

NOTE: This disposition is nonprecedential.

**United States Court of Appeals
for the Federal Circuit**

BELL SEMICONDUCTOR LLC,
Appellant

v.

**NXP B.V., NXP USA, INC., NXP SEMICONDUCTORS
N.V.,**
Cross-Appellants

2023-1260, 2023-1262, 2023-1263, 2023-1264

Appeals from the United States Patent and Trademark
Office, Patent Trial and Appeal Board in Nos. IPR2021-
00966, IPR2021-00967.

Decided: December 5, 2024

BLAIR A. SILVER, Irell & Manella LLP, Washington, DC,
argued for appellant. Also represented by JASON SHEASBY,
HONG ANNITA ZHONG, Los Angeles, CA.

TRUMAN FENTON, Slayden Grubert Beard PLLC,
Austin, TX, argued for cross-appellants. Also represented
by BRIAN C. BANNER.

Before LOURIE, REYNA, and HUGHES, *Circuit Judges*.

LOURIE, *Circuit Judge*.

In this consolidated appeal, Bell Semiconductor LLC (“Bell”) appeals from the final written decisions in two *inter partes* reviews (“IPRs”), determining that 23 claims of U.S. Patents 8,049,340 (“the ’340 patent”) and 8,288,269 (“the ’269 patent”) were unpatentable. NXP B.V. and related entities (collectively, “NXP”) cross-appeal the final written decisions in those same IPRs with respect to 11 of the remaining 16 challenged claims that the Board determined had not been shown to be unpatentable. *NXP B.V. v. Bell Semiconductor, LLC*, No. IPR2021-000966 (P.T.A.B. Oct. 6, 2022) (“’340 Decision”), J.A. 1–81; *NXP B.V. v. Bell Semiconductor, LLC*, No. IPR2021-000967 (P.T.A.B. Oct. 6, 2022) (“’269 Decision”), J.A. 82–138.¹ For the following reasons, we *affirm* the decisions of the Board.²

BACKGROUND

The ’340 patent is “directed to the design of an integrated circuit package that minimizes parasitic

¹ The final written decisions consolidated in this appeal share similar analyses of the issues relevant to the parties’ disputes. Unless otherwise indicated, we cite the ’340 Decision as representative.

² NXP’s principal brief, in part, purports to challenge the Board’s determination with respect to claims 12, 15, and 16 of the ’269 patent, requesting that this court “instead find these claims obvious.” NXP Principal Br. at 77; *see also id.* at 62 (statement of the issues). However, the Board did find those claims obvious, ’269 Decision, J.A. 135–37, and NXP appears to have dropped claims 12, 15, and 16 from its conclusion statement in reply, *see* NXP Reply Br. at 20. For that reason, we will assume the statement in NXP’s principal brief was a typographical error rather than an improperly raised cross-appeal.

capacitance between metal layers in a ball grid array integrated circuit package.” ’340 patent at col. 1, ll. 10–13. Independent claim 1 of the ’340 patent claims “[a]n integrated circuit package substrate comprising” a series of electrically conductive and insulating layers, wherein the second electrically conductive layer includes “a plurality of cutouts . . . for reducing parasitic capacitance.” *Id.* at col. 6, ll. 36–54. The ’269 patent is a continuation of the ’340 patent and claims methods of “forming” those electrically conductive and insulating layers. *See* ’269 patent at col. 6, l. 39–col. 8, l. 45.

NXP petitioned for IPR, asserting that the challenged claims of both patents would have been obvious over U.S. Patent 6,765,298 (“Chin”) alone or in combination with other references. The Board found that claims 1, 4, and 12–17 of the ’340 patent and claims 1, 4, 7, and 9–20 of the ’269 patent had been shown to be unpatentable, but that claims 2, 3, 5–11, 18, and 19 of the ’340 patent and 2, 3, 5, 6, and 8 of the ’269 patent had not been shown to be unpatentable. ’340 *Decision*, J.A. 79; ’269 *Decision*, J.A. 136. Both Bell and NXP timely appealed. We have jurisdiction under 28 U.S.C. § 1295(a)(4)(A).

DISCUSSION

Obviousness is a question of law based on underlying findings of fact. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 427 (2007). We review the Board’s legal conclusion on obviousness *de novo* and its findings of fact for substantial evidence. *HTC Corp. v. Cellular Commc’ns Equip., LLC*, 877 F.3d 1361, 1369 (Fed. Cir. 2017).

I

On appeal, Bell primarily argues that the Board’s obviousness analysis was both legally and factually flawed because the Board failed to consider Chin as a whole. According to Bell, when properly considered, Chin does not teach the use of its invention with integrated circuit

package substrates, only printed circuit boards, and that all challenged claims of the '340 and '269 patents are limited to integrated circuit package substrates. NXP responds that Bell's arguments are based on the erroneous premise that the Board's analysis of Chin should have been limited to the preferred embodiments disclosed in Chin and that Bell attempts to improperly frame issues of fact as issues of law. We agree with NXP.

The question of obviousness requires "an expansive and flexible approach." *KSR*, 550 U.S. at 415. Bell seems to argue that single-reference obviousness requires a more rigid test that looks to the preferred embodiment—or in Bell's words: "final device"—of the primary reference and requires the Board to "identify any reason(s) to abandon its key features." Bell Principal Br. 24–29. However, rigid approaches to the question of obviousness have repeatedly been rejected. *See KSR*, 550 U.S. at 415; *see also LKQ Corp. v. GM Glob. Tech. Operations LLC*, 102 F.4th 1280, 1293 (Fed. Cir. 2024). We therefore disagree with Bell that the Board somehow legally erred in its single-reference obviousness analysis of Chin. The remaining questions are therefore ones of fact, *i.e.*, the scope and content of the prior art and differences between the prior art and the claims at issue, reviewed for substantial evidence. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

The Board's findings of fact with respect to Chin were supported by substantial evidence. The Board determined that Chin discloses the key limitation of claim 1 that requires "cutouts formed in the second electrically conductive layer for reducing parasitic capacitance," '340 patent at col. 6, ll. 44–46, because "Chin expressly states that it includes [holes in the second electrically conductive layer] to reduce the corresponding pad's parasitic capacitance," '340 *Decision*, J.A. 34. This conclusion was not unreasonable. In fact, the very first sentence of the detailed description of Chin states "[a] landing pad's parasitic capacitance may be reduced by forming patterned

holes in one or more reference potential layers below the landing pad.” Chin at col. 3, ll. 45–47. The Board also considered Bell’s arguments regarding the additional disclosures of Chin and correctly rejected them. *See* ’340 *Decision*, J.A. 35–38 (“Patent Owner’s arguments regarding the ‘second half of Chin’s methodology’ are misplaced.”). The Board’s finding that Chin teaches the key limitation of claim 1 was therefore supported by substantial evidence.

Similarly, the Board’s finding that a person of ordinary skill in the art would have understood that Chin “expressly suggests implementing its invention in an [integrated circuit] package substrate” was not unreasonable. ’340 *Decision*, J.A. 21. Chin states that its invention is applicable to “multi-layered substrates,” Chin at col. 1, l. 8, “semiconductor implementations,” *id.* at col. 6, ll. 1–3, and “a substrate used inside a [Ball Grid Array] package,” *id.* at col. 1, ll. 56–58. Relying on those disclosures and expert testimony, the Board concluded that a person of ordinary skill in the art would have understood Chin’s disclosure to apply to an integrated circuit package substrate. ’340 *Decision*, J.A. 22. That conclusion was reasonable given the above disclosures of Chin and therefore was supported by substantial evidence. Because the Board determined that Chin applied to both integrated circuit package substrates as well as printed circuit boards, we need not resolve Bell’s argument that the claims are limited to integrated circuit package substrates.

We have considered Bell’s remaining arguments and find them unpersuasive. For the forgoing reasons, we find that the Board did not err in its unpatentability determination with respect to claims 1, 4, and 12–17 of the ’340 patent and claims 1, 4, 7, 9–20 of the ’269 patent.

II

On cross-appeal, NXP focuses on the claims that require the cutouts to be the same size as the contact pads,

see, e.g., '340 patent at col. 6, ll. 62–64 (“wherein the cutouts have the same dimensions as the contact pads”), and the claims that require a specific location for a “routing layer,” *see, e.g.*, '340 patent at col. 6, ll. 59–60 (“the second electrically conductive layer being a routing layer”).

NXP argues that the Board legally erred by not considering key evidence in Chin that teaches same-sized cutouts and by misapplying its construction of “routing layer.” Bell responds that NXP presents new unsupported arguments on appeal and that the Board’s findings should be affirmed as supported by substantial evidence. We agree with Bell.

The Board did not ignore key evidence in Chin that teaches same-sized cutouts as argued by NXP. The Board accurately characterized NXP’s expert testimony as conclusory and correctly pointed out that the only evidence in NXP’s petition was a citation of their expert’s declaration that parrots the language of the petition. *See '340 Decision*, J.A. 49; *see also* J.A. 364, 1599. The Board also correctly evaluated NXP’s underdeveloped “obvious to try” argument. *See '340 Decision*, J.A. 53–54. Subsequent attorney argument made for the first time on appeal cannot save a petition the Board reasonably concluded was evidentiarily deficient. *See Estee Lauder Inc. v. L’Oreal, S.A.*, 129 F.3d 588, 595 (Fed. Cir. 1997) (“[A]rguments of counsel cannot take the place of evidence lacking in the record[.]” (citation omitted)).

Similarly, the Board did not misapply its construction of “routing layer” as argued by NXP. In fact, the Board did not construe “routing layer.” Instead, in discussing an untimely and forfeited argument by NXP that “routing layer” was non-limiting, the Board merely stated that “‘routing layer’ is limiting and requires at least one routing trace.” *'340 Decision*, J.A. 44–45. And even if that was a construction of “routing layer,” NXP fails to persuasively explain how that construction changes the Board’s finding

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of a lack of motivation to relocate Chin's routing layer to the location required by the claims. *See id.* at J.A. 42–44. The Board's finding that Chin does not teach or disclose the routing layer location limitations was therefore supported by substantial evidence.

We have considered NXP's remaining arguments and find them unpersuasive. For the forgoing reasons, we find that the Board did not err in finding that claims 2, 3, 5, 6, 11, and 18 of the '340 patent and 2, 3, 5, 6, and 8 of the '269 patent had not been shown to be unpatentable. NXP does not appeal the Board's findings with respect to claims 7–10 and 19 of the '340 patent, which the Board also found had not been shown to be unpatentable.

CONCLUSION

Having fully considered the parties' arguments, we affirm the Board's determinations in IPR2021-000966 and IPR2021-000967.

AFFIRMED

COSTS

No costs.