

Petition for Rehearing of Denial of
Inter Partes Review of U.S. Patent No. 7,145,369

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

XILINX, INC.,

Petitioner

v.

POLARIS INNOVATIONS LIMITED,

Patent Owner.

U.S. PATENT NO. 7,145,369

Case No. IPR2023-00514

**PETITIONER'S REQUEST FOR REHEARING ON
DECISION DENYING INSTITUTION
PURSUANT TO 37 C.F.R. § 42.71(d)**

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Petition for Rehearing of Denial of
Inter Partes Review of U.S. Patent No. 7,145,369

Pursuant to 37 C.F.R. § 42.71(d), Xilinx, Inc. (“Petitioner”) respectfully requests rehearing of the Board’s Decision denying institution of *inter partes* review (IPR) of U.S. Patent No. 7,145,369 (“the ’369 Patent”). *See* Decision Denying Institution, IPR2023-00514, Paper No. 12 (Aug. 1, 2023) (“Decision”).

I. INTRODUCTION AND STATEMENT OF RELIEF REQUESTED

Petitioner requested IPR of claims 1–8, 14–16, and 18 of the ’369 Patent across four obviousness grounds: Lee (EX1005); Lee and Thomann (EX1006); Lee and JESD79 (EX1007); and Lee, JESD79, and Garrett (EX1008). *See* Petition for IPR, IPR2023-00514, Paper No. 2, at 3 (Feb. 6, 2023) (“Petition” or “Pet.”).

The Board denied institution based on a purported failure of the asserted grounds to teach the limitation of claim 1¹ that requires:

a control unit for providing a control signal for setting a driver strength of the driver circuit to provide at least one of the output line potential and the output line current in *a desired power range* of a specification-prescribed potential range and a specification-prescribed current range.

Decision 16 (quoting EX1001, 6:63-66); *see also id.* at 17-21, 25-26, 29-30, 31.

¹ Independent claims 14 and 18 recite similar limitations, such as “controlling a driver strength” (claim 14), “a control means for providing a control signal for setting a driver strength” (claim 18), and “a lower power range” (claims 14 and 18). *See* Decision 9-10, 28-30.

Although the Board recognized that neither party proposed an express construction for this limitation, the Board proceeded to consider the scope of the term “desired/lower power range” without expressly construing the limitation. *See* Decision 9-10 (citing to Pet. 9-14; Patent Owner’s Preliminary Response, IPR2023-00514, Paper No. 9, at 9 (May 15, 2023) (“Prelim. Resp.”)). Based on Patent Owner’s arguments regarding the “desired/lower power range” (*see, e.g.*, Decision 15, 19-20, 25, 29 (citing Prelim. Resp. 2, 20-23, 25-27)), the Board appears to require that the “desired/lower power range” must be a particular (i.e., predetermined and fixed), controlled power range (*id.* at 19-20, 25); and that the “desired power range” must be a subset of a specification-prescribed range (*id.* at 19). The Board’s interpretation conflicts with the intrinsic record, which notably does not provide a definition or disavowal. Rather, the claims simply require setting or controlling the driver strength such that at least one of the output line potential/current is in a desired or lower power range of a specification-prescribed potential/current range.

Under a proper construction, the Board failed to adequately address the combination of Lee and Thomann (Ground 2) with respect to claim 1, merely providing a conclusion “for the same reasons as discussed” for Lee alone. *See* Decision 25-26. In doing so, the Board overlooked the combination of Lee and Thomann and the teachings of Thomann advanced in the Petition.

Further, in applying its claim interpretation, the Board improperly focused its attention again on Lee when addressing the combination of Lee and JESD79 (Ground 3), misapprehending JESD79's disclosure, and overlooking expert testimony related to the combination and JESD79's disclosure. *See id.* at 29-30.

Accordingly, the Board should grant Petitioner's request for rehearing to expressly construe the claims consistent with the intrinsic record and reconsider its decision in light of the proper construction and evidence in the record.

II. THE BOARD FAILED TO PROVIDE AN EXPRESS CONSTRUCTION OF "DESIRED/LOWER POWER RANGE"

Independent claims 1, 14, and 18 recite similar limitations regarding a desired or lower "power range." *See* EX1001 at 6:62-67, 7:63-8:6, 8:34-39. Despite recognizing that it must construe claim terms to resolve controversy, the Board overlooked the need, given the apparent dispute, to provide an express construction for a "desired/lower power range" and reasoning for such construction if the decision to institute rests on such a construction. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017). In denying institution based solely on the limitation reciting a "desired/lower power range," the Board implicitly required that the desired or lower "power range" must be a particular (i.e., predetermined and fixed), controlled power range, and further that the "desired power range" must be a subset of a specification-prescribed

range.² *See* Decision 17-20, 25. However, none of these requirements are in the claims or mandated by the intrinsic record.

III. THE BOARD’S APPARENT CLAIM INTERPRETATION IS INCORRECT

A. THE CLAIMS DO NOT REQUIRE A PARTICULAR, CONTROLLED “POWER RANGE”

At Patent Owner’s urging, the Board apparently interpreted the “power range” to require a *particular, controlled* “power range.” Decision 15, 19-20, 25 (citing Prelim. Resp. 1-2, 20-23, 23-25); *see also* Prelim. Resp. at 1 (asserting “claimed inventions address the problem of setting the output voltage in a *particular power range*” due to deviations and fluctuations). However, a particular (i.e., predetermined and fixed), controlled “power range,” is neither mandated by independent claims, nor by lexicography or disavowal. *See Hill-Rom Servs., Inc. v.*

² The Board also required that the “desired/lower power range” must correspond to a low or high output level, but did not explain how the independent claims or specification mandate this requirement. *See* Decision 20-21. Because this Request focuses on Grounds 2 and 3, which each disclose a “desired/lower power range” that corresponds to both low and high output levels, Petitioner does not separately address this claim interpretation by the Board. *See, e.g.,* Pet. 52-54, 56-58, 64-67, 69-73.

Stryker Corp., 755 F.3d 1367, 1371 (Fed. Cir. 2014) (departing “from the plain and ordinary meaning” requires “lexicography and disavowal”).

Contrary to the Board’s conclusion that “claim 1 requires the ‘desired power range’ to be a *particular* range that a ‘control unit . . . provide[s],’” (Decision 19-20, 25), claim 1 only requires that the “control unit” is “for providing a control signal.” EX1001, 6:62. That control signal is “for setting a driver strength of the driver circuit” in order “to provide at least one of” the output line potential/current “in a desired power range.” *Id.* at 6:62-65; *see also id.* at 7:63-8:6 (cl. 14) and 8:34-39 (cl. 18). There is no requirement that the control unit actively determine whether the output is in a bounded range of values. Further, the claims distinguish between the “power range,” which is merely a “*desired* power range” (cl. 1) or “*lower* power range” (cls. 14, 18), from particular ranges or values that are predetermined and fixed, such as the “specification-prescribed potential range” and “specification-prescribed current range.” *See id.* at 6:62-67, 8:4-6, 8:37-39. Indeed, claim 1 “does not specify” a particular, controlled “desired power range.” *See* Decision 19 (“[I]ndependent claim 1 does not specify where within the specification-prescribed power range the desired range must be.”). Thus, the plain language of the claims indicates that the “control unit” does not directly control or provide a particular “power range;” rather, the “control unit” simply provides “a control signal for setting a driver strength” that provides (results in) at least one of

the output potential/current in a desired/lower power range. In other words, as evidenced by Patent Owner's positions in the litigation, the plain language of the claim would be met if the control unit controlled the drive strength to provide an output potential/current to be at a particular setpoint (not a range), and that setpoint was previously set at a value that a designer of the circuit previously determined to be within the claimed ranges. *See* EX1015, ¶¶36-37 (cited by Pet. 38, 46).

Additionally, the specification does not show lexicography or disavowal, and the cited passages simply describe an embodiment. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1323 (Fed. Cir. 2005) (en banc) (warning “against confining the claims” to specific, described embodiments). Specifically, the Board quotes passages relating to Figure 1, which is only one embodiment, or Figures 2a and 2b which “show the switching behaviors of” the driver circuit in Figure 1. *See* EX1001, 6:8-12, 5:50-51, 6:35-37, 3:62-63, 4:4-5, 4:41; Decision 19; *see also* Pet. 3-7. Similarly, in addressing deviations or fluctuations, the specification describes an embodiment—not all “claimed inventions” as Patent Owner asserts. *See* EX1001, 2:50-67 (one “aspect of the invention” involving “a lower power range” in which “it is *possible* to take into account” deviations and fluctuations) (emphasis added), cl. 4 (reciting a “lower portion” of a range). Nowhere do these quoted passages set forth a definition or express a manifest exclusion or restriction that requires the “power range” be a particular, controlled “power range.” *See Hill-Rom*

Servs., Inc., 755 F.3d at 1371 (“To act as its own lexicographer, a patentee must clearly set forth a definition of the disputed claim term other than its plain and ordinary meaning and must clearly express an intent to redefine the term.”), 1372 (Embodiments cannot limit the scope of the claims absent patentee’s “words or expressions of manifest exclusion or restriction.”) (internal quotations omitted).

Further, it appears the Board overlooked the portions of the intrinsic record that do not require a controlled “power range.” Contrary to the embodiment that purportedly “sets the desired range to a ‘lower power range’” in which there are two reference voltages (Decision 19 (quoting EX1001, 5:50-51)), the ’369 Patent discloses that only one reference potential may be provided (*see* EX1001, 3:19-25, 7:26-30 (claim 6)). *See also* Pet. 11-12 (claim 18 does not require “multiple reference values” or comparators unlike certain disclosed embodiments with multiple comparators). Thus, there is no support for limiting the desired/lower “power range” to a particular, controlled “power range.”

B. CLAIM 1 DOES NOT REQUIRE THE “DESIRED POWER RANGE” BE A SUBSET OF A SPECIFICATION-PRESCRIBED RANGE

The Board also interpreted the “desired power range” to require that it be a subset of a specification-prescribed range or that it cannot be the same as the specification-prescribed range. *See* Decision 19. This negative limitation is not

found in claim 1 and there is no lexicography or disavowal to warrant importing a limitation from the specification. *See Hill-Rom Servs., Inc.*, 755 F.3d at 1371.

Claim 1 simply requires “a desired power range *of* a specification-prescribed potential range and a specification-prescribed current range.” EX1001, 6:65-67 (emphasis added). The plain meaning is that the unclaimed potential/current range of the “desired power range” is *equal to or a subset of* the specification-prescribed potential/current range. As the Board acknowledges, the ’369 Patent discloses that the lower limit of the desired range can be the same as the lower limit of the specification range. *See* Decision 18 (citing EX1001, 3:1-8, 6:38-45, claim 2). And with respect to the upper limit, there is no lexicography or disavowal requiring that the upper limit of the desired range be less than the upper limit of the specification range. *See Phillips*, 415 F.3d at 1323. The Board quotes passages in the specification relating to Figure 1, which is only one embodiment, or Figures 2a and 2b, which “show the switching behaviors of” the driver circuit in Figure 1. EX1001, 6:8-12; *see also* EX1001, 5:50-51, 6:35-37 (quoted in Decision 19), 3:62-63, 4:4-5, 4:41. Nowhere do these quoted passages set forth a definition or express a manifest exclusion or restriction that requires the upper limit of the “desired power range” be less than the upper limit of a specification range. *See Hill-Rom Servs., Inc.*, 755 F.3d at 1371-72. Indeed, the ’369 Patent does not *require* reducing power consumption or a lower power range. *See, e.g.*, EX1001, Abstract

(potential/current values “*may* lie in a lower power range”), 2:20-23 (same), 2:24-30 (It is “possible” the potential/current values are in a lower power range such that “the power consumption of the output driver *can* be reduced”), 2:51-55 (“the driver strength . . . *may* be set . . . in such a way that” the current/potential “lies in a lower power range”), 2:64-67 (comparing a “lower power range” to “energy consumption of a noncontrolled driver circuit”).

Further, the “desired power range” of claim 1 is differentiated from the range of claim 4 that must correspond to “a lower portion” of the specification-prescribed range. EX1001, 7:18-21. Accordingly, there is a presumption that the “power range” of claim 1 is not limited to a subset or lower portion of the specification-prescribed range. *See Hill-Rom Servs., Inc.*, 755 F.3d at 1374 (“[T]he presence of a dependent claim that adds a particular limitation raises a presumption that the limitation in question is not found in the independent claim.”) (quoting *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 910 (Fed. Cir. 2004)).

C. THE BOARD’S APPARENT CLAIM INTERPRETATION CONFLICTS WITH PATENT OWNER’S IMPLICIT INTERPRETATION

In addition to the Board’s claim interpretation conflicting with the intrinsic record, the interpretation also conflicts with Patent Owner’s implicit claim interpretation in litigation. Namely, Patent Owner alleges that adjusting an output voltage (VRN) relative to a *single* reference voltage (VREF) affects the driver

strength of the driver circuit, which provides the output line current/potential in a desired power range, and thus allegedly satisfies the claims. *See* EX1015, ¶¶36-37 (citing EX1016, 309) (cited by Pet. 38, 46). Contrary to Patent Owner's positions in this IPR proceeding, nowhere in its infringement allegations does Patent Owner interpret the claims as requiring a particular (i.e., predetermined and fixed) and controlled "power range" in which the desired range is a subset of the specification-prescribed range. *See generally id.*; *see, e.g.*, Decision 15, 19-20, 25, 29 (citing Prelim. Resp. 2, 20-23, 25-27). Thus, Patent Owner's interpretation in litigation conflicts with its own positions in this IPR proceeding and the Board's apparent claim interpretation. *See Amazon.com, Inc. v. Barnesandnoble.com, Inc.*, 239 F.3d 1343, 1351 (Fed. Cir. 2001) ("A patent may not, like a nose of wax, be twisted one way to avoid anticipation and another to find infringement.").

IV. THE BOARD FAILED TO ADEQUATELY ADDRESS LEE AND THOMANN UNDER THE CORRECT CONSTRUCTION

The Board overlooked the combination of Lee and Thomann in Ground 2 under a proper construction that does not limit the claims to the unclaimed requirements of "power range." In its decision, the Board simply stated that it agreed with Patent Owner for the reasons discussed for Ground 1. Decision 25-26. But those reasons relied on the Board's unduly narrow claim interpretations discussed above. *See* Decision 19-21 (requiring a particular, controlled "power

range” and a “desired power range” that cannot be the same as a specification-prescribed range). Further, Patent Owner’s argument (and implicitly the Board’s corresponding conclusion) that Thomann “fails to disclose anything about how or where to set the absolute value of VOH DRIVER or VOL DRIVER or whether or not that value is in a particular power range” both overlooks and misapprehends the evidence in the record and relies on improper claim interpretations regarding a “particular power range” and requiring setting an “absolute value”³ of the VOH DRIVER or VOL DRIVER.

As Petitioner explained in its motivation to combine Lee and Thomann, which is not disputed by Patent Owner (*see* Decision 24), Figure 3 of Thomann shows the output voltages before and after calibration. *See* Pet. 53 (citing EX1006, FIG. 3, 5:39-44, 5:58-65). In relation to Figure 3, Thomann describes setting the drive strength of a transistor to a minimum setting and incrementally adjusting it to achieve a balanced output voltage swing using calibration. *See* Pet. 54 (citing

³ Patent Owner never explained why the claims require an “absolute value,” a term that is not even mentioned in the ’369 Patent. To the extent the claims require such an additional limitation, they are still obvious over the combination of Lee and JESD79 in Ground 3 of the Petition, which provides numerical values. *See* Pet. 65-66, 69-73; *see also* Pet. 76-77 (citing EX1007, 60).

EX1006, 6:23-31, 4:3-5:19; EX1003, ¶120). Further, Patent Owner did not dispute that setting such a drive strength corresponds to an output voltage above a minimum level such as VOH MIN or VOL MIN, *which minimizes the power dissipated*. See Pet. 54 (citing EX1010, 8:13-32, FIGS. 4-5; EX1006, 6:23-31; EX1003, ¶120); *see generally* Prelim. Resp. 25-27. Against this background of the combination that explains how the drive strengths and corresponding output voltages are controlled to achieve a balanced output voltage swing and minimize power dissipation, Petitioner explained that Thomann teaches output in a desired power range corresponding to “symmetric VOH and VOL levels symmetric about VREF *and* within the voltage ranges between VOH MAX and VOH MIN and between VOL MAX and VOL MIN.” Pet. 57 (emphasis added) (citing EX1006, FIG. 3, 3:33-36, 5:62-65, 6:23-26). Thus, under a proper claim construction, where the desired output range need not be 1) predetermined and fixed or 2) a subset of the specification-prescribed range, Patent Owner and the Board have overlooked or misapprehended the disclosure and teachings of the Lee-Thomann combination.

V. EVEN UNDER THE BOARD’S APPARENT CONSTRUCTION, THE BOARD MISAPPREHENDED AND OVERLOOKED THE TEACHINGS OF LEE AND JESD79

Even if the Board declines to reconsider its implicit claim interpretation and provide express constructions consistent with the intrinsic record, which does not impose unclaimed requirements regarding the “power range,” the Board

nonetheless overlooked unrebutted expert testimony and misapprehended and overlooked the meaning of JESD79 as it relates to the Lee-JESD79 combination.

In its Decision, the Board misapprehended JESD79's disclosure in concluding that it suggests ranges "for use as a *specification* for a memory device being designed using a simulation tool" and not "operational range[s]" "for use within the Maximum and Minimum curves." Decision 29-30. This conclusion lacks any supporting record evidence or argument by Patent Owner. JESD79 discloses curves (max., typical, min.) for data driver output and separately discloses that the curves can further be used for IBIS. *See e.g.*, Pet. 64-65 (citing EX1007, 59). However, nowhere does JESD79 *limit* the use of its curves from data driver output to merely design/simulation. *See id.* at 64 (discussing IBIS or other simulation in a different context, about a timing reference, not data driver curves).

The Board also overlooked the full disclosure of JESD79 and the unrebutted testimony of Petitioner's expert, who made clear that JESD79 provides "I-V curves *for the output driver* [of the memory device], including minimum, maximum, typical low, and typical high curves for the pull-up and pull-down transistor(s) of the output driver." EX1003, ¶¶69, 142-44, 163; EX1007, 60 (providing max., min., typical voltage values)). As discussed in the Petition, JESD79 discloses user-controlled drive strength settings, "normal" and "weak," which reside in a register used *in operation*. *See* Pet. 21-23 (citing EX1007, 16, 59-60; EX1003, ¶¶69-70);

see also EX1007, 16 (Register “must be loaded” and “will retain” its information until “programmed again or the *device loses power*” and then waiting “before initiating *any subsequent operation*.”). JESD79 also discloses its “I-V curves [are] for the normal drive strength.” EX1007, 16. As Petitioner’s expert explained, JESD79’s I-V curves for the normal operational setting “define the maximum values (Maximum), minimum values (Minimum), and nominal values (Typical).” EX1003, ¶¶69-70; *see* EX1016, 16, 59-60. Accordingly, JESD79 teaches and discloses that the maximum, minimum, and typical I-V curves and values are used for memory device operation, contrary to the Board’s conclusion limiting their use design/simulation.

Further, the Board overlooked the Lee-JESD79 combination. The Board’s conclusion that “there is no teaching or suggestion in the combination of achieving” any desired/lower power range within specification-provided ranges (Decision 30), overlooks and misapprehends the combination, which Patent Owner does not challenge. *See id.* at 27. The Petition explains that the combination *modifies* Lee’s control logic in view of JESD79 such that the feedback control logic of Lee adjusts the drive strength consistent with the I-V curves in JESD79. *See* Pet. 67-68. As the unrebutted testimony of Petitioner’s expert explains, JESD79 specifies the curves for an output driver, which in the combination is for the pullup and pulldown transistors of Lee’s driver. EX1003, ¶¶142-146 (cited by

Pet. 64-68). Petitioner's expert also explained, without challenge, that the drive strength would be adjusted to provide an output within the I-V curve such that "the voltage . . . is maintained at a minimum level that allows current to be largely independent of [voltage] while minimizing [the voltage] to minimize power dissipated during voltage swings." EX1003, ¶147 (cited by Pet. 68). Thus, the Board erred by overlooking the Lee-JESD79 combination as set forth in the Petition and supported by the unrebutted expert testimony of Petitioner's expert, which are not addressed by Patent Owner's arguments about the combination and the lack of what Lee purportedly "ensures." *See* Decision 29.

VI. CONCLUSION

In imposing additional limitations on the "desired/lower power range," the Board implicitly interpreted the claims at odds with the intrinsic record, which confirms that nothing requires those limitations. Petitioner has demonstrated that the Lee-Thomann combination in Ground 2 satisfies the proper claim construction of "power range" and that the Board overlooked and misapprehended Thomann's teachings. Even under the Board's unduly narrow interpretation, the Board misapprehended and overlooked the unrebutted evidence that JESD79's curves are used in actual operation of devices and that the Lee-JESD79 combination teaches a desired or lower "power range" within a specification-prescribed range. Accordingly, Petitioner requests institution of *inter partes* review.

Petition for Rehearing of Denial of
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Respectfully submitted,

/Brian W. Oaks/

Brian W. Oaks (Reg. No. 44,981)
Aashish G. Kapadia (Reg. No. 78,844)
McDERMOTT WILL & EMERY LLP
303 Colorado Street, Suite 2200
Austin, TX 78701
TEL: 512-726-2600
FAX: 512-532-0002
boaks@mwe.com
akapadia@mwe.com

*Attorneys for Petitioner,
Xilinx, Inc.*

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CERTIFICATE OF SERVICE

Pursuant to 37 CFR §§ 42.6(e)(4)(i) *et seq.* and 42.105(a), the undersigned certifies that on August 31, 2023, a complete and entire copy of this

PETITIONER'S REQUEST FOR REHEARING ON DECISION DENYING

INSTITUTION was provided via electronic mail to the counsel of record for the

Patent Owner as follows:

david@nelbum.com
brent@nelbum.com
polaris@nelbum.com

/Brian W. Oaks/

Brian W. Oaks

Lead Counsel for Petitioner