UNITED STATES INTERNATIONAL TRADE COMMISSION
WASHINGTON, D.C.

In the Matter of CERTAIN SOLID STATE STORAGE DRIVES, STACKED ELECTRONICS COMPONENTS, AND PRODUCTS CONTAINING SAME	Investigation No. 337-TA-_____

COMPLAINT UNDER SECTION 337 OF THE TARIFF ACT OF 1930, AS AMENDED

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I. INTRODUCTION

1. This Complaint is filed, pursuant to Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, by Complainant BiTMICRO, LLC ("Complainant") based on the unlawful importation into the United States, sale for importation into the United States, or sale within the United States after importation of solid state storage drives, stacked electronics components, and products containing same ("Accused Products") by proposed Respondents: Samsung Electronics Co., Ltd., Samsung Semiconductor, Inc., Samsung Electronics America, Inc., SK Hynix Inc., SK Hynix America Inc., Dell Inc., Dell Technologies Inc., Lenovo Group Ltd., Lenovo (United States) Inc., HP Inc., Hewlett Packard Enterprise Co., ASUSTeK Computer Inc., ASUS Computer International, Acer Inc., Acer America Corp., VAIO Corporation, and Transcosmos America, Inc. (collectively, "Respondents"). The proposed Respondents' infringing products include solid state storage drives ("SSDs") and products, such as laptop, desktop, and tablet computers, that incorporate SSDs. The infringing products also include stacked electronics components such as those found in SDRAM memory, processor/DRAM packages, application processors, high-bandwidth memory, and products (*e.g.*, mobile phones, tablets, and watches) that incorporate those components or other stacked electronics components.

2. Respondents' Accused Products infringe one or more of claims 1, 2, 11, and 12 of U.S. Patent No. 7,826,243 ("the '243 patent"), claims 1-20 of U.S. Patent No. 6,529,416 ("the '416 patent"), claims 1-101 of U.S. Patent No. 9,135,190 ("the '190 patent"), and claims 12 and 16 of U.S. Patent No. 8,093,103 ("the '103 patent") in violation of Section 337(a)(1)(B).

3. As required by Sections 337(a)(1)(B) and (a)(2)-(3), an industry exists in the United States based on the activities and investments of Complainant's licensee, BiTMICRO Networks,

Inc. ("BNI"). Specifically, an industry in the United States exists relating to BNI's solid state storage drives, stacked electronics components, and products containing same and the Asserted Patents, which are practiced by BNI's solid state storage drives, stacked electronics components, and products containing same. BNI designs, develops, assembles, tests, and supports products in the United States that it sells primarily to U.S. military contractors for use in mission critical applications. To design, develop, assemble, test, and support BNI's products, BNI makes in the United States significant investments in plant and equipment, employs significant labor and capital, and makes substantial investments in the exploitation of the Asserted Patents through activities such as engineering, research and development, assembly, testing, and product support.

4. Complainant seeks limited exclusion orders barring from entry infringing solid state storage drives, stacked electronics components, and products containing same imported, sold for importation, or sold within the United States after importation by each Respondent in violation of Section 337.

5. Complainant also seeks, as relief, permanent cease and desist orders ("CDO") against Respondents prohibiting the sale, offer for sale, advertising, marketing, packaging, distribution, maintaining inventory, or solicitation of any sale of imported infringing solid state storage drives, stacked electronics components, and products containing same, whether through traditional "brick and mortar" retailers, distributors, the internet, or other electronic means.

II. THE PARTIES

A. Complainant and Its Licensee

6. Complainant BiTMICRO, LLC ("BiTMICRO") is a Delaware corporation, located at 11921 Freedom Drive, Suite 550, Reston, Virginia 20190. BiTMICRO is co-owned by BNI.

BiTMICRO became the owner of the Asserted Patents through a Patent Purchase Agreement and a Recordable Assignment of Patent Rights on June 29 and 30, 2017. *See* Exs. 1C and 2C.

7. BNI is a California corporation with its principal place of business at 47929 Fremont Blvd., Fremont, California 94538. BNI is a co-owner of BiTMICRO, LLC. BNI was founded in 1995 and is a leader in enterprise flash storage for mission-critical computing, particularly for military applications. BNI made critical advances in the SSD technology that is embodied in many of the Asserted Patents. BNI's products are best known for exceeding the extreme performance and data integrity required for enterprise, industrial, and military environments.

8. BNI is currently actively engaged in the design, development, assembly, and support of solid state storage drives and stacked electronics components. BNI designs, develops, and commercializes products that incorporate the technology protected by the Asserted Patents, including through its E-Disk Altima series and ACE series products. Much of this technology has been incorporated by all makers of solid state storage drives, including products manufactured by Respondents or incorporated into Respondents' products. BNI's primary customers are Department of Defense contractors that require rugged electronic products for military applications.

9. BNI is the immediate predecessor-in-interest of the Asserted Patents and, by virtue of a license back by Complainant, is fully licensed to practice each of the Asserted Patents. Ex. 1C at ¶3.9.

B. Proposed Respondents

10. On information and belief, the Respondents include manufacturers, importers, distributors, and retail companies, and their agents, that import, sell for importation, and/or sell within the United States after importation solid state storage drives, stacked electronics components, and products containing the same, such as tablet, laptop and desktop computers, as well as mobile phones, and wearables that infringe one or more claims of the Asserted Patents.

1. Samsung Electronics Co., Ltd., Samsung Semiconductor, Inc. and Samsung Electronics America, Inc.

11. On information and belief, Respondent Samsung Electronics Co., Ltd. is a multi-national corporation organized under the laws of the Republic of Korea, with its principal place of business located at 129 Samsung-Ro, Yeongtong-Gu, Suwon, Gyeonggi-do, South Korea. *See* Exs. 3 and 4.

12. On information and belief, Respondent Samsung Semiconductor, Inc. is a California corporation with its principal place of business located at 3655 North First Street, San Jose, California 95134. *See* Ex. 5.

13. On information and belief, Respondent Samsung Electronics America, Inc. is a New York corporation with its principal place of business located at 85 Challenger Road, Ridgefield Park, New Jersey 07660. *See* Exs. 4 and 6.

14. On information and belief, Respondents Samsung Semiconductor, Inc. and Samsung Electronics America, Inc. are wholly owned subsidiaries of Samsung Electronics Co., Ltd.; these three entities are therefore collectively referred to herein as "Samsung." *See Certain Audio Processing Hardware, Software, & Prods. Containing the Same*, Inv. No. 337-TA-1026, Samsung's Response to Complaint at ¶27 (Nov. 21, 2016); *Certain RF Capable Integrated*

Circuits & Prods. Containing the Same, Inv. No. 337-TA-982, Samsung's Response to Complaint at ¶37 (Feb. 22, 2016). On information and belief, certain solid state storage drives, stacked electronics components, and products containing same that infringe one or more claims of the Asserted Patents are imported into the United States, sold for importation into the United States, and/or sold within the United States after importation by Samsung, including through the internet, for example, at http://www.samsung.com/us.

2. SK Hynix Inc. and SK Hynix America Inc.

15. On information and belief, Respondent SK Hynix Inc. is a corporation organized under the laws of the Republic of Korea, with its principal place of business at 2091, Gyeongchung-daero, Bubal-eub Icheon-si, Gyeonggi-do, South Korea. *See* Exs. 7 and 8.

16. On information and belief, Respondent SK Hynix America Inc. is a California corporation with its principal place of business located at 3101 North First Street, San Jose, California 95134. *See* Exs. 8 and 9.

17. On information and belief, SK Hynix America Inc. operates as a subsidiary of SK Hynix Inc. *See* Ex. 9. These two entities are therefore collectively referred to herein as "SK Hynix." On information and belief, certain solid state storage drives, stacked electronics components, and products containing same that infringe one or more claims of the Asserted Patents are imported into the United States, sold for importation into the United States, and/or sold within the United States after importation by SK Hynix.

3. Dell Inc. and Dell Technologies Inc.

18. On information and belief, Respondent Dell Inc. is a privately held corporation organized under the laws of the State of Delaware, with its principal place of business located at 1 Dell Way, Round Rock, Texas 78664. *See* Ex. 10.

19. On information and belief, Respondent Dell Inc. acquired EMC Corporation and its subsidiaries on or around September 7, 2016, and the combined company was renamed Dell Technologies Inc. *See Certain Integrated Circuits with Voltage Regulators & Prods. Containing Same*, Inv. No. 337-TA-1024, Dell's Response to Complaint at ¶21 (Nov. 7, 2016). On information and belief, Respondent Dell Technologies Inc. is a Delaware corporation with its principal place of business also located at 1 Dell Way, Round Rock, Texas 78664. *See* Ex. 11. Dell Inc. and Dell Technologies Inc. are therefore collectively referred to herein as "Dell."

20. On information and belief, certain solid state storage drives and products containing the same that infringe one or more claims of the Asserted Patents are imported into the United States, sold for importation into the United States, and/or sold within the United States after importation by Dell. For example, as set forth in more detail below, Dell imports into the United States, sells for importation into the United States, and/or sells within the United States after importation, including through the internet, computers that incorporate at least infringing solid state storage drives supplied by SK Hynix. *See* http://www.dell.com.

21. On information and belief, Dell also imports into the United States, sells for importation into the United States, and/or sells within the United States after importation computer products that incorporate infringing solid state storage drives manufactured by suppliers other than SK Hynix. On information and belief, discovery of Dell will identify Dell's other suppliers and demonstrate that their respective solid state storage drives incorporated into Dell's products infringe the Asserted Patents.

4. Lenovo Group Ltd. and Lenovo (United States) Inc.

22. On information and belief, Respondent Lenovo Group Ltd. is a Chinese multinational technology company with its corporate office at No. 6 Chuang Ye Road, Shangdi

Information Industry Base, Haidan District, Beijing, China 100085. *See* Ex. 12. On information and belief, Lenovo Group Ltd. has a U.S. headquarters at 1009 Think Place, Morrisville, North Carolina. *Id.*

23. On information and belief, Respondent Lenovo (United States) Inc. is a Delaware corporation having its principal place of business at 1009 Think Place, Morrisville, North Carolina 27560. *See* Exs. 13 and 14. On information and belief, Lenovo (United States) Inc. is a subsidiary of Lenovo Group Ltd. *See* Ex. 13; *Certain Graphics Processors, DDR Memory Controllers, & Prods. Containing the Same*, Inv. No. 337-TA-1037, Lenovo's Response to Complaint at ¶¶22-24 (Feb. 21, 2017). Respondents Lenovo Group Ltd. and Lenovo (United States) Inc. are collectively referred to herein as "Lenovo."

24. On information and belief, certain solid state storage drives and products containing the same that infringe one or more claims of the Asserted Patents are imported into the United States, sold for importation into the United States, and/or sold within the United States after importation by Lenovo. For example, as set forth in more detail below, Lenovo imports into the United States, sells for importation into the United States, and/or sells within the United States after importation, including through the internet, computer products that incorporate at least infringing solid state storage drives supplied by Samsung. *See* http://www3.lenovo.com.

25. On information and belief, Lenovo also imports into the United States, sells for importation into the United States, and/or sells within the United States after importation computer products that incorporate infringing solid state storage drives manufactured by suppliers other than Samsung. On information and belief, discovery of Lenovo will identify Lenovo's other suppliers

and demonstrate that their respective solid state storage drives incorporated into Lenovo's products infringe the Asserted Patents.

5. HP Inc. and Hewlett Packard Enterprise Co.

26. On information and belief, Respondent HP Inc. is a Delaware corporation with its principal place of business at 1501 Page Mill Road, Palo Alto, California 94304. *See* Ex. 15.

27. On information and belief, Respondent Hewlett Packard Enterprise Co. is a Delaware corporation with its principal place of business at 3000 Hanover Street, Palo Alto, California 94304. *See* Ex. 16 at 4.

28. On information and belief, on or around November 2015, the Hewlett-Packard Company split into HP Inc. and Hewlett Packard Enterprise Co. *See Certain Integrated Circuits with Voltage Regulators & Prods. Containing Same*, Inv. No. 337-TA-1024, Hewlett Packard Enterprise Co.'s Response to Complaint at ¶27 (Nov. 7, 2016). The split was structured such that HP Inc. is the legal successor of the Hewlett-Packard Company and retained its personal computer and printing business. *Id.* Hewlett Packard Enterprise Co. was created as a new publicly traded company and took over Hewlett-Packard Company's servers and enterprise business. *Id.* Respondents HP Inc. and Hewlett Packard Enterprise Co. are collectively referred to herein as "HP."

29. On information and belief, certain solid state storage drives and products containing the same that infringe one or more claims of the Asserted Patents are imported into the United States, sold for importation into the United States, and/or sold within the United States after importation by HP. For example, as set forth in more detail below, HP imports into the United States, sells for importation into the United States, and/or sells within the United States after

importation, including through the internet, computer products that incorporate at least infringing solid state storage drives supplied by Samsung and SK Hynix. *See* http://store.hp.com.

30. On information and belief, HP also imports into the United States, sells for importation into the United States, and/or sells within the United States after importation computer products that incorporate infringing solid state storage drives manufactured by suppliers other than Samsung and SK Hynix. On information and belief, discovery of HP will identify HP's other suppliers and demonstrate that their respective solid state storage drives incorporated into HP's products infringe the Asserted Patents.

6. ASUSTeK Computer Inc. and ASUS Computer International

31. On information and belief, ASUSTeK Computer Inc. is a corporation organized under the laws of the Republic of China (Taiwan) with its principal place of business at No. 15, Li-Te Road, Peitou, Taipei, Taiwan, R.O.C. *See* Exs. 17 and 18.

32. On information and belief, ASUS Computer International is a wholly-owned subsidiary of ASUSTeK Computer Inc. *See Certain Semiconductor Devices, Semiconductor Device Packages, & Prods. Containing Same*, Inv. No. 337-TA-1010, ASUS's Response to Complaint at ¶25 (July 26, 2016). ASUS Computer International is a California corporation with its headquarters located at 800 Corporate Way, Fremont, California 94539. *See* Ex. 19. Respondents ASUSTeK Computer Inc. and ASUS Computer International are collectively referred to herein as "ASUS."

33. On information and belief, certain solid state storage drives, stacked electronics components, and products containing the same that infringe one or more claims of the Asserted Patents are imported into the United States, sold for importation into the United States, and/or sold within the United States after importation by ASUS. For example, as set forth in more detail below,

ASUS imports into the United States, sells for importation into the United States, and/or sells within the United States after importation, including through the internet, computer products that incorporate at least infringing solid state storage drives supplied by SK Hynix and mobile phones that contain stacked electronics components. *See* http://store.asus.com.

34. On information and belief, ASUS also imports into the United States, sells for importation into the United States, and/or sells within the United States after importation computer products that incorporate infringing solid state storage drives manufactured by suppliers other than SK Hynix. On information and belief, discovery of ASUS will identify ASUS's other suppliers and demonstrate that their respective solid state storage drives incorporated into ASUS's products infringe the Asserted Patents.

7. Acer Inc. and Acer America Corp.

35. On information and belief, Respondent Acer Inc. is a Taiwanese corporation with its principal place of business at 8F, 88, Sec. 1, Xintai 5th Rd. Xizhi, New Taipei City 221, Taiwan. *See* Ex. 20 at 1.

36. On information and belief, Respondent Acer America Corp. is a California corporation with its principal place of business at 333 West San Carlos Street, Suite 1500, San Jose, California 95110. *See* Ex. 20 at 5. On information and belief, Acer Inc. is the parent corporation of Acer America Corp. *See Certain Audio Processing Hardware & Software & Prods. Containing Same*, Inv. No. 337-TA-949, Acer's Response to Complaint at ¶¶24-25 (April 6, 2015). Respondents Acer Inc. and Acer America Corp. are collectively referred to herein as "Acer."

37. On information and belief, certain solid state storage drives and products containing the same that infringe one or more claims of the Asserted Patents are imported into the United States, sold for importation into the United States, and/or sold within the United States after

importation by Acer. For example, as set forth in more detail below, Acer imports into the United States, sells for importation into the United States, and/or sells within the United States after importation, including through the internet, computer products that incorporate at least infringing solid state storage drives supplied by SK Hynix. *See* http://www.acer.com.

38. On information and belief, Acer also imports into the United States, sells for importation into the United States, and/or sells within the United States after importation computer products that incorporate infringing solid state storage drives manufactured by suppliers other than SK Hynix. On information and belief, discovery of Acer will identify Acer's other suppliers and demonstrate that their respective solid state storage drives incorporated into Acer's products infringe the Asserted Patents.

8. VAIO Corporation and Transcosmos America Inc.

39. On information and belief, Respondent VAIO Corporation is a Japanese corporation with its principal place of business at 5432 Toyoshina Azumino, Japan 399-8282. *See* Ex. 21. Respondent VAIO Corporation is referred to herein as "VAIO."

40. On information and belief, certain solid state storage drives and products containing the same that infringe one or more claims of the Asserted Patents are imported into the United States, sold for importation into the United States, and/or sold within the United States after importation by VAIO. For example, as set forth in more detail below, VAIO imports into the United States, sells for importation into the United States, and/or sells within the United States after importation, including through the internet, computer products that incorporate at least infringing solid state storage drives supplied by Samsung. *See* http://us.vaio.com.

41. On information and belief, VAIO also imports into the United States, sells for importation into the United States, and/or sells within the United States after importation computer

products that incorporate infringing solid state storage drives manufactured by suppliers other than Samsung. On information and belief, discovery of VAIO will identify VAIO's other suppliers and demonstrate that their respective solid state storage drives incorporated into VAIO's products infringe the Asserted Patents.

42. On information and belief, Respondent Transcosmos America Inc. is a California corporation with its principal place of business at 879 West 190th Street, Suite 1050, Gardena, California 90248. Ex. 22. On information and belief, Transcosmos sells and distributes VAIO products after importation into the United States. Ex. 23. Respondent Transcosmos America Inc. is referred to herein as "Transcosmos."

III. THE PRODUCTS AT ISSUE

43. The proposed Respondents' infringing products include SSDs and products, such as laptop, desktop, and tablet computers, that incorporate SSDs. The infringing products also include stacked electronics components such as those found in SDRAM memory, processor/DRAM packages, application processors, high-bandwidth memory, and products (*e.g.*, mobile phones, tablets, and watches) that incorporate those components or other stacked electronics components. Specific examples of infringing products imported into and sold within the United States by or on behalf of the proposed Respondents are set forth below in detail. Photographs of representative infringing imported articles from each proposed Respondent are provided in Appendix A.

44. On information and belief, the proposed Respondents maintain commercially significant volumes of imported infringing products in the United States.

IV. THE ASSERTED PATENTS

A. U.S. Patent No. 7,826,243

45. The '243 patent relates to, among other things, module stacking and packaging for electronic devices. Specifically, multiple modules, such as semiconductor dies, are stacked together and connected to create a stacked module, such as a multiple chip module ("MCM"). A stacked module creates a package with a specific function or a range of memory capacity. Multiple packages can be stacked to create a desired memory capacity or different packages can be stacked to create a desired functionality. The stacking techniques described in the '243 patent allow large capacity storage and high functionality devices to be implemented in a smaller package, saving space on an integrated circuit board and thus allowing smaller devices to include memory capacity that may otherwise be unachievable. Expanding capacity or functionality can also be implemented horizontally, depending on the board area and desired capacity. The '243 patent further describes interconnections and signal routing between two or more of the plurality of modules. The signal paths described in the '243 patent may be used to test stacked modules to ensure proper function. Furthermore, the signal paths may be used in the operation of a stacked module.

46. The '243 patent issued on November 2, 2010 from application number 11/322,442, having a priority date of December 29, 2005. On November 28, 2017, the USPTO issued a Certificate of Correction for the '243 Patent to correct certain omissions from the specification that occurred during the prosecution. A copy of the '243 patent along with the Certificate of Correction is attached as Exhibit 24.[1]

[1] A certified copy of the '243 patent has been ordered from the Patent Office but has not yet arrived. Complainant will submit the certified version as soon as it arrives.

47. BiTMICRO, LLC owns by assignment the entire right, title, and interest in the '243 patent. A certified copy of the recorded assignment of the '243 patent transferring title from BNI to BiTMICRO, LLC is attached as Exhibit 25.

48. Pursuant to Commission Rule 210.12(c), a certified copy and three additional copies of the prosecution histories of the '243 patent, as well as four copies of the applicable pages from each technical reference cited in the prosecution history, are attached as Appendices B and C, respectively.

49. Pursuant to Commission rule 210.12(a)(9)(v), Complainant provides below a list of all foreign patents, foreign patent applications (not already issued as a patent), and each foreign patent application that has been denied, abandoned, or withdrawn corresponding to the '243 patent.

Country	Status	Patent Number
Taiwan	Granted	I332701B53
Korea	Granted	10-1391068
Japan	Granted	5,745,730
Japan	Granted	5,859,181
China	Granted	101375391B

B. U.S. Patent No. 6,529,416

50. The '416 patent relates to, among other things, parallel erase operations in memory systems. The invention provides a way of increasing the speed of flash memory erase and write operations by pre-erasing a block of non-volatile flash memory in order to subsequently write new data temporarily stored in a volatile memory cache into that block. This is done by detecting the specific data to be written into the non-volatile memory and erasing a portion of the non-volatile memory to accommodate writing the cached data into the non-volatile memory using multiple sequential write operations. Since the time taken by the flash erase and the write operations affect

the operating speed of the entire flash memory system, the invention taught by the '416 patent provides a system and method for substantially decreasing memory operation times.

51. The '416 patent issued on March 4, 2003 from application number 09/819,423, having a priority date of March 27, 2001. A copy of the '416 patent is attached as Exhibit 26.[2]

52. BiTMICRO, LLC owns by assignment the entire right, title, and interest in the '416 patent. A certified copy of the recorded assignment of the '416 patent transferring title from BNI to BiTMICRO, LLC is attached as Exhibit 27.

53. Pursuant to Commission Rule 210.12(c), a certified copy and three additional copies of the prosecution histories of the '416 patent, as well as four copies of the applicable pages from each technical reference cited in the prosecution history, are attached as Appendices D and E, respectively.

54. Pursuant to Commission rule 210.12(a)(9)(v), there are no foreign patents, foreign patent applications (not already issued as a patent), or foreign patent applications that have been denied, abandoned, or withdrawn corresponding to the '416 patent.

C. U.S. Patent No. 9,135,190

55. The '190 patent relates to, among other things, a multi-profile memory controller for computing devices. Specifically, the '190 patent is directed to a memory controller that can operate with memory locations, memory devices, or both which are associated with different memory attributes, different attribute qualifiers, or the like. For example, a non-volatile memory storage device may be portioned to allow a memory controller to treat a portion of the memory

[2] A certified copy of the '416 patent has been ordered from the Patent Office but has not yet arrived. Complainant will submit the certified version as soon as it arrives.

device as a temporary cache memory to store data prior to writing the data to a permanent storage location. This eliminates the need for a separate memory cache, often composed of volatile memory. This has the additional advantage of maintaining the temporary data in the non-volatile cache partition in the event of an unexpected power loss.

56. The '190 patent issued on September 15, 2015, from application number 12/876,113, having a priority date of September 4, 2009. A copy of the '190 patent is attached as Exhibit 28.[3]

57. BiTMICRO, LLC owns by assignment the entire right, title, and interest in the '190 patent. A certified copy of the recorded assignment of the '190 patent transferring title from BNI to BiTMICRO, LLC is attached as Exhibit 29.

58. Pursuant to Commission Rule 210.12(c), a certified copy and three additional copies of the prosecution histories of the '190 patent, as well as four copies of the applicable pages from each technical reference cited in the prosecution history, are attached as Appendices F and G, respectively.

59. Pursuant to Commission rule 210.12(a)(9)(v), there are no foreign patents, foreign patent applications (not already issued as a patent), or foreign patent applications that have been denied, abandoned, or withdrawn corresponding to the '190 patent.

D. U.S. Patent No. 8,093,103

60. The '103 patent relates to, among other things, module stacking and packaging for electronic devices. Specifically, multiple modules, such as semiconductor dies, are stacked

[3] A certified copy of the '190 patent has been ordered from the Patent Office but has not yet arrived. Complainant will submit the certified version as soon as it arrives.

together and connected to create a stacked module, such as a multiple chip module ("MCM"). A stacked module creates a package with a specific function or a range of memory capacity. Multiple packages can be stacked to create a desired memory capacity or different packages can be stacked to create a desired functionality. The stacking techniques described in the '103 patent allow large capacity storage and high functionality devices to be implemented in a smaller package, saving real estate on an integrated circuit board and thus allowing smaller devices to include memory capacity that may otherwise be unachievable. Expanding capacity or functionality can also be implemented horizontally, depending on the board area and desired capacity. The '103 patent further describes interconnections and signal routing between two or more of the plurality of modules. The signal paths described in the '103 patent may be used to test a stacked module to ensure proper function. Furthermore, the signal paths may be used in the operation of a stacked module.

61. The '103 patent issued on January 10, 2012, from application number 12/907,023. The '103 patent application was a division of application number 11/322,442 and has a priority date of December 29, 2005. A copy of the '103 patent is attached as Exhibit 30.[4]

62. BiTMICRO, LLC owns by assignment the entire right, title, and interest in the '103 patent. A certified copy of the recorded assignment of the '103 patent transferring title from BNI to BiTMICRO, LLC is attached as Exhibit 31.

63. Pursuant to Commission Rule 210.12(c), a certified copy and three additional copies of the prosecution histories of the '103 patent, as well as four copies of the applicable pages

[4] A certified copy of the '103 patent has been ordered from the Patent Office but has not yet arrived. Complainant will submit the certified version as soon as it arrives.

from each technical reference cited in the prosecution history, are attached as Appendices H and I, respectively.

64. Pursuant to Commission rule 210.12(a)(9)(v), there are no foreign patents, foreign patent applications (not already issued as a patent), or foreign patent applications that have been denied, abandoned, or withdrawn corresponding to the '103 patent.

E. Licensees

65. As part of the patent purchase agreement between BNI and BiTMICRO, LLC, BiTMICRO, LLC granted back to BNI a license under each Asserted Patent to make, have made, use, import, offer for sale and sell products covered by each Asserted Patent in the United States. The patent purchase and license agreement is attached to the Complaint as Confidential Exhibit 1C. The Asserted Patents have not been the subject of any other licensing agreements.

V. THE DOMESTIC INDUSTRY

66. There is a domestic industry as defined under 19 U.S.C. § 1337(a)(3)(A), (B), and/or (C), comprising BNI's continuing significant investments in plant and equipment, employment of labor and capital, and substantial investment in exploitation of the Asserted Patents in the United States.

A. BNI's Investments in the Domestic Industry

67. BNI engages in a broad range of qualifying domestic industry activities in the United States directed to articles protected by the Asserted Patents. These articles include BNI's E-Disk Altima series products (including BNI's original E-Disk Altima and its new E-Disk Altima II products) and ACE series products (including BNI's original ACE and its new ACE II products) (the "BNI Domestic Industry Products"). As discussed below, the BNI Domestic Industry Products each practice at least one valid claim of each Asserted Patent.

68. BNI has been at all times either the owner or a licensee of each Asserted Patent. *See* Exs. 1C and 2C.

69. BNI has made and continues to make significant investments in plant and equipment with respect to each of the BNI Domestic Industry Products. Those investments in plant and equipment are dedicated to design, development, assembly, and various customer support activities focused on the BNI Domestic Industry Products.

70. BNI has made and continues to make significant investments in labor and capital with respect to each of the BNI Domestic Industry Products. Those investments in labor and capital are dedicated to design, development, assembly, and various customer support activities focused on the BNI Domestic Industry Products.

71. BNI further engages in exploitation of the Asserted Patents through its substantial domestic investments in engineering and research and development activities directed to the BNI Domestic Industry Products. These activities include, *inter alia*, engineering, research and development, and design tied to the claimed technology in the Asserted Patents implemented into the BNI Domestic Industry Products. These activities have occurred in the past and are ongoing with respect to future versions of BNI products currently under development.

72. A significant amount of BNI's technical activities directed to the BNI Domestic Industry Products takes place in BNI's Fremont, California headquarters.

73. BNI's investments and activities are significant and substantial both in absolute terms and relative to BNI's overall operations, taking into account the nature of such expenditures in the SSD and stacked integrated circuit industry, BNI's relative size, and the relative importance of BNI's domestic operations compared to its overseas activities.

74. BNI's investments and activities are important to the protected articles and represent significant domestic added value, particularly where the protected articles are designed, developed, and assembled in the United States. Moreover, BNI's investments and activities are significant and substantial in the context of comparable products, the company's overall investments, and the relevant marketplace.

75. BNI's investments and activities are also significant and substantial because those activities and investments are directed to highly-specialized, low-volume products that U.S. Department of Defense contractors incorporate into products used in military and national security applications. BNI's production volumes, investments, and activities are significant in the context of the highly-specialized and customized segment of the solid state drive market in which it operates.

76. The activities described above and BNI's investments made to support those activities are explained in detail in the Declarations of Stephen Uriarte, attached as Exhibit 32C (Confidential) and of Larry Rosolowski, attached as Exhibit 33C (Confidential).

B. BNI's Products Practice the Asserted Patents

77. BNI's E-Disk Altima series products practice many of the claims of the Asserted Patents. Claim charts showing how BNI's E-Disk Altima products practice at least one representative claim of each Asserted Patent practiced are attached as Exhibits 34C, 35C, and 37C.

78. BNI's ACE series products practices many of the claims of the '190 patent. A claim chart showing at least one representative claim of each patent practiced by the ACE series products are attached as Exhibits 38C.

79. Photographs of each representative domestic industry products are provided in Appendix A.

VI. SPECIFIC INSTANCES OF IMPORTATION AND SALE

80. On information and belief, the Respondents are importing and will continue to import, sell for importation and/or sell within the United States after importation solid state storage drives, stacked electronics components, and products containing same that infringe one or more claims of the Asserted Patents.

81. Specific instances of importation, sale for importation into the United States, and/or sale within the United States after importation of Accused Products by the Respondents are set forth below. These instances are exemplary in nature and not intended to restrict the scope of any exclusion order or other remedy the U.S. International Trade Commission may order.

82. Complainants have successfully placed orders and purchased in the United States representative samples of each of the Respondents' imported solid state storage drives, stacked electronics components, and products containing same that infringe one or more claims of the Asserted Patents. A detailed description of the steps Complainants took in procuring these samples and obtaining information about Respondents' products is set forth in the Declaration of Szymon Maziakowski in Support of the Complaint, attached as Exhibit 39, and in the Declaration of Andrew Mussgnug in Support of the Complaint, attached as Exhibit 40.

A. Importation and Sale of Infringing Samsung Products

83. On information and belief, solid state storage drives, stacked electronics components, and products containing same that infringe one or more claim of the Asserted Patents are imported, sold for importation, and/or sold within the United States after importation by Respondent Samsung. The packaging in which Samsung's Accused Products are sold in the United

States indicates those products are made in China, Vietnam, and Korea. *See* Ex. 39, Maziakowski Declaration at ¶¶16-33; *see* Ex. 40, Mussgnug Declaration at ¶¶5, 6, 18, and 21. Additionally, infringing Samsung solid state storage drives and stacked electronics components are imported into the United States in downstream products, such as laptop computers, tablet computers, and mobile phones, by Samsung's customers, including at least Samsung itself, Lenovo, HP, and VAIO.

B. Importation and Sale of Infringing SK Hynix Products

84. On information and belief, solid state solid state storage drives, stacked electronics components, and products containing same that infringe one or more claim of the Asserted Patents are imported, sold for importation, and/or sold within the United States after importation by Respondent SK Hynix. The packaging in which SK Hynix's Accused Products are sold in the United States indicates those products are made in Korea and China. *See* Ex. 39, Maziakowski Declaration at ¶¶34-35; *see* Ex. 40, Mussgnug Declaration at ¶¶29-30. Additionally, infringing SK Hynix solid state storage drives and stacked electronics components are imported into the United States in downstream products, such as laptop computers, tablet computers, and phones by SK Hynix's customers, including at least Samsung, Dell, HP, ASUS, and Acer.

C. Importation and Sale of Infringing Dell Products

85. On information and belief, solid state storage drives and products containing same that infringe one or more claim of the Asserted Patents are imported, sold for importation, and/or sold within the United States after importation by Respondent Dell. These include infringing Dell laptop computers that incorporate at least an infringing SK Hynix solid state storage drive. *See* Ex. 40, Mussgnug Declaration at ¶¶7-8. The packaging in which Dell's Accused Products are sold in

the United States indicates those products are made in China. *See* Ex. 39, Maziakowski Declaration at ¶¶6-9.

D. Importation and Sale of Infringing Lenovo Products

86. On information and belief, solid state storage drives and products containing same that infringe one or more claim of the Asserted Patents are imported, sold for importation, and/or sold within the United States after importation by Respondent Lenovo. These include infringing Lenovo laptop and tablet computers that incorporate at least an infringing Samsung solid state storage drive. *See* Ex. 40, Mussgnug Declaration at ¶11. The packaging in which Lenovo's Accused Products are sold in the United States indicates those products are made in China. *See* Ex. 39, Maziakowski Declaration at ¶¶14-15.

E. Importation and Sale of Infringing HP Products

87. On information and belief, solid state storage drives and products containing same that infringe one or more claim of the Asserted Patents are imported, sold for importation, and/or sold within the United States after importation by Respondent HP. These include infringing HP laptop and tablet computers that incorporate at least infringing Samsung and SK Hynix solid state storage drives. *See* Ex. 40, Mussgnug Declaration at ¶¶9-10. The packaging in which HP's Accused Products are sold in the United States indicates those products are made in China. *See* Ex. 39, Maziakowski Declaration at ¶¶10-13.

F. Importation and Sale of Infringing ASUS Products

88. On information and belief, solid state storage drives, stacked electronics components, and products containing same that infringe one or more claim of the Asserted Patents are imported, sold for importation, and/or sold within the United States after importation by Respondent ASUS. These include infringing ASUS laptop computers that incorporate at least an

infringing SK Hynix solid state storage drive and phones that incorporate at least infringing Samsung stacked electronic components. *See* Ex. 40, Mussgnug Declaration at ¶¶3, 6. The packaging in which ASUS's Accused Products are sold in the United States indicates those products are made in China. *See* Ex. 39, Maziakowski Declaration at ¶¶4-5; Ex. 40, Mussgnug Declaration at ¶5.

G. Importation and Sale of Infringing Acer Products

89. On information and belief, solid state storage drives and products containing same that infringe one or more claim of the Asserted Patents are imported, sold for importation, and/or sold within the United States after importation by Respondent Acer. These include infringing Acer laptop computers that incorporate at least an infringing SK Hynix solid state storage drive. *See* Ex. 40, Mussgnug Declaration at ¶2. The packaging in which Acer's Accused Products are sold in the United States indicates those products are made in China. *See* Ex. 39, Maziakowski Declaration at ¶¶2-3.

H. Importation and Sale of Infringing VAIO and Transcosmos Products

90. On information and belief, solid state storage drives and products containing same that infringe one or more claim of the Asserted Patents are imported, sold for importation, and/or sold within the United States after importation by Respondents VAIO and Transcosmos. These include infringing VAIO laptop computers that incorporate at least an infringing Samsung solid state storage drive. *See* Ex. 40, Mussgnug Declaration at ¶31. The packaging in which VAIO's and Transcosmos' Accused Products are sold in the United States indicates those products are made in Japan. *See* Ex. 39, Maziakowski Declaration at ¶¶36-37.

I. Harmonized Tariff Schedule Numbers for Respondents' Infringing Products

91. On information and belief, the proposed Respondents' infringing products are imported into the United States under at least the following headings of the Harmonized Tariff Schedule of the United States: 8523.51.00, 8542.32.00 and 8473.30.11 (SSDs; flash memory devices; DRAM); 8517.12.00, 8517.62.00, or 8517.70.00 (mobile phones); 8471.30.01, 8471.41.01, 8471.49.00, or 8471.50.01 (handheld computers); 8471.30.01 (laptop and desktop computers); and 9101.19.20, 9102.12, or 9102.91.20 (wearables and smartwatches).

VII. UNLAWFUL AND UNFAIR ACTS COMMITTED BY THE PROPOSED RESPONDENTS

92. On information and belief, Respondents import into the United States, sell for importation into the United States, and/or sell within the United States after importation solid state storage drives, stacked electronics components, and products containing same in violation of Section 337 by infringement of one or more claims of one or more Asserted Patents either literally or under the doctrine of equivalents. The following table summarizes the Asserted Patent claims infringed by each individual Respondent:

Respondent	'243 patent	'416 patent	'190 patent	'103 patent
Samsung	1, 2, 11, and 12	1-20	1-101	12, 16
SK Hynix	1, 2, 11, and 12	1-20	1-101	12, 16
Dell		1-20		
Lenovo		1-20	1-101	
HP		1-20	1-101	
ASUS	1, 2, 11, and 12	1-20		
Acer		1-20		
VAIO		1-20	1-101	

A. Samsung

1. '243 Patent

93. Examination of Respondent Samsung's representative Accused Products, specifically the Samsung processor/DRAM packages MSM8998 (QC Snapdragon 835) / Samsung K3UH6H60AM-NGCJ (6GB LPDDR4X); MSM8998 (QC Snapdragon 835) / K3UH5H50MM-NGCJ (4GB LPDDR4X); and MSM8996 pro (QC Snapdragon 821) / Samsung K3RG6G60MM-MGCJ (6GB LPDDR); Samsung application processors Exynos 7 Dual (7270), Exynos 8 Octa (8890), Exynos 7 Octa (7870), Exynos 7 Octa (7580); and Samsung end-user products such as the following mobile phones, tablets, and watches: Samsung Galaxy S8, Samsung Galaxy S8+, Samsung Galaxy Note 8, Samsung Gear S3 Classic, Samsung Galaxy Tab A 10.1, Samsung Galaxy View, Samsung Galaxy S7 Edge; and Samsung SDRAM M393A8G40D40-CRB demonstrates that those products directly infringe at least claims 1, 2, 11, and 12 of the '243 patent both literally and under the doctrine of equivalents. Charts that apply independent claim 1 of the '243 patent to Samsung's infringing representative Accused Products, including photographs of the physical Accused Products, are attached as Exhibits 43 and 44 (and photograph Exhibits attached to Mussgnug Declaration).

94. Upon information and belief, the Samsung processor/DRAM packages MSM8998 (QC Snapdragon 835) / Samsung K3UH6H60AM-NGCJ (6GB LPDDR4X); MSM8998 (QC Snapdragon 835) / K3UH5H50MM-NGCJ (4GB LPDDR4X); and MSM8996 pro (QC Snapdragon 821) / Samsung K3RG6G60MM-MGCJ (6GB LPDDR) all comprise an infringing stacked processor and memory as shown in Exhibit 43. *See* Exs. 51, 52, and 53. Thus, Exhibit 43 is representative for each of those Samsung processor/DRAM packages, as well as for the Samsung end-user products that contain them, *e.g.*, Samsung Galaxy S8; and Samsung Galaxy Note 8.

95. Upon information and belief, the Samsung Galaxy S8+ mobile phone contains the SK Hynix processor/DRAM package MSM8998 (QC Snapdragon 835) / SK Hynix H9HKNNNCRMMU (4GB LPDDR4X), which comprises an infringing stacked processor and memory as shown in Exhibit 48. *See* Ex. 54. Thus, Exhibit 48 is representative for the Samsung Galaxy S8+ mobile phone.

96. Upon information and belief, the Samsung application processors Exynos 7 Dual (7270), Exynos 8 Octa (8890), Exynos 7 Octa (7870), Exynos 7 Octa (7580) all comprise an infringing stacked processor and memory as shown in Exhibit 43. *See* Ex. 55. Thus, Exhibit 43 is representative for each of those Samsung application processors, as well as for the Samsung end-user products that contain them, *e.g.*, Samsung Gear S3 Classic, Samsung Galaxy Tab A 10.1, Samsung Galaxy View, Samsung Galaxy S7 Edge.

97. Upon information and belief, the Samsung SDRAM M393A8G40D40-CRB contains infringing stacked modules with through-silicon-vias ("TSVs") as shown in Exhibit 44. *See* Ex. 56. Thus, Exhibit 44 is representative for that Samsung SDRAM.

98. On information and belief, Samsung also knowingly induces and/or contributes to the infringement of at least claims 1, 2, 11, and 12 of the '243 patent by others. On information and belief, Samsung has had knowledge of the '243 patent, and its infringement of the '243 patent, since at least the filing of this Complaint. On information and belief, Samsung tests, demonstrates, or otherwise operates its Accused Products in the United States, thereby performing the claimed methods and directly infringing any asserted claims of the '243 patent requiring such operation. Similarly, Samsung's customers and the end users of the Accused Products test and/or operate the Accused Products in the United States in accordance with Samsung's instructions contained in, for

example, its user manuals, thereby also performing the claimed methods and directly infringing the asserted claims of the Asserted Patents requiring such operation. *See* Ex. 40, Mussgnug Declaration at ¶¶6, 15, 16, 19, 22-26.

99. Samsung also contributes to infringement of the '243 patent by selling for importation into the United States, importing into the United States, and/or selling within the United States after importation the Accused Products and the non-staple constituent parts of those products, which are not suitable for substantial non-infringing use and which embody a material part of the invention described in the '243 patent. These products are known by Samsung to be especially made or especially adapted for use in the infringement of the '243 patent. Samsung also contributes to the infringement of the '243 patent by selling for importation into the United States, importing into the United States, and/or selling within the United States after importation components, such as the solid state storage drives, of the Accused Products, which are not suitable for substantial non-infringing use and which embody a material part of the invention described in the '243 patent. The Accused Products are known by Samsung to be especially made or especially adapted for use in the infringement of the '243 patent. Specifically, on information and belief, Samsung sells Accused Products, with knowledge that the devices are used for infringement, to resellers, retailers, and end users. End users of those products directly infringe the '243 patent. *See* Ex. 40, Mussgnug Declaration at ¶¶6, 15, 16, 19, 22-26.

2. '103 Patent

100. Examination of Respondent Samsung's representative Accused Products, specifically Samsung SDRAM M393A8G40D40-CRB, demonstrates that those products directly infringe at least claims 12 and 16 of the '103 patent both literally and under the doctrine of equivalents. Charts that apply independent claim 12 of the '103 patent to Samsung's infringing

representative Accused Products, including photographs of the physical Accused Products, are attached as Exhibit 45 (and photograph Exhibits attached to Mussgnug Declaration).

101. Upon information and belief, the Samsung SDRAM M393A8G40D40-CRB contains infringing stacked modules with TSVs as shown in Exhibit 45. *See* Ex. 56. Thus, Exhibit 45 is representative for that Samsung SDRAM.

102. On information and belief, Samsung also knowingly induces and/or contributes to the infringement of at least claims 12 and 16 of the '103 patent by others. On information and belief, Samsung has had knowledge of the '103 patent, and its infringement of the '103 patent, since at least the filing of this Complaint. On information and belief, Samsung tests, demonstrates, or otherwise operates its Accused Products in the United States, thereby performing the claimed methods and directly infringing any asserted claims of the '103 patent requiring such operation. Similarly, Samsung's customers and the end users of the Accused Products test and/or operate the Accused Products in the United States in accordance with Samsung's instructions contained in, for example, its user manuals, thereby also performing the claimed methods and directly infringing the asserted claims of the Asserted Patents requiring such operation. *See* Ex. 40, Mussgnug Declaration at ¶22.

103. Samsung also contributes to infringement of the '103 patent by selling for importation into the United States, importing into the United States, and/or selling within the United States after importation the Accused Products and the non-staple constituent parts of those products, which are not suitable for substantial non-infringing use and which embody a material part of the invention described in the '103 patent. These products are known by Samsung to be especially made or especially adapted for use in the infringement of the '103 patent. Samsung also

contributes to the infringement of the '103 patent by selling for importation into the United States, importing into the United States, and/or selling within the United States after importation components, such as the solid state storage drives, of the Accused Products, which are not suitable for substantial non-infringing use and which embody a material part of the invention described in the '103 patent. The Accused Products are known by Samsung to be especially made or especially adapted for use in the infringement of the '103 patent. Specifically, on information and belief, Samsung sells Accused Products, with knowledge that the devices are used for infringement, to resellers, retailers, and end users. End users of those products directly infringe the '103 patent. *See* Ex. 40, Mussgnug Declaration at ¶22.

3. '416 Patent

104. Examination of Respondent Samsung's representative Accused Products, specifically Samsung SSDs MZVLW256HEHP; MZVLW512HMJP; and Samsung end-user product 850 EVO demonstrates that those products directly infringe at least claims 1-20 of the '416 patent both literally and under the doctrine of equivalents. Charts that apply independent claims 1, 6, 11 and 16 of the '416 patent to Samsung's infringing representative Accused Products, including photographs of the physical Accused Products, are attached as Exhibit 41 (and photograph Exhibits attached to Mussgnug Declaration).

105. Upon information and belief, the Samsung SSDs MZVLW256HEHP; MZVLW512HMJP; and 850 EVO SSD all contain infringing write-cache buffer flushing and garbage collection functionality as shown in Exhibit 41. *See* Exs. 57, 58, 60, 61, and 62. Thus, Exhibit 41 is representative for each of those Samsung SSDs, as well as for the Samsung end-user products that contain them, *e.g.*, Samsung ArtPC and Samsung Notebook 9 (900X5N-X01).