

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MONOLITHIC POWER SYSTEMS, INC.,

Petitioner,

v.

GREENTHREAD, LLC,

Patent Owner.

Case No: IPR2024-00468

U.S. Patent No. 8,421,195

PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE

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PUBLIC VERSION

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Petitioner's Reply to Patent Owner's Response

UPDATED EXHIBIT LIST

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Ex. 1007	U.S. Patent No. 6,043,114 to Kawagoe, et al., (“Kawagoe”)
Ex. 1008	Wolf and Tauber, Silicon Processing For The VLSI Era, Vol 1, Lattice Press (2000)
Ex. 1009	U.S. Patent No. 4,160,985 (“Kamins”)
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Ex. 1024	U.S. District Courts – Case Statistics, obtained at https://www.uscourts.gov/statistics-reports/analysis-reports/federal-court-management-statistics , dated June 30, 2023
Ex. 1025	U.S. Patent No. 4,435,896 ("Parrillo")
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Ex. 1027	U.S. Patent Application Publication No. 2007/0045682 to Hong et al. ("Hong")
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Ex. 1042	Certified translation of Japanese Unexamined Patent Application Publication No. H8-279598 ("Onoda")
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Ex. 1055	Deposition of Dr. Alexander Glew
Ex. 1056	Excerpts from LePlante, Electrical Engineering Dictionary, ISBN 0-8493-2170-0 (2000)
Ex. 1057	Excerpts from The Authoritative Dictionary of IEEE Standards Terms, 6 th Ed ISBN 0-7381-2601-2 (2000)
Ex. 1058	Excerpts from Dictionary of Electrical and Computer Engineering, McGraw-Hill, ISB 0-07-144210-3
Ex. 1059	Sproul, Understanding the p-n junction
Ex. 1060	https://www.rpxcorp.com/faqs/#we-are-a-unique-solution-to-all-forms-of-patent-risk
Ex. 1061	https://www.rpxcorp.com/solutions/rpx-network/

INTRODUCTION

PO relies on the false premise that the physical movement of a “minority carrier” must be proven—by calculating all forces in a device—to render obvious “aid the movement of minority carriers” for a device that has a “graded concentration of dopants.” This is not required by the claims or to establish obviousness.

The claims recite an apparatus with a “graded concentration” that creates a “electric drift field” that “aid[s] the movement of minority carriers.” PO twice—without equivocation—argued that a graded dopant concentration inherently creates a field that “aid[s] the movement of minority carriers” to overcome a 35 U.S.C. § 112 rejection and a district court indefiniteness challenge. PO cannot disavow these arguments to avoid obviousness.

Even if PO were allowed to escape those statements—and its all-force-calculation argument were given weight—the prior art still renders obvious the “aid the movement” limitation. Grounds 1-3 teach a downward force, and a POSITA would have found it obvious that it would affect an electron's movement. This is especially true because none of Onoda, Nishizawa, and Kawagoe describe the forces PO deems obviousness-defeating.

The teachings of Nishizawa and Kawagoe of Grounds 2 and 3, respectively, teach “aid the movement of minority carriers.” Nishizawa states that “electrons ...

created by alpha-particle in the p⁺ type buried region 33a” would normally drift upwards with a uniform dopant concentration (EX1046, 18:36-43), and “to prevent such flow of electrons, it is only necessary to form an impurity concentration gradient” (*id.*, 18:46-48). Kawagoe teaches “electrons produced by the a-ray are attracted to the substrate body 2S by that concentration gradient.” (EX1007, 16:7-9.) PO’s arguments ignore these teachings and should be rejected.

THE EVIDENCE DEMONSTRATES OBVIOUSNESS

PO’s arguments do not comport with the claims and its USPTO arguments

PO’s argument improperly injects limitations requiring minority carrier movement by requiring a calculation of all device forces. This is not supported by the claims and directly contradicts PO’s prosecution and district court arguments.

The claims support that a graded dopant concentration meets “aid the movement of minority carriers”

PO’s position is not supported by the claims. The claims recite a device (EX1001, 4:13) that has a “drift layer having a graded concentration of dopants.” (*Id.*, 4:19-23.) They describe a device’s *structure*, not a method and active performance. *ParkerVision, Inc. v. Qualcomm Inc.*, 903 F.3d 1354, 1361 (Fed. Cir. 2018) (device claims “cover what a device *is*, not what a device *does*”). The claims, moreover, merely require that the claimed “electric field” form the “drift layer” “aid the movement,” not that the field overcome all other forces that may exist within a theoretical device—none of which are identified the specification or

prosecution history. *ParkerVision*, 903 F.3d at 1361 (a device may be “reasonably capable of operating so as to meet the claim limitations, even if it does not meet the claim limitations in all modes of operation.”) PO’s restrictions are unsupported.

PO incorrectly argues that Petitioner’s interpretation renders the limitations superfluous. (POR, 12-14.) The claims recite a field, and the “aid the movement” phrase describes the field’s direction. The claims recite a physical element (“graded concentration of dopants,” EX1001, 4:20-21, 4:26-27) along with the field effect it creates (“static unidirectional electric drift field,” *id.*, 4:23-24, 4:27-28). The field effect is limited in the effect it has on minority carriers: it aids their movement ***downward*** (“from said surface layer to said substrate”). PO’s premise is wrong.¹

Moreover, neither district court order supports PO’s arguments. (POR at 13-14.) They involved different disputes and held that the claimed “graded concentration” merely requires a relative slope. The W.D. Tex. order addressed the indefiniteness of a “graded concentration.” (EX2074, 32, 41.) The parties disputed whether “graded” had any meaning; PO argued that the specification sufficiently depicted “graded” because it depicted a downward slope (*id.*, 36, 38) while a third-party argued that “graded” hinges on an intentional design choice and

¹ For the same reason, PO’s usage of *Phillips*’ “steel baffles” is not analogous.

is indefinite. (*Id.*, 34-35.) The court found definiteness based on the specification's disclosure of a relative slope. (*Id.*, 39). The Eastern District of Texas order construed the "single drift layer" and its "unidirectional electric field." (EX2075, 10.) The court addressed whether the construction required a non-varying, constant slope. (*Id.*) The court held that "the slope of the graded concentration need not be solely decreasing or solely increasing to yield the recited 'unidirectional electric drift field.'" (*Id.*, 11.) Neither order supports PO.

PO argued that a "graded concentration," itself, meets "aid the movement" to overcome section 112

PO directly contradicts arguments it made in district court and during prosecution to overcome § 112 challenges. This is improper. *Omega Eng'g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1323 (Fed. Cir. 2003) (patentees cannot "recaptur[e] through claim interpretation specific meanings disclaimed during prosecution"); *Data Engine Techs. LLC v. Google LLC*, 10 F.4th 1375, 1381 (Fed. Cir. 2021) (claims cannot be twisted like a "nose of wax" across challenges).

In district court, PO argued that "aid the movement" is "a simple term" (EX1030, 25) that was definite because "[e]lectric drift fields are a well-known phenomenon that cause carriers to move, and a POSITA would have readily recognized that when a 'static unidirectional electric drift field' is present that it aids the movement of minority carriers." (*Id.*, 26, 2.) PO continued: "[w]hile the claims require that the graded dopants create an electric field that aids movement

of the carriers, they do not require a specific range of doping, a particular doping field, or a particular result, and this information is not necessary to understand the scope of [Inventor's] invention.” (*Id.*, 28.) This directly contradicts PO's newly manufactured arguments that a slope's magnitude, and the combined effects of numerous “forces,” would need to be calculated to ascertain whether the limitation is present in the prior art.

In prosecution, PO stated that “the graded dopant concentration itself creates a ‘built-in’ electrical field that forces the movement of carriers into a particular direction.” (EX1002, 289-90; EX1055, (72:11-74:11 (Dr. Glew agreeing with statement and stating that gradient creates a field vector).) The prosecution history—which PO mischaracterizes—is described below to demonstrate the clarity of PO's admissions.²

To overcome a § 112 rejection, Applicant amended the claims from “drawing all” to “aid the movement of,” and argued that a graded dopant concentration inherently aids movement. The USPTO's rejection argued that the

² The Board has concluded that “statements made by Patent Owner during prosecution of the '195 parent patent contradict its arguments in the present proceeding.” *Monolithic Power Systems, Inc. v. Greenthread, LLC*, IPR2024-00470, Paper 25, 29 (2024).

then-claim limitation of “a unidirectional drift field ***drawing all*** minority carriers from said surface layer to said substrate” lacked enabling support. (EX1002, 269-270 (“It is not clear if simply the application of ‘a unidirectional drift field’ is sufficient to achieve the effect of ‘***drawing all*** minority carriers from said substrate to said surface layer’”) (emphasis added).) The USPTO reasoned that a graded concentration alone would not necessarily ***draw all*** minority carriers to the substrate due to other forces. (*Id.*, 270 (“movement of minority carriers is affected by multiple forces and fields, and it does not appear that simply the presence of ‘a unidirectional drift field’ in itself can achieve ‘drawing all minority carriers from said surface layer to said substrate’”).)

Applicant's response emphatically disagreed, stating that “a unidirectional drift (electric) field ***necessarily affects all*** the present minority carriers in the same way – ***moving all*** minority carriers in the same direction...” (EX1002, 289 (emphases added).) Applicant further argued that the USPTO had failed to recognize that “the ***graded dopant concentration itself*** creates a ‘built-in’ electrical field that ***forces the movement*** of carriers into a particular direction.” (*Id.*, 289-90 (emphases added).) Applicant went even further—“without conceding Applicant's position on this issue,” it amended the claims to recite “aid the movement of minority carriers” instead of “drawing all.” (*Id.*, 290, 286.) Thus, Applicant unequivocally committed itself to the position that a downward dopant

gradient, by itself, “aid[s] the movement of minority carriers.”

Subsequent exchanges confirm this. After the above, the USPTO rejected the claims, stating that the then-pending claim language of “create and maintain a single static unidirectional electric drift field” still failed to comply with § 112. (EX1002, 301, 286.) In response, Applicant removed the language of “maintain” and “single,” but argued that the “static” field was supported because it was “created by [a] graded concentration of dopants which does not change over time.” (*Id.*, 318 (internal quotations omitted).) The claims were subsequently allowed. (*Id.*, 341.)

Applicant, moreover, relied on the teachings of prior art (Kamins/Jastrzebski) to argue that a graded dopant concentration inherently aids minority carrier movement. (EX1002, 333, 290.) Kamins teaches “carriers created below the maximum dopant concentration are accelerated into the substrate” (EX1009, 3:8-10). Jastrzebski teaches “a drift field created by a graded concentration” where the “drift field is... directed to force most of the charge carriers ... deep into the substrate.” (EX1010, 5:12-19.)

To convince the USPTO to issue its claims, PO argued that a downward dopant gradient—in itself—aids carrier movement and that a POSITA would understand as much. PO is now precluded from disavowing those statements.

PO misrepresents the prosecution history

To support its position, PO misrepresents the prosecution history.

First, PO wrongly states that the Examiner argued that “‘without knowing other parameters of the device’ one cannot say whether the field would aid carrier movement.” (POR, 11.) In actuality, the cited rejection did not address the “aid the movement” limitation—it was added *in response to* the cited rejection. (EX1002, 270 (rejection for “drawing all”).)

After this rejection, Applicant removed “drawing all” and added “aid the movement of” to the claims. (*Id.*, 286.) Applicant argued that the drift field affects all carriers and the Examiner had not properly recognized that “the graded dopant concentration itself creates a ‘built-in’ electric field that forces the movement of carriers.” (*Id.*, 289.) The claims were subsequently allowed. (*Id.*, 341.)

Second, PO misrepresents the evidence when it states that, in prosecution, it argued that the graded dopant concentration must move carriers and emphasized that “aid the movement of minority carriers” is a separate element from the graded concentration of dopants. (POR, 14.) PO’s alleged support does not come from

the prosecution history, it cites a section of its claim construction brief—that did not deal with the prosecution history—against Intel. (*Id.* (citing to EX1030, 29).)³

Third, PO falsely claims that the slope's magnitude was emphasized during prosecution. (POR, 15-16.) In actuality, Applicant emphasized the slope's *direction*, not its *magnitude*:

“a unidirectional drift (electric) field necessarily affects all the present minority carriers in the same way - ***moving all minority carriers in the same direction*** because of the unidirectional drift due to the existence of the electric field... ***Depending on the particular slope*** of the graded concentration of dopant, all minority carriers ***are either swept 'down'*** (from the surface layer to the substrate) ***or 'up'*** (from the substrate to the surface layer).”

(EX1002, 289 (emphases added with Applicant-added emphasis removed).)

Fourth, PO falsely claims that it argued in prosecution that “aid the movement” was an “additional parameter” beside the dopant gradient. (POR, 15-16.) In the cited exchange, Applicant emphasized that the Examiner had overlooked that the graded dopant concentration inherently provides the field that aids movement:

“the graded dopant concentration itself creates a ‘built-in’ electrical field that forces the movement of carriers into a particular direction ... [and] ***this inherent ‘built-in’ unidirectional electric field is the additional parameter*** for ensuring that all minority carriers are being moved in

³ The cite is a typo. The quote is found in EX1030.

one direction *and which parameter the Office Action
deemed to be missing from the disclosure.*"

(EX1002, 289-90 (underlined emphasis in original and bolded emphases added).)

That PO resorts to such blatant misrepresentations of the prosecution history demonstrates the lack of merit in its arguments.

PO's all-force-calculation requirement does not comport with obviousness law

PO's claim scope arguments are incorrect and, absent that premise, PO lacks a novelty position.

Even if PO's arguments were entertained, the claims are still obvious. PO's argument that obviousness cannot be reached due to the possibility of other forces in devices misapplies the governing law, misstates science, and contradicts the references' literal teachings.

PO misapplies obviousness law

PO misstates the Petition and misapplies obviousness law. It recasts the Petition as relying on inherency, requiring more than a "probability." (POR, 2-3.) PO then argues that there are other forces that may prevent an electron from moving downward and one cannot reach obviousness absent their calculation.

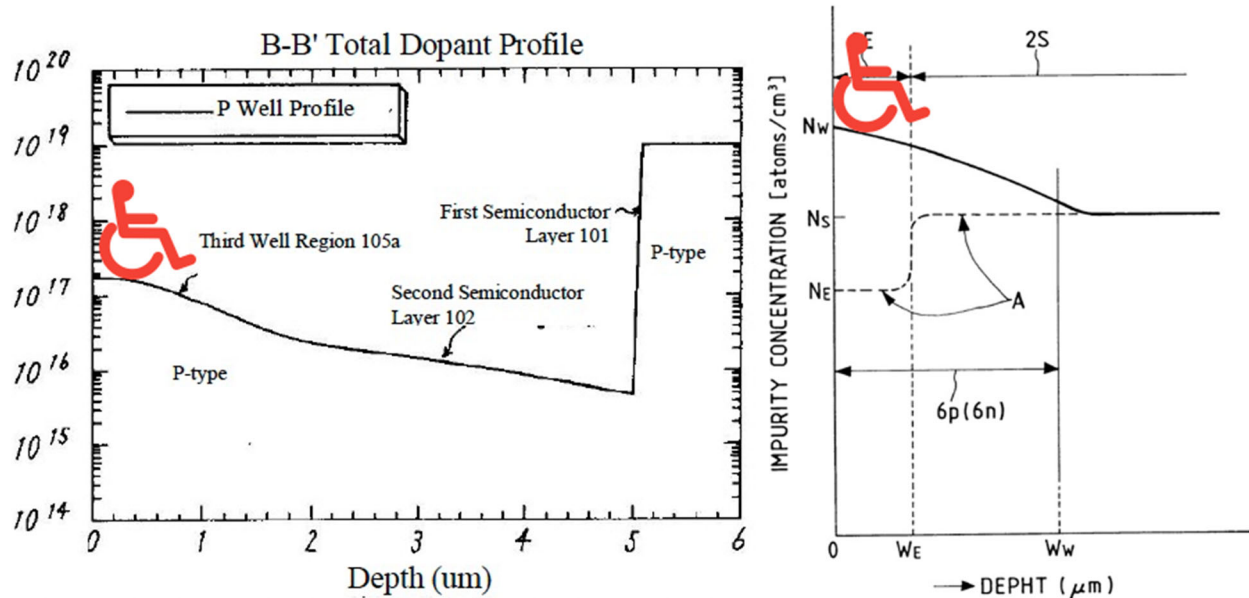
The Petition, however, does not take a missing limitation and state that it is inherently present. Rather, it identifies the limitation ("graded concentration of dopants"), describes the field effect it creates ("static unidirectional electric drift field"), and then describes the force applied on a minority carrier ("aid the

movement of minority carriers from said surface layer to said substrate”).

Grounds 1-3 render this obvious. Each of Onoda, Nishizawa, and Kawagoe teach a graded dopant concentration that generates a field. (EX1042, FIG. 11; EX1046, 18:35-58; EX1007, 16:2-9.) The dopant concentration is graded in a particular direction and, as PO repeatedly represented, a POSITA knows that a gradient generates a unidirectional electric drift field. (§II.A.) Naturally, there is only one of two directions of the overall force applied to the electron (up or down) and it would have been obvious to a POSITA that the graded dopant concentration would apply a downward force. (EX1054, ¶4.)

As PO argued to avoid indefiniteness, the graded dopant concentration is like a wheelchair ramp, and “nobody would dispute that a wheelchair ramp ‘aids the movement’ of someone in a wheelchair.” (1030, 25; *see also id.*, 27-28 (stating slope magnitude not required).) The graphics below (Onoda FIG. 11 (left) and Kawagoe FIG. 16 (right)) illustrate the simple point.⁴

⁴ Nishizawa teaches this in text. (EX1046, 18:51-59.)



PO improperly seeks to apply a rigid test requiring all forces be calculated to reach obviousness. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 403, (2007)

("Rigid preventative rules that deny recourse to common sense are neither necessary under, nor consistent with, this Court's case law.") Tellingly, Dr. Glew testified that it was impossible to reach obviousness absent tests. (EX1055, 90:23-93:12 (concluding that it "would be impossible to understand or determine the other forces [] acting on the carrier.)) This draconian standard is not the law.

The impropriety of PO's arguments is evident in Grounds 2 and 3.

Nishizawa and Kawagoe both describe the downward force applied upon the electron via the dopant concentration. (EX1046, 18:35-58; EX1007, 16:2-9.)

While, at the same time, both are silent regarding the "forces" listed by PO. A POSITA would have found it obvious that the dopant concentration's force—as the described field affecting an electron—would have aided an electron's movement.

(EX1054, ¶7.)

Finally, PO's arguments defy common sense. PO argues that the prior art prevents upward movement. Logically, if electron movement is prevented upwards, there are two positional options: (1) not allowed to move; or (2) pushed downwards. Locking the electron in place requires that all net-forces be finely tuned to "0." This—which PO appears to argue—is an impractical scenario. The Nishizawa and Kawagoe electrons' movements would be aided downward.

(EX1054, ¶¶6-7.)

PO's analysis does not comport with obviousness law, and Grounds 1-3 demonstrate obviousness.

The slopes of Grounds 1-3 render obvious "aid the movement"

PO's arguments also overlooks that the prior art dopant gradients match those of the '195 Patent's specification. PO argues that the relative slope in the '195 Patent (decrease of 10x, EX1001, 2:38-40) generates a sufficient electric field to aid the movement of a minority carrier. (POR, 10-11.) Onoda provides a 10x decrease. (EX1042, FIG. 11 (from 10^{17} to 10^{16}).) Nishizawa shows a 1000x decrease. (EX1046, 18:50-54 (start at 10^{17}), 18:64 (substrate at 10^{14}).) Kawagoe shows a 46x decrease. (EX1007 at 16:13 (starts at 6×10^{16}), 6:62-64 (substrate at 1.3×10^{15}).) The prior art slope magnitudes are equal to—or larger than—the '195 Patent's and render obvious "aid the movement."

PO's all-force-calculation premise is faulty

PO's positions are unsupported by basic physics. PO trumpets Dr. Campbell's scientific descriptions as key admissions (POR, 8-9), but that is misdirection. The recognition that other factors could theoretically have influence on carrier movement does not support PO's argument.

Dr. Campbell—in his general background—stated that an electric field oriented downward will push minority carriers away from the surface. (EX1003, ¶32.) He testified that an electric field must have a direction and have a magnitude to influence a carrier (*e.g.*, an electron). (EX2058, 34:1-14.) This is basic physics: an electron needs force applied upon it to drift and the stronger the electric field, the stronger the force. (EX1054, ¶¶4-5.)

These uncontroversial basics do not support PO. Dr. Glew and PO have expressly—and repeatedly—acknowledged that a graded dopant concentration will create a drift field to aid carrier movement:

“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.’”

(EX2057, ¶33; *see also* EX1002, 289; EX1030, 26, 28; EX1055, 72:11-74:11.)

PO's listing of other “forces” (resistance, temperature, and imperfections, POR, 9-10) does nothing to counteract the dopant gradient's drift field. Except for

the P-N junction capacitance, PO's purported "forces" are not forces. Their influence impedes movement and is omnidirectional—the resistance or temperature increases or decreases the speed of carrier movement, equally in all directions. (EX1055, 77:11-23, 79:15-81:5.) Similarly, imperfections would not generate a field in a singular direction because they would typically be uniform or minimal and non-impactful. (*Id.* at 86:7-89:21 (Dr. Glew stating that calculating imperfections is complex and reduced them).) None of these conditions would counteract the force provided by the graded dopant concentration.

This leaves the force introduced by the P-N junction capacitance as the only factor that—even theoretically—could affect the direction of carrier movement. The P-N junction capacitance exists in every P-N junction, including those junctions disclosed in the '195 Patent. (EX1001, FIG. 5(b).) But the '195 Patent says nothing about it, much less (1) attribute any significance to it, (2) suggest that it might counteract the drift field created by the dopant gradient, or (3) claim the capacitance as a deficiency in the prior art that the claims somehow address. Tellingly, PO said nothing about this capacitance when pursuing its patent claims, instead stating that "the graded dopant concentration itself creates a 'built-in' electrical field that forces the movement of carriers into a particular direction" and that "this inherent 'built-in' unidirectional electric field ... ensur[es] that all minority carriers are being moved in one direction." (EX1002, 289-90 (emphasis

in original).) PO is trying to sew confusion where it earlier stated there was none.

The absence of a force-calculation for the P-N junction was immaterial to the Applicant during prosecution and is immaterial to the instant Petition.

Moreover, the field effect from the P-N junctions requires an applied voltage for electrons to flow (EX2058, 35:10-17; EX1059, 18-20 (stating that flow in a non-biased PN junction reaches equilibrium), which the claims do not require. The graded dopant concentration is *static*—always present regardless of the device's power state. PO has no viable position for its all-force-calculation argument.

PO's third-party material does not support its arguments. EX2031 supports Petitioner because it recognizes that a graded dopant profile—even with capacitive effects—provides an electric field. (EX1030, 7:4-7.) EX2056 is a transcript of a non-party engineer, who was answering if “there [is] anything that affects the ease of carrier movement” (EX2056, 71:22-72:8) of a particular device (*id.*, 93:8-95:3), not forces counteracting the prior art's graded dopants. Both should be given no weight: they post-date the filing date and, EX2056, moreover, is a random person describing a third-party device.

Grounds 1-3 demonstrate obviousness

PO provides its arguments in a general section with back-references. The Reply follows this structure.

Onoda renders the challenged claims obvious

Onoda renders obvious “aid the movement of minority carriers from said surface layer to said substrate.” Onoda teaches a graded dopant concentration from the surface layer to the substrate and a POSITA would have found it obvious that the graded dopant concentration would aid in the movement of minority carriers. (Pet., 28-32.) PO’s argument that Petitioner must conduct an all-force-calculation is not supported by the claims nor does it comport with obviousness law or the facts at hand (§II.A & B).

Onoda in view of Nishizawa renders the challenged claims obvious

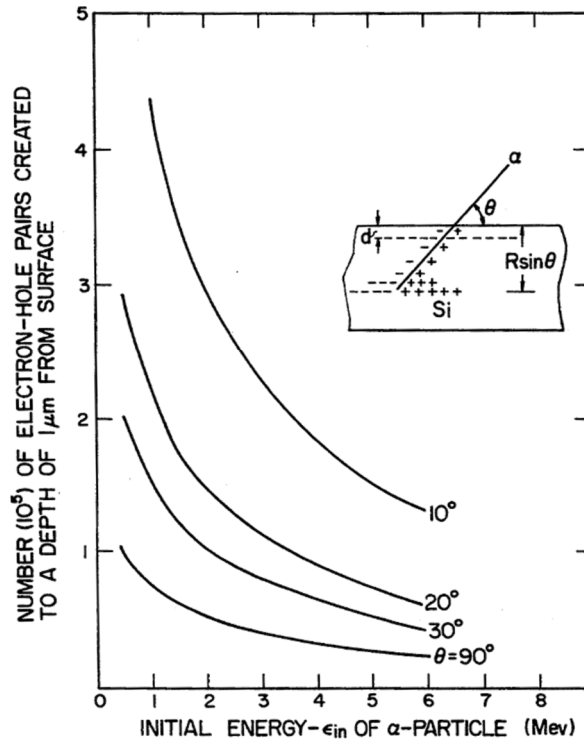
PO misrepresents—and ignores—Petitioner’s usage of Nishizawa. PO fails to present rebuttal argument against Ground 2 at a threshold level.

First, PO misrepresents the Petition as relying on Nishizawa to teach the “surface,” and aiding carrier movement therefrom to the “substrate.” Petitioner did not rely on Nishizawa’s device structure (surface, substrate, or drift layer). (Pet., 50 (Onoda teaches [1.1], [1.2], and [1.4]).) Instead, Ground 2 relies on Onoda’s device structure supplemented with Nishizawa’s recognition that a layer with a downward dopant concentration creates a field that drifts electrons downward. (Pet., 52.) PO does not address the teachings of Nishizawa (column 18) Petitioner relied on. (Pet., 50-51.) PO’s Nishizawa arguments are divorced from Ground 2.

Second, PO incorrectly argues that Nishizawa prevents the flow of electrons upwards and does not teach aiding them downward (POR, 7), and that electrons—generated by alpha-rays—at the surface can be ignored. (POR, 21.)

PO's arguments contradict Nishizawa's teachings of a graded dopant concentration to drift electrons downward. Nishizawa teaches that a p⁺ type buried region 33a (tan)—with a substantially uniform dopant concentration—will prevent electrons generated in the p-type substrate 11 (red circle) from entering the p⁺ type buried region 33a. (EX1046, 18:4-6, 18:18-22.) A uniform concentration, however, does not solve the problem of electrons generated via alpha-rays in the p⁺ type buried region 33a from reaching the n⁺ type region 13 (red). (*Id.*, 18:35-43.) To solve this problem, Nishizawa teaches “it is only necessary to form an impurity concentration gradient in the p⁺ type buried region 33a in the direction toward the p type substrate 11.” (*Id.*, 18:46-50; EX1055 at 104:5-14 (stating that this layer is creating a force to push electrons downward), 100:2-18 (same); EX1054, ¶9)

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FIG. 36

PO back-references its force arguments which fail as described in §II.A & B.

Ground 2 renders the challenged claims obvious.

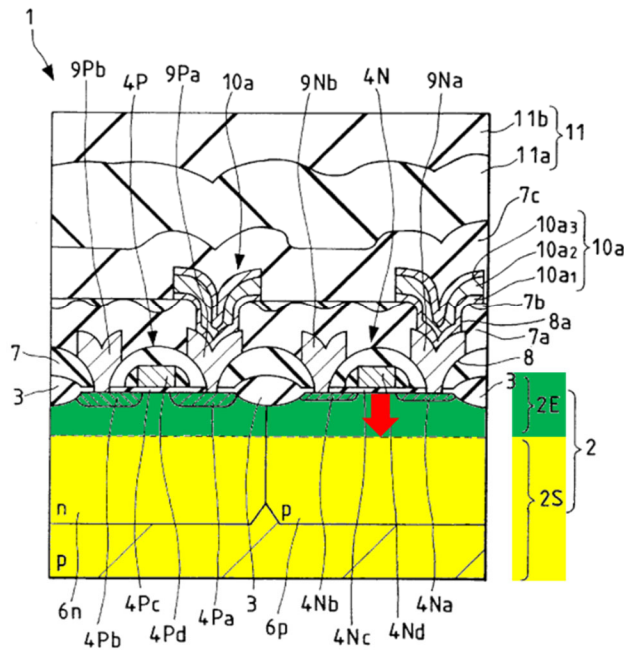
Kawagoe renders the challenged claims obvious

PO's arguments go against Kawagoe's literal teachings.

First, PO's argument that Kawagoe excludes α -rays generating electrons near the surface is wrong. Kawagoe teaches: "electrons produced by the α -ray are attracted to the substrate body 2S." (EX1007, 16:7-9.) Parsing this language, electrons will be attracted to the substrate body 2S (yellow) which means that they exist outside the substrate body 2S (*i.e.*, epitaxial layer 2E (green)) to be attracted to it (red arrow). Kawagoe, moreover, states that its purpose is to reduce the

influence of α -rays by including a graded dopant concentration “from the surface of the epitaxial layer 2E, so that the influence to be caused by the carriers (or electrons) due to the α -ray is lowered.” (*Id.*, 16:2-7; EX1054, ¶12.)

FIG. 16



PO's argument is also based on the faulty premise that α -rays will not hit Kawagoe's p-well 6p to generate electrons. This extreme position is unsupported by Kawagoe.

Second, PO's argument that Kawagoe solely “*inhibits* carrier movement” contradicts its literal text. (POR, 22-23.) PO illogically suggests that everything following the “and” in 16:7-11 (“prevented”) negates everything preceding it (“attracted”). Kawagoe contains literal teachings that “electrons produced by the α -ray are *attracted* to the substrate body 2S.” (EX1007, 16:7-9 (emphasis added);

EX1055, at 122:1-123:7 (conceding that the gradient imparts a force).) This is enough to render obvious “aid the movement.”

Nonetheless, even if PO's argument of “prevented” is given its full weight (and “attracted” is ignored), it still nonetheless fails. α -rays will hit the p-well, and they will have three possible vertical movements for an electron: (1) up, (2) down, or (3) locked in place. PO states that they will not go up, and thus there are only two options left. It defies common sense to state that these electrons will be locked in place; they will drift downwards. (EX1054, ¶7.)

PO back-references its force arguments which fail as described in §II.A & B.

Kawagoe thusly renders obvious the challenged claims.

PO's reliance on Dr. Campbell is misplaced

PO attempts to sew confusion via its citations to Dr. Campbell's general discussion of the purpose of all references grouped together, arguing that this general testimony supports the proposition that the art teaches only prevention of upward movement. (POR, 21, 23, 25.) This discussion was in response to a question directed to “block[ing] the carriers from coming up into the substrate” (EX2058, 43:8-11), which is not specific to the teachings of each references' dopant gradients. This general discussion does not negate the specific evidence from the prior art disclosures (and Dr. Campbell's discussion of them). *KSR*, 550

U.S. at 402 (regardless of a prior art's purported purpose, its teachings still can provide obvious examples).

This citation is also misleading. Dr. Campbell testified that no reference was describing “totally blocking all of the carriers.” (EX2058, 43:14.) “[T]otally blocking all” electrons is an impractical scenario because some electrons from an α -ray would be initially excited upwards and could go into upper layers, but would thereafter be aided downward due to a graded dopant concentration. (EX1054, ¶¶4-5.)

Dr. Glew's testimony should be given no weight

Dr. Glew's testimony should not be given weight. He was evasive, biased, and not credible. He has worked with PO on its countless litigations and *Inter Partes* Reviews (EX1055, 145:14-19), billing hundreds of hours (*id.* at 145:5-13). He repeatedly took positions that contradict the prior art's plain wording. He took extreme positions: *e.g.*, that no α -rays would hit Kawagoe's p-well to generate electrons. (*Id.*, 116:19-120:19.) He filibustered, and refused to answer simple questions, *e.g.*, whether electrons generated via an α -ray will move up, down, or stay locked in place (*id.*, 106:8-109:21) or plainly what constitutes a minority carrier in a p-layer or an n-layer (*id.*, 127:6-128:12, 129:19-130:7, 130:25-131:22, 133:19-138:11), even though that is clearly identified in standard references:

Minority carrier: “a hole in an n-type or an electron in a p-type semiconductor.” (EX1056; *see also* EX1057, EX1058.)

PO's request to give Dr. Campbell's declaration no weight because he looked at excerpts of a 391-page file history and did not look at licenses lacks merit, as the same applies to Dr. Glew. (EX1055, 71:7-10. 144:23-145:4.) PO's bold statement that the declaration in another proceeding was “rubber-stamped” lacks any citation or merit. (EX2058 at 11:20-12:1 (Dr. Campbell stating that EX1003 was his declaration).)

PO fails to demonstrate secondary considerations

PO argues that licenses demonstrate secondary considerations. Bare licenses fail to establish a nexus to the merits of the claimed invention because parties often pay licenses to avoid litigation costs; a nexus is required. *Iron Grip Barbell Co. Inc. v. USA Sports, Inc.*, 392 F.3d 1317, 1324 (Fed. Cir. 2004).

Its litigation-based licenses should be accorded no weight.

The other license is with RPX which is a cost-saving service that “spread[s] the cost of reducing patent litigation across a large network of participating companies” and “remove[s] patents from circulation before they become costly issues.” (EX1060.) For members who join, RPX offers “far less litigation; and far less cost and risk.” (EX1061.) An RPX license should, accordingly, be accorded less weight than a typical license because it is an aggregate service for members to

save litigation costs. Further, RPX approached PO after its lawsuits against others.

(EX2072, ¶5.) [REDACTED] never approached PO (*id.*) because they are presumably members. Moreover, there is no actual evidence that [REDACTED] obtained licenses. (EX2072, ¶5 (stating, at most, hearsay: “I understand RPX did in fact grant to them” sub-licenses).) There is no nexus.

Greenthread further relies on a decision (*Fox Factory*) that was later vacated. *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1378 (Fed. Cir. 2019). On remand, the Board found the claims unpatentable, concluding that “at best, PO shows a weak nexus” for licenses mentioning the challenged patent and “no nexus with respect to the remaining licenses.” *Fox Factory, Inc. v. SRAM, LLC*, IPR2017-00472, Paper 74, 11, 14-15 (2021). Here, the challenged patent is part of a long list, and it cannot be discerned whether any alleged merits are attributable to it. (EX2072, 45, 79, 99.) There is no nexus.

THE PETITION IS NOT TIME-BARRED

PO rehashes previously rejected privity arguments. (Paper 23 at 27-35.)⁵

PO asserts that Petitioner—via component sales—is in privity with licensees ([REDACTED] and Intel). But a standard manufacturer-customer relationship, even with

⁵ Patent Owner's “Hail Mary” argument that IPRs are unconstitutional lacks merit.

Oil States Energy Servs., LLC v. Greene's Energy Grp., LLC, 584 U.S. 325 (2018).

indemnity provisions, does not establish privity. *Luminex Int'l Co. Ltd. v. Signify Holdings B.V.*, IPR2024-00101, Paper 20 at 22–24 (2024).

PO's burden of proof arguments are misplaced because it has not come forward with *any* evidence showing privity. *Worlds Inc. v. Bungie, Inc.*, 903 F.3d 1237, 1242–44 (Fed. Cir. 2018). PO does not dispute that its prior cases had nothing to do with Petitioner. PO's infringement allegations against others were not directed to any of Petitioner's products. EX2003, EX2005, EX2006, EX2009. Petitioner had no notice or opportunity to participate in those matters and no knowledge of, or involvement in, the resulting settlements. And [REDACTED] and Intel have no role in the current proceedings or related IPRs.

Petitioner's supplier-customer relationships do not create the type of “substantive legal relationship” that establishes privity. *Luminex*, IPR2024-00101, Paper 20 at 22–24. Petitioner sells commodity chips. The products PO identifies are low-cost chips available in the public marketplace that others integrate into larger systems. EX1050; EX1052. The MP6924 sells for less than a dollar. EX1050. The MP2953B complies with Intel's standards, and countless other companies provide similar components that comply with those standards. EX2019, EX1053. Moreover, PO has not accused those chips—or any [REDACTED] or Intel products—in the litigation. EX2016. This is nothing like PO's cited supplier-customer cases, which involved indemnification relationships, exclusive

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

Further, Petitioner is not a party to any license agreement. PO argues that Petitioner is an “agent” under the licenses by making products on their behalf under the “have made” clause, POR at 45-48, but any such agency relationship with respect to products has nothing to do with the privity analysis. “[T]he relevant question is whether Petitioner is acting as an agent for Intel or [REDACTED] in filing a petition for *inter partes* review.” (Paper 23 at 30.) PO does not assert that Petitioner is acting as an agent for Intel or [REDACTED] in filing the Petition.

PO also argues that Petitioner, on one hand, and Intel and [REDACTED] on the other, are “preceding and succeeding owners” of the components Petitioner sells to Intel and [REDACTED]. (POR at 48-50.) As noted above, this is a simple restatement of the ordinary supplier-customer relationship that the PTAB have repeatedly found does not create privity. *Luminex*, IPR2024-00101, Paper 20 at 22-24. PO argues that Petitioner is a third-party beneficiary, POR at 50-51, but the licenses do not reflect an intent to benefit Petitioner and, nonetheless, cannot create privity. PO also argues that the license creates a patent exhaustion defense but cites no authority.

(POR at 51-52.)

PO's arguments about the same products being at issue in prior cases and Petitioner's sales being both licensed and infringing are nonsensical. A licensed sale is not infringing. 35 U.S.C. § 271(a). Any license or exhaustion outcomes are the result of PO's actions, beginning when PO entered the RPX Agreements, followed by RPX later purportedly sublicensing Intel and [REDACTED]. PO itself created this situation and cannot "ignore[] the practical consequences of its own actions." *Assa Abloy AB v. CPC Patent Tech. Pty., Ltd.*, IPR2022-01006, Paper 47 at 18, 42, 45-47 (2023).

If any party's due process rights are at risk, it is Petitioner's. Petitioner was a stranger to prior litigations and IPRs, and it would be unjust to bind Petitioner as a privy to those cases. *Taylor v. Sturgell*, 553 U.S. 880, 893-95 (2008).

CONCLUSION

For reasons stated here and in the Petition, Grounds 1-3 render the challenged claims obvious.

PUBLIC VERSION

PTAB Case No. 00468, Patent No. 8,421,195
Petitioner's Reply to Patent Owner's Response

Dated: February 14, 2025

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PUBLIC VERSION

PTAB Case No. IPR2024-00468, Patent No. 8,421,195

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CERTIFICATION OF WORD COUNT UNDER 37 CFR § 42.24(d)

Under the provisions of 37 CFR § 42.24(d), the undersigned hereby certifies that the word count for the foregoing PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE totals 5,527 words, excluding the parts exempted by 37 C.F.R. § 42.24(a). This word count was made by using the built-in word count function tool in the Microsoft Word 365 software used to prepare the document.

Dated: February 14, 2025

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that true copies of the foregoing
PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE and EXHIBITS
1054-1061 were served in their entirety this 14th of February, 2025 by electronic
mail on the Patent Owner via its attorneys of record:

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