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<sup>10</sup> *Standard Bent Glass Corp. v. Glassrobots Oy*, 333 F.3d 440, 445 (3d Cir. 2003) (“[i]n a commercial transaction involving the sale of goods, where the parties’ performance demonstrates agreement, [courts] look past disputes over contract formation and move directly to ascertain its terms”); *Waukesha Foundry, Inc. v. Indus. Eng’g, Inc.*, 91 F.3d 1002, 1007 (7th Cir. 1996) (when “it is clear that the parties exchanged writings containing different terms” and “the course of conduct by both parties demonstrates the existence of a series of contracts for the sale of castings,” “[t]here is no need to identify at precisely what point in time each contract of sale between [buyer] and [seller] came into being”); *accord* § 2-204(2) (“An agreement sufficient to constitute a contract for sale may be found even though the moment of its making is undetermined.”); *see also, e.g., McJunkin Corp. v. Mechanicals, Inc.*, 888 F.2d 481, 483–87 (6th Cir. 1989) (applying § 2-207(3) where the parties performed and the seller’s acceptance form was made expressly conditional on the buyer’s assent to its terms); *Diamond Fruit Growers, Inc. v. Krack Corp.*, 794 F.2d 1440, 1443–45 (9th Cir. 1986) (same).

shipment dates was a ‘definite and reasonable [*sic*] expression of . . . written confirmation’” under § 2-207(1), thereby binding Vicor to all of the Foxconn Terms without reservation. Appx120 (ellipsis in original). Under the Commission’s flawed analysis, Goodwin’s email was an “acceptance” because a separate provision of the UCC, § 2-206, provides that an offer invites acceptance “in any manner and by any medium reasonable in the circumstance.” § 2-206(1)(a). And because “[t]he POs did not specify acceptance via an SOA, and nothing in the email correspondence from Vicor’s employees stated that the response was not final pending an SOA[,] [a]n email response to an email PO is facially reasonable and sufficient under Massachusetts law.” Appx120. The Commission erred for five independent reasons, each detailed below.

**A. Peter Goodwin’s October 1 email did not include any objective manifestation of assent to PO 176.**

Section 2-207 is intended to address a scenario in which a party provides a definitive acceptance of a contractual offer, but in doing so attempts to impose different or additional terms from those in the offer. As Comment 1 to § 2-207 explains, a “definite and seasonable expression of acceptance” refers to the prototypical “wire or letter *expressed and intended* as an acceptance,” as happens with “the exchange of printed purchase order and acceptance (sometimes called ‘acknowledgment’) forms.” Peter Goodwin’s email providing four “ship date[s]” in response to FII’s request for an “update on the docking status of [PO 176]” does not

fit this bill because it contains no objective expression of acceptance. Accordingly, the email did not purport to form a contract, and § 2-207's rules for determining the resulting contract terms simply do not apply.

The Seventh Circuit's decision in *Echo, Inc. v. Whitson Co., Inc.*, 121 F.3d 1099 (7th Cir. 1997), rejected an argument nearly identical to the erroneous "email acceptance" theory the Commission adopted here. And it explains why correspondence that merely clarifies certain terms in an order is not a "definite and seasonable expression of acceptance" where it does not use any language of acceptance—even when considering that § 2-206(a)(1) permits acceptance "in any manner and by any medium reasonable in the circumstance."

In *Echo*, a dispute arose between a buyer (PTC, distributor of power tools) and a seller (Echo, manufacturer of power tools) about whether seller-Echo "accepted" buyer-PTC's purchase order, which "requested Echo to deliver the equipment in installments over the period between December 1992 and July 1993." 121 F.3d at 1101. Seller-Echo sent buyer-PTC a letter that "mention[ed] three enclosed computer reports 'recapping your 1993 Spring Booking of Units and Accessories,'" and "state[d] that the computer reports should be helpful 'when reconciling your order' and that '[i]t is extremely important to verify that the information on these reports matches your records' because 'mistakes and omissions can sometimes occur' when entering the orders into the computer." *Id.* Buyer-PTC

argued that “Echo’s . . . letter signaled Echo’s acceptance of the [Purchase] Order.” *Id.* at 1103. And it supported its argument by pointing to the same provision of § 2-206(1)(a) that the Commission relied on here. *Id.*

In rejecting buyer-PTC’s argument, the Seventh Circuit explained that “the UCC retains the basic common law requirements of offer, acceptance, and consideration,” and that “[e]ven though the ‘modes of a valid acceptance may be varied, the requirement of an acceptance by the offeror still exists.’” *Id.* (citation omitted). Under that standard, the court held that seller-Echo’s letter was not an acceptance because it “does not use the vocabulary of acceptance.” *Id.* Although the computer reports “recap[ped]” the buyer-PTC’s order and reflected the seller’s entry of order details into its computer system, the letter “reveal[ed] a clarification purpose rather than any commitment to provide the goods PTC requested.” *Id.*

So too here. The language of the October 1 Goodwin email, whether read alone or in the full context of the parties’ transactions, confirms that it was not “*expressed and intended as an acceptance*” of PO 176. § 2-207, cmt. 1. The email “does not use [any] vocabulary of acceptance.” *Echo*, 121 F.3d at 1103. And no record evidence suggests that anyone understood it to be an acceptance either.

FII’s own email responses to the October 1 Goodwin email confirm that no one understood Goodwin’s email to be an acceptance. Three days later, FII’s Carolyn Lee asked: “Can you tell me when the next delivery is coming and verify

that it is coming direct here from MA.” Appx11357. Then, on October 5, Lee *again* asked Goodwin: “Do you have an update on the status of the PO’s?” *Id.*

Foxconn’s witness on this issue also admitted at the evidentiary hearing that the Goodwin email *was not even a confirmation* of shipment dates because the details had not been finalized:

Q. For instance, let’s go to RX-1631C, which you relied on in your witness statement. This is the e-mail in which you say that Vicor accepted a purchase order from FII USA, correct?

A. Well, I don’t see a sentence here. ***Looks like they are still trying to get some confirmation.***

Appx10414:6-11 (emphasis added). When presented with Goodwin’s October 1 email again, Foxconn’s witness similarly testified:

Q. Now, you testified in your witness statement that once Mr. Goodwin sent the response to RX-1631C giving tentative ship dates, “There was no doubt that Vicor was going to fulfill purchase order” -- the 176 purchase order, right?

A. Well, I mean, I -- I don’t know. I mean, is this the -- you know, I mean, there are some still -- ***it doesn’t look like it’s final yet.*** I mean, ***I think there’s still some back and forth thing that’s actually going to confirm, right?*** The ship dates and the receiving dates and all of those things. So I -- what are you trying to tell me here?

Appx10419:11-21 (emphasis added). Foxconn’s witness also testified that he understood that a “PO is binding” only “whenever there’s no more questions and . . . all the questions are resolved,” and agreed that, as of October 5, 2021 (four

days after Goodwin sent his email): “Q. . . . [i]t’s apparent that there were still questions, right? A. Right.” Appx10420:25-10421:2.

Even under the UCC’s more flexible standards for offer and acceptance, “the purported acceptance must still be certain enough to evince mutual assent.” *Stanwood Boom Works, LLC v. BP Expl. & Prod., Inc.*, 476 F. App’x 572, 575 (5th Cir. 2012). And nothing in the October 1 email, “considered in the full context of the parties’ negotiations, . . . evince[d] such assent.” *Id.*; see *McCarty v. Verson Allsteel Press Co.*, 89 Ill. App. 3d 498, 510 (1980) (§ 2-207(1) “does not change the basic common law requirement that there must be an objective manifestation of mutual assent”).

**B. The Commission ignored the parties’ course of dealing, which confirmed that Vicor could accept a PO only by sending an SOA.**

“[A] course of dealings” between the parties may inform what can reasonably be construed as an acceptance. *Ismert & Assocs., Inc. v. New England Mut. Life Ins. Co.*, 801 F.2d 536, 541–42 (1st Cir. 1986); see § 1-303(b) (“A ‘course of dealing’ is a sequence of conduct concerning previous transactions between the parties to a particular transaction that is fairly to be regarded as establishing a common basis of understanding for interpreting the parties’ expressions and other conduct.”).

Here, the Commission erred in finding that Peter Goodwin’s email was an acceptance of PO 176, given that the Vicor Terms that Foxconn received in the course of hundreds of prior transactions state that: (1) Vicor can accept a PO *only*

“through delivery of a SOA to buyer,” and (2) no Vicor employee is “authorized by Vicor” to alter those terms. Appx12106. As the Massachusetts district court correctly held: “the parties’ conduct, in the form of their course of dealing, demonstrates that [Foxconn] w[as] aware that Vicor did not authorize its [sales representatives] to negotiate contract terms with its buyers.” *Vicor*, 2024 WL 3548786, at \*13.

Courts routinely find that a prior course of dealing may be established with an exchange of forms that put one party on notice of the other party’s terms. In *Rational Software Corp. v. Sterling Corp.*, the First Circuit applying Massachusetts law held that a carrier had put a shipper on notice of its limitation-of-liability terms through 200 prior transactions in which the carrier had supplied the shipper with a bill of lading containing the terms. 393 F.3d 276, 279–80 (1st Cir. 2005); *see also Ins. Co. of N. Am. v. NNR Aircargo Serv. (USA), Inc.*, 201 F.3d 1111, 1115 (9th Cir. 2000) (“actual notice” of terms sent in 47 prior transactions is not required to establish a course of dealing). And in *Schulze & Burch Biscuit Co. v. Tree Top, Inc.*, the Seventh Circuit held that an arbitration clause contained in a seller’s “confirmation form” sent repeatedly in nine prior transactions “g[a]ve notice to [the buyer] that an arbitration clause would likely be included in” the seller’s form. 831 F.2d 709, 714 (7th Cir. 1987); *accord Mid-S. Packers, Inc. v. Shoney’s, Inc.*, 761 F.2d 1117, 1123 (5th Cir. 1985) (“[T]he extensive course of dealing between the two parties clearly indicated to [buyer] that the [seller’s] invoices would follow [the buyer’s] purchase

orders and, [buyer] having received several of the invoices in prior transactions, the interest and collection costs terms came as no surprise to [buyer].”<sup>11</sup>

The Commission did not challenge Vicor’s course-of-dealing evidence. Instead, it speculated that “[e]ven if Vicor always sent an SOA as alleged, there is no reason to conclude that the SOA, as opposed to the ‘courtesy emails,’ constituted confirmation in the parties’ course of dealing.” Appx120. There are three key flaws with this conclusion.

*First*, the course of dealing made clear that the emails would not constitute expressions of acceptance. The uncontroverted evidence showed that Foxconn had been notified of the Vicor Terms on hundreds of occasions prior to the emails at issue though (1) Vicor’s data sheets and quotations sent “before [Foxconn] ever place[s] an order,” (2) hundreds of SOAs, and (3) invoices sent after an order was fulfilled. Appx10966:18-24. For example, Foxconn received at least 400 SOAs with Vicor Terms prior to the transactions at issue, Appx12193, a point that neither Foxconn witness contested. And it is undisputed that the Vicor Terms that Foxconn repeatedly received state clearly that the sole means to accept a PO is through

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<sup>11</sup> Conversely, a repeated exchange of competing forms over a 12-year relationship, with each side’s form containing divergent terms, indicates that the parties “have not reached an agreement over the terms in dispute.” *Transwestern*, 46 Cal. App. 4th at 516. The fact that the record contains no evidence that Vicor accepted or agreed to the Foxconn Terms confirms that Vicor did not “accept” those terms with a single email responding to a request for estimated shipment dates.

Vicor’s “delivery of a SOA to buyer,” and that no Vicor employee was authorized to alter those terms. Appx12106.

*Second*, “[t]here is no evidence in the record to support the [Commission’s] assertion that” the parties had a shared understanding that Vicor accepted POs by email in contravention of their course of dealing. *Rambus Inc. v. Rea*, 731 F.3d 1248, 1257 (Fed. Cir. 2013). Nor could the Commission have reached such a conclusion, as no record evidence supports the theory that the parties shared a custom or “common basis of understanding” that Vicor accepted POs by email. § 1-303(b). When asked, “You, sir, don’t have any basis to deny that sending a sales order acknowledgment is a standard part of Vicor’s process for accepting a PO, right?,” Foxconn’s witness responded: “I cannot deny that.” Appx10423:24-10424:2.

*Third*, the Commission’s reference to a “confirmation” is inapt because under § 2-207(1), a “confirmation” is a written confirmation of a prior informal agreement, and there was no prior informal agreement. As explained in Section II.E below, the Commission erroneously conflated the distinct concepts of a “definite and seasonable expression of acceptance” and a “written confirmation” under § 2-207(1), thereby erroneously concluding that a mere “confirmation” email necessarily constitutes a legally binding “acceptance” under § 2-207(1).

In short, just as the ALJ and Massachusetts district court both correctly concluded, through hundreds of prior transactions, Foxconn had been put “on notice

of Vicor’s position that its SOAs were Vicor’s only method of acceptance of a PO, and that agreements were formed only upon Vicor’s terms and conditions—terms which [Vicor sales representatives] could not alter.” *Vicor*, 2024 WL 3548786, at \*13; Appx337. On the other hand, *no* evidence suggests a common understanding that Vicor “accepted” POs by email. The Commission erred in holding otherwise.

**C. The Goodwin email is not an acceptance because its four “ship date[s]” differed materially from PO 176’s “delivery date.”**

The October 1 Goodwin email cannot operate as an acceptance because it estimated “ship date[s]” that exceeded PO 176’s October 15, 2021 delivery date by 210 days at the earliest, and 231 days at the latest. Appx11358. As the ALJ and the Massachusetts district court both correctly concluded, even assuming that Foxconn POs could be an “offer” (they are not, *see infra* at II.C), Vicor’s response contained materially different terms and thus is not an acceptance. Appx337; *Vicor*, 2024 WL 3548786, at \*11-12.

In Massachusetts, “[i]t is axiomatic that to create an enforceable contract, there must be agreement between the parties on the material terms of that contract, and the parties must have a present intention to be bound by that agreement.” *Situation Mgmt. Sys., Inc. v. Malouf, Inc.*, 724 N.E.2d 699, 703 (Mass. 2000). As the First Circuit explained in *Lambert v. Kysar*, where a responsive writing “diverge[s] as to price, quality, quantity, or delivery terms,” the responsive writing “amount[s]

to a *rejection* of the original offer.” 983 F.2d 1110, 1115 (1st Cir. 1993) (quoting White, *et al.*, Uniform Commercial Code, § 2:14 (6th ed.) (emphasis added)).

Instructive here is *Alliance Wall Corp. v. Ampat Midwest Corp.* There, the court held that a seller’s multiple responses to a buyer’s purchase order containing divergent shipment dates did not constitute an acceptance of the purchase order, and that the parties formed a contract only by their subsequent conduct (performance) under § 2-207(3). 477 N.E.2d 1206, 1210–11 (Ohio App. 1984). In *Alliance Wall*, the buyer’s purchase order initially specified shipment “within five (5) weeks of” production, which the buyer modified by letter to be shipment “within seven (7) weeks of” the letter. *Id.* at 1208. In response, the seller sent an acknowledgement form specifying a “tentative shipping date” more than two weeks after the shipment date specified by the seller. *Id.* at 1210. The court concluded that the parties did not reach agreement through their competing writings because they differed as to the “dickered for” shipment date term. *Id.* at 1211. Even so, because “the goods were shipped and received, and the price was partially paid,” the “conduct by both parties [was] sufficient to establish a contract” under § 2-207(3), in which “the terms of the contract consist of the terms upon which the parties agreed together with the ‘gap-filler’ provisions of the Uniform Commercial Code.” *Id.*<sup>12</sup> So too here.

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<sup>12</sup> See also, *e.g.*, *Gen. Elec. Co. v. G. Siempelkamp GmbH & Co.*, 29 F.3d 1095, 1099 (6th Cir. 1994) (no acceptance where responsive form differed as to “dickered for” terms, including “delivery date”); *Jalor Color Graphics, Inc. v. Knoll Pharm. Co.*,

The Commission “disagree[d] with the Final ID (and District Court) that the email responses were not acceptances because they provided shipment dates different than specified” by FII. Appx121. But its only reasoning was that “the Foxconn Respondents gave no indication that the May 2022 delivery dates were unacceptable for PO ’176 patent [*sic*], nor did they indicate any intent to cancel the PO upon learning of the altered delivery dates.” *Id.* In other words, the Commission relied on Foxconn communications post-dating the purported acceptance to conclude that the delivery date was not a material term. But acceptance requires an objective manifestation of “a *present intention* to be bound,” *Malouf*, 430 Mass. at 878, which is ascertained “at the moment of [the purported contract’s] formation.” *Basis Tech. Corp. v. Amazon.com, Inc.*, 878 N.E.2d 952, 961 (Mass. App. 2008); *see Kelly v. Bensen*, 58 N.Y.S.3d 169, 172 (N.Y. App. 3d Div. 2017) (when determining mutual assent to “all material terms,” “the court looks not to the parties’ after-the-fact professed subjective intent, but rather at their objective intent as manifested by their expressed words and conduct at the time of the [alleged] agreement”).

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26 F. App’x 38, 39 (2d Cir. 2001) (“Here, as the district court correctly found, the parties did not reach agreement on such essential terms as . . . the dates of delivery and production”).

Foxconn's POs make clear that, at the time of the purported acceptance, the delivery date was material, and that Vicor did not accept the PO by sending estimated shipment dates that diverged from PO 176's delivery date by over six months:

- Note 1 specifies that the seller cannot alter the buyer's terms, stating:

Any different or additional provision provided by Seller in any acceptance, confirmation, or acknowledgement to this Purchase Order ('PO') is null and void.

Appx12173; *see also* Appx12216 (testifying that Foxconn includes Note 1 so "Vicor cannot try to change [the PO's] terms without getting proper agreement in writing from" Foxconn).

- General Term No. 6 specifies:

Seller shall deliver Products *in strict accordance with this PO, DN, and other delivery request provided by Buyer*. In case that any shipment will or may likely be delayed, Seller shall immediately notify Buyer of the reasons for and the effect of such delay. . . . *If Seller fails to deliver Products in a timely manner, in addition to the remedies under applicable laws, Buyer is entitled to penalty at 0.5% of the total Price of the delayed Products per day, starting from Delivery Date as specified in this PO and ending on the Delivery Completion Date. . . .*

Appx12174 (emphases added).

Foxconn's POs require strict adherence to the "Delivery Date," a requirement enforced by severe consequences, including daily financial penalties. *Id.* As a result, "the disparity between the POs and the dates offered in Vicor's emails indicate imperfect negotiations, with the latter dates best understood as counteroffers to the dates proposed by [Foxconn]." *Vicor*, 2024 WL 3548786, at \*12.

The Commission also erroneously relied on *Borden Chemical, Inc. v. Jahn Foundry Corp.*, 834 N.E.2d 1227 (Mass. App. 2005) to suggest that agreement as to “product, price, and quantity” creates a binding agreement. But that is a misreading of *Borden*. In *Borden*, the parties exchanged forms: a purchase order from the buyer and an invoice from the seller (who contemporaneously shipped the goods). There was no dispute that the seller had accepted by providing invoices. The only question was whether a specific indemnity term in the invoices became part of the resulting contract. *Id.* at 1229-30.

*Borden* is inapposite. The dispute in this case is not whether specific terms in an acceptance form should be incorporated into the parties’ agreement, but whether specific communications—Vicor’s emails—were acceptances in the first place. Section 2-207 applies only when there is “a definite and seasonable expression of acceptance or a written confirmation.” *Borden*’s *dicta* concerning the “essential components of the sale” at issue in that case, *id.* at 1231, does not explain this statutory language and thus has no bearing on whether the Vicor emails were acceptances. Further, in *Borden*, the parties’ arrangement was that individual shipments would be ordered by telephone (under the terms of an annual purchase order) and then shipped by the seller with a corresponding invoice. *Id.* at 1229. Accordingly, there was no issue regarding the *timing* of the shipments, as in the present case.

**D. Foxconn’s POs were not “offers” Vicor could accept.**

“An offer is the manifestation of willingness to enter into a bargain made in such a way as to justify the other person in understanding that his assent will conclude the agreement.” *N. Beacon 155 Assocs., LLC v. Mesirow Fin. Interim Mgmt., LLC*, 135 F. Supp. 3d 1, 5 (D. Mass. 2015) (citation omitted). Foxconn’s POs were not “offers” that Vicor could accept because they provided “that the PO alone does not obligate [Foxconn] to buy anything, even should Vicor ‘accept’ the PO.” *Vicor*, 2024 WL 3548786, at \*10.

The language of Foxconn’s POs confirms that the PO itself cannot be “accepted” (such that the buyer would be bound by a promise to perform) without additional action by the buyer:

- Note 6 states that “This PO and any particular DN or delivery request issued by Buyer constitute an independent and complete agreement between both parties. This PO ***shall not constitute Buyer’s purchase obligation without DN or other delivery requests.***” Appx12173 (emphasis added). Note 6 also states that “Final quantity and/or delivery date shall be subject to the provisions of the most current DN or other delivery requests.” Appx12173.
- Note 3 reinforces that no agreement may be formed without a “DN” or “delivery request” by requiring that the Seller “shall perform all

obligations under this PO *and DN or other delivery requests.*”

Appx12173.

- Note 4 confirms that the PO itself is not a delivery request, because it specifies that the “order of precedence in case of conflict among the following documents shall be (1) *DN or other delivery requests*, (2) *PO*; (3) Purchase Agreement.” Appx12173.

As the Massachusetts district court correctly held, there is “no doubt that Defendants (who are the “Buyer”) must issue a ‘DN or delivery request’ before an agreement is formed pursuant to this plain language.” *Vicor*, 2024 WL 3548786, at \*10. As a result, “each individual PO was merely an invitation to negotiate or to discuss a purchase-and-sale arrangement.” *Id.* at \*11.

Foxconn’s POs also were not offers because they provided no consideration. *See Neuhoff v. Marvin Lumber and Cedar Co.*, 370 F.3d 197, 201 (1st Cir. 2004) (“A contract must have consideration to be enforceable”); *Crellin Techs., Inc. v. Equipmentlease Corp.*, 18 F.3d 1, 7 (1st Cir. 1994) (“[t]he law requires mutuality of obligation as a prerequisite to a binding bilateral contract.”); *Gill v. Richmond Co-op. Ass’n*, 309 Mass. 73, 80 (1941) (“Since the plaintiffs bound themselves to nothing, the defendant received no consideration . . .”). Foxconn’s POs contained no promises. They expressly disavowed any commitment to purchase goods without first sending another document—a “DN or other delivery request.” Since the PO

“bound [Foxconn] to nothing,” *Gill*, 309 Mass. at 80, Vicor received no consideration at the time of the supposed acceptances, and no contract was formed.

The Commission did not dispute that Foxconn’s POs “require that Foxconn send a ‘DN or other delivery request.’” Appx121. But it concluded, with no reasoning, that “Lee’s September 27, 2021 email transmitting the PO [and] ask[ing] Vicor to ‘confirm ETA asap’” constituted a “delivery request.” *Id.* The Commission’s reasoning withstands no scrutiny. The PO makes clear that a “DN” or “delivery request” will specify a date certain for delivery, which the seller must comply with: “Final . . . delivery date shall be subject to the provisions on the most current DN or other delivery requests.” Appx12173. An email asking the seller to “confirm [*estimated* time of arrival]” for a pending PO is not a specification of a date certain; at most, it is an inquiry about feasible dates for Vicor, without obligating Foxconn to purchase the goods (per note 6).<sup>13</sup> Foxconn’s POs thus were not “offers” that could be accepted.

**E. The Commission erred by concluding that the October 1 Goodwin Email was a “written confirmation” under § 2-207(1).**

The Commission independently erred in concluding that Goodwin’s October 1 email was a “definite and reasonable [sic] expression of . . . *written confirmation*.”

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<sup>13</sup> The fact the PO requires “*strict accordance* with this PO, DN, and other delivery request” confirms that Goodwin’s response with substantially divergent “ship date[s]” was not an expression of acceptance to such “strict” terms.

Appx120 (quoting § 2-207(1)). Throughout its decision, the Commission concluded that the October 1 email bound Vicor to PO 176 because it served as a “written confirmation from the seller” and might have “constituted *confirmation* in the parties’ course of dealing,” Appx120, thereby rendering it a binding acceptance under § 2-207(1). This was clear error.

As Comment 1 explains, § 2-207(1) “is intended to deal with two typical situations.” One is a “written confirmation” that is sent *after* a prior oral or informal agreement is reached. § 2-207, cmt. 1. The other is a “definite and seasonable expression of acceptance,” which is a document “expressed and intended as an acceptance,” like an “acceptance ([or] ‘acknowledgment’) form[.]” *Id.* Goodwin’s October 1 email cannot be a “written confirmation” under § 2-207, as there was no prior agreement to “confirm.”

The Seventh Circuit in *Echo* repudiated the Commission’s precise logic when it rejected the appellant’s attempt to treat a “confirmation” as an “acceptance” under § 2-207(1). As noted above, in *Echo*, the buyer argued that the seller had “accepted” the buyer’s purchase order when the seller sent a letter with computer records confirming the buyer’s purchase order. To circumvent the letter’s lack of any language of acceptance, the buyer argued “that even a ‘confirmation’ can operate as an acceptance” under § 2-207(1). *See* 121 F.3d at 1103 (arguing that “confirmation of a mere offer (like the recap letter here)” was sufficient). The Seventh Circuit

rejected this argument, explaining that “‘confirmation’ as used in the UCC refers to confirmation of *a prior agreement*.” *Id.* As such, merely confirming a purchase order does not constitute either a “definite and seasonable expression of acceptance” or a “written confirmation” under § 2-207(1).

The Commission thus independently erred when it concluded that “[p]roviding shipment dates was a ‘definite and reasonable [*sic*] expression of . . . *written confirmation*’” under § 2-207(1).

### **III. The Commission’s reasoning for finding that Vicor “accepted” Ingrasys’s PO 265 cannot be discerned from the record.**

The Commission erred in concluding, without any evidentiary basis or reasoned explanation, that Vicor “accepted” PO 265. The Commission mentions PO 265 in only four places in its “Analysis,” Appx121, Appx122, and in none of them does the Commission pinpoint when, how, and by what means Vicor “accepted” the PO. Regardless, no such acceptance occurred for the same reasons explained in Sections II.A-E above in connection with PO 176:

(1) The June 13, 2023 Vicor email that Foxconn cites as “acceptance” of PO 265, Appx11499, did not include any objective manifestation of assent. *Vicor*, 2024 WL 3548786, at \*12. Vicor merely identified a quantity for shipment and a ship date. Appx11499. Vicor then requested that Foxconn revise the terms of PO 265, which Foxconn did, resulting in transmission of a new PO 265. Appx11506-07 (attachment 4500273265.pdf); Appx11514. In response to the revised PO 265, Vicor

responded with its SOA, just as it had in the hundreds of prior transactions. Appx11265-66 (dated June 13, 2023 eastern standard time / GMT -5). The intermediary email providing a ship date and quantity thus could not be considered an objective manifestation of assent to the terms of PO 265, which was sent *after* the purported “acceptance email.”

(2) The Commission ignored the parties’ course of dealing, which confirmed that Vicor could accept PO 265 only by sending an SOA. There is no record evidence to suggest that the parties had a shared understanding that Vicor would accept PO 265 by email in contravention of that course of dealing.

(3) The ship date that Vicor included in its purported “acceptance” email differed from PO 265’s “delivery date” by approximately seven weeks. *Compare* Appx11514, *with* Appx11499. Because Vicor’s response contained materially different terms, it was not an acceptance. *See* Appx11514 (requiring strict adherence to its “Delivery Date”).

(4) PO 265 was not an “offer” Vicor could accept for the same reasons noted above, as to PO 176.

(5) The June 13, 2023 Vicor email was not a “written confirmation” under § 2-207(1) because there was no prior agreement to “confirm.”

## CONCLUSION

The Court should reverse the Commission's decision finding that Vicor gave Foxconn a free license to Vicor patents embodied in the goods Foxconn purchased from Vicor.

Dated: January 2, 2026

Respectfully submitted,

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# ADDENDUM

**UNITED STATES INTERNATIONAL TRADE COMMISSION  
Washington, D.C.**

**In the Matter of**

**CERTAIN POWER CONVERTER  
MODULES AND COMPUTING  
SYSTEMS CONTAINING THE SAME**

**Investigation No. 337-TA-1370**

**NOTICE OF THE COMMISSION'S FINAL DETERMINATION FINDING A  
VIOLATION OF SECTION 337; ISSUANCE OF A LIMITED EXCLUSION ORDER  
AND CEASE AND DESIST ORDERS; TERMINATION OF THE INVESTIGATION**

**AGENCY:** U.S. International Trade Commission.

**ACTION:** Notice.

**SUMMARY:** Notice is hereby given that the U.S. International Trade Commission has found a violation of section 337 in the above-captioned investigation. The Commission has determined to issue: (1) a limited exclusion (“LEO”) prohibiting the unlicensed entry of infringing power converter modules and computing systems containing the same that are manufactured by or on behalf of, or imported by or on behalf of, the respondents; and (2) cease and desist orders (“CDOs”) against certain respondents. The investigation is terminated.

**FOR FURTHER INFORMATION CONTACT:** Joelle P. Justus, Esq., Office of the General Counsel, U.S. International Trade Commission, 500 E Street, S.W., Washington, D.C. 20436, telephone (202) 205-2593. Copies of non-confidential documents filed in connection with this investigation may be viewed on the Commission’s electronic docket (EDIS) at <https://edis.usitc.gov>. For help accessing EDIS, please email [EDIS3Help@usitc.gov](mailto:EDIS3Help@usitc.gov). General information concerning the Commission may also be obtained by accessing its Internet server at <https://www.usitc.gov>. Hearing-impaired persons are advised that information on this matter can be obtained by contacting the Commission’s TDD terminal on (202) 205-1810.

**SUPPLEMENTARY INFORMATION:** On August 17, 2023, the Commission instituted this investigation under section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. 1337 (“section 337”), based on a complaint filed by Vicor Corporation (“Vicor”) of Andover, Massachusetts. *See* 88 FR 56050-51 (Aug. 17, 2023). The complaint, as supplemented, alleges a violation of section 337 based upon the importation into the United States, the sale for importation, and the sale within the United States after importation of certain power converter modules and computing systems containing the same by reason of the infringement of certain claims of U.S. Patent Nos. 9,166,481; 9,516,761; and 10,199,950. *See id.* The notice of investigation names the following respondents: Delta Electronics, Inc. of Taipei, Taiwan; Delta Electronics

(Americas) Ltd. of Fremont, California; Delta Electronics (USA) Inc. of Plano, Texas; Cyttec Co., Ltd. of Hsinchu, Taiwan; Quanta Computer Inc. and Quanta Cloud Technology Inc., both of Taoyuan City, Taiwan; Quanta Cloud Technology USA LLC of San Jose, California; Quanta Computer USA Inc. of Fremont, California; Hon Hai Precision Industry Co. Ltd. (d/b/a, Foxconn Technology Group) of Taipei City, Taiwan; Foxconn Industrial Internet Co. Ltd. of Shenzhen, China; FII USA Inc. (a/k/a Foxconn Industrial, Internet USA Inc.) of Milwaukee, Wisconsin; Ingrasys Technology Inc. of Taoyuan City, Taiwan; and Ingrasys Technology USA Inc. of Fremont, California (collectively, “Respondents”). *See id.* The Office of Unfair Import Investigations (“OUII”) is also a party to the investigation. *See id.*

On January 25, 2024, the Commission partially terminated the investigation as to respondents Delta Electronics (USA) Inc., Quanta Cloud Technology Inc., and Quanta Cloud Technology USA LLC based on withdrawal of the complaint as to those respondents. *See Order No. 16 (Dec. 22, 2023), unreviewed by Comm’n Notice (Jan. 25, 2024).*

On January 26, 2024, the Commission amended the complaint and notice of investigation to add DET Logistics (USA) Corporation of Fremont, California as a respondent. *See Order No. 18 (Jan. 2, 2024), unreviewed by Comm’n Notice (Jan. 26, 2024).*

On March 22, 2024, the ALJ granted in part Respondents’ motion for summary determination of no infringement of any patent under the doctrine of equivalents. *See Order No. 37.* The Commission determined not to review the partial grant of summary determination. *See Comm’n Notice (Apr. 23, 2024).*

On September 27, 2024, the ALJ issued the Final ID finding a violation of section 337. The Final ID finds, *inter alia*: (1) as to the ’481 patent, the accused power converter modules manufactured by or on behalf of Cyttec (“Cyttec Products”) infringe asserted claim 1 but that the accused power converter modules manufactured by or on behalf of Delta (“Delta Products”) and certain asserted redesign products do not infringe claim 1, asserted claim 1 is not invalid, and certain asserted domestic industry products practice asserted claim 1; (2) as to the ’761 patent, the accused Delta Products infringe asserted claims 1-7, claims 1-3 and 7 are invalid as anticipated, claims 4-6 are not invalid for obviousness or indefiniteness, and the asserted domestic industry products practice claims 1-7; (3) as to the ’950 patent, the accused Delta and Cyttec Products do not infringe asserted claims 9, 13, 14, and 33-38, the asserted claims are not invalid for obviousness, and the domestic industry products do not practice any asserted claim; (4) Respondents do not have a license to practice the asserted patents; and (5) Vicor has satisfied the domestic industry requirement of section 337 with respect to each of the asserted patents.

The ALJ also issued a Recommended Determination on remedy and bonding (“RD”). The RD recommends that, if the Commission finds a violation, it should issue a limited exclusion order. The RD also recommends the issuance of cease and desist orders as to all Respondents. The RD further recommended that the Commission set a bond of zero percent (0%) as to the Cyttec Products and various bond amounts as to the other infringing products imported during the period of Presidential review.

On October 29, 2024, Vicor and respondent FII USA submitted public interest comments pursuant to Commission Rule 210.50(a)(4) (19 CFR 210.50(a)(4)). No submissions were filed in response to the Commission's *Federal Register* notice seeking submissions on the public interest. *See* 89 FR 80604-05 (Oct. 3, 2024).

On October 11, 2024, Vicor filed a petition for review of the Final ID's findings concerning: (1) as to the '481 patent, no infringement by the Delta accused products and certain aspects of the Final ID's validity analysis; (2) as to the '761 patent, that certain claims are invalid as anticipated and certain subsidiary aspect of the Final ID's remaining validity analysis; (3) as to the '950 patent, no infringement, that the domestic industry products do not practice any asserted claim, and certain aspects of the Final ID's economic prong analysis; and (4) as to all patents, that Vicor has not shown the secondary indicia of non-obviousness of copying. Also on October 11, 2024, Respondents filed a petition for review of the Final ID's findings concerning: (1) as to the '481 patent, that claim 1 is not invalid as obvious; (2) as to the '761 patent, that the accused products infringe the asserted claims and claims 4-6 are not invalid as obvious; (3) as to the '950 patent, that the asserted claims are not invalid as obvious; (4) certain of the ALJ's pre-hearing orders; and (5) that Vicor has satisfied the economic prong as to each Asserted Patent. On October 21, 2024, OUII filed a combined response to the petitions. On October 22, 2024, Vicor and Respondents each filed responses to the other party's petition.

On December 4, 2024, the Commission determined to review the Final ID in part. 89 FR 99278-80 (Dec. 10, 2024). Specifically, the Commission determined to review the Final ID's findings regarding: (1) as to the '481 patent, whether the accused Delta Products infringe claim 1 and whether Vicor has demonstrated commercial success to overcome a finding of prima facie obviousness; (2) as to the '761 patent, whether the accused Delta Products infringe asserted claims 1-7 and whether the asserted claims are valid; (3) as to the '950 patent, whether the accused Delta and Cyntec Products and redesign products infringe asserted claims 9, 13, 14, and 33-36 and whether Vicor showed the domestic industry products practice any asserted claim; (4) whether Vicor has satisfied the economic prong of the domestic industry requirement as to all of the asserted patents; and (5) the license defense asserted by respondents FII USA, Inc., Ingrasys Technology, Inc., and Ingrasys Technology USA Inc. The Commission determined not to review the remainder of the Final ID's findings. *Id.* at 99278. The Commission requested briefing from the parties on certain issues under review, and from the parties, interested government agencies, and other interested persons on the issues of remedy, the public interest, and bonding. *Id.* at 99279-80.

On January 7, 2025, Vicor and OUII filed their written submissions on the issues under review and on remedy, public interest, and bonding. On January 8, 2025, the Chair granted Respondents' request to file out of time their written submission on the issues under review and on remedy, public interest, and bonding. On January 15, 2025, the parties filed their reply submissions. The Commission did not receive comments on the public interest from non-parties.

Having examined the record in this investigation, including the Final ID, the petitions for review, and the responses thereto, the Commission has determined to find a violation of section 337 as to the '481 and '761 patents and to find no violation as to the '950 patent. As set forth in

the simultaneously-issued Commission opinion, as to the issues on review, the Commission finds as follows:

- As to the '481 patent: affirm the Final ID's finding that the accused Delta Products do not infringe claim 1 and take no position regarding whether Vicor has demonstrated commercial success as a secondary consideration of non-obviousness.
- As to the '761 patent: affirm the Final ID's finding that the accused Delta Products infringe claims 1-7; reverse the Final ID's finding that claims 1-3 and 7 are invalid as anticipated and/or obvious; affirm in part and take no position in part regarding Vicor's purported secondary considerations of non-obviousness; and otherwise affirm the Final ID's finding that the asserted claims are not invalid.
- As to the '950 patent: affirm the Final ID's finding that the accused Delta and Cyntec Products and the asserted redesign products do not infringe claims 9, 13, 14, and 33-36; and affirm the Final ID's finding that Vicor has failed to show the domestic industry products practice at least one asserted claim.
- Reverse the Final ID and find FII USA, Inc. and Ingrasys Technology, Inc. have a license to the '761 patent.
- Affirm with modified reasoning the Final ID's finding that Vicor has satisfied the economic prong of the domestic industry requirement as to the '481 and '761 patents and take no position regarding whether Vicor satisfied the economic prong of the domestic industry requirement as to the '950 patent.

The Commission otherwise affirms the findings and analysis of the Final ID that are not inconsistent with the Commission's opinion.

The Commission has determined that the appropriate form of relief is an LEO prohibiting the unlicensed entry of infringing power converter modules and computing systems containing the same manufactured by or on behalf of Respondents or any of their affiliated companies, parents, subsidiaries, or other related business entities, or their successors or assigns. The Commission has also determined to issue CDOs to respondents Delta Electronics (Americas) Ltd., FII USA Inc., Ingrasys Technology USA Inc., Quanta Computer Inc., and Quanta Computer USA Inc.

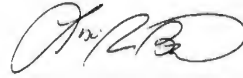
The Commission has further determined that the public interest factors enumerated in subsections (d)(1) and (f)(1) (19 U.S.C. 1337(d)(1), (f)(1)) do not preclude issuance of the above-referenced remedial orders. Additionally, the Commission has determined to impose a bond of zero percent (0%) as to Cyntec Products, and various bond amounts as to the other infringing products imported during the period of Presidential review (19 U.S.C. 1337(j)).

The investigation is terminated.

The Commission vote for this determination took place on February 13, 2025.

This action is taken under the authority of section 337 of the Tariff Act of 1930, as amended (19 U.S.C. 1337), and in Part 210 of the Commission's Rules of Practice and Procedure (19 CFR Part 210).

By order of the Commission.

A handwritten signature in black ink, appearing to read 'Lisa R. Barton', enclosed in a faint rectangular box.

Lisa R. Barton  
Secretary to the Commission

Issued: February 13, 2025

**PUBLIC VERSION**

**UNITED STATES INTERNATIONAL TRADE COMMISSION  
Washington, D.C.**

**In the Matter of**

**CERTAIN POWER CONVERTER  
MODULES AND COMPUTING  
SYSTEMS CONTAINING THE SAME**

**Investigation No. 337-TA-1370**

**LIMITED EXCLUSION ORDER**

The United States International Trade Commission (“Commission”) has determined that there is a violation of section 337 of the Tariff Act of 1930, as amended (19 U.S.C. § 1337), in the unlawful importation, sale for importation, or sale within the United States after importation by respondents Delta Electronics, Inc., Delta Electronics (Americas) Ltd., and DET Logistics (USA) Corporation (collectively, “Delta”); Cyntec Co., Ltd. (“Cyntec”); Hon Hai Precision Industry Co. Ltd. (d/b/a, Foxconn Technology Group), Foxconn Industrial Internet Co. Ltd., and FII USA Inc. (a/k/a Foxconn Industrial, Internet USA Inc.) (collectively, “Foxconn”); Ingrasys Technology Inc. and Ingrasys Technology USA Inc. (collectively, “Ingrasys”); and Quanta Computer Inc. and Quanta Computer USA Inc. (collectively, “Quanta”) of certain power converter modules and computing systems containing the same (as defined in paragraph 2 below) that infringe one or more of claim 1 of U.S. Patent No. 9,166,481 (“the ’481 patent”) and claims 1-7 of U.S. Patent No. 9,516,761 (“the ’761 patent”) (collectively, “the Asserted Patents”).

Having reviewed the record in this investigation, including the written submissions of the parties, the Commission has made its determinations on the issues of remedy, the public interest, and bonding. The Commission has determined that the appropriate form of relief is a limited exclusion order prohibiting the unlicensed entry of infringing power converter modules and

computing systems containing the same manufactured by or on behalf of Respondents or any of their affiliated companies, parents, subsidiaries, agents, or other related business entities, or their successors or assigns.

The Commission has also determined that the public interest factors enumerated in 19 U.S.C. § 1337(d) do not preclude the issuance of the limited exclusion order, and that the bond during the period of Presidential review shall be in the amount of [

] of the entered value of power converter modules manufactured by or on behalf of any of the Delta Respondents (“Delta products”), zero percent (0%) bond on power converter modules manufactured by or on behalf of Cyntec (“Cyntec Products”), and one hundred percent (100%) bond on the entered value of all other articles subject to this order.

Accordingly, the Commission hereby **ORDERS** that:

1. Power converter modules and computing systems containing the same that infringe one or more of claim 1 of the ’481 patent and claims 1-7 of the ’761 patent and are manufactured abroad by, or on behalf of, or imported by or on behalf of Respondents or any of their affiliated companies, parents, subsidiaries, agents, or other related business entities, or their successors or assigns, are excluded from entry for consumption into the United States, entry for consumption from a foreign-trade zone, or withdrawal from a warehouse for consumption, for the remaining terms of the Asserted Patents, except under license from, or with the permission of, the patent owner or as provided by law.

2. The power converter modules and computing systems containing the same subject to this exclusion order (*i.e.*, “covered articles”) are as follows: power converter modules used in data center server, artificial intelligence and cloud computing systems, to power artificial intelligence (‘AI’) accelerators, tensor processing units (‘TPU’), graphical processing units

(‘GPU’) and central processing units (‘CPU’), and computing systems containing the same.

3. Notwithstanding paragraph 1 of this Order, covered articles are entitled to entry into the United States for consumption, entry for consumption from a foreign trade zone, or withdrawal from a warehouse for consumption, under bond in the amount of [

] of the entered value of Delta products, zero percent (0%) of the entered value of Cyntec products, and one hundred percent (100%) of the entered value of all other covered articles, pursuant to subsection (j) of section 337 (19 U.S.C. § 1337(j)) and the Presidential Memorandum for the United States Trade Representative of July 21, 2005 (70 Fed. Reg. 43,251), from the day after this Order is received by the United States Trade Representative until such time as the United States Trade Representative notifies the Commission that this Order is approved or disapproved but, in any event, not later than sixty (60) days after the receipt of this Order. All entries of covered articles made pursuant to this paragraph are to be reported to U.S. Customs and Border Protection (“CBP”), in advance of the date of the entry, pursuant to procedures CBP establishes.

4. At the discretion of CBP and pursuant to the procedures it establishes, persons seeking to import articles may be required to certify that they are familiar with the terms of this Order, that they have made appropriate inquiry, and thereupon state that, to the best of their knowledge and belief, the products being imported are not excluded from entry under paragraph 1 of this Order. At its discretion, CBP may require persons who have provided the certification described in this paragraph to furnish such records or analyses as are necessary to substantiate the certification.

5. In accordance with 19 U.S.C. § 1337(l), the provisions of this Order shall not apply to covered articles that are imported by and for the use of the United States, or imported

**PUBLIC VERSION**


for and to be used for, the United States with the authorization or consent of the Government.

6. The Commission may modify this Order in accordance with the procedures described in Rule 210.76 of the Commission's Rules of Practice and Procedure (19 C.F.R. § 210.76).

7. The Secretary shall serve copies of this Order upon each party of record in this investigation and upon CBP.

8. Notice of this Order shall be published in the Federal Register.

By order of the Commission.

A handwritten signature in black ink, appearing to read "Lisa R. Barton", enclosed in a thin black rectangular border.

Lisa R. Barton  
Secretary to the Commission

Issued: February 13, 2025

**CERTAIN POWER CONVERTER MODULES AND  
COMPUTING SYSTEMS CONTAINING THE SAME**

**Inv. No. 337-TA-1370**

**CONFIDENTIAL CERTIFICATE OF SERVICE**

I, Lisa R. Barton, hereby certify that the attached **ORDER** has been served via EDIS upon the following parties as indicated, on **February 13, 2025**.



Lisa R. Barton, Secretary  
U.S. International Trade Commission  
500 E Street, SW, Room 112  
Washington, DC 20436

**On Behalf of Complainant Vicor Corporation:**

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- Via Express Delivery
- Via First Class Mail
- Other: Email Notification of Availability for Download

**On Behalf of Respondents Cyntec Co., Ltd., Delta Electronics, Inc., Delta Electronics (Americas) Ltd., Quanta Computer Inc., Quanta Computer USA Inc., Hon Hai Precision Industry Co. Ltd. (d/b/a Foxconn Technology Group), Foxconn Industrial Internet Co. Ltd., FII USA Inc. (a/k/a Foxconn Industrial Internet USA Inc.), Ingrasys Technology Inc., Ingrasys Technology USA Inc., and DET Logistics (USA) Corporation:**

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- Via Hand Delivery
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**UNITED STATES INTERNATIONAL TRADE COMMISSION**  
**Washington, D.C.**

**In the Matter of**

**CERTAIN POWER CONVERTER  
MODULES AND COMPUTING  
SYSTEMS CONTAINING THE SAME**

**Investigation No. 337-TA-1370**

**COMMISSION OPINION**

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**I. INTRODUCTION**

On December 4, 2024, the Commission determined to review in part a final initial determination (“Final ID”) issued by the presiding administrative law judge (“ALJ”) on September 27, 2024. 89 Fed. Reg. 99278-80 (Dec. 10, 2024). On review, the Commission has determined that there has been a violation of section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337 (“section 337”), with respect to U.S. Patent Nos. 9,166,481 (“the ’481 patent”) and 9,516,761 (“the ’761 patent”), but no violation as to U.S. Patent No. 10,199,950 (“the ’950 patent”) (collectively, the “Asserted Patents”).

In summary of the issues on review,<sup>1</sup> the Commission finds that the Delta Accused Modules do not infringe the asserted claim of the ’481 patent, all of the accused modules infringe the asserted claims of the ’761 patent, the asserted claims of the ’761 patent are not invalid, the accused modules do not infringe the asserted claims of the ’950 patent, the complainant has demonstrated that a domestic industry exists for purposes of the ’481 and ’761 patents, and certain respondents have a license to the ’761 patent. In terms of remedy, the Commission has determined to issue a limited exclusion order (“LEO”) and cease and desist orders (“CDOs”) as to certain respondents, and impose a bond of [REDACTED] percent ([REDACTED]) for infringing Delta modules, zero percent (0%) for infringing Cyntec modules, and one hundred percent (100%) of entered value for all other infringing products imported during the Presidential review period.

This opinion sets forth the Commission’s reasoning in support of that determination. The Commission adopts the remainder of the ID that is not inconsistent with this opinion.

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<sup>1</sup> The complete findings of the Commission, including the findings of the Final ID that the Commission determined not to review, are set forth, *infra*, at Section VII.

## **II. BACKGROUND**

### **A. Procedural History**

The Commission instituted this investigation on August 17, 2023, based on a complaint filed by Vicor Corporation (“Vicor”). 88 Fed. Reg. 56050-51 (Aug. 17, 2023). The complaint, as supplemented, alleges violations of section 337 in the importation into the United States, the sale of importation, and the sale within the United States after importation of certain power converter modules and computing systems containing the same by reason of infringement of claim 1 of the ’481 patent, claims 1-7 of the ’761 patent, and claims 9, 13, 14, and 33-38 of the ’950 patent. *Id.* The complaint further alleges that a domestic industry exists. *Id.* The Commission’s notice of investigation names as respondents Delta Electronics, Inc. of Taipei, Taiwan, Delta Electronics (Americas) Ltd. of Fremont, California, and Delta Electronics (USA) Inc. of Plano, Texas (collectively, “Delta”); Cynotec Co., Ltd. of Hsinchu, Taiwan (“Cynotec”); Quanta Computer Inc. of Taoyuan City, Taiwan, Quanta Cloud Technology Inc. of Taoyuan City, Taiwan, Quanta Cloud Technology USA LLC of San Jose, California, and Quanta Computer USA, Inc. of Fremont, California (collectively, “Quanta”); Hon Hai Precision Industry Co. Ltd. (d/b/a Foxconn Technology Group) of Taipei City, Taiwan, Foxconn Industrial Internet Co. Ltd. of Shenzhen, China, FII USA Inc. (a/k/a Foxconn Industrial Internet USA Inc.) of Milwaukee, Wisconsin, Ingrasys Technology Inc. of Taoyuan City, Taiwan, and Ingrasys Technology USA Inc. of San Jose, California (collectively, “Foxconn”) (all respondent entities collectively, “Respondents”). *Id.* The Office of Unfair Import Investigations (“OUII”) is a party to the investigation. *Id.*

On January 25, 2024, the Commission partially terminated the investigation as to respondents Delta Electronics (USA) Inc., Quanta Cloud Technology Inc., and Quanta Cloud Technology USA LLC based on withdrawal of the complaint as to those respondents. Order No.

16 (Dec. 22, 2023), *unreviewed by* Comm'n Notice (Jan. 25, 2024). On January 26, 2024, the Commission amended the complaint and notice of investigation to add DET Logistics (USA) Corporation of Fremont, California as a respondent. Order No. 18 (Jan. 2, 2024), *unreviewed by* Comm'n Notice (Jan. 26, 2024).

On April 23, 2024, the Commission determined not to review an initial determination (Order No. 37) granting Respondents' motion for summary determination of no infringement of the Asserted Patents under the doctrine of equivalents. Order No. 37 (March 22, 2024) *unreviewed by* Comm'n Notice (Apr. 23, 2024).

The ALJ did not hold a *Markman* hearing. On February 20, 2024, the ALJ issued a *Markman* Order resolving the parties' claim construction disputes. Order No. 30 (Feb. 20, 2024). The relevant limitations construed in the *Markman* Order are discussed in the substantive analysis below.

The ALJ held an evidentiary hearing from April 29 to May 3, 2024.

On September 27, 2024, the ALJ issued the Final ID finding a violation of section 337 as to the '481 and '761 patents, but not as to the '950 patent. The Final ID also included the ALJ's Recommended Determination on remedy and bonding ("RD"). The RD recommends that, if the Commission finds a violation, it should issue an LEO and CDO to all Respondents. RD at 201-04. The RD further recommends that the Commission set a [REDACTED] percent ([REDACTED]) bond as to Delta's products, zero percent bond as to Cynotec's products, and one hundred percent (100%) bond as to all other infringing products imported during the period of Presidential review. *Id.* at 205.

On October 29, 2024, Vicor and respondent FII USA submitted comments pursuant to Commission Rule 210.50(a)(4) (19 C.F.R. § 210.50(a)(4)).<sup>2</sup> These submissions are summarized, *infra*, Section VIII.B. No submissions were filed in response to the Commission’s *Federal Register* notice seeking submissions on the public interest. *See* 89 Fed. Reg. 80604-05 (Oct. 3, 2024).

On October 11, 2024, Vicor filed a petition for review of the Final ID’s findings concerning: (1) as to the ’481 patent, no infringement by the Delta accused products, and certain aspects of the Final ID’s validity analysis; (2) as to the ’761 patent, that certain claims are invalid as anticipated and certain subsidiary aspect of the Final ID’s remaining validity analysis; (3) as to the ’950 patent, no infringement, no technical domestic industry, and certain aspects of the Final ID’s economic prong analysis; and (4) as to all patents, no copying (secondary indicia of non-obviousness).<sup>3</sup> Also on October 11, 2024, Respondents filed a petition for review of the Final ID’s findings concerning: (1) as to the ’481 patent, that claim 1 is not invalid as obvious; (2) as to the ’761 patent, that the accused products infringe the asserted claims and claims 4-6 are not invalid as obvious; (3) as to the ’950 patent, that the asserted claims are not invalid as obvious; (4) certain of the ALJ’s pre-hearing orders; and (5) that Vicor has satisfied the economic prong as to each Asserted Patent.<sup>4</sup> On October 21, 2024, OUII filed a combined

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<sup>2</sup> Complainant Vicor Corporation’s Submission Relating to the Public Interest (Oct. 29, 2024) (“Compl. PI Sub.”); Public Interest Comments of FII USA, Inc. in Investigation No. 337-TA-1370 (Oct. 29, 2024) (“FII USA PI Sub.”).

<sup>3</sup> Complainant Vicor Corporation’s Petition and Contingent Petition for Commission Review of the Initial Determination on Violation of Section 337 (Oct. 11, 2024) (“CPet.”).

<sup>4</sup> Respondents’ Petition for Review of the Initial Determination of Violation of Section 337 (Oct. 11, 2024) (“RPet.”).

response to the petitions.<sup>5</sup> On October 22, 2024, Vicor and Respondents each filed responses to the other party's petition.<sup>6</sup>

On December 4, 2024, the Commission determined to review the Final ID in part. 89 Fed. Reg. 99278-80 (Dec. 10, 2024). Specifically, the Commission determined to review the Final ID's findings regarding: (1) as to the '481 patent, whether the accused Delta products infringe claim 1 and whether Vicor has demonstrated commercial success to overcome a finding of prima facie obviousness; (2) as to the '761 patent, whether the accused Delta products infringe asserted claims 1-7 and whether the asserted claims are valid; (3) as to the '950 patent, whether the accused Delta and Cytotec products and redesigned products infringe asserted claims 9, 13, 14, and 33-36 and whether Vicor has satisfied the technical prong of the domestic industry requirement; (4) whether Vicor has satisfied the economic prong of the domestic industry requirement as to all of the asserted patents; and (5) the license defense asserted by respondents FII USA, Inc., Ingrasys Technology, Inc., and Ingrasys Technology USA Inc. (collectively, "Foxconn Respondents"). *Id.* at 99279. The Commission determined not to review the remainder of the Final ID's findings. *Id.*

In connection with its review of the Final ID, the Commission sought briefing from the parties on various issues. *Id.* The Commission also sought written submissions on the issues of remedy, the public interest, and bonding from the parties, interested government agencies, and

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<sup>5</sup> Commission Investigative Staff's Combined Response to (1) Complainant's Petition and Contingent Petition for Commission Review of the Initial Determination on Violation of Section 337 and (2) Respondents' Petition for Review of the Initial Determination of Violation of Section 337 (Oct. 21, 2024) ("OUII Resp.").

<sup>6</sup> Respondents' Response to Complainant's Petition and Contingent Petition for Review of the Initial Determination of Violation of Section 337 (Oct. 22, 2024) ("Resp. to CPet."); Complainant Vicor Corporation's Response to Respondents' Petition for Review of the Initial Determination of Violation of Section 337 (Oct. 22, 2024) ("Resp. to RPet.").

the public. *Id.* On January 7, 2025, Vicor and OUII filed their initial submissions on the issues raised in the Commission’s notice of review.<sup>7</sup> On January 8, 2025, Respondents’ filed their initial submission.<sup>8</sup> On January 15, 2025, the parties filed their reply submissions.<sup>9</sup>

**B. The Asserted Patents**

The technology at issue in this investigation relates to power converter modules used in data center servers, artificial intelligence and cloud computing systems, artificial intelligence accelerators, tensor processing units, graphical processing units, central processing units, and computing systems containing the same. 88 Fed. Reg. at 56050. Vicor asserts three patents in this investigation, directed to three distinct aspects of the accused products. A detailed overview of the Asserted Patents is provided in their respective sections *infra*.

**C. The Accused Products**

The products at issue in this investigation are “power converter modules used in data center server, artificial intelligence and cloud computing systems, to power artificial intelligence (‘AI’) accelerators, tensor processing units (‘TPU’), graphical processing units (‘GPU’) and central processing units (‘CPU’), and computing systems containing the same.” 88 Fed. Reg. at

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<sup>7</sup> Complainant Vicor Corp.’s Initial Br. in Response to the Comm’n’s Request for Written Submissions on the Issues Under Review and on Remedy, the Public Interest, and Bonding (Jan. 7, 2025) (“Compl. Init. Sub.”); Br. of the Office of Unfair Import Investigations on Issues Under Review and on Remedy, the Public Interest, and Bonding (Jan. 7, 2025) (“OUII Init. Sub.”)

<sup>8</sup> Respondents’ Response to the Comm’n’s Questions on Review and Request for Comments on Remedy and Bond (Jan. 8, 2025) (“Resp. Init. Sub.”).

<sup>9</sup> Complainant Vicor Corp.’s Reply Br. in Response to the Comm’n’s Request for Written Submissions on the Issues Under Review and on Remedy, the Public Interest, and Bonding (Jan. 15, 2025) (“Compl. RSub.”); The Office of Unfair Import Investigations’ Reply to the Private Parties’ Responses to Issues Under Review and on Remedy, the Public Interest, & Bonding (Jan. 15, 2025) (“OUII RSub.”); Respondents’ Reply Br. Regarding Comm’n’s Questions on Review and Request for Comments on Remedy and Bond (Jan. 15, 2025) (“Resp. RSub.”).

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56050. The accused power converter modules are manufactured by Delta and Cynotec (the “Accused Modules”). Final ID at 7. The Final ID’s identification of representative products is inconsistent. *Compare id.* at 7 with *id.* at 25 (listing representative Delta Modules). For clarification, the products that the parties stipulated are representative of the Accused Modules are as follows:

Patent	Delta Representative Accused Modules	Cynotec Representative Accused Module
’481 patent	U50SU4P162PMAR U50SU4P162PMDRF	MPN541382-PVA
’761 patent	U50SU4P162PMAR U50SU4P180PMDAL	No accused modules
’950 patent	U50SU4P162PMAR U50SU4P180PMDAL	MPN541382-PVA

CPet. at 13. In our analysis below, MPN541382-PVA is referred to as the “Cynotec Accused Module.” “Delta Accused Modules” refer to both of the products identified in the chart above.

The remaining Respondents incorporate one or more of the Accused Modules into computing systems (“the “Accused Systems”). *Id.* The Accused Systems are identified in the parties’ Joint Stipulation Regarding Representative Accused Products and Domestic Industry Products (March 22, 2024) (“Joint Stipulation”) (EDIS Doc. ID 816661). The list is also reproduced as Exhibit A to Vicor’s petition for review.

Delta and Cynotec each requested adjudication of a redesigned power converter. Final ID at 9. Specifically, the new models are Delta U50SU4P1A2PMDAF (“Delta Redesign Module”) and Cynotec MPN541382PVA1 (“Cynotec Redesign Module”) (collectively, the “Redesign Products”). The Final ID analyzes the factors set forth in *Certain Human Milk Oligosaccharides and Methods of Producing the Same*, Inv. No. 337-TA-1120, Comm’n Op. (June 8, 2020), and finds that the Redesign Products are ripe for adjudication. Vicor did not petition for review of this finding and the Commission did not review this finding.

**D. The Domestic Industry Products**

The parties stipulated that the following Vicor products are representative of all domestic industry products:<sup>10</sup>

<b>Patent</b>	<b>Representative DI Products</b>
'481 patent	BCM6135CD1E5165T00 DCM3110S60E02A3TN0 MCM3208S59Z01A6T05 and MCD3509 NBM2317S60D1580T0R VTM2308S52Z0276T01
'761 patent	BCM380P475T1K2A31 DCM24AP050T180A50 MCM3208S59Z01A6T05 NBM2317S60D1580T0R
'950 patent	NBM2317S60D1580T0R

A complete list of the products Vicor asserts practice the Asserted Patents are attached to Vicor’s petition for review. CPet., Ex. A at 22-24 (collectively, “the ’481 patent DI Products”); *id.* at 13-21 (collectively, “the ’761 patent DI Products”); *id.* at 21 (collectively, “the ’950 patent DI Products”).

**III. COMMISSION REVIEW OF THE FINAL ID**

When the Commission reviews an initial determination, in whole or in part, it reviews the determination *de novo*. *Certain Electronic Stud Finders, Metal Detectors and Electrical Scanners*, Inv. No. 337-TA-1221, Comm’n Op. at 9 (Feb. 15, 2022) (citations omitted), *aff’d*, *Zircon Corp. v. Int’l Trade Comm’n*, 101 F.4th 817 (Fed. Cir. 2024). Upon review, the “Commission has ‘all the powers which it would have in making the initial determination,’ except where the issues are limited on notice or by rule.” *Certain Electronic Devices, Including Streaming Players, Televisions, Set Top Boxes, Remote Controllers, and Components Thereof* (“*Streaming Players*”), Inv. No. 337-TA-1200, Comm’n Op. at 7 (Nov. 10, 2021) (citations

<sup>10</sup> See Final ID at 6; Joint Stipulation at 15-26; CPet. at 14 & Ex. A.

omitted), *aff'd*, *Roku, Inc. v. Int'l Trade Comm'n*, 90 F.4th 1367 (Fed. Cir. 2024). With respect to the issues under review, “the Commission may affirm, reverse, modify, set aside or remand for further proceedings, in whole or in part, the initial determination of the administrative law judge.” 19 C.F.R. § 210.45(c). The Commission also “may take no position on specific issues or portions of the initial determination,” and “may make any finding or conclusions that in its judgment are proper based on the record in the proceeding.” *Id.*; *see also* *Beloit Corp. v. Valmet Oy*, 742 F.2d 1421, 1423 (Fed. Cir. 1984).

#### **IV. LEGAL STANDARDS**

##### **A. Claim Construction**

Claim terms are normally construed according to their ordinary and customary meaning in the art, as understood by a person of ordinary skill in the art. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13 (Fed. Cir. 2005) (en banc). The person of ordinary skill is understood to read the claim terms in the context of the particular claim in which the term appears, as well as the context of the entire patent, including the specification. *Id.* at 1313. The intrinsic record, comprising the claims, the patent specification, and the prosecution history, “is the most significant source of legally operative meaning of disputed claim language.” *Bell Atl. Network Servs., Inc. v. Covad Commc’ns Grp., Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001). Extrinsic evidence, including expert and inventor testimony, dictionary definitions, and treatises, “can shed useful light on the relevant art,” but “is less significant than the intrinsic record” in determining the meaning of claim language. *Phillips*, 415 F.3d at 1317 (internal quotation marks omitted).

##### **B. Infringement**

Section 337 prohibits “the importation into the United States, the sale for importation, or the sale within the United States after importation . . . of articles that infringe a valid and

enforceable United States patent . . .” 19 U.S.C. § 1337(a)(1)(B). Direct infringement includes making, using, offering to sell, or selling a patented invention or importing a patented invention into the United States, without consent of the patent owner. 35 U.S.C. § 271(a).

To prove direct infringement, the plaintiff must establish by a preponderance of the evidence that one or more claims of the asserted patent read on the accused product or process, either literally or under the doctrine of equivalents. *Advanced Cardiovascular Sys., Inc. v. Scimed Life Sys., Inc.*, 261 F.3d 1329, 1336 (Fed. Cir. 2001). Each limitation in a patent claim is considered material and essential to an infringement determination. *London v. Carson Pirie Scott & Co.*, 946 F.2d 1534, 1538 (Fed. Cir. 1991). “Literal infringement of a claim exists when each of the claim limitations reads on, or in other words is found in, the accused device.” *Allen Eng. Corp. v. Bartell Indus.*, 299 F.3d 1336, 1345 (Fed. Cir. 2002). If any claim limitation is found to be absent from the accused product or process, then there is no literal infringement. *Bayer AG v. Elan Pharm. Research Corp.*, 212 F.3d 141, 1247 (Fed. Cir. 2000).

### **C. Validity**

Patent invalidity is an affirmative defense to an action for infringement before the Commission. 35 U.S.C. § 282(b); 19 U.S.C. § 1337(c) (“All legal and equitable defenses may be presented in all cases.”); *Guangdong Alison Hi-Tech Co. v. Int’l Trade Comm’n*, 936 F.3d 1353, 1359 (Fed. Cir. 2019)). All factual propositions and inferences underlying an invalidity defense must be proven by clear and convincing evidence. *Microsoft Corp. v. I4I Ltd. P’ship*, 564 U.S. 91, 95 (2011).

#### **1. Anticipation**

A determination that a patent is invalid as being anticipated under 35 U.S.C. § 102 requires a finding, based upon clear and convincing evidence, that each and every limitation is found either expressly or inherently in a single prior art reference. *Celeritas Techs. Inc. v.*

*Rockwell Int'l Corp.*, 262 F.3d 1258, 1361 (Fed. Cir. 1998). The limitations must be arranged or combined in the same way as in the claimed invention, although an identity of terminology is not required. *Id.* at 1334 (“[T]he reference need not satisfy an ipsissimis verbis test”); MPEP § 2131. Anticipation is a question of fact. *In re Gleave*, 560 F.3d 1331, 1334-45 (Fed. Cir. 2009).

## 2. Obviousness

Pursuant to section 103 of the Patent Act:

A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains.

35 U.S.C. § 103(a). To determine whether a patent claim would have been obvious, the Commission must evaluate “(1) the scope and content of the prior art, (2) the differences between the prior art and the claims at issue, (3) the level of ordinary skill in the art, and (4) any relevant secondary considerations, such as commercial success, long felt but unsolved needs, and the failure of others.” *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). “Obviousness is a question of law based on underlying questions of fact.” *Scanner Techs. Corp. v. ICOS Vision Sys. Corp. N.V.*, 528 F.3d 1365, 1379 (Fed. Cir. 2008). One such fact is the presence of evidence of secondary considerations, such as commercial success and copying. *See Graham*, 383 U.S. at 17. “In order to accord substantial weight to secondary considerations in an obviousness analysis, the evidence of secondary considerations must have a ‘nexus’ to the claims, i.e., there must be a legally and factually sufficient connection between the evidence and the patented invention.” *Fox Factory, Inc. v. SRAM LLC*, 944 F.3d 1366, 1373 (Fed. Cir. 2019) (internal quotation marks omitted). The patentee bears the burden of showing that a nexus exists. The

party challenging the patent must show invalidity by clear and convincing evidence. *Apotex USA, Inc. v. Merck & Co.*, 254 F.3d 1031, 1036 (Fed. Cir. 2001).

### **3. Indefiniteness**

A patent is indefinite “if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). This standard “mandates clarity, while recognizing that absolute precision is unattainable.” *Id.* at 910. The Federal Circuit has explained that words of degree are not “inherently indefinite,” but that a “court must determine whether the patent provides some standard for measuring that degree.” *Biosig Instruments, Inc. v. Nautilus, Inc.*, 783 F.3d 1374, 1378 (Fed. Cir. 2015) (internal quotation marks omitted). “Moreover, any fact critical to a holding on indefiniteness . . . must be proven by the challenger by clear and convincing evidence.” *Grace Instrument Indus., LLC v. Chandler Instruments Co.*, 57 F.4th 1001, 1008 (Fed. Cir. 2023) (internal quotation marks omitted); *Ironburg Inventions Ltd. v. Valve Corp.*, 64 F.4th 1274, 1284-85 (Fed. Cir. 2023).

#### **D. Domestic Industry Requirement**

When a section 337 investigation is based on allegations of patent infringement, the complainant must show that “an industry in the United States, relating to the articles protected by the patent . . . exists or is in the process of being established.” 19 U.S.C. § 1337(a)(2). “[A]n industry is considered to exist if there is in the United States, with respect to the articles protected by the patent . . . concerned –

- (A) significant investment in plant and equipment;
- (B) significant employment of labor or capital; or

(C) substantial investment in its exploitation, including engineering, research and development, or licensing.”

19 U.S.C. § 1337(a)(3).

The “domestic industry requirement” consists of a so-called “technical prong” and a so-called “economic prong.” *Philip Morris Products S.A. v. Int’l Trade Comm’n*, 63 F.4th 1328, 1341 (Fed. Cir. 2023). A complainant satisfies the technical prong by showing it is practicing, licensing, or otherwise exploiting the patents at issue. *Certain Movable Barrier Operator Systems and Components Thereof*, Inv. No. 337-TA-1118, Comm’n Op. at 16 (Dec. 3, 2020), *aff’d*, *Chamberlain Group, Inc. v. Int’l Trade Comm’n*, 2023 WL 3115579 (Fed. Cir. Apr. 27, 2023). The test for “practicing” a patent is essentially the same as it is for infringement, only it involves comparing the complainant’s own “domestic industry products” to one or more claims of the patent. *Alloc, Inc. v. Int’l Trade Comm’n*, 342 F.3d 1361, 1375 (Fed. Cir. 2003). It is sufficient that the domestic industry product practices at least one claim of each patent that serves as a basis for relief; it is not necessary for the complainant to practice the same claims it is asserting against the respondent. *Broadcom Corp. v. Int’l Trade Comm’n*, 28 F.4th 240, 250 (Fed. Cir. 2022).

## **V. ANALYSIS**

The Commission’s findings, conclusions, and supporting analysis follow. The Commission affirms and adopts the ID’s findings, conclusions, and supporting analysis that are not inconsistent with the Commission’s opinion.

### **A. The ’481 Patent**

Vicor alleged the Delta and Cynotec Accused Modules infringe claim 1 of the ’481 patent. Final ID at 25. The Final ID concludes that the Cynotec Accused Module infringes claim 1, but that the Delta Accused Modules, Delta Redesign Modules, and Cynotec Redesign Module do not

infringe claim 1. *Id.* at 25-83. The Final ID also finds that claim 1 is not invalid as obvious. *Id.* at 73-84.

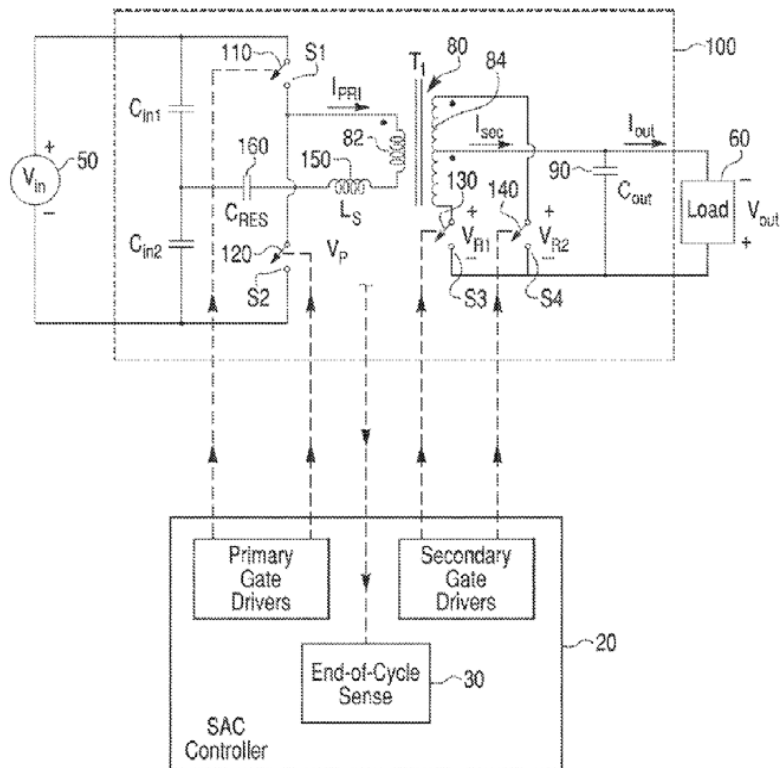
The Commission determined to review whether the Delta Accused Modules infringe claim 1 and whether Vicor demonstrated commercial success to overcome any finding of prima facie obviousness. 89 Fed. Reg. at 99279. For the reasons set forth below, the Commission finds that the Delta Accused Modules do not infringe claim 1. The Commission takes no position regarding whether Vicor demonstrated commercial success as a secondary indicia of non-obviousness for the '481 patent. Accordingly, the Commission finds a violation of section 337 as to claim 1 of the '481 for the Cyntec Accused Module.

#### **1. '481 Patent Overview**

The '481 patent, entitled "Digital Control of Resonant Power Converters," issued from U.S. Patent Application No. 13/830,262 ("the '262 application") on October 20, 2015. CX-0010.0001 ('481 patent) at cover page. The '262 application was filed on March 14, 2013. *Id.* The named inventors are Patrizio Vinciarelli and Sergey Luzanov. *Id.* The patent is assigned to Vicor. Because the '262 application was filed before March 16, 2013, the '481 patent is subject to pre-America Invents Act ("AIA") patentability provisions of the Patent Act. Manual of Patent Examining Procedure § 1440.

The '481 patent is directed to digital control of resonant zero current and zero voltage switching power converters. CX-0010.0016 at 1:6-9. Resonant power converters were known in the art. *Id.* at 1:13-20. Figure 1 depicts one such converter, known as a "Sine Amplitude Converter":

Fig. 1



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Prior Art

In relevant part, this circuitry is connected to power source **50** and load **60**. *Id.* at 1:23. A power transfer interval is initiated by closing switches **S1 110** and **S3 130** when the voltages across the switches and the resonant portion of the primary current are substantially zero. *Id.* at 1:28-32. Closing the switches causes current to flow into the primary winding **82**. *Id.* at 1:32-34. When the current flow completes a half-cycle, the current returns to zero, and switches **S1 110** and **S3 130** are opened. A so-called “energy recycling interval” follows, allowing the transformer **80** current to charge and discharge capacitances such that the voltages across the secondary switches

**S2 120** and **S4 140** approach zero. *Id.* at 1:36-44. When this occurs, the secondary switches are turned ON to initiate another power transfer interval. *Id.* at 43-52. According to the '481 patent, each converter operating cycle comprises two power transfer intervals of equal length and two energy recycling intervals of equal length. *Id.* at 1:46-52.

The inventive aspect of the '481 patent lies in the control of the timing signals used to operate the primary and secondary switches. CX-0010.0002 at 2:26-41. More specifically, the '481 patent is directed to the use of an oscillator to generate clock signals at an oscillator frequency.<sup>11</sup> *Id.* These clock signals are then used to generate timing signals for multiple events, including turning the primary and secondary switches ON and OFF with zero current flowing and essentially zero voltage across the switches. *Id.*; *see also* CX-0010.0016 at Abstract. "Each event may be set independently of the other events and the timing signals for controlling various aspects of the converter may also be set independently of the other timing signals and events." *Id.* at 5:41-44.

Vicor alleged infringement of independent claim 1 of the '481 patent. Final ID at 25. Vicor likewise asserted that its domestic industry products practice claim 1. *Id.* at 50. Claim 1 is reproduced below (disputed limitations in bold, limitation labeling per the Final ID):

1. [1.a.1] A method of synchronously operating a power converter in a series of converter operating cycles, [1.a.2] the converter having at least one primary switch to drive a resonant powertrain and at least one secondary switch, [1.a.3] the resonant power train including a transformer and having a characteristic resonant frequency and period, the method comprising:
  - [1.b] providing an oscillator for generating clock signals at an oscillator frequency;

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<sup>11</sup> Figure 4 illustrates a timing block architecture for a digital controller. *See also* CX-0010.0018 at 1:9.

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[1.c] generating timing control signals for each of a plurality of events based upon the clock signals in a (A) standard converter operating cycle, having a standard operating period and frequency, to:

[1.d] (i) turn the at least one primary switch ON and OFF at times when essentially zero voltage is impressed across the respective at least one primary switch and essentially zero resonant current is flowing in the respective at least one primary switch; and

[1.e] (ii) turn the at least one secondary switch ON and OFF at times when essentially zero current is flowing in the respective at least one secondary switch and essentially zero voltage is impressed across the respective at least one secondary switch; and

[1.f] wherein the oscillator frequency is preset, and

[1.g] the **timing of the timing control signals for one or more selected events may be set independently** of other timing control signals and events.

'481 patent at 20:41-67 (cl. 1) (emphasis added).

## **2. Infringement**

### **a. Final ID**

The Final ID concludes that the Cyntec Accused Module infringes claim 1 of the '481 patent, and that Cyntec is liable for induced infringement in connection with the Cyntec Accused Module. Final ID at 43-50.14. The Final ID also finds that the Delta Accused Modules and the Redesign Products do not infringe claim 1. *Id.* The crux of the Final ID's infringement analysis for the Delta Accused Modules turns on whether the accused modules practice limitation [1.g], namely, "the timing of the timing control signals for one or more selected events may be set independently of other timing control signals and events." *Id.* at 24, 35-50; CPet. at 16.

Vicor argued that the Delta Accused Modules satisfy limitation [1.g] because the products contain a digital control that sets the timing signals [REDACTED] *Id.* at 35. The Final ID agrees with Vicor that the start of one signal can be altered without affecting the start or end of the other signal, thus meeting the claim requirement that the events may be set

independently. *Id.* at 37. Both timing signals originate from a single signal referred to as [REDACTED] but have specific deadtime intervals<sup>12</sup> that can be set independent of the other. *Id.* at 38. Referring to Figure 4-26 of CX-0703, the Final ID explains that [REDACTED] [REDACTED] [REDACTED] can be set independently. *Id.* at 37 (citing CX-0703.0087).

However, the Final ID notes, during the manufacturing process, the [REDACTED] [REDACTED] *Id.* at 39. Moreover, the Final ID notes, during the manufacturing process, the [REDACTED] for the identified timing signals are [REDACTED] [REDACTED] then locked behind a key. *Id.* Thus, the Final ID finds that although the signals *could be* set to different values at some point during the product development process, the [REDACTED] prior to importation into the United States. *Id.* at 39-40; *accord id.* at 42-43 (making the same finding as to the Delta PMDRF product). In other words, the Final ID finds that the Delta Accused Modules may practice limitation [i.g.] at some point during the manufacturing process in China but cannot satisfy this limitation in the form in which they are imported into the United States, or subsequently used by customers in the United States. *Id.* at 40.

**b. Analysis**

Vicor argued in its petition for review that Delta's theory that its Accused Modules do not infringe because the timing signals cannot be set independently by the end user was not

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<sup>12</sup> Deadtime is a period of delay used to prevent two switches from conducting at the same time, causing excessive current flow. CX-0703.0086. Switches do not turn on and off instantaneously, so deadtime is used to ensure only one switch is active at a time. *Id.*; see Final ID at 36 (reproducing Figure 4-26 from CX-0703) (depicting deadtimes DTH and DTL).

timely raised and is legally incorrect. CPet. at 17, 24. The Commission disagrees as to both points.

Initially, Vicor argued that Delta’s non-infringement theory was waived because Delta raised the argument for the first time in its post-hearing reply brief. CPet. at 17. To the contrary, Respondents expressly raised the argument in their pre-hearing and initial post-hearing briefs. Respondents’ Pre-Hearing Brief (“RPHB”) at 63 (“[T]he same [REDACTED] in the U50SU4P162PMAR is used for both [REDACTED], and [REDACTED] [REDACTED] (citing RX-0010C (Hopkins RWS at Q/A 434); RIB<sup>13</sup> at 30 (same)); *see id.* (citing RX-0017C (Feng FWS) at Q/A 35-37; 44-52; Tr. at 535:5-24, 537:1-548:15); *see* Tr. at 535:23-24 [REDACTED] [REDACTED]).

Vicor also argued that Delta conceded liability for indirect infringement. CPet. at 25. This argument is based on Respondents’ pre-hearing brief, which contains a placeholder under the heading “The Accused Products Do Not Indirectly Infringe Any Asserted Claim.” RPHB at 79. Nowhere in the brief did Respondents “concede” liability for indirect infringement as Vicor contended. To the contrary, Respondents explicitly asserted in the heading that the Accused Products do not indirectly infringe, and elaborated on this argument in their initial post-hearing brief. RIB at 40-41. Regardless, OUII raised the argument in its pre-hearing brief. Commission Investigative Staff’s Pre-Hearing Br. & Stmt at 187 (“Because the evidence is not expected to show that the ’481 Accused Modules directly infringe claim 1, [], there can be no direct infringement, either by inducement or contributorily.”). Therefore, the Final ID did not err in finding the Accused Products do not indirectly infringe claim 1 of the ’481 patent.

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<sup>13</sup> Respondents’ Corrected Initial Post-Hearing Brief (May 24, 2024) (“RIB”).

In terms of the substance, Vicor argued the Final ID errs as a matter of law in finding that the Delta Accused Modules do not practice limitation [1.g]. CPet. at 27-28. Vicor noted that this limitation requires that the “timing of the timing control signals for one or more selected events *may be set independently* of other timing control signals and events.” *Id.* (emphasis by Vicor). According to Vicor, “method claims that rely on the capability of a device used in the method (as limitation 1(g) is here) do not require the user of a device in fact be able to carry out the recited capability.” *Id.* at 28 (emphasis by Vicor).

The Federal Circuit spoke directly to the issue of “capability” in *INVT SPE LLC v. ITC*, 46 F.4th 1361 (Fed. Cir. 2022). The Court explained what is required to show infringement of a claim directed to the capability to perform a particular function:

Because we require claim limitations to have some teeth and meaning, proof of reasonable capability of performing claimed functions requires, at least as a general matter, proof that an accused product—when put into operation—in fact executes all of the claimed functions at least some of the time or at least once in the claim-required environment.

46 F.4th at 1377. Applying this test, the Final ID correctly determines that the Delta Accused Modules do not satisfy limitation [1.g]. No customer can set the relevant timing signals to operate independently. Final ID at 40, 43. In other words, at no time after completion of the manufacturing process are the Delta Accused Modules capable of satisfying limitation [1.g], including at the time of or after importation into the United States. Accordingly, with the supplemental analysis set forth above, the Commission affirms the Final ID’s finding that the Delta Accused Modules do not infringe claim 1 of the ’481 patent.

### **3. Commercial Success**

The Final ID finds Respondents did not show that the asserted combination of prior art references teaches the limitations of claim 1. Final ID at 73-84. The Commission determined not to review that finding. *See* Fed. Reg. at 99279. Accordingly, the Commission has

determined to take no position on the Final ID's finding that Vicor failed to demonstrate commercial success of the '481 patent DI Products as evidence of secondary indicia of non-obviousness. Final ID at 83-84; *Beloit*, 742 F.3d at 1424.

For the reasons stated herein and further in the Final ID, the Commission finds a violation of section 337 with respect to claim 1 of the '481 patent.

**B. The '761 Patent**

The Final ID finds that the Delta Accused Modules infringe claims 1-7 of the '761 patent. Final ID at 90. The Final ID further finds that claims 1, 2, 3, and 7 are invalid as anticipated, but that Respondents failed to show by clear and convincing evidence that claims 4-6 are invalid as obvious. *Id.* at 91-118.

The Commission determined to review both infringement and validity. 89 Fed. Reg. at 99279. For the reasons set forth below, the Commission finds that the accused modules infringe the asserted claims, and the asserted claims have not been shown invalid. Accordingly, the Commission finds a violation of section 337 as to the '761 patent.

**1. '761 Patent Overview**

The '761 patent, entitled "Encapsulated Modular Power Converter with Symmetric Heat Distribution," issued from U.S. Patent Application No. 14/635,467 ("the '467 application") on December 6, 2015. *See* CX-0012.0001 ('761 patent) at cover page. The '467 application was filed on March 2, 2015, as a divisional of U.S. Patent Application No. 13/105,696, filed on May 11, 2011. *Id.* The named inventors are Patrizio Vinciarelli, Michael B. LaFleur, Sean Timothy Fleming, Rudolph F. Mutter, and Andrew T. D'Amico. *Id.* The patent is assigned to Vicor. Because the effective filing date of the '467 application pre-dates March 2013, the '761 patent is subject to the is subject to pre-AIA patentability provisions of the Patent Act. *See* 35 U.S.C. § 100(i).

The '761 patent is directed to (a) arranging the components on a printed circuit board (“PCB”) in symmetrical manner(s), *see* CX-0012.0052 at 23:16-25:32; and (b) encapsulating the PCB. As to the former, Figure 27 depicts potential layouts vis a vis vertical axis **27** and longitudinal axis **28**:

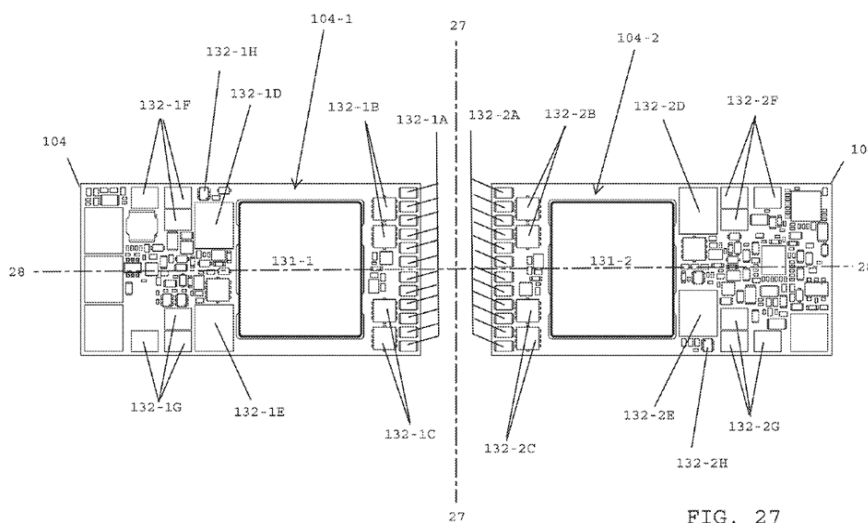


FIG. 27

The '761 patent teaches that larger components,<sup>14</sup> such as input field effect transistors (“FETs”) **132-1D**, **132-1E**, **132-2D**, and **132-2E**, are equally distributed and in a mirror image relationship on the top **104-2** and bottom **104-1** surfaces of the PCB. *Id.* at 23:16-30. Such distribution “may decrease stresses on the PCB” and “may improve the co-planarity and mechanical integrity of the device.” *Id.* at 23:38-42. The mirror image orientation further allows the pairs of components to share common sets of conductive vias used to electrically connect the components on the PCB surfaces to internal conductive layers. *Id.* at 24:25-29. “Because each via is used for both components in the pair, the total number of vias for making connections to

<sup>14</sup> Elements 131-1 and 131-2 are the upper and lower E-cores of the magnetic core. CX-0012.0047 at 14:46-51.



the pair of components may be reduced (by as much as a factor of two) increasing the area of conductive layers useable for making connections and thus reducing resistance.” *Id.* at 30-34.

The components may also be arranged symmetrically on each surface. For example, the input capacitors **132-1F** and **132-1G** on the bottom surface **104-1** are in a “mirror-image relationship” across the longitudinal axis **28**. CX-0012.0052 at 23:47-54. The same is true for the six input capacitors **132-2F** and **132-2G** on the top surface **104-2**. *Id.* at 23:54-56. The ’761 patent explains that this distribution across the longitudinal axis of the PCB likewise decreases stress on the PCB during the encapsulation process, and has the additional advantage of “spread[ing] the heat produced by power dissipating devices using a greater surface area for heat extraction improving thermal performance.” *Id.* at 23:64-24:6.

As to encapsulation, Figure 7 shows a cross-section of a panel assembly enclosed between an upper 161 and lower 162 mold press. CX-0012.0047 at 14:29-31.

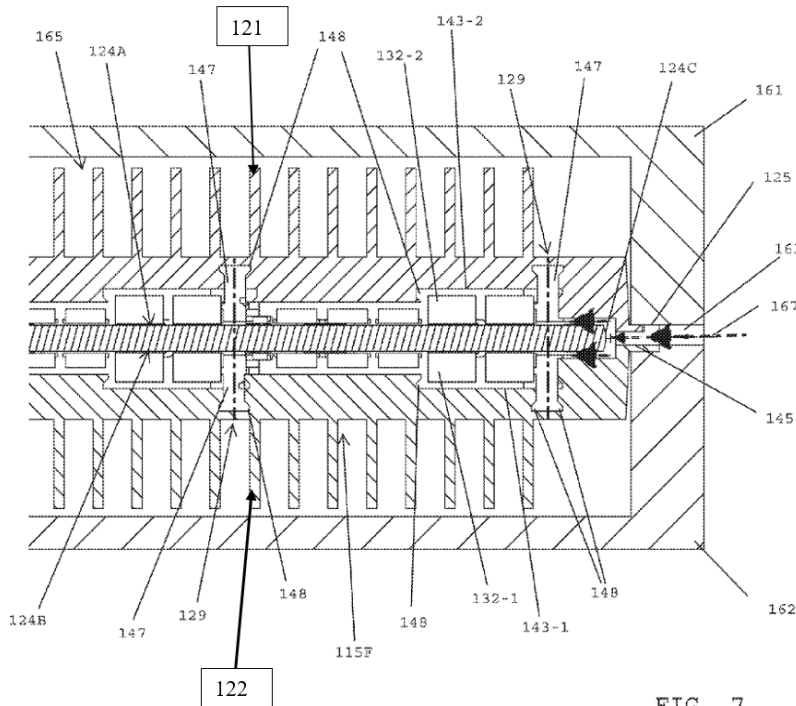


FIG. 7

Molding compound is forced into channel **163** to fill the unoccupied spaces between the heat sinks **121** and **122**. *Id.* at 14:36-46. The modules are separated from the panel assembly by cutting. *Id.* at 15:27-33. The individual modules may be combined with a variety of mounts, resulting in a module that can be connected to a customer motherboard, like that depicted in Figure 1:

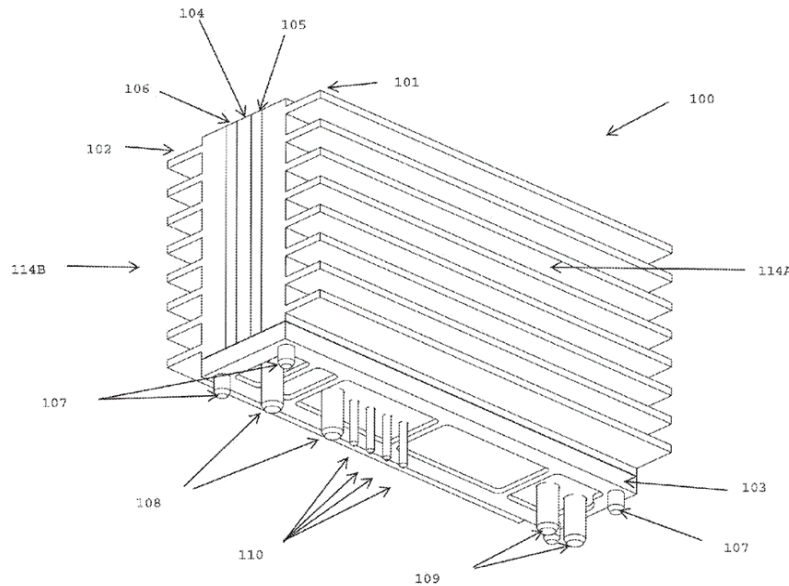


FIG. 1

Vicor alleged the Delta Accused Modules infringe of claims 1-7 of the '761 patent. Final ID at 85-86. These claims are reproduced below (disputed limitations in bold, limitation labeling per the Final ID):

1. An apparatus comprising:
  - [1.a] a power converter including
    - [1.b] a printed circuit board (PCB) comprising a plurality of conductive layers and having a top surface and a bottom surface;
    - [1.c] a magnetic core structure **magnetically coupled to a winding** formed by traces in one or more of the conductive layers in the PCB; and

[1.d] a **plurality of power semiconductor devices**, a first set of the power semiconductor devices being mounted on the top surface and electrically connected to **dissipate power** at a level, Pt, during operation of the converter, a second set of the power semiconductor devices being mounted on the bottom surface and electrically connected to **dissipate power** at a level, Pb, during operation of the converter;

[1.e] **wherein the power semiconductor devices are distributed between the first and second sets to distribute heat generation during operation of the converter such that each level Pt, Pb is less than 150% of the other level Pb, Pt.**

2. The apparatus of claim 1 wherein a plurality of the power semiconductor devices in the first set are each positioned in a location on the top surface **substantially overlapping** a location on the bottom surface occupied by a power semiconductor device in the second set.
3. The apparatus of claim 1 wherein the power semiconductor devices are electrically connected using a respective set of conductive vias in the PCB, and a plurality of the power semiconductor devices in the first set share their respective sets of conductive vias with corresponding power semiconductor devices in the second set.
4. The apparatus of claim 2 wherein the power converter further comprises circuitry including a pair of cells having a common circuit topology and each including **power semiconductor switches** from each of the first and second sets; each cell having its respective components arranged in a pattern, wherein the pattern of components of one cell is **substantially a mirror image** of the pattern of components in the other cell.
5. The apparatus of claim 4 wherein a component from one of the cells is located on an opposite surface of a respective component from the other one of the cells.
6. The apparatus of claim 5 wherein the cells comprise input cells.
7. The apparatus of claim 3 wherein the power semiconductor devices comprise output switches.

'761 patent at 28:13-59 (cls. 1-7) (emphasis added).

## **2. Claim Construction & Infringement**

The Commission determined to review the Final ID's finding that the Delta Accused Modules infringe asserted claims 1-7 of the '761 patent and asked the parties to brief certain questions regarding the terms "magnetically coupled" (limitation [1.c]) and "dissipate power"

(limitation [1.e]) recited in claim 1. 89 Fed. Reg. at 99279. For the reasons set forth below, the Commission finds that the Delta Accused Modules practice both limitations. Together with the reasons stated in the Final ID, the Commission finds that the Delta Accused Modules infringe claims 1-7 of the '761 patent.

**a. Construction of “Magnetically Coupled”**

**i. Final ID**

Claim 1 of the '761 patent is directed to a power converter with a specific layout of components on the top and bottom of a printed circuit board (“PCB”). CX-0012 at 28:13-34. Limitation [1.c] requires that the claimed apparatus include “a magnetic core structure magnetically coupled to a winding formed by traces in one or more of the conductive layers in the PCB.” *Id.* at 28:18-20. The parties did not identify the term as requiring construction during *Markman* proceedings. *See* Order No. 30. Rather, Respondents, in their pre-hearing brief, appeared to argue that the term meant the core and windings were “magnetically attached,” as opposed to attached by adhesive means. *See* Final ID at 87; RPHB at 122-26. At the pre-hearing conference, the ALJ suggested that “magnetically coupled” means “‘in essence,’ that ‘it works like a transformer’”:

I think that it seems pretty clear that the person of ordinary skill in the art would understand that “magnetically coupled” means it works like a transformer, because that’s what they are. It even says so in the patent. It refers to transformer cores. That’s what does the power conversion, right? You have a step-down transformer. So I don’t think anyone thinks that if you’ve got a step-down transformer in a power conversion module, that there is no magnetic coupling. Of course, there is. So you can make the argument that they haven’t proven it, but you’ve got an uphill battle.

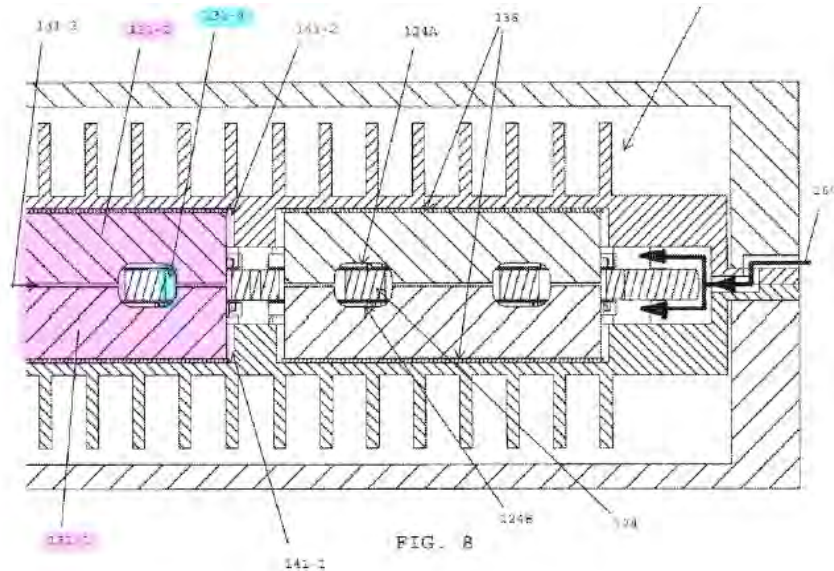
Tr. at 43:9-20. The Final ID characterizes this discussion as “not a formal claim construction,” and states “ultimately the term was not construed.” Final ID at 87-88.

**ii. Parties' Positions**

**(A) Vicor's Position**

In response to the Commission's request for briefing, Vicor argues that the "meaning of ["magnetically coupled"] is plain on its face, [so] no construction is required." Compl. Init. Sub. at 1. In the alternative, Vicor proposes that the plain meaning of "magnetically coupled" as used in claim 1 is "forming an inductor or transformer with," or "forming an inductive component with." *Id.* Vicor suggests that the context of this claim term is "clear": "[a magnetic core structure] '*magnetically coupled*' to a winding formed by traces in . . . the PCB' refers to the arrangement of components—a core and a winding—to form an inductive component [with] such as [an] inductor or transformer." *Id.* at 1-2 (emphasis by Vicor); *see id.* at 5 ("the intrinsic record and extrinsic evidence confirm that 'magnetically coupled to' in the claim 1 phrase . . . means 'forming an inductor or transformer with,' or 'works like a transformer'"). Vicor argues that the specification explains "what is well-known in the field": "[o]ne or more magnetic core structures . . . in combination with conductive traces on [the] PCB **104**, may form planar magnetic components such as inductors and transformers." *Id.* (quoting CX-0012 at 10:67-11:3); *see also id.* (citing CX-0012 at 1:37-40) (noting power converters may include "one or more inductive components, such as inductors and transformers"). Vicor notes that Figure 8 of the '761 patent depicts a "transformer core" **131-2** (purple) with openings **131-4** to accommodate windings (blue):

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*See id.* at 2 (annotations by Vicor). Vicor further notes that one embodiment refers to “reducing losses in the magnetic components,” i.e., “transformer or inductor losses.” *Id.* at 3 (quoting CX-0012 at 11:54-57 (emphasis by Vicor)).

In terms of extrinsic evidence, Vicor points to its expert’s, Dr. Fayed’s, witness statement as explaining that “[a] POSITA would certainly understand that ‘magnetically coupled’ in reference to the magnetic core structure and windings refers to arrangement of these elements to form an inductor or transformer.” *Id.* at 2 (quoting CX-0008C (Fayed WS) at Q/A 297). At trial, Dr. Fayed testified that “magnetically coupled” means “you have an element that has core current and that, due to that varying flow of current, it creates a magnetic field. This magnetic field can interact with another element and induces current and voltage in that other element as a result.” *Id.* (quoting Tr. at 245:25-246:4). Vicor additionally points to testimony by Respondents’ invalidity expert, Dr. Ehsani, in which he identifies transformers in various prior art references. *Id.* at 3-4.

In response to Vicor’s arguments, Respondents argue that Vicor “submitted to” the ALJ’s informal construction of “works like a transformer,” and thus forfeited a construction including inductors. Resp. RSub. at 4-5. Specifically, Respondents fault Vicor for offering a “results-oriented construction,” conflating transformers and inductors. Resp. Init. Sub. at 3; Resp. RSub. at 1. Respondents argue that the ’761 patent’s use of the terms “inductors” and “transformers” shows these two things are not the same. *Id.*, n.4. Respondents further cite a textbook, *Fundamentals of Power Electronics*, which covers transformers and coupled inductors in separate subsections. *Id.* (citing RX-0561.0545-.0547). Respondents contend that both Vicor’s expert (Dr. Fayed) and Respondents’ expert (Dr. Ranjram) testified that in coupled inductors, the two windings are magnetically coupled *to each other*, not to the core. *Id.* at 4 (citing Tr. at 243:9-11 (Fayed); Tr. at 626:16-23 (Ranjram)). Respondents argue that Vicor’s evidence “supports the uncontroversial proposition that magnetic cores and windings can be used in inductor systems, but not that the magnetic core and windings in such systems are ‘magnetically coupled’ to each other.” Resp. RSub. at 3.

**(B) OUII’s Position**

OUII argues that “magnetically coupled” as used in claim 1 of the ’761 patent means “magnetic interaction of the field/flux of the magnetic core and the windings, such that the magnetic core and the windings, in essence, work like a transformer (or similar planar magnetic component, such as an inductor).” OUII Init. Sub. at 3. OUII suggests this is the term’s plain and ordinary meaning as disclosed in the patent. *Id.* OUII contends that the specification does not explicitly describe “magnetically coupled” because the phrase is “commonly understood to those in the art.” *Id.*

As evidence of this common knowledge, OUII points to two patents incorporated by reference into the ’761 patent. First, OUII refers to U.S Patent No. 8,427,269 (“the ’269 patent”)

(see CX-0012 at 1:30-54).<sup>15</sup> Figure 1 of the '269 patent discloses a PCB assembly 50, including “an inductive component, which may be a transformer, having top and bottom magnetically permeable core pieces 20, 22 and one or more windings. The windings may be formed from conductive traces on one or more layers of PCB 10.” RX-0375 ('269 patent) at 6:3-5.

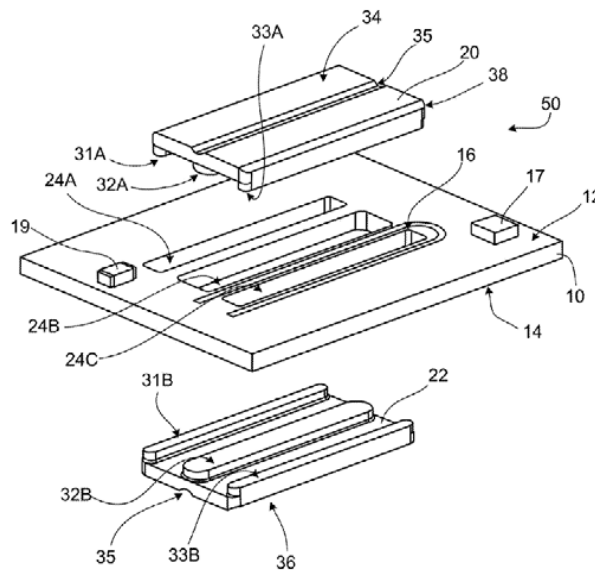


FIG. 1

The '269 patent explains, “[c]ores of the type shown in Fig. 1 are known in the field of planar magnetics, and are commonly used in applications where size reduction is important.” *Id.* at 6:15-17. Elsewhere, the '269 patent describes prior art and inventive cores that direct magnetic fields from the windings within the cores. OUII Init. Sub. at 5-6 (quoting '269 patent at 7:38-8:24 (discussing Figs. 5 & 19B)).

The '269 patent incorporates by reference U.S. Patent No. 7,187,263 (“the '263 patent”), describing the latter as teaching “[p]rinted circuit transformers” as disclosed in Figure 1 of the '269 patent. *Id.* at 5; '269 patent at 6:28-33; *see* OUII Sub., Ex. A ('263 Patent). OUII refers

<sup>15</sup> The '761 patent refers to U.S. Patent Application No. 12/493,773, which issued as U.S. Patent No. 8,427,269.

to Figure 2 of the '263 patent, which describes a “serpentine transformer” with pairs of magnetic core pieces **16a-16c**, **17a-17c** that form a path for the flux linking a pair of transformer windings:

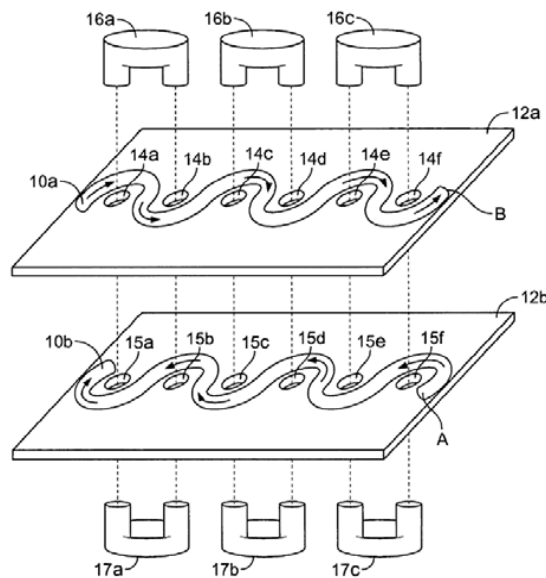


FIG. 2

OUII Init. Sub. at 7 ('263 patent at Fig. 2); *see also id.* (“[A] time varying voltage source, Vp **42**, connected to the primary winding 24 induces a time-varying flux in the core pieces . . . . The time varying flux induces voltages in the two secondary windings **20, 21**.”) (quoting '263 patent at 4:61-66). OUII thus concludes that the intrinsic record demonstrates that “magnetically coupled” means magnetic interaction of the field/flux of the core and the windings such that they, in essence, work like a transformer or similar component. *Id.* at 9.

OUII only briefly addresses extrinsic evidence, noting in a footnote that Respondents’ invalidity expert, Dr. Ehsani, testified that the BMR 453 prior art module satisfies limitation [1.c] because “the winding traces during operation of the converter interact with the magnetic core structure’s field such that they guide the resulting electromagnetic field in the secondary side windings.” *Id.*, n.3 (citing Tr. at 637:10-638:22; RX-0006C at Q/A 41).

Respondents fault OUII's proposed construction as "baselessly broadening the construction to include inductors." Resp. RSub. at 4. Respondents note that the titles of both the '269 and '263 patents refer to transformers and do not support a construction including inductors. *Id.*

**(C) Respondents' Position**

Respondents contend that "magnetically coupled" means energy is transferred from one coupled element to another, namely, the core and a winding. Resp. Init. Sub. at 1-2; Resp. RSub. at 1 ("The plain and ordinary meaning of 'magnetic coupling' is energy transfer between two elements via magnetic field."). In terms of intrinsic evidence, Respondents point to three patents cited by the '761 patent, and describe "coupling" as requiring a transfer of energy, specifically:

- U.S. Patent No. 5,557,142 at 1:43-44 ("a conductive material that is electrically coupled to the surrounding area");
- U.S. Patent No. 6,184,585 at 2:38-39 ("one electrode that is electrically coupled to the gate electrode"); and
- U.S. Patent No. 7,015,587 at 2:53-54 ("electrical connectors that are electrically coupled to such bond pads").

Resp. Init. Sub. at 2.

In support of their proposed construction, Respondents emphasize testimony by Vicor's infringement expert, Dr. Fayed, that

"Magnetically coupled" means that you have an element that has core current and that, due to that varying flow of current, it creates a magnetic field. This magnetic field can interact with another element and *induces current and voltage in that other element* as a result. *This is what magnetic coupling between two things means.*

*Id.* at 1 (quoting Tr. at 245:24-246:5) (emphasis by Respondents). Respondents also cite the Federal Circuit's decision in *NegoMagic Corp. v. Trident Microsystems*, 287 F.3d 1052 (Fed.

Cir. 2002), as likewise stating that coupling means “the transfer of energy.” *Id.* (quoting 287 F.3d at 1070 (emphasis omitted)).

Vicor objects to Respondents’ construction as nonsensical because it is “contrary to how transformers and inductors work.” Compl. RSub. at 1. Specifically, Vicor argues that no electrical current runs through the core and, thus, there is no energy to transfer between the windings and core by design: in a power converter, transferring energy from the first winding to the core and then from the core to the second winding would waste energy and make the power converter inefficient. *Id.* (citing Tr. at 248:9-15). Instead, Vicor asserts, in a power converter, a current runs through a first winding, generating an electromagnetic field, and the core’s field guides the field from the first winding to the second winding, causing the voltage conversion. *Id.* at 2 (quoting Respondents’ expert Dr. Ehsani, RX-0006C at Q/A 41, 107); *see id.* at 2 (citing similar testimony from Respondents’ expert Dr. Ranjram and Vicor’s expert Dr. Fayed). Vicor notes that the ’761 patent teaches reducing the length of the path across the magnetic components, thus reducing transformer or inductor losses. *Id.* (citing CX-0012 at 11:55-57).

Vicor also emphasizes that the specification does not describe or suggest transferring energy between a winding and the core, as Respondents assert. Compl. RSub. at 2-3. Moreover, according to Vicor, the prior art references Respondents cite refer to “electrically coupled” components, not “magnetically coupled” components. *Id.* at 4; OUII RSub. at 4. Similarly, OUII argues that there is no disclosure in the intrinsic evidence suggesting “magnetically coupled” requires energy transfer between a winding and the magnetic core. OUII RSub. at 2. Moreover, Vicor and OUII contend, the case law cited by Respondents refers to different terms in different patents and, thus, are irrelevant to the construction of the ’761 patent. Compl. RSub. at 4-5; OUII RSub. at 4.

Vicor further contends that no expert witnesses testified in support of Respondents' proffered construction, and that Respondents take Dr. Fayed's testimony out of context. *Id.* at 3; *accord* OUII RSub. at 4. Vicor argues that Dr. Fayed testified consistently with all other experts in the case in explaining how the magnetic fields of the core and windings interact to transfer energy from one winding to another, as opposed to between the core and a winding. Compl. RSub. at 4; *see id.* at 5 (citing Respondents' expert Dr. Ranjram, RX-1619C at 108:23-109:4).

Finally, Vicor argues, Respondents' construction is new (and thus waived), and Respondents' "ever-evolving constructions" demonstrate they are unreliable. *Id.* at 4.

### **iii. Analysis**

Beginning with the claim language, claim 1 recites "a magnetic core structure magnetically coupled to a winding . . . ." CX-0012.0054 at 28:18-20. The specification does not define "coupled" and, in fact, uses the term only once, parroting the claim language. *Id.* at 8:53-55. Elsewhere the specification notes that "[o]ne or more magnetic core structures may be provided, which in combination with conductive traces on PCB 104, may form planar magnetic components such as inductors and transformers." *Id.* at 10:67-11:3. Thus, the specification indicates that the magnetic coupling recited in claim 1 relates to the type of coupling formed in an inductor or transformer.

Only Dr. Fayed, Vicor's infringement expert, explicitly testified regarding the meaning of "magnetically coupled." Specifically, Dr. Fayed stated that "[a person of ordinary skill in the art] would certainly understand that 'magnetically coupled' in reference to the magnetic core structure and windings refers to [the] arrangement of these elements to form an inductor or transformer." CX-0008C at Q/A 297. Dr. Fayed explained:

This is a very basic understanding of a transformer: you have a winding around a core, and because a time-varying current is flowing into the winding it will generate a time-varying magnetic field and the core will

concentrate and direct that magnetic field so that[,] if there is another winding around that magnetic core, the time-varying magnetic field will induce a time-varying voltage across the winding, and thereby transferring energy from one winding to another winding. This mechanism of energy transfer is referred to in the art as “magnetic coupling,” or in other words, energy is coupled magnetically *from one winding to another*. The POSITA would not think of magnetic coupling as requiring physical magnetic attachment. The windings are generally made of copper or another non-magnetic material, while the magnetic core structure is generally made of ferrite magnetic material that can be magnetically polarized—having a magnetic attachment between the winding and the core makes no sense.

*Id.* (emphasis added). At the evidentiary hearing, Dr. Fayed noted that “the whole point of all these products in converting power from one winding to another” is to “have energy in one winding [] transfer to the other winding.” Tr. at 251:18-25. Dr. Fayed explained that the purpose of the magnetic core between the windings is to route the electromagnetic field from one winding to the other and minimize the amount of energy lost to leakage during the transfer. Tr. at 249:17-250:10.

Dr. Ehsani’s testimony explaining the operation of a transformer in the context of the BMR 453 Module with regard to the “magnetically coupled” limitation is consistent with Dr. Fayed’s explanation. RX-0006C at Q/A 45 (“[W]hen electrical current runs through the winding traces during operation of the converter, those currents establish an electromagnetic field, and that electromagnetic field will interact with the magnetic core structure’s field such that they guide the resulting electromagnetic field in the secondary-side windings, which causes the voltage conversion . . .”). In other words, Dr. Fayed and Dr. Ehsani agree that a transformer works by using a magnetic field generated by the windings that interacts with the core to transfer the energy from one winding to the other, as claim 1 requires, and that a transformer does not transfer energy between the core and a winding.

The patent explains that the claimed magnetic core structure in combination with conductive traces on the PCB **104** “may form planar magnetic components such as inductors and

transformers.” CX-0012 at 10:67-11:33. No other examples of “magnetic components” are provided in the specification. Yet, as explained above, Respondents’ proposed construction would explicitly exclude inductors and implicitly exclude transformers from the scope of the asserted claims because transformers do not transfer energy between a winding and the core.

Alternatively, Respondents argue that Vicor should be bound by the ALJ’s informal construction that the core and winding “works like a transformer.” Resp. RSub. at 4-5. Respondents argue that the patent’s use of the terms “inductors” and “transformers” shows these two things are not the same, Resp. RSub. at 4, and cite a textbook, *Fundamentals of Power Electronics*, which covers transformers and coupled inductors in separate subsections, Resp. Init. Sub. at 3 (citing RX-0561.0545-.0547). Respondents argue, in essence, that while the specification refers to both inductors and transformers, if Respondents’ primary construction is rejected, claim 1 should be understood to be directed to transformers only. *See* Resp. Init. Sub. at 3; Resp. RSub. at 1.

Respondents contend that transformers and inductor operate differently but, in their submissions, never articulate the difference between transformers and “coupled inductors.” *Id.* The only explanation in the record is from Respondents’ expert, Dr. Hopkins, who stated:

Transformer windings are specifically wound so that the magnetic field in a first winding efficiently couples with the second winding. This is often accomplished by literally physically tightly coupling the first and second windings together. Coupled inductors like HA-T1A and HA-T2A, on the other hand, are more loosely coupled such that a not insignificant portion of the magnetic field generated by one winding couples to that winding itself, rather than coupling with the second winding.

RX-0010C at Q/A 95. In other words, the difference between a transformer and a coupled inductor, as relevant here, is that the windings of a coupled inductor are “more loosely coupled.” *Id.* Respondents’ initial submission describes coupled inductors as “two windings that are magnetically coupled to each other,” Resp. Init. Sub. at 3-4, which is how both Vicor’s and

Respondents' experts describe transformers. *Id.* Even if coupled inductors are “more loosely coupled,” nothing in the patent suggests a particular level of “magnetic coupling” is required to satisfy the claim limitation.

The '761 patent specification contains three references to transformers and inductors together (*see* CX-0012 at 1:40, 10:67-11:3, 11:56-57, 12:56-58), as well as four references to embodiments including transformers in particular (*see id.* at 7:57-58, 22:50-51, 24:28-29, 27:59-28:5). The specification does not discuss any differences in operation between inductors or transformers, including any that might be relevant to the claimed invention. The experts are unanimous that both transformers and coupled inductors operate by transferring energy between windings, the difference is a matter of degree. The specification makes clear the claims are intended to cover both inductors and transformers, and it identifies no other magnetic structure that could be covered by the claims.

Accordingly, the Commission construes “magnetically coupled” to mean “forming an inductive component with, such as an inductor or transformer.”<sup>16</sup>

**b. Infringement of Limitation [1.c]**

Applying the proper construction of “magnetically coupled,” the Commission finds that the Delta Accused Modules practice limitation [1.c].

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<sup>16</sup> In its infringement analysis, Respondents argue that Complainant's construction is flawed because Vicor's expert, Dr. Fayed, testified that there would be “magnetic coupling” between two windings even in the absence of a magnetic core. Resp. Init. Sub. at 6 (quoting Tr. at 251:7-25 (explaining that in the absence of a magnetic core structure, the coupling factor between windings “is going to be very weak”). This argument is a red herring. The question before the Commission is what “magnetic coupling” means in the context of the '761 patent, which, per the claim language, requires coupling between a magnetic core structure and a winding. It is irrelevant what “magnetic coupling” might mean in the context of a hypothetical patent that addressed multiple windings with no magnetic core.

**i. Final ID**

Vicor's expert, Dr. Fayed, explained that the magnetic core in the Delta Accused Modules have the designators [REDACTED] CX-0008C (Fayed WS) at Q/A 247, 262. Dr. Fayed also identified the traces that form the windings. *Id.*; *see also* RPX-0066C (reproducing the three-dimensional view of the accused module referenced by Dr. Fayed). Dr. Fayed opined that "[t]he magnetic core structure is magnetically coupled to the winding by its arrangement and close proximity to the winding." CX-0008C at Q/A 247, 262. The Final ID characterizes Respondents' expert testimony as silent on whether the windings are magnetically coupled to the core. Final ID at 88. Accordingly, the Final ID credits Dr. Fayed's testimony and finds that the Delta Accused Modules satisfy limitation [1.c]. *Id.*

**ii. Parties' Positions**

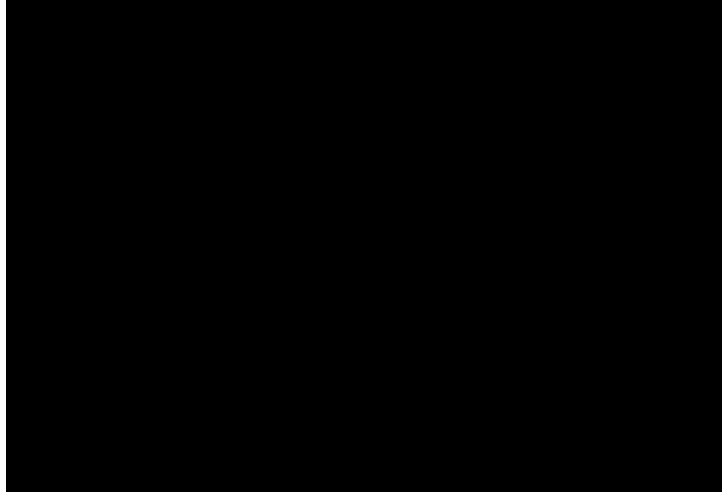
**(A) Vicor's Position**

Vicor reiterates Dr. Fayed's testimony, based on circuit schematics, assembly diagrams, and bills of material, showing a magnetic core and winding formed by traces in the PCBs of the Delta Accused Modules. Compl. Init. Sub. at 5-6 (citing CX-0008C at Q/A 247, 262, 277). As one example, for the U50SU4P162PMAR module includes a magnetic core structure comprising

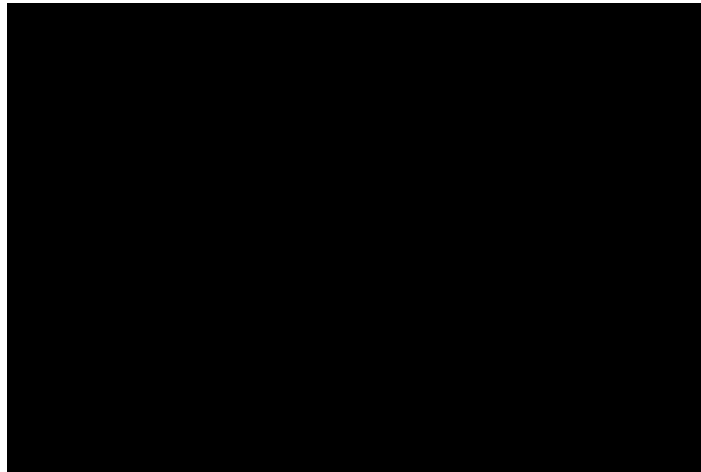
[REDACTED]


[REDACTED]

**CONFIDENTIAL MATERIAL REDACTED  
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RPX-0061C.0001, 0002; *see* CX-0008C at Q/A 247. Examples of the tracing that form the windings can be seen in various layers of the PCB:



RPX-0066C; *see* CX-0008C at Q/A 247. Dr. Fayed explains the magnetic core structure is magnetically coupled to the winding “by its arrangement and close proximity to the winding.” Elsewhere, Dr. Fayed testified this accused module comprises transformer windings and a magnetic core . *See* CX-0008C at Q/A 474 (infringement analysis for ’950 patent).

**(B) OUII’s Position**

OUII agrees with the Final ID and Vicor that the Delta Accused Modules infringe limitation [1.c], citing the same evidence proffered by Vicor and discussed above. OUII Init.

Sub. at 9-10 (discussing CX-0008C at Q/A 247); *see also* CX-008C at Q/A 262 (infringement analysis for U50SU4P180PMDAL module), Q/A 277 (infringement analysis for Q54SH12084NNDH module).

**(C) Respondents' Position**

Respondents argue that the accused modules do not infringe because the windings of the Delta Accused Modules are magnetically coupled to each other, not to the core structure. Resp. Init. Sub. at 4. Respondents offer the cross-examination testimony of Vicor's expert, Dr. Fayed, who admitted that the magnetic core in the accused modules "just basically routes the [magnetic] field from one side to the other side of the core," and that no electrical current runs through the core. *Id.* at 5 (quoting Tr. at 246:16-21, 248:9-15). Respondents do not suggest the Delta Accused Products do not satisfy limitation [1.c] pursuant to Vicor's construction. *See* Resp. RSub. at 1-4. To the contrary, Respondents cite their own experts as testifying that that Delta Accused Modules utilize "coupled inductors." *Id.* at 2 (citing Tr. at 627:19-23 (Ranjram); RX-0010C (Hopkins) at Q/A 386).

**iii. Analysis**

The record demonstrates that the Delta Accused Modules practice limitation [1.c] of claim 1 of the '761 patent. Vicor's expert Dr. Fayed provides detailed, unrebutted testimony identifying the necessary magnetic core structure and winding in each accused module. CX-0008C at Q/A 247, 262, 277. Dr. Fayed explained that "[t]he magnetic core structure is magnetically coupled to the winding by its arrangement and close proximity to the winding." *Id.* The three dimensional drawings of the modules reflect the windings on various layers of the PCB, in close proximity to one of the magnetic cores ( [REDACTED] ):



*See, e.g.*, RPX-0061C.0001. Respondents do not dispute Dr. Fayed’s description of relevant components, contesting only the characterization of these components as “transformers.” *See* RSub. at 2. Regardless of whether the components are characterized as transformers or inductors, they satisfy the definition of “magnetically coupled” as properly construed, because they encompass core and winding structures that function as either transformers or inductors. *Id.* Accordingly, the Commission finds that the Delta Accused Modules practice limitation [1.c].

**c. Construction of “Dissipate Power”**

**i. Final ID**

Limitation [1.d] provides for a plurality of power semiconductor devices on the top and bottom surfaces of a PCB with similar power dissipation levels. More specifically, the limitation states that the power semiconductor devices on the top surface are “electrically connected to dissipate power at a level,  $P_t$ , during operation of the converter,” and the power semiconductor devices on the bottom surface are “electrically connected to dissipate power at a level,  $P_b$ , during operation of the converter.” Limitation [1.e] further provides that “the power semiconductor devices are distributed between [the top and bottom surfaces] to distribute heat generation during operation of the converter such that each level  $P_t$ ,  $P_b$  is less than 150% of the other level  $P_b$ ,  $P_t$ .”

During *Markman* proceedings, the parties agreed that the phrase “dissipate power at a level” should be given its plain and ordinary meaning but disagreed as to the meaning of “dissipate.” *See* Order No. 30 at 31; Final ID at 86. Vicor argued that “dissipate” refers “generally to the loss of electrical energy.” *Id.* at 31. Respondents argued that “dissipate” means to “disperse” and “power” encompasses “all types of power,” including heat and electrical. *Id.* OUII argued the ALJ should construe the term to have its plain and ordinary meaning, *i.e.*, “dissipate power at an amount.” *Id.* The ALJ agreed with OUII and deferred Respondents’ argument regarding heat versus electrical power pending further development. *Id.* at 32. As for “dissipate,” the ALJ rejected Respondents’ proposal on the grounds the specification uses the term “disperse” to mean “place” or “dispose,” which is not relevant to the meaning of dissipation of power lost during operation of the module. *See id.*

Respondents petitioned for review of the Final ID’s construction of “dissipate power at a level,” arguing that the term “power” includes energy in any form, and thus to “dissipate power” (*i.e.*, levels Pt and Pb), the heat generated by the power semiconductor devices on the PCB must be “transferred out of the [power semiconductor device].” RPet. at 16. By contrast, Respondents characterized Vicor’s view as “all that is required is for a [power semiconductor device] to convert electrical energy into heat, even if that heat still sits right inside the same [power semiconductor device].” *Id.*

**ii. Parties’ Positions**

**(A) Respondents’ Position**

Respondents argue that the term “power” “includes energy in any form, whether electricity or heat,” and as a result, to “dissipate power,” “electrical energy would have to be converted into heat energy and transferred out of the [power semiconductor device].” RPet. at 16. In other words, because heat is a form of power, if the heat is not transferred from the power

semiconductor device, the power has not “dissipated.” *Id.*; *see also* Resp. Init. Sub. at 9, n.6 (explaining that “Respondents’ construction is concerned only with heat “transfer” from the power semiconductor devices that generate the heat, not with heat ‘removal’ from the power converter entirely”).

In support of their construction, Respondents assert that the plain meaning of “power” includes both electrical energy and heat. RPet. at 21. Respondents suggest the ’761 patent makes clear that “power” includes heat, using “heat dissipation” and “power dissipation” interchangeably:

J4. Symmetrical ***Power Dissipation*** Between PCB Surfaces

The components may be arranged between the PCB surfaces according to ***heat dissipated*** during operation. For example, the ***heat dissipative*** components may be arranged in a manner that distributes the heat evenly between the two PCB surfaces allowing heat produced by power dissipating devices to be extracted from both surfaces of the PCB improving the thermal performance. This type of ***heat dissipation*** symmetry is also factored into the component layout shown in the power converter of FIG. 27. . . . To ensure ***heat dissipation*** symmetry between the two surfaces, the cells may be arranged in mirror image layouts as shown.

RPet. at 22 (quoting CX-0012 at 24:45-55, 24:65-67) (emphasis by Respondents). According to Respondents, when the patent intends to refer to electrical energy (as opposed to heat), it specifies “electronic power.” *Id.* (citing CX-0012 at 1:25, 1:30-31, 1:38, 1:40-41 (referring to “electronic power”). Respondents thus conclude that the ’761 patent’s use of the term “power” necessarily includes “heat.” *Id.*

Respondents emphasize that claim 1 uses the terms “dissipate power” and “heat generation,” “presumptively indicating a difference between the two.” RPet. at 23 (citing *Board of Regents of the Univ. of Texas Sys. v. BENQ Am. Corp.*, 533 F.3d 1362, 1371 (Fed. Cir. 2008)). Respondents argue that because power dissipation levels on the top and bottom of the converter

are defined in limitation [1.d] as Pt and Pb respectively, if power dissipation and heat generation mean the same thing, the strikethrough portion of limitation [1.e] would be redundant:

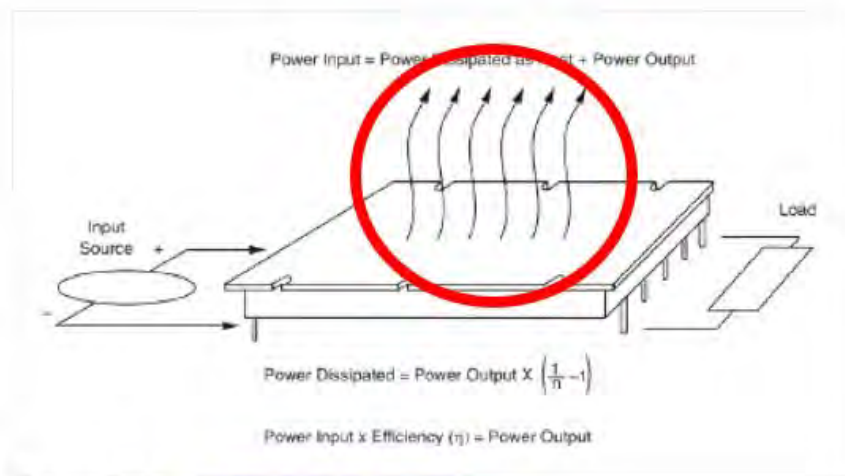
~~wherein the power semiconductor devices are distributed between the first and second sets to distribute heat generation during operation of the converter~~ such that each [power dissipation] level Pt, Pb is less than 150% of the other level Pb, Pt.

Resp. Init. Sub. at 10 (annotating '761 patent, claim 1). Respondents also argue that the use of the phrase “such that” in limitation [1.e] implies that heat generation occurs before power dissipation, again indicating heat generation and power dissipation are distinct concepts. *Id.* Respondents also point to the excerpt from column 24 reproduced above as demonstrating that claims are concerned with dissipating heat, not merely generating heat. *Id.* at 10-11; *see id.* at 11 (citing *Sequoia Tech., LLC v. Dell Inc.*, 66 F.4th 1317, 1326 (Fed. Cir. 2023) (The “express purpose of the invention informs the proper construction of claim terms.”)).

Respondents explain that the purpose of the invention is to improve the thermal performance of power converters through the use of mechanisms like heat sinks to transfer heat away from a converter. *Id.* at 12 (citing CX-00012 at 24:53). According to Respondents, the specification “discusses techniques to efficiently transfer heat and avoid hotspots,” but only Respondents’ construction of “dissipate power” addresses this goal; Vicor’s construction “would render large swaths of the specification . . . irrelevant and render the claims unconcerned about the stated purpose of the patent.” *Id.* at 12-13.

In terms of extrinsic evidence, Respondents point to a graphic from Vicor’s power converter documentation as showing heat transfer out of the device as “dissipated power”:

**CONFIDENTIAL MATERIAL REDACTED**  
**PUBLIC VERSION**



**Figure 20.1a** — **Dissipated power**

RPet. at 23 (annotated excerpt of RX-0631.0002). Respondents also point to testimony by their experts, Dr. Ranjram and Dr. Ehsani, as articulating a difference between generating heat and dissipating heat. RPet. at 24 (citing Tr. (Ranjram) at 612:12-18 (“Q. Do you agree that power dissipation is a measure of how much power in a circuit is converted into heat? A. I would agree that power dissipation encompasses heat, but it’s not just the generation – heat isn’t just generated. Heat goes somewhere. So when one refers to power dissipation, it refers to both the generation of heat and the transfer of that heat.”); Tr. (Ehsani) at 641:8-12 (recognizing a distinction between power dissipation and heat generation) (emphasis by Respondents)).

Respondents also cite the Modern Dictionary of Electrics, which defines “power dissipation” as “[t]he dispersion of the heat generated within a device or component when a current flows through it. This is accomplished by convection to the air, radiation to the surroundings, or conduction.” Resp. Init. Sub. at 11 (quoting Respondents’ Opening Claim Construction Br., Ex. 12 at 581) (emphasis by Respondents).

**(B) Vicor’s Position**

Vicor argues that nothing in the claim language requires a “transfer of heat” or removal. Resp. to RPet. at 19. Vicor contends that in the specification, “the claimed power dissipation (and resulting ‘heat generation’) is distinct from *heat removal*, which is not claimed.” *Id.* at 20 (emphasis by Vicor). Specifically, Vicor argues that the specification refers to heat removal only in connection with components that are not claimed in claim 1, including molding compounds, pads, heat sinks, and flush-mount techniques. *Id.* For example, the specification explains that “[t]he *compliant pads* may be chosen for good thermal conduction and optionally adhesive properties *facilitating heat removal from the cores into the heat sink* while optionally providing structural integrity to the assembly.” *Id.* (quoting CX-0012 at 14:59-61) (emphasis by Vicor); *see* CX-0012 at 20:45-48 (“A flush-mount technique may be used . . . to allow the bottom sink to come into contact with the customer PCB, *e.g., for heat removal.*”) (emphasis added). Vicor also cites portions of the specification that refer to conducting heat out of the module using such components. Resp. to RPet. at 20 (citing CX-0012 at 11:6-12 (“a thermally conductive medium in which heat may be readily conducted away from the PCB and components to the heat sinks”); 20:15-30 (“to allow better conduction of heat from the module”); 21:37-41 (“conduct heat out of the module”)). For this reason, Vicor contends that Respondents’ analysis of the “purpose” of the claims is misguided: Respondents cite the specification’s discussion of tools for extracting heat when those tools and structures are not recited in the claims. *Id.* at 23.

As for extrinsic evidence, Vicor relies on contemporaneous dictionaries and expert testimony. Resp. to RPet. at 21-22. Vicor cites the Authoritative Dictionary of IEEE Standard terms, defining “dissipation” as “[l]oss of electric energy as heat” (CX-2918.0006) and the McGraw-Hill Dictionary of Scientific and Technical Terms, similarly defining dissipation as “[a]ny loss of energy, generally by conversion into heat” (CX-2916.0003). *Id.* at 20. Vicor’s

expert, Dr. Fayed, testified that “dissipate power” as used in limitation [1.d] “refers to the loss of electrical energy as heat and is related to the referenced ‘heat generation during the operation of the converter.’” *Id.* at 22 (quoting CX-0008C at Q/A 87). Vicor also cites Respondents’ experts as testifying consistent with Dr. Fayed:

- Dr. Ranjram stated that “[p]ower dissipation is the process by which an electrical device produces heat that is energy loss or waste, as an undesirable derivative of its primary action.” Tr. at 612:7-11.
- Dr. Ehsani, in analyzing the BMR 453 prior art module, testified that “[t]he power dissipation from the three output switches on one side would be approximately nearly exactly equal to the power dissipation, power generation, at least, thermal power generation of the switch, the other output switch, yes.” Tr. at 641:8-12.

*Id.* at 21. Vicor also objects to Respondents’ reliance on the internal Vicor document as irrelevant because it illustrates heat transfer out of a module, whereas the claim refers to power dissipation by the power semiconductor device within the module. *Id.* at 22.

### (C) OUII’s Position

OUII argues that the intrinsic record demonstrates that (1) “dissipate power” means “‘the loss of electrical energy,’ which causes/results in ‘heat generation,’” and (2) “‘to distribute heat generation during operation’ refers to the distribution of heat generation.” OUII Init. Sub. at 11 (citing CX-0012 at 24:47-55). In response to the Commission’s specific question on review, OUII argues that although dissipating power results in heat generation, “power” is measured in energy per unit time (e.g., joule per second), and “heat” is measured just in terms of energy (e.g., joule). *Id.* at 12. In this sense, “dissipating power” and “heat generation” theoretically have distinct meanings, but because “power” is not discussed in terms of units of time, in this context the terms do not have distinct meanings. *Id.*

**iii. Analysis**

The Commission agrees with Vicor and OUII that the plain and ordinary meaning of “dissipate power” does not require the transfer or removal of heat away from the power dissipating component.

Beginning with the claim language, limitation [1.d] recites “a first set of the power semiconductor devices being mounted on the top surface and electrically connected to dissipate power at a level, **Pt**, during operation of the converter” and “a second set of the power semiconductor devices being mounted on the bottom surface and electrically connected to dissipate power at a level, **Pb**, during operation of the converter.” CX-0012 at 28:24-28 (emphasis added). The claim language is important because it indicates that the power semiconductor devices on the PCB are “dissipat[ing] power.” This is consistent with Vicor’s and OUII’s explanation that the power semiconductor devices are losing electrical energy during operation of the converter, which all parties agree results in the generation of heat. Under Respondents’ construction, the power semiconductor devices must both generate the heat and must transfer heat away from themselves. This is facially illogical, and, as discussed below, inconsistent with the specification’s discussion of techniques for conducting heat away from the components mounted to the PCB.

The specification supports the understanding that “dissipat[ing] power” refers to the components on the PCB losing electrical energy, which results in the generation of heat. In particular, the specification discusses contouring heat sinks to account for “heat dissipating components,” CX-0012 at 11:17, 26-28, and arranging cells on the PCB to “ensure heat dissipation symmetry,” *id.* at 24:65-67. The specification elsewhere refers to “power dissipative components of the input cells,” and “power dissipated by the power FETs.” *Id.* at 25:4-8, 11-24. In other words, throughout the specification the components mounted to the PCB that generate

heat are characterized as “dissipating power” or “heat dissipating,” which the specification uses interchangeably. Components like a heat sink, which are designed to remove heat from the modules, are not referred to as “heat dissipating,” implying dissipation is not equivalent to removal. *See, e.g.*, CX-0012 at 11:6-23, 26-28; *id.* at 20:25-28, 45-48; *id.* at 21:4-8, 24-47.

By contrast, the specification separately refers to encapsulation and other techniques to remove the heat generated by the power semiconductor devices mounted to the PCB. For example, the specification explains that “[e]ncapsulation . . . may aid in conducting heat out of the over-molded components.” CX-0012 at 1:34-35. The specification also discusses using pins connecting to a heat sink or protruding from the bottom of the board to “conduct heat out of the module.” *Id.* at 21:37-41, 44-47. The patent further describes using molding compound, pads, flush mounting, thermal adhesive, and removing a bottom surface to “facilitate removal of heat.” *Id.* at 11:6-13 (molding compound “provides a thermally conductive medium in which heat may be readily conducted away from the PCB”), 14:59-62 (pads “facilitating heat removal”), 20:25-27 (removing the bottom “to allow better 27 conduction of heat from the module”), 20:45-48 (flush-mount technique “for heat removal”), 21:4-7 (thermal adhesive between the PCB and heat sink “to facilitate removal of heat”); *see also id.* at 21:7-9 (“Additionally, the PCB surface may include thermally conductive features to conduct heat away from the module 615.”). As Vicor argued, these techniques and features for removing heat are not recited in the claim language, indicating “heat removal” is not a requirement of the claimed device.

Furthermore, in two places the specification teaches that spreading out the components symmetrically on the PCB “spread[s] the heat produced by power dissipating devices,” which allows for better “heat extraction.” CX-0012 at 24:2-6, 45-55. In only one place in the specification, “dissipate” is used in the manner suggested by Respondents. Specifically, the

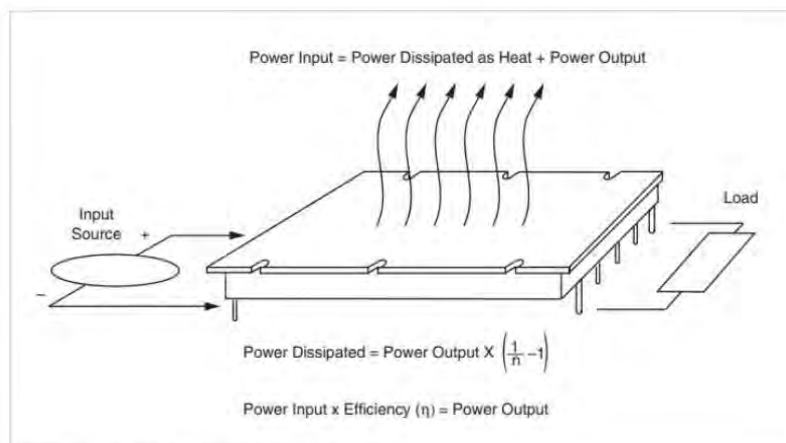
patent states “a heat sink component (not shown) may be fitted onto the protruding pins to help dissipate heat.” *Id.* at 21:47-49. While this could support Respondents’ argument that “dissipate” requires removing the heat generated by the power semiconductor devices, this single sentence does not outweigh the otherwise clear instruction from the specification that the power semiconductor devices “dissipate power” by losing electrical energy during operation of the device, which results in the generation of heat.

Respondents also argue that because claim 1 uses both “dissipate power” and “heat generation,” the terms presumptively have different meanings. RPet. at 23; Resp. Init. Sub. at 10. We agree with OUII that while, in theory, power dissipation and heat are measured differently, the measurement of power dissipation is relevant only to limitations [1.d] and [1.e], so there is no practical difference between “dissipat[ing] power” and “heat generation” for purposes of claim 1. Respondents further argue that the use of the term “such that” implies that heat generation occurs before power dissipation. Resp. Init. Sub. at 10. The claim language does not clearly reflect the order in which events occur; “such that” can also be read to connote that the result of the distribution of components is that the levels Pt and Pb are less than 150 percent of each other. Even if Respondents’ reading is correct, that is not sufficient to overcome the clear guidance in the specification that the power semiconductor devices generate heat, but are not required to remove that heat, *i.e.*, unclaimed components are used to remove the heat generated by the power dissipating components.

As to the purpose of the invention, additional context is useful. The applicant had multiple co-pending applications to cover a wide range of concepts disclosed in the

specification.<sup>17</sup> The invention the application chose to claim in the '761 patent relate to symmetrical alignment of the components to evenly distribute the heat generated by those components during operation. The applicant was free to elect a subset of the inventions disclosed in the specification to claim in this patent, and here the applicant decided not to claim the methods or tools for removing the heat generated by power dissipation.

The extrinsic evidence cited by Respondents does not overcome the clear instruction from the intrinsic record. Respondents cite Vicor's Design Guide & Application Manual for certain converters. RX-0631.0001. Figure 20.1a of the manual shows "power dissipated as heat" from a module:



**Figure 20.1a** — Dissipated power

<sup>17</sup> The application that issued as the '761 patent was a divisional of and claimed priority to U.S. Patent App. No. 13/105,696, which issued as U.S. Patent No. 8,966,747 ("the '747 patent"). CX-0012 at 1:8-11. The '761 patent is also related to U.S. Patent Appl. No. 14/635,420, which issued at U.S. Patent No. 9,439,297 ("the '297 patent"). *Id.* at 1:11-13. The '761 patent shares a specification with the '747 and '297 patents. The claims of the '747 patent are directed to methods of manufacturing PCB with electrical contacts. The claims of the '297 patent are directed to methods of making electronic devices encapsulated and cover in molding. The application that issued as the '761 patent originally contained more than 153 claims, and the applicant elected to cancel all claims except those that issued as claims 1-7.

RX-0631.0002. The manual itself explains that some of the input power “is dissipated as heat within the converter.” *Id.* To the extent this document is at all relevant to the interpretation of the patent, it is consistent with Vicor’s and OUII’s contention that power is lost in the form of heat generation from the power semiconductor devices (the patent’s term for relevant components on the PCB) within the claimed converter, but there is no requirement in the claims that the generated heat be removed from the surface of the component that generated the heat. Likewise, the dictionary definition Respondents cite defines power dissipation as dispersion “within a device or component.” Nothing in this definition requires removal from the device after the heat is dispersed from the component.

For these reasons, the Commission finds that “dissipate power” does not require transfer or removal of heat from the power semiconductor devices.

**d. Infringement of Limitation [1.e]**

Applying the proper construction of “dissipate power,” the Commission affirms, with the supplemental analysis below, the Final ID’s finding that the Delta Accused Modules practice limitation [1.e].

**i. Final ID**

The Final ID credits the testimony of Vicor’s expert, Dr. Fayed, that the Delta Accused Modules have [REDACTED]. Final ID at 90. Dr. Fayed explained that because of the [REDACTED], making the power dissipation values  $P_t$  and  $P_b$  “essentially equal.” *Id.* Respondents argued that the power dissipation by the components on the top and bottom of the PCB are not equivalent because the accused modules contain [REDACTED]. *Id.* at 89. The fact, the Final ID finds, that “packaging, mounting components, or other extrinsic structures may change heat generation

during actual operation is irrelevant,” otherwise, “infringement of an apparatus claim could be avoided by the simple expedient of adding components, which is contrary to the law.” *Id.* at 89-90; *see id.* at 90 (citing *Amgen, Inc. v. F. Hoffman-La Roche Ltd.*, 581 F.Supp.2d 160, 201 (D. Mass. 2008) (“merely adding elements to an otherwise infringing device will not enable the infringer to escape liability”) (citing *A.B. Dick Co. v. Burroughs Corp.*, 713 F.2d 700, 703 (Fed. Cir. 1983))). The Final ID further finds that Respondents’ argument that “heat generation is not similar on both sides” of the accused modules is “entirely new” and thus waived. *Id.* at 89. Accordingly, based on Dr. Fayed’s testimony, the Final ID finds that the Delta Accused Modules satisfy the requirement in limitation [1.e] that Pt and Pb each be “less than 150% of the other level.” *Id.* at 90.

**ii. Parties’ Positions**

**(A) Respondents’ Position**

Respondents argue that Vicor failed to show that the accused modules practice limitation [1.e] because Vicor’s expert did not address the effect of resistance on power dissipation. Resp. Init. Sub. at 15-16. Respondents note that Vicor’s expert, Dr. Fayed, admitted that the temperature of a device will affect the resistance, which in turn affects heat generation. *Id.* at 16. However, Respondents assert, Dr. Fayed did not address the temperature of the accused modules during operation. *Id.* (citing Tr. at 225:16-17). Respondents argue that “temperature could potentially have large impacts on resistance and, in turn, large impacts on power dissipation,” and the “temperature of the power semiconductor devices is very dissimilar ‘during operation of the converter.’” *Id.* (quoting RX-0636C.0014). Respondents argue that failing to analyze whether the power semiconductor devices operate at similar temperature “forecloses Vicor’s ability to carry its burden” on infringement. *Id.* Respondents further argue that this argument was not waived because (1) a party cannot waive a failure of proof argument and (2) the first

time Respondents could have raised the argument that Vicor failed to meet its burden at trial was in its initial post-hearing brief. Resp. RSub. at 6-7.

**(B) Vicor’s Position**

Vicor reiterates the testimony from Dr. Fayed the Final ID credits that the accused modules have [REDACTED], resulting in the same power dissipation on top and bottom. Compl. Init. Sub. at 7-8. Vicor emphasizes that Respondents’ expert’s, Dr. Ranjram’s, non-infringement position was based entirely on Respondents’ position that “dissipation of power” requires “transfer of heat out of that device.” *Id.* at 8. Vicor also notes Respondents that failed to raise the argument regarding asymmetrical heat generation in their non-infringement contentions, expert reports, or pre-hearing briefing. Compl. RSub. at 8.

**(C) OUII’s Position**

OUII notes that Respondents did not dispute that the accused modules practice limitation [1.d], which recites two sets of power semiconductor devices that “dissipate power” at levels Pt and Pb. OUII Init. Sub. at 12. OUII reasons that “given that ‘heat generation’ and ‘dissipate power’ are essentially the same,” the accused modules must also practice the “heat generation” limitation in [1.e]. *Id.* at 13. OUII also notes that Dr. Ranjram admitted that if “dissipate power” does not require transfer of heat away from a component, “he does not have a non-infringement opinion with respect to element [1.e].” *Id.* at n.5.

**iii. Analysis**

As a threshold matter, the Commission agrees with the Final ID that Respondents failed to timely raise the argument that Vicor’s infringement evidence is insufficient because Vicor did not model how the [REDACTED] on the accused modules affect heat *generation* by the power semiconductor devices. Final ID at 89. Respondents’ argument in their Pre-Hearing

Brief regarding limitation [1.e] focuses entirely on how the [REDACTED] affect *heat removal* from the module. RPHB at 133. Respondents were on notice of Vicor’s position that “dissipate power” does not require heat removal no later than the filing of Vicor’s opening *Markman* brief on December 12, 2023. Complainant Vicor Corp. Opening Claim Construction Br. at 20-21 (Dec. 12, 2023) (EDIS Doc. Id. 810264). Yet Respondents did not raise the argument that Vicor’s failed to produce sufficient evidence of equivalent heat *generation* (as opposed to removal) until their Post-Hearing Brief, submitted May 24, 2024.

The Commission finds that Dr. Fayed’s testimony provides sufficient evidence for the Commission to find Vicor met its burden to show it is more likely than not that the power semiconductor devices on the accused modules dissipate power at the rates required by limitation [1.e] of claim 1. *See* Final ID at 90; CX-0008C at Q/A 278-79. Accordingly, the Commission affirm the Final ID’s finding that the Delta Accused Modules practice limitation [1.e] under the proper construction of “dissipate power” and, together with the additional analysis in the Final ID, infringe each of asserted claims 1-7.

### **3. Validity**

Respondents asserted five grounds for invalidity with respect to the ’761 patent:<sup>29</sup>

- Claims 1-3 and 7 are anticipated by BMR 453 Module<sup>18</sup>
- Claims 1-7 are obvious over BMR 453 Module
- Claims 1-2 and 4-6 are obvious over Wanes<sup>19</sup>

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<sup>18</sup> BMR 453 Module is a DC/DC converter manufactured by Ericsson. Final ID at 91-92. The technical specification documentation for the BMR 453 Module can be found in the record as RX-0299.

<sup>19</sup> U.S. Patent No. 6,965,517 (RX-0321) entitled “Component Substrate for a Printed Circuit Board and Method of Assembling the Substrate and the Circuit Board” (“Wanes”).

- Claims 1-7 are obvious over Takeshima<sup>20</sup>
- Claims 2 and 4 are invalid as indefinite

The Final ID finds that claims 1-3 and 7 are invalid as anticipated by the BMR 453 Module, but otherwise rejects Respondents' grounds for invalidity. Final ID at 97-118.

As set forth below, the Commission has determined to reverse the Final ID's finding that the BMR 453 Module anticipates or renders obvious claims 1-3 and 7. The Commission further has determined to: (1) affirm the Final ID's finding that Waner teaches the limitations of claims 1 and 2 but not claims 4-6; (2) affirm with modified reasoning the Final ID's finding that Vicor showed commercial success of the '761 DI Products as a secondary indicia of non-obviousness, take no position on the Final ID's finding that Vicor did not demonstrate copying as a secondary indicia of non-obviousness, and therefore ultimately affirm the ID's finding that no claim of the '761 patent has been shown to be obvious; and (3) affirm with modified analysis the Final ID's finding that claims 2 and 4 are not invalid as indefinite. The Commission affirms the Final ID's analysis that claims 1-7 are not obvious over Takeshima and the Final ID's analysis regarding long-felt need, failure of others, and licensing as secondary indicia of non-obviousness.

**a. Anticipation by BMR 453 Module**

**i. Final ID**

For its first invalidity grounds, Respondents argued that claims 1, 2, 3, and 7 of the '761 patent are invalid as anticipated by the BMR 453 Module. Final ID at 92. In the alternative, Respondents argued that claims 1-3 and 7 are invalid as obvious over the BMR 453 Module. RIB at 70. The BMR 453 Module was made by Ericsson and sold to multiple customers in the United States in 2008 and 2009. Final ID at 92. Respondents' expert, Dr. Ehsani, tested six

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<sup>20</sup> U.S. Patent No. 6,970,367 (RX-0322) entitled "Switching Power Supply" ("Takeshima").

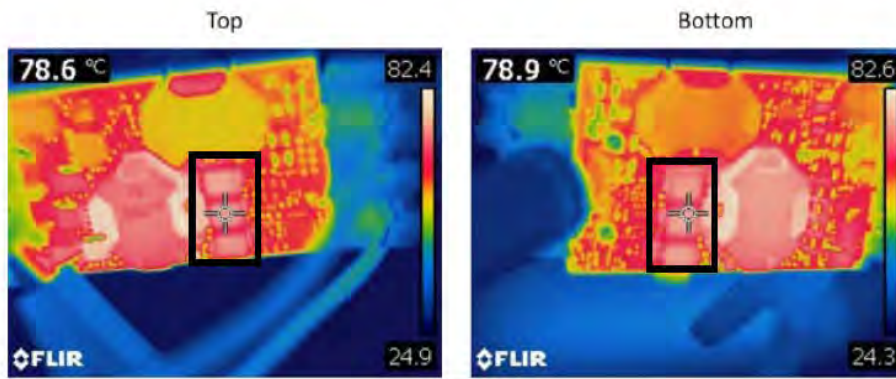
physical samples of the module. *Id.* Respondents also introduced the technical manual for the module into evidence as RX-0299. Vicor did not dispute that the BMR 453 Module teaches most of the limitations of claim 1. *See id.* at 94 (noting Vicor did not contest Dr. Ehsani’s testimony that the BMR 453 Module teaches limitations [1.a], [1.b], and [1.c]).

The crux of the parties’ dispute arose out of the term “a plurality of power semiconductor devices” recited in limitation [1.d].<sup>21</sup> Limitations [1.d] and [1.e]<sup>22</sup> together require that the claimed apparatus dissipate power (*i.e.*, generate heat) from the top and bottom surfaces at levels Pt and Pb such that the levels are within 150 percent of each other. Respondents argued that the reference to “a plurality of power semiconductor devices” means the claim language is satisfied so long as some subset of two or more of the power semiconductor devices on the top surface dissipates power within 150 percent of the level of some subset of two or more of the power semiconductor devices on the bottom surface. *Id.* at 95. Respondents’ expert, Dr. Ehsani, testified that testing of the BMR 453 module demonstrated that the power dissipated in the form of heat generated by the three MOSFET switches on the top and bottom of the PCB (in the black boxes) was nearly equal:

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<sup>21</sup> In relevant part, limitation [1.d] recites a “plurality of power semiconductor devices, a first set of the power semiconductor devices being mounted on the top surface . . . a second set of the power semiconductor devices being mounted on the bottom surface. . . .”

<sup>22</sup> Limitation [1.e] recites “wherein the power semiconductor devices are distributed between the first and second sets to distribute heat generation during operation of the converter such that each level Pt, Pb is less than 150% of the other level Pb, Pt.”



RDX-0006C.0011

RX-0006C at Q/A 55 (annotations added). Vicor responded that the power dissipation level of *all* power semiconductor devices on one surface must be with 150 percent of that for *all* of the power semiconductor devices on the opposite surface. Final ID at 95. Vicor argued that Dr. Ehsani’s failure to account for the heat generated by all power semiconductor devices on the top of the BMR 453 Module meant Respondents failed to meet their burden to show the BMR 453 Module practices limitation [1.e]. *Id.*

The Final ID agrees with Respondents, noting that the claim refers to “a plurality” of devices, comprising a “first set” and a “second set.” *Id.* at 95-96. The Final ID explains that the word “set” implies at least two, and that “the number of elements in each set must be the same.” *Id.* The Final ID acknowledges the specification’s emphasis on symmetrical arrangement of components, but notes that the claim language is broad such that exact symmetry is not required. *Id.* at 96. The Final ID further explains that by setting the threshold at 150 percent (rather than closer to 100 percent), claim 1 would seem to contemplate a disparate number of components. *Id.*

Vicor cited *Apple Inc. v. Samsung Electronics Co., Ltd.*, 695 F.3d 1370 (Fed Cir. 2013), in support of its construction. *Id.* at 97 (discussed further, *infra*). The Final ID, however,

distinguishes *Apple* on the grounds that, unlike the claim at issue in *Apple*, in claim 1 of the '761 patent, there is no limitation that applies to all of the power semiconductor devices collectively. *Id.* Vicor also emphasized that the U.S. Patent and Trademark Office Patent Trial and Appeal Board (“PTAB”) declined to institute an *inter partes* review of the '761 patent based on a petition filed by Delta. *Id.* In the decision declining to institute an *inter partes* review, the PTAB construed the term “plurality” consistent with Vicor’s arguments here.<sup>23</sup> *Id.* at 97-98. Accordingly, Vicor argued, Respondents’ proposed construction would be contrary to the PTAB’s. *Id.* at 98.

Applying Respondents’ construction of “plurality,” the Final ID finds that three MOSFET switches on each side of the BMR 453 would dissipate the same amount of power and thus satisfy the 150 percent threshold recited in limitation [1.e]. *Id.* at 98. Vicor did not dispute that the BMR 453 Module teaches the additional limitations of dependent claims 2, 3, and 7. *Id.* Accordingly, the Final ID finds claims 1, 2, 3, and 7 of the '761 patent are invalid as anticipated by the BMR 453 Module.

**ii. Parties’ Positions**

**(A) Vicor’s Position**

Vicor argued that the Final ID errs in construing “plurality,” and that the claim language should be read to require a comparison of the power dissipation by all power semiconductors on the top and bottom surfaces of the PCB respectively. CPet. at 38. Vicor argued that the Final ID’s construction is inconsistent with the plain meaning of the claim language and the purpose of the invention, which is to “disclose a symmetrical distribution of components between PCB surfaces.”. *Id.* at 39.

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<sup>23</sup> See IPR2024-00227, Paper 13 (May 24, 2024).

Vicor explained that “a plurality” simply means “the state of being plural.” CPet. at 39. In other words, “Claim 1’s ‘a plurality of semiconductor devices’ merely demonstrates that the invention encompasses power converters that have—at a minimum—two or more power semiconductor devices.” *Id.* Vicor argued that the term “a plurality of power semiconductor devices” does not disclose “separate pluralities, wherein a [person of ordinary skill in the art] can pick and choose which power semiconductor devices to consider.” *Id.* at 40. Vicor suggested that picking and choosing would be inconsistent with the purpose of the patent, namely, distributing the heat generating components to attain specific power dissipation levels during operation of the device. *Id.* Vicor emphasized that “a plurality of power semiconductor devices” precedes the patent’s use of “set,” and thus the Final ID’s construction commits the same error as the district court in *Apple*. *Id.* at 41.

**(B) Respondents’ Position**

Respondents argued the Final ID’s construction is consistent with the claim language. *See* Resp. to CPet. at 27. Specifically, Respondents argue that the plain meaning of “a” is “one or more,” and thus, there can be “one or more” plurality of power semiconductor devices on the claimed module. *Id.* Likewise, Respondents reasoned, there can be one or more “first sets” of devices on the top of the PCB, and one or more “second sets” on the bottom of the PCB. *Id.* at 27-28. Respondents suggested that the “a” rule is “twice as strong” in this scenario because the claim references both “a plurality” and “a first/second set.” *Id.* (emphasis by Respondents). Respondents argued that Vicor’s construction would render superfluous the terms “a first set” and “a second set.” *Id.* Respondents distinguished *Apple* on the grounds it “did not announce some general rules of claim construction that ‘a plurality’ always means ‘all[.]’” *Id.* at 29. Respondents further argued that the ’761 patent discusses an embodiment in which certain power

semiconductor devices are not considered in calculating the power dissipation ratio. *Id.* at 32 (citing CX-0012 at 224:60-25:24).

**(C) OUII's Position**

OUII initially agreed with Vicor's construction of "plurality," but opposed Vicor's petition for review of the Final ID's finding. OUII Resp. at 14. Quoting the Final ID, OUII argued that the Final ID did not err in rejecting Vicor's arguments, including in distinguishing *Apple*. *Id.* at 15-16. OUII also noted that the PTAB did not have Respondents' proposed construction before it in evaluating the parties' arguments. *Id.* at 16.

**iii. Analysis**

The Commission has determined to reverse the Final ID's construction of "plurality." Limitation [1.d] recites "a plurality of power semiconductor devices," organized into "a first set" on the top surface, and "a second set" on the bottom surface. Limitation [1.e] reinforces this layout, providing that "*the* power semiconductor devices are distributed between the first and second sets" to achieve the required equivalent power dissipation levels. The Commission finds that the use of "the" in limitation [1.e] ("*the* power semiconductor devices") reflects that the first and second sets include all of the "plurality" of power semiconductor devices required by limitation [1.d].

The specification does not clearly support either of the approaches offered here: (a) the Final ID's approach, comparing any subset of two or more power semiconductor devices on the top of the PCB to any subset of two or more power semiconductor devices on the bottom of the PCB; or (b) Vicor's approach, requiring a comparison of the power dissipated by all power semiconductor devices on the top and bottom of the PCB. Overall, the specification places great weight on the symmetrical distribution of large components between the top and bottom of the PCB, symmetrical arrangement of those components on opposing sides of the PCB, and

symmetrical arrangement based on power dissipation by components. *See* CX-0012 at 23:16-25:32. The patent explains that “spreading the components out symmetrically on each surface helps to spread the heat produced by power dissipating devices using a greater surface area for heat extraction improving the thermal performance.” *Id.* at 24:2-6; *see also id.* at 7:40-43 (“[E]ach of a plurality of the top-side large-footprint switches can share its respective set of conductive vias with a corresponding one of the bottom-side large-footprint switches.”).

However, there are embodiments in the patent that discuss symmetrical arrangement of less than all components on the PCB. At several points, the specification explains that “*most* of the large-footprint components can be distributed symmetrically . . . .” *Id.* at 6:39-40, 7:43-56. Likewise, there are two references to “*a plurality of the power semiconductor devices*” being arranged in overlapping locations with corresponding devices on the opposing surface of the PCB. *See id.* at 9:6-9 (“[A] plurality of the power semiconductor devices in the first set can share their respective sets of conductive vias with corresponding power semiconductor devices in the second set.”); *id.* at 8:67-9:4.

Despite the variance in the specification, *Apple* resolves this dispute. The claim at issue in *Apple* recited, in relevant part:

*a plurality of heuristic modules* configured to search for information that corresponds to the received information descriptor, wherein:

*each heuristic module* corresponds to a respective area of search and employs *a different, predetermined heuristic algorithm* corresponding to said respective area, and the search areas include storage media accessible by the apparatus . . .

695 F.3d at 1373. The District Court interpreted the claim language to mean that the “each” clause modifies “plurality of heuristic models,” such that claim requires that “each of at least two modules” employ a different algorithm, not “each and every module.” *Id.* at 1378. The Federal Circuit reversed, finding the District Court’s interpretation ran counter to the plain terms of the

claim. *Id.* As the Federal Circuit explained, “[t]he word ‘each appears not before ‘plurality of modules,’ but inside the ‘wherein’ clause and before the phrase ‘heuristic modules.’” *Id.* The Federal Circuit faulted the District Court construction for “plucking ‘each’ from where it appears and planting it before the phrase ‘plurality of modules.’” *Id.* at 1378.

The same is true here. Claim 1 recites “a plurality of power semiconductor devices . . . wherein the power semiconductor devices are distributed . . .” The word “the” appears not before “plurality of semiconductor devices,” but inside the “wherein” clause and before the phrase describing the distribution of devices. Use of the phrase “the power semiconductor devices” in limitation [1.e] is an express requirement that all of the power semiconductor devices in the plurality be collectively distributed between the top and bottom surfaces of the PCB. *Cf.* Final ID at 97.<sup>24</sup> The use of “first set” and “second set” is to distinguish between the devices on the top and bottom surfaces of the PCB and does not suggest that the person of ordinary skill could pick and choose which devices to consider in evaluating power dissipation levels Pt and Pb. *Cf., id.* Accordingly, the Commission finds that the comparison of power dissipation levels Pt and Pb must take into account all power semiconductors on each surface.

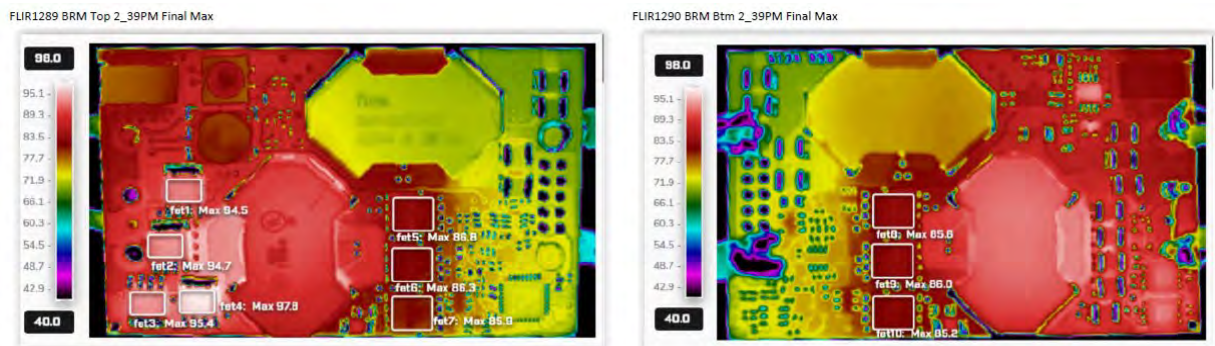
Respondents argued that the record showed the BMR 453 Module teaches limitation [1.e], even under Vicor’s construction of “plurality.” Resp. to CPet. at 36. Respondents explained that “[u]nder Vicor’s construction of ‘a plurality,’ the power dissipation of the four inverter FETs (used as input switches) must also be accounted for along with the six output FETs.” *Id.* Respondents argued that including the four input switches does not change the

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<sup>24</sup> The same reasoning applies to Respondents’ argument that the phrases “a first set” and “a second set” in limitation [1.d] means more than one set of power semiconductors can be on each of the top and bottom surfaces. Resp. to CPet. at 28. The reference to “the first set” and “the second set” in limitation [1.e] requires consideration of all power semiconductor devices on each side of the PCB to be considered in comparing levels Pt and Pb. *Apple*, 695 F.3d at 1378.

analysis. *Id.* at 36-37. Respondents do not present any affirmative evidence in support of this argument. Rather, Respondents took an equation used by Dr. Fayed and argue that Dr. Fayed’s calculation did not use the correct input resistance for the switches on the BMR 453 Module. *Id.* at 37. Respondents argued that using the correct resistance data, the equation demonstrates the input FETs “do not materially affect the balance of power dissipation.” *Id.* at 38-39.

For its part, Vicor relied on thermal images of the BMR 453 Module that show the heat generated by the input FETs. CPet. at 48. The images show that the four input FETs in red to white color, reflecting the top of the temperature scale:



CX-3632C. The four input FETs can be seen on the bottom left of the first image, with maximum temperatures ranging from 94.5 degrees to 97.8 degrees. Referring to his own testing, Dr. Ehsani testified that “he could not even tell where the inverter [was] on the thermal imaging because it’s so cool.” Tr. at 652:14-21. Confronted with the images above at trial, Dr. Ehsani maintained his position that “heat generation of the four inverter switches in the BMR 453 is insignificant,” stating “you don’t do these things by visual art.” *Id.* at 656:3-10. On redirect, Dr. Ehsani stated as follows:

This converter is a voltage step-down power converter, a high-voltage DC, 48 volts, is converted to a lower voltage DC, 12 volts. That’s the reduction of voltage by a factor of four. Power is the same. Therefore, current at the input is also only a quarter of the current at the output.

Now, power dissipation of a switch is directly related to the amount of current that it has, both in conduction and in switching. And that power dissipation, thermal power dissipation, you can say is approximately proportional to the square of the current. So if it's carrying one-fourth of the current at the end, it's dissipating one-16th of the thermal power at the input compared to the switches of the output.

And that is the reason that they appear cooler, they don't contribute as much power to one side versus the other. Therefore, they can be asymmetrically distributed based on other constraints of geometry and fabrication, and they still meet the constraint of 150 percent.

Tr. at 673:2-20. In response to Vicor's petition for review, Respondents did not rely on Dr. Ehsani's explanation. Rather, they argued that the heat observed in the images is a result of the proximity of the switches to the windings extending out of the core. Resp. to CPet. at 41-42. Respondents did not cite any testimony or record evidence in support of this analysis.

Taking the record as a whole, we find that Respondents have not shown by clear and convincing evidence that the BMR 453 Module practices limitation [1.e] when properly construed to require comparison of power dissipated by all power semiconductor devices on each surface of the PCB. The thermal images showing non-negligible heat generated by the four input FETs calls into question the theoretical evidence offered by Respondents.

Accordingly, the Commission has determined to reverse the Final ID's finding that the BMR 453 Module practices limitation [1.e] and, thus, reverse the finding that the BMR 453 Module anticipates and renders obvious claims 1-3 and 7. Because claims 4-6 ultimately depend from claim 1, the Commission takes no position regarding whether the BMR 453 Module discloses the additional limitations of those claims, but finds the claims not anticipated or rendered obviousness based on the failure to show claim 1 is invalid. *See Beloit*, 742 F.3d at 1424.

**b. Obviousness over Waner**

The Final ID finds that claims 1 and 2 of the '761 patent would have been obvious over Waner, but that Waner does not teach the additional limitations of claims 4-6. Final ID at 102-05; RX-0321.0001 ("Waner"). The Commission affirms the Final ID's finding that Waner teaches the limitations of claims 1 and 2, with the following supplemental analysis with respect to limitation [1.e].

**i. Claims 1 and 2**

Respondents' expert, Dr. Ehsani, noted that Figure 1B of Waner shows a single set of primary-side windings in a transformer with two sets of secondary windings in parallel, for each half of the module:

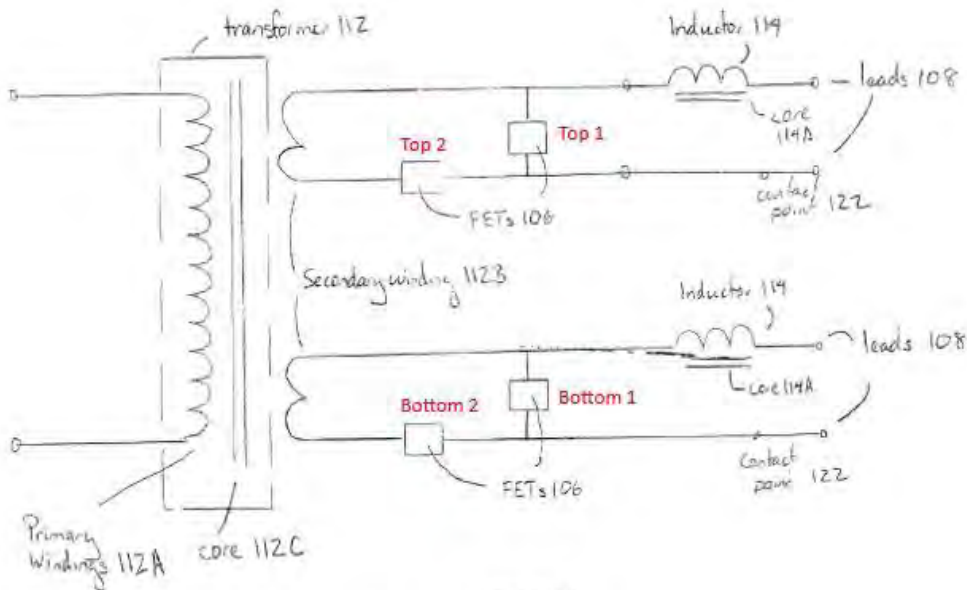


FIGURE 1B\*

RX-0006C at Q/A 90 (annotating Waner, Fig. 1B). Dr. Ehsani explains:

[A] POSITA would understand, you have two FETs on the top splitting power with two identical FETs on the bottom in a parallel configuration intended to share power equally. A POSITA would therefore have understood that the top-side and bottom-side circuits would have operated identically when paralleled with the same input as shown here. In other words, the two FETs 106 in the first circuit on top would have the same

power dissipation as the two FETs 106 in the second circuit on bottom. And, Waner teaches that this setup is just replicated across the other two output circuits not shown in Figure 1B, so you have another set of these two circuits also with the same power dissipation on the top and bottom.

*Id.* Dr. Ehsani suggests that “just as a matter of common sense,” Waner teaches four identical converters that are symmetric and mirrored, “so it is not surprising that the power dissipation on top and bottom would be the same in the same environment.” *Id.*; *see id.* (noting that operating the converters differently “would seem to undermine the rationale for using the same converter replicated four times to begin with”).

Vicor’s expert, Dr. Fayed, did not testify that the person of ordinary skill in the art would not have a reasonable expectation of success in sharing power equally between the top and bottom side circuits in Waner. *See CX-3578C at Q/A 69-70.* Dr. Fayed states that Waner does not identify certain components, including the input circuitry, and thus “it is impossible to conclude as to the power dissipation levels of the power semiconductor devices in the circuit.” *Id.* at 69. However, even if the power dissipation levels of the module in Waner cannot be determined based on the reference’s disclosures, Dr. Fayed does not suggest, as Dr. Ehsani contends, that the person of ordinary skill would be unable to configure Waner to dissipate power as required by limitation [1.e]. *See id.* Rather, Dr. Fayed merely testified that *under certain conditions (i.e., lighter loads)*, the person of ordinary skill would deactivate certain branches:

[W]hether all the branches are active/switching or not is very much dependent on the level of the load current. When the load current is large and losses are dominated by conduction losses rather than switching losses, it would make sense (and also the known practice) to have all the branches active/switching and split the current equally among them since this reduces conduction losses, which matters the most for efficiency in this scenario. However, at lighter load currents, where the losses are typically dominated by switching losses of the FETs, it would make no sense at all to have all the branches active/switching as this would be maintaining low conduction losses even though it is nondominant anyway while leaving high switching

losses (since all the branches are switching), which is the most critical for efficiency in this scenario. Instead, as a matter of common sense (and also the known practice), some of the parallel phases are typically completely deactivated in order to reduce switching losses and improve efficiency. In other words, Dr. Ehsani's assertion does not really hold unless Wanes teaches that all the branches are active/switching at all conditions, which Wanes does not appear to teach.

*Id.* at Q/A 70 (emphasis added). Dr. Fayed's testimony supports Dr. Ehsani's and the Final ID's conclusion that Wanes could be configured to distribute power equally between the top and bottom circuits, and the person of ordinary skill would be motivated to do so. Moreover, Dr. Fayed's conclusion rests on a faulty legal conclusion, namely that Wanes must teach equal current splitting under all conditions in order to teach the limitation for obviousness purposes. It is enough that the person of ordinary skill would be motivated to (and have a reasonable expectation of success in) configuring Wanes to distribute current equally under high load conditions, thus practicing limitation [1.e]. *See Chapman v. Casner*, 315 F. App'x 294, 297–98 (Fed. Cir. 2009) (disclosure of production of compound under certain conditions rendered obvious claim to the compound).

**ii. Claims 4-6**

The Commission affirms the Final ID's finding that Respondents did not meet their burden to show that Wanes inherently teaches switches. Final ID at 105. The Commission further finds Respondents did not show Wanes teaches the limitations of claims 5 and 6 for the same reason as claim 4. The Commission otherwise takes no position regarding whether Respondents demonstrated that Wanes teaches the additional limitations of claims 5 and 6.

**CONFIDENTIAL MATERIAL REDACTED  
PUBLIC VERSION****c. Secondary Considerations of Non-Obviousness****i. Commercial Success****(A) Final ID**

Vicor identified four “representative” DI Products for the ’761 patent, referred to by the parties using their three-letter prefixes: BCM380P475T1K2A31 (“BCM”); DCM24AP050T180A50 (“DCM”); MCM3208S59Z01A6T05 (“MCM”); and NBM2317S60D1580T0R (“NBM”) (collectively, “the ’761 DI Products”). The Final ID explains that Vicor has sold [REDACTED] units of the ’761 DI Products, generating [REDACTED] in revenue and [REDACTED] in gross profits between 2019 and the first half of 2023. Final ID at 111. Respondents challenged the relevance of this evidence, arguing a lack of nexus between the sales and the claimed inventions. *Id.* at 112. The Final ID states that “[w]here, as here, the commercially successfully [sic] product is an embodiment of the claimed invention, there is a presumption of nexus.” *Id.* The Final ID explains that this nexus may be rebutted by evidence that commercial success was due to factors other than the claimed invention, but that Respondents failed to introduce such evidence here. *Id.*

**(B) Parties’ Positions****(1) Vicor’s Position**

Vicor argues that the ’761 patent “discloses an innovative class of power converters designed to symmetrically distribute heat, thereby enhancing thermal performance, efficiency, and structural integrity.” Compl. Init. Sub. at 9. Vicor contends that it showed “through un rebutted expert testimony and detailed technical documentation (including source code, bills of materials, and assembling drawings), that the ’761 DI Products “are power converters that are coextensive with the discrete structure, layout, features, and requirements of each aspect of the ’761 invention.” *Id.* at 9-10. Vicor further contends that the invention is coextensive with the

'761 DI Products, “as opposed to some subcomponent thereof,” and thus Vicor is entitled to a presumption of nexus between the success of the '761 DI Products and the claimed invention. *Id.* at 10 (collecting cases regarding nexus).

Vicor clarifies that Respondents' nexus challenge has always concerned only one of the four representative '761 DI Products, namely the NBM. Compl. Init. Sub. at 10. On reply, Vicor contends Respondents did not specifically challenge the nexus showing as to the BCM and DCM products. Compl. RSub. at 9-10. Vicor points to record cites for the sales of the other three products and suggests the Commission can affirm a finding of commercial success without reaching the question of whether the NBM product is coextensive with the invention. Compl. Init. Sub. at 10. Nonetheless, Vicor argues, the NBM product is entitled to a presumption of nexus because there is no evidence that encapsulation of the power converter (a characteristic not claimed by the '761 patent) is critical to the product. *Id.* Vicor also challenges the legal basis for Respondents' argument that, just because the NBM product is encapsulated (a feature not required by the '761 patent), Vicor cannot show that commercial success is related to the patent, noting “virtually every innovative product inevitably has some unclaimed feature that materially affects its functionality.” *Id.* (quoting *Teva Pharm. Int'l GmbH v. Eli Lilly & Co.*, 8 F.4th 1349, 1361 (Fed. Cir. 2021)).

## (2) Respondents' Position

Respondents argue that “the fact that the DI products span four different product families of varying success confirms that there are features in these products other than technology claims in the '761 patent that drive sales.” Resp. Init. Sub. at 18. Respondents reason that “[t]here would be no reason for a customer to choose one family over another and no reason for Vicor to offer four different product families in the first place if they were all coextensive with the '761 patent.” *Id.* Respondents also note that certain of the '761 DI Products are covered by other

patents, namely the MCM (subset containing VTM3 controllers practice the '481 patent) and the NBM (marked by Vicor as practicing 15 other patents). *Id.* Finally, Respondents cite Vicor's expert, Dr. Seth, as stating that the DI Products were successful relative to Vicor's older generation products because they include "Factorized Power Architecture," which is unrelated to the '761 patent. *Id.* at 18-19 (citing CX-0009C at Q/A 28, 30-31).

### **(3) OUII's Position**

OUII agrees with Respondents that the record does not show that the '761 DI Products are coextensive with the claimed invention for purposes of commercial success. OUII Init. Sub. at 14. OUII argues that Vicor did not present evidence that the commercial success of the '761 DI Products is limited to the features of the claimed invention, as *Fox Factory* instructs. *Id.* at 15; *see id.* (quoting *Fox Factory*, 944 F.3d at 1373 ("In other words, a nexus exists if the commercial success of a product is limited to the features of the claimed invention.")). OUII further notes that the NBM product is covered by at least thirteen other patents not asserted in this case. *Id.* OUII quotes Respondents' expert, Dr. Leeb, as stating that "the encapsulation method of the NBM Products is critical to the overall functionality of the NBM Products." *Id.* at 16 (quoting RX-0008C at Q/A 53-54).

### **(C) Analysis**

In *Fox Factory*, the Federal Circuit explained that a patentee is entitled to a rebuttable presumption of nexus if the patentee shows "the asserted evidence is tied to a specific product and that the product *is the invention* disclosed and claimed." 944 F.3d at 1373 (emphasis added) (internal quotation marks omitted). "That is, presuming nexus is appropriate 'when the patentee shows that the asserted objective evidence is tied to a specific product and that product embodies the claimed features, and is coextensive with them.'" *Id.* (quoting *Polaris*, 882 F.3d at 1056). If, for example, the patented invention is only a component of a commercially successful machine,

the patentee is not entitled to a presumption of nexus. *Id.*<sup>25</sup> However, “if the unclaimed features amount to nothing more than additional insignificant features, presuming nexus may nevertheless be appropriate.” *Id.* at 1374.

For the BCM and DCM products, Respondents’ only substantive argument regarding unclaimed features is Respondents’ citation to Vicor’s expert, Dr. Seth, who stated that the success of the “Advanced” line of products (which includes the BCM and DCM) is due in part to the “Factorized Power Architecture.” Resp. Init. Sub. at 18-19. Vicor’s fact witness, Phil Davies, testified that the Factorized Power Architecture refers to the [REDACTED] and [REDACTED] power module products. CX-0006C at Q/A 22. Thus, “Factorized Power Architecture” is not a feature of the BCM and DCM products. Vicor’s sales data indicates that over the relevant time frame (2019-1H 2023), Vicor sold [REDACTED] units of the BCM product with sales of approximately [REDACTED], and [REDACTED] units of the DCM product with sales of approximately [REDACTED]. *See* CX-2912C. We find this is proof of commercial success. *See* Final ID at 111.

Next, the Commission must weigh the evidence of commercial success of the BCM and DCM products with the showing that Waner teaches the limitations of claims 1 and 2 of the ’761 patent. The Federal Circuit has explained that the requirement that courts always consider secondary considerations “is in recognition of the fact that each of the Graham factors helps to inform the ultimate obviousness determination.” *See WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1328 (Fed. Cir. 2016). The Commission has in the past found a patent to be not obvious based on evidence of secondary indicia even where the prior art taught all limitations of the claims.

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<sup>25</sup> Although a patentee may show a nexus without the benefit of the presumption, *Fox Factory*, 944 F.3d at 1373-74, Vicor does not attempt to do so here.

*Certain Wearable Elec. Devices with ECG Functionality & Components Thereof*, Inv. No. 337-TA-1266, Comm'n Op. at 44-45 (Jan. 20, 2023). “The commercial response to an invention is significant to determinations of obviousness, and is entitled to fair weight.” *Demaco Corp. v. F. Von Langsdorff Licensing Ltd.*, 851 F.2d 1387, 1391 (Fed. Cir. 1988). In our view, the extensive sales of the BCM and DCM modules, combined more than [REDACTED], is strong evidence the invention of the '761 patent was not obvious. This is particularly true given Respondents did not produce any evidence that the success of these particular modules were due to other factors. *Demaco*, 851 F.2d at 1392-93.

Accordingly, the Commission finds that Respondents failed to show by clear and convincing evidence that any of the asserted claims of the '761 patent are invalid as obvious. The Commission takes no position regarding whether Vicor demonstrated commercial success of the NMB and MCM products. *Beloit*, 742 F.3d at 1424.

**ii. Copying**

Vicor also relied on alleged copying by Delta as evidence of non-obviousness. Final ID at 112-13. The Commission finds that Vicor's evidence of commercial success warrants a finding of non-obviousness, and therefore the Commission takes no position regarding the Final ID's finding of no copying. *Beloit*, 742 F.3d at 1424.

**iii. Indefiniteness**

Respondents argued that the terms “substantially overlapping” and “substantially a mirror image” as used in claims 2 and 4 respectively render those claims invalid as indefinite. Final ID at 116. Specifically, Respondents argued that the terms “substantially overlapping” and “substantially mirror image” are “fundamentally subjective,” and that “there are no objective guideposts available to determine the outer boundary of the scope of each claim.” RIB at 96.

The Final ID finds that the claims are not indefinite. Final ID at 118. The Final ID notes that the specification explains one benefit of components “sharing footprints” is that they can share a common set of conductive vias, increasing the useable area for conductors. *Id.* at 117 (quoting CX-0012.0052 at 24:25-44). The Final ID reasons that claim 2 should be broader than claim 3, which requires the sets of power semiconductor devices to “share their respective sets of conductive vias.” *Id.* The Final ID reasons therefore that “substantially overlapping” as used in claim 2 should be understood to mean “overlapping so as to be capable of sharing the same set of vias.” *Id.*<sup>26</sup>

The Commission agrees with the Final ID that Respondents have not shown by clear and convincing evidence that claim 2 is invalid as indefinite. Final ID at 117-18. The Commission is not persuaded by Respondents’ argument that Final ID errs in not separately analyzing claim 4. RPet. at 53-54. In their initial post-hearing brief, Respondents stated that the indefiniteness issues for claims 2 and 4 “are effectively the same,” and Respondents did not separately address claim 4. RIB at 90 n.20. As such, the Final ID does not err in addressing only claim 2 but also finding claim 4 not indefinite. *See* Final ID at 117.

The Commission notes, however, that claim 3 of the ’761 patent depends from claim 1 not claim 2. Accordingly, the Commission does not adopt the Final ID’s analysis that claim 2 requires a broader scope than claim 3. *See id.* at 117. The Commission otherwise adopts the Final ID’s analysis that Respondents did not show claims 2 and 4 are indefinite.

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<sup>26</sup> As discussed, *infra*, Respondents analyzed only claim 2 in their initial post-hearing brief, asserting that the question of indefiniteness was identical for claim 4. RIB at 90, n.20. The Final ID follows suit and does not separately analyze claim 4.

**C. The '950 Patent**

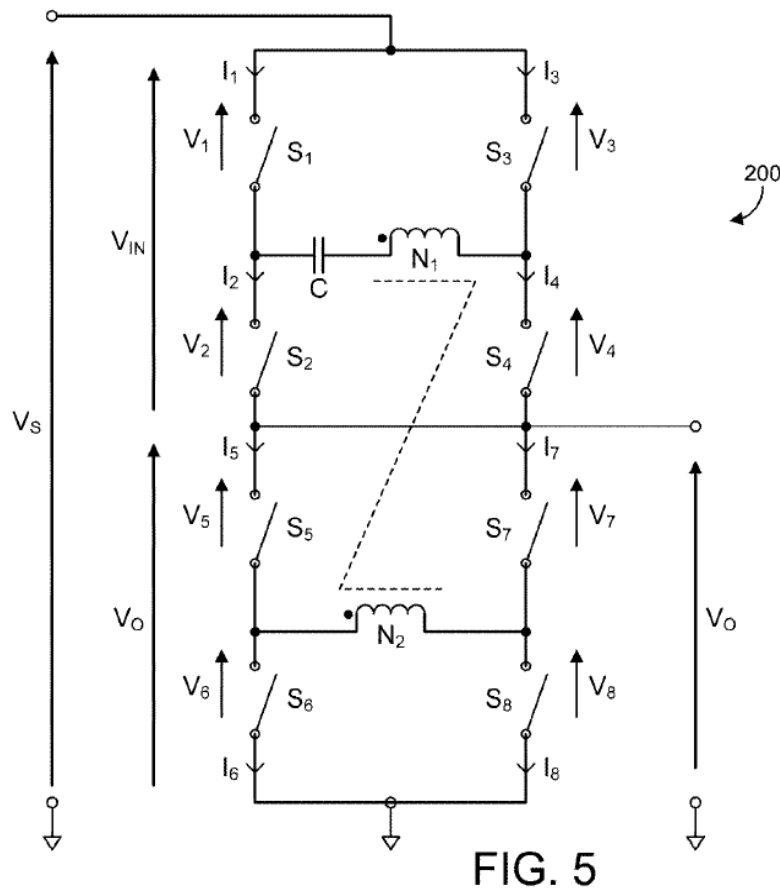
The Commission determined to review the Final ID's findings that the Accused Modules do not infringe the asserted claims of the '950 patent, and that Vicor failed to show that the '950 patent DI Products practice any claim of the patent and thus did not meet the technical prong of the domestic industry requirement. 89 Fed. Reg. at 99279. The Commission posed several questions regarding the proper claim construction of the terms "input circuit" and "output circuit" as recited in the asserted claims and infringement. *Id.* For the reasons set forth in the Final ID, the Commission affirms the Final ID's finding that Vicor failed to show the '950 patent DI Products practice at least one asserted claim, and thus Vicor failed to satisfy the technical prong of the domestic industry requirement. For the reasons set forth below, the Commission further affirms that the accused modules do not infringe the asserted claims of the '950 patent.

**1. '950 Patent Overview**

The '950 patent, entitled "Power Distribution Architecture with Series-Connected Bus Converter," issued from application no. 13/933,352 ("the '352 application") on February 5, 2019. *See* CX-0014.0001 at cover page. The '352 application was filed on July 2, 2013. *Id.* The named inventors are Patrizio Vinciarelli and Andrew D'Amico. *Id.* The patent is assigned to Vicor. Because the '352 application was filed after March 16, 2013, the '950 patent is subject to AIA patentability provisions of the Patent Act. *See* Manual of Patent Examining Procedure § 1440.

The '950 patent is directed to circuit topology designed to reduce power processing and loss. *See* CX-0014.0001 ('950 patent) at Abstract. The patent teaches a power converter including an input circuit and an output circuit. *Id.* at 1:42-45. An input voltage  $V_{IN}$  is applied to the input circuit, and an output voltage  $V_{OUT}$  is produced by the output circuit. *Id.* at 1:46-50. The power converter has a substantially fixed voltage transformation ration of  $K_{DC} = V_{OUT} /$

$V_{IN}$ .<sup>27</sup> *Id.* The patent further recites a series connection between the input circuit and at least a portion of the output circuit “such that an absolute value of the input voltage  $V_{IN}$  applied to the input circuit is approximately equal to the absolute value of the DC source voltage  $V_S$  minus a number  $N$  times the absolute value of the output voltage  $V_{OUT}$  where  $N$  is at least 1.”<sup>28</sup> *Id.* at 1:59-65. An example, Figure 5 shows a series-connected converter according to an embodiment of the patent:



<sup>27</sup> The voltage transformation ratio of a system, as described in the '950 patent, is “the ratio of its output voltage to its input voltage at a specified current such as an output current.” CX-0014.0026 at 4:57-60.

<sup>28</sup> This can be represented as:  $|V_{in}| = |V_S| - N * |V_{out}|$ .

The input circuit comprises switches **S1**, **S2**, **S3**, and **S4**, resonant circuit including capacitor **C**, and input voltage  $V_{IN}$ . CX-0014.0027 at 5:37-42. The output circuit comprises switches **S5**, **S6**, **S7**, and **S8**, resonant circuit including capacitor **C**, and output voltage  $V_o$ . *Id.* at 5:42-45.

At this stage, Vicor alleges infringement of claims 9, 13, 14, and 33-36 of the '950 patent. *See* Final ID at 119. Vicor likewise alleges that the asserted domestic industry products practice claims 9, 13, 14, and 33-38. *Id.* at 145. The claims remaining at issue for infringement purposes are reproduced below (disputed limitations in bold, limitation labels per the parties<sup>29</sup>):

9. An apparatus comprising:
  - [9.a] a power converter comprising
  - [9.b] **an input circuit and an output circuit**,
  - [9.c] wherein the power converter is configured to receive power from a power distribution system comprising a source for providing power at a DC source voltage  $V_S$ ,
  - [9.d] the power converter being adapted to convert power from the input circuit to the output circuit at a **substantially fixed voltage transformation ratio**,  $K_{DC}$ , at an output current,
  - [9.e] **wherein an input voltage  $V_{IN}$  is applied to the input circuit** and
  - [9.f] an output voltage  $V_{OUT}$  is produced by the output of the power converter, and
  - [9.g] wherein the substantially fixed voltage transformation ratio can be represented as  $K_{DC}=V_{OUT}/V_{IN}$ , wherein the power converter further comprises:
  - [9.h] **a series connection between the input circuit of the power converter and at least a portion of the output circuit** of the power converter across the source,
  - [9.i] **such that an absolute value of the input voltage  $V_{IN}$  applied to the input circuit is approximately equal to the absolute value of the DC**

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<sup>29</sup> Complainant Vicor Corporation's Opening Post-Hearing Brief (May 24, 2024) ("CIB") at xxxiv.

**source voltage  $V_s$  minus a number  $N$  times the absolute value of the output voltage  $V_{OUT}$ , where  $N$  is at least 1;**

- [9.j] wherein the power converter comprises an inductive component and one or more power switches in the input circuit, the output circuit, or both; and
- [9.k] wherein a current flowing in the inductive component charges and discharges capacitances in the power converter reducing a voltage across said one or more switches prior to turning ON said one or more switches.
13. The apparatus of claim 9, wherein the power converter comprises:
- [13.a] a transformer,
- [13.b] and a resonant circuit including the transformer having a characteristic resonant frequency and period,
- [13.c] the input circuit including two or more primary switches connected to drive the resonant circuit and
- [13.d] **the output circuit being connected to receive power from the transformer;** and
- [13.e] a switch controller adapted to operate the primary switches in a series of converter operating cycles, each converter operating cycle characterized by
- [13.f] two power transfer intervals of essentially equal duration each interval having a duration less than the characteristics resonant period,
- [13.g] during which one or more of the primary switches are ON and power is transferred from the input to the output via the transformer.
14. The apparatus of claim 9, wherein the power converter is part of a bus converter that is a self-contained assembly adapted to be installed as a unit.
33. An apparatus comprising:
- a bus converter comprising **an input circuit and an output circuit**, the bus converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio,  $K_{DC}$ , at an output current, **wherein an input voltage  $V_{IN}$  is applied to the input circuit** and an output voltage  $V_{OUT}$  is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as  $K_{DC}=V_{OUT}/V_{IN}$ ;

wherein the input circuit of the bus converter and the output circuit of the bus converter are galvanically connected; and

wherein the bus converter comprises an inductive component and one or more power switches in the input circuit or output circuit or both; and

wherein a current flowing in the inductive component charges and discharges capacitances in the converter reducing a voltage across said one or more switches prior to turn ON said one or more switches.

34. The apparatus of claim **33**, wherein the bus converter comprises:
- a transformer, and a resonant circuit including the transformer having a characteristic resonant frequency and period, the input circuit including two or more primary switches connected to drive the resonant circuit and the output circuit being connected to receive power from the transformer; and
  - a switch controller adapted to operate the primary switches in a series of converter operating cycles, each converter operating cycle characterize by two power transfer intervals of essentially equal duration each interval having a duration less than the characteristics resonant period, during which one or more of the primary switches are ON and power is transferred from the input to the output via the transformer.
35. The apparatus of claim **33** wherein the voltage across said one or more switches is reduced to essentially zero volts prior to turn ON of said one or more switches.
36. The apparatus of claim **33** wherein the **input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected in series** across the source such that an absolute value of the input voltage  $V_{IN}$  applied to the input circuit is approximately equal to the absolute value of the DC source voltage  $V_S$  minus a number  $N$  times the absolute value of the output voltage  $V_{OUT}$ , where  $N$  is at least 1.

'950 patent at 11:37-65 (cl. 9), 12:19-37 (cls. 13-14), 16:23-17:3 (cls. 33-36) (emphasis added).

## 2. Claim Construction & Infringement

Vicor alleged that the Delta Accused Modules, Cynotec Accused Module, and the Redesign Products infringe claims 9, 13-14, and 33-38 of the '950 patent, but has since

abandoned its infringement allegations as to claims 37 and 38.<sup>30</sup> Final ID at 119; CPet. at 73 n.8. The Final ID finds that Vicor failed to show the accused modules infringe any of the asserted claims. Final ID at 121-144. The Commission affirms in part and takes no position in part on the Final ID's infringement analysis, overall affirming the Final ID's finding of no infringement with supplemental analysis.

**a. Claim 9**

**i. Limitation [9.b]**

**(A) Final ID**

For limitation [9.b],<sup>31</sup> Vicor's expert, Dr. Fayed, relied on reverse-engineered schematics and schematics produced by Delta<sup>32</sup> to identify the components Vicor contends constitute the necessary input and output circuits. *See* Final ID at 122-123 (excerpting CX-0008C (Fayed W/S) at Q/A 473. 474). For example, in reference to the Delta PMAR module, Dr. Fayed explained (referring to the figure reproduced below):

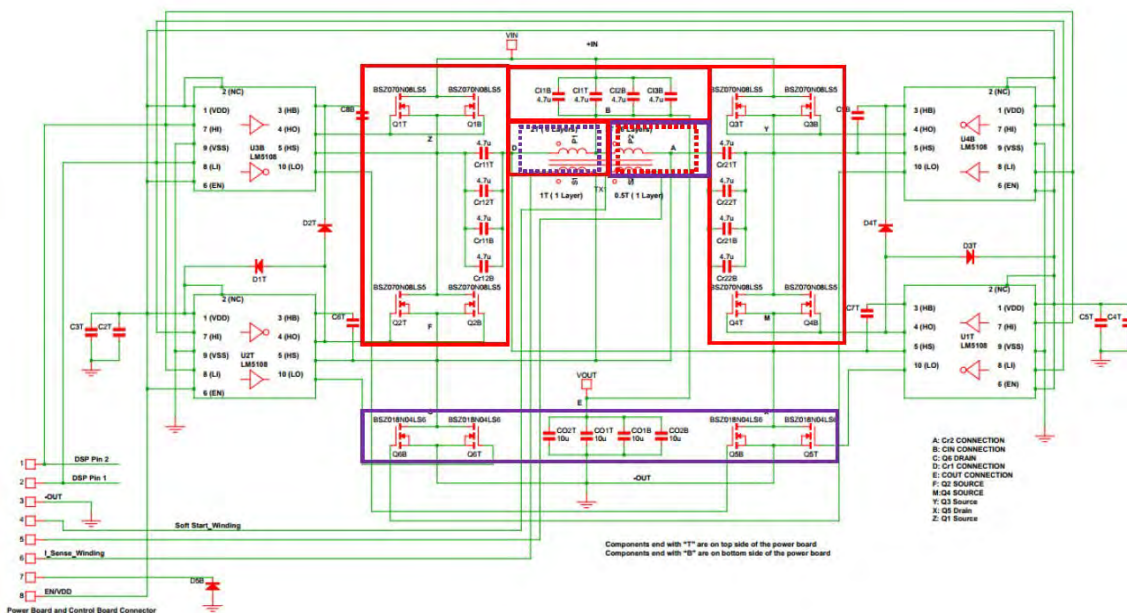
[I]n a reverse-engineered schematic of the U50SU4P162PMAR, CX-3161, the input circuit (indicated in red) includes power semiconductor devices (*e.g.*, Q1T and Q1B, Q2T and Q2B, Q3T and Q3B, and Q4T and Q4B), resonant capacitors (*e.g.*, CR11T, CR12T, CR11B, CR12B and CR21T, CR22T, CR21B, CR22B), input capacitors (*e.g.*, CI1T and CI1B and CI2T, CI2B), and transformer windings (*e.g.*, P1 and P2 depending on the phase). The output circuit (indicated in purple) includes transformer windings (*e.g.*, P2 and P1 depending on the phase), output switches (*e.g.*, Q5T and Q5B and Q6T, Q6B), and output capacitors (*e.g.*, CO1T, CO1B, CO2T, CO2B).

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<sup>30</sup> The Final ID finds it is "undisputed that any differences between the representative [accused] products and the redesign products are immaterial for the 950 patent." Final ID at 144. For simplicity we refer only to the Accused Modules, but the analysis and recommendation applies equally to the redesign products.

<sup>31</sup> Limitation [9.b] recites "a power converter comprising an input circuit and an output circuit."

<sup>32</sup> Although the Final ID addresses the Delta and Cynotec Accused Modules separately, Vicor's petition for review addressed the accused modules together. Unless otherwise indicated, the analysis herein is equally applicable to the Delta and Cynotec Accused Modules.



*Id.* at 122-23 (excerpting CX-0008C (Fayed WS) at Q/A 473).<sup>33</sup>

Respondents took issue with Dr. Fayed’s identification of the circuits because the two transformer windings are identified as components of both the input and output circuits depending upon the phase of operation. *Id.* at 124; *see* CX-0008C at Q/A 474 (stating that both the input and output circuits include windings P1 and P2<sup>34</sup> “depending on phase”). Respondents’ expert, Dr. Hopkins, explained that if the input circuit and output circuit share components in this manner, “the apparatus cannot ‘convert power from the input circuit to the output circuit’ as required without periodically switching circuit components.” *Id.* at 124 (quoting RX-0010C (Hopkins RWS) at Q/A 95). The Final ID credits Dr. Hopkins’s testimony and concludes that “[a] topology where the two circuit are not fixed, such that the components swap back and forth

<sup>33</sup> Unless otherwise indicated, the analysis herein applies equally to both the Delta and Cyntec Accused Modules.

<sup>34</sup> The Final ID refers to [REDACTED] as the windings at issue, but these are actually the designators for the magnetic cores. CX-0008C at Q/A 473. This was a typographical error at most and does not affect the Final ID’s substantive analysis. CPet. at 54 n.7

between circuits as the phase shifts, does not satisfy the requirement of an ‘input circuit and an output circuit.’”<sup>35</sup> *Id.*

**(B) Parties’ Positions**

The Commission asked the parties to brief the proper claim construction of the terms “input circuit” and “output circuit” in order to determine whether the ’950 patent precluded the claimed input and output circuits from sharing overlapping components as the Final ID holds. 89 Fed. Reg. at 99279.

**(1) Vicor’s Position**

Complaint argues that “input circuit” and “output circuit” should be construed as follows:

*Output circuit:* the plurality of electrical components through which current flows between the series connection and the ground terminals.

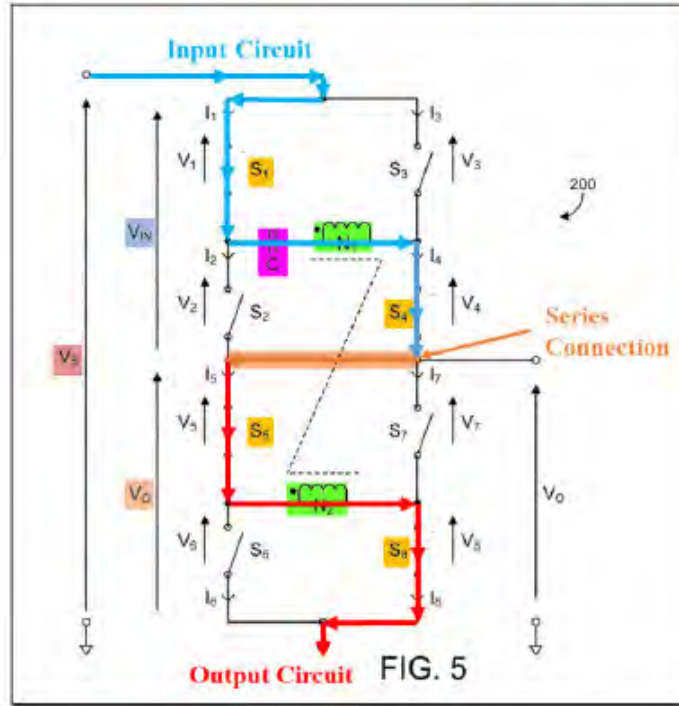
*Input circuit:* the plurality of electrical components through which current flows between the VS and the ground terminals, other than the components in the output circuit.

Compl. Init. Sub. at 12. Vicor asserts that the specification describes four embodiments in two categories of topology. *Id.* According to Vicor, the asserted claims cover “non-isolated or series-connected, topology,” meaning the input and output circuit are connected by a wire. *Id.* (citing claims 9, 33). Vicor further alleges that the ’950 patent teaches that the input and output circuit “vary between the two phases of the operation of the power converter.” *Id.* at 16. As illustrated with Complaint’s annotated versions of Figure 5, during the first phase of operation, certain switches are turned ON (and thus are part of their respective circuits), while others are OFF (and thus not part of their respective circuits):

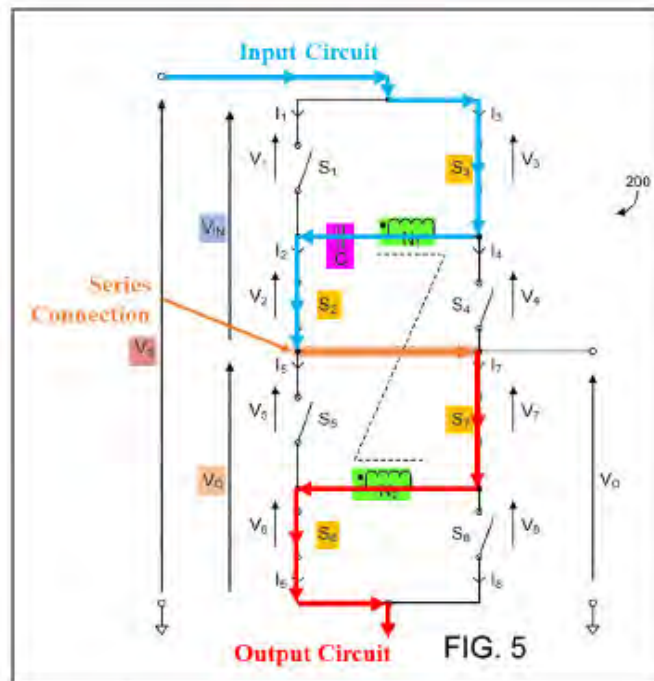
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<sup>35</sup> The Final ID identifies a number of other general errors with Dr. Fayed’s analysis, including (a) failing to take into account the variance in circuit elements when analyzing the remaining claim limitations; (b) questionable reliability of the reverse-engineered schematics; and (c) inconsistent characterization of Dr. Fayed’s identification of the input and output circuits by both Vicor and Dr. Fayed himself. *Id.* at 125-26.

$V_s \rightarrow S_1 \rightarrow \text{cap. } C \rightarrow \text{winding } N_1 \rightarrow S_4 \rightarrow \text{Series Connect.} \rightarrow S_5 \rightarrow \text{winding } N_2 \rightarrow S_8 \rightarrow \text{ground}$



Compl. Init. Sub. at 18. The inverse is true during the second phase of operation:

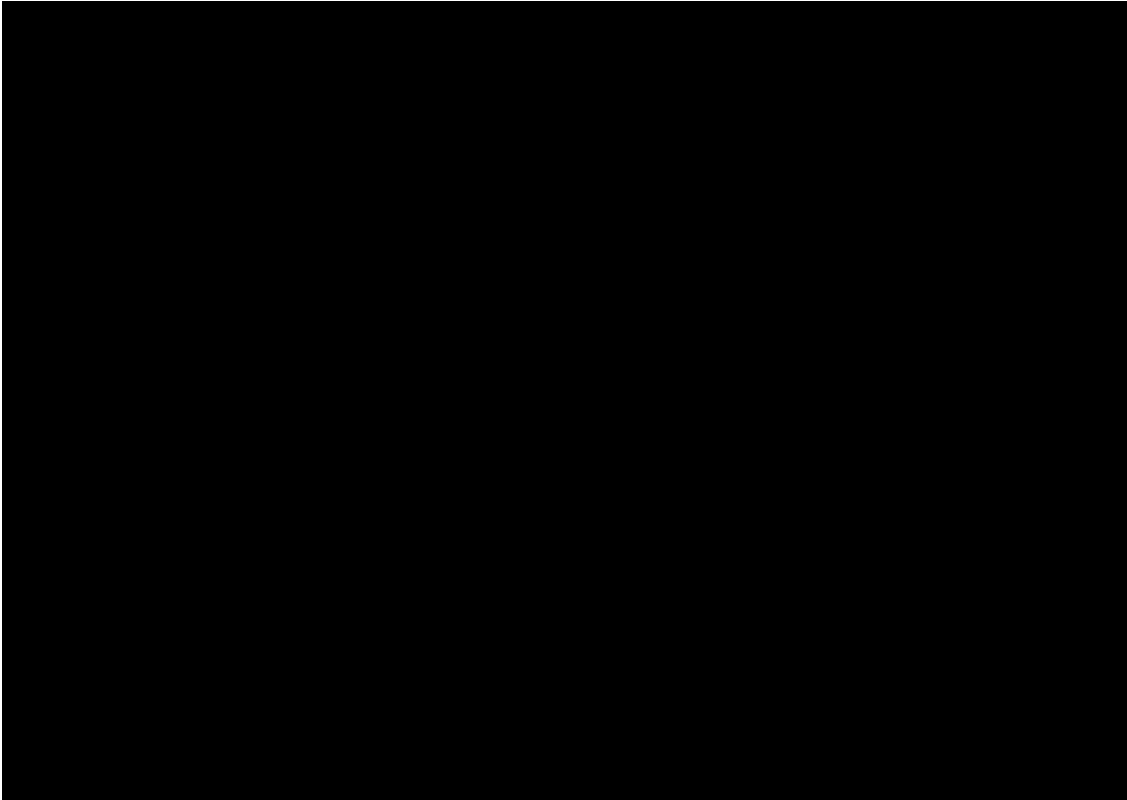


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**PUBLIC VERSION**



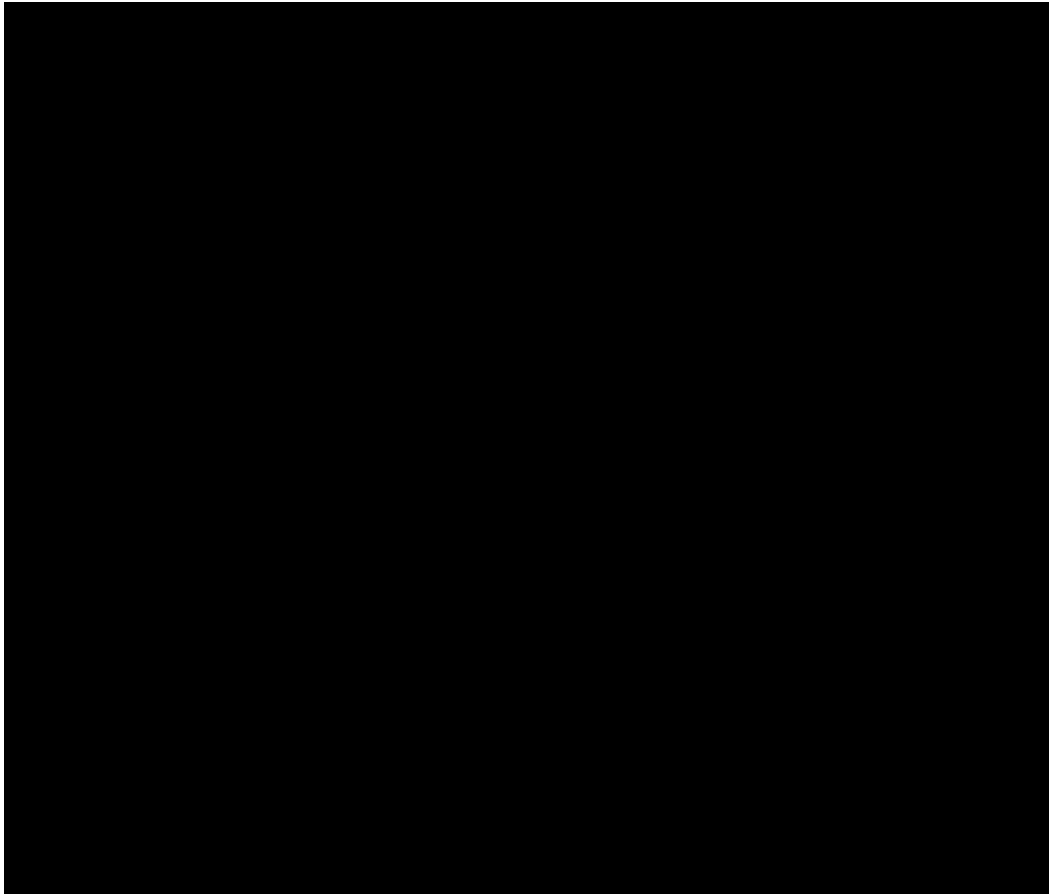
*Id.* at 19.

Vicor argues that the accused modules infringe because they have clearly defined input and output circuits, although the components that comprise those circuits vary based on the phase of operation. *Id.* at 21-25. For example, with respect to the Delta PMAR Accused Module, during the first phase of operation, Vicor identifies the circuits as follows:



Compl. Init. Sub. at 22. And during the second phase of operation, Vicor identifies the components as follows:

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*Id.* at 23-24. The experts agreed that the topologies of all accused products are similar for purposes of the '950 patent. *Id.* at 24

**(2) Respondent's Position**

Respondent proposes defining the terms at issue as follows:

*Input Circuit:* first circuit, on the input side of a transformer, including an input winding and providing a current to the input winding.

*Output Circuit:* second circuit, separate from the input circuit and located on the output side of the transformer, that provides an output voltage and includes an output winding

Resp. Init. Sub. at 20. Respondents argue that the core of the invention of the '950 patent is to provide a series connection across otherwise isolated input and output circuits, without disturbing the original (isolated) topology of the circuits. *Id.* at 21-22. Respondents contend that

the claim language makes clear that the input and output circuits are distinct and do not share any components *regardless of phase of operation* because they are on opposite sides of the transformer. *Id.* at 23. For example, Respondents assert, claims 9 and 33 require the converter to be “adapted to convert power *from* the input circuit *to* the output circuit.” *Id.* (emphasis by Respondents). Moreover, Respondents contend, claims 9 and 36 require “a series connection between the input circuit . . . and at least a portion of the output circuit.” *Id.* at 23-24. Respondents argue that a circuit cannot be in series with itself, so if the circuits can be overlapping, this limitation is nonsensical. *Id.* at 24. Respondents also argue that allowing the circuit to change based on phase of operation is inconsistent with the requirement in claims 9 and 33 that the converter have a “substantially fixed voltage transformation ratio.” *Id.* Respondents argue that “substantially fixed” would be meaningless if the identity of the input circuit could vary over time. *Id.* Respondents note that in the embodiments in the patent, none of the circuits share overlapping components, regardless of phase of operation. *Id.* at 27.

For purposes of infringement, Respondents argue the accused modules do not infringe because, according to Vicor, depending upon the phase of operation certain switches and inductors are considered part of the input circuit, but change to the output circuit in the other phase of operation. Resp. Init. Sub. at 30-31.

### **(3) OUII’s Position**

OUII proposes that in the context of this patent, “input circuit” means “a circuit to which input voltage is applied,” and “output circuit” is “a circuit, separate and distinct from the input circuit, that produces an output voltage.” OUII Init. Sub. at 17. OUII points to the same figures as Vicor (Figures 4-6) as demonstrating that the patent considers the circuits to be separate and

distinct. *Id.* OUII also echoes Respondents' arguments that the claim language indicates that the circuits are distinct. *See id.* at 17-18.

According to OUII, none of the accused modules or redesigned products infringe under the proper construction of "input circuit" and "output circuit." OUII Init. Sub. at 18. OUII points to the testimony of Respondents' expert, Dr. Hopkins, that the PMAR product "is a single-circuit design that does not comprise a separate 'input circuit' and 'output circuit.'" *Id.* at 18-19. Dr. Hopkins criticizes Dr. Fayed's grouping of components as arbitrary. *Id.* Dr. Hopkins also notes that Dr. Fayed's diagrams include inductors [REDACTED] in *both* the alleged input and output circuits, contrary to the requirement that the circuits be distinct. *Id.*

### (C) Analysis

The parties agree the claims require separate input and output circuits. The key question is whether a component that is part of the input circuit during one phase of operation can properly be considered a component of the output circuit during the second phase of operation. The Commission agrees with Respondents and OUII that the circuits cannot share components across the phases of operation.

The claim language is the best evidence of this. For example, claim 37 recites "the input circuit comprises a first winding" and "the output circuit comprises a second winding." CX-0014 at 17:4-7. Claim 34 states "power is transferred from the input to the output via the transformer." *Id.* at 16:58-60. Both of these limitations indicate, as Respondents argue, that the input and output circuits are on opposite sides of the transformer, and thus do not share components. Similarly, claims 9 and 33 refer to the "input circuit, the output circuit, *or both*," again indicating the two circuits are separate. *Id.* at 11:60-61, 16:38-39. The Commission also finds persuasive Respondents' point that the key figures in the patent (namely Figures 4-6) show distinct input and output circuits, regardless of the phase of operation.

As applied to the accused modules, there is no dispute that at least inductors [REDACTED] [REDACTED] are both part of the input and output circuits, depending on the phase of operation. Thus, the Commission agrees with the Final ID that Vicor failed to show the accused modules have the claimed “input circuit” and “output circuit,” for the reasons stated in the Final ID and supplemented with the analysis above.

**ii. Limitations [9.e], [9.h]**

Because the accused modules do not practice limitation [9.b] or limitation [9.i] (for the reasons set forth in the Final ID) the Commission takes no position on the Final ID’s analysis of limitations [9.e] and [9.h]. *Beloit*, 742 F.3d at 1424.

**b. Claims 13-14**

The Final ID finds that the accused modules do not practice the additional limitations of claim 13 while the products do practice the additional requirements of claim 14, but neither claim is infringed given the claims depend from claim 9. Final ID at 132. The Commission therefore finds that the accused modules do not infringe claims 13 and 14 for the same reasons as claim 9. The Commission takes no position regarding whether Vicor showed the accused modules practice the additional limitations of claim 13. *Beloit*, 742 F.3d at 1424. The Commission affirms the Final ID’s finding that Vicor showed the Accused Modules practice the additional limitation of claim 14. Final ID at 132.

**c. Claims 33-36**

The parties agreed the disputes as to claims 9 and 33 are identical for purposes of this investigation. Final ID at 133. Accordingly, for the reasons discussed *supra* in connection with limitation [9.b], the Commission finds that the accused modules do not infringe claim 33.

Claim 34 depends from claim 33 and, like claim 13, requires that the output circuit receive power from the transformer. The Commission finds claim 34 not infringed for the same

reasons as claim 33 but takes no position on whether the accused modules practice the additional limitations of claim 34. *Beloit*, 742 F.3d at 1424.

Claim 35 also depends from claim 33. The Commission affirms the Final ID's finding that Vicor showed that the Accused Modules practice the additional limitation of claim 35. The Commission nonetheless finds claim 35 not infringed for the same reasons as claim 33.

Claim 36, which also depends from claim 33, includes the requirements set forth in limitations [9.h] and [9.i]. The Commission agrees with the Final ID that the accused modules do not practice limitation [9.i], and thus do not infringe claim 36.

\* \* \*

In sum, for the '950 patent, the Commission finds that Vicor failed to show that the accused modules or redesigned products infringe any of the asserted claims. For the reasons set forth in the Final ID, Vicor also failed to show the '950 DI Products practice any claim of the '950 patent, and thus failed to satisfy the technical prong of the domestic industry requirement. Accordingly, the Commission affirms the Final ID's finding of no violation as to the '950 patent.

#### **D. Economic Prong of the Domestic Industry**

On review the Commission affirms with modified reasoning the Final ID's finding that Vicor has satisfied the economic prong for the '481 and '761 patents and takes no position regarding the economic prong for the '950 patent.

##### **1. Final ID**

Vicor argued it has satisfied the domestic industry requirement through significant investments in plant and equipment under Subsection (A), and significant employment of labor and capital for manufacturing and engineering, research, and development under Subsection (B). Final ID at 193. The Final ID credits the following investment totals for each of the Asserted Patents:

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**PUBLIC VERSION**

Patent	Plant & Equipment Investments (Subsection (A))	Labor and Capital (Subsection (B))
'481 patent	<div style="background-color: black; width: 100px; height: 15px; margin-bottom: 5px;"></div> (10.8% of total domestic plant & equipment investments)	<div style="background-color: black; width: 100px; height: 15px; margin-bottom: 5px;"></div> (12% of total domestic labor and capital)
'761 patent	<div style="background-color: black; width: 100px; height: 15px; margin-bottom: 5px;"></div> (15.7% of total domestic plant & equipment investments)	<div style="background-color: black; width: 100px; height: 15px; margin-bottom: 5px;"></div> (18% of total domestic labor and capital)
'950 patent	<div style="background-color: black; width: 100px; height: 15px; margin-bottom: 5px;"></div> (4.2% of total domestic plant & equipment investments)	<div style="background-color: black; width: 100px; height: 15px; margin-bottom: 5px;"></div> (4.6% of total domestic labor and capital)

*Id.* at 194-96. The Final ID agrees with Vicor that the investments as to the '481 and '761 patents are significant because they “represent a significant portion of Vicor’s total domestic expenses in those activities.” *Id.* at 193-94, 196. The Final ID disagrees, however, as to the '950 patent, finding that the asserted investments, which total 4.2 percent of Vicor’s total domestic plant & equipment investments (Subsection (A)) and 4.6 percent of Vicor’s total domestic labor and capital expenditures (Subsection (B)) are not significant. *Id.* at 196.

As an alternative contextual analysis, Vicor asserted that its investments in each Asserted Patent are significant because all of Vicor’s investments in plant and equipment and employment of labor and capital for manufacturing and assembly and engineering, research, and development (“ER&D”) of the DI Products are domestic. CIB at 191. The Final ID conducts its own mathematical analysis of this assertion, but ultimately agrees that because almost all of the relevant investments by Vicor are domestic, those investments are significant. Final ID at 198. Specifically, the Final ID relies on the vendor payment data produced by Vicor (CX-3014C),

which identifies two types of vendors: “IC Vendors”<sup>36</sup> and “DI Plating Vendors.”<sup>37</sup> Final ID at 198. The Final ID notes that the payments to “DI Plating Vendors” are to domestic entities and are accounted for in the calculation of domestic investments by Vicor’s expert, Dr. Seth. *Id.*

For the “IC Vendors,” during the relevant time frame Vicor paid approximately [REDACTED] [REDACTED] to foreign entities for fabrication services and [REDACTED] to domestic entities for fabrication services. *Id.*; see CX-3014C.0002. The Final ID performs the following calculation to find that about 10 percent of Vicor’s total investments are foreign, that is, more than 90 percent are domestic:

$$\frac{[REDACTED]}{[REDACTED]} = 8.96\% \text{ Foreign Investments}$$

(wherein [REDACTED] is Vicor’s total international expenditures, [REDACTED] is Vicor’s total domestic investments in plant and equipment, and [REDACTED] is Vicor’s total domestic investments in labor and capital).<sup>38</sup> *Id.* at 198. The Final ID concludes that “Vicor’s claim that it ‘performs all its DI product manufacturing and ER&D activities in the United States’ is therefore only a minor exaggeration.” *Id.* The Final ID notes that Vicor is “close to having a ‘complete lack of foreign investment,’ a situation which ‘weigh[s] heavily in favor’ of finding [sic] economic prong satisfied.” *Id.* (quoting *Certain Polycrystalline Diamond Compacts & Articles Containing Same*,

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<sup>36</sup> “RI IC Vendors” listed in CX-3014C.0002 are “third-party vendors that Vicor contracts with for semiconductor foundry services and additional semiconductor processing.” CX-0005C.015-.016 (Q/A 93). “Once Vicor finishes the design, we send the designs to third-party foundries to make the silicon components that are incorporated into Vicor’s products.” *Id.* The record indicates that the silicon components of the DI Products are fabricated overseas, but all other manufacturing takes place domestically. CX-0005C (Morrison WS) at Q/A 93.

<sup>37</sup> “DI Plating Vendors” are third-party entities that are involved in finishing operations that apply a coating of metal over a base substrate. CX-3104. Since 2022, Vicor has been in the process of moving plating operations to its own facility. CX-0005C.0006 (Q/A 23).

<sup>38</sup> So as to not overestimate domestic investments, the Final ID assumes the [REDACTED] in payments to domestic entities were already accounted for in the denominator. Final ID at 198.

Inv. No. 337-TA-1236, Initial Determination at 156-57 (Mar. 3, 2022), *not reviewed in relevant part*, Comm'n Op. at 56 (Oct. 26, 2022)). The Final ID reasons that because Vicor relies on foreign vendors for all of its chip fabrication, "there is no reason not to prorate the associated expense evenly across all products." *Id.* at 198-99. The Final ID concludes that the investments in the '481 and '761 patents are "unquestionably significant, because over 90% are domestic." *Id.* at 199. As for the '950 patent, the Final ID finds that the more than [REDACTED] in plant and equipment investments and more than [REDACTED] in employment of labor and capital are also significant, "with over 90% of all investments [being] domestic." *Id.*

The Commission determined to review the Final ID's analysis of the economic prong of the domestic industry requirement. 89 Fed. Reg. at 99279. The Commission asked the parties to brief whether the record permitted allocation of the overall payments made by Vicor to foreign IC Vendors to the DI Products for each of the Asserted Patents. *Id.*

## 2. Analysis<sup>39</sup>

Respondents argue that the Final ID's comparison of investments in the domestic industry products to overall domestic investments is not a meaningful comparison because it

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<sup>39</sup> Commissioner Kearns does not join this section (except for its determination to take no position with respect to the '950 patent) or the finding of significance based on a comparison of Vicor's investments in the DI products to its overall domestic investments. This comparison only indicates how important a particular set of products is to a company's overall operations, and says nothing about the significance of the domestic investments in the DI products as compared to foreign investments. As he has noted before, "A firm's operations in engineering, researching, developing, and producing a product almost entirely in the United States, with the attendant significant investments in plant and equipment and employment of labor and capital, would be no less a domestic industry if the firm also had larger operations on other product lines. Thus, this mode of comparison could put large firms with many product lines at a disadvantage in demonstrating a domestic industry compared to small, focused firms." *Certain Automated Put Walls and Automated Storage and Retrieval Systems, Associated Vehicles, Associated Control Software, and Component Parts Thereof*, Inv. No. 337-TA-1293, Comm'n Op. at 26 n.21 (July 31, 2023).

simply showed that “bigger selling products take up more R&D and manufacturing investments than smaller selling products.” RPet. at 88. According to Respondents, this approach “only ends up benefiting complainants whose DI products are popular, to the disadvantage of potential lower-selling DI products (or products of companies with many different product lines.)” *Id.* Respondents note that in *Certain Wearable Electronic Devices with ECG Functionality and Components Thereof*, Inv. No. 337-TA-1266, the Commission rejected complainant’s comparison of its domestic labor expenses in the domestic industry products to its company-wide labor and capital expenditures, holding that

[W]hile we do not preclude that a complainant may rely on a comparison of its domestic industry investments to company-wide investments in establishing significance given the facts and circumstances of a particular

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Rather, for the ‘761 and ‘481 patents, Commissioner Kearns finds Vicor’s allocated investments for domestic plant & equipment (“P&E”) and labor & capital (“L&C”) for each patent to be significant based on a comparison to its allocated payments to foreign foundries, the only foreign expenditures by Vicor. He finds this comparison appropriate to assess significance because, while the manufacturing operations of Vicor itself are entirely domestic, the IC manufacturing by the foreign foundries is an important part of the final DI products, and thus payments to them should be considered. There is little in the record to suggest that Vicor has additional material foreign expenditures given that the majority of the DI product manufacturing takes place in the United States. CIB at 191. Respondents do not cite any other components manufacturing abroad or fabrication steps not performed by Vicor.

For the ‘761 patent, total domestic P&E investments from 2019 to June 2023 were \$ [REDACTED], and total L&C investments over this period were [REDACTED]. ID at 194. For the ‘481 patent, considering only those product families that were shown to practice the patent, total P&E investments from 2019 to June 2023 were [REDACTED], and total L&C investments were \$ [REDACTED]. ID at 195.

Vicor provided a reasonable patent-by-patent allocation of the \$ [REDACTED] million in payments to foreign foundries from 2019 to June 2023, using the percentages its expert used to allocate its domestic investments. Compl. Init. Sub. at 26-31. This allocation yields an allocation of [REDACTED] for the ‘761 patent and [REDACTED] for the ‘481 patent. *Id.* at 28 Table 3. The domestic investments set forth above are significant in comparison to these foreign payments, even without any ability to further allocate these payments to P&E and L&C. Moreover, even were he not to credit Vicor’s allocation of the payments to foreign foundries (which he does), he would find that the domestic investments are significant even in comparison to the full unallocated payments to the foreign foundries.

Commissioner Kearns thus finds that Vicor has satisfied the economic prong for the ‘761 and the ‘481 patents under both 19 U.S.C. § 1337(a)(3)(A) and (B).

investigation, AliveCor has failed to explain or substantiate why such a comparison in the context of this investigation nonetheless demonstrates the significance of its domestic industry investments[.]

Comm'n Op. at 24-25 (Jan. 20, 2023).

In its response, Vicor notes that in *Certain Graphic Systems, Components Thereof, and Digital Televisions Containing the Same*, the Commission determined not to review an initial determination granting summary determination that the complainant satisfied the economic prong under Subsections (A) and (B) based on comparisons between complainant's domestic and worldwide investments. Resp. to RPet. at 89 (citing Inv. No. 337-TA-1318, Initial Determination at 14-15 (Feb. 6, 2023), *unreviewed in relevant part by* Comm'n Notice (Mar. 15, 2023)).

Respondents read the Commission's decision in *Wearable Devices* too broadly. The Commission did not hold, as Respondents suggest, that a comparison of domestic investments in DI products can never be compared to a complainant's overall domestic investments to establish significance. Rather, the Commission observed, the complainant failed to articulate why the proffered comparison was useful in determining quantitative significance of the complainant's investments *as to the products at issue in that investigation*. This is not to say a similar comparison could not be useful in a different investigation. As Vicor notes, the Commission came to a different conclusion in *Graphic Systems*. In *Graphic Systems*, the complainant argued that its investments in plant and equipment under section 337(a)(3)(A) were significant based on a comparison of its domestic investments in its DI products "as a percentage of 'overall U.S. plant and equipment R&D expenses across all products,'" explaining that "[t]his is a metric which would demonstrate the value of domestic DI Product investment to [complainant's] total U.S. operations (*i.e.*, how important are the products to [complainant])." *Graphic Sys.*, ID at 14. The ALJ agreed the investments expressed as a percentage of complainant's U.S. research and

development and technical customer support activities were “a significant sum, especially when viewed against the enormous dollar amounts in question.” *Id.* The Commission determined not to review this aspect of the ID’s findings.<sup>40</sup> Comm’n Notice at 3 (Mar. 15, 2023).

We agree with the Final ID that the comparison of Vicor’s domestic investments in plant and equipment for the ’481 and ’761 patent DI Products to Vicor’s overall domestic investments in plant and equipment, and the comparison of Vicor’s domestic investments in labor and capital for the ’481 and ’761 patent DI Products to Vicor’s overall domestic investments in labor and capital each demonstrate the significance of Vicor’s DI Product investments as to the articles protected by those patents, respectively.<sup>41</sup> *See* Final ID at 194-96 (charts detailing the comparison); *see* Resp. to RPet. at 90. This demonstration of the importance of the DI Products to Vicor’s overall domestic operations is the same rationale the Commission accepted in *Graphic Systems*. *Graphic Sys.*, ID at 14; *see also* Complainant Vicor Corp.’s Opening Post-Hearing Br. at 184-85 (discussing various metrics demonstrating the importance of the DI Products to Vicor’s overall business). Respondents’ argument that there may be hypothetical circumstances in which this type of comparison may not be appropriate, RPet. at 88, is therefore irrelevant to the analysis presented in this investigation.

Moreover, the fact that all of Vicor’s manufacturing and ER&D takes place in the United States, provides an additional reason to affirm the FID’s finding that Vicor’s investments in plant and equipment and labor and capital are significant. This is consistent with the Commission’s

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<sup>40</sup> The Commission reviewed the ID and, except for Commissioner Kearns, took no position on footnote 2 of the ID, discussing “direct” versus “allocated” investments. Comm’n Notice at 3 & n.1; *see Graphic Sys.*, ID at 11, n.2. The Commission otherwise determined not to review the ID. Comm’n Notice at 3.

<sup>41</sup> As explained *infra*, the Commission takes no position regarding the significant analysis as it relates to the ’950 patent.

approach in investigations involving domestic manufacturing. For example, in *Certain Toner Supply Containers and Components Thereof (I)*, Inv. No. 337-TA-1259, the Commission affirmed the ALJ's finding that the complainant's domestic investments were significant because the complainant's "domestic production of its DI products represents a major fraction of Canon's worldwide production of products covered by the Asserted Patents." Comm'n Op. at 11 (Aug. 19, 2022). Here, Vicor's investments in domestic production and ER&D of its DI Products is 100 percent of its worldwide investments in the production and ER&D of DI products covered by the asserted patents, including plant and equipment and labor and capital. *See also Wuhan Healthgen Biotechnology Corp. v. ITC*, No. 23-1389, Slip Op. at 8-9 (Feb. 7, 2025). Thus, we find it unnecessary under the facts and circumstances of this investigation to analyze what portions of the inputs in the manufacturing operations are domestic or foreign sourced in view of the nature and extent of these manufacturing and ER&D investments relating Vicor's DI products.

Accordingly, the Commission affirms the Final ID's finding that Vicor demonstrated its domestic investments as to the '481 and '761 DI Products are significant, and thus satisfied both subsections (A) and (B) of the economic prong of the domestic industry requirement. As set forth above, the Commission finds the Accused Modules do not infringe the '950 patent, and the '950 patent DI Products do not practice any claims of the patent. *Supra*, at Section V.C. Therefore, the Commission takes no position regarding whether Vicor showed its domestic investments in the '950 patent DI Products are significant. Having found Vicor's investments significant based on the comparison to overall domestic plant and equipment and overall domestic labor and capital investments, as well as 100% of Vicor's manufacturing and ER&D relating to the DI products are in the United States, the Commission need not reach the Final

ID's analysis regarding the comparison of Vicor's domestic and foreign investments (Final ID at 197-99).

**E. Foxconn License Defense**

Respondents FII USA and Ingrasys (the "Foxconn Respondents") asserted a license defense, arguing that in May 2023 or earlier, the Foxconn Respondents issued purchase orders ("POs") for power converters from Vicor that contained an IP licensing provision. Final ID at 172. The Final ID found the parties did not have a binding contract including the licensing provision. *Id.* at 174. The Commission determined to review the Final ID's findings concerning the Foxconn Respondents' license defense and asked briefing questions. 89 Fed. Reg. at 99729-80. For the reasons set forth below, the Commission reverses the Final ID and finds the license provision enforceable by FII USA, Inc. and Ingrasys Technology, Ltd. as to the '761 patent.

**1. Governing Law**

The parties assume for purposes of this investigation that Massachusetts law governs this issue. RPet. at 84 n.24; *see* Resp. to RPet. at 83. Two provisions of Massachusetts law are particularly relevant here. Section 2-206(a) of Massachusetts General Law 106 provides that "[u]nless otherwise unambiguously indicated by the language or circumstances," an offer "shall be construed as inviting acceptance in any manner and by any medium reasonable in the circumstances." Mass. Gen. Laws ch. 106 § 2-206 ("section 2-206"). Section 2-207 states:

(1) A definite and seasonable expression of acceptance or a written confirmation which is sent within a reasonable time operates as an acceptance even though it states terms additional to or different from those offered or agreed upon, unless acceptance is expressly made conditional on assent to the additional or different terms.

(2) The additional or different terms are to be construed as proposals for addition to the contract. Between merchants such terms become part of the contract unless:

(a) the offer expressly limits acceptance to the terms of the offer;

(b) they materially alter it; or

(c) notification of objection to them has already been given or is given within a reasonable time after notice of them is received.

(3) Conduct by both parties which recognizes the existence of a contract is sufficient to establish a contract for sale although the writings of the parties do not otherwise establish a contract. In such case the terms of the particular contract consist of those terms on which the writings of the parties agree, together with any supplementary terms incorporated under any other provisions of this chapter.

Mass. Gen. Laws ch. 106 § 2-207 (“section 2-207”).

## **2. Factual Background**

The license provision in the Foxconn purchase orders states:

### **10. Intellectual Property Right**

Seller agrees to grant Buyer and its customer(s) a perpetual, irrevocable, non-transferable, and royalty-free license under all intellectual property rights included in the Products supplied to Buyer by Seller, so that Buyer and its customer(s) have the right to make, use, sell, offer to sell or import similar products or other products which contain the aforesaid intellectual property rights worldwide.

RX-1635C at 2; RX-1630C at 2; RX-1639C at 2.

### **a. Purchase Order No. 460000176**

On Sunday, September 26, 2021, Anita Wang of Foxconn emailed Purchase Order No. 460000176 (“PO ’176”) to [REDACTED] at Vicor. RX-1631C.0004-.0005. PO ’176 requested [REDACTED] units of the NBM2317S60D1580TOR power controller for \$ [REDACTED] each, with a delivery date of October 15, 2021. RX-1630C. The email stated in relevant part, “Please find attached new POs and confirm ETA asap.” RX-1631C.0004. On Monday, September 27, 2021, [REDACTED] forwarded the email without comment to Carolyn Lee of Foxconn. *Id.* at .0003. Carolyn Lee explained in response that Foxconn was in the process of transitioning its buying to its Wisconsin location but, in the meantime, [REDACTED] should expect to receive POs from Foxconn’s Asia team. *Id.* Lee also asked “[d]o you have an update on the docking statute of [PO ’176].” [REDACTED] responded in an email dated Friday, October 1, 2021, with “[REDACTED] ship date

5-13-22, [REDACTED] 5-20, [REDACTED] 5-27 and [REDACTED] 6-3.” *Id.* at .0002. On October 5, 2021, Lee asked for clarification, stating “[a]ccording to your dates below, we should have received all of [PO ’176].” CDX-0010C.0149. On October 6, 2021, [REDACTED] clarified that the PO ’176 order would ship in full on May 13, 2022. *Id.* at .0148. Vicor also issued a “Sales Order Acknowledgment” (“SOA”) for the PO on Wednesday, October 6, 2021. CDX-0010C.0032-.0033.

**b. Purchase Order No. 4500273265**

As background regarding Purchase Order No. 4500273265 (“PO ’265”):

PO 265 was generated after [Respondents] informed [Vicor] that they wished to cancel a prior PO ([“PO 991”]), for which [Vicor] had already sent an SOA. . . . To accommodate [Respondents], [Vicor] offered to reallocate a portion of PO 991 originally destined for Taiwan to a subsidiary of [Respondents] in Shenzhen, China, that was more in need of the parts than the original recipient. Thereafter, [Respondents] requested that the portion of PO 991 described above be transferred to a new PO that ultimately became PO 265.

*Vicor Corp. v. FII USA, Inc.*, No. 24-10060-LTS, Order on Vicor’s Mot. for Prelim. Inj., 2024 WL 3548786, at \*8 (June 24, 2024). On May 31, 2023, Foxconn sent PO ’265 to Vicor. CDX-0010C.0183. Vicor responded the same day, indicating they were confirming certain parts required for the build, and stating that Vicor anticipated partial shipments “earlier than the August and September backlog dates.” *Id.* at .0188. On June 1 and again on June 6, 2023, Foxconn asked Vicor to provide the delivery date. *Id.* at .0193, .0200. On June 6, 2023, Vicor replied asking to revise certain delivery terms (not including the date) and the warranty period. *Id.* at .0206. On June 13, 2023, Vicor’s [REDACTED] emailed Foxconn stating [REDACTED] pieces would ship on September 29, 2023, pursuant to PO ’265. *Id.* at .0280. On June 13, 2023, [REDACTED] also emailed Foxconn a screenshot of the revised PO, thanking Foxconn for revising the delivery terms and asking for the requested revision to the warranty term. *Id.* at .0287-.0288.

On June 14, Foxconn sent the revised PO, then emailed seeking to cancel the order. *Id.* at .0287-.0298. Vicor responded that the “overall quantity of this part on order is not cancellable.” *Id.* at .0306. Vicor submitted the SOA for PO ’265 on June 14, 2023. *Id.* at .0315.

In January 2024, Vicor filed suit in the United States District Court for the District of Massachusetts seeking to enjoin Foxconn from arbitrating a license dispute in China. *Id.* at 172. The District Court granted Vicor a preliminary injunction, finding that Vicor was likely to succeed on the merits of its argument that it is not bound by the arbitration provision in the Foxconn purchase orders. *See Vicor Corp.*, 2024 WL 3548786, at \*9-14.

### **3. Final ID**

The Final ID agrees with the District Court’s preliminary analysis as to why Vicor was likely to succeed in its dispute. Final ID at 172-74. In particular, the Final ID notes the district court’s agreement with Vicor that “the emails [Vicor’s] staff sent in response to Foxconn purchase orders did not qualify as legally binding acceptances of offers” and, thus, there was no “agreement between the parties on material terms of the contract,” particularly the delivery dates. *Id.* at 173-74 (citing *Situation Management Systems, Inc. v. Malouf, Inc.*, 724 N.E.2d 699, 703 (Mass. 2000)). The Final ID concludes that there was no valid acceptance of an offer as to PO ’176 and with respect to PO ’265, the offer was withdrawn after purported acceptance. *Id.* at 174-75.

### **4. Parties’ Positions**

#### **a. Respondents’ Position**

Respondents contend that the purchase orders Foxconn submitted to Vicor were classic “offers.” Resp. Init. Sub. at 37. In support, Respondents cite *Vicor Corp. v. Concurrent Computer Corp.*, a Massachusetts Superior Court matter in which the Court found that Vicor was obligated to arbitrate a dispute with its customer Concurrent regarding certain power converters

pursuant to an arbitration clause in the terms and conditions available at a hyperlink in the purchase order Concurrent submitted to Vicor. See 20 Mass.L.Rptr. 717, 2006 WL 1047522 (Mass. Super. Ct. 2006), *aff'd*, 68 Mass. App. Ct. 1108 (2007). Relying on *Concurrent*, Respondents argue that the offers from Respondents, once accepted, created binding contracts including the license clause at issue. Resp. Init. Sub. at 37.

As to acceptance, Respondents note that pursuant to Massachusetts law, “Complainant just needed to respond with ‘[a] definite and reasonable expression of acceptance or a written confirmation’ ‘within a reasonable time.’” Resp. Init. Sub. at 37 (quoting Mass. Gen. Law ch. 106 § 2-207(1) (“section 2-207”). Respondents contend that Vicor “accepted orders by responding with ‘many, many emails’ that left no doubt it intended to fulfill them per the terms ‘worked out over email.’” *Id.* at 38 (quoting Tr. at 938:3-15). Giving the example of PO ’176, Respondents explained that upon receipt, Vicor provided specific ship dates of May 13, May 20, May 27, and June 3. *Id.* When Foxconn followed up, Vicor “stressed that the goods would ship on [May 13].” *Id.* Respondents emphasize that it was only after promising ship dates that Vicor auto-generated a sales order acknowledgment with Vicor’s purported terms and conditions. Resp. Init. Sub. at 37.

Regarding PO ’265, Respondents explain that the parties discussed the terms by email, with Vicor asking to revise certain provisions. *Id.* at 38. Respondents contend that on June 13, 2023, Vicor emailed Foxconn to state a quantity of [REDACTED] pieces was scheduled to ship on September 29, 2023. *Id.* (citing RX-1911C.0002). Respondents assert that, when Foxconn subsequently tried to cancel the order, but *before* Vicor sent the automated acknowledgment, Vicor asserted the parties already had a binding contract. *Id.* at 39.

Respondents argue that the Final ID errs in finding that because Vicor's proposed shipping dates differed from those in the Foxconn's purchase orders, Vicor's responses did not constitute acceptances of the offers.<sup>42</sup> Resp. Init. Sub. at 39. Specifically, Respondents contend that section 2-207 provides that different terms in a response do not preclude formation of a contract "unless acceptance is *expressly* made conditional on assent to the additional or different terms." *Id.* (emphasis by Respondents). Respondents note that the Final ID relies on legal authority that does not relate to the Uniform Commercial Code ("UCC") or transactions in goods in concluding that the ship date variances were material. *Id.* at 40. Respondents cite *Chicopee Concrete Service Inc. v. Hart Engineering Company*, 20 Mass. App.Ct. 315 (1985), as holding that a seller changing the terms of a purchase order did not preclude acceptance under section 2-207, it merely raised the question as to whether the differing terms became part of the contract. *Id.* Respondents contend the same holds true here. *Id.*

Respondents argue that, because Vicor's emails constituted acceptances of the purchase order offers, section 2-207(2) "squarely bars consideration of later-sent terms." Resp. Init. Sub. at 41. Respondents note that the purchase orders state that any different or additional terms provided by the seller are null and void "unless accepted by authorized person of [Foxconn] in writing," which did not occur. *Id.* (citing RX-1630C.0001; RX-1636C.0001). Moreover, Respondents assert, elimination of the license term would be a material alteration that would not become part of the contract by operation of section 2-207(2)(b). *Id.*

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<sup>42</sup> Respondents also assert in a footnote that "the supposed variance was not 'material.'" Resp. Init. Sub. at 40, n.14. Respondents do not cite any authority in support of this proposition but fault the Final ID for failing to cite any authority under Massachusetts law treating ship-date variance as material to contract formation. *Id.*

As to the Commission's specific question regarding Note 3 of the Foxconn purchase order,<sup>43</sup> Respondents argue that Vicor sent its email acceptances "within a reasonable time," as is required by statute. Resp. Init. Sub. at 41-42. Respondents contend that note 3 "simply tells a seller to 'confirm' the PO within 2 days but is *not* a statement that a seller can accept *only* through that confirmation. *Id.* at 42 (emphasis by Respondents). Respondents argue that reading note 3 to require confirmation within 2 days would be illogical because the second sentence of note 3 provides that product delivery according to the order would be deemed acceptance. *Id.* Respondents further note that Vicor confirmed PO '176 the next day, *id.* at 43 (citing CDX-0010C.0149) and provided ship dates one day after receiving the revised order at issue in PO '265, *id.* (citing CDX-0010C.0074-75, RX-1911C.0001).

**b. Vicor's Position**

Vicor argues that its emails providing delivery dates in response to Foxconn POs did not constitute binding acceptance of the POs, for four reasons. Compl. Init. Sub. at 31-32.

First, Vicor contends that its standard practice for all customers is to accept purchase orders via its SOA forms. Compl. Init. Sub. at 31, 32. The SOA states that the order is subject to Vicor's standard terms and conditions and contains a hyperlink to a website with the full text of the terms. *Id.* at 32-33. Part 25 of the terms states that "[n]othing in the Sales Agreement is to be construed as a grant or assignment of any license or other right to Buyer of any of Vicor's intellectual property rights." CX-3328.0014. The SOA further states that Vicor's acceptance of

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<sup>43</sup> Note 3 states in full: "Seller shall confirm this PO with Buyer within 2 working days upon Seller's receipt. Seller's delivery of Products according to the provisions on Delivery Notice ("DN") or other delivery requests from Buyer shall be deemed as Seller's acceptance of this PO and Seller shall perform all obligations under this PO and DN or other delivery requests." RX-1630C.0001. The Commission asked the parties to address whether the purported email acceptances were sent "within a reasonable time" as required by section 2-207(1) in light of Note 3.

the purchase order is expressly conditioned on acceptance of Vicor's terms and conditions. Compl. Init. Sub. at 31 (citing CX-3328, ¶ 1). Vicor emphasizes that "no Vicor employee . . . is authorized to reach any agreement that is inconsistent with the terms." *Id.* at 33. Vicor explains that it "responded to every Foxconn PO alleged to have been accepted by email, with an SOA and/or Invoice, stating acceptance of each order is subject to Vicor's T&Cs." *Id.* at 34 (citing exhibits). Vicor contends that, as a result, either Vicor's terms and conditions (barring a license) control, or the parties' competing license terms drop out of the resulting contract. *Id.*

Vicor characterizes the emails with delivery dates as "stray intervening emails" that did not constitute "definite and seasonable" acceptance of the POs under section 2-207(1). Compl. Init. Sub. at 35. Vicor argue that over the parties' five-year course of dealing involving more than 700 transactions, "[Vicor] consistently accepted Foxconn's POs only via its SOAs." *Id.* at 32. Vicor argues that "[i]t simply is not objectively reasonable to conclude, in light of the 700+ surrounding transactions that involved transmission of an SOA incorporating Vicor's T&Cs, that an interim courtesy email was a 'definite' acceptance in a handful of circumstances." *Id.* at 36.

Second, Vicor emphasizes that at the time of the emails, the parties had not come to an agreement as to material terms. Compl. Init. Sub. at 36 (citing *Whoop, Inc. v. Ascent Int'l Holdings, Ltd.*, No. 19-10210-LTS, 2019 WL 2075591, at \*6 (D. Mass. May 10, 2019)). Namely, Vicor argues, the proposed delivery dates "differed from those requested by Foxconn, by a matter of weeks or months." *Id.* With respect to PO '176, Vicor contends that the delivery date Vicor proposed was more than six months after the date requested by Foxconn. *Id.* at 37. Foxconn witness Robert Yuan, in reference to the email exchange, stated it "looks like they are still trying to get some confirmation." *Id.* (quoting Tr. 413:6-11, referencing RX-1631C). For PO '265, Vicor asserts that the delivery date Vicor proposed was more than six weeks after the

date specified in the purchase order. *Id.* Vicor contends that the parties separately disagreed as to the warranty provision in PO '265. *Id.* at 37-38. Moreover, Vicor asserts, a subsequent, revised purchase order followed the purported acceptance of the PO '265, quickly followed by Foxconn's attempt to cancel the order. *Id.* at 38.

Third, Vicor argues that the emails should not be considered acceptance of the POs because the POs were not "offers." Compl. Init. Sub. at 38. Echoing the Massachusetts District Court, Vicor argues that Note 6 of the POs<sup>44</sup> disclaimed any contract formation until Foxconn provided a Delivery Notice ("DN") or delivery request. *Id.* (citing RX-1630C; RX-1638C). Vicor explains that Massachusetts law defines an "offer" as "inviting acceptance in any manner and by any medium reasonable in the circumstances." *Id.* (quoting Mass. Gen. Laws ch. 106 § 2-206). According to Vicor, a PO cannot be "accepted" to create a binding agreement without a delivery request, which Foxconn did not provide. Further, Vicor contends that the POs contemplate there will be no acceptance until the delivery of goods pursuant to the delivery request. *Id.* at 39 ("[D]elivery of Products according to the provisions on [DN] or other delivery requests from Buyer shall be deemed as Seller's acceptance of this PO.") (quoting RX-1630C).

Fourth, Vicor argues that pursuant to note 3 of the Foxconn POs, confirmation must have been sent within two working days in order for acceptance to have been sent within a "reasonable time" as understood in section 2-207(1). Comp. Init. Sub. at 39. Specifically, Vicor notes that PO '176 is dated August 18, 2021, was received by Vicor on September 26, 2021, and

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<sup>44</sup> Note 6 reads (in relevant part): "This PO and any particular DN or delivery request issued by Buyer constitute an independent and complete agreement between both parties. This PO shall not constitute Buyer's purchase obligation without DN or other delivery requests. Final quantity and/or delivery date shall be subject to the provisions on the on the most current DN or other delivery requests. Seller agrees to Products according to such particular DN or delivery request. Unit Price shall be the most current one as agreed by both parties before payment." RX-1630C.0001.

was allegedly accepted by the email dated October 1, 2021. *Id.* (citing RX-1630C; RX-1631C). Vicor further notes that PO '265 is dated May 31, 2023, was received on June 1, 2023, and was allegedly accepted by the email dated June 13, 2023. *Id.* at 39-41 (citing RX-1635C; RX-1911C).

**c. OUII's Position**

OUII agrees with Vicor that there is no binding agreement between Vicor and the Foxconn Respondents, including the license provision. OUII Init. Sub. at 29. OUII's submission focuses on two arguments: (1) the Massachusetts District Court's decision finding that the Foxconn POs do not govern the sales of Vicor's products to Foxconn; and (2) before Foxconn submitted the POs at issue, Vicor notified Foxconn that Vicor's terms and conditions would apply and rejected Foxconn's general terms. *Id.*

*District Court Decision.* OUII reiterates that the District Court found, based on the language of the Foxconn POs themselves, that the POs are not "offers" under Massachusetts law. OUII Init. Sub. at 30. Rather, OUII argues, each PO is "mere[ly] an invitation to negotiate or to discuss a purchase-and-sale arrangement." *Id.* at 30 (quoting 2024 WL 3548786, at \*10-11). OUII notes the District Court's emphasis that, by its own terms, the Foxconn PO states that it "shall not constitute Buyer's purchase obligation without DN or other delivery request." *Id.* at 31 (quoting 2024 WL 3548786, at \*10-11). That sentence "written by [Foxconn]," OUII asserts, makes clear that Foxconn had to issue a "DN or deliver request" before an agreement is formed." *Id.* Furthermore, OUII argues, in the absence of a delivery notice from Foxconn, the email exchanges did not establish a contract. *Id.* at 31-32.

*Vicor's Rejection of Foxconn PO Terms.* OUII argues that the Commission does not need to resolve the offer/acceptance issue because the evidence shows that before Foxconn submitted its initial PO to Vicor, Foxconn was on notice of Vicor's terms and conditions,

including Vicor's rejection of Foxconn's general terms. OUII Init. Sub. at 33. Specifically, OUII notes, at the outset of a Foxconn project using Vicor's products, Vicor provided a data sheet that included a notice of Vicor's standard terms and conditions:

**Vicor's Standard Terms and Conditions and Product Warranty**

All sales are subject to Vicor's Standard Terms and Conditions of Sale, and Product Warranty which are available on Vicor's webpage (<http://www.vicorpower.com/termsconditionswarranty>) or upon request.

*Id.* (excerpting CX-0859C). In relevant part, Vicor's terms and conditions state:

These Terms and Conditions of Sale ("Terms") [1] *shall be the sole terms and conditions governing the sale of products and services ("Goods") by Vicor Corporation . . . to the commercial party listed on the order form or other documentation ("Purchase Order") provided to Vicor by that party ("Buyer"), except to the extent these Terms conflict with those of an existing, separate contract signed by Vicor and Buyer may take precedence over these Terms. [2] Vicor's express acceptance of a Purchase Order under these Terms is evidenced by its delivery of a Sales Order Acknowledgement ("SOA"), and such acceptance of a Purchase Order is expressly conditioned on Buyer's assent to these Terms, as described in Section 2. Only upon delivery by Vicor of a SOA to Buyer shall these Terms and the associated Purchase Order together become a binding, bilateral contract between Vicor and Buyer, with enforceable rights and performance obligations (the "Sales Agreement"). A Sales Agreement will not exist, and Vicor will not be obligated to fulfill a Purchase Order, unless Vicor affirmatively acknowledges the respective responsibilities of Vicor and Buyer through delivery of a SOA to Buyer. No party has been authorized by Vicor to make any statement or representation as to the sale of Goods inconsistent with these Terms, and no such statements, if made, will be binding upon Vicor or be grounds for any claim.*

The Sales Agreement shall not fail as a contract due to the presence of conflicting terms and conditions of purchase of the Buyer set forth in [3] *Buyer's Purchase Order, as any and all such terms and conditions, including but not limited to provisions of purchase accompanying a Purchase Order, are hereby rejected and shall be of no effect. [4] In the event of any conflict between these Terms and terms and conditions of purchase of the Buyer, these Terms shall prevail, except in those circumstances when Vicor has expressly consented to the specific application of the conflicting condition(s) of Buyer to the Sales Agreement, as specifically indicated in the SOA. If, subsequent to the issuance of a SOA, Vicor agrees to modify these Terms, Vicor's express consent will be valid and binding upon Vicor only when an amendment to the SOA is executed, as set forth in Section 3 below. . .*

OUII Init. Sub. at 35 (quoting CX-3328 at 1 (emphasis added)). OUII notes that, at the beginning of a project or in the event of a price change, Vicor would send a price quote again containing the notice of Vicor's terms and conditions. *Id.* at 34. *Id.* OUII further notes that such notice accompanying a price quote would always precede Foxconn's PO because, without it, Foxconn would not know what price to include in the PO. *Id.* OUII reasons that by issuing its POs after receiving notice of Vicor's terms and conditions (including the conditions rejecting they buyer's terms), Foxconn implicitly agreed to Vicor's terms. *Id.* OUII notes that Vicor sent the "Sales Order Acknowledgement" referenced in Vicor's terms and conditions hundreds of times and "there is no evidence that Foxconn ever objected." *Id.* at 36.

Finally, OUII argues that for the reasons articulated above, the emails sent by Vicor cannot constitute "acceptance" under Massachusetts law, therefore it is irrelevant whether the emails were sent within the two-day time frame specified by note 3 of the Foxconn POs. OUII Init. Sub. at 28.

## **5. Analysis**

We find that Vicor accepted a valid offer when Vicor's employee [REDACTED] provided shipment dates for the requested products via the email dated October 1, 2021. RX-1631C.0002. The resulting contract included the Foxconn license provision as a governing term, granting the buyers (FII USA, Inc. and Ingrasys Technology Inc.) a license to the sole asserted patent covering the NBM power converter sold by Vicor, namely the '761 patent. Accordingly, the Commission reverses the Final ID's finding that Foxconn failed to show the license provision was enforceable because there was no valid acceptance of an offer. *See* Final ID at 174-75, and instead find that the license provisions are enforceable by FII USA, Inc. and Ingrasys Technology Inc. as to the '761 patent.

On its face, the submission of the purchase orders and responses with shipment dates were offers and acceptances under the UCC and Massachusetts law. “[T]he essential components of the sale were agreed to, that is, product, price, and quantity.” *Borden Chemical, Inc. v. Jahn Foundry Corp.*, 64 Mass.App.Ct. 638, 643 (2005). We found no authority (and Vicor and OUII cited none) stating that terms and conditions provided by a seller before an offer (made by the seller or the buyer) govern the manner of acceptance of a subsequent offer—*i.e.*, Vicor could accept only through an SOA as its terms and conditions purported to state. Nor did we locate any authority that disregarded an “interim” or “stray” written confirmation from the seller in favor of a later-issued form by the seller. Providing shipment dates was a “definite and reasonable expression of . . . written confirmation.” Mass. Gen. Law ch. 106 § 2-207(1).

We do not find persuasive Vicor’s assertion that only the SOA functioned as acceptance of the offer. Compl. Init. Sub. at 31. Rather, the statute provides that an offer invites acceptance “in any manner and by any medium reasonable in the circumstance.” Mass. Gen. Law ch. 106 § 2-206. The POs did not specify acceptance via an SOA, and nothing in the email correspondence from Vicor’s employees stated that the response was not final pending an SOA. An email response to an email PO is facially reasonable and sufficient under Massachusetts law. Restatement (Second) of Contracts § 65, cmt. a (1981) (“[A]n offer invites acceptance by any reasonable medium unless there is contrary indication.”); Mass. Gen. Law ch. 106 § 2-206, UCC cmt. 1 (“This section is intended to remain flexible and its applicability to be enlarged as new media of communication develop or as the more time-saving present day media come into general use.”). Even if Vicor always sent an SOA as alleged, there is no reason to conclude that the SOA, as opposed to the “courtesy emails,” constituted confirmation in the parties’ course of dealing.

Moreover, we disagree with the Final ID (and District Court) that the email responses were not acceptances because they provided shipment dates different than specified in the POs. Both decisions cite *Situation Management Systems, Inc. v. Malouf*, 430 Mass. 875 (2000), for the general proposition that “there must be agreement between the parties on the material terms of that contract.” But *Malouf* did not involve the sale of goods, does not discuss section 2-207, and does not suggest that a shipping date would be a material term of the contract in this context. Here, the Foxconn Respondents gave no indication that the May 2022 delivery dates were unacceptable for PO ’176 patent, nor did they indicate any intent to cancel the PO upon learning of the altered delivery dates; Lee simply asked for update. See RX-1631C.0001-.0003. As for PO ’265, the purported cancellation was based on customer demand, not the shipment date provided by Vicor. CDX-0010C.0298 (“The customer has cancelled the demand and needs to cancel the order for this[.]”).<sup>45</sup>

We are likewise unpersuaded by the District Court’s and Vicor’s emphasis on Note 6’s requirement that Foxconn send a “DN or other delivery request.” 2024 WL 3548786, at \*10; Compl. Init. Sub. at 38-39. As Respondents point out, Lee’s September 27, 2021 email transmitting the PO asked Vicor to “confirm ETA asap.” RX-1631C.0004. Foxconn repeatedly requested a delivery date for PO ’265. CDX-0010C.0193, .0200. Vicor fails to articulate what more of a “delivery request” was necessary.

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<sup>45</sup> The Massachusetts District Court also cited James J. White *et al.*, Uniform Commercial Code § 2:14 (6th ed., 2023), as “listing ‘delivery terms’ among the type of terms that cannot differ between an offer and an acceptance.” 2024 WL 3548786, at \*11. To the contrary, the cited portion of White cites the Idaho Supreme Court’s decision in *Southern Idaho Pipe & Steel Co. v. Cal-Cut Pipe & Supply, Inc.*, 98 Idaho 495 (495) (1977) as holding that “an acceptance occurred even though the buyer’s ‘accepting’ form was the same form sent by the seller, the buyer having stricken the seller’s delivery date, inserted his own, and returned the form.” White, § 2:14. White acknowledges that “[t]here, the parties may still have been bargaining over the delivery date, a fact not present in [the] hypothetical case.” *Id.*

Finally, the Commission asked the parties to address the effect, if any, of the provision in note 3 that “Seller shall confirm this PO with Buyer within 2 working days upon Seller’s receipt.” RX-1630C.0001. “An offeree’s power of acceptance is terminated at the time specified in the offer, or, if no time is specified, at the end of a reasonable time.” Rstmt. (Second) Contracts § 41. This provision is not sufficiently clear to function as a deadline for acceptance after which Vicor’s acceptance was invalid. After stating that the PO must be confirmed within 2 working days, note 3 further states that “Seller’s delivery of Products according to the provisions on Delivery Notice (“DN”) or other delivery requests from Buyer shall be deemed as Seller’s acceptance of this PO.” RX-1630C.0001. Because the delivery request was made simultaneous with (or the day following, for PO ’265) transmission of the PO, Vicor had the option of accepting the PO by delivering the goods, which (according to the delivery dates in the POs) would have been more than two days later. In other words, the PO specified one possible method of acceptance that would occur more than two days later. Thus, the offer did not expire within two working days of receipt. Vicor’s response providing delivery dates for the requested product within the same work week it received PO ’176 was reasonable acceptance. *See Mathewson Corp. v. Allied Marine Indus., Inc.*, 827 F.2d 850, 853 (1st Cir. 1987) (acceptance of settlement offer within seven days occurred within a reasonable time). Likewise, Vicor accepted PO ’265 the day after Foxconn sent the PO with the revised delivery terms. *See CDX-0010C.0288*. For these reasons, Commission finds that Vicor accepted the offer in the POs via email and, thus, is bound by the license provision in both POs.

The remaining question is which of the accused products and Respondents the license covers. Pursuant to the license term, Vicor granted “Buyer and its customer(s) a perpetual . . . license under all intellectual property rights included in the Products supplied to Buyer by

Seller.” RX-1630C.0002. “Products” is defined in General Term 1 as “any product, its spare part and component manufactured and/or provided by Seller to Buyer pursuant to this Purchase Order.” *Id.* Respondents argue the license covers “all asserted patents and, by extension, all accused products.” Resp. Init. Sub. at 43. Respondents further contend that the license applies to “all Foxconn entities regardless of whether they were all direct signatories” because “Complainant repeatedly ‘lump[s] [Respondents] together.” *Id.* at 44. Vicor argues the license should be limited to the patents Vicor’s NBM product is found to practice and should be limited to FII USA Inc. and Ingrasys Technology Inc. Compl. Init. Sub. at 41.

We agree with Vicor on this point. Respondents assert that under Massachusetts law, “non-signatories can assert contract rights by ‘equitable estoppel’ or as ‘third-party beneficiaries.’” Resp. Init. Sub. at 44 (citing *Machado v. System4 LLC*, 471 Mass. 204, 209-10 (2015)). Respondents contend this concept applies here because Vicor “lump[s] [Respondents] together,” and “knew that Foxconn Respondents ‘switch[ed] projects from one legal entity to another.” *Id.* (alterations in original). As *Machado* explained “actual dependence on the underlying contract . . . is [] always the sine qua non . . . for applying equitable estoppel.” *Machado*, 471 Mass. at 211-12 (internal quotations omitted). Respondents do not allege that any of the Foxconn Respondents (much less those other than FII USA and Ingrasys Technology) actually depended on the license in the purchase orders. Moreover, as set forth in the Final ID (for the ’481 and ’761 patents) and above (as to the ’950 patent), Vicor’s NBM module has been shown to practice only the ’761 patent.

Based on the preceding discussion, the Commission reverses the Final ID’s license analysis and finds that FII USA, Inc. and Ingrasys Technology, Inc. have a license to the ’761 patent. As a result, any sale for importation, importation, or sale after importation of power

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converter modules or systems containing the same by or on behalf of either entity will not be within the scope of the limited exclusion order. Likewise any cease and desist order issued against FII USA will not apply to modules or systems containing the same unless they practice claim 1 of the '481 patent.

\* \* \*

Therefore, the Commission finds a violation of section 337 as to the '481 and '761 patents, but no violation of section 337 as to the '950 patent.

## **VI. REMEDY, THE PUBLIC INTEREST, AND BONDING**

### **A. Remedy**

The Commission has “broad discretion in selecting the form, scope, and extent of the remedy.” *Philip Morris Products S.A. v. Int’l Trade Comm’n*, 63 F.4th 1328, 1339-1340 (Fed. Cir. 2023). As set forth below, the Commission has determined to issue a standard limited exclusion order (“LEO”) and cease and desist orders (“CDOs”) as to certain respondents. The Commission further finds that the public interest will not be adversely affected by the issuance of the remedial orders. Finally, the Commission imposes a bond of [REDACTED] percent ([REDACTED]) as to Delta Accused Modules, zero percent (0%) bond as to Cyntec Accused Modules, and one hundred percent bond (100%) as to the accused systems imported during the period of Presidential Review.

#### **1. Limited Exclusion Order**

Section 337(d)(1) provides that “[i]f the Commission determines, as a result of an investigation under this section, that there is a violation of this section, it shall direct that the articles concerned, imported by any person violating the provision of this section, be excluded from entry into the United States, unless, after considering the [public interest], it finds that such articles should not be excluded from entry.” 19 U.S.C. § 1337(d)(1).

Before the ALJ, Respondents did not dispute that a limited exclusion order is warranted if the Commission finds a violation, but they requested a carve out for “non-infringing and/or non-accused products.” RD at 201. The RD rejects that request and recommends the Commission issue a LEO as to all Respondents without any specific carve out provision. *Id.* Respondents now ask the Commission to make clear in the Commission’s opinion that the Final ID finds that the redesigns do not infringe any asserted patents, identify where in the record the parties’ stipulated as to non-infringing products, and indicate that Vicor dropped its infringement allegations as to certain Delta products. Resp. Init. Sub. at 46. The Commission has determined to issue its standard LEO in this instance, identifying the relevant claims of the ’481 and ’761 patents. However, for ease of reference for CBP, the Commission notes that the Commission finds neither of the redesigned products (U50SU4P1A2PMDAF and MPN541382-PVA1) infringe any asserted claim in this investigation. The Commission also notes that the parties stipulated to a list of products outside the scope of any remedial order, attached as Exhibit 3 to Respondents’ Initial Submission. Finally, the Commission notes Respondents’ argument that Vicor dropped its infringement allegations regarding certain Delta products, but those products have not been adjudicated as non-infringing.

## **2. Cease and Desist Orders**

Section 337(f)(1) provides that in addition to, or in lieu of, the issuance of an exclusion order, the Commission may issue a cease and desist order (“CDO”) as a remedy for violation of section 337. *See* 19 U.S.C. § 1337(f)(1). CDOs are generally issued when, with respect to the imported infringing products, respondents maintain commercially significant inventories in the United States or have significant domestic operations that could undercut the remedy provided by an exclusion order. *See, e.g., Certain Tobacco Heating Articles and Components Thereof*, Inv. No. 337-TA-1199, Comm’n Op. at 49 (Sept. 29, 2021), *aff’d*, *Philip Morris Products S.A.*,

63 F.4th at 1332; *Certain Audio Players and Controllers, Components Thereof, and Products Containing Same*, Inv. No. 337-TA-1191, Comm’n Op. at 26 (Jan. 6, 2022), *aff’d*, *Sonos, Inc. v. Int’l Trade Comm’n*, 2024 WL 1507605 (Fed. Cir. Apr. 8, 2024). Complainants bear the burden on this issue. “A complainant seeking a cease and desist order must demonstrate, based on the record, that this remedy is necessary to address the violation found in the investigation so as to not undercut the relief provided by the exclusion order.” *Tobacco Heating Articles*, Comm’n Op. at 49-50 (citations omitted); *Audio Players*, Comm’n Op. at 26-27 (citations omitted); *see also* H.R. REP. No. 100-40, at 160 (1987).

The RD recommends issuance of cease and desist orders as to each of the eleven (11) Respondents. RD at 203-04. Vicor continues to seek CDOs against both the domestic and foreign respondents. Compl. Init. Sub. at 43-45. OUII argues CDOs are appropriate only as to the domestic respondents. OUII Sub. at 40-41. Respondents do not dispute that CDOs should issue as to Quanta Computer USA Inc., FII USA Inc., and Ingrasys Technology USA Inc., but argue that the remaining Respondents do not satisfy the Commission’s criteria for CDOs because they do not maintain commercially significant inventories of infringing products in the United States or have significant domestic operations that could undercut an LEO. Resp. Init. Sub. at 47-49. In addition to the three domestic respondents against which Respondents do not dispute CDOs should issue, the Commission has determined to issue CDOs against one additional domestic respondent (Delta Electronics (Americas) Ltd), and one foreign respondent (Quanta Computer Inc.).

*Domestic Respondents.* Respondents argue there is no evidence of any inventories of accused products owned or controlled by Delta Electronics (Americas) Ltd. and DET Logistics (USA) Corporation. Resp. Init. Sub. at 48. The RD notes that the Delta Respondents do not

themselves maintain commercially significant inventory of infringing products in the United States. RD at 203. The record shows, however, that Delta Electronics (Americas) has a significant domestic presence, with [REDACTED]

[REDACTED]. *Id.*; Resp. Init.

Sub. at 48-49. Respondents argue that because these Delta entities have no control over unrelated customers' inventories, CDOs would have no impact on the disposition of those products. Resp. Init. Sub. at 49. However, given the Delta Respondents' extensive operations in the United States, including Delta Electronics (Americas)'s agreement to distribute Cyntec power modules (*see* CX-0553), a CDO as to Delta Electronics (Americas) Ltd is appropriate. We agree with Respondents that the record is devoid of evidence of domestic inventory or any explanation of the domestic operations by DET Logistics (USA) Corporation that would allegedly undercut an LEO such that a CDO would be warranted.<sup>46</sup> Accordingly, the Commission declines to issue a CDO against DET Logistics (USA) Corporation.

*Foreign Respondents.* Respondents argue that each of Quanta Computer Inc., Hon Hai Precision Industry Co. Ltd. (d/b/a Foxconn Technology Group), Foxconn Industrial Internet Co., Ltd., and Ingrasys Technology Inc. are located in Taiwan or China, and that there is no evidence any of these companies have any domestic inventories or operations. Resp. Init. Sub. at 47. The RD finds that as of February 2024, QCH, Inc., a subsidiary of Quanta Computer Inc., maintained in the U.S. more than [REDACTED] units of accused systems worth more than [REDACTED]. RD at 202-04. The RD also notes that as of February 2024, FII USA Inc. had a domestic inventory of [REDACTED] units of infringing Delta Accused Modules, worth approximately [REDACTED]. *Id.* at 202.

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<sup>46</sup> To the contrary, the parties' stipulation regarding infringement indicates that FII USA takes ownership of modules from DET Logistics in Bangkok, Thailand; FII USA then imports the modules into the United States. CX-3057C at ¶ 3.

And finally the RD notes that in February 2024, Ingrasys Technology USA Inc. had a domestic inventory of [REDACTED] units of infringing Delta Accused Modules (valued at approximately [REDACTED]), and [REDACTED] units of infringing Ingrasys systems (valued at approximately [REDACTED]). *Id.* at 202-03. Citing these inventories, the RD recommends the Commission issue CDOs against all of the foreign Quanta, Foxconn, and Ingrasys respondents. *Id.* at 203-04.

The Commission has previously issued CDOs against foreign respondents where their domestic distributor is not a respondent, so as to effectively bind the domestic distributor. *Certain Digital Models, Digital Data, & Treatment Plans for Use in Making Incremental Dental Positioning Adjustment Appliances, the Appliances Made Therefrom, & Methods of Making the Same*, Inv. No. 337-TA-833, Comm'n Op. at 147-48 (Apr. 9, 2014). The Commission will follow this approach and issue a CDO as to Quanta Computer Inc. to account for the domestic operations of its subsidiary, QCH, Inc. However, the logic of *Digital Models* does not extend to the foreign Foxconn and Ingrasys respondents because the domestic Foxconn and Ingrasys entities are respondents in this investigation and will be bound by cease and desist orders.

Both the RD and Vicor cite *Certain Toner Cartridges & Components Thereof*, Inv. No. 337-TA-740, Comm'n Op. (Oct. 5, 2011), for the proposition that “CDOs are appropriate ‘against a foreign respondent where that respondent’s domestic distributor,’ which is also a respondent, ‘has maintained a commercially significant [domestic] inventory.’” Compl. Init. Sub. at 29 (quoting *Toner Cartridges*, Comm'n Op. at 7); RD at 204. However, neither the RD nor Vicor cite any evidence establishing that FII USA is a distributor for Hon Hai or Foxconn Industrial Internet Co. Nor is there any evidence cited by the RD or Vicor evidencing a distributor relationship between the foreign and domestic Ingrasys entities. Rather, the evidence

indicates FII USA and Ingrasys Technology USA purchase modules from DET Logistics in Thailand (CX-2057C) and import the modules themselves. CX-3057C at ¶ 3; CX-3058C at ¶ 3.

Specifically, Ingrasys Technology Inc. purchases modules from a separate Delta entity (also in Thailand), ships the modules to its factory in Taiwan, and incorporates the modules into systems sold in Taiwan or Hong Kong. CX-3058C at ¶ 4. Ingrasys Technology Inc. stipulated that it sold systems for importation into the United States previously, but there is nothing establishing a distributor-type relationship between the two Ingrasys entities. *Id.* at ¶ 10. On this record, the Commission declines to issue CDOs as to Hon Hai, Foxconn Industrial Internet, and Ingrasys Technology Inc. *See Certain Tobacco Heating Articles & Components Thereof*, Inv. No. 337-TA-1199, Comm'n Op. at 53 (Oct. 19, 2021) (declining to issue a CDO against a foreign affiliate of a domestic respondent because there was “no evidence as to whether [foreign respondent] plays a role in the United States in the sale or distribution of the Accused Products”).

Finally, Respondents argue that respondents Delta Electronics Inc. and Cynotec Co. Ltd. are Taiwanese corporate entities with no domestic inventory or operations. *Resp. Init. Sub.* at 49. We agree that there is no evidence either entity has any domestic operations. There is no evidence to suggest these specific entities play a role in the sale or distribution of accused modules or systems in the United States. Vicor repeats the evidence cited by the RD as to Delta Electronics (Americas) but does not point to anything in the record regarding the activities of the foreign Delta and Cynotec respondents. *Compl. RSub.* at 100. Therefore, the Commission declines to issue CDOs against Delta Electronics Inc. and Cynotec Co. Ltd. *Tobacco Heating Articles*, Comm'n Op. at 53.

For these reasons, the Commission has determined to issue CDOs as to the following entities: Quanta Computer USA Inc., FII USA Inc., and Ingrasys Technology USA Inc., Delta Electronics (Americas) Ltd., and Quanta Computer Inc.

**B. Public Interest**

Section 337 requires the Commission, upon finding a violation of section 337, to issue an LEO “unless, after considering the effect of such exclusion upon the public health and welfare, competitive conditions in the United States economy, the production of like or directly competitive articles in the United States, and United States consumers, it finds that such articles should not be excluded from entry.” 19 U.S.C. § 1337(d)(1). Similarly, the Commission must consider these public interest factors before issuing a CDO. 19 U.S.C. § 1337(f)(1).

Under appropriate facts and circumstances, the Commission may determine that no remedy should issue because of the adverse impacts on the public interest. *See, e.g., Certain Fluidized Supporting Apparatus & Components Thereof*, Inv. Nos. 337-TA-182/188, USITC Pub. 1667, Comm’n Op. at 1-2, 23-25 (Oct. 1984) (finding that the public interest warranted denying complainant’s requested relief); *see Philip Morris Products S.A.*, 63 F.4th at 1339-1340 (the Commission has “wide latitude for judgment and the courts will not interfere except where the remedy selected has no reasonable relation to the unlawful practices found to exist”) (citation omitted). Moreover, when the circumstances of a particular investigation require, the Commission has tailored its relief in light of the statutory public interest factors. For example, the Commission has allowed continued importation for ongoing medical research, exempted service parts, grandfathered certain infringing products, and delayed the imposition of remedies to allow affected third-party consumers to transition to non-infringing products. *E.g., Certain Microfluidic Devices*, Inv. No. 337-TA-1068 Comm’n Op. at 1, 22-48, 53-54 (analyzing the public interest, discussing applicable precedent, and ultimately issuing a tailored LEO and a

tailored CDO); *Certain Road Milling Machines & Components Thereof*, Inv. No. 337-TA-1067, Comm'n Op. at 32-33 (July 18, 2019) (exempting service parts); *Certain Baseband Processor Chips & Chipsets, Transmitter, & Receiver (Radio) Chips, Power Control Chips, & Prods. Containing Same, Including Cellular Tel. Handsets*, 337-TA-543, USITC Pub. No. 4258, Comm'n Op. at 150-151 (Oct. 2011) (grandfathering certain products); *Certain Personal Data & Mobile Comm'n Devices & Related Software*, 337-TA-710, USITC Pub. No. 4331, Comm'n Op., at 72-73, 80-81 (June 2012) (delaying imposition of remedy).

The statute requires the Commission to consider and make findings on the public interest in every case in which a violation is found regardless of the quality or quantity of public interest information supplied by the parties. 19 U.S.C. § 1337(d)(l), (f)(l). Thus, the Commission publishes a notice inviting the parties as well as interested members of the public and interested government agencies to gather and present evidence on the public interest at multiple junctures in the proceeding. 19 U.S.C. § 1337(d)(l) & (f)(l).

The Commission did not instruct the ALJ to making findings and a recommendation as to the public interest. On October 29, 2024, Vicor and Respondent FII USA submitted comments pursuant to Commission Rule 210.50(a)(4) (19 C.F.R. § 210.50(a)(4)). Those submissions are discussed *infra*, Section VIII.B. No submissions were filed in response to the Commission's *Federal Register* notice seeking submissions on the public interest. *See* 89 Fed. Reg. 80604-05 (Oct. 3, 2024). Apart from the parties' submissions, no submissions regarding remedy, public interest, or bonding were filed in response to the Commission's whether to review notice.

**1. Parties' Positions****a. Vicor's Position**

In its submission responsive to Commission Rule 210.50(a)(4), Vicor argued that remedial orders would advance the public interest.<sup>47</sup> In part, Vicor argued that it and other companies not subject to the orders can meet the market demand for the accused products (or non-infringing alternative products). Compl. PI Sub. at 3-5.

In its submission on review, Vicor again argues that the requested remedies will advance the public interest. Compl. Init. Sub. at 46. Vicor asserts it is a U.S. company with more than 1,000 U.S. employees and several domestic facilities for engineering, manufacturing, and distribution of the DI Products. *Id.* at 47, 48. Vicor argues that remedial orders would not implicate any public health, safety, or welfare concerns. *Id.* at 47. Moreover, Vicor argues, remedial orders would likely increase its domestic production of its DI Products. *Id.* Vicor further asserts that U.S. consumers will not face any shortages because of “competitive offerings from Vicor and other third-party manufacturers.” *Id.* Vicor emphasizes that it seeks to exclude only a subset of products from a subset of manufacturers of power converter modules and related systems. *Id.* Vicor argues that declining to issue remedial orders would “disincentivize future investment in similar technology at a time when datacenter and related computing system needs are rapidly expanding.” *Id.*

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<sup>47</sup> Complainant Vicor Corporation's Submission Relating to the Public Interest (Oct. 29, 2024) (“Compl. PI Sub.”).

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**b. Respondents' Position**

In its submission pursuant to Commission Rule 210.50(a)(4),<sup>48</sup> FII USA argued that supplying its high-tech boards to [REDACTED] is crucial to national security and stability and that an exclusion order would harm workers at FII USA's factory in Wisconsin. FII USA PI Sub at 3-4. FII USA asked the Commission to decline to issue remedial orders as to the Delta accused products or, in the alternative, to delay implementation of the orders to allow it to qualify other suppliers of the relevant modules. *Id.* at 4-5.

Respondents did not make any arguments regarding the public interest in response to the Commission's whether to review notice. Vicor suggests that the failure of Respondents to submit arguments on the public interest cast doubt on FII's earlier public interest arguments. Compl. Init. Sub. at 49.

**c. OUII's Position**

OUII agrees with Vicor that the statutory public interest factors do not support denial of any remedial orders in this investigation. OUII Init. Sub. at 42. OUII did not otherwise offer argument on the public interest considerations.

**2. Public Health and Welfare**

None of the parties identified any applications that pertain to public health and welfare, such as medical-related applications, for the accused products, and there is nothing in the record to suggest the remedial orders would implicate public health or welfare concerns.

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<sup>48</sup> Public Interest Comments of FII USA, Inc. In Investigation No. 337-TA-1370 (Oct. 29, 2024) ("FII USA PI Sub.").

**3. Competitive Conditions in the United States**

The parties did not articulate any potential harm to the competitive conditions in the United States if the remedial orders were to issue, and there is no evidence on record to suggest that the remedial orders would harm competitive conditions in the United States.

Vicor argues the respondents represent only a subset of manufacturers of power converters and systems. Compl. Init. Sub. at 47. Respondents do not contest this. Vicor does not identify any alternative products available in the United States, but the website of at least one Vicor distributor (Mouser) lists a number of DC-DC converters manufactured by entities not named as respondents in this case, including CUI, RECOM, Cincon, Mean Well, Murata, Monolithic Power Systems, Texas Instruments, Bel Power, TDK-Lambda, and Torex.<sup>49</sup> Thus, nothing in the record suggests that the remedial orders would adversely affect the competitive conditions in the United States.

**4. The Production of Like of Directly Competitive Articles in the United States**

Vicor asserts that it and third-party manufacturers may increase domestic production in the absence of Respondents' infringing products on the market. Compl. Init. Sub. at 47. Respondents do not challenge the assertion, and there is no evidence to the contrary in the record.

**5. United States Consumers**

The number of similar products available online would tend to support Vicor's assertion that Vicor and/or third-party manufacturers have sufficient product offerings to satisfy U.S. market demand, and thus issuance of the remedial orders would not adversely affect U.S. consumers. *See supra*, n.49.

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<sup>49</sup> <https://www.mouser.com/new/power/dc-dc-converters/n-brvxe> (accessed January 28, 2025).

In sum, the Commission finds that the public interest factors do not preclude the issuance of the remedial orders in this investigation.

**C. Bonding**

If the Commission enters an exclusion order or a cease and desist order, a respondent may continue to import and sell its products during the 60-day period of Presidential review under a bond in an amount determined by the Commission to be “sufficient to protect the complainant from any injury.” 19 U.S.C. § 1337(j)(3); see also 19 C.F.R. § 210.50(a)(3). When reliable price information is available in the record, the Commission has often set the bond in an amount that would eliminate the price differential between the domestic product and the imported, infringing product. *See Streaming Players*, Comm’n Op. at 41-42 (citations omitted); *Tobacco Heating Articles*, Comm’n Op. at 77 (citations omitted). The Commission also has used a reasonable royalty rate to set the bond amount where a reasonable royalty rate could be ascertained from the evidence in the record. *See, e.g., id.* Where the record establishes that the calculation of a price differential is impractical or there is insufficient evidence in the record to determine a reasonable royalty, the Commission has imposed a 100 percent bond. *See, e.g., id.*

The RD recommends three different rates for purposes of bonding. RD at 204-05. First, because neither Vicor nor OUII sought a bond as to Cynotec, the RD recommends no bond as to Cynotec’s accused modules. *Id.* at 205. Second, the RD recommends a [REDACTED] percent bond for Delta products, the rationale being that Vicor and Delta directly compete, and [REDACTED] percent represents the price differential between Vicor’s and Delta’s products. *Id.* at 204. Third, the RD finds that the downstream products sold by the remaining respondents are sold at “different levels of commerce,” making determination of a price differential impractical. *Id.* at 205. The RD thus recommends a 100 percent bond for the remaining products. *Id.*

Respondents do not contest the RD’s recommendation as to the Delta or Cynotec products.

Resp. Init. Sub. at 49-50. As to the remaining accused products, Respondents argue that “[a] 100% bond would amount to [REDACTED]; doubling the price of Quanta’s (and Foxconn’s) downstream products due to their inclusion of a [REDACTED] power module, and providing Vicor with a huge windfall, rather than compensation for its loss of sales, should those bonds be forfeited to it.” Resp. Init. Sub. at 50. Respondents argue this 100 percent bond would be “wholly disproportionate to any injury that could be suffered by Vicor.” *Id.* Instead, Respondents suggest the Commission impose a bond of (a) [REDACTED] per downstream product ([REDACTED] percent of the average value of the incorporated Delta module) or (b) [REDACTED] per downstream product (100 percent of the average value of the incorporated Delta module). *Id.* Vicor and OUII support the RD’s recommendation. Compl. RSub. at 30; OUII Init. Sub. at 43.

Respondents’ arguments regarding the downstream products are new. Before the ALJ, Respondents merely argued that OUII did not address whether a 100 percent bond on downstream products would effectively prevent importation. Resp. Post-Hearing Reply at 99. Respondents waived any objection to the 100 percent bond rate for downstream products. On the merits of the argument, the Commission agrees with Vicor. The downstream products are sold at a wide range of prices and at a different level of commerce compared to Vicor’s modules, making it impractical to accurately determine a price differential for bond purposes. RDID at 204-05; *see* CPHB at 748 (estimating prices of downstream products from [REDACTED]). In such circumstances, the Commission finds it appropriate to impose a 100 percent bond for the downstream products. *Streaming Players*, Comm’n Op. at 42.

For these reasons, the Commission shall impose a bond in the amount of [REDACTED] percent of entered value for Delta modules, zero percent of entered value for Cyntec modules,

and one hundred percent of entered value for all other infringing products imported during the period of Presidential Review.

## **VII. CONCLUSION**

The Commission has considered all of the other arguments by the parties and does not find them persuasive. Therefore, for the reasons set forth herein and in the Final ID, the Commission finds as follows:

- As to the '481 patent:
  - The Cyntec Accused Modules infringe asserted claim 1, but the Delta Accused Modules do not infringe asserted claim 1.
  - The Redesign Products do not infringe asserted claim 1.
  - Asserted claim 1 has not been show invalid.
  - The '481 patent DI Products containing VTM3 controllers practice claim 1, but the '481 patent DI Products containing VTM4 controllers do not practice claim 1.
  - Vicor showed significant employment of plant and equipment and labor and capital with respect to the '481 patent DI Products containing VTM3 controllers and therefore satisfied the economic prong of the domestic industry requirement.

Therefore, the Commission finds a violation of section 337 with respect to '481 patent.

- As to the '761 patent:
  - The Delta Accused Modules infringe asserted claims 1-7.
  - The Redesign Products do not infringe asserted claims 1-7.
  - Asserted claims 1-7 have not been shown invalid.
  - The '761 patent DI Products practice claims 1-7.
  - Vicor showed significant employment of plant and equipment and labor and capital with respect to the '761 patent DI Products and therefore satisfied the economic prong of the domestic industry requirement.

Therefore, the Commission finds a violation of section 337 with respect to '761 patent.

**CONFIDENTIAL MATERIAL REDACTED  
PUBLIC VERSION**

- As to the '950 patent:
  - The Delta Accused Modules do not infringe asserted claims 9, 13-14, and 33-38.
  - The Redesign Products do not infringe asserted claims 9, 13-14, and 33-38.
  - Asserted claims 9, 13-14, and 33-38 have not been shown invalid.
  - The '950 patent DI Products do not practice claims 9, 13-14, or 33-38.
  - The Commission takes no position regarding whether Vicor satisfied the economic prong with respect to the '950 patent DI Products.

Therefore, the Commission finds no violation of section 337 with respect to '950 patent.

The Commission determines that the appropriate remedy is a limited exclusion order, as well as cease and desist orders as to certain respondents, that the public interest does not preclude that remedy, and the bond during the period of Presidential review is set at [REDACTED] percent ([REDACTED]) of entered value as to Delta products, zero percent (0%) as to Cyn [REDACTED] products, and one hundred percent (100%) as to all remaining products.

By order of the Commission.



Lisa R. Barton  
Secretary to the Commission

Issued: February 26, 2025

**CERTAIN POWER CONVERTER MODULES AND  
COMPUTING SYSTEMS CONTAINING THE SAME**

**Inv. No. 337-TA-1370**

**CONFIDENTIAL CERTIFICATE OF SERVICE**

I, Lisa R. Barton, hereby certify that the attached **COMMISSION OPINION** has been served via EDIS upon the following parties as indicated, on **February 13, 2025**.



Lisa R. Barton, Secretary  
U.S. International Trade Commission  
500 E Street, SW, Room 112  
Washington, DC 20436

**On Behalf of Complainant Vicor Corporation:**

Louis S. Mastriani, Esq.  
**POLSINELLI PC**  
1401 Eye Street NW, Suite 800  
Washington, DC 20005  
Email: [lmastriani@polsinelli.com](mailto:lmastriani@polsinelli.com)

- Via Hand Delivery
- Via Express Delivery
- Via First Class Mail
- Other: Email Notification of Availability for Download

**On Behalf of Respondents Cynotec Co., Ltd., Delta Electronics, Inc., Delta Electronics (Americas) Ltd., Quanta Computer Inc., Quanta Computer USA Inc., Hon Hai Precision Industry Co. Ltd. (d/b/a Foxconn Technology Group), Foxconn Industrial Internet Co. Ltd., FII USA Inc. (a/k/a Foxconn Industrial Internet USA Inc.), Ingrasys Technology Inc., Ingrasys Technology USA Inc., and DET Logistics (USA) Corporation:**

Paul F. Brinkman, Esq.  
**KIRKLAND & ELLIS LLP**  
1300 Pennsylvania Avenue, NW  
Washington, DC 20004  
Email: [paul.brinkman@kirkland.com](mailto:paul.brinkman@kirkland.com)

- Via Hand Delivery
- Via Express Delivery
- Via First Class Mail
- Other: Email Notification of Availability for Download

**PUBLIC VERSION**

**UNITED STATES INTERNATIONAL TRADE COMMISSION  
Washington, D.C.**

**In the Matter of**

**CERTAIN POWER CONVERTER  
MODULES AND COMPUTING  
SYSTEMS CONTAINING THE SAME**

**Investigation No. 337-TA-1370**

**CEASE AND DESIST ORDER**

**IT IS HEREBY ORDERED THAT RESPONDENT FII USA Inc. (a/k/a Foxconn Industrial Internet USA Inc.)** of Milwaukee, Wisconsin, cease and desist from conducting any of the following activities in the United States: importing, selling, offering for sale, marketing, advertising, distributing, transferring (except for exportation), soliciting United States agents or distributors, and aiding or abetting other entities in the importation, sale for importation, sale after importation, transfer (except for exportation), or distribution of certain power converter modules and computing systems containing the same (as defined in Definition (G) below) that infringe one or more of claim 1 of U.S. Patent No. 9,166,481 (“the ’481 patent”) and claims 1-7 of U.S. Patent No. 9,516,761 (“the ’761 patent”) (collectively, the “Asserted Patents”) in violation of section 337 of the Tariff Act of 1930, as amended (19 U.S.C. § 1337).

**I.  
Definitions**

As used in this order:

- (A) “Commission” shall mean the United States International Trade Commission.
- (B) “Complainant” shall mean Vicor Corporation, 25 Frontage Road, Andover, MA 01810.

**PUBLIC VERSION**

- (C) “Respondent” shall mean FII USA Inc. (a/k/a Foxconn Industrial Internet USA Inc.) of Milwaukee, Wisconsin.
- (D) “Person” shall mean an individual, or any non-governmental partnership, firm, association, corporation, or other legal or business entity other than Respondent or its majority-owned or controlled subsidiaries, successors, or assigns.
- (E) “United States” shall mean the fifty States, the District of Columbia, and Puerto Rico.
- (F) The terms “import” and “importation” refer to importation for entry for consumption under the Customs laws of the United States.
- (G) The term “covered products” shall mean power converter modules and computing systems containing the same that infringe one or more of claim 1 of the ’481 patent and claims 1-7 of the ’761 patent. The power converter modules and computing systems containing the same subject to this order are as follows: power converter modules used in data center server, artificial intelligence and cloud computing systems, to power artificial intelligence (‘AI’) accelerators, tensor processing units (‘TPU’), graphical processing units (‘GPU’) and central processing units (‘CPU’), and computing systems containing the same. Covered products shall not include articles for which a provision of law or license avoids liability for infringement.
- (H) “Delta products” shall mean power converter modules manufactured by or on behalf of Delta Electronics, Inc., Delta Electronics (Americas) Ltd., and DET Logistics (USA) Corporation, or any of their affiliated companies, parents, subsidiaries, agents, or other related business entities, or its successors or assigns.

**PUBLIC VERSION**

- (I) “Cyntec products” shall mean power converter modules manufactured by or on behalf of Cyntec Co., Ltd. or any of its affiliated companies, parents, subsidiaries, agents, or other related business entities, or its successors or assigns.

**II.  
Applicability**

The provisions of this Cease and Desist Order shall apply to Respondent and to any of its principals, stockholders, officers, directors, employees, agents, distributors, controlled (whether by stock ownership or otherwise) and majority-owned business entities, successors, and assigns, and to each of them, insofar as they are engaging in conduct prohibited by section III, *infra*, for, with, or otherwise on behalf of, Respondent.

**III.  
Conduct Prohibited**

The following conduct of Respondent in the United States is prohibited by this Order.

For the remaining terms of the Asserted Patents, Respondent shall not:

- (A) import or sell for importation into the United States covered products;
- (B) market, distribute, sell, offer to sell, or otherwise transfer (except for exportation) in the United States imported covered products;
- (C) advertise imported covered products;
- (D) solicit U.S. agents or distributors for imported covered products; or
- (E) aid or abet other entities in the importation, sale for importation, sale after importation, transfer (except for exportation), or distribution of imported covered products.

**PUBLIC VERSION**

**IV.  
Conduct Permitted**

Notwithstanding any other provision of this Order, specific conduct otherwise prohibited by the terms of this Order shall be permitted if:

- (A) in a written instrument, the owner of the Asserted Patents licenses or authorizes such specific conduct; or
- (B) such specific conduct is related to the importation or sale of covered products by or for the United States.

**V.  
Reporting**

For purposes of this requirement, the reporting periods shall commence on January 1 of each year and shall end on the subsequent December 31. The first report required under this section shall cover the period from the date of issuance of this order through December 31, 2025. This reporting requirement shall continue in force until such time as Respondent has truthfully reported, in two consecutive timely filed reports, that it has no inventory (whether held in warehouses or at customer sites) of covered products in the United States.

Within thirty (30) days of the last day of the reporting period, Respondent shall report to the Commission: (a) the quantity in units and the value in dollars of covered products that it has (i) imported and/or (ii) sold in the United States after importation during the reporting period, and (b) the quantity in units and value in dollars of reported covered products that remain in inventory in the United States at the end of the reporting period.

When filing written submissions, Respondent must file the original document electronically on or before the deadlines stated above. Submissions should refer to the investigation number (“Inv. No. 337-TA-1370”) in a prominent place on the cover pages and/or

**PUBLIC VERSION**

the first page. *See Handbook for Electronic Filing Procedures*,  
[http://www.usitc.gov/secretary/fed\\_reg\\_notices/rules/handbook\\_on\\_electronic\\_filing.pdf](http://www.usitc.gov/secretary/fed_reg_notices/rules/handbook_on_electronic_filing.pdf).  
Persons with questions regarding filing should contact the Secretary (202-205-2000). If  
Respondent desires to submit a document to the Commission in confidence, it must file the  
original and a public version of the original with the Office of the Secretary and must serve a  
copy of the confidential version on Complainant's counsel.<sup>1</sup>

Any failure to make the required report or the filing of any false or inaccurate report shall  
constitute a violation of this Order, and the submission of a false or inaccurate report may be  
referred to the U.S. Department of Justice as a possible criminal violation of 18 U.S.C. § 1001.

**VI.  
Record-Keeping and Inspection**

- (A) For the purpose of securing compliance with this Order, Respondent shall retain  
any and all records relating to the sale, marketing, or distribution in the United  
States of covered products, made and received in the usual and ordinary course of  
business, whether in detail or in summary form, for a period of three (3) years  
from the close of the fiscal year to which they pertain.
- (B) For the purposes of determining or securing compliance with this Order and for  
no other purpose, subject to any privilege recognized by the federal courts of the  
United States, and upon reasonable written notice by the Commission or its staff,  
duly authorized representatives of the Commission shall be permitted access and  
the right to inspect and copy, in Respondent's principal offices during office

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<sup>1</sup> Complainant must file a letter with the Secretary identifying the attorney to receive reports and bond information associated with this Order. The designated attorney must be on the protective order entered in the investigation.

**PUBLIC VERSION**

hours, and in the presence of counsel or other representatives if Respondent so chooses, all books, ledgers, accounts, correspondence, memoranda, and other records and documents, in detail and in summary form, that must be retained under subparagraph VI(A) of this Order.

**VII.  
Service of Cease and Desist Order**

The Secretary shall serve copies of this Order upon each party of record in this investigation.

Respondent is ordered and directed to:

- (A) Serve, within fifteen (15) days after the effective date of this Order, a copy of this Order upon each of its respective officers, directors, managing agents, agents, and employees who have any responsibility for the importation, marketing, distribution, transfer, or sale of imported covered products in the United States;
- (B) Serve, within fifteen (15) days after the succession of any persons referred to in subparagraph VII(A) of this order, a copy of the Order upon each successor; and
- (C) Maintain such records as will show the name, title, and address of each person upon whom the Order has been served, as described in subparagraphs VII(A) and VII(B) of this order, together with the date on which service was made.

The obligations set forth in subparagraphs VII(B) and VII(C) shall remain in effect until the expiration of the Asserted Patents.

**VIII.  
Confidentiality**

Any request for confidential treatment of information obtained by the Commission pursuant to any section of this order should be made in accordance with section 201.6 of the

**PUBLIC VERSION**

Commission's Rules of Practice and Procedure (19 C.F.R. § 201.6). For all reports for which confidential treatment is sought, Respondent must provide a public version of such report with confidential information redacted.

**IX.  
Enforcement**

Violation of this order may result in any of the actions specified in section 210.75 of the Commission's Rules of Practice and Procedure (19 C.F.R. § 210.75), including an action for civil penalties under section 337(f) of the Tariff Act of 1930 (19 U.S.C. § 1337(f)), as well as any other action that the Commission deems appropriate. In determining whether Respondent is in violation of this order, the Commission may infer facts adverse to Respondent if it fails to provide adequate or timely information.

**X.  
Modification**

The Commission may amend this order on its own motion or in accordance with the procedure described in section 210.76 of the Commission's Rules of Practice and Procedure (19 C.F.R. § 210.76).

**XI.  
Bonding**

The conduct prohibited by section III of this order may be continued during the sixty (60) day period in which this Order is under review by the United States Trade Representative, as delegated by the President (70 Fed. Reg. 43,251 (Jul. 21, 2005)), subject to Respondent's posting of a bond in the amount of [ ] of the entered value of Delta products, zero percent (0%) of the entered value of Cyntec Products, and one hundred percent (100%) of the entered value of all other articles subject to this order. This bond provision does not apply to conduct that is otherwise permitted by section IV of this Order. Covered products imported on

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or after the date of issuance of this Order are subject to the entry bond as set forth in the exclusion order issued by the Commission and are not subject to this bond provision.

The bond is to be posted in accordance with the procedures established by the Commission for the posting of bonds by complainants in connection with the issuance of temporary exclusion orders. *See* 19 C.F.R. § 210.68. The bond and any accompanying documentation are to be provided to and approved by the Commission prior to the commencement of conduct that is otherwise prohibited by section III of this Order. Upon the Secretary's acceptance of the bond, (a) the Secretary will serve an acceptance letter on all parties, and (b) Respondent must serve a copy of the bond and accompanying documentation on Complainant's counsel.<sup>2</sup>

The bond is to be forfeited in the event that the United States Trade Representative approves this Order (or does not disapprove it within the review period), unless (i) the U.S. Court of Appeals for the Federal Circuit, in a final judgment, reverses any Commission final determination and order as to Respondent on appeal, or (ii) Respondent exports or destroys the products subject to this bond and provides certification to that effect that is satisfactory to the Commission.

This bond is to be released in the event (i) the United States Trade Representative disapproves this Order and no subsequent order is issued by the Commission and approved (or not disapproved) by the United States Trade Representative, (ii) the U.S. Court of Appeals for the Federal Circuit, in a final judgment, reverses any Commission final determination and order as to Respondent on appeal, or (iii) Respondent exports or destroys the products subject to this bond and provides certification to that effect that is satisfactory to the Commission, upon service

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<sup>2</sup> *See* Footnote 1.

**PUBLIC VERSION**

on Respondent of an order issued by the Commission based upon application therefor made by  
Respondent to the Commission.

By order of the Commission.



Lisa R. Barton  
Secretary to the Commission

Issued: February 13, 2025

**CERTAIN POWER CONVERTER MODULES AND  
COMPUTING SYSTEMS CONTAINING THE SAME**

**Inv. No. 337-TA-1370**

**CONFIDENTIAL CERTIFICATE OF SERVICE**

I, Lisa R. Barton, hereby certify that the attached **ORDER** has been served via EDIS upon the following parties as indicated, on **February 13, 2025**.



Lisa R. Barton, Secretary  
U.S. International Trade Commission  
500 E Street, SW, Room 112  
Washington, DC 20436

**On Behalf of Complainant Vicor Corporation:**

Louis S. Mastriani, Esq.  
**POLSINELLI PC**  
1401 Eye Street NW, Suite 800  
Washington, DC 20005  
Email: [lmastriani@polsinelli.com](mailto:lmastriani@polsinelli.com)

- Via Hand Delivery
- Via Express Delivery
- Via First Class Mail
- Other: Email Notification of Availability for Download

**On Behalf of Respondents Cytotec Co., Ltd., Delta Electronics, Inc., Delta Electronics (Americas) Ltd., Quanta Computer Inc., Quanta Computer USA Inc., Hon Hai Precision Industry Co. Ltd. (d/b/a Foxconn Technology Group), Foxconn Industrial Internet Co. Ltd., FII USA Inc. (a/k/a Foxconn Industrial Internet USA Inc.), Ingrasys Technology Inc., Ingrasys Technology USA Inc., and DET Logistics (USA) Corporation:**

Paul F. Brinkman, Esq.  
**KIRKLAND & ELLIS LLP**  
1300 Pennsylvania Avenue, NW  
Washington, DC 20004  
Email: [paul.brinkman@kirkland.com](mailto:paul.brinkman@kirkland.com)

- Via Hand Delivery
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- Other: Email Notification of Availability for Download

**PUBLIC VERSION**

**UNITED STATES INTERNATIONAL TRADE COMMISSION  
Washington, D.C.**

**In the Matter of**

**CERTAIN POWER CONVERTER  
MODULES AND COMPUTING  
SYSTEMS CONTAINING THE SAME**

**Investigation No. 337-TA-1370**

**CEASE AND DESIST ORDER**

**IT IS HEREBY ORDERED THAT RESPONDENT** Ingrasys Technology USA Inc. of San Jose, California, cease and desist from conducting any of the following activities in the United States: importing, selling, offering for sale, marketing, advertising, distributing, transferring (except for exportation), soliciting United States agents or distributors, and aiding or abetting other entities in the importation, sale for importation, sale after importation, transfer (except for exportation), or distribution of certain power converter modules and computing systems containing the same (as defined in Definition (G) below) that infringe one or more of claim 1 of U.S. Patent No. 9,166,481 (“the ’481 patent”) and claims 1-7 of U.S. Patent No. 9,516,761 (“the ’761 patent”) (collectively, the “Asserted Patents”) in violation of section 337 of the Tariff Act of 1930, as amended (19 U.S.C. § 1337).

**I.  
Definitions**

As used in this order:

- (A) “Commission” shall mean the United States International Trade Commission.
- (B) “Complainant” shall mean Vicor Corporation, 25 Frontage Road, Andover, MA 01810.
- (C) “Respondent” shall mean Ingrasys Technology USA Inc. of San Jose, California.

**PUBLIC VERSION**

- (D) “Person” shall mean an individual, or any non-governmental partnership, firm, association, corporation, or other legal or business entity other than Respondent or its majority-owned or controlled subsidiaries, successors, or assigns.
- (E) “United States” shall mean the fifty States, the District of Columbia, and Puerto Rico.
- (F) The terms “import” and “importation” refer to importation for entry for consumption under the Customs laws of the United States.
- (G) The term “covered products” shall mean power converter modules and computing systems containing the same that infringe one or more of claim 1 of the ’481 patent and claims 1-7 of the ’761 patent. The power converter modules and computing systems containing the same subject to this order are as follows: power converter modules used in data center server, artificial intelligence and cloud computing systems, to power artificial intelligence (‘AI’) accelerators, tensor processing units (‘TPU’), graphical processing units (‘GPU’) and central processing units (‘CPU’), and computing systems containing the same. Covered products shall not include articles for which a provision of law or license avoids liability for infringement.
- (H) “Delta products” shall mean power converter modules manufactured by or on behalf of Delta Electronics, Inc., Delta Electronics (Americas) Ltd., and DET Logistics (USA) Corporation, or any of their affiliated companies, parents, subsidiaries, agents, or other related business entities, or its successors or assigns.

**PUBLIC VERSION**

- (I) “Cyntec products” shall mean power converter modules manufactured by or on behalf of Cyntec Co., Ltd. or any of its affiliated companies, parents, subsidiaries, agents, or other related business entities, or its successors or assigns.

**II.  
Applicability**

The provisions of this Cease and Desist Order shall apply to Respondent and to any of its principals, stockholders, officers, directors, employees, agents, distributors, controlled (whether by stock ownership or otherwise) and majority-owned business entities, successors, and assigns, and to each of them, insofar as they are engaging in conduct prohibited by section III, *infra*, for, with, or otherwise on behalf of, Respondent.

**III.  
Conduct Prohibited**

The following conduct of Respondent in the United States is prohibited by this Order.

For the remaining terms of the Asserted Patents, Respondent shall not:

- (A) import or sell for importation into the United States covered products;
- (B) market, distribute, sell, offer to sell, or otherwise transfer (except for exportation) in the United States imported covered products;
- (C) advertise imported covered products;
- (D) solicit U.S. agents or distributors for imported covered products; or
- (E) aid or abet other entities in the importation, sale for importation, sale after importation, transfer (except for exportation), or distribution of imported covered products.

**PUBLIC VERSION**

**IV.  
Conduct Permitted**

Notwithstanding any other provision of this Order, specific conduct otherwise prohibited by the terms of this Order shall be permitted if:

- (A) in a written instrument, the owner of the Asserted Patents licenses or authorizes such specific conduct; or
- (B) such specific conduct is related to the importation or sale of covered products by or for the United States.

**V.  
Reporting**

For purposes of this requirement, the reporting periods shall commence on January 1 of each year and shall end on the subsequent December 31. The first report required under this section shall cover the period from the date of issuance of this order through December 31, 2025. This reporting requirement shall continue in force until such time as Respondent has truthfully reported, in two consecutive timely filed reports, that it has no inventory (whether held in warehouses or at customer sites) of covered products in the United States.

Within thirty (30) days of the last day of the reporting period, Respondent shall report to the Commission: (a) the quantity in units and the value in dollars of covered products that it has (i) imported and/or (ii) sold in the United States after importation during the reporting period, and (b) the quantity in units and value in dollars of reported covered products that remain in inventory in the United States at the end of the reporting period.

When filing written submissions, Respondent must file the original document electronically on or before the deadlines stated above. Submissions should refer to the investigation number (“Inv. No. 337-TA-1370”) in a prominent place on the cover pages and/or

**PUBLIC VERSION**

the first page. *See Handbook for Electronic Filing Procedures*,  
[http://www.usitc.gov/secretary/fed\\_reg\\_notices/rules/handbook\\_on\\_electronic\\_filing.pdf](http://www.usitc.gov/secretary/fed_reg_notices/rules/handbook_on_electronic_filing.pdf).  
Persons with questions regarding filing should contact the Secretary (202-205-2000). If  
Respondent desires to submit a document to the Commission in confidence, it must file the  
original and a public version of the original with the Office of the Secretary and must serve a  
copy of the confidential version on Complainant's counsel.<sup>1</sup>

Any failure to make the required report or the filing of any false or inaccurate report shall  
constitute a violation of this Order, and the submission of a false or inaccurate report may be  
referred to the U.S. Department of Justice as a possible criminal violation of 18 U.S.C. § 1001.

**VI.**  
**Record-Keeping and Inspection**

- (A) For the purpose of securing compliance with this Order, Respondent shall retain  
any and all records relating to the sale, marketing, or distribution in the United  
States of covered products, made and received in the usual and ordinary course of  
business, whether in detail or in summary form, for a period of three (3) years  
from the close of the fiscal year to which they pertain.
- (B) For the purposes of determining or securing compliance with this Order and for  
no other purpose, subject to any privilege recognized by the federal courts of the  
United States, and upon reasonable written notice by the Commission or its staff,  
duly authorized representatives of the Commission shall be permitted access and  
the right to inspect and copy, in Respondent's principal offices during office

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<sup>1</sup> Complainant must file a letter with the Secretary identifying the attorney to receive reports and bond information associated with this Order. The designated attorney must be on the protective order entered in the investigation.

**PUBLIC VERSION**

hours, and in the presence of counsel or other representatives if Respondent so chooses, all books, ledgers, accounts, correspondence, memoranda, and other records and documents, in detail and in summary form, that must be retained under subparagraph VI(A) of this Order.

**VII.  
Service of Cease and Desist Order**

The Secretary shall serve copies of this Order upon each party of record in this investigation.

Respondent is ordered and directed to:

- (A) Serve, within fifteen (15) days after the effective date of this Order, a copy of this Order upon each of its respective officers, directors, managing agents, agents, and employees who have any responsibility for the importation, marketing, distribution, transfer, or sale of imported covered products in the United States;
- (B) Serve, within fifteen (15) days after the succession of any persons referred to in subparagraph VII(A) of this order, a copy of the Order upon each successor; and
- (C) Maintain such records as will show the name, title, and address of each person upon whom the Order has been served, as described in subparagraphs VII(A) and VII(B) of this order, together with the date on which service was made.

The obligations set forth in subparagraphs VII(B) and VII(C) shall remain in effect until the expiration of the Asserted Patents.

**VIII.  
Confidentiality**

Any request for confidential treatment of information obtained by the Commission pursuant to any section of this order should be made in accordance with section 201.6 of the

**PUBLIC VERSION**

Commission's Rules of Practice and Procedure (19 C.F.R. § 201.6). For all reports for which confidential treatment is sought, Respondent must provide a public version of such report with confidential information redacted.

**IX.  
Enforcement**

Violation of this order may result in any of the actions specified in section 210.75 of the Commission's Rules of Practice and Procedure (19 C.F.R. § 210.75), including an action for civil penalties under section 337(f) of the Tariff Act of 1930 (19 U.S.C. § 1337(f)), as well as any other action that the Commission deems appropriate. In determining whether Respondent is in violation of this order, the Commission may infer facts adverse to Respondent if it fails to provide adequate or timely information.

**X.  
Modification**

The Commission may amend this order on its own motion or in accordance with the procedure described in section 210.76 of the Commission's Rules of Practice and Procedure (19 C.F.R. § 210.76).

**XI.  
Bonding**

The conduct prohibited by section III of this order may be continued during the sixty (60) day period in which this Order is under review by the United States Trade Representative, as delegated by the President (70 Fed. Reg. 43,251 (Jul. 21, 2005)), subject to Respondent's posting of a bond in the amount of [ ] of the entered value of Delta products, zero percent (0%) of the entered value of Cyntec Products, and one hundred percent (100%) of the entered value of all other articles subject to this order. This bond provision does not apply to conduct that is otherwise permitted by section IV of this Order. Covered products imported on

**PUBLIC VERSION**

or after the date of issuance of this Order are subject to the entry bond as set forth in the exclusion order issued by the Commission and are not subject to this bond provision.

The bond is to be posted in accordance with the procedures established by the Commission for the posting of bonds by complainants in connection with the issuance of temporary exclusion orders. *See* 19 C.F.R. § 210.68. The bond and any accompanying documentation are to be provided to and approved by the Commission prior to the commencement of conduct that is otherwise prohibited by section III of this Order. Upon the Secretary's acceptance of the bond, (a) the Secretary will serve an acceptance letter on all parties, and (b) Respondent must serve a copy of the bond and accompanying documentation on Complainant's counsel.<sup>2</sup>

The bond is to be forfeited in the event that the United States Trade Representative approves this Order (or does not disapprove it within the review period), unless (i) the U.S. Court of Appeals for the Federal Circuit, in a final judgment, reverses any Commission final determination and order as to Respondent on appeal, or (ii) Respondent exports or destroys the products subject to this bond and provides certification to that effect that is satisfactory to the Commission.

This bond is to be released in the event (i) the United States Trade Representative disapproves this Order and no subsequent order is issued by the Commission and approved (or not disapproved) by the United States Trade Representative, (ii) the U.S. Court of Appeals for the Federal Circuit, in a final judgment, reverses any Commission final determination and order as to Respondent on appeal, or (iii) Respondent exports or destroys the products subject to this bond and provides certification to that effect that is satisfactory to the Commission, upon service

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<sup>2</sup> *See* Footnote 1.

**PUBLIC VERSION**

on Respondent of an order issued by the Commission based upon application therefor made by  
Respondent to the Commission.

By order of the Commission.



Lisa R. Barton  
Secretary to the Commission

Issued: February 13, 2025

**CERTAIN POWER CONVERTER MODULES AND  
COMPUTING SYSTEMS CONTAINING THE SAME**

**Inv. No. 337-TA-1370**

**CONFIDENTIAL CERTIFICATE OF SERVICE**

I, Lisa R. Barton, hereby certify that the attached **ORDER** has been served via EDIS upon the following parties as indicated, on **February 13, 2025**.



Lisa R. Barton, Secretary  
U.S. International Trade Commission  
500 E Street, SW, Room 112  
Washington, DC 20436

**On Behalf of Complainant Vicor Corporation:**

Louis S. Mastriani, Esq.  
**POLSINELLI PC**  
1401 Eye Street NW, Suite 800  
Washington, DC 20005  
Email: [lmastriani@polsinelli.com](mailto:lmastriani@polsinelli.com)

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**On Behalf of Respondents Cytotec Co., Ltd., Delta Electronics, Inc., Delta Electronics (Americas) Ltd., Quanta Computer Inc., Quanta Computer USA Inc., Hon Hai Precision Industry Co. Ltd. (d/b/a Foxconn Technology Group), Foxconn Industrial Internet Co. Ltd., FII USA Inc. (a/k/a Foxconn Industrial Internet USA Inc.), Ingrasys Technology Inc., Ingrasys Technology USA Inc., and DET Logistics (USA) Corporation:**

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**UNITED STATES INTERNATIONAL TRADE COMMISSION**  
**Washington, D.C.**

**In the Matter of**

**CERTAIN POWER CONVERTER  
MODULES AND COMPUTING SYSTEMS  
CONTAINING THE SAME**

**Inv. No. 337-TA-1370**

**INITIAL DETERMINATION ON VIOLATION OF SECTION 337 AND  
RECOMMENDED DETERMINATION ON REMEDY AND BOND**

Administrative Law Judge Cameron Elliot

(09/27/2024)

Pursuant to the Notice of Investigation and Rule 210.42(a) of the Rules of Practice and Procedure of the United States International Trade Commission, this is my Initial Determination in the matter of *Certain Power Converter Modules And Computing Systems Containing The Same*, Investigation No. 337-TA-1370.



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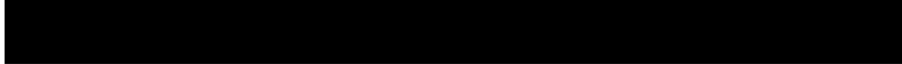


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**TABLE OF ABBREVIATIONS**

CDX	Complainant's Demonstrative Exhibit
CIB	Complainant's Initial Post-Hearing Brief
CPB	Complainant's Pre-Hearing Brief
CPX	Complainant's Physical Exhibit
CRB	Complainant's Reply Post-Hearing Brief
CX	Complainant's Exhibit
Tr.	Hearing Transcript
JX	Joint Exhibit
RDX	Respondents' Demonstrative Exhibit
RIB	Respondents' Corrected Initial Post-Hearing Brief
RPB	Respondents' Pre-Hearing Brief
RPX	Respondents' Physical Exhibit
RRB	Respondents' Reply Post-Hearing Brief
RX	Respondents' Exhibit
SIB	Staff's Initial Post-Hearing Brief
SRB	Staff's Reply Post-Hearing Brief



**I. INTRODUCTION**

**A. Procedural Background**

Complainant Vicor Corporation (“Vicor” or “Complainant”) filed the complaint underlying this investigation on July 12, 2023. *See* 88 Fed. Reg. 46182 (July 19, 2023); EDIS Doc. ID 800217 (complaint). The complaint alleged respondents Delta Electronics, Inc., Delta Electronics (Americas) Ltd., Delta Electronics (USA) Inc., and Cyntec Co., Ltd.; Quanta Computer Inc., Quanta Cloud Technology Inc., Quanta Cloud Technology USA LLC, and Quanta Computer USA, Inc.; and Hon Hai Precision Industry Co. Ltd. (d/b/a Foxconn Technology Group), Foxconn Industrial Internet Co. Ltd., FII USA Inc. (a/k/a Foxconn Industrial Internet USA Inc.), Ingrasys Technology Inc., and Ingrasys Technology USA Inc., import or sell in connection with importation certain power converter modules and computing systems containing the same that infringe one or more claims of U.S. Patent Nos. 9,166,481 (“481 patent”), 9,516,761 (“761 patent”), and 10,199,950 (“950 patent”), (collectively, the “Asserted Patents”).

By publication of a notice in the *Federal Register* on August 17, 2023, the U.S. International Trade Commission ordered that:

Pursuant to subsection (b) of section 337 of the Tariff Act of 1930, as amended, an investigation be instituted to determine whether there is a violation of subsection (a)(1)(B) of section 337 in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain products identified in paragraph (2) by reason of infringement of one or more of claim 1 of the ’481 patent; claims 1-7 of the ’761 patent; and claims 9, 13, 14, and 33-38 of the ’950 patent, and whether an industry in the United States exists as required by subsection (a)(2) of section 337[.]

88 Fed. Reg. 56050 (August 17, 2023).

On August 14, 2023, this investigation was assigned to Administrative Law Judge Doris Johnson Hines. EDIS Doc. ID 802255. Ten days later on August 24, 2023, this investigation was reassigned to Administrative Law Judge Bryan F. Moore. EDIS Doc. ID 803152. On September



25, 2023, Order No. 11 set the target date as February 3, 2025. Order No. 11, Ex. A at 3. Order No. 11 also set a *Markman* hearing date of January 16, 2024 and the evidentiary hearing for April 29, 2024-May, 2024. *Id.* at 1, 3. On October 27, 2023, the investigation was reassigned to me. EDIS Doc. ID 807065.

On December 21, 2023, Vicor moved to terminate the Investigation with respect to named respondents Delta Electronics (USA), Inc., Quanta Cloud Technology Inc., and Quanta Cloud Technology USA LLC and to amend the complaint to add Respondent DET Logistics (USA) Corporation. *See* EDIS Doc. ID 810881; EDIS Doc. No. 810883. The motion to terminate was granted on December 22, 2023, and the motion to amend was granted on January 2, 2024. *See* Order Nos. 16, *unreviewed by* Comm’n Notice, EDIS Doc. 812593; 18, *unreviewed by* Comm’n Notice, EDIS Doc. 829390; *see* Motion to Amend Complaint, EDIS Doc. ID 810881 and Exhibit A thereto (“Compl.”).

The *Markman* hearing was canceled on January 10, 2024, and the parties’ claim construction disputes were resolved on February 20, 2024. Order Nos. 21, 30.

A pre-hearing conference was held on April 29, 2024, and an evidentiary hearing was held from April 29 to May 3, 2024.

As of the date of this initial determination, no motions remain pending.

**B. The Parties**

**1. Complainant**

Vicor is a Delaware corporation with its principal place of business located in Andover, Massachusetts. Compl. at ¶ 8. Vicor develops, manufactures, and sells high-performance power converter modules and systems for use in various industries, and it manufactures its power converter modules in the United States. *See* Compl. at ¶¶ 8-13; CPB at 32-34.



**2. Respondents**

**a) Delta and Cyttec**

Respondent Delta Electronics, Inc. is a Taiwanese public company with its primary place of business in Taipei, Taiwan. *See* EDIS Doc. ID 804726 (Delta Answer) at ¶14. Respondent Delta Electronics (Americas), Ltd. is a US-based division of Delta Electronics, Inc. with its principal place of business in Fremont, California. *Id.* Respondent DET Logistics (USA) Corporation is a U.S. company with its principal place in Fremont, California. *Id.* DET Logistics (USA) Corporation is an indirect subsidiary of Respondent Delta Electronics, Inc. *See* Order No. 18, at 2. Delta Electronics, Inc., Delta Electronics (Americas), Ltd. and DET Logistics (USA) Corporation are collectively the “Delta Respondents” or “Delta.” *See* RPB at 3.

Respondent Cyttec Co., Ltd. (“Cyttec”) is a Taiwanese company with its principal place of business in Hsinchu, Taiwan. *See* EDIS Doc. No. 815041 (Cyttec Ans. To Amended Compl.) at ¶14. Cyttec is affiliated with the Delta Respondents but is operated as a separate entity in competition with the Delta Respondents, at least with respect to the products accused in this investigation. *See id.*; RPB at 4.

**b) Quanta**

Respondent Quanta Computer Inc. is headquartered in Taiwan and has as its subsidiary Respondent Quanta Computer USA, Inc., headquartered in California (collectively, “Quanta”). CPB at 35; CX-0786; EDIS Doc. No. 815044 (Quanta Ans. To Amended Compl.) at ¶18. Respondent Quanta Computer Inc. purchases the accused Delta power converter modules outside the United States and then incorporates them into the accused Quanta systems and/or components of the accused Quanta systems, which then are sold for importation into the United States or directly



imported to the United States for further assembly and, eventually, sale. *See* CX-3060C (Quanta Stipulation); CPB at 35-36.

**c) Foxconn and Ingrasys**

Respondent Hon Hai Precision Industry Co. Ltd. (d/b/a Foxconn Technology Group) is a Taiwanese company with its principal place of business in Taiwan. *See* EDIS Doc. No. 815047 (Hon Hai Ans. To Amended Compl.) at ¶16. Respondent Foxconn Industrial Internet Co. Ltd. (“FII China”) is a Chinese company with its principal place of business in China. *See* EDIS Doc. No. 815046 (FII China Ans. To Amended Compl.) at ¶16. Respondent FII USA, Inc. (“FII USA”) is a United States company with its principal place of business in Wisconsin. *See* EDIS Doc. No. 815042 (FII USA Ans. To Amended Compl.) at ¶16.

Respondent Ingrasys Technology Inc. is a Taiwanese company with its principal place of business in Taiwan. *See* EDIS Doc. No. 815492 (Ingrasys Ans. To Amended Complaint) at ¶16. Respondent Ingrasys Technology USA Inc. is a United States company with its principal place of business in San Jose, California. *Id.* Ingrasys Technology Inc. purchases the accused Delta modules from Delta Electronics (Thailand) Public Company and ships them to Ingrasys Technology Inc.’s factory in Xin-zhu, Taiwan where they are incorporated into products sold into Taiwan or Hong Kong; Ingrasys Technology Inc. does not import or manufacture any accused product into the United States. *See* RPB at 6 (citing RX-0180C.0008 (Ingrasys Seventh Supplemental Responses to Vicor’s First Set of Interrogatories)). Ingrasys Technology USA Inc. is both an importer and manufacturer of system product prototypes, including accused products. *Id.*

**d) Staff**

The Commission Investigative Staff (“Staff”) is a party.



**C. The Asserted Patents and Claim**

The 481 patent, titled “Digital Control of Resonant Power Converters,” issued on October 20, 2015 to Patrizio Vinciarelli and Sergey Luzanov from U.S. Application No. 13/830,262, filed March 14, 2013. At a high level, the 481 patent relates “to digital control of resonant zero-current and zero-voltage switching resonant power converters.” 481 patent at 1:6-10. The 481 patent has 35 claims. As of the date of this order, claim 1 is asserted in this investigation.

The 761 patent, titled “Encapsulated Modular Power Converter With Symmetric Heat Distribution,” issued on December 6, 2016 to Patrizio Vinciarelli, Michael B. Lafleur, Sean Timothy Fleming, Rudolph F. Mutter, and Andrew T. D’Amico from U.S. Application No. 14/635,467, filed March 2, 2015. The 14/635,467 application is a divisional of, and claims priority under 35 U.S.C. 121 to, U.S. application Ser. No. 13/105,696, filed on May 11, 2011. The 761 patent generally “relates to the field of encapsulating electronic assemblies and more particularly to encapsulated power converters.” 761 patent at 1:19-21. The 761 patent has seven claims. As of the date of this order, claims 1-7 are asserted in this investigation.

The 950 patent, titled “Power Distribution Architecture with Series-Connected Bus Converter,” issued on February 5, 2019 to Patrizio Vinciarelli and Andrew D’Amico from U.S. Application No. 13/933,252, filed on July 2, 2013. The 950 patent generally “relates to apparatus and methods of converting and distributing power in electrical systems such as computer and telecommunication systems and servers.” 950 patent at 1:6-10. The 950 patent has 40 claims. As of the date of this order, claims 9, 13, 14, and 33-38 are asserted in this investigation.

The following patent claims are presently at issue in this investigation, according to Vicor’s briefing:

<b>Asserted Patent</b>	<b>Infringement Claims</b>	<b>Domestic Industry Claims</b>
481 patent	1	1
761 patent	1-7	1-7
950 patent	9, 13-14, 33-38	9, 13-14, 33-38

See CIB at 18, 21, 23.

#### **D. Products at Issue**

The products at issue are “power converter modules used in data center server, artificial intelligence and cloud computing systems, to power artificial intelligence (‘AI’) accelerators, tensor processing units (‘TPU’), graphical processing units (‘GPU’) and central processing units (‘CPU’), and computing systems containing the same.” 88 Fed. Reg. 56050.

##### **1. Domestic Industry Products**

Vicor asserts that a wide variety of its products practice the asserted claims, and the parties stipulated that the following Domestic Industry Products (“DI products”) are representative of all DI Products for purposes of technical domestic industry analysis:

- As to the 761 patent: BCM380P475T1K2A31, DCM24AP050T180A50, MCM3208S59Z01A6T05, and NBM2317S60D1580T0R.
- As to the 950 patent: NBM2317S60D1580T0R.
- As to the 481 patent: BCM6135CD1E5165T00, DCM3110S60E02A3TN0, MCM3208S59Z01A6T05 and MCD3509, NBM2317S60D1580T0R, and VTM2308S52Z0276T01.

See EDIS Doc. ID 816661 at 15-26. The parties further stipulated as to the precise products represented. *See id.*



**2. Accused Products**

Vicor accuses certain power converter modules manufactured by the Delta and Cyntec Respondents (the “Accused Modules”), and computing systems manufactured by the remaining Respondents that incorporate one or more of the Accused Modules (“Accused Systems”) (collectively, the “Accused Products”). The parties filed a Joint Stipulation identifying the Accused Products. *See* EDIS Doc. ID 816661 at 2-14; *see also* EDIS Doc. ID 822584 (Corrected Stipulation regarding Delta’s products).

**3. Accused Modules**

The parties have agreed and stipulated that the following Delta Products are representative of certain other Delta Products for purposes of infringement analysis of the 761 patent:

<b>Representative Module Product</b>	<b>Represented Module Products</b>
U50SU4P162PMAR	U50SU4P162PMAR U50SU4P162PMARC U50SU4P162PMARD U50SU4P162PMDR U50SU4P162PMNR U50SU4P162PMNRB U50SU4P162PMNRG U50SU4P162PMNRQ U50SU4P162PMDRE U50SU4P162PMDRF U50SU4P162PMDRFT
U50SU4P180PMDALF	U50SU4P180PMDAL U50SU4P180PMDAL U50SU4P180PMDAC U50SU4P180PMDALC U50SU4P180PMDAM U50SU4P180PMDAF U50SU4P180PMDAMF U50SU4P180PMDRF

EDIS Doc. ID 816661 at 2; EDIS Doc. ID 822584 at 2; CIB at viii (Table of Products at Issue), 33.

The parties have agreed and stipulated that the following Delta Products are representative of certain other Delta Products for purposes of infringement analysis of the 950 patent:



Representative Module Product	Represented Module Products
U50SU4P162PMAR	U50SU4P162PMAR U50SU4P162PMARC U50SU4P162PMARD U50SU4P162PMDR U50SU4P162PMNR U50SU4P162PMNRB U50SU4P162PMNRG U50SU4P162PMNRQ U50SU4P162PMDRE U50SU4P162PMDRF U50SU4P162PMDRFT U50SU8P167PMDA
U50SU4P180PMDAL	U50SU4P180PMDAC U50SU4P180PMDAL U50SU4P180PMDALC U50SU4P180PMDAM U50SU4P180PMDAF U50SU4P180PMDALF U50SU4P180PMDAMF U50SU4P180PMDRF U50SU8P167PMDA

EDIS Doc. ID 816661 at 3; EDIS Doc. ID 822584.

The parties have agreed and stipulated that the following Delta Products are representative of certain other Delta Products for purposes of infringement analysis of the 481 patent:

Representative Module Product	Represented Module Products
U50SU4P162PMAR	U50SU4P162PMAR U50SU4P162PMARC U50SU4P162PMARD U50SU4P162PMDR U50SU4P162PMNR U50SU4P162PMNRB U50SU4P162PMNRG U50SU4P162PMNRQ U50SU4P180PMDAC U50SU4P180PMDAL U50SU4P180PMDALC U50SU4P180PMDAM
U50SU4P180PMDAL	U50SU4P162PMDRE U50SU4P162PMDRF U50SU4P162PMDRFT



	U50SU4P180PMDAF U50SU4P180PMDAMF U50SU4P180PMDRF U50SU4P180PMDALF U50SU8P167PMDA2
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EDIS Doc. ID 816661 at 2-3; EDIS Doc. ID 822584.

Vicor also accuses Cynotec’s MPN541382-PVA product of infringing claims of the 950 and 481 patents. EDIS Doc. ID 816661 at 4; CIB at 15.

#### **4. Accused Systems**

Vicor accuses over 100 Quanta Accused Systems of infringement, and these are enumerated in the parties’ stipulation, along with the Delta Accused Module incorporated into them. *See* EDIS Doc. ID 816661 at 4-13; *see also* CIB at x-xviii (Table of Products at Issue). It appears, however, that 13 of the Quanta Accused Systems are no longer at issue because Vicor no longer accuses their incorporated Accused Module, the Delta Q50SN12050RND, of infringement. *Compare* EDIS Doc. ID 816661 at 13 *with* CIB at viii, x-xviii. Vicor also accuses several systems made and/or imported by the other respondents of infringement, and these Accused Systems are also enumerated in the parties’ stipulation, although here, too, one of the Accused Systems (the Ingrasys G48C) is no longer at issue because its incorporated Accused Module (the Q54SH120A1NCDHR) is no longer accused of infringement. *See* EDIS Doc. ID 816661 at 13-14.

#### **5. Non-Accused and Redesigned Products**

In addition to the accused products, Respondents request adjudication of several dozen products that Vicor does not accuse of infringement. *See* RIB at 12-13. Respondents cite no evidence of the structure or operation of these products, however, so these products cannot be adjudicated, although they will presumably not be subject to any remedial order. *See id.*

Respondents Delta and Cynotec each redesigned a power converter as a new product model, called Delta U50SU4P1A2PMDAF and Cynotec MPN541382PVA1, respectively (collectively “the

[REDACTED]

Redesigned Products”). *See* RIB at 38-40, 125-26. Respondents argue that the Redesigned Products are ripe for adjudication and that they do not infringe any asserted claim. *Id.* They are plainly within the scope of the investigation and Vicor stipulated they were imported, so the first two *Oligosaccharides* factors are satisfied. *See Certain Human Milk Oligosaccharides and Methods of Producing the Same*, Inv. No. 337-TA-1120, Comm’n Op. at 18 (June 8, 2020) (“*Oligosaccharides*”), *aff’d sub nom. Jennewein Biotechnologie GMBH v. ITC*, No. 20-2220, 2021 WL 4250784 (Sep. 17, 2021); EDIS Doc. ID 812104 at 2; EDIS Doc. ID 812220 at 2. The bulk of the documentary and physical evidence relevant to the Redesigned Products was produced by January 8, 2024, which was timely, and although Vicor complains that some of Respondents’ interrogatory responses were late, which is irrelevant under the circumstances, Vicor otherwise does not dispute that Respondents’ discovery was sufficient. *See* Order No. 34 at 10; CIB at 165.

Vicor’s only substantial objection to adjudicating the Redesigned Products is that they are not fixed in design. *See* CIB at 160-64. It is true that both products [REDACTED]

[REDACTED] *See* Tr. (Li) at 340:2-20; CX-3309C (Chan Dep.) at 84:4-85:5. But if there is such further development, the [REDACTED] *See* Tr. (Li) at 340:21-23 (“[REDACTED] [REDACTED]”); Tr. (Chan) at 397:4-25 (“any change . . . [REDACTED]

[REDACTED] So Respondents are correct that “the particular redesigns already manufactured and provided in litigation” are fixed in design, even if ultimately they are not commercialized. RRB at 93 (emphasis omitted). All four *Oligosaccharides* factors are therefore satisfied, and the Redesigned Products are ripe for adjudication.



## II. STANDARDS OF LAW

### A. Claim Construction

“The construction of claims is simply a way of elaborating the normally terse claim language in order to understand and explain, but not to change, the scope of the claims.” *Embrex, Inc. v. Serv. Eng’g Corp.*, 216 F.3d 1343, 1347 (Fed. Cir. 2000). Although most of the disputed claim terms were construed in an earlier order, some of the issues presented below are only resolvable with additional claim construction.

Claim construction focuses on the intrinsic evidence, which consists of the claims themselves, the specification, and the prosecution history. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005) (en banc); *see also Markman v. Westview Instr., Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc). As the Federal Circuit in *Phillips* explained, courts must analyze each of these components to determine the “ordinary and customary meaning of a claim term” as understood by a person of ordinary skill in art at the time of the invention. 415 F.3d at 1313. “Such intrinsic evidence is the most significant source of the legally operative meaning of disputed claim language.” *Bell Atl. Network Servs., Inc. v. Covad Commc'ns Grp., Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001).

“It is a ‘bedrock principle’ of patent law that ‘the claims of a patent define the invention to which the patentee is entitled the right to exclude.’” *Phillips*, 415 F.3d at 1312 (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). “Quite apart from the written description and the prosecution history, the claims themselves provide substantial guidance as to the meaning of particular claims terms.” *Id.* at 1314; *see Interactive Gift Express, Inc. v. Compuserve Inc.*, 256 F.3d 1323, 1331 (Fed. Cir. 2001) (“In construing claims, the analytical focus must begin and remain centered on the language of the claims themselves, for it is that language that the patentee chose to use to ‘particularly point [ ] out and distinctly claim [ ] the subject



matter which the patentee regards as his invention.”). The context in which a term is used in an asserted claim can be “highly instructive.” *Phillips*, 415 F.3d at 1314. Additionally, other claims in the same patent, asserted or unasserted, may also provide guidance as to the meaning of a claim term. *Id.* “Courts do not rewrite claims; instead, we give effect to the terms chosen by the patentee.” *K-2 Corp. v. Salomon S.A.*, 191 F.3d 1356, 1364 (Fed. Cir. 1999). “[T]he specification ‘is always highly relevant to the claim construction analysis. Usually it is dispositive; it is the single best guide to the meaning of a disputed term.’” *Phillips*, 415 F.3d at 1315 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). “[T]he specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess. In such cases, the inventor’s lexicography governs.” *Id.* at 1316.

In addition to the claims and the specification, the prosecution history should be examined, if in evidence. *Phillips*, 415 F.3d at 1317; see *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 913 (Fed. Cir. 2004). The prosecution history can “often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be.” *Phillips*, 415 F.3d at 1317; see *Chimie v. PPG Indus. Inc.*, 402 F.3d 1371, 1384 (Fed. Cir. 2005) (“The purpose of consulting the prosecution history in construing a claim is to exclude any interpretation that was disclaimed during prosecution.”).

When the intrinsic evidence does not establish the meaning of a claim, then extrinsic evidence (*i.e.*, all evidence external to the patent and the prosecution history, including dictionaries, inventor testimony, expert testimony, and learned treatises) may be considered. *Phillips*, 415 F.3d at 1317. Extrinsic evidence is generally viewed as less reliable than the patent itself and its prosecution history in determining how to define claim terms. *Id.* “The court may receive extrinsic



evidence to educate itself about the invention and the relevant technology, but the court may not use extrinsic evidence to arrive at a claim construction that is clearly at odds with the construction mandated by the intrinsic evidence.” *Elkay Mfg. Co. v. Ebco Mfg. Co.*, 192 F.3d 973, 977 (Fed. Cir. 1999).

The construction of a claim term is generally guided by its ordinary meaning. However, courts may deviate from the ordinary meaning when: (1) “the intrinsic evidence shows that the patentee distinguished that term from prior art on the basis of a particular embodiment, expressly disclaimed subject matter, or described a particular embodiment as important to the invention;” or (2) “the patentee acted as his own lexicographer and clearly set forth a definition of the disputed claim term in either the specification or prosecution history.” *Edwards Lifesciences LLC v. Cook Inc.*, 582 F.3d 1322, 1329 (Fed. Cir. 2009); see *Apple Inc. v. Wi-LAN Inc.*, 25 F.4th 960, 967 (Fed. Cir. 2022); *GE Lighting Sols., LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014) (“the specification and prosecution history only compel departure from the plain meaning in two instances: lexicography and disavowal.”); *Omega Eng’g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1324 (Fed. Cir. 2003) (“[W]here the patentee has unequivocally disavowed a certain meaning to obtain his patent, the doctrine of prosecution disclaimer attaches and narrows the ordinary meaning of the claim congruent with the scope of the surrender.”); *Rheox, Inc. v. Entact, Inc.*, 276 F.3d 1319, 1325 (Fed. Cir. 2002) (“The prosecution history limits the interpretation of claim terms so as to exclude any interpretation that was disclaimed during prosecution.”). Nevertheless, there is a “heavy presumption that a claim term carries its ordinary and customary meaning.” *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002) (citations omitted). The standard for deviating from the plain and ordinary meaning is “exacting” and requires “a clear and unmistakable disclaimer.” *Thorner v. Sony Computer Entm’t Am. LLC*, 669 F.3d 1362, 1366-67 (Fed. Cir. 2012);



see *Epistar Corp. v. Int'l Trade Comm'n*, 566 F.3d 1321, 1334 (Fed. Cir. 2009) (requiring “expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope” to deviate from the ordinary meaning) (citation omitted).

**B. Infringement**

“An infringement analysis entails two steps. The first step is determining the meaning and scope of the patent claims asserted to be infringed. The second step is comparing the properly construed claims to the device accused of infringing.” *Markman*, 52 F.3d at 976. A patentee may prove infringement either literally or under the doctrine of equivalents. Infringement of either sort must be proven by a preponderance of the evidence. *SmithKline Diagnostics, Inc. v. Helena Labs. Corp.*, 859 F.2d 878, 889 (Fed. Cir. 1988). A preponderance of the evidence standard “requires proving that infringement was more likely than not to have occurred.” *Warner-Lambert Co. v. Teva Pharm. USA, Inc.*, 418 F.3d 1326, 1341 n.15 (Fed. Cir. 2005).

Literal infringement is a question of fact. *Finisar Corp. v. DirecTV Group, Inc.*, 523 F.3d 1323, 1332 (Fed. Cir. 2008). “To establish literal infringement, every limitation set forth in a claim must be found in an accused product, exactly.” *Microsoft Corp. v. GeoTag, Inc.*, 817 F.3d 1305, 1313 (Fed. Cir. 2016) (quoting *Southwall Techs., Inc. v. Cardinal IG Co.*, 54 F.3d 1570, 1575 (Fed. Cir. 1995)). If any claim limitation is absent, there is no literal infringement of that claim as a matter of law. *Bayer AG v. Elan Pharm. Research Corp.*, 212 F.3d 1241, 1247 (Fed. Cir. 2000).

Doctrine of equivalents is also a form of infringement. One rubric for evaluating if a claimed feature is not literally, but nonetheless equivalent to, a claimed feature is known as the function-way-result test. Under this test, the accused feature is equivalent to the claim limitation when “it performs substantially the same function in substantially the same way to obtain the same result.” *Duncan Parking Techs., Inc. v. IPS Grp., Inc.*, 914 F.3d 1347, 1362 (Fed. Cir. 2019) (quoting *Graver*



*Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 608 (1950)). Another is known as the insubstantial differences test, where “[a]n element in the accused device is equivalent to a claim limitation if the only differences between the two are insubstantial.” *Voda v. Gordia Corp.*, 536 F.3d 1311, 1326 (Fed. Cir. 2008) (citing *Honeywell Int’l Inc. v. Hamilton Sundstrand Corp.*, 370 F.3d 1131, 1139 (Fed. Cir. 2004)). The Supreme Court has further instructed, “the proper time for evaluating equivalency . . . is at the time of infringement, not at the time the patent was issued.” *Warner-Jenkinson Co., Inc. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 37 (1997).

In addition to direct infringement, Section 271 of the Patent Act defines two categories of indirect infringement, inducement of infringement and contributory infringement. 35 U.S.C. § 271. For indirect infringement violations under Section 337, the direct infringement element may occur after importation, so long as all the other elements of indirect infringement are met at the time of importation. See *Certain Vision-Based Driver Assistance System Cameras and Components Thereof*, Inv. No. 337-TA-907, Comm’n Op. at 19 (Dec. 1, 2015) (citing *Suprema, Inc. v. Int’l Trade Comm’n*, 796 F.3d 1338, 1348 (Fed. Cir. 2015)). It is well settled that “[a]bsent direct infringement of the patent claims, there can be neither contributory infringement ... nor inducement of infringement.” *Met-Coil Sys. Corp. v. Korner Unltd., Inc.*, 803 F.2d 684, 687 (Fed.Cir.1986) (citations omitted).

As to the first category, “[w]hoever actively induces infringement of a patent shall be liable as an infringer.” 35 U.S.C. § 271(b); see *DSU Med. Corp. v. JMS Co.*, 471 F.3d 1293, 1305 (Fed. Cir. 2006) (en banc) (“To establish liability under section 271(b), a patent holder must prove that once the defendants knew of the patent, they actively and knowingly aided and abetted another’s direct infringement.”) (citations omitted). “The mere knowledge of possible infringement by others does not amount to inducement; specific intent and action to induce infringement must be proven.”



*Id.* (citations omitted). A defendant’s belief regarding patent validity is not a defense to a claim of induced infringement. *Commil USA, LLC v. Cisco Sys., Inc.*, 135 S. Ct. 1920 (2015). A defendant’s willful blindness on the question of infringement will satisfy the knowledge requirement. *Global-Tech Appliances, Inc. v. SEB S.A.*, 563 U.S. 754, 765, 768-771 (2011). The requisite intent to induce infringement “may be established through circumstantial evidence” and “may be inferred from all of the circumstances.” See *Broadcom Corp. v. Qualcomm, Inc.*, 543 F.3d 683, 699 (Fed. Cir. 2008) (citing *DSU Med. Corp. v. JMS Co.*, 471 F.3d 1293 (Fed. Cir. 2006); *Water Techs. Corp. v. Claco, Ltd.*, 850 F.2d 660, 669 (Fed. Cir. 1988)).

As to the second category, “a party who sells a component with knowledge that the component is especially designed for use in a patented invention, and is not a staple article of commerce suitable for substantial noninfringing use, is liable as a contributory infringer.” *Wordtech Sys., Inc. v. Integrated Networks Solutions, Inc.*, 609 F.3d 1308, 1316 (Fed. Cir. 2010). Contributory infringement is premised upon a finding that: (1) the entity sells, offers to sell, or imports into the United States a component of a product; (2) the component has no substantial non-infringing use; (3) the component constitutes a material part of the claimed invention; (4) the entity was aware of the patent and knew that the product may be covered by a claim of the patent; and (5) the use of the component in the product directly infringes the claim. See *Certain Gaming & Entm’t Consoles, Related Software, & Components Thereof*, Inv. No. 337-TA-752, Initial Determination (Remand) at 7-8 (Mar. 22, 2013) (citing 35 U.S.C. § 271(c); *Arris Group v. British Telecomm. PLC*, 639 F.3d 1368, 1376 (Fed. Cir. 2011)), *non-reviewed*, Notice (May 23, 2013). As with inducement, willful blindness on the question of infringement will satisfy the knowledge requirement. *Global-Tech*, 563 U.S. at 765, 768-771.



**C. Domestic Industry**

In an investigation based on a claim of patent infringement, section 337 requires that an industry in the United States, relating to the articles protected by the patent, exist or be in the process of being established. 19 U.S.C. § 1337(a)(2). Under Commission precedent, the domestic industry requirement has been divided into (i) a “technical prong” (which requires articles covered by the Asserted Patent) and (ii) an “economic prong” (which requires certain levels of activity with respect to the protected articles or patent itself). *See Certain Video Game Systems and Controllers*, Inv. No. 337-TA-743, Comm’n Op. at 6-7 (April 14, 2011) (“*Video Game Systems*”).

**1. Technical Prong**

The technical prong of the domestic industry requirement is satisfied when the complainant in a patent-based section 337 investigation establishes that it is practicing or exploiting the patents at issue. *See* 19 U.S.C. §§ 1337 (a)(2), (3); *Certain Microsphere Adhesives, Process for Making Same and Prods. Containing Same, Including Self-Stick Repositionable Notes*, Inv. No. 337-TA-366, Comm’n Op. at 8 (U.S.I.T.C. Jan. 16, 1996). “In order to satisfy the technical prong of the domestic industry requirement, it is sufficient to show that the domestic industry practices any claim of that patent, not necessarily an asserted claim of that patent.” *Certain Ammonium Octamolybdate Isomers*, Inv. No. 337-TA-477, Comm’n Op. at 55 (U.S.I.T.C. Aug. 28, 2003). Historically, the Commission permits the complainant’s products, and those of its licensees, to be considered for technical prong purposes. *See Certain Magnetic Tape Cartridges and Components Thereof*, Inv. No. 337-TA-1058, Comm’n Op. at 28-29 (April 9, 2019).

The test for claim coverage for the purposes of the technical prong of the domestic industry requirement is the same as that for infringement. *See Certain Doxorubicin and Preparations Containing Same*, Inv. No. 337-TA-300, Initial Determination at 109 (U.S.I.T.C. May 21, 1990),



*aff'd*, Views of the Commission at 22 (U.S.I.T.C. Oct. 31, 1990); *Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 1375 (Fed. Cir. 2003). “First, the claims of the patent are construed. Second, the complainant’s article or process is examined to determine whether it falls within the scope of the claims.” *Certain Doxorubicin and Preparations Containing Same*, Inv. No. 337-TA-300, Initial Determination at 109. As with infringement, the technical prong of the domestic industry can be satisfied either literally or under the doctrine of equivalents. *Certain Dynamic Sequential Gradient Devices and Component Parts Thereof*, Inv. No. 337-TA-335, ID at 44, Pub. No. 2575 (U.S.I.T.C. May 15, 1992). In short, the patentee must establish by a preponderance of the evidence that the domestic product practices one or more claims of the patent.

## **2. Economic Prong**

The “economic prong” of the domestic industry requirement is satisfied when there exists in the United States, in connection with products practicing at least one claim of the patent at issue: (A) significant investment in plant and equipment; (B) significant employment of labor or capital; or (C) substantial investment in its exploitation, including engineering, research and development, and licensing. 19 U.S.C. § 1337(a)(3). Establishment of the “economic prong” is not dependent on any “minimum monetary expenditure” and there is no need for complainant “to define the industry itself in absolute mathematical terms.” *Certain Stringed Musical Instruments and Components Thereof*, Inv. No. 337-TA-586, Comm’n Op. at 25-26 (May 16, 2008) (“*Stringed Instruments*”). However, a complainant must substantiate the significance of its activities with respect to the articles protected by the patent. *Certain Printing and Imaging Devices and Components Thereof*, Inv. No. 337-TA-690, Comm’n Op. at 30 (Feb. 17, 2011) (“*Imaging Devices*”). Further, a complainant can show that its activities are significant by showing how those activities are important to the articles protected by the patent in the context of the company’s operations, the marketplace, or the industry



in question. *Id.* at 27-28. That significance, however, must be shown in a quantitative context. *Lelo Inc. v. Int’l Trade Comm’n*, 786 F.3d 879, 886 (Fed. Cir. 2015). The Federal Circuit noted that when the ITC first addressed this requirement, it found the word “‘significant’ denoted ‘an assessment of the *relative* importance of the domestic activities.’” *Id.* at 883-4 (internal citation omitted) (emphasis added). In general, “[t]he purpose of the domestic industry requirement is to prevent the ITC from becoming a forum for resolving disputes brought by foreign complainants whose only connection with the United States is ownership of a U.S. patent.” *Certain Battery-Powered Ride-On Toy Vehicles*, Inv. No. 337-TA-314, USITC Pub. No. 2420, Initial Determination at 21 (Aug. 1991); see *Certain Vacuum Insulated Flasks and Components Thereof*, Inv. No. 337-TA-1216, Notice at 3-4 (Oct. 21, 2021) (“Given the nature and extent of [complainant’s] investments in plant and equipment as a whole, [complainant] is not a mere importer.”).

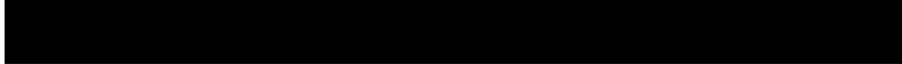
**D. Invalidity**

**1. 35 U.S.C. § 101**

Section 101 states:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

35 U.S.C. § 101. To determine patent eligibility under § 101, courts apply the two-step *Alice* test and first “determine whether the claims at issue are directed to a patent-ineligible concept,” and then if so, “examine the elements of the claim to determine whether it contains an ‘inventive concept’ sufficient to ‘transform’ the claimed abstract idea into a patent-eligible application.” *Alice Corp. Pty. v. CLS Bank Intern.*, 573 U.S. 208, 217-18, 221 (2014). “The ‘directed to’ inquiry applies a stage-one filter to claims, considered in light of the specification, based on whether ‘their character as a whole is directed to excluded subject matter.’” *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335 (Fed. Cir. 2016) (citing *Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343, 1346



(Fed. Cir. 2015); *Genetic Techs. Ltd. v. Merial L.L.C.*, 818 F.3d 1369, 1375 (Fed. Cir. 2016)). To save a patent at the second step, an inventive concept must be evident in the claims. *Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1151-52 (Fed. Cir. 2016).

**2. 35 U.S.C. § 102**

Pursuant to 35 U.S.C. § 102, a patent claim is invalid as anticipated if:

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant;

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States;

35 U.S.C. § 102 (pre-AIA). “A patent is invalid for anticipation if a single prior art reference discloses each and every limitation of the claimed invention. Moreover, a prior art reference may anticipate without disclosing a feature of the claimed invention if that missing characteristic is necessarily present, or inherent, in the single anticipating reference.” *Schering Corp. v. Geneva Pharm., Inc.*, 339 F.3d 1373, 1377 (Fed. Cir. 2003) (citations omitted); *see Santarus, Inc. v. Par Pharm., Inc.*, 694 F.3d 1344, 1354 (Fed. Cir. 2012). “A century-old axiom of patent law holds that a product ‘which would literally infringe if later in time anticipates if earlier.’” *Upsher-Smith Labs., Inc. v. PamLab, L.L.C.*, 412 F.3d 1319, 1322 (Fed. Cir. 2005) (citing *Schering Corp.*, 339 F.3d at 1322). Anticipation, and all other grounds of patent invalidity, must be proved by clear and convincing evidence. *Microsoft Corp. v. I4I Ltd. P’ship*, 564 U.S. 91, 95, (2011).

**3. 35 U.S.C. § 103**

Section 103 of the Patent Act states:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

[REDACTED]

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

35 U.S.C. § 103(a) (pre-AIA). “Obviousness is a question of law based on underlying questions of fact.” *Scanner Techs. Corp. v. ICOS Vision Sys. Corp. N.V.*, 528 F.3d 1365, 1379 (Fed. Cir. 2008). The underlying factual determinations include: “(1) the scope and content of the prior art, (2) the level of ordinary skill in the art, (3) the differences between the claimed invention and the prior art, and (4) objective indicia of non-obviousness.” *Id.* (citing *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17-18 (1966)). These factual determinations are often referred to as the “*Graham* factors.”

The critical inquiry in determining the differences between the claimed invention and the prior art is whether there is a reason to combine the prior art references. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418-21 (2007). In *KSR*, the Supreme Court rejected the Federal Circuit’s rigid application of the teaching-suggestion-motivation test. While the Court stated that “it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does,” it described a more flexible analysis:

Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue . . . . As our precedents make clear, however, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.

*Id.* at 418. Since *KSR*, the Federal Circuit has announced that, where a patent challenger contends that a patent is invalid for obviousness based on a combination of prior art references, “the burden falls on the patent challenger to show by clear and convincing evidence that a person of ordinary



skill in the art would have had reason to attempt to make the composition or device . . . and would have had a reasonable expectation of success in doing so.” *PharmaStem Therapeutics, Inc. v. ViaCell, Inc.*, 491 F.3d 1342, 1360 (Fed. Cir. 2007); *see KSR*, 550 U.S. at 399 (“The proper question was whether a pedal designer of ordinary skill in the art, facing the wide range of needs created by developments in the field, would have seen an obvious benefit to upgrading Asano with a sensor.”). In addition to demonstrating that a reason exists to combine prior art references, the challenger must demonstrate that the combination of prior art references discloses all of the limitations of the claims. *Velandar v. Garner*, 348 F.3d 1359, 1363 (Fed. Cir. 2003) (explaining that a requirement for a finding of obviousness is that “all the elements of an invention are found in a combination of prior art references”).

An obviousness determination should also include a consideration of how “secondary considerations” such as “commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.” *Graham*, 338 U.S. at 17-18. “For [such] objective evidence to be accorded substantial weight, its proponent must establish a nexus between the evidence and the merits of the claimed invention.” *In re GPAC Inc.*, 57 F.3d 1573, 1580 (Fed. Cir. 1995); *see Merck & Cie v. Gnosis S.P.A.*, 808 F.3d 829, 837 (Fed. Cir. 2015). “Where the offered secondary consideration actually results from something other than what is both claimed and novel in the claim, there is no nexus to the merits of the claimed invention.” *In re Huai-Hung Kao*, 639 F.3d 1057, 1068 (Fed. Cir. 2011); *see Apple Inc. v. Samsung Elecs. Co., Ltd.*, 839 F.3d 1034, 1054-1056 (Fed. Cir. 2016).

**4. 35 U.S.C. § 112**

Pursuant to 35 U.S.C. § 112, a patent claim is invalid for lack of written description if the patent’s specification fails to “reasonably convey[] to those skilled in the art that the inventor had



possession of the claimed subject matter as of the filing date.” *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc). “[T]he test requires an objective inquiry into the four corners of the specification from the perspective of a person of ordinary skill in the art” (*id.*), and “the level of detail required to satisfy the written description requirement varies depending on the nature and scope of the claims and on the complexity and predictability of the relevant technology” (*id.* (citing *Capon v. Eshar*, 418 F.3d 1349, 1357-58 (Fed. Cir. 2005))).

### **III. IMPORTATION AND STATUTORY AUTHORITY**

Respondents do not contest any issues pertaining to importation or statutory authority. *See* RIB at 13. They do note, however, that Hon Hai and FII China are only alleged to be proper respondents based on their status as parent companies of FII USA and Ingrasys. *See id.*

### **IV. U.S. PATENT NO. 9,166,481**

#### **A. Level of Ordinary Skill in the Art**

A person having ordinary skill in the art of the 481 patent at the time of invention:

[W]ould have at least a Master’s degree in electrical engineering and two or more years of work experience relating to power electronics and the design and control of switching power converters, with more experience potentially substituting for education, or vice-versa.

Order No. 30 at 16. The parties do not challenge this definition (*see* CIB at 100; RIB at 52; SIB at 69), and it is applied throughout this initial determination.

#### **B. Claims-at-Issue**

Claim 1 of the 481 patent (the “481 Asserted Claim”) is at issue in this investigation, through allegations of infringement and DI technical prong. *See* CIB at 103, 115. It is reproduced below with annotated identifiers:

1. [1.a.1] A method of synchronously operating a power converter in a series of converter operating cycles,



[1.a.2] the converter having at least one primary switch to drive a resonant power train and at least one secondary switch,

[1.a.3] the resonant power train including a transformer and having a characteristic resonant frequency and period, the method comprising:

[1.b] providing an oscillator for generating clock signals at an oscillator frequency;

[1.c] generating timing control signals for each of a plurality of events based upon the clock signals in a (A) standard converter operating cycle, having a standard operating period and frequency, to:

[1.d] (i) turn the at least one primary switch ON and OFF at times when essentially zero voltage is impressed across the respective at least one primary switch and essentially zero resonant current is flowing in the respective at least one primary switch; and

[1.e] (ii) turn the at least one secondary switch ON and OFF at times when essentially zero current is flowing in the respective at least one secondary switch and essentially zero voltage is impressed across the respective at least one secondary switch; and

[1.f] wherein the oscillator frequency is preset, and

[1.g] the timing of the timing control signals for one or more selected events may be set independently of other timing control signals and events.

**C. Claim Construction**

As part of the *Markman* process, the following claim terms of the 481 patent were construed:

<b>Claim Term</b>	<b>Construction</b>
Standard operating period and frequency	The resonant period and frequency of a resonant converter
Characteristic resonant frequency and period	The resonant frequency and period of the resonant power train. The preamble is limiting.
preset	Set in advance
Primary switch	Device that allows current flow when closed through the primary winding of a transformer and provides isolation when open
Secondary switch	Device that allows current flow when closed through the secondary winding of a transformer and provides isolation when open

See Order No. 30 at 16-17, 23.



The parties apparently present an additional term for construction, discussed but not resolved by Order No. 30—“standard converter operating cycle.” CIB at 101-103; RIB at 19; SIB at 71-72; *see* Order No. 30 at 16-17. The parties do not identify any dispute that requires construction of this term, however, so it will not be construed. *See* CIB at 103; RIB at 19; SIB at 72.

**D. Infringement**

Vicor contends the 481 Accused Products and the 481 Redesigned Products infringe claim 1 of the 481 patent. CIB at 115. Both Vicor and Respondents discuss the Delta representative products U50SU4P162PMAR and U50SU4P162PMDRF together, first, and then the Cyntec MPN541382-PVA. *Id.* at 115, 148; RIB at 23, 36. Following this, infringement of the Delta redesigned product U50SU4P1A2PMDAF and the Cyntec redesigned product MP541382-PVA1 is discussed. *See* CIB at 167-68; RIB at 38-40. For the following reasons, Vicor has shown infringement of claim 1 only by the Cyntec MPN541382-PVA.

**1. Delta U50SU4P162PMAR and U50SU4P162PMDRF**

As noted, the parties agree that two products, Delta’s U50SU4P162PMAR and U50SU4P162PMDRF, are representative of all Delta Accused Products for purposes of infringement of the 481 patent. *See* EDIS Doc. ID 816661 at 2-3. Vicor contends the Delta U50SU4P162PMAR and U50SU4P162PMDRF infringe claim 1. CIB at 115-148. Neither Respondents nor Staff dispute that limitations [1.a.1], [1.b], and [1.f] are met. *See* RIB at 23-36; RRB at 11-31; SIB at 78-86. Vicor’s expert, Dr. Ayman Fayed, opines that each representative product includes: a power converter operating synchronously in a series of cycles (element [1.a.1]) and an internal oscillator which generates clock signals at a preset frequency (elements [1.b], [1.f]), so these elements are found in the Delta Accused Products. CX-0008C (Fayed WS) at Q/A 765-772, 785-786, 801-803, 809-815, 823-824, 838-840.

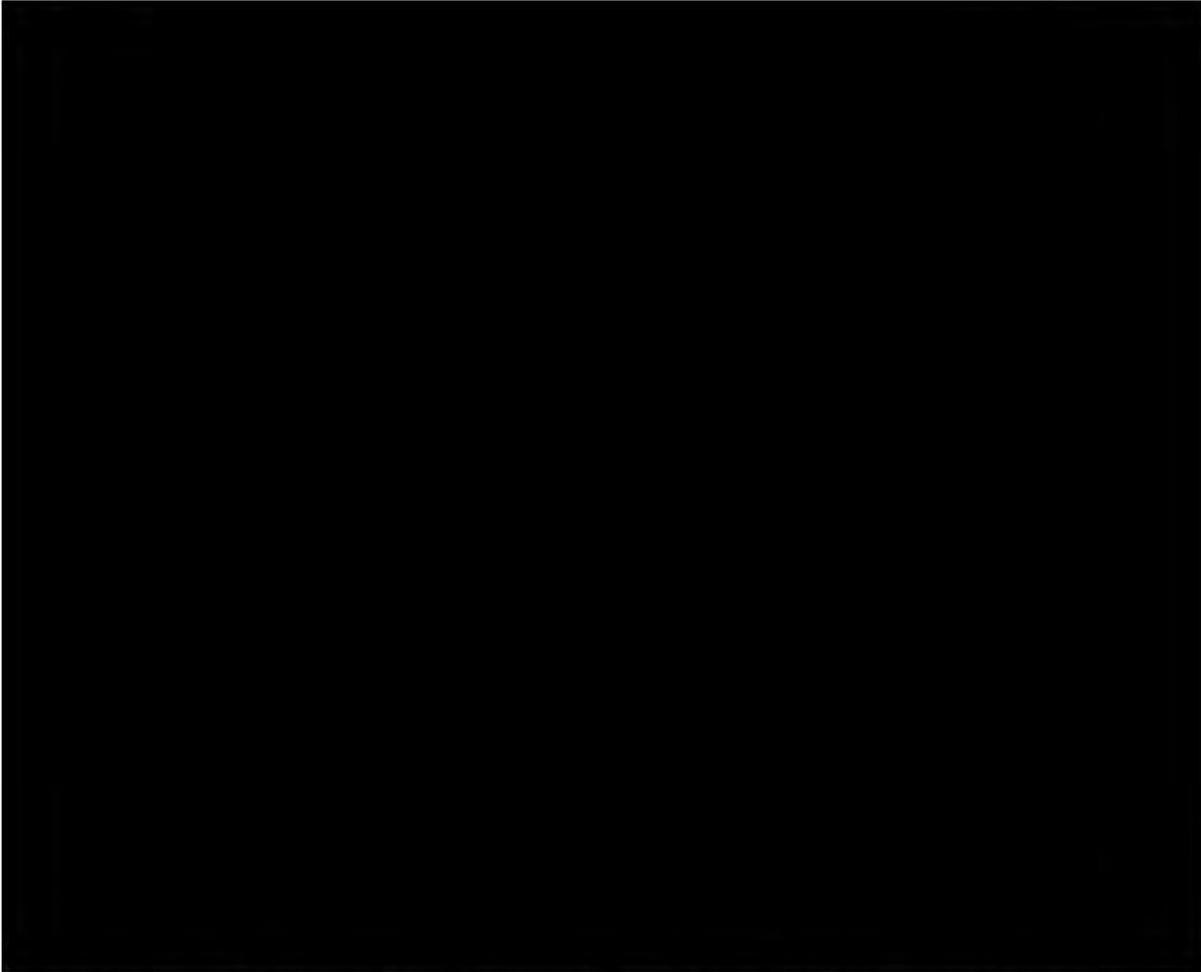
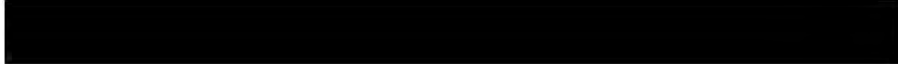
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**a) Limitation [1.a.2] the converter having at least one primary switch to drive a resonant power train and at least one secondary switch**

As for limitation [1.a.2], “primary switch” has been construed as a “device that allows current flow when closed through the primary winding of a transformer and provides isolation when open,” and “secondary switch” has been construed as a “device that allows current flow when closed through the secondary winding of a transformer and provides isolation when open.” Order No. 30 at 23. Vicor contends the limitation is met in the U50SU4P162PMAR based on the testimony of Dr. Fayed, who relies on a reverse-engineered schematic and a source code layout file produced by Respondents. CIB at 119-120 (citing CX-0008C (Fayed WS) at Q/A 773-774)). Within the layout file, shown below, Vicor identifies the “primary switch” [REDACTED]

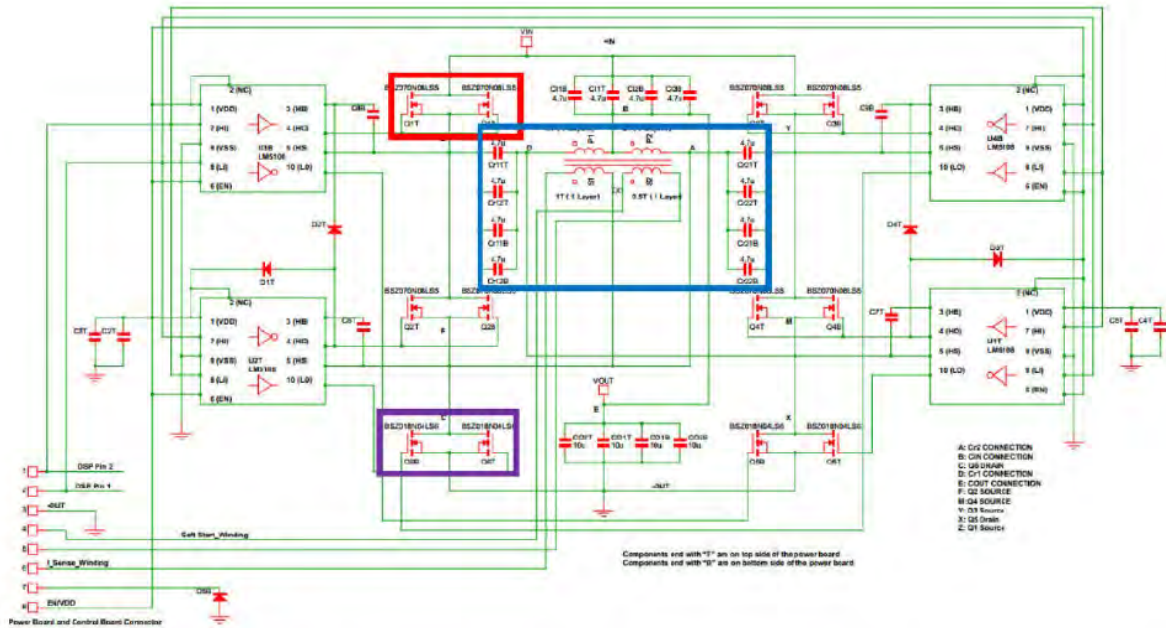
[REDACTED]

[REDACTED]



CIB at 120 (citing RPX-0063C); *see* CX-0008C (Fayed WS) at Q/A 774 (citing CPX-0008C).

Within the reverse-engineered diagram, Vicor identifies the “primary switch” as switches Q1T, Q1B; “secondary switch” as switches Q6T, Q6B; “primary winding” as inductor P1; and “secondary winding” as inductor P2:



CIB at 119 (citing CX-0008C (Fayed WS) at Q/A 773); CX-3161C.0002. For further support, Vicor refers to U.S. Patent No. 11,469,674 (“the 674 patent”) (CX-2097C), a patent assigned to respondent Delta Electronics, Inc., as evidence of the structure of U50SU4P162PMAR and the characterization of its inductors. *Id.* (citing CX-0008C (Fayed WS) at Q/A 775)); *see id.* at 121 (citing Tr. (Hopkins) at 802:7-13).

Vicor contends “[t]he same is true for the U50SU4P162PMDRF.” CIB at 121 (citing CX-0008C (Fayed WS) at Q/A 816-819). With respect to a layout file that is nearly identical to that shown above, Vicor states, “[t]he U50SU4P162PMDRF contains primary switches, secondary switches, a resonant power train, and capacitors with the same designators as the U50SU4P162PMAR listed above.” *Id.* (citing CX-0008C (Fayed WS) at Q/A 817; RPX-0071C).

Vicor has shown the limitation is met in both products even though Respondents raise a number of grounds in opposition. First, Respondents argue that Vicor has not actually applied the ordered “primary switch” and “secondary switch” constructions of Order No. 30 to the evidence,

[REDACTED]

and in particular it has not shown that the identified switches allow current flow through the primary or secondary windings of a transformer or provide isolation. RIB at 24. Relatedly, they argue there are no “primary” or “secondary” windings whose current flow is controlled by the switches because

[REDACTED]

[REDACTED] RIB at 24-25 (citing RX-0010C (Hopkins RWS) at Q/A 95, 386-389, 4546-457; Tr. (Hopkins) at 801:9-802:15).

But Respondents’ expert Dr. Douglas C. Hopkins admitted that [REDACTED]  
[REDACTED], and as noted Delta is the assignee of the 674 patent. Tr. (Hopkins) at 782:7-10, 784:7-20; RX-0010C (Hopkins RWS) at Q/A 386. The 674 patent describes its inductors, T1 and T2, as two windings which make up a transformer:

The windings T1 and T2 are wound around the same magnetic core pillar to form a close-coupling transformer T. There is an air gap on the magnetic core of the transformer T. The resonance is generated among the resonant capacitors C1 and C2 and the resonant inductor through controlling the plurality of switches on and off.

674 patent at 4:17-22. The patent continues: “Regarding the equivalent circuits of the transformer T shown in FIG. 5A and FIG. 5B, since the dotted terminal of the winding T1 and the undotted terminal of the winding T2 are electrically connected, the windings T1 and T2 can be equivalent to two ideal windings T1’ and T2’ connected in series.” *Id.* at 4:40-45. And Dr. Fayed characterizes the structure in the U50SU4P162PMAR as an [REDACTED]

[REDACTED] CX-0008C (Fayed WS) at Q/A 777. So Dr. Hopkins’ testimony that “we go out of our way to make sure that we don’t confuse [the identified structure] with transformers” is not supported by the weight of the evidence, and [REDACTED]

[REDACTED] qualify as primary and secondary windings of a transformer. Tr. (Hopkins) at 801:9-802:13. Because the identified primary switches allow current flow through the primary winding when

[REDACTED]

closed, and the identified secondary switches allow current flow through the secondary winding when closed, the identified switches qualify as “primary” and “secondary” switches.

Respondents’ next point is that because [REDACTED]

[REDACTED]

[REDACTED] Vicor cannot show that [REDACTED]

[REDACTED]. RIB at 24-25 (citing RX-0010C (Hopkins RWS) at Q/A 389,

456-457). This argument, which is seemingly a construction-of-a-construction, is unpersuasive.

“Device that allows current flow when closed through the primary winding of a transformer and provides isolation when open” does not mean that the primary winding must be completely isolated

whenever the primary switch is open, it simply means the switch provides isolation in that no current flows through itself. The plain and ordinary meaning of “switch” does not mean that every

downstream component receives no power when the switch is open; two switches in parallel are commonplace (for example, in household lighting) but neither alone can completely isolate the

device they control. *See* Order No. 30 at 23. Respondents cite no intrinsic evidence to support their narrow interpretation, and to the extent it presents a claim construction dispute it is rejected.

Respondents’ final challenge to limitation [1.a.2] is that winding [REDACTED]

[REDACTED]

[REDACTED] RIB at 26. Similarly, they allege [REDACTED]

[REDACTED] *Id.* Respondents argue that this conflicts with the patent,

where it is disclosed the “primary winding” is exclusively connected to the input, and “secondary winding” is exclusively connected to the load. *Id.* (citing RX-0010C (Hopkins RWS) at Q/A 385-

386, 456-457; 481 patent at Fig. 2). This construction-of-a-construction is also not persuasive. As determined above, [REDACTED],

[REDACTED]

[REDACTED]

[REDACTED] *See, e.g.,* CX-0237C. This is sufficient. Whether the windings are called “first” and “second,” or “primary” and “secondary,” is a matter of semantics (*see* Tr. (Hopkins) at 802:3-13), and Respondents’ cited intrinsic evidence is consistent with this general usage.

Accordingly, limitation [1.a.2] is met in the U50SU4P162PMAR and U50SU4P162PMDRF.

**b) Limitation [1.a.3]**

The dispute over limitation [1.a.3] is similar to [1.a.2]. The limitation reads, “the resonant power train including a transformer and having a characteristic resonant frequency and period.” 481 patent at cl. 1. Using the reverse-engineered diagram of the U50SU4P162PMAR, Vicor points to two collections of resonant capacitors, each collection connected in series with the inductor windings P1 and P2 (CIB at 122), and Dr. Fayed’s testing results which show resonant current waveforms having a standard frequency and period (*id.* at 123). For the U50SU4P162PMDRF, Vicor states “the same is true. . . . Dr. Fayed’s testing confirms that U50SU4P162PMDRF meets this limitation.” *Id.* at 123-124. As noted above, Respondents challenge whether the products can accurately be called “transformers” (RIB at 24-25; RRB at 12), but, for the reasons discussed, they can. Respondents do not otherwise challenge the remainder of the limitation.

Accordingly, limitation [1.a.3] is met in the U50SU4P162PMAR and U50SU4P162PMDRF.

**c) Limitations [1.c]-[1.e]**

Limitations [1.c] through [1.e] concern the timing signals sent to the primary and secondary switches, where those signals are based upon clock signals having a standard/resonant frequency

[REDACTED]

and period, and where those signals turn ON and OFF the primary and secondary switches, coinciding with certain zero voltage and zero current conditions. *See* 481 patent at cl. 1. Vicor contends the limitation is met in both the U50SU4P162PMAR and U50SU4P162PMDRF, and primarily cites the source code analysis and experimental testing performed by Dr. Fayed for support. *See* CIB at 124-137 (citing, *inter alia*, CX-0008 (Fayed WS) at Q/A 787-792, 825-829, 793-796, 830-833, 797-800, 834-837). Importantly, Vicor notes, accurately, that “Dr. Hopkins does not dispute the Delta Accused Modules practice ZVS [Zero Volt Switching] and ZCS [Zero Current Switching]” and that the parties’ dispute surrounds the control signals sent to the switches. *Id.* at 135, 137.

As for those control signals, Respondents argue that “[t]he plain language of limitations 1(c)-(e) requires separate timing control signals to (i) turn ON and OFF the primary switch(es) and (ii) turn ON and OFF the secondary switch(es)” and “[n]othing in the specification contradicts this plain meaning—every embodiment in the ’481 Patent has separate timing control signals for the primary and secondary switches.” RIB at 26 (citing RX-0010C (Hopkins RWS) at Q/A 396-399; 481 patent). Respondents add, “[i]n the broader context of claim 1, this limitation makes sense: the claim generally relates to the independent control of timing control signals—if the same signal is controlling all events, independent control is not possible.” *Id.* at 26-27 (citing RX-0010C (Hopkins RWS) at Q/A 399).

In light of this, Respondents argue Vicor has failed to point to *separate* timing control signals. RIB at 27. Respondents explain that DSP Pin 1 and DSP Pin 2, which Vicor designates in the reverse-engineered diagram as the pins supplying the first and second control signals, correspond to the [REDACTED] for the U50SU4P162PMAR, and the [REDACTED] for the U50SU4P162PMDRF as shown in the

[REDACTED]

source code layout files. *See id.* at 27 (citing RX-0010C (Hopkins RWS) at Q/A 401-406, 458-462), 27 n.6. Although Respondents' brief reverses [REDACTED] in its introduction to each accused product (RIB at 27), it is understood the [REDACTED] are the same across the two products, as are the [REDACTED] (*see* RPX-0063C; RPX-0071C). When these pins are compared to the specific transistors Vicor identifies as the claimed "primary switch" and "secondary switch," Respondents contend that both of Vicor's "primary switch" and "secondary switch" are in fact [REDACTED]

[REDACTED] *Id.* at 27-28 (citing RX-0010C (Hopkins RWS) at Q/A 403, 461). Therefore, according to Respondents, "in both of the Delta representative modules, there are not separate timing control signals for each of the plurality of events, *i.e.*, there are not separate timing control signals used to (i) turn ON/OFF the primary switches and to turn ON/OFF the secondary switches." *Id.* at 28. Importantly, Respondents take the position that Vicor has only ever identified [REDACTED] as the claimed "primary switch" and [REDACTED] as the claimed "secondary switch." *Id.* ("neither Dr. Fayed nor Complainant ever identified another set of primary and secondary switches as part of their infringement analysis . . ."); RRB at 12 ("[F]or the first time [in] its post-hearing briefing, Vicor accuses [REDACTED] as primary switches and [REDACTED] as secondary switches. . . . This new theory is untimely at least because it was not [in] Vicor's pre-hearing brief."), 15. Staff agrees with Respondents. SIB at 78-80.

It is true that Vicor only identified [REDACTED] as the claimed switches in its prehearing brief. *See* CPB at 507-08. For reference, it appears that [REDACTED] refer to labels in the source code layout file (RPX-0063C), and the corollary transistors in the reverse-engineered diagram are Q1T, Q1B and Q6T, Q6B (CX-3161C). Also, it is evident from both the reverse-engineered diagram and source code layout file that the "primary switch" transistor pairs

[REDACTED]

and the “secondary switch” transistor pairs are all triggered by the same control signal—DSP Pin 2 (CX-3161C) or [REDACTED] (RPX-0063C).

However, Dr. Fayed opines that the other pin (DSP Pin 1 (CX-3161C) or [REDACTED] (RPX-0063C)) “[REDACTED], [REDACTED]

[REDACTED]” CX-0008C (Fayed WS) at Q/A 792. This point was made in Vicor’s pre-hearing brief, albeit on pages not cited by Respondents.

CPB at 520 (“This is true, but Dr. Hopkins ignores that this signal is used [REDACTED] [REDACTED]

[REDACTED]”). There is no dispute that the U50SU4P162PMAR and U50SU4P162PMDRF operate in this way— [REDACTED]

[REDACTED], [REDACTED] [REDACTED] Tr. (Hopkins) at 827:2-829:17; *see* CDX-0024C.0052-65. And

contrary to Respondents’ assertions, the timing signals of all transistors being linked in two groups, in combination with the timing diagrams discussed below in connection with limitation [1.g], means

that it is more likely than not all of the transistors operate at ZVS and ZCS. *See* RRB at 15-16. Indeed, there is no evidence or testimony from Dr. Hopkins to the contrary. *See id.* And

Respondents argue, for limitation [1.g], that if any timing settings are changed (like deadtime), the products lose ZVS and ZCS, which only confirms they have ZVS and ZCS in a first place. *See id.*

at 17.

Accordingly, limitations [1.c]-[1.e] are present in the U50SU4P162PMAR and U50SU4P162PMDRF.

[REDACTED]

**d) Limitation [1.g]**

Limitation [1.g] states, “the timing of the timing control signals for one or more selected events may be set independently of other timing control signals and events.” 481 patent at cl. 1. For the representative U50SU4P162PMAR product, Vicor contends, based on the testimony of Dr. Fayed, that “the U50SU4P162PMAR contains the [REDACTED] digital controller, which is programmed to set the timing of the timing control signals (e.g., DSP Pin 1 and DSP Pin 2 or [REDACTED]), as reflected on the [REDACTED]”:

[REDACTED]

CIB at 138-139 (citing CX-0008C (Fayed WS) at Q/A 804; RX-0800.0005, -.0190). Vicor refers to other figures in the datasheet which show how [REDACTED]  
[REDACTED]:

[REDACTED]

[REDACTED]

CIB at 140 (citing CX-0703.0065); *see* CDX-0024C.0075). And, according to Vicor, the [REDACTED]

[REDACTED]

[REDACTED], to accomplish the following timing diagram:

[REDACTED]

CIB at 141 (citing CX-0703.0087); *see* RDX-0017C.87).

[REDACTED]

[REDACTED]

*Id.* at 142 (citing RPX-0166C.0006); *see* RX-0010C (Hopkins RWS) at Q/A 426.

A few inferences can be drawn from the above evidence. First, as Respondents argue, both [REDACTED] originate from the same [REDACTED] (RIB at 31) and it follows that if the [REDACTED] (which is problematic (CX-0703.0086)), then [REDACTED] would rise and fall exactly with [REDACTED] and [REDACTED] would follow oppositely. So the starting basis for [REDACTED]

However, [REDACTED] are non-zero. So [REDACTED] as compared to the rise of [REDACTED] but the [REDACTED] remains unchanged—it continues to match the fall of [REDACTED]. Conversely, [REDACTED] as compared to the fall of [REDACTED] but its fall remains unchanged—it continues to match the [REDACTED] RRB at 25 (discussing how falling edges remain unchanged from deadtime alteration).

So because [REDACTED]  
[REDACTED] it has been shown that the timing of each “control signal” may be set independently of the other—*i.e.*, [REDACTED]  
[REDACTED]

[REDACTED]

[REDACTED]. Thus, the limitation—at some point in time—was present in the U50SU4P162PMAR.

Respondents raise several points in opposition, but only a few concern [REDACTED] and need discussion. For example, [REDACTED] are immaterial in light of the subsequent alteration of [REDACTED]. See RIB at 31-32; RX-0010C (Hopkins RWS) at Q/A 423. And as with limitations [1c]-[1e], Staff agrees with Respondents. SIB at 81-86.

First, Respondents refer to [REDACTED]  
[REDACTED]  
[REDACTED] RIB at 30; RRB at 22; see RRB at 18, 25. This is not true, as shown above. The timing of [REDACTED] does not meaningfully depend on the timing of [REDACTED]. Both depend on [REDACTED] as modified by their specific [REDACTED], but they do not depend on each other.

Respondents also argue that the flow diagram showing the branch from [REDACTED]  
[REDACTED]  
[REDACTED] thus making the timing of the signals not independent. RIB at 31; RRB at 23. However, [REDACTED]  
[REDACTED]  
[REDACTED]. RPX-0166C.0006 (showing [REDACTED]). The datasheet even provides guidance on the [REDACTED]  
[REDACTED] (emphasis added):

[REDACTED]

[REDACTED]

CX-0703.0086.

Lastly, Respondents assert that the U50SU4P162PMAR, as manufactured, calibrated, and sold, [REDACTED]

[REDACTED]

[REDACTED]:

As Ms. Feng, software designer for the Accused Delta Products explains, the

[REDACTED] Tr. (Feng) at 547:12-23. A different [REDACTED] *Id.* at 548:1-4. After the values are determined by Delta engineers during the design phase, the software and products are [REDACTED]. *Id.* 547:2-11; RX-0017C (Feng WS) at Q/A 42-52, 36-37; RX-0018C (Liu WS) at Q/A 43-53. Customers cannot [REDACTED]

[REDACTED] Tr. (Feng) at 547:2-11; RX-0017C (Feng WS) at Q/A 47-52; RX-0018C (Liu WS) at Q/A 43-53. Vicor's argument that the user can change these values (CIB at 141) is contrary to all record evidence. And even if they could be changed, the products wouldn't work and wouldn't meet other limitations, like 1(c)-(e), because the timing of the signals would necessarily be different. RX-0010C (Hopkins RWS) at Q/A 427, 449-450. The Accused Products, as designed and imported, [REDACTED]

[REDACTED] *Id.*

[REDACTED]

RRB at 16-17. Respondents reason, “[a]s imported, the Accused Products are not set independently and may not be changed so that they may be set independently. . . . No person in the United States has ever used an Accused Product where the timing may be set independently, as discussed above.” *Id.* at 17-18 (citing *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1317 (Fed. Cir. 2009)).

Vicor offers no rebuttal to these facts or legal argument and consequently has not met its burden to show infringement. *See* CIB at 138-148, 155-160 (describing testing/usage in the US, generally, but no mention of setting registers as part of that testing/usage); *see generally* CRB; CX-0008C (Fayed WS) at Q/A 805-807. There can be no dispute that, at one point in time, outside the United States, the [REDACTED] in the U50SU4P162PMAR were set independently from one another. This is shown in the source code excerpt reproduced above and confirmed by Delta witness Ms. Feng. RPX-0166C.0006 (“[REDACTED] [REDACTED]”); RRB at 16-17 (“After the values are determined by Delta engineers during the design phase, the software and products are [REDACTED]”). More than likely, control signals whose timing was set [REDACTED] were also generated under the claimed method.

But as a method claim, there must be performance of claim 1 within the United States for any given article “to infringe.” 19 U.S.C. § 1337(a)(1)(B); *Lucent Techs.*, 580 F.3d at 1317 (citing *Joy Techs., Inc. v. Flakt, Inc.*, 6 F.3d 770, 775 (Fed. Cir. 1993)). If the ability to set the timing of the two control signals (independently, or dependently) has been disabled before the product is imported, then the method step of generating control signals whose timing “may be set” has not occurred. The only control signals so generated have fixed timings. Again, Vicor offers no rebuttal to this circumstance and it is dispositive.

[REDACTED]

Accordingly, the U50SU4P162PMAR has not been shown to infringe limitation [1.g], and so it does not infringe claim 1.

With respect to the U50SU4P162PMDRF, it [REDACTED] than the U50SU4P162PMAR (CIB at 115), and so Respondents' opposition varies somewhat. Here, Vicor contends the two control signals [REDACTED] :

[REDACTED]

CIB at 145 (citing CX-0643.0126). Vicor points to another datasheet advertising a variety of programmable pulse customizations (*id.* at 144 (citing CX-0028.0001)), and, with respect to the

[REDACTED]

registers shown above, presents [REDACTED]

[REDACTED]:

[REDACTED]

*Id.* at 146-147 (citing CX-0643.0170-0171). Vicor adds that, in practice, “as Ms. Feng testified, Delta’s source code shows that they [REDACTED].” *Id.* at 147-148 (citing Tr. (Feng) at 533:20-535:3); RPX-0143C).

As with the U50SU4P162PMAR, the evidence shows the limitation—at some point in time—was present in the U50SU4P162PMDRF. Respondents’ arguments to the contrary, involving

[REDACTED]

[REDACTED] (RIB at 34-36), do not take away from this conclusion.

However, the same unrebutted argument from Respondents prevents finding infringement by the U50SU4P162PMDRF; namely, that the [REDACTED] relied on by Vicor to show infringement are locked or otherwise protected from alteration prior to importation. *See* RIB at 16-17. When that is the case, the method step of “generating timing control signals” whose timings “may be set independently” does not happen within the United States. After importation, no setting of timing— independent or dependent—is allowed to take place. Thus, there is no infringement. 19 U.S.C. § 1337(a)(1)(B); *Lucent Techs.*, 580 F.3d at 1317 (citing *Joy Techs.*, 6 F.3d at 775).

Accordingly, the U50SU4P162PMDRF has not been shown to infringe limitation [1.g], and so it does not infringe claim 1.

## **2. Cyntec MPN541382-PVA**

The Cyntec MPN541382-PVA is accused of infringement of claim 1 of the 481 patent. It is not alleged or shown to be representative of any other products (EDIS Doc. ID 816661 at 4; CIB at ix) despite Vicor’s characterization in some parts of its brief (CIB at 148). Neither Respondents nor Staff dispute the presence of limitations [1.b] through [1.f]. *See* RIB at 36-38; RRB at 31-33; SIB at 86-87. Dr. Fayed opines it includes: a power converter operating synchronously in a series of cycles (element [1.a.1]), a resonant power train including a transformer with resonant frequency (element [1.a.3]), an internal oscillator which generates clock signals at a preset frequency (elements [1.b], [1.f]), and control signals generated based upon the clock signals that turn switches ON and OFF at ZVS and ZCS conditions (elements [1.c]-[1.e]), and these elements are accordingly found in the MPN541382-PVA. CX-0008C (Fayed WS) at Q/A 846-848, 852-868.

[REDACTED]

**a) Limitation [1.a.2]**

Vicor contends the limitation is met in the MPN541382-PVA based on the testimony of Dr. Fayed, who relies on a source code layout file produced by Respondents. CIB at 150-151 (citing CX-0008C (Fayed WS) at Q/A 849-851). Within the layout file, shown below, Vicor identifies the “primary switch” as switches [REDACTED]; “secondary switch” as switches [REDACTED]; and a [REDACTED]:

[REDACTED]

*Id.* (citing RPX-0163C). As with the Delta Accused Products, Vicor has shown the limitation is met.

Respondents’ challenge here is the same as with the Delta Accused Products, arguing the structure does not include primary or secondary windings (RIB at 36; RRB at 31-32) and the alleged primary and secondary switches do not provide isolation of those windings when open (RIB at 36; RRB at 32-33). As discussed above, these arguments are not persuasive. The layout file is easy to read and shows how the switches [REDACTED]

[REDACTED]

[REDACTED]. RPX-0163C. And the product indisputably functions to convert a higher voltage to a lower voltage, using [REDACTED]. *See, e.g.*, CX-0303C; RIB at 36-37; CX-0008C (Fayed WS) at Q/A 605; RX-0010C (Hopkins RWS) at Q/A 267. Altogether, this is sufficient.

Accordingly, limitation [1.a.2] is met in the MPN541382-PVA.

**b) Limitation [1.g]**

Limitation [1.g] is presented above. For the MPN541382-PVA, Vicor contends, based on the testimony of Dr. Fayed, that the product includes the same [REDACTED] controller from the Delta U50SU4P162PMAR, which [REDACTED] [REDACTED] CIB at 154-155 (citing CX-0008C (Fayed WS) at Q/A 869-871). Thus, according to Vicor, “[t]he MPN541382-PVA may set the timing of timing control signals for one or more selected events independently of other timing control signals and events.” *Id.* at 154. Respondents agree the [REDACTED] are the same and restate their opposition from the Delta U50SU4P162PMAR. *See* RIB at 37-38 (citing RX-0010C (Hopkins RWS) at Q/A 492-494) [REDACTED]; RRB at 33. Staff agrees with Respondents. SIB at 86-87. For the reasons discussed above, Vicor has sufficiently shown the timing of the [REDACTED] may be set independent from each other through at least the [REDACTED].

Respondents do not, however, assert that these [REDACTED] are locked down or made inaccessible to users prior to importation of the MPN541382-PVA. *See* RIB at 36-38; RRB at 31-33. Thus, the evidence shows the entire method of claim 1 is performed by the MPN541382-PVA within the United States, constituting an “article[] that infringe[s].” CX-0008C (Fayed WS)




at Q/A 881 (method is performed any time the product is turned on); U.S.C. § 1337(a)(1)(B); *Lucent Techs.*, 580 F.3d at 1317 (citing *Joy Techs.*, 6 F.3d at 775).

Accordingly, claim 1 is infringed by the MPN541382-PVA.

**3. Delta Redesign Product U50SU4P1A2PMDAF**

Vicor contends the Delta Redesign Product U50SU4P1A2PMDAF infringes claim 1 of the 481 patent as “Respondents did not provide any evidence that Delta’s PMDAF redesign has any changes to design around the [481 patent].” CIB at 167 (citing RPB at 76-77, 445-447; CX-0008C (Fayed WS) at Q/A 45, 872, 873; Tr. (Hopkins) at 821:2-8); CRB at 95. Respondents, on the other hand, allege a general failure of proof by Vicor stating, “Vicor does not cite any evidence in support of its allegation that Delta’s redesign product, the U50SU4P1A2PMDAF, infringes claim 1 of the ’481 Patent. . . . not the source code, schematics, or other documentation Respondents produced detailing the operation of the U50SU4P1A2PMDAF module.” RIB at 38 (citing RX-0010C (Hopkins RWS) at Q/A 495-496; CX-0008C (Fayed WS) at Q/A 872-873); RRB at 95 (citing *Certain LED Lighting Devices, LED Power Supplies, and Components Thereof*, Inv. No. 337-TA-1081, Comm’n Op. at 10 (July 23, 2019)), 96 (citing *Oligosaccharides*, Inv No. 337-TA-1120, Comm’n Op. at 22-23 (June 8, 2020)). Respondents complain that “Dr. Hopkins can necessarily only address that which Vicor has alleged, and in any event Dr. Hopkins[’] *non-infringement* theories cannot prove infringement for Vicor.” RIB at 38 (emphasis in original). Staff agrees with Respondents. SIB at 125.

Respondents are correct that Vicor has not met its burden. Uniquely, there is no agreement from Respondents that the redesigned U50SU4P1A2PMDAF is represented by other Delta products, like the U50SU4P162PMDRF. Vicor cites hearing testimony from Dr. Hopkins that both products include an  (Tr. (Hopkins) at 820:4-821:8), but that is the only similarity

[REDACTED]

mentioned. And Dr. Hopkins' testimony is not reliable enough to establish representativeness on its own. Tr. (Hopkins) at 820:10-16 ("I would have to say yes, but I'm not clear in my mind if I evaluated both of those products. Are they showing up in my rebuttal?"). If the U50SU4P162PMDRF shared, for example, the same or similar source code layout file or reverse-engineered diagram that were the evidentiary basis for the Delta Accused Products, then it would have been simple for Vicor to cite and mention. But Vicor did neither. Thus, representativeness has not been shown, Dr. Fayed opines that the U50SU4P1A2PMDAF operates the same as the non-infringing U50SU4P162PMDRF, and proof of infringement is not attempted any other way. See CX-0008C (Fayed WS) at Q/A 872-73.

Accordingly, Vicor has not met its burden to show the U50SU4P1A2PMDAF infringes claim 1 of the 481 patent.

#### **4. Cytotec Redesign Product MPN541382-PVA1**

Vicor contends the Cytotec Redesign Product MPN541382-PVA1 infringes claim 1 of the 481 patent as "Dr. Fayed testified it is [REDACTED] in all respects, including those material to the infringement analysis of the '481 patent." CIB at 167 (citing CX-0008C (Fayed WS) at Q/A 874). Vicor adds that this similarity was confirmed by the Cytotec corporate witness. *Id.* at 167-168 (citing CX-3319 (Liu Dep.) at 24:5-7, 46:2-8). Additionally, Vicor acknowledges "the only difference between the two products [REDACTED] [REDACTED] but implies this is immaterial for infringement. See *id.* at 168 (citing CX-0008C (Fayed WS) at Q/A 874); CRB at 95.

Respondents first criticize Vicor and Dr. Fayed for, again, not relying on any of "the source code, schematics, or other documentation Respondents produced detailing the operation of the MPN541382-PVA1 module [] in support of its infringement allegation." RIB at 39; RRB at 94-95.

[REDACTED]

Respondents then incorporate their defenses from the MPN541382-PVA product, and add that in the redesign, the [REDACTED]

[REDACTED]

[REDACTED].” RIB at 39 (citing RPX-0148C; RX-0010C (Hopkins RWS) at Q/A 498-499). They argue, more specifically, that [REDACTED]

[REDACTED] *Id.* (citing CX-0703.0069). Respondents reason, much like for the U50SU4P162PMAR and MPN541382-PVA which use the same controller, [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] *Id.* at 39-40. Respondents further contend the [REDACTED]

[REDACTED] (*id.* (citing RX-0010C (Hopkins RWS) at Q/A 501; RX-0018C (Liu RWS) at Q/A 41-53)). Staff agrees with Respondents. SIB at 125-129.

Respondents are persuasive that the redesign avoids infringement of claim 1. For limitation [1.g], the accused model MPN541382-PVA was found to infringe by way of [REDACTED]

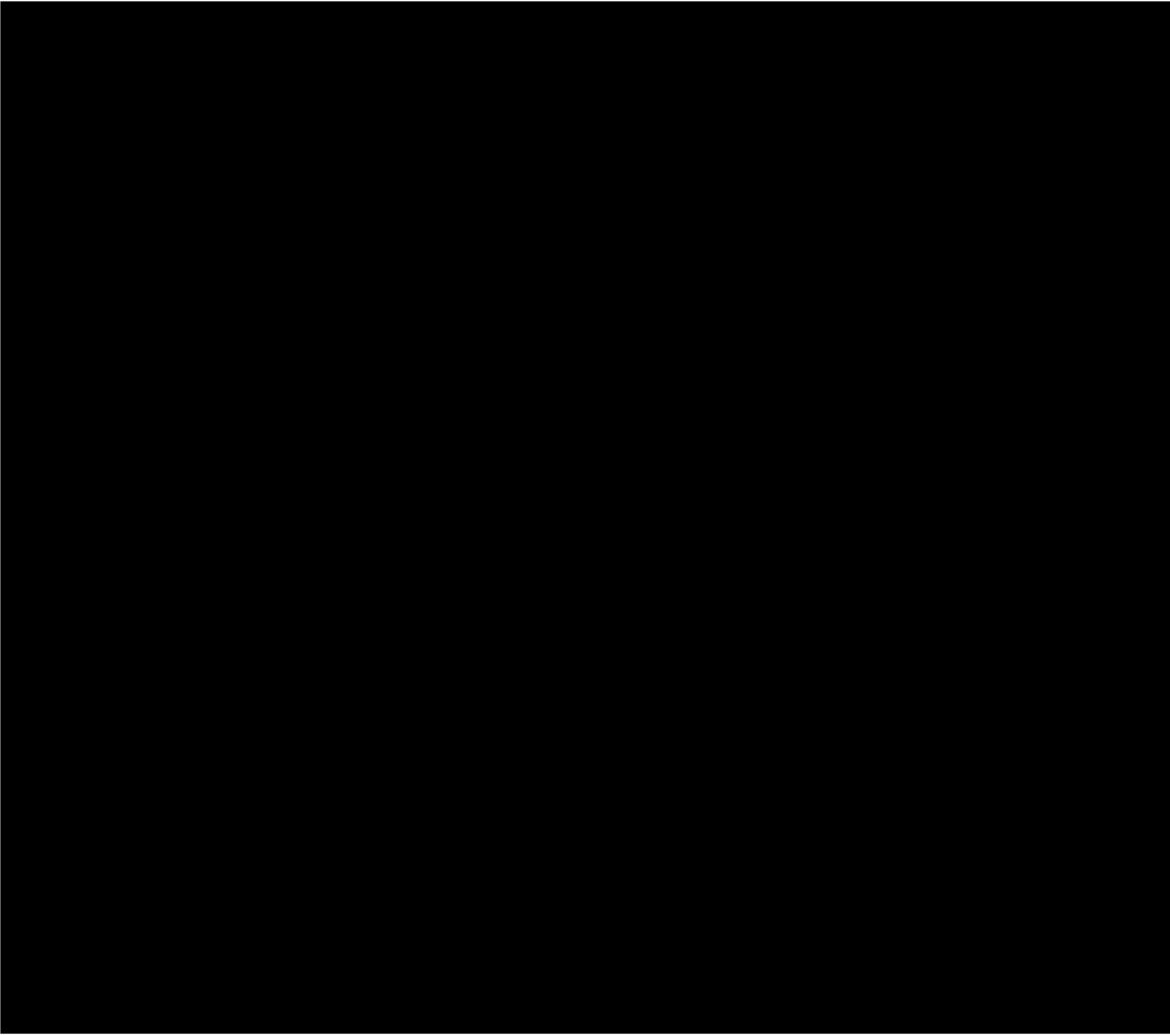
[REDACTED]. *See* CX-0008C (Fayed WS) at Q/A 806. But

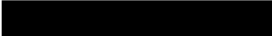
[REDACTED]

[REDACTED]. RRB at 39-40 [REDACTED]

[REDACTED]). This

is supported by the datasheet associated with the MPN541382-PVA and MPN541382-PVA1:



CX-0703.0069 (annotated). Thus, there is no showing that the timing of the control signals, , can be set independently under limitation [1.g]. Moreover, like the Delta Accused Products U50SU4P162PMAR and U50SU4P162PMDRF, the unrebutted testimony is that the source code for the MPN541382-PVA1 is locked down and cannot be altered after it is sold. RX-0018C (Liu RWS) at Q/A 36-38, 51-53; RX-0010C (Hopkins RWS) at Q/A 501; RIB at 40. So there is no showing that the entire method of claim 1 is performed by the MPN541382-PVA1 within the United States so as to constitute an “article[] than infringe[s].” 19 U.S.C. § 1337(a)(1)(B); *Lucent Techs.*, 580 F.3d at 1317 (citing *Joy Techs.*, 6 F.3d at 775).



Accordingly, Vicor has not met its burden to show the MPN541382-PVA1 infringes claim 1 of the 481 patent.

**E. Indirect Infringement**

In addition to the direct infringement theory over method claim 1 discussed above, Vicor contends that each of the Respondents also indirectly infringes. CIB at 155. Vicor argues, “Respondents intentionally instructed or enabled their customers to test and/or use the ’481 accused products within the United States, and continued to do so after their knowledge of their infringement of the ’481 Patent, which, again, occurs any time the product is turned on.” *Id.* (citing CX-0008C (Fayed WS) at Q/A 881). Vicor cites a variety of testimony and documentary evidence to show how Respondents “encouraged, enabled, or instructed their customers to test/us[e]” the accused products (*id.* at 156-160 (citing, *inter alia*, CX-0008C (Fayed WS) at Q/A 881-884)) and add that “all Respondents have had knowledge of infringement at least since the filing of the Complaint but nevertheless continue to import and sell their products in the United States and instruct their customers to use the same” (*id.* at 156).

Respondents do not offer any opposition to Vicor’s indirect infringement theory other than to argue there is no direct infringement. RIB at 40; RRB at 33. Staff argues similarly. SIB at 87.

“Whoever actively induces infringement of a patent shall be liable as an infringer.” 35 U.S.C. § 271(b). Accordingly, to the extent an accused product is found to directly infringe method claim 1 of the 481 patent, it has been shown that the respective respondent indirectly infringes as well through its uncontested sales, training, and support activities

**F. Domestic Industry – Technical Prong**

Vicor contends all of the 481 DI Products practice claim 1 of the 481 patent. CIB at 103. As noted above, there are five models of 481 DI Products which Vicor and Respondents treat as

[REDACTED]

representative of the rest: BCM6135CD1E5165T00, DCM3110S60E02A3TN0, MCM3208S59Z01A6T05 and MCD3509, NBM2317S60D1580T0R, and VTM2308S52Z0276T01. *Id.*; *see id.* at xxix-xxxi. In reality these five models are only representative of others for limitations [1.a.1] through [1.a.3]. For limitations [1.b] through [1.g], all 481 DI Products are classified into two different groups based on whether they use a VTM3 or VTM4 controller. *Id.* at 104; *see CX-0008C* (Fayed WS) at Q/A 721 (listing products using VTM3), 735 (listing products using VTM4). As determined below, Vicor has shown practice of claim 1 for the VTM3 products but not the VTM4.

### **1. Undisputed Claim Limitations**

Vicor contends that the majority of the claim limitations are not in dispute across all 481 DI Products including limitations [1.a.1]-[1.a.3], [1.b], and [1.d]-[1.f]. CIB at 104 (citing EDIS Doc. ID 821356). Respondents' and Staff's briefing confirms this is the case. *See RIB* at 19-23; RRB at 9-11; SIB at 74. For these limitations, Dr. Fayed opines that each representative product includes: a power converter operating synchronously in a series of cycles (element [1.a.1]), a primary switch to drive a resonant power train including a transformer with resonant frequency, and a secondary switch (elements [1.a.2], [1.a.3]), an internal oscillator which generates clock signals at a preset frequency (elements [1.b], [1.f]), and control signals generated based upon the clock signals that turn switches ON and OFF at ZVS and ZCS conditions (elements [1.d], [1.e]). *CX-0008C* (Fayed WS) at Q/A 701-720, 721-734, 735-745.

### **2. Limitation [1.c]**

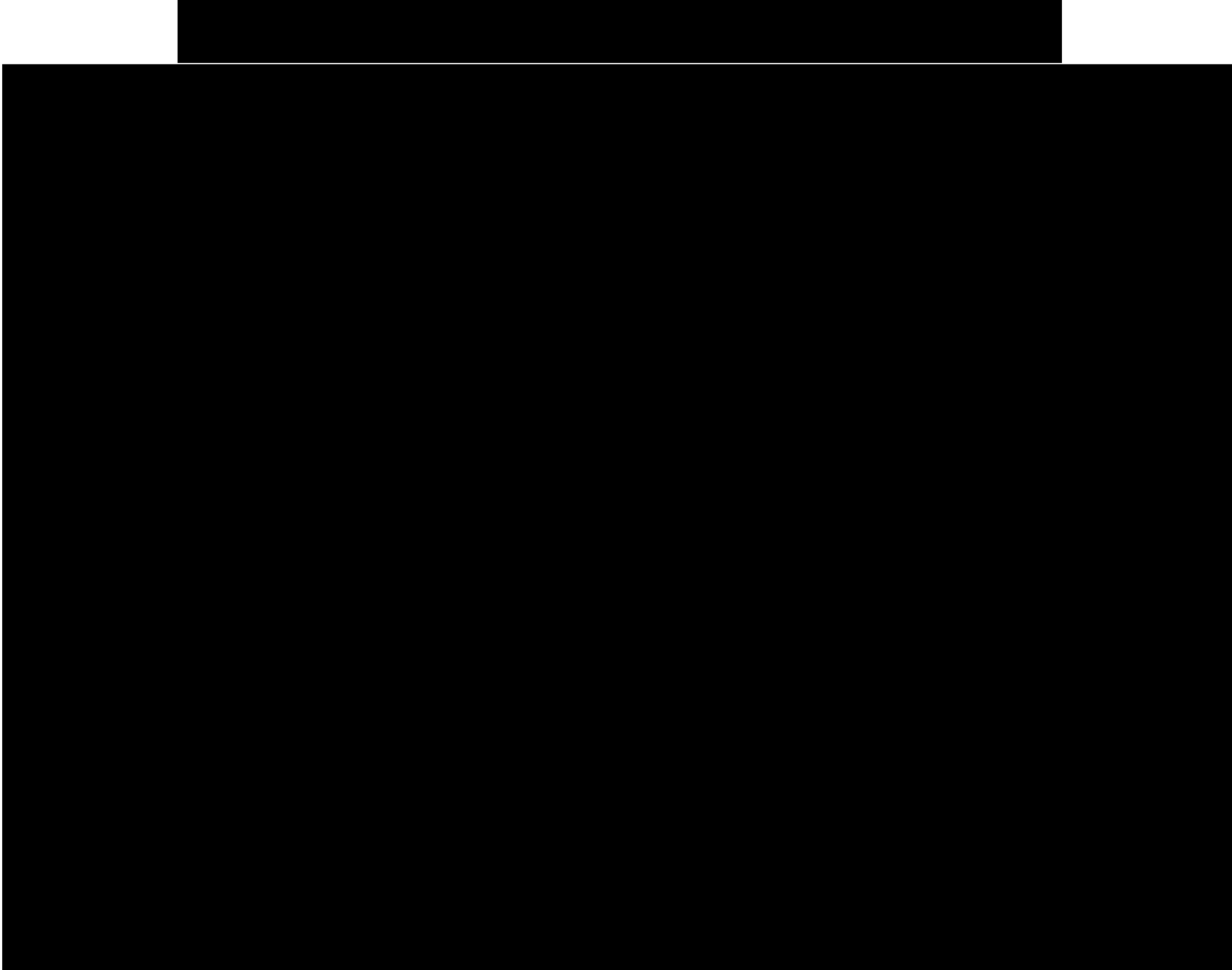
Limitation [1.c] is presented above and concerns the generation of clock signals based on the circuit's standard, or resonant, operating period and frequency. *See* 481 patent at cl. 1. Starting with the VTM3 products, Vicor points to four [REDACTED]

[REDACTED]

[REDACTED]. CIB at 105 (citing CX-0008C (Fayed WS) at Q/A 726). Vicor  
argues, [REDACTED]

[REDACTED]

[REDACTED]



[REDACTED]

[REDACTED]

*Id.* at 106-107 (citing CX-1034C.0002). For both controllers, Vicor argues [REDACTED]

[REDACTED]

[REDACTED] *Id.* at 107 (citing

CX-0008C (Fayed WS) at Q/A 726, 729). Vicor correctly argues that Respondents do not actually dispute this limitation for one of the VTM3 products (MCM) and one of the VTM4 products (NBM).

*Id.* at 107-108, 108 n.17 (citing EDIS Doc. ID 821356). Staff agrees with Vicor. SIB at 74-75.

Respondents have two counter arguments in connection with limitation [1.c]. For just the BCM and VTM products, they argue the datasheets of these products—as distinguished from the datasheets specific to the VTM3 and VTM4 controllers—indicate they “operate with variable switching frequencies,” which is a problem because Vicor allegedly distinguished claim 1 from

[REDACTED]

variable switching frequency techniques in the invalidity context. *See* RIB at 20-21 (citing RX-0010C (Hopkins RWS) at Q/A 507-509; CX-0958.0005 (BCM datasheet); CX-0963.0005 (VTM datasheet); CX-3578C (Fayed RWS) at Q/A 145-146)); RRB at 10. For the DCM product, Respondents argue it is a “regulated power converter” which, again, Vicor allegedly disclaimed from the scope of claim 1 in connection with invalidity. *See* RIB at 21 (citing RX-0010C (Hopkins RWS) at Q/A 510-511; CX-2078.0001 (DCM datasheet); CX-3578C (Fayed RWS) at Q/A 141, 146, 148, 151-152, 154); RRB at 10-11.

For the BCM and VTM products, Respondents are not persuasive. Their argument that BCM and VTM vary [REDACTED]  
[REDACTED], which Vicor and Dr. Fayed credibly explain  
[REDACTED]:



**BCM6135CD1E5165yzz**

**Electrical Specifications**

Specifications apply over all line and load conditions, unless otherwise noted; **boldface** specifications apply over the temperature range of  $-40^{\circ}\text{C} \leq T_{\text{INTERNAL}} \leq 125^{\circ}\text{C}$  (T-Grade). All other specifications are at  $T_{\text{INTERNAL}} = 25^{\circ}\text{C}$  unless otherwise noted.

Attribute	Symbol	Conditions / Notes	Min	Typ	Max	Unit
<b>General Powertrain Specification – Forward-Direction Operation (High-Voltage Side to Low-Voltage Side)</b>						
HI-Side Voltage Range, Continuous	$V_{\text{HI\_DC}}$		260	384	410	V
HI-Side Voltage Range, Transient	$V_{\text{HI\_TRANS}}$		260		410	V
HI-Side Voltage Initialization Threshold	$V_{\text{HI\_ACTIVE}}$	HI-side voltage where internal bias and controller are initialized (powertrain inactive)		150		V
HI-Side Quiescent Current	$I_{\text{HI\_Q}}$	Disabled, EN inactive state, $V_{\text{HI\_DC}} = 384\text{V}$		2		mA
No-Load Power Dissipation	$P_{\text{HI\_NL}}$	$V_{\text{HI\_DC}} = 384\text{V}$		14	42	W
		$V_{\text{HI\_DC}} = 260 - 410\text{V}$			62	
Transformation Ratio	$K$	High voltage to low voltage $K = V_{\text{LO\_DC}} / V_{\text{HI\_DC}}$ , at no load		1/8		V/V
LO-Side Current, Continuous	$I_{\text{LO\_OUT\_DC}}$				65	A
LO-Side Current, Pulsed	$I_{\text{LO\_OUT\_PULSE}}$	20ms pulse, 25% duty cycle			78	A
LO-Side Peak Overload Current	$I_{\text{LO\_OUT\_OVL0}}$	5ms			97.5	A
		1ms			104	
		500μs			110.5	
		200μs			123.5	
Efficiency, Ambient	$\eta_{\text{AMB}}$	$V_{\text{HI\_DC}} = 384\text{V}$ , $I_{\text{LO\_OUT\_DC}} = 65\text{A}$	96.1	97.1		%
		$V_{\text{HI\_DC}} = 260 - 410\text{V}$ , $I_{\text{LO\_OUT\_DC}} = 65\text{A}$	95.0			%
		$V_{\text{HI\_DC}} = 384\text{V}$ , $I_{\text{LO\_OUT\_DC}} = 32.5\text{A}$	96.8	97.8		%
LO-Side Output Resistance	$R_{\text{LO\_AMB}}$	$V_{\text{HI\_DC}} = 384\text{V}$ , $I_{\text{LO\_OUT\_DC}} = 65\text{A}$	9.8	16.5	22.2	mΩ
Switching Frequency	$F_{\text{SW}}$	$V_{\text{HI\_DC}} = 384\text{V}$ , $I_{\text{LO\_OUT\_DC}} = 65\text{A}$	1.1	1.2	1.3	MHz
		Over rated line, continuous load range, temperature	1.1		1.5	
LO-Side Voltage Ripple	$V_{\text{LO\_OUT\_PP}}$	$C_{\text{LO\_EXT}} = 0\mu\text{F}$ , $I_{\text{LO\_OUT\_DC}} = 65\text{A}$ , $V_{\text{HI\_DC}} = 384\text{V}$ , 20MHz BW		425		mV
Effective HI-Side Capacitance	$C_{\text{HI\_INT}}$	Effective value at $V_{\text{HI\_DC}} = 384\text{V}$		0.188		μF
Effective LO-Side Capacitance	$C_{\text{LO\_INT}}$	Effective value at $V_{\text{LO\_DC}} = 48\text{V}$		37.7		μF
Rated LO-Side Capacitance (External)	$C_{\text{LO\_OUT}}$	Rated LO-side connected capacitance at start up, $I_{\text{LO\_OUT\_DC}} = 0\text{A}$ . Excessive capacitance may prevent module start up.			100	μF
Rated LO-Side Capacitance (External), Parallel Array Operation	$C_{\text{LO\_OUT\_AEXT}}$	$C_{\text{LO\_EXT}} \text{ Max} = N \cdot 0.5 \cdot C_{\text{LO\_EXT}} \text{ Max}$ , where N = number of units in parallel				

CX-0958.0005;

[REDACTED]

[REDACTED]

CX-0936C.0005; CX-0008C (Fayed WS) at Q/A 751. This is typical electronic product tolerance information. And the cover pages of the product datasheets flatly state [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

CX-1033C.0001;

[REDACTED]

[REDACTED]

CX-1034C.0001; *see* RX-0867C (Ladas Dep.) at 77:1-9, 92:20-21. Dr. Hopkins asserts the BCM devices have a switching frequency “that moves”—and implies the same for the VTM—but offers no explanation of why it would move or by what control mechanism. *See* RX-0010C (Hopkins RWS) at Q/A 507-509. Nor does he attempt to explain the cover page statements provided above. Moreover, the argument was not made against the DCM product (challenged on separate grounds, below), which may be because its datasheet tolerance table leaves [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

CX-2078C.0005. Overall, Respondents' position is untenable.

For the DCM product, the DCM3110S60E02A3TN0 is a "48V to Point-of-Load Regulated DC Converter":

[REDACTED]

CX-2078C.0001. Vicor does not dispute that "regulated" converters do not meet limitation [1.c]—*i.e.*, Respondents do not mischaracterize Vicor's invalidity position. CIB at 109; CX-0008C (Fayed WS) at Q/A 754.

Nevertheless, the overall weight of the evidence favors Vicor's explanation that [REDACTED]

[REDACTED]

*See* CIB at 109 (citing CPX-0009C.489-491); CX-0008C (Fayed WS) at Q/A 754. Respondents do

[REDACTED]

not dispute this factual matter, and instead argue that all other evidence is a “red herring” as compared to the datasheet’s cover page. RRB at 10-11. Given other information within the document that corroborates Vicor’s explanation, Vicor is more persuasive here. CX-2078C.0001 ([REDACTED]), 0012 ([REDACTED]), 0017 ([REDACTED]); CPX-0009C.490 ([REDACTED]), 491 ([REDACTED]).

Accordingly, all DI Products have been shown to practice limitation [1.c].

**3. Limitation [1.g]**

Limitation [1.g] is presented above and concerns the timing of the timing control signals sent to the primary and secondary switches. The parties divide the discussion between products using the VTM3 or VTM4 controllers.

For the VTM3 products, Vicor contends [REDACTED]

[REDACTED]

[REDACTED] In his explanation, Dr. Fayed cites the following table showing [REDACTED]:

[REDACTED TABLE]

CX-0008C (Fayed WS) at Q/A 733 (citing CX-1033C.0013). Vicor then describes a different

[REDACTED]

[REDACTED]. CIB at 110-111 (citing CPX-0009C.0703). Vicor adds,

[REDACTED]

[REDACTED]

[REDACTED] *Id.* at 110 (citing CX-0008C (Fayed WS) at Q/A 733). And in response to Respondents’ assertion that it has not adequately shown the generation of the timing control signals (whose own timing must be set independently), Vicor argues:

As Dr. Fayed explained, each of these arguments is flawed and without merit. CX-0008C (Fayed WS) at Q/A 761–762. Similar to the VTM4 Controller allegations with respect to claim limitation [1.g] discussed below, the main point here is that the ON time and OFF time is programmed independently. CX-0008C (Fayed WS) at Q/A 762. These are the events Dr. Fayed focuses on to show the practice of claim limitation [1.g] of the claim. Again, Dr. Hopkins does not dispute this, and his other arguments miss the point and are irrelevant to the analysis, even though they are also flawed. *Id.*

CIB at 112. Staff agrees with Vicor. SIB at 75-78.

Respondents generally argue as Vicor describes—that the alleged secondary signals Q51G and Q52G can be generated two ways, and that Vicor “has failed to show which of these two methods is used to generate the secondary control signals.” RIB at 23 (citing RX-0010C (Hopkins RWS) at Q/A 515). They add that Vicor has not shown enough connections under one of these two ways and “[w]ithout this evidence, Vicor has not and cannot establish that the VTM3 controller can meet limitation 1(g).” *Id.*; *see generally* RRB at 11.

The record shows the limitation is met. There is no dispute that [REDACTED]

[REDACTED]

[REDACTED]. CX-0008C (Fayed WS) at Q/A 726; CX-0013C.0002; CPX-0009C.0385. And the cited layout files show

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

CPX-0009C.0386 (showing PDIR\_ON);

[REDACTED]

[REDACTED]

*Id.* at .0387 ([REDACTED]); CX-0008C

(Fayed WS) at Q/A 731, 733.

On the secondary side, there is no dispute that [REDACTED]

[REDACTED]. But it does not matter, as Respondents allege, whether [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] CPX-

0009C.0385-387, 703. Nor is there evidence that [REDACTED]

[REDACTED]. CPX-0009C.0702.

So, in this way, the timing of the [REDACTED]

[REDACTED] which satisfies the claim language, “may be set independently of other timing control signals and events.”

Accordingly, the VTM3 products practice limitation [1.g], and thus all of claim 1 of the 481 patent.

For the VTM4 products, Vicor contends, [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] CIB at 112 (citing CX-0008C (Fayed WS) at Q/A 744; CX-1034C.0002; CPX-0009C.0414). Vicor refers to the following layout shown in the VTM4 datasheet to show

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

CX-1034C.0002; *see* CIB at 107, 112-113. Vicor then specifically identifies a [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] To demonstrate this relationship, Vicor refers

to the following timing diagram and explains that the [REDACTED]

[REDACTED]

[REDACTED]

CIB at 114 (citing CX-0008C (Fayed WS) at Q/A 745; CPX-0009C.0427). Vicor dismisses the

[REDACTED]

Respondents and Dr. Hopkins do not dispute this and this is the key point. . . . Dr. Hopkins’s other arguments are beside the point.” *Id.* at 115.

The evidence shows the limitation is not met. As stated above in the contexts of infringement and VTM3 products, limitation [1.g] requires setting the timing of a control signal independently, that is, without affecting the timing of other control signals. In other words, [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] This is confirmed

by Dr. Hopkins and Mr. Ladas. RIB at 22 (citing RX-0010C (Hopkins RWS) at Q/A 515-516; RX-0025C (Ladas Dep.) at 91:10-92:10 (“[REDACTED].”). So any time

[REDACTED], and it

has not been shown the timing of one signal may be set independent of the other. Vicor argues that

setting ON independently from OFF is sufficient, but as Respondents state, “ON and OFF times are

not timing control signals, but rather the length of time the timing control signals are ON and OFF.”

RRB at 11.

And to the extent Vicor argues [REDACTED]

[REDACTED] (*see generally* CIB at

112-113, 115)—this argument is inconsistent with Vicor’s arguments as to other elements. The

claimed “control signals” are introduced in limitation [1.c], and Vicor identifies them [REDACTED]

[REDACTED]; nowhere in Vicor’s briefing or Dr. Fayed’s testimony are TON and TOFF identified in the

context of limitation [1.c]. *Compare* CIB at 107 ([REDACTED]

[REDACTED]) *with id.* at 115 (“limitation [1.g] is practiced because in VTM4, the ON TIME and OFF

TIME are programmed independently”); CX-0008C (Fayed WS) at Q/A 739, 748-756.

Accordingly, the VTM4 products do not practice limitation [1.g], and thus do not practice

claim 1 of the 481 patent.

**G. Validity**

Respondents contend claim 1 of the 481 patent is invalid as obvious over a single prior art combination. RIB at 41-51. For the reasons discussed below, Respondents have not shown claim 1 to be invalid.

**1. Priority Date**

The parties first dispute the priority date of the 481 patent. Vicor contends, “[t]he invention claimed in claim 1 of the ’481 Patent was conceived in April 2010 and reduced to practice from April 2010 to mid-2011.” CIB at 100 (citing CX-0001C (Vinciarelli WS) at Q/A 74-90); *see generally* CRB at 56-57 (citing, *inter alia*, RX-0828C.0004). More specifically, Vicor alleges the invention came about “

” CIB at 100 (citing, *inter alia*, CX-1020C; CX-0998C; CX-1005C; CX-0999C); *see id.* (citing CX-1009C; CX-2161; CX-0008C (Fayed WS) at Q/A 670-675). Alternatively, Vicor contends the priority date should be the filing of non-provisional application 13/830,262 on March 14, 2013. *Id.* Respondents and the Staff assert the patent is only entitled to the later date of March 14, 2013. *See* RIB at 16; SIB at 69-70.


A patent owner may antedate an asserted prior art patent by showing conception of the claimed invention prior to the critical date and “[a] conception must encompass all limitations of the claimed invention.” *Cumberland Pharms. Inc. v. Mylan Institutional LLC*, 846 F.3d 1213, 12158 (Fed. Cir. 2017) (citing, *inter alia*, *Slip Track Sys., Inc. v. Metal-Lite, Inc.*, 304 F.3d 1256, 1263 (Fed. Cir. 2002)). “Conception requires more than ‘a general goal or research plan’; it requires a ‘definite and permanent,’ ‘specific, settled idea,’ namely, the idea defined by the claim at issue.” *Id.* (citing *Burroughs Wellcome Co. v. Barr Labs., Inc.*, 40 F.3d 1223, 1228 (Fed. Cir. 1994)).

[REDACTED]

Vicor has not shown this. The only document dated in April of 2010 is an email chain designated CX-1020C, and as Respondents argue, these emails fail to demonstrate the inventors had possession of at least the claim limitation “[REDACTED]” See CX-1020C; RIB at 18. No witnesses testified that any of the technical details present in the document implicate this feature. See CX-0001C (Vinciarelli WS) at Q/A 76-80, 89; CX-0008C (Fayed WS) at Q/A 667-672; CX-3578C (Fayed RWS) at Q/A 116-119. Rather, Vicor contends that a separate email exchange dated late May-June, 2010, RX-0828C, provides the disclosure. CRB at 57 (citing CX-3578C (Fayed RWS) at Q/A 118). Vicor states: “However, as Dr. Fayed explains, RX-0828C.0004 shows that [REDACTED] [REDACTED] [REDACTED] as Claim 1 requires.” CRB at 57 (citing CX-3578C (Fayed RWS) at Q/A 118).

RX-0828C is not among the filed exhibits, but it has the same bates number (VICOR-ITC\_00054745) as CX-0997C. CX-0997C is dated between May and June 2010, and is not evidence of conception in April 2010. Nor is it any sort of summary or clarification of what had been previously communicated in CX-1020C. Rather, it is a continuation of the brainstorming session between the inventors—focused on a [REDACTED] See CX-0997C.0003 (“Sergey, On further reflection, [REDACTED] [REDACTED]”), .0002 (“Sergey, summarizing the outcome of our discussion earlier today . . .”), .0001 (suggesting [REDACTED] Moreover, the document fails to disclose [REDACTED], and even if the [REDACTED] [REDACTED] according to Vicor’s theory (see CRB at 57), they have no clear



 disclosed or shown in CX-1020C. *See* CX-1020C.0001 (figure). Indeed, Vicor does not attempt to make the connection between the documents. *See* CRB at 57; CX-3578C (Fayed RWS) at Q/A 118.

Accordingly, Vicor has not shown conception of all limitations of claim 1 in April 2010. The priority date of the 481 patent is thus its filing date, March 14, 2013.

**2. Prior Art**

Respondents' obviousness invalidity case is based on two prior art references: an article submitted by Texas Instruments as part of the Power Supply Design Seminar (RX-0551; RX-0585) ("McDonald"), and a technical manual for a Texas Instruments digital controller (RX-0556) (TI "UCD3138"). *See* RIB at 41-43; Tr. (Hall-Ellis) at 564:21-565:6. McDonald is entitled, "Design and Optimization of a High-Performance LLC Converter," its cover notes it is "[r]eproduced from 2012 Texas Instruments Power Supply Design Seminar SEM2000, Topic 5, TI Literature Number: SLUP306," and it is authored by Brent McDonald and Dave Freeman. RX-0551.0001-2. Respondents contend it "was publicly available at least by September 25, 2012." RIB at 41 (citing RX-0009 (Hall-Ellis WS) at Q/A 61; Tr. (Hall-Ellis) at 577:9-587:12; RX-0587.0006), 42 (citing RX-0586.0004; CX-3739.0018).

The record reflects a clear and convincing case that McDonald was publicly disseminated by September 25, 2012 and is prior art under 35 U.S.C. § 102(a) (pre-AIA). The document has a 2012 copyright year, and while it has an additional 2013 copyright year, Respondents' expert Dr. Hall-Ellis provides persuasive testimony that 2013 refers to a two-page appendix of contact information. Tr. (Hall-Ellis) at 574:1-576:22. The document notes it was distributed as part of a seminar series occurring in 2012 (RX-0551.0001), which a current TI website capture and a past October 2012 capture corroborate (RX-0586.0004; RX-0587.0006). The October 2012 capture



further lists September 25, 2012 as the first event of the seminar series (RX-0587.0004), and Dr. Hall-Ellis provides credible expert testimony that paper copies or e-copies on thumb drives were commonly provided at seminars of that time, despite not having been at that seminar herself. Tr. (Hall-Ellis) at 577:13-21. Vicor’s unpersuasively questions Dr. Hall-Ellis’ credibility, but does not challenge the authenticity of either website capture, and does not provide any alternative explanation for the 2012 date appearing in multiple exhibits. See CRB at 58-59. Vicor also contends Respondents failed to raise this theory of seminar-distribution in their pre-hearing brief (*id.*), but the brief states “McDonald is a paper from the 2012 Texas Instruments Power Supply Design Seminar held on September 25, 2012” and cites Dr. Hall-Ellis’s testimony, which fairly makes the point. See RPB at 80 (citing RX-0009 (Hall-Ellis WS) at Q/A 61-64). Accordingly, McDonald is prior art to the 481 patent under 35 U.S.C. § 102(a) (pre-AIA).

TI UCD3138 is entitled, “UCD3138 Highly Integrated Digital Controller for Isolated Power [Data Manual].” RX-0556.0001. The cover page states: “Literature Number: SLUSAP2 A, March 2012—Revised March 2012” as well as “PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of the Texas Instruments standard warranty. Production Processing does not necessarily include testing of all parameters.” *Id.* Every page of the document bears a footnote with a copyright year of 2012. RX-0556. Respondents contend, “TI UCD3138 is a publicly accessible March 2012 data manual from Texas Instruments for the UCD3138 Highly Integrated Digital Controller for Isolated Power,” and “TI UCD3138 qualifies as prior art under 35 U.S.C. § 102(a)” based on a March 14, 2013 priority date for the 481 patent. RIB at 43 (citing RX-0556.0001). Vicor offers no dispute. See CRB at 60. Accordingly, TI UCD3138 is also prior art to the 481 patent under 35 U.S.C. § 102(a) (pre-AIA).

**3. Obviousness in View of McDonald and TI UCD3138**

Respondents contend the combination of McDonald and TI UCD3138 render claim 1 invalid as obvious under 35 U.S.C. § 103. RIB at 41. Respondents look to McDonald for its disclosed transformer circuit, including primary switches Q1, Q2 and secondary (rectifier) switches Q3 and Q4 as shown below:

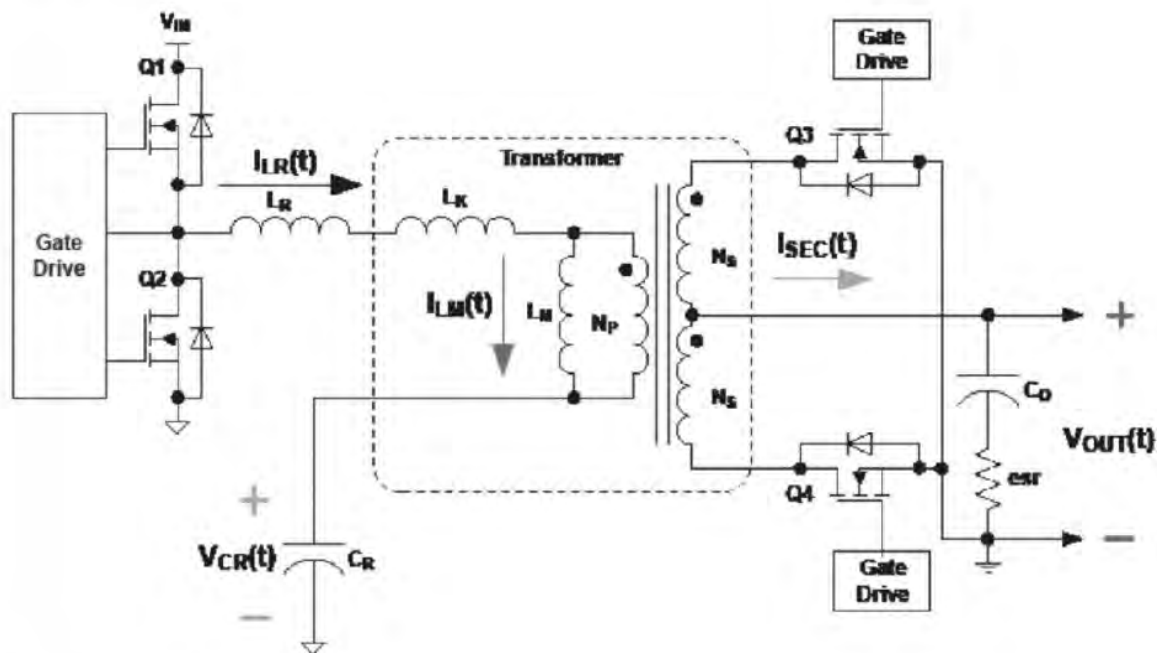


Figure 1 – Basic LLC schematic.

RX-0551; see RIB at 44. And they look to TI UCD3138 as the controller which sends signals DPWM0A, DPWM0B, DPWM1A, and DPWM1B to control the switching events of Q1-Q4. RIB at 45-47 (citing RX-0007C (Hopkins WS) at Q/A 383-385; RX-0556.0029), 50-51 (citing RX-0007C (Hopkins WS) at Q/A 395); RX-0556.0027). Respondents argue it would have been obvious to combine the references in this way because “McDonald explicitly states that the converter depicted therein uses ‘a Texas Instruments UCD3138 digital controller’ to facilitate ‘easy



optimization and evaluation of the various control features.” *Id.* at 43-44 (citing RX-0007C (Hopkins WS) at Q/A 375; RX-0551.0022).

Vicor first notes that the Patent Trial and Appeal Board (“PTAB”) recently denied institution of an IPR on the 481 patent based on these same references. CRB at 58 (citing EDIS Doc. ID 822081, Ex. 1). Vicor then disputes whether a POSITA would have made the proffered combination based on a lack of motivation (*id.* at 60-63). This is not persuasive. Vicor acknowledges McDonald’s by-name disclosure of UCD3138 as its controller but argues “McDonald’s brief mention of TI UCD 3138, RX-0551.0022, is not enough to establish that a POSITA would have combined the references *in the way* Dr. Hopkins did.” *Id.* at 61 (emphasis in original). Yet “the way” Respondents and Dr. Hopkins use the UCD3138 controller is exceedingly straightforward—it generates the on/off control signals sent to the four switches. Indeed, Vicor identifies a complicated technical consideration disclosed in McDonald as solved by the UCD3138 (“mode-switching problems” (RX-0551.0022)) only to then concede, “[t]his is again contrary to how Dr. Hopkins argued a POSITA would have used the TI UCD3138, which is simply to provide signals for switching the switches.” *Id.* at 62. So there is no teaching away or unpredictability of success in these references. The authors of McDonald expressly state they used the TI UCD3138 in their experimental build for this control-signal function:

## V. CONCLUSION

Figure 37 shows a picture of the completed evaluation module (EVM), while Figure 38 shows the corresponding efficiency of this converter.



Figure 37 – LLC EVM.

This EVM incorporates all of the features described in this paper, enabling a solution that provides competitive efficiency while maintaining the classic high-performance features designers are accustomed to using in buck-derived topologies.

The heart of this system uses a Texas Instruments UCD3138 digital controller. This facilitated easy optimization and evaluation of the various control features discussed in Section IV. The digital core of the UCD3138 also provided an efficient solution to the mode-switching problems while maintaining a minimum component count.

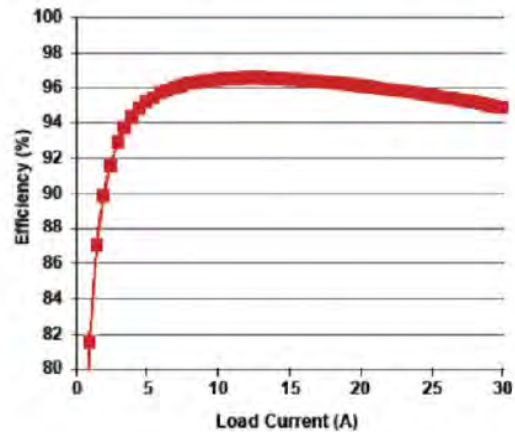


Figure 38 – LLC EVM efficiency.

RX-0551.0022. Accordingly, Respondents have clearly shown the combination would have been obvious. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1372-3 (Fed. Cir. 2019) (“HP relied on Nelson simply to demonstrate that a person of ordinary skill in the art would have understood that the string compression disclosed in O’Brien was, in fact, a type of dictionary encoder, the terminology used in the ‘812 patent.”).

Respondents then provide a limitation-by-limitation comparison of the combination against each limitation of claim 1. RIB at 44-51. These contentions are largely persuasive. For limitations [1.a.1]-[1.a.3], McDonald discloses a DC-DC power converter, with primary and secondary switches (Q1-Q4), with a resonant power train including a transformer (inductors  $N_p$ ,  $N_s$ ) and resonant frequency and period (“Operation at resonance”). RIB at 44-45 (citing RX-0007C (Hopkins WS) at Q/A 377-381; RX-0551.0003-4 (“In Figure 2, the input voltage has been varied so



that the system control effort (the operating frequency) is exactly equal to the dominant frequency of the resonant tank.”). Vicor’s reference to McDonald teaching variable-frequency control schemes (CRB at 63) does not take away from it also teaching operating at a circuit’s resonant frequency (*In re Mouttet*, 686 F.3d 1322, 1331 (Fed. Cir. 2012) (“A reference may be read for all that it teaches, including uses beyond its primary purpose.”) (internal citation omitted)).

For limitation [1.b], Respondents point to TI UCD3138 and argue it “discloses an oscillator with an oscillator frequency that generates clock signals.” RIB at 46 (citing RX-0007C (Hopkins WS) at Q/A 383; RX-0556.0017, 0030, Fig. 2.4). Vicor seems to complain that a POSITA would not know “which signals from TI UCD3138 should be connected to which signals in Fig. 1 of McDonald.” CRB at 64 (citing CX-3578C (Fayed RWS) at Q/A 142). But this has nothing to do with whether the TI UCD3138 uses an oscillator to generate clock signals, which it does.

For limitation [1.c], as noted, Respondents contend the TI UCD3138 generates signals DPWM0A, DPWM0B, DPWM1A, and DPWM1B to control the opening and closing of switches Q1-Q4 in McDonald. RIB at 46-47 (citing RX-0007C (Hopkins WS) at Q/A 385). These signals from McDonald are shown below:

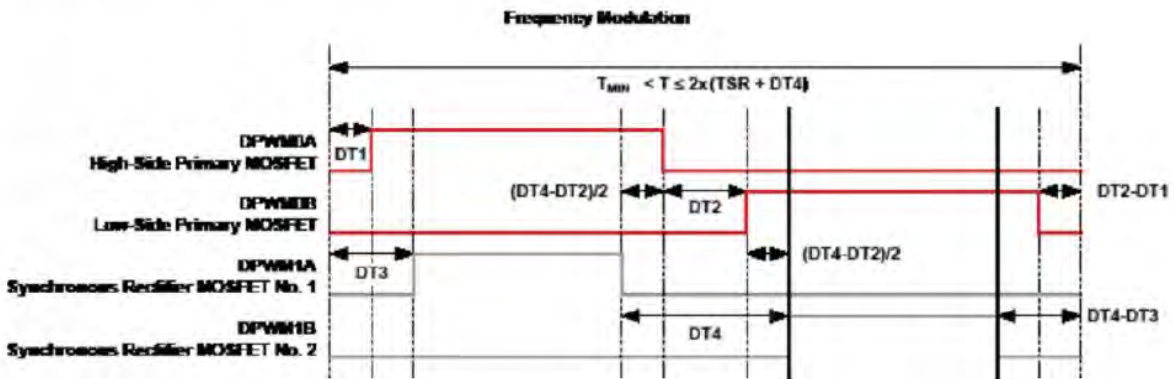
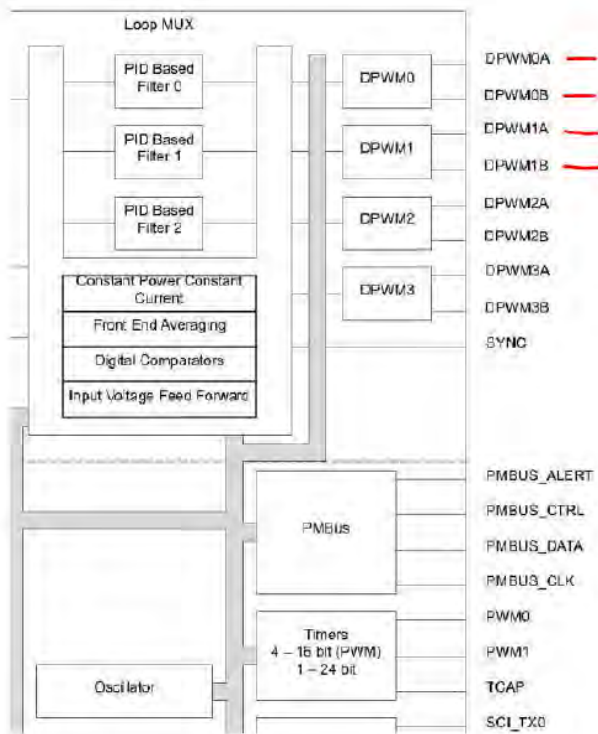


Figure 25 – Frequency modulation.

RX-0551.0018, Fig. 25. And here they are in UCD3138:



**4.4.1.3 DPWM Events**

Each DPWM can control the following timing events:

1. *Sample Trigger Count*—This register defines where the error voltage is sampled by the EADC in relationship to the PWM period. The programmed value set in the register should be one fourth of the value calculated based on the PWM clock. As the DCLK (DCLK = 62.5 MHz max) controlling the circuitry runs at one fourth of the PWM clock (PCLK = 250MHz max). When this sample trigger count is equal to the PWM Counter, it initiates a front end calculation by triggering the EADC, resulting in a CLA calculation, and a DPWM update. Over-sampling can be set for 2, 4 or 8 times the sampling rate.
2. *Phase Trigger Count*—count offset for slaving another DPWM (Multi-Phase/Interleaved operation).
3. *Period*—low resolution switching period count. (count of PCLK cycles)
4. *Event 1*—count offset for rising PWM A event. (Count of PCLK cycles)
5. *Event 2*—PWM count for falling PWM A event that sets the duty ratio. Last 4 bits of the register are for high resolution control. Upper 14 bits are the number of PCLK cycle counts.
6. *Event 3*—PWM count for rising PWM B event. Last 4 bits of the register are for high resolution control. Upper 14 bits are the number of PCLK cycle counts.
7. *Event 4*—PWM count for falling PWM B event. Last 4 bits of the register are for high resolution control. Upper 14 bits are the number of PCLK cycle counts.
8. *Cycle Adjust*—Constant offset for Event 2 and Event 4 adjustments.

Basic comparisons between the programmed registers and the PWM counter can create the desired edge placements in the DPWM. High resolution edge capability is available on Events 2, 3 and 4.

RX-0556.0009, Fig. 2.4 (annotated), 0028 (annotated). Respondents conclude: “As a result, one can set the event-count values in TI UCD3138 to make independent timing control signals



(DPWM01, DPWM0B, DPWM1A, DPWM1B) have a resonant period and frequency to operate the switches of the converter in resonance mode.” RIB at 47. The 481 patent states in its background that a POSITA would know the benefits of operating at the resonant (standard) operating period and frequency. *See* 481 patent at 1:60-2:22 (“One way to efficiently recycle the energy is to use a resonant technique.”). And McDonald alludes to its benefits as well. RX-0551.0008 (“You can address this by constraining the operating frequency to a range where the curves are monotonic, as shown by the gray box. . . . This method is an extremely useful approximation for determining the DC operating point near the resonant frequency.”); *see id.* at .0007, Fig. 9 (marking “Nominal Operating Point” approximately on resonant frequency line).

Thus, it is clear a POSITA would have found it obvious to set clock signals based on the circuit’s resonant frequency, and then generate the control signals DPWM01, DPWM0B, DPWM1A, DPWM1B based on that clock. Vicor’s opposition to this limitation is essentially that McDonald also teaches varying the operative frequency away from resonant to control output voltage. *See* CRB at 64-66 (“Consistently, Dr. Hopkins also agreed that ‘McDonald . . . discusses operating above the resonant frequency’ and ‘below the resonant frequency.’”). That may be so, but again, a reference is good for all that it teaches (*In re Moullett*, 686 F.3d at 1331) and McDonald teaches the concept of matching operating frequency to resonant frequency (*see, e.g.*, RX-0551.0004, Fig. 3).

Skipping ahead to limitations [1.f] and [1.g], Respondents persuasively contend the oscillator in TI UCD3138 “has an internal oscillator frequency  $f_{(PCLK)}$  that is preset and has a typical frequency of 250 MHz” (RIB at 50 (citing RX-0556.0017)) and “the timing of the timing control signals is set independently because each rising edge and falling edge of DPWM A and DPWM B are independent events (Event 1, Event 2, Event 3, and Event 4) and are not dependent on the timing



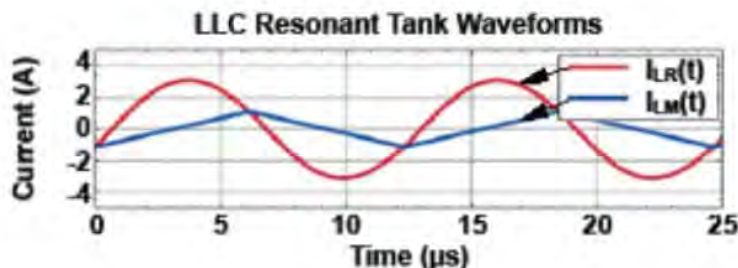
of other events” in its open-loop mode of operation (*id.* at 51 (citing RX-0556.0029)). Vicor offers no dispute to these limitations in the McDonald and TI UCD3138 combination, and they are disclosed as alleged. *See* CRB at 58-70.

This leaves limitations [1.d] and [1.e], which concern ZVS and ZCS for all of Q1-Q4. Here, Respondents do not meet the “clear and convincing” standard. For limitation [1.d], Respondents have shown that McDonald teaches the primary switches, Q1 and Q2, operating with ZVS because it is explicitly disclosed in McDonald:

Figure 2 illustrates how this system achieves zero voltage-switching (ZVS) on Q1 and Q2. In this figure, both Q1 and Q2 are modeled as ideal switches in parallel with a capacitor and diode. The node connecting Q1 and Q2 is driven by an inductor. This inductor behaves, conceptually, as a current source during the transition time.

RX-0551.0005; *see* RIB at 47-48. Vicor does not dispute this. *See* CRB at 67-69. McDonald also explicitly teaches the secondary switches, Q3 and Q4, operating with ZCS: “In Figures 3 and 4, notice that the current through Q3 and Q4 naturally decays to 0A, providing zero current switching (ZCS) for these devices.” RX-0551.0003; *see* RIB at 49.

As for the primary switches operating with ZCS, Dr. Hopkins opines that it is shown in Figure 3 of McDonald. Specifically, he explains that the peaks of the triangular  $I_{LM}$  waveform, shown below, indicate the points at which Q1 and Q2 switch:





RX-0007C (Hopkins WS) at Q/A 387 (“This means that the switches are switching on and off at the minimum and maximum points of the magnetizing current  $I_{LM}$  (blue waveform) . . .”) (citing RX-0551.0004, Fig. 3). And, according to Respondents and Dr. Hopkins, based on the labeling of currents  $I_{LR}$  and  $I_{LM}$  in the circuit diagram of Figure 1, when  $I_{LR} = I_{LM}$  the resonant current must be zero. RIB at 48; RX-0007C (Hopkins WS) at Q/A 387. Thus, they reason, because the peaks of  $I_{LM}$  occur right where  $I_{LR}$  and  $I_{LM}$  intersect, zero current switching exists. RIB at 48; RX-0007C (Hopkins WS) at Q/A 387.

Vicor offers no technical opposition here except to argue that Figure 3 is not actually achieved by the McDonald system, as compared to the more commonly achieved waveforms of Figure 4 and 5. CRB at 68 (“Dr. Hopkins again took the ‘piecewise’ analysis of McDonald’s operation, RX-0551 at 5.0004—that discusses a boundary state (operation at a specific frequency)—and claims that this boundary, singular state is representative of the entire operation of the converter.”). But, again, a reference is good for all it teaches, and McDonald teaches operating at resonant frequency as in Figure 3 (however difficult in practice it may be). Vicor also refers to a passage which describes circumstances in which ZCS is “los[t]” for “these devices” (*id.* at 67 (citing RX-0551.0005)), but when read in context, the passage clearly relates to switches Q3 and Q4 losing ZCS, not Q1 and Q2:

Figure 5 illustrates the waveforms for the condition of Equation 3. More distortion is now present in the waveforms, making the sinusoidal characteristics less pronounced. In this case, the primary MOSFETs Q1 and Q2 are switched before  $I_{LR}(t)$  is equal to  $I_{LM}(t)$ . This does not affect the ZVS on Q1 and Q2; however, it does change the switching characteristics of Q3 and Q4.

In Figures 3 and 4, notice that the current through Q3 and Q4 naturally decays to 0 A, providing zero current switching (ZCS) for these devices. In this case, switching Q1 and Q2 – prior to Q3 and Q4 reaching zero current – results in the loss of ZCS for these devices.

(RX-0551.0005). So limitation [1.d] is disclosed in McDonald as alleged.

As for limitation [1.e], however, Vicor disputes whether Q3 and Q4 achieve ZVS, and Respondents have not clearly and convincingly shown these secondary switches operate at ZVS for turning both ON and OFF. *See* 481 patent at cl. 1. Respondents and Dr. Hopkins are persuasive in their assertion—without dispute from Vicor—that turning OFF from an ON state with zero voltage across the switch is inherent “because when a MOSFET switch is on it has zero volts across it, and in the short time it takes to turn off, the voltage does not change significantly because the inherent capacitance of the device mitigates fast changes in voltage.” RIB at 50; RX-0007C (Hopkins WS) at Q/A 389; *see* CRB at 69-70.

But when turning ON from an OFF state, Dr. Hopkins’ explanation is less clear. In his direct testimony, he simply points to the following excerpt from McDonald without more: “that in all cases, the body-diode conduction time across the synchronous rectifiers is very close to minimum.” RX-0007C (Hopkins WS) at Q/A 389; RIB at 50 (citing RX-0551.0021). And during his redirect he added, “[a]nd then when they turn on, you turn your MOSFET, the diodes are already conducting, the internal diodes are conducting, which means you have no voltage across it. So then you turn



your MOSFET on and the zero voltage on the secondary devices also.” Tr. (Hopkins) at 752:15-19.

The relevance of “body-diode conduction time” being low or at a minimum has not been shown, and it is critical to Dr. Hopkins’ theory that the secondary switches turn on when the diodes are conducting, but unlike the detailed explanation for Q1 and Q2, there is no disclosure in McDonald of this occurring for Q3 or Q4. On cross examination, in fact, Dr. Hopkins admitted that “just before Q3 turns on . . . you would have a voltage—could have a voltage across it in reverse direction.” Tr. (Hopkins) at 710:18-25. His cross examination testimony regarding Q4 was more qualified (*see id.* at 711:20-714:3), but he did state that “there is voltage across the diode in reverse direction,” and in any event the disclosure in McDonald regarding OFF to ON switching of Q4 is essentially the mirror image of the disclosure regarding Q3 (*see* RX-0551.0021, Figs. 32 & 33). This is shown in Figures 32-34 of McDonald, which suggest drastic non-zero voltages at Q3 and Q4 OFF-to-ON switching times (CRB at 70; CX-3578C (Fayed RWS) at Q/A 155):



Figures 32, 33 and 34 illustrate this feature in action. Using the schematic in Figure 1 as a reference, the following legend applies to all three plots:

- Channel 1: Q3  $V_{DS}$
- Channel 2: Q4  $V_{DS}$
- Channel 3:  $I_{LR}$
- Channel 4: Q2  $V_{DS}$

Notice that in all cases, the body-diode conduction time across the synchronous rectifiers is very close to the minimum.

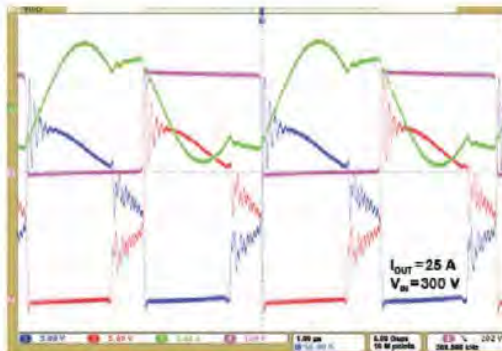
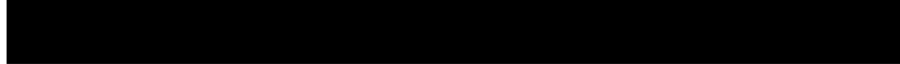


Figure 32 -  $V_{IN} = 300 V$ ,  $I_{OUT} = 25 A$ .

RX-0551.0021. Respondents do not address these figures, let alone rebut Dr. Fayed's characterization of them. See generally RIB at 43-50; RX-0007C (Hopkins WS) at Q/A 388-389; Tr. (Hopkins) at 709:3-714:3. Thus, a clear and convincing case of secondary-side ZVS in McDonald has not been made.

Accordingly, in view of the *Graham* factors, particularly the scope and content of the prior art, Respondents have not shown a prima facie case that the combination of McDonald and TI UCD3138 would have rendered claim 1 invalid as obvious. As for objective indicia of non-obviousness, as explained below in connection with the 761 patent Vicor has not shown copying and the licensing evidence is non-specific, and Vicor's case for long-felt need and failure of others hinges on "improved efficiency and heat dissipation," which have no clear connection to the 481 patent. CRB at 80; see generally *id.* at 71-88. There may be significant commercial success for embodiments of the 481 patent, but Vicor does not break down the relevant evidence between DI



Products containing the VTM3 controller relative to the VTM4 controller. *See* CX-0009C (Seth WS) at Q/A 187-88. So although the asserted DI Products for the 481 patent have certainly enjoyed commercial success (*see id.*), the actual proven embodiments have not been shown to enjoy it.

On balance, though, the failure to establish a prima facie case of obviousness is sufficient to find that Respondents have not met their burden. Therefore, the obviousness of claim 1 of the 481 patent has not been proven.

**V. U.S. PATENT NO. 9,516,761**

**A. Level of Ordinary Skill in the Art**

A person having ordinary skill in the art of the 761 patent at the time of invention:

would have at least a Master's degree in electrical engineering and two or more years of work experience relating to power electronics and the manufacture of power converters or printed circuit board design for power converters, with more experience potentially substituting for less education, or vice-versa.

Order No. 30 at 16. The parties do not challenge this definition (*see* CIB at 24; RIB at 52; SIB at 20), and it is applied throughout this initial determination.

**B. Priority Date**

The 761 patent issued from a divisional application of, and claims priority to, U.S. Patent Application No. 13/105,696, which was filed May 11, 2011. *See* 761 patent. There is evidence that the inventions claimed in the 761 patent were conceived as early as April 2010. *See* CX-0008C (Fayed WS) at Q/A 92-99. The three prior art references on which Respondents rely, however, all qualify as prior art even based on an April 2010 priority date, as explained below, nor is there any other disputed issue as to which the priority date is relevant. *See* RIB at 65-67 (citing RX-0321, RX-0322, and CX-3308C (Borgengren Dep.) at 69:20-70:18). The priority date of the 761 patent is therefore immaterial.



**C. Claims at Issue**

Claims 1-7 of the 761 patent (the “761 Asserted Claims”) are at issue in this investigation, either through allegations of infringement or DI technical prong. *See* CIB at 32-33. They are reproduced below, arranged based on their dependence from a preceding claim:

1. [pre] An apparatus comprising:

[a] a power converter including

[b] a printed circuit board (“PCB”) comprising a plurality of conductive layers and having a top surface and a bottom surface;

[c] a magnetic core structure magnetically coupled to a winding formed by traces in one or more of the conductive layers in the PCB; and

[d] a plurality of power semiconductor devices, a first set of the power semiconductor devices being mounted on the top surface and electrically connected to dissipate power at a level, Pt, during operation of the converter, a second set of the power semiconductor devices being mounted on the bottom surface and electrically connected to dissipate power at a level, Pb, during operation of the converter;

[e] wherein the power semiconductor devices are distributed between the first and second sets to distribute heat generation during operation of the converter such that each level Pt, Pb is less than 150% of the other level Pb, Pt.

2. The apparatus of claim 1 wherein a plurality of the power semiconductor devices in the first set are each positioned in a location on the top surface substantially overlapping a location on the bottom surface occupied by a power semiconductor device in the second set.

4. The apparatus of claim 2 wherein the power converter further comprises circuitry including a pair of cells having a common circuit topology and each including power semiconductor switches from each of the first and second sets; each cell having its respective components arranged in a pattern, wherein the pattern of components of one cell is substantially a mirror image of the pattern of components in the other cell.

5. The apparatus of claim 4 wherein a component from one of the cells is located on an opposite surface of a respective component from the other one of the cells.

6. The apparatus of claim 5 wherein the cells comprise input cells.

3. The apparatus of claim 1 wherein the power semiconductor devices are electrically connected using a respective set of conductive vias in the PCB, and a



plurality of the power semiconductor devices in the first set share their respective sets of conductive vias with corresponding power semiconductor devices in the second set.

7. The apparatus of claim 3 wherein the power semiconductor devices comprise output switches.

**D. Claim Construction**

As part of the *Markman* process, the following claim terms of the 761 Patent were construed:

<b>Claim Term</b>	<b>Construction</b>
a plurality of power semiconductor devices	two or more power semiconductor devices
pair of cells	two cells
a printed circuit board (“PCB”) comprising a plurality of conductive layers and having a top surface and a bottom surface	a printed circuit board (“PCB”) having at least two conductive layers and a top surface and a bottom surface, wherein said conductive layers can be surface layers
cell	set of components
input cells	set of components that handles input power
dissipate power at a level	dissipate power at an amount
output switch	device that allows current flow to the output when closed and provides isolation when open

*See* Order No. 30 at 16, 22-34. The parties present other disputes that allegedly require claim construction, which are addressed below. *See* CIB at 26-32; RIB at 52-59; SIB at 23-25, 27-29.

**E. Infringement**

As noted, the parties agree that two products, Delta’s U50SU4P162PMAR and U50SU4P180PMDAL, are representative of all Delta Accused Modules for purposes of infringement of the 761 patent. *See* EDIS Doc. ID 816661 at 2. The parties also agree that certain systems of Quanta, Ingrasys, and FII USA containing one of the two Delta representative modules are representative of other Accused Systems of Quanta, Ingrasys, and FII USA. *See id.* at 4-14. Vicor no longer asserts infringement of the 761 patent by either of Delta’s Q54SH12084NNDH or Q54SH120A1NCDHR, or by Delta’s U50SU8P167PMDA. *Compare id.* at 2 with CIB at 33; *see* EDIS Doc. ID 822584.

[REDACTED]

For infringement, then, only the two Delta representative products need be considered. Dr. Fayed opines that each representative product includes a power converter (element 1(a)) including a PCB comprising a plurality of conductive layers and top and bottom surfaces (element 1(b)), and a plurality of power semiconductor devices satisfying the limitations of element 1(d). *See* CX-0008C (Fayed WS) at Q/A 245, 246, 248, 260, 261, 263. Dr. Fayed also opines that the additional elements of dependent claims 2-7 are satisfied by the Delta representative products. *See id.* at Q/A 250-57, 265-72. Neither Respondents nor Staff dispute these opinions, nor did Respondents' expert Dr. Mike Ranjram. *See* SIB at 23; EDIS Doc. ID 821356 at 5-6; Tr. (Ranjram) at 603:20-23.

As for the magnetic core structure magnetically coupled to a winding formed by traces in a layer of the PCB (element 1(c)), Respondents argue that the representative products have [REDACTED] [REDACTED] RIB at 62. There are two problems with this argument. First, it is not presented in Respondents' Prehearing Brief, and Dr. Ranjram does not opine on this element in his witness statement, so the argument has been waived. *See* RPB at 128-31; CRB at 10; RX-0011C (Ranjram WS) at Q/A 44. Respondents were permitted to assert "a failure of proof on this element," to be sure, but asserting that the representative products possess structures that Respondents seemingly never previously identified goes well beyond merely asserting a failure of proof. Tr. at 43:8.

Second, the record does not support the assertion in any event. In their Prehearing Brief Respondents argued that "magnetically coupled" should be construed to mean "magnetically attached." Tr. at 39:18; *see* RPB at 122-26, 128-31. At the prehearing conference before the start of the hearing, Respondents clarified that they were no longer advancing that argument. *See* Tr. at 38:4-41:2. Although I suggested at the prehearing conference that "magnetically coupled" means, "in essence," that "it works like a transformer," that suggestion is obviously not a formal claim

[REDACTED]

construction, and ultimately the term was not construed. *See id.* at 41:7-9 (“I came in here this morning thinking I was going to have to construe the claim, but I don't think I do anymore”), 41:22-24.

Respondents’ current position, nevertheless, is apparently that the components Dr. Fayed identifies as meeting this claim element are [REDACTED]

[REDACTED] *See* RIB at 60-62. Dr. Ranjram opines that [REDACTED]

[REDACTED] Tr. (Ranjram) at 626:5-627:23. Dr. Hopkins, who opines on other patents, similarly agreed at the hearing that “the accused products use [REDACTED]

[REDACTED] *See* Tr. (Hopkins) at 783:8-17, 801:8-802:16. By contrast, Dr. Fayed testified that each representative product’s circuit schematic, board assembly three-dimensional view, and bill of material show [REDACTED]

[REDACTED]

[REDACTED] CX-0008C (Fayed WS) at Q/A 247, 262. Such testimony and its supporting documentation is not inconsistent with the testimony of Drs. Ranjram and Hopkins, and proves that element 1(c) is met by the representative products, with no claim construction needed.

As for the heat generation distribution limitations (element 1(e)), Respondents’ position is confusing. They assert that construction of the term “power” is disputed, but that term appears expressly only in element 1(d) (“dissipate power”), an element they do not dispute is met by the representative products. *See* RIB at 55-59, 62-65. They argue that if the “dissipate[d] power” is limited to heat, then various structural asymmetries in the representative products cause those products’ “heat dissipation” to fall outside the numerical limits element 1(e) specifies, but at the same time propose that “power” be construed as “power” (inclusive of electrical energy, heat, or

[REDACTED]

other energy),” that is, the “dissipate[d] power” is not limited to heat. *Id.* at 55, 62-64. They further argue that the [REDACTED] [REDACTED] of any module containing a representative product, but the claim language requires that the level of dissipated power on each side be similar (i.e., each level is less than 150% of the other level), not that the generated heat be similar. *See* 761 patent at cl. 1; RIB at 64-65.

In any event, two of Respondents’ points are readily rejected. First, the term “power” is arguably implicit in element 1(e) through references to “Pt” and “Pb,” which are defined as the level (or, as construed, “amount”) of dissipated power. *See* Order No. 30 at 31-32. But as explained below, even accepting Respondents’ proposed construction of “power” as “power inclusive of electrical energy, heat, or other energy,” the representative products satisfy the language of element 1(e), so the term does not require construction. *See* RIB at 55. Second, although Respondents presented the [REDACTED] argument in their Prehearing Brief, the [REDACTED] argument is entirely new. *See* RPB at 131-35; CRB at 12-13. So the latter argument has been waived.

As for the former argument, any [REDACTED] in the representative products are caused by “external” components. CRB at 12; *see* RIB at 62-64 (arguing that [REDACTED] [REDACTED]). The claim language requires merely that the power semiconductor devices be “distributed” between the top and bottom sides “to distribute heat generation during operation of the converter” such that the power dissipation similarity threshold is met. 761 patent at cl. 1. That packaging, mounting components, or other extrinsic structures may change heat generation during actual operation is irrelevant to whether the power semiconductor devices are “distributed between the [top and bottom sides] to distribute heat generation during operation.” If extrinsic structures were relevant, then infringement of an apparatus claim could be avoided by the

[REDACTED]

simple expedient of adding components, which is contrary to the law. *See Amgen, Inc. v. F. Hoffman-La Roche Ltd.*, 581 F.Supp.2d 160, 201 (D. Mass. 2008) (“merely adding elements to an otherwise infringing device will not enable the infringer to escape liability”) (citing *A.B. Dick Co. v. Burroughs Corp.*, 713 F.2d 700, 703 (Fed. Cir. 1983)).

And infringement has been shown in light of Dr. Fayed’s opinion. He observes that the representative products both have [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] CX-0008C (Fayed WS) at Q/A 249, 264.

Because of the symmetrical arrangement on both sides, his opinion that the power dissipations  $P_t$  and  $P_b$  for both representative products are “essentially equal” and thus satisfy the “less than 150% of the other level” limitations is well-supported, however “power” is construed.

Accordingly, Vicor has shown infringement of claims 1-7 of the 761 patent by all Accused Products.

As for the Redesigned Products, Vicor concedes that they do not infringe any claim of the 761 patent. *See CPB* at 676. This is because Delta’s redesigned product has [REDACTED] [REDACTED] than other Delta Accused Modules, and Cyntec’s redesigned product is [REDACTED] [REDACTED], which Vicor does not accuse of infringing any claim of the 761 patent. CX-0008C (Fayed WS) at Q/A 43-44. Therefore, Vicor has not shown infringement of any claim of the 761 patent by the Redesigned Products.

**F. Domestic Industry – Technical Prong**

As noted, the parties agree that four Vicor products, the BCM380P475T1K2A31, DCM24AP050T180A50, MCM3208S59Z01A6T05, and NBM2317S60D1580T0R, are



representative of all DI Products that allegedly practice the 761 patent. *See* EDIS Doc. ID 816661 at 15-23. Dr. Fayed opines that each representative product includes a power converter (element 1(a)) including a PCB comprising a plurality of conductive layers and top and bottom surfaces (element 1(b)), a magnetic core structure magnetically coupled to a winding formed by traces in a layer of the PCB (element 1(c)), and a plurality of power semiconductor devices satisfying the limitations of element 1(d) and distributed so as to distribute heat generation that satisfies the limitations of element 1(e). *See* CX-0008C (Fayed WS) at Q/A 118-22, 151-55, 182-86, 211-15. Dr. Fayed also opines that the additional elements of dependent claims 2-7 are satisfied by Vicor’s representative products. *See id.* at Q/A 129-48, 160-79, 191-208, 220-42. Neither Respondents nor Staff dispute these opinions. *See* SIB at 23; RIB at 59; EDIS Doc. ID 821356 at 6-7. Accordingly, Vicor has shown its asserted DI Products practice claims 1-7 of the 761 patent.

**G. Validity**

**1. Prior Art**

Respondents’ invalidity case under Sections 102 and 103 relies on three prior art references: a power converter module previously sold by Ericsson designated the BMR 453 (e.g., RX-0299), U.S. Patent No. 6,965,517 (“Wanes”) (RX-0321), and U.S. Patent No. 6,970,367 (“Takeshima”) (RX-0322). *See* RIB at 65-67.

**a) BMR 453 Module**

The BMR 453 is a DC/DC converter for stepping down voltages from between 36 and 75 volts to approximately 9 or 12 volts. *See* RX-0299 at 1, 6, 9. Respondents’ expert, Dr. Mehrdad Ehsani, confirmed through inspection and testing that the BMR 453 has a PCB comprising multiple conductive layers and top and bottom surfaces (element 1(b)), and a magnetic core structure

[REDACTED]

magnetically coupled to a winding formed by traces in a conductive layer of the PCB (element 1(c)).  
*See* RX-0006C (Ehsani WS) at Q/A 38-45.

Dr. Ehsani tested six physical samples, all of which are, in relevant part, [REDACTED]  
[REDACTED] RX-0006C (Ehsani WS) at Q/A 30. The corporate representative of Ericsson's successor in interest also confirmed that the [REDACTED]  
[REDACTED]. *See* CX-3308C (Borgengren Dep.) at 76:17-88:2. [REDACTED]  
[REDACTED]. *See* CX-3308C (Borgengren Dep.) at 69:16-71:15. This is consistent with one technical specification in evidence, which is dated September 2008. *See* RX-0299; *but see* RX-0715 (technical specification dated July 2010). It is true that a later version was sold in August 2010, after the asserted April 2010 priority date, but this is beside the point because of the 2008 sale. *See* CRB at 15 (citing CX-3308C (Borgengren Dep.) at 90:19-23). It may also be that one sample Dr. Ehsani tested lacked a "baseplate." CX-3308C (Borgengren Dep.) at 38:1-39:15; *see* CRB at 15-16. This does not appear to be relevant, however, because there is no evidence the baseplate makes a difference to the invalidity analysis, and, again, the various samples are otherwise materially identical. On balance, therefore, the BMR 453 was sold in the U.S. more than one year before April 2010, and therefore qualifies as prior art under 35 U.S.C. § 102(b) (pre-AIA); *see* SRB at 7-8.

**b) Wanes**

Wanes discloses a "DC to DC power converter" (100) comprising a PCB (104) to which are mounted four "substrates" (102 and 120), two on either side of the PCB, with the substrates holding windings for transformers (112) and multiple FETs (106):

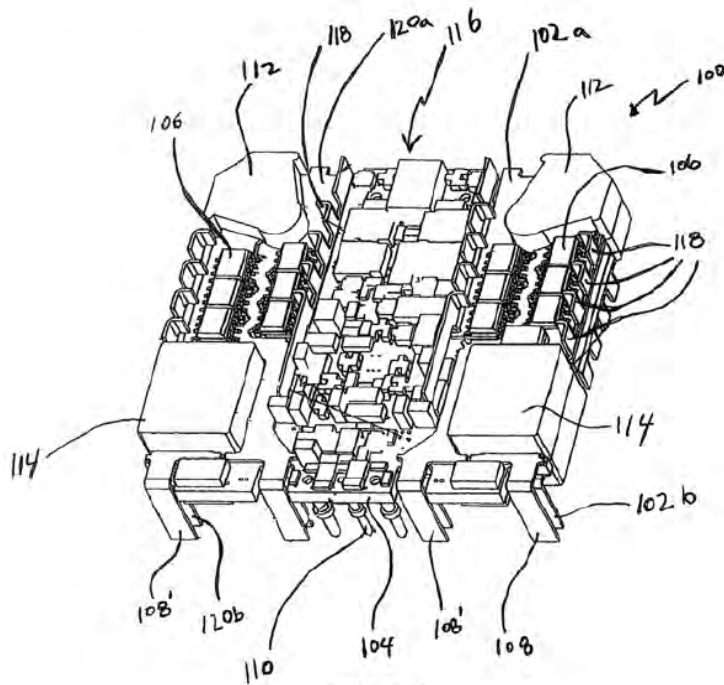
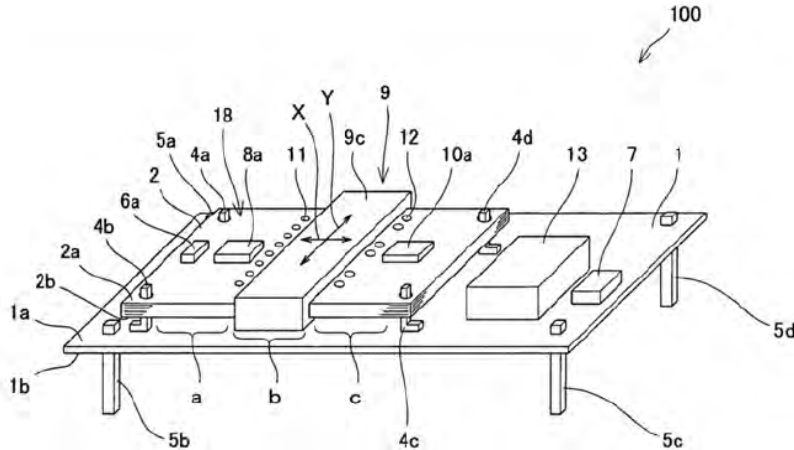


FIGURE 1A

RX-0321 at 3:54-4:12, Fig. 1A. Wanes issued November 15, 2005 and is therefore prior art under 35 U.S.C. § 102(b) (pre-AIA), which Vicor does not dispute. *See* RX-0321; CRB at 21.

**c) Takeshima**

Takeshima discloses a “switching power supply device” (100) having “MOS field-effect transistors” (8a and 8b) and a transformer (9) having primary and secondary windings and a transformer core, all mounted on a “multi-layer printed circuit board” (2):

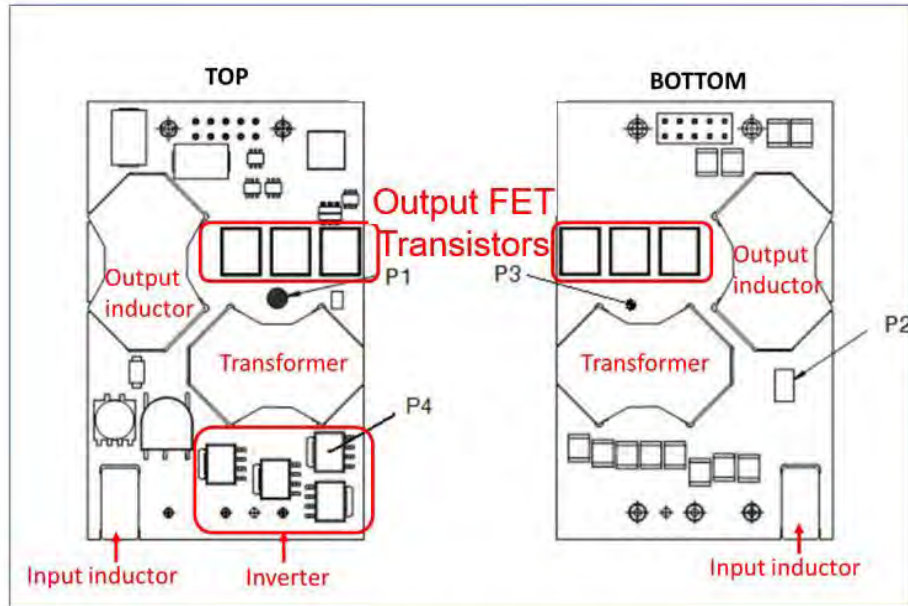


RX-0322 at 8:41-54, 9:45, Fig. 1. Takeshima issued November 29, 2005 and is therefore prior art under 35 U.S.C. § 102(b) (pre-AIA), which Vicor does not dispute. *See* RX-0322; CRB at 26.

## 2. Anticipation by BMR 453 Module

### a) Claim 1

According to Dr. Ehsani, the BMR 453 steps voltage down from 48 volts to 12 volts, and possesses a PCB with 12 conductive layers and top and bottom surfaces, with a ferrite magnetic core that is magnetically coupled to windings formed by traces in the conductive layers of the PCB. *See* RX-0006C (Ehsani WS) at Q/A 36-45. Vicor does not contest these findings, so elements 1(a), 1(b), and 1(c) are satisfied by the BMR 453. *See* CRB at 16. The BMR 453 also possesses three MOSFETs on each side which together function as an output switch and which are connected in parallel:



RDX-0006C.0009 (annotating RX-0299 at 15); see RX-0006C (Ehsani WS) at Q/A 46-50; Tr. (Ehsani) at 640:6-641:1. Although Vicor disputes the satisfaction of element 1(d), it does not dispute the presence of these structural limitations, nor does it dispute that the MOSFETs dissipate power during operation, so the limitations of element 1(d) are largely met. See *id.* at Q/A 46-50; CRB at 16-20.

Vicor's dispute over element 1(e), however, as well as certain aspects of element 1(d), is more substantial. See CRB at 16-20. Its principal argument is that "a plurality of power semiconductor devices" should be construed to mean "all of the converter's power semiconductor devices," such that all power semiconductor device power dissipation is accounted for in evaluating the 150% threshold requirement. *Id.* at 4. Respondents' position is that the proper construction of the term should permit "'one or more' pluralities of power semiconductor devices." RIB at 53-54 (emphasis omitted). Staff agrees with Vicor. See SIB at 27; SRB at 9-15.

The claim language uses "a plurality," and further specifies a "first set" and "second set" of such devices. 761 patent at cl. 1. Assuming the term "set" requires at least two elements, the



minimum the claim requires overall is two devices in each set, but nothing about “set” implies that the number of elements in each set must be the same. *See* RIB at 54. Nothing else in the claim language limits how the devices in each set are selected, or the number in each set, nor does Vicor identify any such language. *See* CRB at 4-6. The specification does suggest that a “symmetrical distribution of components” would help in “balancing the overall heat generation” (*see* 761 patent at 24:47-25:32), but one disclosed embodiment is described as possessing symmetry involving just the “significant power dissipative components of the input cells” (*id.* at 25:4-8), implying that components with insignificant power dissipation may be ignored. Claims 2 and 4, in fact, further limit the invention of claim 1 to “substantially overlapping” component locations and cells configured as “mirror image[s]” of each other. *Id.* at cls. 1, 2, 4. This implies that claim 1 may be satisfied by component configurations that are not mirrored or substantially overlapping, and so do not include every power semiconductor device, or even include the same number of components. *See* RIB at 53. The 150% power dissipation threshold also seemingly permits disparate numbers of components in each set, particularly with a large number of relatively low power devices. No party cites to any other intrinsic evidence, except for a Patent Trial and Appeal Board proceeding, which is addressed below. *See* RIB at 53-54; CRB at 4-6, 16-20 (citing EDIS Doc. ID 822279, Ex. 1 (“PTAB Decision 761”)); SRB at 9-15.

The intrinsic evidence therefore largely supports Respondents’ position. Vicor nonetheless presents several additional unpersuasive arguments. It first argues that Respondents’ proposed claim construction is waived because it was not raised during the *Markman* process or in their prehearing brief. *See* CRB at 4. In fact it is Vicor that proposes a claim construction that deviates from the plain and ordinary meaning of the claim language, but regardless, Respondents plainly did provide their position on this dispute in their prehearing brief. *See* RPB at 154-59. And although



no party proposed to construe this aspect of the claim during the *Markman* process, apparently because the present dispute arose after that process ended, the prior art simply cannot be analyzed without construing the claim. *See* RPB at 154; Order No. 10 at G.R. 7.1; *see generally* Order No. 30.

Vicor next cites *Apple Inc. v. Samsung Electronics Co., Ltd.*, 695 F.3d 1370 (Fed. Cir. 2013), for the proposition that “plurality” in the present context means “all,” rather than “a subset of two or more.” *See* CRB at 5. In *Apple*, the invention was an apparatus “for locating information in a network,” comprising, among other elements, “a plurality of heuristic modules” wherein “each heuristic module . . . employs a different, predetermined heuristic algorithm.” 695 F.3d at 1373. The Federal Circuit held that “each heuristic module” meant “all” modules in the apparatus, rather than “a subset of modules,” in part because “the addition of other modules that do not use different heuristic algorithms . . . would impermissibly wipe out the express limitation that requires every module to have a unique heuristic algorithm.” *Id.* at 1378-79. Unlike in *Apple*, though, the language of claim 1 of the 761 patent contains no “express” requirement that “all” or “each” of the power semiconductor devices have some limitation that applies to them collectively. The use of “first set” and “second set,” in fact, suggests that “a POSITA could pick and choose which power semiconductor devices to consider.” CRB at 5; 761 patent at cl. 1. *Apple* is accordingly inapposite.

Vicor lastly cites the PTAB Decision 761, of which official notice is taken as part of the 761 patent’s prosecution history, which denied Delta’s request for *inter partes* review of the 761 patent. *See* PTAB Decision 761 at 1-2. The PTAB adopted Vicor’s proposed construction: “we interpret ‘a power converter including . . . a plurality of semiconductor power devices’ . . . to refer to all of the power semiconductor devices in the power converter, not merely a subset of the power semiconductor devices.” PTAB Decision 761 at 15. The PTAB’s claim construction analysis



focused on *Apple* and other caselaw interpreting the term “plurality,” as well as the specification, particularly those portions describing the benefits of “symmetrical placement of power dissipative components,” although apparently not the portion describing the embodiment possessing symmetry involving just the significant power dissipative components. *Id.* at 12-15. As explained above, and even considering the PTAB’s analysis, neither *Apple* nor the intrinsic evidence, especially the claim language itself, supports Vicor’s proposed construction. So I respectfully disagree with the PTAB on this point—although, in fairness, Delta did not propose a construction of its own, so the PTAB did not have before it the fulsome briefing presented here. *Id.* at 11.

Vicor’s proposed construction is therefore rejected, and its primary argument regarding elements 1(d) and 1(e) is similarly rejected. Vicor’s final argument is that empirical testing of the BMR 453 in operation shows that the 150% threshold requirement is not met. *See* CRB at 17-20. But this argument assumes that all semiconductor power devices on each side must be considered, which is incorrect. *See id.* Vicor even admits that the three MOSFET switches on each side of the BMR 453 “dissipate essentially the same amount of power,” which results in satisfaction of the claim language. *Id.* at 18-19.

In sum, all the elements of claim 1 are disclosed in the BMR 453 under the correct claim construction. The BMR 453 therefore anticipates claim 1.

**b) Claims 2, 3, and 7**

Vicor does not dispute that the BMR 453 discloses the elements added by claims 2, 3, and 7, namely, substantial overlap in positioning between the power semiconductor devices mounted on the top and bottom surfaces of the PCB, the two sets of devices share respective sets of vias, and the semiconductor devices comprise output switches. *See* 761 patent at cls. 2, 3, 7; CRB at 16. Dr.



Ehsani opined that these elements are present in the BMR 453. *See* RX-0006C at Q/A 57-66. Therefore, claims 2, 3, and 7 are also anticipated by the BMR 453.

### 3. Obviousness in View of BMR 453 Module

Respondents assert a single-reference obviousness case regarding all claims of the 761 patent. *See* RIB at 70-75. They rely on the doctrine that anticipation is the “epitome of obviousness” for claims 1, 2, 3, and 7, and a combination of the BMR 453 with the knowledge of a skilled artisan for claims 4, 5, and 6. *Id.* (citing *Connell v. Sears, Roebuck Co.*, 722 F.2d 1542, 1548 (Fed. Cir. 1983)); *see* RX-0006C (Ehsani WS) at Q/A 68-78. Vicor does not dispute the obviousness of claims 5 and 6 separately from claim 4. *See* CRB at 21. Staff agrees with Vicor. *See* SRB at 15-19.

Respondents have met their burden to show a prima facie case of obviousness as to claims 1, 2, 3, and 7 in light of *Connell*, but have not met their burden as to claims 4, 5, or 6. The basic concept on which Dr. Ehsani relies is that when a single BMR 453 would have been “insufficient to provide necessary power to a system, one option was to use multiple [BMR 453 modules] to increase power delivery capability.” RX-0006C (Ehsani WS) at Q/A 69. He calls one such module a “quarter brick” and “the next standard size up” a “half brick,” consisting of two BMR 453 modules connected in parallel. *Id.* Dr. Ehsani states that the “obvious approach” to creating such a half brick would be to “mirror” the power semiconductor devices of the BMR 453 “on a single, larger board of half-brick size,” so that the “original inverter and output MOSFET power semiconductor devices of the quarter-brick BMR 453 converter would be a cell, and they would be mirrored on an extended PCB of half-brick size.” RX-0006C (Ehsani WS) at Q/A 69.

It stands to reason that two BMR 453 modules connected in parallel would double the converted power, and that a POSITA would know how to accomplish this with a reasonable expectation of success, as Dr. Ehsani explains. *See* RX-0006C (Ehsani WS) at Q/A 71-73; *see also*

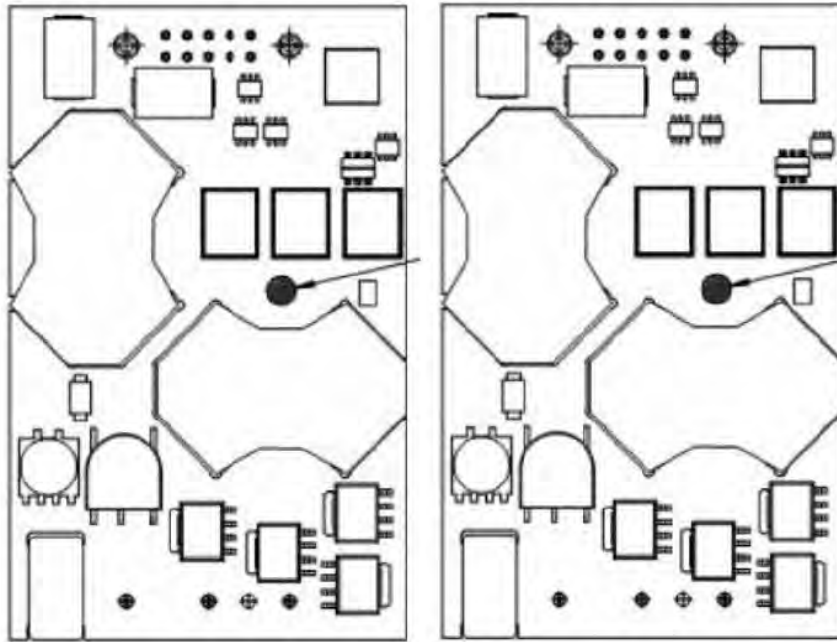


CX-3578C (Fayed WS) at Q/A 57 (agreeing that one specific half brick configuration was “a well-known technique”). But as Vicor notes, Respondents have not shown a reason to combine two BMR 453 modules in the specific manner required by the claims, namely, “to mirror the inverter and FET power semiconductor devices of the BMR 453 Module on a single, larger board of half-brick size.” CRB at 20.

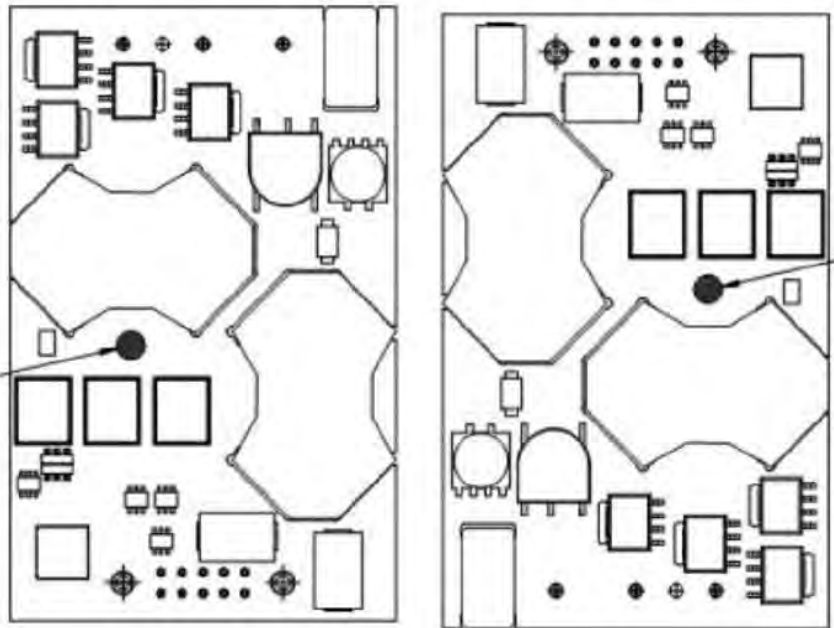
More precisely, Dr. Ehsani offers no clear explanation why a POSITA would combine BMR 453 modules such that “the pattern of components of one cell is substantially a mirror image of the pattern of components in the other cell.” 761 patent at cl. 4. As Dr. Fayed points out, mere duplication significantly complicates the design process, so mirroring would likely complicate it even more. *See* CX-3578C (Fayed WS) at Q/A 57. Dr. Ehsani states that mirroring was “well known in the art,” which may be true, but that does not mean that a POSITA would have had a reason to mirror the BMR 453 specifically. RX-0006C at Q/A 73. So his presentation of examples of mirroring is not especially helpful. *See id.* at Q/A 72; RX-0670 at .0002; RX-0680 at .0005. And in any event, two of his examples are not clearly prior art, while the third (Wanes) discloses mirrored component patterns, but without disclosing other elements of claim 4, as explained below, and thus is especially unhelpful. *See* RX-0006C (Ehsani WS) at Q/A 70, 72 (citing RX-0673 and RX-0681); RDX-0006C.0020. Dr. Ehsani even suggests that a POSITA would modify a two-BMR 453 module half brick configuration to eliminate redundancies, thereby presumably making the mirroring process more complicated; in other words, a POSITA may actually have been motivated to not mirror components. *See* RX-0006C (Ehsani WS) at Q/A 70 (rejecting merely placing two BMR 453 modules on a single PCB), 71 (a POSITA would have “avoid[ed] duplication of redundant components”). According to Dr. Fayed, duplication followed by elimination of redundancies is “inconsistent” with the component patterns being “mirrored.” CX-3578C (Fayed WS) at Q/A 59.



And duplication of the BMR 453 component configuration, even without eliminating redundancies, does not satisfy the “mirror image” limitation. This is clear from the BMR 453’s asymmetrical component layout, where the MOSFETs are not centered on the PCB, and the inverter appears only on one side of the PCB:



RX-0299 at 15 (top side, duplicated). Mounting two modules side-by-side plainly does not yield anything like a mirror image configuration. The same is true when one cell is rotated, so that the relevant cell components are on opposite sides of the PCB:



*Id.* (top side, duplicated and rotated). Given the component arrangement taught by the BMR 453, Dr. Fayed is correct that “significant engineering resources and costs” would seem to be necessary to design and implement a rearranged component configuration that satisfies the “substantially a mirror image” limitation. CX-3578C (Fayed WS) at Q/A 58.

Respondents do not offer any reason why or how a skilled artisan would or could rearrange the component configuration on the BMR 453 to meet this limitation. This is fatal to their obviousness case, given the *Graham* factors, because the scope and content of the presented prior art does not include all elements of claims 4 or 6, and because the level of skill in the art does not suffice to fill in the missing elements. A prima facie case of obviousness of claims 4, 5, and 6 in view of the BMR 453 has therefore not been shown.

**4. Obviousness in View of Wanes**

Respondents advance a single-reference obviousness case in view of Wanes, as to claims 1, 2, 4, 5, and 6. See RIB at 75-81. According to Dr. Ehsani, Wanes discloses a power converter



comprising a PCB to which are mounted four “substrates,” two on either side of the PCB, with the substrates holding windings for transformers and multiple FETs. *See* RX-0006C (Ehsani WS) at Q/A 84-88. Vicor does not contest these findings, so elements 1(a) and 1(c) are taught by Wanes. *See* CRB at 21. Vicor does, however, contest elements 1(d) and 1(e), and one aspect of element 1(b), as well as the elements added by the dependent claims. *See id.* at 21-26. Staff agrees with Vicor. *See* SRB at 19-25.

As to claim 1, Vicor raises three points: (1) Wanes teaches away from mounting components directly on the PCB top and bottom surfaces, (2) it does not disclose enough information to identify the components in the first and second sets, and (3) it does not disclose enough information to show that the power dissipation level limitations are met. *See* CRB at 21, 23-24. On the first point, Wanes expressly discloses that PCBs have “substrate layers,” some such PCBs are “multilayer,” and the disclosed substrates are “electrically conductive.” RX-0321 at 1:33-38, 1:52-53. It then discloses an embodiment (among other disclosed embodiments) where the power converter components are mounted directly on substrates, which are themselves mounted flush to the tops and bottoms of a PCB, and a skilled artisan would surely recognize that the disclosed substrates are simply additional conductive layers added to an existing sandwich of conductive layers, which is all that element 1(b) requires. RX-0321 at 3:63-4:8; *see* 761 patent at cl. 1; RX-0006C (Ehsani WS) at Q/A 85.

A skilled artisan would also be able to fill in the other gaps Vicor identifies. Vicor specifically points to Wanes’ dearth of description of “the total components, the type of components, or how those components operate.” CRB at 23. According to Vicor, such description is needed to identify both the components in the first and second sets, which must be “electrically connected to dissipate power,” and how those sets are distributed “to distribute heat generation” such that the 150% power dissipation threshold is satisfied. 761 patent at cl. 1; *see* CRB at 23-26. Respondents



argue in rebuttal that Waner “teaches four sets of identical components . . . that are constructed identically and operate in identical fashion,” such that the power dissipations on the top and bottom surfaces are equal. RRB at 54.

Waner discloses four substrates, each having a “mirror image configuration,” including a “single-layer circuit track” on each substrate, so a POSITA would likely conclude that the component layout and connections for all four substrates are mirror images of each other. RX-0321 at 3:63-4:10, 11:9-13. Waner also teaches the desirability of “an assembly that can carry relatively high electrical currents [and] dissipate heat,” and describes the transformer and some of the output circuitry. *Id.* at 1:41-46, 4:31-44. Waner does not fully disclose the input circuitry, the supporting and control circuitry, the precise connections between all the components, or how and under what conditions each component operates, nor do Respondents contend that it does. *See* RIB at 77-80; *see generally* RX-0321. A high proportion of what appear likely to be heat-generating components depicted in the various Figures are not even labeled; even the most heavily-annotated Figure is simply a depiction of one of the substrates, with only a few mounted devices. *E.g.*, RX-0321 at 6:42-7:55, Fig. 2A. Given the express disclosures, though, the simplest operating configuration would be four identical sets of circuitry, connected in the same way, and, to accommodate the contemplated “high electrical currents,” all operating at the same time, with the same input and output voltages. RX-0321 at 1:43. A POSITA would surely recognize this as the most obvious and straightforward way of implementing what Waner expressly discloses.

And if that is the implementation, then the power dissipation and heat generation would be expected to be substantially the same across all four substrate-mounted pieces of the overall power converter. This is admittedly not expressly disclosed, but it would be understood by a skilled artisan. *See* CX-3578C (Fayed WS) at Q/A 70 (“When the load current is large . . . it would make sense . . .



to have all the branches active/switching and split the currently equally among them . . .”). So Respondents have made out a prima facie case of obviousness of claim 1 of the 761 patent over Wanes in view of the knowledge of a skilled artisan, given that artisan’s level of skill, the scope and content of the presented prior art, and the minimal differences between the claimed invention and the prior art. The same is true of claim 2, which requires “substantial[] overlap[]” in positioning of the power semiconductor devices (i.e., FETs) in the top and bottom sets, given the mirroring of the component configurations. 761 patent at cl. 2; *see* RIB at 80.

The same cannot be said, however, of claims 4, 5, and 6. As a threshold issue, Vicor did preserve the specific disputes it now raises over at least claims 4 and 6. *Compare* CPB at 232-33 (asserting that Wanes does not disclose power semiconductor switches or input cells) *with* CRB at 25-26 (same). So Respondents’ assertion that Vicor does not dispute the additional limitations of claim 4 is incorrect. *See* RIB at 80.

And those additional limitations are not disclosed or rendered obvious by Wanes. The terms “switch” and “switches” are not recited in Wanes’ specification or claims (*see generally* RX-0321), Respondents do not use either term in the relevant sections of their post-hearing briefs (*see* RIB at 80-81; RRB at 53-55), and Dr. Ehsani does not use either term in his witness statement (*see* RX-0006C (Ehsani WS) at Q/A 93-95), nor did he testify that Wanes discloses switches or that they would have been an obvious addition to or modification of Wanes (*see* Tr. (Ehsani) at 657:13-661:23). So Wanes does not explicitly describe power semiconductor switches, even if the FETs it does describe could be used as switches, and Respondents make no effort to demonstrate otherwise. Respondents have therefore failed to prove the obviousness of claim 4 over Wanes because they have not addressed power semiconductor switches at all. The same goes for claim 6, because Respondents do not address “input cells,” which are similarly not disclosed by Wanes. 761 patent

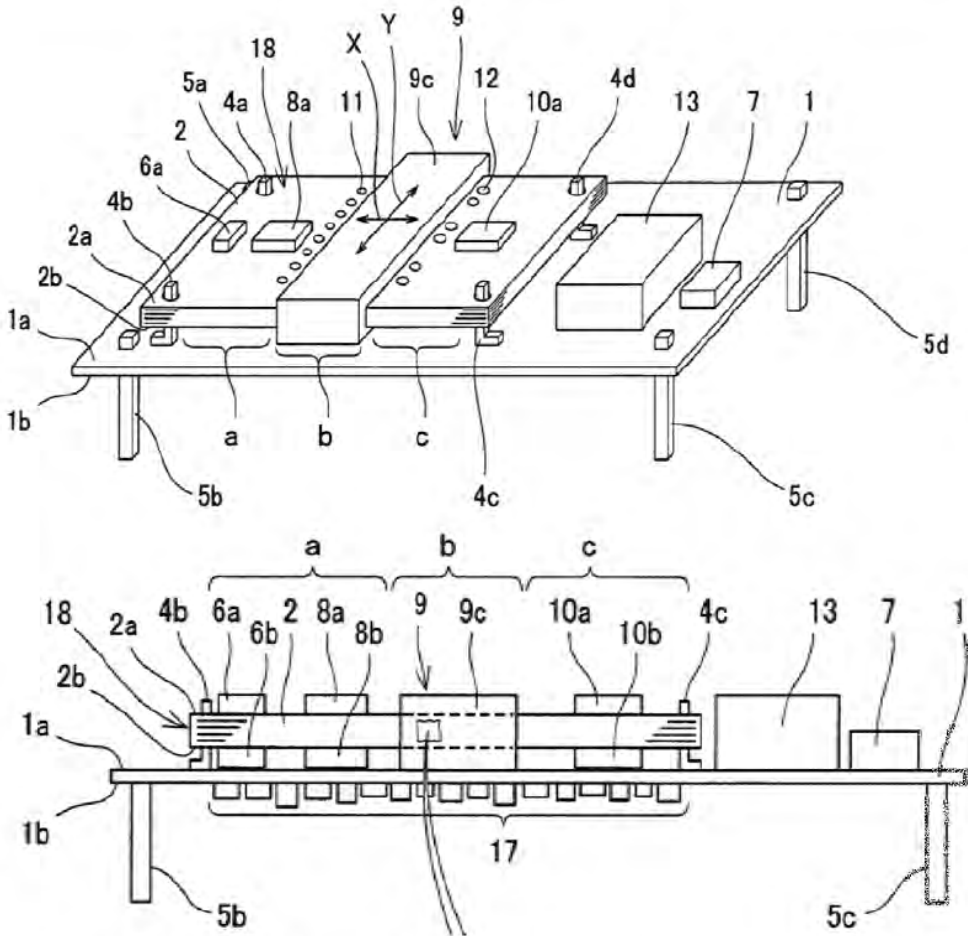


at cl. 6; *see* RIB at 80-81; RRB at 53-55; RX-0006C (Ehsani WS) at Q/A 98-99; Tr. (Ehsani) at 657:13-661:23. Therefore, considering the *Graham* factors, Respondents have not demonstrated that claims 4, 5 (which depends from claim 4), or 6 of the 761 patent would have been obvious in view of Wanes.

**5. Obviousness in View of Takeshima**

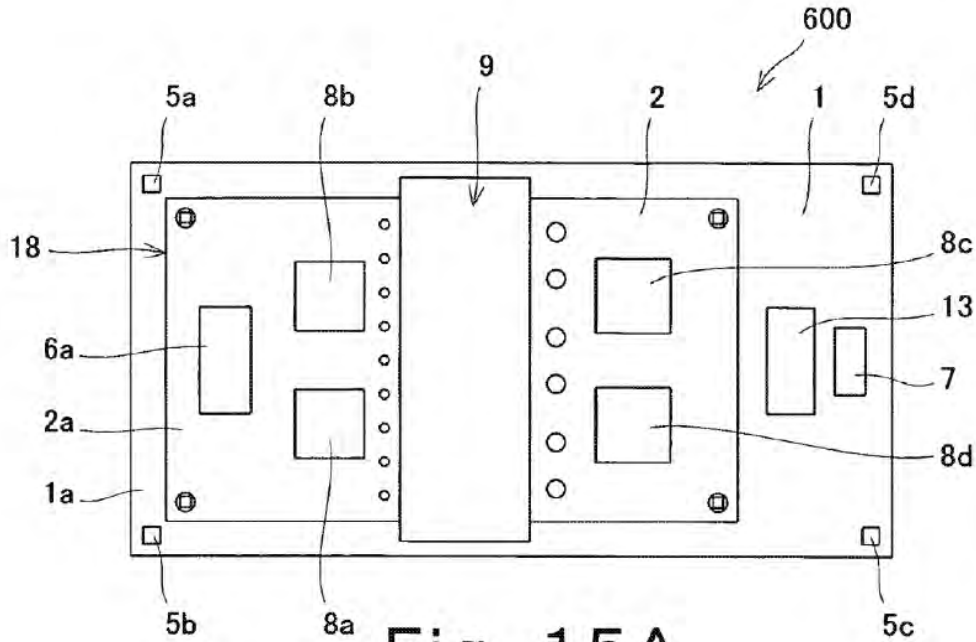
Respondents advance a single-reference obviousness case in view of Takeshima, as to all claims of the 761 patent. *See* RIB at 81-90. According to Dr. Ehsani, Takeshima discloses a power converter comprising a multi-layer PCB with a top and bottom surface, and with a magnetic core that interacts with windings formed by traces in the conductive layers of the PCB. RX-0006C (Ehsani WS) at Q/A 105-07. Vicor does not contest these findings, so elements 1(a), 1(b), and 1(c) are taught by Takeshima. *See* CRB at 26. Vicor does, however, contest elements 1(d) and 1(e), as well as the elements added by the dependent claims. *See id.* at 26-33. Staff agrees with Vicor. *See* SRB at 25-34.

Takeshima discloses multiple specific embodiments, the first of which has a PCB (2) on which are mounted two MOSFETs (8a and 8b), one on the top and one on the bottom, and two diodes (10a and 10b), one on the top and one on the bottom:

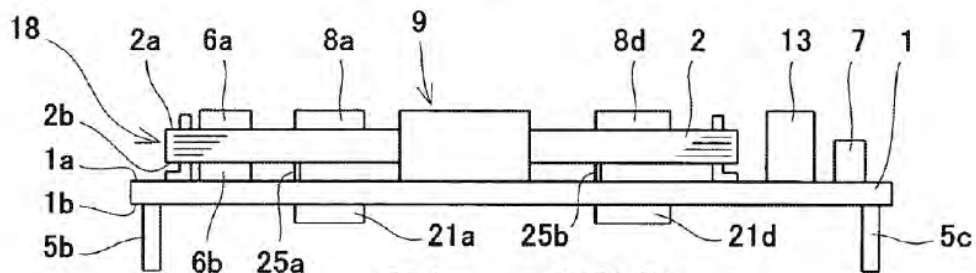


RX-0322 at 10:51-67, Figs. 1 and 2. The MOSFETs are mounted on top of each other on one side of the central transformer (9), and the diodes are mounted on top of each other on the other side of the transformer. *See id.*

The third disclosed embodiment has a PCB (2) on which are mounted four MOSFETs (8a, 8b, 8c, and 8d), all on the top surface, with two on each side of the central transformer (9):



**Fig. 15A**



**Fig. 15B**

RX-0322 at 20:55-21:41, Figs. 15A and 15B. The only components on the bottom of the PCB are “wiring lines” (25a and 25b) connecting the four MOSFETs with their associated drivers (21a, 21b, 21c, and 21d), the lower portion of the transformer (9), and a capacitor (6b). *Id.* at 18:60, 21:49-53.

Respondents argue as to element 1(d) that Takeshima’s first embodiment “teaches power semiconductor devices on both sides of the PCB . . . that are electrically connected to dissipate power at respective levels,  $P_t$  and  $P_b$ , during operation of the converter.” RIB at 81-82. Diodes are semiconductor devices which carry power, at least as taught by Takeshima, and all the power semiconductor devices of the first embodiment are electrically connected in a “forward-type”



circuit, a “half-bridge type” circuit, or some other circuit topology. 761 patent at 7:35-50, Figs. 4 and 7; *see* RX-0692 at 75. Vicor does not dispute this. *See* CRB at 26-27. So element 1(d) is met by Takeshima’s first embodiment.

Respondents argue as to element 1(e), and the dependent claims, that an “asserted embodiment” renders all claims obvious. RIB at 81. That asserted embodiment is essentially a hybrid of Takeshima’s “first” and “third” embodiments, using the first embodiment’s component layout diagram with the third embodiment’s circuit diagram, that is, Figure 2 except with “Figure 14’s switches instead of Figure 7’s diodes.” *See id.* at 82; RRB at 58. Delta’s petition for *inter partes* review presented the same asserted embodiment, and in denying review the PTAB found that Delta “does not explain adequately why, when ‘employ[ing] the half-bridge converter taught in Takeshima’s Figure 14,’ two of the MOSFETs would instead be relocated to the bottom surface of the PCB.” PTAB Decision 761 at 36 (interlineation in original).

Respondents’ explanation here is similarly inadequate. It is true that Takeshima teaches a range of possible secondary-side circuit topologies for the first embodiment: “the converter circuit is not limited to the forward-type converter circuit and the half-bridge type converter circuit and other converter circuits may be used.” RX-0322 at 14:56-59. It is also true that Takeshima suggests that MOSFETs may be advantageously used in place of diodes for rectification on the secondary side: in the third embodiment, “the diodes 10a and 10b [in the first embodiment] are replaced with the MOSFETs 8c and 8d,” and “a high-speed switching operation of the MOSFETs 8a to 8d becomes possible, and it becomes possible to reduce switching loss.” *Id.* at 19:44-45, 21:57-61.

But this suggestion must be understood in context:

“[t]he configuration of the switching power supply device according to the [third] embodiment is different from that of the switching power supply device 100 described in the first preferred embodiment in that the diodes 10a and 10b are replaced with the MOSFETs 8c and 8d.”



RX-0322 at 19:41-45. That is, the two different embodiments represent two different configurations that are not necessarily interchangeable. The “structure” and “appearance” of the two embodiments, in fact, are so immaterial in Takeshima that the differences between the two are “omitted” from Takeshima’s written description:

However, the switching power supply device [of the third] embodiment is substantially the same as the switching power supply device 100 [of the first embodiment] in terms of their appearance. For this reason, the description concerning the structure [of the third] embodiment will be omitted.

*Id.* at 19:45-49. And elsewhere Takeshima states that it would be “advantageous” to mount all the semiconductor devices on the top of the PCB, and run wires containing control signals (“minute wiring lines”) through the PCB to the other side of a second PCB, to “achieve about 30% size reduction.” *Id.* at 13:49-62. As Dr. Fayed explains, this was “consistent with conventional wisdom” to place high power-dissipating components on the top surface of the board. CX-3578C (Fayed WS) at Q/A 81.

Although Dr. Fayed overstates his case, because Figure 2 shows MOSFETs on both sides of the mapped PCB, every embodiment in Takeshima with more than two MOSFETs in one power switching module places those MOSFETs on the top surface. *See* RX-0322 at Figs. 5 (four MOSFETs), 15A and 15B (four MOSFETs); *but see* Fig. 8 (showing two modules together with four MOSFETs total). And the only embodiment with MOSFETs as the rectifying switches places those MOSFETs on the top surface. *See id.* at Figs. 15A and 15B. So even if Takeshima does not quite teach away from claim 1 of the 761 patent, as Dr. Fayed asserts, it also does not provide a reason to dispose secondary-side MOSFETs on both the top and bottom of a PCB with a reasonable expectation of success.



Dr. Ehsani does not provide any such reason, either. The closest he comes is in opining that “diodes are a type of switch, and therefore using the output FET switches in Takeshima’s Figure 14 converter would have been a natural fit and well within the ordinary skill in the art.” RX-0006C (Ehsani WS) at Q/A 108. But he completely ignores Dr. Fayed’s point that placing high-power devices on the top of the PCB was conventional wisdom, and his opinion on physical placement of the MOSFETs is otherwise conclusory and unsupported. Nor are the generalizations of one of the co-inventors particularly probative. *See* RRB at 58-59 (citing RX-2142C (Fleming Tr.) at 24:20-24). Thus, in view of the scope and content of the prior art and the level of skill in the art, Respondents have not made out a prima facie case that their “asserted embodiment” would have been obvious, so none of the claims of the 761 patent would have been obvious in view of Takeshima.

#### 6. Objective Indicia of Non-Obviousness

Vicor asserts multiple objective indicia of non-obviousness, the strongest and clearest of which is commercial success. *See* CRB at 71-88. Vicor contends that its products had a “commanding market share,” which they did, as Delta was well aware. CRB at 84 (citing CX-103C.0012, CX3326C (Yin Dep.) at 26:16-30:14). The economic prong evidence establishes that the DI Products had enough market share to qualify as commercially successful. CRB at 84 (citing CX-3578C (Fayed RWS) at Q/A 317); *see* CX-0009C (Seth WS) at Q/A 187-88. As to the embodiments of the 761 patent in particular, [REDACTED] units were sold, generating [REDACTED] in revenues and [REDACTED] in gross profits (i.e., revenues less cost of goods sold), all between 2019 and the first half of 2023. *See* CX-0009C (Seth WS) at Q/A 187-88. Such “significant sales in a relevant market” weigh heavily in favor of non-obviousness. *Chemours Co. FC, LLC v. Daikin Indus., Ltd.*, 4 F.4th 1370, 1378 (Fed. Cir. 2021).

[REDACTED]

Respondents nonetheless argue that a nexus between the sales and the claimed inventions has not been shown. *See* RIB at 167-71. Where, as here, the commercially successful product is an embodiment of the claimed invention, there is a presumption of nexus. *See WBIP, LLC v. Kohler Co.*, 829 F.3d 1327, 1330 (Fed. Cir. 2016). The presumption may be rebutted by evidence that the commercial success or other secondary consideration is due to “extraneous factors” other than the claimed invention. *Id.* Respondents’ evidence is irrelevant because it pertains to Delta’s products, not to the embodiments of the 761 patent. *See* RIB at 169-71. So the commercial success of embodiments of the claims of the 761 patent stands unrebutted.

Vicor also relies on copying, long-felt need, failure of others, and licensing. *See* CRB at 71-88. As for copying, all three Asserted Patents issued by February 2019 and were actually known to Delta no later than [REDACTED]

[REDACTED]

[REDACTED] *See* 950 patent; CX-0157C at 7; CX-0056C at 5; Tr. (Li) at 313:2-5, 327:13-19. Delta presented a proposal to [REDACTED]

[REDACTED] *See* Tr. (Li) at 308:10-309:13, 321:17-20. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] CX-0054C at 5, 8. [REDACTED]

[REDACTED] *See* Tr. (Li) at 299:6-10. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] *Id.* at 323:17-324:7, 328:1-24; CX-0059C at 17. [REDACTED]

[REDACTED]

[REDACTED] Tr.

(Liu) at 555:11-560:6. [REDACTED]

[REDACTED] See CX-3578C (Fayed WS) at Q/A 270-71; CX-0415C.

Taken together, such evidence shows that Delta knew of the Asserted Patents [REDACTED]

[REDACTED]

[REDACTED]. See CRB at 76. It also shows that Delta [REDACTED]

[REDACTED]; [REDACTED]

[REDACTED] Id.; CX-

0059C at 17. But it does not show that Delta copied the NBM2317 series as such; the designation

“2317” in Delta’s documentation refers to the dimensions of the converter. See Tr. (Li) at 383:2-

10. [REDACTED]

[REDACTED]; [REDACTED]

[REDACTED]

[REDACTED] See Tr. (Li) at 380:9-381:8. The component layout of [REDACTED]

[REDACTED]

[REDACTED]:

[REDACTED]

[REDACTED]

RX-0378C at 18; CPX-0009C at 274; *see* 761 patent at Fig. 27; CX-0055C at 78 (internal Delta email stating that [REDACTED]). This by itself weighs heavily against a finding of copying. *See Iron Grip Barbell Co. v. USA Sports, Inc.*, 392 F.3d 1317, 1325 (Fed. Cir. 2004) (“copying requires the replication of a specific product”).

So the circumstantial evidence of copying is thin, while the direct evidence consists of flat denials by Delta and Cyntec witnesses. *See* Tr. (Li) at 297:3-7; Tr. (Liu) at 560:11-18. If Vicor had evidence of Delta’s and Cyntec’s actual design processes, it should have presented them, and in the absence of such evidence Vicor’s copying case is both circumstantial and weak. Respondents may have had means, motive, and opportunity, and the representative Accused Products infringe the claims of the 761 patent, but proof of copying requires more persuasive evidence than what Vicor has presented. *See Iron Grip Barbell*, 392 F.3d at 1325 (“[n]ot every competing product that arguably falls within the scope of a patent is evidence of copying”).

As for long-felt need and failure of others, Vicor’s position is that there was a long-felt need for “higher power density and efficiency” that accounted for “limited space and greater power processing demands,” and that its inventions “offered concrete efficiency and power density gains that others failed to replicate or provide.” CRB at 80, 82. According to Vicor, the Asserted Patents built on earlier inventions with “additional innovations” that pushed efficiency from “nearly 97%” to “approximately 98%,” and that resulted in “power density gains.” CX-3578C (Fayed WS) at Q/A 290-92. Dr. Fayed summarizes the evidence supporting this, and as to the 761 patent, in particular, he points to “shared vias” and “less space” taken up on the PCB because of symmetrical and overlapping placement of heat-generating components, resulting in a reduced number of vias and reduced resistance. *Id.* at Q/A 300 (citing 761 patent at 24:25-34), 313; *see generally id.* at Q/A

[REDACTED]

299-316. He also cites the NBM2317 series of DI Products as having high power density and high performance. *See id.* at Q/A 304.

Dr. Fayed's opinion is otherwise conclusory on this point, however, and overall Respondents are correct that the record fails to show that the 761 patent satisfies the asserted long-felt need or succeeds where others failed. There is no evidence that the 761 patent specifically produces higher efficiencies or power densities, or that others tried and failed to achieve those features. The only evidence Dr. Fayed cites (as to the 761 patent in particular, and as to increased efficiency and power density, as opposed to reduced heat generation) is that one series of DI Products demonstrates higher power density. *See CX-3578C (Fayed WS)* at Q/A 304. But that series of products (NBM2317) is only one among many embodiments of the claims, so it cannot be concluded that embodiments of the claims of the 761 patent in general solved a long-felt need or that others tried and failed to satisfy that need. *See RIB* at 164-67. The other evidence Dr. Fayed cites, [REDACTED]

[REDACTED]

are too disconnected from the asserted long-felt need and the claims of the 761 patent to be especially probative. *See CX-3578C (Fayed WS)* at Q/A 303, 305, 307, 312; *CX-0001C (Vinciarelli WS)* at Q/A 125. There is accordingly insufficient nexus between the 761 patent and either long-felt need or failure of others.

As for licensing, Vicor relies on a license taken by [REDACTED] that has yielded nearly [REDACTED] [REDACTED] between July 2021 and March 2024. *See CX-0003C (D'Amico WS)* at Q/A 96-98; *CX-0041C*. Although that dollar amount is impressive, the license grants the right to [REDACTED], and Vicor makes no effort to [REDACTED]. *See CX-0041C* at §§ 2.12 ([REDACTED])

[REDACTED]

[REDACTED]), 3.3; CRB at 86-88. [REDACTED]

[REDACTED]

[REDACTED]. See CX-0003C (D’Amico WS) at Q/A 85-94; Tr. (D’Amico) at 77:1-2; RIB at 171. Such licensing evidence is therefore of little probative value.

Overall, then, there is very strong evidence of commercial success, which weighs heavily against obviousness even in the absence of other objective indicia. The commercial success of the DI Products is powerful enough, in fact, to overcome Respondents’ prima facie obviousness case as to the claims of the 761 patent. Accordingly, no claim of the 761 patent has been shown to have been obvious.

**7. 35 U.S.C. § 112 - Indefiniteness**

Respondents argue that the terms “substantially overlapping” in claim 2 and “substantially a mirror image” in claim 4 are indefinite. See RIB at 90-96 & n.20. Their argument, which focuses on claim 2, is essentially that these terms are “fundamentally subjective and there are no objective guideposts available to determine the outer boundary of the scope of each claim.” *Id.* at 96. Respondents previously advanced this argument in a summary determination motion, which was denied. See Order No. 26 at 3-5. Staff agrees with Vicor that Respondents have not shown indefiniteness. See SRB at 34-37; CRB at 34-39.

“A patent’s claims, viewed in light of the specification and prosecution history, [must] inform those skilled in the art about the scope of the invention with reasonable certainty.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 910 (2014). *Id.* at 910. Claim 2 requires the first set of devices to be “positioned in a location” on the top of the PCB “substantially overlapping [the] location on the bottom” occupied by the second set of devices, and claim 4 further requires “the



pattern of components of one cell [to be] substantially a mirror image of the pattern of components in the other cell.” 761 patent at cls. 2, 4. According to the specification, two components may “substantially” overlap if, among other things, they are positioned such that they share the same set of vias:

One benefit of sharing footprints allows the pair of components to share a common set of conductive vias used to electrically connect the components on the PCB surfaces to internal conductive layers, e.g. used to form the windings of the transformer. Because each via is used for both components in the pair, the total number of vias for making connections to the pair of components may be reduced (by as much as a factor of two) increasing the area of conductive layers useable for making connections and thus reducing resistance. For example, assuming 6 vias are required for each output FET (a total of 12 vias for two FETs), using symmetrical footprint approach, the pair of FETs can share the same 6 vias (without increasing the via resistance) and because the number has been reduced the useable area for conductors may be increased. Alternatively, while reducing the total number of vias from 12 to some intermediate number, e.g. 8, the resistance of the vias may be decreased because of the increase in effective vias per FET while still increasing the area useable for conductors.

761 patent at 24:25-44. Notably, claim 3 requires a plurality of devices in the first and second sets to “share their respective sets of conductive vias,” so for claim 2 to have broader scope than claim 3, “substantially overlapping” should probably be understood to mean “overlapping so as to be capable of sharing the same set of vias,” rather than actually sharing the same set of vias. 761 patent at cl. 3. In any event, Dr. Fayed cites this guidance from the specification in opining that indefiniteness has not been shown. *See* CX-3578C (Fayed WS) at Q/A 27-29.

Dr. Ehsani, by contrast, does not fairly address this passage from the specification. He states that “a designer could easily squeeze in several shared conductive vias even if [the components] only overlap by a small amount relative to their overall size.” RX-0006C (Ehsani WS) at Q/A 139. The specification, however, contemplates sharing of the vias that “are required for each” component, that is, all the required vias, not merely some of the required vias. 761 patent at 24:35. So Dr. Ehsani’s overall opinion, including his analysis of a prior art reference (the DNK Module) as an



example of sharing only some vias, is grounded in a mischaracterization of the specification and is accordingly not well-supported. *See* RX-0006C (Ehsani WS) at Q/A 137, 140.

Respondents' other points are unpersuasive. That the inventors could not articulate an objective standard for "substantially" is not especially probative, and the existence of passages in the specification that do not support an objective standard is both unsurprising and irrelevant. *See* RX-0006C (Ehsani WS) at Q/A 138-39. Nor does the fact that context matters render the "substantially overlapping" requirement "fundamentally subjective." RIB at 95. As with any patented invention, a POSITA by definition must understand whatever context is relevant to the art, and in this case would understand it well enough to also understand the metes and bounds of the claims, given the guidance on vias provided by the specification. On balance, therefore, Respondents have not carried their burden of proving indefiniteness.

#### **8. Summary**

To summarize, claims 1, 2, 3, and 7 of the 761 patent are anticipated by the BMR Module. No claims have been proven invalid either as obvious or as indefinite.

### **VI. U.S. PATENT NO. 10,199,950**

#### **A. Level of Ordinary Skill in the Art**

A person having ordinary skill in the art of the 950 Patent at the time of invention:

would have at least a Master's degree in electrical engineering and two or more years of work experience relating to power electronics and the design and control of switching power converters, with more experience potentially substituting for education, or vice-versa.

Order No. 30 at 16. The parties do not challenge this definition (*see generally* CIB; CRB; RIB; RRB), and it is applied throughout this initial determination.



**B. Claims-at-Issue**

Claims 9, 13, 14, and 33-38 of the 950 patent are at issue in this investigation, either through allegations of infringement or DI technical prong. *See* CIB at 3. They are reproduced below:

9. An apparatus comprising:

a power converter comprising an input circuit and an output circuit, wherein the power converter is configured to receive power from a power distribution system comprising a source for providing power at a DC source voltage  $V_S$ ,

the power converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio,  $K_{DC}$ , at an output current,

wherein an input voltage  $V_{IN}$  is applied to the input circuit and an output voltage  $V_{OUT}$  is produced by the output of the power converter, and wherein the

substantially fixed voltage transformation ratio can be represented as

$$K_{DC} = V_{OUT} / V_{IN},$$

wherein the power converter further comprises:

a series connection between the input circuit of the power converter and at least a portion of the output circuit of the power converter across the source, such that an absolute value of the input voltage  $V_{IN}$  applied to the input circuit is approximately equal to the absolute value of the DC source voltage  $V_S$  minus a number  $N$  times the absolute value of the output voltage  $V_{OUT}$ , where  $N$  is at least 1;

wherein the power converter comprises an inductive component and one or more power switches in the input circuit, the output circuit, or both; and

wherein a current flowing in the inductive component charges and discharges capacitances in the power converter reducing a voltage across said one or more switches prior to turning ON said one or more switches.

13. The apparatus of claim 9, wherein the power converter comprises:

a transformer, and a resonant circuit including the transformer having characteristic resonant frequency and period,

the input circuit including two or more primary switches connected to drive the resonant circuit and the output circuit being connected to receive power from the transformer; and

[REDACTED]

a switch controller adapted to operate the primary switches in a series of converter operating cycles,

each converter operating cycle characterized by two power transfer intervals of essentially equal duration each interval having a duration less than the characteristics resonant period,

during which one or more of the primary switches are ON and power is transferred from the input to the output via the transformer.

14. The apparatus of claim 9, wherein the power converter is part of a bus converter that is a self-contained assembly adapted to be installed as a unit.

33. An apparatus comprising:

a bus converter comprising an input circuit and an output circuit,

the bus converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, KDC, at an output current,

wherein an input voltage  $V_{IN}$  is applied to the input circuit and an output voltage  $V_{OUT}$  is produced by the output of the bus converter, and

wherein the substantially fixed voltage transformation ratio can be represented as  $KDC=V_{OUT}/V_{IN}$ ;

wherein the input circuit of the bus converter and the output circuit of the bus converter are galvanically connected; and

wherein the bus converter comprises an inductive component and one or more power switches in the input circuit or output circuit or both; and

wherein a current flowing in the inductive component charges and discharges capacitances in the converter reducing a voltage across said one or more switches prior to turn ON said one or more switches.

34. The apparatus of claim 33, wherein the bus converter comprises: a transformer, and a resonant circuit including the transformer having a characteristic resonant frequency and period, the input circuit including two or more primary switches connected to drive the resonant circuit and the output circuit being connected to receive power from the transformer; and a switch controller adapted to operate the primary switches in a series of converter operating cycles, each converter operating cycle characterized by two power transfer intervals of essentially equal duration each interval having a duration less than the characteristics resonant period, during which one or more of the primary switches are ON and power is transferred from the input to the output via the transformer.



35. The apparatus of claim 33 wherein the voltage across said one or more switches is reduced to essentially zero volts prior to turn ON of said one or more switches.

36. The apparatus of claim 33 wherein the input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected in series across the source such that an absolute value of the input voltage  $V_{IN}$  applied to the input circuit is approximately equal to the absolute value of the DC source voltage  $V_S$  minus a number  $N$  times the absolute value of the output voltage  $V_{OUT}$ , where  $N$  is at least 1.

37. The apparatus of claim 33, wherein the input circuit comprises a first winding having a first number of turns, wherein the output circuit comprises a second winding having a second number of turns, and wherein the voltage transformation ratio is a function of a ratio of the first number of turns to the second number of turns.

38. The apparatus of claim 37, wherein at least a portion of the input circuit of the bus converter is connected in series with at least a portion of the output circuit of the bus converter such that an absolute value of a voltage applied to the first winding is approximately equal to the absolute value of the input voltage,  $V_{IN}$ , minus a number  $N$  times the absolute value of the output voltage  $V_{OUT}$ , where  $N$  is at least 1.

950 patent at cls. 9, 13, 14, 33, 34, 35, 36, 37, and 38.

**C. Claim Construction**

As part of the *Markman* process, the following claim terms of the 950 Patent were construed:

<b>Claim Term</b>	<b>Construction</b>
characteristic resonant frequency and period	the resonant frequency and period of the resonant circuit
primary switches	device that allows current flow when closed through the primary winding of a transformer and provides isolation when open
galvanically connected	directly electrically connected

*See* Order No. 30 at 16-17, 35, 39.

**D. Infringement**

Vicor accuses Delta's and Cynotec's modules of infringing the 950 patent. As discussed above, the parties stipulated that certain Delta modules (U50SU4P162PMAR and U50SU4P180PMDAL) and a Cynotec module (MPN541382-PVA) are representative of other Delta

[REDACTED]

and Cynotec modules. The Accused Products are alleged to infringe claims 9, 13-14, and 33-38 of the 950 patent. CIB at 67, 90.

**1. Delta U50SU4P162PMAR and U50SU4P180PMDAL**

**a) Claim 9**

Dr. Fayed opines that the U50SU4P162PMAR module is an apparatus that includes a power converter (element 9(a)) that produces an output voltage  $V_{OUT}$  (element 9(f)), comprising an inductive component—namely, an autotransformer—and one or more switches in the input circuit, the output circuit, or both (element 9(j)), and wherein a current flowing in the inductive component charges and discharges capacitances in the power converter reducing a voltage across said one or more switches prior to turning ON said one or more switches (element 9(k)). *See* CX-0008C (Fayed WS) at Q/A 469-72, 486, 494-97, 504. His opinion is the same for the U50SU4P180PMDAL. *See id.* at Q/A 547-48. Neither Respondents nor Staff dispute these opinions, although Dr. Hopkins characterizes the inductive component as [REDACTED]. *See*

SIB at 44, 58; RIB at 103-11; EDIS Doc. ID 821356 at 7; RX-0010C (Hopkins RWS) at Q/A 95

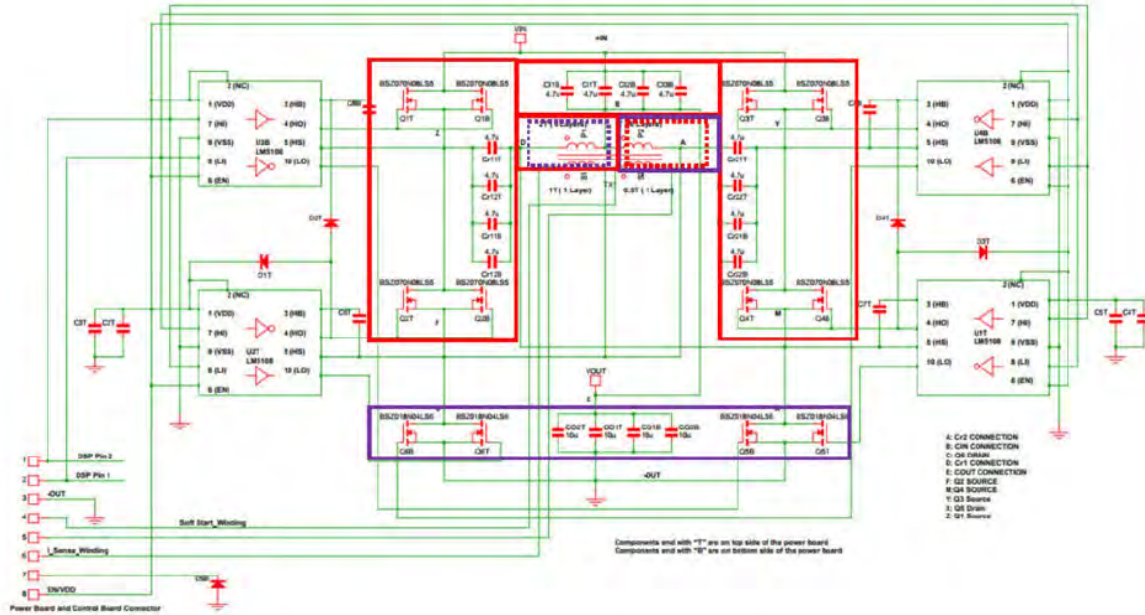
[REDACTED] Staff contends that all elements are satisfied in both representative modules. *See* SIB at 44-59. Nonetheless, Vicor has failed to show by a preponderance of the evidence that either representative module practices all elements of claim 9 of the 950 patent.

**(1) Limitation [9.b] an input circuit and an output circuit**

Dr. Fayed opines that, based on a reverse-engineered schematic of the U50SU4P162PMAR (RX-0880 or CX-3161):

[T]he input circuit (indicated in red) includes power semiconductor devices (e.g., Q1T and Q1B, Q2T and Q2B, Q3T and Q3B, and Q4T and Q4B), resonant capacitors (e.g., CR11T, CR12T, CR11B, CR12B and CR21T, CR22T, CR21B, CR22B), input capacitors (e.g., CI1T and CI1B and CI2T, CI2B), and transformer

windings (e.g., P1 and P2 depending on the phase). The output circuit (indicated in purple) includes transformer windings (e.g., P2 and P1 depending on the phase), output switches (e.g., Q5T and Q5B and Q6T, Q6B), and output capacitors (e.g., CO1T, CO1B, CO2T, CO2B).




CX-0008C (Fayed WS) at Q/A 473. Dr. Fayed further opines that Delta’s own schematics support his analysis:



*Id.* at Q/A 474 (citing RPX-0063C). Dr. Fayed’s testimony regarding the U50SU4P180PMDAL is



essentially the same as his testimony regarding the U50SU4P162PMAR, but with different designators for certain components. *See* CX-0008C (Fayed WS) at Q/A 561.

Delta correctly argues that under Dr. Fayed’s identification of the circuits, the two transformer windings  are in both the “input circuit” and the “output circuit,” depending on the phase of operation. RIB at 104-05 (citing CX-0008C (Fayed WS) at Q/A 474)). That is, Vicor must “include all transformer windings in both circuits to cobble together [its] input and output circuits,” so the input circuit necessarily includes part of the output circuit, and vice versa, and the apparatus cannot “convert power from the input circuit to the output circuit” as required without periodically switching circuit components. RX-0010C (Hopkins RWS) at Q/A 95 (emphasis omitted). A topology where the two circuits are not fixed, such that the components swap back and forth between circuits as the phase shifts, does not satisfy the requirement of “an input circuit and an output circuit.”

There are three other problems with Vicor’s position. First, given that the input and output circuits comprise circuit elements that vary periodically (that is, with the phase of the input electricity), the analysis of other elements of the claim must take that periodic variation into account, by considering how the accused circuitry operates in both phases. As explained below, however, Dr. Fayed almost never accounts for that variation at all.

Second, Vicor’s identification of certain components, particularly the inductive components, is baffling. Vicor and Dr. Fayed generally rely on the two schematics for the U50SU4P162PMAR discussed above regarding the 481 patent, one produced by Delta (RX-0063C) and one “reverse-engineered” but otherwise of unknown provenance (CX-3161). CX-0008C (Fayed WS) at Q/A 473-74; *see* RX-1908C (Fayed Dep.) at 49:24-50:12. Dr. Fayed testified that he confirmed the reverse-engineered schematic was accurate, but in fact there are unexplained discrepancies. *See* RX-1908C

[REDACTED]

(Fayed Dep.) at 50:13-24. As one example, the reverse-engineered schematic seemingly has four transformer windings, S1, S2, P1, and P2, where S1 and S2 are electrically isolated from P1 and P2 (see CX-3161), while Delta's schematic shows [REDACTED] (see RX-0063C). As another example, Dr. Fayed identifies a "second winding" he labels "P2," which confusingly appears to be called [REDACTED] in the schematic, and which is part of an "autotransformer." See CX-0008C (Fayed WS) at Q/A 474, 476. But he does not explain how an autotransformer works, and he identifies only two sets of windings in the Delta schematic, as opposed to four in the reverse-engineered schematic. See *id.* So in addition to a confusing mapping of elements, it is not even clear that Vicor's evidence is reliable. As a third, especially mystifying example, for the U50SU4P180PMDAL Dr. Fayed identifies four MOSFETs, [REDACTED], which are both "power semiconductors" in the "input circuit" and also "output switches." CX-0008C (Fayed WS) at Q/A 561. This may have been a typographical error, but it is unclear how it should be resolved, that is, whether the MOSFETs are part of the input circuit or part of the output circuit, or if their characterization varies with phase.

Third, Dr. Hopkins opines that during one phase of operation, current flows through a particular switch, [REDACTED] such that [REDACTED] acts as part of the input circuit. RX-0010C (Hopkins RWS) at Q/A 88 (emphasis omitted). But Dr. Fayed identifies [REDACTED] as part of the output circuit regardless of phase. See CX-0008C (Fayed WS) at Q/A 474. Although Dr. Hopkins' explanation of the current flows is not entirely clear, neither Dr. Fayed nor Vicor even attempt to refute this point. See *id.* at Q/A 476; CIB at 72.

Indeed, Vicor does not even accurately characterize Dr. Fayed's opinion. It contends that "Dr. Fayed identified as the input circuit the elements between  $V_{IN}$  . . . and the wire connecting B and  $V_{OUT}$ ," and "identified as the output circuit the elements between the series connection and



ground.” CIB at 72. Referring to Vicor’s reverse-engineered schematic, CX-3161, though, Dr. Fayed identified as the output circuit the elements between the wire connecting B and  $V_{OUT}$ , plus one of the two transformer windings. *See* CX-0008C (Fayed WS) at Q/A 473. And referring to Delta’s own schematic, RX-0063C, Dr. Fayed identified as the output circuit certain switches and capacitors between  $V_{OUT}$  and ground, plus one of the two transformer windings. *See id.* at Q/A 474. And again, the two transformer windings swap membership in the input and output circuits depending on the phase, as is clear from how Dr. Fayed annotated CX-3161, with both transformer windings enclosed within both red and purple boxes. *Id.* at Q/A 473. Dr. Fayed himself mischaracterizes his own identification: “The devices I grouped as an input circuit are on the primary side of the autotransformer, while the devices I grouped as an output circuit are the devices on the secondary winding of the autotransformer.” In fact the “devices” he grouped are on both sides, as explained. Lastly, it is irrelevant whether the inductive component is a transformer or autotransformer, because the circuits are improperly defined either way, and it is also irrelevant whether or not the circuitry overall is considered as one or two or some other number of circuits. *See id.* at Q/A 476; CIB at 72.

On balance, then, Vicor has not shown that element 9(b) is satisfied in either the U50SU4P162PMAR or the U50SU4P180PMDAL. *See* CX-0008C (Fayed WS) at Q/A 473. And as explained below, the proof problems with this element propagate through the other elements, as well.

**(2) Limitation [9.c] wherein the power converter is configured to receive power from a power distribution system comprising a source for providing power at a DC source voltage  $V_S$**

Dr. Fayed testified that the datasheet for the U50SU4P162PMAR “shows a typical application including bi-directional power delivery via the converter between a high side voltage



and a low side voltage,” and identifies the high side voltage in the datasheet as V<sub>Hs</sub>. CX-0008C (Fayed WS) at Q/A 477 (citing CX-0237C). Dr. Fayed provides a similar opinion regarding the U50SU4P180PMDAL. *Id.* at Q/A 562 (citing CPX-0030C).

Delta argues that if  $K_{DC}$  is 4 or  $\frac{1}{4}$ , “ $V_{IN}$  must be equal to the hi-side input voltage of the module (because 54V input voltage/13.5V output voltage = 4) and thus also equal to  $V_s$ .” RIB at 107 (citing RX-0010C (Hopkins RWS) at Q/A 110-112, 206-208). But if Vicor’s identification of  $V_s$  is inconsistent with other claim limitations, or if its identification of  $V_{IN}$  or  $K_{DC}$  are incorrect, those flaws relate to other limitations. And Dr. Hopkins’s testimony does not otherwise dispute or undermine that the U50SU4P162PMAR and U50SU4P180PMDAL each comprise a power converter that is configured to receive power from a power distribution system comprising a source for providing power at a DC source voltage  $V_s$ . *See* RX-0010C (Hopkins RWS) at Q/A 109-12. So Vicor has shown that element 9(c) is satisfied in both the U50SU4P162PMAR and the U50SU4P180PMDAL.

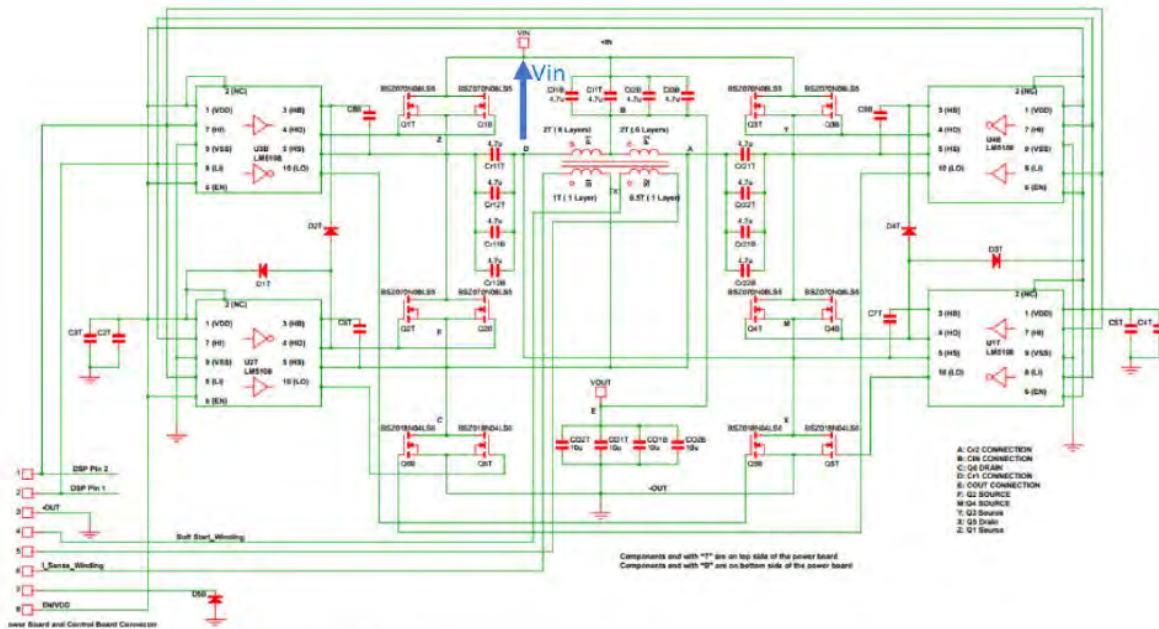
**(3) Limitation [9.d] the power converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio,  $K_{DC}$ , at an output current**

Dr. Fayed testified that the datasheets for the U50SU4P162PMAR and U50SU4P180PMDAL show that they are fixed ratio converters. *See* CX-0008C (Fayed WS) at Q/A 449 (citing CX-0237C), 563 (CX-0030C). Both datasheets state “Fixed Ratio Factor:  $K=4$ .” CX-0237C.0001; CX-0030C.0001. This is sufficient evidence that the  $K_{DC}$  ratio (defined as  $V_{OUT} / V_{IN}$ ) is also fixed, and Vicor has met its burden of proof on this limitation.

**(4) Limitation [9.e] wherein an input voltage  $V_{IN}$  is applied to the input circuit and**



Dr. Fayed testified that based on the reverse-engineered U50SU4P162PMAR schematic, “the “VIN+” node is connected to the input circuit . . . [t]hus, an input voltage  $V_{IN}$  is applied to the input circuit.” CX-0008C (Fayed WS) at Q/A 484. The voltage difference is thus between “+IN” and “VOUT”:



Id. Vicor accordingly argues that [REDACTED]

[REDACTED] CIB at 74. Dr. Fayed testified that a similar analysis applies to the U50SU4P180PMDAL. See CX-0008C (Fayed WS) at Q/A 564.

Vicor and Dr. Fayed again ignore the periodic variation in circuit elements, which by itself fails to satisfy the preponderance of the evidence standard. See CX-0008C (Fayed WS) at Q/A 484-85; CIB at 74-77. Additionally, Dr. Hopkins points out that “what Dr. Fayed identifies as the ‘input circuit’ is in fact [REDACTED] . . . resulting in  $V_S = V_{IN}$ ,” such that the input voltage is actually applied across both the input and output circuits. RX-0010C (Hopkins RWS) at Q/A 125. Dr. Hopkins’ explanation of this point is not entirely clear, but neither Dr. Fayed nor Vicor offer



anything but conclusory rebuttal to it. See CX-0008C (Fayed WS) at Q/A 484-85; CIB at 76-77.

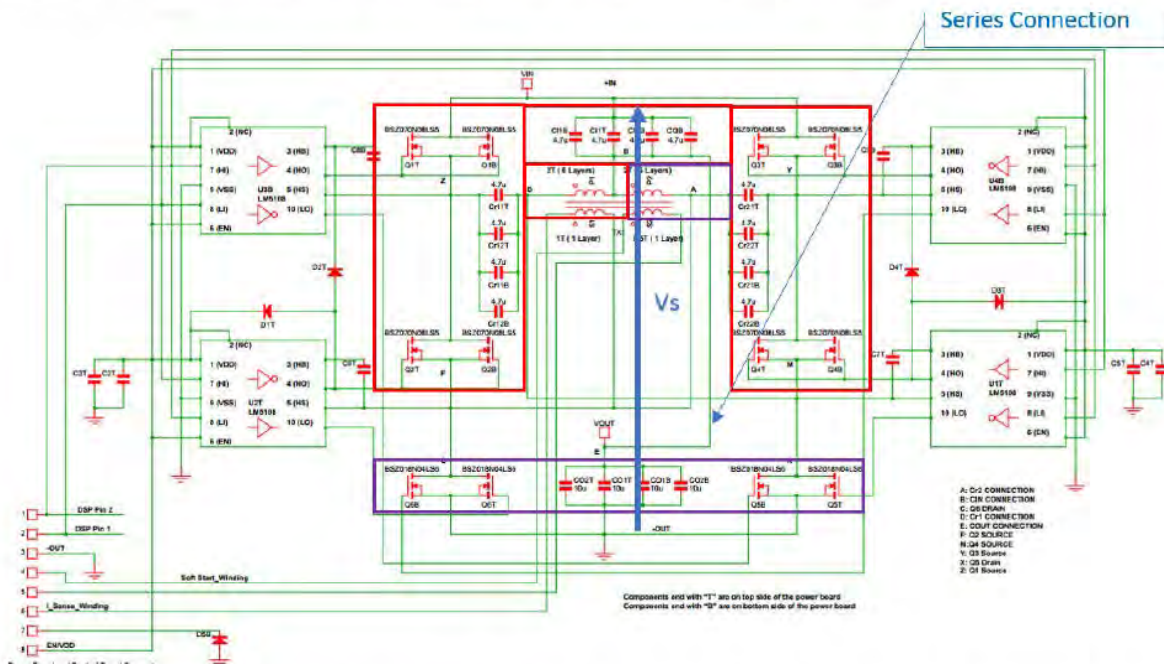
So Vicor has not met its burden of proof on this limitation.

**(5) Limitation [9.g] wherein the substantially fixed voltage transformation ratio can be represented as  $K_{DC}=V_{OUT}/V_{IN}$ , wherein the power converter further comprises:**

The parties agree that this element rises or falls with element 9(d) above. See CIB at 79; RIB at 106-07; SIB at 46, 58. Vicor has shown that element 9(d) is met, so Vicor has also shown that element 9(g) is met.

**(6) Limitation [9.h] a series connection between the input circuit of the power converter and at least a portion of the output circuit of the power converter across the source,**

Vicor contends, based on the testimony of Dr. Fayed, that the U50SU4P162PMAR and U50SU4P180PMDAL meet this limitation. See CIB at 79-81. Dr. Fayed provided an illustration of the series connection on the reverse-engineered U50SU4P162PMAR schematic:



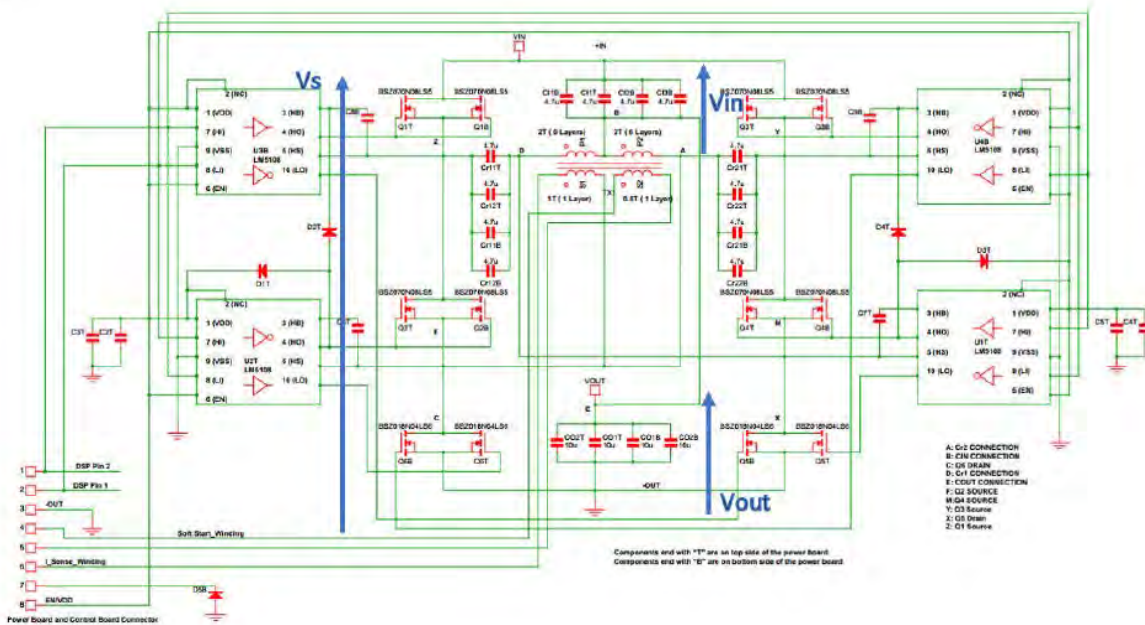
CX-0008C (Fayed WS) at Q/A 490. Dr. Fayed also opines that Delta’s circuit schematic shows

[REDACTED]. *Id.* Vicor argues that the U50SU4P180PMDAL shares the same designators of input and output circuit elements as the U50SU4P162PMAR, and therefore Dr. Fayed’s analysis is equally applicable to the U50SU4P180PMDAL. *See* CIB at 75; CX-0008C (Fayed WS) at Q/A 567.

As noted, the boundaries between the input and output circuits are not entirely clear, so although Vicor and Dr. Fayed have identified a series connection, it is uncertain that the connection is between the input circuit and a portion of the output circuit; certainly Dr. Fayed does not account for the periodic shifting of circuit components described above. *See* CX-0008C (Fayed WS) at Q/A 490-91. Nor does Vicor address Delta’s argument that there are multiple connections between the two nodes Dr. Fayed identifies, such that the input and output circuits are connected both in series and in parallel, and that a series/parallel connection does not fall within the plain and ordinary meaning of “series.” *Compare* RIB at 109-10 (“two circuits cannot be connected along multiple electrical paths . . . and still be connected in series”) *with* CIB at 79-81. Accordingly, Vicor has failed to prove by a preponderance of the evidence that the U50SU4P162PMAR and U50SU4P180PMDAL meet this limitation.

**(7) Limitation [9. i] such that an absolute value of the input voltage  $V_{IN}$  applied to the input circuit is approximately equal to the absolute value of the DC source voltage  $V_S$  minus a number  $N$  times the absolute value of the output voltage  $V_{OUT}$ , where  $N$  is at least 1;**

Dr. Fayed opines that this limitation is met for the U50SU4P162PMAR, stating that “with reference to the circuit diagram, CX-3161, the voltage applied to the input circuit is  $V_S$  (source voltage) -  $V_{OUT}$  (output voltage). Thus,  $N$  is 1.” CX-0008C (Fayed WS) at Q/A 492:



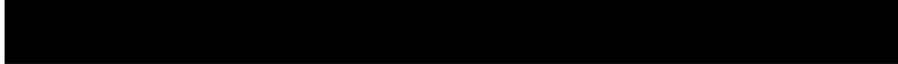
Dr. Fayed also opines that Delta’s schematic supports his interpretation because [REDACTED]

[REDACTED]

[REDACTED] *Id.* (citing RPX-0063C). Dr. Fayed further opines that the U50SU4P180PMDAL meets this limitation for the same reasons. *Id.* at Q/A 569 (citing CPX-0008C).

As with other limitations, “the alleged ‘input circuit’ . . . is connected [REDACTED] in what Dr. Fayed has identified as the ‘output circuit’ . . . and as a result, during operation, the voltage applied to the ‘input circuit’ is [REDACTED] identified by Dr. Fayed as  $V_{IN[.]}$ ” RX-0010C (Hopkins RWS) at Q/A 135 (emphasis omitted). In other words, because the [REDACTED]

[REDACTED] *Id.* Dr. Fayed’s rebuttal to Dr. Hopkins is conclusory and unpersuasive, as it merely states that Dr. Fayed correctly identified  $V_{IN}$  but Dr. Hopkins did not. *See* CX-0008C



(Fayed WS) at Q/A 439. Because Dr. Hopkins' testimony is better supported by the evidence than Dr. Fayed's, Vicor has failed to prove by a preponderance of the evidence that the U50SU4P162PMAR and U50SU4P180PMDAL meet this limitation.

In summary, Vicor has failed to prove by a preponderance of the evidence that the U50SU4P162PMAR and U50SU4P180PMDAL infringe claim 9 of the 950 patent.

**b) Dependent Claims 13 and 14**

Dr. Fayed opines that the U50SU4P162PMAR and U50SU4P180PMDAL each comprise a transformer, a resonant circuit, and a switch controller, and that they satisfy many of the elements recited in dependent claims 13 and 14. *See* CX-0008C (Fayed WS) at Q/A 498-516, 549-58, 573. Respondents dispute the presence of multiple limitations in claim 13, and of the additional limitation of claim 14. *See* RIB at 111-14. The most substantial dispute is over the requirement of the "output circuit being connected to receive power from the transformer." *See* RIB at 112-13. Dr. Fayed here admits that the identity of the output circuit depends "on the phase operation." *See* CX-0008C (Fayed WS) at Q/A 507. But he then mischaracterizes his own opinion regarding claim 1: "in my annotation, I highlighted only one of [the windings] as being part of the output circuit." *Id.* This is incorrect, as noted above, and in any event Vicor has not clearly identified the output circuit, or how the output circuit can receive power from the transformer, which is itself part of the output circuit. And as for claim 14, Dr. Fayed opines that the ranges of input and output voltages for both representative products "are consistent with the well-known bus converter application," to which Dr. Hopkins has no meaningful rejoinder. CX-0008C (Fayed WS) at Q/A 514-16, 573; *see* RX-0010C (Hopkins RWS) at Q/A 160, 162, 237.



So although the additional limitation of claim 14 has been shown, the requirements of claim 13 have not been shown. And in any event, Vicor has not shown infringement of either claim 13 or claim 14 by either representative product because infringement of claim 9 has not been shown.

**c) Claim 33**

There are a few differences between independent claim 9 and independent claim 33, including that in claim 33 the apparatus must comprise a bus converter and the input and output circuits must be galvanically connected. *See* 950 patent at cl. 33. The parties nonetheless agree that the disputes with respect to claim 33 are largely identical to those raised for claim 9. *See* CIB at 88; RIB at 114; SIB at 57, 59. Both claims require “an input circuit and an output circuit” and an “input voltage  $V_{IN}$  applied to the input circuit,” which are not present in either representative product, so claim 33 is also not infringed by either product. 950 patent at cls. 9, 33.

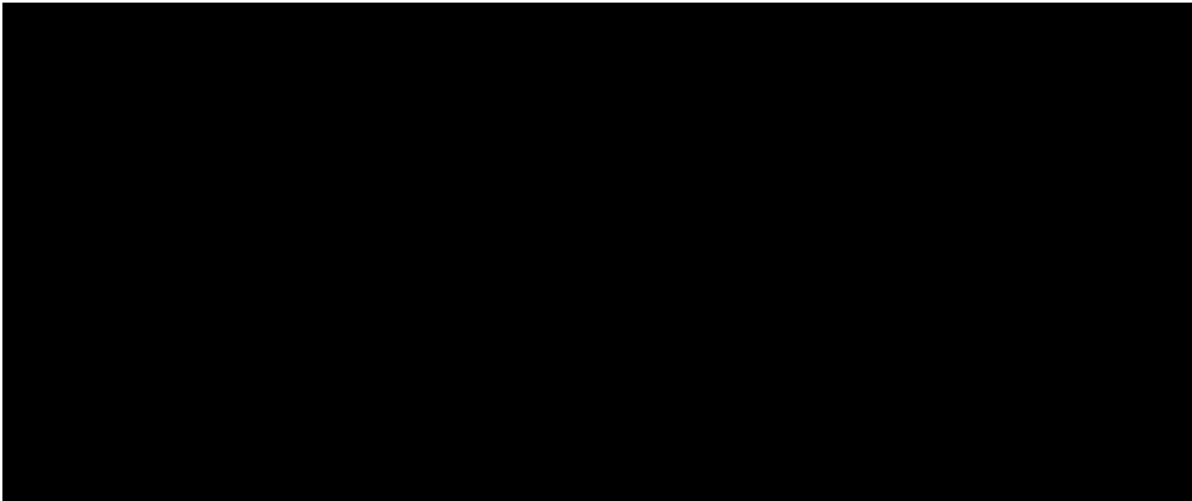
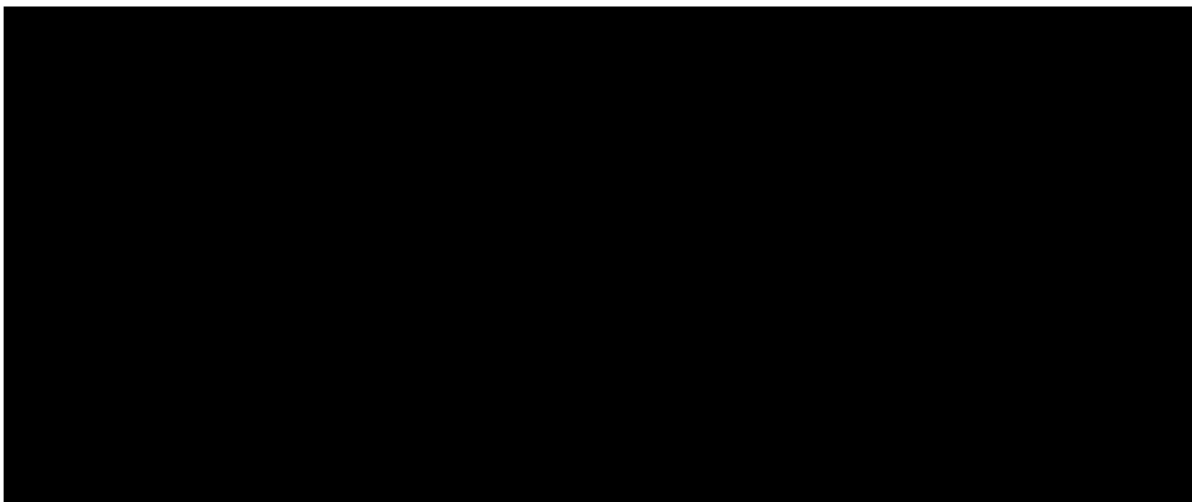
**d) Dependent Claims 34 - 38**

Claim 34 depends from claim 33 and adds, among other elements, the same requirement found in claim 13 that the “output circuit” is “connected to receive power from the transformer.” 950 patent at cl. 34. Delta argues that this element is not satisfied by either representative product, and it is not for the same reasons given above for claim 13. *See* RIB at 114. Claim 35 depends from claim 33 and adds the limitation “wherein the voltage across said one or more switches is reduced to essentially zero volts prior to turn ON of said one or more switches.” 950 patent at cl. 35. Dr. Fayed opines that this limitation is met in both representative products, and Delta has no rejoinder other than that independent claim 33 is not practiced. *See* CX-0008C (Fayed WS) at Q/A 537, 593. Claim 36 depends from claim 33 and adds the requirements found in claim 9 of a “series connection” between the input circuit and at least a portion of the output circuit, and “an absolute value of the input voltage  $V_{IN}$  applied to the input circuit is approximately equal to the absolute value of the DC



source voltage  $V_S$  minus a number  $N$  times the absolute value of the output voltage  $V_{OUT}$ , where  $N$  is at least 1.” 950 patent at cl. 36. These limitations are lacking in the representative Accused Products for the same reasons articulated above as to claim 9.

Claim 37 depends from claim 33 and adds the requirement “wherein the input circuit comprises a first winding having a first number of turns, wherein the output circuit comprises a second winding having a second number of turns, and wherein the voltage transformation ratio is a function of a ratio of the first number of turns to the second number of turns.” 950 patent at cl. 37. Dr. Fayed here accounts for the varying component composition of the input and output circuits:



CX-0008C (Fayed WS) at Q/A 541-42; *see id.* at Q/A 597-98.

[REDACTED]

Dr. Fayed’s analysis is nonetheless incomplete because it does not explain how either representative product functions as a 4:1 step-down power converter, that is, how it steps down voltage by the amount specified in the datasheets. *See* CX-0237C at 1 (U50SU4P162PMAR); CX-0030C at 1 (U50SU4P180PMDAL). As Dr. Hopkins points out, “Dr. Fayed now contends . . . that the [REDACTED]” RX-0010C (Hopkins RWS) at Q/A 174; *see* CX-0008C (Fayed WS) at Q/A 543. Put another way, [REDACTED] [REDACTED] CX-0008C (Fayed WS) at Q/A 543. But if that is true, then the [REDACTED] [REDACTED]

Consequently, Delta, while overstating the problem, is fundamentally correct: “Complainant has not identified or conducted any analysis regarding what the voltage transformation ratio is, what the transformer turns ratio is, or whether the voltage transformation ratio is related to the transformer turns ratio in any way.” RIB at 115. On balance, then, Vicor has not shown that the element added by claim 37 is met by either representative product.

As to claim 38, Vicor did not present any argument for the Delta U50SU4P162PMAR and U50SU4P180PMDAL in its initial post-hearing brief. *See* CIB at 90. Delta argues that “Vicor did not address infringement of this limitation by the Delta modules in its initial brief, so Respondents understand this claim to be dropped as to those products.” RRB at 91. I agree, and on that basis, Vicor has not shown infringement of claim 38 by either representative product.

In sum, Vicor has not shown infringement of any asserted claim of the 950 patent by the Delta Accused Products, either directly or indirectly.



**2. Cyntec MPN541382-PVA**

**a) Claim 9**

Dr. Fayed opines that the MPN541382-PVA module is an apparatus that includes a power converter (element 9(a)) that produces an output voltage  $V_{OUT}$  (element 9(f)), comprising an inductive component—namely, a transformer—and one or more switches in the input circuit, the output circuit, or both (element 9(j)), and wherein a current flowing in the inductive component charges and discharges capacitances in the power converter reducing a voltage across said one or more switches prior to turning ON said one or more switches (element 9(k)). *See* CX-0008C (Fayed WS) at Q/A 603-04, 609, 613-14. Neither Cyntec nor Staff disputes these opinions, and Staff contends that all elements are satisfied. *See* SIB at 59-68; RIB at 116-21; EDIS Doc. ID 821356 at 8. Nonetheless, Vicor has failed to show by a preponderance of the evidence that the representative module practices all elements of claim 9 of the 950 patent.

**(1) Limitation [9.b] an input circuit and an output circuit,**

In contrast to the Delta products, the record for the Cyntec representative module includes a relatively easy to read schematic, produced by Respondents as DELTA\_SC\_000606 and discussed above with respect to the 481 patent. *See* CX-0008C (Fayed WS) at Q/A 605. Dr. Fayed does not show this schematic anywhere in his witness statement (*see id.* at Q/A 603-50), but Dr. Hopkins provides an annotated and slightly rearranged version as a demonstrative:

[REDACTED]

[REDACTED]

RDX-0017C.56 (citing RPX-0163C). Both experts agree that what is labeled [REDACTED] [REDACTED] is a transformer (as opposed to an autotransformer or coupled inductors). See CX-0008C (Fayed WS) at Q/A 605; RX-0010C (Hopkins RWS) at Q/A 267. Citing this schematic, Dr. Fayed explains the operation of the MPN541382-PVA during one phase:

[REDACTED]

CX-0008C (Fayed WS) at Q/A 611.

[REDACTED]

Dr. Hopkins opines, without dispute from Dr. Fayed, that during the “second phase” the MPN541382-PVA operates in essentially mirror image fashion:

[REDACTED]

RX-0010C (Hopkins RWS) at Q/A 275. Dr. Hopkins also provides a simplified version of the schematic, with each [REDACTED] and annotated to show current flows during the “second phase”:

[REDACTED]

*Id.* at Q/A 275 (citing RDX-0017C.57).

[REDACTED]

Cyntec criticizes Vicor’s evidence on multiple grounds, including that the input and output circuits are actually just a single circuit (a point Delta also makes regarding the Delta Accused Products). *See* RIB at 104, 117. More substantively, Dr. Fayed’s opinion is internally inconsistent. For element 9(b) he states that the “input circuit . . . include[es] the transformer” and the output circuit includes only switches and capacitors, regardless of phase, but for element 9(h) he states that “during a first phase” the input circuit includes [REDACTED] and the output circuit includes [REDACTED] [REDACTED] CX-0008C (Fayed WS) at Q/A 605, 611. As Cyntec notes, both assertions cannot simultaneously be true—either the entire transformer is part of the input circuit (element 9(b)), or one winding is part of the input circuit and one part of the output circuit, with the windings swapping circuits as the phase changes (element 9(h)). *See* RIB at 117; RX-0010C (Hopkins RWS) at Q/A 267, 273. Vicor has no response to this critique other than to incorporate by reference its arguments on the Delta Accused Products. *See* CIB at 91.

And as with the Delta Accused Products, the problem is particularly acute for element 9(b) because Dr. Fayed’s characterization of other circuit components is also flawed. Dr. Hopkins opines, without dispute from Dr. Fayed, that in the second phase current flows [REDACTED] [REDACTED] [REDACTED] [REDACTED] (blue in the simplified schematic). RX-0010C (Hopkins RWS) at Q/A 275 (citing RDX-0017C.57); *see* CX-0008C (Fayed WS) at Q/A 605. Thus, [REDACTED] [REDACTED], so both switches must be part of the input circuit, but Dr. Fayed opines that [REDACTED] is part of the output circuit. *See* CX-0008C (Fayed WS) at Q/A 605.



In short, Vicor has not shown that the MPN541382-PVA possesses “an input circuit and an output circuit” because it has not identified those circuits accurately and consistently.

**(2) Limitation [9.c] wherein the power converter is configured to receive power from a power distribution system comprising a source for providing power at a DC source voltage  $V_S$ ,**

Dr. Fayed testified that the datasheet for the MPN541382-PVA “shows a typical application for power delivery,” and identifies the high side voltage in the datasheet as  $V_H$ . CX-0008C (Fayed WS) at Q/A 606 (citing CX-0303C at 2). Cyntec argues that Dr. Fayed misstates the voltage transformation ratio, but if Vicor’s identification of  $V_S$  is inconsistent with other claim limitations, or if its identification of  $K_{DC}$  is incorrect, those flaws relate to other limitations. See RIB at 119. And Dr. Hopkins’s testimony does not otherwise dispute or undermine that the MPN541382-PVA comprises a power converter that is configured to receive power from a power distribution system comprising a source for providing power at a DC source voltage  $V_S$ . See RX-0010C (Hopkins RWS) at Q/A 281-83. So Vicor has shown that element 9(c) is satisfied in the MPN541382-PVA.

**(3) Limitation [9.d] the power converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio,  $K_{DC}$ , at an output current,**

Dr. Fayed testified that the datasheet for the MPN541382-PVA shows that it is a fixed ratio converter. See CX-0008C (Fayed WS) at Q/A 607 (citing CX-0303C at 1). The datasheet states that it is a “1:4 intermediate bus converter.” CX-0303C at 1. This is sufficient evidence that the  $K_{DC}$  ratio (defined as  $V_{OUT} / V_{IN}$ ) is also fixed.

**(4) Limitation [9.e] wherein an input voltage  $V_{IN}$  is applied to the input circuit and**

Vicor and Dr. Fayed again ignore the periodic variation in circuit elements, which fails to satisfy the preponderance of the evidence standard. *See* CX-0008C (Fayed WS) at Q/A 608; CIB at 92-93. So Vicor has not met its burden of proof on this limitation, either.

**(5) Limitation [9.g] wherein the substantially fixed voltage transformation ratio can be represented as  $K_{DC}=V_{OUT}/V_{IN}$ , wherein the power converter further comprises:**

The parties agree that this element rises or falls with element 9(d) above. *See* CIB at 94; RIB at 118-19; SIB at 60-61. Vicor has shown that element 9(d) is met, so Vicor has also shown that element 9(g) is met.

**(6) Limitation [9.h] a series connection between the input circuit of the power converter and at least a portion of the output circuit of the power converter across the source,**

As noted, the boundaries between the input and output circuits are not entirely clear, so although Vicor and Dr. Fayed have identified a series connection, it is uncertain that the connection is between the input circuit and a portion of the output circuit; Dr. Fayed, in fact, only describes the alleged series connection “during a first phase.” *See* CX-0008C (Fayed WS) at Q/A 611. Nor does Vicor address Cyntec’s argument that there are multiple connections between the two “series” nodes Dr. Fayed identifies, such that the input and output circuits are connected both in series and in parallel, and that a series/parallel connection does not fall within the plain and ordinary meaning of “series.” *Compare* RIB at 120-21 (“two circuits cannot be connected along multiple electrical paths and still be connected in series”) *with* CIB at 94-95. Accordingly, Vicor has failed to prove by a preponderance of the evidence that the MPN541382-PVA meets this limitation.

**(7) Limitation [9.i] such that an absolute value of the input voltage  $V_{IN}$  applied to the input circuit is approximately equal to the absolute value of the DC source voltage  $V_S$  minus a**



**number N times the absolute value of the output voltage  $V_{OUT}$ , where N is at least 1;**

On cross examination Dr. Hopkins apparently admitted that Dr. Fayed's identification of  $V_{IN}$ ,  $V_{OUT}$ , and  $V_S$  is accurate, and that N equals 1. *See* Tr. (Hopkins) at 779:8-800:2; CX-0008C (Fayed WS) at Q/A 612. Nonetheless, the requirement of "the input voltage  $V_{IN}$  applied to the input circuit" cannot be satisfied because the input circuit has not been properly identified, as explained. So Vicor has not shown that this element is satisfied.

In summary, Vicor has failed to prove by a preponderance of the evidence that the MPN541382-PVA infringes claim 9 of the 950 patent.

**b) Dependent Claims 13 and 14**

Dr. Fayed opines that the MPN541382-PVA comprises a transformer, a resonant circuit, and a switch controller, and that it satisfies many of the elements recited in dependent claims 13 and 14. *See* CX-0008C (Fayed WS) at Q/A 616-22. Cynotec disputes the presence of two limitations in claim 13, and of the additional limitation of claim 14. *See* RIB at 122-23. The most substantial dispute is over the requirement of the "output circuit being connected to receive power from the transformer." *See* RIB at 122-23. Dr. Fayed's opinion on this element fails to address Respondents' persuasive argument that the output circuit cannot "receive" power from the transformer, which is already part of the output circuit. *See* CX-0008C (Fayed WS) at Q/A 619; RIB at 123. And as for claim 14, Dr. Fayed notes that the MPN541382-PVA datasheet states that it is a bus converter, to which Dr. Hopkins has no meaningful rejoinder. *See id.* at Q/A 303; CX-0008C (Fayed WS) at Q/A 623.

So although the additional limitation of claim 14 has been shown, the requirement of claim 13 that the output circuit receive power from the transformer has not been shown. And in any event, Vicor has not shown infringement of either claim 13 or claim 14 by either representative product because infringement of claim 9 has not been shown.



**c) Claim 33**

The parties agree that the disputes with respect to claim 33 are largely identical to those raised for claim 9. *See* CIB at 97; RIB at 123; SIB at 59. Both claims require “an input circuit and an output circuit” and an “input voltage  $V_{IN}$  applied to the input circuit,” which are not present in the MPN541382-PVA, so claim 33 is also not infringed by it. 950 patent at cls. 9, 33.

**d) Dependent Claims 34 - 38**

Cyntec argues that the elements added by claim 34 are not satisfied by the MPN541382-PVA, and they are not for the same reasons given above for claim 13. *See* RIB at 124. Claim 35 depends from claim 33 and adds the limitation “wherein the voltage across said one or more switches is reduced to essentially zero volts prior to turn ON of said one or more switches.” 950 patent at cl. 35. Dr. Fayed opines that this limitation is met by the MPN541382-PVA, and Cyntec has no rejoinder other than that independent claim 33 is not practiced, so this additional limitation is satisfied. *See* CX-0008C (Fayed WS) at Q/A 643; RIB at 124. Claim 36 depends from claim 33 and adds the requirements found in claim 9 of a “series connection” between the input circuit and at least a portion of the output circuit, and “an absolute value of the input voltage  $V_{IN}$  applied to the input circuit is approximately equal to the absolute value of the DC source voltage  $V_S$  minus a number  $N$  times the absolute value of the output voltage  $V_{OUT}$ , where  $N$  is at least 1.” 950 patent at cl. 36. These limitations are lacking in the MPN541382-PVA for the same reasons articulated above as to claim 9.

Claim 37 depends from claim 33 and adds the requirement “wherein the input circuit comprises a first winding having a first number of turns, wherein the output circuit comprises a second winding having a second number of turns, and wherein the voltage transformation ratio is a function of a ratio of the first number of turns to the second number of turns.” 950 patent at cl. 37.

[REDACTED]

As with the Delta Accused Products, Dr. Fayed’s analysis does not explain how the MPN541382-PVA functions as a 1:4 (or 4:1) power converter, that is, how it steps voltage up or down by the amount specified in the datasheets. *See* CX-0303C at 1; CX-0008C (Fayed WS) at Q/A 647-48.

As Dr. Hopkins points out, [REDACTED]

[REDACTED] RX-0010C (Hopkins RWS) at Q/A 316. Vicor’s only response to this is to repeat its unpersuasive argument related to the Delta Accused Products. *See* CIB at 98. On balance, then, Vicor has not shown that the element added by claim 37 is met by the MPN541382-PVA.

Claim 38 depends from claim 37 and requires a series connection between the input circuit and “at least a portion of the output circuit,” as well as “an absolute value of a voltage applied to the first winding is approximately equal to the absolute value of the input voltage.” 950 patent at cl. 38. Cyntec correctly notes that Vicor did not correctly identify  $V_{IN}$ , so it has not shown that claim 38’s additional limitations are satisfied by the MPN541382-PVA. *See* RIB at 125; CIB at 99.

In sum, Vicor has not shown infringement of any asserted claim of the 950 patent by the Cyntec Accused Products, either directly or indirectly.

### 3. Redesigned Products

As noted, Respondents identified two redesigned products, Delta’s U50SU4P1A2PMDAF and Cyntec’s MPN541382-PVA1, which they allege should be adjudicated as noninfringing. *See* RIB at 125-26. It is undisputed that any differences between the representative products and the redesigned products are immaterial for the 950 patent. *See* CIB at 165-67. Therefore, the two redesigned products do not infringe any claim of the 950 patent.

**E. Domestic Industry – Technical Prong**

As noted, the parties agree that the NBM2317S60D1580T0R module is representative of all DI Products that allegedly practice the 950 patent. *See* EDIS Doc. ID 816661 at 26. Vicor contends that this module practices claims 9, 13-14, and 33-38. *See* CIB at 40.

**1. Claim 9**

Dr. Fayed opines that the NBM2317S60D1580T0R module is an apparatus that includes a power converter (element 9(a)) comprising an input circuit and an output circuit (element 9(b)), wherein the power converter is configured to receive power from a power distribution system comprising DC source voltage  $V_S$  (element 9(c)), and is adapted to convert power from the input circuit to the output circuit at a substantially fixed ratio,  $K_{DC}$ , at an output current (element 9(d)). *See* CX-0008C (Fayed WS) at Q/A 364-76. Dr. Fayed also opines that the power converter produces an output voltage  $V_{OUT}$  (element 9(f)), comprises a series connection between the input circuit and at least a portion of the output circuit across the source (element 9(h)), and further comprises an inductive component—namely, a transformer—and one or more switches in the input circuit, the output circuit, or both (element 9(j)). *See id.* at Q/A 380, 385, 390. Neither Respondents nor Staff dispute these opinions. *See* SIB at 32; RIB at 96-100; EDIS Doc. ID 821356 at 9. Nonetheless, Vicor has failed to show by a preponderance of the evidence that the representative NBM2317S60D1580T0R module practices all elements of claim 9 of the 950 patent.

**a) Limitation [9.e] wherein an input voltage  $V_{IN}$  is applied to the input circuit**

Vicor relies on Dr. Fayed's annotations to show [REDACTED]

[REDACTED]

[REDACTED]

CIB at 43 (citing CX-0008C (Fayed WS) at Q/A 377 (annotating CPX-0009C.278)). Staff agrees with Vicor. SIB at 32-33. Vicor argues that [REDACTED]

[REDACTED] CX-0008C (Fayed WS) at Q/A 379. Dr. Fayed explains that this is because

[REDACTED] *Id.* Vicor argues that this is consistent with Figure 2 of the 950 patent, which Vicor argues shows the input circuit and output circuit connected in series. *See* CIB at 43-44.

Respondents argue that Vicor has not shown an input voltage  $V_{IV}$  being applied to the input circuit. *See* RIB at 97. Respondents argue that [REDACTED]

[REDACTED] *Id.* (emphasis in original). Dr. Hopkins provides a schematic showing this:

[REDACTED]

[REDACTED]

RX-0010C (Hopkins RWS) at Q/A 377; RDX-0017C.73. Respondents argue that “Vicor even simultaneously relies on the same [REDACTED] RIB at 97 (emphasis in original) (citing CX-0008C (Fayed WS) at Q/A 380).

Vicor has not shown that the NBM2317S60D1580T0R practices this limitation; their position, in fact, is baffling. According to Dr. Fayed’s identification, the input circuit consists of a

[REDACTED]

[REDACTED]

[REDACTED] See CX-0008C (Fayed

WS) at Q/A 368; CPX-0009C.278. The output circuit consists of [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] See CX-0008C (Fayed WS) at Q/A 368; CPX-0009C.278. Dr. Fayed states at one point that the dividing line between the input and output circuits is the series connection between the two [REDACTED]

[REDACTED]

[REDACTED]” CX-0008C (Fayed WS) at Q/A 385. So the most natural identification of the [REDACTED]

[REDACTED]

[REDACTED]. 950 patent at cl. 9. Certainly this is how  $V_{IN}$  is labeled in Dr. Fayed’s annotation of the schematic. See CX-0008C (Fayed WS) at Q/A 377 (annotating CPX-0009C.278).

But the voltage identified by Dr. Fayed and asserted by Vicor for purposes of this element is not the one shown in Dr. Fayed’s annotation, and is instead [REDACTED]

[REDACTED] See CX-0008C (Fayed WS) at Q/A 377 (annotating CPX-0009C.278), 379. As Dr. Hopkins and Respondents observe, the identified input voltage is applied across both [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] See RRB at 67-68; RX-0010C (Hopkins RWS) at Q/A 337-39. And the claim requires  $V_{IN}$  to be “applied to the input circuit,” not applied to an amalgamation of the input circuit and the output circuit. CX-0008C (Fayed WS) at Q/A 379; 950 patent at cl. 9. The identified voltage therefore does not meet the requirement that it be “an input voltage  $V_{IN}$  [] applied to the input circuit.”

Vicor has therefore misidentified the input voltage, and it has no meaningful response to Respondents’ observation of this misidentification. Vicor states that Respondents and Dr. Hopkins are “wrong” to characterize [REDACTED] CIB at 43. But it is not just Respondents and Dr. Hopkins who say this—Dr. Fayed opines that [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] CX-0008C (Fayed WS) at Q/A 385. And again, in his annotation of the schematic  $V_{IN}$  is labeled [REDACTED]

[REDACTED]

[REDACTED] See CX-0008C (Fayed WS) at Q/A 377 (annotating CPX-0009C.278).

Vicor also states that the input and output circuits are “connected in series . . . just as illustrated” in Figure 2 of the 950 patent:

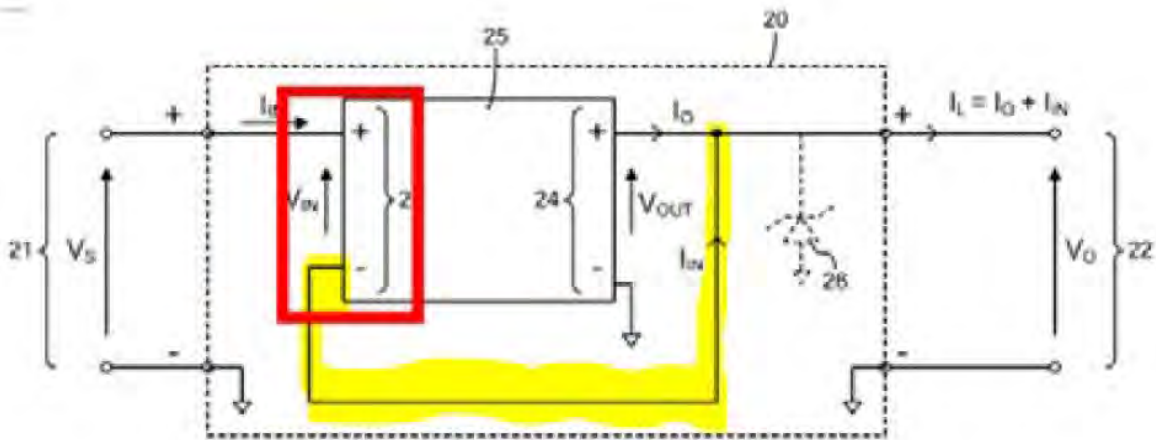


FIG. 2

CIB at 44; see CX-0008C (Fayed WS) at Q/A 379 (annotating series connection in yellow). In reality, the differences between Figure 2 and the NBM2317S60D1580T0R illustrate Vicor’s error. In Figure 2, the output of the input circuit is connected directly to the input of the output circuit, such that the sum of  $V_{IN}$  and  $V_{OUT}$  total  $V_S$ , or as the 950 patent puts it in describing Figure 2:

$$V_{IN} = V_S - V_O \quad (1)$$

950 patent at 5:6. The NBM2317S60D1580T0R, by contrast, is not an embodiment of Figure 2 because [REDACTED]. See CX-0008C

[REDACTED]

(Fayed WS) at Q/A 387. Instead, it is closer to [REDACTED]

[REDACTED]

[REDACTED]

$$V_{IN-210} = V_S - 2V_O \quad (14)$$

950 patent at 8:15. Dr. Fayed confirms this in opining on element 9(i), as discussed further below:

[REDACTED]

CX-0008C (Fayed WS) at Q/A 387.

The problem, then, is not simply that Vicor has misidentified the input voltage, but that it identifies two distinct input voltages, one for element 9(e) and a different one for element 9(i). And the only fair reading of the claim is that there can be only one  $V_{IN}$ . See 950 patent at cl. 9. Nor does it make a difference that the correct  $V_{IN}$  is the one identified for element 9(i), as is readily apparent from the NBM2317S60D1580T0R schematic, because an “alternative analysis that was never argued before the ALJ” may not be adopted. *Certain Marine Air Conditioning Systems, Components Thereof, and Products Containing the Same*, Inv. No. 337-TA-1346, Comm’n Op. at 76 (Mar. 11, 2024).

Accordingly, Vicor has failed to show by a preponderance of the evidence that the NBM2317S60D1580T0R practices limitation 9(e).

**b) Limitation [9.g] wherein the substantially fixed voltage transformation ratio can be represented as  $K_{DC} = V_{OUT}/V_{IN}$**

Dr. Fayed opines, citing the datasheet for the NBM2317S60D1580T0R module, that it is a “Fixed-Ratio” converter. CX-0993 at 1 (“high-side to low-side K factor of  $\frac{1}{4}$ ”); see CX-0008C (Fayed WS) at Q/A 372 (citing *id.* at 1). Dr. Fayed identifies  $V_{OUT}$  as the voltage [REDACTED] [REDACTED] and, as noted, identifies  $V_{IN}$  as the voltage between [REDACTED]



[REDACTED]

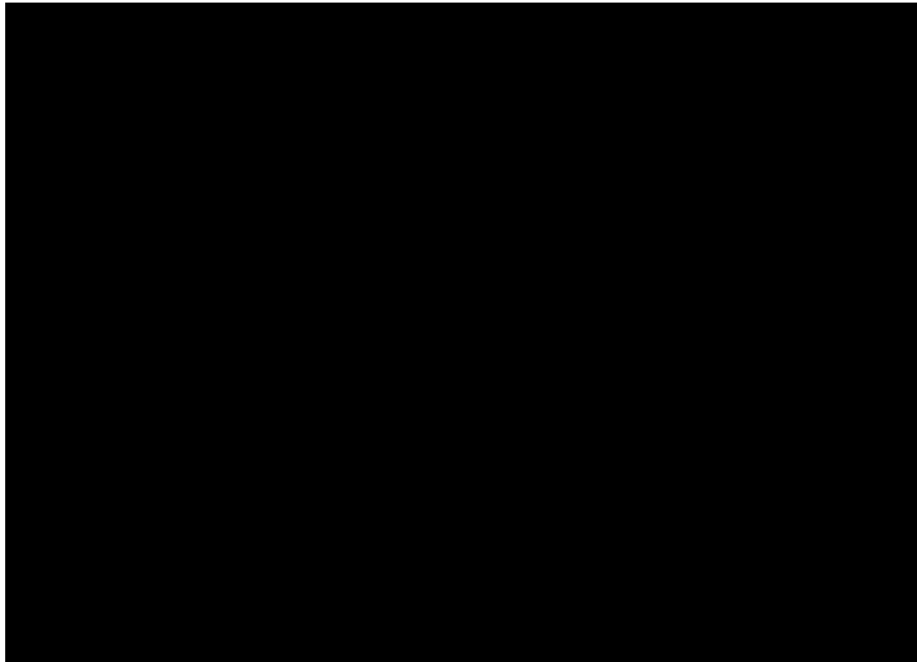
[REDACTED]

[REDACTED]

[REDACTED]

*Id.* Staff agrees with Vicor. *See* SIB at 33-35.

As noted, the  $V_{IN}$  for this element is not the same as the  $V_{IN}$  for element 9(e), because it is applied only downstream to the series connection rather than all the way to the +out terminal, as the annotated schematic shows:



CX-0008C (Fayed WS) at Q/A 387 (annotating CPX-0009C.278). But because [REDACTED]

[REDACTED]

[REDACTED]

Although Dr. Hopkins opines that this element cannot be satisfied if  $V_{IN}$  is equal to  $V_S$ , which it clearly is not, he does not expressly criticize Dr. Fayed’s explanation of how this limitation is satisfied given the actual values of  $V_{IN}$ ,  $V_{OUT}$ , and  $V_S$ , and Respondents accordingly rely entirely on attorney argument to contest this limitation. *See* RX-0010C (Hopkins RWS) at Q/A 343; RIB at 98; RRB at 69. As for that argument, Dr. Fayed does indeed “explain how the specific  $V_{OUT}$  . . . is

[REDACTED]

impressed across the windings of the center-tapped transformer”: given a particular switch configuration at any specific moment, one half-winding supplies the output voltage and the other half-winding “reflect[s]” the same voltage but without supplying it as an output. RRB at 69; CX-0008C (Fayed WS) at Q/A 387. This is the point of Dr. Fayed’s citation to Figure 6 of the 950 patent, where the center-tapped secondary winding similarly results in only one-half of the voltage across the entire winding being output. *See* CX-0008C (Fayed WS) at Q/A 387; 950 patent at 8:1-17. And even if Dr. Fayed could have connected a voltmeter to the circuit to confirm this relationship, his explanation of the operation of the circuit is sufficient without empirical testing. *See* RRB at 69.

Accordingly, Vicor has shown that the NBM2317S60D1580T0R practices limitation 9(i), given the redefinition of  $V_{IV}$ .

**d) Limitation [9.k] wherein a current flowing in the inductive component charges and discharges capacitances in the power converter reducing a voltage across said one or more switches prior to turning ON said one or more switches.**

Dr. Fayed, citing multiple exhibits, opines that this element is met. *See* CX-0008C (Fayed W/S) at 392-95. The datasheet for the NBM2317S60D1580T0R module’s controller, the VTM 4, states that the controller’s operation “[REDACTED]” *Id.* at Q/A 392 (citing CX-1034C at 1); *see* CPX-0009C.278 (showing a VTM 4 controller). The datasheet also characterizes the NBM2317S60D1580T0R module as

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] CX-1034C at 1; CX-0008C (Fayed W/S) at Q/A 394 (citing CX-3539 at 33:10-36:36); *see* CX-3539 at 5:29-30 ([REDACTED])

[REDACTED]

[REDACTED] 6:6-8 ([REDACTED])  
[REDACTED]

And measurement of voltage across a Q08 switch during NBM2317S60D1580T0R operation demonstrates that voltage drops to close to zero as the switch is turned on, as Dr. Fayed explains:

Q395: Can you elaborate?

[REDACTED]

CX-0008C (Fayed W/S) at Q/A 395 (citing CX-3573C); *see* CX-0008C (Fayed W/S) at Q/A 68

[REDACTED]

[REDACTED] Taken together, such evidence shows that element 9(k) is met.

[REDACTED]

Respondents argue that Vicor has not met its burden to show that the NBM2317S60D1580T0R practices this limitation for four reasons. RIB at 99 (citing RX-0010C (Hopkins RWS) at Q/A 345-51); RRB at 69-70. First, Respondents argue that if the datasheet supports this limitation because it discloses uses of [REDACTED], then the Huang and Liu references also disclose this limitation by reference. *Id.* at 99. Maybe so, but that has no bearing on whether the NBM2317S60D1580T0R satisfies this limitation. Second, Respondents argue that their acquiescence on certain points regarding the 481 patent are not evidence as to the 950 patent. *Id.* The affirmative evidence that the NBM2317S60D1580T0R satisfies this limitation does not, however, include any such acquiescence. Third, Respondents argue that Dr. Fayed assumes without evidence that the NBM2317S60D1580T0R uses SAC topology, as taught by CX-3539. *Id.* at 99-100. But the datasheet for the NBM2317S60D1580T0R controller says on its first page that the module employs SAC topology, and Dr. Fayed cites to CX-3539 (a patent having one inventor in common with the 950 patent) simply to explain the topology, not to show that the NBM2317S60D1580T0R practices a claim of the patent of CX-3539. *See* CX-1034C at 1; CX-0008C (Fayed W/S) at Q/A 394 (citing CX-3539). Fourth, Respondents argue that there is no information to substantiate that the waveforms relied upon by Dr. Fayed are reliable evidence of how the NBM2317S60D1580T0R works. *Id.* at 100. Although Dr. Fayed's explanation of CX-3573C is admittedly terse, Respondents cite no evidence to contradict his statement that it shows "the waveforms for the NBM product," and that it was "provided by Vicor." CX-0008C (Fayed W/S) at Q/A 395. Mere skepticism by Respondents is insufficient to overcome such evidence.

Accordingly, Vicor has proven by a preponderance of the evidence that the NBM2317S60D1580T0R practices element 9(k). Overall, however, Vicor has failed to show that



the representative NBM2317S60D1580T0R module practices element 9(e), and therefore that it practices claim 9 of the '950 patent.

**2. Dependent Claims 13 and 14**

Dr. Fayed opines that the NBM2317S60D1580T0R comprises a transformer, a resonant circuit including the transformer having a characteristic resonant frequency and period, two or more primary switches in the input circuit connected to drive the resonant circuit, and a switch controller adapted to operate the primary switches in a series of converter operating cycles, where the output circuit is connected to receive power from the transformer, and during power transfer intervals one or more of the primary switches are ON and power is transferred from the input to the output via the transformer, all as required by dependent claim 13. *See* CIB at 49-53; CX-0008C (Fayed WS) at Q/A 397-407, 412-13. Dr. Fayed also opines that the NBM2317S60D1580T0R is part of a bus converter that is a self-contained assembly adapted to be installed as a unit, as required by dependent claim 14. *See* CIB at 53; CX-0008C (Fayed WS) at Q/A 414-15. Respondents and Staff do not dispute any of this. *See generally* RIB at 96-103; RRB at 60-72; SIB at 37-39.

Respondents do, however, dispute the practice of element 13(f), “each converter operating cycle characterized by two power transfer intervals of essentially equal duration each interval having a duration less than the characteristic[] resonant period.” *See* RIB 100-01; RRB at 71. Dr. Fayed opines, like with element 9(k), that “the waveforms for the NBM product” that were “provided by Vicor” show that in operation the NBM2317S60D1580T0R has two power transfer intervals which are last approximately half of the characteristic interval:

[REDACTED]

[REDACTED]

CX-0008C (Fayed WS) at Q/A 408; CX-3571C. It may be inferred from Dr. Fayed’s explanation of these waveforms that the operating period shown is the “characteristic[] resonant period,” and that during this period one switch (top in blue) is ON and another switch (bottom in purple) is OFF during one of the two power transfer intervals, and they then swap states during the other power transfer interval. *See* CX-0008C (Fayed WS) at Q/A 408; CX-3571C. And each interval is clearly of essentially equal duration, with that duration clearly less than the characteristic resonant period. *See* CX-0008C (Fayed WS) at Q/A 408; CX-3571C. Dr. Fayed also opines that the source code for the NBM2317S60D1580T0R controller shows a [REDACTED], the controller’s datasheet shows a [REDACTED] and the symmetrical switching topology of the module is consistent with a power transfer interval of about half of the resonant period. *See* CX-0008C (Fayed WS) at Q/A 409 (citing CPX-0009C.415-445), 411 (citing CX-1034C). Staff agrees with Vicor. SIB at 37-39.

Respondents object to such evidence on the grounds that the waveform evidence is unreliable and Dr. Fayed’s explanation is inadequate. *See* RIB at 101; RRB at 71. Oddly, the waveforms



shown in CX-3571C are for switches Q06 and Q08, which are “secondary switch[es]” in the output circuit, rather than primary switches in the input circuit, as required by the claim. CX-0008C (Fayed WS) at Q/A 395; *see* CX-3571C (annotating the waveforms as “Q6” and “Q8”). But the module’s symmetrical switching topology clearly applies to both the input and output circuits, suggesting the primary switches operate similarly to the secondary switches, and in fact all three exhibits in evidence recording measured waveforms show square (or square-ish) waves toggling between ON and OFF over the duration of an operating cycle. *See* CX-3571C (switches Q06 and Q08); CX-3572C (switch Q05); CX-3573C (switch Q08). Moreover, Respondents do not even address the diagrams in the source code documents (*see* CPX-0009C.424), and in any event although Dr. Fayed’s explanation here is as terse as it was for element 9(k), Respondents’ arguments amount to little more than mere skepticism. The NBM2317S60D1580T0R module therefore practices this element of claim 13.

In sum, because Vicor has failed to show that the representative NBM2317S60D1580T0R practices claim 9, it has failed to show that it practices claims 13 and 14. However, if it had shown that it practiced claim 9, it would have shown that it also practices claims 13 and 14.

### **3. Claim 33**

There are a few differences between independent claim 9 and independent claim 33, including that in claim 33 the apparatus must comprise a bus converter and the input and output circuits must be galvanically connected. *See* 950 patent at cl. 33. These elements are undisputed, however, so the parties agree that the disputes with respect to claim 33 that do exist are essentially identical to those raised for claim 9. *See* CIB at 53; RIB at 101; RRB at 60-70; SIB at 39-40. And Vicor has offered evidence that the NBM2317S60D1580T0R is a bus converter (CX-0008C (Fayed WS) at Q/A 420) with a galvanic connection between the input and output circuits (*id.* at Q/A 432).



So the only dispute that must be addressed is over the requirement of claim 33 that the “input voltage  $V_{IN}$  is applied to the input circuit.” 950 patent at cl. 13. Dr. Fayed opines that this limitation is met, but for “the same reasons [he] provided for element 9[e].” CX-0008C (Fayed WS) at Q/A 426-27. And for the same reasons Vicor and Dr. Fayed were mistaken with respect to claim 9(e), they are also mistaken with respect to this element in claim 33.

Accordingly, Vicor has failed to show that the representative NBM2317S60D1580T0R practices claim 33 of the 950 patent.


#### **4. Dependent Claims 34 – 38**


Claims 34 and 36 depend from claim 33 and add elements also recited in claims 9 and 13, and which the representative NBM2317S60D1580T0R practices. *See* 950 patent at cls. 34, 36. Respondents dispute this conclusion for the same reasons they dispute the practice of claims 9 and 13, and Respondents’ position is rejected for the reasons explained above. *See* RIB at 101-02; RRB at 71. Dependent claims 35, 37, and 38 add elements not found in claims 9 and 13, however, so those elements are addressed below. *See* 950 patent at cls. 35, 37, 38. Staff contends that the NBM2317S60D1580T0R practices all these dependent claims. *See* SIB at 40-43.

Claim 35 adds the requirement “wherein the voltage across said one or more switches is reduced to essentially zero volts prior to turn ON of said one or more switches.” 950 patent at cl. 35. According to Dr. Fayed, both the NBM2317S60D1580T0R controller datasheet and a recorded waveform of voltage across “primary switch Q5” show that the NBM2317S60D1580T0R practices this limitation. CX-0008C (Fayed WS) at Q/A 452-53 (citing CX-1034C). Although Dr. Fayed cites CX-3573C as the waveform, this appears to be a typographical error; CX-3572C shows the voltage across Q5, while CX-3573C shows the voltage across Q8. *Compare* CX-3573C with CX-



3572C; *see* CX-0008C (Fayed WS) at Q/A 453. The NBM2317S60D1580T0R therefore practices this limitation, a point Respondents do not dispute. *See* RIB at 101.

Respondents do, however, dispute the practice of the elements added by claim 37. That claim adds the requirement “wherein the input circuit comprises a first winding having a first number of turns, wherein the output circuit comprises a second winding having a second number of turns, and wherein the voltage transformation ratio is a function of a ratio of the first number of turns to the second number of turns.” 950 patent at cl. 37. According to Dr. Fayed, “the voltage transformation ratio, which is defined as  $K_{DC} = V_{OUT} / V_{IN}$  as I discussed, is a function of a ratio of the first number of turns ( $N_{pri}$ ) to the second number of turns ( $N_{sec}$ ).” CX-0008C (Fayed WS) at Q/A 461. Dr. Fayed identifies  $N_{pri}$  as the number of turns in T201A, one of the two transformer windings in the input circuit, and  $N_{sec}$  as the number of turns in a half-winding of T201B, the transformer in the output circuit. *Id.* at Q/A 459. He opines that because the input voltage is applied across two primary windings, and the output voltage is produced across one secondary winding, and all windings have   $K_{DC} = V_{OUT} / V_{IN} = N_{sec} / 2 N_{pri}$ , which satisfies the requirement that the voltage transformation ratio is a function of a ratio of  $N_{pri}$  to  $N_{sec}$ . *Id.* at Q/A 461. Staff agrees with Vicor. *See* SIB at 40-42.

Respondents argue that Dr. Fayed “cites to no specific supporting evidence,” and that his current opinion conflicts with his earlier opinion that the transformation ratio is . *See* RIB at 102; RRB at 71-72; *see also* RX-0010C (Hopkins RWS) at Q/A 364-65. But Dr. Fayed does cite specific supporting evidence. He refers back to his discussion of the voltage transformation ratio, which encompassed the controller datasheet’s statement that the NBM2317S60D1580T0R employs a SAC topology. *See* CX-0008C (Fayed WS) at Q/A 394, 461; CX-1034C at 1. He also notes that under that topology the voltage transformation ratio “is a function of the transformer turns ratio.”

[REDACTED]

CX-0008C (Fayed WS) at Q/A 462 (citing 950 patent at 5:37-53). Dr. Fayed also performs circuit analysis to conclude that for the NBM2317S60D1580T0R, the ratio can be expressed as  $K_{DC} = V_{OUT} / V_{IN} = N_{sec} / 2 N_{pri}$ , based on Dr. Fayed's identification of  $V_{IN}$  as the voltage between the +in terminal and the series connection. See CX-0008C (Fayed WS) at Q/A 461. It is not clear from his analysis that [REDACTED]

[REDACTED]

See CPX-0009C.278. And as explained above, there is no particular ratio required by the claim, so the fact that Dr. Fayed changed his opinion regarding the numerical value of the voltage transformation ratio is beside the point. The NBM2317S60D1580T0R therefore practices this limitation.

The same is true of the elements added by claim 38. That claim adds the requirement "wherein at least a portion of the input circuit of the bus converter is connected in series with at least a portion of the output circuit of the bus converter such that an absolute value of a voltage applied to the first winding is approximately equal to the absolute value of the input voltage,  $V_{IN}$ , minus a number N times the absolute value of the output voltage  $V_{OUT}$ , where N is at least 1." 950 patent at cl. 38. Dr. Fayed opines that the NBM2317S60D1580T0R has a series connection between its input and output circuits, that  $V_{OUT}$  is [REDACTED]  $V_{IN}$ , as he explained in connection with claim 37, that the voltage across one of the primary windings is [REDACTED]  $V_{IN}$ , and that [REDACTED] because the voltage applied to the first winding (T201A) is  $V_{IN} - V_{OUT}$ , that is,  $V_{IN} - V_{IN}$  [REDACTED]. See CX-0008C (Fayed WS) at Q/A 463-65 (citing CPX-0009C.278). Staff agrees with Vicor that this limitation is met. See SIB at 42-43.

Respondents point out that there are [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] RX-0010C (Hopkins RWS) at Q/A 367; *see* RIB at 102-03. Dr. Hopkins opines that “[REDACTED] the voltage across the capacitor is significant and thus voltage applied to the first winding is *not approximately equal* to the absolute value of the input voltage,  $V_{IN}$ , minus the absolute value of the output voltage  $V_{OUT}$ .” *Id.* (emphasis in original). In response, Dr. Fayed asserts that the capacitors “[REDACTED].” CX-0009C (Fayed WS) at Q/A 467. This conclusion is reasonable. The schematic seemingly shows a [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]. *See* CPX-0009C.278. And again, the NBM2317S60D1580T0R [REDACTED], they are similarly irrelevant for claim 38. Vicor has therefore shown that the NBM2317S60D1580T0R practices claim 38.

In sum, because Vicor has failed to show that the representative NBM2317S60D1580T0R practices claim 33, it has failed to show that it practices claims 34 through 38. However, if it had shown that it practiced claim 33, it would have shown that it also practices claims 34 through 38.

**F. Validity**

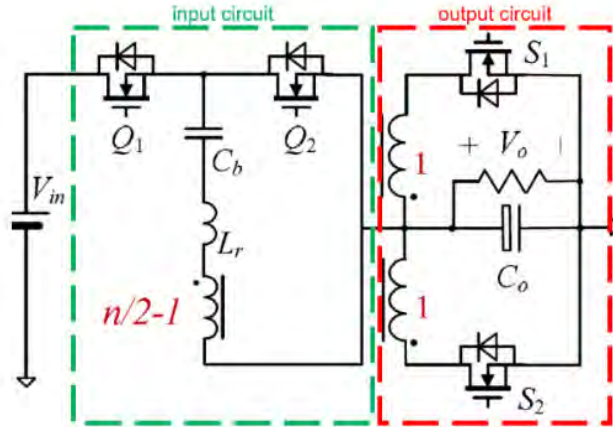
Respondents assert single-reference obviousness theories, as to all claims of the 950 patent, based on two references, “Novel Non-Isolated LLC Resonant Converters,” by Huang, et al. (“Huang”) (RX-0588), and U.S. Patent No. 7,307,857 (“Liu”) (RX-0533). *See* RIB at 127-51. Staff contends that obviousness has not been shown, but because its arguments generally mirror Vicor’s, Staff’s points are not otherwise addressed. *See* SRB at 38-56.



**1. Prior Art**

**a) Huang**

Huang describes non-isolated power converters with zero-voltage and zero-current switching. See RX-0588 at 1. Respondents rely principally on the half-bridge converter depicted in Figure 12(b):



RX-0588 at 1373 (annotated); see RIB at 128-41.

Huang was presented at a professional conference in February 2012, published in the *2012 Twenty-Seventh Annual IEEE Applied Power Electronics Conference and Exposition* no later than March 9, 2012, and cataloged in a public database no later than June 26, 2012. See RX-0009 (Hall-Ellis WS) at Q/A 65-70. The application leading to the 950 patent was filed July 2, 2013, so Huang is prior art under 35 U.S.C. § 102(a)(1), a point Vicor no longer disputes. See CRB at 40-42; 950 patent at front matter.

**b) Liu**

Liu issued December 11, 2007 and is therefore prior art to the 950 patent under 35 U.S.C. § 102(a)(1). See RX-0533 at front matter. Liu discloses various power converters, including non-isolated converters capable of zero-voltage switching:

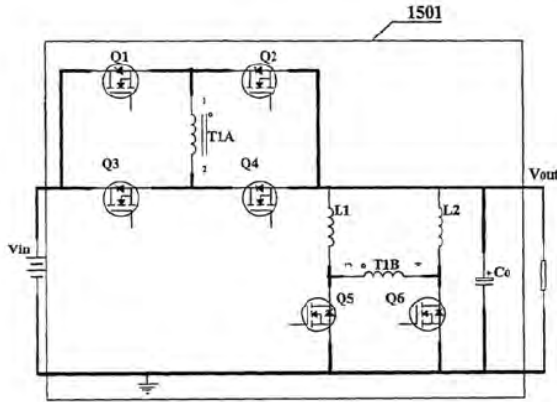


Fig. 15

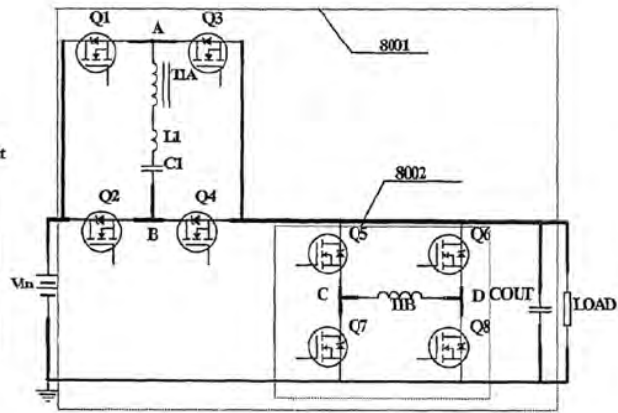


FIG. 80

*Id.* at Figs. 15, 80; *see id.* at 18:21-31.

## 2. Obviousness

The main dispute between the parties is over one limitation of claims 9 and 33: “a substantially fixed voltage transformation ratio.” *Compare* RIB at 129-33 with CRB at 42-46. Vicor, in fact, only disputes one other limitation of claims 9 and 33 and their dependent claims, namely, the requirement that the apparatus be a “bus converter.” *See* CRB at 42-56. In view of Dr. Hopkins’ testimony, the limitations of the claims other than these two are expressly disclosed in or would have been obvious over both Huang and Liu. RX-0007C (Hopkins WS) at Q/A 87-124 (Huang), 213-43 (Liu). In particular, the requirement that the “voltage across said one or more [power] switches” be “reduc[ed]” prior to the switches turning on is satisfied by the disclosure of zero-voltage switching in both Huang and Liu. 950 patent at cls. 9, 13; RX-0588 at 1373; RX-0533 at 18:25-28.

### a) Huang

Huang expressly teaches a fixed transformer turns ratio. *See* RX-0588 at 1379 (“The transformer turns ratio is 3:1:1.”). Respondents do not, however, point to any express teaching of a “substantially fixed voltage transformation ratio.” *See* RIB at 129-33. There is a reason Huang does



not teach this: Huang is directed to “point-of-load (POL) and [] voltage regulator[s] (VR) for processors.” RX-0588 at 1373. And such devices are “regulated,” that is, they can change their operating frequency or pulse width to maintain a constant output voltage even when input voltage varies, such that “by definition [they do] not have a fixed conversion ratio”  $K_{DC} = V_{OUT}/V_{IN}$ . RX-0007C (Hopkins WS) at Q/A 98, 100; *see* CX-3578C (Fayed RWS) at Q/A 189.

Huang even discloses that the “switching frequency [may be] at or above resonant frequency,” so that the transformation ratio changes and the output voltage is regulated. RX-0588 at 1378. Respondents argue that because the switching frequency may be “at” the resonant frequency, in which case the voltage gain and voltage transformation ratio are “only affected by the transformer turns ratio,” Huang teaches that “the transformation ratio is [] fixed.” RX-0007C (Hopkins WS) at Q/A 96; *see* RIB at 129-31. But the switching frequency may also be “above” the resonant frequency, in which case the voltage gain and voltage transformation ratio vary “depending on the variation in the input voltage and the specified regulated output voltage,” so the transformation ratio necessarily cannot be fixed. *See* CX-3578C (Fayed RWS) at Q/A 189. Respondents also argue that Huang teaches “an alternative solution to future VR and POL converters,” meaning that Huang does not necessarily describe a regulated converter. RIB at 130-31 (emphasis omitted) (citing RX-0588 at 1373). But in context the “alternative” is plainly one that reduces “high switching loss, high driver loss and high body diode loss,” not one that eliminates the need for output voltage regulation. RX-0588 at 1373. And the fact that a skilled artisan would know how to make an unregulated converter does not provide a reason for a skilled artisan to modify Huang to be unregulated, that is, to satisfy the “substantially fixed voltage transformation ratio” element. *See* RIB at 131.



Respondents, in fact, offer no reason or motivation at all to modify Huang so as to meet this element. *See* RIB at 127-33. The Patent Trial and Appeal Board, in denying institution of inter parties review of the asserted claims of the 950 patent, reached the same conclusion. *See Delta Electronics, Inc. v. Vicor Corporation*, IPR 2024-00134, Paper 8 at 35 (PTAB May 17, 2024) (“PTAB Decision 950”). PTAB Decision 950 is cited by all parties, and official notice is taken of it. *See* CRB at 40; RIB at 132; SRB at 38 n.7. The PTAB first observed that the voltage transformation ratio in Huang, as a regulated converter, “is not ‘substantially fixed’ as required by the claim language.” *Id.* It then held that there was no “reason provided by [Delta] or Dr. Hopkins as to why a [POSITA] would be motivated to modify Huang’s regulated LLC resonant converter to be the bus converter recited in challenged claim 1,” and that “we are not satisfied [Delta] has shown that Huang would have rendered this limitation obvious.” *Id.* at 36-37 (emphasis omitted).

Although Dr. Hopkins’ testimony on this point is more fulsome in this investigation than in his expert declaration in the PTAB proceeding, Respondents continue to offer no reason for a skilled artisan to modify Huang to achieve a substantially fixed voltage transformation ratio, even considering the various other prior art references Dr. Hopkins cites. *See* RIB at 127-33; RX-0007C (Hopkins WS) at Q/A 88-113. Accordingly, in view of the *Graham* factors, especially the differences between the claimed invention and the prior art, Respondents have not established a prima facie case of obviousness of either claim 9 or claim 33 over Huang.

As for the dependent claims, Dr. Hopkins opines that the additional elements are satisfied in Huang. *See* RX-0007C (Hopkins WS) at Q/A 125-49. In particular, Dr. Hopkins explains that “a POSA would have known that a DC-DC converter” such as Huang “could be used in an Intermediate Bus Architecture (IBA)” such as that described in the 950 patent, and thus “could be called a bus converter,” as required by claim 14, claim 33, and the claims depending from claim 33. *Id.* at 140



(citing 950 patent at 1:13-14). Vicor disputes this, but Dr. Fayed’s opinion on this issue is conclusory, and Dr. Hopkins’ testimony regarding Figure 1 of the 950 patent, to the effect that a bus converter can be unregulated, on which Vicor relies, has no clear relevance. *See* CX-3578C (Fayed RWS) at Q/A 192; CRB at 46 (citing Tr. (Hopkins) at 734:8-17). Vicor does not dispute the obviousness of any other claims or elements beyond the lack of disclosure of a substantially fixed voltage transformation ratio and a bus converter. *See* CRB at 47. Notwithstanding this lack of dispute, though, Respondents have failed to establish a prima facie case of obviousness of any asserted claim over Huang, as explained above.

**b) Liu**

Liu discloses a voltage transformation ratio, or as Liu calls it, a “conversion ratio.” *See* RX-0533 at 13:8-11. It describes the invention as an example of a “voltage regulator module or VRM” (*id.* at 1:43), it states that the output voltage is a function of both the (fixed) turns ratio and the “duty cycle” (*id.* at 18:36-45), and it expressly teaches that the duty cycle, which is itself a function of the “switching period,” “may be altered to change the output voltage of the converter” (*id.* at 2:11, 7:37). Liu’s conversion ratio, in short, is variable, not fixed, and Respondents cite no evidence that Liu teaches an unregulated power converter having a fixed transformation ratio. *See* RIB at 144-46.

That Liu teaches a regulated converter means that it suffers from the same obviousness problem as Huang, and Respondents’ efforts to overcome this problem are similarly unconvincing. *See* RIB at 144-46. Respondents rely on the same point made with Huang, that if the duty cycle/switching period is set at a particular amount (here, a 50% duty cycle), then the voltage transformation ratio depends only on the transformer turns ratio. *See id.* at 143-44. As with Huang, this is true but irrelevant because Liu’s duty cycle “may be altered.” RX-0533 at 7:37; *see* CRB at 53. And also as with Huang, neither Respondents nor Dr. Hopkins offer any reason for a skilled



artisan to modify Liu to satisfy the “substantially fixed voltage transformation ratio” limitation. *See* RIB at 142-46; RX-0007C (Hopkins WS) at Q/A 214-32. Lastly, the PTAB denied institution in view of Liu, for the same reason it denied institution in view of Huang. *See* PTAB Decision 950 at 46-47. Accordingly, in view of the *Graham* factors, especially the differences between the claimed invention and the prior art, Respondents have not established a prima facie case of obviousness of either claim 9 or claim 33 over Liu.

As for the dependent claims, Respondents assert the obviousness of claims 14 and 35-37, and Dr. Hopkins opines that the additional elements of these claims are satisfied in Liu. *See* RX-0007C (Hopkins WS) at Q/A 244-49, 263-71. In particular, Dr. Hopkins explains that “a POSA would have known that Liu’s converters could be used wherever needed in a power distribution system architecture,” including as a bus converter. *Id.* at Q/A 244, 249. Vicor disputes this, but Dr. Fayed’s opinion, that because Liu discloses a converter where both the input and output voltage may vary, it does not disclose a bus converter, is beside the point, because it is undisputed that Liu does not expressly disclose a bus converter. *See* CX-3578C (Fayed RWS) at Q/A 220. Nor does Liu describe anything that might qualify as “teaching away” from a bus converter; Dr. Fayed’s opinion on this point is conclusory. *See id.* Vicor does not dispute the obviousness of any other claims or elements beyond the lack of disclosure of a substantially fixed voltage transformation ratio and a bus converter. *See* CRB at 55-56. Notwithstanding this lack of dispute, though, Respondents have failed to establish a prima facie case of obviousness of any asserted claim over Liu, as explained above.

**c) Objective Indicia of Non-Obviousness**

Vicor asserts four indicia of non-obviousness: copying, long-felt but unmet need, failure of others, and commercial success. *See* CRB at 71-88. As noted, the 950 patent is not infringed by

[REDACTED]

any Accused Product and is not embodied by any DI Product—the Accused Products, in fact, are strikingly and “materially different” from any asserted claim. RIB at 161 (citing *Stone Strong, LLC v. Del Zotto Products of Florida, Inc.*, 455 F.App’x 964, 971 (Fed. Cir. 2011)). They are also materially different from the DI Products, which are admittedly closer to being embodiments of the asserted claims. So although there is circumstantial evidence of copying, which Vicor enumerates in detail, Respondents’ products are simply “not copies” of Vicor’s products or patented inventions. RIB at 161; *see* CRB at 71-80.

As for long-felt need and failure of others, Vicor’s position is that there was a long-felt need for “increased power density” and “improved efficiency” that accounted for “limited space and greater power processing demands,” and that its inventions “offered concrete efficiency and power density gains that others failed to replicate or provide.” CRB at 80, 82. According to Vicor, the Asserted Patents built on earlier inventions with “additional innovations” that pushed efficiency from “nearly 97%” to “approximately 98%,” and that resulted in “power density gains.” CX-3578C (Fayed WS) at Q/A 290-92. Dr. Fayed summarizes the evidence supporting this, and as to the 950 patent in particular, he points to “non-isolated converter topologies in conjunction with unique circuit layout[s] . . . that result[] in less heat loss.” *Id.* at Q/A 313; *see id.* at Q/A 298.

Dr. Fayed’s opinion is otherwise conclusory on this point, however, and overall Respondents are correct that the record fails to show that the 950 patent satisfies the asserted long-felt need or succeeds where others failed. There is no evidence beyond Dr. Fayed’s conclusory opinion that embodiments of the 950 patent produce lower heat loss, or that others tried and failed to achieve it, and as noted, the DI Products have not been shown to embody any asserted claim. Heat loss, in fact, is not even mentioned in the 950 patent specification as an advantage of the invention. *See generally* 950 patent. Other evidence Dr. Fayed cites [REDACTED],

[REDACTED]

[REDACTED] are too disconnected from the asserted long-felt need and failure of others, on the one hand, and the claims of the 950 patent, on the other. *See* CX-3578C (Fayed WS) at Q/A 303, 305, 307, 312; CX-0001C (Vinciarelli WS) at Q/A 125. There is accordingly insufficient nexus between the 950 patent and either long-felt need or failure of others.

As for commercial success, Vicor has not shown that the DI Products embody any claim of the 950 patent, so there is no nexus between that patent and the impressive commercial success of the DI Products. Vicor also relies on the [REDACTED] license, which as explained is of little probative value. *See* CRB at 86-88.

Overall, then, there is no meaningful objective evidence of non-obviousness. Combined with Respondents' failure to make out a prima facie case of obviousness, however, no claim of the 950 has been shown to have been obvious.

## VII. LICENSE

Respondents assert two distinct license defenses. The first pertains only to products of [REDACTED], and arises from [REDACTED] sales to [REDACTED]. *See* RIB at 173-74. Vicor accuses [REDACTED] products of infringement, [REDACTED]. *See* CIB at xix. [REDACTED] took a license to [REDACTED]. *See* CX-0041C. According to the license, [REDACTED]. [REDACTED]. [REDACTED]. [REDACTED] CX-0041C at 2.

Vicor does not dispute that [REDACTED] sells all of its accused products [REDACTED], and that [REDACTED] license covers products sold by [REDACTED] to [REDACTED]. *Compare* RIB at 173-74 with CRB

[REDACTED]

at 92-93. Vicor's principal argument is [REDACTED]  
[REDACTED]. See CRB at 93 [REDACTED]  
[REDACTED]  
[REDACTED]). Staff agrees with [REDACTED] that the relevant products are licensed, but does not squarely  
address Vicor's point. See SIB at 117-19. [REDACTED] similarly does not squarely address Vicor's  
point, but does argue that "[REDACTED]  
[REDACTED]." RIB at  
175; see id. [REDACTED]  
[REDACTED]

The language of the license supports Vicor's position. T [REDACTED]  
[REDACTED]  
[REDACTED] CX-0041C at 4-5. [REDACTED]  
[REDACTED]. See RX-1444C [REDACTED]  
[REDACTED]  
[REDACTED]. See CX-0003C (D'Amico  
WS) at Q/A 96-98.

Therefore, for [REDACTED] to show that all its sales to [REDACTED] are licensed, it must show, [REDACTED]  
[REDACTED]  
[REDACTED] See CX-0041C at 3. [REDACTED] has failed to satisfy its burden, not  
only because it has not shown that [REDACTED] but also because  
it has offered no evidence that [REDACTED]  
[REDACTED]. See RIB at 173-75. Nor is it clear that all of [REDACTED] products  
are covered by the license, because [REDACTED]

[REDACTED]

[REDACTED]. E.g., RX-1444C. It stands to reason, [REDACTED]  
[REDACTED], that  
some of [REDACTED] products are indeed licensed. But it is impossible to tell by a preponderance of  
the evidence which products are licensed and which products are not, so [REDACTED] license defense  
stands unproven.

The second license defense pertains to products of respondents FII USA, Inc., Ingrasys  
Technology Inc., and Ingrasys Technology USA Inc. (collectively “Foxconn”). See RIB at 7 n.3,  
175-82. Each of these three Foxconn respondents issued purchase orders for power converters from  
Vicor in May 2023 or earlier, and they now assert that “[Vicor] received, negotiated, and agreed to  
purchase orders submitted by the Foxconn Respondents over email, and the terms of those orders  
establish a license to the asserted patents.” *Id.* at 178; see RX-1630C (FII USA, Inc.), RX-1635C  
(Ingrasys Technology Inc.), RX-1639C (Ingrasys Technology USA Inc.). The relevant language is  
identical for each purchase order and is written in English on the reverse side of the document:

10. Intellectual Property Right

Seller agrees to grant Buyer and its customer(s) a perpetual, irrevocable, non-transferable, and royalty-  
free license under all intellectual property rights included in the Products supplied to Buyer by Seller,  
so that Buyer and its customer(s) have the right to make, use, sell, offer to sell or import similar  
products or other products which contain the aforesaid intellectual property rights worldwide.

RX-1635C at 2; see RX 1630C at 2, RX-1639C at 2.

On January 8, 2024 Vicor filed an action in the U.S. District Court for the District of  
Massachusetts, seeking to enjoin Foxconn from arbitrating the license defense in China. See EDIS  
Doc. ID 824369 at 1 (“D.Mass. Order”). On June 24, 2024, after the parties filed their posthearing  
briefs, the District Court issued an order allowing in part Vicor’s motion for preliminary injunction.  
See *id.* at 32 (reported as *Vicor Corp. v. FII USA, Inc.*, Civil No. 24-10060-LTS, 2024 WL 3548786  
(June 24, 2024)). That order explains, with much greater clarity than Foxconn makes in its own



scattershot case for a license, the multiple reasons why Vicor is likely to succeed on the merits of its claim for injunctive relief. *See id.* at 17-27.

One of those reasons is especially pertinent here. Vicor contends that the emails its staff sent in response to Foxconn purchase orders did not qualify as legally binding acceptances of offers. *See* CRB at 88-92. The District Court agreed: “Vicor’s [staff members] were not ‘accepting’ the [purchase orders] . . . [and Foxconn] could not and did not reasonably understand the email exchanges to constitute agreement to the terms set out in” the purchase orders. D.Mass. Order at 25. Although Vicor does not dispute that it routinely communicated with Foxconn by email after receiving a purchase order (*see* Tr. (Jungjohann) at 938:2-21), the specific evidence which Foxconn cites in its posthearing brief is limited to exemplary purchase orders issued by FII USA, Inc. (RX-1630C) and Ingrasys Technology Inc. (RX-1635C). *See* RIB at 179-81.

For the first purchase order (PO 4600000176), which gave October 15, 2021 as the delivery date, the responsive email on which Foxconn relies states, in relevant part:

Hi Carolyn,  
PO# 4600000176 ..... 2K ship date 5-13-22, 2K 5-20, 2K 5-27 and 1400 6-3.  
Peter

RX-1631C at 7; *see* RIB at 179. Foxconn seemingly agrees that this email communicates a delivery date of May 13, 2022 at the earliest. *See* RIB at 179. Vicor argues that the email was “advance notice of delivery dates that Vicor will propose” by a separate document, rather than an acceptance, the District Court found that the email proposed “serious differences in material terms,” such that the email did not qualify as an acceptance, and I agree. CRB at 88-89; D.Mass. Order at 24-25. No party disputes that Massachusetts law applies here, and under Massachusetts law for a contract to be enforceable “there must be agreement between the parties on the material terms of that contract.” *Situation Management Systems, Inc. v. Malouf, Inc.*, 724 N.E.2d 699, 703 (Mass. 2000). A change



from a delivery date of all units on October 15, 2021, to four separate shipments with delivery dates over six months later, is surely material under the circumstances, and Foxconn makes no effort to show otherwise. *See* RIB at 179-80.

For the second purchase order (PO 4500273265), which issued May 31, 2023, Foxconn concedes that it and Vicor negotiated over multiple terms until June 13, 2023, including over the warranty period. RX-1635C at 1; *see* RIB at 180. The day after the purchase order issued, in fact, Foxconn asked Vicor for a delivery date, even though the purchase order stated a delivery date of August 9, 2023. *See* RX-1635C at 1; RX-1636C at 12. Foxconn then sent Vicor four different versions of the purchase order between June 1 and June 13 or 14 (depending on time zone). *See* CX-3588C (Jungjohann RWS) at Q/A 165, 179. Foxconn contends that Vicor accepted the purchase order by email on June 13, 2023. *See* RIB at 180 (citing RX-1911C at 2). But Vicor's proposed delivery date was September 29, 2023, not August 9, 2023, which is also a material difference in contract terms. *See* RX-1911C at 2. Moreover, the purchase order was cancelled one minute after it was sent to Vicor. *See* RX-1911C at 1. Foxconn argues that because Vicor insisted that there was a binding contract by rejecting the cancellation, it necessarily accepted the terms of the purchase order. *See* RIB at 180. But in addition to the material difference in the delivery date, such that the June 13, 2023 email could not have been an acceptance, unilateral cancellation of the purchase order by Foxconn was expressly permitted under Foxconn's own language:

5. Purchase Order Change

Both Parties agree that, Buyer may, from time to time before Seller's shipment of Products, cancel the shipment or changes: 1) the method of shipment or packing, 2) time and/or place of delivery, and/or 3) the quantity of Products specified under this PO, DN or other delivery request.

RX-1635C at 2.

In short, neither contract Foxconn relies on as evidence of a license was ever enforceable because there was no valid acceptance of an offer, and for one contract the offer was even withdrawn



after the purported acceptance. Although Foxconn and Vicor make a number of other points related to the asserted license, this finding suffices to conclude that Foxconn has no license to any asserted patent.

#### **VIII. DOMESTIC INDUSTRY - ECONOMIC PRONG**

In a patent-based complaint, a violation of Section 337 can be found “only if an industry in the United States, relating to the articles protected by the patent ... concerned, exists or is in the process of being established.” 19 U.S.C. § 1337(a)(2). Under Commission precedent, this “domestic industry requirement” of Section 337 consists of an economic prong and a technical prong. *Stringed Instruments*, Inv. No. 337-TA-586, Comm’n Op. at 12-14. The complainant bears the burden of establishing that the domestic industry requirement is satisfied. *See Certain Set-Top Boxes and Components Thereof*, Inv. No. 337-TA-454, Initial Determination at 294 (June 21, 2002) (not reviewed in relevant part).

The economic prong of the domestic industry requirement is defined in subsection (a)(3) of Section 337 as follows:

- (3) For purposes of paragraph (2), an industry in the United States shall be considered to exist if there is in the United States, with respect to the articles protected by the patent, copyright, trademark or mask work concerned --
  - (A) Significant investment in plant and equipment;
  - (B) Significant employment of labor or capital; or
  - (C) Substantial investment in its exploitation, including engineering, research and development, or licensing.

19 U.S.C. § 1337(a)(3). The economic prong of the domestic industry requirement is satisfied by meeting the criteria of any one of the three factors listed above. Importantly, the Commission has clarified that investments in plant and equipment, labor, and capital that may fairly be considered investments in research and development are eligible for consideration under Subsections (A) and



(B), in addition to Subsection (C). *See Certain Solid State Storage Drives, Stacked Electronics Components, and Products Containing Same*, Inv. No. 337-TA-1097, Comm'n Op. at 14 (June 29, 2018) (“*Solid State Storage*”).

Vicor contends, with the support of Dr. Pallavi Seth, Vicor’s economic expert, that the economic prong is met under each of Subsections (A) and (B) for each Asserted Patent through its investments in manufacturing and design, engineering, and research and development (“ER&D”). CIB at 169; *see also* CX-0009 (Dr. Seth WS) at Q/A 12 (“I have concluded that an economic domestic industry in the United States exists for Vicor related to (A) significant investments in plant and equipment with respect to products protected by the Asserted Patents, and (B) significant employment of labor or capital with respect to products protected by the Asserted Patents.”). Respondents did not proffer their own economic expert and generally do not dispute the evidence concerning Vicor’s domestic investments. Respondents instead contend that “not every DI product practices each patent so Complainant should not be permitted to rely on aggregate investments to establish an economic domestic industry.” RIB at 193. Respondents also contend that Dr. Seth’s analysis concerning significance is not meaningful. *Id.* at 194 (“Even ignoring the conflation of qualitiveness and quantitiveness, Dr. Seth’s analysis does not meaningfully show that Complainant’s domestic investments are significant to the DI products.”). Staff avers that Vicor satisfies the economic prong of the domestic industry requirement under both Subsections (A) and (B). SIB at 132; *see also* SIB at 167-179 (“The evidence shows, based on Dr. Seth’s testimony that Vicor’s domestic industry in relation to Vicor’s overall investments in plant and equipment and employment of labor and capital in the United States reported in CX-3014C and CX-3015C, is quantitatively significant.”).

[REDACTED]

Respondents are correct that not all of the DI products belonging to the [REDACTED] product families practice the 481 patent, so Vicor’s lack of specific allocation for the individual DI products within these families makes it impossible to assess the significance of them in the aggregate. As explained below, however, the preponderance of the evidence shows that the economic prong is satisfied by the [REDACTED] product family, all articles of which practice claim 1 of the 481 patent, and Vicor does not otherwise aggregate any investments. As for the 761 patent, the evidence shows that the economic prong is satisfied. And as for the 950 patent, no DI Products practice any of its claims, so no domestic industry exists with respect to that patent, although the investments related to the 950 patent are analyzed below for completeness.

**A. Qualifying Domestic Activities**

Vicor’s qualifying domestic activities include “designing, developing and manufacturing power converter products.” CIB at 169. All Vicor’s products are power converter modules, which Vicor separates into two categories – (1) Vicor’s legacy, or “Brick,” products, which make up its original product line, and (2) Vicor’s newer, or “Advanced,” products. CX-0009 (Dr. Seth WS) at Q/A 28; *see also* CIB at 169; CX-3053 (Form 10-K) at 0005-0007. The DI Products are a subset of Vicor’s Advanced products. CX-0009 (Dr. Seth WS) at Q/A 31.

Vicor’s domestic locations include two sites in Andover, Massachusetts, and satellite offices in California, Illinois, Rhode Island, Texas, and Oregon. CX-0009 (Dr. Seth WS) at Q/A 23, *see also id.*, at Q/A 24-27; *see also* CIB at 169-170. Additionally, Vicor has five U.S. and eight foreign subsidiaries. CX-0009 (Dr. Seth WS) at Q/A 23. With a few exceptions described below, Dr. Seth limited her domestic industry analysis to Vicor’s activities and investments incurred in its two Andover locations and its Rhode Island satellite office. *Id.* at Q/A 25; *see also id.* at Q/A 23 (“

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Regarding Vicor’s domestic product manufacturing, it “manufactures both ‘Brick’ and ‘Advanced’ power converters at its 320,000 square feet Federal Street facility in Andover, Massachusetts.” *See, e.g.*, CX-0001C (Vinciarelli WS) at Q/A 6, 38; CX-0004C (McNamara WS) at Q/A 24-25, 32; CX-3053.10; CX-3053.026 (explaining that the “facility includes a 90,000 square feet expansion that increased Vicor’s Advanced product production area”); CX-0009C (Seth WS) at Q/A 27, 35, 38, 39. One activity performed at this facility is surface mounting, where components are mounted on printed circuit boards:

[REDACTED]

CX-2967C; *see* CX-0004C (McNamara WS) at Q/A 44-45. Another activity is plating, which serves multiple functions, including completion of electrical connections:



CX-2965C; *see* CX-0004C (McNamara WS) at Q/A 55-57.

Vicor manufactures the DI Products during three shifts per day, five days per week. *See, e.g.,* CX-3009. Vicor's manufacturing and assembly processes for the DI Products are highly automated and involve numerous steps performed by complex equipment at multiple stations. CX-0004C (McNamara WS) at Q/A 39; CX-3001C (explaining the specific manufacturing, assembly, and quality testing steps at the Federal Street facility, along with the equipment used in those steps concerning the representative products within each DI Product family); CX-0004C (McNamara WS) at Q/A 32-41. The manufacturing employees oversee these processes to ensure the products, including the DI Products, go from station to station correctly. CX-0004C (McNamara WS) at Q/A 15, 66; *see also* CIB at 170-171.

[REDACTED]

“For some products that Vicor manufactures, Vicor uses wafer foundries to manufacture Vicor-designed ASICs incorporated in its products.” CIB at 170; *see also* CX-0004C (McNamara WS) at Q/A 32-34 (explaining that Vicor’s designed printed circuit boards (PCBs) are “made by third party foundry partners,” located [REDACTED]); CX-0005C (Morrison WS) at Q/A 29; CX-0001C (Vinciarelli WS) at Q/A 38 (“While we do rely on outside semiconductor fabs that make certain components, Vicor designs those components”). Vicor also formerly used domestic third-party contractors to provide certain advanced product plating services. CIB at 170; CX-0004C (McNamara WS) at Q/A 29-30. Mr. Michael McNamara, Vice President and General Manager of Vicor’s Andover operations, further explained that Vicor does not manufacture its semiconductor devices domestically because Vicor is a fabless manufacturer, “which is typical in the industry because of the cost required to build a semiconductor fab.” CX-0001C (Vinciarelli WS) at Q/A 33.

Vicor performs the “ER&D for its power converter products at its headquarters in Andover and at a satellite facility in Rhode Island.” CIB at 171-172; *see also id.* at 171 (“Vicor performs 100 percent of its product ER&D, including for the DI Products, at its facilities in Andover, MA and Rhode Island.”); CX-0001C (Vinciarelli WS) at Q/A 38; 128-132; CX-2714; CX-0009C (Seth WS) at Q/A 35. Vicor’s headquarters is approximately 90,000 square feet, and its Rhode Island office is approximately 34,000 square feet. CX-3053 (Form 10-K) at 026; CX-0009C (Seth WS) at Q/A 40, 41, 42.

Vicor’s ER&D is performed through the work of four business units: (i) VI Chip, (ii) Picor, (iii) Shared, and (iv) Brick. CIB at 171-172; CX-0001C (Vinciarelli WS) at Q/A 130-133; CX-0005C (Morrison WS) at Q/A 34; CX-2714; CX-0004C (McNamara WS) at Q/A 24-25, 32; CX-3053.10. The “VI Chip” (or “VICHP”) business unit includes employees with a diverse range of

[REDACTED]

engineering disciplines, such as mechanical engineers, electrical engineers, magnetic engineers, thermal engineers, manufacturing test engineers, and process engineers, who manage all phases of ER&D, including post-manufacture testing and qualification for the Advanced products. CX-0001C (Vinciarelli WS) at Q/A 134-138; CX-0004C (McNamara WS) at Q/A 65. VI Chip employees also interface with Vicor's customers in the initial stages of product development for custom-designed products. CX-0001C (Vinciarelli WS) at Q/A 138.

The "Brick" business unit employees have similar responsibilities as Vicor's VI Chip employees, but also work on both the Advanced and Brick products. CX-0001C (Vinciarelli WS) at Q/A 148-149. The "Shared" business unit employees support manufacturing and assembly processes for Brick and Advanced products and develop and manage compliance testing and quality control procedures. CX-0001C (Vinciarelli WS) at Q/A 157; CX-0005C (Morrison WS) at Q/A 34. The "Picor" business unit manages all activities related to Vicor's custom-designed semiconductors. Picor includes engineers who design and develop all custom silicon components, including [REDACTED] [REDACTED] CX-0005C (Morrison WS) at Q/A 28-29, 34, 93; CX-0001C (Vinciarelli WS) at Q/A 150-153; CX-0009C (Seth WS) at Q/A 26 ("I understand that Picor designed, developed, and manufactured custom semiconductor devices that Vicor implemented into Vicor's products").

**1. Subsection (A) – Plant & Equipment**

**a) Manufacturing**

Vicor's investments between 2019 and June 2023 in its manufacturing plant and equipment included: Allocation - Facilities; Depreciation; Lease; Repair and Maintenance; Utilities; Equipment Depreciation; Equipment & Tooling; Furniture & Office Equipment, Materials & Supplies; and Repair & Maintenance. CIB at 173; CX-0009 (Seth WS) at Q/A 43, 44, 45, 49; CX-

[REDACTED]

3248C; CX-0005C (Morrison WS) at Q/A 48-73. Vicor provided the investment amounts in a spreadsheet (CX-3015C), which Mr. Campbell Morrison, Vicor’s Vice President and Corporate Controller, explained provides a “granular accounting of Vicor’s operating expenses for its product manufacturing and [ER&D] activities” at its U.S. facilities. CX-0005C (Morrison WS) at Q/A 40. Mr. Morrison explained that this spreadsheet provides “the amounts of each expenditure,” along with the “account number” and “expense category” for each expenditure and the “departments within Vicor that incur, or get allocated a portion of, the particular expenditure.” *Id.* at Q/A 41-43.


Dr. Seth concluded that “Vicor invested a total of [REDACTED] in its manufacturing facility and [REDACTED] in manufacturing equipment” from 2019 through June 2023. CX-0009C (Seth WS) at Q/A 49; *see also id.* at Q/A 45-49; CX-3246C; CX-3248C; CX-3249C; CDX-0009.3C. Dr. Seth summarized her analysis in the table below:

CDX-0009.3C					
Vicor’s Unallocated Domestic Plant and Equipment Investments for Manufacturing					
Plant	2019	2020	2021	2022	1H 2023
Advanced and Brick	[REDACTED]				
Advanced	[REDACTED]				
Total	[REDACTED]				
Equipment	2019	2020	2021	2022	1H 2023
Advanced and Brick	[REDACTED]				
Advanced	[REDACTED]				
Total	[REDACTED]				


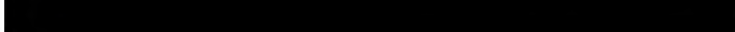

CX-0009C (Seth WS) at Q/A 50. However, Vicor does not track expenses on a product-by-product basis. CX-0005C (Morrison WS) at Q/A 45-46; CX-0004C (McNamara WS) at Q/A 11. As a result, Dr. Seth performed a two-step allocation approach: a first allocation to Advanced products, followed by a second allocation to the DI Products (which are a subset of the Advanced Products), based on the cost of goods sold (“COGS”). CIB at 174-175; CX-0009C (Seth WS) at Q/A 55 (describing step 1); 60 (describing step 2).



Dr. Seth’s two-step allocation approach is reasonable based on this record. She opined that “based on my experience in analyzing manufacturing-based domestic industries and my conversations with Mr. McNamara I determined that an allocation based on Vicor’s cost of goods sold, or COGS, is an economically appropriate approach.” CX-0009C (Seth WS) at Q/A 53-54; *see also* CIB at 174. And Mr. McNamara testified that he would use product COGS “as a guidepost” (CX-0004C (McNamara WS) at Q/A 13) because “[u]sing COGS would more accurately account for [product] differences and better capture the distinct types of investments needed to manufacture our different types of products” (*id.* at Q/A 14). Mr. McNamara further explained that “Vicor’s manufacturing efforts don’t necessarily correspond to product price so using revenues wouldn’t be as accurate as COGS.” *Id.* at Q/A 14. Respondents do not dispute the validity of the two-step allocation approach, nor have Respondents advanced any alternative.

Regarding step one of the allocation approach, Dr. Seth used Vicor’s spreadsheet concerning extended COGS (CX-3016C) to determine that from 2019 through June 2023, approximately  of shared manufacturing costs are directed to work on both Advanced and Brick products in each year, respectively. CX-0009C (Seth WS) at Q/A 58; *see also id.* at Q/A 55-58; *see also* CX-0005C (Morrison WS) at Q/A 106-110.

**TABLE 13: COGS ALLOCATIONS TO ADVANCED PRODUCTS FOR CERTAIN MANUFACTURING DEPARTMENTS 2019 TO JUNE 2023**

	2019 [A]	2020 [B]	2021 [C]	2022 [D]	June 2023 [E]	Total [F]
<b>Departments Dedicated to Advanced and Brick Products</b>						
COGS - Advanced Products	[1]					
COGS - All Products	[2]					
Advanced Product Allocation	[3]					

CX-0009C (Seth WS) at Q/A 59.

Regarding step two of the allocation approach, Dr. Seth further allocated the portion of domestic Advanced product manufacturing investments attributable to the DI Products for each



Asserted Patent using CX-2912C and CX-3016C, which detail COGS associated with the DI Products. CX-0009C (Seth WS) at Q/A 60-61 (“Thus, a total extended COGS based allocation is an effective way to reflect the distinct investment levels necessary for manufacturing each type of product.”); CX-0005C (Morrison WS) at Q/A 96-105. Specifically, she used Vicor’s total extended COGS for each Asserted Patent’s DI Products and Vicor’s total extended Advanced product COGS to derive the “final patent-level COGS allocation values for each Asserted Patent in each year from 2019 through June 2023.” CX-0009C (Seth WS) at Q/A 61; CIB at 175. Dr. Seth estimated that, between 2019 and June 2023, Vicor had spent [REDACTED] of its extended COGS on products practicing the 761 patent, [REDACTED] of its extended COGS on products practicing the 481 patent, and [REDACTED] of its extended COGS on products practicing the 950 patent. CX-0009C (Seth WS) at Q/A 63. She summarized her analysis in the table below:

**TABLE 14: PATENT-LEVEL COGS ALLOCATIONS TO DI PRODUCTS FOR MANUFACTURING DEPARTMENTS 2019 TO JUNE 2023<sup>393</sup>**

	2019	2020	2021	2022	June 2023	Total
	[A]	[B]	[C]	[D]	[E]	[F]
<b>COGS</b>						
'761 Patent [1]						
'481 Patent [2]						
'950 Patent [3]						
All Advanced Products [4]						
<b>Patent Level Allocations</b>						
'761 Patent [5]						
'481 Patent [6]						
'950 Patent [7]						

CX-0009C (Seth WS) at Q/A 63

Based on these allocations, Dr. Seth determined Vicor’s domestic investments in plant and equipment for manufacturing the 761 patent, 481 patent, and 950 patent DI Products each year from 2019 through June 2023. CX-0009C (Seth WS) at Q/A 65-70; CX-3262C; CX-3265C; CX-3268C.



Allocated Manufacturing Investments in Plant & Equipment 2019 – June 2023					
'761 DI products	2019	2020	2021	2022	1H 2023
Plant	[REDACTED]				
Equipment	[REDACTED]				
'481 DI products	2019	2020	2021	2022	1H 2023
Plant	[REDACTED]				
Equipment	[REDACTED]				
'950 DI products	2019	2020	2021	2022	1H 2023
Plant	[REDACTED]				
Equipment	[REDACTED]				

CIB at 175; *see also* CX-0009C (Seth WS) at Q/A 65-70. She also determined Vicor’s domestic investments in plant and equipment directed to manufacturing the DI Products for each Asserted Patent on a family basis by dividing the total extended COGS of each product family by the total Advanced product extended COGS. CX-0009C (Seth WS) at Q/A 71-74. Dr. Seth opined specifically on the [REDACTED] and [REDACTED] families:

I determined that Vicor invested \$ [REDACTED] \$ [REDACTED] \$ [REDACTED] \$ [REDACTED] and \$ [REDACTED] in plant and \$ [REDACTED] \$ [REDACTED] \$ [REDACTED] and \$ [REDACTED] in equipment directed to manufacturing the '481 patent [REDACTED] Domestic Industry Products during that period.

I determined that Vicor invested \$ [REDACTED] \$ [REDACTED] \$ [REDACTED] and \$ [REDACTED] in plant and \$ [REDACTED] \$ [REDACTED] \$ [REDACTED] and \$ [REDACTED] in equipment directed to manufacturing the '481 patent [REDACTED] Domestic Industry Products during that period.

CX-0009C (Seth WS) at Q/A 81; *see also id.*, 79-80. The results from this analysis are summarized in the table below:



**TABLE R. 5: '481 PATENT ALLOCATED MANUFACTURING INVESTMENTS IN PLANT AND EQUIPMENT BY PRODUCT FAMILY 2019 TO JUNE 2023**

			2019	2020	2021	2022	June 2023	Total
			[A]	[B]	[C]	[D]	[E]	[F]
DCM	Plant	[4]						
	Equipment	[5]						
	Total	[6]						
MCD	Plant	[10]						
	Equipment	[11]						
	Total	[12]						
MCM	Plant	[13]						
	Equipment	[14]						
	Total	[15]						
NBM	Plant	[16]						
	Equipment	[17]						
	Total	[18]						
VTM	Plant	[19]						
	Equipment	[20]						
	Total	[21]						

CX-0009C (Seth WS) at Q/A 82.

**b) ER&D**

Vicor tracked its qualifying ER&D expenses similarly to its qualifying manufacturing expenses, and these expenses are summarized in the same spreadsheet. CIB at 177; CX-0009 (Seth WS) at Q/A 44, 45, 98; CX-3248C; CX-3015C; *see also* CX-0005C (Morrison WS) at Q/A 40-43; CX-3247C. Dr. Seth analyzed Vicor’s evidence and generated several tables, reproduced below. She concluded that “Vicor invested a total of \$ in its facilities and \$ in ER&D equipment for the departments listed in CX-3247C and the account numbers listed in CX-3248C” from 2019 through June 2023. CX-0009C (Seth WS) at Q/A 98; *see also id.* at Q/A 95-97; CX-3247C; CX-3248C; CX-3015C.



**TABLE 9.A: UNALLOCATED ER&D INVESTMENTS IN PLANT  
 2019 TO JUNE 2023**

	2019 [A]	2020 [B]	2021 [C]	2022 [D]	June 2023 [E]	Total [F]
<b>All R&amp;D Departments</b>						
Allocation - Facilities	[17]	[REDACTED]				
Depreciation	[18]	[REDACTED]				
Repair & Maintenance	[19]	[REDACTED]				
Utilities	[20]	[REDACTED]				
<b>Plant Total</b>	[21]	[REDACTED]				

**TABLE 9.B: UNALLOCATED ER&D INVESTMENTS IN EQUIPMENT  
 2019 TO JUNE 2023**

	2019 [A]	2020 [B]	2021 [C]	2022 [D]	June 2023 [E]	Total [F]
<b>All R&amp;D Departments</b>						
Equipment Depreciation	[21]	[REDACTED]				
Equipment & Tooling	[22]	[REDACTED]				
Furniture & Office Equipment	[23]	[REDACTED]				
Materials & Supplies	[24]	[REDACTED]				
Repair & Maintenance	[25]	[REDACTED]				
<b>Equipment Total</b>	[26]	[REDACTED]				
<b>Plant and Equipment Total</b>	[27]	[REDACTED]				

CX-0009C (Seth WS) at Q/A 99.

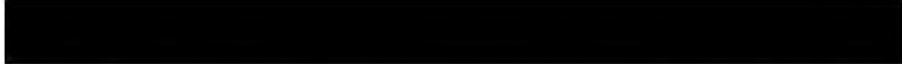
Because all Vicor’s ER&D departments perform activities almost exclusively directed to the Advanced products, Vicor contends that no apportionment is necessary to isolate investments into Advanced product ER&D. CIB at 178; *see also* CX-0001C (Vinciarelli WS) at Q/A 133-157. To allocate the amount of Vicor’s domestic investments in plant and equipment directed to ER&D for the DI Products protected by each Asserted Patent, Dr. Seth employed a cost estimate of effort (salaries, wages, and benefits) allocation method. CX-0009C (Seth WS) at Q/A 100-102. She relied “on two documents that Vicor produced and Mr. Morrison testified about that provide Vicor’s cost estimate of effort directed to ER&D projects for Domestic Industry Products as well as for all Vicor products.” CX-0009C (Seth WS) at Q/A 103; CX-3010; CX-3017. These two documents include four types of ER&D projects related to the DI products, specifically ‘ [REDACTED],’ ‘ [REDACTED],’ ‘ [REDACTED],’ and ‘ [REDACTED]’ CX-0009C (Seth WS) at Q/A 103.



Based on this allocation (*see, e.g.*, CX-0009C (Seth WS) at Q/A 103-108), Dr. Seth determined that from 2019 through June 2023, approximately [REDACTED] [REDACTED] and [REDACTED] of Vicor’s domestic ER&D investments were directed to products protected by the 761, 481, and 950 patents, respectively. *Id.* at Q/A 109-110; CX-3529C.

Allocated Investments in Plant & Equipment for ER&D 2019 – June 2023					
<b>'761 DI products</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>1H 2023</b>
<b>Plant</b>	[REDACTED]				
<b>Equipment</b>	[REDACTED]				
<b>'481 DI products</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>1H 2023</b>
<b>Plant</b>	[REDACTED]				
<b>Equipment</b>	[REDACTED]				
<b>'950 DI products</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>1H 2023</b>
<b>Plant</b>	[REDACTED]				
<b>Equipment</b>	[REDACTED]				

CIB at 178-179; *see also* CX-0009C (Seth WS) at Q/A 112-117. She also determined Vicor’s domestic investments in plant and equipment directed to ER&D for the DI Products for each Asserted Patent on a family basis based on the same cost estimate of effort allocation, including for ER&D related to just the [REDACTED] and [REDACTED] families. CX-0009C (Seth WS) at Q/A 118-128.



**TABLE R. 14: '481 PATENT ALLOCATED ER&D INVESTMENTS IN PLANT AND EQUIPMENT BY PRODUCT FAMILY 2019 TO JUNE 2023**

			2019	2020	2021	2022	June 2023	Total
			[A]	[B]	[C]	[D]	[E]	[F]
BCM	Plant	[1]						
	Equipment	[2]						
	Total	[3]						
DCM	Plant	[4]						
	Equipment	[5]						
	Total	[6]						
MCD	Plant	[10]						
	Equipment	[11]						
	Total	[12]						
MCM	Plant	[13]						
	Equipment	[14]						
	Total	[15]						
NBM	Plant	[16]						
	Equipment	[17]						
	Total	[18]						
VTM	Plant	[19]						
	Equipment	[20]						
	Total	[21]						

CX-0009C (Seth WS) at Q/A 129.

**2. Subsection (B) - Labor or Capital**

Vicor divided its labor or capital investments similarly, that is, between manufacturing and ER&D. *See* CIB at 180-83.

**a) Manufacturing**

Dr. Seth concluded that Vicor invested a total of to employ labor at its manufacturing facility and “Vicor invested a total of in capital for the manufacturing services provided by and which where plating vendors used , from 2019 through June 2023. CX-0009C (Seth WS) at Q/A 141-145; CX-3014C; CX-3015C; CX-3253C. Dr. Seth summarized her analysis in the table below:

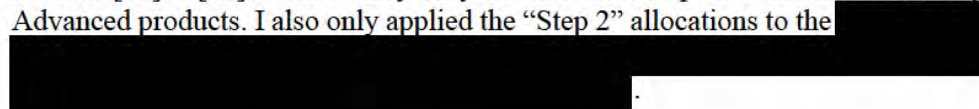


CDX-0009.16C					
Vicor's Unallocated Domestic Employment of Labor and Capital for Manufacturing					
Labor	2019	2020	2021	2022	1H 2023
Advanced and Brick	[REDACTED]				
Advanced					
Total					
Capital	2019	2020	2021	2022	1H 2023
[REDACTED]	[REDACTED]				
Total					

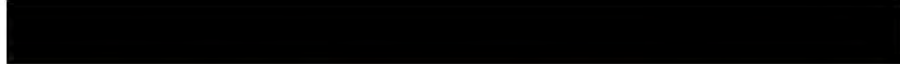
CX-0009C (Seth WS) at Q/A 145.

Dr. Seth applied a two-step extended COGS allocation, like that described above regarding Subsection (A), to allocate investments under Subsection (B). CX-0009C (Seth WS) at Q/A 147; CIB at 181. Regarding step one of the allocation approach, she used CX-3014C and CX-3015C to determine Vicor's domestic investments in labor and capital to manufacture Advanced products from 2019 to June 2023; these are summarized in the table above. CX-0009C (Seth WS) at Q/A 141-145; CX-3253C; CDX-0009.16C. Regarding step two of the allocation approach, Dr. Seth further allocated the portion of domestic Advanced product manufacturing investments attributable to the DI Products for each Asserted Patent. CX-0009C (Seth WS) at Q/A 146-147; CX-3012C; CX-3014C; CX-3246C; CX-32582C; CX-0005C (Morrison WS) at Q/A 75-94. As she explained:

I applied the "Step 1" and "Step 2" allocations to the employment of labor in rows [1] – [11] because they include labor expenses for manufacturing Advanced and Brick products. I only applied the "Step 2" allocations to the employment of labor in rows [12] – [22] because they only include labor expenses for manufacturing Advanced products. I also only applied the "Step 2" allocations to the [REDACTED]



CX-0009C (Seth WS) at Q/A 147.



Allocated Manufacturing Employment of Labor and Capital 2019 – June 2023					
'761 DI products	2019	2020	2021	2022	1H 2023
Labor	[REDACTED]				
Capital	[REDACTED]				
'481 DI products	2019	2020	2021	2022	1H 2023
Labor	[REDACTED]				
Capital	[REDACTED]				
'950 DI products	2019	2020	2021	2022	1H 2023
Labor	[REDACTED]				
Capital	[REDACTED]				

CX-0009C (Seth WS) at Q/A 148-153.

Dr. Seth also determined Vicor’s domestic investments in labor and capital directed to manufacturing the DI products for each Asserted Patent on a family basis. CX-0009C (Seth WS) at Q/A 154-165. This included domestic investments in labor and capital for manufacturing just the [REDACTED] and [REDACTED] families:

I determined that Vicor employed in the United States \$ [REDACTED] \$ [REDACTED] \$ [REDACTED] \$ [REDACTED] and \$ [REDACTED] in labor and \$ [REDACTED] \$ [REDACTED] \$ [REDACTED] and \$ [REDACTED] in capital directed to manufacturing the '481 patent [REDACTED] Domestic Industry Products during that period.

I determined that Vicor employed in the United States \$ [REDACTED] \$ [REDACTED] \$ [REDACTED] \$ [REDACTED] and \$ [REDACTED] in labor and \$ [REDACTED] \$ [REDACTED] \$ [REDACTED] and \$ [REDACTED] in capital directed to manufacturing the '481 patent [REDACTED] Domestic Industry Products during that period.

CX-0009C (Seth WS) at Q/A 159; *see also id.* at Q/A 159-160. Her analysis is summarized in the table below:



**TABLE R. 8: '481 PATENT ALLOCATED MANUFACTURING INVESTMENTS IN LABOR AND CAPITAL BY PRODUCT FAMILY 2019 TO JUNE 2023**

			2019	2020	2021	2022	June 2023	Total
			[A]	[B]	[C]	[D]	[E]	[F]
DCM	Labor	[4]						
	Capital	[5]						
	Total	[6]						
MCD	Labor	[10]						
	Capital	[11]						
	Total	[12]						
MCM	Labor	[13]						
	Capital	[14]						
	Total	[15]						
NBM	Labor	[16]						
	Capital	[17]						
	Total	[18]						
VTM	Labor	[19]						
	Capital	[20]						
	Total	[21]						

CX-0009C (Seth WS) at Q/A 160

**b) ER&D**

Vicor tracked its qualifying ER&D expenses, which included compensation, bonuses, training, and benefits, similarly to its qualifying manufacturing expenses. CX-0009C (Seth WS) at Q/A 168-170. From 2019 to June 2023, Dr. Seth determined that Vicor invested to employ domestic labor for its ER&D departments. *Id.* at Q/A 169-170; CX-3254C; CX-3255C; CIB at 182-183. Dr. Seth again applied her cost estimate of effort allocation for each year from 2019 through June 2023. CX-0009C (Seth WS) at Q/A 171-176.

Allocated Employment of Labor for ER&D 2019 – June 2023					
	2019	2020	2021	2022	1H 2023
'761 DI products					
'481 DI products					
'950 DI products					

CIB at 183; *see* CX-3273C; CX-3276C; CX-3279C.

Dr. Seth then determined Vicor’s domestic investments in labor and capital directed to ER&D for DI products on a family basis, including for the and families. CX-0009C

[REDACTED]

(Seth WS) at Q/A 177-184.

I determined that Vicor employed in the United States \$ [REDACTED] \$ [REDACTED] \$ [REDACTED] \$ [REDACTED] and \$ [REDACTED] of labor directed to ER&D for the '481 patent [REDACTED] Domestic Industry Products during that period.

I determined that Vicor employed in the United States \$ [REDACTED] \$ [REDACTED] \$ [REDACTED] \$ [REDACTED] and \$ [REDACTED] of labor directed to ER&D for the '481 patent [REDACTED] Domestic Industry Products during that period.

CX-0009C (Seth WS) at Q/A 182; *see also id.* at Q/A 183. Dr. Seth’s results from this analysis are summarized in the table below:

**TABLE R. 17: '481 PATENT ALLOCATED ER&D INVESTMENTS IN LABOR BY PRODUCT FAMILY 2019 TO JUNE 2023**

			2019 (A)	2020 (B)	2021 (C)	2022 (D)	June 2023 (E)	Total (F)
BCM	Labor	(1)	[REDACTED]					
DCM	Labor	(2)						
MCD	Labor	(4)						
MCM	Labor	(5)						
NBM	Labor	(6)						
VTM	Labor	(7)						

CX-0009C (Seth WS) at Q/A 183.

**B. Significance**

Vicor argues that its domestic investments are significant under both Subsections (A) and (B) “under any relevant metric.” CIB at 184. The principal metric upon which Vicor relies is a comparison of DI Product investments to “overall domestic investments.” *Id.* at 186, 188. Staff agrees. *See* SIB at 164, 167.

Dr. Seth concluded that Vicor’s domestic investments in plant and equipment under Subsection (A) and employment of labor and capital under Subsection (B) for manufacturing and ER&D (combined) directed to the DI Products for each Asserted Patent represent a significant portion of Vicor’s total domestic expenses in those activities. CX-0009C (Seth WS) at Q/A 192-



193. For the 761 and 481 patents, the percentages and dollar values show significance under Subsection (A), and for the 950 patent the dollar value is impressive but the percentage is not:

CDX-0009.24C					
Quantitative Significance; Vicor's Domestic Industry Plant and Equipment Compared to Total Domestic Plant and Equipment Reported in CX-3015C					
	2020	2021	2022	1H 2023	2019 – 1H 2023
'761 P&E					
'481 P&E					
'950 P&E					
Total P&E					
'761 %	11.7%	13.6%	19.0%	24.5%	15.7%
'481 %	19.6%	20.3%	27.0%	30.6%	22.8%
'950 %	1.8%	2.6%	7.3%	7.0%	4.2%

CX-0009C (Seth WS) at Q/A 195. The same is true under Subsection (B):

CDX-0009.28C					
Quantitative Significance; Vicor's Domestic Industry Labor and Capital Compared to Total Domestic Labor and Capital Reported in CX-3014C and CX-3015C					
	2020	2021	2022	1H 2023	2019 – 1H 2023
'761 L&C					
'481 L&C					
'950 L&C					
Total L&C					
'761 %	14.3%	17.7%	23.4%	24.9%	18.0%
'481 %	23.5%	26.0%	32.9%	31.0%	25.9%
'950 %	2.2%	3.4%	8.7%	7.0%	4.6%

CX-0009C (Seth WS) at Q/A 204.

Using Vicor's principal metric, such evidence is sufficient to show significant investment for the 761 patent under both Subsections, but for the other two patents it is problematic. The 481 patent is practiced by only some of the DI Products Vicor identified—namely, those DI Products incorporating the VTM3 controller—and even though Dr. Seth analyzed the DI Products based on product family, she did not analyze them based on the controller used. *E.g.*, CX-0009C (Seth WS) at Q/A 209 (charting total investments under Subsection (B) for the 481 patent, broken out by product family). Nor does any party argue that DI Products containing the VTM3 can or should be analyzed as a separate category, although Respondents do observe that Vicor is not allowed to



“aggregate” investments. RIB at 193; *see generally* RIB at 192-97; CIB at 183-92; SIB at 129-80; CRB at 95-99; RRB at 96-98.

Ordinarily this would be fatal to Vicor’s case for the 481 patent, because “the fact finder [need not] sift through the record evidence to construct an allocation that meets the complainant’s burden.” *Certain Artificial Eyelash Extension Systems, Products, and Components Thereof*, Inv. No. 337-TA-1226, Comm’n Op. at 61 (Oct. 24, 2022). The record here, however, has already been sifted enough to readily show the significance of investments related to the 481 patent. Specifically, all products within the [REDACTED] product families comprise a VTM3 controller, and otherwise practice claim 1 of the 481 patent, and Dr. Seth analyzed the [REDACTED] product family data separately. *See* CX-0008C (Fayed WS) at Q/A 721; CX-3208C at 10; CX-0009C (Seth WS) at Q/A 199, 208. Her analysis showed that investment in the two product families between 2019 and 2023 totaled 10.8% (3.4% + 7.4%) under Subsection (A) and 12% (3.8% + 8.2%) under Subsection (B):

CDX-0009.26C						
481 Patent Quantitative Significance; Vicor’s Domestic Industry Plant and Equipment Compared to Total Domestic Plant and Equipment Reported in CX-3015C						
		2020	2021	2022	1H 2023	2019 – 1H 2023
[REDACTED]	P&E	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	P&E	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	P&E	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	P&E	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	P&E	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	P&E	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Total P&E	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	%	0.4%	0.8%	0.6%	2.1%	0.8%
[REDACTED]	%	4.2%	4.2%	4.8%	5.6%	4.2%
[REDACTED]	%	2.8%	3.2%	4.1%	5.4%	3.4%
[REDACTED]	%	6.9%	7.4%	8.4%	10.8%	7.4%
[REDACTED]	%	0.2%	0.4%	3.4%	4.3%	1.8%
[REDACTED]	%	5.0%	4.2%	5.6%	2.4%	5.2%

CX-0009C (Seth WS) at Q/A 200.



CDX-0009.30C						
'481 Patent Quantitative Significance; Vicor's Domestic Industry Labor and Capital Compared to Total Domestic Labor and Capital Reported in CX-3014C and CX-3015C						
		2020	2021	2022	1H 2023	2019 – 1H 2023
	L&C					
	L&C					
	L&C					
	L&C					
	L&C					
	L&C					
	Total L&C					
	%	0.7%	1.1%	0.8%	2.2%	1.0%
	%	5.4%	5.7%	6.2%	6.2%	5.3%
	%	3.3%	4.0%	4.9%	5.3%	3.8%
	%	7.9%	9.1%	10.0%	10.5%	8.2%
	%	0.3%	0.5%	4.0%	4.1%	1.8%
	%	5.8%	5.3%	6.8%	2.6%	5.7%

CX-0009C (Seth WS) at 209. Such percentages, combined with the high dollar amounts (a total of [REDACTED] under Subsection (A) and almost [REDACTED] under Subsection (B)), are sufficient to satisfy both Subsections. That is, there is a domestic industry relating to the [REDACTED] product families under both Subsections using this metric, because both families practice the 481 patent, regardless of what other products also practice the 481 patent.

But this metric remains problematic for the 950 patent, because the percentages are so low: 4.2% and 4.6% under Subsections (A) and (B), respectively, between 2019 and 2023. *See* CX-0009C (Seth WS) at Q/A 195, 204. Dr. Seth's opinion that investments related to this patent are significant using this metric is thus not supported by the record. Nor is there significance using the metric of comparing just manufacturing expenses (*see id.* at Q/A 212), because the dollar amounts drop and the percentages only increase to 7.0% and 6.7%, respectively (*see id.* at Q/A 215, 226). For the [REDACTED] product families (as a subset of total investment relating to the 481 patent) and the 761 patent, by contrast, the percentages using this metric remain significant: 19.2% and 24.6%, respectively, under Subsection (A) and 19.1% and 24.1%, respectively, under Subsection (B). *See id.* at Q/A 215, 220, 226, 231. So comparing manufacturing costs and disregarding ER&D, the 761



and 481 patents continue to have significant investment under both Subsections, and the 950 patent does not. *See* RRB at 97-98 (arguing that the 950 patent’s investments are not significant because they are “substantially lower” than the other patents’).

Respondents criticize Vicor’s significance case as “not meaningful” because it simply shows that “bigger selling products take up more R&D and manufacturing investments than smaller selling products.” RIB at 194. As a threshold matter, this is not necessarily a valid criticism. The Commission has, to be sure, rejected the existence of a domestic industry where there was no “contextual analysis” of foreign investments even though the relevant DI product was “manufactured entirely abroad.” *Solid State Storage* at 34-35. But it has more recently held that “it does not require a domestic-to-foreign comparison, nor does it express a general preference for such a comparison to establish significance,” and “a complainant may rely on a comparison of its domestic industry investments to company-wide investments in establishing significance given the facts and circumstances of a particular investigation.” *Certain Wearable Electronic Devices with ECG Functionality and Components Thereof*, Inv. No. 337-TA-1266, Comm’n Op. at 24, 26 (Jan. 20, 2023).

Regardless, Vicor has presented evidence of its foreign manufacturing expenses, and argues that its “domestic industry investments are significant in comparison to Vicor’s worldwide investments . . . directed to [the DI] products,” although without Dr. Seth’s assistance. *See* CIB at 191-92. Staff agrees with Vicor. *See* SIB at 178-80. Respondents argue that Vicor should have conducted a formal “value added” analysis, but otherwise have no rebuttal, and the “value added” approach is in any event just one alternative to a direct comparison of domestic and foreign expenses. RRB at 96-98; *see Certain Carburetors and Products Containing Such Carburetors*, Inv. No. 337-TA-1189, Comm’n Op. at 18 (Oct. 28, 2019).

[REDACTED]

As for evidence supporting a direct comparison, again, Vicor employs a “fables” business model, meaning it contracts with third parties to manufacture the chips it incorporates into its products, to avoid the “massive investment required to build and operate a semiconductor foundry.” CX-0005C (Morrison WS) at Q/A 93-94. And during the relevant time period it used third party vendors for “plating services,” although the plating vendors are all domestic and Dr. Seth already counted payments to them as domestic labor expenses related to manufacturing. *Id.* at Q/A 88-89; *see* CX-0009C (Seth WS) at Q/A 142. Vicor’s records show that between 2019 and June 2023 it paid about [REDACTED] to third party “IC Vendors,” compared with [REDACTED] and [REDACTED] in company-wide domestic plant and equipment and labor and capital expenses, respectively. *See* CX-3014C at tab RECAP; CX-0009C (Seth WS) at Q/A 195, 204. Of that [REDACTED] about [REDACTED] went to foreign vendors. *See* CX-3014C at tab RECAP. It is unclear whether Dr. Seth considered the difference [REDACTED] as part of Vicor’s domestic manufacturing expenses, but even assuming conservatively that she did, the ratio of foreign expenses to total manufacturing and ER&D expenses is about 9% ( $\frac{[REDACTED]}{([REDACTED] + [REDACTED] + [REDACTED])}$ ).

So over 90% of Vicor’s company-wide manufacturing and ER&D costs were domestic, and Vicor’s claim that it “performs all its DI product manufacturing and ER&D activities in the United States” is therefore only a minor exaggeration. CIB at 183. More to the point, Vicor is close to having a “complete lack of foreign investment,” a situation which “weigh[s] heavily in favor” of finding economic prong satisfied. *Certain Polycrystalline Diamond Compacts and Articles Containing Same*, Inv. No. 337-TA-1236, Initial Determination at 156-57 (Mar. 3, 2022), *not reviewed in pertinent part*, Comm’n Op. at 56 (Oct. 26, 2022). It is possible that Vicor’s foreign expenses relate more to the DI Products than to other Vicor products, or to one product family more than another, but because Vicor uses mainly foreign vendors for all of its chip fabrication, there is

[REDACTED]

no reason not to prorate the associated expense evenly across all products. On that basis, DI investments relating to the 761 patent and the [REDACTED] product families are unquestionably significant, because over 90% are domestic. And as for the 950 patent, total domestic investments come to about [REDACTED] under Subsection (A) and [REDACTED] under Subsection (B), with over 90% of all investments domestic, and this, too, unquestionably establishes significance under both Subsections. CX-0009C (Seth WS) at Q/A 195, 204.

In sum, a domestic industry exists with respect to the 761 patent and the 481 patent. A domestic industry would also exist with respect to the 950 patent, except that no DI Product has been shown to practice any claim of that patent.

#### **IX. CONCLUSIONS OF LAW**

Violations have been proven with respect to U.S. Patent Nos. 9,166,481 and 9,516,761, but not with respect to U.S. Patent No. 10,199,950. Specifically:

- A. Claim 1 of the 481 patent has been infringed, has not been proven invalid, and a domestic industry practicing that claim exists.
- B. Claims 1-7 of the 761 patent have been infringed, claims 1, 2, 3, and 7 have been proven invalid as obvious, claims 4, 5, and 6 have not been proven invalid, and a domestic industry practicing claims 4, 5, and 6 exists.
- C. Claims 9, 13-14, and 33-38 of the 950 patent have not been infringed, no claim of the 950 patent has been proven invalid, and the economic prong of the domestic industry requirement has been satisfied but no domestic industry product practices claims 9, 13-14, or 33-38.
- D. No respondent possesses a license to practice any asserted claim.



**X. RECOMMENDED DETERMINATION ON REMEDY AND BOND**

The Commission's Rules provide that subsequent to an initial determination on the question of violation of section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, the administrative law judge shall issue a recommended determination concerning the appropriate remedy in the event that the Commission finds a violation of section 337, and the amount of bond to be posted by respondent during Presidential review of the Commission action under section 337(j). *See* 19 C.F.R. § 210.42(a)(1)(ii).

The Commission has broad discretion in selecting the form, scope, and extent of the remedy in a section 337 proceeding. *Viscofan, S.A. v. Int'l Trade Comm'n*, 787 F.2d 544, 548 (Fed. Cir. 1986). Under Section 337(d)(1), if the Commission determines as a result of an investigation that there is a violation of section 337, the Commission is authorized to enter either a limited or a general exclusion order. 19 U.S.C. § 1337(d)(1). A limited exclusion order ("LEO") instructs the U.S. Customs and Border Protection ("CBP") to exclude from entry all articles that are covered by the patent at issue and that originate from a named respondent in the investigation. A general exclusion order instructs the CBP to exclude from entry all articles that are covered by the patent at issue, without regard to source. *Certain Purple Protective Gloves*, Inv. No. 337-TA-500, Comm'n Op. at 5 (Dec. 22, 2004). Under section 337(f)(1), the Commission may issue a cease and desist order ("CDO") in addition to, or instead of, an exclusion order. 19 U.S.C. § 1337(f)(1). The Commission generally issues a cease and desist order directed to a domestic respondent when there is a "commercially significant" amount of infringing, imported product in the United States that could be sold, thereby undercutting the remedy provided by an exclusion order. *See Certain Crystalline Cefadroxil Monohydrate*, Inv. No. 337-TA-293, USITC Pub. 2391, Comm'n Op. on Remedy, the Public Interest and Bonding at 37-42 (June 1991); *Certain Condensers, Parts Thereof and Prods.*



*Containing Same, Including Air Conditioners for Automobiles*, Inv. No. 337-TA-334 (Remand), Comm’n Op. at 26-28 (Sept. 10, 1997).

Additionally, during the 60-day period of Presidential review under 19 U.S.C. § 1337(j), “articles directed to be excluded from entry under subsection (d) . . . shall . . . be entitled to entry under bond prescribed by the Secretary in an amount determined by the Commission to be sufficient to protect the complainant from any injury.” *See* 19 U.S.C. § 1337(j)(3). “The Commission typically sets the bond based on the price differential between the imported infringing product and the domestic industry article or based on a reasonable royalty. However, where the available pricing or royalty information is inadequate, the bond may be set at one hundred (100) percent of the entered value of the infringing product.” *Certain Industrial Automation Systems and Components Thereof Including Control Systems, Controllers, Visualization Hardware, Motion and Motor Control Systems, Networking Equipment, Safety Devices, and Power Supplies*, Inv. No. 337-TA-1074, Comm’n Op. at 13 (Apr. 23, 2019) (“*Automation Systems*”) (public version) (citation omitted).

**A. Limited Exclusion Order**

Respondents do not dispute that an LEO should issue, but request that any LEO “carve out Respondents’ non-infringing and/or non-accused products.” RIB at 198. Staff correctly observes that such a limitation is not the Commission’s standard practice, and Respondents offer no persuasive reason to deviate from that practice. *See* SIB at 181; *Certain Graphics Systems, Components Thereof, and Digital Televisions Containing the Same*, Inv. No. 337-TA-1318, Comm’n Op. at 59 (Feb. 23, 2024). Respondents have also not shown that any product is licensed. *See* RRB at 98; SIB at 180-81. It is therefore my recommendation that if any violation is found the Commission should issue its standard LEO directed to all respondents.

[REDACTED]

**B. Cease and Desist Order**

Vicor bears the burden to prove CDOs are warranted. *Certain Microfluidic Devices, Inv.* No. 337-TA-1068, Comm’n Op. at 23 (Jan. 10, 2020). Such orders “are generally issued when, with respect to the imported infringing products, respondents maintain commercially significant inventories in the United States or have significant domestic operations that could undercut the remedy provided by an exclusion order.” *Id.* at 22-23 (citations omitted).

The parties have stipulated to much of the pertinent evidence. As of February 5, 2024, QCH, Inc., a subsidiary of respondent Quanta Computer Inc., maintained [REDACTED] of Quanta products incorporating Delta Accused Modules in inventory in the U.S., having a value of [REDACTED]. *See* CX-3730C at 4. Those Delta Accused Modules infringe claims 4, 5, and 6 of the 761 patent, but some of Quanta’s products incorporate a Delta Accused Module (Q50SN12050RND) that has not been shown to infringe any asserted claim. *See id.* at 12. Neither Quanta respondent (Quanta Computer Inc. and Quanta Computer USA, Inc.) maintained any inventory of infringing products as of February 5, 2024. *See id.* at 3. Nonetheless, the Quanta respondents do not dispute that QCH, Inc.’s inventory of accused Quanta products in the U.S. is commercially significant. *See id.* at 4.

As of February 5, 2024, respondent FII USA Inc. maintained [REDACTED] units of infringing Delta Accused Modules in inventory in the U.S., having a value of [REDACTED]. *See* CX-3648C at 3. FII USA Inc. incorporates Delta’s modules into its own accused products, but it maintains no inventory of its own accused products, because it employs a “strategic ‘Build-to-Order’ business model.” *Id.* at 2-3. FII USA Inc. does not dispute that its inventory of infringing Delta Accused Modules in the U.S. is commercially significant. *See id.* at 3.

As of February 5, 2024, respondent Ingrasys Technology USA Inc. maintained [REDACTED] units of infringing Delta Accused Modules in inventory in the U.S., having a value of [REDACTED], and [REDACTED]

[REDACTED]

units of infringing Ingrasys system products in inventory in the U.S., having a value of [REDACTED].  
*See* CX-3729C at 4. Ingrasys Technology USA Inc. does not dispute that its inventory of infringing  
Delta Accused Modules and of infringing Ingrasys system products in the U.S. are each  
commercially significant. *See id.*

Vicor offers no evidence that either Cyntec or the Delta respondents themselves maintain a  
commercially significant inventory of infringing products in the U.S. *See* CIB at 195-96; RRB at  
98. Vicor instead asserts that a CDO is warranted against Delta and Cyntec because domestic  
“distributors and retailers” collectively maintain a commercial significant inventory, and that Cyntec  
and the Delta respondents have significant domestic operations. *Id.* at 196-97; *see* CX-0009C (Seth  
WS) at Q/A 253-62. As of February 5, 2024, Delta Electronics (Americas) Ltd. employed [REDACTED]  
[REDACTED] around the U.S. CX-0148C at 4-5. Delta also “perform[s]  
FAE (field application engineering) testing in the United States . . . as part of its customer service  
operations.” CX-0145C at 11; *see* CX-0485C. Delta Products Corporation, which Delta does not  
dispute is affiliated with the Delta respondents, has [REDACTED]  
[REDACTED]. *See* CX-0558C ([REDACTED]), CX-0561C ([REDACTED]),  
CX-3002C ([REDACTED]), CX-3008C ([REDACTED]); RIB at 199. These  
agreements obligate Delta to [REDACTED]  
[REDACTED]  
[REDACTED] (*see* CX-3002C at 3; CX-0561C at 1). [REDACTED]  
[REDACTED]. *See* CX-0553C,  
CX-0560C.


Because of commercially significant inventories of infringing products, CDOs are warranted  
against the Quanta respondents, FII USA Inc. and affiliated foreign respondents, and Ingrasys



Technology USA Inc. and affiliated foreign respondents. Respondents and Staff object as to the foreign respondents, but it is appropriate to issue a CDO “against a foreign respondent where that respondent’s domestic distributor,” which is also a respondent, “has maintained a commercially significant inventory in the United States.” *Certain Toner Cartridges and Components Thereof*, Inv. No. 337-TA-740, Comm’n Op. at 7 (Oct. 5, 2011); see RIB at 198-200; SIB at 182. And it is clear that the Delta respondents have significant domestic operations, on behalf of both themselves and Cytotec, so CDOs are appropriate as to them, as well. Lastly, Respondents request that any CDO permit “re-export” of infringing articles, but this appears to be a standard provision in CDOs. RIB at 200; see, e.g., EDIS Doc. ID 760422 at 1 (CDO in Inv. No. 337-TA-1200, prohibiting “transferring (except for exportation)” of infringing articles). In sum, it is recommended that if a violation is found, CDOs should issue against all respondents, regardless of domicile.

**C. Bond**

“The complainant bears the burden of establishing the need for a bond” during the Presidential Review period. See *Robotic Vacuums*, Inv. No. 337-TA-1057, Comm’n Op. at 68. The amount of the bond is generally set “to be sufficient to protect the complainant from any injury.” 19 U.S.C. § 1337(e)(1), (j3). “The Commission has set bond amounts based on the price difference between the infringing imports and the domestic industry products or on a reasonable royalty applicable to the infringing products.” *Certain Non-Volatile Memory Devices and Products Containing the Same*, Inv. No. 337-TA-1046, Comm’n Op. at 67 (Oct. 26, 2018) (EDIS Doc. ID 659979).

Vicor’s expert, Dr. Seth, explained in detail how the respective products of Vicor and Delta compete directly, and opined that based on those products’ price differences, a  bond is appropriate. See CX-0009C (Seth WS) at Q/A 266-74. As to other products, Vicor and Staff assert,



without dispute from Respondents, that a 100% bond is appropriate because such “downstream products” are sold at “different levels of commerce,” so determining price differentials is impractical. RIB at 199; SIB at 184. No party addresses Cyntec’s products, which seemingly also compete directly with Vicor’s rather than being “downstream,” so there is insufficient evidence to justify a bond as to Cyntec. Respondents have no substantial argument against a bond, other than to observe that it should not be so high that it “effectively prevents importation during the Presidential Review period,” but no party offers evidence on this point and it is accordingly immaterial. RIB at 200. It is therefore recommended that if a violation is found, a bond of [REDACTED] should be imposed on infringing Delta products, no bond should be imposed on infringing Cyntec products, and a 100% bond should be imposed on infringing products of all other respondents.

**XI. INITIAL DETERMINATION AND ORDER**

Based on the foregoing,<sup>1</sup> it is my Initial Determination that there is a violation of Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain power converter modules and computing systems containing the same in connection with the asserted claims of U.S. Patent Nos. 9,516,761 and 9,166,481. There has been no violation in connection with U.S. Patent No 10,199,950.

The undersigned hereby certifies to the Commission this Initial Determination, together with the record of the hearing in this investigation consisting of the following: the transcript of the

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<sup>1</sup> All matters raised by the parties have been considered, and if they have not been discussed in this Initial Determination they have been determined to be irrelevant or meritless.



evidentiary hearing, with appropriate corrections as may hereafter be ordered; and the exhibits accepted into evidence in this investigation.<sup>2</sup>

Pursuant to 19 C.F.R. § 210.42(h), this Initial Determination shall become the determination of the Commission sixty (60) days after the date of service of the Initial Determination, unless a party files a petition for review of the Initial Determination within twelve (12) days after service of the Initial Determination pursuant to 19 C.F.R. § 210.43(a) or the Commission, pursuant to 19 C.F.R. § 210.44, orders on its own motion, a review of the Initial Determination or certain issues therein. Any issue or argument not raised in a petition for review, or response thereto, will be deemed to have been abandoned and may be disregarded by the Commission in reviewing the Initial Determination pursuant to 19 C.F.R. § 210.43(b) and (c).

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<sup>2</sup> The pleadings of the parties filed with the Secretary need not be certified as they are already in the Commission's possession in accordance with Commission rules.



**Confidentiality Notice:**

This Initial Determination is being issued as confidential, and a public version will be issued pursuant to Commission Rule 210.5(f). Within seven (7) days of the date of this Initial Determination, the parties shall jointly submit: (1) a proposed public version of this opinion with any proposed redactions bracketed in red; and (2) a written justification for any proposed redactions specifically explaining why the piece of information sought to be redacted is confidential and why disclosure of the information would be likely to cause substantial harm or likely to have the effect of impairing the Commission's ability to obtain such information as is necessary to perform its statutory functions.<sup>3</sup>

**SO ORDERED.**

A handwritten signature in cursive script, appearing to read "Cameron Elliot", written over a horizontal line.

Cameron Elliot  
Administrative Law Judge

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<sup>3</sup> Under Commission Rules 210.5 and 201.6(a), confidential business information includes: information which concerns or relates to the trade secrets, processes, operations, style of works, or apparatus, or to the production, sales, shipments, purchases, transfers, identification of customers, inventories, or amount or source of any income, profits, losses, or expenditures of any person, firm, partnership, corporation, or other organization, or other information of commercial value, the disclosure of which is likely to have the effect of either impairing the Commission's ability to obtain such information as is necessary to perform its statutory functions, or causing substantial harm to the competitive position of the person, firm, partnership, corporation, or other organization from which the information was obtained, unless the Commission is required by law to disclose such information. *See* 19 C.F.R. § 201.6(a). Thus, to constitute confidential business information the disclosure of the information sought to be designated confidential must likely have the effect of either: (1) impairing the Commission's ability to obtain such information as is necessary to perform its statutory functions; or (2) causing substantial harm to the competitive position of the person, firm, partnership, corporation, or other organization from which the information was obtained.

**CERTAIN POWER CONVERTER MODULES AND  
COMPUTING SYSTEMS CONTAINING THE SAME**

**Inv. No. 337-TA-1370**

**CONFIDENTIAL CERTIFICATE OF SERVICE**

I, Lisa R. Barton, hereby certify that the attached **INITIAL DETERMINATION** has been served via EDIS upon the Commission Investigative Attorney, **Paul Gennari, Esq.** and the following parties as indicated, on **September 27, 2024**.



Lisa R. Barton, Secretary  
U.S. International Trade Commission  
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Washington, DC 20436

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- Via Express Delivery
- Via First Class Mail
- Other: Email Notification of Availability for Download

**On Behalf of Respondents Cynotec Co., Ltd., Delta Electronics, Inc., Delta Electronics (Americas) Ltd., Quanta Computer Inc., Quanta Computer USA Inc., Hon Hai Precision Industry Co. Ltd. (d/b/a Foxconn Technology Group), Foxconn Industrial Internet Co. Ltd., FII USA Inc. (a/k/a Foxconn Industrial Internet USA Inc.), Ingrasys Technology Inc., Ingrasys Technology USA Inc., and DET Logistics (USA) Corporation:**

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- Via Hand Delivery
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**UNITED STATES INTERNATIONAL TRADE COMMISSION  
Washington, D.C.**

**In the Matter of  
CERTAIN POWER CONVERTER  
MODULES AND COMPUTING SYSTEMS  
CONTAINING THE SAME**

**Inv. No. 337-TA-1370**

**NOTICE OF INITIAL DETERMINATION  
ON VIOLATION OF SECTION 337**

Administrative Law Judge Cameron Elliot

(September 27, 2024)

On this date, I issued an initial determination on violation of section 337 in the above-referenced investigation. Below are my Initial Determination and the Conclusions of Law from said filing, which are a matter of public record. A complete public version of the Initial Determination will issue when all the parties have submitted their redactions and I have had an opportunity to review such redactions.

**SO ORDERED.**



Cameron Elliot  
Administrative Law Judge

## **CONCLUSIONS OF LAW**

Violations have been proven with respect to U.S. Patent Nos. 9,166,481 and 9,516,761, but not with respect to U.S. Patent No. 10,199,950. Specifically:

A. Claim 1 of the 481 patent has been infringed, has not been proven invalid, and a domestic industry practicing that claim exists.

B. Claims 1-7 of the 761 patent have been infringed, claims 1, 2, 3, and 7 have been proven invalid as obvious, claims 4, 5, and 6 have not been proven invalid, and a domestic industry practicing claims 4, 5, and 6 exists.

C. Claims 9, 13-14, and 33-38 of the 950 patent have not been infringed, no claim of the 950 patent has been proven invalid, and the economic prong of the domestic industry requirement has been satisfied but no domestic industry product practices claims 9, 13-14, or 33-38.

D. No respondent possesses a license to practice any asserted claim.

## **INITIAL DETERMINATION AND ORDER**

Based on the foregoing, it is my Initial Determination that there is a violation of Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain power converter modules and computing systems containing the same in connection with the asserted claims of U.S. Patent Nos. 9,516,761 and 9,166,481. There has been no violation in connection with U.S. Patent No 10,199,950.

**UNITED STATES COURT OF APPEALS  
FOR THE FEDERAL CIRCUIT**

**CERTIFICATE OF SERVICE**

**Case Number** 25-1616

**Short Case Caption** Vicor Corporation v. ITC

**NOTE:** Proof of service is only required when the rules specify that service must be accomplished outside the court’s electronic filing system. See Fed. R. App. P. 25(d); Fed. Cir. R. 25(e). Attach additional pages as needed.

I certify that I served a copy of the foregoing filing on 1/02/2026

by  U.S. Mail  Hand Delivery  Email  Facsimile  
 Other: \_\_\_\_\_

on the below individuals at the following locations.

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Additional pages attached.

Date: 1/02/2026

Signature: /s/ Oleg Elkhunovich

Name: Oleg Elkhunovich

**UNITED STATES COURT OF APPEALS  
FOR THE FEDERAL CIRCUIT**

**CERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME LIMITATIONS**

**Case Number:** 25-1616

**Short Case Caption:** Vicor Corporation v. ITC

**Instructions:** When computing a word, line, or page count, you may exclude any items listed as exempted under Fed. R. App. P. 5(c), Fed. R. App. P. 21(d), Fed. R. App. P. 27(d)(2), Fed. R. App. P. 32(f), or Fed. Cir. R. 32(b)(2).

The foregoing filing complies with the relevant type-volume limitation of the Federal Rules of Appellate Procedure and Federal Circuit Rules because it meets one of the following:

- the filing has been prepared using a proportionally-spaced typeface and includes 12,711 words.
- the filing has been prepared using a monospaced typeface and includes \_\_\_\_\_ lines of text.
- the filing contains \_\_\_\_\_ pages / \_\_\_\_\_ words / \_\_\_\_\_ lines of text, which does not exceed the maximum authorized by this court's order (ECF No. \_\_\_\_\_).

Date: 1/02/2026

Signature: /s/ Oleg Elkhunovich

Name: Oleg Elkhunovich