PUBLIC VERSION

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CIRRUS LOGIC, INC. and
OMNIVISION TECHNOLOGIES, INC.,
Petitioners

v.

GREENTHREAD, LLC,
Patent Owner

Case: IPR2024-00021
U.S. Patent No. 11,121,222

PATENT OWNER'S RESPONSE

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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	Definition of "privity" in Black's Law Dictionary (11th ed. 2019) available from Westlaw at westlaw.com	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

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	Email communication from Patent Owner's counsel to Petitioners' counsel dated October 20, 2023	X
Ex. 2012	Email Attachment – Cirrus Logic Technical Support Article Number 000207340	X
Ex. 2013	Email Attachment - Cirrus Logic Investor Presentation as of April 28, 2015	X
Ex. 2014	Email Attachment - GlobalFoundries 2022 Capital Markets Day, available at https://investors.gf.com/static-files/65f5f1b9-2aea-47a3-8455-10413c6560f4	X
Ex. 2015	Email Attachment - Intel RealSense Product Family D400 Series, dated 2019	X
Ex. 2016	Email communication from Petitioners' counsel to Patent Owner's counsel dated October 24, 2023	X
Ex. 2017	Email communication from Patent Owner's counsel to Board, copying Petitioners' counsel dated November 1, 2023	X
Ex. 2018	*Greenthread, LLC v. Cirrus Logic, Inc.*, No. 1:23-cv-00369 (Supplemental Preliminary Infringement Contentions) (W.D. Tex., served Oct. 13, 2023)	X
Ex. 2019	*Greenthread, LLC v. Cirrus Logic, Inc.*, No. 1:23-cv-00369, Dkt. 29 (Scheduling Order) (W.D. Tex. Aug. 18, 2023)	X

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Ex. 2020	Article entitled "Cirrus Logic Helps Ease PC Industry Transition to New MIPI SoundWire® Interface" available at https://investor.cirrus.com/news-and-events/investor-news/news-details/2023/Cirrus-Logic-Helps-Ease-PC-Industry-Transition-to-New-MIPI-SoundWire-Interface/default.aspx	X
Ex. 2021	*Greenthread, LLC v. Intel Corp.*, 6:22-cv-00105-ADA, Dkt. 120-8, Greenthread's Amended Preliminary Infringement Contentions (W.D. Tex., filed Jan. 23, 2023)	X
Ex. 2022	Confidential agreement	X
Ex. 2023	CS42L42, Low Power Audio Codec with SoundWire and Audio Processing, available at https://www.cirrus.com/pubs/proBulletin/cs42l43-cs36l56-bulletin.pdf	X
Ex. 2024	Cirrus Logic Immersive PC Audio Solution, available at https://www.cirrus.com/pubs/proBulletin/cs42l43-cs36l56-bulletin.pdf	X
Ex. 2025	Cirrus Logic – What Drives Our Success, available at https://investor.cirrus.com/company-overview/what-drives-our-success/default.aspx	X
Ex. 2026	Cirrus Logic, Inc. Terms and Conditions of Sale, available at https://www.cirrus.com/legal/productterms/	X
Ex. 2027	*Greenthread, LLC v. OmniVision Technologies Inc.*; 2:23-cv-212, Dkt. 1 (Complaint) (E.D. Tex May 10, 2023)	X
Ex. 2028	Confidential declaration	X

Exhibit No.	Description	Submitted Previously?
Ex. 2029	*Greenthread, LLC v. OmniVision Technologies Inc.*, 2:23-00212, Preliminary Infringement Contentions for OmniVision Technologies Inc.	X
Ex. 2030	[redacted]	X
Ex. 2031	Intel RealSense Product Family D400 Series, dated September 2023	X
Ex. 2032	Confidential declaration	X
Ex. 2033	GlobalFoundries Annual Report on Form 20-F for the fiscal year ended December 31, 2022, available at https://investors.gf.com/static-files/cc73efd0-09c1-442a-b4dd-0bcb74610e31	X
Ex. 2034	Confidential agreement	X
Ex. 2035	TechInsights Report on [redacted]	X
Ex. 2036	TechInsights Report Ad	X
Ex. 2037	Email communication from Petitioners' counsel to Patent Owner's counsel dated between January 9, 2024 through January 10, 2024	X
Ex. 2038	Email communication from Petitioners' counsel to Patent Owner's counsel dated between October 20, 2023 through October 31, 2023	X

Exhibit No.	Description	Submitted Previously?
Ex. 2039	*Greenthread, LLC v. Intel Corp.*, No. 6:22-cv-00105-ADA, Dkt. 7 (summons returned executed) (W.D. Tex. Feb. 7, 2022)	X
Ex. 2040	[redacted]	X
Ex. 2041	[redacted]	X
Ex. 2042	[redacted]	X
Ex. 2043	*Greenthread, LLC v. OmniVision Technologies Inc.*; 2:23-cv-212 (OmniVision's Responses and Objections to Greenthread's Fourth Set of Common Interrogatories)	X
Ex. 2044	Email communication from Petitioners' counsel to Patent Owner's counsel dated between November 28, 2023 through December 6, 2023	X
Ex. 2045	[redacted]	X
Ex. 2046	Email communication to Petitioners' counsel attaching production dated October 5, 2023	X
Ex. 2047	Email communication to Petitioners' counsel attaching production dated June 30, 2023	X
Ex. 2048	*Greenthread, LLC v. Samsung Electronics Co., Ltd. et al*, EDTX-2-19-cv-00147, Dkt. 1 (Complaint) (E.D.Tex., April 30, 2019)	X

Exhibit No.	Description	Submitted Previously?
Ex. 2049	*Greenthread, LLC v. Samsung Electronics Co., Ltd. et al*, EDTX-2-19-cv-00147, Dkt. 6 (Order granting Motion for Extension of Time, and Waiver of Foreign Service Requirement) (E.D.Tex., May 31, 2019)	X
Ex. 2050	Correspondence from Patent Owner's counsel to Petitioners' counsel dated May 4, 2023	X
Ex. 2051	Webpage from DigiKey for Cirrus Logic CS35L41 (https://www.digikey.com/en/products/detail/cirrus-logic-inc/CS35L41-CWZR/16377919)	X
Ex. 2052	Webpage from DigiKey for Cirrus Logic CS40L25 (https://www.mouser.com/ProductDetail/Cirrus-Logic/CS40L25-CWZR?qs=xZ%2FP%252Ba9zWqYWfeisEtcaTA%3D%3D)	X
Ex. 2053	Webpage from Mouser for Cirrus Logic CS40L25 (https://www.mouser.com/ProductDetail/Cirrus-Logic/CS40L25-CWZR?qs=xZ%2FP%252Ba9zWqYWfeisEtcaTA%3D%3D)	X
Ex. 2054	Webpage from ArduCam for OmniVision OV9282 (https://www.arducam.com/product/ov9282-monochrome-globalshutter-camera-module-depthai-oak/)	X
Ex. 2055	Webpage from Uctronics for OmniVision OV9282 (https://www.uctronics.com/ov9282-monochrome-global-shutter-camera-module-depthai-oak.html)	X
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.)	

Exhibit No.	Description	Submitted Previously?
Ex. 2057	Declaration of Dr. Alexander Glew	
Ex. 2058	Transcript of Deposition of Dr. Sanjay Banerjee	
Ex. 2059	Excerpts from Chen, J. Y., CMOS Devices and Technology for VLSI, Prentice-Hall (1990)	
Ex. 2060	U.S. Patent No. 5,384,476 ("Nishizawa")	
Ex. 2061	CV of Dr. Alexander Glew	
Ex. 2062	U.S. Patent No. 8,421,195	
Ex. 2063	U.S. Patent No. 10,510,842	
Ex. 2064	U.S. Patent No. 9,190,502	
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. 8,421,195	
Ex. 2068	File History of U.S. Patent No. 10,510,842	
Ex. 2069	File History of U.S. Patent No. 9,190,502	

Exhibit No.	Description	Submitted Previously?
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)	
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*, IPR2023-00552, Ex. 1003 (Dr. Blalock Declaration), Jan. 31, 2023	
Ex. 2077	*Greenthread, LLC v. Cirrus Logic, Inc.*, No. 1:23-cv-00369-DC, Dkt. 86 (W.D. Tex. Jul. 11, 2024)	

I. INTRODUCTION[1]

The Petition fails, because none of Petitioners' references expressly teach "the drift layer further having a first static unidirectional electric drift field to aid the movement of carriers from the surface layer to an area of the substrate where there are no active regions" or "the well region having a graded concentration of dopants [] to aid the movement of carriers from the surface layer" downward.

Payne and Onoda do not say anything at all about using graded dopants to move carriers. They just have a concentration that Petitioners say is graded.

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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 30, the "Decision") and to the Petition for *Inter Partes* Review (Paper 1, "Petition") filed by Cirrus Logic, Inc. ("Cirrus"), OmniVision Technologies, Inc. ("OmniVision"), and ams Sensors USA, Inc. (collectively, "Petitioners"; ams Sensors USA, Inc. is no longer a party). This Response is timely filed in accordance with the parties' stipulation (Paper 35). The Board instituted review of U.S. Patent No. 11,121,222 ("the '222 patent" or "the Challenged Patent") (Ex. 1001) on three grounds that challenge claim 44 ("the Challenged Claim") of the Challenged Patent. Decision, 5, 32.

In the absence of any teaching of the claim limitation in the prior art, Petitioners have two options: 1) they can read "aid the movement of carriers from said surface layer" out of the claim or 2) they can argue that any "graded concentration of dopants" in the active region will "aid the movement of 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). Petitioners cannot ignore a claim limitation.

The second option—inherency—also fails. The "probability or possibility" that a dopant gradient aids carrier movement "is insufficient." In re Robertson, 169 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). Petitioners cannot possibly overcome this high bar.

First, one of the Petitioners, *admitted that a graded dopant concentration does not inherently aid carrier movement.* In the parallel district court proceedings Cirrus's 30(b)(6) witness on "[t]he movement of carriers" in the accused devices testified that it is impossible to determine whether a dopant gradient aids the

movement of minority carriers based on knowledge of the dopant gradient alone, because "there's a long list of … physical attributes which affect the movement of carriers." Id. at 72:6-8. He said that "there's other things that might affect carrier movement besides the gradient." 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 carrier movement" 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). Petitioners cannot take the "aid the movement of carriers" limitation out of the patent for validity and then put it back in for infringement.

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 without the threat of any litigation*. These companies approached Greenthread first. 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 Petitioners' competitors looked at the evidence and came to the opposite conclusion than what

Petitioners urge here. The Board should reach the same conclusion as [redacted] and confirm the patentability of the Challenged Claim.

II. THE '222 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, 1:48-63. Dr. Rao (the named inventor) recognized, however, that graded concentrations of dopants can be used to improve certain aspects of the performance of transistors and other semiconductor devices. *Id.*, Abstract, 3:25-35, 3:56-58. 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 Payne (Ex. 1005). Pet., 7. The Petition's second ground relies on Onoda (Ex. 1042) for anticipation, and the third ground relies on Onoda as the primary reference for an obviousness combination. Pet., 7. Dr. Glew provides an overview of pertinent portions of these references relevant to the present dispute. Ex. 2057, ¶¶38-45.

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 Claim. Each term of the Challenged Claim should be given its plain and ordinary meaning. Ex. 2057, ¶¶20-25, 46. However, as discussed below, Petitioners' argument rests on an improper collapsing of the terms "graded concentration of dopants" and "aid the movement of carriers." Further, Petitioners assert that the "aid the movement of carriers" limitation can be met in situations where there is no carrier movement—an absurd result. *Infra* Section VI.A.1. In light of Petitioners' positions, the Board should clarify that these are separate terms and that the plain and ordinary meaning of "aid the movement of 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 CLAIM

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 carriers" limitations (Elements [44.5]/[44.6]) which are found in the Challenged Claim.

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

Petitioners' references do not teach the "aid the movement of carriers" claim limitation. Therefore, to locate "aid the movement of carriers" in the prior art, Petitioners assert that *any* "graded concentration of dopants" will "aid the movement of carriers." Petitioners are wrong.

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

Petitioner Cirrus Logic has admitted that a graded concentration of dopants does not inherently aid carrier movement. Cirrus's 30(b)(6) witness on the "movement of carriers" in its devices, Scott Warrick, agreed 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). Greenthread showed Cirrus's corporate representative a doping profile from one of the Cirrus accused products and asked him if the downward sloping gradient met the "aid carrier movement" 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.***" Id. at 95:2-5; 96:1-13 (PDF pages 20-21 of 118) (emphasis added). Petitioners cannot interpret Greenthread's claims one way when comparing them to the accused products and another when comparing them to the prior art. *Amazon.com, Inc. v. Barnesandnoble.com, Inc.*, 239 F.3d 1343, 1351 (Fed. Cir. 2001).

Second, Greenthread's expert, Dr. Glew, agrees that the net force acting on a carrier is what determines whether it moves and the direction of motion. Ex. 2057, ¶¶47-51. Other forces, such as the intrinsic resistance of silicon, may prevent movement or push in the opposite direction from the force exerted by the gradient. Petitioners' assumption that the gradients in their prior art references would aid carrier movement fails, because they assume that any gradient would suffice to overcome the other forces that are present, such as the inherent resistance of silicon. Since Petitioners do not measure or account for these forces, and do 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.

Indeed, Petitioners' 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, Petitioners' "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 carriers" requires "movement." Petitioners fail to address this claim limitation. *Id*., ¶50.

Third, the specification, like Greenthread's statements during prosecution, describes the slope of the dopant concentration as a relevant parameter for determining whether a concentration gradient will aid carrier movement. "The gradient can be linear, quasi linear, exponential or complimentary error function. The relative slope of the donor concentration throughout the base creates a suitable aiding drift electric field, to help the" carriers move. Ex. 1001, 2:60-64.

Fourth, during prosecution, the examiner 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. 1020, 270. This is exactly what Cirrus Logic's 30(b)(6) and Greenthread's expert testified. Ex. 2057, ¶50.

Fifth, not one but two District Courts have previously agreed with Greenthread that not *all* doping gradients *must* 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 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).

2. Greenthread never said all graded dopant concentrations aid the movement of carriers.

Petitioners argue that Greenthread admitted that any dopant gradient would "aid the movement of carriers," but Greenthread's claims themselves show why that cannot be so. 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 carriers*" "strongly implies" that a "graded concentration of dopants" "does not inherently" "aid the movement of carriers." *Id.*

Petitioners point to the prosecution history to support conflating "graded" with "aided," but—setting aside the fact that Petitioners misrepresent 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, Petitioners argue 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 32-33. 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 carriers" is a separate claim element from "graded dopant concentration"—the exact opposite of what Petitioners assert. 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. 1030 (Patent Owner's Responsive Claim Construction Brief) at 38.

Further, Petitioners claim 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 32-33. Greenthread, however, added that the movement of carriers "[*d*]*epend*[*s*] *on the particular slope* of the graded concentration of dopant[s]." Ex. 1020 (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 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 carriers" limitation. (Elements [44.5], [44.6]).

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 carriers."[2]

1. The Petition fails, because it restricts its analysis to the direction of the gradient—and nothing else.

The Petition fails because it rests on a false premise. As discussed above, a mere downward sloping gradient does *not* inherently "aid the movement of minority carriers." *See supra* Section VI.A. Cirrus admitted that the existence of a gradient alone is not enough to determine whether the gradient would "aid carrier movement." *See* Ex. 2056 (Warrick Deposition) at 95:2-96:13 (PDF pages 20-21 of 118). Since the Petition fails to analyze the magnitude of the dopant gradient or the

[2] (A) Element [44.5]: "the drift layer further having a first static unidirectional electric drift field to ***aid the movement of carriers*** from the surface layer to an area of the substrate where there are no active regions" and (B) Element [44.6]: "the well region having a graded concentration of dopants and a second static unidirectional electric drift field to ***aid the movement of carriers*** from the surface layer to the area of the substrate where there are no active regions."

magnitude of other forces, it cannot show that the prior art dopant gradients aided carrier movement. Ex. 2057, ¶¶50-51.

2. Petitioners' Payne-Based Arguments are Deficient.

The Petition fails to demonstrate that Payne teaches the "aid the movement of carriers" claim limitation. The Petition points to Figures 10-11 of Payne for the claimed "graded concentration of dopants" of limitations [44.5]-[44.6]. Pet. at 30-46. But for the claimed "aid the movement of carriers" feature of limitations [44.5] and [44.6], the Petition relies entirely on Greenthread's supposed admissions:

> Payne's downward-sloping graded-dopant concentration aids the movement of minority carriers from the surface layer to the substrate … *to the same extent* to which Applicant relied on the prior art and admitted to the Patent Office that such carrier movement would occur under the same scenario.

Pet. at 32 (emphasis added). As explained above (*see supra* Sections VI.A.2, VI.B.1), Petitioners' premise is flawed; indeed, as Cirrus testified, "other things … might affect carrier movement besides the gradient[.]" Ex. 2056 (Warrick Deposition) at 96:10-13 (PDF page 21 of 118). Petitioners and Dr. Banerjee did not take into account anything besides the existence of a downward-sloping concentration gradient in concluding that Payne teaches the "aid the movement of carriers" aspect of limitations [44.5] (Pet., 30-40) and [44.6] (*id.*, 40-46), and thus their analysis is based on an incorrect premise. Ex. 2057, ¶¶50-51.

3. Petitioners' Onoda-Based Arguments are Deficient.

The Petition's Onoda-based grounds fail for similar reasons as the Payne-based ground: Onoda does not say that the dopant gradient it discloses has any effect on carriers at all. For these grounds, the Petition points to Onoda disclosing "a downward-sloping dopant concentration" where, "given Applicant's repeated representations[,]" "such a downward-sloping graded-dopant concentration creates a 'built-in' unidirectional electric drift field to aid the movement of minority carriers[.]" Pet. at 68-71. As explained above, the existence of a downward-sloping graded-dopant concentration alone is not sufficient to establish the "aid the movement of carriers" claim limitation. *Supra* Sections VI.A.2, VI.B.1. As explained above (*see supra* Sections VI.A.2, VI.B.1), Petitioners' premise is flawed; indeed, as Cirrus testified, "other things … might affect carrier movement besides the gradient[.]" Ex. 2056 (Warrick Deposition) at 96:10-13 (PDF page 21 of 118). Petitioners and Dr. Banerjee 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 carriers" aspect of limitations [44.5] (Pet., 68-72) and [44.6] (*id.*, 72-80), and thus their analysis is based on an incorrect premise. Ex. 2057, ¶¶51-54.

The Petition relies on Onoda in view of Wolf for the Challenged Claim in Ground III. Pet., 7. But Wolf does not cure the above-discussed deficiencies of

Petitioners' Onoda-based analysis for the Challenged Claim. Pet., 49-50 (Petition's reliance on Wolf for preamble of claim 44, but not for elements [44.5]/[44.6], 68-80 (Petition's analysis of elements [44.5]/[44.6], not relying on Wolf). Therefore, Ground III is deficient.

C. The Petition has not presented proper obviousness analysis.

Ground I of the Petition is characterized as obviousness over Payne. Pet., 7 (specifying "§ 103" as the basis for Ground I), 16 ("Payne renders claim 44 obvious."). But, this putative obviousness ground is defective because Petitioners have not conducted a proper obviousness analysis, as explained below.

1. Petitioners cannot prevail under either obviousness or anticipation.

Ground I, which the Petition characterizes as an obviousness ground under 35 U.S.C. § 103 (Pet., 7, 16), contains no actual obviousness analysis and does not even mention "obvious" or "obviousness" for the Challenged Claims (apart from cursory, conclusory mention of rendering obvious various elements)—which is a fatal flaw for an obviousness ground. Pet., 17 (stating regarding element [44.1]: "Payne discloses, or at a minimum, renders obvious this element."), 21 (stating "Payne discloses or renders obvious this element" regarding element [44.3]), 24 (stating same regarding element [44.4]), 30 (stating "Payne discloses or, at a minimum, renders obvious this element" regarding element [44.5]), 40 (stating same regarding element [44.6]). *Kranos Corp. v. Riddell, Inc.*, IPR2016-01646, Paper 10 at 68

(PTAB Feb. 14, 2017) ("[O]bviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.") (citing *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007)). The Petition attempts to have its cake and eat it too, purportedly pursuing an obviousness ground and yet apparently contending that Payne itself discloses all the elements of claim 44. In Ground I of the Petition, there is no articulated reasoning with any rational underpinning supporting the legal conclusion of obviousness with respect to any limitations of claim 44, and consequently the Petition's analysis for that ground is deficient.

It is well established in patent law that: "The question of obviousness is resolved on the basis of underlying factual determinations, including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) where in evidence, so-called secondary considerations." *Apple Inc. v. Yu*, IPR2019-01258, Paper 29 at 39 (PTAB Jan. 5, 2021) (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966)). By not addressing what is missing from Payne such that an obviousness modification would be hypothetically made, the Petition's analysis is flawed at least with respect to the second Graham factor noted above.

Additionally, the Petition does not analyze for Ground I whether a POSITA would have had a reasonable expectation of success regarding any hypothetical obviousness implementation (which the Petition does not even mention)—which is a required component of obviousness analysis even for a single-reference obviousness ground as in the Petition. *In re Stepan Co.*, 868 F.3d 1342, 1346 n.1 (Fed. Cir. 2017) ("The dissent suggests the PTO need not establish a reasonable expectation of success where there is a single prior art reference. … We do not agree.").

Thus, Petitioners have only presented analysis regarding what Payne allegedly *discloses*, not what that reference renders obvious. Petitioners are confined to their arguments in Ground I regarding what Payne allegedly discloses. And Petitioners cannot win on obviousness for claim 44 when Petitioners and their expert Dr. Banerjee have not even addressed any obviousness analysis or what is missing from Payne that Petitioners might be using obviousness to bridge.

2. Petitioners had the chance to draft their Petition clearly, and rewarding Petitioners here would violate the APA's notice requirements for IPRs.

As explained above in Section VI.C.1, the Petition cannot be the basis for the Board finding claim 44 unpatentable over Payne under either obviousness or anticipation. That legal limbo is entirely of Petitioners' own making, because Petitioners had the opportunity to draft their Petition however they wanted and yet

opted to proceed with no anticipation grounds regarding Payne and a single-reference obviousness ground (Ground I) that lacks proper obviousness analysis for claim 44, as noted above. "The burden is on Petitioner, not the Board, to specify with particularity how [the prior art] teaches [various claimed features]." *Amazon Web Services, Inc. v. Saint Regis Mohawk Tribe*, IPR2019-00103, Paper 22 at 17 (PTAB May 10, 2019). Petitioners' unclear statements as to whether they are relying on obviousness, or instead on Payne's teachings, for claim 44 in Ground I impermissibly shift the burden away from Petitioners, and therefore should not be rewarded. *Id.* ("By failing to address whether [a certain reference] teaches a memory hierarchy, and movement of data between members of the memory hierarchy, Petitioner has placed the burden on the Board to ascertain how the prior art allegedly reads on the challenged claims—a task we do not undertake."); *see also Corning Incorp. v. Danjou's DSM IP Assets B.V.*, Case No. IPR2013-00043, Paper 95 at 13 (PTAB May 1, 2014) (citing the 7th Circuit's statement that "[a] brief must make all arguments accessible to the judges, rather than ask them to play archaeologist with the record.")

The futility of the Petition under both obviousness and anticipation is not some hyperliteral technicality that the Board may overlook, but rather goes to the heart of the procedural requirements imposed on the Board by the Administrative Procedures Act (APA). Indeed, in another IPR much like the present one, the Federal Circuit

held that the Board "deviated impermissibly from the invalidity theory set forth in [the petitioner's] petition when it held that [a certain claim] was anticipated by [a certain prior art reference]" that was not specified as an anticipatory reference in a ground of that IPR. *M&K Holdings, Inc. v. Samsung Elecs. Co.*, 985 F.3d 1376, 1385 (Fed. Cir. 2021). *M&K Holdings* involved a situation in which [redacted] petition asserted obviousness of a certain claim over a combination of three prior art references, without including an anticipation ground for that claim. *Id.* at 1386. In its final written decision, the Board stated that it was holding that claim to be obvious over the combination of three references, yet its analysis of the patentability of that claim was based on anticipation, not obviousness. *Id.* The Board further stated that a disclosure anticipating a claim also renders that claim obvious because "anticipation is the epitome of obviousness." *Id.* at 1385 (internal citation omitted).

As the Federal Circuit explained in *M&K Holdings*, the patent owner "was not put on notice that the Board might find that [the reference relied upon by the Board] disclosed all of the limitations in [the claim] and might invalidate [the claim] based on anticipation," and "[t]hat amounts to a marked deviation" from the invalidity theory set forth in [redacted] petition. *Id.* The Board explained that "[i]n a formal adjudication, such as an inter partes review, the [APA] imposes particular procedural requirements on the Board," and "[t]he Board must timely inform the patent owner of the matters of fact and law asserted and give all interested parties

the opportunity to submit and consider facts and arguments, among other requirements." *Id.* at 1383 (internal citation and quotation marks omitted). The Board further explained that the underlying concern was that if the Board "departed markedly from the evidence and theories presented by the petition or institution decision, [that would] creat[e] unfair surprise." *Id.* at 1384. (citing *Arthrex Inc. v. Smith & Nephew, Inc.*, 935 F.3d 1319, 1328 (Fed. Cir. 2019).

The same concern compels the Board to reject Petitioners' improper challenge here. Just like in *M&K Holdings*, Petitioners have opted for an obviousness ground based on Payne instead of an anticipation ground. Indeed, in *M&K Holdings*, the Federal Circuit specifically found the presence of an obviousness ground and the absence of an anticipation ground as an alternative unpatentability theory to cut against the petitioner. *M&K Holdings*, 985 F.3d at 1386. Here, Patent Owner relied upon the Petition to craft its strategy (e.g., regarding deposing Petitioners' expert, preparing this Response, etc.), and a finding of anticipation by the Board (even if the Board characterizes it as obviousness, like in *M&K Holdings*) would constitute unfair surprise that impermissibly deprives Patent Owner of notice under the APA. Indeed, Patent Owner has already been prejudiced by Petitioners' unclear presentation of its grounds because although Patent Owner has included arguments regarding secondary considerations of nonobviousness based on licensing (*infra* Section VII), Patent Owner has had to allocate its resources (word count, time, and

cost) without knowing whether Ground I truly is an obviousness ground or not. Clearly, secondary considerations of nonobviousness apply only in the context of an obviousness challenge, and Patent Owner has not presented arguments/evidence regarding various other secondary considerations factors out of concern about potentially wasting words on what appears to not truly be obviousness grounds.

Notwithstanding Petitioners' vague Petition or any arguments Petitioners may make in their reply to this Response, the Board cannot apply principles of anticipation to find the Challenged Claim obvious over Payne. The requisite analysis here is obviousness analysis because the Petition includes an obviousness ground under § 103 based on Payne, and as explained above, Petitioners have failed to provide proper obviousness analysis in that ground.

In sum, Petitioners could have drafted their Petition more clearly to include actual obviousness analysis, or an anticipation ground based on Payne—yet opted instead to present a deeply defective Petition.

VII. OBJECTIVE INDICIA OF NON-OBVIOUSNESS ESTABLISH THAT THE CHALLENGED CLAIM IS 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]. 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.[3]

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, 3:52-56. The specification also ties that part of the invention to "important performance enhancements" in semiconductor devices such as "decrease[d] programming time in nonvolatile memory devices" and "[p]ixel and color resolution … enhance[ments] in imaging ICs." *Id.*, 3:30-31, 3:47-49, 3:64-4:2.

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

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[3] 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.

(Ex. 1001); 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. 2062); 9,190,502 (Ex. 2064) ("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 Payne and Onoda, at best, show a downward sloping gradient, with no information about whether, why, or how such a gradient might be useful. *Supra* Section VI. Petitioners rely 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 Petitioners' 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.

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 PETITIONERS' EXPERT IS UNRELIABLE.

The declaration of Petitioners' expert Dr. Banerjee (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. Banerjee admitted that portions of his declaration include material that was merely provided to him by Petitioners' attorneys.

Dr. Banerjee's declaration relies on the same Payne reference as the expert declaration of Dr. Travis Blalock supporting an IPR petition that Intel previously filed against the Challenged Patent. *See* Ex. 2076 (Blalock declaration). And more significantly, the Payne-based analysis in Dr. Banerjee's declaration matches Dr. Blalock's declaration nearly verbatim. *Compare* Ex. 1003 *with* Ex. 2076. For example, regarding claim elements [44.5]-[44.6], which recite the "aid the movement of carriers" feature discussed above in Section VI, Dr. Banerjee's declaration is nearly identical to Dr. Blalock's declaration. *Compare* Ex. 1003, ¶¶90-121 *with* Ex. 2076, ¶¶89-117. Dr. Banerjee stated during his deposition that he was given Dr. Blalock's declaration and that he "didn't see any point in reinventing the wheel." Ex. 2058, 53:13-54:10; *see also id.*, 54:11-17 (when asked

if it would surprise him that his analysis matches the analysis of Intel's expert Dr. Blalock almost verbatim, Dr. Banerjee responded "[i]t does not surprise me"), 57:13-58:5 (Q: "[I]f we were to do a line-by-line comparison here, would it surprise you to find substantially identical lines and sentences in paragraphs in Dr. Blalock's declarations and your declarations?" / A: "No, it did not surprise me. …").

It is simply not plausible that Dr. Banerjee reached the exact same conclusions as Dr. Blalock on ***every*** aspect of the latter's analysis regarding the Payne-based grounds. Instead, it is apparent that Petitioners just asked Dr. Banerjee to sign on to Dr. Blalock's existing analysis, and Dr. Banerjee complied.

These are not the hallmarks of a reliable declarant or declaration.

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

A. Background

1. Prior Litigation Involving the Challenged Patents

a. [redacted] Litigation

On April 30, 2019, Greenthread filed a complaint against [redacted] 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 [redacted] settled the litigation and Greenthread granted a license to [redacted] as described below.

b. Intel-[redacted]-[redacted] Litigation

On February 1, 2022, Greenthread served Intel and [redacted] with a complaint filed in the Western District of Texas alleging infringement all of the Challenged Patents, except the '014 patent. Ex. 2001 (Complaint), 1-4; Ex. 2039 (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. 2040 (IPR2023-00324, Petition), Ex. 2041 (IPR2023-00325, Petition), Ex. 2042 (IPR2023-00375, Petition). The [redacted]

petitions named [redacted] as a real-party-in-interest. *E.g.*, Ex. 2008, 7; Ex. 2040, 7; Ex. 2041, 7; Ex. 2042, 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 [redacted] Ex. 2010. [redacted] other counsel did not represent [redacted] Greenthread and Intel, [redacted] settled their disputes and Greenthread granted [redacted] and Intel licenses as described below.

c. Greenthread Licenses to [redacted] Intel, and [redacted]

As part of the settlements, Greenthread granted [redacted] Intel, and [redacted] releases for past infringement and a license to Greenthread's patents, by way of sublicense through RPX Corporation ("RPX") ("Licenses"). Ex. 2022, 2. Greenthread licensed [redacted] (and two other companies) in one agreement signed July 8, 2020. Ex. 2034. Greenthread signed the second agreement, licensing and Intel and [redacted] on April 7, 2023. Ex. 2022. 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 [redacted] acquired the full scope of sublicensable rights Greenthread granted to RPX at the time the RPX-Greenthread Agreement was executed." Ex. 2028.

The Licenses grant Licensees (i.e. [redacted] Intel, and [redacted] 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. 2022, 3 (definition of "Patent License"); Ex. 2034, 3 (definition of "Patent License"); see also Ex. 2028.

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. 2022, 2; Ex. 2034, 2.

The Licenses cover all of Greenthread's patents, including the Challenged Patent. *See* Ex. 2022, 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 Petitioners or "purchase" from Petitioners is a "Licensed Product or Service" which Licensees have the right to "use, … sell, … obtain, … acquire, … receive, … and otherwise exploit." Ex. 2022, 2-3; *see also* Ex. 2034, 2-3.

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

Patent Owner is currently involved in district court litigation against CL and OV. Each of the district court actions was filed before any of these petitions was filed.

a. Cirrus Logic

i. Litigation against Cirrus Logic

On March 31, Greenthread filed a complaint in the U.S. District Court for the Western District of Texas alleging that CL infringes each of the Challenged Patents. Greenthread's preliminary infringement contentions identified, among other products, CL's CS35L41, CS40L25 and CS42L42. Ex. 2018, 4.

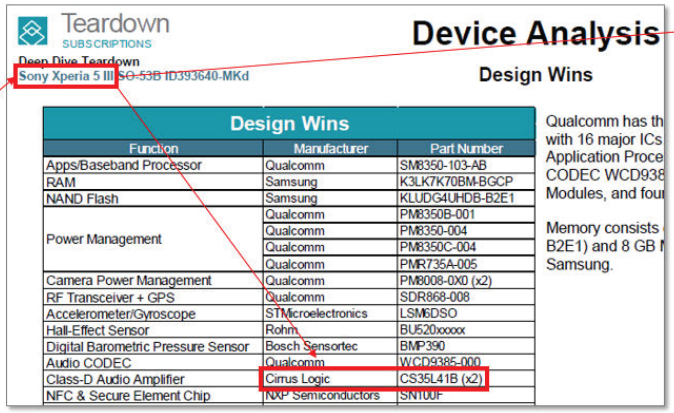
ii. Accused CL product sales overlap with prior litigation.

[redacted] and [redacted] are major CL customers. A CL investor presentation lists [redacted] and [redacted] as among its "Tier One Customers." Ex. 2013, 5.

In 2022, [redacted] published a list of its suppliers, confirming that Cirrus Logic "agreed to be disclosed" as a supplier. Ex. 2045, 1.

Cirrus Logic chips, including those currently accused, are incorporated into numerous [redacted] products, including products accused in the [redacted] litigation. For example, CS35L41 and CS40L25 are both currently accused, Ex. 2018 at 4, and both are components of the [redacted], which was accused in the [redacted] litigation. *Compare* Ex. 2021, 17-18 *with* Ex. 2035 at 2, 10, 63, 64 *with* Ex. 2018 at 4. Additionally, Greenthread has moved to amend its infringement contentions to include all Cirrus Logic products made with a particular Global Foundries process. Ex. 2077, 1. Accordingly, additional products will be added.

Sony Complaint (Ex. 2021 at 17)



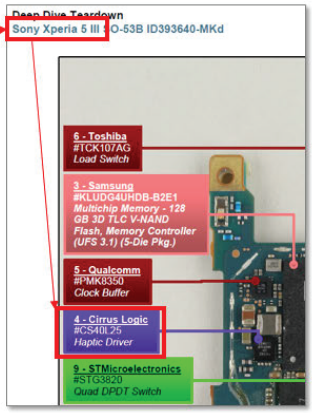
Teardown
SUBSCRIPTIONS
Deep Dive Teardown
Sony Xperia 5 III SO-53B ID393640-MKd

Device Analysis
Design Wins

Design Wins		
Function	Manufacturer	Part Number
Apps/Baseband Processor	Qualcomm	SM8350-103-AB
RAM	Samsung	K3LK7K70BM-BGCP
NAND Flash	Samsung	KLUDG4UHDB-B2E1
Power Management	Qualcomm	PM8350B-001
	Qualcomm	PM8350-004
	Qualcomm	PM8350C-004
	Qualcomm	PMR735A-005
Camera Power Management	Qualcomm	PM8008-0X0 (x2)
RF Transceiver + GPS	Qualcomm	SDR868-008
Accelerometer/Gyroscope	STMicroelectronics	LSM6DSO
Hall-Effect Sensor	Rohm	BU520xxxxx
Digital Barometric Pressure Sensor	Bosch Sensortec	BMP390
Audio CODEC	Qualcomm	WCD9385-000
Class-D Audio Amplifier	Cirrus Logic	CS35L41B (x2)
NFC & Secure Element Chip	NXP Semiconductors	SN100F

Qualcomm has th
with 16 major ICs
Application Proce
CODEC WCD938
Modules, and fou

Memory consists
B2E1) and 8 GB
Samsung.



Xperia Teardown (Ex. 2035 at 2, 63)

iii. Cirrus Logic works closely with and indemnifies Licensees.

CL says that its "engineers work closely with" product teams at electronics manufacturers to make "custom" products. Ex. 2025. CL's standard sales agreements include indemnification of its customer. Ex. 2026, 1, 4-5. CL admits

that it indemnifies Licensees, but claims that the indemnification arrangement is not "straightforward." Paper 11, 8.

iv. Cirrus Logic admits to being a sub-licensee under the Licenses.

After CL received the [redacted] license, CL has insisted that some of its products are licensed, because they are manufactured by one of the other companies licensed in that agreement. CL says it "intend[s] to continue treating the product as a licensed product." Ex. 2037, 1.

b. OmniVision

i. Litigation against OmniVision

On May 10, 2023, Greenthread filed a complaint in the U.S. District Court for the Eastern District of Texas alleging that OmniVision infringes the Challenged Patents. Ex. 2027. On July 6, 2023, Greenthread served its infringement contentions identifying, among other OmniVision products, the OV9282 and OV7261 image sensors. Ex. 2029, 6, 8.

ii. Accused OV Product sales overlap with prior litigation.

OmniVision sells the accused OV9282 to Intel who incorporates it into its RealSense D400 series stereo vision depth camera system. Ex. 2015, 34.

Table 3-13. Wide Left and Right Imager Properties

Parameter	Camera Sensor Properties
Image Sensor	OmniVision OV9282
Active Pixels	1280 X 800
Sensor Aspect Ratio	8:5

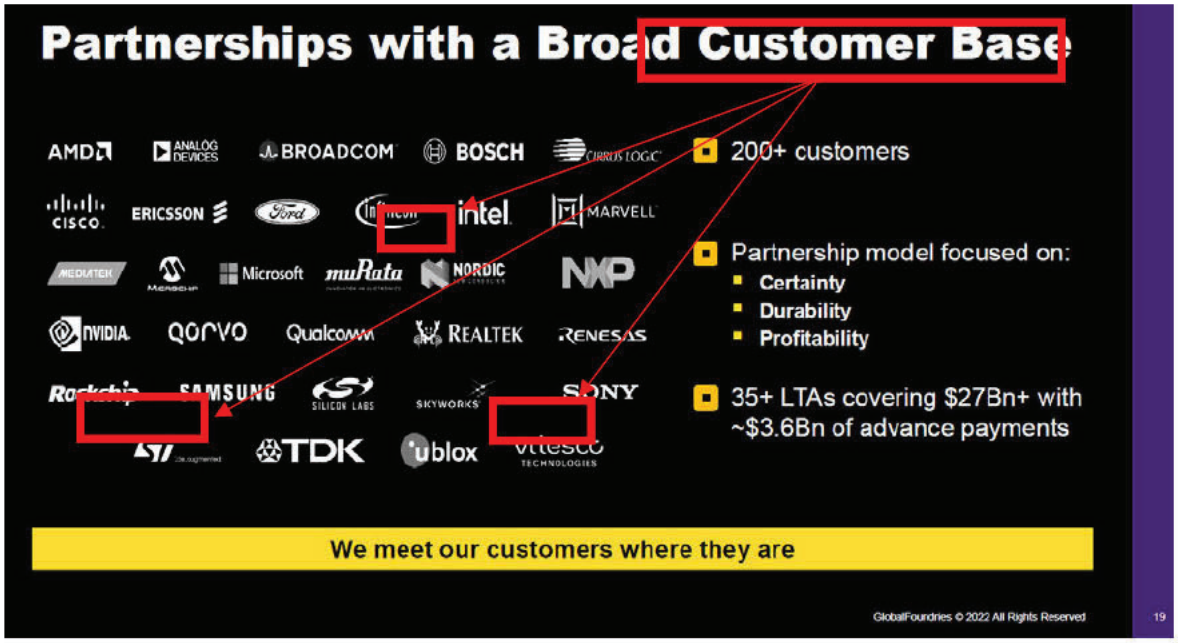
Intel Realsense Datasheet (Ex. 2015 at 34)

iii. OV claims the benefit of the Licenses.

In response to one of Greenthread's interrogatories, OV said it intends to assert a license or exhaustion defense based on sales to [redacted] and/or Intel. Ex. 2043, 6-7. When Greenthread asked OV which products were licensed, OV responded: "Greenthread is in the best position to address its own license agreements and whether OmniVision is a beneficiary in some manner. Please let us know which OmniVision products Greenthread believes are already licensed." Ex. 2044, 1.

c. Global Foundries creates custom products for Licensees and Indemnifies them.

Global Foundries investor materials state that it manufactures products under contract for all three Licensees. Ex. 2014, 19.



Additionally, Global Foundries' investor disclosures state that its primary business is manufacturing to specifications provided by its customers. GF describes itself as a "pure-play foundry" which is "focuse[d] on producing ICs for other companies, rather than those of its own design." Ex. 2033 at 12, 35.

GF "defend[s]" its customers against "intellectual property infringement claims and indemnify[ies] them for damages." Ex. 2033, 24.

3. These Proceedings

On October 11, 2023, Petitioners filed the first petition in these proceedings, IPR2024-00016; IPR2024-00001 followed on October 12 and IPR2024-00017 followed on October 18. On October 20, 2023 Greenthread notified Petitioners that the Petitions are time barred by virtue of Petitioners' contracts with Licensees. Ex. 2011, 1. Greenthread's email included much of the evidence of Petitioners

relationships with Licensees discussed above and pointed Petitioners to the Licenses, which they had already received in discovery.[4] Greenthread requested that Petitioners withdraw their petitions or at a minimum provide discovery into whether the petitions are time barred.

On October 24, 2023, Petitioners responded that they "have demonstrated that the petitions are not time barred" and that they "object to" Greenthread's request for discovery. Ex. 2016, 1.

On October 27, Petitioners filed four more petitions, IPR2024-00018, IPR2024-00019, IPR2024-00020, and IPR2024-00021. In spite of the parties' correspondence, these petitions included the identical assertion that "Petitioner [sic] is not barred or estopped from requesting IPR of the Challenged Claims" unsupported by any argument or evidence whatsoever. IPR2024-00018, Paper 1 (Petition), 4; IPR2024-00019, Paper 1 (Petition), 4; IPR2024-00020, Paper 1 (Petition), 4; IPR2024-00021, Paper 1 (Petition), 4. The same day, Greenthread

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[4] Petitioners were aware of the Licenses before filing any of the Petitions. On May 2, 2023 Greenthread's counsel offered to produce the Licenses to CL. Ex. 2050, 1. CL responded that it had no significant liability and was not interested. Greenthread nevertheless served CL with copies of the Licenses on October 5, 2023. Ex. 2046. Greenthread served OV with copies of the Licenses on June 30, 2023. Ex. 2047.

informed Petitioners that its objections to the first three IPRs applied equally to the additional four. Ex. 2038, 3-4.

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, 12. 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 or even awareness of the prior litigation are <u>*not necessary*</u> to establish privity. Rather, *Taylor* identifies a "pre-existing 'substantive legal relationship'" as <u>*one*</u>

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. Petitioners 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. 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 Petitioners are in privity with [redacted] Intel, or [redacted] Greenthread has disputed the timeliness of the Petition with evidence showing that Petitioners are in privity with Licensees. Petitioners have offered no evidence whatsoever to controvert Greenthread's evidence or demonstrate the timeliness of its Petition. Accordingly, the Petition should be dismissed.

3. The Petitions should be dismissed, because Petitioners have 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 Petitioners 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. Some of the products Petitioners supply, such as those GF manufactures, are custom made for Licensees. Ex. 2014, 19. CL "collaborates" with Intel and makes "custom" products for its customers. Ex. 2020, 1. A number of these products were at issue in the litigation with Licensees, including the Cirrus Logic CS35L41 and CS40L25, which were components of the [redacted] accused in the [redacted] litigation (*compare* Ex. 2021, 17-18 *with* Ex. 2035 at 2, 10, 63, 64 *with* Ex. 2018 at 4), and the OmniVision OV9282, which is a component of Intel's RealSense D400 series stereo vision depth camera system (*compare* Ex. 2015, 34 *with* Ex. 2029, 8.). Petitioners do not dispute, and even acknowledge, that sales of accused products to Licensees are licensed. Ex. 2037, 1; Ex. 2044, 1. Ex. 2038, 6. Finally, Petitioners owe indemnity obligations to Licensees for these products. Ex. 2026, 1, 4-5; Ex. 2033, 24.

b. Petitioners have 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, Petitioners "lose[]," because (1) they have the burden to show that the Petitions are timely and (2) Petitioners deliberately chose to ignore the issue, even after Patent Owner expressly identified it to them. *Id.* In short, Petitioners have not even attempted to meet their burden.

The instant Petition, like all seven of the Petitions, simply asserts, without support or explanation, that "Petitioner [sic] is not barred or estopped from requesting IPR of the Challenged Claims on the grounds identified in this Petition." Pet., 5. That is inadequate. The burden therefore falls on Petitioners to establish that the relationship does *not* create privity. Meeting their burden requires Petitioners to put into the record evidence about its 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 Petitioners, 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 Petitioners' 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.

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

Indeed, not only do Petitioners lose in the absence of any evidence, the "lack of evidence" that would presumably be in Petitioners' 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 Petitioners' resistance to providing evidence to meet their burden that the evidence (not in the record) is unfavorable to Petitioners.

c. Petitioners cannot show timeliness by asserting that they have "standard" relationships.

Petitioners claim that they are not in privity with Licensees' because they "have standard, arms-length relationships with their customers." Paper 11, 7. That is incorrect. There is no "standard" 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, Petitioners admit that they have customer-supplier relationships with time barred parties, but have 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. Petitioners cannot prevail on a "fact-dependent question" when they offer no evidence to support a finding of facts. *AIT*, IPR2015-01750, Paper 128 at 7.

Further, Petitioners do not dispute that "an indemnity relationship is the type of relationship that can establish privity" or that they have such indemnity obligations. *Ericsson*, IPR2017-01197, Paper 56 at 8, 10 (PTAB Sept. 18, 2020). CL just claims that its indemnity obligations are not "straightforward." Paper 11, 8. GF admits indemnifying its customers and does not dispute that its obligations are "straightforward." Ex. 2033, 24. The other petitioner OV does not deny owing indemnity to Licensees and offers no explanation of why its indemnity obligations

to Licensees would not be dispositive here. Since Petitioners bear the burden of persuasion, their failure to produce the contracts is dispositive.[6]

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 Petitioners bear the burden of proof on that issue and have not even attempted to meet their burden. If the Board chooses

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[6] The fact that Greenthread did not raise a *res judicata* defense in district court in response to invalidity counterclaims is irrelevant. When a patent owner and the same alleged infringer are involved in successive litigation regarding the same patent, the alleged infringer may re-assert an invalidity defense if the accused products in the second litigation are materially different than those in the first litigation. *Hallco Mfg. Co. v. Foster*, 256 F.3d 1290, 1297 (Fed. Cir. 2001). Here, Greenthread is alleging infringement based on some products that were at issue in the prior litigation, but also other products that are materially different. Therefore, even if Greenthread were litigating against Intel or [redacted] themselves, those parties would be able to re-assert their invalidity defenses, because the products in the litigations are different.

to look at the evidence of record, however, it is clear that the Petitions are time-barred.

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, Petitioners are in privity with Licensees. Since Licensees are time-barred, Petitioners are likewise time-barred.

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

Petitioners are 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."[7]

Here, Petitioners are 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 Petitioners are 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 Petitioners 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*, Petitioners "[a]ssembl[e] equipment"—or manufacture accused products—at Petitioners' instruction. For example, when GF

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[7] 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.

"produc[es] ICs for other companies, rather than those of its own design," or when CL makes "custom" products, their actions are legally indistinguishable from the contractors in Google assembling equipment at Google's direction. Ex. 2033 at 12, 35. Therefore, Petitioners are Licensees' agent and is in privity with Licensees. *Herrion*, 448 F. App'x at 73.

Finally, to be in privity with Licensees, Petitioners do not need to be Licensees' agent for these proceedings or the prior proceedings. What matters is whether Petitioners are agents 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 Petitioners' 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. Petitioners and Licensees are "preceding and succeeding owners of property" and parties to sales of accused goods.

It is undisputed that Petitioners on the one hand and Licensees on the other are "preceding and succeeding owners of" the licensed and/or infringing products, because Petitioners products are indisputably components of Licensees' products.[8] *Taylor*, 553 U.S. at 894.

Petitioners also do not dispute that several of these Licensee products were accused in the prior litigation, including [redacted]. GF has not identified what products it makes for Licensees, but GF products, such as accused Intel or [redacted] chips, may actually be Licensees' products, not just components.[9]

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[8] Petitioners apparently sell at least some of these accused models to parties other than licensees, such as Digikey and Mouser Electronics. Exs. 2051-2055. These sales and sales of other accused products are the subject of the current district court litigation.

[9] Even if none of the products currently accused by model number were sold to Licensees, Greenthread has moved to amend its infringement contentions against Cirrus Logic and add GlobalFoundries as a party to the case. "'It is expected that during [] discovery, infringement contentions may be clarified or refined' based

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 Petitioners 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 Petitioners and Licensees in privity. *WesternGeco*, 889 F.3d at 1318.

In their opposition to Greenthread's discovery motion, CL and OV tried to distance themselves from Licensees, by claiming to sell to Licensees through "distributors." Paper 11, 8, 9. This argument fails.

First, GF does not claim to sell through distributors. It makes products for Licensees, according to Licensees' specifications. Ex. 2033 at 12, 35. Since GF is in privity with Licensees, the Petitions are time barred, even if CL and OV are not independently in privity. 35 U.S.C. § 315(b).

Second, CL and OV do not dispute that their products are components in Licensee products, including products accused in the prior litigation. If CL and OV

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upon information produced during discovery." *Arigna Tech. Ltd. v. Volkswagen AG*, No. 2:21-cv-00054, 2022 WL 2761288, at *2 (E.D. Tex. Jan. 19, 2022)).

believe that there is some relevance to their use of distributors, they must provide evidence showing how their products are sold and their contracts with Licensees and/or "distributors." For example, Petitioners do not provide evidence, showing whether all the relevant products are sold through distributors. Petitioners also do not indicate whether any "distributors" are Licensees' contractors, such as third-parties who assemble Licensees products.

Third, even if CL's and OV's claims were supported by evidence, selling through distributors does not change the fact that CL and OV have direct relationships with Licensees and make the products for Licensees. CL says that its "engineers work closely with" product teams at electronics manufacturers to make "custom" products. Ex. 2025. CL "collaborat[es]" with Intel. Ex. 2020, 1. Additionally, CL acknowledges that it owes indemnity to Licensees. CL just asserts that its obligation is not "straightforward." Paper 11, 8.

Finally, how CL's and OV's products end up in Licensee's products is irrelevant. CL and OV are still preceding owners of property that was previously accused and is accused again, even if the property flows through another party.

i. Petitioners 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, Petitioners operate under and are beneficiaries of Licensees' agreements with Patent Owner. That agreement is "directly related to" the accused products. *Id.*

Under the Licenses, "any product" Licensees "have made" by Petitioners or "purchase" from Petitioners 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. Petitioners are 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, Petitioners are beneficiaries 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. Petitioners' 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 Petitioners sell 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 Petitioners 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 Petitioners even asserts a license defense. Petitioners still limit Patent owner's rights vis-à-vis the "property" they sell under the Licenses by giving future owners an exhaustion defense. Thus, Petitioners effectively provide rights to third-parties under the Licenses and, therefore, is in privity with Licensees.

c. Petitioners' indemnity obligations to Licensees support a finding of privity.

"[A]n indemnity relationship is the type of relationship that can establish privity," particularly when the indemnity obligations "directly relate to the" accused products. *Ericsson*, IPR2017-01197, Paper 56 at 8, 10. Here, CL does not dispute that it indemnifies Licensees, but instead claims that its indemnity obligation is not "straightforward." Paper 11, 8. CL does not say what is not "straightforward" about its indemnity obligations and does not deny that they apply to accused products. If CL believes that its indemnity obligations do not create privity, it must explain why and produce the relevant documents

GF also admits that it indemnifies its customers. GF does not characterize its obligations in any way which would negate a finding of privity. Ex. 2033, 24. To the contrary, it says that in the past these indemnity obligations have been significant costs to the company. *Id.*

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

a. Petitioners are 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 Petitioners are attempting here. Right now, Petitioners want to claim that they are strangers to Licensees' agreement, and therefore not in privity with them. But, Petitioners refuse to produce any evidence to support that conclusion or to say whether it will later claim the benefit of the agreement to reduce the likely damages against it in district court. Petitioners are "playing fast and loose" with the Board and the district court. *Id.* Petitioners stepped into Licensees' shoes by making and selling products under their license. Petitioners should not be able to take those

shoes off when standing before the Board, only to put them back on again when it appears in district court.[10]

b. Petitioners' 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 Petitioners benefit from a license that does not cover *all* of Petitioners' sales is irrelevant. Petitioners *still benefit* from the license (and exercises Licensees' "have

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[10] Patent Owner is not suggesting that Petitioners could make their Petition timely by disclaiming a license defense in district court. Whether or not Petitioners 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, Petitioners are in privity with Licensees. Petitioners will have the opportunity to challenge the validity of the Challenged Patent in district court. The only question before the Board is whether Petitioners can avail themselves of *additional* challenges here. The answer Congress provided in § 315(b) is "no."

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

A finding in favor of Petitioners 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, Petitioners made various "factual assertions" in its preliminary reply to support institution, which the Board apparently relied on, such as Petitioners' assertion that they have merely "a standard supplier-customer relationship" with Licensees. E.g. Paper 19, at 11 Paper 11, 7 (asserting without evidence that "Petitioners have standard, arms-length relationships with their customers"); *id.* 5 (offering to provide a declaration that was never provided). But there is no evidence to support this conclusion in the record, just the statement from Petitioners' attorney. Greenthread has had no opportunity to cross examine any witness about those assertions or see relevant documents, because Petitioners did not identify a declarant, other than Petitioners' counsel.

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 Petitioners under § 315(b). For example, it is undisputed that Petitioners have a customer-supplier relationship with time-barred parties and that such relationships can create privity. The Board has apparently determined that Petitioners have merely "a standard supplier-customer relationship" with Licensees. E.g. Paper 19, at 11. However, neither Greenthread has not seen the documents governing petitioners' relationships, or any other evidence to support a finding for Petitioners under § 315(b). Therefore, Greenthread has not had the "opportunity to show that [Petitioners' 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 Petitioners are currently litigating their disputes, including the issue of patent validity, in Article III Courts. *Greenthread, LLC v. Cirrus Logic, Inc.*, 23-cv-00369 (W.D. Tex); *Greenthread LLC v. OmniVision Technologies Inc.*, 23-cv-00212 (E.D. Tex.). 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). 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, Petitioners have failed to prove by a preponderance of the evidence that the Challenged Claim is unpatentable. Patent Owner respectfully requests that the Board confirm the patentability of the Challenged Claim and enter judgment against Petitioners.

Dated: August 16, 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 13,278 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.

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CERTIFICATE OF SERVICE

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