

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MICRON TECHNOLOGY, INC.,
Petitioner

v.

YANGTZE MEMORY TECHNOLOGIES COMPANY, LTD.,
Patent Owner

Case No.: IPR2024-00792
U.S. Patent No. 11,468,957
Issue Date: October 11, 2022

Title: ARCHITECTURE AND METHOD FOR NAND MEMORY OPERATION

**PETITIONER'S REQUEST FOR DIRECTOR REVIEW OF THE BOARD'S
FINAL WRITTEN DECISION**

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1001	U.S. Patent No. 11,468,957 B2 to Lee et al. (“’957 patent”)
1002	File History of U.S. Patent No. 11,468,957 to Lee et al.
1003	Declaration of David Kuan-Yu Liu, Ph.D.
1004	<i>Curriculum Vitae</i> of David Kuan-Yu Liu, Ph.D.
1005	Chinese Patent Publ. No. 109065091 A to Hongtao Liu et al. (certified translation and original) (“Hongtao”)
1006	U.S. Patent Publ. No. 2019/0198117 A1 to Yu et al. (“Yu”)
1007	U.S. Patent Publ. No. 2021/0082505 A1 to Suzuki (“Suzuki”)
1008	U.S. Patent Publ. No. 2018/0012667 A1 to Costa (“Costa”)
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1010	Minute Order, Dkt. No. 42, dated February 22, 2024 in <i>Yangtze Memory Technologies Company, Ltd. V. Micron Technology, Inc. and Micron Consumer Products Group, LLC</i> , Case No. 3:23-cv-05792-RFL
1011	Combined Civil and Criminal Federal Court Management Statistics (December 31, 2023), available at https://www.uscourts.gov/sites/default/files/data_tables/fcms_na_distcomparison1231.2023.pdf
1012	Docket from <i>Yangtze Memory Technologies Company, Ltd. V. Micron Technology, Inc. and Micron Consumer Products Group, LLC</i> , Case No. 3:23-cv-05792-RFL
1013	U.S. Patent No. 9,589,978 B1 to Yip
1014	Aritome, “NAND Flash Memory Technologies” (2016)
1015	Silvagni, “3D NAND Flash Based on Planar Cells,” <i>Computers</i> 2017
1016	U.S. Patent Publ. No. 2020/0168276 A1 to Yang

Exhibit	Description
1017	U.S. Patent No. 9,620,233 B1 to Dong et al.
1018	Micheloni, “3D Flash Memories” (2016)
1019	U.S Patent No. 9,361,993 B1 to Chen et al.
1020	U.S Patent No. 10,276,251 B1 to Lobana et al.
1021	U.S. Patent Publ. No. 2019/0348122 A1 to Ko et al.
1022	U.S. Patent Publ. No. 2013/0077404 A1 to Nawata et al.
1023	U.S Patent No. 10,121,529 B2 to Lee
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1030	U.S. Patent No. 10,861,537 to Lien et al.
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1032	Petitioner’s Hearing Demonstratives

LIST OF ABBREVIATIONS

ABBREVIATION	TERM
'957 patent	U.S. Patent No. 11,468,957 B2 (Ex. 1001)
Hongtao	Chinese Patent Publ. No. 109065091 A (Ex. 1005)
Yu	U.S. Patent Publ. No. 2019/0198117 A1 (Ex. 1006)
Suzuki	U.S. Patent Publ. No. 2021/0082505 A1 (Ex. 1007)
Costa	U.S. Patent Publ. No. 2018/0012667 A1 (Ex. 1008)
Seo	U.S. Patent Publ. No. 2021/0027848 A1 (Ex. 1009)
Petition or Pet.	Petition for <i>Inter Partes</i> Review of U.S. Patent No. 11,468,957 (IPR2024-00792, Paper 1)
POR	Patent Owner's Response (IPR2024-00792, Paper 17)
Reply	Petitioner's Reply Brief (IPR2024-00792, Paper 20)
FWD	Judgment – Final Written Decision (IPR2024-00792, Paper 36)
Patent Owner	Yangtze Memory Technologies Co. Ltd.
Petitioner	Micron Technology, Inc.

I. INTRODUCTION

Petitioner Micron Technology, Inc. requests Director Review of the Board’s Final Written Decision that claims 1-6 of the ’957 patent are not unpatentable for obviousness. The ’957 patent relates to “apparatuses and methods for verifying/reading memory cells of a 3D-NAND memory device.” ’957 patent, 1:44-49. Petitioner demonstrated that the combinations of (1) Hongtao and Yu, and (2) Costa and Seo would have rendered claims 1-6 obvious. The Board’s rejection of those grounds rests on clear factual and legal errors that warrant Director Review and vacatur. *See* Director Review Process, § 2.B (Nov. 25, 2025).

First, the Board erred in relying on unsupported expert testimony that directly contradicts what Hongtao discloses. Hongtao teaches a multi-step reading operation in which a first voltage applied to the gate terminal of a memory cell in a pre-conduction phase is greater than a second voltage applied to the terminal in a reading phase—just as claim 1 of the ’957 patent requires. This is clear from the waveform in Hongtao’s Figure 2, which traces the relative magnitude of the different voltages over time. The Board, however, determined that Hongtao is “silent” about the relative magnitudes of its voltages—relying on testimony from Patent Owner’s expert, Dr. Przybylski, who asserted that a skilled artisan *would not* have understood Hongtao’s Figure 2 to disclose what it self-evidently depicts. Dr. Przybylski testified that a skilled artisan would have read Hongtao to disclose a *redrawn* version of

Figure 2 that depicts a completely different waveform. But nothing more than the conclusory say-so of Patent Owner's expert supports his opinion, and the Board erred in crediting that testimony as a matter of law. Controlling law requires vacatur of the Board's decision.

Second, the Board reached a conclusion about what Seo discloses that is (1) inconsistent with the Board's own factual findings, (2) not supported by adequate reasoning, and (3) based on an argument that neither party had advanced, in contravention of well-settled principles of administrative law. The Board itself recognized that Seo discloses a multi-step reading operation that involves applying voltages in a first time period that are different than a reading voltage applied in a second time period. The Board nevertheless concluded that Seo does not disclose a "pre-verify stage that is distinct from the verify/read stage," as claim 1 of the '957 patent requires. This conclusion is irreconcilable with the Board's own factual findings about what Seo discloses. At a minimum, the Board failed to adequately explain why Petitioner's evidence did not demonstrate that Seo discloses a "distinct" pre-verify stage. And because even Patent Owner had never disputed that the stages of Seo's operation are "distinct," Petitioner was unlawfully deprived of an opportunity to address the Board's *sua sponte* grounds for rejecting this obviousness ground. Each of these errors independently requires vacatur.

II. The Board Clearly Erred In Crediting Unsupported Expert Testimony That Directly Contradicts What A Prior Art Reference Discloses.

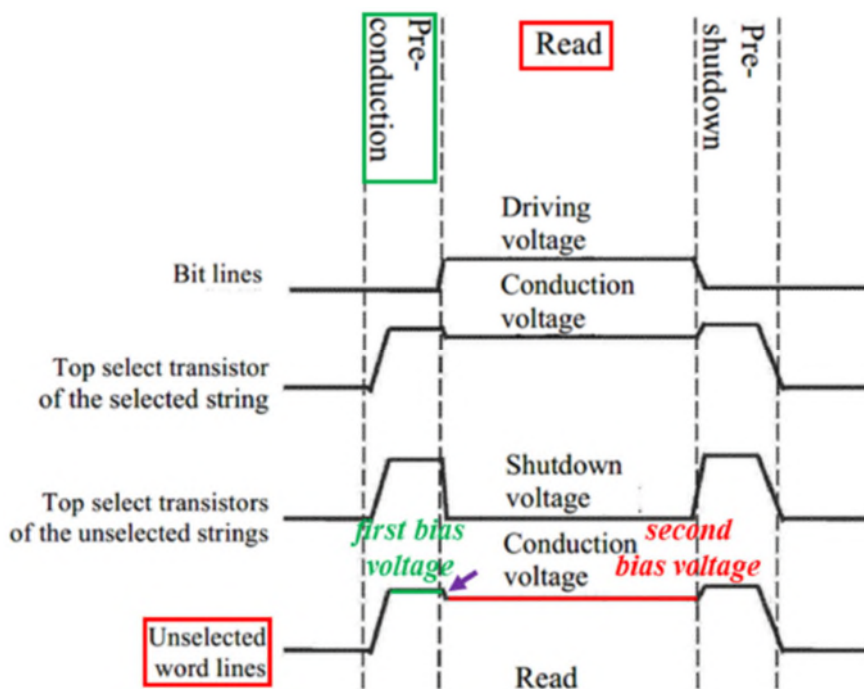
“[A]n unsupported [expert] opinion is not substantial evidence,” and the Board may not credit an expert opinion that “contradict[s] a [prior art] reference.” *Ericsson Inc. v. Intell. Ventures LLC*, 890 F.3d 1336, 1346 (Fed. Cir. 2018) (“[T]his is not a matter of credibility but of technological evidence.”); *see Homeland Housewares, LLC v. Whirlpool Corp.*, 865 F.3d 1372, 1378 (Fed. Cir. 2017) (“[W]e must disregard the testimony of an expert that is plainly inconsistent with the record.”). Yet the Board relied on just such improper expert testimony here: In order to find that the combined teachings of Hongtao and Yu fail to render claims 1-6 obvious, the Board credited unsupported testimony from Patent Owner’s expert, Dr. Przybylski, that directly contradicts what Hongtao discloses.

Claim 1 of the ’957 patent requires an apparatus for reading a memory device configured to “apply ... a first bias voltage on a gate terminal” in a “pre-verify stage” and “a second bias voltage on the gate terminal” in a “verify stage” wherein the “second bias voltage is smaller than the first bias voltage.” ’957 patent, 17:32-56. Petitioner demonstrated that Hongtao discloses this limitation: it includes an embodiment in which a “pre-conduction voltage ... applied” in a “pre-conduction stage” precedes “a conduction voltage” that is “applied ... through the unselected word lines” to the “gates of the [memory cells]” in a “read” stage. Pet. 33-36, 39-40; *see* Hongtao, [0023]-[0025]. Hongtao also includes “Figure 2,” a “timing

diagram” of this “specific embodiment” that clearly depicts the voltage in the “pre-conduction” stage ramping up and plateauing at a certain level before the start of the “read” stage, at which point the voltage ramps down and stabilizes at a lower level.

Id., [0021], Fig. 2.

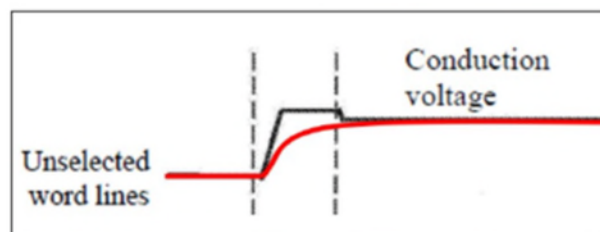
As Figure 2 (annotated below) demonstrates, Hongtao discloses the claim 1 limitation requiring a “second bias voltage” (the “Conduction voltage”) that is “smaller than the first bias voltage” (the “Pre-conduction voltage”):



Pet. 39; *see* Ex. 1003, ¶ 120. Indeed, Hongtao explains why one would drop the voltage in the read stage: “[t]he greater the voltage, the stronger the read interference.” Pet. 40 (quoting Hongtao, [0026]); *see* Ex. 1003, ¶ 120.

The Board declined to find the claim limitation obvious—but only by effectively adopting the view that Hongtao *does not mean what it says*. The Board

credited Patent Owner’s expert, Dr. Przybylski, who contended that Figure 2 depicts “*target values* for the word-line voltages”—not the “resulting voltages that develop on the gate terminals.” FWD 16-17 (emphasis added); *see* Ex. 2003, ¶ 95. Dr. Przybylski explained that these “target” values “*may* differ” from the “actual voltages” applied to the gate terminal if not given enough opportunity to “develop over time.” *Id.* ¶¶ 94-96 (emphasis added). And Dr. Przybylski speculated, despite what he viewed as an absence of “detail to determine how the ... [voltages] develop over time,” that the Figure 2 voltages are not given sufficient time to develop to their target values. *Id.* ¶¶ 98-99. This allegedly results in voltages that “remain the same between the pre-conduction phase and the reading phase.” *Id.* In other words, although Figure 2 depicts a voltage in the pre-conduction stage that is larger than the voltage in the reading phase, Dr. Przybylski opined that a skilled artisan would read it to disclose something else entirely—as illustrated by Dr. Przybylski’s *redrawn* version of Figure 2 that depicts a completely different waveform (in red):



Id. ¶ 98. But Dr. Przyblyski failed to support his opinions that (1) Figure 2 discloses “target values” rather than applied voltages; and (2) Hongtao teaches that its applied voltages do not reach their “target values” until the reading phase, as shown in his

redrawn version of Figure 2. The Board erred in relying on Dr. Przybylski's unsupported expert testimony, which directly contradicts what Hongtao itself discloses. *See Ericsson*, 890 F.3d at 1346.

A. Dr. Przybylski Did Not Support His Opinion That Hongtao's Figure 2 Depicts Target Values.

Dr. Przybylski provided no evidentiary basis for his opinion that Hongtao would have been understood to depict “target values” (which Hongtao never even mentions) rather than “voltages applied to the gate terminals” (which Hongtao expressly recites).

As the Board acknowledged, Hongtao discloses that Figure 2 depicts an embodiment in which “[t]he gates ... are applied with a conduction through the unselected word lines.” Hongtao, [0019], [0025]; *see* FWD 10 (“The conduction voltage is applied to the gates ... through the unselected word lines.”); *id.* at 16-17 (“Hongtao teaches applying voltages on gate terminals”). Figure 2, in turn, depicts a waveform in which a “conduction voltage” is applied through “unselected word lines”—self-evidently corresponding to the “conduction” that is “applied [to the gates] ... through the unselected word lines” in Hongtao's paragraph 25. Hongtao, Fig. 2, [0025]; *see supra* 3-4. The notion that Hongtao does not depict applied voltages in Figure 2 is therefore “inconsistent with the record.” *Homeland Housewares*, 865 F.3d at 1378.

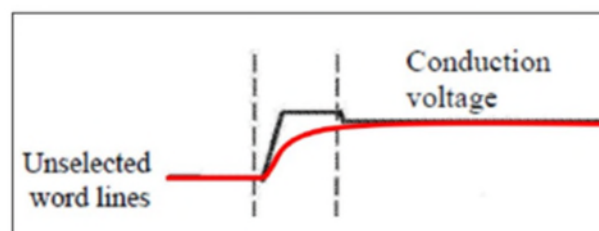
What's more, Dr. Przybylski provided no evidentiary support for his contention that Figure 2 *actually* depicts “target values” rather than voltages applied to the gate terminal. Dr. Przybylski based this opinion on the fact that the Figure 2 waveform uses “steep slew rates ..., straight lines, and sudden changes.” Ex. 2003, ¶ 96. According to Dr. Przybylski, that would “signify[] target voltages” to a skilled artisan. *Id.* But Dr. Przybylski provided no documentary support whatsoever for this conclusory notion. *See Advanced Tech. Materials, Inc. v. Praxair, Inc.*, 228 F. App'x 983, 985 (Fed. Cir. 2007) (“[f]aced with prior art plainly disclosing [the claim limitation],” “conclusory” expert testimony cannot defeat obviousness as a matter of law). Meanwhile, Petitioner's expert, Dr. Liu, contradicted that view, providing evidence that the prior art depicts actual voltages applied to gate terminals with *either* curved or straight-line waveforms. *See* Ex. 1027, ¶¶ 50-51 (citing Suzuki, Fig. 11; Ex. 1019, Fig. 15B; Suzuki, [0134]); Reply 19-20. And, as Dr. Liu pointed out, the '957 patent itself depicts actual voltages applied to gate terminals with *both* curved and straight-line waveforms. *See* Ex. 1027, ¶¶ 49-50 (explaining that the '957 patent uses a curved waveform solely to “illustrate voltages that do not fully develop” to a target value before the reading phase); Reply 17-19. Dr. Przybylski's conclusory assertion about “general scientific knowledge”—i.e., that use of straight waveforms and sudden changes would necessarily disclose target values to a skilled artisan—“require[s] support by documentary evidence in order to receive probative

weight,” especially “when challenged.” *Upjohn Co. v. Mova Pharm. Corp.*, 225 F.3d 1306, 1311 (Fed. Cir. 2000). Because Dr. Przybylski provided none, the Board should have rejected his conclusory opinion.

B. Dr. Przybylski Did Not Support His Opinion That Hongtao Discloses Applied Voltages That Fail To Reach Their Target Values.

Even if the Board were correct to credit Dr. Przybylski’s unsupported view that Figure 2 depicts “target values” rather than the “voltages applied to the gate terminals,” the Board *still* erred in determining that Hongtao fails to disclose the relevant claim limitation. Hongtao nowhere suggests that its applied voltages are given insufficient time to reach the purported target values—and Dr. Przybylski provided no evidentiary support to conclude otherwise. As such, even if Figure 2 depicts only target values, it still teaches an applied “conduction voltage” that is smaller than the voltage applied in the pre-conduction phase.

As discussed above, Dr. Przybylski annotated Figure 2 with a redrawn version of the waveform (in red, below) that supposedly depicts the actual, applied voltages that Hongtao discloses—in which the voltage magically reaches its target value at precisely the start of the read phase, but no sooner:



Ex. 2003, ¶ 98. Yet even Dr. Przybylski admitted that his redrawn version of the Figure 2 waveform had no evidentiary support. Dr. Przybylski testified that in his view, Hongtao does not “provide enough detail to determine how the [actual] voltages being applied to the gate terminals ... develop over time.” *Id.* By Dr. Przybylski’s own telling, then, the notion that Hongtao discloses a pre-conduction phase with *insufficient* time for the voltages applied at the gate terminals to reach their target values amounts to nothing but “mere speculation.” *NuVasive, Inc. v. Iancu*, 752 F. App’x 985, 998 (Fed. Cir. 2018); *see* Reply 23; Ex. 1027, ¶¶ 60-61. On the other hand, Dr. Liu testified that, because Figure 2 depicts a voltage that peaks and plateaus for a period of time, a skilled artisan would have reached the opposite conclusion: that Hongtao’s voltages *are* given sufficient time to develop to their target values. *Id.*, ¶ 19. Indeed, the notion that a skilled artisan would expect that Hongtao’s applied voltages fail to reach their target values contradicts the “well-established” principle that Hongtao is “presumed enabling.” *Apple Inc. v. Corephotonics, Ltd.*, 861 F. App’x 443, 449 (Fed. Cir. 2021); *see* Reply 23. In sum, Dr. Przybylski again failed to back up his conclusory assertion that a skilled artisan would have reason to conclude that Hongtao teaches something other than what Figure 2 appears to depict. *See Upjohn*, 225 F.3d at 1311 (expert testimony about general scientific knowledge cannot “receive probative weight” when “challenged” absent supporting documentary evidence).

Relying on Dr. Przybylski's testimony, the Board reasoned that Hongtao needed to at least disclose "how the gate voltages develop over time" and "the length of the pre-conduction period" in order to render claim 1 obvious. FWD 16. But as just discussed, Figure 2 illustrates how the gate voltages develop over time: It is a "timing diagram" that illustrates the voltage rising for a period of time, then plateauing at a higher level, then dropping in the conduction phase, and then stabilizing there at a lower level. Hongtao, [0021], Fig. 2; Ex. 1027, ¶ 19. And regardless, claim 1 of the '957 patent does not dictate any particular timing parameters for the development of its gate voltages; all that matters is that the "second bias voltage is smaller than the first bias voltage." '957 patent, 17:55-56. The Board effectively "added unclaimed limitations to the claim[]," which is clear error "when analyzing obviousness." *Janssen Pharm., Inc. v. Teva Pharm. USA, Inc.*, 97 F.4th 915, 925-27 (Fed. Cir. 2024).

* * *

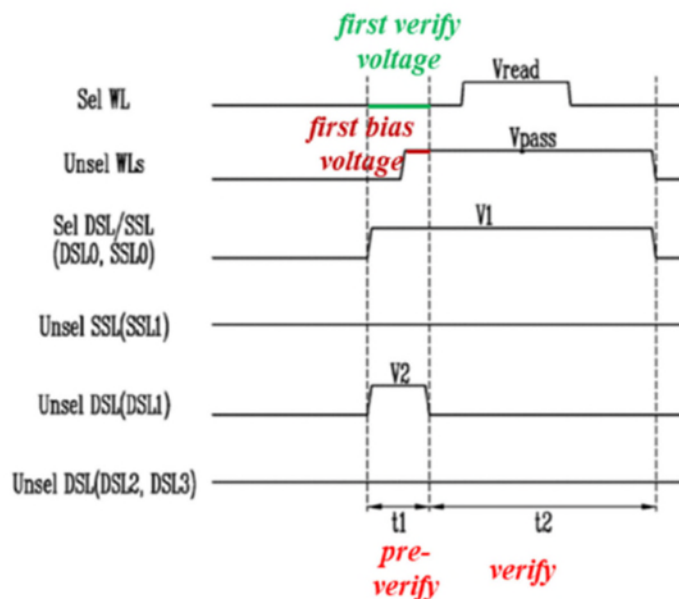
If Dr. Przybylski's unsupported expert testimony is set aside, as it must be, Hongtao indisputably renders obvious a "second bias voltage ... smaller than [a] first bias voltage" "appl[ied] ... on a gate terminal." '957 patent, 17:32-56. Hongtao is not "silent with respect to the magnitudes of the pre-conduction and conduction voltages" at all, as the Board incorrectly concluded. FWD 15; *see also id.* at 16 (incorrectly concluding that Hongtao does not "describe[s] the magnitudes of the

pre-conduction and conduction [voltages] relative to each other”). Rather, Figure 2 discloses a conduction voltage smaller than the pre-conduction voltage. *See supra* 3-4; Pet. 39; *see also In re Boyd*, 55 F.2d 493, 494 (C.C.P.A. 1932) (“[D]escription for purposes of [invalidity] may be by drawings alone, as well as by words.”).

III. The Board Clearly Erred In Reaching A Nonobviousness Conclusion That Is Inconsistent With Its Factual Findings, Lacks Adequate Reasoning, And Is Not Based On Either Party’s Arguments.

The Board also committed clear error in concluding that claims 1-6 are not obvious over a combination of Costa and Seo on the sole ground that Seo purportedly does not disclose a “pre-verify stage that is distinct from the verify/read stage.” FWD 29. That conclusion conflicts with the Board’s own factual findings, lacks adequate reasoning in support, and was never advanced by Patent Owner as a ground for rejecting Petitioner’s obviousness contention.

As mentioned above, *supra* 3, claim 1 of the ’957 patent requires an apparatus for reading a memory device that applies different voltages in “pre-verify” and “verify” stages. ’957 patent, 17:32-56. Petitioner demonstrated that Seo clearly discloses a “pre-verify” stage. Pet. 26, 106-107. Seo discloses applying voltages in a “time period t1” before “read voltage Vread ... [is applied] during a second time period t2,” Seo, [0088]-[0090], as illustrated by the annotated version of Seo’s Figure 8 below:



Pet. 27 (quoting Ex. 1003, ¶ 89). Dr. Liu testified that a skilled artisan would have understood that time period t_1 corresponds to the “pre-verify period” claimed by the ’957 patent. Ex. 1003, ¶¶ 89, 249. The Board nevertheless held that Seo failed to disclose this claim limitation, reasoning that Seo does not teach that its “time period t_1 is a pre-verify stage that is distinct from the verify/read stage.” FWD 29.

Three independent errors require vacatur of the Board’s decision. First, the Board erred in reaching a conclusion “inconsisten[t]” with its own “factual findings.” *Polygroup Ltd. MCO v. Willis Elec. Co., Ltd.*, 780 F. App’x 880, 884 (Fed. Cir. 2019). The Board recognized that Seo discloses a “read operation [that] includes two time periods during which different voltages are applied.” FWD 29. And the Board recognized that Seo discloses a read operation in which the “read voltage Vread” is only applied “during [the] second time period t_2 ”—as distinct

from the “first time period t1.” *Id.*, 27; *see also id.* 28-29 (quoting Seo, ¶¶ 88-90, Fig. 8). The “first time period t1” therefore necessarily constitutes a “*pre-verify* stage that is *distinct* from the verify/read stage.” *Contra id.* 29 (emphases added). After all, time period t1 occurs prior to (“pre-”) the time period t2 in which the read voltage is applied (the “verify/read stage”). The Board should have found the claim limitation satisfied based on its own factual findings. *Polygroup*, 780 F. App’x at 884.

Second, the Board never explained what more Petitioner needed to show in order to render the claimed “pre-verify” stage obvious. This absence of a “reasoned explanation” alone requires vacatur of the Board’s decision. *See In re NuVasive, Inc.*, 842 F.3d 1376, 1383 (Fed. Cir. 2016); *Microsoft Corp. v. Parallel Networks Licensing, LLC*, 715 F. App’x 1013, 1021 (Fed. Cir. 2017) (vacat[ing] decision where “Board provided insufficient explanation to justify rejecting the [obviousness] challenge”). The Board rejected the testimony of Petitioner’s expert, Dr. Liu, who testified that Seo teaches a “pre-verify stage” by disclosing a “first time period t1 preceding a read/verify period t2.” FWD 29 (quoting Ex. 1003, ¶ 249). The Board reasoned that this testimony was “not persua[sive]” absent “further explanation.” *Id.* But the Board did not articulate what “further explanation” was necessary to demonstrate that Seo satisfies the claim limitation. *NuVasive*, 842 F.3d at 1373 (“conclusory statements” are insufficient). To the extent that the Board understood

the claimed “pre-verify stage” to constitute something *other* than a time period that precedes the period in which the ready/verify occurs, the Board erred in failing to provide Petitioner notice of any such construction. *See Qualcomm Inc. v. Intel Corp.*, 6 F.4th 1256, 1263 (Fed. Cir. 2021) (noting that the Board must “provide notice of and an adequate opportunity to respond to its construction”). Moreover, the Board overlooked other evidence Petitioner *did* provide elsewhere: For example, undisputed testimony from Dr. Liu explained that a skilled artisan would have recognized that Seo “appl[ies] voltages in a time period t1 *before* the read operation” in order to “reduce[] HCI[,] ... just like ... the ’957 patent.” Ex. 1003, ¶ 89; *see In re Sullivan*, 498 F.3d 1345, 1353 (Fed. Cir. 2007) (“By failing to consider the submitted evidence, the Board thus committed error.”). In sum, the Board did not meet its obligation under well-settled principles of administrative law to “examine the relevant [evidence] and articulate a satisfactory explanation for its action.” *NuVasive*, 842 F.3d at 1382 (quoting *Motor Vehicle Mfrs. Ass’n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983)).

Third, the Board erred in failing to “base its decision on arguments that were advanced by [Patent Owner], and to which [Petitioner] was given a chance to respond.” *In re IPR Licensing, Inc.*, 942 F.3d 1363, 1368-69 (Fed. Cir. 2019). Patent Owner had never disputed that Seo “use[s] a *distinct* [time] period t1” in which different voltages are applied prior to the application of the read voltage in “time

period t2.” Ex. 2003, ¶¶ 148-49 (emphasis added); *see* POR 60 (recognizing that Seo’s “read” operation “is divided into a ‘first time period t1’ and a ‘second time period t2’”). Patent Owner had only ever contended that because Seo discusses this partitioning in the context of a “*read* operation,” a skilled artisan would not have understood it to suggest a “two-step *verification* operation.” POR 59-60 (emphasis added); *see* Ex. 2003, ¶¶ 148-149. In response, Petitioner provided copious evidence that read and verify operations are “virtually identical.” Reply 28-29; *see id.* at 23-25; *see generally* Ex. 1027, ¶ 70 (explaining that both read and verify are “sensing operation[s]” with different “reference voltage[s]”) (citing, *inter alia*, Ex. 1017, Fig. 13, 20:40-22:57); *id.* at ¶¶ 66-74, 87-89. The Board implicitly agreed with Petitioner that “reading and verifying [are] interchangeable,” Reply 24-25—referring to the claimed “verify stage” as a “verify/*read* stage,” FWD 29 (emphasis added). But the Board nevertheless found the claim limitation nonobvious based on a supposed lack of “distinct[ion]” between the “pre-verify” and “verify/read” stages in Seo. FWD 29. Because this had “never [been] identified by the parties as an issue,” Petitioner had no opportunity address it. *Apple Inc. v. Corephotonics, Ltd.*, 81 F.4th 1353, 1362 (Fed. Cir. 2023). The appropriate remedy is vacatur. *Id.*

IV. CONCLUSION

For the reasons stated above, the Director should vacate the Board’s final written decision finding claims 1-6 of the ’957 patent not unpatentable.

Respectfully submitted,

ORRICK, HERRINGTON & SUTCLIFFE LLP

Dated: December 5, 2025

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CERTIFICATE OF SERVICE

The undersigned hereby confirms that the foregoing Petitioner's Request for Director Review were caused to be served on December 5, 2025 via electronic mail, upon the following attorneys of record for the Patent Owner:

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