UNITED STATES INTERNATIONAL TRADE COMMISSION
WASHINGTON DC

In the Matter of CERTAIN GRAPHICS SYSTEMS, COMPONENTS THEREOF, AND CONSUMER PRODUCTS CONTAINING THE SAME	Investigation No. 337-TA-___

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

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APPENDICES

A. One certified copy and three additional copies of the U.S. Patent and Trademark Office prosecution history for the U.S. Patent 7,633,506 File History

B. A certified copy of U.S. Patent No. 7,633,506 and three additional copies, and four copies of the applicable pages of each technical reference mentioned in the prosecution history for U.S. Patent No. 7,633,506

C. One certified copy and three additional copies of the U.S. Patent and Trademark Office prosecution history for the U.S. Patent 7,796,133 File History

D. A certified copy of U.S. Patent No. 7,796,133 and three additional copies, and four copies of the applicable pages of each technical reference mentioned in the prosecution history for U.S. Patent No. 7,796,133

E. One certified copy and three additional copies of the U.S. Patent and Trademark Office prosecution history for the U.S. Patent 8,760,454 File History

F. A certified copy of U.S. Patent No. 8,760,454 and three additional copies, and four copies of the applicable pages of each technical reference mentioned in the prosecution history for U.S. Patent No. 8,760,454

I. INTRODUCTION

1. This Complaint is filed by Advanced Micro Devices, Inc. and ATI Technologies ULC (collectively "AMD" or "Complainants") pursuant to Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337 ("Section 337") to remedy the unlawful and unauthorized importation, sale for importation, and/or sale within the United States after importation, into the United States, of certain graphics systems, components thereof, and consumer products containing the same (the "Accused Products") that infringe United States Patent No. 7,633,506, United States Patent No. 7,796,133, and United States Patent No. 8,760,454 (together, "Asserted Patents").

2. AMD is an American multinational semiconductor company and pioneer of cutting-edge computer graphics technology. Since at least as early as 1985, ATI Technologies has made substantial investments to research, develop, and have manufactured high quality graphics systems. The Asserted Patents stem from the research and design of innovative proprietary technology developed by ATI Technologies. Advanced Micro Devices, Inc. acquired ATI Technologies in 2006, and has continued to make substantial investments to research, develop, and have manufactured high quality graphics systems that practice the Asserted Patents.

3. Over the past three years, and in the United States alone, AMD invested hundreds of millions of dollars and employed thousands of engineers, scientists, technicians, and administrative staff in connection with its products that include AMD's innovative graphics technology. AMD invested significant and substantial domestic resources to research, develop, test, manufacture, launch, support, and maintain groundbreaking graphics technology that practices the Asserted Patents. (Declaration of AMD Declarant (attached as Confidential Exhibit 1), ("AMD Decl.") at ¶¶3, 6-32; AMD claim charts (attached as Confidential Exhibits 2-5)).

4. AMD's semiconductor technology powers millions of intelligent devices, covering personal computers, game consoles, and cloud servers. AMD technology is featured inside major gaming consoles and laptop computers, including the Microsoft Xbox One, Sony PlayStation, and Apple MacBook Pro. Additionally, AMD's patented technology is critical to delivering rich interfaces and photorealistic graphics to consumer products such as smartphones, tablets, televisions, and wearable devices. Industry leaders in the consumer products space, such as Samsung, Qualcomm, and Intel, are licensed to, or otherwise authorized to practice AMD's patented technology covered by the Asserted Patents.

5. The proposed Respondents are LG Electronics, Inc., LG Electronics U.S.A., Inc., and LG Electronics MobileComm U.S.A, Inc. (together "LG"); VIZIO, Inc. ("VIZIO"); MediaTek Inc. and MediaTek USA Inc. (together "MediaTek"); and Sigma Designs, Inc. ("SDI"). All of these proposed respondents are collectively referred to throughout this Complaint as "Respondents." On information and belief, each of the Respondents imports, sells for importation, and/or sells in the United States after importation, into the United States, Accused Products that directly infringe, contributorily infringe, and/or induce the infringement of, the Asserted Patents.

6. The Accused Products infringe AMD's patented graphics technology, which is covered by the Asserted Patents. Pursuant to Commission Rule 210.12(a)(12), categories of these Accused Products include, without limitation, televisions, smartphones, tablets, wearable devices, graphics processors, integrated circuits, and other consumer products containing such components and systems. AMD asserts that the Accused Products practice at least the following claims of one or more Asserted Patents:[1]

[1] Independent claims in the chart of asserted claims in each patent are in bold.

Patent	Asserted Claims
7,633,506	**1**-9
7,796,133	**1**-13 and **40**
8,760,454	**2-5**, 6-10, and **11**

7. To remedy Respondents' continuing and unlawful violation of Section 337, AMD seeks, as permanent relief, a limited exclusion order pursuant to 19 U.S.C. § 1337(d), barring from entry into the United States all of Respondents' Accused Products that directly infringe, contributorily infringe, or induce the infringement of one or more of the claims of the Asserted Patents. AMD also seeks cease and desist orders pursuant to 19 U.S.C. § 1337(f), prohibiting each domestic Respondent from engaging in the importation, sale for importation, and/or sale within the United States after importation, into the United States, of Accused Products that infringe, either directly or indirectly, one or more claims of the Asserted Patents.

8. Further, AMD requests that the Commission impose a bond upon Respondents' importation of infringing Accused Products during the 60-day Presidential review period pursuant to 19 U.S.C. § 1337(j) to prevent further injury to AMD and its licensees' domestic industry relating to each of the Asserted Patents.

II. THE PARTIES

A. The Complainants

9. Complainant Advanced Micro Devices, Inc. is a Delaware corporation, and has a principal place of business at One AMD Place, Sunnyvale, California 94085. ATI Technologies ULC is incorporated in Canada and has a principal place of business at 1 Commerce Valley Drive East, Markham, Ontario L3T 7X6, Canada. ATI Technologies ULC is a wholly-owned indirect subsidiary of Advanced Micro Devices, Inc. ATI Technologies ULC is the sole owner by assignment of all right, title, and interest in each Asserted Patent. Confidential Exhibit 1 (AMD Decl. at ¶¶4-5).

B. The Proposed Respondents

10. With regard to the proposed Respondents, Complainants allege the following on information and belief:

1. LG

LG Electronics, Inc.

11. Respondent **LG Electronics, Inc.**, a Korean company, is located at 128 Yeoui-Daero, Yeongdeungpo-Gu, Seoul 07336 South Korea. LG Electronics, Inc., either itself and/or through the activities of its subsidiaries, is in the business of designing, manufacturing, importing, selling for importation, and/or selling within the United States after importation, into the United States, graphics systems, components thereof, and consumer products containing the same. Such devices may include, but are not limited to, smartphone handsets, tablet computers, televisions, wearable devices, integrated circuits, and graphics processors. LG Electronics, Inc. is the parent corporation of Respondents LG Electronics U.S.A., Inc. and LG Electronics MobileComm U.S.A., Inc.

LG Electronics U.S.A., Inc.

12. Respondent **LG Electronics U.S.A., Inc.** is a wholly-owned subsidiary of Respondent LG Electronics, Inc. LG Electronics U.S.A., Inc. is a corporation organized and existing under the laws of the state of Delaware, with its principal place of business located at 1000 Sylvan Ave., Englewood Cliffs, New Jersey, 07632. Respondent LG Electronics U.S.A., Inc. manages the North American operations of Respondent LG Electronics MobileComm U.S.A., Inc., and the two entities provide sales and marketing support in North America for their ultimate parent, LG Electronics, Inc. LG Electronics U.S.A., Inc., offers for sale, supports, imports, sells for importation, and/or sells within the United States after importation, into the United States, graphics systems, components thereof, and consumer products containing the

same that are manufactured outside of the United States. Such devices include, but are not limited to, smartphone handsets, tablet computers, televisions, wearable devices, integrated circuits, and graphics processors. LG Electronics U.S.A., Inc. has imported such goods manufactured by LG Electronics, Inc. from Mexico and China into the United States.

LG Electronics MobileComm U.S.A., Inc.

13. Respondent **LG Electronics MobileComm U.S.A., Inc.** (d/b/a LG Mobile Phones) is a wholly-owned subsidiary of Respondent LG Electronics, Inc. LG Electronics MobileComm U.S.A., Inc. is a corporation organized and existing under the laws of the state of California with its principal place of business located at 10101 Old Grove Road, San Diego, California, 92131. Respondent LG Electronics MobileComm U.S.A., Inc. sells, offers for sale, imports, sells for importation, and/or sells within the United States after importation, into the United States, a variety of products containing graphics systems, components thereof, and consumer products containing the same to customers throughout North America. Such devices include, but are not limited to, smartphone handsets, tablet computers, televisions, wearable devices, integrated circuits, and graphics processors. LG Electronics MobileComm U.S.A., Inc. has imported such goods manufactured by LG Electronics, Inc. from China into the United States. Respondents LG Electronics, Inc.; LG Electronics U.S.A., Inc.; and LG Electronics MobileComm U.S.A., Inc. are referred to collectively as "LG."

2. VIZIO

VIZIO, Inc.

14. Respondent **VIZIO, Inc.** ("VIZIO") is a corporation organized and existing under the laws of the state of California with its principal place of business located at 39 Tesla, Irvine, California, 92618. VIZIO is in the business of designing, manufacturing, importing,

selling for importation, and/or selling within the United States after importation, into the United States, products containing graphics systems, components thereof, and consumer products containing the same. Such devices may include, but are not limited to, televisions, remote control tablets, integrated circuits, and graphics processors.

3. MediaTek

MediaTek Inc.

15. Respondent **MediaTek Inc.**, a Taiwanese company, is located at No. 1, Dusing Road 1, Hsinchu Science Park, Hsinchu City 30078, Taiwan. MediaTek Inc. is the parent corporation of Respondent MediaTek USA Inc. MediaTek Inc., either itself and/or through the activities of its subsidiaries, designs, manufactures, has manufactured, sells, imports, sells for importation, and/or sells within the United States after importation, into the United States, graphics systems and components thereof, such as graphics capable integrated circuits. These graphics capable integrated circuits provided by MediaTek Inc. are incorporated into various consumer products sold by Respondents, such as LG and VIZIO. Such consumer products may include, but are not limited to, smartphones, tablets, televisions, and various other devices that include graphics processors. Upon information and belief, MediaTek Inc. also imports into the United States graphics capable integrated circuits, which have not yet been incorporated into consumer products.

16. MediaTek Inc. is itself a fabless entity, meaning that MediaTek Inc. does not own manufacturing plants that produce integrated circuits. On information and belief, MediaTek Inc. employs the services of foreign third parties who manufacture the graphics capable integrated circuits, designed by MediaTek Inc. As will be demonstrated below, consumer products, such as smartphones, televisions, and tablets, that incorporate MediaTek Inc.

graphics capable integrated circuits, are manufactured and assembled by the other Respondents in foreign countries. These Respondent products containing the MediaTek Inc. integrated circuits are then imported into the United States for consumption by consumers in the United States.

MediaTek USA Inc.

17. Respondent **MediaTek USA Inc.** is a wholly-owned subsidiary of Respondent MediaTek Inc. MediaTek USA Inc. is a corporation organized and existing under the laws of the state of Delaware, with its principal place of business located at 2840 Junction Avenue, San Jose, California, 95134. Respondent MediaTek USA Inc. provides sales and research and development support in North America for its ultimate parent, MediaTek Inc. MediaTek USA Inc., offers for sale, supports, imports, sells for importation, and/or sells within the United States after importation, into the United States, graphics systems and components thereof that are manufactured outside of the United States. Such devices include, but are not limited to, integrated circuits and graphics processors. Respondents MediaTek Inc. and MediaTek USA Inc. are referred to collectively as "MediaTek."

4. SDI

Sigma Designs, Inc.

18. Respondent **Sigma Designs, Inc.** ("SDI") is a domestic corporation organized and existing under the laws of the state of California, with its principal place of business located at 47467 Fremont Boulevard, Fremont, California 94538. SDI, either itself and/or through the activities of its subsidiaries, designs, manufactures, has manufactured, sells, imports, sells for importation, and/or sells within the United States after importation, graphics systems and components thereof, such as graphics capable integrated circuits. These graphics capable integrated circuits provided by SDI are incorporated into various consumer products sold

by Respondents, such as LG and VIZIO. Such consumer products may include, but are not limited to, televisions and various other devices that include graphics processors. SDI also imports into the United States graphics capable integrated circuits, such as integrated circuits containing graphics processors, which have not yet been incorporated into consumer products.

19. SDI is itself a fabless entity, meaning that SDI does not own manufacturing plants that produce integrated circuits. On information and belief, SDI employs the services of foreign third parties who manufacture the graphics capable integrated circuits, designed by SDI. As will be demonstrated below, consumer products that incorporate SDI integrated circuits, are manufactured and assembled by the other Respondents in foreign countries. These Respondent products containing the SDI integrated circuits are then imported into the United States for consumption by consumers in the United States.

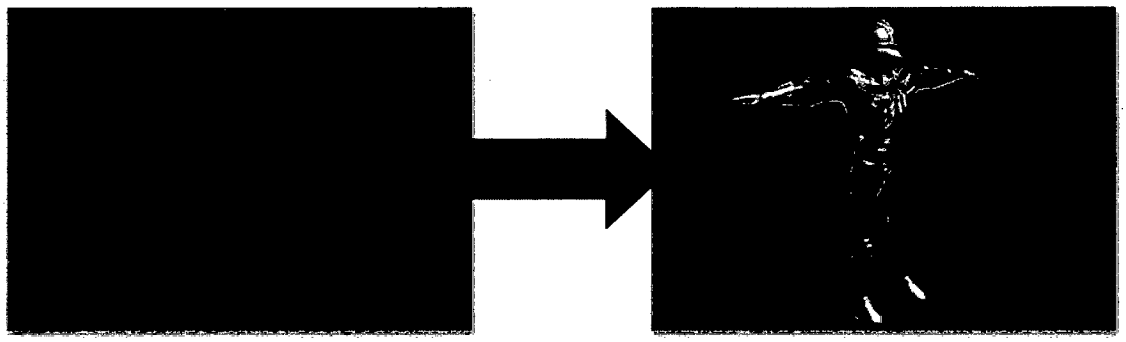
III. THE PATENTS

20. The Asserted Patents disclose novel architectures for graphics processing unit circuitry.[2] Consumer products are often used to generate and display graphics on an output device such as a monitor. When complex and realistic graphics are desired, there is often additional specialized circuitry, in the form of a chip, which is added to the consumer product to assist it with the complex processing that it must perform to render the graphics to the screen. This specialized circuitry is known as a graphics processing unit or "GPU."

21. GPUs are used to manipulate and render three-dimensional (3-D) graphical objects onto a two-dimensional (2-D) display screen. In particular, GPUs consist of circuitry that is specially designed to convert 3-D objects (typically represented by a collection of

[2] The non-technical description of the patented technology provided herein is provided solely for compliance with the Commission Rules and is not intended to limit, define, or otherwise effect the construction and/or application of any of the Asserted Patents.

geometrical shapes such as triangles) into a 2-D image (typically comprising a collection of pixels) as shown below.



22. The 2-D image represents a photorealistic depiction of the 3-D objects, rendered from the perspective of a given viewer, and shaded to convey the object's surface material illuminated from a given light source.

A. THE ASSERTED '506 PATENT

1. Ownership and Asserted Claims of the '506 Patent

23. United States Patent No. 7,633,506 ("the '506 Patent") is entitled "Parallel pipeline graphics system" and issued on December 15, 2009 to inventors Mark M. Leather and Eric Demers. The '506 Patent issued from United States Patent Application No. 10/724,384 filed on November 26, 2003. The '506 Patent claims priority to United States Provisional Patent Application No. 60/429,976, filed on November 27, 2002.

24. By way of assignment, Complainant ATI Technologies ULC owns all rights, title, and interest to the '506 Patent. As required by Commission Rules 210.12(a)(9)(i)-(ii), certified copies of the '506 Patent and its assignment record are attached as Exhibits 6 and 7.[3]

[3] ATI Technologies ULC was formerly known as ATI Technologies Inc. Exhibit 13, Certified Copy of the Assignment Record at Reel-Frame No. 032265/0101. Complainants have submitted this name change for recordation by the United States Patent and Trademark Office. Because the submission was made recently, there are no certified copies of the assignment record that reflect this change of name. Complainants will provide certified copies when they become available.

25. In accordance with Commission Rules 210.12(c)(1)-(2), Appendix A to this Complaint includes one certified and three additional copies of the United States Patent and Trademark Office prosecution history for the '506 Patent. Appendix B includes a certified copy of the '506 Patent and four copies of each patent, and applicable pages of each technical reference, mentioned in the prosecution history of the '506 Patent.

26. All maintenance fees for the '506 Patent have been timely paid, and there are no fees currently due.

27. The '506 Patent has 21 claims, including three independent claims (1, 10, and 17), and 18 dependent claims. Complainants are asserting at least claims 1-9 of the '506 Patent (the "Asserted '506 Patent Claims") against LG, VIZIO, MediaTek, and SDI.

2. Licenses Relating to the '506 Patent

28. Certain licenses relate to the '506 Patent. Confidential Exhibit 1, AMD Decl. at ¶7, sets forth details regarding licensees of the '506 Patent, including AMD's domestic industry licensees, GlobalFoundries and Samsung Electronics. Pursuant to Commission Rule 210.12(a)(9)(iii), Complainants have attached as Confidential Exhibit 8 a list of entities that may potentially be licensed to the '506 Patent.

3. Foreign Counterparts to the '506 Patent

29. In accordance with Commission Rule 210.12(a)(9)(v), Complainants state that they are aware of no foreign counterparts issued, filed, abandoned, withdrawn, or rejected relating to the '506 Patent.

4. Non-Technical Description of the '506 Patent

30. Prior to the '506 Patent, efforts were made to improve the realism of 3-D graphics by generating and storing a greater amount of data that describes the image for display.

This image data was stored in a device known as a frame buffer. In order to store a greater amount of data in the frame buffer, the industry believed that it was necessary to make the size of the frame buffer larger. However, the GPU architectures known at the time of the '506 Patent behaved as a bottleneck, and were unsuitable for rendering vast amounts of graphics data to a larger size frame buffer.

31. The '506 Patent solved the bottleneck problem by disclosing a new graphics processing architecture, which enables a greater amount of graphics data to be rendered to a larger size frame buffer. In some embodiments, the graphics processing architecture includes multiple parallel graphics "pipelines." Moreover, each pipeline can feature a special circuit that is programmable to perform texture shading in addition to color shading operations. Based on the innovations disclosed by the '506 Patent, modern graphics processors are able to deliver higher-quality realism of three-dimensional graphics.

B. THE ASSERTED '133 PATENT

1. Ownership and Asserted Claims of the '133 Patent

32. United States Patent No. 7,796,133 ("the '133 Patent") is entitled "Unified shader," and issued on September 14, 2010 to inventors Mark M. Leather and Eric Demers. The '133 Patent issued from United States Patent Application No. 10/730,965, filed on December 8, 2003. The '133 Patent is a continuation of United States Patent Application No. 10/716,946, filed November 18, 2003, now abandoned, which claims priority to United States Provisional Patent Application No. 60/427,338, filed on November 18, 2002.

33. By way of assignment, Complainant ATI Technologies ULC owns all rights, title, and interest to the '133 Patent. As required by Commission Rules 210.12(a)(9)(i)-(ii), certified copies of the '133 Patent and its assignment records are attached as Exhibits 9 and 10.[4]

34. In accordance with Commission Rules 210.12(c)(1)-(2), Appendix C to this Complaint includes one certified and three additional copies of the United States Patent and Trademark Office prosecution history for the '133 Patent. Appendix D includes a certified copy of the '133 Patent and four copies of each patent, and applicable pages of each technical reference, mentioned in the prosecution history of the '133 Patent.

35. All maintenance fees for the '133 Patent have been timely paid, and there are no fees currently due.

36. The '133 Patent has 43 claims, including seven independent claims (1, 14, 27, 40, 41, 43, and 43), and 36 dependent claims. Complainants are asserting at least claims 1-13 and 40 of the '133 Patent (the "Asserted '133 Patent Claims") against LG, VIZIO, MediaTek, and SDI.

2. Licenses Relating to the '133 Patent

37. Certain licenses relate to the '133 Patent. Confidential Exhibit 1, AMD Decl. at ¶7, sets forth details regarding licensees of the '133 Patent, including AMD's domestic industry licensees, GlobalFoundries and Samsung Electronics. Pursuant to Commission Rule 210.12(a)(9)(iii), Complainants have attached as Confidential Exhibit 8 a list of entities that may potentially be licensed to the '133 Patent.

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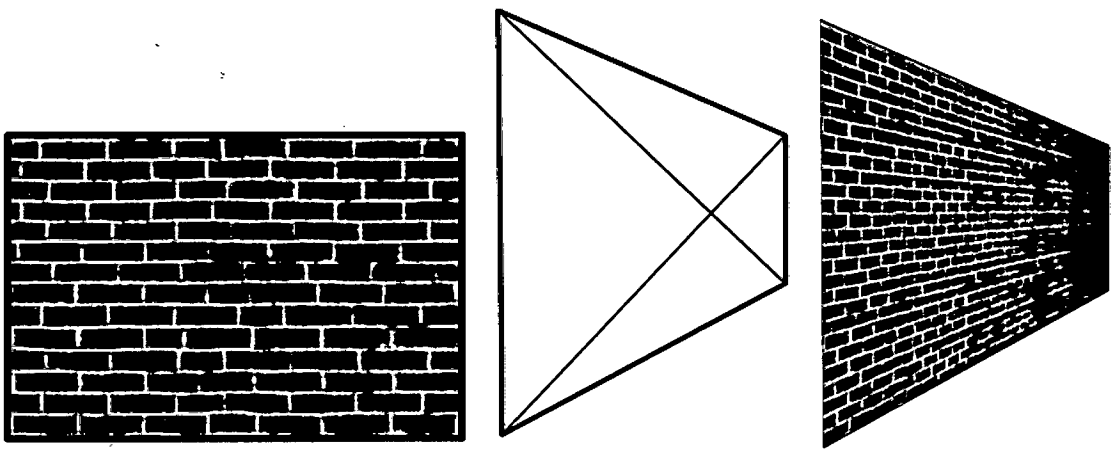
[4] ATI Technologies ULC was formerly known as ATI Technologies Inc. Exhibit 13, Certified Copy of the Assignment Record at Reel-Frame No. 032265/0101. Complainants have submitted this name change for recordation by the United States Patent and Trademark Office. Because the submission was made recently, there are no certified copies of the assignment record that reflect this change of name. Complainants will provide certified copies when they become available.

3. Foreign Counterparts to the '133 Patent

38. In accordance with Commission Rule 210.12(a)(9)(v), Complainants state that they are aware of no foreign counterparts issued, filed, abandoned, withdrawn, or rejected relating to the '133 Patent.

4. Non-Technical Description of the '133 Patent

39. The '133 Patent relates to specialized "texture" processing circuitry that is employed by GPUs. Texture processing is a technology that is used, for example, to allow a 2-D image of a brick wall to be mapped to a 3-D wall object in a perspective-correct way as shown below.



40. Because artists and game designers made heavy-use of textures, the conventional wisdom in the graphics processing industry was to employ highly specialized and dedicated "fixed-function" circuitry for applying textures to pixels, and separate fixed function circuitry for color shading. The disadvantage of this approach is that it constrained the generality, flexibility, and overall usefulness of shading algorithms.

41. The '133 Patent departs from this conventional approach and instead provides a specialized circuit that is capable of performing both texture and color operations. This novel circuit architecture employs a combination of fixed-function and programmable

circuitry stages for texture and color operations. Advantageously, in some embodiments, any operation, be it for color shading, or texture shading, may loop back and be combined with any other operation. As a result, the '133 Patent simplifies the complexity of programming for two separate conventional fixed-function circuits with different levels of precision. In addition, the '133 Patent provides improved utilization of graphics circuitry, which enables system manufacturers to build more power efficient graphics circuitry.

C. THE ASSERTED '454 PATENT

1. Ownership and Asserted Claims of the '454 Patent

42. United States Patent No. 8,760,454 ("the '454 Patent") is entitled "Graphics processing architecture employing a unified shader," and issued on June 24, 2014 to inventors Stephen L. Morein, Laurent Lefebvre, Andrew E. Gruber, and Andi Skende. The '454 Patent issued from United States Patent Application No. 13/109,738 filed on May 17, 2011.

43. The '454 Patent is the result of a continuation of United States Patent Application No. 12/791,597, filed on June 1, 2010, which is a continuation of United States Patent Application No. 11/842,256, filed on August 21, 2007, which is a continuation of United States Patent Application No. 11/117,863, filed on April 29, 2005, now United States Patent No. 7,327,369, which is a continuation of United States Patent Application No. 10/718,318, filed on November 20, 2003, now United States Patent No. 6,897,871.

44. By way of assignment, Complainant ATI Technologies ULC owns all rights, title, and interest to the '454 Patent. As required by Commission Rules 210.12(a)(9)(i)-(ii), certified copies of the '454 Patent and its assignment records are attached as Exhibits 11-13.

45. In accordance with Commission Rules 210.12(c)(1)-(2), Appendix E to this Complaint includes one certified and three additional copies of the United States Patent and

Trademark Office prosecution history for the '454 Patent. Appendix F includes a certified copy of the '454 Patent and four copies of each patent, and applicable pages of each technical reference, mentioned in the prosecution history of the '454 Patent.

46. All maintenance fees for the '454 Patent have been timely paid, and there are no fees currently due.

47. The '454 Patent has 11 claims, including six independent claims (1-5 and 11), and 5 dependent claims. Complainants are asserting at least claims 2-11 of the '454 Patent (the "Asserted '454 Patent Claims") against LG and MediaTek.

2. Licenses Relating to the '454 Patent

48. Certain licenses relate to the '454 Patent. Confidential Exhibit 1, AMD Decl. at ¶7, sets forth details regarding licensees of the '454 Patent, including AMD's domestic industry licensees, GlobalFoundries and Samsung Electronics. Pursuant to Commission Rule 210.12(a)(9)(iii), Complainants have attached as Confidential Exhibit 8 a list of entities that may potentially be licensed to the '454 Patent.

3. Foreign Counterparts to the '454 Patent

49. In accordance with Commission Rule 210.12(a)(9)(v), Complainants have attached as Exhibit 11 the only known foreign counterparts to the '454 Patent. Complainants are unaware of any foreign counterparts issued, filed, abandoned, withdrawn, or rejected, other than those identified in Exhibit 14.

4. Non-Technical Description of the '454 Patent

50. Prior to the '454 Patent, and the advent of GPUs more generally, the industry employed general-purpose processors to render 3-D computer graphics in software. But

general purpose processors handled graphics processing operations in an inefficient way, leading to poor performance.

51. As a result, the industry progressed away from general purpose processors to GPU circuitry that was specialized for graphics processing. To improve upon the inefficiencies of general purpose processors, the universal belief was that these GPUs needed separate, discrete, and dedicated circuitry stages, with each circuitry stage performing different graphics processing operations. For example, one dedicated circuitry stage would perform geometry processing (concerning the triangles representing a 3-D object), and another would perform pixel processing (concerning the pixels making up the 2-D representation of that 3-D object). These different circuitry stages were organized in a sequential, pipelined fashion to form a GPU having a "fixed-function" architecture.

52. While fixed-function architecture GPUs showed promising performance gains over the general purpose processor approach, they were relatively large in size, with much of the real estate being taken up by the geometry and pixel processing hardware. In addition, as a result of the serialized architecture, the geometry processor operated on the 3-D geometrical triangle data before the pixel processor could operate on pixel data, which resulted in a performance penalty.

53. The '454 Patent solved these problems by disclosing a novel "unified shader" hardware architecture. In a break from the fixed-function architecture, the unified shader hardware architecture includes a shared processing unit that can handle both geometry and pixel processing operations, while leaving certain other graphics operations to dedicated, fixed-function circuitry. In some embodiments, the unified shader hardware can operate on vertex and pixel data simultaneously. Despite initial skepticism, the graphics processing industry has

embraced AMD's groundbreaking unified shader architecture. By employing the patented unified shader hardware architecture, graphics processors are smaller and more power efficient. As a result, the '454 Patent enables smaller form factor consumer products that are more power efficient.

D. THE '967 APPLICATION

1. Ownership and Claims of the '967 Application

54. United States Patent Application No. 14/614,967 ("the '967 Application") is entitled "Graphics processing architecture employing a unified shader," and was filed on February 5, 2015. The '967 Application was allowed on January 12, 2017, and is anticipated to issue in the near future to inventors Stephen L. Morein, Laurent Lefebvre, Andrew E. Gruber, and Andi Skende. To the extent that a patent does not issue from the '967 Application before the Commission issues a decision regarding institution, Complainants intend on filing a motion to amend this Complaint and the corresponding notice of investigation after institution to include the patent that issues from the '967 Application.

55. The '967 Application is the result of a continuation of United States Patent Application No. 14/312,014, filed on June 23, 2014, which is a continuation of United States Patent Application No. 13/109,738, filed on May 17, 2011, now United States Patent No. 8,760,454, which is a continuation of United States Patent Application No. 12/791,597, filed on June 1, 2010, which is a continuation of United States Patent Application No. 11/842,256, filed on August 21, 2007, which is a continuation of United States Patent Application No. 11/117,863, filed on April 29, 2005, now United States Patent No. 7,327,369, which is a continuation of United States Patent Application No. 10/718,318, filed on November 20, 2003, now United States Patent No. 6,897,871.

56. By way of assignment, Complainant ATI Technologies ULC owns all rights, title, and interest to the '967 Application. Copies of the '967 Application and its certified assignment records are attached as Exhibits 15-18.

57. Because the '967 Application has been allowed only recently, there are no certified copies of the patent or prosecution history available. Complainants will provide certified copies of the patent, prosecution history, and four copies of each patent, and applicable pages of each technical reference, mentioned in the prosecution history of the '967 Application, when they become available.

58. Complainants have paid the issue fee for the '967 Application. All fees for the '967 Application have been timely paid, and there are no fees, for maintenance or otherwise, currently due.

59. The '967 Application has 8 claims, including one independent claim (claim 1), and 7 dependent claims. Complainants intend on asserting at least claims 1-8 of the '967 Application (the "'967 Application Claims") against LG and MediaTek.

2. Licenses Relating to the '967 Application

60. Certain licenses relate to the '967 Application. Confidential Exhibit 1, AMD Decl. at ¶7, sets forth details regarding licensees of the '967 Application, including AMD's domestic industry licensees, GlobalFoundries and Samsung Electronics. Pursuant to Commission Rule 210.12(a)(9)(iii), Complainants have attached as Confidential Exhibit 8 a list of entities that may potentially be licensed to the '967 Application.

3. Foreign Counterparts to the '967 Application

61. In accordance with Commission Rule 210.12(a)(9)(v), Complainants have attached as Exhibit 14 the only known foreign counterparts to the '967 Application.

Complainants are unaware of any foreign counterparts issued, filed, abandoned, withdrawn, or rejected other than those identified in Exhibit 14.

4. Non-Technical Description of the '967 Application

62. Prior to the '967 Application, and the advent of GPUs more generally, the industry employed general-purpose processors to render 3-D computer graphics in software. But general purpose processors handled graphics processing operations in an inefficient way, leading to poor performance.

63. As a result, the industry progressed away from general purpose processors to GPU circuitry that was specialized for graphics processing. To improve upon the inefficiencies of general purpose processors, the universal belief was that these GPUs needed separate, discrete, and dedicated circuitry stages, with each circuitry stage performing different graphics processing operations. For example, one dedicated circuitry stage would perform geometry processing (concerning the triangles representing a 3-D object), and another would perform pixel processing (concerning the pixels making up the 2-D representation of that 3-D object). These different circuitry stages were organized in a sequential, pipelined fashion to form a GPU having a "fixed-function" architecture.

64. While fixed-function architecture GPUs showed promising performance gains over the general purpose processor approach, they were relatively large in size, with much of the real estate being taken up by the geometry and pixel processing hardware. In addition, as a result of the serialized architecture, the geometry processor operated on the 3-D geometrical triangle data before the pixel processor could operate on pixel data, which resulted in a performance penalty.

65. The '967 Application solved these problems by disclosing a novel "unified shader" hardware architecture. In a break from the fixed-function architecture, the unified shader hardware architecture includes a shared processing unit that can handle both geometry and pixel processing operations, while leaving certain other graphics operations to dedicated, fixed-function circuitry. In some embodiments, the unified shader hardware can operate on vertex and pixel data simultaneously. Despite initial skepticism, the graphics processing industry has embraced AMD's groundbreaking unified shader architecture. By employing the patented unified shader hardware architecture, graphics processors are smaller and more power efficient. As a result, the '967 Application enables smaller form factor consumer products that are more power efficient.

IV. UNFAIR ACTS OF PROPOSED RESPONDENTS – PATENT INFRINGEMENT AND IMPORTATION

66. The unfair acts of the Respondents involve the design, manufacture, importation, sale for importation, and/or sale within the United States after importation, into the United States, of certain infringing graphics systems, components thereof, and consumer products containing the same, including, without limitation, the Accused Products. These common infringing graphics systems are generally available for purchase on the open market in the form of smartphones, tablets, smart watches, televisions, graphics processors, integrated circuits, and consumer products containing such components and systems. [5]

67. Upon information and belief, the Accused Products as listed herein directly and/or indirectly infringe at least the Asserted Claims and the allowed '967 Application

[5] Complainants believe that the general familiarity of the Accused Products, along with the charts and photographs provided with this Complaint, make the provision of physical exhibits unnecessary. However, should the Commission request physical samples, Complainants will provide physical exhibits to the extent practicable.

Claims. Discovery may reveal that the Accused Products infringe additional claims of the Asserted Patents and the '967 Application. In addition, Complainants anticipate that discovery may reveal that additional products of Respondents infringe the Asserted Patents and the '967 Application, including but not limited to unreleased products that will become commercially available in the United States prior to the conclusion of this Investigation.

A. LG

1. Representative Involved Article

68. On information and belief, LG is engaged in the design, manufacture, importation, sale for importation, and/or sale within the United States after importation, into the United States, of Accused Products that infringe literally or by equivalence at least the Asserted '506 Patent, '133 Patent, '454 Patent Claims and the '967 Application Claims. Complainants have obtained LG's 49UH6500 television (the "LG Television") and XPower smartphone (the "LG XPower Smartphone") that LG imported, sold for importation, and/or sold within the United States after importation, into the United States.

69. Complainants believe that the LG Television and LG XPower Smartphone are exemplary of numerous other Accused Products imported, sold for importation, or sold within the United States after importation, into the United States, by LG because such other devices feature the same or substantially similar infringing functionality. Accordingly, on information and belief, numerous other devices that are covered by the Asserted Patent and '967 Application claims have been imported, sold for importation, or sold within the United States after importation, into the United States, by LG. Pursuant to Commission Rule 210.12(a)(9)(x), Exhibits 22 and 23 contain photographs of the LG Television and LG XPower Smartphone.

70. Pursuant to Commission Rule 210.12(a)(9)(viii), Complainants are required to chart "a representative involved article" of LG that violates Section 337. As set forth

below, the charts in Exhibits 19-22 demonstrate that the representative involved articles violate Section 337.

2. Infringement of the '506 Patent

71. Exhibit 25 includes a chart comparing independent claim 1 of the '506 Patent to the LG Television and LG XPower Smartphone. Exhibit 19 shows that the LG Television and LG XPower Smartphone are covered by at least claim 1 of the '506 Patent.

3. Infringement of the '133 Patent

72. Exhibit 26 includes a chart comparing independent claims 1 and 40 of the '133 Patent to the LG Television and LG XPower Smartphone. Exhibit 20 shows that the LG Television and LG XPower Smartphone are covered by at least claims 1 and 40 of the '133 Patent.

4. Infringement of the '454 Patent

73. Exhibit 21 includes a chart comparing independent claims 2-5 and 11 of the '454 Patent to the LG Television and LG XPower Smartphone. Exhibit 21 shows that the LG Television and LG XPower Smartphone are covered by at least claims 2-5 and 11 of the '454 Patent.

5. Infringement of the '967 Application

74. Exhibit 22 includes a chart comparing allowed independent claim 1 of the '967 Application to the LG Television and LG XPower Smartphone. Exhibit 22 shows that the LG Television and LG XPower Smartphone are covered by at least claim 1 of the '967 Application.

6. Specific Instance of Sale and Importation

75. LG imports, sells for importation, and/or sells within the United States after importation, into the United States, the LG Television and LG Xpower Smartphone depicted in Exhibits 23 and 24.

76. Pursuant to Commission Rule 210.12(a)(3), Exhibit 25 contains receipts from Amazon and Boost Mobile showing a sale of the LG Television and LG XPower Smartphone within the United States after importation into the United States. As shown in Exhibit 23, the LG Television was made in Mexico. As further shown in Exhibit 24, the LG XPower Smartphone was made in China. Therefore, the LG Television and LG XPower Smartphone were imported.

77. Thus, LG is violating Section 337 of the Tariff Act of 1930 by importing, selling for importation, and/or selling within the United States after importation, into the United States, the LG Television and LG Xpower Smartphone, as well as other Accused Products that infringe the Asserted Patents.

B. VIZIO

1. Representative Involved Article

78. On information and belief, VIZIO is engaged in the design, manufacture, importation, sale for importation, and/or sale within the United States after importation, into the United States, of Accused Products that infringe literally or by equivalence at least the Asserted '506 Patent and '133 Patent Claims. Complainants have obtained VIZIO's E43U-D2 television (the "VIZIO Television") that VIZIO imported, sold for importation, and/or sold within the United States after importation, into the United States.

79. Complainants believe that the VIZIO Television is exemplary of numerous other Accused Products imported, sold for importation, or sold within the United

States after importation, into the United States, by VIZIO because such other devices feature the same or substantially similar infringing functionality. Accordingly, on information and belief, numerous other devices that are covered by the Asserted Patent claims have been imported, sold for importation, or sold within the United States after importation, into the United States, by VIZIO. Pursuant to Commission Rule 210.12(a)(9)(x), Exhibit 26 contains photographs of the VIZIO Television.

80. Pursuant to Commission Rule 210.12(a)(9)(viii), Complainants are required to chart "a representative involved article" of VIZIO that violates Section 337. As set forth below, the charts in Exhibits 27 and 28 demonstrate that the representative involved article violates Section 337.

2. Infringement of the '506 Patent

81. Exhibit 27 includes a chart comparing independent claim 1 of the '506 Patent to the VIZIO Television. Exhibit 27 shows that the VIZIO Television is covered by at least claim 1 of the '506 Patent.

3. Infringement of the '133 Patent

82. Exhibit 28 includes a chart comparing independent claims 1 and 40 of the '133 Patent to the VIZIO Television. Exhibit 28 shows that the VIZIO Television is covered by at least claims 1 and 40 of the '133 Patent.

4. Specific Instance of Sale and Importation

83. VIZIO imports, sells for importation, and/or sells within the United States after importation, into the United States, the VIZIO Television depicted in Exhibit 26.

84. Pursuant to Commission Rule 210.12(a)(3), Exhibit 29 contains a receipt from Best Buy showing a sale of the VIZIO Television within the United States after importation

into the United States. As shown in Exhibit 26, the VIZIO Television was made in China, and therefore it was imported.

85. Thus, VIZIO is violating Section 337 of the Tariff Act of 1930 by importing, selling for importation, and/or selling within the United States after importation, into the United States, the VIZIO Television, as well as other Accused Products that infringe the Asserted Patents.

C. MediaTek

1. Representative Involved Article

86. On information and belief, MediaTek is engaged in the design, manufacture, importation, sale for importation, and/or sale within the United States after importation, into the United States, of Accused Products that infringe literally or by equivalence at least the Asserted '506 Patent, '133 Patent, '454 Patent Claims and the '967 Application Claims.

87. Complainants have obtained Accused Products incorporating components, which upon information and belief, are designed, manufactured, sold, imported, sold for importation, and/or sold within the United States after importation, into the United States, by MediaTek. As already noted, Exhibits 19-22 include charts comparing the independent claims of the Asserted '506 Patent, '133 Patent, and '454 Patent Claims, in addition to the '967 Application Claims, to the LG XPower Smartphone, which includes a MediaTek Helio P10 integrated circuit. Complainants believe that the MediaTek Helio P10 integrated circuit is exemplary of numerous other Accused Products imported, sold for importation, or sold within the United States after importation, into the United States, by MediaTek because such other devices feature the same or substantially similar infringing functionality. Accordingly, on information and belief, numerous other devices that are covered by the Asserted Patent and '967 Application

claims have been imported, sold for importation, or sold within the United States after importation, into the United States, by MediaTek. Pursuant to Commission Rule 210.12(a)(9)(x), Exhibit 24 contains photographs of the MediaTek Helio P10 integrated circuit.

88. Pursuant to Commission Rule 210.12(a)(9)(viii), Complainants are required to chart "a representative involved article" of MediaTek that violates Section 337. As set forth below, the charts in Exhibits 19-22 demonstrate that the representative involved article violates Section 337.

2. Infringement of the '506 Patent

89. Exhibit 19 includes a chart comparing independent claim 1 of the '506 Patent to the MediaTek Helio P10 integrated circuit contained in the LG XPower Smartphone. Exhibit 19 shows that the MediaTek Helio P10 integrated circuit is covered by at least claim 1 of the '506 Patent.

3. Infringement of the '133 Patent

90. Exhibit 20 includes a chart comparing independent claims 1 and 40 of the '133 Patent to the MediaTek Helio P10 integrated circuit. Exhibit 20 shows that the MediaTek Helio P10 integrated circuit is covered by at least claims 1 and 40 of the '133 Patent.

4. Infringement of the '454 Patent

91. Exhibit 21 includes a chart comparing independent claims 2-5 and 11 of the '454 Patent to the MediaTek Helio P10 integrated circuit contained in the LG XPower Smartphone. Exhibit 21 shows that the MediaTek Helio P10 integrated circuit is covered by at least claims 2-5 and 11 of the '454 Patent.

5. Infringement of the '967 Application

92. Exhibit 22 includes a chart comparing independent claim 1 of the '967 Application to the MediaTek Helio P10 integrated circuit contained in the LG XPower Smartphone. Exhibit 22 shows that the MediaTek Helio P10 integrated circuit is covered by at least claim 1 of the '967 Application.

6. Specific Instance of Sale and Importation

93. MediaTek imports, sells for importation, and/or sells within the United States after importation, into the United States, the MediaTek Helio P10 integrated circuit depicted in Exhibit 24.

94. Pursuant to Commission Rule 210.12(a)(3), Exhibit 25 contains a receipt from Boost Mobile showing a sale of the LG XPower Smartphone within the United States after importation into the United States. As shown in Exhibit 24, the LG XPower Smartphone was made in China, and therefore it was imported. Further, upon information and belief, Respondent MediaTek imports, sells for importation, and/or sells within the United States after importation, into the United States, components that are used by Respondents and other customers. As shown in Exhibit 24, MediaTek's Helio P10 integrated circuit used in the LG XPower Smartphone is manufactured by Taiwan Semiconductor Manufacturing Company Limited ("TSMC"), using its 28 nm HPC+ process node. As shown in Exhibit 30, TSMC manufactures its 28 nm products in Fab 14 and 15. As shown in Exhibit 31, Fab 14 and 15 are located in Taiwan. Therefore, the MediaTek Helio P10 integrated circuit was imported.

95. Thus, MediaTek is violating Section 337 of the Tariff Act of 1930 by importing, selling for importation, and/or selling within the United States after importation, into

the United States, the MediaTek Helio P10 integrated circuit, as well as other Accused Products that infringe the Asserted Patents.

D. SDI

1. Representative Involved Article

96. On information and belief, SDI is engaged in the design, manufacture, importation, sale for importation, and/or sale within the United States after importation, into the United States, of Accused Products that infringe literally or by equivalence at least the Asserted '506 Patent and '133 Patent Claims.

97. Complainants have obtained Accused Products incorporating components, which upon information and belief, are designed, manufactured, sold, imported, sold for importation, and/or sold within the United States after importation, into the United States, by SDI. As already noted, Exhibits 27 and 28 include charts comparing the independent claims of the Asserted '506 Patent and '133 Patent Claims to the VIZIO Television, which includes an SDI SX7 integrated circuit. Complainants believe that the SDI SX7 integrated circuit is exemplary of numerous other Accused Products imported, sold for importation, or sold within the United States after importation, into the United States, by SDI because such other devices feature the same or substantially similar infringing functionality. Accordingly, on information and belief, numerous other devices that are covered by the Asserted Patent claims have been imported, sold for importation, or sold within the United States after importation, into the United States, by SDI. Pursuant to Commission Rule 210.12(a)(9)(x), Exhibit 26 contains photographs of the SDI SX7 integrated circuit.

98. Pursuant to Commission Rule 210.12(a)(9)(viii), Complainants are required to chart "a representative involved article" of SDI that violates Section 337. As set forth

below, the charts in Exhibits 27 and 28 demonstrate that the representative involved article violates Section 337.

2. Infringement of the '506 Patent

99. Exhibit 27 includes a chart comparing independent claim 1 of the '506 Patent to the SDI SX7 integrated circuit contained in the VIZIO Television. Exhibit 27 shows that the SDI SX7 integrated circuit is covered by at least claim 1 of the '506 Patent.

3. Infringement of the '133 Patent

100. Exhibit 28 includes a chart comparing independent claims 1 and 40 of the '133 Patent to the SDI SX7 integrated circuit contained in the VIZIO Television. Exhibit 28 shows that the SDI SX7 integrated circuit is covered by at least claims 1 and 40 of the '133 Patent.

4. Specific Instance of Sale and Importation

101. SDI imports, sells for importation, and/or sells within the United States after importation, into the United States, the SDI SX7 integrated circuit depicted in Exhibit 26.

102. Pursuant to Commission Rule 210.12(a)(3), Exhibit 29 contains receipts from Best Buy showing a sale of the VIZIO Television within the United States after importation into the United States. As shown in Exhibit 26, the VIZIO Television was made in China, and therefore it was imported. Further, upon information and belief, Respondent SDI imports, sells for importation into the United States, and/or sells within the United States after importation components that are used by Respondents and other customers. As shown in Exhibit 26, SDI's SX7 integrated circuit used in the VIZIO Television is marked "Taiwan," which upon information and belief, designates the country of origin. Therefore the SDI SX7 integrated circuit was imported.

103. Thus, SDI is violating Section 337 of the Tariff Act of 1930 by importing, selling for importation, and/or selling within the United States after importation, into the United States, the SDI SX7 integrated circuit, as well as other Accused Products that infringe the Asserted Patents.

V. HARMONIZED TARIFF SCHEDULE INFORMATION

104. On information and belief, the articles subject to this Complaint are classifiable under at least the following headings and subheadings of the Harmonized Tariff Schedule ("HTS") of the United States: 8517.12.00 (Telephones for cellular networks or for other wireless networks); 8517.62.00 (Machines for the reception, conversion and transmission or regeneration of voice, images or other data, including switching and routing apparatus); 8525.60.10 (Transceivers); 8525.50.70 (Transmission apparatus for radio-broadcasting or television, whether or not incorporating reception apparatus or sound recording or reproducing apparatus; television cameras, digital cameras and video camera recorders: for radiobroadcasting transmitters); 8529.10.21 (Television); 8529.90.53 (Flat panel screen assemblies for the apparatus of subheadings 8528.59.15, 8528.59.21, 8528.59.23, 8528.59.25, 8528.59.31, 8528.59.33, 8528.69.35, 8525.69.40, 8528.69.45, 8528.69.50, 8528.72.62, 8528.72.64, 8528.72.68 and 8528.72.72).

105. These HTS identifications are for illustrative purposes only in compliance with the Commission Rules and are not intended to restrict the scope of the Investigation.

VI. RELATED LITIGATION

106. The '454 Patent and the '967 Application are indirect continuations of United States Patent Nos. 6,897,871 ("the '871 Patent") and 7,327,369 ("the '369 Patent")(collectively, the "Related Litigation Patents"). AMD is asserting the '871 Patent in an

action that was filed on March 5, 2014 in the United States District Courts for the Northern District of California, styled as *Advanced Micro Devices, Inc. et al. v. LG Electronics, Inc., et al.*, 3-14-cv-01012, (N.D. Cal.). The '369 Patent was previously at issue in such action, but has since been dismissed by joint stipulation of the parties. Until recently, such action was stayed pending resolution of multiple *inter partes review* proceedings before the Patent Trial and Appeal Board ("PTAB"), based on petitions filed by Respondent LG. On August 19, 2016, the District Court lifted the stay.

107. The Related Litigation Patents were the subject of *inter partes review* proceedings, based on petitions filed by Respondent LG, styled as *LG Electronics, Inc., et al.* v. *ATI Technologies ULC*, IPR2015-00326 (PTAB) and *LG Electronics, Inc., et al.* v. *ATI Technologies ULC*, IPR2015-00330 (PTAB). In its final written decisions, the PTAB ruled that Respondent LG was unsuccessful in its challenge to the validity of claim 20 of the '871 Patent, but prevailed on challenges to certain other claims of the '871 Patent and claims 1-2 of the '369 Patent. The PTAB decisions are the subject of an appeal before the Federal Circuit, styled as *ATI Technologies ULC v. LG Electronics, Inc.*, 2016-2222 (Fed. Cir.). Appellant ATI Technologies ULC tendered its opening brief on December 16, 2016.

108. Complainant AMD is also asserting each of the '506 Patent, '133 Patent, and '454 Patent in actions filed recently in the United States District Courts for the District of Delaware, styled as Advanced Micro Devices, Inc., et al. v. LG Electronics, Inc., et al., 1:17-cv-00065-UNA (D. Del.); Advanced Micro Devices, Inc., et al. v. VIZIO, Inc., 1:17-cv-00064-UNA (D. Del.); Advanced Micro Devices, Inc., et al. v. Sigma Designs, Inc., 1:17-cv-00063-UNA (D. Del.). No responsive pleading has been filed in any of these district court proceedings.

109. Pursuant to Commission Rule 210.12(a)(5), Complainants state that, other than the litigations specified above, to Complainants' knowledge, the alleged unfair methods of competition and unfair acts, or the subject matter thereof, are not, and have not been, the subject of any court or agency litigation.

VII. DOMESTIC INDUSTRY RELATING TO THE ASSERTED PATENTS

110. A domestic industry as defined in Section 337(a)(3) exists in the United States as the result of the domestic activities related to the technology of the Asserted Patents and '967 Application and products that practice the Asserted Patents and the '967 Application due to investments of AMD and its manufacturing supplier, GlobalFoundries, in at least certain graphics systems, components thereof, and products containing the same. Additionally, a domestic industry in the United States is in the process of being established as to each of the Asserted Patents and the '967 Application due to investments by AMD and GlobalFoundries in certain confidential products that are still under development and not yet commercialized. These domestic industry products are described in more detail in the attached Confidential Declaration of AMD.

111. A domestic industry also exists in the United States as the result of the domestic activities related to products that practice the Asserted Patents and the '967 Application due to investments of licensees Samsung Electronics and its subsidiary, Samsung Austin Semiconductor LLC (together, "Samsung"), and GlobalFoundries in at least certain graphics systems, components thereof, and products containing the same. Pursuant to Commission Rule 210.12(a)(9)(iv), Complainants have attached to the Complaint, as Confidential Exhibit 32, a copy of the Samsung license agreement, and as Exhibit 33, a public copy of the GlobalFoundries license agreement.

A. AMD

112. AMD is an American multinational semiconductor corporation headquartered in Sunnyvale, California. Founded in 1969, AMD has, for over four decades, been a leading innovator in semiconductor development. For instance, in 2004, AMD introduced the world's first x86 dual-core processor; in 2006 AMD was the first to introduce a computing platform that broke the teraflop performance barrier; in 2011 AMD brought the first Accelerated Processing Units (a processing unit that integrates a central processing unit and graphics processing unit into one chip) to market; and in 2012, introduced the industry's first quad-core x86 system-on-chip. Exhibit 34 (Nov. 2015 AMD Investor Presentation).

113. AMD designs, develops, manufactures, and sells products that use technology claimed by the Asserted Patents and the '967 Application. More specifically, and as set forth in more detail below, AMD graphics processing unit ("GPU") products containing certain AMD-proprietary graphics pipeline microarchitectures practice and/or are expected to practice, the Asserted Patents and the '967 Application (collectively, the "AMD Products").

114. AMD has made, and continues to make, significant and substantial domestic investments in connection with the protected articles that practice the Asserted Patents and the '967 Application. In addition, AMD is in the process of making significant and substantial investments in certain future products which are expected to practice the Asserted Patents and the '967 Application. AMD is actively engaged in the steps leading to the exploitation of the Asserted Patents and the '967 Application, and there is a significant likelihood that an industry will be established in the future. As a result of these investments, a domestic industry in the United States exists and is in the process of being established under Section 337(a)(3)(A) due to AMD's significant investment in plant and equipment; under Section 337(a)(3)(B) due to AMD's significant employment of labor and capital; and under

Section 337(a)(3)(C) due to AMD's substantial investment in research and development with respect to each of the Asserted Patents and the '967 Application.

115. AMD's proprietary graphics pipeline microarchitectures are incorporated into certain AMD Products (or, in the case of certain future AMD Products, are in the process of being incorporated). These current and future AMD Products are described in further detail in the Confidential AMD Declaration, attached as Confidential Exhibit 1, at ¶8.

116. AMD Products practice or, in the case of certain future products, are expected to practice each of the Asserted Patents and the '967 Application.

117. Exhibit 2 includes a chart comparing claims of the '506 Patent to the AMD Products. Exhibit 2 shows that the AMD Products practice, and are expected to practice, at least one claim of the '506 Patent.

118. Exhibit 3 includes a chart comparing claims of the '133 Patent to the AMD Products. Exhibit 3 shows that the AMD Products practice, and are expected to practice, at least one claim of the '133 Patent.

119. Exhibit 4 includes a chart comparing claims of the '454 Patent to the AMD Products. Exhibit 4 shows that the AMD Products practice, and are expected to practice, at least one claim of the '454 Patent.

120. Exhibit 5 includes a chart comparing claims of the '967 Application to the AMD Products. Exhibit 5 shows that the AMD Products practice, and are expected to practice, at least one claim of the '967 Application.

121. AMD invests significant sums, and is in the process of investing additional significant sums, in domestic plant and equipment relating to the AMD Products, including AMD's next-generation future products. Specifically, AMD has multiple facilities across the

United States directed to, among other things, research and development, and technical customer support services of AMD Products. Details relating to AMD's domestic expenditures on property, plant, and equipment, and in specific connection with the AMD Products, are set forth in the accompanying Confidential Declaration of AMD, attached as Confidential Exhibit 1, at ¶¶6, 11-17. This exhibit also describes additional investments in property, plant, and equipment that AMD is in the process of making.

122. Numerous AMD employees work in the United States researching and developing, and/or providing technical support services, for the AMD Products, including future products. Details relating to the significant number of such domestic employees, and the significant investments AMD makes in connection with these employees in specific relation to the AMD Products, are set forth in Confidential Exhibit 1 (AMD Decl. at ¶¶6, 18-20, 28-32).

123. AMD makes substantial investments in research and development of the AMD Products, including future products. Exhibit 35 (AMD 2015 10-K at 12); Confidential Exhibit 1 (AMD Decl. at ¶¶6, 11-20, 30-32). For example, in fiscal years 2015, 2014, and 2013, AMD has invested approximately $900 million, $1.1 billion, and $1.2 billion, respectively, in its ongoing research and development activities for its products, including the AMD Products. Exhibit 35 (AMD 2015 10-K at 18); Confidential Exhibit 1 (AMD Decl. at ¶¶6, 11-20, 30-32).

124. Further, AMD's manufacturing supplier, GlobalFoundries, is a global semiconductor foundry with significant manufacturing operations in the United States. GlobalFoundries is the successor entity to an AMD subsidiary, and was formed as a joint venture between Advanced Technology Investment Company ("ATIC") and AMD in 2009. In 2012, GlobalFoundries repurchased AMD's stake in the company, thus becoming wholly-owned by

ATIC (now Mubadala Technologies; *see* Exhibit 36). Exhibit 37 (GlobalFoundries 2013 Corporate Responsibility Report, at 6).

125. GlobalFoundries owns and operates semiconductor fabrication facilities in Saratoga County, New York ("GlobalFoundries NY"), totaling more than 2.5 million square feet of clean room, administrative, and research and development space. Exhibit 38 ("About GLOBALFOUNDRIES"); Exhibit 39 (GlobalFoundries: Manufacturing); Exhibit 40 (Articles: "Economic Impact of GlobalFoundries on Saratoga County"). GlobalFoundries' investments in New York alone have directly generated 2,400 jobs (with a total payroll of approximately $206 million) and indirectly generated an additional 3,000 jobs. *Id.* GlobalFoundries incurred additional capital expenditures of $9-10 billion toward its manufacturing facilities throughout 2014-2015, and the majority of these investments will be directed to the Saratoga Facility. Exhibit 41 (GlobalFoundries Fast Facts). Most recently, GlobalFoundries announced an additional multi-billion dollar investment in the Saratoga facility to enable development and production for 7 nm FinFET. Exhibit 42 (Articles: "GlobalFoundries to Deliver Industry's Leading-Performance Offering of 7nm FinFET Technology").

126. AMD subcontracts the manufacturing and mass-production of the latest and next generation of AMD Products to GlobalFoundries NY. (Confidential Exhibit 1, AMD Decl. at ¶21). AMD has already made significant investments in connection with the manufacture of certain AMD Products by GlobalFoundries NY, and expects to continue to make such investments in connection with next generation of AMD Products by GlobalFoundries NY. (Confidential Exhibit 1, AMD Decl. at ¶¶21-27, 30-32). Details relating to AMD's domestic expenditures on the manufacturing of the AMD Products by GlobalFoundries NY, are set forth

in the accompanying Confidential Declaration of AMD. (Confidential Exhibit 1, AMD Decl. at ¶¶6, 21-27, 30-32).

127. AMD plans to subcontract the manufacturing and mass-production of future AMD Products to GlobalFoundries NY. Significant and substantial investments have been made and will continue to be made in connection with manufacturing such products within the United States. (Confidential Exhibit 1, AMD Decl. at ¶¶6, 21-27, 30-32).

128. In sum, AMD has expended, and will continue to expend, significant and substantial domestic resources in plant and equipment, labor and capital, research and development, and engineering, in connection with the manufacture of the AMD Products that are protected by the Asserted Patents, and will be protected by the patent that issues from the '967 Application. GlobalFoundries has similarly expended, and is expected to expend, significant and substantial resources in plant, equipment, labor, and capital in connection with certain AMD Products that are protected by the Asserted Patents, and will be protected by the patent that issues from the '967 Application. (Confidential Exhibit 1, AMD Decl. at ¶¶30-32). A domestic industry therefore exists and is in the process of being established in connection with the Asserted Patents and the '967 Application.

B. Samsung

129. Samsung is licensed to practice the Asserted Patents and the '967 Application and design, develop, manufacture and sell products that practice one or more claims of the Asserted Patents and the '967 Application (the "Samsung Products"). Specifically, certain of Samsung's Exynos system-on-chip products ("SoC") that are manufactured by Samsung's wholly-owned subsidiary, Samsung Austin Semiconductor LLC ("SAS"), practice the Asserted Patents and the '967 Application, and are encompassed within the scope of Samsung's license.

Exhibit 43, AMD 2014 10-K at 39, n.2; Exhibit 44 (Inv. No. 337-TA-941, Complaint at 59-60). The Samsung Products include, without limitation, at least the products listed below.

Model Number	Fabrication Process
Exynos 2 Dual 3250	28 nm HKMG
Exynos 3 Quad 3470	28 nm
Exynos 3 Quad 3475	28 nm HKMG
Exynos 4 Dual 4210	45 nm
Exynos 4 Dual 4212	32 nm HKMG
Exynos 4 Quad 4415	28 nm HKMG
Exynos 5 Dual 5250	32 nm HKMG
Exynos 5 Hexa 5260	28 nm HKMG
Exynos 5 Octa 5420	28 nm HKMG
Exynos 5 Octa 5430	20 nm HKMG
Exynos 7 Octa 5433	20 nm HKMG
Exynos 5 Octa 5800	28 nm HKMG
Exynos 7 Octa 7420	14 nm LPE
Exynos 7 Quad 7570	14 nm
Exynos 7 Octa 7580	28 nm HKMG
Exynos 7 Hexa 7650	28 nm HKMG
Exynos 7 Octa 7870	14 nm LPP
Exynos 7 Octa 7880	28 nm HKMG
Exynos 8 Octa 8890	14 nm LPP
Exynos 8 Octa 8895	10 nm

130. Samsung Products practice at least one claim of each of the Asserted Patents and the '967 Application.

131. Exhibit 45 includes a chart comparing claims of the '506 Patent to the Samsung Products. Exhibit 45 shows that the Samsung Products practice at least one claim of the '506 Patent.

132. Exhibit 46 includes a chart comparing claims of the '133 Patent to the Samsung Products. Exhibit 46 shows that the Samsung Products practice at least one claim of the '133 Patent.

133. Exhibit 47 includes a chart comparing claims of the '454 Patent to the Samsung Products. Exhibit 47 shows that the Samsung Products practice at least one claim of the '454 Patent.

134. Exhibit 48 includes a chart comparing claims of the '967 Application to the Samsung Products. Exhibit 48 shows that the Samsung Products practice at least one claim of the '967 Application.

135. Samsung has made, and continues to make, substantial domestic investments in connection with the protected articles. As a result of these investments, a domestic industry in the United States exists under Section 337(a)(3)(A) due to Samsung's significant investment in plant and equipment, and under 337(a)(3)(B) due to Samsung's significant employment of labor and capital relating to both research and development and manufacture of the Samsung products which practice the Asserted Patents and the '967 Application. Exhibit 49 (U.S.I.T.C. Inv. No. 337-TA-941, Order No. 12 (Initial Determination) (granting Samsung motion for summary determination that it satisfies the domestic industry economic prong based on SAS's manufacture of the Exynos 5430, Exynos 5433, Exynos 3470, and Exynos 4412 products). Samsung fabrication facilities in Austin, Texas are used to manufacture the above referenced Samsung Products. Exhibit 44 (Inv. No. 337-TA-941, Complaint at 59-60); Exhibit 49 (Inv. No. 337-TA-941, Order No. 12 (Initial Determination)).

136. Samsung opened its SAS fabrication facility in Austin, Texas in 1996. Exhibit 50 (Samsung.com article: "Samsung Austin Semiconductor Begins $3.6B Expansion for Advanced Logic Chips"). Construction of this facility cost about $1.4 billion dollars and the facility employed about 1,000 people. *Id.*; Exhibit 51 (Samsung.com article: "Samsung Opens Largest Wafer Plant in Austin, Texas").

137. In 2007, Samsung announced the opening of a second fabrication facility in Austin, Texas. *Id.* This second facility is housed in a 1.6 million square foot building. *Id.* It is one of the largest buildings in Austin, and is one of the largest semiconductor facilities in the United States. *Id.* Further, as a result of the construction and implementation of this second facility, the number of Samsung employees in Austin grew to about 1,600. *Id.* By 2011, SAS had grown to more than 2,400 employees in Austin, and Samsung had invested more than $9 billion in its Austin facilities.

138. Samsung's investment in Austin is the largest foreign investment in Texas and one of the largest foreign investments in the United States. Exhibit 52 (Samsung.com article: "Samsung's Austin Logic Line Breaks Record Achievements"). Most recently, SAS announced that it will invest over $1B by the first half of 2017 to enhance its production capabilities to meet the growing demands in the industry for advanced SoC products. Exhibit 53 (Businesswire.com article: "Samsung Austin Semiconductor Continues Central Texas Growth with more than $1 Billion in Investment"). Samsung's total investment in its Austin facilities is over $16 billion. *Id.*; *see also generally* Exhibit 44 (Inv. No. 337-TA-941, Complaint at 59-60).

139. Significant quantities of Samsung Products have been, and continue to be, incorporated into consumer products sold all over the world. For example, most of the above Samsung Products, incorporating technology claimed by the Asserted Patents and the '967 Application, have been employed in versions of the Samsung Galaxy series smartphones and tablets, one of the most popular lines of converged devices in the world. Exhibit 54 (Article: "The Samsung Galaxy S6 and S6 Edge Review"); Exhibit 55 (Article: "Galaxy Alpha is powered by Exynos 5430, Samsung's first 20nm processor"); Exhibit 56 (Article: "Samsung Galaxy Alpha will be equipped with Exynos 5433 processor and 12MP camera"); Exhibit 57 (Article:

"Samsung Galaxy S5 mini review"); Exhibit 58 ("Samsung Galaxy Alpha vs Samsung Galaxy S III"); and Exhibit 59 (Article: "Samsung's Exynos 7420 Is One Small Chip – Galaxy S6 Teardown Reveals A lot").

140. The existence of a domestic industry based on the manufacture of Samsung Products at SAS is further evidenced by the fact that the ALJ in Investigation No. 337-TA-941 found that a domestic industry existed in the United States based on SAS's manufacture of at least a subset these very same products, and the Commission did not review this determination. Exhibit 49 (Inv. No. 337-TA-941, Order No. 12 (Initial Determination)); Exhibit 60 (Aug. 13, 2015 Commission Notice of Determination Not to Review Order No. 12).

141. Specifically, on July 16, 2015, ALJ David P. Shaw issued an initial determination (Order No. 12) in Investigation No. 337-TA-941 granting Samsung's motion for summary determination that it satisfied the economic prong of the domestic industry requirement based on Samsung's significant investment in plant and equipment and labor and capital related to the manufacture of the Exynos 5430, Exynos 5433, Exynos 3470, and Exynos 4412 products at SAS in Austin, Texas. Exhibit 49 (Inv. No. 337-TA-941, Order No. 12 (Initial Determination)).

142. Consequently, a domestic industry exists in connection with the Samsung Products as result of Samsung's significant and substantial investments within the United States in labor and capital, plant and equipment, and research, development and engineering. In particular, Samsung's significant expenditures incurred in connection with its manufacture of Samsung Products in Texas constitute a significant and substantial investment supporting the existence of a domestic industry in protected articles that practice the Asserted Patents and the '967 Application.

VIII. RELIEF REQUESTED

143. WHEREFORE, by reason of the foregoing, Complainants request that the United States International Trade Commission:

a. Institute an investigation pursuant to Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, with respect to the Respondents' violations of Section 337 based on the design, manufacture, importation into the United States, sale for importation into the United States, sale within the United States after importation, and instruction of purchasers on the infringing use of any articles, including graphics systems, components thereof, and consumer products containing the same, that infringe one or more claims of one or more of the '506 Patent, '133 Patent, and '454 Patent;

b. Schedule and conduct an evidentiary hearing on permanent relief pursuant to 19 U.S.C. § 1337(d) and (f) of the Tariff Act of 1930, as amended;

c. Issue a Limited Exclusion Order specifically directed to each named Respondent, pursuant to 19 U.S.C. § 1337(d), excluding from entry into the United States any articles, including graphics systems, components thereof, and consumer products containing the same, that infringe one or more of the '506 Patent, '133 Patent, and '454 Patent;

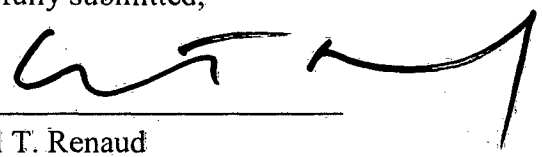
d. Issue permanent cease and desist orders pursuant to 19 U.S.C. § 1337(f) prohibiting each domestic Respondent from, among other things, importing, selling, offering for sale (including via the Internet or electronic mail), advertising (including via the Internet or electronic mail), or distributing articles, including graphics systems, components thereof, and consumer products containing the same, that infringe one or more claims of one or more of the '506 Patent, '133 Patent, and '454 Patent; and

e. Impose a bond upon Respondents who continue to import infringing articles, including infringing graphics systems, components thereof, and consumer

products containing the same, during the 60-day-Presidential review period per 19 U.S.C. § 1337(j); and issue such other and further relief as the Commission deems just and proper under the law, based upon the facts determined by the investigation and the authority of the Commission.

Dated: January 24, 2017

Respectfully submitted,



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