PUBLIC VERSION

[redacted]

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MONOLITHIC POWER SYSTEMS, INC.,
Petitioner

v.

GREENTHREAD, LLC,
Patent Owner

Case: IPR2024-00468
U.S. Patent No. 8,421,195

PATENT OWNER'S RESPONSE

[redacted]

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EXHIBIT LIST

Exhibit No.	Description	Submitted Previously?
Ex. 2001	*Greenthread, LLC v. Intel Corp.*, No. 6:22-cv-00105-ADA, Dkt. 1 (Complaint) (W.D. Tex. Jan. 27, 2022)	X
Ex. 2002	*Greenthread, LLC v. Intel Corp.*, No. 6:22-cv-00105-ADA, Dkt. 7 (summons returned executed) (W.D. Tex. Feb. 7, 2022)	X
Ex. 2003	*Greenthread, LLC v. Intel Corp.*, 6:22-cv-00105-ADA, Dkt. 38 (First Amended Complaint for Patent Infringement) (W.D. Tex., filed Apr. 29, 2022)	X
Ex. 2004	*Greenthread, LLC v. Intel Corp.*, No. 6:22-cv-00105-ADA, Dkt. 113 (Redacted Memorandum Opinion and Order) (W.D. Tex. Dec. 27, 2022)	X
Ex. 2005	*Greenthread, LLC v. Intel Corp.*, 6:22-cv-00105-ADA, Dkt. 38-8 (Greenthread's Amended Preliminary Infringement Contentions) (W.D. Tex., filed Apr. 29, 2022)	X
Ex. 2006	*Greenthread, LLC v. Intel Corp.*, 6:22-cv-00105-ADA, Dkt. 38-12 (Exs. D-1, D-2, D-3, D-6 to Greenthread's Preliminary Infringement Contentions) (W.D. Tex., filed Apr. 29, 2022)	X
Ex. 2007	*Greenthread, LLC v. Intel Corp.*, 6:22-cv-00105-ADA, Dkt. 49 (Notice of Appearance of Additional Counsel) (W.D. Tex., filed June 9, 2022)	X
Ex. 2008	Petition (Paper 1) in *Sony Group Corp. v. Greenthread, LLC*, IPR2023-00376	X

[redacted]

Exhibit No.	Description	Submitted Previously?
Ex. 2009	*Greenthread, LLC v. Dell Inc.*, No. 6:22-cv-105-ADA, Dkt. 120 (Second Amended Complaint)	X
Ex. 2010	*Greenthread, LLC v. Intel Corp.*, 6:22-cv-00105-ADA, Dkt. 135 (Motion for Admission Pro Hac Vice of L. Popovski on Behalf of Sony) (W.D. Tex., filed January 30, 2023)	X
Ex. 2011	[SEALED] Confidential agreement	X
Ex. 2012	[SEALED] Confidential declaration	X
Ex. 2013	February 5, 2024 Neil Ozarkar email to the counsel regarding IPR2014-00468, -00469, -00470	X
Ex. 2014	February 21, 2024 Miguel Bombach email to counsel regarding IPR2014-00468, -00469, -00470	X
Ex. 2015	March 6, 2024 Arvind Jairam email to the Board regarding IPR2014-00468, -00469, -00470	X
Ex. 2016	Greenthread's December 13, 2023 Preliminary Infringement Contentions to Monolithic	X
Ex. 2017	Monolithic Power Systems, Inc., Investor/Analyst Day 2018 Presentation	X
Ex. 2018	Monolithic Power Systems, Inc. Q2 2021 Earnings Call Transcript	X
Ex. 2019	Monolithic Power Systems, Inc. Data Sheet MP2953B Intel VR12.5 Compliant Controller	X
Ex. 2020	Monolithic Power Systems, Inc. LinkedIn post regarding Sony PlayStation 5	X

[redacted]

Exhibit No.	Description	Submitted Previously?
Ex. 2021	May 2, 2015 Investor's Business Daily, "Sony PlayStation 4 Chipmaker Monolithic Power Systems Tops Q1 Views"	X
Ex. 2022	Monolithic Power Systems, Inc. 2023 Form 10-K	X
Ex. 2023	Petition (Paper 2) in *Sony Group Corp. v. Greenthread, LLC*, IPR2023-00324	X
Ex. 2024	Petition (Paper 3) in *Sony Group Corp. v. Greenthread, LLC*, IPR2023-00325	X
Ex. 2025	Petition (Paper 1) in *Sony Group Corp. v. Greenthread, LLC*, IPR2023-00375	X
Ex. 2026	*Greenthread, LLC v. Monolithic Power Systems, Inc.*, No. 23-cv-579, Dkt. 1 (Complaint with accompanying exhibits) (D. Del. May 26, 2023)	X
Ex. 2027	*Greenthread, LLC v. ON Semiconductor Corp.*, No. 23-443-RGA, Dkt. 24 (Scheduling Order) (D. Del. Sept. 11, 2023)	X
Ex. 2028	Definition of "agent" in Black's Law Dictionary (11th ed. 2019) available from Westlaw at westlaw.com	X
Ex. 2029	Joint Claim Construction Brief [Defendants' Answering Positions], *Greenthread, LLC v. Monolithic Power Systems, Inc.*, No. 23-cv-579 (D. Del.) (served April 12, 2024)	X
Ex. 2030	U.S. Patent No. 8,704,292 to Disney	
Ex. 2031 to 2033	[RESERVED]	

[redacted]

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Ex. 2034	Confidential agreement	
Ex. 2035 to 2055	[RESERVED]	
Ex. 2056	Excerpts of the Deposition Transcript of Scott Warrick taken on June 7, 2024 along with marked Exhibits 3-5 in *Greenthread, LLC v. Cirrus Logic, Inc.*, 1:23-cv-00369-DC (W.D. Tex.)	
Ex. 2057	Declaration of Dr. Alexander Glew	
Ex. 2058	Transcript of Deposition of Dr. Stephen A. Campbell	
Ex. 2059	Excerpts from Chen, J. Y., CMOS Devices and Technology for VLSI, Prentice-Hall (1990)	
Ex. 2060	U.S. Patent No. 8,421,195	
Ex. 2061	CV of Dr. Alexander Glew	
Ex. 2062	U.S. Patent No. 9,190,502	

[redacted]

Exhibit No.	Description	Submitted Previously?
Ex. 2063	U.S. Patent No. 10,510,842	
Ex. 2064	U.S. Patent No. 11,121,222	
Ex. 2065	U.S. Patent No. 10,734,481	
Ex. 2066	U.S. Patent No. 11,316,014	
Ex. 2067	File History of U.S. Patent No. 9,190,502	
Ex. 2068	File History of U.S. Patent No. 10,510,842	
Ex. 2069	File History of U.S. Patent No. 11,121,222	
Ex. 2070	File History of U.S. Patent No. 10,734,481	
Ex. 2071	File History of U.S. Patent No. 11,316,014	
Ex. 2072	Declaration of Mohan Rao	
Ex. 2073	Statista Information	
Ex. 2074	*Greenthread, LLC v. Cirrus Logic Inc.*, No. 1:23-cv-369-DC-DTG, Dkt. 53 (Claim Construction Order and Memorandum in Support Thereof) (W.D. Tex. Mar. 13, 2024)	

[redacted]

Exhibit No.	Description	Submitted Previously?
Ex. 2075	*Greenthread, LLC v. Samsung Electronics Co., Ltd. Et Al.*, 2:19-cv-00147, Dkt. No. 67 (Claim Construction Memorandum Opinion and Order) (E.D. Tex. Apr. 20, 2020)	
Ex. 2076	*Intel Corp. v. Greenthread LLC*, IPR2023-00548, Ex. 1003 (Dr. Blalock Declaration), Jan. 30, 2023	
Ex. 2077	*Greenthread, LLC v. Cirrus Logic, Inc.*, No. 1:23-cv-00369-DC, Dkt. 86 (W.D. Tex. Jul. 11, 2024)	

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I. INTRODUCTION[1]

The Petition fails, because none of Petitioner's references expressly teach "said drift layer further having a first static unidirectional electric drift field to aid the movement of minority carriers from said surface layer to said substrate" or "said well region having a graded concentration of dopants [] to aid the movement of minority carriers from said surface layer" downward.

Onoda does not say anything at all about using graded dopants to move carriers. It just has a concentration that Petitioner says is graded.

Nishizawa expressly says it is not concerned with carriers at the surface of the device and that such carriers can be "disregarded." Petitioner's expert confirmed that Nishizawa's goal was to *prevent* carriers from moving *up* from the *substrate* not *aid* carriers moving *down* from the *surface layer*.

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[1] Greenthread, LLC ("Patent Owner," "PO," or "Greenthread") submits this Response to the Board's decision to institute *inter partes* review (IPR) (Paper 23, the "Decision") and to the Petition for *Inter Partes* Review (Paper 1, "Petition") filed by Monolithic Power Systems, Inc. ("Petitioner" or "MPS"). The Board instituted review of U.S. Patent No. 8,421,195 ("the '195 patent" or "the Challenged Patent") (Ex. 1001) on three grounds that challenge claims 1–3 and 5–6 ("the Challenged Claims") of the Challenged Patent. Institution Decision (Paper 23), 36.

[redacted]

Kawagoe, like Nishizawa, teaches the use of graded dopants to *impede* carrier movement up from the *bottom* of a device. Kawagoe does not teach *aiding* movement of any carriers. Regardless, Kawagoe does not teach *anything* about carriers in the active region at the *top* of the device. The fact that Kawagoe's transistors presumably have carriers in the active region is beside the point. Kawagoe says nothing about those carriers and Petitioner does not point to any teaching about those carriers.

In the absence of any teaching of the claim limitation in the prior art, Petitioner has two options: 1) it can read the "aid the movement" limitation out of the claim or 2) it can argue that any "graded concentration of dopants" in the active region will "aid the movement of minority carriers." Both options fail.

The first option is clearly wrong, because it is "contrary to the well-established rule that claims are interpreted with an eye toward giving effect to all terms in the claim." *Digital-Vending Servs. Int'l, LLC v. Univ. of Phoenix, Inc.*, 672 F.3d 1270, 1275 (Fed. Cir. 2012) (internal quotation marks omitted). Petitioner cannot ignore a claim limitation. Moreover, multiple district courts have already construed the Challenged Patent claims and held that "aiding movement" requires more than just grading as a matter of claim construction.

The second option—inherency—also fails. The "probability or possibility" that a dopant gradient aids carrier movement "is insufficient." *In re Robertson*, 169

[redacted]

F.3d 743, 745 (Fed. Cir. 1999). The prior art "must *necessarily* include the unstated limitation." *Transclean Corp. v. Bridgewood Servs., Inc.*, 290 F.3d 1364, 1373 (Fed. Cir. 2002) (emphasis in original). Petitioner cannot possibly overcome this high bar.

First, Petitioner's expert, Dr. Campbell, admitted that in order to aid minority carrier movement, the electric field created by a dopant gradient must be "properly constructed" and must "have a sufficient electric field intensity." Ex. 1003, ¶32; Ex. 2058, 34:1-14. However, Dr. Campbell admitted that he did not include his analysis of field intensity in his report. He also said that there are numerous factors affecting the fields that his report does not address, including temperature, capacitance effects at the PN junction, and imperfections in the silicon crystal. Ex. 2058, 34:15-36:19; 39:8-12; see also *id.* at 20:7-10 ("[Q.] So, you didn't calculate the electric field for any of the prior art cited in your declaration? [A.] That's correct.").

Second, one of the petitioners in a co-pending IPR proceeding (Cirrus Logic) *admitted that a graded dopant concentration does not inherently aid carrier movement*.[2] Cirrus' reasoning was the same as Dr. Campbell's. Its corporate

[2] Cirrus Logic, Inc. ("Cirrus Logic") is a Petitioner in IPR2024-00001 and IPR2024-00016–21, all of which relate to Greenthread's challenged patents, including the '195 Patent challenged in this proceeding.

[redacted]

representative, Scott Warrick, testified that "there's a long list of … physical attributes which affect the movement of carriers." Ex. 2056, 72:6-8. He said that "there's other things that might affect carrier movement besides the gradient." *Id.* at 96:1-13 (PDF pages 15, 21 of 118) (emphasis added). When Greenthread showed Mr. Warrick a dopant gradient in an accused product, he said it was not possible to say from the gradient alone whether the product met the "aid the movement of minority carriers" claim limitation because of these other "physical attributes." *Id.* at 72:6-8, 95:2-5, 96:1-13 (PDF pages 15, 20-21 of 118).

Furthermore, objective indicia of non-obviousness confirm the patentability of Greenthread's claims. Two multibillion-dollar semiconductor companies, [redacted], paid for licenses covering just the patent family at issue here <u>*without the threat of any litigation*</u>. <u>*These companies approached Greenthread first*</u>. If either company had wanted to, it could have challenged Greenthread's patents at virtually no expense. At the time of the licenses, [redacted] had IPRs pending against Greenthread's patents. [redacted] could have joined those petitions, filed copycat petitions, or drafted their own petitions (as they regularly do). There is no plausible explanation for these transactions, except that two of Petitioner's competitors looked at the evidence and came to the opposite conclusion than what Petitioner urges here. The Board should reach the same conclusion as [redacted] and confirm the patentability of the Challenged Claims.

[redacted]

II. THE '195 PATENT

A. Background Technology Regarding Dopants

Silicon is an example of a semiconductor. In its pure form, it is typically an insulator, but it can become an electrical conductor when impurities called "dopants" are added into the silicon crystal. These dopants are often phosphorous or boron atoms that have one more or one less valence electron than a silicon atom. If the dopant has one less valence electron, then it creates what is called a "hole" where there was an electron, which can be thought of a positive unit of charge. The extra electrons or holes disturb the local charge equilibrium in the silicon and can become mobile in response to electric fields. Thus, the electrons and holes are called "charge carriers." Ex. 2057 ("Glew Decl."), ¶33; *id.*, ¶¶1-32, 35-36.

These dopants can also change the local net electrical charge distribution in the surrounding silicon, influencing the motion of other charge carriers passing by. When the dopant concentration is graded in a particular direction, other charge carriers will move in the gradient direction (or opposite direction) depending on the charge carrier's polarity. This phenomenon is called "carrier drift." *Id.*, ¶33.

B. Overview of Challenged Patent

At the time of invention of the Challenged Patent, most semiconductor devices relied on spatially uniform concentrations of dopants. Ex. 1001 (Challenged Patent), Abstract, 1:36-51. Dr. Rao (the named inventor) recognized, however, that

[redacted]

graded concentrations of dopants can be used to improve certain aspects of the performance of transistors and other semiconductor devices. *Id.*, Abstract, 3:3-13, 3:33-35. The claimed invention is clearly disclosed in, e.g., Figs. 5B-5C of the Challenged Patent, and the corresponding parts of the specification. Ex. 2057, ¶¶34-37.

III. ALLEGED PRIOR ART

The Petition's first ground relies on single-reference obviousness over Onoda (Ex. 1043 (Original), Ex. 1042 (Translation)), and the second ground relies on Onoda as the primary reference for an obviousness combination with Nishizawa (Ex. 1046). Pet., 4-5. The Petition's third ground relies on single-reference obviousness over Kawagoe (Ex. 1007). Pet., 4-5. Dr. Glew provides an overview of pertinent portions of these references relevant to the present dispute. Ex. 2057, ¶¶38-49.

IV. LEVEL OF ORDINARY SKILL

A person of ordinary skill in the art (POSITA) in the technology field of the Challenged Patent would be a person with at least a Bachelor's of Science degree in electrical or computer engineering, materials science, chemical engineering, applied physics, or a related field, with emphasis on semiconductor manufacturing, or an equivalent degree, and at least four years of experience in semiconductor design and manufacturing. Additional education in a relevant field or industry experience may

compensate for a deficit in one of the other aspects of the requirements stated above. Ex. 2057, ¶¶17-18.

V. CLAIM CONSTRUCTION

The claims in an IPR are construed using the same standard that applies in district court proceedings, as set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc); 37 C.F.R. § 100(b) (2019). "The Board only construes the claims when necessary to resolve the underlying controversy." *Toyota Motor Corp. v. Cellport Systems, Inc.*, IPR2015-00633, Paper 11 at 16 (PTAB Aug. 14, 2015) (citing *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)). Patent Owner does not believe express claim construction is necessary for any claim terms of the Challenged Claims. Each term of the Challenged Claims should be given its plain and ordinary meaning. Ex. 2057, ¶¶20-25, 46. However, as discussed below, Petitioner's argument rests on an improper collapsing of the terms "graded concentration of dopants" and "aid the movement of minority carriers." Further, Petitioner suggests that the "aid the movement of minority carriers" limitation can be met in situations where there is no carrier movement—an absurd result. *Infra* Section VI.A.1. This is contrary to the position Petitioner took in the district court, where Petitioner argued that the claims require showing actual movement. Ex. 2030 (Petitioner's claim construction brief in district court), 45 ("POSITA has no way to be reasonably certain that 'minority carrier movement' has

been aided if minority carriers need not actually move."). In light of Petitioner's positions, the Board should clarify that these are separate terms and that the plain and ordinary meaning of "aid the movement of minority carriers" requires that a carrier move in the specified direction.

VI. THE CITED REFERENCES DO NOT DISCLOSE OR SUGGEST ALL THE FEATURES OF THE CHALLENGED CLAIMS

The Petition is deficient because it fails to establish that the references identified in the Petition teach or suggest at least the "aid the movement of minority carriers" limitations (Elements [1.5]/[1.6]) which are found in the challenged independent claim.

A. "Graded" does not mean "aided" and "aided" is not inherent in "graded."

Petitioner's references do not teach the "aid the movement of minority carriers" claim limitation. Therefore, to locate "aid the movement of minority carriers" in the prior art, the Petition assumes that *any* "graded concentration of dopants" will "aid the movement of minority carriers." Petitioner is wrong.

1. A "graded concentration of dopants" does not inherently "aid the movement of minority carriers."

Petitioner's expert admitted *in his report* that a graded concentration of dopants does not inherently aid minority carrier movement. His report states that "an electric field *that is properly constructed* will push the minority carriers away from the surface." Ex. 1003, ¶32 (emphasis added). Many forces act on a carrier

[redacted]

and the net sum of all those forces is what determines carrier movement. Ex. 2057, ¶¶55-56. A gradient may be too weak, push in the wrong direction, or there may be no carrier movement at all. *Id.* Since only a "properly constructed" field will aid carrier movement, movement cannot be inherent from any field.

When Greenthread asked Dr. Campbell "What did you mean by 'properly constructed'?" Dr. Campbell replied "the direction has to be correct" and "*you have to have a sufficient electric field intensity*." Ex. 2058, 34:1-14. Yet, nothing in Dr. Campbell's report addresses the "intensity" of the electrical fields. Dr. Campbell claims he *did* calculations of the electric fields in the prior art references, but testified that he "couldn't find [his] notes as to what the field was." *Id.* at 20:20-21. When asked why he didn't simply refer to his report for these calculations he said "*I don't think I wrote it in my report*." *Id*. at 21:7-8.

A review of Dr. Campbell's report confirms that he failed to address the intensity of the relevant electric fields. Dr. Campbell and the Petition point to the mere gradient itself as evidence that the prior art gradients "aids movement." That is insufficient, as Dr. Campbell admitted.

Even if Dr. Campbell had included relevant analysis in his report, his analysis would be inadequate, because he failed to address key factors that he admits are important to the electric fields and carrier movement. These include temperature,

[redacted]

capacitance effects at the PN junction, and imperfections in the silicon crystal. *Id.* at 34:15-36:19; 39:8-12.

With regards to PN junction capacitance Dr. Campbell testified that "[i]t creates a fairly substantial electric field in the depletion region … near the junction," which he said is *in addition to* the field created by the dopant gradient. Ex. 2058 at 35:22-36:4; Ex. 2057 ¶60. Petitioner's representations to the Office also confirms that capacitance effects must be considered to determine the effect of a graded dopant profile: Ex. 2031 (U.S. Patent No. 8,704,292) at 7:4-7 ("*a graded doping profile*, ***in combination with*** the capacitive depletion effect …, may provide a substantially uniform electric field within the drift region.") (emphasis added).

Greenthread's expert, Dr. Glew also testifies that the inherent resistance of silicon also affects carrier movement. Ex. 2057, ¶56. Dr. Glew and the specification also show that the slope of the dopant concentration is a relevant parameter for determining whether a concentration gradient will aid carrier movement.

> The relative doping concentrations of emitter and collector regions varies from 10^{18} to $10^{20}/cm^3$, where as the base region is 10^{14} to $10^{16}/cm^3$ depending on the desired characteristics of the BJT. In graded base p-n-p transistors, the donor dopant concentration may be 10 to 100× at the emitter-base junction, relative to the base-collector junction (1×). The gradient can be linear, quasi linear, exponential or complimentary error function. The relative slope of the donor concentration throughout

[redacted]

> the base creates a suitable aiding drift electric field, to help the" carriers move.

Ex. 1001, 2: 35-50; Ex. 2057, ¶57. Yet, Dr. Campbell fails to address any of these numerous factors in his declaration.

The importance of the factors which Dr. Campbell failed to address are confirmed by a petitioner from a co-pending IPR, Cirrus Logic. Greenthread showed Cirrus Logic's corporate representative, Scott Warrick, a doping profile from one of the Cirrus Logic accused products and asked him if the downward sloping gradient met the "aid the movement of minority carriers" claim limitation. He said "***I cannot tell you that***." *Id.* (emphasis added). Greenthread then asked "***is that because there's other things that might affect carrier movement besides the gradient***?" to which Mr. Warrick replied "***Yes.***" Ex. 2056 at 95:2-5; 96:1-13 (PDF pages 20-21 of 118) (emphasis added). Mr. Warrick further testified that "there's a ***long list of … physical attributes which affect the movement of carriers***" and "there's other things that might affect carrier movement besides the gradient." Ex. 2056 at 72:6-8 (emphasis added), 96:1-13 (PDF pages 15 and 21 of 118).

During prosecution, the examiner likewise said that in "a complex electronic device, movement of minority carriers is affected by multiple forces and fields" and that a "drift field may attempt to apply a force on all minority carriers in a specific direction" but that "without knowing other parameters of the device" one cannot say whether the field would aid carrier movement. Ex. 1002, 270. This is exactly what

MPS's expert, Cirrus Logic's 30(b)(6) witness, and Greenthread's expert testified. Ex. 2057, ¶50.

The net force acting on a carrier—the result of all of these factors and forces—is what determines whether it moves and the direction of motion. Ex. 2057, ¶¶47-51. These other forces may prevent movement or push in the opposite direction from the force exerted by the gradient. Petitioner's assumption that the gradients in their prior art references would aid carrier movement fails, because the Petition fails to analyze whether the specific gradients at issue in the context of the disclosed devices would suffice to overcome the other forces that are present. Since Petitioner does not measure or account for these forces, and does not compare them to the magnitude of the force exerted by the gradients in the alleged prior art, they fail to establish that the disclosed gradients would "aid the movement of minority carriers." Ex. 2057, ¶50.

2. A finding that a "graded concentration of dopants" "aid the movement of minority carriers" is inconsistent with the claim language and district court *Markman* orders.

Finding that any gradient satisfies the "aid movement" claim term also goes against the plain language of the claim. If *any* "graded concentration of dopants" would "aid the movement of minority carriers" then there was no reason to include the separate claim term. Greenthread included "aided" and "graded" as two separate claim terms, because they have separate meaning. As the Federal Circuit said in

Phillips v. AWH Corp., "[w]hen a claim refers to 'steel baffles,'" that "strongly implies that the term 'baffles' does not inherently mean objects made of steel." 415 F.3d 1303, 1314 (Fed. Cir. 2005). Here, "a graded concentration of dopants [] *to aid the movement of minority carriers*" "strongly implies" that a "graded concentration of dopants" "does not inherently" "aid the movement of minority carriers." *Id.*

Petitioner's apparent position that *any* gradient aids carrier movement, leads to absurd results that are plainly inconsistent with the claim language. For example, if the forces acting on a carrier—i.e. the force exerted by a gradient and any other forces—cancel each other out, the carriers do not move at all. Yet, Petitioner's "graded" entails "aided" assumption (or claim construction) implies that a gradient can "aid" the movement of carriers that do not move at all. "Aid[ing] the movement of minority carriers" requires "movement." Petitioner fails to address this claim limitation, except to say that it is "inherent"—a position which Petitioner's expert admits is wrong. Ex. 2058, 34:1-14; 20:7-10; 34:15-36:19; 39:8-12.

Not one but two District Courts have previously agreed with Greenthread that not *all* doping gradients aid carrier movement. The Western District of Texas unequivocally stated, "a graded concentration…that is [not 'sufficiently graded'] will not aid in the movement of minority carriers[.]" Ex. 2074, 39-40. And the Eastern District of Texas understood that direction alone does not determine whether a gradient aids carrier movement—the ***magnitude*** of the gradient must also be

[redacted]

considered. Ex. 2075, 15 (explaining that "the slope [of the gradient] has both a direction and a magnitude and [d]efendant [incorrectly] suggests that the direction of the drift electric field depends solely on ***the direction*** of the slope of the graded concentration") (emphasis in original).

3. The prosecution history supports Greenthread.

Petitioner points to the prosecution history to support conflating "graded" with "aided," but—setting aside the fact that Petitioner misrepresents that history—the prosecution history is the wrong place to start. "The prosecution history represents an ongoing negotiation between the PTO and the applicant, rather than the final product of that negotiation, it often lacks the clarity of the specification and thus is less useful" in understanding the scope of the patent. *Phillips*, 415 F.3d at 1317. The prosecution history cannot overcome the clear claim language distinguishing the "graded" and "aided" terms.

First, Petitioner argues that Greenthread argued in prosecution that the "graded dopant concentration itself creates a 'built-in' electrical field that forces the movement of carriers into a particular direction." Pet. at 10. The point of the sentence Greenthread actually wrote is that a "graded dopant concentration" must move carriers *to meet the claim limitation*, not that any and every graded dopant concentration must move carriers. Greenthread was emphasizing that "aid the movement of minority carriers" is a separate claim element from "graded dopant

[redacted]

concentration"—the exact opposite of what Petitioner asserts. In context, Greenthread said:

> Defendants assert that the specification does not provide guidance on how to assess or measure carrier movement. This is not true. The claims and the specification make clear that the electric field must move the carriers in a particular direction (from the surface layer to the substrate). Whether the carrier movement has a particular speed or acceleration is beyond the scope of the claim, as long as it meets the other limitations of the claim.

Ex. 2030 (Patent Owner's Responsive Claim Construction Brief) at 38.

Further, Petitioner claims that Greenthread represented during prosecution that "a downward-sloping graded-dopant concentration was known in the prior art to create an 'inherent "built-in" unidirectional electric field' that moves carriers deep into the substrate[.]" Pet. at 9-10. Greenthread, however, added that the movement of carriers "[*d*]*epend*[*s*] *on the particular slope* of the graded concentration of dopant[s]." Ex. 1002 (195 prosecution history) at 289. Moreover, Greenthread was responding to an Office Action regarding a claim that required a "single static unidirectional electric drift field to aid the movement of carriers." *Id.* at 286. Those additional claim limitations were, as Greenthread said, an "*additional parameter* for ensuring that all minority carriers are moved in one direction." *Id.* at 290 (emphasis added). The fact that an "additional parameter" *besides* the graded dopants is

[redacted]

necessary to "ensur[e] that all minority carriers are moved" shows that Greenthread was not asserting that "graded" entails "aided."

B. The Petition fails to establish that the prior art discloses or suggests the "aid the movement of minority carriers" limitation. (Elements [1.5], [1.6]).

For all of the asserted grounds, the Petition fails to show that any of the primary references disclose any of the claim elements requiring "aid the movement of minority carriers."[3]

1. Petitioner's Onoda-Based Arguments are Deficient.

The Petition fails to demonstrate that Onoda teaches the "aid the movement of minority carriers" claim limitation. *Onoda does not say that a dopant gradient has any effect on carriers at all*. For the Onoda-based grounds, the Petition points to Onoda disclosing "a downward-sloping dopant concentration" and jumps to the conclusion that the gradient would necessarily "aid the movement of minority

[3] (A) Element [1.5]: "said drift layer further having a first static unidirectional electric drift field to aid the movement of minority carriers from said surface layer to said substrate" and (B) Element [1.6]: "at least one well region disposed in said single drift layer, said well region having a graded concentration of dopants and a second static unidirectional electric drift field to aid the movement of minority carriers from said surface layer to said substrate."

[redacted]

carriers[.]" Pet. at 32-33. As explained above, the existence of a downward-sloping graded-dopant concentration alone is not sufficient to establish the "aid the movement of minority carriers" claim limitation. *Supra* Sections VI.A.2, VI.B.1. As explained above (*see supra* Sections VI.A.2, VI.B.1), Petitioner's premise is flawed; indeed, as Dr. Campbell admitted that a "properly constructed" "electric field" "will push minority carriers." Ex. 1003 (Campbell Declaration), ¶32. Nothing in the Petition explains how Onoda's field is "properly constructed" or analyzes the numerous factors that Dr. Campbell admits affect carrier movement (e.g. temperature, silicon imperfections, resistance, and slope). *Id.* at 34:15-36:19; 39:8-12. As shown below, there are a number of PN junctions that create "substantial electric fields" which Dr. Campbell failed to account for. Since Dr. Campbell does not identify the net force acting on the carriers, or analyze the factors necessary to identify it, the Petition fails to show that the gradient aids carrier movement.

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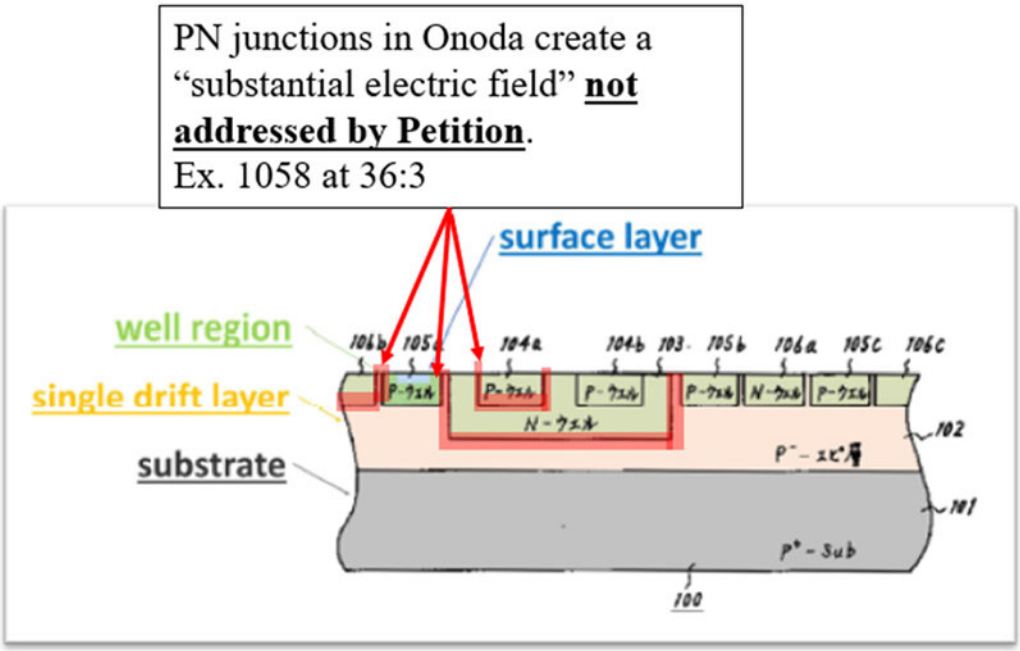

Pet. at 39 (annotations added)

Pet. at 39 (annotations added).

Further, as noted above, Cirrus Logic testified that "other things … might affect carrier movement besides the gradient[.]" Ex. 2056 (Warrick Deposition) at 96:10-13 (PDF page 21 of 118). Petitioner and Dr. Campbell did not take into account anything besides the existence of a downward-sloping concentration gradient in concluding that Onoda teaches the "aid the movement of minority carriers" aspect of limitations [1.5] (Pet., 32-34) and [1.6] (*id.*, 34-39). Therefore, the Petition is based on an incorrect premise and fails to carry Petitioner's burden. Ex. 2057, ¶¶51-54.

[redacted]

2. Petitioner's Onoda-Nishizawa Combination is Deficient.

The Petition relies on Onoda in view of Nishizawa for claims 1–3 and 5–6 in Ground II. Pet., 4-5. But Nishizawa does not cure the above-discussed deficiencies of Onoda regarding claim 1. Pet., 17-40.

First, Nishizawa does not expressly teach the claim limitations 1.5 and 1.6, because it does not teach moving carriers down from the surface layer. Nishizawa was trying to solve the problem of carriers created by alpha rays causing carriers to move *up* from *substrate* of the device. Ex. 2057, ¶¶44-45; Ex. 2058, 43:8-20. Nishizawa expressly says that it was *not* addressing carriers at the surface of the device, because alpha rays do not create carriers there in large enough quantities to be relevant. Ex. 1046, 19:21-34. Nishizawa says carriers at the surface of the device can be "disregarded" for its purposes and does not provide any teaching about how its gradient would affect carriers in the surface layer. *Id.* at 20:19-22. Since Nishizawa is silent on carriers in the surface layer, it does not teach the claim limitation.

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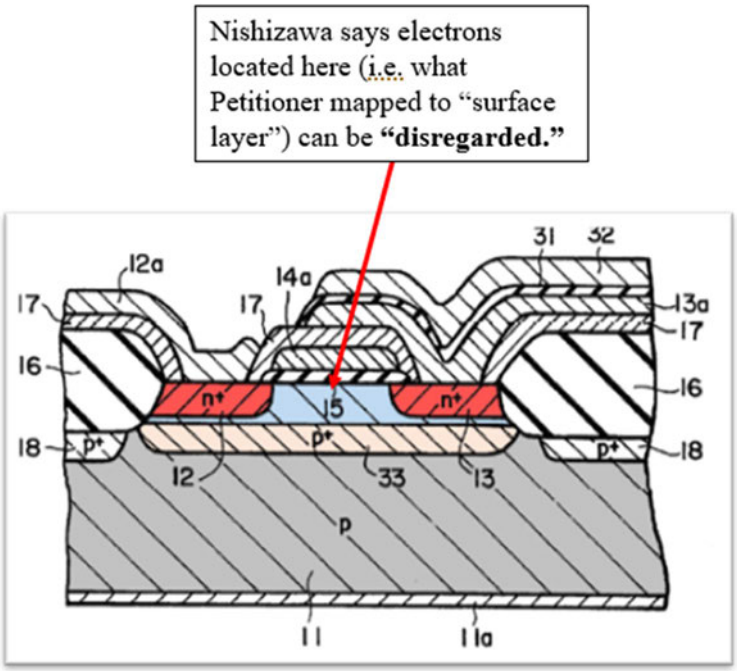

Pet. at 51 (annotations added).

In the testimony reproduced below, Dr. Campbell confirms that the problem that Nishizawa was trying to solve is preventing carriers moving up from the substrate, not assisting in moving carriers at the surface downwards. Ex. 2058, 43:8-20. Petitioner offers no reason why or how a POSITA would have modified Nishizawa to achieve a different result.

[redacted]

Petitioner's Expert

8 **Q. And the focus of Kawagoe and**
9 **Nishizawa and Onoda, was to solve that problem**
10 **and block the carriers from coming up into the**
11 **substrate, or into the transistor?**
12 A. I would put it just slightly
13 differently. They are not saying that they are
14 totally blocking all of the carriers. They are
15 reducing the carrier flow to an acceptable level.
16 **Q. Okay. But they are reducing the**
17 **carrier flow in an upwards direction?**
18 A. Yes, that's correct.
19 **Q. Upwards from the substrate?**
20 A. Yes, that's correct.

Ex. 2058, 43:8-20 (annotations added).

Second, Petitioner cannot simply rely on a gradient in Nishizawa for the same reason it cannot rely on the mere gradient in Onoda. As with all the grounds, the Petition does not mention the net force on carriers in Nishizawa or analyze numerous relevant factors that act on carriers *in addition* to the gradient, (e.g. temperature, silicon imperfections, resistance, and slope). *See, generally*, Petition. As with Onoda, there are electric field-creating PN junctions in Nishizawa that are not discussed in the Petition. Ex. 2057, ¶60. Without analyzing these other forces, Petitioner has no basis to conclude that a mere gradient alone in Nishizawa would aid carrier movement.

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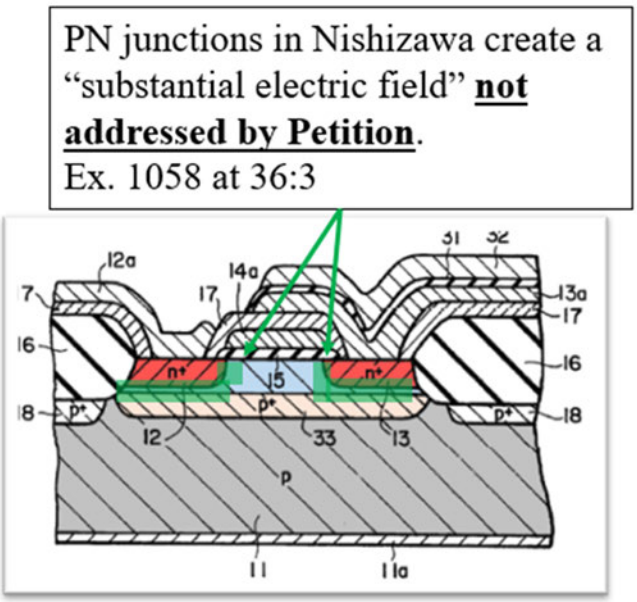

Pet. at 51 (annotations added)

Pet. at 51 (annotations added); *see also* Ex. 2058 at 36:3.

3. Petitioner's Kawagoe-Based Arguments are Deficient.

The Petition fails to demonstrate that Kawagoe teaches the "aid the movement of minority carriers" claim limitation. Ex. 2057, ¶¶47-55.

The Challenged Patent and Kawagoe are talking about two very different things. Kawagoe's teaching is about preventing carriers in the substrate from reaching the top of the device—just like Nishizawa. Greenthread's claims require a graded dopant concentration to move carriers from the surface towards the bottom of the device. Kawagoe does not talk about that at all.

The Petition strategically truncates a quote from Kawagoe to suit its purposes. The Petition cites Kawagoe to state that "this graded dopant profile results in 'electrons . . . [being] attracted to the substrate body 2S by that concentration

[redacted]

gradient.' Pet., 71 (citing Kawagoe at 16:7-11); *see also* Pet., 53 (citing Kawagoe at 16:3-8). What is missing from each of Petitioner's quotes is Kawagoe's teaching that the graded concentration actually *inhibits* carrier movement. The full sentence from Kawagoe that Petitioner elides actually states:

> Specifically, 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 the soft errors can be reduced in case the MIS memory of the DRAM or the like is formed in the p-well 6p.

Ex. 1007, 16:7-11 (emphasis added).

Dr. Campbell confirmed that Kawagoe's teaching is about preventing carriers from moving up, not about moving them down.

Petitioner's Expert

8 **Q. And the focus of Kawagoe and**
9 **Nishizawa and Onoda, was to solve that problem**
10 **and block the carriers from coming up into the**
11 **substrate, or into the transistor?**
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15 reducing the carrier flow to an acceptable level.
16 **Q. Okay. But they are reducing the**
17 **carrier flow in an upwards direction?**
18 A. Yes, that's correct.
19 **Q. Upwards from the substrate?**
20 A. Yes, that's correct.

Ex. 1058 at 43 (annotations added)

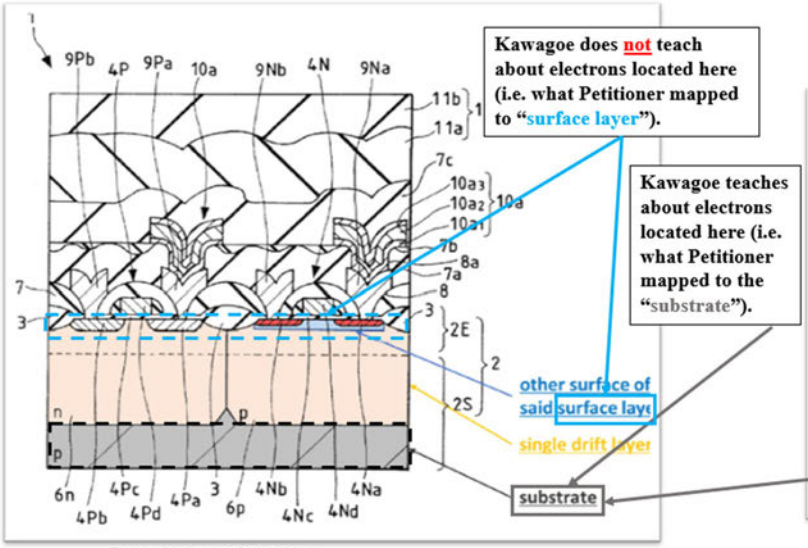
[redacted]

As Dr. Glew explains, Dr. Campbell's testimony is correct and the theory of the Petition is wrong. Ex. 2057, ¶54. A POSITA would have understood when Kawagoe mentions "electrons produced by the α-ray" (Ex. 1007, 16:7-11), Kawagoe is *not* describing electrons near the surface. Ex. 2057, ¶54. Dr. Glew cites Nishizawa—Petitioner's own reference—to demonstrate what a POSITA would have known:

> Accordingly, it will be understood that the alpha-particle immediately after irradiation to the surface of a semiconductor body has an energy of several MeV, for example about 5 MeV, and that, accordingly, ***the probability of creation of electron-hole pairs is extremely low near the surface***. The alpha-particle will begin to create electron-hole pairs after it has entered into the semiconductor substrate to a certain distance.

Ex. 1046, 19:21-34; *see also id.*, 20:19-22 ("[T]he 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."); Ex. 2057, ¶54. Thus, a POSITA would have understood that Kawagoe's electrons that are prevented from entering the p-well are *not* created near the surface. *Id.* Kawagoe says nothing about how any carriers at the surface are affected by its gradient.

[redacted]



Pet. at 64 (annotations added)

Petitioner's Expert

8 **Q. And the focus of Kawagoe and**
9 **Nishizawa and Onoda, was to solve that problem**
10 **and block the carriers from coming up into the**
11 **substrate, or into the transistor?**
12 A. I would put it just slightly
13 differently. They are not saying that they are
14 totally blocking all of the carriers. They are
15 reducing the carrier flow to an acceptable level.
16 **Q. Okay. But they are reducing the**
17 **carrier flow in an upwards direction?**
18 A. Yes, that's correct.
19 **Q. Upwards from the substrate?**
20 A. Yes, that's correct.

Ex. 1058 at 43 (annotations added)

The Petition points to Figures 16 and 17 of Kawagoe for the claimed "graded dopant concentration" of limitation [1.5]. Pet. at 71-74. But for the claimed "aid the movement of minority carriers" feature of limitation [1.5], the Petition contains no discussion of the magnitude of the slope of the gradient or net forces. To the contrary, the Petition focuses on the downward-sloping direction of Kawagoe's slope. *Id.* Again, as Dr. Campbell has testified, other factors—which he did not analyze—affect carrier movement, such as temperature, capacitance effects at the PN junction, and imperfections in the silicon crystal. Ex. 2058 at 34:1-36:19; 39:8-12. Cirrus Logic and Greenthread's expert concur. Ex. 2056 (Warrick Deposition) at 96:10-13; Ex. 2057, ¶¶55-56. Without analyzing the other factors, the Petition fails to show that the gradient would aid minority carrier movement.

[redacted]

VII. OBJECTIVE INDICIA OF NON-OBVIOUSNESS ESTABLISH THAT THE CHALLENGED CLAIMS ARE PATENTABLE.

"Objective evidence of nonobviousness … may often be the most probative and cogent evidence in the record. It may often establish that an invention appearing to have been obvious in light of the prior art was not." *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.*, 699 F.3d 1340, 1349 (Fed. Cir. 2012). During its prior litigation against [redacted] RPX Corp. ("RPX") approached Greenthread about negotiating a license on behalf of [redacted] and other companies. Greenthread and RPX then negotiated a license for [redacted] Ex. 2072 (Rao Decl.). The license covered only the patent family at issue here—no other patents. Moreover, Greenthread had never threatened litigation against either [redacted] in any way. *Id.* Rather, both companies first approached Greenthread through RPX.

"[L]icenses with companies under no apparent threat of litigation" are especially probative of non-obviousness. *Transocean*, 699 F.3d at 1353. For example, the Board has previously found claims not unpatentable based on licenses that were not "prompted by a threat of litigation." *Samsung Electronics Co. Ltd*., et al, v. *Neonode Smartphone LLC*, IPR2021-00144, Paper 59 at 51 (PTAB Dec. 15, 2022). Here, both [redacted] are sophisticated semiconductor companies with substantial annual revenue—in excess of $7 billion [redacted] and $20 billion [redacted]. Ex. 2073. Both companies also frequently file IPR petitions. *See, e.g.,*

[redacted]

Kioxia Corp., et al. v. Sonrai Memory Ltd., IPR2022-00255; *SK Hynix Inc.* et al. v. *Netlist, Inc.*, IPR2020-01421. In short, both companies know how to evaluate semiconductor technology and challenge patents they believe are invalid. Moreover, the expense for [redacted] to challenge Greenthread's patents would have been trivial. In addition to filing their own IPRs, they could have sought to join [redacted] then-pending IPRs or filed copy-cat petitions. Yet, without any threat of litigation, both paid for licenses covering just the single patent family at issue here.[4]

Furthermore, the specification of the Challenged Patent, which is common to the Greenthread family, identifies "a novel technique" of creating "a drift field to sweep these unwanted minority carriers from the active circuitry at the surface into the substrate." Ex. 1001, 3:30-33. The specification also ties that part of the invention to "important performance enhancements" in semiconductor devices such

[4] Greenthread later acquired two patents as part of its most recently signed license. Greenthread's earlier licenses provide for a springing license to future-acquired patents to ensure permanent peace between the parties and because it is part of RPX's standard terms. However, at the time of the earlier licenses no party had an expectation that Greenthread would acquire patents outside the Greenthread family. Ex. 2072.

[redacted]

as "decrease[d] programming time in nonvolatile memory devices" and "[p]ixel and color resolution … enhance[ments] in imaging ICs." *Id.*, 3:8-9, 3:25-27, 3:41-45.

This aspect of Greenthread's invention is part and parcel of Greenthread's licenses, because every patent in the family contains claim language relating to using graded dopants to move carriers "from the active circuitry at the surface" further down into the device. *See, e.g.*, U.S. Pat. Nos. 11,316,014 (Ex. 2066); 11,121,222 (Ex. 2064); 10,510,842 (Ex. 2063); 10,734,481 (Ex. 2065) ("graded dopant concentration to aid carrier movement from the [first surface or active region]…"); U.S. Pat. Nos. 8,421,195 (Ex. 1001); 9,190,502 (Ex. 2062) ("a graded concentration of dopants… to aid the movement of minority carriers from said surface…).

Moreover, moving carriers "from the active circuitry at the surface" is missing from the prior art. Both Onoda and Kawagoe, at best, show a downward sloping gradient, with no information about whether, why, or how such a gradient might be useful. *Supra* Section VI. Petitioner relies entirely on post-hoc expert testimony and misreading of the prosecution history to locate that claim limitation in the prior art. Greenthread's licenses discredit Petitioner's argument as hindsight. [redacted] had access to the same prosecution history and employ numerous semiconductor experts, but decided to license Greenthread's invention, without any threats or coercion.

[redacted]

Finally, licenses that are part of litigation settlements can also be probative of non-obviousness. *Fox Factory Inc. v. SRAM LLC*, IPR2017-00472, Paper 64 at 44 (PTAB April 18, 2018). Here, in addition to [redacted], other major semiconductor companies—Intel, [redacted] Micron, and Western Digital, and AMS-OSRAM—have all taken licenses to Greenthread's patents (with no expectation of receiving licenses to other patents) to settle litigation. Ex. 2072. In total, eight major semiconductor companies have paid more than $50 million—more than $6 million per company on average—for licenses all of which covered *only one patent family*. These agreements confirm that Greenthread's patents have been widely recognized in the industry and valid and valuable.

VIII. THE DECLARATION OF PETITIONER'S EXPERT IS UNRELIABLE.

The declaration of Petitioner's expert Dr. Stephen A. Campbell (Ex. 1003) is unreliable and should be disregarded for numerous reasons. His declaration does not add anything of value beyond what is already found in the Petition.

Additionally, Dr. Campbell admitted during his deposition that the analysis that he conducted for the IPRs was either not complete or inconsistent with what he stated in his declaration. For example, his declaration states that he reviewed the materials cited in his declaration "in their entirety, even if only portions are discussed here." Ex. 1003, ¶12. However, in deposition, Dr. Campbell testified he had not read the complete prosecution history of the Challenged Patent. Instead, he stated

that it was not his "job" to consider "the back and forth between the patent examiner and the inventor or patent owner during patent prosecution," and that he had read "*just" the portions of the prosecution history that were excerpted* in his expert declaration:

> Q. Okay. Do you understand what I am referring to when I say "file history"?
> A. It would be best if you were to explain it to me.
> Q. Okay. So the, I'm referring to the back and forth between the patent examiner and the inventor or patent owner during patent prosecution.
> A. Yes. I remember getting that document. **I glanced at it, but that wasn't my objective or my job.**
> Q. [Y]our declaration refers to various statements by the patent owner during patent prosecution, do you recall that?
> A. I do recall that, yes.
> Q. **Did you look at the other parts of the prosecution history or just the excerpts that are in your report?**
> A. **Just the excerpts in the report.**

Ex. 2058, 49:12-50:11.

Further, Dr. Campbell's declaration also states that obviousness is to be considered in view of several factors including "the taking of licenses under the patent by others and the nature of those licenses." Ex. 1003, ¶50. Indeed, Dr. Campbell understood that Intel had a license to Greenthread's patents (Ex. 2058, 25:22-26:5). Yet despite knowing that Intel had taken a license and understanding that "the taking of licenses under the patent" was relevant to obviousness, Dr.

Campbell blatantly admitted that he did not consider that in his obviousness analysis. Ex. 2058, 26:6-8.

It is unknown how many other misstatements or misrepresentations are in Dr. Campbell's declaration. Indeed, Dr. Campbell plainly asserted that he had submitted only one declaration in the MPS IPRs—conceding that the declaration submitted in IPR2024-00550, IPR2024-00551, IPR2024-00552, and IPR2024-00553 was either not his, or just rubber-stamped by him. His declaration in this proceeding consequently should also be considered unreliable, and it should not be given any weight.

IX. THE PETITION IS UNTIMELY UNDER 35 U.S.C. § 315(B).

A. Background

1. Prior Litigation Involving the Challenged Patents

a. Litigation

On April 30, 2019, Greenthread filed a complaint against in the Eastern District of Texas alleging infringement of the Challenged Patent and other patents not at issue in the Petition. On July 8, 2020, Greenthread and settled the litigation and Greenthread granted a license to as described below.

b. Intel- Litigation

On February 1, 2022, Greenthread served Intel and and (collectively,) with a complaint filed in the Western

[redacted]

District of Texas alleging infringement all of the Challenged Patents, except the '014 patent. Ex. 2001 (Complaint), 1-4; Ex. 2002 (Returned Summons). After the '014 patent issued, Greenthread filed a First Amended Complaint against [redacted] and Intel which it served via ECF on April 29, 2022. Ex. 2003. The cases against Intel and [redacted] were severed and the case against Intel was transferred to the District of Oregon. Ex. 2004, 22. The [redacted] litigation remained in Texas and continued in parallel with the Intel litigation.

[redacted] was a real-party-in-interest to the [redacted] litigation. Greenthread's allegations in the First Amended Complaint against [redacted] (i.e. the April 29 complaint) were based on, among other things, [redacted] components in [redacted] products. Ex. 2003, ¶¶18, 60, 76-81; Ex. 2005, 8 ("[redacted] Accused Products"), 18-20 (section entitled "[redacted] Accused Products"); Ex. 2006, 1-34. After Greenthread served the April 29 complaint accusing [redacted] products, additional counsel stepped in to represent [redacted] with respect to [redacted] products. Ex. 2007. [redacted] then filed its own IPRs against the Challenged Patents that had been asserted against [redacted] products. Ex. 2008 (IPR2023-00376, Petition), Ex. 2023 (IPR2023-00324, Petition), Ex. 2024 (IPR2023-00325, Petition), Ex. 2025 (IPR2023-00375, Petition). The [redacted] petitions named [redacted] as a real-party-in-interest. *E.g.*, Ex. 2008, 7; Ex. 2023, 7; Ex. 2024, 7; Ex. 2025, 8. Afterwards, Greenthread added [redacted] as a party to the [redacted] litigation. Ex. 2009. After [redacted] was added to the case, [redacted] counsel for [redacted]

products appeared in the case for Ex. 2010. other counsel did not represent Greenthread and Intel, and settled their disputes and Greenthread granted and Intel licenses as described below.

c. Greenthread Licenses to Intel, and

As part of the settlements, Greenthread granted Intel, and releases for past infringement and a license to Greenthread's patents, by way of sublicense through RPX Corporation ("RPX") ("Licenses"). Ex. 2011, 2. Greenthread licensed (and two other companies) in one agreement signed July 8, 2020. Ex. 2034. Greenthread signed the second agreement, licensing and Intel and on April 7, 2023. Ex. 2011. The two agreements are similar in all relevant respects. In a parallel IPR, RPX submitted an affidavit stating: "By operation of their membership agreements with RPX, Intel and acquired the full scope of sublicensable rights Greenthread granted to RPX at the time the RPX-Greenthread Agreement was executed." Ex. 2012.

The Licenses grant Licensees (i.e. Intel, and via RPX) the right "to make, have made, use, have used, sell, … offer for sale, have offered for sale, have sold, … import, have imported, own, order, … purchase, … obtain, keep, acquire, receive, … and otherwise exploit or dispose of any Licensed Product and Service." Ex. 2011, 3 (definition of "Patent License"); Ex. 2034, 3 (definition of "Patent License"); *see also* Ex. 2012.

[redacted]

The Licenses define "Licensed Product and Service" to include "any product … made, have made, used, purchased, provided, hosted, sold, leased, licensed, distributed, transmitted, exported, imported or offered for sale, lease, or import or otherwise exploited or disposed of by or on behalf of" Licensees. Ex. 2011, 2; Ex. 2034, 2.

The Licenses cover all of Greenthread's patents, including the Challenged Patent. *See* Ex. 2011, 3-4 ("'Patents' shall mean ….") and 17 (listing patents); see also Ex. 2034, 3 ("'Patents' shall mean ….") and 15 (listing patents).

Accordingly, "any product" Licensees "have made" by Petitioner or "purchase" from Petitioner is a "Licensed Product or Service" which Licensees have the right to "use, … sell, … obtain, … acquire, … receive, … and otherwise exploit." Ex. 2011, 2-3; *see also* Ex. 2034, 2-3.

2. Petitioner's Relationship with Patent Owner's Licensees and the Co-Pending District Court Proceedings

Patent Owner is currently involved in district court litigation against MPS. On May 26, 2023, Greenthread filed a complaint in the U.S. District Court for the Delaware that MPS infringes each of the Challenged Patents. The district court action was filed before MPS filed any IPR petitions against the Greenthread patents.

While the district court case was stayed before discovery was underway, public information confirms that Petitioner's chips are incorporated into Intel and [redacted] products and that [redacted] and Intel are significant MPS customers. For instance,

[redacted]

Petitioner announced during Investor/Analyst Day in 2018 that its technology would be used in Intel processors. Ex. 2017, 18. Petitioner's Q2 2021 earnings call referred to its success including its technology in Intel products. Ex. 2018, 5. Petitioner's MP2953B is a digital multi-phase controller that provides power for the core of the Intel VR12.5 platform. Ex. 2019. Publicly-available information also confirms that Petitioner is a chip supplier for [redacted] Ex. 2020, 2021.

3. These Proceedings

On February 3, 2024, Petitioner filed the first three petitions in these proceedings, IPR2024-00468, IPR2024-00469, and IPR2024-00470. Two days later, on February 5, Greenthread notified Petitioner that the Petitions are time barred by virtue of Petitioner's contracts with Licensees. Ex. 2013. Greenthread's email included the information of Petitioner's relationships with Licensees discussed above. Greenthread requested that Petitioner withdraw their petitions or at a minimum provide discovery into whether the petitions are time barred.

On February 6, Petitioner responded refusing to withdraw the petitions or provide any discovery. Ex. 2014.

On March 18, Petitioner filed four more petitions, IPR2024-00550, IPR2024-00551, IPR2024-00552, and IPR2024-00553. In spite of the parties' correspondence, these petitions included the identical assertion that "Petitioner is not barred or estopped from requesting IPR of the Challenged Claims" unsupported by

any argument or evidence whatsoever. IPR2024-00550, Paper 1 (Petition), 4; IPR2024-00551, Paper 1 (Petition), 8; IPR2024-00552, Paper 1 (Petition), 12; IPR2024-00553, Paper 1 (Petition), 9. Greenthread informed Petitioner that its objections to the first three IPRs applied equally to the additional four.

B. The Petition should be dismissed under 35 U.S.C. § 315(b).

1. Control of prior litigation is not required to establish privity.

Section 315(b) provides that "[a]n inter partes review may not be instituted if the petition requesting the proceeding is filed more than 1 year after the date on which the petitioner, real party in interest, or privy of the petitioner is served with a complaint alleging infringement of the patent." 35 U.S.C. § 315(b). In its institution, the panel said that "the rationale behind § 315(b)'s time bar, [is] 'to prevent successive challenges to a patent by those who previously have had the opportunity to make such challenges in prior litigation.'" Decision, 18. Greenthread respectfully contends that the purpose of § 315(b) and the privity inquiry is not so narrow.

Whether two parties are privies with respect to one another is evaluated under the "common law" framework set forth in *Taylor v. Sturgell*, 553 U.S. 880 (2008). *WesternGeco LLC v. ION Geophysical Corp.*, 889 F.3d 1308, 1317 (Fed. Cir. 2018); *see also* Office Trial Practice Guide at 13 (citing *Taylor*). Control of the prior litigation is *sufficient* to establish privity between the parties. *See, e.g.*, *WesternGeco LLC v. ION Geophysical Corp.*, 889 F.3d 1308, 1319 (Fed. Cir. 2018). But control

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or even awareness of the prior litigation are *not necessary* to establish privity. Rather, *Taylor* identifies a "pre-existing 'substantive legal relationship'" as *one* reason to find privity and litigation via "proxy" or "control over the [prior] litigation" as *different* reasons to find privity. 553 U.S. at 894-95 (cleaned up). Preclusion based on a pre-existing substantive legal relationship is justified by the "needs of property law," *not* because a precluded party was adequately represented in prior litigation, controlled prior litigation, or served as a proxy. *Id.* "Preclusion is extended or denied in an effort to protect conflicting property interests *rather than an effort to implement concepts of participation or representation.*" *Wright & Miller* (3d ed.) § 4448 Persons Affected by Preclusion (emphasis added).

The Board also has distinguished between privity based on a proxy relationship and privity based on pre-existing substantive legal relationship. For example, in the *Worlds* remand decision, the Board rejected the argument that the petitioner was not in privity when it "was not placed on notice of the infringement" previously and could not "control the [prior] District Court litigation." *Bungie Inc. v. Worlds Inc.*, IPR2015-01264, Paper 64 at 38, 44 (PTAB Jan. 14, 2020).

Therefore, *Taylor* and the Board have identified "a variety of pre-existing 'substantive legal relationship[s]' between" two parties that can create privity, even in the absence of control over the prior litigation. *Taylor*, 553 U.S. at 894 (alterations in original). For example, customer-supplier relationships can and frequently do

create privity. *See, e.g.*, *Ventex Co., Ltd. v. Columbia Sportswear N. Am., Inc.*, IPR2017-00789, Paper 148 at 14, (PTAB Jan. 24, 2019) (precedential); *Volkswagen Grp. of Am. Inc. v. Argina Tech. Ltd.*, IPR2021-01263, Paper 16 (PTAB Jan. 21, 2022); *Ericsson Inc. v. Regents of Univ. of Minn.*, IPR2017-01197, Paper 56 at 8, 10 (PTAB Sept. 18, 2020). "[A]n indemnity relationship is [also] the type of relationship that can establish privity," particularly when the indemnity obligations "directly relate to the" accused products. *Ericsson Inc. v. Regents of Univ. of Minnesota*, IPR2017-01197, Paper 56 at 8, 10 (PTAB Sept. 18, 2020). A finding of privity is also appropriate when two parties are "preceding and succeeding owners of property" and when one party acts as the "agent" for the other. *Taylor*, 553 U.S. 894-95.

2. Petitioner bears the burden to show that its petition is timely—i.e. it is not in privity with a time-barred party.

"[T]he IPR petitioner bears the burden of persuasion to demonstrate that its petitions are not time-barred" under § 315(b). *Samsung Electronics Co. Ltd. v. Netlist, Inc.*, IPR2022-00615, Paper 40 at 2 (PTAB Feb. 3, 2023) (quoting *Worlds Inc. v. Bungie, Inc.*, 903 F.3d 1237, 1242 (Fed. Cir. 2018)). There is no "rebuttable presumption that formally shifts a burden of production to the patent owner" or a presumption that a petition is timely because a petitioner asserts that it is. *Worlds*, 903 F.3d at 1242. Such a presumption would be unfair, because it would "disfavor the party that likely has inferior access to potential sources of proof." *Id.* at 1244.

[redacted]

As in this case, a patent owner is unlikely to know the details (or even existence) of a petitioner's relationships that might give rise to privity. Therefore, to dispute the timeliness of the petition, "a patent owner must produce *some* evidence that" a petition is time barred—but only "*some*." *Worlds*, 903 F.3d at 1244 (emphasis in original). Once the patent owner has "presented evidence sufficient to put" the timeliness of the petition "into dispute," "the Board c[an] no longer merely rely upon" the petitioner's assertion that its petition is timely. *Id.* at 1246. Throughout the proceeding, the "burden remains with the petitioner to establish" that its petition is timely. *Id.* at 1242.

[redacted] Intel, and [redacted] were served with a complaint alleging infringement of the Challenged Patent more than one year prior to the filing of the Petition. Ex. 2001, 2, 4; Ex. 2018. [redacted] was an RPI to the First Amended Complaint against [redacted] (served by ECF on April 29, 2022). Ex. 2032; Ex. 2017, 7. Thus, the Petition is untimely if Petitioner is in privity with Intel or [redacted] Greenthread has disputed the timeliness of the Petition with evidence showing that Petitioner is in privity with Licensees. Petitioner has offered no evidence whatsoever to controvert Greenthread's evidence or demonstrate the timeliness of their Petition. Accordingly, the Petition should be dismissed.

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3. The Petitions should be dismissed, because Petitioner has not attempted to carry their burden.

a. Patent Owner has satisfied its "practical" burden under *Worlds*.

There can be no serious dispute that Patent Owner here has met its initial "practical" burden under Worlds. *Worlds*, 903 F.3d at 1243-44. First, it is well-established that customer-supplier relationships can create privity and there is no dispute that Petitioner and the Licensees have such a relationship. *See supra* Section IX.A.2; Ex. 2035 at 2, 10, 63, 64; Ex. 2030, 1; Ex. 2015, 34. Public filings suggest that Petitioner's sales to Licensees are custom products. Petitioner has said that its products "typically require a highly technical sales and applications engineering effort" and Petitioner maintains a staff of "applications engineers who work directly with customers' engineers." Ex. 2022, 6. In MPS's opposition to PO's motion for additional discovery, MPS claimed that to comply with PO's requested additional discovery, it would have needed to search its "engineering team" communications. Opp. to Motion for Additional Discovery (Paper 12), 13. This demonstrates that MPS engineers work directly with Licensees on the accused products, and these products are not simply "commodity" products later sold in the public marketplace, such as on the Digikey website.

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b. Petitioner has done nothing to satisfy its burden under Section 315(b).

"Failure to prove [a] matter … means that the party with the burden of persuasion loses on that point—thus, if the fact trier of the issue is left uncertain, the party with the burden loses." *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378–79 (Fed. Cir. 2015). Here, Petitioner "loses," because (1) it has the burden to show that the Petitions are timely and (2) Petitioner deliberately chose to ignore the issue, even after Patent Owner expressly identified the issue to it. *Id.* In short, Petitioner has not even attempted to meet their burden.

The instant Petition, like all seven of the Petitions, simply asserts, without support or explanation, that "Petitioner is not barred or estopped from requesting IPR of the Challenged Claims on the grounds identified in this Petition." Pet., 3-4. That is inadequate. The burden therefore falls on Petitioner to establish that the relationship does *not* create privity. Meeting its burden requires Petitioner to put into the record evidence about their relationships.

The privity inquiry is a "highly fact-dependent question," "handled by the Office on a case-by-case basis.'" *Ventex Co., Ltd. v. Columbia Sportswear N. Am., Inc.*, IPR2017-00651, Paper 148 at 6 (PTAB Jan. 24, 2019) (precedential). Therefore, in virtually every case where the Board has found that a petitioner met its burden, the Board examined the actual agreements and correspondence between the alleged privies. *See, e.g.*, *WesternGeco LLC v. ION Geophysical Corp.*, 889 F.3d

1308, 1321 (Fed. Cir. 2018) ("the Board reviewed the purchase agreements"); *Samsung Electronics Co. Ltd. v. Netlist Inc.*, IPR2022-00615, Paper 64 at 14-15 (PTAB Jun. 30, 2023) (examining "indemnification correspondence" and contracts); *Assa Abloy AB v. CPC Patent Tech. Pty., Ltd.*, IPR2022-01093, Paper 20 at 18 (PTAB Feb. 2, 2023) (citing an "88-page agreement"). When the documents are *not* in the record the Board has consistently said that the absence of evidence "cuts against" the *petitioner*, not the patent owner. *Ventex Co., Ltd. v. Columbia Sportswear N. Am., Inc.*, IPR2017-00789, Paper 148 at 14 (PTAB Jan. 24, 2019) (precedential).[5] Moreover, to the extent that control of the prior litigation is relevant, "the lack of evidence" regarding control should count against Petitioner, not Greenthread. *Bungie Inc. v. Worlds Inc.*, IPR2015-01264, Paper 64 at 35 (PTAB Jan. 14, 2020). Mere "attorney argument that itself fail[s] to cite evidence" cannot meet Petitioner's burden. *Worlds*, 903 F.3d at 1246. With no evidence to support the

[5] The only exception of which Greenthread is aware are decisions involving Greenthread. *E.g.*, *Semiconductor Components Indus., LLC v. Greenthread, LLC*, IPR2023-01242, Paper 31 (PTAB Feb. 5, 2024). *See also* IPR2023-01243, Paper 30 (PTAB Feb. 5, 2024); IPR2023-01244, Paper 31 (PTAB Feb. 5, 2024). Greenthread respectfully urges the panel decide this case in accordance with the Board's other post-*Worlds* precedents.

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timeliness of the Petitions, Petitioner "lose[]." *Dynamic Drinkware*, 800 F.3d at 1379.

Indeed, not only does Petitioner lose in the absence of any evidence, the "lack of evidence" that would presumably be in Petitioner's possession, such as their contracts with Licensees, affirmatively "cuts against the party bearing the burden of proof on these issues." *Ventex Co., Ltd. v. Columbia Sportswear N. Am., Inc.*, IPR2017-00789, Paper 148 at 14, 2019 WL 858745, at *6 (PTAB Jan. 24, 2019) (precedential). Therefore, the Board can reasonably infer from Petitioner's resistance to providing evidence to meet their burden that the evidence (not in the record) is unfavorable to Petitioner.

c. Petitioner cannot show timeliness by asserting that it has "standard" or "commodity" relationships.

Petitioner claims that it is not in privity with Licensees' because its sales are "commodity" sales. Opposition to Motion for Additional Discovery (Paper 12), 2-6. That is incorrect. There is no "standard" or "commodity" relationship that evades privity. Privity "is a 'highly fact-dependent question.'" *Apps. in Internet Time, LLC v. RPX Corp.*, IPR2015-01750, Paper 128 at 7 (PTAB Oct. 2, 2020) ("*AIT*") (precedential).

Customer-supplier relationships can and frequently do create privity. *See, e.g., Ventex Co., Ltd. v. Columbia Sportswear N. Am., Inc.*, IPR2017-00789, Paper 148 at 14, (PTAB Jan. 24, 2019) (precedential); *Volkswagen Grp. of Am. Inc. v.*

Argina Tech. Ltd., IPR2021-01263 Paper 16 (PTAB Jan. 21, 2022); *Ericsson Inc. v. Regents of Univ. of Minn.*, IPR2017-01197, Paper 56 at 8, 10 (PTAB Sept. 18, 2020).

Here, Petitioner admits that it has customer-supplier relationships with time-barred parties, but has introduced no evidence regarding the nature of those relationships. A petitioner's failure to produce pertinent documents regarding its customer-supplier relationships precludes institution. *Volkswagen*, IPR2021-01263, Paper 16 at 10 n.4. *Ventex,* IPR2017-00789, Paper 148 at 14. Petitioner cannot prevail on a "fact-dependent question" when it offers no evidence to support a finding of facts. *AIT*, IPR2015-01750, Paper 128 at 7.

Further, Petitioner's contracts with Licensees could implicate an indemnity relationship, and "an indemnity relationship is the type of relationship that can establish privity." *Ericsson*, IPR2017-01197, Paper 56 at 8, 10 (PTAB Sept. 18, 2020). Since Petitioner bear the burden of persuasion, their failure to produce the contracts is dispositive.

4. The Petition should be dismissed, because evidence of record shows that the Petition is time-barred.

The Board need not evaluate whether Patent Owner's evidence suffices to show that the Petition are time-barred, because Petitioner bear the burden of proof on that issue and have not even attempted to meet their burden. If the Board chooses to look at the evidence of record, however, it is clear that the Petitions are time-barred.

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Whether two parties are privies with respect to one another is evaluated under the "common law" framework set forth in *Taylor v. Sturgell*, 553 U.S. 880 (2008). *WesternGeco LLC v. ION Geophysical Corp.*, 889 F.3d 1308, 1317 (Fed. Cir. 2018); *see also* Office Trial Practice Guide at 13 (citing *Taylor*). *Taylor* identifies "a variety of pre-existing 'substantive legal relationship[s]' between" two parties that can create privity. *Taylor*, 553 U.S. at 894 (alterations in original). Among them are when two parties are "preceding and succeeding owners of property" and when one party acts as the "agent" for the other. *Id.* at 894-95. Here, Petitioner is in privity with Licensees. Since Licensees are time-barred, Petitioner is likewise time-barred.

a. Petitioner act as Licensees' "agent" for Licensees' "have made" rights.

Petitioner is in privity with Licensees, because, by virtue of their contracts with Licensees, they exercise Licensees' rights under the Licenses and are thus Licensees' agents.

It is well established that "agents and principals are in privity for res judicata purposes 'if the prior action concerned a matter within the agency.'" *Herrion v. Children's Hosp. Nat. Med. Ctr.*, 448 F. App'x 71, 73 (D.C. Cir. 2011). The D.C. Circuit is "hardly alone in this approach to privity between principals and their agents." *Herrion v. Children's Hosp. Nat. Med. Ctr.*, 786 F. Supp. 2d 359, 371 n.9 (D.D.C.), *aff'd*, 448 F. App'x 71 (D.C. Cir. 2011). Courts around the country have held similarly and the leading treatise on Federal procedure agrees. *Id.* (citing cases

from the Supreme Court, First, Second, Third, Fifth, Sixth, Seventh, Ninth, and Eleventh Circuits); Wright & Miller § 4460 (3d ed.).

For example, in *John St. Leasehold, LLC v. Cap. Mgmt. Res., L.P.*, 283 F.3d 73, 75 (2d Cir. 2002), the FDIC contracted with asset managers to exercise its rights as receiver for a failed bank. The Second Circuit held that the asset managers were the FDIC's agents, acting within "the scope of their agency," and thus "in privity with the" FDIC. *Id.* at 75.

Likewise in *Fiumara v. Fireman's Fund Ins. Companies*, 746 F.2d 87, 87 (1st Cir. 1984), a motel operator sued his fire insurer for denying his claim. The motel operator lost and then sued the contractors the insurer used to investigate his claim. *Id.* The First Circuit affirmed summary judgment for the contractors, holding that the contractors were "acting as agents of the" insurer and therefore "clearly qualify as persons in privity." *Id.* at 92.

Finally, *In re Google LLC*, 949 F.3d 1338, 1346 (Fed. Cir. 2020) the Federal Circuit said that contracts between Google and an internet service provider to "[a]ssembl[e] equipment based on information and instructions provided by" Google were "suggestive of an agency relationship."[6]

[6] The contractors were not "conducting Google's business within the meaning of the [venue] statute," but that is irrelevant for purposes of agency. *Id.* at 1346.

Here, Petitioner is in the same position as the (1) contract asset managers in *John St. Leasehold* acting on behalf of the FDIC and (2) the contract investigators acting on behalf of the insurance company in *Fiumara*, because Petitioner is likewise exercising the contractual rights of another party as its agent. The specific contractual rights are different—controlling the operation of a failed bank, investigating a fire, and making licensed products—but privity does not turn on the nature or scope of the agency. Here, Licensees could exercise their license rights by making the accused products themselves, but choose to "have [the accused products] made" by Petitioner instead, just as the FDIC or insurer could have exercised their rights directly, but chose to employ an agent. For privity, what matters is not the scope or nature of the agency, but whether "the prior action concerned a matter within the agency." *Herrion*, 448 F. App'x at 73. Here, the manufacture of licensed or accused goods is obviously relevant to these proceedings.

Furthermore, as in *Google*, Petitioner likely "[a]ssembl[es] equipment"—or manufactures accused products—at Licensee's instruction. For example, when MPS "typically require[s] a highly technical sales and applications engineering effort" and MPS maintains a staff of "applications engineers who work directly with customers' engineers," its actions are legally indistinguishable from the contractors in Google assembling equipment at Google's direction. Ex. 2022, 6. Therefore, Petitioner is Licensees' agent and is in privity with Licensees. *Herrion*, 448 F. App'x at 73.

Finally, to be in privity with Licensees, Petitioner does not need to be Licensees' agent for these proceedings or the prior proceedings. What matters is whether Petitioner is an agent with respect to the facts giving rise to the parties' dispute. In all of the examples cited above—*Herrion*, *St. John's Leasehold*, *Fiumara*, and *Google*—the party held to be in privity was an agent with respects to the fact underlying the dispute, not the prior litigation. Nothing in any of those cases indicates that the party in privity was an agent with respect to the prior litigation.

Moreover, the Board has rejected the argument that § 315(b) "should not apply if a petitioner was not placed on notice of the [prior] infringement allegation" or if the petitioner lacked "the opportunity to participate in and control the District Court litigation." *Bungie*, IPR2015-01264, Paper 64 at 44. To the extent that control is relevant, it is Petitioner's burden to show that they did not control the prior litigation. There is no evidence in the record to support such a finding, and "the lack of evidence [on that point] also precludes [the Board] from being able to find that Petitioner has met its burden." *Id.* at 35.

b. Petitioner and Licensees are "preceding and succeeding owners of property" and parties to sales of accused goods.

It is undisputed that Petitioner on the one hand and Licensees on the other are "preceding and succeeding owners of" the licensed and/or infringing products,

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because Petitioner products are indisputably components of Licensees' products.[7] *Taylor*, 553 U.S. at 894.

Petitioner also do not dispute that several of these Licensee products were accused in the prior litigation, including [redacted]

Under the America Invents Act ("AIA"), privity "extend[s] to parties to transactions and other activities relating to the property in question," i.e., infringing goods. *WesternGeco LLC v. ION Geophysical Corp.*, 889 F.3d 1308, 1318 (Fed. Cir. 2018) (quoting legislative history of the AIA). Here, the "transactions … in question" are the sales Petitioner make to Licensees and "the property in question" is the goods conveyed in those sales. *Id.* Each sale of accused products to Licensees is a "transaction" regarding a piece of "property" which puts Petitioner and Licensees in privity. *WesternGeco*, 889 F.3d at 1318.

In their opposition to Greenthread's discovery motion, MPS tried to distance itself from Licensees, by claiming to sell to Licensees through "commodity" sales. Paper 12, 2-6. This argument fails. First, MPS does not dispute that its products are

[7] Petitioner apparently sells at least some of these accused models to parties other than licensees, such as online marketplaces. *See, e.g.*, Petitioner's Opp. to Motion for Additional Discovery (Paper 12), 13. These sales and sales of other accused products are the subject of the current district court litigation.

[redacted]

components in Licensee products, including products accused in the prior litigation. If MPS believe that there is some relevance to its "commodity" sales, it must provide evidence showing how its products are sold and their contracts with Licensees.

Second, even if MPS's claims were supported by evidence, making "commodity" sales does not change the fact that MPS has direct relationships with Licensees and make the products for Licensees. MPS says its products "typically require a highly technical sales and applications engineering effort" and Petitioner maintains a staff of "applications engineers who work directly with customers' engineers." Ex. 2022, 6.

Finally, how MPS's products end up in Licensees' products is irrelevant. MPS is still a preceding owner of property that was previously accused and is accused again, even if the property flows through another party.

i. Petitioner and RPI are beneficiaries of Licensees' "agreement[] directly related" to the accused products.

"[A]greements directly related to the product accused of infringing the patent at issue in this proceeding" satisfy Taylor's "pre-existing substantive legal relationship" test. *Ventex Co. v. Columbia Sportswear North America, Inc.*, IPR2017-00651, Paper 148 (PTAB Jan. 24, 2019) (precedential)). Here, Petitioner operates under and is a beneficiary of Licensees' agreements with Patent Owner. That agreement is "directly related to" the accused products. *Id.*

[redacted]

Under the Licenses, "any product" Licensees "have made" by Petitioner or "purchase" from Petitioner is a "Licensed Product or Service" which Licensees have the right to "use, … sell, … obtain, … acquire, … receive, … and otherwise exploit." Ex. 2022, 2-3; Ex. 2034, 2-3. Furthermore, the license grants a limited sublicense to Licensees' "have-made vendors" (for the limited purposes of making products for Licensees). Ex. 2022, 5; Ex. 2034, 5. Petitioner is such vendors and therefore are (limited) sublicensees of Licensees under the Licenses. Even if that were not the case, "have-made vendors" are entitled to a limited implied license. *See LaserDynamics, Inc. v. Quanta Computer, Inc.*, 694 F.3d 51, 73 (Fed. Cir. 2012). Therefore, Petitioner is a beneficiary of Licensees' "agreements directly related to the product accused of infringing the patent at issue in this proceeding" satisfying Taylor's "pre-existing substantive legal relationship" test. *Ventex*, IPR2017-00651, Paper 148 (precedential).

ii. Petitioner's licensed sales encumber otherwise infringing articles.

Under the doctrine of exhaustion, a licensed "sale is treated, for purposes of patent exhaustion, as if the patentee made the sale itself. The result: The sale exhausts the patentee's rights *in that item*." *Impression Prod., Inc. v. Lexmark Int'l, Inc.*, 581 U.S. 360, 376 (2017) (emphasis added). Therefore, after Petitioner sells a product under the Licenses, any downstream user of the article sold would have an exhaustion defense against Patent Owner. Put differently, the "property" of which

Petitioner and Licensees are "preceding and succeeding owners" becomes encumbered under the doctrine of exhaustion. *Taylor*, 553 U.S. at 894. Further, it does not matter whether the products were accused in the instant litigation or whether Petitioner even asserts a license defense. Petitioner still limits Patent owner's rights vis-à-vis the "property" they sell under the Licenses by giving future owners an exhaustion defense. Thus, Petitioner effectively provides rights to third-parties under the Licenses and, therefore, is in privity with Licensees.

5. Due Process and the policy underlying the AIA support dismissing the Petition.

a. Petitioner is trying to take inconsistent positions before the Board and in district court.

"[T]o protect the integrity of the judicial process," "courts have uniformly … prohibit[ed] parties deliberately changing [litigation] positions according to the exigencies of the moment." *New Hampshire v. Maine*, 532 U.S. 742, 750 (2001). That is what Petitioner is attempting here. Right now, Petitioner wants to claim that they are strangers to Licensees' agreement, and therefore not in privity with them. But, Petitioner refuses to produce any evidence to support that conclusion or to say whether they will later claim the benefit of the agreement to reduce the likely damages against it in district court. Petitioner is "playing fast and loose" with the Board and the district court. *Id.* Petitioner stepped into Licensees' shoes by making and selling products under their license. Petitioner should not be able to take those

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shoes off when standing before the Board, only to put them back on again when it appears in district court.[8]

b. Petitioner's other interests are irrelevant.

"Congress 'chose language that bars petitions where proxies or privies would *benefit* from an instituted IPR, even where the petitioning party might separately have its own interest in initiating an IPR.'" *Power Integrations, Inc. v. Semiconductor Comps. Indus., LLC*, 926 F.3d 1306, 1316 (Fed. Cir. 2019) (emphasis in original); *RPX Corp. v. Applications in Internet Time LLC*, IPR2015-01750, Paper 128 at 10 (PTAB Oct. 2, 2020) (precedential) (same). Therefore, the fact that the Petitioner benefits from a license that does not cover *all* of Petitioner sales is irrelevant. Petitioner *still benefits* from the license (and exercises Licensees' "have

[8] Patent Owner is not suggesting that Petitioner could make their Petition timely by disclaiming a license defense in district court. Whether or not Petitioner actually asserts its license defense, they still have been acting under the license and reaping benefits from it, such as not owing any indemnity to Licensees. *Supra* § IX.A.2. Petitioner also has been selling goods subject to exhaustion, thereby limiting Patent Owner's rights, whether or not Petitioner disclaims any license. *Supra* § IX.B.1. Petitioner cannot turn privity on and off at will. Patent Owner's point is simply that Petitioner's apparent strategy is unfair and the Board should not condone it.

made" rights). Therefore, Petitioner is privity with Licensees. Petitioner will have the opportunity to challenge the validity of the Challenged Patent in district court. The only question before the Board is whether Petitioner can avail themselves of *additional* challenges here. The answer Congress provided in § 315(b) is "no."

c. A finding in Petitioner's favor here would violate due process.

A finding in favor of Petitioner on § 315(b) would violate Greenthread's constitutional right to due process. First, "[i]n almost every setting where important decisions turn on questions of fact, due process requires an opportunity to confront and cross-examine adverse witnesses." *Goldberg v. Kelly*, 397 U.S. 254, 269 (1970). Here, the Board suggests that there is "no factual support in the record" "sufficient to demonstrate privity for purposes of nonparty preclusion." Paper 23, 32. But this is due to the denial of PO's motion for additional discovery (Paper 8), which requested additional information key to this inquiry. Instead, Petitioner made various factual assertions in its opposition to support institution, which the Board apparently relied on, such as Petitioner's assertion that it merely has "commodity" sales with Licensees. Opposition (Paper 12), 2-6. But there is no evidence to support this conclusion in the record, just the statement from Petitioner's attorney. Greenthread has had no opportunity to cross examine any witness about those assertions or see relevant documents, because Petitioner did not identify a declarant, other than Petitioner's counsel, and was not required to produce any documents.

Second, "where governmental action seriously injures an individual, and the reasonableness of the action depends on fact findings, the evidence used to prove the Government's case must be disclosed to the individual so that he has an opportunity to show that it is untrue." *Greene v. McElroy*, 360 U.S. 474, 496 (1959). Here, Greenthread has received no notice of any evidence to support a finding for Petitioner under § 315(b). For example, it is undisputed that Petitioner has a customer-supplier relationship with time-barred parties and that such relationships can create privity. However, neither Greenthread has not seen the documents governing petitioner's relationships, or any other evidence to support a finding for Petitioner under § 315(b). Therefore, Greenthread has not had the "opportunity to show that [Petitioner's assertions about the facts are] untrue." *Id.*

X. THE AIA IS UNCONSTITUTIONAL.

The Board should dismiss this IPR, because the AIA violates the Supreme Court's non-delegation doctrine and the Constitution. "Congress generally cannot delegate its legislative power to [the Executive] Branch" without identifying an "intelligible principle" to guide the Executive's exercise of that power. *Mistretta v. United States*, 488 U.S. 361, 372 (1989). In determining whether a statutory scheme violates the non-delegation doctrine, Courts consider "(1) whether Congress has delegated power to the agency that would be legislative power but-for an intelligible principle to guide its use and, if it has, (2) whether it has provided an intelligible

principle such that the agency exercises only executive power." *Jarkesy v. Sec. & Exch. Comm'n*, 34 F.4th 446, 461 (5th Cir. 2022).

The power to determine whether a dispute proceeds before an "Article III court" or in an "agency adjudication" is a "legislative power" "that Congress uniquely possesses." *Id.* at 462. Here, Greenthread and Petitioner is currently litigating its dispute, including the issue of patent validity, in Article III Courts. *Greenthread, LLC v. Monolithic Power Systems*, *Inc.*, 1:23-cv-00579 (D.Del.). In the AIA, however, Congress delegated to the Director the power to determine whether the PTAB should decide the very same dispute. In other words, the Director decides whether Greenthread "should receive *certain legal processes* (those accompanying Article III proceedings)" such as the protections of a jury trial and the clear and convincing evidence standard for patent validity. *Id.* (emphasis in original); *see also Microsoft Corp. v. i4i Ltd. P'ship*, 564 U.S. 91, 95 (2011) (affirming the clear and convincing evidence standard).

In § 314(a), Congress has told the Director when she can institute proceedings—i.e., only if "there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims"—but once that criterion is satisfied, the decision to institute is committed "to the Director's unreviewable discretion" without any further guiding principle. 35 U.S.C. § 314(a); *United States v. Arthrex, Inc.*, 141 S. Ct. 1970, 1977 (2021); *Apple Inc. v. Vidal*, 63 F.4th 1, 6 (Fed. Cir. 2023).

[redacted]

After making the threshold finding under § 314(a), the Director can institute or not institute for any reason, no reason, or a completely arbitrary reason, like the flip of a coin. She could institute every petition meeting the § 314(a) or no petitions at all, if she prefers. She need not give any reasons for her decision. Since Congress provided no intelligible principle for the Director to apply in deciding whether to institute IPR proceedings, the statute governing these proceedings is unconstitutional and the Petition must be dismissed.

XI. CONCLUSION

For the foregoing reasons, Petitioner has failed to prove by a preponderance of the evidence that any of the Challenged Claims are unpatentable. Patent Owner respectfully requests that the Board confirm the patentability of the Challenged Claims and enter judgment against Petitioner.

[redacted]

Dated: November 8, 2024

Respectfully submitted,

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CERTIFICATE OF WORD COUNT

The undersigned hereby certifies that the portions of the above-captioned **PATENT OWNER'S RESPONSE** specified in 37 C.F.R. § 42.24 have 12,544 words, in compliance with the 14,000 word limit set forth in 37 C.F.R. § 42.24(b)(1). This word count was prepared using Microsoft Word 2016 and by adding 335 words as counted from text annotations in the figures.

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that the foregoing **PATENT OWNER'S RESPONSE** and supporting exhibits were served electronically via e-mail on November 8, 2024, in its entirety on the following counsel of record for Petitioner:

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