

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. IPR2024-00794
U.S. Patent No. 10,950,623

Title: 3D NAND MEMORY DEVICE AND METHOD OF FORMING THE
SAME

AUTHORIZED RESPONSE TO DIRECTOR REVIEW REQUEST

TABLE OF CONTENTS

	<u>Page</u>
I. INTRODUCTION	1
II. ARGUMENT	2
A. The Board Properly Concluded Petitioner Failed to Carry Its Burden of Showing Obviousness over Park Alone.....	2
B. The Board Properly Determined that Petitioner Failed to Establish a Motivation to Modify Shibata in View of Park.....	6
C. The Board Properly Concluded that Petitioner Failed to Show Obviousness over Park in View of Shibata.....	8
III. CONCLUSION.....	13

TABLE OF AUTHORITIES

	<u>Page(s)</u>
FEDERAL CASES	
<i>Arctic Cat Inc. v. Polaris Indus., Inc.</i> , 795 F. App’x 827 (Fed. Cir. 2019)	9
<i>In re Ethicon, Inc.</i> , 844 F.3d 1344 (Fed. Cir. 2017)	5
<i>Henny Penny Corp. v. Frymaster LLC</i> , 938 F.3d 1324 (Fed. Cir. 2019)	9
<i>Honeywell Int’l Inc. v. 3G Licensing, S.A.</i> , 124 F.4th 1345 (Fed. Cir. 2025)	9
<i>Laboratory Corp. of Am. Holdings v. Ravgen, Inc.</i> , 2025 WL 32904 (Fed. Cir. Jan. 6, 2025)	9, 11
<i>LG Elecs. v. ImmerVision</i> , 39 F.4th 1364 (Fed. Cir. 2022)	5
<i>Medichem, S.A. v. Rolabo, S.L.</i> , 437 F.3d 1157 (Fed. Cir. 2006)	5
<i>Winner Int’l Royalty Corp. v. Wang</i> , 202 F.3d 1340 (Fed. Cir. 2000)	9
FEDERAL STATUTES	
35 U.S.C. § 316	5

I. Introduction

Petitioner's Request for Director Review of the Board's Final Written Decision ("Request") ignores or distorts record evidence, while alleging nonexistent legal error. Petitioner's Request should be denied.

First, the Board properly found that Petitioner failed to carry its burden of showing obviousness of claim 2 (and claims depending therefrom) over Park alone. Petitioner's argument depended entirely on Park's Figure 36, yet—as the Board correctly found—a POSITA would immediately recognize that Figure 36 is irreconcilable with the rest of Park's disclosure. Petitioner conceded this discrepancy, admitting it was "just as likely" that other figures—not Figure 36—contained errors. Petitioner offered no theory by which those figures, described by Park as showing one single embodiment, could be reconciled. Accordingly, Petitioner failed to carry its burden of showing what Park discloses, and the Board properly rejected Petitioner's obviousness theory.

Second, the Board correctly concluded that Petitioner failed to carry its burden of showing that a POSITA would have been motivated to modify Shibata in light of Park. Petitioner asserts that the Board required the motivation to combine come from Shibata or Park. Not so. Rather, consistent with the law, the Board examined Petitioner's proffered motivations and found that none provided a persuasive, evidence-supported rationale for making the proposed modifications. The Board's

decision properly rests on a factual deficiency in Petitioner’s showing, not on the legal premise presented in Petitioner’s Request.

Third, the Board correctly found that Petitioner failed to carry its burden of establishing obviousness over Park in view of Shibata. The Board properly weighed the asserted benefits of Petitioner’s proposed combinations against the substantial, well-supported disadvantages—including severe etching and deposition risks—and reasonably found that a POSITA would not view Petitioner’s redesigns as desirable. The Board likewise properly rejected Petitioner’s untimely reliance on new “alternative” features and correctly concluded that Petitioner had failed to offer any reasoned explanation for why a POSITA would have a reasonable expectation of success as to the proposed combinations. Petitioner’s arguments mischaracterize the Board’s fact-bound analysis and do not demonstrate legal error.

II. Argument

A. The Board Properly Concluded Petitioner Failed to Carry Its Burden of Showing Obviousness over Park Alone

Petitioner did not carry its burden of showing claim 2 is obvious over Park. That claim requires “one or more second dielectric trenches formed in the TSG and extending in the length direction of the substrate to separate the TSG into a plurality of sub-TSGs.” ’623, Claim 2. Petitioner contended Park’s upper string select line (“SSL”) corresponded to the claimed TSG. *See* Pet. 39–40. Petitioner conceded,

however, that Park does not disclose the claimed separation using dielectric trenches. *Id.* at 41. So Petitioner argued it would have been obvious to add dielectric trenches to Park’s SSL at the same lateral positions where Park forms isolation insulating layers in its ground select line (“GSL”) layer—*i.e.*, the asserted BSG of the claims. *See* Pet. 41. But Park’s SSL **does not** extend over the portion of the GSL that has isolation insulating layers. *See* POR 40–41; Pet. 41 (conceding that Park’s SSL “is not present over the portion of the GSL divided by ‘isolation insulating layers.’”).

Park’s specification makes clear why the SSL has a shorter lateral extent than the GSL: Park’s memory array uses a staircase configuration, in which each lower layer extends farther laterally than the one above it, because the stepped ends of the layers form the “pad regions” used for electrical contacts. *See* Park, 6:56–64, 7:60–8:6. Extending Park’s SSL over the portion of the GSL with the isolation insulating layers—as Petitioner proposed—would eliminate the stepped structures used for cell contacts and render the device inoperable. *See* KuhnII ¶ 104 (Ex. 2010); FWD 27.

In an attempt to avoid these problems, Petitioner relied exclusively on Park’s Figure 36, which purports to show Park’s SSL extending the same lateral distance as Park’s GSL. But—as the Board correctly found—that figure is inconsistent with the rest of Park’s disclosure, including Figure 27 and several other Figures. As the Board recognized, a POSITA would immediately see that Park’s Figures 27 and 36 cannot both be correct: Figure 27 shows the upper SSL layers extend only a short

distance laterally, to form the staircase structure, while Figure 36 incorrectly depicts upper layers with the same lateral extent as the lower layers, meaning there would be no staircase structure. *See* FWD 27; POR 40–41.

Petitioner conceded this discrepancy, stating “it is just as likely that it is Figure 27—and not all of Figures 21, 29, 31, 34, and 36—that wrongly depicts the TSG’s physical extent.” FWD 26 (quoting Pet. Reply 13). But this concession creates an additional, fatal problem: that figure and its analogs supply the “plurality of word lines positioned over the BSG with a staircase configuration” as required by claim 1, and if those figures are wrong, Petitioner’s mapping falls apart for claim 1 and all claims that depend from it, including claim 2. *See* ’623, Claim 1. In either event, Petitioner’s mapping for claim 2 falls apart.

The Board explained that the entire record supports the “obvious nature of the error,” including “Petitioner’s lack of an alternative explanation for the inconsistency of the contested figures, Park’s inconsistency in describing Figure 29 as a cross-section along both III-III’ and IV-IV’, Park’s description of its staircase structure, and Dr. Kuhn’s testimony that removal of the stepped structure would render Park’s device inoperable.” FWD 27. The Board further emphasized that “Petitioner has not provided any reason why Park teaches such extension of the TSG layers, except for the disputed Figures and the asserted breadth of Park’s teaching,” whereas “Patent Owner has provided credible reasons why such extension would not

occur, citing the criticality of staircase structure lacking such upper SSL regions in providing pad regions to provide required electrical connections.” *Id.* at 27–28.

Petitioner does not challenge any of this. Instead, Petitioner asserts legal error, arguing that the Board was not permitted to find that “a person having ordinary skill in the art would have substantially discounted the conflicting teachings relied upon by Petitioner.” FWD 27; *see* Request 7–10.

There is no merit to Petitioner’s argument. Petitioner bears “the burden of proving a proposition of unpatentability by a preponderance of the evidence.” 35 U.S.C. § 316(e). In order to meet that burden, Petitioner must show, more likely than not, “what a reference teaches.” *In re Ethicon, Inc.*, 844 F.3d 1344, 1349 (Fed. Cir. 2017); *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006).

Petitioner failed to carry its burden. Petitioner conceded that Park contains conflicting disclosures, offered no reconciliation, and failed to show why a POSITA would rely on one over the other. As the Board correctly observed, “Petitioner’s burden is to show that the basis for its obviousness assertions are ‘more likely than not,’ not ‘just as likely,’ correct.” FWD 26. This conclusion is supported by *LG Elecs. v. ImmerVision, Inc.*, 39 F.4th 1364 (Fed. Cir. 2022). There, the Federal Circuit explained that a prior art reference “cannot be said to disclose subject matter” where the “reference includes an obvious error of a typographical or similar nature that would be apparent to one of ordinary skill in the art.” *Id.* at 1372. That is

precisely the situation here. Petitioner’s own admission that it was “just as likely” that Figure 27—not Figure 36—is correct defeats Petitioner’s burden of showing what a POSITA would understand Park to disclose.

Moreover, even assuming *arguendo* that Figure 36 depicts a distinct alternative embodiment,¹ Petitioner’s argument fails for the independent reason that Petitioner failed to explain how a POSITA could or would combine that supposed alternative embodiment with the embodiment underlying Figures 26–28. The alleged Figure 36 “alternative embodiment” lacks any staircase structure. But claim 1—from which claim 2 depends—explicitly requires “a plurality of word lines positioned over the BSG *with a staircase configuration*.” Thus, any embodiment lacking a staircase configuration cannot satisfy claim 1 or claim 2.

B. The Board Properly Determined that Petitioner Failed to Establish a Motivation to Modify Shibata in View of Park

The Board properly concluded that Petitioner failed to carry its burden of showing that a POSITA would be motivated to modify Shibata in view of Park, and Petitioner’s contrary argument mischaracterizes the Board’s decision.

The Board recognized that instead of “substituting a component from Park . . .

¹ As Patent Owner explained more fully in its POR, the entire series of Figures 18 through 36 depict the same embodiment. *See* Park, 12:53–55 (“FIGS. 18 through 36 are views illustrating a method of manufacturing a memory device according to an example of the present inventive concept.”) (emphasis added); *see also* POR 43.

into the device of Shibata,” Petitioner was “duplicating Shibata’s top separation portions 62a, originally present in its TSG, and placing those into [Shibata’s] BSG.” FWD 51. The Board explained that nothing in Park teaches the reduction of memory cell string selection circuitry, and nothing in the prior art suggested removing Shibata’s multiple BSG layers or replacing them with word line layers. FWD 53. Instead, Petitioner relied on its “own creation of a new design of Shibata,” *not* on teachings from the art. FWD 53. As the Board stated, “[t]he *only* reason” to do so “is the recreation of Patent Owner’s claim 1,” but “a reason to combine should be found in the art, not in the challenged patent.” FWD 53.

Further, the Board explained that Petitioner’s proposed combination would increase manufacturing complexity such that it “would be considered less advantageous by a person having ordinary skill in the art.” FWD 54–55. The Board also found that Petitioner failed to show that the proposed combination “would reduce the height of the memory array so as to provide motivation to combine the teachings.” FWD 55. The Board thus concluded that “Petitioner’s creation of a Shibata-Shibata combination, based on incomplete ‘design guidance’ from Park, amounts to ‘impermissible hindsight.’” FWD 53 (citing POR 55).

The Board did not require motivation to combine to come from only Shibata or Park. The Board considered all of Petitioner’s proffered sources of motivation—including prior art beyond Shibata and Park—and concluded that none supplied a

motivation to make the specific modifications Petitioner proposed. For example, the Board evaluated Ex. 1008, which Petitioner invoked as supporting a general design goal of reducing selection circuitry. *See* Request 8. But the Board found that this reference did not teach or suggest the *specific* modifications Petitioner proposed. *See* FWD 50 (discussing Ex. 1008). As the Board explained, the proposed “improvement[] to Shibata . . . does not come from Park. *Nor does it come from the prior art*, except broadly speaking as a goal to be achieved.” FWD 53 (emphasis added). The Board thus found that Petitioner failed to carry its burden: “[n]o teaching” whatsoever “was identified to guide a person of ordinary skill in the art to remove two BSG layers from Shibata and replace them with word lines.” FWD 53.

The Board applied the correct legal standard and simply found that Petitioner failed to identify any evidence-based motivation to combine.

C. The Board Properly Concluded that Petitioner Failed to Show Obviousness over Park in View of Shibata

Petitioner raises an array of meritless challenges to the Board’s conclusion that Petitioner failed to show that the ’623 patent’s claims are obvious over the combined teachings of Park and Shibata.

First, the Board did not apply “an improperly heightened” legal standard for motivation to combine. Request 10. In order to establish a motivation to combine, Petitioner bore the burden of showing that the proposed combination is “desirable.”

Laboratory Corp. of Am. Holdings v. Ravgen, Inc., 2025 WL 32904, at *2 (Fed. Cir. Jan. 6, 2025); see *Honeywell Int’l Inc. v. 3G Licensing, S.A.*, 124 F.4th 1345, 1355 (Fed. Cir. 2025) (“‘[T]he question is whether there is something in the prior art as a whole to suggest the desirability, and thus the obviousness,’ of the claimed invention.”) (citation omitted). To evaluate desirability, the law is well established that “[t]he benefits, *both lost and gained*, should be weighed against one another.” *Henny Penny Corp. v. Frymaster LLC*, 938 F.3d 1324, 1332 (Fed. Cir. 2019) (emphasis in original) (quoting *Winner Int’l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 n.8 (Fed. Cir. 2000)).² The Board applied this standard. See FWD 39 (discussing the standard and recognizing that “[a] given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine.” (citation omitted)).

Applying that standard, the Board found, after weighing the specific advantages and disadvantages, that a POSITA would view the proposed combination as undesirable. The Board stated that the proposed combination “would be fraught with the risk of incomplete manufacture leading to potentially severe operational

² Petitioner criticizes the Board for citing *Winner*, supposedly because it was issued before *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398 (2007), but the Federal Circuit has repeatedly cited *Winner* for the same proposition. See, e.g., *Henny Penny*, 938 F.3d at 1332; *Arctic Cat Inc. v. Polaris Indus., Inc.*, 795 F. App’x 827, 833 (Fed. Cir. 2019).

problems. The evidence does not indicate that the risk of such problems would be sufficiently ameliorated by dry etching, Shibata's drive circuits, Park's dummy channels, and/or Park's open regions such that a [POSITA] would pursue these options and consider Petitioner's combination to be a desirable option." FWD 48.

Indeed—and contrary to Petitioner's argument here—the Board's decision is *replete* with conclusions that the proposed combination is undesirable. *See, e.g.*, FWD 40 ("[T]his would result in numerous undesirable properties of the resulting memory structure."); 40 ("These indicate significant drawbacks to Petitioner's combination."); 41 ("Petitioner does not attempt to explain how the significant drawbacks of the combination . . . are outweighed by efficiency gains due to reduction of common source regions."); 42 (similar); 47 (similar); 48 (similar).

Petitioner's contrary argument rests on isolated statements in the Board's decision about how a POSITA would not consider the proposed combination's advantages to "outweigh[]" its significant disadvantages. Request 11 (citing FWD 41, 47). But in context, the Board was not imposing a heightened legal requirement—it was simply evaluating the desirability of the proposed combination and concluding, as a factual matter, that Petitioner had failed to show any net advantage that would motivate a POSITA to pursue its proposed design. Petitioner's "first argument—that the Board imposed an improperly heightened standard for obviousness—mischaracterizes the analysis of the Board in an attempt to reframe

factual issues as legal ones.” *Laboratory Corp.*, 2025 WL 32904, at *2.

Second, contrary to Petitioner’s argument, the Board did not require Petitioner to identify any particular “degree of replacement” as a legal prerequisite. Request 13. Instead, the Board explained that Petitioner failed to establish that its proposal of “replacing fewer common lines”—whether that refers to some, many, or all of Park’s common source lines—would have been viewed by a POSITA as desirable in light of the significant disadvantages the combination introduces. FWD 47.³ The Board explained that reducing the number of common source lines reduces etching and deposition problems “commensurately” with the reduction in Petitioner’s asserted benefits, leaving Petitioner with no evidence-based rationale for why a POSITA would choose any particular degree of replacement at all. FWD 47. The Board determined not that Petitioner had to establish a precise quantitative threshold, but that Petitioner failed to provide a reasoned explanation showing why a POSITA would consider any level of partial replacement to be desirable. That determination

³ Petitioner mischaracterizes the Board’s analysis in claiming that “the Board agreed” that partial replacement would render “any downsides . . . minimal.” Request 12 (citing FWD 47). The Board did no such thing. The quoted language reflects Petitioner’s own assertion, not the Board’s finding. *See* FWD 47 (“Petitioner asserts that replacement of some of Park’s common lines with insulating layers ‘ensures that the majority of sacrificial layers are removed and replaced with conductive material, thereby improving device performance without the need for separate drivers.’”) (quoting Pet. 62–63). The Board ultimately rejected Petitioner’s position, concluding that Petitioner failed to show that any degree of replacement would be viewed as desirable by a POSITA.

did not impose a new legal requirement.

Finally, the Board properly rejected Petitioner’s alternative combination. Petitioner proposed “using either the dummy channels and open regions taught by Park or drive circuits taught by Shibata” to “overcome etching and deposition problems in the proposed combination.” Request 14. The Board correctly concluded that Petitioner waived this argument. Petitioner concedes that it “did not discuss Park’s particular disclosures of dummy channels and open regions until the reply.” Request 14. And while Petitioner contends this failure is excusable because these techniques are examples “of a known technique to address the potential etching problem,” Request 14, Petitioner offers no argument whatsoever rebutting the Board’s contrary finding, *see* FWD 45 (“Shibata does not represent its drive circuits as knowledge in the art, but as part of its inventive semiconductor memory device. Ex. 1005 ¶¶ 443, 448–449. Similarly, Park describes its dummy channel and its open regions as ‘examples of the present inventive concept.’ Ex. 1004, 11:52–59; 12:10–52. We determine that Petitioner has not shown that these features of Park and Shibata represent the knowledge in the art that a person having ordinary skill in the art would take into account when contemplating Petitioner’s combination.”).

Moreover, and independently, the Board properly concluded that Petitioner failed to show a reasonable expectation of success. Petitioner argues that the Board applied the wrong legal standard by requiring evidence that a prior art reference

expressly demonstrates successful implementation of the proposed Park-Shibata combination. Request 15. But this argument rests on a misreading of the Final Written Decision. The Board did not require an express embodiment or example in the prior art. Instead, the Board faulted Petitioner for relying only on the assertion that the prior-art features “are capable of performing the relied-upon functions or could possess the relied-upon structure,” without providing any reasoned explanation why a POSITA would expect them to work when transplanted into Petitioner’s new Park-Shibata combination. FWD 46. The Board correctly explained that this is not enough. Petitioner must “show a reason why the application of Shibata would be reasonably expected to have been successfully applied in Park, not merely state that there is ‘no reason’ to expect that it would not be successful.” FWD 46 (citing *DSS Tech. Mgmt., Inc. v. Apple Inc.*, 885 F.3d 1367, 1377 (Fed. Cir. 2018) (requiring “additional, reasoned analysis” even when two structures have the “same physical structure”)). Petitioner offers no response to this core deficiency.

In sum, the Board applied the correct legal standards and reached well-reasoned and well-supported factual conclusions. Petitioner’s Request identifies no legal error, nor does it provide any basis for Director review.

III. Conclusion

Petitioner provides no basis to disturb the Board’s well-supported findings. The Request for Director Review should be denied.

Dated: December 16, 2025

Respectfully submitted,

/s/ Andrew Radsch

Andrew Radsch

(admitted *pro hac vice*)

MUNGER, TOLLES & OLSON LLP

560 Mission Street, 27th Floor

San Francisco, California 94105

Telephone: (415) 512-4000

andrew.radsch@mto.com

Attorney for Patent Owner Yangtze

Memory Technologies Co., Ltd.

CERTIFICATE OF SERVICE

I, Andrew Radsch, hereby certify that on this 16th day of December 2025, a copy of the foregoing **AUTHORIZED RESPONSE TO DIRECTOR REVIEW REQUEST** was served via the Patent Trial and Appeal Case Tracking System (P-TACTS), with an additional courtesy copy via e-mail, on the following:

K. Patrick Herman, pherman@orrick.com
Jermy Jason Lang, jliang@orrick.com
Jared Bobrow, Jbobrow@orrick.com
P52PTABDocket@orrick.com
PTABDocketJJL2@orrick.com
PTABDocketJ3B3@orrick.com
Micron-ymtc_ohs@orrick.com

Dated: December 16, 2025

/s/ Andrew Radsch

Name: Andrew Radsch

MUNGER, TOLLES & OLSON LLP