

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INNOSCIENCE (ZHUHAI) TECHNOLOGY COMPANY, LTD.,
AND INNOSCIENCE AMERICA, INC.,
Petitioners,

v.

EFFICIENT POWER CONVERSION CORPORATION,
Patent Owner.

IPR2023-01381
U.S. Patent 8,350,294

PETITIONER'S REQUEST FOR DIRECTOR REVIEW

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***Emphasis added herein unless otherwise noted**

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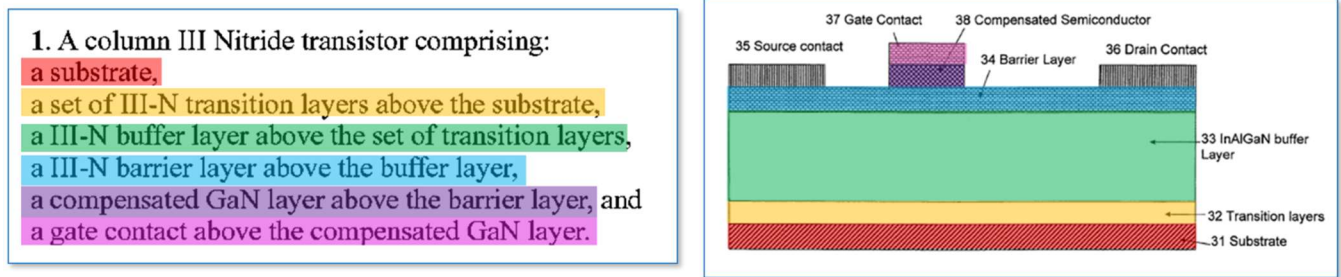
I. INTRODUCTION

A claim exclusively enabled by prior art is necessarily obvious over that same prior art. *In re '318 Patent Infringement Litig.*, 578 F. Supp. 2d 711, 736 (D. Del. 2008), *aff'd*, 583 F.3d 1317 (Fed. Cir. 2009) (“[S]ince plaintiffs rely exclusively on the prior art to establish enablement, the court agrees with defendants that the ’318 patent cannot both be non-obvious and enabled.”). Yet the Board here determined that Patent Owner’s new substitute claims were simultaneously non-obvious over, but somehow enabled by, the same prior art. Final Written Decision (Paper 45, “Decision”). Reaching that conclusion also required the Board to ignore the *Wands* factors the Board itself had identified as the “factors to consider for enablement.” Paper 29, 9. The Director should reverse these errors and find the claims unpatentable as not enabled or at least vacate and remand for further proceedings.

II. PROCEDURAL HISTORY AND THE BOARD’S DECISION

A. The Patent and Institution of Trial

U.S. Patent 8,350,294 (the Patent, Ex. 1001) relates to “enhancement mode gallium nitride (GaN) transistors.” Ex. 1001, 1:13-15; Decision, 3-4. It describes and claims transistors with a sequence of “layers” one above another. Decision, 7. The figure below uses color coding to map representative claim 1 to FIG. 2 of the Patent. *Id.*; Paper 1, 4. Petitioner challenged all twelve claims as obvious, including the four independent claims. Decision, 1.



Ex. 1001, Claim 1 (left), FIG. 2 (right)

B. Motion to Amend and Petitioner's Opposition

Patent Owner filed a non-contingent Motion to Amend (Paper 17) under the Office's Pilot Program. *See* Decision, 1; Paper 17, 1. The Motion requested cancellation of claims 4-6 and 10-12, and entry of new claims 13 and 14. Paper 17, 1. The substitute claims added elements to cancelled claims 4 and 10. *Id.*, 3. For example, new claim 13 added the underlined language below to cancelled claim 4:

Claim 13 (Substitute for claim 4)

13. An enhancement mode [A] column III Nitride transistor comprising:
 a substrate,
 a set of III-N transition layers above the substrate,
 a III-N buffer layer above the set of transition layers,
 a III-N barrier layer above the buffer layer, [and]
 a semi-insulating III-N layer above the barrier layer, wherein the semi-insulating III-N layer comprises a compensated GaN layer containing acceptor type dopant atoms passivated with hydrogen, and
a gate comprising a gate contact and the compensated GaN layer, wherein no two-dimensional electron gas (2DEG) region exists below the gate at zero volts applied gate bias.

Paper 17, Appx. A

Petitioner opposed the Motion based on a lack of enablement of the new substitute claims. Paper 27, 8-19. The new claims added competing and

contradictory limitations. *Id.* One limitation requires **high** doping concentration (for a “no two-dimensional electron gas”). *Id.*, 9-11. But another limitation requires **low** doping concentration (for “semi-insulating III-N layer”). *Id.* The Patent never teaches how to implement the claimed transistor; as Petitioner’s expert Dr. Shealy declared, the “patent does not enable these competing requirements without undue experimentation.” Ex. 1039, ¶53. In fact, the Patent fails to disclose any doping concentration, let alone one that achieves the competing requirements recited in the new claims. Paper 27, 11; *see generally* Ex. 1001.

Following the Pilot Program, the Board issued preliminary guidance on the Motion (Paper 29). The guidance emphasized the “highly fact dependent” nature of enablement, pointed to the *Wands*’ factors as the “[f]actors to consider for enablement,” and “encourage[d] the parties to address this issue.” Paper 29, 8-10.

Patent Owner replied, but chose to ignore the factual considerations the guidance identified. *See* Paper 31, 6-11. While acknowledging the new claims required experimentation beyond the specification, Patent Owner asserted the Patent “provides adequate guidance as to the direction of experimentation to make its disclosure enabling.” *Id.*, 10. Patent Owner never disputed that the new claims required competing dopant concentrations. *Id.*, 6-10. Instead, it argued a POSITA would understand “the Mg acceptor concentration must be **sufficiently** high.” *Id.*, 9.

Petitioner’s Sur-Reply explained that giving an abstract target—i.e., “sufficiently high”—falls short of enabling because “enablement ‘requires a description of an invention, not an indication of a result that one might achieve’” Paper 37, 3 (citing *Regents of the Univ. of Cal. v. Eli Lilly & Co.*, 119 F.3d 1559, 1568 (Fed. Cir. 1997)). Following the Board’s guidance, Petitioner also evaluated the *Wands* factors, concluding they all favor no enablement. Paper 37, 9.

C. The Board’s Decision and its Improper Enablement Analysis

In its Decision, the Board correctly found claims 1-3 and 7-9 unpatentable over the prior art and cancelled amended claims 4-6 and 10-12. Decision, 62.

But the Board incorrectly granted Patent Owner’s motion to amend, finding the new claims enabled and non-obvious. *Id.*, 42-59, 61. On enablement, the Board credited Patent Owner’s expert—who *relied on personal prior knowledge*—to conclude that “one of ordinary skill in the art, using only routine experimentation, could ‘tune’ the level of p-type dopants and hydrogen.” Decision, 61.

Worse still, the Decision ignored the factors the Board had identified as determining enablement. The Decision contained no analysis of the factual considerations on enablement or the *Wands* factors the Board identified in its guidance. *Id.*, 59-61. Instead, the Board improperly evaluated enablement by giving “credit” to conclusory expert testimony and basing its conclusion on obviousness arguments. *Id.* This is reversible error. *See Trs. of Bos. Univ. v. Everlight Elecs. Co.*,

896 F.3d 1357, 1364 (Fed. Cir. 2018) (reversing enablement verdict that was based on “conclusory or unsupportive expert testimony”).

III. ARGUMENT

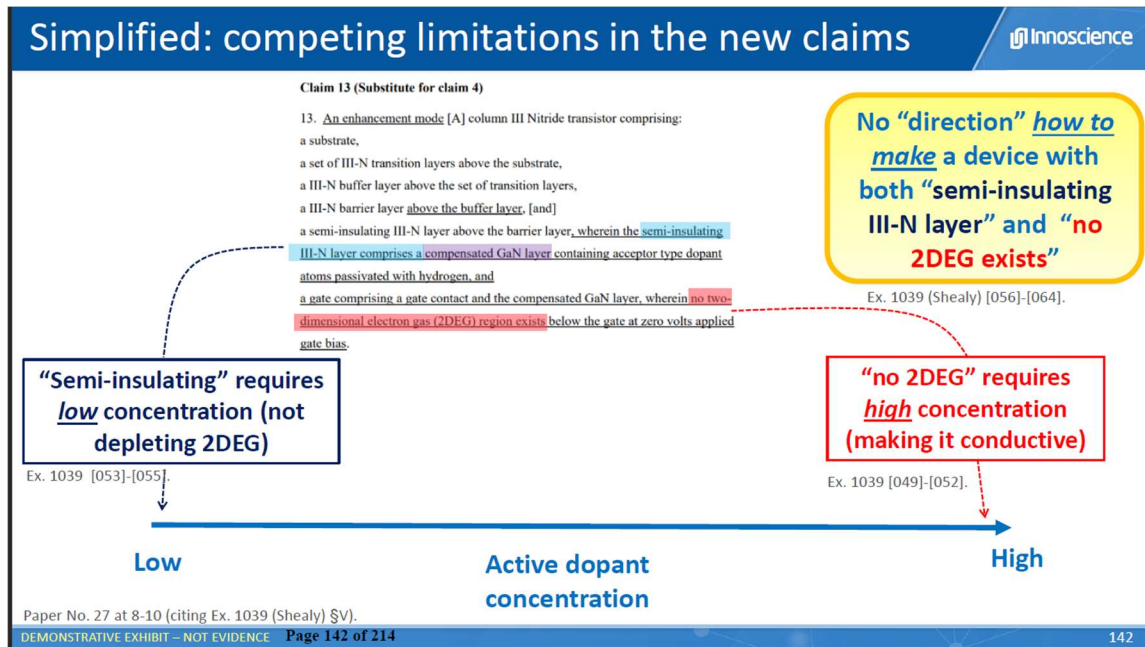
A. The Board’s Enablement Analysis is Improper And Conflicts with Its Non-Obviousness Determination

1. The Board Erred by Finding a Disclosure of What “Could Be” Done Fulfills the Enablement Requirement

The law requires *the specification* “to describe the invention ‘in such full, clear, concise, and exact terms as to enable any person skilled in the art’ to ‘make and use’ the invention. § 112(a).” *Amgen Inc. v. Sanofi*, 598 U.S. 594, 612 (2023) (citing 35 U.S.C. § 112). But here, the Patent’s specification never teaches **how to** make the new claims. So the Board had to rely on a purported teaching of the possibility of what “**could be**” done. Decision, 61. Relying on a possibility for enablement is a legal error. *Amgen*, 598 U.S. 614 (finding “research assignments” insufficient to enable); *In re ’318 Pat. Infringement Litig.*, 583 F.3d 1317, 1327 (Fed. Cir. 2009) (finding to “state a hypothesis and propose testing” insufficient to enable).

The new claims require two competing doping concentration effects that the Patent never explains how to achieve. Paper 27, 9-11. On one hand, the GaN layer must contain a **high** dopant concentration to meet the “no two-dimensional gas” limitation. *See* Decision, 60. On the other hand, the GaN layer must contain a **low** dopant concentration to comply with the “semi-insulating III-V layer” limitation. *Id.* These requirements conflict because a high dopant concentration makes the layer

conductive, which is incompatible with the low concentration needed for semi-insulating conductivity. Paper 37, 8. The demonstrative below illustrates how claim 13 requires both low and high doping concentrations. *See* Paper 44, 42.



Ex. 1050, 142

The Patent never teaches how to resolve this conflict or how to make a device that balances doping concentrations to achieve both limitations. Paper 37, 2-11. Indeed, the Patent fails to describe any dopant concentration at all. *See generally* Ex. 1001.

Still, the Board found the new claims enabled. Decision, 61. And it did so without pointing to any enabling disclosure in the specification. *See id.* Because there is none. Instead, the Board latched onto a possibility: “a semi-conductive compensated GaN layer (or semi-insulating layer) *could be* sufficiently doped to completely remove the 2DEG layer but remain semi-conductive.” Decision, 61. And the Board credited testimony of Patent Owner expert “that one of ordinary skill in

the art, using only routine experimentation, *could ‘tune’* the level of p-type dopants and hydrogen to form a semi-insulating, compensated GaN layer that could deplete the 2DEG.” *Id.* But that is not enablement.

Describing what *could be* done cannot enable claims. “If mere plausibility were the test for enablement,” “applicants could obtain patent rights to ‘inventions’ consisting of little more than respectable guesses....” *Rasmusson v. SmithKline Beecham Corp.*, 413 F.3d 1318, 1325 (Fed. Cir. 2005). Instead, “the specification of a patent must teach those skilled in the art how to make and use the full scope of the claimed invention without undue experimentation.” *Baxalta Inc. v. Genentech, Inc.*, 81 F.4th 1362, 1365 (Fed. Cir. 2023). Only describing what *could be* done provides “little more than a research assignment,” forcing the POSITA to engage in “painstaking experimentation” to see what works. *Amgen*, 598 U.S., 614. “That is not enablement.” *Id.*

2. The Board Also Erred by Relying on Prior Art and Prior Knowledge for Enablement Instead of the Specification

Because the Patent fails to disclose *how* to make the device recited in the new claims, the Decision relied on the prior art and outside knowledge for enablement. *See* Decision, 61. That was error.

The Decision pointed to the Patent’s background and admitted prior art to pose the problem: “[i]t is undisputed that enhancement mode transistors were known in the art and that the doping level of a layer under the gate needed to be *sufficiently*

high to deplete the 2DEG under the gate.” Decision, 59-60 (citing Ex. 1001, 1:45-56). Then, to determine how to achieve a “sufficiently high” doping concentration needed to meet the claims’ competing requirements, the Decision relied on the *asserted prior art*: “It is also undisputed that using hydrogen to passivate active acceptors was a known method in the art.” *Id.* (citing to Petitioner’s asserted prior art in Ex. 1008, 7). Based on this prior art and testimony of Patent Owner’s expert about his knowledge, the Decision reasoned that “given the knowledge of skill in the art, the disclosures of prior art patents, and the known techniques for localized passivation and resistivity control” an “ordinarily skilled artisan could use the disclosures of the ’294 patent to form the claimed transistors without undue experimentation.” *Id.*, 61. But the Decision’s enablement analysis provides no passage *in the Patent* that teaches how to make the new claims. *See id.*, 59-61.

Finding the claims enabled by the prior art and expert testimony about prior knowledge, “detract[s] from the basic statutory requirement that a patent’s specification” must describe how to make and use the full scope of the claimed invention. *See Amgen*, 598 U.S., 612. This error should be reversed.

3. The Board Erred In Reaching an Enablement and Obviousness Conclusion that Has Already Been Rejected

A claim exclusively enabled by prior art is necessarily obvious over that prior art. *In re ’318 Patent*, 578 F. Supp. 2d, 736. The Board’s contrary finding contradicts how courts address the tension between obviousness and enablement.

The Court in *In re '318 Patent* faced a similar situation. The claims there were also challenged both as obvious and non-enabled. *Id.*, 716. Like here, the patentee argued that the specification conveyed an expectation of what could be done, and that this expectation, combined with the “background art,” enabled the invention. *See id.*, 736 n. 38. And, like here, the patentee argued that—despite relying on the prior art for enablement—the claims were non-obvious. *Id.*, 732. But the Court there and the Board here reached opposite conclusions. The Court found the claims cannot both be non-obvious and enabled because “plaintiffs rely exclusively on the prior art to establish enablement.” *Id.*, 736. The Board here inverts the Court’s logic to find enablement “consistent with Petitioner’s obviousness argument.” That error should be reversed.

B. The Board Erred in Ignoring the Factual Considerations That Determine Enablement, Which Point to Only One Outcome: The New Claims Are Not Enabled

The “undue experimentation” test for enablement “is not a single, simple factual determination, but rather is a conclusion reached by weighing many factual considerations.” *Cephalon, Inc. v. Watson Pharms., Inc.*, 707 F.3d 1330, 1336 (Fed. Cir. 2013). Those considerations are often called the *Wands* factors. *US Synthetic Corp. v. Int’l Trade Comm’n*, 128 F.4th 1272, 1285 (Fed. Cir. 2025).

Despite initially acknowledging that enablement in this case was “highly fact dependent,” the Board jumped past analyzing the relevant factual considerations.

See Decision 59-61. That leap caused the Board to improperly focus on the possibility the patent conveyed, conclusory testimony, and arguments drawn from Petitioner’s obviousness analysis. *Id.* That flawed approach led to the wrong determination; a determination that not only contradicts that statute and cases interpreting it but also conflicts with the Board’s own findings on obviousness.

The Board’s own preliminary guidance highlighted enablement as “highly fact dependent.” Paper 29, 9. And it even listed the *Wands* factors to consider “(1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims.” *Id.* (citing *Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988)). Yet, in its Decision, the Board failed to apply—or even discuss—any of these factors.

Had the Board done the correct analysis, it would have realized all the factual considerations show a lack of enablement. And the Motion would have been denied.

Factor 1 analyzes the quantity of experimentation required. This factor favors non-enablement.

Without guidance from the patent, developing a device with the conflicting limitations in the new claims would require extensive trial-and-error experimentation. *See* Paper 37, 9-10. As Dr. Shealy explained, a POSITA would

need to conduct “hundreds—even thousands—of trial-and-error experiments, testing, and device architectures to attempt to arrive at the claimed device (*if ever*).” Ex. 1039 ¶64.

But the Decision never analyzed the quantity of experimentation necessary. Instead, it simply “credit[ed]” Patent Owner’s expert conclusion that “using only routine experimentation, could ‘tune’ the level of p-type dopants.” Decision, 61 (citing Ex. 2024 ¶¶28-31). The Board’s analysis has two problems. *First*, the Board incorrectly relied on conclusory expert testimony. *MobileMedia Ideas LLC v. Apple Inc.*, 780 F.3d 1159, 1172 (Fed. Cir. 2015) (“Conclusory statements by an expert ... are insufficient”). Contrary to the Board’s analysis, expert testimony alone cannot establish that a process was “routine”—especially where, as here, the specification does not disclose the process and no evidence supports the expert’s conclusory opinion that the process was “routine.” *See Trs. of Bos. Univ.*, 896 F.3d, 1362–63 (reversing enablement finding where expert testimony that the claims were achievable “with not much experimentation” was deemed conclusory considering the specification’s lack of disclosure). *Second*, the Board’s analysis is divorced from the specification. Without any guidance on how to do it, making the new claimed device would require “an unguided brute force trial-and-error of multiple variables in an inherently expensive and complex process” even if it is possible. Ex. 1039 ¶60.

Factors 2 and 3 examine the direction or guidance presented in the patent, including the presence or absence of working examples. These two factors strongly support non-enablement.

First, the Patent provides no examples. It does not provide any examples of doping concentrations—let alone guidance on what concentrations might achieve the competing high and low doping concentration requirements of the claims. *See generally* Ex. 1001. The Patent also lacks both examples of doping configurations or a single working example. *Id.* The Board clamps on a teaching that a layer “could be **sufficiently** doped” to meet the competing requirements. Decision, 61. But that wishfulness fails to teach any methods to determine when a layer is “sufficiently doped” or how to achieve it—leaving the reader without knowledge of how to practice the invention. *See generally* Ex. 1001; Ex. 1039, ¶¶42-48.

Second, the Patent provides no guidance on how to make the full scope of the new claims. Even if, as the Board concluded, the patent teaches a layer “**could be** sufficiently doped” to meet the requirements in the new claims (Decision, 61), the Patent does not teach **how to** make it. It offers no guideposts or pathways on how to make the layer that is “sufficiently doped” to meet the competing claim limitations. Decision, 61. In fact, as discussed above, both Patent Owner’s expert and the Board hinged their enablement determinations on prior art and knowledge outside the patent itself. *Supra* § III.A.2. Even assuming the Patent conveyed what *could be*

done, the Patent provides no guidance on *how to* do it. *Trs. of Bos. Univ.*, 896 F.3d, 1364. (“Simply observing that it could be done—years after the patent’s effective filing date—bears little on the enablement inquiry”).

Factors 4-7 analyze the nature of the invention, predictability of the art, skill of a POSITA, and state of the prior art. Competing expert testimony on the principles of operation, Patent Owner’s statements of an “unexpected,” “counterintuitive,” and “outside conventional wisdom” invention (Paper 18, 1-2, 37), and the Board’s obviousness determination show factors 4-7 favor no enablement.

Experts disagree on the basic operation of the GaN transistors and what would be required to achieve the contradictory requirements in the new claims—if that is even possible. *See* Ex. 1039 ¶¶54-55, 71 (Dr. Shealy describing one operation and passivation); Ex. 2024 ¶27 (Dr. Schubert describing a different operation and passivation); Ex. 2017, 1145:1-1146:8 (Dr. Doolittle testifying Schubert’s theory “is not possible”). Such disagreement among experts, all of whom possess the requisite skill, underscores the lack of guidance and the unpredictability of the art.

Patent Owner’s own characterizations further reinforce this. Patent Owner contended that the doping effects it claims were “*entirely unexpected*” according to the conventional wisdom.” Paper 18, 6. It also contended that “*counterintuitive results* ... precipitated the invention.” *Id.*, 61. Patent Owner’s descriptions of an “entirely unexpected” invention based on “counterintuitive results” belies its, its

expert's, and the Board's arguments, that the invention was achievable with "only routine experimentation." Decision, 61.

And factors 4-7 highlight the inconsistency in the Board's reasoning finding the claims enabled by the prior art and still non-obvious in view of the same prior art. *Supra* § III.A.3. If, as the Board concluded, the prior art and prior skill of those in the art were insufficient to render the new claims obvious (Decision, 44, 59), then they cannot suffice to enable the full scope of the new claims. *In re '318 Patent*, 578 F. Supp. 2d 736. The Board's finding of non-obviousness necessarily mean that factors 4-7 also favor non-enablement.

Factor 8—the "breadth of the claims"—also favors non-enablement. The new claims recite elements generally as a sequence of "layers" one above the other, without specifying dimensions or concentrations. *See* Decision, 36-37. The Board has also found that the claims have no processing or fabrication constraints. *Id.*, 31 (finding product-by-process interpretation should not apply). Given the breadth the new claims seek, the nonexistent enabling disclosure in the Patent is not commensurate with the claimed scope. *Sitrick v. DreamWorks, LLC*, 516 F.3d 993, 999 (Fed. Cir. 2008) ("A patentee who chooses broad claim language must make sure the broad claims are fully enabled").

For example, the claims generically recite "acceptor type dopant atoms." *Id.* The specification discloses a wide range of acceptor dopants "for example, Mg, Zn,

Be, Cd, or Ca” (Ex. 1001, 3:10-12). The Board found the new claims enabled based on Patent Owner’s expert testimony that “a POSITA would understand from [the Patent’s] disclosure that *the Mg acceptor* concentration must be sufficiently high.” Ex. 2024, ¶30; *see* Decision, 61 (citing Ex. 2024 ¶¶28-31). But the new claims cover more, claiming not only the Mg but all “acceptor type dopants.” Decision, 36-37. Even if the Patent enabled the Mg dopant, there is still nothing in the record showing the Patent enables all the remaining dopants the new claims cover. *See* Ex. 2024 ¶¶21-32 (only discussing Mg); Paper 44, 51 (“[Patent Owner is] going to be talking about one of the dopants, magnesium. What about all the others?”). Yet the Board found claims enabled without even analyzing whether the specification is commensurate with the claim scope.

In sum, the Board correctly recognized the importance of the *Wands* factors in its preliminary guidance but failed to apply them in the Decision. A proper analysis of the factors results in only one outcome—the new claims are not enabled.

IV. CONCLUSION

Petitioners respectfully request (i) vacatur of the Board’s grant of Patent Owner’s Motion to Amend and (ii) correction the Board’s errors through either reversal or remand.

Dated: April 17, 2025

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that the foregoing **Petitioner's Request for Director Review** was served on April 17, 2025, via email directed to counsel of record for the Patent Owner at the following:

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