

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MONOLITHIC POWER SYSTEMS, INC.,

Petitioner,

v.

GREENTHREAD, LLC,

Patent Owner.

Case No: IPR2024-00470

U.S. Patent No. 11,121,222

**PETITIONER'S REPLY TO
PATENT OWNER'S PRELIMINARY RESPONSE**

Petitioner Monolithic Power Systems, Inc. (“MPS”) respectfully submits this Reply to Patent Owner’s Preliminary Response (Paper 9).

I. The Petition is not time-barred under § 315(b).

MPS is one of numerous component suppliers to companies like [REDACTED] and Intel that integrate those parts into complex electronic systems. Greenthread (“PO”) sued [REDACTED] and Intel in 2022 for infringement of the challenged patent on allegations that had nothing to do with MPS. Accordingly, MPS was never notified of those lawsuits and had no opportunity to participate in—much less control—any prior district court or IPR proceedings. MPS had no involvement in the resulting settlements and is not a party to the patent licenses. And [REDACTED], and Intel have no role in the current proceedings. As the Board has previously found under similar facts, these circumstances do not create privity under any theory.

MPS is a commodity component supplier. MPS sells small, inexpensive components that other companies incorporate into larger integrated electronic systems. The products PO identifies as having been purchased by [REDACTED] and Intel are low-cost, commodity power chips available for sale in the public marketplace. *See* EX1050; EX1052. The MP6924 sells for less than a dollar. EX1050. The MP2953B complies with Intel’s standards for voltage regulation, and countless other companies provide similar components that comply with those standards. EX2019, EX1053. PO did not identify the MP6924 or MP2953B in its Infringement Contentions to MPS in the Delaware litigation. *See* EX2016.

MPS was uninvolved in the prior [REDACTED] / Intel litigation and [REDACTED] / Intel

are uninvolved in the MPS litigation. PO's infringement allegations against [REDACTED] and Intel in the 2022 Texas litigation were not directed to any MPS products. *See* EX2003, EX2005, EX2006, EX2009. MPS could not have and did not participate in any way in those matters, the related IPRs, or the settlement. Likewise, PO's new allegations against MPS in the 2023 Delaware litigation do not reference any [REDACTED] or Intel products, and those parties have no involvement with the current litigation and related IPRs.

MPS is not in privity with [REDACTED] and Intel. PO raised the same arguments it raises here against a similarly situated supplier in recent IPR proceedings. *Semiconductor Components Indus., LLC, v. Greenthread, LLC*, IPR2023-01242, Paper 35 at 11-22 (PTAB Feb. 21, 2024); Paper 44 (PTAB Apr. 24, 2024) (director denying PO request for review of privity arguments). The Board rejected those arguments to find that the petitioner was not time barred and should do so here as well.

MPS's sales to [REDACTED] and Intel do not give rise to privity. The Federal Circuit and the Board have consistently found that the type of supplier-customer relationship here does not create the type of "substantive legal relationship" that establishes privity. *WesternGeco LLC v. ION Geophysical Corp.*, 889 F.3d 1308, 1321-22 (Fed. Cir. 2018); *see Wi-Fi One, LLC v. Broadcom Corp.*, 887 F.3d 1329, 1340-41 (Fed. Cir. 2018); *Samsung Elecs. Co. v. Netlist, Inc.*, IPR2022-00615, Paper 62 at 14-15 (PTAB June 30, 2023). MPS sells commodity chips to [REDACTED] and Intel. This is nothing like PO's cited supplier-customer cases, POPR at 19-20, which involved indemnification relationships, exclusive supply arrangements, and the

petitioners’ prior assertions of RPI status in other proceedings. *See Ventex Co., Ltd. v. Columbia Sportswear N. Am., Inc.*, IPR2017-00789, Paper 148 at 12-14 (PTAB Jan. 24, 2019); *Volkswagen Grp. of Am. Inc. v. Argina Tech. Ltd.*, IPR2021-01263, Paper 16 at 5-12 (PTAB Jan. 21, 2022); *Ericsson Inc. v. Regents of Univ. of Minn.*, IPR2017-01197, Paper 56 at 8, 10 (PTAB June 19, 2020).

The Greenthread/RPX license agreements do not give rise to privity. MPS is not a party to the license agreements. PO argues that MPS is a third-party beneficiary, POPR at 26-27, but the licenses do not reflect an intent to benefit MPS and, nonetheless, cannot create privity. *See Semiconductor Components*, IPR2023-01242, Paper 35 at 16 n.8 (“In contract law, a third-party beneficiary is not a privy.”). PO also argues that the license creates a patent exhaustion defense but cites no authority or legal principle creating privity from such a defense. POPR at 27-28. PO’s agency argument also fails because the fact that [REDACTED] and Intel are licensed undercuts any suggestion that MPS is acting as their agent or proxy in this proceeding—[REDACTED] and Intel have no motive to seek to challenge patent validity again and there is no evidence they are attempting to do so. As the Board has previously explained, PO’s case law is not on point. *See Semiconductor Components*, IPR2023-01242, Paper 35 at 20-22. MPS has met its burden of persuasion under § 315(b).

II. PO’s arguments on the prior art contradict its own previous statements to the USPTO and misrepresent the art and petition.

As an initial matter, PO misrepresents the Petition. PO argues that “Petitioner relies *entirely* on PO’s purported admissions that a downward slope ‘creates an

inherent' electric field 'to aid the movement of minority carriers.'" POPR at 6 (emphasis added). This is incorrect; Ground 1 relies on Dr. Campbell's unrebutted analysis that the graded concentration in Onoda's Figures 8/11 causes carriers to move downward from the surface to the substrate. EX1003 at ¶¶ 72-83, 141-142. Dr. Campbell determined, using principles of physics, that the slope of the graded concentration creates an electric field that aids the movement of minority carriers. PO's admissions were simply another piece of evidence supporting this analysis.

Regarding those admissions, PO now argues it did not admit that any downward slope creates an inherent electric field to aid minority carrier movement, POPR at 2-5, but this directly contradicts PO's prior statements to the USPTO. PO now declares that "[w]hether a gradient aids carrier movement, depends on circumstances besides the mere direction of the gradient as Petitioner assumes," and recites the Examiner's understanding in agreement ("[in] a complex electronic device, movement of minority carriers is affected by multiple forces and fields"). POPR at 4.

But PO's current position directly contradicts its prior disagreement of that exact same Examiner statement when it sought to obtain a patent. EX1002 at 289 (quoting the same language by Examiner while stating "Applicant respectfully disagrees with this position ... a unidirectional drift (electric) field necessarily affects all the present minority carriers in the same way—moving all minority carriers in the same direction because of the unidirectional drift due to the existence of the electric field.") (emphasis in original). PO cannot tell the USPTO one thing to secure a patent, then years later, to avoid an invalidity challenge, falsely deny having

made the statement. (37 C.F.R. §§ 42.11(a) (stating parties have a duty of candor).)

Similarly, PO again contradicts its earlier representations by now arguing an additional parameter “besides the graded dopants is necessary to ‘ensure[e] that all minority carriers are moved.’” POPR at 3. Yet in the same response during prosecution quoted above, when rebutting the Examiner’s premise that “[a unidirectional drift field] does not appear to ensure (without knowing other parameters of the device) that it will draw ‘all’ minority carriers...”, PO argued that “Applicant respectfully submits that this inherent ‘built-in’ unidirectional electric field is the additional parameter for ensuring that all minority carriers are being moved in one direction and which parameter the Office Action deemed to be missing from the disclosure.” EX1002 at 290 (emphasis added); *see also* EX1003 ¶ 38. PO’s position here is exactly opposite what it told the USPTO when trying to obtain its patent.

PO also misrepresents the prior art via wordplay of “prevents” and “impede,” without any evidentiary or expert support. In addressing the limitation “aid carrier movement [downward],” PO argues that Nishizawa and Kawagoe “teach using a graded concentration to *impede* carrier movement.” POPR at 5; *see also id.* (stating Kawagoe “prevents” carrier movement to the surface); *id.* at 8 (stating same for Nishizawa). While PO would have the Board believe that carrier movement is impeded downward or simply halted altogether, the references state that carrier movement is only impeded *upwards* towards the circuit because the dopant concentration gradient migrates those carriers *downwards*. This makes logical sense; if something is aided downwards, it is prevented from going upwards.

This obvious point is described in the passage from Kawagoe which read: “the electrons produced by the α -ray are attracted to the substrate body 2S by that concentration gradient and prevented from entering the p-well 6p so that soft errors can be reduced.” (EX1007 at 16:7-11; Pet. at 59 (citing same).) Kawagoe further states that “impurity concentration of the p-well 6p is given such a gradient that it is gradually lowered in the depthwise direction from the surface of the epitaxial layer 2E, so that the influence to be caused by the carriers (or electrons) due to the a-ray is lowered.”¹ (*Id.* at 16:2-7.) Naturally, because electrons are moved down to the substrate body 2s they are prevented from going upwards into the conductive active region, thus reducing errors resulting from conduction. *See* EX1003 ¶¶ 33-34 (describing in detail.) PO’s reliance on the word “prevents” misrepresents Kawagoe.

The full context of Nishizawa also further shows that the concentration gradient aids carriers downward to prevent errors. Nishizawa describes this in a problem/solution statement. It identifies the problem that electrons migrate into the n+ type region 13 of FIG. 35, i.e., the active region at the surface, from the p+ type

¹ In footnote 5, PO assumes the “surface layer” is not located in the p-well 6p. Dr. Campbell explains that “Kawagoe’s single drift layer...includes the upper portion of the substrate body 2S...and the epitaxial layer 2E.” EX1003 ¶ 111, 151. 2E comprises the same area of the surface layer. The two are not mutually exclusive. This understanding is consistent with PO’s understanding. EX1045 ¶ 19 (“The corresponding transistor is then built in a surface layer located in the upper part of the well.”); 47 (“the ‘surface layer’ is the layer at the surface of the silicon.”).

region. (Nishizawa at 18:37-42 (“electrons which have been created by alpha particle in the p⁺ type buried region 33a, which are located in the upper half portion of the p⁺ type buried region 33a located closer to the n⁺ type region 13, will diffuse toward that side which is contiguous with the n⁺ type region 13.”) As its solution, it applies an impurity concentration in the p⁺ type region that decreases downward. (*Id.* at 18:42-50 (“In order to prevent such flow of electrons, it is only necessary to form an impurity concentration gradient in the p⁺ type buried region 33a in the direction toward the p substrate 11”); 18:54-56 (“with progressively lowered concentration as the portions of the buried region 33a go progressively toward the p type substrate”).) This means that the electrons go downwards. (EX1003 at ¶¶ 91-92, 96-97 (citing Nishizawa at 18:10-19:53), 145-146.) This is un rebutted evidence because PO has no expert testimony. Again, PO’s reliance on the word “prevents” misrepresents the art.

PO’s wordplay continues with its argument that Nishizawa “expressly states that such carriers can be ‘disregarded.’” POPR at 7. Nishizawa discloses that in certain conditions, the effect of electrons is small and will not affect memory and can thusly be disregarded. EX1046 at 20:19-22 (“the amount of electrons created which adversely affect the memory action is no greater than only 10% of the stored electric charge, and thus it can be disregarded”); EX1046 at 19:67-20:22 (describing graph that shows electron hole pairs). That Nishizawa states that the probability that an electron causing memory errors is small does not mean that its downward gradient does not migrate electrons downwards. These are two different concepts.

Dated: September 25, 2024

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that on September 25, 2024, a true and correct copy of the foregoing **REPLY TO PATENT OWNER’S PRELIMINARY RESPONSE** was served by electronic mail on the Patent Owner via its attorneys of record:

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Respectfully submitted,

Date: September 25, 2024

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