

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

INNOVATIVE FOUNDRY
TECHNOLOGIES LLC,

Plaintiff,

v.

TAIWAN SEMICONDUCTOR
MANUFACTURING COMPANY
LIMITED; and
TSMC TECHNOLOGY, INC.

Defendants.

C.A. No.:

JURY TRIAL DEMANDED

COMPLAINT FOR PATENT INFRINGEMENT

Innovative Foundry Technologies LLC (“IFT” or “Plaintiff”), brings this action for patent infringement under 35 U.S.C. § 271 against Taiwan Semiconductor Manufacturing Company Limited and TSMC Technology, Inc. (collectively “Defendants” or “TSMC”), and alleges as follows:

THE PARTIES

1. Plaintiff Innovative Foundry Technologies LLC is a Delaware corporation, and has a principal place of business at 40 Pleasant Street, Suite 208, Portsmouth, NH 03801.

2. Taiwan Semiconductor Manufacturing Company Limited is a Taiwanese company, and is located at 8, Li Hsin Road 6, Hsinchu Science Park, Hsinchu City 30078, Taiwan. Taiwan Semiconductor Manufacturing Company Limited is the parent corporation of Defendant TSMC Technology, Inc.

3. Taiwan Semiconductor Manufacturing Company Limited, either itself and/or through the activities of its subsidiaries, makes, uses, sells, offers for sale, and/or imports

throughout the United States, including within this District, products, such as semiconductor devices and integrated circuits, that infringe the Asserted Patents, defined below. Taiwan Semiconductor Manufacturing Company Limited's customers incorporate these products into downstream products that are made, used, sold, offered for sale, and/or imported throughout the United States, including within this District. These downstream products may include, but are not limited to, integrated circuits, smartphones, tablets, televisions, smartwatches, and various other products that include semiconductor devices and integrated circuits.

4. TSMC Technology, Inc. is a wholly-owned subsidiary of Defendant Taiwan Semiconductor Manufacturing Company Limited. TSMC Technology, Inc. is a Delaware corporation, and has a principal place of business at 2851 Junction Avenue, San Jose, California 95134. TSMC Technology, Inc. provides sales, research, and development support in North America for its ultimate parent, Taiwan Semiconductor Manufacturing Company Limited. TSMC Technology, Inc. makes, uses, sells, offers for sale, and/or imports throughout the United States, including within this District, products, such as semiconductor devices and integrated circuits, that infringe the Asserted Patents. TSMC Technology, Inc.'s customers incorporate these products into downstream products that are made, used, sold, offered for sale, and/or imported throughout the United States, including within this District. These downstream products may include, but are not limited to, smartphones, tablets, televisions, smartwatches, and various other products that include semiconductor devices and integrated circuits.

THE ASSERTED PATENTS

5. United States Patent No. 6,583,012 ("the '012 Patent") is entitled "Semiconductor Devices Utilizing Differently Composed Metal-Based In-Laid Gate Electrodes" and issued on June 24, 2003 to inventors Matthew S. Buynoski, Qi Xiang, and Paul R. Besser. The '012 Patent issued

from United States Patent Application No. 09/781,436 filed on February 13, 2001. A copy of the '012 Patent is attached hereto as Exhibit A.

6. United States Patent No. 6,797,572 (“the '572 Patent”) is entitled “Method For Forming a Field Effect Transistor Having a High-K Gate Dielectric and Related Structure” and issued on September 29, 2004 to inventors Joong S. Jeon and Huicai Zhong. The '572 Patent issued from United States Patent Application No. 10/618,273 filed on July 11, 2003. A copy of the '572 Patent is attached hereto as Exhibit B.

7. United States Patent No. 7,009,226 (“the '226 Patent”) is entitled “In-Situ Nitride/Oxynitride Processing With Reduced Deposition Surface Pattern Sensitivity” and issued on March 7, 2006 to inventor Sey-Ping Sun. The '226 Patent issued from United States Patent Application No. 10/887,836 filed on July 12, 2004. A copy of the '226 Patent is attached hereto as Exhibit C.

8. United States Patent No. 7,880,236 (“the '236 Patent”) is entitled “Semiconductor Circuit Including a Long Channel Device and a Short Channel Device” and issued on February 1, 2011 to inventors Andreas Kerber and Kingsuk Maitra. The '236 Patent issued from United States Patent Application No. 12/181,180 filed on July 28, 2008. A copy of the '236 Patent is attached hereto as Exhibit D.

9. United States Patent No. 9,373,548 (“the '548 Patent”) is entitled “CMOS Circuit Having a Tensile Stress Layer Overlying an NMOS Transistor and Overlapping a Portion of Compressive Stress Layer” and issued on June 21, 2016 to inventors Gen Pei, Scott D. Luning, Johannes Van Meer. The '548 Patent issued from United States Patent Application No. 12/199,659 filed on August 27, 2008. The '548 Patent claims priority to United States Patent Application No.

11/532,753, filed on September 18, 2006. A copy of the '548 Patent is attached hereto as Exhibit E.

10. By way of assignment, Plaintiff owns all rights, title, and interest to the '012 Patent, the '572 Patent, the '226 Patent, the '236 Patent, and the '548 Patent (collectively, the "Asserted Patents").

11. The Asserted Patents are each valid and enforceable.

JURISDICTION AND VENUE

12. This action arises under the Patent Act, 35 U.S.C. § 1 *et seq.*

13. Subject matter jurisdiction is proper in this Court under 28 U.S.C. §§ 1331 and 1338(a).

14. Venue in this District is proper under 28 U.S.C. § 1391(c)(3) and 28 U.S.C. § 1400(b). Defendant Taiwan Semiconductor Manufacturing Company Limited is not a resident of the United States and may be sued in any district, including this District. Defendant TSMC Technology, Inc. resides in this District. All Defendants have committed acts of infringement in this District.

15. This Court has personal jurisdiction over Defendants. Defendant TSMC Technology, Inc. resides in this District. Defendants have conducted and do conduct business within the State of Delaware. Defendants, directly or through subsidiaries or intermediaries (including distributors, retailers, and others), ship, distribute, make, use, offer for sale, sell, import, and/or advertise (including by providing an interactive web page) their products and/or services in the United States and the District of Delaware and/or contribute to and actively induce their customers to ship, distribute, make, use, offer for sale, sell, import, and/or advertise (including the provision of an interactive web page) infringing products and/or services in the United States and the District of Delaware. Defendants, directly and through subsidiaries or intermediaries (including

distributors, retailers, and others), have purposefully and voluntarily placed one or more of their infringing products and/or services, as described below, into the stream of commerce with the expectation that those products will be purchased and used by customers and/or consumers in the District of Delaware. These infringing products and/or services have been and continue to be made, used, sold, offered for sale, purchased, and/or imported by customers and/or consumers in the District of Delaware. Defendants have committed acts of patent infringement within the District of Delaware.

BACKGROUND

16. Plaintiff incorporates the allegations of all of the foregoing paragraphs as if fully restated herein.

17. The Asserted Patents stem from the research and design of innovative and proprietary technology developed by IFT's licensee, Advanced Micro Devices, Inc. ("AMD"). AMD is an American multinational company and pioneer of cutting-edge semiconductor technology. Founded in 1969 in Santa Clara, California, AMD has made substantial investments to research, develop, and/or have manufactured high quality semiconductor devices, integrated circuits, and products containing the same. The Asserted Patents cover inventions relating to important aspects of AMD's integrated circuit and microfabrication technology.

18. Defendants made, used, sold, offered for sale, imported, tested, designed, and/or marketed in the United States semiconductor devices, integrated circuits, and products containing the same that infringe, or were manufactured using processes that infringe, the Asserted Patents.

19. Defendants have been placed on actual notice of the Asserted Patents. Defendants received actual notice of the Asserted Patents at least as early as February 2019 by way of a letter to TSMC dated February 8, 2019. Additionally, the filing of this Complaint also constitutes notice in accordance with 35 U.S.C. § 287.

20. After receiving actual notice of the Asserted Patents, the Defendants proceeded to make, use, test, design, sell, and/or offer to sell in this District and elsewhere in the United States, and import into this District and elsewhere in the United States, semiconductor devices, integrated circuits, and products containing the same that infringe, or were manufactured using processes that infringe, the Asserted Patents.

21. Defendants have directly infringed, and continue to directly infringe, the Asserted Patents under 35 U.S.C. § 271(a) and (g) by one or more of making, using, selling and/or offering to sell, in this District and elsewhere in the United States, and importing into this District and elsewhere in the United States, certain infringing semiconductor devices, integrated circuits, and products containing the same including, but not limited to, semiconductor devices, integrated circuits, and products containing the same, which infringe, or were manufactured using processes that infringe, the Asserted Patents, as further described in detail in Counts I-X *infra* (collectively, “Accused Products”).

22. Defendants have also indirectly infringed, and continue to indirectly infringe, the Asserted Patents under 35 U.S.C. § 271(b) and (c). Defendants knew and intended to induce and contribute to the infringement of the Asserted Patents. The Accused Products, and the processes of manufacture of the Accused Products, have no substantial non-infringing use. After receiving actual notice of the Asserted Patents, the Defendants proceeded to actively induce, and materially contribute to, its customers’ infringement of the Asserted Patents by making, using, selling, offering for sale, marketing, advertising, and/or importing semiconductor devices, integrated circuits, and products containing the same that infringe, or were manufactured using processes that infringe, the Asserted Patents, and instructing customers to infringe the Asserted Patents.

23. Thus, Defendants have indirectly infringed, and continue to indirectly infringe, the Asserted Patents under 35 U.S.C. § 271(b) by actively inducing their customers to infringe the Asserted Patents by making, using, selling, offering for sale, marketing, advertising, and/or importing the Accused Products to their customers for use in downstream products that infringe, or were manufactured using processes that infringe, the Asserted Patents, and by instructing customers to infringe the Asserted Patents, as described in detail in Counts I-X *infra*. Additionally, Defendants have indirectly infringed, and continue to indirectly infringe the Asserted Patents under 35 U.S.C. § 271(c) by materially contributing to their own customers' infringement of the Asserted Patents by making, using, selling, offering for sale, advertising, marketing, and/or importing the Accused Products to their customers for use in downstream products that infringe, or which were manufactured using processes that infringe, the Asserted Patents, and by instructing customers to infringe the Asserted Patents, as described in detail in Counts I-X *infra*.

24. The Accused Products include, but are not limited to all TSMC semiconductor devices, integrated circuits, and products manufactured at 5-65 nanometer technology nodes including, but not limited to, semiconductor devices manufactured using the 65 nm GP, 65 nm LP, 40 nm GP, 40 nm LP, 40 nm ULP, 28 nm LP, 28 nm HKMG, 22 nm HPC, 22 nm ULP, 22 nm ULL, 20 nm , 16 nm FinFet, 16 nm FinFet Plus, 16 nm FinFet Compact, 12 nm FinFet Compact, 10 nm FinFet, 7 nm FinFet, and 5 nm FinFet technology nodes.

25. Defendants' acts of infringement have caused damage to Plaintiff. Plaintiff is entitled to recover from Defendants the damages incurred by Plaintiff as a result of Defendants' wrongful acts.

COUNT I
(Defendants' Infringement of the '012 Patent)

26. Plaintiff incorporates the allegations of all of the foregoing paragraphs as if fully restated herein.

27. Plaintiff is the assignee and lawful owner of all right, title and interest in and to the '012 Patent. The '012 Patent is valid and enforceable.

28. Defendants have directly infringed, and continue to directly infringe, the '012 Patent by making, using, selling, offering for sale, or importing into the United States products manufactured using processes that infringe the '012 Patent including, but not limited to, semiconductor devices, integrated circuits, and products containing the same. The accused products that infringe one or more claims of the '012 Patent include, but are not limited to, at least the Accused Products. Further discovery may reveal additional infringing products and/or models.

29. For example, and without limitation, the Accused Products were manufactured using processes that infringe claims 1-11 of the '012 Patent.

30. Attached hereto as Exhibit E, and incorporated into this Complaint, is a claim chart showing that the manufacture of an exemplary device, the TSMC 16 nm FinFET technology node, is covered by at least Claim 1 of the '012 Patent. Attached hereto as Exhibit G, and incorporated into this Complaint, is a claim chart showing that the manufacture of an exemplary device, the TSMC 28 nm HKMG technology node, is covered by at least Claim 1 of the '012 Patent. These claim charts are exemplary and, on information and belief, many other products provided by TSMC infringe the '012 Patent.

31. Defendants have, and continue to, indirectly infringe the '012 Patent by actively inducing and contributing to the infringement of the '012 Patent by others, such as fabless companies, original equipment manufacturers, customers, resellers, and retailers. These others

include, but are not limited to, MediaTek Inc. and its affiliates, Qualcomm Incorporated and its affiliates, BBK Communication Technology Co., Ltd. and its affiliates, Hisense Electric Co., Ltd. and its affiliates, TCL Corporation and its affiliates, and VIZIO, Inc. and its affiliates, who, for example, incorporate the Accused Products which were manufactured using processes that infringe the '012 Patent into downstream products made, sold, offered for sale, and/or imported throughout the United States, including within this District.

32. Defendants specifically intended these others, such as original equipment manufacturers, customers, resellers, and retailers, to infringe the '012 Patent and knew that these others perform acts that constituted direct infringement. For example, Exhibit F shows that an exemplary product, TSMC's 16 nm FinFET technology node, which is incorporated in MediaTek's MT6763T integrated circuit and BBK Communication Technology Co., Ltd.'s Oppo F5 smartphone, is manufactured using processes that infringe the '012 Patent. As further example, Exhibit G shows that an exemplary product, TSMC's 28 nm HKMG technology node, which is incorporated in MediaTek's MSDURP1602 integrated circuit and TCL Corporation's 55R617 television, is manufactured using processes that infringe the '012 Patent. Defendants designed the Accused Products such that they would each infringe the '012 Patent as described in Exhibits F-G if made, used, sold, offered for sale, or imported into the United States. Defendants provided, directly or indirectly, Accused Products to others, such as, but not limited to, customers, knowing and intending that those others would use, sell, offer for sale, and/or import in and into the United States downstream products that include the Accused Products, thereby directly infringing one or more claims of the '012 Patent.

33. In addition, upon information and belief, Defendants provide instructions, user guides, and/or other design documentation to the infringing others regarding the use and operation

of the Accused Products. When the others follow such instructions, user guides, and/or other design documentation, they directly infringe one or more claims of the '012 Patent. By providing such instructions, user guides, and/or other design documentation, Defendants know and intend that those others will follow those instructions, user guides, and other design documentation, and thereby directly infringe one or more claims of the '012 Patent. Defendants thus know that their actions actively induce infringement.

34. The Accused Products have no substantial non-infringing uses and are a material part of the invention. As described in Exhibits F-G, any manufacture, use, sale offer for sale or importation in or into the United States of an Accused Product or a downstream product incorporating an Accused Product infringes the '012 patent. The Accused Products are semiconductor devices and integrated circuits that provide vital functionality to downstream products. The Accused Products cannot be used without being incorporated into a downstream product. Thus, the Accused products have no substantial non-infringing uses. Moreover, because the Accused Products provide vital functionality to the down-stream products, the Accused Products constitute a material part of the invention claimed in the '012 Patent.

35. Defendants have had knowledge of the '012 Patent since at least as of receiving a letter to TSMC dated February 8, 2019.

36. Defendants' continued infringement of the '012 Patent has damaged and will continue to damage Plaintiff.

37. Plaintiff is entitled to recover damages adequate to compensate it for Defendants' infringement.

COUNT II
(Defendants' Willful Infringement of the '012 Patent)

38. Plaintiff incorporates the allegations of all of the foregoing paragraphs as if fully restated herein.

39. Defendants have infringed and/or do willfully infringe the '012 Patent.

40. Defendants received actual notice of the '012 Patent at least as early as February 2019 by way a letter to TSMC dated February 8, 2019. After receiving such actual notice of the '012 Patent, Defendants proceeded to make, use, test, sell, and/or offer to sell in this District and elsewhere in the United States, and import into this District and elsewhere in the United States, the Accused Products.

41. On information and belief, Defendants engaged in such activities despite an objectively high likelihood that its actions constituted infringement of valid patents, including the '012 Patent. Defendants knew and should have known that its actions would cause direct and indirect infringement of the '012 Patent.

COUNT III
(Defendants' Infringement of the '572 Patent)

42. Plaintiff incorporates the allegations of all of the foregoing paragraphs as if fully restated herein.

43. Plaintiff is the assignee and lawful owner of all right, title and interest in and to the '572 Patent. The '572 Patent is valid and enforceable.

44. Defendants have directly infringed, and continue to directly infringe, the '572 Patent by making, using, selling, offering for sale, or importing into the United States products manufactured using processes that infringe the '572 Patent including, but not limited to, semiconductor devices, integrated circuits, and products containing the same. The accused

products that infringe one or more claims of the '572 Patent include, but are not limited to, at least the Accused Products. Further discovery may reveal additional infringing products and/or models.

45. For example, and without limitation, the Accused Products were manufactured using processes that infringe claims 1-7 of the '572 Patent.

46. Attached hereto as Exhibit H, and incorporated into this Complaint, is a claim chart showing that the manufacture of an exemplary product, the TSMC 16 nm FinFET technology node, is covered by at least Claim 1 of the '572 Patent. Attached hereto as Exhibit I, and incorporated into this Complaint, is a claim chart showing that the manufacture of an exemplary product, the TSMC 28 nm HKMG technology node, is covered by at least Claim 1 of the '572 Patent. These claim charts are exemplary and, on information and belief, many other products provided by TSMC infringe the '572 Patent.

47. Defendants have, and continue to, indirectly infringe the '572 Patent by actively inducing and contributing to the infringement of the '572 Patent by others, such as fabless companies original equipment manufacturers, customers, resellers, and retailers. These others include, but are not limited to, MediaTek Inc. and its affiliates, Qualcomm Incorporated and its affiliates, BBK Communication Technology Co., Ltd. and its affiliates, Hisense Electric Co., Ltd. and its affiliates, TCL Corporation and its affiliates, and VIZIO, Inc. and its affiliates, who, for example, incorporate the Accused Products which were manufactured using processes that infringe the '572 Patent into downstream products made, sold, offered for sale, and/or imported throughout the United States, including within this District.

48. Defendants specifically intended these others, such as original equipment manufacturers, customers, resellers, and retailers, to infringe the '572 Patent and knew that these others perform acts that constituted direct infringement. For example, Exhibit H shows that an

exemplary product, TSMC's 16 nm FinFET technology node, which is incorporated in MediaTek's MT6763T integrated circuit and BBK Communication Technology Co., Ltd.'s Oppo F5 smartphone, is manufactured using processes that infringe the '572 Patent. As further example, Exhibit I shows that an exemplary product, TSMC's 28 nm HKMG technology node, which is incorporated in MediaTek's MSDURP1602 integrated circuit and TCL Corporation's 55R617 television, is manufactured using processes that infringe the '572 Patent. Defendants designed the Accused Products such that they would each infringe the '572 Patent as described in Exhibits H-I if made, used, sold, offered for sale, or imported into the United States. Defendants provided, directly or indirectly, Accused Products to others, such as, but not limited to, customers, knowing and intending that those others would use, sell, offer for sale, and/or import in and into the United States downstream products that include the Accused Products, thereby directly infringing one or more claims of the '572 Patent.

49. In addition, upon information and belief, Defendants provide instructions, user guides, and/or other design documentation to the infringing others regarding the use and operation of the Accused Products. When the others follow such instructions, user guides, and/or other design documentation, they directly infringe one or more claims of the '572 Patent. By providing such instructions, user guides, and/or other design documentation, Defendants know and intend that those others will follow those instructions, user guides, and other design documentation, and thereby directly infringe one or more claims of the '572 Patent. Defendants thus know that their actions actively induce infringement.

50. The Accused Products have no substantial non-infringing uses and are a material part of the invention. As described in Exhibits H-I, any manufacture, use, sale offer for sale or importation in or into the United States of an Accused Product or a downstream product

incorporating an Accused Product infringes the '572 patent. The Accused Products are semiconductor devices and integrated circuits that provide vital functionality to downstream products. The Accused Products cannot be used without being incorporated into a downstream product. Thus, the Accused products have no substantial non-infringing uses. Moreover, because the Accused Products provide vital functionality to the down-stream products, the Accused Products constitute a material part of the invention claimed in the '572 Patent.

51. Defendants have had knowledge of the '572 Patent since at least as of receiving a letter to TSMC dated February 8, 2019.

52. Defendants' continued infringement of the '572 Patent has damaged and will continue to damage Plaintiff.

53. Plaintiff is entitled to recover damages adequate to compensate it for Defendants' infringement.

COUNT IV
(Defendants' Willful Infringement of the '572 Patent)

54. Plaintiff incorporates the allegations of all of the foregoing paragraphs as if fully restated herein.

55. Defendants have infringed and/or do willfully infringe the '572 Patent.

56. Defendants received actual notice of the '572 Patent at least as early as February 2019 by way of a letter to TSMC dated February 8, 2019. After receiving such actual notice of the '572 Patent, Defendants proceeded to make, use, test, sell, and/or offer to sell in this District and elsewhere in the United States, and import into this District and elsewhere in the United States, the Accused Products.

57. On information and belief, Defendants engaged in such activities despite an objectively high likelihood that its actions constituted infringement of valid patents, including the

'572 Patent. Defendants knew and should have known that its actions would cause direct and indirect infringement of the '572 Patent.

COUNT V
(Defendants' Infringement of the '226 Patent)

58. Plaintiff incorporates the allegations of all of the foregoing paragraphs as if fully restated herein.

59. Plaintiff is the assignee and lawful owner of all right, title and interest in and to the '226 Patent. The '226 Patent is valid and enforceable.

60. Defendants have directly infringed, and continue to directly infringe, the '226 Patent by making, using, selling, offering for sale, or importing into the United States products and/or methods covered by one or more claims of the '226 Patent including, but not limited to, semiconductor devices, integrated circuits, and products containing the same. The accused products that infringe one or more claims of the '226 Patent include, but are not limited to, at least the Accused Products. Further discovery may reveal additional infringing products and/or models.

61. For example, and without limitation, the Accused Products infringe claims 1-9 of the '226 Patent.

62. Attached hereto as Exhibit J, and incorporated into this Complaint, is a claim chart showing where in an exemplary product, the TSMC 28 nm LP technology node, each limitation of Claim 1 is met. This claim chart is exemplary and, on information and belief, many other products provided by TSMC infringe the '226 Patent.

63. Defendants have, and continue to, indirectly infringe the '226 Patent by actively inducing and contributing to the infringement of the '226 Patent by others, such as original equipment manufacturers, customers, resellers, and retailers. These others include, but are not limited to, MediaTek Inc. and its affiliates, Qualcomm Incorporated and its affiliates, BBK

Communication Technology Co., Ltd. and its affiliates, Hisense Electric Co., Ltd. and its affiliates, TCL Corporation and its affiliates, and VIZIO, Inc. and its affiliates, who, for example, incorporate the Accused Products which infringe the '226 Patent into downstream products made, sold, offered for sale, and/or imported throughout the United States, including within this District.

64. Defendants specifically intended these others, such as original equipment manufacturers, customers, resellers, and retailers, to infringe the '226 Patent and knew that these others perform acts that constituted direct infringement. For example, Exhibit J shows that an exemplary product, the TSMC 28 nm LP technology node, which is incorporated in Qualcomm Incorporated's MSM8952 integrated circuit and TCL Corporation's Blackberry DTEK50 smartphone, infringes the '226 Patent. Defendants designed the Accused Products such that they would each infringe the '226 Patent as described in Exhibit J if made, used, sold, offered for sale, or imported into the United States. Defendants provided, directly or indirectly, Accused Products to others, such as, but not limited to, customers, knowing and intending that those others would use, sell, offer for sale, and/or import in and into the United States downstream products that include the Accused Products, thereby directly infringing one or more claims of the '226 Patent.

65. In addition, upon information and belief, Defendants provide instructions, user guides, and/or other design documentation to the infringing others regarding the use and operation of the Accused Products. When the others follow such instructions, user guides, and/or other design documentation, they directly infringe one or more claims of the '226 Patent. By providing such instructions, user guides, and/or other design documentation, Defendants know and intend that those others will follow those instructions, user guides, and other design documentation, and thereby directly infringe one or more claims of the '226 Patent. Defendants thus know that their actions actively induce infringement.

66. The Accused Products have no substantial non-infringing uses and are a material part of the invention. As described in Exhibit J, any manufacture, use, sale offer for sale or importation in or into the United States of an Accused Product or a downstream product incorporating an Accused Product infringes the '226 patent. The Accused Products are semiconductor devices and integrated circuits that provide vital functionality to downstream products. The Accused Products cannot be used without being incorporated into a downstream product. Thus, the Accused products have no substantial non-infringing uses. Moreover, because the Accused Products provide vital functionality to the down-stream products, the Accused Products constitute a material part of the invention claimed in the '226 Patent.

67. Defendants have had knowledge of the '226 Patent since at least as of receiving a letter to TSMC dated February 8, 2019.

68. Defendants' continued infringement of the '226 Patent has damaged and will continue to damage Plaintiff.

69. Plaintiff is entitled to recover damages adequate to compensate it for Defendants' infringement.

COUNT VI
(Defendants' Willful Infringement of the '226 Patent)

70. Plaintiff incorporates the allegations of all of the foregoing paragraphs as if fully restated herein.

71. Defendants have infringed and/or do willfully infringe the '226 Patent.

72. Defendants received actual notice of the '226 Patent at least as early as February 2019 by way a letter to TSMC dated February 8, 2019. After receiving such actual notice of the '226 Patent, Defendants proceeded to make, use, test, sell, and/or offer to sell in this District and

elsewhere in the United States, and import into this District and elsewhere in the United States, the Accused Products.

73. On information and belief, Defendants engaged in such activities despite an objectively high likelihood that its actions constituted infringement of valid patents, including the '226 Patent. Defendants knew and should have known that its actions would cause direct and indirect infringement of the '226 Patent.

COUNT VII
(Defendants' Infringement of the '236 Patent)

74. Plaintiff incorporates the allegations of all of the foregoing paragraphs as if fully restated herein.

75. Plaintiff is the assignee and lawful owner of all right, title and interest in and to the '236 Patent. The '236 Patent is valid and enforceable.

76. Defendants have directly infringed, and continue to directly infringe, the '236 Patent by making, using, selling, offering for sale, or importing into the United States products and/or methods covered by one or more claims of the '236 Patent including, but not limited to, semiconductor devices, integrated circuits, and products containing the same. The accused products that infringe one or more claims of the '236 Patent include, but are not limited to, at least the Accused Products. Further discovery may reveal additional infringing products and/or models.

77. For example, and without limitation, the Accused Products infringe claims 1-18 of the '236 Patent.

78. Attached hereto as Exhibit K, and incorporated into this Complaint, is a claim chart showing where in an exemplary product, the TSMC 16 nm FinFET technology node, each limitation of Claim 1 is met. Attached hereto as Exhibit L, and incorporated into this Complaint, is a claim chart showing where in an exemplary product, the TSMC 28 nm HKMG technology

node, each limitation of Claim 1 is met. These claim charts are exemplary and, on information and belief, many other products provided by TSMC infringe the '236 Patent.

79. Defendants have, and continue to, indirectly infringe the '236 Patent by actively inducing and contributing to the infringement of the '236 Patent by others, such as fabless companies original equipment manufacturers, customers, resellers, and retailers. These others include, but are not limited to, MediaTek Inc. and its affiliates, Qualcomm Incorporated and its affiliates, BBK Communication Technology Co., Ltd. and its affiliates, Hisense Electric Co., Ltd. and its affiliates, TCL Corporation and its affiliates, and VIZIO, Inc. and its affiliates, who, for example, incorporate the Accused Products which infringe the '236 Patent into downstream products made, sold, offered for sale, and/or imported throughout the United States, including within this District.

80. Defendants specifically intended these others, such as original equipment manufacturers, customers, resellers, and retailers, to infringe the '236 Patent and knew that these others perform acts that constituted direct infringement. For example, Exhibit K shows that an exemplary product, TSMC's 16 nm FinFET technology node, which is incorporated in MediaTek's MT6763T integrated circuit and BBK Communication Technology Co., Ltd.'s Oppo F5 smartphone, infringes the '236 Patent. As further example, Exhibit L shows that an exemplary product, TSMC's 28 nm HKMG technology node, which is incorporated in MediaTek's MSDURP1602 integrated circuit and TCL Corporation's 55R617 television, infringes the '236 Patent. Defendants designed the Accused Products such that they would each infringe the '236 Patent as described in Exhibits K-L if made, used, sold, offered for sale, or imported into the United States. Defendants provided, directly or indirectly, Accused Products to others, such as, but not limited to, customers, knowing and intending that those others would use, sell, offer for sale, and/or

import in and into the United States downstream products that include the Accused Products, thereby directly infringing one or more claims of the '236 Patent.

81. In addition, upon information and belief, Defendants provide instructions, user guides, and/or other design documentation to the infringing others regarding the use and operation of the Accused Products. When the others follow such instructions, user guides, and/or other design documentation, they directly infringe one or more claims of the '236 Patent. By providing such instructions, user guides, and/or other design documentation, Defendants know and intend that those others will follow those instructions, user guides, and other design documentation, and thereby directly infringe one or more claims of the '236 Patent. Defendants thus know that their actions actively induce infringement.

82. The Accused Products have no substantial non-infringing uses and are a material part of the invention. As described in Exhibits K-L, any manufacture, use, sale offer for sale or importation in or into the United States of an Accused Product or a downstream product incorporating an Accused Product infringes the '236 patent. The Accused Products are semiconductor devices and integrated circuits that provide vital functionality to downstream products. The Accused Products cannot be used without being incorporated into a downstream product. Thus, the Accused products have no substantial non-infringing uses. Moreover, because the Accused Products provide vital functionality to the down-stream products, the Accused Products constitute a material part of the invention claimed in the '236 Patent.

83. Defendants have had knowledge of the '236 Patent since at least as of receiving a letter to TSMC dated February 8, 2019.

84. Defendants' continued infringement of the '236 Patent has damaged and will continue to damage Plaintiff.

85. Plaintiff is entitled to recover damages adequate to compensate it for Defendants' infringement.

COUNT VIII
(Defendants' Willful Infringement of the '236 Patent)

86. Plaintiff incorporates the allegations of all of the foregoing paragraphs as if fully restated herein.

87. Defendants have infringed and/or do willfully infringe the '236 Patent.

88. Defendants received actual notice of the '236 Patent at least as early as February 2019 by way a letter to TSMC dated February 8, 2019. After receiving such actual notice of the '236 Patent, Defendants proceeded to make, use, test, sell, and/or offer to sell in this District and elsewhere in the United States, and import into this District and elsewhere in the United States, the Accused Products.

89. On information and belief, Defendants engaged in such activities despite an objectively high likelihood that its actions constituted infringement of valid patents, including the '236 Patent. Defendants knew and should have known that its actions would cause direct and indirect infringement of the '236 Patent.

COUNT IX
(Defendants' Infringement of the '548 Patent)

90. Plaintiff incorporates the allegations of all of the foregoing paragraphs as if fully restated herein.

91. Plaintiff is the assignee and lawful owner of all right, title and interest in and to the '548 Patent. The '548 Patent is valid and enforceable.

92. Defendants have directly infringed, and continue to directly infringe, the '548 Patent by making, using, selling, offering for sale, or importing into the United States products and/or methods covered by one or more claims of the '548 Patent including, but not limited to,

semiconductor devices, integrated circuits, and products containing the same. The accused products that infringe one or more claims of the '548 Patent include, but are not limited to, at least the Accused Products. Further discovery may reveal additional infringing products and/or models.

93. For example, and without limitation, the Accused Products infringe claims 1-3 of the '548 Patent.

94. Attached hereto as Exhibit M, and incorporated into this Complaint, is a claim chart showing where in an exemplary product, the TSMC 28 nm LP technology, node each limitation of Claim 1 is met. This claim chart is exemplary and, on information and belief, many other products provided by TSMC infringe the '548 Patent.

95. Defendants have, and continue to, indirectly infringe the '548 Patent by actively inducing and contributing to the infringement of the '548 Patent by others, such as original equipment manufacturers, customers, resellers, and retailers. These others include, but are not limited to, MediaTek Inc. and its affiliates, Qualcomm Incorporated and its affiliates, BBK Communication Technology Co., Ltd. and its affiliates, Hisense Electric Co., Ltd. and its affiliates, TCL Corporation and its affiliates, and VIZIO, Inc. and its affiliates, who, for example, incorporate the Accused Products which infringe the '548 Patent into downstream products made, sold, offered for sale, and/or imported throughout the United States, including within this District.

96. Defendants specifically intended these others, such as original equipment manufacturers, customers, resellers, and retailers, to infringe the '548 Patent and knew that these others perform acts that constituted direct infringement. For example, Exhibit M shows that an exemplary product, the TSMC 28 nm LP technology node, which is incorporated in Qualcomm Incorporated's MSM8952 integrated circuit and TCL Corporation's Blackberry DTEK50 smartphone, infringes the '548 Patent. Defendants designed the Accused Products such that they

would each infringe the '548 Patent as described in Exhibit M if made, used, sold, offered for sale, or imported into the United States. Defendants provided, directly or indirectly, Accused Products to others, such as, but not limited to, customers, knowing and intending that those others would use, sell, offer for sale, and/or import in and into the United States downstream products that include the Accused Products, thereby directly infringing one or more claims of the '548 Patent.

97. In addition, upon information and belief, Defendants provide instructions, user guides, and/or other design documentation to the infringing others regarding the use and operation of the Accused Products. When the others follow such instructions, user guides, and/or other design documentation, they directly infringe one or more claims of the '548 Patent. By providing such instructions, user guides, and/or other design documentation, Defendants know and intend that those others will follow those instructions, user guides, and other design documentation, and thereby directly infringe one or more claims of the '548 Patent. Defendants thus know that their actions actively induce infringement.

98. The Accused Products have no substantial non-infringing uses and are a material part of the invention. As described in Exhibit M, any manufacture, use, sale offer for sale or importation in or into the United States of an Accused Product or a downstream product incorporating an Accused Product infringes the '548 patent. The Accused Products are semiconductor devices and integrated circuits that provide vital functionality to downstream products. The Accused Products cannot be used without being incorporated into a downstream product. Thus, the Accused products have no substantial non-infringing uses. Moreover, because the Accused Products provide vital functionality to the down-stream products, the Accused Products constitute a material part of the invention claimed in the '548 Patent.

99. Defendants have had knowledge of the '548 Patent since at least as of receiving a letter to TSMC dated February 8, 2019.

100. Defendants' continued infringement of the '548 Patent has damaged and will continue to damage Plaintiff.

101. Plaintiff is entitled to recover damages adequate to compensate it for Defendants' infringement.

COUNT X
(Defendants' Willful Infringement of the '548 Patent)

102. Plaintiff incorporates the allegations of all of the foregoing paragraphs as if fully restated herein.

103. Defendants have infringed and/or do willfully infringe the '548 Patent.

104. Defendants received actual notice of the '548 Patent at least as early as February 2019 by way of a letter to TSMC dated February 8, 2019. After receiving such actual notice of the '548 Patent, Defendants proceeded to make, use, test, sell, and/or offer to sell in this District and elsewhere in the United States, and import into this District and elsewhere in the United States, the Accused Products.

105. On information and belief, Defendants engaged in such activities despite an objectively high likelihood that its actions constituted infringement of valid patents, including the '548 Patent. Defendants knew and should have known that its actions would cause direct and indirect infringement of the '548 Patent.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff respectfully requests the following relief:

- a) A judgment that the Asserted Patents are valid and enforceable;

- b) A judgment that Defendants have infringed, directly and indirectly, either literally or under the Doctrine of Equivalents, one or more claims of the '012 Patent;
- c) A judgment that Defendants' infringement of the '012 Patent was willful, and that Defendants' continued infringement of the '012 Patent is willful;
- d) A judgment that Defendants have infringed, directly and indirectly, either literally or under the Doctrine of Equivalents, one or more claims of the '572 Patent;
- e) A judgment that Defendants' infringement of the '572 Patent was willful, and that Defendants' continued infringement of the '572 Patent is willful;
- f) A judgment that Defendants have infringed, directly and indirectly, either literally or under the Doctrine of Equivalents, one or more claims of the '226 Patent;
- g) A judgment that Defendants' infringement of the '226 Patent was willful, and that Defendants' continued infringement of the '226 Patent is willful;
- h) A judgment that Defendants have infringed, directly and indirectly, either literally or under the Doctrine of Equivalents, one or more claims of the '236 Patent;
- i) A judgment that Defendants' infringement of the '236 Patent was willful, and that Defendants' continued infringement of the '236 Patent is willful;
- j) A judgment that Defendants have infringed, directly and indirectly, either literally or under the Doctrine of Equivalents, one or more claims of the '548 Patent;
- k) A judgment that Defendants' infringement of the '548 Patent was willful, and that Defendants' continued infringement of the '548 Patent is willful;
- l) An injunction against Defendants, their officers, agents, servants, employees, all parent and subsidiary entities, all assignees and successors in interest, and those

persons or entities acting in concert or participation with Defendants, including distributors, enjoining them from further infringement of the Asserted Patents;

m) A judgment that awards Plaintiff all appropriate damages under 35 U.S.C. § 284 for Defendants' past infringement, and any continuing or future infringement of the Asserted Patents, including pre or post judgment interest, costs, and disbursements as justified under 35 U.S.C. § 284 and, if necessary to adequately compensate Plaintiff for Defendants' infringement, an accounting:

- i. that Plaintiff be awarded enhanced damages by reason of the Defendants' willful infringement of the '012 Patent;
- ii. that Plaintiff be awarded enhanced damages by reason of the Defendants' willful infringement of the '572 Patent;
- iii. that Plaintiff be awarded enhanced damages by reason of the Defendants' willful infringement of the '226 Patent;
- iv. that Plaintiff be awarded enhanced damages by reason of the Defendants' willful infringement of the '236 Patent;
- v. that Plaintiff be awarded enhanced damages by reason of the Defendants' willful infringement of the '548 Patent;
- vi. that this case be declared exceptional within the meaning of 35 U.S.C. § 285 and that Plaintiff be awarded its reasonable attorneys' fees against Defendants incurred in prosecuting this action;
- vii. that Plaintiff be awarded costs and expenses incurred in prosecuting this action; and

- n) A judgment that Plaintiff be awarded such further relief at law or in equity as the Court deems just and proper.

DEMAND FOR JURY TRIAL

Pursuant to Under Fed. R. Civ. P. 38, Plaintiff hereby demand trial by jury on all claims and issues so triable.

Dated: February 13, 2019

Respectfully submitted,

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