IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

BESANG INC., Plaintiff, v. **MICRON TECHNOLOGY, INC., MICRON SEMICONDUCTOR PRODUCTS, INC., and MICRON TECHNOLOGY TEXAS, LLC** Defendants.	CIVIL ACTION NO. 2:23-cv-00028 JURY TRIAL DEMANDED

PLAINTIFF'S ORIGINAL COMPLAINT

Plaintiff BeSang Inc. ("BeSang" or "Plaintiff") files this Original Complaint against Defendant Micron Technology, Inc. ("Micron Technology"), Micron Semiconductor Products, Inc. ("Micron Semiconductor"), and Micron Technology Texas, LLC ("Micron Texas") (collectively, "Micron" or "Defendants") for patent infringement under 35 U.S.C. § 271. Plaintiff alleges, based on its own personal knowledge with respect to its own actions and based upon information and belief with respect to all others' actions, as follows:

THE PARTIES

1. Plaintiff BeSang Inc. is a corporation organized and existing under the laws of the state of Oregon, having a principal place of business at 1915 NE Stucki Avenue, Suite 400, Hillsboro, Oregon 97006.

2. Defendant Micron Technology is a corporation organized and existing under the laws of the State of Delaware. On information and belief, Micron Technology has a regular and established place of business at 950 W. Bethany Drive, Suite 120, Allen, Texas 75013. On information and belief, Micron Technology is registered to do business in the State of Texas, and

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Exhibit 1032

can be served through its registered agent, Corporation Service Company, at 211 E. 7th Street, Suite 620, Austin, Texas 78701-3218.

3. Defendant Micron Semiconductor is a corporation organized and existing under the laws of Idaho. On information and belief, Micron Semiconductor has a regular and established place of business at 950 W. Bethany Drive, Suite 120, Allen, Texas 75013. On information and belief, Micron Semiconductor is registered to do business in the State of Texas, and can be served through its registered agent, Corporation Service Company, at 211 E. 7th Street, Suite 620, Austin, Texas 78701-3218.

4. Defendant Micron Texas is a corporation organized and existing under the laws of the State of Idaho. On information and belief, Micron Texas has a regular and established place of business at 950 W. Bethany Drive, Suite 120, Allen, Texas 75013. On information and belief, Micron Texas is registered to do business in the State of Texas, and can be served through its registered agent, Corporation Service Company, at 211 E. 7th Street, Suite 620, Austin, Texas 78701-3218.

5. On information and belief, Micron Semiconductor and Micron Texas are wholly owned subsidiaries of Micron Technology. On information and belief, Micron Technology does not separately report revenue from Micron Semiconductor or Micron Texas in its filings to the Securities Exchange Commission, but rather reports combined revenue from its various products and subsidiaries.

6. On information and belief, Defendants have semiconductor fabrication plants in the United States and other countries throughout the world and manufacture memory products such as NAND Flash at those plants. On information and belief, Defendants also use, sell, and offer for sale in the United States, import into the United States and/or export from the United States

Micron's 3D NAND flash memory products, including 3D NAND chips and the memory devices in which they are incorporated such as solid-state drives, embedded multimedia cards, and Universal Flash Storage ("UFS") devices ("Accused Products"). On information and belief, Defendants have at least used, sold, or offered to sell products and services, including the Accused Products in this judicial district, for example, through sales and distribution channels managed by Defendants.

7. On information and belief, Defendants place, have placed, and contributed to placing Accused Products into the stream of commerce via an established distribution channel knowing or understanding that such products would be sold and used in the United States, including in this judicial district. On information and belief, Defendants have also derived substantial revenues from infringing acts in this District, including from the sale and use of the Accused Products.

JURISDICTION AND VENUE

8. This action includes a claim of patent infringement arising under the patent laws of the United States, 35 U.S.C. §§ 1 *et seq*. This Court has jurisdiction over this action pursuant to 28 U.S.C. §§ 1331 and 1338(a).

9. This Court has personal jurisdiction over Defendants. On information and belief, Defendants conduct business, have committed acts of patent infringement directly or through subsidiaries, and have induced acts of patent infringement by others in this District and elsewhere in the United States. On information and belief, Defendants place, have placed, and contribute to placing their products into the stream of commerce through established distribution channels knowing or understanding that such products would be sold and used in the United States, including in this District.

10. Venue is proper in this District pursuant to 28 U.S.C. §§ 1391 and 1400(b), because Defendants have committed and continue to commit acts of patent infringement in this District, by, among other things, directly and/or indirectly making, using, selling, offering to sell, or importing products that infringe one or more claims of the Patent-in-Suit, and have a regular and established place of business in this District.

11. On information and belief, Micron has a regular and established place of business at least at 950 W. Bethany Drive, Suite 120, Allen, Texas 75013.

12. On information and belief, Micron uses its Allen Texas facility for the design of semiconductor memories.

13. On information and belief, Micron's Allen Texas facility is a 200,000 square foot building, which houses between 112 and 200 employees.[1]

14. On information and belief, Micron also employs persons with relevant knowledge of the accused technology in Allen, Texas.

ASSERTED PATENT

15. On May 27, 2008, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 7,378,702 ("the '702 Patent"), entitled "Vertical Memory Device Structures." A copy of the '702 Patent is attached as Exhibit A.

16. The '702 Patent is valid and enforceable. *See* Ex. A.

17. The '702 Patent is directed to patentable subject matter. Particularly, the '702 Patent is directed to a novel, tangible semiconductor memory structure. The inventive, tangible

[1] Kaizen Development Partners, *Micron Technology Signs Office Lease at 2000,0000 SF One Bethany West in Allen, Texas*, http://www.onebethanyallen.com/onebethanyblog/micron-technology-signs-office-lease-at-200000-sf-one-bethany-west-in-allen-texas. (last visited January 19, 2023).

claimed structures of the ’702 Patent provides increased circuit density in integrated circuits, which reduces cost-per-bit and improves memory performance. The claimed inventions provide specific concrete solutions to the technical problem of increasing circuit density in semiconductor memory structures. *See generally* Ex. A.

18. The claimed elements of the inventions of the ’702 Patent individually and as an ordered combination are not well-understood, routine, or conventional. For example, the claimed, tangible, semiconductor structures of the ’702 Patent provide increased circuit density in integrated circuits without necessarily requiring memory structures to be made smaller. *See generally* Ex. A.

19. BeSang owns all rights, title, and interest in and to the ’702 Patent and possesses all rights of recovery.

FACTUAL ALLEGATIONS

20. Semiconductor memory in computers and other electronic devices is used for digital data storage. Semiconductor memory typically refers to devices in which data is stored within metal-oxide-semiconductor (“MOS”) transistors in memory cells and can be categorized as volatile or nonvolatile memory.

21. For example, a solid-state drive (“SSD”) is a printed circuit board that contains, among other components, a plurality of individual memory chips, such as NAND flash memory chips. NAND flash memory is a type of nonvolatile memory that is able to retain data without power. One NAND chip may consist of billions of memory cells where data is stored.

22. Traditionally, the memory cells in a NAND memory chip were laterally oriented, forming a horizontal array above and parallel to the substrate. This type of NAND memory is commonly known as “planar NAND” or “2D NAND.”

23. In 2D NAND, the array of memory cells can only extend in two dimensions, and it consumes a significant amount of area on the chip. Therefore, the capacity of 2D NAND memory is constrained by the number of memory cells that can fit within finite width and length dimensions. As the manufacturing equipment and technologies required to support such high density became increasingly expensive with each new generation of smaller devices, "[p]lanar NAND flash memory [was] nearing its practical scaling limits, posing significant challenges for the memory industry."[2]

24. Dr. Sang-Yun Lee incorporated BeSang in 2003 to develop, in part, three-dimensional (3D) integrated circuit technologies to overcome the above-mentioned deficiencies of the 2D solutions. Dr. Lee is the President and CEO of BeSang.

25. In 2004, Dr. Lee filed the application that would become the '702 Patent to claim his inventions. The '702 Patent teaches the use of vertical memory cells, which allows the memory array to expand in a third dimension, as well as putting logic circuitry underneath the memory array, which further increases density and helps achieve faster performance. For example, the specification of the '702 Patent recites, "[i]n FIG. 1, a logic circuit 114 including sense amplifier and column/row selectors may be implemented in base semiconductor substrate 103 while nonvolatile memory devices are implemented in first FLD layer 101." Ex. A at 38 ('702 Patent 5:60–63). Figure 1 of the '702 Patent depicts the substrate 103 under the layer 101. *See id.* at 2 ('702 Patent Fig. 1).

[2] Micron Investor Relations Press Release, *Micron and Intel Unveil New 3D NAND Flash Memory* (Mar. 26, 2015), https://investors.micron.com/news-releases/news-release-details/micron-and-intel-unveil-new-3d-nand-flash-memory (last visited Jan. 19, 2023).

26. Dr. Lee assigned all right, title, and interest in the '702 Patent to BeSang on December 15, 2010. This assignment was recorded at the United States Patent and Trademark Office.

27. BeSang soon became a recognized pioneer in the semiconductor industry for its development of 3D memory technologies. BeSang successfully created prototypes of 3D memory devices, utilizing facilities at the Stanford Nanofabrication Facility in California and the National NanoFab Center in Korea.

28. By 2009, BeSang's 3D memory technology achieved critical acclaim. For example, EE Times listed BeSang as one of the 60 emerging start-ups on its Silicon 60 List.[3] In the same year, the well-known business consulting firm Frost & Sullivan described BeSang's 3D memory technology as having "clear-cut winning edges" compared to other technologies.[4] The Global Semiconductor Alliance praised BeSang's technology as "anticipated to eventually change the semiconductor industry standard from two-dimensional (2D) device shrinking to 3D stacking."[5]

29. BeSang's 3D memory technology also gained recognition from the academic world. Dr. Simon Sze, Member of the U.S. National Academy of Engineering and co-inventor of the floating-gate transistor for nonvolatile memory cells in 1967, stated in interviews that "[b]efore

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[3] Peter Clarke, *EE Times Updates List of Emerging Startups to Version 8.0* (Feb. 2, 2009), https://www.edn.com/ee-times-updates-list-of-emerging-startups-to-version-8-0/ (last visited Jan. 18, 2023).

[4] Peter Clarke, *Frost & Sullivan Tips BeSang as 3-D IC Winner* (Mar. 20, 2009), https://www.eetimes.com/frost-sullivan-tips-besang-as-3-d-ic-winner/ (last visited Jan. 18, 2023).

[5] GSA Forum at 17, *Exploring the Potential of Emerging Semiconductor Technology: Private Sh owing* (June 2011), https://www.gsaglobal.org/wp-content/uploads/2019/04/201102_GSA_Forum.pdf (last visited Jan. 18, 2023).

BeSang's design came, all other past attempts were pseudo 3D,"[6] and that "BeSang's 3D IC is a very attractive technology."[7]

30. The '702 Patent has been cited by more than three hundred patents. The family of the '702 Patent has been cited during prosecution of patents owned by dozens of companies.

31. Before Micron released any 3D NAND products, Micron had knowledge of BeSang's inventions. For example, the '702 Patent was cited during prosecution of over 45 Micron patents. And at least nine of Micron's applications were rejected by the United States Patent and Trademark Office based on the '702 Patent during prosecution.[8]

32. In addition to knowing of the '702 Patent, Micron has been aware of BeSang for at least fifteen years. In July 2007, BeSang made a detailed presentation to Micron about the limitations of the conventional memory technologies and how BeSang's 3D technology made it possible to produce memory cells with higher density and lower costs. The presentation emphasized vertical memory cells and placing logic circuits under the memory array, both of which are disclosed in the '702 Patent.

33. In May 2012, BeSang's president and the named inventor on the '702 Patent, Dr. Sang-Yun Lee, made a presentation at the IEEE IMW Workshop on the topic of "Architecture of 3D Memory Cell Array on 3D IC." Kirk Prall and Agostino Pirovano, both then working at Micron, attended the workshop.

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[6] EET Asia, *World's First 3D Chip Technology Surfaces* (Aug. 13, 2008), https://archive.eetasia.com/www.eetasia.com/ART_8800539348_480100_NT_11f84e48.HTM (last visited Jan. 18, 2023).

[7] Ann Steffora Mutschler, *Stanford, Korean Nanofab Center, Oregon-Based Semi Startup Claim 3D IC Breakthrough*, https://www.edn.com/stanford-korean-nanofab-center-oregon-based-semi-startup-claim-3d-ic-breakthrough/ (last visited Jan. 18, 2023).

[8] *See, e.g.*, prosecution history of U.S. Patent Nos. 11,295,807; 10,854,611; 10,847,516; 10,790,008; 10,381,357; 10,079,235; 10,056,386; 7,504,298.

34. In 2014 and 2015, Matt Freeman, then Senior Director of Corporate Development at Micron, engaged in discussions with BeSang about a potential acquisition of BeSang.

35. On Monday March 23, 2015, Matt Freeman contacted Dr. Lee of BeSang and the parties arranged for a call to discuss a potential M&A transaction.

36. On Thursday March 26, 2015, Micron announced it would be releasing its first 3D NAND flash memory technology.[9] According to Micron, the 3D NAND structure "enables more storage in a smaller space, bringing significant cost savings, low power usage and high performance."[10]

37. The next day on Friday March 27, 2015, Mr. Freeman contacted BeSang and discussed the possibility of Micron acquiring BeSang's patents in lieu of an M&A transaction. BeSang declined to sell its patents to Micron.

38. Subsequent to Micron's announcement that it would be introducing 3D NAND products, Micron incorporated 3D NAND flash memory technology into its products at least as early as 2016, including the Micron 1100 SSD, which used a 32-layer NAND memory chip.[11] Micron continues to manufacture and sell 3D NAND products, including the Micron's Accused Products.

39. According to Micron, one of the most critical breakthroughs of its 3D NAND Flash products was the "CMOS under array" technology, which means to "get the majority of logic under the array."[12]

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[9] Micron Investor Relations Press Release, *Micron and Intel Unveil New 3D NAND Flash Memory* (Mar. 26, 2015), https://investors.micron.com/news-releases/news-release-details/micron-and-intel-unveil-new-3d-nand-flash-memory / (last visited Jan. 18, 2023).
[10] *Id.*
[11] Slobodan Simic, *Micron Announces Its First Client 1100 And 2100 SSDs*, https://www.fudzilla.com/news/memory-and-storage/40819-micron-announces-its-first-client-1100-and-2100-ssds.
[12] Mark Lapedus, What's Next For NAND?, https://semiengineering.com/whats-next-for-nand/.

40. Micron's 3D NAND Flash products incorporating CMOS under Array are covered by the claims of BeSang's '702 Patent.

41. On information and belief, Micron's Accused Products include its 3D NAND products with a 32-Layer 3D TLC NAND feature[13]; a 64-Layer 3D TLC NAND feature[14]; a 96-Layer 3D TLC NAND feature[15]; and a 176-Layer 3D TLC NAND feature[16], and its Crucial brand of SSDs.[17] Micron's Accused Products also include Micron's 3D NAND memory parts[18] containing features identified as infringing herein, including future releases. For example on information and belief, the Accused Products include Micron's 3D NAND products that include its 232-Layer NAND memory, announced in July 2022, which is expected to "feature[] the

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[13] *See, e.g.*, Micron 1100 SSD series, Micron 5100 SSD series.

[14] *See, e.g.*, Micron 5200 SSD series, Micron 5210 SSD series, Micron 2100AI/AT SSD series, Micron 2200 SSD series, Micron 9300 NVMe SSD series, Micron's UFS 2.1.

[15] Micron 5300 SSD series, Micron 7300 SSD with NVMe series, Micron 2300 SSD series, Micron 7400 SSD with NVMe series products.

[16] *See, e.g.*, Micron 2450 SSD with NVMe series, Micron 3400 SSD with NVMe series, Micron 2400 SSD with NVMe series, Micron 5400 SSD series, Micron 7450 SSD with NVMe series.

[17] *See e.g.,* Crucial P3 NVMe SSD; Crucial P3 Plus NVMe SSD; Crucial P5 Plus SSD; Crucial BX500 SSD; Crucial MX500 SSD.

[18] *See, e.g.*, Micron Part Nos. MT29F128G08CBCEBJ4-37ITR, MT29F1T08EEHAFJ4-3R, MT29F1T08EEHAFJ4-3T, MT29F1T08EEHBFJ4-R, MT29F1T08EEHBFJ4-T, MT29F1T08EELCEJ4-R, MT29F1T08EELEEJ4-R, MT29F1T08EELEEJ4-T, MT29F1T08EMHAFJ4-3R, MT29F256G08CECEBJ4-37ITR, MT29F256G08EBCAGB16A3WC1, MT29F256G08EBHAFJ4-3R, MT29F2T08EMHAFJ4-3R, MT29F2T08EMHAFJ4-3T, MT29F2T08EMHBFJ4-R, MT29F2T08EMHBFJ4-T, MT29F2T08EMLCEJ4-R, MT29F2T08EMLEEJ4-R, MT29F2T08EMLEEJ4-T, MT29F4T08EUHAFM4-3R, MT29F4T08EUHAFM4-3T, MT29F4T08EUHBFM4-R, MT29F4T08EUHBFM4-T, MT29F4T08EULCEM4-R, MT29F4T08EULEEM4-R, MT29F4T08EULEEM4-T, MT29F512G08CMCEBJ4-37ITR, MT29F512G08EBHAFB17A3WC1, MT29F512G08EBHAFJ4-3R, MT29F512G08EBHAFJ4-3T, MT29F512G08EBHBFB27A3WC1-R, MT29F512G08EBHBFJ4-R, MT29F512G08EBHBFJ4-T, MT29F512G08EBLCEB27B3WC1-R, MT29F512G08EBLCEJ4-R, MT29F512G08EBLEEB47R3WC1-R, MT29F512G08EBLEEJ4-R, MT29F512G08EBLEEJ4-T, MT29F512G08EEHAFJ4-3R, MT29F8T08EWHAFJ6-3R, MT29F8T08EWHAFJ6-3T, MT29F8T08EWLEEM5-Rmm, MT29F8T08EWLEEM5-T.

industry's highest areal density" and "enable best-in-class support of the most data-intensive use cases."[19]

42. Micron had actual knowledge of the '702 Patent prior to this lawsuit, as shown above, or subjectively believed there was a high probability that the '702 Patent existed and took deliberate actions to avoid learning of the '702 Patent. Micron also has knowledge of the '702 Patent by the filing and service of this Complaint.

43. Micron knew and continues to know that the acts complained of below constitute infringement of the '702 Patent, or at least subjectively believed that there was a high probability of infringement of the '702 Patent but took deliberate steps to avoid confirming the same.

44. Micron does not have any rights to the '702 Patent.

45. On information and belief, Micron's Accused Products all use a "CMOS under array" structure, which means to have CMOS control circuits underneath the memory array in order to lower costs, "reduce die sizes[,] and deliver improved performance when compared to competitive approaches."[20]

46. In the interest of providing detailed averments of infringement, BeSang has identified below at least one claim of the '702 Patent to demonstrate infringement. However, the selection of claims should not be considered limiting, and additional claims of the '702 Patent that are infringed by Micron will be disclosed in compliance with the Court's schedule.

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[19] Micron, *Micron Ships World's First 232-Layer NAND, Extends Technology Leadership*, https://investors.micron.com/news-releases/news-release-details/micron-ships-worlds-first-232-layer-nand-extends-technology.

[20] Micron Investor Relations Press Releases, *Micron and Intel Extend Their Leadership in 3D NAND Flash Memory* (May 21, 2018), https://investors.micron.com/news-releases/news-release-details/micron-and-intel-extend-their-leadership-3d-nand-flash-memory

COUNT ONE: INFRINGEMENT OF THE ’702 PATENT

47. BeSang incorporates by reference the preceding paragraphs as if fully set forth herein.

48. U.S. Patent No. 7,378,702 (“the ’702 Patent”), entitled “Vertical Memory Device Structures,” was legally and duly issued on May 27, 2008, naming Sang-Yun Lee as the inventor. *See* Exhibit A.

49. BeSang owns all rights, title, and interest in the ’702 Patent, and holds all substantial rights pertinent to this suit, including the right to sue and recover for all past, current, and future infringement.

50. BeSang has complied with all statutory requirements, including the requirements of 35 U.S.C. § 287, to pursue and recover for any infringement of the ’702 Patent.

51. On information and belief, Micron directly infringed and is currently infringing, literally and/or under the doctrine of equivalents, at least one claim of the ’702 Patent by, among other things, making, using, selling, offering to sell, and/or importing within this District and elsewhere in the United States, without authority, the Accused Products. For example, as shown below, the Accused Products practice at least claim 13 of the ’702 Patent.

52. Claim 13 of the ’702 Patent recites:

> [preamble] A semiconductor memory structure, comprising:
>
> > [13a] a substrate having electrical devices formed therein, and
> >
> > [13b] further having a dielectric layer disposed above the electrical devices;
> >
> > [13c] a stackable add-on layer having a plurality of vertically oriented semiconductor memory cells; and
> >
> > [13d] the stackable add-on layer being bonded to the dielectric layer; and

[13e] wherein the memory cells are nonvolatile memory cells having at least one transistor.

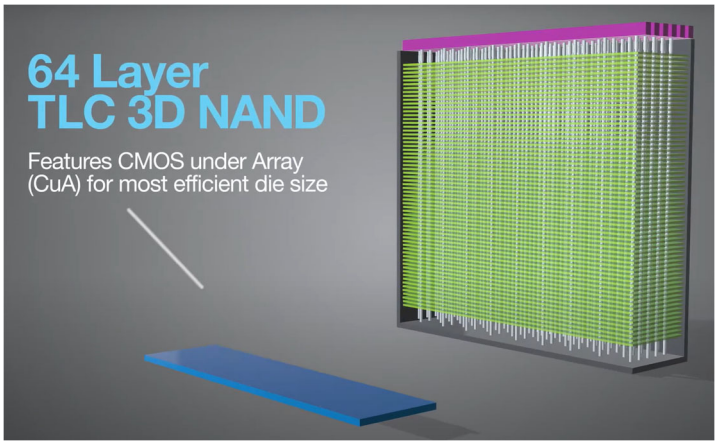
53. For purposes of showing infringement of the '702 Patent, on information and belief, all the series and models of Micron's Accused Products share a similar structure and infringe in the same way.

54. The Accused Products are all 3D NAND products designed by Micron and share a common structure.

55. The Accused Products all include stacking layers of data storage cells vertically to create storage devices.

56. The Accused Products all contain a "CMOS under Array" ("CuA") architecture, which places periphery circuitry under the memory array.[21]

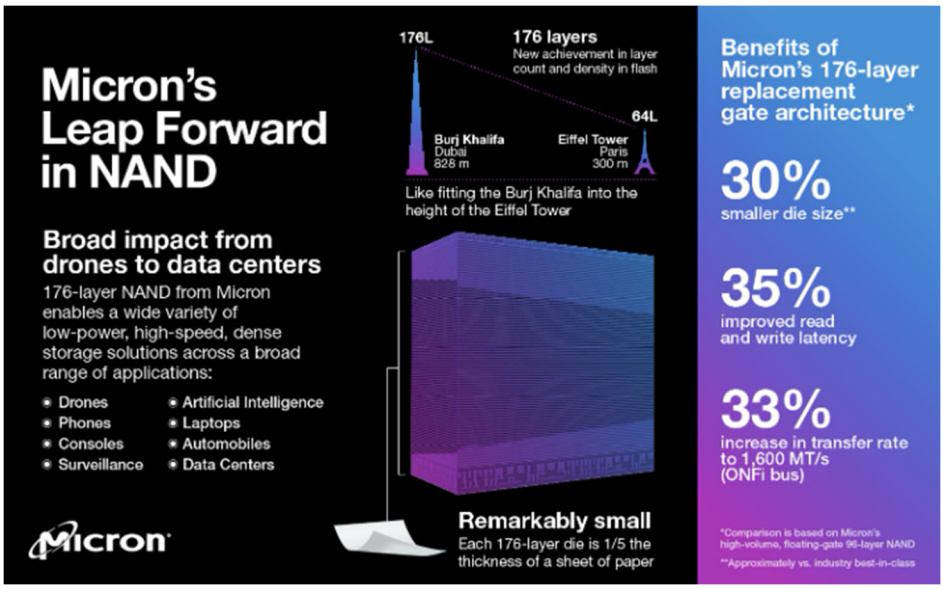
57. For example, Micron used its CuA design for its first generation 32-Layer 3D NAND Products, and Micron's marketing materials make it clear that its second generation 64-Layer 3D NAND products use its CuA architecture "for most efficient die size."[22]



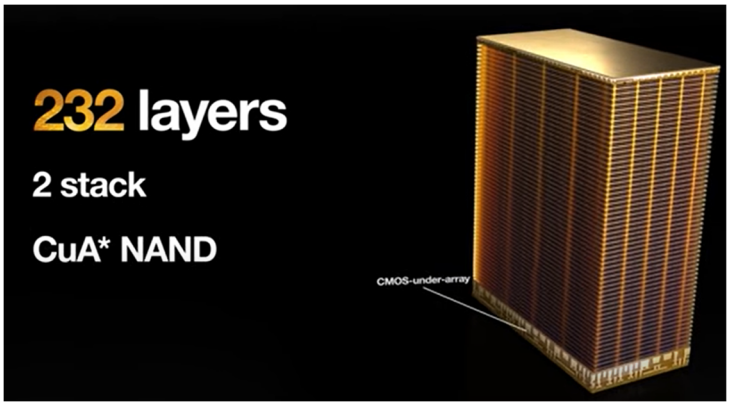
[21] *See, e.g.*, Micron Investor Relations, *Micron and Intel Extend Their Leadership in 3D NAND Flash Memory* (May 21, 2018), https://investors.micron.com/static-files/3524ce13-cb1e-4def-a557-c569faa4f8e9.

[22] Micron, *Augment Your Imagination with Micron Mobile TLC 3D NAND*, https://www.youtube.com/watch?v=VheOBC5ZThg (1:09).

58. Micron likewise uses its CuA design in its third and fourth generation 96-layer and 128-layer 3D NAND products and markets its fifth generation 176-Layer NAND products as having a CuA architecture.[23][24]



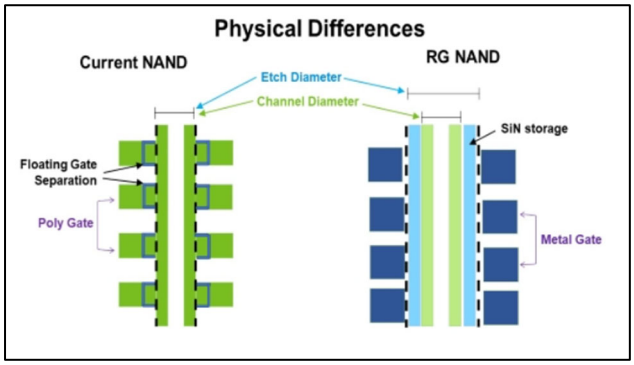
59. Micron's newest 232-layer Product is also advertised as incorporating a CuA architecture.[25]



[23] ProVideo Coalition, *New Crucial SSDs will be bigger, faster, and cheaper*, https://www.provideocoalition.com/new-crucial-ssds-will-be-bigger-faster-and-cheaper/ (image attributed to Micron) (last visited January 19, 2023).
[24] Micron, *176-Layer NAND*, https://www.micron.com/products/nand-flash/176-layer-nand (last visited January 19, 2023).
[25] Micron 232-Layer NAND Technology: Innovation and Leadership, https://www.youtube.com/watch?v=lp2p-bMH_-0&t=74s (1:00).

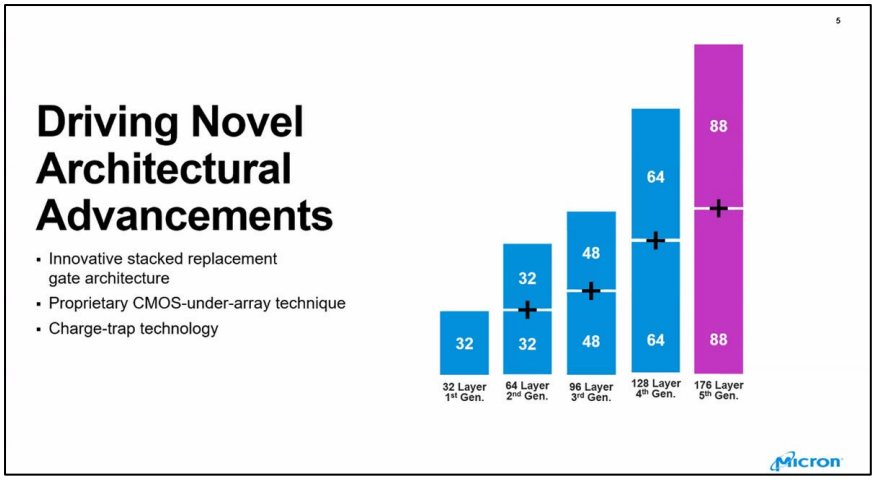
60. On information and belief, Micron's 3400 SSD with NVMe product was designed and manufactured with the structures and architectures common to all Micron's 3D NAND products.

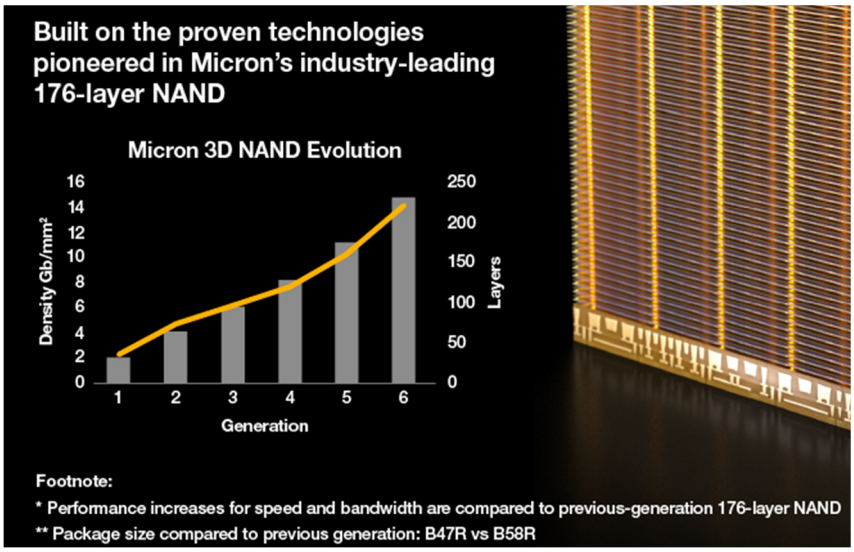
61. Micron has continued to implement memory cells connected through vertically oriented channels. For example on information and belief, Micron began implementing a replacement-gate technology in its 176-layer devices, but continued to use vertically oriented channels with its memory cells.[26]



62. The Micron 3D NAND product generations all contain the same features and architectures described above. For example, as shown in the below image from Micron, each generation of Micron Accused Products include CMOS under Array and vertically stacked memory cells.[27][28]

[26] Micron, *176-Layer NAND*, https://www.micron.com/products/nand-flash/176-layer-nand (last visited January 19, 2023).
[27] PC World, *SSDs are primed to get bigger and faster with Micron's new NAND memory Tech* https://www.pcworld.com/article/393710/ssds-are-primed-to-get-bigger-and-faster-with-micron-nand.html (image attributed to Micron)
[28] Micron, *232 Layer NAND*, https://www.micron.com/products/nand-flash/232-layer-nand (last visited January 19, 2023).

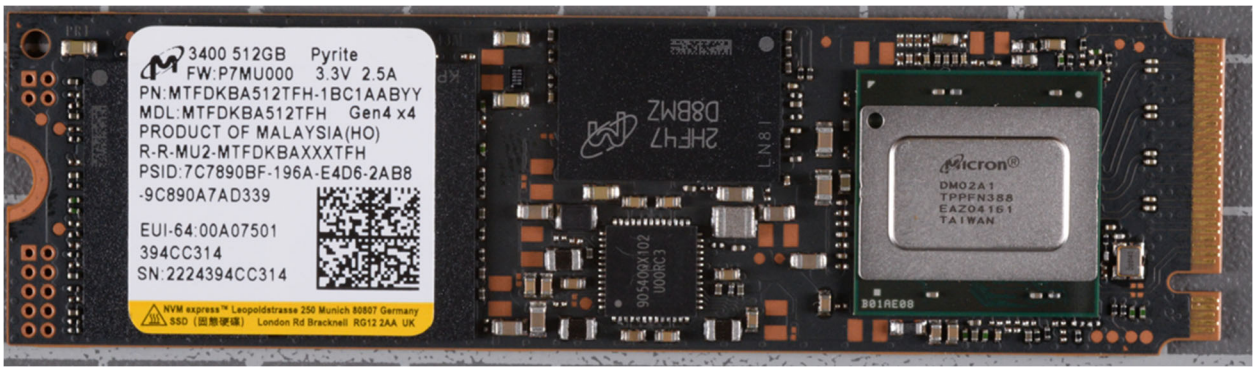




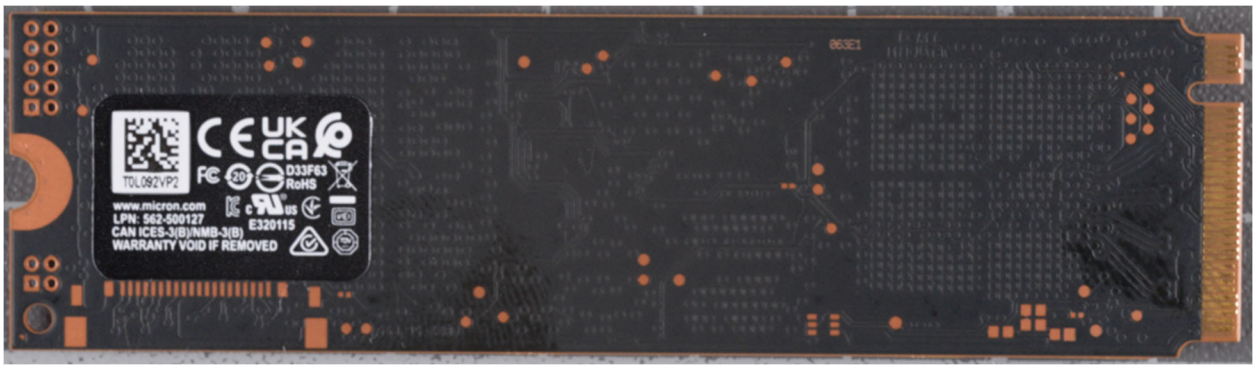
63. Accordingly, Micron's 3400 SSD with NVMe product is representative of all Micron's Accused Products, and the infringing features present in Micron's 3400 SSD with NVMe Series product are common in all of Micron's Accused Products.

64. To the extent the preamble is considered a limitation, Micron's Accused Products contain a semiconductor memory structure. '702 Patent, claim 13, preamble.

65. For example, the memory chips in Micron's 3400 SSD with NVMe Series product are semiconductor memory structures:

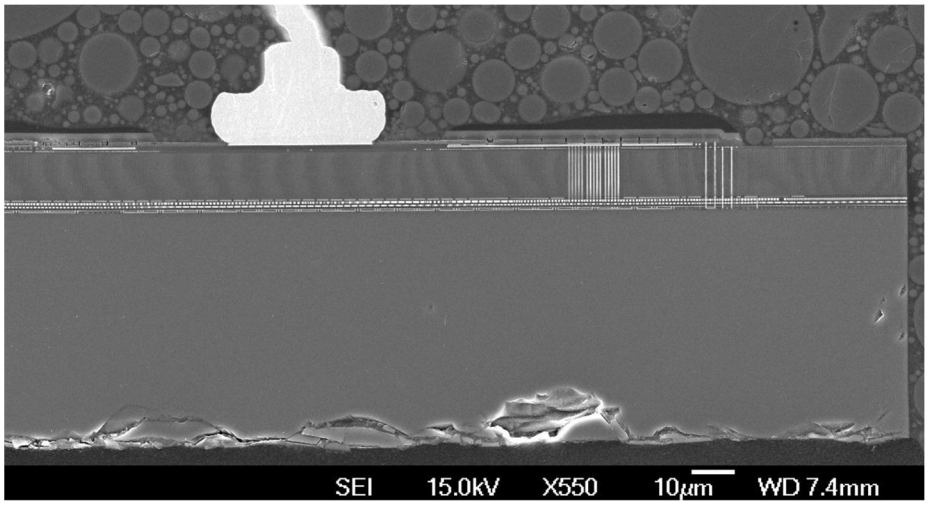


Micron 3400 SSD with NVMe (Top)



Micron 3400 SSD with NVMe (Bottom)

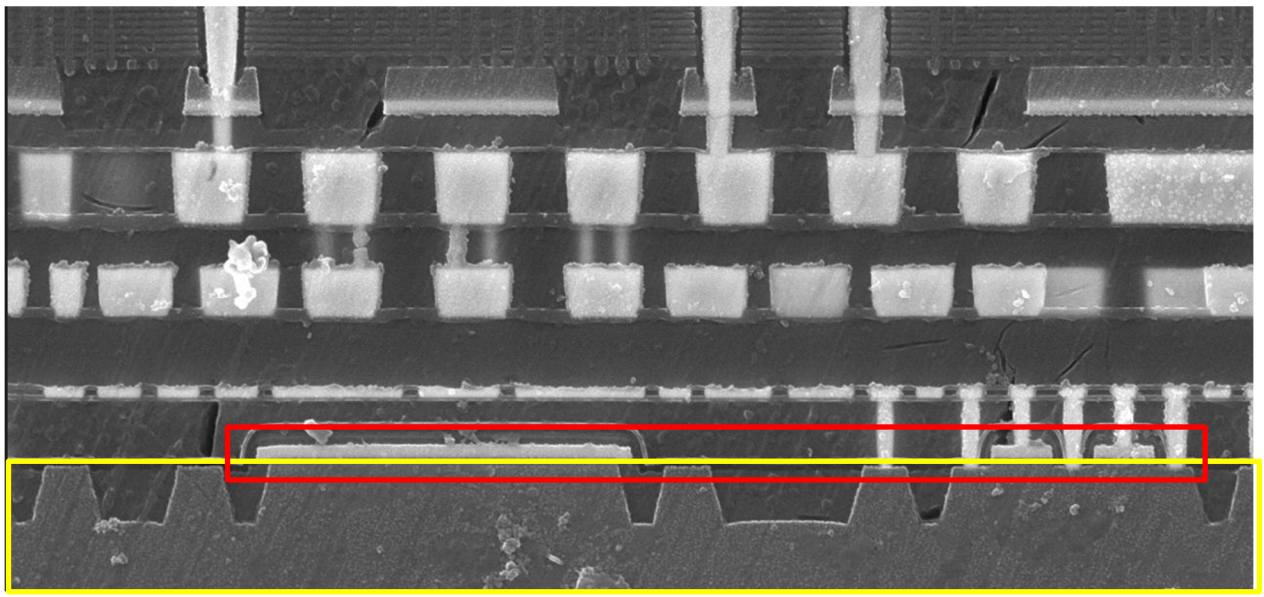
3D NAND Chip Extracted from Micron 3400 SSD with NVMe



Cross Section of Micron's 3D NAND Chip

66. Micron's Accused Products contain a substrate having electrical devices formed therein. '702 Patent, claim 13, element [13a].

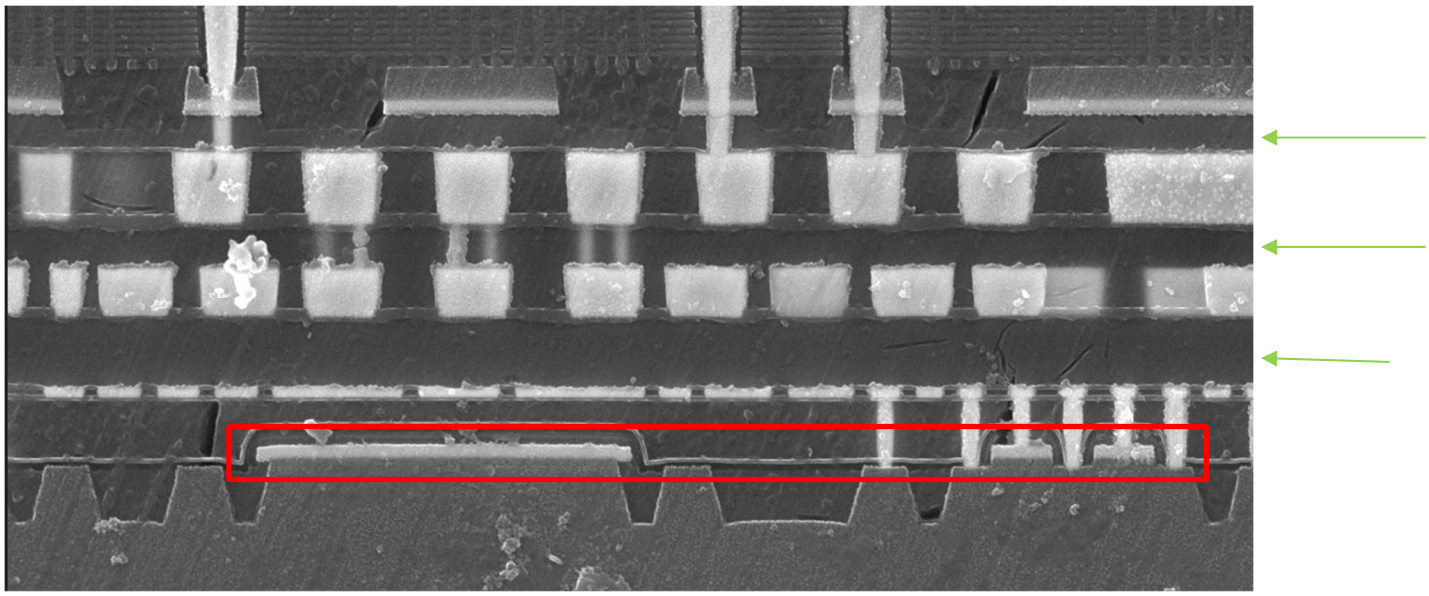
67. For example, the Micron Accused Products contain CMOS circuits (annotated in red) formed in the substrate (annotated in yellow):



Cross Section of Micron's 3D NAND Chip

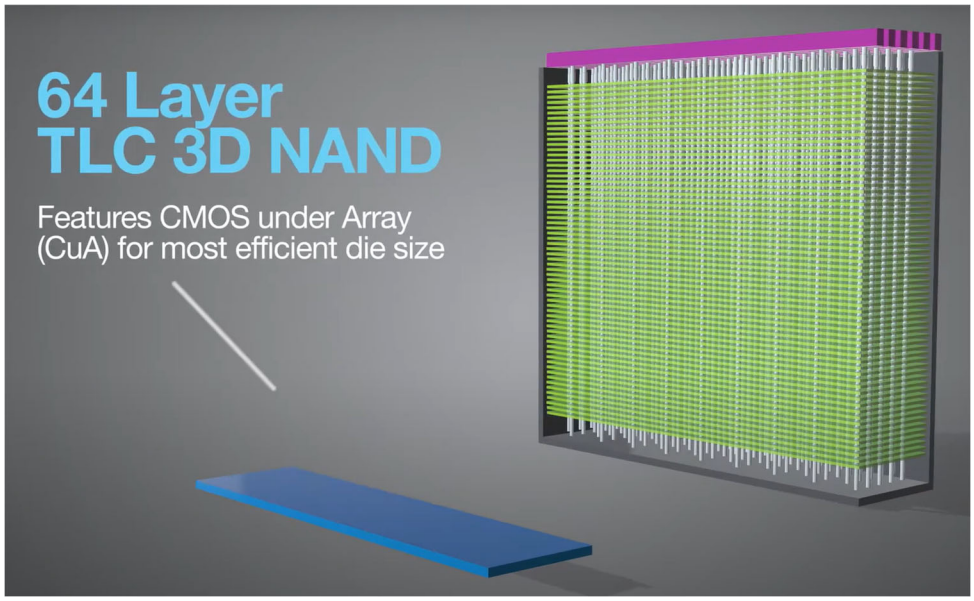
68. Micron's Accused Products contain further having a dielectric layer disposed above the electrical devices. '702 Patent, claim 13, element [13b].

69. For example, the Micron Accused Products contain a dielectric layer (annotated in green) disposed above the CMOS circuits (annotated in red):



Cross Section of Micron's 3D NAND Chip

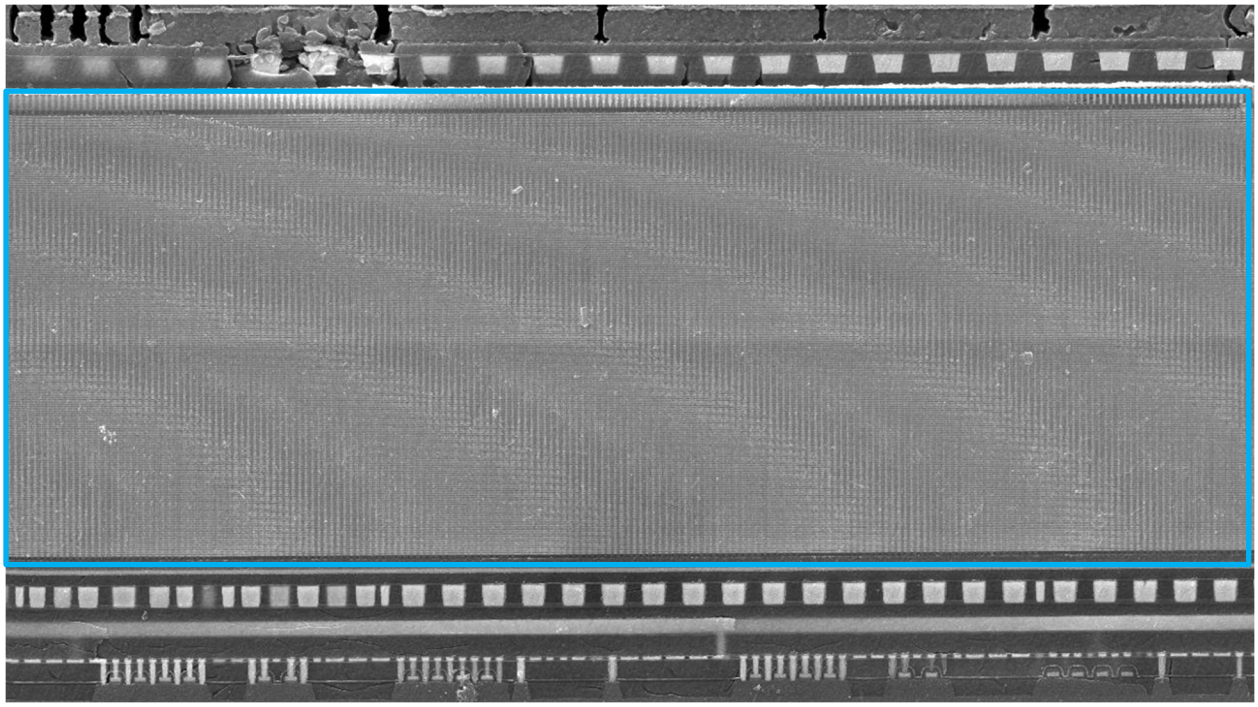
70. Marketing material from Micron's webpage on "Mobile TLC 3D NAND" confirms Micron's 3D NAND memory products have CuA architecture.[29]



[29] Micron, *Mobile TLC 3D NAND*, https://www.micron.com/products/nand-flash/3d-nand/micron-mobile-tlc-3d-nand (video at 1:11).

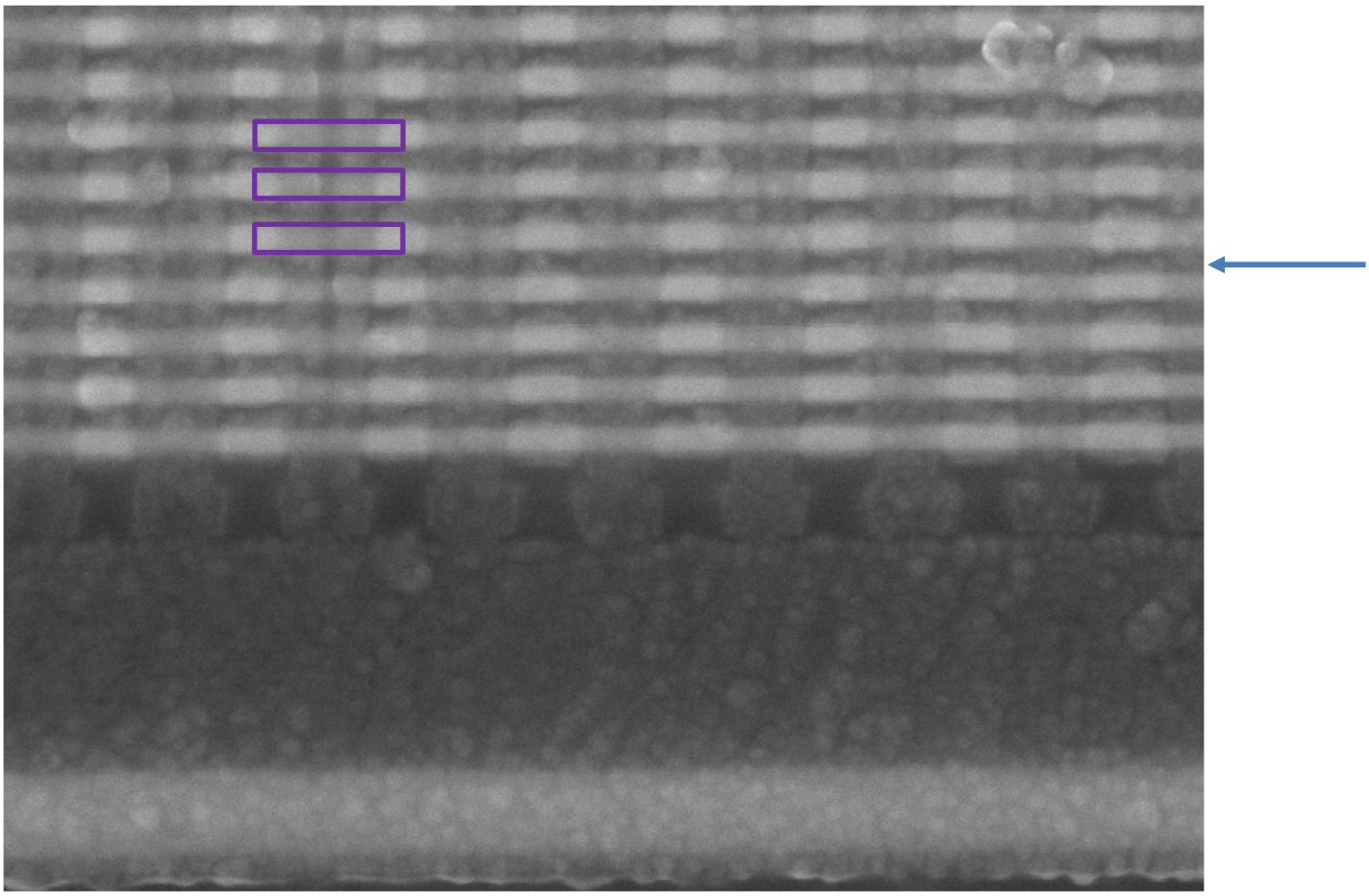
71. Micron's Accused Products contain a stackable add-on layer having a plurality of vertically oriented semiconductor memory cells. '702 Patent, claim 13, element [13c].

72. For example, Micron's Accused Products contain an array of memory cells (annotated in blue).



Cross Section of Micron's 3D NAND Chip

73. The array of memory cells comprises a stackable add-on layer (annotated in blue). The memory array also has a plurality of vertically oriented semiconductor memory cells (examples annotated in purple):



Cross Section of Micron's 3D NAND Chip

74. Micron's marketing material describes its 3D NAND technology as having stack storage tiers to provide the highest-capacity NAND die available.[30]

[30] Micron, Micron 3D NAND Flash Memory, https://media-www.micron.com/-/media/client/global/documents/products/product-flyer/3d_nand_flyer.pdf?la=en&rev=3cd61615c93c4cb9a6db81b0bd73fb65 (last visited January 19, 2023).

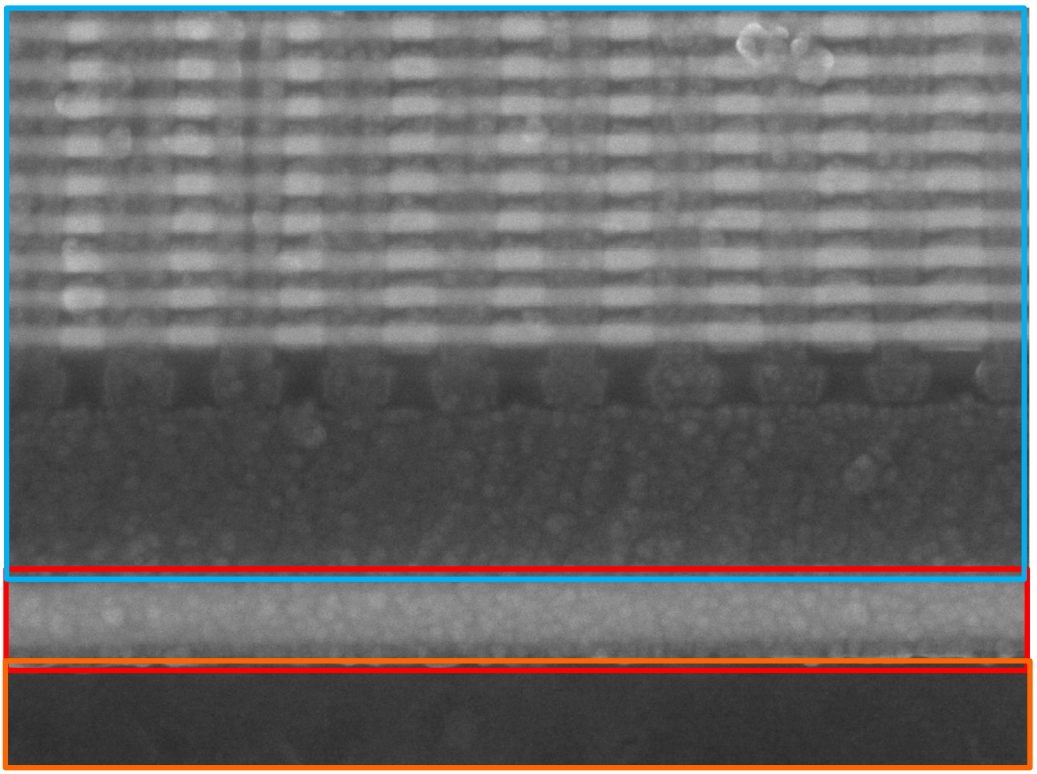
Why Micron 3D NAND?

1. High Capacities

Get the performance you need with some of the highest-capacity NAND die available — thanks to our 32-stack storage tiers.

75. Micron's Accused Products contain the stackable add-on layer being bonded to the dielectric layer. '702 Patent, claim 13, element [13d].

76. The memory array (annotated in blue) comprising the stackable add-on layer in the Micron Accused Products is bonded to the dielectric layer (annotated in orange). The stackable add-on layer in the Micron Accused Products is bonded to the dielectric layer through a conductive plane (annotated in red):

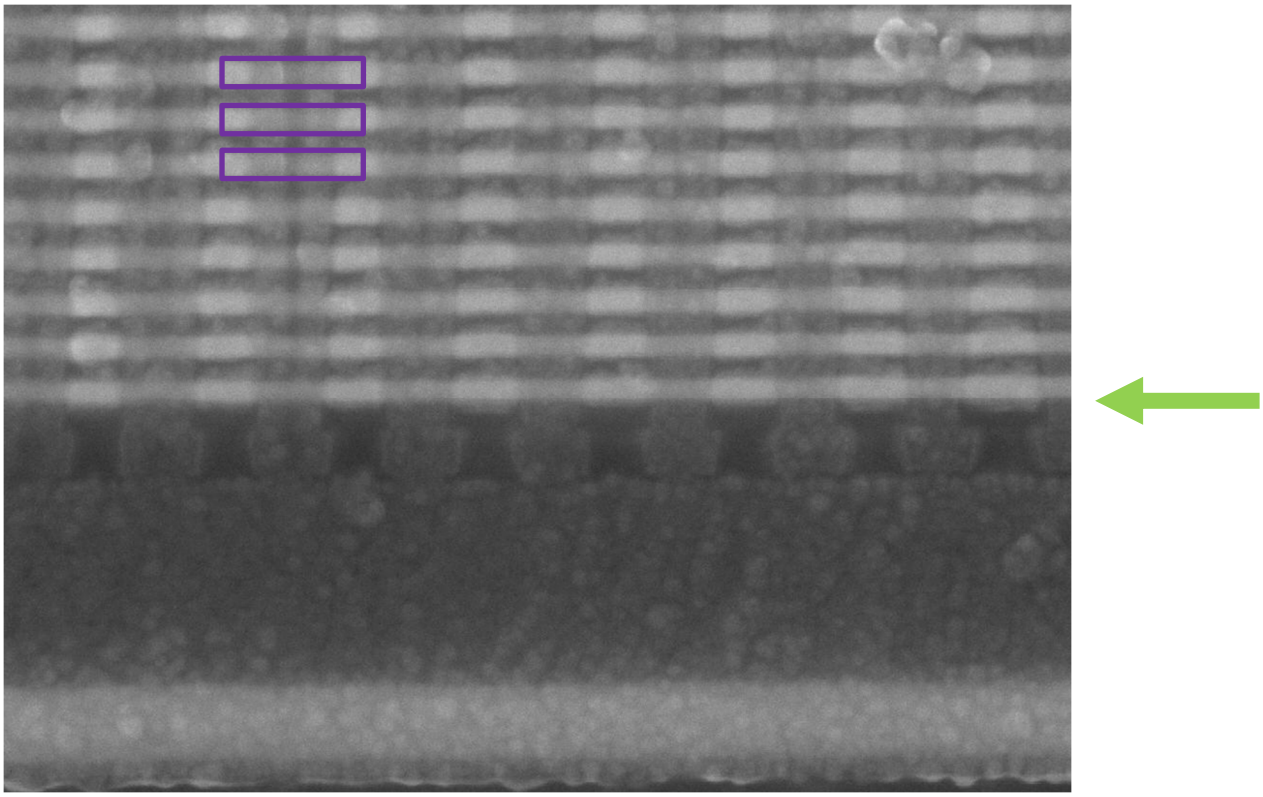


Cross Section of Micron's 3D NAND Chip

77. The Micron Accused Products contain memory cells wherein the memory cells are nonvolatile memory cells having at least one transistor. ’702 Patent, claim 13, element [13e].

78. The memory cells in the Micron Accused Products are NAND cells, which are nonvolatile memory cells.

79. The nonvolatile memory cells (examples annotated in purple) have at least one transistor, such as the select gate source transistor (annotated in light green):



Cross Section of Micron’s 3D NAND Chip

80. Accordingly, Micron’s 3D NAND Chip from its Micron 3400 with NVMe SSD products contain each and every element in claim 13 of the ’702 Patent.

81. As further evidence that Micron’s 3400 SSD with NVMe product is representative, Micron’s 64-Layer products also practice claim 13 of the ’702 Patent in a similar manner. For example, Micron’s B16A UFS contains every element of claim 13 of the ’702 Patent.

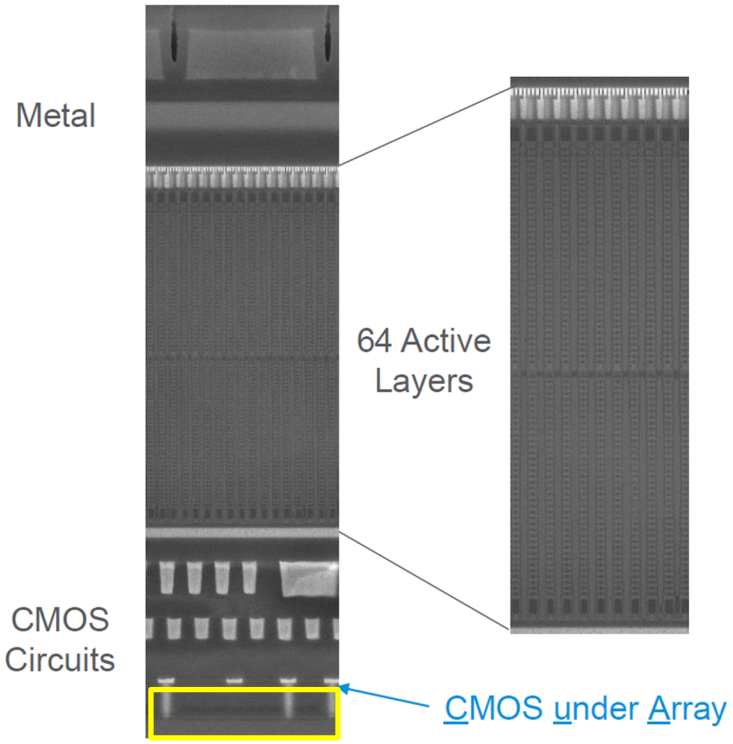
82. To the extent the preamble is considered a limitation, Micron's B16A UFS contains a semiconductor memory structure. '702 Patent, claim 13, preamble.

83. For example, the Micron B16A UFS contains a semiconductor memory structure:[31]

84. Micron's Accused Products contain a substrate having electrical devices formed therein. '702 Patent, claim 13, element [13a].

85. For example, Micron's B16A UFS contains CMOS circuits (annotated in blue in the original) formed in the substrate (annotated in yellow):[32]

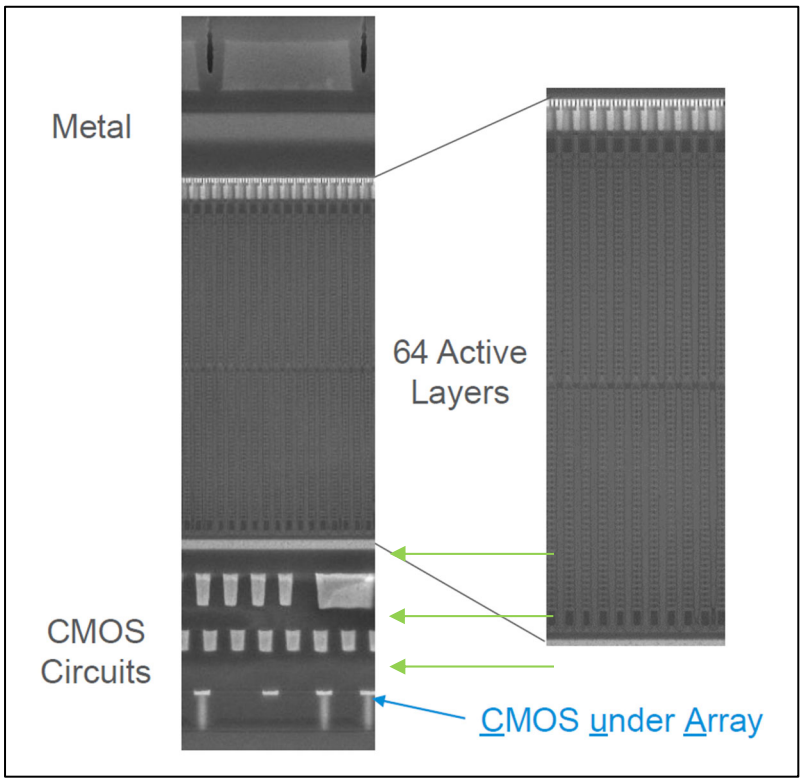
[31] Micron, *Introducing 2nd Generation Micron Mobile TLC 3D NAND*, https://media-www.micron.com/-/media/client/global/documents/products/presentation/micron-mobile-tlc-3d-nand-launch-deck.pdf?la=en&rev=e0069154fbd94f01a714780259ad78f1.
[32] *Id.*



86. Micron's B16A UFS contains further having a dielectric layer disposed above the electrical devices. '702 Patent, claim 13, element [13b].

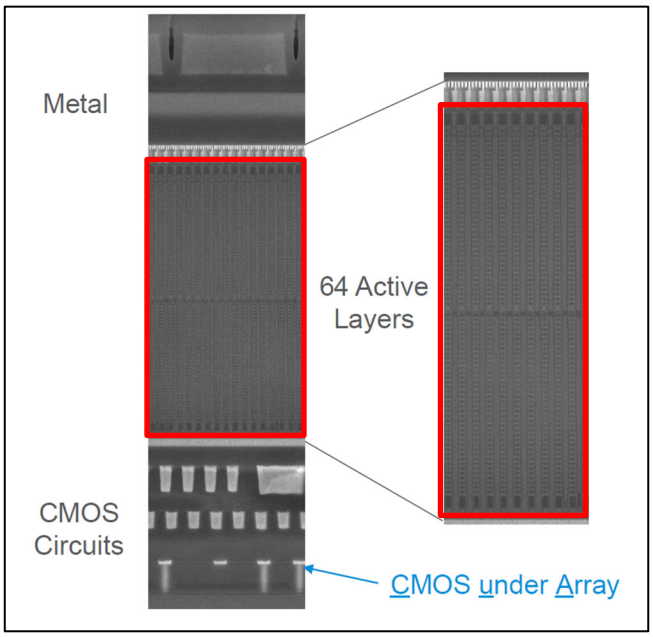
87. For example, Micron's B16A UFS contains a dielectric layer (annotated in green) disposed above the CMOS circuits (annotated in blue in the original): [33]

[33] *Id.*

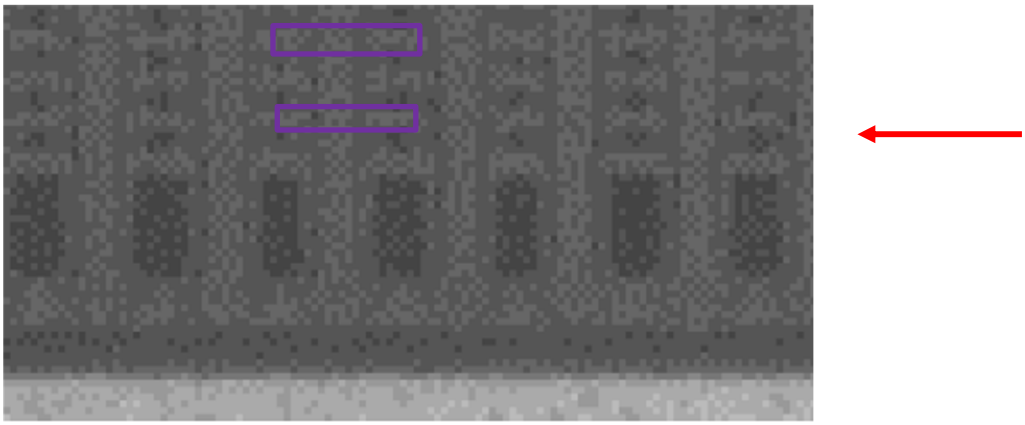


88. Micron's B16A UFS contains a stackable add-on layer having a plurality of vertically oriented semiconductor memory cells. '702 Patent, claim 13, element [13c].

89. For example, Micron's B16A contains an array of memory cells (annotated in red):



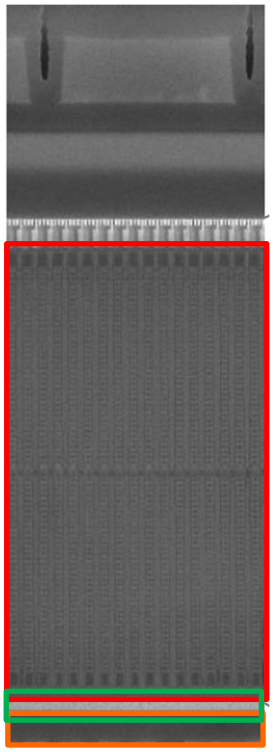
90. The array of memory cells comprises a stackable add-on layer (annotated in red). The memory array also has a plurality of vertically oriented semiconductor memory cells (examples annotated in purple): [34]



91. The Micron B16A UFS contains the stackable add-on layer being bonded to the dielectric layer. '702 Patent, claim 13, element [13d].

92. The memory array (annotated in red) comprising the stackable add-on layer in the Micron Accused Products is bonded to the dielectric layer (annotated in orange). The stackable add-on layer in the Micron Accused Products is bonded to the dielectric layer through a conductive plane (annotated in green): [35]

[34] *Id.*
[35] *Id.*

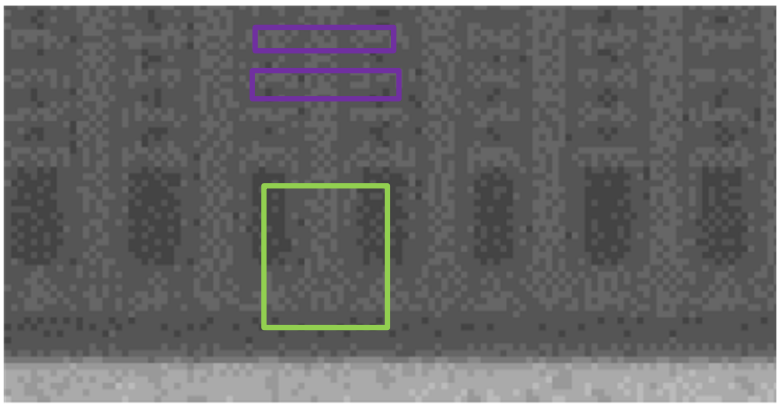


93. The Micron B16A UFS contains memory cells wherein the memory cells are nonvolatile memory cells having at least one transistor. ’702 Patent, claim 13, element [13e].

94. The memory cells in the Micron B16A UFS are NAND cells, which are nonvolatile memory cells.

95. The nonvolatile memory cells (examples annotated in purple) have at least one transistor, such as the select gate source transistor (annotated in light green): [36]

[36] *Id.*



96. Accordingly, Micron's B16A UFS product contains each and every element in claim 13 of the '702 Patent in a similar way to Micron's 3400 SSD with NVMe product. Thus, Micron's 3400 SSD with NVMe product is representative of Micron's Accused Products and Micron's Accused Products contain each and every element in claim 13 of the '702 Patent.

97. Micron directly infringes alone or jointly, literally and/or under the doctrine of equivalents, because it makes, uses, offers for sale, sells, and/or imports the Micron's Accused Products in the United States without BeSang's permission in violation of 35 U.S.C. § 271(a).

98. Micron indirectly infringes the '702 Patent because it has induced third parties, including customers, end users, computer manufacturers, data center operators, distributors, and/or retailers, to have made, use, offer for sale, sell, and/or import Micron's Accused Products without BeSang's permission in violation of 35 U.S.C. § 271(b).

99. Based on information and belief, third parties, including customers, end users, computer manufacturers, data center operators, distributors, and/or retailers, have directly infringed the '702 Patent by having made, using, offering for sale, selling, and/or importing Micron's Accused Products, including, for example, by manufacturing, configuring, using, and operating a device incorporating Micron's Accused Products.

100. Micron induced these third parties' direct infringement by advertising, encouraging, instructing, providing support for, and/or operating Micron's Accused Products for or on behalf of such third parties. For example, on information and belief, Micron publishes specifications, datasheets, instruction manuals, support materials, developer materials, marketing materials, and user guide materials that explain, advertise, instruct on, or provide support for Micron's Accused Products.

101. Micron took the above actions intending to cause infringing acts by these third parties.

102. If Micron did not know that the actions it encouraged constituted infringement of the '702 Patent, Micron was willfully blind as to its inducing infringement of others. Micron subjectively believed that there was a high probability that others would infringe the '702 Patent but took deliberate steps to avoid confirming that it was actively inducing infringement by others.

103. Micron knew of the '702 Patent before 2016.

104. Micron has notice of the '702 Patent before 2016.

105. Additionally, Micron has been on notice of the '702 Patent no later than the filing and service of this Complaint.

106. BeSang has sustained damages owing to Micron's infringement of the '702 Patent.

107. Micron had knowledge of the '702 Patent before 2016 and knew its actions constituted infringement of the '702 Patent, or at least subjectively believed that there was a high probability that the '702 Patent existed and took deliberate actions to avoid learning of the '702 Patent.

108. BeSang has sustained damages owed to Micron's infringement of the '702 Patent.

109. Micron's infringement of the '702 Patent is exceptional and BeSang is entitled to recover reasonable attorneys' fees incurred in prosecuting this action in accordance with 35 U.S.C. § 285.

JURY DEMAND

Plaintiff hereby demands a trial by jury on all issues so triable.

PRAYER FOR RELIEF

WHEREFORE Plaintiff BeSang Inc. asks this Court for an order granting the following relief:

a. a judgment in favor of Plaintiff that Defendants have infringed, either literally and/or under the doctrine of equivalents, the '702 Patent;

b. all equitable relief the Court deems just and proper as a result of Micron's infringement, including an injunction;

c. a judgment and order finding that Defendants' infringement has been willful;

d. a judgment and order requiring Defendants to pay Plaintiff its damages, costs, expenses, and any enhanced damages to which Plaintiff is entitled for Defendant's infringement;

e. a judgment and order requiring Defendants to provide an accounting and to pay supplemental damages to Plaintiff, including without limitation, pre-judgment and post-judgment interest;

f. a judgment and order requiring Defendants to pay on-going royalties;

g. a judgment and order finding that this is an exceptional case within the meaning of 35 U.S.C. § 285 and awarding Plaintiff its reasonable attorneys' fees against Defendant; and

h. any and all other relief as the Court may deem appropriate and just under the circumstances.

DATED: January 23, 2023

Respectfully submitted,

/s/ Warren J. McCarty, III

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