

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.: IPR2024-00789
U.S. Patent No. 10,861,872

PETITIONER'S PRELIMINARY REPLY

	<u>TABLE OF CONTENTS</u>	<u>Page</u>
I.	INTRODUCTION	1
II.	PATENT OWNER’S CLAIM CONSTRUCTIONS ARE INCONSISTENT WITH THE INTRINSIC RECORD AND ERRONEOUSLY EXCLUDE EXPRESS EMBODIMENTS	1
A.	“Dummy Source Structure”	1
B.	“Conductive Contact”	5

LISTING OF EXHIBITS

EXHIBIT NO.	DESCRIPTION
1001	U.S. Patent No. 10,861,872 B2 to Liu et al.
1002	File History of U.S. Patent No. 10,861,872 to Liu et al.
1003	Declaration of Dr. Sanjay Banerjee (“Banerjee”)
1004	<i>Curriculum Vitae</i> of Dr. Sanjay Banerjee
1005	U.S. Patent No. 9,859,297 B2 to Park et al. (“Park”)
1006	U.S. Patent Publ. No. 2019/0081061 A1 to Tessariol et al. (“Tessariol”)
1007	Aritome, “NAND Flash Memory Technologies” (2016)
1008	Silvagni, “3D NAND Flash Based on Planar Cells,” Computers 2017
1009	Micheloni et al., “Inside Solid State Drives (SSDs)” (2 nd Ed. 2018)
1010	U.S. Patent No. 10,381,369 B2 to Kim et al.
1011	U.S. Patent No. 10,475,737 B2 to Tang et al.
1012	Certified English Translation of Chinese Patent Application Publ. No. CN108766971 to Liu (“Liu”)
1013	Chinese Patent Application Publ. No. CN108766971 to Liu
1014	U.S. Patent No. 8,945,996 B2 to Tang et al.
1015	YMTC’s Exemplary Infringement Claim Chart for U.S. Patent No. 10,861,872 – (Ex. 49) 128L [PROTECTIVE ORDER MATERIAL – FILED UNDER SEAL]

EXHIBIT NO.	DESCRIPTION
1016	YMTC's Exemplary Infringement Claim Chart for U.S. Patent No. 10,861,872 – (Ex. 50) 176L [PROTECTIVE ORDER MATERIAL – FILED UNDER SEAL]
1017	YMTC's Exemplary Infringement Claim Chart for U.S. Patent No. 10,861,872 – (Ex. 51) 232L [PROTECTIVE ORDER MATERIAL – FILED UNDER SEAL]
1018	Print out from Geographic Wiki, https://www.studycountry.com/wiki/what-is-a-piece-of-land-surrounded-by-water-on-2-side (last visited Mar. 28, 2024)
1019	U.S. Patent No. 9,530,492 to Lee
1020	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
1021	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
1022	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
1023	Micheloni, “3D Flash Memories” (2016)
1024	<i>Intentionally Omitted</i>
1025	<i>Intentionally Omitted</i>
1026	<i>Intentionally Omitted</i>
1027	<i>Intentionally Omitted</i>

EXHIBIT NO.	DESCRIPTION
1028	<i>Intentionally Omitted</i>
1029	<i>Intentionally Omitted</i>
1030	<i>Intentionally Omitted</i>
1031	Complaint for Patent Infringement, Dkt. No. 1, filed Nov. 9, 2023, 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
1032	First Amended Complaint for Patent Infringement, Dkt. No. 29, filed Feb. 2, 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
1033	Plaintiff and Counterclaim Defendant Yangtze Memory Technologies Company, Ltd.'s Disclosure of Asserted Claims and Infringement Contentions, dated May 6, 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
1034	Declaration of Jared Bobrow in Support of Petitioner's Motion for Admission <i>Pro Hac Vice</i>

I. INTRODUCTION

Petitioner Micron Technology, Inc. (“Micron”) respectfully submits this Preliminary Reply. *See* Paper 12. PO invites error by construing “dummy source structure” to exclude the express embodiment in which this structure may function as a source. Indeed, the specification and claim language confirm that the dummy source structure may function as a source. As for “conductive contact,” PO asks the Board to construe the term contrary to the way it is described repeatedly in the specification and file history, thereby excluding express embodiments. PO’s assertions about the plain and ordinary meaning of these terms cannot override intrinsic evidence to the contrary.

II. PATENT OWNER’S CLAIM CONSTRUCTIONS ARE INCONSISTENT WITH THE INTRINSIC RECORD AND ERRONEOUSLY EXCLUDE EXPRESS EMBODIMENTS

A. “Dummy Source Structure”

PO asks the Board to construe “dummy source structure” as “a structure that does not function as a source,” which allegedly is “[c]onsistent with the plain and ordinary meaning.” POPR (Paper 11), 15. A simple Google search undermines the assertion that “dummy source structure” has a plain and ordinary meaning. Not surprisingly, PO cites no dictionaries or textbooks for support.¹ Accordingly, the

¹ PO’s expert, Dr. Kuhn, offers *zero support* for PO’s position and even states that

intrinsic evidence is critical. In view of that evidence, PO's construction fails on multiple counts.

First, PO's construction would read out express embodiments. The specification, not surprisingly, states that a "source structure" may function as a source: "***Source structures*** formed in the inner region ***may be connected with surround channel structures*** (e.g., channel structure 220 of memory string 218 shown in FIG. 2E) ***via a common source***, such as a doped region (not shown) ***in substrate 202.***"² Ex. 1001, 16:34-38.³ Immediately thereafter, the specification states: "***In some embodiments, dummy source structure 246 may not connect to channel structures in the inner region.***" *Id.*, 16:38-40. By stating that a "dummy source structure" *may not* function as a source "[i]n some embodiments," it follows that a "dummy source structure" *may* function as a source in other embodiments.

PO's construction is Micron's construction. Ex. 2001, ¶35.

² Structures function as a "source" by providing a "source" to the bottom of the memory strings ("channel structures") via the source region in the substrate. POPR (Paper 11), 37 (admitting that Park's common source lines 144, which connect to the memory strings via the source region, function as a source); Ex. 1003, ¶54 (strings connect to "common source"); Ex. 1007, 297 (same).

³ All emphasis added unless otherwise noted.

The Federal Circuit held as much in *Guardant Health, Inc. v. Vidal*, No. 2021-1104, 2023 WL 3262962 (Fed. Cir. May 5, 2023) (nonprecedential). There, the Federal Circuit found that because the specification states “‘*[i]n some embodiments* each polynucleotide in a set *is mappable*’ ... [i]t follows that *other embodiments* include polynucleotides that *do not map*” *Id.* at *2. The specification’s use of “may not” is a permissive phrase which simply means that the “dummy source structure” may or may not function as a source. *See i4i Ltd. P’ship v. Microsoft Corp.*, 598 F.3d 831, 844 (Fed. Cir. 2010) (“The specification’s permissive language, ‘could be,’ ...does not clearly disclaim systems lacking these [features].”).

The specification itself makes clear that the permissive description of “some embodiments” means that dummy source structures may function as a source. The specification states: “[i]t is noted that references in the specification to ... ‘*some embodiments*,’ etc., *indicate that the embodiment described may include a particular feature*, structure, or characteristic, *but every embodiment may not necessarily include the particular feature*, structure, or characteristic. Ex. 1001, 3:1-7. By stating that a “dummy source structure 246 may not” function as a source “[i]n some embodiments,” and then describing what it may do “*[i]nstead*” (*id.*, 16:38-44), the specification recognizes that the alternative—functioning as a source—is an option. By excluding an embodiment in this way, PO’s construction cannot be correct. *On-Line Techs., Inc. v. Bodenseewerk Perkin-Elmer GmbH*, 386

F.3d 1133, 1138 (Fed. Cir. 2004) (“a claim interpretation that excludes a preferred embodiment from the scope of the claim is rarely, if ever, correct”). What makes a “dummy source structure” unique is its use in the gate replacement process, not whether it functions as a source. Ex. 1001, 8:28-42.

Second, the claims and specification consistently describe the dummy source structure's ability to function as a source. The claimed “dummy source structure” includes “a conductive contact.” Ex. 1001, Claim 1. Contrary to PO's assertion (POPR, 16), the specification states that when the dummy source structure includes a conductive core, it “may function as an interconnect,” **not** a support structure.⁴ Ex. 1001, 16:66-17:3. And the specification states that some, or all, of the dummy source structures may **extend into the substrate**. *Id.*, 13:30-38, 16:44-49, 18:14-23. This is precisely what a structure does to function as a source. *Id.*, 16:34-38 (connecting to “common source” region in “substrate”).

Third, when distinguishing the prior art in the file history, Applicant described the “dummy source structure” purely structurally, never disclaiming any functions.

⁴ The specification provides an example of the dummy source structure connecting to a “peripheral device,” using the permissive term “may function.” Importantly, this example stands for the fact that the dummy source structure may connect to a “device,” e.g., the channel structures (transistors) via the common source.

Ex. 1002, p. 514 (describing “example of a dummy source structure 178, including contact 179 and spacer 177”). The file history provides no support for PO's attempt to read a negative functional limitation into the claims.

PO's construction also cannot be correct because it includes a negative limitation which renders the term meaningless: a tree house is “a structure that does not function as a source,” but qualifies as a “dummy source structure” under PO's construction. PO's attempt to interpret “dummy source structure” by construing “dummy” and “source” in isolation also fails. POPR, 15-16. There is no dispute that the “dummy source structure” may not be a “dummy.” *Id.*, 16 (interconnect function). And “source” in the specification refers to two different things: (1) the “dummy source hole” is a source for deposition materials (Petition, 24-27), and (2) the dummy source structure may function as a source (Ex. 1001, 16:34-40). Thus, construing each word in isolation says nothing about the term as a whole.

B. “Conductive Contact”

Relying on its expert's description of extrinsic evidence, PO alleges that a “conductive contact,” according to its plain and ordinary meaning, has the “functional property” of being part of a “current flow path.”⁵ POPR, 41. That

⁵ Dr. Kuhn's declaration (Ex. 2001) cites exemplary embodiments of a “dummy source contact” (¶42) and then ignores the specification and focuses solely on

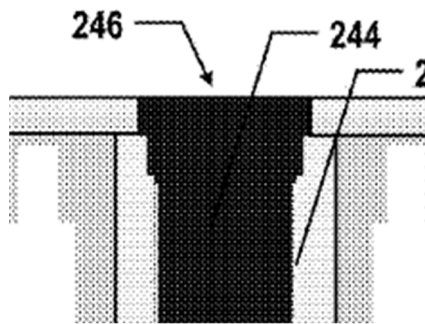
evidence, however, is nothing but a hodgepodge of textbooks describing specific types of contact (e.g., ohmic contact). Ex. 2001, ¶¶47-54. And even if “conductive contact” had the “plain and ordinary meaning” that PO portrays, “[t]he fact that [a claim term] has multiple dictionary meanings does not mean that all of these meanings are reasonable interpretations in light of this specification.” *PPC Broadband, Inc. v. Corning Optical Commc'ns RF, LLC*, 815 F.3d 747, 752 (Fed. Cir. 2016). PO's construction is incorrect for multiple reasons.

The '872 Patent describes the “conductive contact” in structural (not functional) terms: conductive material that fills the dummy source hole. Petition, 62-63. The specification does so repeatedly. Ex. 1001, 2:2-8, 11:37-39, 16:13-25, 16:50-52, 16:63-64, 18:38-41. *See GPNE Corp. v. Apple Inc.*, 830 F.3d 1365, 1370–71 (Fed. Cir. 2016) (it is “proper to construe [a] claim term” based on how the patent “repeatedly and consistently” uses the term). PO's extrinsic evidence that is inconsistent with the intrinsic record is irrelevant to claim construction. *Seabed Geosolutions (US) Inc. v. Magseis FF LLC*, 8 F.4th 1285, 1287 (Fed. Cir. 2021).

The “conductive contact” is not, as PO insinuates (POPR, 41), the place where the dummy source contacts the substrate, much less where current must flow. This would exclude embodiments, for example, in which the “dummy source

extrinsic evidence (¶¶43-54).

structure” serves as a “dummy” and in which it does not contact the substrate. *E.g.*, Ex. 1001, 18:22-23; *Oatey Co. v. IPS Corp.*, 514 F.3d 1271, 1276–77 (Fed. Cir. 2008) (holding that “where claims can reasonably [be] interpreted to include a specific embodiment, it is incorrect to construe the claims to exclude that embodiment, absent probative evidence on the contrary,” *e.g.*, “disclaime[r]”). It also runs headlong into Figure 2L’s arrow identifying contact 244 as the core—not the bottom portion where it *may or may not* contact the substrate:



What’s more, during prosecution, Applicant distinguished the prior art’s “pillar” from the “conductive contact” on purely structural grounds, with no mention of it contacting the substrate or of current flowing through it. Ex. 1002, 514-15.

PO’s expert opines at length about a necessary “ohmic” contact between the dummy source structure and substrate. Ex. 2001, ¶¶47-54. But the specification does not even use the word “ohmic.” Tellingly, the substrate need not even be conductive, contradicting this made-up “ohmic” requirement. Ex. 1001, 3:53-57.

Respectfully submitted,

ORRICK, HERRINGTON & SUTCLIFFE LLP

Dated: August 22, 2024

/Jeremy Jason Lang/

Jeremy Jason Lang
Lead Counsel for Petitioner
Reg. No. 73,064
1000 Marsh Road
Menlo Park, CA 94025-1015
T: (650) 614-7400
F: (650) 614-7401
Email: PTABDocketJJL2@orrick.com

*Attorneys for Petitioner Micron
Technology, Inc.*

CERTIFICATE OF SERVICE

The undersigned hereby confirms that the foregoing paper was caused to be served on August 22, 2024 via electronic mail, upon the following attorneys of record for the Patent Owner:

James L. Davis (James.L.Davis@ropesgray.com)
Andrew T. Radsch (andrew.radsch@ropesgray.com)
Christopher M. Bonny (Christopher.Bonny@ropesgray.com)
Allen S. Cross (allen.cross@ropesgray.com)
YMTC-Micron-IPRs-Ropes-Service@ropesgray.com

/Valerie Cloyd/

Valerie Cloyd