

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE**

MONTEREY RESEARCH, LLC,)	
)	
Plaintiff,)	
)	C.A. No. _____
v.)	
)	JURY TRIAL DEMANDED
NANYA TECHNOLOGY CORPORATION,)	
NANYA TECHNOLOGY CORPORATION,)	
U.S.A., and NANYA TECHNOLOGY)	
CORPORATION DELAWARE,)	
)	
Defendants.		

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Monterey Research, LLC (“Monterey”), for its Complaint for Patent Infringement against Defendants Nanya Technology Corporation (“Nanya Technology Corp.”), Nanya Technology Corporation, U.S.A. (“Nanya USA”), and Nanya Technology Corporation Delaware (“Nanya Delaware”) (collectively, “Nanya” or “Nanya Defendants”) alleges as follows:

INTRODUCTION

1. Monterey is an intellectual property and technology licensing company. Monterey’s patent portfolio comprises over 2,700 active and pending patents worldwide, including approximately 2,000 active United States patents. Monterey’s patent portfolio stems from technology developed from a number of leading high-technology companies, including Cypress Semiconductor Corporation, Advanced Micro Devices, Fujitsu, NVX Corporation, Ramtron, and Spansion. Those companies developed key innovations that have greatly enhanced the capabilities of computer systems, increased electronic device processing power, and reduced electronic device power consumption. Among other things, those inventions produced significant technological advances, including smaller, faster, and more efficient semiconductors and integrated circuits.

2. The Nanya Defendants, jointly and severally, have infringed and continue to infringe Monterey's patents. Moreover, despite Monterey notifying them of infringement, the Nanya Defendants have thus far refused to license Monterey's patents and, instead, have continued to make, use, sell, offer to sell, and/or import Monterey's intellectual property within the United States without Monterey's permission.

NATURE OF THE CASE

3. This action arises under 35 U.S.C. § 271 for Nanya's infringement of Monterey's United States Patent Nos. 6,363,031 ("the '031 patent"); 6,651,134 ("the '134 patent"); 6,680,516 ("the '516 patent"); 6,825,526 ("the '526 patent"); 6,902,993 ("the '993 patent"); and 7,158,429 ("the '429 patent") (collectively, "the Patents-in-Suit").

THE PARTIES

4. Plaintiff Monterey is a Delaware limited liability company with offices in New Jersey and California. Monterey maintains a registered agent for service in Delaware: Intertrust Corporate Services Delaware Ltd. located at 200 Bellevue Parkway, Suite 210, Wilmington, Delaware 19808.

5. Defendant Nanya Technology Corp. is a corporation organized under the laws of Taiwan, with a corporate office at No. 98 Nanlin Road Dake Vil., Taishan District, New Taipei City, Taiwan. Nanya Technology Corp. is a publicly traded company and is the parent corporation of defendants Nanya U.S.A. and Nanya Delaware.

6. Defendant Nanya U.S.A. is a California corporation with a principal place of business at 1735 Technology Drive, Suite 400, San Jose, California, 95110. Nanya U.S.A. is a wholly-owned subsidiary of Nanya Technology Corp. Nanya Technology Corp.'s semiconductor research and engineering business is conducted wholly or in part through the actions of Nanya U.S.A. Furthermore, Nanya U.S.A. is responsible for the sales, offers for sale, importation, and

marketing of Nanya's products throughout the United States. Nanya Technology Corp. controls and directs the actions of Nanya U.S.A., and therefore both directs Nanya U.S.A. to infringe and itself infringes Monterey's patents.

7. Defendant Nanya Delaware is a Delaware corporation with a principal place of business at 20 Winter Sport Lane, Suite 105, Williston, Vermont, 05945. Defendant Nanya Delaware is a wholly-owned subsidiary of Nanya Technology Corp. Nanya Delaware is responsible, among other things, for designing, researching, developing, and testing Nanya products. Nanya Technology Corp. controls and directs the actions of Nanya Delaware, and therefore both directs Nanya Delaware to infringe and itself infringes Monterey's patents. Nanya Delaware may be served through its registered agent for service, Business Filings Incorporated, 108 West 13th Street, New Castle, Delaware, 19801.

8. Nanya Technology Corp. exercises control over Nanya U.S.A. and Nanya Delaware, and acts collectively with Nanya U.S.A. and Nanya Delaware to infringe Monterey's patents by making, using, selling, offering for sale, and/or importing products (including importing products made by a patented process) throughout the United States, including within this District. Nanya's customers incorporate those products into downstream products that are made, used, sold, offered for sale, and/or imported throughout the United States, including within this District. Those downstream products include, but are not limited to, smartphones, tablets, televisions, smartwatches, and other products that include Nanya semiconductor devices and integrated circuits.

JURISDICTION AND VENUE

9. This Court has jurisdiction over the subject matter of this action under 28 U.S.C. §§ 1331 and 1338(a) at least because this action arises under the patent laws of the United States, including 35 U.S.C. § 271 *et seq.*

10. Personal jurisdiction exists over each Nanya Defendant.

11. Personal jurisdiction exists over Nanya Delaware at least because Nanya Delaware is a Delaware corporation organized under the laws of the State of Delaware. Nanya Delaware also has a registered agent for service of process in Delaware. In addition, Nanya Delaware has committed, aided, abetted, contributed to and/or participated in the commission of acts of infringement giving rise to this action within the State of Delaware by, *inter alia*, directly and/or indirectly making, using, selling, offering for sale, importing products and/or practicing methods that practice one or more claims of the Patents-in-Suit. Furthermore, Nanya Delaware has transacted and conducted business in the State of Delaware and with Delaware residents by making, using, selling, offering to sell, and/or importing (including importing products made by a patented process) products and instrumentalities that practice one or more claims of the Patents-in-Suit. Among other things, Nanya Delaware, directly and/or through intermediaries, uses, sells, ships, distributes, imports into, offers for sale, and/or advertises or otherwise promotes its products throughout the United States, including in the State of Delaware. *See, e.g.*, www.nanya.com/en. At least for those reasons, Nanya Delaware has the requisite minimum contacts within the forum such that the exercise of jurisdiction over Nanya Delaware would not offend traditional notions of fair play and substantial justice.

12. Personal jurisdiction exists over Nanya U.S.A. and Nanya Technology Corp. at least because they have committed, aided, abetted, contributed to, and/or participated in the commission of acts of infringement giving rise to this action within the State of Delaware by, *inter alia*, directly and/or indirectly making, using, selling, offering for sale, importing products, and/or practicing methods that practice one or more claims of the Patents-in-Suit. Nanya U.S.A., under the control of Nanya Technology Corp., is responsible for sales and marketing in the United States,

and transacted and conducted business in the State of Delaware and with Delaware residents with respect to the products and instrumentalities that practice one of more claims of the Patents-in-Suit. Among other things, Nanya U.S.A. and Nanya Technology Corp., directly and/or through intermediaries, use, sell, ship, distribute, import into, offer for sale, and/or advertise or otherwise promote their products throughout the United States, including in the State of Delaware. *See, e.g.*, www.nanya.com/en. For example, Nanya U.S.A. and Nanya Technology Corp. have committed and continue to commit acts of direct infringement in the State of Delaware by selling their products online, including through sales on Arrow and other online platforms. *See, e.g.*, <https://www.arrow.com/en/products/search?cat=&q=nanya+memory&r=true>. At least for those reasons, Nanya U.S.A. and Nanya Technology Corp. have the requisite minimum contacts within the forum such that the exercise of jurisdiction over Nanya U.S.A. and Nanya Technology Corp. would not offend traditional notions of fair play and substantial justice.

13. Venue is proper in this Court pursuant to 28 U.S.C. §§ 1391(b) and (c) and 1400(b). Nanya Delaware resides in this district and has committed acts of infringement in this district. Nanya U.S.A. has committed acts of infringement in this district, including in conjunction with Nanya Delaware by, among other things, selling and offering for sale in this district (and elsewhere) infringing products made, used, developed, tested, and otherwise practiced by Nanya Delaware, a resident in this district. Additionally, Nanya U.S.A. has acted in conjunction with and under the control of Nanya Technology Corp. by, among other things, selling and offering for sale in this district (and elsewhere) infringing products made, used, developed, tested, and otherwise practiced by Nanya Technology Corp. Venue is proper with respect to Nanya Technology Corp. at least because Nanya Technology Corp. is a foreign corporation, has committed acts of infringement in this district, and venue is proper in any district in which Nanya Technology Corp.

is subject to personal jurisdiction. Venue is further proper based on the facts alleged in the preceding paragraphs, which Monterey incorporates by reference as if fully set forth herein.

THE PATENTS-IN-SUIT

14. Monterey incorporates by reference the preceding paragraphs as if fully set forth herein.

A. U.S. Patent No. 6,363,031

15. The '031 patent, titled "Circuit, Architecture and Method for Reducing Power Consumption in a Synchronous Integrated Circuit," was duly and properly issued by the USPTO on March 26, 2002. A true and correct copy of the '031 patent is attached hereto as Exhibit A.

16. Monterey is the owner and assignee of the '031 patent; owns all right, title, and interest in the '031 patent; and holds the right to sue and recover damages for infringement thereof, including past infringement.

B. U.S. Patent No. 6,651,134

17. The '134 patent, titled "Memory Device with Fixed Length Non Interruptible Burst," was duly and properly issued by the USPTO on November 18, 2003. A true and correct copy of the '134 patent is attached hereto as Exhibit B.

18. Monterey is the owner and assignee of the '134 patent; owns all right, title, and interest in the '134 patent; and holds the right to sue and recover damages for infringement thereof, including past infringement.

C. U.S. Patent No. 6,680,516

19. The '516 patent, titled "Controlled Thickness Gate Stack," was duly and properly issued by the United States Patent and Trademark Office ("USPTO") on January 20, 2004. On December 12, 2006, the USPTO issued a Certificate of Correction for the '516 patent. A true and

correct copy of the '516 patent and the Certificate of Correction is attached hereto as Exhibit C.

20. Monterey is the owner and assignee of the '516 patent; owns all right, title, and interest in the '516 patent; and holds the right to sue and recover damages for infringement thereof, including past infringement.

D. U.S. Patent No. 6,825,526

21. The '526 patent, titled "Structure for Increasing Drive Current in a Memory Array and Related Method," was duly and properly issued by the USPTO on November 30, 2004. A true and correct copy of the '526 patent is attached hereto as Exhibit D.

22. Monterey is the owner and assignee of the '526 patent; owns all right, title, and interest in the '526 patent; and holds the right to sue and recover damages for infringement thereof, including past infringement.

E. U.S. Patent No. 6,902,993

23. The '993 patent, titled "Gate Electrode for MOS Transistors," was duly and properly issued by the USPTO on June 7, 2005. On June 7, 2005, the USPTO issued a Certificate of Correction for the '993 patent. A true and correct copy of the '993 patent and the Certificate of Correction is attached hereto as Exhibit E.

24. Monterey is the owner and assignee of the '993 patent; owns all right, title, and interest in the '993 patent; and holds the right to sue and recover damages for infringement thereof, including past infringement.

F. U.S. Patent No. 7,158,429

25. The '429 patent, titled "System for Read Path Acceleration," was duly and properly issued by the USPTO on January 2, 2007. A true and correct copy of the '429 patent is attached hereto as Exhibit F.

26. Monterey is the owner and assignee of the '429 patent; owns all right, title, and

interest in the '429 patent; and holds the right to sue and recover damages for infringement thereof, including past infringement.

FACTUAL BACKGROUND

27. Monterey incorporates by reference the preceding paragraphs as if fully set forth herein.

28. The Patents-in-Suit stem from the research and design of innovative and proprietary technology developed by leading high-technology companies, including Cypress Semiconductor Corporation (“Cypress”).¹ Cypress is an American multinational company and pioneer of cutting-edge semiconductor technology. Founded in 1982, Cypress has made substantial investments in researching, developing, and manufacturing high-quality semiconductor devices, integrated circuits, and products containing the same.

29. The Patents-in-Suit are directed to inventive technology relating to semiconductor devices, integrated circuits, and/or products containing the same.

30. The Nanya Defendants work closely with their customers, OEMs, foundry suppliers, distributors, and/or other third parties to make, use, sell, offer to sell, and/or import semiconductor devices, integrated circuits, and/or products containing the same. Among other things, the Nanya Defendants optimize their manufacturing process for their customers and optimize their products for integration into downstream products. The Nanya Defendants’ affirmative acts in furtherance of the manufacture, use, sale, offer to sell, and importation of their products in and/or into the United States include, but are not limited to, any one or combination of: (i) designing specifications for manufacture of their products; (ii) collaborating on, encouraging, and/or funding the development of processes for the manufacture of their products;

¹ Another leading high-technology company that contributed to inventions disclosed in the Patents-in-Suit is Advanced Micro Devices, Inc. (“AMD”).

(iii) soliciting and/or sourcing the manufacture of their products; (iv) licensing, developing, and/or transferring technology and know-how to enable the manufacture of their products; (v) enabling and encouraging the use, sale, or importation of their products in the United States; and (vi) advertising their products and/or downstream products incorporating them in the United States.

31. The Nanya Defendants also provide marketing and/or technical support services for their products from their facilities in the United States. For example, Nanya maintains a website that advertises their products, including identifying the applications for which they can be used and providing specifications for their products. *See, e.g.,* www.nanya.com/en. Nanya's publicly-available website also contains user manuals, product documentation, and other materials related to their products. *See, e.g.,* www.nanya.com/en. For example, Nanya's website contains part numbering guides, reliability reports, and a customer service page. *See, e.g.,* www.nanya.com/en.

NANYA'S PRE-SUIT KNOWLEDGE OF MONTEREY'S PATENTS AND CHARGE OF INFRINGEMENT

32. Before filing this action, Monterey, through its agent IPValue Management, Inc. ("IPValue"), notified Nanya about the Patents-in-Suit and Nanya's infringement thereof. Among other things, Monterey, through its agent IPValue, identified the Patents-in-Suit to Nanya; alleged that Nanya infringed the Patents-in-Suit, including identifying exemplary infringing products; and offered to license the Patents-in-Suit to Nanya. By way of example and not limitation:

a. On December 15, 2016, Monterey sent a letter to Nanya, notifying Nanya of their infringement of certain Monterey patents, including the '031 and '134 patents. Among other things, Monterey identified representative Nanya products that utilize those patents, expressly charged that Nanya and their customers infringed those patents, and explained that Nanya required a license from Monterey. Monterey identified IPValue as Monterey's appointed agent and requested a meeting with Nanya.

b. On January 9, 2017, having received no response from Nanya, Monterey sent a follow up letter and attached the December 15, 2016 letter notifying Nanya of their infringement of certain Monterey patents, including the '031 and '134 patents.

c. On February 1, 2017, still without a response from Nanya, Monterey sent another follow up letter and attached the January 9, 2017 and December 15, 2016 letters notifying Nanya of their infringement of certain Monterey patents, including the '031 and '134 patents.

d. On February 24, 2017, at Nanya's request, Monterey sent a letter to Nanya that included detailed claim charts. Among other things, those claim charts identified specific Monterey patents, including the '031 and '134 patents, to Nanya; identified representative Nanya products that utilize those patents; and expressly alleged that Nanya infringed those patents.

e. On March 1, 2017, Monterey sent another letter to Nanya detailing how despite Nanya's request for claim charts, delivery of Monterey's February 24, 2017 letter was refused by Nanya. Among other things, Monterey once again sent Nanya the February 24, 2017 letter and a number of claim charts. Among other things, those claim charts identified specific Monterey patents, including the '031 and '134 patents, to Nanya; identified representative Nanya products that utilize those patents; and expressly alleged that Nanya infringed those patents.

f. On May 12, 2017, Monterey requested a meeting with Nanya to discuss Monterey's patents.

g. On May 15, 2017, Monterey sent another letter to Nanya detailing how Nanya refused to accept delivery of Monterey's May 12, 2017 letter. Among other things, Monterey attached the rejected May 12, 2017 letter and requested a meeting with Nanya.

h. Finally, on July 25, 2017, IPValue met in-person with Nanya in Taiwan and presented Nanya an overview of Monterey's patent portfolio and with detailed infringement claim

charts of certain Monterey patents. Among other things, IPValue identified specific Monterey patents, including the '031 and '134 patents, to Nanya; identified representative Nanya products that utilize those patents; expressly alleged that Nanya infringed those patents; and explained that Nanya required a license from Monterey.

i. On February 2, 2018, IPValue again met in-person with Nanya in Taiwan and presented Nanya with detailed infringement claim charts of certain Monterey patents. Among other things, IPValue's presentations identified specific Monterey patents including the '031, '134, '516, '526, '993, and '429 patents (as well as exemplary patent claims); identified representative Nanya products that utilize those patents; identified where every element of each of those exemplary patent claims was found in the representative Nanya products; expressly charged that Nanya and their customers infringed those patents; and explained that Nanya required a license from Monterey.

j. On February 7, 2018, IPValue, on behalf of Monterey, emailed copies of those infringement claim charts to Nanya.

k. On September 12, 2018, IPValue again met in-person with Nanya in Taiwan and presented Nanya with further information on how Nanya's products infringed certain Monterey patents and why Nanya required a license to those patents. Among other things, IPValue's presentation confirmed Nanya's infringement of Monterey patents including the '031, '134, '516, '526, '993, and '429 patents and confirmed again that Nanya required a license from Monterey.

l. On September 18, 2018, IPValue, on behalf of Monterey, emailed Nanya copies of Monterey's presentations of the '031, '134, and '429 patents from the September 12, 2018 meeting.

m. On September 19, 2018, IPValue, on behalf of Monterey, emailed Nanya copies of Monterey's presentations of the '516, '526, and '993 patents from the September 12, 2018 meeting.

n. Most recently, Monterey participated in an October 17, 2019 teleconference to discuss the Monterey patents, including the Patents-in-Suit, at Nanya's behest. Again, despite requesting the teleconference, Nanya refused to engage in meaningful discussions and refused to license the Patents-in-Suit.

33. Despite Monterey's repeated efforts—which have continued for well over two years—Nanya still has not engaged in any settlement discussions to end their infringement of the Patents-in-Suit and has not taken a license to them. Instead, Nanya continues to knowingly, intentionally, and willfully infringe Monterey's patents directly, contributorily, and by inducement, to obtain their significant benefits without a license from Monterey. Monterey thus has no other choice but to seek relief through litigation.

COUNT ONE
INFRINGEMENT OF THE '031 PATENT

34. Monterey incorporates by reference the preceding paragraphs as if fully set forth herein.

35. Monterey is the assignee and lawful owner of all right, title, and interest in and to the '031 patent.

36. The '031 patent is valid and enforceable.

37. The '031 patent is generally directed to an architecture and method for reducing power consumption in a synchronous integrated circuit, as described in JEDEC standards JESD79-3F DDR3 SDRAM, JESD79-4A DDR4 SDRAM, JESD209-3 LPDDR3, JESD209-4 LPDDR4, and similar versions of the JEDEC DDRx standards.

38. The '031 patent explains that semiconductor devices can reduce power consumption in “powered down” or “sleep” mode after receiving a power reduction command signal. An example of a power reduction command was the JEDEC-standard “ZZ” signal. The “ZZ” pin was configured to place the device in a “sleep” mode for reducing power consumption. Prior to the '031 patent, before activating the “ZZ” sleep mode, a synchronous integrated circuit was preferably first deselected by controlling chip enable input signals. Therefore, to effectively use the reduced power “sleep” mode, (i) a relatively complex setup procedure must be followed, (ii) circuitry must be provided for generating the “ZZ” command signal, and (iii) a “ZZ” pin must be provided to receive the “ZZ” command signal.

39. The '031 patent teaches, among other things, an apparatus comprising a circuit configured to automatically generate a sleep signal upon detecting that one or more chip select signals have been in a first state for a predetermined number of clock cycles. When the chip select signal has been in the inactive state for a predetermined number of clock cycles, the electronic device enters the “powered down” or “sleep” mode. The '031 patent provides a circuit, architecture and method for reducing power consumption in a synchronous integrated circuit that may (i) be implemented without the need for a separate sleep pin, (ii) eliminate the need for circuitry to generate a sleep signal, and/or (iii) automatically power down a chip that is deselected or unused after a predetermined length of time.

40. Nanya products use memory devices that are compliant with JEDEC standards JESD79-3F DDR3 SDRAM, JESD79-4A DDR4 SDRAM, JESD209-3 LPDDR3, JESD209-4 LPDDR4 and similar versions of the JEDEC DDRx standards that incorporate the innovations of the '031 patent's automatic generation of a sleep signal in a synchronous integrated circuit.

41. Nanya has directly infringed one or more claims of the '031 patent under 35 U.S.C.

§ 271(a) and/or 35 U.S.C. § 271(g), either literally and/or under the doctrine of equivalents, by, among other things, making, using, selling, offering to sell, and/or importing in or into the United States without authorization products covered by one or more claims of the '031 patent, including, but not limited to, products that comply with the JEDEC standards JESD79-3F DDR3 SDRAM, JESD79-4A DDR4 SDRAM, JESD209-3 LPDDR3, JESD209-4 LPDDR4 and similar versions of the JEDEC DDRx standards that use synchronous integrated circuits with automatically generated sleep signals, such as the NT6CL128M32AS-H2/H3 integrated circuit and other products in the 6C, 5C, 6A, and 5A product families; other Nanya semiconductor devices, integrated circuits, and products that are compliant with JESD79-3F DDR3 SDRAM, JESD79-4A DDR4 SDRAM, JESD209-3 LPDDR3, JESD209-4 LPDDR4 or similar versions; and all other semiconductor devices, integrated circuits, and products with similar infringing technology (“the Accused '031 Products”).

42. As one non-limiting example, Nanya infringed claim 1 of the '031 patent since the Nanya NT6CL128M32AS-H2/H3 integrated circuit contains LPDDR3 SDRAM memory controllers that operate in conformance with JEDEC's LPDDR3 SDRAM standard. For example, the Nanya NTC6CL128M32AS-H2/H3 contains an apparatus comprising:

- a. a circuit configured to automatically generate a sleep signal (e.g., power down signal of the NT6CL128M32AS-H2/H3) upon detecting that one or more chip select signals (e.g., chip select signal and/or signals of the NT6CL128M32AS-H2/H3) has been in a first state (e.g., chip select signal and/or signals are at a particular logic level of the NT6CL128M32AS-H2/H3) for a predetermined number of clock cycles (e.g., timing period of the NT6CL128M32AS-H2/H3);
- b. wherein said circuit is enabled or disabled in response to an enable signal

(e.g., enable signal of the NT6CL128M32AS-H2/H3).

43. Claim 1 of the '031 patent applies to each Accused '031 Product at least because each of those products either complies with the same JEDEC JESD209-3 LPDDR3 SDRAM standard, or similar versions of the JEDEC standard, including but not limited to JESD79-3F DDR3, JESD79-4A DDR4, and JESD209-4 LPDDR4, which result in infringing features (e.g., reducing power consumption in a synchronous integrated circuit using automatic generation of a sleep signal of the Accused '031 Products) found in the JESD209-3 LPDDR3 SDRAM standard.

44. Nanya has known of the '031 patent and their infringement of that patent since at least as early as December 15, 2016.

45. Nanya has induced infringement of one or more claims of the '031 patent under 35 U.S.C. § 271(b), either literally and/or under the doctrine of equivalents, by, among other things, actively inducing others, including their customers, to make, use, sell, offer to sell, and/or import in or into the United States without authorization the Accused '031 Products, as well as products containing the same. Nanya knowingly and intentionally instructs their customers, OEMs, foundry suppliers, distributors, and/or third parties to infringe at least through user manuals, product documentation, and other materials, such as those located on Nanya's website at www.nanya.com/en. Additional non-limiting examples include the materials found on Nanya's website at <https://www.nanya.com/en/Page/88?q=NT6CL128M32BQ-H2>.

46. Nanya has contributed to the infringement of one or more claims of the '031 patent under 35 U.S.C. § 271(c), either literally and/or under the doctrine of equivalents, by, among other things, selling, offering to sell, and/or importing in or into the United States the Accused '031 Products, which constitute a material part of the invention of the '031 patent, knowing the Accused '031 Products to be especially made or especially adapted for use in an infringement of such patent,

and not a staple article or commodity of commerce suitable for substantial noninfringing use.

47. Monterey has sustained and is entitled to recover damages as a result of Nanya's past infringement.

48. Nanya's infringement of the '031 patent has been knowing, deliberate, and willful, since at least as early as December 15, 2016, the date of Monterey's letter to Nanya and therefore the date on which Nanya knew of the '031 patent and that their conduct constituted and resulted in infringement of the '031 patent. Monterey continued to put Nanya on notice of the '031 patent and Nanya's infringement thereof, including without limitation through communications on January 9, 2017; February 1, 2017; February 24, 2017; March 1, 2017; July 25, 2017; February 2, 2018; February 7, 2018; September 12, 2018; September 18, 2018 and yet again through this complaint. Nanya nonetheless has committed acts of direct and indirect infringement despite knowing that their actions constituted infringement of the valid and enforceable '031 patent, despite a risk of infringement that was known or so obvious that it should have been known to Nanya, and/or even though Nanya otherwise knew or should have known that their actions constituted an unjustifiably high risk of infringement of that valid and enforceable patent. Nanya's conduct in light of these circumstances is egregious. Nanya's knowing, deliberate, and willful infringement of the '031 patent entitles Monterey to increased damages under 35 U.S.C. § 284 and to attorney fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

COUNT TWO
INFRINGEMENT OF THE '134 PATENT

49. Monterey incorporates by reference the preceding paragraphs as if fully set forth herein.

50. Monterey is the assignee and lawful owner of all right, title, and interest in and to the '134 patent.

51. The '134 patent is valid and enforceable.

52. The '134 patent generally concerns memory devices, and is more specifically related to non-interruptible burst read and write access features, as described in JEDEC standards JESD79-3F DDR3 SDRAM, JESD79-4A DDR4 SDRAM, JESD209-3 LPDDR3, JESD209-4 LPDDR4, and similar versions of the JEDEC DDRx standards.

53. The '134 patent provides a faster and more efficient way for burst read and write access over conventional DRAM devices existing when the patent was filed in early 2000. A conventional DRAM may need an interrupt to perform data refreshes. Prior to the '134 patent, DRAM memory devices had a burst mode that had the possibility of needing to continually perform interrupts to perform data refreshes.

54. The '134 patent teaches, among other things, a fixed burst memory that can have non-interruptible bursts, hide required DRAM refreshes inside a known fixed burst length, free up the address and control busses for multiple cycles, and operate at higher frequencies without needing interrupts to perform refreshes of data.

55. Nanya products use memory devices that are compliant with the JEDEC standards JESD79-3F DDR3 SDRAM, JESD79-4A DDR4 SDRAM, JESD209-3 LPDDR3, JESD209-4 LPDDR4 and similar versions of the JEDEC DDRx standards that incorporate the innovations of the '134 patent's non-interruptible fixed burst length.

56. Nanya has directly infringed, and continues to directly infringe, one or more claims of the '134 patent under 35 U.S.C. § 271(a), either literally and/or under the doctrine of equivalents, by, among other things, making, using, selling, offering to sell, and/or importing in or into the United States without authorization products covered by one or more claims of the '134 patent, including, but not limited to, products that comply with the JEDEC standards JESD79-3F

DDR3 SDRAM, JESD79-4A DDR4 SDRAM, JESD209-3 LPDDR3, JESD209-4 LPDDR4 and similar versions of the JEDEC DDRx standards that use non-interruptible burst read or write operations, such as the NT5C512M4GN integrated circuit and other products in the 5C, 5A, 6C, and 6A product families; other Nanya semiconductor devices, integrated circuits, and products that are compliant with JESD79-3F DDR3 SDRAM, JESD79-4A DDR4 SDRAM, JESD209-3 LPDDR3, JESD209-4 LPDDR4 or similar versions; and all other semiconductor devices, integrated circuits, and products with similar infringing technology (“the Accused ’134 Products”).

57. As one non-limiting example, Nanya infringes claim 1 of the ’134 patent since the Nanya NT5C512M4GN integrated circuit contains DDR3 SDRAM memory controllers that operate in conformance with JEDEC’s DDR3 SDRAM standard. For example, the Nanya NT5C512M4GN contains a circuit comprising:

- a. a memory comprising a plurality of storage elements (e.g., banks of storage elements of the NT5C512M4GN);
- b. each configured to read and write data in response to an internal address signal (e.g., stored bits of memory bank addressed and defined by internal addresses of the NT5C512M4GN);
- c. a logic circuit configured to generate a predetermined number of said internal address signals (e.g., generating addresses based on bank addresses, row addresses, and column addresses of the NT5C512M4GN) in response to an external address signal (e.g., read and write signals of the NT5C512M4GN), a clock signal (e.g., clock signal of the NT5C512M4GN), and one or more control signals (e.g., control signal of the NT5C512M4GN);
- d. wherein said generation of said predetermined number of internal address signals is non-interruptible (e.g., burst reads or writes cannot be terminated or interrupted in the

NT5C512M4GN).

58. Claim 1 of the '134 patent applies to each Accused '134 Product at least because each of those products either complies with the same JEDEC JESD79-3F DDR3 SDRAM standard, or similar versions of the JEDEC standard, including but not limited to JESD79-4A DDR4 SDRAM, JESD209-3 LPDDR3, and JESD209-4 LPDDR4, which result in infringing features (e.g., non-interruptible burst oriented read or write operations of the Accused '134 Products) found in the JESD79-3F DDR3 SDRAM standard.

59. Nanya has known of the '134 patent and their infringement of that patent since at least December 15, 2016.

60. Nanya has induced infringement of, and continues to induce infringement of, one or more claims of the '134 patent under 35 U.S.C. § 271(b), either literally and/or under the doctrine of equivalents, by, among other things, actively inducing others, including their customers, to make, use, sell, offer to sell, and/or import in or into the United States without authorization the Accused '134 Products, as well as products containing the same. Nanya knowingly and intentionally instructs their customers, OEMs, foundry suppliers, distributors, and/or other third parties to infringe at least through user manuals, product documentation, and other materials, such as those located on Nanya's website at www.nanya.com/en. A more specific non-limiting example includes the materials found on Nanya's website at <https://www.nanya.com/en/Product/4105/NT5CB256M8JQ-DI>.

61. Nanya has contributed to the infringement of, and continues to contribute to the infringement of, one or more claims of the '134 patent under 35 U.S.C. § 271(c), either literally and/or under the doctrine of equivalents, by, among other things, selling, offering to sell, and/or importing in or into the United States the Accused '134 Products, which constitute a material part

of the invention of the '134 patent, knowing the Accused '134 Products to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use.

62. Monterey has sustained and is entitled to recover damages as a result of Nanya's past and continuing infringement.

63. Nanya's infringement of the '134 patent has been knowing, deliberate, and willful, since at least as early as December 15, 2016, the date of Monterey's letter to Nanya and therefore the date on which Nanya knew of the '134 patent and that their conduct constituted and resulted in infringement of the '134 patent. Monterey continued to put Nanya on notice of the '134 patent and Nanya's infringement thereof, including without limitation through communications on January 9, 2017; February 1, 2017; February 24, 2017; March 1, 2017; July 25, 2017; February 2, 2018; February 7, 2018; September 12, 2018; September 18, 2018 and yet again through this complaint. Nanya nonetheless has committed—and continues to commit—acts of direct and indirect infringement despite knowing that their actions constituted infringement of the valid and enforceable '134 patent, despite a risk of infringement that was known or so obvious that it should have been known to Nanya, and/or even though Nanya otherwise knew or should have known that their actions constituted an unjustifiably high risk of infringement of that valid and enforceable patent. Nanya's conduct in light of these circumstances is egregious. Nanya's knowing, deliberate, and willful infringement of the '134 patent entitles Monterey to increased damages under 35 U.S.C. § 284 and to attorney fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

COUNT THREE
INFRINGEMENT OF THE '516 PATENT

64. Monterey incorporates by reference the preceding paragraphs as if fully set forth

herein.

65. Monterey is the assignee and lawful owner of all right, title, and interest in and to the '516 patent.

66. The '516 patent is valid and enforceable.

67. The '516 patent is directed to semiconductor structures, particularly to a semiconductor gate stack and related features. A gate stack can include, for example, a gate insulating layer, a gate layer, a metallic layer—which may optionally be separated from the gate layer by a barrier layer—and an etch-stop layer.

68. The '516 patent explains that as the size of a semiconductor element is reduced, it does not necessarily follow that the thickness of specific layers that form that element can be equally reduced. By way of non-limiting example, the thickness of a nitride layer necessary for forming a self-aligned contact (type of contact) may still need to be at least 800 angstroms. This could lead to, among other things, designs for devices that require large aspect ratios for contact vias, and such vias may not be properly filled. An aspect ratio can be, for example, the ratio of the gate stack height to the via width.

69. The '516 patent teaches, among other things, a gate stack height of at most 2700 angstroms and a via width of at most 0.12 microns. A gate stack with a controlled thickness can, for example, help to avoid forming contact vias with a large aspect ratio. The '516 patent further teaches, among other things, a gate stack which can include a nitride layer that may be used for forming self-aligned contacts “SAC,” which may be used in designs to significantly reduce device size.

70. Nanya products use a semiconductor gate stack structure having a controlled thickness, and the Nanya products use vias to connect to certain portions of the semiconductor

structure. Specifically, at least the Nanya products which are manufactured with a 42nm or smaller process node have infringing gate stacks of at most 2700 angstroms, via widths of at most 0.12 microns, and other infringing features that use the technology of the '516 patent.

71. Nanya has directly infringed, and continues to directly infringe, one or more claims of the '516 patent under 35 U.S.C. § 271(a), either literally and/or under the doctrine of equivalents, by, among other things, making, using, selling, offering to sell, and/or importing in or into the United States without authorization products covered by one or more claims of the '516 patent, including, but not limited to, products with a gate stack structure with a controlled thickness, such as the N2CB2G80DN-CG and MT41K512M8RH-125:E integrated circuits and other products in the Elixir, MT41K, 5T, 5C, 5A, 6T, 6C, and 6A series product families; other Nanya 42 nm and smaller process node semiconductor devices, integrated circuits, and products; and all other semiconductor devices, integrated circuits, and products with similar infringing technology ("the Accused '516 Products").

72. The N2CB2G80DN-CG integrated circuit and other products in the Elixir family are branded with a semiconductor die marking which includes a Nanya logo.

73. The MT41K512M8RH-125:E integrated circuit and other products in the MT41K product family are branded with a semiconductor die marking which includes a Nanya logo.

74. As one non-limiting example, Nanya infringes claim 5 of the '516 patent. For example, the Nanya N2CB2G80DN-CG integrated circuit contains:

- a. a semiconductor substrate (e.g., silicon substrate of the N2CB2G80DN-CG);
- b. a gate layer, a metallic layer, an etch-stop layer, and an insulating layer (e.g., transistor gate stack of the N2CB2G80DN-CG);

c. a via with a via width of at most 0.12 micron (e.g., via to a portion of a transistor of the N2CB2G80DN-CG);

d. and a gate stack height of at most 2700 angstroms (e.g., transistor gate stack of the N2CB2G80DN-CG).

75. Claim 5 of the '516 patent applies to each Accused '516 Product at least because each of those products contain the same or similar structures as the Nanya N2CB2G80DN-CG.

76. Nanya has known of the '516 patent and their infringement of that patent since at least as early as February 2, 2018.

77. Nanya has induced infringement of, and continues to induce infringement of, one or more claims of the '516 patent under 35 U.S.C. § 271(b), either literally and/or under the doctrine of equivalents, by, among other things, actively inducing others, including their customers, to make, use, sell, offer to sell, and/or import in or into the United States without authorization the Accused '516 Products, as well as products containing the same. Nanya knowingly and intentionally instructs their customers, OEMs, foundry suppliers, distributors, and/or other third parties to infringe at least through user manuals, product documentation, and other materials, such as those located on Nanya's website at www.nanya.com/en/. Additional non-limiting examples include the materials found on Nanya's websites at www.nanya.com/en/Product/ and www.nanya.com/en/Product/List/450/2249.

78. Nanya has contributed to the infringement of, and continues to contribute to the infringement of, one or more claims of the '516 patent under 35 U.S.C. § 271(c), either literally and/or under the doctrine of equivalents, by, among other things, selling, offering to sell, and/or importing in or into the United States the Accused '516 Products, which constitute a material part of the invention of the '516 patent, knowing the Accused '516 Products to be especially made or

especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use.

79. Monterey has sustained and is entitled to recover damages as a result of Nanya's past and continuing infringement.

80. Nanya's infringement of the '516 patent has been knowing, deliberate, and willful, since at least as early as February 2, 2018, the date on which Nanya was presented with the '516 claim chart, knew of the '516 patent, and knew that their conduct constituted and resulted in infringement of the '516 patent. Monterey continued to put Nanya on notice of the '516 patent and Nanya's infringement thereof, including without limitation through communications on February 7, 2018; September 12, 2018; September 19, 2018; and yet again through this complaint. Nanya nonetheless has committed—and continues to commit—acts of direct and indirect infringement despite knowing that their actions constituted infringement of the valid and enforceable '516 patent, despite a risk of infringement that was known or so obvious that it should have been known to Nanya, and/or even though Nanya otherwise knew or should have known that their actions constituted an unjustifiably high risk of infringement of that valid and enforceable patent. Nanya's conduct in light of these circumstances is egregious. Nanya's knowing, deliberate, and willful infringement of the '516 patent entitles Monterey to increased damages under 35 U.S.C. § 284 and to attorney fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

COUNT FOUR
INFRINGEMENT OF THE '526 PATENT

81. Monterey incorporates by reference the preceding paragraphs as if fully set forth herein.

82. Monterey is the assignee and lawful owner of all right, title, and interest in and to

the '526 patent.

83. The '526 patent is valid and enforceable.

84. The '526 patent is directed to a structure for increasing drive current in a memory array, where the increased drive current is achieved without increasing the size of the flash memory array.

85. Product development efforts in flash memory arrays have focused on reducing cell dimensions. Prior to the '526 patent, the drive current, which can be the current that flows between the drain and source regions of the flash memory array, could be increased by increasing the channel width. However, an increase in channel width in a flash memory array may cause an undesirable increase in the size of the flash memory array.

86. The '526 patent teaches, among other things, a memory array comprising a trench situated between the first and second isolation regions, where the trench defines trench sidewalls and a trench bottom in the substrate. The memory array further comprises a channel region extending along the trench sidewalls and trench bottom, where the effective channel width increases as the height of the trench sidewalls increases. Thus, the increase in effective channel width causes an increase in the drive current in the memory array.

87. Nanya products use memory arrays comprising a trench situated between the first and second isolation regions. The trench defines trench sidewalls and a trench bottom in the substrate. In addition, the channel region extends along the trench sidewalls and trench bottom, causing an increase in the effective channel width.

88. Nanya has directly infringed, and continues to directly infringe, one or more claims of the '526 patent under 35 U.S.C. § 271(a) and/or 35 U.S.C. § 271(g), either literally and/or under the doctrine of equivalents, by, among other things, making, using, selling, offering to sell, and/or

importing (including importing products made by a patented process) in or into the United States without authorization products covered by one or more claims of the '526 patent, including, but not limited to, products with a trench situated between the first and second isolation regions and a channel region, such as the NT5TU64M16GG and the NT6TL64M32AQ integrated circuits and other products in the 5T and 6T product families; other Nanya 75 nm, 50 nm, and 20 nm process node semiconductor devices, integrated circuits, and products; and all other semiconductor devices, integrated circuits, and products with similar trenches and channel regions ("the Accused '526 Products").

89. As one non-limiting example, Nanya infringes claim 1 of the '526 patent. For example, the Nanya NT5TU64M16GG integrated circuit contains:

- a. first and second isolation regions situated in a substrate, said first and second isolation regions (e.g., first and second isolation regions in the DRAM memory cells of the NT5TU64M16GG) being separated by a separation distance;
- b. a trench situated between first and second isolation regions situated in a substrate (e.g., trenches of the NT5TU64M16GG), said trench defining trench sidewalls and a trench bottom in said substrate;
- c. a tunnel oxide layer situated between said first and second isolation regions (e.g., tunnel oxide layer of the NT5TU64M16GG), said tunnel oxide layer being situated on said trench sidewalls and said trench bottom (e.g., tunnel oxide layer situated on the trench sidewalls and bottom of the NT5TU64M16GG);
- d. a channel region situated underneath said tunnel oxide layer (e.g., channel region underneath tunnel oxide layer of the NT5TU64M16GG), said channel region extending along said trench sidewalls and said trench bottom, said channel region having an effective channel

width, wherein said effective channel width corresponds to a height of said trench sidewalls (e.g., channel region underneath tunnel oxide layer, with an effective channel width corresponding to the height of the trench sidewalls in the NT5TU64M16GG);

e. wherein said effective channel width is greater than said separation distance between said first and second isolation regions (e.g., effective channel width greater than the separation distance between the first and second isolation regions in the DRAM memory cells of the NT5TU64M16GG).

90. Claim 1 of the '526 patent applies to each Accused '526 Product at least because each of those products contain infringing trenches and channel regions.

91. Nanya has known of the '526 patent and their infringement of that patent since at least as early as February 2, 2018.

92. Nanya has induced infringement of, and continues to induce infringement of, one or more claims of the '526 patent under 35 U.S.C. § 271(b), either literally and/or under the doctrine of equivalents, by, among other things, actively inducing others, including their customers, to make, use, sell, offer to sell, and/or import (including import products made by a patented process) in or into the United States without authorization the Accused '526 Products, as well as products containing the same. Nanya knowingly and intentionally instructs their customers, OEMs, foundry suppliers, distributors, and/or other third parties to infringe at least through user manuals, product documentation, and other materials, such as those located on Nanya's website at www.nanya.com/en. Additional non-limiting examples include Nanya's materials found on the websites <https://www.datasheets360.com/pdf/-8962390457115509067> and <https://www.datasheets.com/datasheet/NT6TL256T32AQ-G1-Nanya%20Technology-73042910>.

93. Nanya has contributed to the infringement of, and continues to contribute to the infringement of, one or more claims of the '526 patent under 35 U.S.C. § 271(c), either literally and/or under the doctrine of equivalents, by, among other things, selling, offering to sell, and/or importing in or into the United States the Accused '526 Products, which constitute a material part of the invention of the '526 patent, knowing the Accused '526 Products to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use.

94. Monterey has sustained and is entitled to recover damages as a result of Nanya's past and continuing infringement.

95. Nanya's infringement of the '526 patent has been knowing, deliberate, and willful, since at least as early as February 2, 2018, the date on which Nanya was presented with the '526 claim chart, knew of the '526 patent, and knew that their conduct constituted and resulted in infringement of the '526 patent. Monterey continued to put Nanya on notice of the '526 patent and Nanya's infringement thereof, including without limitation through communications on February 7, 2018; September 12, 2018; September 19, 2018; and yet again through this complaint. Nanya nonetheless has committed—and continues to commit—acts of direct and indirect infringement despite knowing that their actions constituted infringement of the valid and enforceable '526 patent, despite a risk of infringement that was known or so obvious that it should have been known to Nanya, and/or even though Nanya otherwise knew or should have known that their actions constituted an unjustifiably high risk of infringement of that valid and enforceable patent. Nanya's conduct in light of these circumstances is egregious. Nanya's knowing, deliberate, and willful infringement of the '526 patent entitles Monterey to increased damages under 35 U.S.C. § 284 and to attorney fees and costs incurred in prosecuting this action under 35

U.S.C. § 285.

COUNT FIVE
INFRINGEMENT OF THE '993 PATENT

96. Monterey incorporates by reference the preceding paragraphs as if fully set forth herein.

97. Monterey is the assignee and lawful owner of all right, title, and interest in and to the '993 patent.

98. The '993 patent is valid and enforceable.

99. The '993 patent is directed to integrated circuits, particularly to methods of forming gate electrodes for metal oxide semiconductor ("MOS") transistors.

100. The '993 patent explains that a MOS transistor is referred to as being "ON" when current flows through it, and "OFF" when there is no current flow. The speed at which a MOS transistor can be switched ON and OFF is referred to as "switching speed." A MOS transistor preferably has relatively fast switching speed. One way of improving switching speed is by lowering interface contact resistance between layers of the gate electrode.

101. The '993 patent teaches, among other things, forming a gate of a transistor by performing a first thermal treatment on a silicon layer, forming a metal stack over the silicon layer, and performing a second thermal treatment on the metal stack. The first thermal treatment may be a rapid thermal annealing step, while the second thermal treatment may be a rapid thermal nitridation step. The resulting gate exhibits relatively low interface contact resistance between the silicon layer and the metal stack, and may thus be advantageously employed in high-speed devices.

102. Further, the '993 patent teaches, among other things, forming a gate by forming a metal stack over a silicon layer, wherein forming the metal stack comprises: forming a titanium layer over the silicon layer; forming a tungsten nitride layer over the titanium layer; and forming

a tungsten layer over the tungsten nitride layer. A titanium layer may advantageously help prevent a subsequently deposited diffusion barrier layer of, for example, tungsten nitride from reacting with a polysilicon layer to form, for example, silicon nitride. Silicon nitride is a dielectric, and may increase the contact resistance of a gate electrode to an unacceptable level. A tungsten nitride layer may serve as a diffusion barrier layer to advantageously minimize cross-diffusion between gate electrodes. With prior gate electrodes, it was possible for dopants to diffuse from one gate electrode to another through a metal shunt. This could disadvantageously lead to counter doping.

103. Nanya products are produced using an infringing gate electrode formation method for MOS transistors. The products are further produced through annealing a silicon layer, forming a metal stack over the silicon layer, and exposing the metal stack in a heated environment comprising nitrogen to convert a portion of the metal stack to a silicide layer. This method was used, for example, in production of Nanya's 30 nm process node semiconductor devices, in order to, among other things, improve switching speed.

104. Nanya has directly infringed, and continues to directly infringe, one or more claims of the '993 patent under 35 U.S.C. § 271(a) and/or 35 U.S.C. § 271(g), either literally and/or under the doctrine of equivalents, by, among other things, making, using, selling, offering to sell, and/or importing (including importing products made by a patented process) in or into the United States without authorization products covered by one or more claims of the '993 patent, including, but not limited to, products such as the MT41K512M8RH-125:E integrated circuit and other products in the MT41K, 5T, 5C, 5A, 6T, 6C, and 6A series product families; other Nanya 42 nm and 30 nm process node semiconductor devices, integrated circuits, and products; and all other semiconductor devices, integrated circuits, and products with similar infringing technology ("the Accused '993 Products").

105. The MT41K512M8RH-125:E integrated circuit and other products in the MT41K product family are branded with a semiconductor die marking which includes a Nanya logo.

106. As one non-limiting example, Nanya infringes claim 1 of the '993 patent. For example, the method used to produce Nanya's MT41K512M8RH-125:E integrated circuit performs the steps of:

- a. annealing a silicon layer (e.g., polysilicon layer of the MT41K512M8RH-125:E);
- b. forming a metal stack over the silicon layer (e.g., metal stack of the MT41K512M8RH-125:E); and
- c. exposing the metal stack in a heated environment comprising nitrogen to convert a portion of the metal stack to a silicide layer (e.g., converting a portion of a MT41K512M8RH-125:E titanium layer to a titanium silicide layer);
- d. wherein forming the metal stack comprises:
- e. forming a titanium layer (e.g., titanium layer of the MT41K512M8RH-125:E) over the silicon layer;
- f. forming a tungsten nitride layer (e.g., tungsten nitride layer of the MT41K512M8RH-125:E) over the titanium layer; and
- g. forming a tungsten layer (e.g., tungsten layer of the MT41K512M8RH-125:E) over the tungsten nitride layer.

107. Claim 1 of the '993 patent applies to each Accused '993 Product at least because each of those products were produced by the same 30 nm process node, or produced by other technology nodes which result in infringing features.

108. Nanya has known of the '993 patent and their infringement of that patent since at

least as early as February 2, 2018.

109. Nanya has induced infringement of, and continues to induce infringement of, one or more claims of the '993 patent under 35 U.S.C. § 271(b), either literally and/or under the doctrine of equivalents, by, among other things, actively inducing others, including their customers, to make, use, sell, offer to sell, and/or import (including import products made by a patented process) in or into the United States without authorization the Accused '993 Products, as well as products containing the same. Nanya knowingly and intentionally instructs their customers, OEMs, foundry suppliers, distributors, and/or other third parties to infringe at least through user manuals, product documentation, and other materials, such as those located on Nanya's website at www.nanya.com/en/. Additional non-limiting examples include the materials found on Nanya's websites at www.nanya.com/en/Product/ and www.nanya.com/en/Product/List/450/2249.

110. Nanya has contributed to the infringement of, and continues to contribute to the infringement of, one or more claims of the '993 patent under 35 U.S.C. § 271(c), either literally and/or under the doctrine of equivalents, by, among other things, selling, offering to sell, and/or importing in or into the United States the Accused '993 Products, which constitute a material part of the invention of the '993 patent, knowing the Accused '993 Products to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use.

111. Monterey has sustained and is entitled to recover damages as a result of Nanya's past and continuing infringement.

112. Nanya's infringement of the '993 patent has been knowing, deliberate, and willful, since at least as early as February 2, 2018, the date on which Nanya was presented with the '993

claim chart, knew of the '993 patent, and knew that their conduct constituted and resulted in infringement of the '993 patent. Monterey continued to put Nanya on notice of the '993 patent and Nanya's infringement thereof, including without limitation through communications on February 7, 2018; September 12, 2018; September 19, 2018; and yet again through this complaint. Nanya nonetheless has committed—and continues to commit—acts of direct and indirect infringement despite knowing that their actions constituted infringement of the valid and enforceable '993 patent, despite a risk of infringement that was known or so obvious that it should have been known to Nanya, and/or even though Nanya otherwise knew or should have known that their actions constituted an unjustifiably high risk of infringement of that valid and enforceable patent. Nanya's conduct in light of these circumstances is egregious. Nanya's knowing, deliberate, and willful infringement of the '993 patent entitles Monterey to increased damages under 35 U.S.C. § 284 and to attorney fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

COUNT SIX
INFRINGEMENT OF THE '429 PATENT

113. Monterey incorporates by reference the preceding paragraphs as if fully set forth herein.

114. Monterey is the assignee and lawful owner of all right, title, and interest in and to the '429 patent.

115. The '429 patent is valid and enforceable.

116. The '429 patent is directed to improving read path signals in a memory core integrated circuit, and particularly to accelerating the read path.

117. As integrated circuits increased both in clock speed and in complexity with time, circuit designers were forced to deal with the challenge of transmitting signals over long distances,

including, e.g., read path signals in a memory core integrated circuit. One way the prior art to the '429 patent attempted to deal with this challenge included providing specific timing requirements for triggering local amplifiers within the integrated circuit. However, failure of the timing requirements could cause virtual data for the local amplifiers. Further, increasing the timing requirements for triggering the local amplifiers would slow down the read access time.

118. The '429 patent teaches, among other things, an improved memory core system which reduces read access time without modifying clock speed. For example, the '429 patent divides the memory core into a number of segments, each of which couples local amplifiers to a pair of global read data lines, as well as a main amplifier and a main amplifier strobe. This improved system accomplishes the goal of reducing read access time by reducing the margins required for each step in the read process.

119. Nanya products include a memory core, divided into segments, each of which includes a plurality of local amplifiers coupled to a pair of global read data lines, a main amplifier, and a main amplifier strobe. This has resulted in, among other things, Nanya's ability to reduce read access time in their products without relying on increasing timing requirements.

120. Nanya has directly infringed, and continues to directly infringe, one or more claims of the '429 patent under 35 U.S.C. § 271(a), either literally and/or under the doctrine of equivalents, by, among other things, making, using, selling, offering to sell, and/or importing in or into the United States without authorization products covered by one or more claims of the '429 patent, including, but not limited to, all Nanya products including a segmented memory core including local amplifiers, a main amplifier, and a main amplifier strobe, such as the N2CB2G80DN-CG integrated circuit and other products in the Elixir, MT41K, 5C, and 6C series product families; other Nanya DDR SDRAM products; and all other semiconductor devices,

integrated circuits, and products with similar infringing technology (“the Accused ’429 Products”).

121. The N2CB2G80DN-CG integrated circuit and other products in the Elixir family are branded with a semiconductor die marking which includes a Nanya logo.

122. As one non-limiting example, Nanya infringes claim 1 of the ’429 patent. For example, the Nanya N2CB2G80DN-CG integrated circuit contains:

a. a memory core divided into a plurality of segments, each segment having a plurality of local amplifiers coupled to a pair of global read data lines (e.g., bitline sense blocks and amplifiers of the N2CB2G80DN-CG); and

b. a main amplifier having an input coupled to the pair of global read data lines and an output coupled to an output register (e.g., read driver and amplifier of the N2CB2G80DN-CG); and

c. a main amplifier strobe coupled to each of the plurality of local amplifiers (e.g., read data path main amplifier strobe of the N2CB2G80DN-CG).

123. Claim 1 of the ’429 patent applies to each Accused ’429 Product at least because each of those products contain the same or similar structures as the Nanya N2CB2G80DN-CG integrated circuit.

124. Nanya has known of the ’429 patent and their infringement of that patent since at least as early as February 2, 2018.

125. Nanya has induced infringement of, and continues to induce infringement of, one or more claims of the ’429 patent under 35 U.S.C. § 271(b), either literally and/or under the doctrine of equivalents, by, among other things, actively inducing others, including their customers, to make, use, sell, offer to sell, and/or import in or into the United States without authorization the Accused ’429 Products, as well as products containing the same. Nanya

knowingly and intentionally instructs their customers, OEMs, foundry suppliers, distributors, and/or other third parties to infringe at least through user manuals, product documentation, and other materials, such as those located on Nanya's website at www.nanya.com/en/. Additional non-limiting examples include the materials found on Nanya's websites at www.nanya.com/en/Product/ and www.nanya.com/en/Product/List/450/2249.

126. Nanya has contributed to the infringement of, and continues to contribute to the infringement of, one or more claims of the '429 patent under 35 U.S.C. § 271(c), either literally and/or under the doctrine of equivalents, by, among other things, selling, offering to sell, and/or importing in or into the United States the Accused '429 Products, which constitute a material part of the invention of the '429 patent, knowing the Accused '429 Products to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use.

127. Monterey has sustained and is entitled to recover damages as a result of Nanya's past and continuing infringement.

128. Nanya's infringement of the '429 patent has been knowing, deliberate, and willful, since at least as early as February 2, 2018, the date on which Nanya was presented with the '429 claim chart, knew of the '429 patent, and knew that their conduct constituted and resulted in infringement of the '429 patent. Monterey continued to put Nanya on notice of the '429 patent and Nanya's infringement thereof, including without limitation through communications on February 7, 2018; September 12, 2018; September 18, 2018; and yet again through this complaint. Nanya nonetheless has committed—and continues to commit—acts of direct and indirect infringement despite knowing that their actions constituted infringement of the valid and enforceable '429 patent, despite a risk of infringement that was known or so obvious that it should

have been known to Nanya, and/or even though Nanya otherwise knew or should have known that their actions constituted an unjustifiably high risk of infringement of that valid and enforceable patent. Nanya's conduct in light of these circumstances is egregious. Nanya's knowing, deliberate, and willful infringement of the '429 patent entitles Monterey to increased damages under 35 U.S.C. § 284 and to attorney fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

RELIEF REQUESTED

Wherefore, Monterey respectfully requests that this Court enter judgment against Nanya as follows:

- A. that Nanya has infringed each of the Patents-in-Suit;
- B. that Nanya's infringement of each of the Patents-in-Suit is and/or has been willful;
- C. that Monterey be awarded damages adequate to compensate it for the patent infringement that has occurred, together with pre-judgment interest, post-judgment interest, and costs;
- D. that Monterey be awarded an accounting and additional damages for any infringing sales not presented at trial;
- E. that Monterey be awarded all other damages permitted by 35 U.S.C. § 284, including without limitation increased damages up to three times the amount of compensatory damages found;
- F. that this is an exceptional case and that Monterey be awarded its costs and reasonable attorneys' fees incurred in this action as provided by 35 U.S.C. § 285;
- G. that Nanya as well as their officers, directors, agents, employees, representatives, attorneys, and all others acting in privity or in concert with them, their

subsidiaries, divisions, successors and assigns be permanently enjoined from further infringement;

H. that, in the event a permanent injunction preventing further infringement of the patents is not granted, Monterey be awarded a compulsory ongoing licensing fee for any such further infringement; and

I. such other relief as this Court deems just and proper.

DEMAND FOR JURY TRIAL

Monterey hereby demands trial by jury on all claims and issues so triable.

Dated: November 4, 2019

Respectfully submitted,

Of Counsel:

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