UNITED STATES INTERNATIONAL TRADE COMMISSION
WASHINGTON, D.C.

In the Matter of **CERTAIN MEMORY MODULES AND COMPONENTS THEREOF, AND PRODUCTS CONTAINING SAME**	**Investigation No. 337-TA-_____**

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

COMPLAINANT

Netlist, Inc.
175 Technology Drive, Suite 150
Irvine, CA 92618
Telephone: 949-435-0025

COUNSEL FOR COMPLAINANT

Sean C. Cunningham
Erin P. Gibson
Tiffany C. Miller
Jacob D. Anderson
DLA Piper LLP (US)
401 B Street, Suite 1700
San Diego, CA. 92101
Telephone: 619-699-2700
Fax: 619-699-2701

Mark D. Fowler
DLA Piper LLP (US)
2000 University Avenue
East Palo Alto, CA 94303-2215

James Heintz
DLA Piper LLP (US)
11911 Freedom Drive, #300
Reston, VA 20190

PROPOSED RESPONDENTS

SK hynix Inc.
2091, Gyeongchung-daero, Bubal-eub
Icheon-si, Gyeonggi-do
Republic of Korea
Telephone: +82-31-630-4114

SK hynix America Inc.
3101 N. First Street
San Jose, CA 95134
Telephone: 408-232-8000

SK hynix memory solutions Inc.
3103 N. First Street
San Jose, CA 95134
Telephone: 408-987-2400

TABLE OF SUPPORTING MATERIALS

EXHIBITS

Exhibit No.	Description
1	Copy of U.S. Patent No. 8,756,364
2	Copy of U.S. Patent No. 8,516,185
3	Copy of U.S. Patent No. 8,001,434
4	Copy of U.S. Patent No. 8,359,501
5	Copy of U.S. Patent No. 8,689,064
6	Copy of U.S. Patent No. 8,489,837
7	Copy of Assignment Records for U.S. Patent No. 8,756,364
8	Copy of Assignment Records for U.S. Patent No. 8,516,185
9	Copy of Assignment Records for U.S. Patent No. 8,001,434
10	Copy of Assignment Records for U.S. Patent No. 8,359,501
11	Copy of Assignment Records for U.S. Patent No. 8,689,064
12	Copy of Assignment Records for U.S. Patent No. 8,489,837
13	Hynix Product Catalog
14	List of Foreign Counterparts
15	List of Licensees for the Asserted Patents
16	HMA84GL7AMR4N Datasheet (Rev. 1.3, Mar. 2016)
17	Printout of https://www.skhynix.com/products.view.do?vseq=1094&cseq=75
18	H5AN8G4NAMR-xxC Datasheet (Rev. 1.2, Mar. 2016)
19	Infringement Claim Chart for U.S. Patent No. 8,756,364
20	Infringement Claim Chart for U.S. Patent No. 8,516,185
21	Infringement Claim Chart for U.S. Patent No. 8,001,434
22	Infringement Claim Chart for U.S. Patent No. 8,359,501
23	Infringement Claim Chart for U.S. Patent No. 8,689,064
24	Infringement Claim Chart for U.S. Patent No. 8,489,837
25	Documents detailing purchase of Hynix DDR4 LRDIMM, part number HMA84GL7AMR4N-TF
26	Photograph of Hynix DDR4 LRDIMM, part number HMA84GL7AMR4N-TF
27	Documents detailing purchase of Hynix DDR4 RDIMM, part number HMA84GR7MFR4N-TF
28	Photograph of Hynix DDR4 RDIMM, part number HMA84GR7MFR4N-TF
29C	Domestic Industry Claim Chart for U.S. Patent No. 8,756,364 **[CONFIDENTIAL]**
30C	Domestic Industry Claim Chart for U.S. Patent No. 8,756,364 **[CONFIDENTIAL]**

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31C	Domestic Industry Claim Chart for U.S. Patent No. 8,516,185 **[CONFIDENTIAL]**
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33C	Domestic Industry Claim Chart for U.S. Patent No. 8,001,434 **[CONFIDENTIAL]**
34C	Domestic Industry Claim Chart for U.S. Patent No. 8,001,434 **[CONFIDENTIAL]**
35C	Domestic Industry Claim Chart for U.S. Patent No. 8,359,501 **[CONFIDENTIAL]**
36C	Domestic Industry Claim Chart for U.S. Patent No. 8,359,501 **[CONFIDENTIAL]**
37C	Domestic Industry Claim Chart for U.S. Patent No. 8,689,064 **[CONFIDENTIAL]**
38C	Domestic Industry Claim Chart for U.S. Patent No. 8,689,064 **[CONFIDENTIAL]**
39C	Domestic Industry Claim Chart for U.S. Patent No. 8,489,837 **[CONFIDENTIAL]**
40C	Declaration of Gail Sasaki, Chief Financial Officer, Netlist, Inc. **[CONFIDENTIAL]**
41	Excerpts of Netlist's 2015 Annual Report
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43	Netlist HybriDIMM press release, August 9, 2016
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45	Exemplary Hynix DDR4 LRDIMM Memory Module (physical exhibit)
46	Exemplary Hynix DDR4 RDIMM Memory Module (physical exhibit)
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APPENDICES

Appendix Item	Description
A	Copy of Prosecution History for U.S. Patent No. 8,756,364
B	Copy of Prosecution History for U.S. Patent No. 8,516,185
C	Copy of Prosecution History for U.S. Patent No. 8,001,434
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I	Cited References for U.S. Patent No. 8,001,434
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I. INTRODUCTION

1. This Complaint is filed by Netlist, Inc. ("Netlist") for violation of Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, by proposed respondents SK hynix Inc., SK hynix America Inc. and SK hynix memory solutions Inc. (collectively "Respondents" or "Hynix").

2. The violation is based on the unlawful importation into the United States, the sale for importation, or the sale within the United States after importation of certain memory modules and components thereof, and products containing same, by Respondents, including Hynix DDR4 RDIMMs (Registered Dual In-Line Memory Modules) (the "accused RDIMM products") and Hynix DDR4 LRDIMMs (Load-Reduced Dual In-Line Memory Modules) (the "accused LRDIMM products") (collectively the "accused products" or the "accused LRDIMM and RDIMM products"). As set forth in detail below, Respondents' memory modules and components thereof, and products containing same, are covered by and infringe one or more claims of United States Patent No. 8,756,364 ("the '364 patent"), United States Patent No. 8,516,185 ("the '185 patent"), United States Patent No. 8,001,434 ("the '434 patent"), United States Patent No. 8,359,501 ("the '501 patent"), United States Patent No. 8,689,064 ("the '064 patent") and United States Patent No. 8,489,837 ("the '837 patent") (collectively "the asserted patents"). Certified copies of the asserted patents are attached as Exhibits 1 through 6. The presently asserted claims of the asserted patents are as follows:

TABLE 1

U.S. Patent No.	Independent Claims Asserted	Dependent Claims Asserted
8,756,364	1 and 17	2, 3, 4, 6, 7, 10, 13 and 23
8,516,185	1	2, 3, 7, 8, 10, 11 and 12
8,001,434	n/a	2, 3, 5, 6 and 7

8,359,501	n/a	4
8,689,064	16	n/a
8,489,837	1	2, 3, 5 and 6

3. Netlist is the owner by assignment of the asserted patents. Certified copies of the assignment records of the asserted patents are attached as Exhibits 7 through 12.

4. A domestic industry as required by 19 U.S.C. §§ 1337(a)(2) and (3) exists relating to the Netlist products protected by each of the asserted patents, and Netlist's significant and substantial investments in plant, labor, capital, equipment, research and development, and engineering related to inventing the patented technology and developing Netlist's domestic industry products to implement that technology.

5. In the alternative, a domestic industry as required by 19 U.S.C. §§ 1337(a)(2) and (3) is in the process of being established relating to Netlist products protected by each of the asserted patents. Netlist's significant and substantial investments in plant, labor, capital, equipment, research and development, and engineering and exploitation of the asserted patents constitute active engagement in necessary and tangible steps to establish the exploitation of Netlist's intellectual property rights. As a result of these significant and substantial investments, there is a significant likelihood that the domestic industry requirement as to Netlist's domestic industry products will be satisfied in the future.

6. Netlist seeks as relief a limited exclusion order permanently excluding from entry into the United States the Respondents' infringing memory modules and components thereof, and products containing same. Netlist also seeks a cease and desist order prohibiting Respondents' importation, sale, offer for sale, soliciting of the sale, advertising, marketing, demonstrating, promoting, supporting and servicing of the infringing memory modules and components thereof, and products containing same, covered by the claims of the asserted patents.

Netlist also seeks the imposition of a bond during the 60-day Presidential review period to prevent further injury to Netlist's domestic industry relating to each of the asserted patents.

II. THE PROPOSED PARTIES

A. Complainant Netlist

7. Netlist is a corporation organized and existing under the laws of the State of Delaware, having a principal place of business at 175 Technology Drive, Suite 150, Irvine, California 92618.

8. Since its founding in 2000, Netlist has been a leading innovator in high-performance memory module technologies. Netlist designs and manufactures a wide variety of high-performance products for the cloud computing, virtualization and high-performance computing (HPC) markets. Netlist's technology enables users to derive useful information from vast amounts of data in a shorter period of time. These capabilities will become increasingly valuable as the volume of data continues to dramatically increase.

9. Netlist has a long and exceptional track record of innovation. Netlist has twice before introduced disruptive new products that have changed the direction of the server memory industry, creating entirely new product categories that previously did not exist. Netlist's latest breakthrough product, HybriDIMM, introduced to the market for the first time last month, is set to change the industry again.

10. In 2009, Netlist announced the industry's first LRDIMM, HyperCloud, demonstrating what was previously thought to be impossible—that a server could be fully loaded with memory and still operate at the highest system speeds. Using conventional server memory, RDIMM, server systems slow down as more memory is added. Most applications do not require a large amount of memory relative to the maximum memory capacity of the server. RDIMM is a

satisfactory solution for these applications and is less expensive than LRDIMM. However, certain applications, such as big data analytics and high-frequency trading do require large amounts of memory operating at the highest possible speeds. LRDIMM satisfies these demands, and it is Netlist's distributed buffer architecture and load reduction technologies that make this performance possible. Netlist's '185 and '364 patents, for example, cover these critical technologies. Faced with the decisive advantages of Netlist's technology, the industry adopted Netlist's distributed buffer architecture and load reduction technologies wholesale in the latest generation JEDEC standard implementation of LRDIMM. Today, every LRDIMM sold in the market is based on Netlist's patented technology.

11. The development of HyperCloud was a massive undertaking requiring more than nine years and tens of millions of dollars investment in research and development. Netlist engineers had to overcome many technical challenges in the course of this product development, particularly given HyperCloud's novel architecture and the strict timing requirements of the high-speed memory channel. Netlist sought patent protection for many of these early designs, resulting in patents such as the '434, '501, '064, and '837 patents, as well as the '185 and '364 patents. Years later, the industry adopted many of the same solutions as it struggled to address similar technical challenges in the latest generation LRDIMM and RDIMM products.

12. In 2013, HyperCloud began shipping in volume to major server manufacturers, including IBM and HP. For example, HyperCloud was qualified on HP's ProLiant Gen8 servers, the DL360p and DL380p. HyperCloud was also the highest performing memory offered in IBM's System x3650 M4 and was selected by IBM as the default memory option for that platform. These HP and IBM servers were among the highest volume models on the market.

HyperCloud was also adopted by smaller manufacturers targeting the high-performance computing market, such as CIARA's Atlas servers and Titan graphics processing unit systems.

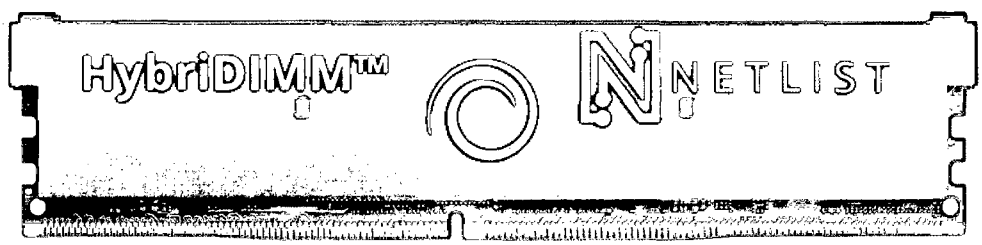
13. Netlist's patented LRDIMM technology will only become more critical as server systems struggle to meet the ever-increasing demands placed on data centers. Upcoming generations of server CPUs will reach speeds that likely cannot be supported by standard RDIMM. Each RDIMM in a server adds an electrical load to the system which slows down data transfers over the memory channel. Standard RDIMM would not be an acceptable solution when it can no longer keep up with the CPU as a result of this added loading. Netlist's patented technologies solve this by, among other things, reducing the electrical load, allowing more memory modules to be used in the server without slowing down the server or allowing the server to operate at faster speeds using the same number of memory modules. LRDIMM will therefore continue to replace standard RDIMM as server CPU speeds and the demand for more memory increase over time.

14. Netlist changed the direction of the industry a second time when it brought Flash memory to the memory channel with the introduction of the first NVDIMM (Non-Volatile DIMM), called NVvault. NVDIMM combines the low cost and non-volatility of Flash with the high-speed and durability of DRAM. NVDIMM leverages this unique combination of semiconductor raw materials to provide fast access to critical data while protecting the data in the event system power is lost. Netlist introduced a memory channel NVDIMM in 2012 that was based on its earlier designs from 2007. The industry again took note and moved to adopt Netlist's technology. Current generation NVDIMMs offered on the market today provide data acceleration and protection for applications such as storage virtualization, RAID, cache

protection and data logging. As with LRDIMM, Netlist holds many fundamental patents covering NVDIMM architecture and key design elements.

15. Netlist has for years been the leading manufacturer of NVDIMM. Dell, for example, was an early adopter of Netlist's NVvault family of products for its high-volume PowerEdge servers and PowerVault Direct Attached Storage solutions. Other leading storage vendors such as Cisco, Nimble Storage, and Avere have designed Netlist products into their Network Attached Storage (NAS) appliances.

16. Netlist is set to change the face of the computing industry again with its recent demonstration of the world's first storage class memory (SCM) product, HybriDIMM. HybriDIMM (also referred to by its internal project name, HyperVault) sets the new standard for delivering fast, inexpensive, persistent system memory.



17. HybriDIMM combines DRAM and Flash into a single persistent memory, running at near DRAM speed but with memory capacities usually associated with traditional storage. Netlist achieved these milestones by building upon its many years of research and development and product know-how. HybriDIMM combines the power of NVvault, taking even greater advantage of the high density and persistence of Flash, with HyperCloud's distributed buffer architecture and load reduction technologies for high-speed access via the memory channel. Netlist also drew upon its broad experience and patented technology developed as part of its LRDIMM and NVDIMM efforts, such as establishing the critical timing parameters

necessary to the operation of high-performance DIMMs. Netlist's '434, '501, and '064 patents are examples of these patented technologies, as is the '837 patent. Certain of these technologies are widely used in the latest generation DIMMs available on the market today to enable high-speed operation on the memory channel, including RDIMM, LRDIMM, NVDIMM, as well as HybriDIMM.

18. Netlist recently demonstrated HybriDIMM at the premier annual event for the Flash industry, the Flash Memory Summit, which was held August 9-11, 2016, in Santa Clara, California. Netlist's press release detailing the launch of HybriDIMM is attached as Exhibit 43. Netlist is working in partnership with Samsung Electronics Co., Ltd. ("Samsung") to bring this compelling new technology to market. The HybriDIMM announcement and demonstration has been well received by major industry players and the news media, for example:

(a) Samsung Ventures America: "We are pleased to partner with Netlist, a company with a long-history of innovative memory technology solutions and intellectual property, to productize and drive broad market adoption."

(b) IDT: "Integrated Device Technology (IDT) is excited to partner with Netlist as its preferred DDR4 LRDIMM chipset supplier for their trailblazing HybriDIMM for storage class memory. The convergence of memory and storage subsystems is enabling a whole new class of applications that will adopt IDT's DDR4 LRDIMM chipset to maximize performance and bandwidth."

(c) Xilinx: "HybriDIMM is a great example of how Xilinx's software-defined and hardware optimized approach brings value to key partners, such as Netlist, who are creating innovative high performance memory solutions to accelerate data in the data center."

(d) Carnegie Mellon University: "The Netlist Storage Class Memory solution is a promising medium that will enable 'real-time' analytical database applications that go beyond what existing hardware can support today. We are excited to collaborate with Netlist and the Storage Class Memory ecosystem partners in our database research projects."

(e) Jim Handy, Objective Analysis: "The promise of SCM is to bridge the price-performance gap between DRAM and NAND. Others are attempting to cross this chasm with new proprietary materials. By combining the best attributes of widely available, proven technologies—DRAM's speed and durability with NAND's capacity, persistence and low cost—Netlist is able to deliver a cost-effective SCM product today... . The SCM market could exceed $2 billion by 2020."

(f) Chris Mellor, The Register: "Say hello to Samsung and Netlist's flash-DRAM grenade: HybriDIMM." The full article is attached as Exhibit 44.

19. Netlist and Samsung entered into a Joint Development and License Agreement ("JDLA") that was publicly announced in November 2015. Under the agreement, Samsung and Netlist agreed to a broad collaboration including a five-year joint development to produce and facilitate broad industry adoption of new SCM products such as HybriDIMM. As an important strategic partner and the undisputed leader in memory, Samsung will lend its considerable technical and marketing expertise to Netlist's SCM product efforts. The JDLA included a variety of elements designed to facilitate the joint development. For example, Samsung agreed to supply Netlist with its industry leading DRAM and Flash products which is important to the joint development effort. Samsung also secured a right of first refusal to acquire Netlist's NVDIMM-P technology (a type of storage class memory being standardized by JEDEC) in a separate, future transaction. Finally, the parties also entered into a patent cross-license to

facilitate the joint development, providing Netlist with access to Samsung's worldwide patent portfolio which includes the single largest collection of U.S. patents.

20. Netlist expects to provide customer samples of HybriDIMM by the end of 2016, and to enter high volume production in 2017.

21. The ingenuity underlying Netlist's products reflects Netlist's deep commitment to research and development. In total, Netlist has invested more than $80,000,000 in research and development since the company's inception.

22. Netlist's mission has always been to create breakthrough products that fill the performance gap between server and storage architectures and the capabilities of existing memory technologies. Netlist's early products were built on a variety of pioneering ideas from Netlist engineers that improved performance and lowered cost compared to conventional memory. Netlist quickly established itself as a creator of unique technology, and as an important supplier of high-performance server memory modules to the world's largest high-tech companies such as Dell, IBM, HP and Apple, among others. Given this track record, customers have even engaged Netlist on an exclusive basis to create custom, proprietary products to satisfy unique requirements.

23. With growing demand for its new server memory technologies, Netlist's business grew rapidly and allowed the company to conduct an initial public offering (IPO) in November 2006. Its common stock began trading on the NASDAQ Global Market under the trading symbol "NLST" on November 30, 2006.

24. Since the company's inception, Netlist has developed and sold hundreds of unique product SKUs, generating revenues in excess of $700 million. More than 75% of this revenue

resulted from the sale of high performance memory modules to global Original Equipment Manufacturers such as Dell, HP, IBM, and Apple.

25. Netlist's memory technologies are developed for applications in which high-speed, high-capacity memory, enhanced functionality, small form factor and heat dissipation are key requirements. These applications include tower servers, rack-mounted servers, blade servers, storage appliances, high-performance computing clusters, engineering workstations, and telecommunications. Netlist's expanding and innovative Flash product portfolio continues to address space constraints that occur in cloud datacenter and enterprise class servers, storage, and embedded systems. The modules are ideal for cache acceleration in tiered storage applications as well as virtualization, boot and operating system loaders. Netlist products include standard PCIe mini, mSATA Slim, and mSata mini interfaces, along with Compact Flash, miniSD, and others.

26. Netlist has continually invested in the equipment, facilities, and personnel necessary to productize the valuable results of its research and development efforts. Hundreds of dedicated professionals have contributed to Netlist's success over the years. Netlist's world-class team of engineers focuses on the original design and development of Netlist's products. Substantially all of this research and development has been conducted by Netlist's employees located in the company's headquarters in Irvine, California. Netlist's engineering and marketing teams work together with Netlist's diversified customer base to identify unmet needs in the marketplace, and then design innovative new products that meet those needs. Netlist built its own dedicated facility in Suzhou, China, where Netlist's products are manufactured and then shipped back into the United States for testing, further development and integration into customer platforms.

27. Netlist has protected its innovative solutions by, among other things, filing and procuring patents. Netlist's patent portfolio, which includes the asserted patents, consists of approximately 63 issued patents and 37 pending patent applications. Netlist's portfolio is extremely valuable and reflects years of Netlist's investment in research and development, as well as a relentless commitment to bring to market novel products in the high performance modular memory industry. These patents cover not only the core features of LRDIMM, NVDIMM, and SCM described above, but also a wide range of supporting technologies such as improvements in stacked substrates, high density module design, and thermal dissipation. The value of Netlist's portfolio has been borne out by the remarkable track record Netlist patents have achieved in third-party validity challenges before the United States Patent & Trademark Office, as described more fully in Section VIII below. Multiple Netlist patents, including three of the asserted patents, have survived the rigors of *inter partes* review (IPR), while another Netlist patent survived a years-long *inter partes* reexamination that was affirmed by the Federal Circuit.

28. Netlist uses the technologies covered by the asserted patents in the United States as described in Section IX below. In connection with the exploitation of these technologies, Netlist has made and continues to make significant investment in the United States in facilities, equipment, labor and capital, also as described in Section IX below.

29. Netlist researched and developed the technology that is protected by the asserted patents. Netlist has made and continues to make significant investment in the design and development of products protected by the asserted patents, as described in Section IX below.

B. The Proposed Respondents

30. On information and belief, proposed respondent SK hynix Inc. is a corporation organized and existing under the laws of the Republic of Korea ("Korea"), having a principal place of business at 2091, Gyeongchung-daero, Bubal-eub, Icheon-si, Gyeonggi-do, Korea. On information and belief, SK hynix Inc. is the worldwide parent corporation for the other Respondents, and is responsible either directly or indirectly through subsidiaries for the Respondents' infringing activities.

31. On information and belief, proposed respondent SK hynix America Inc. is a corporation organized and existing under the laws of California, having a principal place of business at 3101 North 1st Street, San Jose, CA 95134, United States. On information and belief, SK hynix America Inc. is a wholly owned subsidiary of SK hynix Inc. and is a United States operating company for SK hynix Inc. On information and belief, SK hynix America Inc. provides support for sales, technical, and customer/client relationship operations.

32. On information and belief, proposed respondent SK hynix memory solutions Inc. is a corporation organized and existing under the laws of California, having a principal place of business at 3103 North 1st Street, San Jose, CA 95134, United States. On information and belief, SK hynix memory solutions Inc. is a wholly owned subsidiary of SK hynix Inc. and is a United States operating company for SK hynix Inc. On information and belief, SK hynix memory solutions Inc. provides to its customers controller hardware and flash management systems and firmware for devices.

33. Respondents manufacture, import, sell for importation, sell after importation, and/or service and repair certain memory modules and components thereof, and products containing same, including the accused LRDIMM and RDIMM products. The accused products

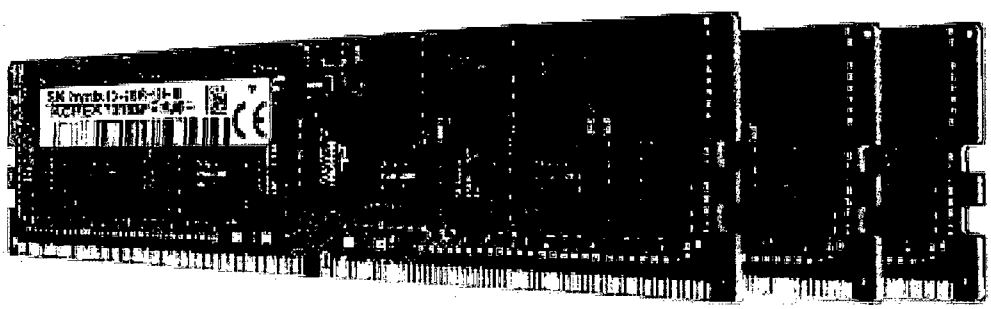
manufactured, imported and sold by the Respondents incorporate, without license, technologies developed by Netlist and protected by patents issued to and owned by Netlist.

34. Netlist accuses all Hynix DDR4 RDIMMs and LRDIMMs of infringing the asserted patent claims. The accused LRDIMM and RDIMM products include but are not limited to the exemplary modules identified in the Hynix Q3 2016 Databook attached as Exhibit 13.[1]

III. THE TECHNOLOGY AND PRODUCTS AT ISSUE

A. The Patented Technologies

35. The technologies at issue relate generally to memory modules and components thereof, and products containing same, imported into and sold within the United States by or on behalf of Respondents. The technologies disclosed and claimed in the asserted patents relate generally to memory modules. Generally speaking, a memory module is a circuit board that contains DRAM integrated circuits that is installed into the memory slot on a computer motherboard. An example of a Hynix LRDIMM memory module is included below:



[1] The products identified in this Complaint and/or in Exhibit 13 are exemplary only and are not intended to exclusively define or otherwise limit the category of accused products. Netlist may, if necessary, amend or modify the descriptions in this Complaint, or add additional exemplary products, as discovery progresses.

36. The '364 and the '185 patents relate to memory modules of a computer system, and more specifically to devices and methods for improving the performance, the memory capacity, or both, of memory modules such as DIMMs. The '434, the '501, and the '064 patents relate to self-testing electronic memory modules. The '837 patent relates to memory modules that perform handshaking during or upon completion of initialization.

B. RDIMM And LRDIMM

37. Server memory modules historically have been standardized by the standard-setting body for the microelectronics industry, JEDEC (Joint Electron Device Engineering Council). RDIMM is a JEDEC-standard memory module, which was first standardized in the mid-1990s. RDIMM accounted for more than 95 percent of all server memory modules shipped worldwide in 2011. Despite its longevity and prevalence, standard RDIMM has become increasingly unable to keep pace with the higher performance requirements of high-end servers.

38. LRDIMM is a different type of memory module also based on a JEDEC standard. JEDEC has not yet approved a final version of the DDR4 LRDIMM standard, though DDR4 products are widely available on the market today that are compliant with draft versions of the standards being considered by JEDEC.

39. The JEDEC RDIMM and LRDIMM memory module standards each delineate common electrical protocols and electrical and mechanical interfaces for memory modules built to implement the standards. But the JEDEC standards do not limit how each manufacturer designs or implements components of the product to conform to the standardized input and output of the memory module.

40. On or about November 22, 2010, Netlist submitted License Assurance/Disclosure Forms identifying the JEDEC LRDIMM standard for several Netlist patents and patent

applications (including Netlist's U.S. Patent Nos. 7,289,386 and 7,619,912 patents, which are parent patents to the '364 patent; U.S. Patent Application No. 12/577,682, which later issued as one of the parent patents to the '364 patent; and U.S. Patent Application No. 12/761,179, which later issued as the '185 patent).

41. On or about September 7, 2011, Netlist submitted License Assurance/Disclosure Forms for several Netlist patents and patent applications to the JC40 (Digital Logic) committee (including Netlist's U.S. Patent Nos. 7,289,386 and 7,619,912 patents, which are parent patents to the '364 patent; U.S. Patent Application No. 12/577,682, which later issued as one of the parent patents to the '364 patent; and U.S. Patent Application No. 12/761,179, which later issued as the '185 patent).

42. On or about April 7, 2016, Netlist submitted License Assurance/Disclosure Forms identifying the JEDEC DDR4 LRDIMM components (RCD&DB) protocol and functionality module, DDR4 RDIMM RCD, DDR4 LRDIMM, and DDR4 RDIMM standards for several Netlist patents and patent applications (including Netlist's '837 patent).

43. On or about April 7, 2016, Netlist submitted License Assurance/Disclosure Forms identifying the JECEC DDR4 LRDIMM components (RCD&DB) protocol and functionality module, DDR4 High Bandwidth Memory DRAM and DDR4 LRDIMM standards for several Netlist patents and patent applications (including Netlist's '434 patent, which is a parent patent to the '501 and '064 patents).

44. Netlist has in all respects acted in a manner consistent with the JEDEC Patent Policy, as set forth in the JEDEC Manual of Organization and Procedure, which states in relevant part that "[a] license will be offered, to applicants desiring to utilize the license for the purpose of

implementing the JEDEC Standard under reasonable terms and conditions that are free of any unfair discrimination... ."

45. Netlist contacted Hynix last year regarding its need for a license to Netlist's patent portfolio and has since been negotiating in good faith to reach a resolution. In the course of these negotiations, Netlist offered to license the asserted patents to Hynix on reasonable terms that are free of any unfair discrimination months before bringing this action. Hynix, however, has from the beginning taken unreasonable positions and refused to attribute any meaningful value to Netlist's fundamental patent portfolio. As a result, the parties have made no progress towards resolution despite months of substantive exchanges and negotiation.

46. Netlist's experiences in this regard are unfortunately consistent with its prior negotiations with Hynix. Netlist has entered into discussions with Hynix twice since 2012 to explore potential business arrangements wherein the companies would work in partnership to bring cutting-edge products to market. Hynix ultimately walked away in each instance after months of negotiation.

47. In September 2012, Netlist made a detailed, formal proposal to Hynix for a high performance memory partnership related to Netlist's HyperCloud product. This proposal included joint product development, component supply and an equity investment. The proposal also included an offer to license Netlist's patents to Hynix. As part of the due diligence process, a team of Hynix attorneys traveled to Netlist's headquarters in Irvine, California and conducted an in-depth review of Netlist's patent portfolio in early 2013. The discussions around a joint product development continued for several months before Hynix walked away without concluding a deal.

48. In 2014 and 2015, Netlist entered into discussions with several candidate companies including Hynix and Samsung to partner with Netlist on its HybriDIMM product (referred to as HyperVault at that time). In October 2014, Netlist's CEO and executive team visited Korea and met with Hynix executives to kick off the discussions. Netlist made several proposals to Hynix during the negotiations for a broad partnership that combined the strength of both companies to address the emerging multi-billion dollar market for storage class memory. Netlist's proposals included joint product development, co-marketing, supply of DRAM and flash, exclusive manufacturing rights, patent licensing, and an investment by Hynix in Netlist. In April 2015, after months of negotiations and the exchange of draft terms, Hynix again terminated the negotiations. Samsung approached Netlist after the Hynix negotiations ended and began discussions that ultimately culminated in Netlist entering into the JDLA with Samsung in November 2015.

49. As discussed above, Netlist again renewed negotiations with Hynix in December 2015 by offering to license Netlist's patent portfolio. During this process, Netlist identified each of the asserted patents and provided Hynix with detailed claim charts describing how Hynix's RDIMM and LRDIMM products practice the claims of the asserted patents, among others. On multiple occasions, Netlist employees traveled to Korea to discuss Netlist's offer to license Netlist's patent portfolio related to RDIMM and LRDIMM.

50. In June 2016, consistent with its obligations to JEDEC, Netlist sent Hynix a formal letter outlining Netlist's offer to license Netlist's patent portfolio for DDR4 RDIMMs and LRDIMMs on reasonable terms and conditions that are free of any unfair discrimination. Netlist again identified the asserted patents, and informed Hynix that Hynix DDR4 RDIMMs and

LRDIMMs practice the asserted patents. Hynix did not accept Netlist's reasonable, good-faith offer.

51. In sum, Netlist has tried for years to reach agreement with Hynix, whether in the context of a broader business arrangement that would have resolved Hynix's liability under Netlist's portfolio or even in negotiations focused solely on a straightforward patent license. All efforts have been met with Hynix's intransigence. Hynix has chosen instead to take Netlist's intellectual property without any compensation to Netlist. Hynix has therefore not fulfilled its obligations to remain a third-party beneficiary of the contract between Netlist and JEDEC. Netlist is now forced to protect its intellectual property rights through an exclusion order directed to the accused products.

IV. THE ASSERTED PATENTS AND NON-TECHNICAL DESCRIPTIONS OF THE INVENTIONS.

A. Overview And Ownership Of The Asserted Patents.

52. As set forth below, Netlist owns by assignment the entire right, title and interest in and to each of the asserted patents. *See* Exhibits 7 to 12.

53. Pursuant to Commission Rule 210.12(c), certified copies of the prosecution histories of each of the asserted patents have been submitted with this Complaint as Appendices A to F. Pursuant to Commission Rule 210.12(c), the cited references for each of the asserted patents also have been submitted with this Complaint as Appendices G to L.[2]

[2] Netlist has been unable to locate a few cited references for the asserted patents, but is continuing work to locate those references and will provide them as soon as possible.

B. Non-Technical Description Of The '364 Patent.[3]

54. The '364 patent, entitled "Multirank DDR Memory Modual With Load Reduction," issued on June 17, 2014 to inventors Jeffrey C. Solomon and Jayesh R. Bhakta. The '364 patent issued from United States Patent Application No. 13/287,042 filed on November 1, 2011. Netlist owns by assignment the entire right, title and interest in and to the '364 patent.

55. The '364 patent has 32 claims, three independent claims and 29 dependent claims.

56. In non-technical terms, the '364 patent discloses and claims a memory module that can be used in a host computer system such as a server, that provides improved performance by isolating the host computer system from the load associated with memory devices (e.g., DRAM) in the memory module. The more load that is placed on the host computer system by attached memory modules, the slower the host computer system must run when accessing the memory modules. The claimed memory module provides load isolation which reduces the load seen by the host, allowing more memory modules to be used in the same host computer without slowing the host computer system, or allowing the host computer to operate at faster speeds using the same number of memory modules. Load isolation as disclosed and claimed in the '364 patent is a critical feature that distinguishes LRDIMM from conventional RDIMM. The claimed memory module has at least two groups, called ranks, of memory devices. The memory module also includes a logic element that selectively enables data communications between the host computer system and a memory device in one of the ranks while isolating a load associated with a memory device in the other rank or ranks. The logic element is also controlled to selectively

[3] This description and any other non-technical descriptions in this Complaint are for illustrative purposes only. Nothing in any non-technical description contained within this Complaint is intended to, either implicitly or explicitly, express any position regarding the proper construction of any claim of the asserted patents.

enable data communication according to a latency value based on a previous memory command from the host computer.

C. Non-Technical Description Of The '185 Patent

57. The '185 patent, entitled "System and method utilizing distributed byte-wise buffers on a memory module," issued to inventors Dr. Hyun Lee and Jayesh R. Bhakta on August 20, 2013. The '185 patent issued from Application No. 12/761,179, filed on April 15, 2010. Netlist owns by assignment the entire right, title and interest in and to the '185 patent.

58. The '185 patent has 19 claims, two independent claims and 17 dependent claims.

59. In non-technical terms, the '185 patent discloses and claims a memory module with a distributed buffer architecture. The claimed distributed buffer architecture includes a plurality of buffer circuits that buffer data signals exchanged between the host computer system and the memory devices in the memory module. These buffers act to selectively allow data transmission between the host computer system and certain of the memory devices while selectively isolating other memory devices on the memory module. As disclosed and claimed in the '185 patent, these buffer circuits include at least one write buffer and at least one read buffer and are positioned on the memory module separate from one another, such as distributed along the edge of the memory module. This separation of the buffer circuits allows for improved performance as compared to the performance that could be achieved with all data signal buffering performed in a central location. The distributed buffer architecture provides various advantages over prior art architectures, including higher speed operation.

D. Non-Technical Description Of The '434 Patent

60. The '434 patent, entitled "Memory board with self-testing capability," issued to inventors Dr. Hyun Lee, Jayesh R. Bhakta and Soonju Choi on August 16, 2011. The '434

patent issued from Application No. 12/422,925, filed on April 13, 2009. Netlist owns by assignment the entire right, title and interest in and to the '434 patent.

61. The '434 patent has 35 claims, three independent claims and 32 dependent claims.

62. In non-technical terms, the '434 patent discloses and claims a self-testing memory module that can be used in a host computer system such as a server. When the memory module is attached to the host system, testing is performed at the memory module by writing data to a memory device and reading it back to determine whether the data was written correctly. For this testing, the claimed memory module generates address signals, control signals, and data at components on the memory module rather than the host memory controller, thereby reducing the specialized operations required by the host controller for testing.

E. Non-Technical Description Of The '501 Patent

63. The '501 patent, entitled "Memory board with self-testing capability," issued to inventors Dr. Hyun Lee, Jayesh R. Bhakta and Soonju Choi on January 22, 2013. The '501 patent issued from Application No. 13/183,253, filed on July 14, 2011, which claims priority as a continuation of Application No. 12/422,925, which issued as the '434 patent. Netlist owns by assignment the entire right, title and interest in and to the '501 patent.

64. The '501 patent has 20 claims, two independent claims and 18 dependent claims.

65. As described above with respect to the '434 patent, the '501 patent discloses various self-test technologies to test the memory module. To perform testing of memory chips on the memory module, the claimed memory module includes components that generate address signals, control signals, and data at the memory module.

F. Non-Technical Description Of The '064 Patent

66. The '064 patent, entitled "Apparatus and method for self-test in a multi-rank memory module," issued to inventors Dr. Hyun Lee, Jayesh R. Bhakta and Soonju Choi on April 1, 2014. The '064 patent issued from Application No. 13/745,790, filed on January 19, 2013, which claims priority as a continuation of Application No. 13/183,253, which issued as the '501 patent, which claims priority as a continuation of Application No. 12/422,925, which issued as the '434 patent. Netlist owns by assignment the entire right, title and interest in and to the '064 patent.

67. The '064 patent has 20 claims, three independent claims and 17 dependent claims.

68. As described above with respect to the '434 and '501 patents, the '064 patent discloses various self-test technologies to test the memory module. To perform testing of memory chips on the memory module, the claimed memory module includes components that generate address signals, control signals, and data at the memory module. The memory module obtains results of the memory tests by reading from the memory chips and comparing the read data to the test data.

G. Non-Technical Description Of The '837 Patent

69. The '837 patent, entitled "Systems and methods for handshaking with a memory module," issued to inventor Dr. Hyun Lee on July 16, 2013. The '837 patent issued from Application No. 12/815,339, filed on June 14, 2010. Netlist owns by assignment the entire right, title and interest in and to the '837 patent.

70. The '837 patent has 18 claims, three independent claims and 15 dependent claims.

71. In non-technical terms, the '837 patent discloses and claims a memory module that performs handshaking during or upon completion of initialization. Establishing the proper

timing for memory modules is very important and particularly challenging given the speed of the memory channel. This includes the timing between the host memory controller and the memory module. The '837 patent discloses and claims various handshaking technologies that are particularly effective when setting the proper phase relationships between the system clock and the address, command, and control signals. These phase relationships must be set properly for the DIMM to operate—otherwise, the memory module is not able to receive address, command, and control signals from the host memory controller. According to certain aspects of the '837 patent, a memory module can operate in at least two modes, including an initialization mode during which the memory module executes at least one initialization sequence and an operational mode. The claimed memory module includes a notification circuit that provides at least one notification signal to the memory controller indicating a status of the initialization sequence while the memory module is in the initialization mode. This notification signal eliminates the need for the host memory controller to poll the memory module to determine when the memory module has completed an initialization sequence.

H. Foreign Counterparts

72. A list of foreign counterparts to the asserted patents is provided as Exhibit 14. Netlist owns all right, title and interest in and to each of these foreign counterparts.

73. Netlist is not aware of any other counterparts or foreign counterpart applications corresponding to the asserted patents that have been issued, abandoned, denied, or which remain pending.

I. Licenses

74. Exhibit 15 includes a list of licensed entities for the asserted patents. On information and belief there are no other current licenses involving the asserted patents.

V. UNLAWFUL AND UNFAIR ACTS OF RESPONDENTS—PATENT INFRINGEMENT

75. Respondents manufacture abroad, sell for importation into the United States, import into the United States, and/or sell within the United States after importation, memory modules and components thereof, including accused LRDIMM and RDIMM products, and products containing same, that infringe one or more of the asserted patents.

76. Each of the Respondents has directly infringed and continues to directly infringe the asserted patents by making, using, selling, offering for sale, and importing the articles claimed by, or practicing the claimed methods of, the asserted patents. As discussed above, on information and belief, each of the Respondents has been aware of the asserted patents since at least January 2016 when Netlist presented to the Respondents detailed claim charts related to each of the asserted patents.

77. On information and belief, each of the Respondents has indirectly infringed and continues to indirectly infringe the asserted patents by contributing to and/or inducing the infringement of these patents by end users of the accused products, because each of the Respondents knows that the use of the infringing memory modules and components thereof, and products containing same, together with instructions provided in user manuals, service manuals, guides and other materials, constitutes infringement of the asserted patents.

A. The '364 Patent

78. On information and belief, the accused LRDIMM products and/or the normal operation thereof infringes at least claims 1, 2, 3, 4, 6, 7, 10, 13, 17 and 23 of the '364 patent. Additionally, on information and belief, users making routine use of the accused LRDIMM products infringe at least claims 1, 2, 3, 4, 6, 7, 10, 13, 17 and 23 of the '364 patent. On information and belief, as set forth in paragraph 76 above, each of the Respondents has been aware of the '364 patent since at least January 2016. Further, on information and belief, each of the Respondents was aware that the accused LRDIMM products infringe at least claims 1, 2, 3, 4, 6, 7, 10, 13, 17 and 23 of the '364 patent, and was aware that users making routine use of the accused LRDIMM products infringe those claims. On information and belief, each of the Respondents specifically intended that users of the accused LRDIMM products infringe at least claims 1, 2, 3, 4, 6, 7, 10, 13, 17 and 23 of the '364 patent, and took actions while the '364 patent was in force intending to cause the infringing acts, including the infringing routine use of the accused LRDIMM products by users. For example, on information and belief, Respondents provide specifications, datasheets, instruction manuals, and/or other materials that encourage and facilitate infringing use of the accused LRDIMM products by users with the intent of inducing infringement. *See, e.g.*, Exhibits 16-18. On information and belief, each of the Respondents contributes to the direct infringement of at least claims 1, 2, 3, 4, 6, 7, 10, 13, 17 and 23 of the '364 patent, including the infringing routine use of the accused LRDIMM products by users. On information and belief, Respondents have sold, offered for sale and/or imported within the United States the accused LRDIMM products for use in a product or process that practices those claims, while the '364 patent was in force. On information and belief, the accused LRDIMM products have no substantial noninfringing use, and constitute a material part of the patented invention. On information and belief, each of the Respondents is aware that the product or

process that includes the accused LRDIMM products may be covered by a claim of the '364 patent or may satisfy a claim of the '364 patent under the doctrine of equivalents. On information and belief, the use of the product or process that includes the accused LRDIMM products infringes at least claims 1, 2, 3, 4, 6, 7, 10, 13, 17 and 23 of the '364 patent.

79. An exemplary claim chart comparing the asserted independent claims of the '364 patent to an exemplary one of the accused LRDIMM products (part number HMA84GL7AMR4N-TF) is attached as Exhibit 19.

B. The '185 Patent

80. On information and belief, the accused LRDIMM products and/or the normal operation thereof infringes at least claims 1, 2, 3, 7, 8, 10, 11 and 12 of the '185 patent. Additionally, on information and belief, users making routine use of the accused LRDIMM products infringe at least claims 1, 2, 3, 7, 8, 10, 11 and 12 of the '185 patent. On information and belief, as set forth in paragraph 76 above, each of the Respondents has been aware of the '185 patent since at least January 2016. Further, on information and belief, each of the Respondents was aware that the accused LRDIMM products infringe at least claims 1, 2, 3, 7, 8, 10, 11 and 12 of the '185 patent, and was aware that users making routine use of the accused LRDIMM products infringe those claims. On information and belief, each of the Respondents specifically intended that users of the accused LRDIMM products infringe at least claims 1, 2, 3, 7, 8, 10, 11 and 12 of the '185 patent, and took actions while the '185 patent was in force intending to cause the infringing acts, including the infringing routine use of the accused LRDIMM products by users. For example, on information and belief, Respondents provide specifications, datasheets, instruction manuals, and/or other materials that encourage and facilitate infringing use of the accused LRDIMM products by users with the intent of inducing

infringement. *See, e.g.*, Exhibits 16-18. On information and belief, each of the Respondents contributes to the direct infringement of at least claims 1, 2, 3, 7, 8, 10, 11 and 12 of the '185 patent by users making routine use of the accused LRDIMM products. On information and belief, Respondents have sold, offered for sale and/or imported within the United States the accused LRDIMM products for use in a product or process that practices those claims, while the '185 patent was in force. On information and belief, the accused LRDIMM products have no substantial noninfringing use, and constitute a material part of the patented invention. On information and belief, each of the Respondents is aware that the product or process that includes the accused LRDIMM products may be covered by a claim of the '185 patent or may satisfy a claim of the '185 patent under the doctrine of equivalents. On information and belief, the use of the product or process that includes the accused LRDIMM products infringes at least claims 1, 2, 3, 7, 8, 10, 11 and 12 of the '185 patent.

81. An exemplary claim chart comparing the asserted independent claim of the '185 patent to an exemplary one of the accused LRDIMM products (part number HMA84GL7AMR4N-TF AB (32GB DDR4 LRDIMM)) is attached as Exhibit 20.

C. The '434 Patent

82. On information and belief, the accused LRDIMM products and/or the normal operation thereof infringes at least claims 2, 3, 4, 5, 6 and 7 of the '434 patent. Additionally, on information and belief, users making routine use of the accused LRDIMM products infringe at least claims 2, 3, 4, 5, 6 and 7 of the '434 patent. On information and belief, as set forth in paragraph 76 above, each of the Respondents has been aware of the '434 patent since at least January 2016. Further, on information and belief, each of the Respondents was aware that the accused LRDIMM products infringe at least claims 2, 3, 4, 5, 6 and 7 of the '434 patent, and was

aware that users making routine use of the accused LRDIMM products infringe those claims. On information and belief, each of the Respondents specifically intended that users of the accused LRDIMM products infringe at least claims 2, 3, 4, 5, 6 and 7 of the '434 patent, and took actions while the '434 patent was in force intending to cause the infringing acts, including the infringing routine use of the accused LRDIMM products by users. For example, on information and belief, Respondents provide specifications, datasheets, instruction manuals, and/or other materials that encourage and facilitate infringing use of the accused LRDIMM products by users with the intent of inducing infringement. *See, e.g.*, Exhibits 16-18. On information and belief, each of the Respondents contributes to the direct infringement of at least claims 2, 3, 4, 5, 6 and 7 of the '434 patent, including the infringing routine use of the accused LRDIMM products by users. On information and belief, Respondents have sold, offered for sale and/or imported within the United States the accused LRDIMM products for use in a product or process that practices those claims, while the '434 patent was in force. On information and belief, the accused LRDIMM products have no substantial noninfringing use, and constitute a material part of the patented invention. On information and belief, each of the Respondents is aware that the product or process that includes the accused LRDIMM products may be covered by a claim of the '434 patent or may satisfy a claim of the '434 patent under the doctrine of equivalents. On information and belief, the use of the product or process that includes the accused LRDIMM products infringes at least claims 2, 3, 4, 5, 6 and 7 of the '434 patent.

83. An exemplary claim chart comparing the asserted claims of the '434 patent to an exemplary one of the accused LRDIMM products (part number HMA84GL7AMR4N-TF AB (32GB DDR4 LRDIMM)) is attached as Exhibit 21.

D. The '501 Patent

84. On information and belief, the accused LRDIMM products and/or the normal operation thereof infringes at least claim 4 of the '501 patent. Additionally, on information and belief, users making routine use of the accused LRDIMM products infringe at least claim 4 of the '501 patent. On information and belief, as set forth in paragraph 76 above, each of the Respondents has been aware of the '501 patent since at least January 2016. Further, on information and belief, each of the Respondents was aware that the accused LRDIMM products infringe at least claim 4 of the '501 patent, and was aware that users making routine use of the accused LRDIMM products infringe that claim. On information and belief, each of the Respondents specifically intended that users of the accused LRDIMM products infringe at least claim 4 of the '501 patent, and took actions while the '501 patent was in force intending to cause the infringing acts, including the infringing routine use of the accused LRDIMM products by users. For example, on information and belief, Respondents provide specifications, datasheets, instruction manuals, and/or other materials that encourage and facilitate infringing use of the accused LRDIMM products by users with the intent of inducing infringement. *See, e.g.*, Exhibits 16-18. On information and belief, each of the Respondents contributes to the direct infringement of at least claim 4 of the '501 patent, including the infringing routine use of the accused LRDIMM products by users. On information and belief, Respondents have sold, offered for sale and/or imported within the United States the accused LRDIMM products for use in a product or process that practices that claim, while the '501 patent was in force. On information and belief, the accused LRDIMM products have no substantial noninfringing use, and constitute a material part of the patented invention. On information and belief, each of the Respondents is aware that the product or process that includes the accused LRDIMM products may be covered by a claim of the '501 patent or may satisfy a claim of the '501 patent under the doctrine of equivalents. On

information and belief, the use of the product or process that includes the accused LRDIMM products infringes at least claim 4 of the '501 patent.

85. An exemplary claim chart comparing the asserted claim of the '501 patent to an exemplary one of the accused LRDIMM products (part number HMA84GL7AMR4N-TF AB (32GB DDR4 LRDIMM)) is attached as Exhibit 22.

E. The '064 Patent

86. On information and belief, the accused LRDIMM products and/or the normal operation thereof infringes at least claim 16 of the '064 patent. Additionally, on information and belief, users making routine use of the accused LRDIMM products infringe at least claim 16 of the '064 patent. On information and belief, as set forth in paragraph 76 above, each of the Respondents has been aware of the '064 patent since at least January 2016. Further, on information and belief, each of the Respondents was aware that the accused LRDIMM products infringe at least claim 16 of the '064 patent, and was aware that users making routine use of the accused LRDIMM products infringe that claim. On information and belief, each of the Respondents specifically intended that users of the accused LRDIMM products infringe at least claim 16 of the '064 patent, and took actions while the '064 patent was in force intending to cause the infringing acts, including the infringing routine use of the accused LRDIMM products by users. For example, on information and belief, Respondents provide specifications, datasheets, instruction manuals, and/or other materials that encourage and facilitate infringing use of the accused LRDIMM products by users with the intent of inducing infringement. *See, e.g.*, Exhibits 16-18. On information and belief, each of the Respondents contributes to the direct infringement of at least claim 16 of the '064 patent, including the infringing routine use of the accused LRDIMM products by users. On information and belief, Respondents have sold, offered

for sale and/or imported within the United States the accused LRDIMM products for use in a product or process that practices that claim, while the '064 patent was in force. On information and belief, the accused LRDIMM products have no substantial noninfringing use, and constitute a material part of the patented invention. On information and belief, each of the Respondents is aware that the product or process that includes the accused LRDIMM products may be covered by a claim of the '064 patent or may satisfy a claim of the '064 patent under the doctrine of equivalents. On information and belief, the use of the product or process that includes the accused LRDIMM products infringes at least claim 16 of the '064 patent.

87. An exemplary claim chart comparing the asserted independent claim of the '064 patent to an exemplary one of the accused LRDIMM products (part number HMA84GL7AMR4N-TF AB (32GB DDR4 LRDIMM)) is attached as Exhibit 23.

F. The '837 Patent

88. On information and belief, the accused LRDIMM and RDIMM products and/or the normal operation thereof infringes at least claims 1, 2, 3, 5 and 6 of the '837 patent. Additionally, on information and belief, users making routine use of the accused LRDIMM and RDIMM products infringe at least claims 1, 2, 3, 5 and 6 of the '837 patent. On information and belief, as set forth in paragraph 76 above, each of the Respondents has been aware of the '837 patent since at least January 2016. Further, on information and belief, each of the Respondents was aware that the accused LRDIMM and RDIMM products infringe at least claims 1, 2, 3, 5 and 6 of the '837 patent, and was aware that users making routine use of the accused LRDIMM and RDIMM products infringe those claims. On information and belief, each of the Respondents specifically intended that users of the accused LRDIMM and RDIMM products infringe at least claims 1, 2, 3, 5 and 6 of the '837 patent, and took actions while the '837 patent was in force

intending to cause the infringing acts, including the infringing routine use of the accused LRDIMM and RDIMM products by users. For example, on information and belief, Respondents provide specifications, datasheets, instruction manuals, and/or other materials that encourage and facilitate infringing use of the accused LRDIMM and RDIMM products by users with the intent of inducing infringement. *See, e.g.*, Exhibits 16-18. On information and belief, each of the Respondents contributes to the direct infringement of at least claims 1, 2, 3, 5 and 6 of the '837 patent, including the infringing routine use of the accused LRDIMM and RDIMM products by users. On information and belief, Respondents have sold, offered for sale and/or imported within the United States the accused LRDIMM and RDIMM products for use in a product or process that practices those claims, while the '837 patent was in force. On information and belief, the accused LRDIMM and RDIMM products have no substantial noninfringing use, and constitute a material part of the patented invention. On information and belief, each of the Respondents is aware that the product or process that includes the accused LRDIMM and RDIMM products may be covered by a claim of the '837 patent or may satisfy a claim of the '837 patent under the doctrine of equivalents. On information and belief, the use of the product or process that includes the accused LRDIMM and RDIMM products infringes at least claims 1, 2, 3, 5 and 6 of the '837 patent.

89. An exemplary claim chart comparing the asserted independent claim of the '837 patent to exemplary accused LRDIMM and RDIMM products (part number HMA84GL7AMR4N-TF AB (32GB DDR4 LRDIMM) and part number HMA84GR7MFR4N-TF TD BA (32GB DDR4 RDIMM)) is attached as Exhibit 24.

VI. SPECIFIC INSTANCES OF UNFAIR IMPORTATION AND SALE

90. Respondents import, sell for importation and/or sell within the United States after importation the infringing articles. The specific instances of importation of infringing articles set forth below are representative examples of Respondents' unlawful importation of infringing articles.

91. An exemplary accused product, the Hynix DDR4 LRDIMM, part number HMA84GL7AMR4N-TF,[4] was sold in the United States on or around March 8, 2016. The receipt for this purchase is attached as Exhibit 25. According to the product packaging/labels, the Hynix DDR4 LRDIMM, part number HMA84GL7AMR4N-TF was manufactured in Korea. *See* Exhibit 26. Thus, the Hynix DDR4 LRDIMM, part number HMA84GL7AMR4N-TF, is imported into the United States.

92. Another exemplary accused product, the Hynix DDR4 RDIMM, part number HMA84GR7MFR4N-TF,[5] was sold in the United States on or around February 10, 2016. The receipt for this purchase is attached as Exhibit 27. According to the product packaging/labels, the Hynix DDR4 RDIMM, part number HMA84GR7MFR4N-TF was manufactured in Korea. *See* Exhibit 28. Thus, the Hynix DDR4 RDIMM, part number HMA84GR7MFR4N-TF is imported into the United States.

VII. HARMONIZED TARIFF SCHEDULE ITEM NUMBERS

93. On information and belief, the accused products fall within at least the following classification of the Harmonized Tariff Schedule ("HTS") of the United States: 8473.30.11.40.

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[4] Netlist has provided an exemplary Hynix DDR4 LRDIMM as a physical exhibit to its complaint (see Physical Exhibit 45).

[5] Netlist has provided an exemplary Hynix DDR4 RDIMM as a physical exhibit to its complaint (see Physical Exhibit 46).

The HTS number is intended to be for illustration only and is not exhaustive of the products accused of infringement in this Complaint. The HTS number is not intended to limit the scope of the Investigation.

VIII. RELATED LITIGATION

94. The '185, the '434 and the '501 patents were the subject of a complaint filed by Netlist on August 23, 2013, in *Netlist, Inc. v. Smart Modular Technologies, Inc.*, Civil Action 4:13-cv-05889, pending in the Northern District of California. On February 12, 2014, Netlist's claims against Smart Modular were dismissed pursuant to a stipulation based on Smart Modular's sworn statement that "SMART Modular does not and has not manufactured, used, sold, offered to sell, or imported the ULLtraDIMM storage product" and that "SMART Modular did not direct, finance, or otherwise participate in the development or production of the ULLtraDIMM line of products." The case was consolidated with *Diablo Technologies, Inc. v. Netlist, Inc.*, Civil Action 4:13-cv-03901 on April 8, 2014. On April 9, 2015, the district court granted a motion to stay the case pending *inter partes* review. The case is stayed.

95. The '185, the '434 and the '501 patents were also the subject of a declaratory judgment complaint filed by Smart Modular Technologies, Inc. on August 23, 2013, in *Smart Modular Technologies, Inc. v. Netlist, Inc.*, Civil Action 4:13-cv-03916, previously pending in the Northern District of California. The case was dismissed on February 12, 2014, based on Smart Modular's sworn statement that "SMART Modular does not and has not manufactured, used, sold, offered to sell, or imported the ULLtraDIMM storage product" and that "SMART Modular did not direct, finance, or otherwise participate in the development or production of the ULLtraDIMM line of products."

96. The '185, the '434 and the '501 patents were also the subject of a declaratory judgment complaint filed by Diablo Technologies, Inc. on August 23, 2013, in *Diablo Technologies, Inc. v. Netlist, Inc.*, Civil Action 4:13-cv-03901, previously pending in the Northern District of California. The case was consolidated with *Netlist, Inc. v. Smart Modular Technologies, Inc.*, Civil Action 4:13-cv-05889 on April 8, 2014, which is stayed.

97. The '185 patent was also the subject of a petition for *inter partes* review filed by SanDisk Corporation on June 24, 2014, in *SanDisk Corporation v. Netlist, Inc.*, Case IPR 2014-01029, previously pending before the USPTO Patent Trial and Appeal Board ("PTAB"). On December 16, 2014, the PTAB issued a decision denying institution of *inter partes* review.

98. The '185 patent was also the subject of a petition for *inter partes* review filed by Smart Modular Technologies, Inc. on August 23, 2014, in *Smart Modular Technologies, Inc. v. Netlist, Inc.*, Case IPR 2014-01369, previously pending before the PTAB. On March 9, 2015, the PTAB issued a decision denying institution of *inter partes* review.

99. The '434 patent was also the subject of a petition for *inter partes* review filed by Smart Modular Technologies, Inc. on August 23, 2014, in *Smart Modular Technologies, Inc. v. Netlist, Inc.*, Case IPR 2014-01373, previously pending before the PTAB. On March 13, 2015, the PTAB issued a decision denying institution of *inter partes* review.

100. The '434 patent was also the subject of another petition for *inter partes* review filed by Smart Modular Technologies, Inc. on August 23, 2014, in *Smart Modular Technologies, Inc. v. Netlist, Inc.*, Case IPR 2014-01372, previously pending before the PTAB. On March 9, 2016, the PTAB issued a final written decision finding that 13 claims of the '434 patent were not unpatentable.

101. The '434 patent was also the subject of another petition for *inter partes* review filed by SanDisk Corporation on June 18, 2014, in *SanDisk Corporation v. Netlist, Inc.*, Case IPR 2014-00970, previously pending before the PTAB. On December 16, 2014, the PTAB issued a decision declining to institute *inter partes* review as to 3 claims of the '434 patent, and instituting *inter partes* review as to 32 claims of the '434 patent. On December 14, 2015, the PTAB issued a final written decision finding 14 claims of the '434 patent were not unpatentable and 18 claims of the '434 patent were unpatentable.

102. The '501 patent was also the subject of a petition for *inter partes* review filed by SanDisk Corporation on June 18, 2014, in *SanDisk Corporation v. Netlist, Inc.*, Case IPR2014-00971, previously pending before the PTAB. On April 27, 2016, the PTAB issued a final written decision finding 1 claim of the '501 patent was not unpatentable and 19 claims of the '501 patent were unpatentable.

103. The '501 patent was also the subject of another petition for *inter partes* review filed by Smart Modular Technologies, Inc. on August 23, 2014, in *Smart Modular Technologies, Inc. v. Netlist, Inc.*, Case IPR 2014-01375, previously pending before the PTAB. On March 13, 2015, the PTAB issued a decision denying institution of *inter partes* review.

104. The '501 patent was also the subject of another petition for *inter partes* review filed by Smart Modular Technologies, Inc. on August 23, 2014, in *Smart Modular Technologies, Inc. v. Netlist, Inc.*, Case IPR 2014-01374, previously pending before the PTAB. On April 27, 2016, the PTAB issued a final written decision finding that 13 claims of the '501 patent were not unpatentable.

105. The alleged unfair methods of competition and unfair acts, and the subject matter thereof, have not been the subject of any other court or agency litigation.

IX. THE DOMESTIC INDUSTRY

106. There is a domestic industry established, as defined under 19 U.S.C. § 1337(a)(3)(A), (B), and (C), comprising significant and substantial investments in physical operations, employment of labor and capital and exploitation of each of the asserted patents. Alternatively, a domestic industry, as required by 19 U.S.C. §§ 1337(a)(2) and (3), is in the process of being established relating to Netlist products protected by each of the asserted patents.

A. Netlist's Practice Of The Asserted Patents

107. Netlist makes extensive use of the asserted patents in several different products. Netlist currently makes and sells high-performance memory modules. Netlist's high-performance memory modules practice one or more claims of the asserted patents. In particular, Netlist's HyperCloud and HybriDIMM memory module products[6] practice at least claim 1 of the '364 patent, claim 1 of the '185 patent, claim 2 of the '434 patent, claim 4 of the '501 patent, and claim 16 of the '064 patent. In addition, Netlist's HybriDIMM products practice at least claim 1 of the '837 patent. Specific examples of use are described in this section, below, and are charted in Exhibits 29C through 39C.

108. The '364 patent is practiced by Netlist's memory module products, including the HyperCloud and HybriDIMM products. A claim chart comparing Netlist's HyperCloud product to exemplary claim 1 of the '364 patent is attached as Confidential Exhibit 29C. A claim chart comparing Netlist's HybriDIMM product to exemplary claim 1 of the '364 patent is attached as Confidential Exhibit 30C.

[6] Netlist has provided exemplary HyperCloud and HybriDIMM memory modules as physical exhibits to its complaint (see Physical Exhibits 47 and 48).

109. The '185 patent is practiced by Netlist's memory module products, including the HyperCloud and HybriDIMM products. A claim chart comparing Netlist's HyperCloud product to exemplary claim 1 of the '185 patent is attached as Confidential Exhibit 31C. A claim chart comparing Netlist's HybriDIMM product to exemplary claim 1 of the '185 patent is attached as Confidential Exhibit 32C.

110. The '434 patent is practiced by Netlist's memory module products, including the HyperCloud and HybriDIMM products. A claim chart comparing Netlist's HyperCloud product to exemplary claim 2 of the '434 patent is attached as Confidential Exhibit 33C. A claim chart comparing Netlist's HybriDIMM product to exemplary claim 2 of the '434 patent is attached as Confidential Exhibit 34C.

111. The '501 patent is practiced by Netlist's memory module products, including the HyperCloud and HybriDIMM products. A claim chart comparing Netlist's HyperCloud product to exemplary claim 4 of the '501 patent is attached as Confidential Exhibit 35C. A claim chart comparing Netlist's HybriDIMM product to exemplary claim 4 of the '501 patent is attached as Confidential Exhibit 36C.

112. The '064 patent is practiced by Netlist's memory module products, including the HyperCloud and HybriDIMM products. A claim chart comparing Netlist's HyperCloud product to exemplary claim 16 of the '064 patent is attached as Confidential Exhibit 37C. A claim chart comparing Netlist's HybriDIMM product to exemplary claim 16 of the '064 patent is attached as Confidential Exhibit 38C.

113. The '837 patent is practiced by Netlist's memory module products, including the HybriDIMM product. A claim chart comparing Netlist's HybriDIMM product to exemplary claim 1 of the '837 patent is attached as Confidential Exhibit 39C.

B. Netlist's Investments In The Domestic Industry.

114. Netlist has an existing economic domestic industry as to HyperCloud and Netlist's exploitation of the asserted patents and the patented technology incorporated into HyperCloud. Netlist also has a domestic industry that exists or is in the process of being established as to its new product HybriDIMM, Netlist's latest breakthrough product that Netlist introduced to the market for the first time last month, and Netlist's exploitation of each of the asserted patents and the patented technology incorporated into HybriDIMM.

115. Netlist makes extensive use of the inventions claimed in the asserted patents in its HyperCloud and HybriDIMM products. HyperCloud and HybriDIMM were built upon Netlist's patented technology. Netlist engineers working in Irvine, California, invented the technology of the asserted patents and worked to implement the patented inventions into Netlist's HyperCloud and HybriDIMM products, which were designed and developed in the United States. As set forth in greater detail above, HyperCloud and HybriDIMM practice the asserted patent claims and thus are Netlist domestic industry products.

116. Netlist engineers working in Irvine, California, started to design and develop HyperCloud in 2007. Netlist introduced HyperCloud in 2009 based upon Netlist's patented rank multiplication and load reduction technology, along with the most efficient distributed buffer architecture and the other patented inventions at issue in this Investigation. IBM and HP are among the companies that qualified HyperCloud for use in their products and purchased HyperCloud. Exhibit 41 (Netlist 10K) at 13.

117. Netlist engineers working in Irvine, California, started to design and develop HybriDIMM in 2013, building upon HyperCloud's then-existing design and the technology of the asserted patents. Netlist's new HybriDIMM technology is designed to be compatible with

the JEDEC DDR4 LRDIMM interface. HybriDIMM is an evolved architecture that combines the proven semiconductor raw materials of DRAM and NAND into a single persistent memory space. It has the same Load / Store model as DRAM, and runs at near DRAM speed, but with capacities usually associated with traditional storage. HybriDIMM can do all of this at a greatly reduced cost compared to DRAM and without system modification. Netlist expects to start shipping HybriDIMM to select customers later this year.

118. On November 12, 2015, Netlist entered into a JDLA with Samsung, pursuant to which Netlist and Samsung agreed to work together to jointly develop a standardized product interface for NVDIMM-P memory modules in order to facilitate broad industry adoption of Netlist's new technology. Exhibit 41 (Netlist 10K) at 34. Netlist received $8 million of non-recurring engineering fees (NRE) from Samsung for the joint development. Exhibit 41 (Netlist 10K) at 34. Netlist and Samsung, along with a group of industry ecosystem partners, will work to bring the compelling benefits of this new technology to a large group of customers in cloud computing, big data, and server and storage markets. By using a hybrid storage solution that appears to the system as a standard LRDIMM, customers will be able to efficiently extract intelligence from large amounts of data in storage systems.

119. Netlist has made significant and substantial investments in the United States directly related to HyperCloud and HybriDIMM, the inventions claimed in the asserted patents, and developing HyperCloud and HybriDIMM to implement Netlist's patented technology. Public information regarding Netlist's investments is set forth below. Detailed confidential information about Netlist's significant and substantial investments is set forth in Confidential Exhibit 40C, the Declaration of Gail Sasaski, who is Netlist's Chief Financial Officer. *See* Confidential Exhibit 40C, Sasaki Declaration.

120. Netlist has made significant domestic investments in labor and capital with respect to HyperCloud and HybriDIMM, the technology of the asserted patents, and developing HyperCloud and HybriDIMM to implement Netlist's patented technology. As of January 2, 2016, Netlist had approximately 45 regular U.S. employees. Exhibit 41 (Netlist 10K) at 9. Approximately half of these employees are Netlist engineers working in Irvine, California on research and development, design, engineering, and testing of HybriDIMM. Since 2007, substantially all of the research and development, design, engineering and testing of HyperCloud and HybriDIMM was done by Netlist engineers working in Irvine, California. Other employees working in jobs other than sales and marketing support Netlist's activities with respect to research and development, design, engineering, testing and production of HyperCloud and HybriDIMM.

121. Netlist has made significant domestic investments in facilities and equipment with respect to HyperCloud and HybriDIMM, the technology of the asserted patents, and developing HyperCloud and HybriDIMM to implement Netlist's patented technology. Netlist's headquarters facility is located in approximately 8,203 square feet of space in Irvine, California. Exhibit 41 (Netlist 10K) at 31. Netlist's total lease expenses were $526,000 in fiscal year 2015 (ended January 2, 2016), most of which relate to lease payments for Netlist's Irvine, California, headquarters facility. Exhibit 41 (Netlist 10K) at F-24. Netlist's Irvine, California headquarters are used for research and development, product design, engineering, testing, production support and other corporate functions. As of the end of fiscal year 2015 (January 2, 2016), Netlist held almost $14 million in property and equipment (not including the value of leased facilities). Exhibit 41 (Netlist 10K) at F-16.

122. Netlist has made substantial investments in engineering, research, and development related to exploitation of the asserted patents, including investments made to invent the technology claimed in the asserted patents and develop HyperCloud and HybriDIMM to implement Netlist's patented technology. Netlist's total expenditures for research and development were approximately $6.0 million and $4.6 million for 2015 and 2014, respectively. Exhibit 41 (Netlist 2015 10K) at 9. As reflected in confidential Exhibit 40C, Netlist's R&D efforts with respect to the technologies of the asserted patents and their incorporation into HyperCloud and HybriDIMM began in 2007.

123. Additional confidential business information regarding Netlist's investments in plant, equipment, labor, capital, research and development, and engineering related to HyperCloud and HybriDIMM, the technology of the asserted patents, and development of HyperCloud and HybriDIMM to implement Netlist's patented technology, is set forth in Confidential Exhibit 40C and in the additional confidential exhibits thereto.

124. As reflected in Confidential Exhibit 40C and in the additional confidential exhibits thereto, Netlist's domestic industry investments are continuing and ongoing.

X. RELIEF REQUESTED

125. WHEREFORE, by reason of the foregoing, Netlist respectfully requests that the United States International Trade Commission:

(a) Institute an immediate investigation, pursuant to Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337(a)(l)(B)(i) and (b)(1), with respect to violations of Section 337 based on the importation, sale for importation, and sale after importation, into the United States of Respondents' memory modules and components thereof, and products containing same, including the accused LRDIMM and RDIMM products made by or on behalf

of Respondents, that infringe one or more asserted claims of the '364, the '185, the '434, the '501, the '064 and the '837 patents;

(b) Schedule and conduct a hearing on said unlawful acts and, following said hearing, determine whether there has been a violation of Section 337;

(c) Issue a limited exclusion order, pursuant to 19 U.S.C. § 1337(d), excluding from entry into the United States articles, including the accused LRDIMM and RDIMM products made by or on behalf of Respondents, that infringe one or more asserted claims of the '364, the '185, the '434, the '501, the '064 and the '837 patents;

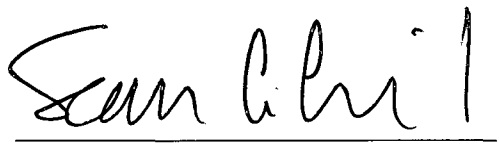
(d) Issue a permanent cease and desist order, pursuant to 19 U.S.C. § 1337(f), prohibiting Respondents, and others acting on their behalf, from importing, marketing, advertising, demonstrating, warehousing inventory for distribution, distributing, offering for sale, selling, licensing, using, or transferring outside the United States for sale in the United States any memory module products and components thereof, and products containing same, including the accused LRDIMM and RDIMM products made by or on behalf of Respondents, that infringe one or more asserted claims of the '364, the '185, the '434, the '501, the '064 and the '837 patents;

(e) Impose a bond during the 60-day Presidential review period pursuant to 19 U.S.C. § 1337(e)(1) and (f)(1) to prevent further injury to Netlist's domestic industry relating to each of the asserted patents; and

(f) Grant such other and further relief as the Commission deems just and proper based on the facts determined by the investigation and the authority of the Commission.

Dated: September 1, 2016

Respectfully Submitted,



Sean C. Cunningham
Erin P. Gibson
Tiffany C. Miller
Jacob D. Anderson
DLA Piper LLP (US)
401 B Street, Suite 1700
San Diego, CA. 92101
Telephone: 619-699-2700
Fax: 619-699-2701

Mark D. Fowler
DLA Piper LLP (US)
2000 University Avenue
East Palo Alto, CA 94303-2215

James Heintz
DLA Piper LLP (US)
11911 Freedom Drive, #300
Reston, VA 20190