UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

ADVANCED INTEGRATED CIRCUIT PROCESS LLC, Plaintiffs, vs. TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY LIMITED, Defendant.	Civil Action No. 2:24-cv-623 **JURY TRIAL DEMANDED**

COMPLAINT FOR PATENT INFRINGEMENT

This is an action for patent infringement in which Plaintiff Advanced Integrated Circuit Process LLC ("AICP" or "Plaintiff") makes the following allegations against Defendant Taiwan Semiconductor Manufacturing Company Limited ("TSMC" or "Defendant") for infringing the Patents asserted in this matter.

PARTIES

1. Plaintiff AICP is a Texas limited liability company with its principal place of business at 825 Watters Creek Blvd, Suite 250, Allen, Texas 75013.

2. Defendant TSMC is a company organized and existing under the laws of Taiwan. It has a principal place of business located at 8, Li-Hsin Rd. 6, Hsinchu Science Park, Hsinchu 300-78, Taiwan, R.O.C. TSMC engages in business in Texas. Pursuant to § 17.044 of the Texas Civil Practice & Remedies Code, TSMC has designated the Secretary of State as its agent for service of process and may be served with process through the Secretary of State. The Secretary of State may forward service to TSMC at its home office address located at 8, Li-Hsin Rd. 6, Hsinchu Science Park, Hsinchu 300-78, Taiwan, R.O.C. Alternatively, TSMC may be served with

process by serving the Registered Agent of its wholly owned subsidiary TSMC North America, Steven A. Schulman, at 2851 Junction Avenue, San Jose, CA 95134.

JURISDICTION AND VENUE

3. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a) because this action arises under the patent laws of the United States, 35 U.S.C. §§ 1 *et seq.*

4. TSMC is subject to this Court's specific personal jurisdiction pursuant to due process and the Texas Long Arm Statute because it directly and/or through subsidiaries and agents makes, imports, ships, distributes, offers for sale, sells, uses, and advertises (including offering products and services through its websites) infringing semiconductor products in the United States, Texas, and this District.

5. TSMC is also subject to this Court's specific personal jurisdiction pursuant to due process and the Texas Long Arm Statute because it directly and/or through its subsidiaries and agents induced its direct and indirect customers to commit acts of infringement in the United Stats, Texas, and this District.

6. TSMC is also subject to this Court's specific personal jurisdiction pursuant to due process and the Texas Long Arm Statute because it directly and/or through its subsidiaries and agents contributed to its direct and indirect customers' acts of infringement in the United States, Texas, and this District.

7. TSMC's subsidiaries and agents include at least TSMC Technology, Inc., which is a wholly owned subsidiary of TSMC that is registered in Texas as a foreign corporation, with a registered agent at 2435 North Central Expressway, Suite 600, Richardson, Texas, and TSMC North America, which is a wholly owned subsidiary of TSMC registered in Texas as a foreign corporation with the Office of the Comptroller. On information and belief, TSMC North America

maintains a physical place of business at 11921 North Mopac Expressway, Austin, Texas 78759.

8. The "Business Activities" for TSMC North America are "[s]ales and marketing of integrated circuits and semiconductor devices" and "[e]ngineering support activities" for TSMC Technology, Inc. TSMC North America was incorporated in 1988, and TSMC Technology, Inc. was incorporated in 1996. *See* 2023 TSMC Annual Report.

9. TSMC directly, through its subsidiaries and agents, and through its direct and indirect customers has purposefully and voluntarily placed infringing semiconductor products in the stream of commerce knowing, expecting, and intending them to be sold in and purchased and used by consumers in the United States, Texas, and this District.

10. TSMC is traded on the New York Stock Exchange. For at least the last five years, TSMC has derived a majority of its net revenue from contracts with companies headquartered in the United States. In 2023, 65% of TSMC's 2023 net revenue was derived from United-States-based contracts. That figure was 66% in 2022, 64% in 2021, 61% in 2020, and 59% in 2019.

11. Similarly, much of TSMC's net revenue is attributable to the use of its products in consumer electronics, such as smartphones and other smart devices. In 2023, "Smartphone," "Internet of Things," and "Digital Consumer Electronics" accounted for 47% of TSMC's 2023 net revenue. That figure was 50% in 2022, 55% in 2021, 45% in 2020, and 62% in 2019.

12. In its 2023 Form 20-F, TSMC identified Advanced Micro Devices, Inc., Broadcom Limited, Infineon Technologies AG, Intel Corporation, MediaTek Inc., Nvidia Corporation, NXP Semiconductors N.V., and Qualcomm Inc. as among its major customers. Each of these companies maintains a physical place of business in Texas, and most of them are nationwide companies headquartered in the United States. The foreign entities (Infineon Technologies, MediaTek, and NXP) maintain substantial operations in the United States. Broadcom, Intel, MediaTek, NXP, and

Qualcomm have been identified in TSMC's Form 20-F as among its major customers for at least the last five years.

13. On information and belief, all of these TSMC customers make, import, ship, distribute, offer for sale, sell, use, and advertise (including offering products and services through websites) TSMC's infringing semiconductor products (or products incorporating TSMC's infringing semiconductor products) in the United States, Texas, and this District.

14. Moreover, at least Broadcom, Intel, MediaTek, NXP, and Qualcomm supply infringing semiconductor products to national end-device makers, like Apple and Samsung, who, in turn, directly or indirectly make, import, ship, distribute, offer for sale, sell, use, and advertise (including offering products and services through websites) products incorporating TSMC's infringing semiconductor products in the United States, Texas, and this District.

15. In fact, Apple is itself one of TSMC's major customers. Apple is one of the largest consumer electronics companies in the United States and it maintains substantial operations and physical places of business throughout Texas. In a March 13, 2024 press release, Apple described TSMC as a "key manufacturing partner[]." Apple CEO Tim Cook has personally attended ceremonies in the United States to commemorate TSMC's building of production facilities within the United States.

16. TSMC's targeted effort to sell its infringing semiconductor devices into the United States, Texas, and this District is further underscored by its investment in United-States-based production facilities. Since 2010, TSMC's wholly owned subsidiary TSMC Washington, LLC, which was incorporated in 1996, has operated a foundry for TSMC customers in Washington State. Between 2020 and 2024, TSMC announced its investment of $65 billion to build three advanced semiconductor fabrication facilities in Arizona. TSMC Arizona Corporation, a wholly owned

subsidiary of TSMC, was incorporated in 2020. The "Business Activities" for both TSMC Washington, LLC and TSMC Arizona Corporation are "Manufacturing, sales, and testing of integrated circuits and other semiconductor devices." 2023 TSMC Annual Report.

17. TSMC has manufactured several generations of semiconductor devices for Apple, which Apple then incorporates into its consumer end-devices, such as iPhones and iPads. For example, TSMC manufactures the Apple A15 Bionic chip, discussed below, which is used in at least Apple's iPhone 13, iPhone SE, iPhone 14, iPad Mini, and Apple TV products.

18. Using its vast, national distribution channels, Apple, directly or indirectly, makes, imports, ships, distributes, offers for sale, sells, uses, and advertises (including offering products and services through its websites) products incorporating TSMC's infringing semiconductor products in the United States, Texas, and this District.

19. TSMC's relationship and business with Apple is sufficient to establish specific personal jurisdiction over TSMC in Texas and this District.

20. The nature of TSMC's business, which it describes as "manufactur[ing] semiconductors using our manufacturing processes for our customers based on proprietary integrated circuit designs provided by them," *see* 2023 TSMC Form 20-F, also requires that TSMC form close relationships with its customers and actively assist them in the development and manufacture of their products. Indeed, TSMC identifies "closely interact[ing] with customers" and "enhanc[ing] the quality of customer collaboration" as among its goals. TSMC 2023 Annual Report. To facilitate this process, TSMC has "established a dedicated customer service team to act as the primary contact window, facilitating seamless communication and coordination with customers in areas such as product design, mask making, wafer manufacturing, and 3DFabric® technology services." And it conducts "quarterly business/technical reviews," "feedback reviews,"

and "surveys" with its customers. *Id.* In short, as TSMC itself described, "the key to TSMC's success has always been to enable its customers' success." 2023 TSMC Annual Report.

21. As an example, for decades, TSMC has enjoyed a close partnership with Freescale Semiconductors, Inc., which merged with NXP in 2015. In 2004, TSMC and Freescale announced "an agreement to jointly develop a new generation" of advanced chip-making technology. That "joint development project" was "located at Freescale's Dan Noble Center in Austin, Texas, USA." TSMC touted this collaboration with Freescale as among its major R&D projects in its 2006 Annual Report.

22. The collaboration between these companies remained alive and well in 2023. On May 16, 2023, NXP "announced its collaboration with TSMC to deliver the industry's first automotive embedded MRAM (Magnetic Random Access Memory) in 16 nm FinFET technology." NXP explicitly acknowledged the longevity of this partnership, stating that "NXP's successful collaboration with TSMC spans decades and has consistently delivered high quality embedded memory technology . . . ."

23. For many years, the United States and its consumer electronics market has been a key driver of TSMC's business. TSMC knows this and has worked closely with various technology companies based in the United States to win and maintain their business. TSMC works hard and takes steps to ensure successful integration of its infringing semiconductor products into its direct and indirect customers' products. It makes itself extensively available to its customers, including through various resources and assets based in the United States and Texas.

24. With TSMC's knowledge, TSMC's customers, directly or indirectly, sell products incorporating TSMC's infringing semiconductor products throughout the United States, Texas, and this District—products that TSMC helps to design and manufacture. In working with and

supplying its customers, TSMC knew and desired that its infringing semiconductor products would reach throughout the United States, including Texas (the second most populous state in the United States) and this District.

25. TSMC also directly and/or through its agents and subsidiaries offers to sell, sells, imports, and/or advertises its infringing semiconductor products throughout the United States, including Texas and this District.

26. TSMC therefore knows, expects, intends, and desires that its infringing semiconductor products, and products containing its infringing semiconductor products, will be sold in the United States, Texas, and this District.

27. Further, on information and belief, this Court has personal jurisdiction over Defendant TSMC at least by virtue of Federal Rule of Civil Procedure 4(k)(2).

28. Venue is proper against Defendant TSMC in this District pursuant to 28 U.S.C. § 1391(c)(3) and 28 U.S.C. § 1400(b). TSMC is not a resident of the United States and may be sued in any district, including this District.

THE PATENTS

29. This complaint asserts causes of action for infringement of United States Patent No. 7,579,227 (the "'227 Patent"), United States Patent No. 7,923,764 (the "'764 Patent"), United States Patent No. 8,198,686 (the "'686 Patent"), United States Patent No. 8,253,180 (the "'180 Patent"), United States Patent No. 8,587,076 (the "'076 Patent"), United States Patent No. 8,796,779 (the "'779 Patent"), and United States Patent No. 8,907,425 (the "'425 Patent") (collectively, the "Asserted Patents").

30. Each of the Asserted Patents claims patent-eligible subject matter and is a valid and enforceable U.S. patent, the entire right, title, and interest to which AICP owns by assignment.

U.S. Patent No. 7,579,227

31. U.S. Patent No. 7,579,227 is entitled "Semiconductor Device and Method for Fabricating the Same," and was issued by the U.S. Patent and Trademark Office (the "PTO") to inventors Junji Hirase, Akio Sebe, Naoki Kotani, Gen Okazaki, Kazuhiko Aida, and Shinji Takeoka on August 25, 2009. Plaintiff holds by assignment all rights and title to the '227 Patent, including the sole and exclusive right to bring a claim for its infringement. A copy of the '227 Patent is attached to this complaint as **Exhibit A**.

32. The '227 Patent generally claims a structure of a MISFET (metal insulator semiconductor field-effect transistor) semiconductor device.

33. To the extent applicable, Plaintiff has complied with 35 U.S.C. § 287(a) with respect to the '227 Patent.

34. TSMC is not licensed to practice the '227 Patent in either an express or implied manner, nor does it enjoy or benefit from any rights in or to the '227 Patent whatsoever.

U.S. Patent No. 7,923,764

35. U.S. Patent No. 7,923,764 is entitled "Semiconductor Device and Method for Fabricating the Same," and was issued by the PTO to inventors Junji Hirase, Akio Sebe, Naoki Kotani, Gen Okazaki, Kazuhiko Aida, and Shinji Takeoka on April 12, 2011. Plaintiff holds by assignment all rights and title to the '764 Patent, including the sole and exclusive right to bring a claim for its infringement. A copy of the '764 Patent is attached to this complaint as **Exhibit B**.

36. The application preceding the '764 Patent was a divisional of U.S. Patent Application No. 11/491,260, which became the '227 Patent.

37. The '764 Patent generally claims a structure of a MISFET (metal insulator semiconductor field-effect transistor) semiconductor device.

38. To the extent applicable, Plaintiff has complied with 35 U.S.C. § 287(a) with respect to the ’764 Patent.

39. TSMC is not licensed to practice the ’764 Patent in either an express or implied manner, nor does it enjoy or benefit from any rights in or to the ’764 Patent whatsoever.

U.S. Patent No. 8,253,180

40. U.S. Patent No. 8,253,180 is entitled “Semiconductor Device,” and was issued by the PTO to inventors Junji Hirase, Akio Sebe, Naoki Kotani, Gen Okazaki, Kazuhiko Aida, and Shinji Takeoka on August 28, 2012. Plaintiff holds by assignment all rights and title to the ’180 Patent, including the sole and exclusive right to bring a claim for its infringement. A copy of the ’180 Patent is attached to this complaint as **Exhibit C**.

41. The application preceding the ’180 Patent was a divisional of U.S. Patent Application No. 12/505,799, which became the ’764 Patent.

42. The ’180 Patent generally claims a structure of a MISFET (metal insulator semiconductor field-effect transistor) semiconductor device.

43. To the extent applicable, Plaintiff has complied with 35 U.S.C. § 287(a) with respect to the ’180 Patent.

44. TSMC is not licensed to practice the ’180 Patent in either an express or implied manner, nor does it enjoy or benefit from any rights in or to the ’180 Patent whatsoever.

U.S. Patent No. 8,587,076

45. U.S. Patent No. 8,587,076 is entitled “Semiconductor Device,” and was issued by the PTO to inventors Junji Hirase, Akio Sebe, Naoki Kotani, Gen Okazaki, Kazuhiko Aida, and Shinji Takeoka on November 19, 2013. Plaintiff holds by assignment all rights and title to the ’076 Patent, including the sole and exclusive right to bring a claim for its infringement. A copy of the

’076 Patent is attached to this complaint as **Exhibit D**.

46. The application preceding the ’076 Patent was a divisional of U.S. Patent Application No. 13/037,831, which became the ’180 Patent.

47. The ’076 Patent generally claims a structure of a MISFET (metal insulator semiconductor field-effect transistor) semiconductor device.

48. To the extent applicable, Plaintiff has complied with 35 U.S.C. § 287(a) with respect to the ’076 Patent.

49. TSMC is not licensed to practice the ’076 Patent in either an express or implied manner, nor does it enjoy or benefit from any rights in or to the ’076 Patent whatsoever.

U.S. Patent No. 8,198,686

50. U.S. Patent No. 8,198,686 is entitled “Semiconductor Device,” and was issued by the PTO to inventors Yoshihiro Sato and Hisashi Ogawa on June 12, 2012. Plaintiff holds by assignment all rights and title to the ’686 Patent, including the sole and exclusive right to bring a claim for its infringement. A copy of the ’686 Patent is attached to this complaint as **Exhibit E**.

51. The ’686 Patent generally claims a semiconductor device including Metal Insulator Semiconductor Field Effect Transistors (MISFET) having varying gate structures.

52. To the extent applicable, Plaintiff has complied with 35 U.S.C. § 287(a) with respect to the ’686 Patent.

53. TSMC is not licensed to practice the ’686 Patent in either an express or implied manner, nor does it enjoy or benefit from any rights in or to the ’686 Patent whatsoever.

U.S. Patent No. 8,796,779

54. U.S. Patent No. 8,796,779 is entitled “Semiconductor Device,” and was issued by the PTO to inventors Satoru Ito, Yoshiya Moriyama, Hiroshi Ohkawa, and Susumu Akamatsu on

August 5, 2014. Plaintiff holds by assignment all rights and title to the '779 Patent, including the sole and exclusive right to bring a claim for its infringement. A copy of the '779 Patent is attached to this complaint as **Exhibit F**.

55. The '779 Patent generally claims a semiconductor device including metal insulator semiconductor (MIS) devices with varying gate structures.

56. To the extent applicable, Plaintiff has complied with 35 U.S.C. § 287(a) with respect to the '779 Patent.

57. TSMC is not licensed to practice the '779 Patent in either an express or implied manner, nor does it enjoy or benefit from any rights in or to the '779 Patent whatsoever.

U.S. Patent No. 8,907,425

58. U.S. Patent No. 8,907,425 is entitled "Semiconductor Device," and was issued by the PTO to inventors Satoru Ito and Toshie Kutsunnai on December 9, 2014. Plaintiff holds by assignment all rights and title to the '425 Patent, including the sole and exclusive right to bring a claim for its infringement. A copy of the '425 Patent is attached to this complaint as **Exhibit G**.

59. The '425 Patent generally claims a structure of a MISFET (metal insulator semiconductor field-effect transistor) semiconductor device with stress layer and a source/drain region that includes a silicon compound layer.

60. To the extent applicable, Plaintiff has complied with 35 U.S.C. § 287(a) with respect to the '425 Patent.

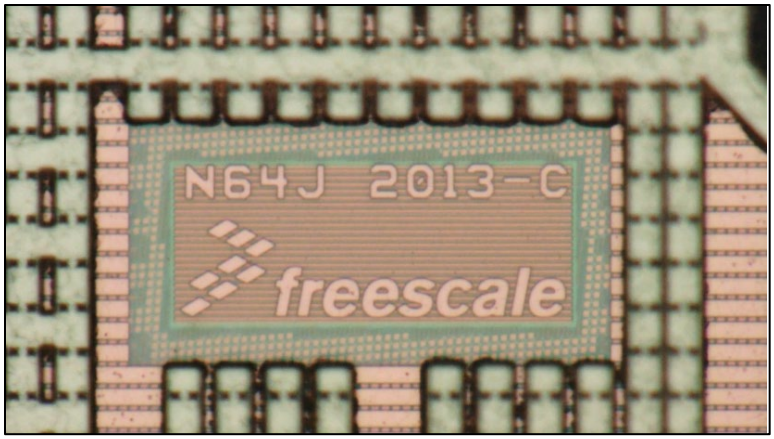
61. TSMC is not licensed to practice the '425 Patent in either an express or implied manner, nor does it enjoy or benefit from any rights in or to the '425 Patent whatsoever.

TSMC'S USE OF AICP'S PATENTED TECHNOLOGY

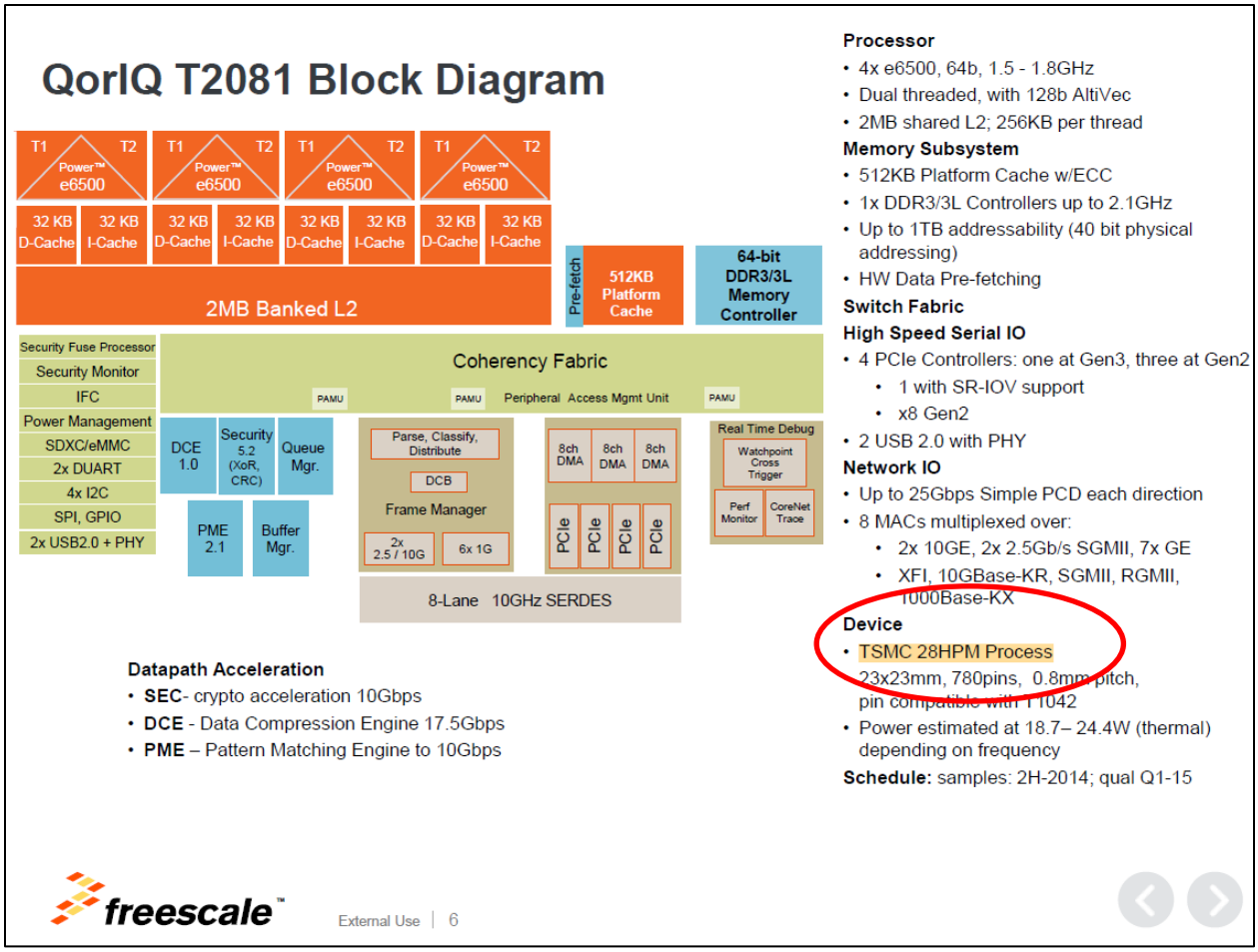
62. TSMC manufactures semiconductor devices at several different process nodes (i.e.,

minimum physical feature size or line width), including the 5 nanometer and 28 nanometer process nodes. The semiconductor devices TSMC manufactures are, in turn, incorporated by TSMC's customers into third-party electronic components and products, such as computer chips, mobile devices, and computer graphics cards.

63. For example, TSMC has manufactured and, on information and belief, continues to manufacture the T2081NSN8MQBUYQCV1517 semiconductor device (the "T2081") for Freescale Semiconductor, now known as NXP Semiconductors, at its 28 nanometer process node. *See, e.g.*:



64. Block diagrams from Freescale Semiconductor describe the circuitry of this device, and specifically identify it as manufactured by the "TSMC 28HPM Process." On information and belief, "28HPM" represents one of TSMC's 28 nanometer manufacturing processes, and "HPM" stands for High Performance Mobile. *See, e.g.*:



65. A document currently available on NXP's website, titled "QorIQ T1 and T2 Families of Communications Processors," similarly identifies the "Process Technology" for the T2081 as "TSMC 28HPM." Indeed, TSMC 28HPM is identified as the "Process Technology" for all four products in the table:

QorIQ Processing Platforms

	T1040/T1020	T1042/T1022	T2081	T2080
CPU Frequency Range	1200–1400 MHz	1200–1400 MHz	1500–1800 MHz	1200–1800 MHz
Cores	4/2	4/2	4	4
Threads	4//2	4/2	8	8
DMIPS	16,800/8,400	16,800/8,400	43,200	43,200
Cache (I/D)	32 K/32 K	32 K/32 K	32 K/32 K	32 K/32 K
Cache L2	256 KB/core	256 KB/core	2 MB Shared	2 MB Shared
Cache L3	256 KB	256 KB	512 KB	512 KB
DDR Controller	32-/64-bit DDR3L/4	32-/64-bit DDR3L/4	64-bit DDR3/3L	64-bit DDR3/3L
DDR Data Rate (GHz)	1.6 GHz	1.6 GHz	2.133 GHz	2.133 GHz
PCI Express®	4 Gen 2.0	4 Gen 2.0	1 Gen 3.0, 3 Gen 2.0	1 Gen 3.0, 3 Gen 2.0
USB 2.0	2	2	2	2
SATA	2	2	N/A	2
SRIO	N/A	N/A	N/A	2 + RMan
GbE	Up to 4 x GbE, 8-port Gigabit Ethernet Switch	Up to 5 x GbE	Up to 7 x GbE, Up to 2 x 10GbE	Up to 8 x GbE, Up to 4 x 10GbE
SerDes	8 lanes @ 5 Gb/s	8 lanes @ 5 Gb/s	8 lanes @ 10 Gb/s	16 lanes @ 10 Gb/s
FPU	Double precision	Double precision	Double precision	Double precision
Accelerators	DPAA, PME, SEC 5.x with Trust Architecture	DPAA, PME, SEC 5.x with Trust Architecture	DPAA, PME, DCE, SEC 5.x with Trust Architecture	DPAA, PME, DCE, RMan, SEC 5.x with Trust Architecture
Package	780 FCPBGA	780 FCPBGA	780 FCPBGA	896 FCPBGA
Process Technology	TSMC 28HPM	TSMC 28HPM	TSMC 28HPM	TSMC 28HPM
Estimated Typical Power	~5.26 W/~4.16 W	~5.13 W/~4.03 W	~14 W	~14.9 W
Other Features	eSPI, 2 x I²C, 4 x UART, CoreNet, QUICC Engine, SD/MMC, DMA, Hardware Hypervisor, IFC, DIU	eSPI, 2 x I²C, 4 x UART, CoreNet, QUICC Engine, SD/MMC, DMA, Hardware Hypervisor, IFC, DIU	eSPI, 4 x I²C, 4 x UART, CoreNet, SD/MMC, DMA, Hardware Hypervisor, IFC, Trust Architecture, AltiVec	eSPI, 4 x I²C, 4 x UART, CoreNet, SD/MMC, DMA, Hardware Hypervisor, IFC, Trust Architecture, AltiVec

66. TSMC has also manufactured and, on information and belief, continues to manufacture products for MediaTek on its 28 nanometer process node.[1] The "Mediatek SoC" analyzed by Tech Insights is referred to as the "MediaTek Device."

67. Hereafter, the term "Accused 28nm Instrumentalities" refers to all products manufactured by TSMC by practicing the '227 Patent, '764 Patent, '686 Patent, '076 Patent, '180 Patent, and/or '425 Patent, including at least all semiconductor devices manufactured according to TSMC's 28 nanometer process node and electronic components and products incorporating such semiconductor devices and processes.

[1] Tech Insights, A Trip Down TSMC Memory Lane – Part 3 (last accessed July 31, 2024), available at: https://www.techinsights.com/blog/trip-down-tsmc-memory-lane-part-3.

68. TSMC has also manufactured and, on information and belief, continues to manufacture, the Apple A15 Bionic semiconductor device (the "A15 Bionic") for Apple. *See, e.g.*:

69. TSMC has manufactured and continues to manufacture the A15 Bionic semiconductor device (the "A15 Bionic") for Apple using a 5 nanometer FinFET manufacturing process.[2]

70. Hereafter, the term "Accused FinFET Instrumentalities" refers to all products manufactured by TSMC by practicing the '779 Patent, including the A15 Bionic and all FinFET semiconductor devices manufactured according to TSMC's 5, 7, 10, and 16 nanometer process nodes and electronic components and products incorporating such semiconductor devices and

[2] UnitedLex, *Revealing the Hidden Innovations within the A15 Bionic SoC Found in the iPhone 13* (last accessed July 31, 2024), available at: https://unitedlex.com/insights/revealing-the-hidden-innovations-within-the-a15-bionic-soc-found-in-the/.

processes.

COUNT ONE
INFRINGEMENT OF U.S. PATENT NO. 7,579,227

71. Plaintiff repeats and incorporates by reference each preceding paragraph as if fully set forth herein and further states:

72. TSMC has directly infringed and continues to directly infringe the ’227 Patent under 35 §§ U.S.C. 271(a), either literally or through the doctrine of equivalents, by making, using, selling, offering to sell, and/or importing in or into the United States Accused 28nm Instrumentalities and other products made by practicing and by performing processes that result in practicing the ’227 Patent as described below, including at least Claim 1. By way of example, such Accused 28nm Instrumentalities include the T2081 devices manufactured, used, sold, offered for sale, and/or imported by TSMC.

73. For example, Claim 1 is illustrative of the claims of the ’227 Patent. It recites “[a] semiconductor device comprising:

> a high dielectric constant gate insulating film formed on an active region in a substrate;
>
> a gate electrode formed on the high dielectric constant gate insulating film; and
>
> an insulating sidewall formed on each side surface of the gate electrode,
>
> wherein the high dielectric constant gate insulating film is continuously formed so as to extend from under the gate electrode to under the insulating sidewall,
>
> at least part of the high dielectric constant gate insulating film located under the insulating sidewall has a smaller thickness than a thickness of part of the high dielectric constant gate insulating film located under the gate electrode,
>
> the insulating sidewall includes a first insulating sidewall formed on a side surface of the gate electrode and a second insulating sidewall formed on the side surface of the gate electrode with the first insulating sidewall interposed therebetween,
>
> the high dielectric constant gate insulating film is continuously formed so as to extend from under the gate electrode to under the first insulating sidewall, and

part of the high dielectric constant gate insulating film located under the first insulating sidewall has a smaller thickness than a thickness of part of the high dielectric constant gate insulating film located under the gate electrode."

74. The exemplar T2081 device manufactured by TSMC meets every element of this claim.[3]

75. The T2081 is a semiconductor device comprising a high dielectric constant gate insulating film formed on an active region in a substrate. It further comprises a gate electrode formed on the high dielectric constant gate insulating film, and an insulating sidewall formed on each side surface of the gate electrode, wherein the high dielectric constant gate insulating film is continuously formed so as to extend from under the gate electrode to under the insulating sidewall.

76. At least part of the high dielectric constant gate insulating film located under the insulating sidewall has a smaller thickness than a thickness of part of the high dielectric constant gate insulating film located under the gate electrode. For example, in the T2081, the tapered edge of the high dielectric constant insulating film is thinner than the non-tapered area under the gate electrode.

77. In the T2081, the insulating sidewall includes a first insulating sidewall formed on a side surface of the gate electrode and a second insulating sidewall formed on the side surface of the gate electrode with the first insulating sidewall interposed therebetween, and the high dielectric constant gate insulating film is continuously formed so as to extend from under the gate electrode to under the first insulating sidewall.

78. Part of the high dielectric constant gate insulating film located under the first insulating sidewall in the T2081 has a smaller thickness than a thickness of part of the high dielectric constant gate insulating film located under the gate electrode.

[3] This description of infringement is illustrative and not intended to be an exhaustive or limiting explanation of every manner in which the T2081 device infringes.

79. Because the T2081 practices at least Claim 1 of the ’227 Patent, all semiconductor devices manufactured according to TSMC’s 28 nanometer process node likewise infringe because infringement occurs as a result of TSMC’s manufacturing process at this node. For example, on information and belief, TSMC uses common MIS transistor structures for all semiconductor devices that it manufactures with its 28 nanometer process node such that all semiconductor devices manufactured at the 28 nanometer node invariably infringe at least Claim 1 of the ’227 Patent in the same manner the T2081 does.

80. In addition to directly infringing the ’227 Patent by making, using, selling, offering to sell, and/or importing Accused 28nm Instrumentalities into the United States, TSMC likewise has induced infringement of the ’227 Patent under 35 U.S.C. § 271(b). TSMC has actively encouraged its customers (*e.g.*, NXP Semiconductors) to directly infringe the ’227 Patent by using, selling, offering for sale, and/or importing electronic devices and products containing the Accused 28nm Instrumentalities (*e.g.*, the T2081). TSMC actively encouraged its customers to employ TSMC’s infringing process nodes to manufacture their semiconductor devices, electronic components, and products by and through TSMC’s sales, engineering, and technical marketing efforts and staff. TSMC’s sales engineers and technical marketing staff interface with TSMC’s customers and potential customers to obtain “design wins” (*i.e.*, contracts with customers) to develop and manufacture infringing chips. In attempting to obtain these “design wins,” TSMC’s sales engineers and technical marketing staff tout the technological and economic benefits of the infringing chips and actively encourage use of the infringing chips. TSMC has known that their customers’ acts constituted direct infringement of at least one claim of the ’227 Patent since at least as of the filing of this Complaint. As a result of TSMC’s active encouragement and intentional inducement, its customers have committed acts directly infringing the ’227 Patent.

81. Moreover, TSMC intends to cause, and has taken affirmative steps to induce, infringement by customers and end-users by at least, *inter alia*, encouraging, promoting, instructing, and/or directing the infringing use of the Accused 28nm Instrumentalities.

82. A 2022 news article titled "TSMC to Customers: It's Time to Stop Using Older Nodes and Move to 28nm" details TSMC's efforts to encourage, promote, instruct, and/or direct its customers and end-users use of the Accused 28nm Instrumentalities. TSMC was "strongly encouraging its customers on its oldest (and least dense) nodes to migrate some of their mature designs to its 28 nm-class process technologies."

83. As Kevin Zhang, Senior Vice President of Business Development at TSMC said at the time, "We are not currently [expanding capacity for] the 40 nm node. . . . 20/28 nm is going to be a very important node to support future specialty. . . . We are working with customer[s] to accelerate [their transition]. . . . I think the customer going to get a benefit, economic benefit, scaling benefit, you have a better power consumption."

84. Switching customers to its 28 nanometer process technology and away from older, larger nodes benefitted TSMC significantly. It allowed TSMC to shift resources and customers away from older, outdated, and less profitable nodes and toward the higher-profit, 28 nanometer node. Indeed, on a 2022 conference call with analysts, C.C. Wei, CEO of TSMC, stated that the 28 nanometer node was the "sweet spot" for TSMC.

85. As detailed above, the T2081 and Accused 28nm Instrumentalities infringe at least Claim 1 of the '227 Patent. Accordingly, by encouraging, promoting, instructing, and/or directing users to use the T2081 and Accused 28nm Instrumentalities, TSMC is actively inducing infringement of the '227 Patent in violation of 35 U.S.C. § 271(b).

86. TSMC likewise is liable as a contributory infringer of the '227 Patent under 35

U.S.C. § 271(c). TSMC has offered to sell and/or sold within the United States services for manufacturing and designs for the Accused 28nm Instrumentalities that practice the ’227 Patent. The Accused 28nm Instrumentalities comprise semiconductor devices, each of which constitutes a material part of the ’227 Patent’s invention that can be incorporated into electronic components and products.

87. For example, such manufacturing services and designs were offered for sale, sold, and marketed by and through TSMC’s sales, engineering, and technical marketing efforts and staff. Such efforts resulted in TSMC’s manufacturing of the infringing T2081 chip. Upon information and belief, TSMC’s customers do not manufacture the Accused 28nm Instrumentalities on their own, but contract with others, such as TSMC, to manufacture such devices. TSMC has known such Accused 28nm Instrumentalities to be especially adapted for practicing, and thus infringing, the ’227 Patent since at least the filing of this Complaint. The Accused 28nm Instrumentalities are not staple articles nor a commodity of commerce suitable for substantial non-infringing use because they cannot be used individually without incorporation into electronic components and products. Thus, TSMC is liable as a contributory infringer.

88. TSMC has had actual knowledge of the ’227 Patent since at least 2012, when the examiner cited U.S. Patent Application No. 2011/0147857, from which the ’180 Patent issued, as a reference in TSMC’s application for U.S. Patent No. 8,258,588. The ’180 Patent and the ’227 Patent are members of the same patent family. There are three additional family-to-family citations between the ’227 Patent family and the following TSMC patents: U.S. Patent Nos. 9,209,298, 10,050,147, 10,784,781.

89. In 2016, two researchers at National Taiwan University studied TSMC’s patent-acquisition strategy and presented their findings in a paper. They found that most of the patents

that TSMC had acquired were those that had been cited during the prosecution of their own patent applications.[4] On information and belief, following the citation of U.S. Patent Application No. 2011/0147857 during the prosecution of TSMC's U.S. Patent No. 8,258,588, which occurred no later than 2012, TSMC began monitoring and tracking the applications and patents in U.S. Patent Application No. 2011/0147857's family for potential acquisition. TSMC's continued infringement following that date, despite its knowledge of the '227 Patent, was intentional and deliberate and willful.

90. TSMC's direct, induced, contributory, and willful infringement of the '227 Patent has caused, and will continue to cause, substantial damage to AICP. Therefore, AICP is entitled to an award of damages adequate to compensate for TSMC's infringement, but not less than reasonable royalty, together with pre-and post-judgment interest, attorneys' fees, and costs as fixed by the Court under 35 U.S.C. §§ 284 and 285.

COUNT TWO
INFRINGEMENT OF U.S. PATENT NO. 7,923,764

91. Plaintiff repeats and incorporates by reference each preceding paragraph as if fully set forth herein and further states:

92. TSMC has directly infringed and continues to directly infringe the '764 Patent under 35 §§ U.S.C. 271(a), either literally or through the doctrine of equivalents, by making, using, selling, offering to sell, and/or importing in or into the United States Accused 28nm Instrumentalities and other products made by practicing and by performing processes that result in practicing the '764 Patent as described below, including at least Claim 1. By way of example, such Accused 28nm Instrumentalities include the T2081 devices manufactured, used, sold, offered for

[4] GreyB, *Tracking Patent Citations – A Strategy to strengthen your Portfolio and market position* (last accessed July 31, 2024), available at: https://www.greyb.com/blog/tracking-citations/.

sale, and/or imported by TSMC.

93. For example, Claim 1 is illustrative of the claims of the '764 Patent. It recites "[a] semiconductor device comprising:

> a high dielectric constant gate insulating film formed on an active region in a substrate;
>
> a gate electrode formed on the high dielectric constant gate insulating film;
>
> a first insulating sidewall formed on each side surface of the gate electrode;
>
> and a second insulating sidewall formed on said each side surface of the gate electrode with the first insulating sidewall interposed therebetween,
>
> wherein the high dielectric constant gate insulating film is continuously formed so as to extend from under the gate electrode to under the first insulating sidewall, and
>
> part of the high dielectric constant gate insulating film located under the first insulating sidewall has a smaller thickness than a thickness of part of the high dielectric constant gate insulating film located under the gate electrode."

94. The exemplar T2081 device manufactured by TSMC meets every element of this claim.[5]

95. The T2081 is a semiconductor device comprising a high dielectric constant gate insulating film formed on an active region in a substrate. It further comprises a gate electrode formed on the high dielectric constant gate insulating film, and a first insulating sidewall formed on each side surface of the gate electrode, and a second insulating sidewall formed on said each side surface of the gate electrode with the first insulating sidewall interposed therebetween, wherein the high dielectric constant gate insulating film is continuously formed so as to extend from under the gate electrode to under the first insulating sidewall.

96. In the T2081, part of the high dielectric constant gate insulating film located under the first insulating sidewall has a smaller thickness than a thickness of part of the high dielectric

[5] This description of infringement is illustrative and not intended to be an exhaustive or limiting explanation of every manner in which the T2081 device infringes.

constant gate insulating film located under the gate electrode. For example, in the T2081, the tapered edge of the high dielectric constant insulating film is thinner than the non-tapered area under the gate electrode.

97. Because the T2081 practices at least Claim 1 of the ’764 Patent, all semiconductor devices manufactured according to TSMC’s 28 nanometer process node likewise infringe because infringement occurs as a result of TSMC’s manufacturing process at this node. For example, on information and belief, TSMC uses common MIS transistor structures for all semiconductor devices that it manufactures with its 28 nanometer process node such that all semiconductor devices manufactured at the 28 nanometer node invariably infringe at least Claim 1 of the ’764 Patent in the same manner the T2081 does.

98. In addition to directly infringing the ’764 Patent by making, using, selling, offering to sell, and/or importing Accused 28nm Instrumentalities into the United States, TSMC likewise has induced infringement of the ’764 Patent under 35 U.S.C. § 271(b). TSMC has actively encouraged its customers (*e.g.*, NXP Semiconductors) to directly infringe the ’764 Patent by using, selling, offering for sale, and/or importing electronic devices and products containing the Accused 28nm Instrumentalities (*e.g.*, the T2081). TSMC actively encouraged its customers to employ TSMC’s infringing process nodes to manufacture their semiconductor devices, electronic components, and products by and through TSMC’s sales, engineering, and technical marketing efforts and staff. TSMC’s sales engineers and technical marketing staff interface with TSMC’s customers and potential customers to obtain “design wins” (*i.e.*, contracts with customers) to develop and manufacture infringing chips. In attempting to obtain these “design wins,” TSMC’s sales engineers and technical marketing staff tout the technological and economic benefits of the infringing chips and actively encourage use of the infringing chips. TSMC has known that their

customers' acts constituted direct infringement of at least one claim of the '764 Patent since at least as of the filing of this Complaint. As a result of TSMC's active encouragement and intentional inducement, its customers have committed acts directly infringing the '764 Patent.

99. Moreover, TSMC intends to cause, and has taken affirmative steps to induce, infringement by customers and end-users by at least, *inter alia*, encouraging, promoting, instructing, and/or directing the infringing use of the Accused 28nm Instrumentalities. As discussed above, TSMC took direct steps to encourage, promote, instruct, and/or direct its customers and end-users use of the Accused 28nm Instrumentalities. Pushing its customers toward the 28 nanometer node benefitted TSMC significantly.

100. As detailed above, the T2081 and Accused 28nm Instrumentalities infringe at least Claim 1 of the '764 Patent. Accordingly, by encouraging, promoting, instructing, and/or directing users to use the T2081 and Accused 28nm Instrumentalities, TSMC is actively inducing infringement of the '764 Patent in violation of 35 U.S.C. § 271(b).

101. TSMC likewise is liable as a contributory infringer of the '764 Patent under 35 U.S.C. § 271(c). TSMC has offered to sell and/or sold within the United States services for manufacturing and designs for the Accused 28nm Instrumentalities that practice the '764 Patent. The Accused 28nm Instrumentalities comprise semiconductor devices, each of which constitutes a material part of the '764 Patent's invention that can be incorporated into electronic components and products.

102. For example, such manufacturing services and designs were offered for sale, sold, and marketed by and through TSMC's sales, engineering, and technical marketing efforts and staff. Such efforts resulted in TSMC's manufacturing of the infringing T2081 chip. Upon information and belief, TSMC's customers do not manufacture the Accused 28nm Instrumentalities on their

own, but contract with others, such as TSMC, to manufacture such devices. TSMC has known such Accused 28nm Instrumentalities to be especially adapted for practicing, and thus infringing, the ’764 Patent since at least the filing of this Complaint. The Accused 28nm Instrumentalities are not staple articles nor a commodity of commerce suitable for substantial non-infringing use because they cannot be used individually without incorporation into electronic components and products. Thus, TSMC is liable as a contributory infringer.

103. TSMC has had actual knowledge of the ’764 Patent since at least 2012, when the examiner cited U.S. Patent Application No. 2011/0147857, from which the ’180 Patent issued, as a reference in TSMC’s application for U.S. Patent No. 8,258,588. The ’180 Patent and the ’764 Patent are members of the same patent family. There are three additional family-to-family citations between the ’764 Patent family and the following TSMC patents: U.S. Patent Nos. 9,209,298, 10,050,147, 10,784,781.

104. On information and belief and in accordance with TSMC’s patent-acquisition strategy described above, following the citation of U.S. Patent Application No. 2011/0147857, which occurred no later than 2012, TSMC began monitoring and tracking the applications and patents in that family for potential acquisition. TSMC’s continued infringement following that date, despite its knowledge of the ’764 Patent, was intentional and deliberate and willful.

105. TSMC’s direct, induced, contributory, and willful infringement of the ’764 Patent has caused, and will continue to cause, substantial damage to AICP. Therefore, AICP is entitled to an award of damages adequate to compensate for TSMC’s infringement, but not less than reasonable royalty, together with pre-and post-judgment interest, attorneys’ fees, and costs as fixed by the Court under 35 U.S.C. §§ 284 and 285.

COUNT THREE
INFRINGEMENT OF U.S. PATENT NO. 8,198,686

106. Plaintiff repeats and incorporates by reference each preceding paragraph as if fully set forth herein and further states:

107. TSMC has directly infringed and continues to directly infringe the ’686 Patent under 35 §§ U.S.C. 271(a), either literally or through the doctrine of equivalents, by making, using, selling, offering to sell, and/or importing in or into the United States Accused 28nm Instrumentalities and other products made by practicing and by performing processes that result in practicing the ’686 Patent as described below, including at least Claim 25. By way of example, such Accused 28nm Instrumentalities include the T2081 devices manufactured, used, sold, offered for sale, and/or imported by TSMC.

108. For example, Claim 25 is illustrative of the claims of the ’686 Patent. It recites “[a] semiconductor device comprising:

a first MIS transistor; and a second MIS transistor, wherein:

the first MIS transistor includes:

> a first gate insulating film formed on a first active region in a semiconductor substrate;
>
> a first gate electrode including a second metal film formed on the first gate insulating film;
>
> first sidewall spacers formed on side surfaces of the first gate electrode, the first sidewall spacers being insulative; and
>
> a silicon nitride film formed, extending over the side surfaces of the first gate electrode on which the first sidewall spacers are formed and upper surfaces of regions located in the first active region laterally outside the first sidewall spacers,

the second MIS transistor includes:

> a second gate insulating film formed on a second active region in the semiconductor substrate;

a second gate electrode including a first metal film formed on the second gate insulating film and a conductive film formed on the first metal film;

second sidewall spacers formed on side surfaces of the second gate electrode, the second sidewall spacers being insulative; and

the silicon nitride film formed, extending over the side surfaces of the second gate electrode on which the second sidewall spacers are formed and upper surfaces of regions located in the second active region laterally outside the second sidewall spacers,

the first and second metal films are made of different metal materials,

the silicon nitride film is not formed on any of upper surfaces of the first and second gate electrodes, and

the silicon nitride film causes first stress in a gate length direction of a channel region in the first active region."

109. The exemplar T2081 device manufactured by TSMC meets every element of this claim.[6]

110. The T2081 is a semiconductor device comprising a first MIS transistor and a second MIS transistor. For example, in the T2081, a first MIS transistor comprises an NMOS transistor, and a second MIS transistor comprises a PMOS transistor.

111. The first MIS transistor in the T2081 includes a first gate insulating film formed on a first active region in a semiconductor substrate, a first gate electrode including a second metal film formed on the first gate insulating film, first sidewall spacers formed on side surfaces of the first gate electrode with the first sidewall spacers being insulative; and a silicon nitride film formed, extending over the side surfaces of the first gate electrode on which the first sidewall spacers are formed and upper surfaces of regions located in the first active region laterally outside the first sidewall spacers.

[6] This description of infringement is illustrative and not intended to be an exhaustive or limiting explanation of every manner in which the T2081 device infringes.

112. The second MIS transistor in the T2081 includes a second gate insulating film formed on a second active region in the semiconductor substrate, a second gate electrode including a first metal film formed on the second gate insulating film and a conductive film formed on the first metal film, second sidewall spacers formed on side surfaces of the second gate electrode with the second sidewall spacers being insulative, and a silicon nitride film formed, extending over the side surfaces of the second gate electrode on which the second sidewall spacers are formed and upper surfaces of regions located in the second active region laterally outside the second sidewall spacers,

113. Within the T2081, the first and second metal films are made of different metal materials. For example, the metal film in the first MIS transistor (the NMOS transistor) is comprised of TiN material, whereas the metal film in the second MIS transistor (the PMOS transistor) is comprised of TaN material.

114. In the T2081, the silicon nitride film is not formed on any of upper surfaces of the first and second gate electrodes, and the silicon nitride film causes first stress in a gate length direction of a channel region in the first active region.

115. Because the T2081 practices at least Claim 25 of the ’686 Patent, all semiconductor devices manufactured according to TSMC’s 28 nanometer process node likewise infringe because infringement occurs as a result of TSMC’s manufacturing process at this node. For example, on information and belief, TSMC uses common MIS transistor structures for all semiconductor devices that it manufactures with its 28 nanometer process node such that all semiconductor devices manufactured at the 28 nanometer node invariably infringe at least Claim 25 of the ’686 Patent in the same manner the T2081 does.

116. In addition to directly infringing the ’686 Patent by making, using, selling, offering

to sell, and/or importing Accused 28nm Instrumentalities into the United States, TSMC likewise has induced infringement of the ’686 Patent under 35 U.S.C. § 271(b). TSMC has actively encouraged its customers (*e.g.*, NXP Semiconductors) to directly infringe the ’686 Patent by using, selling, offering for sale, and/or importing electronic devices and products containing the Accused 28nm Instrumentalities (*e.g.*, the T2081). TSMC actively encouraged its customers to employ TSMC’s infringing process nodes to manufacture their semiconductor devices, electronic components, and products by and through TSMC’s sales, engineering, and technical marketing efforts and staff. TSMC’s sales engineers and technical marketing staff interface with TSMC’s customers and potential customers to obtain “design wins” (*i.e.*, contracts with customers) to develop and manufacture infringing chips. In attempting to obtain these “design wins,” TSMC’s sales engineers and technical marketing staff tout the technological and economic benefits of the infringing chips and actively encourage use of the infringing chips. TSMC has known that their customers’ acts constituted direct infringement of at least one claim of the ’686 Patent since at least as of the filing of this Complaint. As a result of TSMC’s active encouragement and intentional inducement, its customers have committed acts directly infringing the ’686 Patent.

117. Moreover, TSMC intends to cause, and has taken affirmative steps to induce, infringement by customers and end-users by at least, *inter alia*, encouraging, promoting, instructing, and/or directing the infringing use of the Accused 28nm Instrumentalities. As discussed above, TSMC took direct steps to encourage, promote, instruct, and/or direct its customers and end-users use of the Accused 28nm Instrumentalities. Pushing its customers toward the 28 nanometer node benefitted TSMC significantly.

118. As detailed above, the T2081 and Accused 28nm Instrumentalities infringe at least Claim 25 of the ’686 Patent. Accordingly, by encouraging, promoting, instructing, and/or directing

users to use the T2081 and Accused 28nm Instrumentalities, TSMC is actively inducing infringement of the ’686 Patent in violation of 35 U.S.C. § 271(b).

119. TSMC likewise is liable as a contributory infringer of the ’686 Patent under 35 U.S.C. § 271(c). TSMC has offered to sell and/or sold within the United States services for manufacturing and designs for the Accused 28nm Instrumentalities that practice the ’686 Patent. The Accused 28nm Instrumentalities comprise semiconductor devices, each of which constitutes a material part of the ’686 Patent’s invention that can be incorporated into electronic components and products.

120. For example, such manufacturing services and designs were offered for sale, sold, and marketed by and through TSMC’s sales, engineering, and technical marketing efforts and staff. Such efforts resulted in TSMC’s manufacturing of the infringing T2081 chip. Upon information and belief, TSMC’s customers do not manufacture the Accused 28nm Instrumentalities device on their own, but contract with others, such as TSMC, to manufacture such devices. TSMC has known such Accused 28nm Instrumentalities to be especially adapted for practicing, and thus infringing, the ’686 Patent since at least the filing of this Complaint. The Accused 28nm Instrumentalities are not staple articles nor a commodity of commerce suitable for substantial non-infringing use because they cannot be used individually without incorporation into electronic components and products. Thus, TSMC is liable as a contributory infringer.

121. TSMC has had actual knowledge of the ’686 Patent since at least 2023, when DE102014119124B4, a German patent, was issued to TSMC. U.S. Patent Application No. 2010/072523, from which the ’686 Patent issued, is cited on the face of DE102014119124B4 and is further discussed in the Background section of the patent. TSMC’s continued infringement following that date, despite its knowledge of the ’686 Patent, was intentional and deliberate and

willful.

122. TSMC's direct, induced, contributory, and willful infringement of the '686 Patent has caused, and will continue to cause, substantial damage to AICP. Therefore, AICP is entitled to an award of damages adequate to compensate for TSMC's infringement, but not less than reasonable royalty, together with pre-and post-judgment interest, attorneys' fees, and costs as fixed by the Court under 35 U.S.C. §§ 284 and 285.

COUNT FOUR
INFRINGEMENT OF U.S. PATENT NO. 8,253,180

123. Plaintiff repeats and incorporates by reference each preceding paragraph as if fully set forth herein and further states:

124. TSMC has directly infringed and continues to directly infringe the '180 Patent under 35 §§ U.S.C. 271(a), either literally or through the doctrine of equivalents, by making, using, selling, offering to sell, and/or importing in or into the United States Accused 28nm Instrumentalities and other products made by practicing and by performing processes that result in practicing the '180 Patent as described below, including at least Claim 1. By way of example, such Accused 28nm Instrumentalities include the T2081 devices manufactured, used, sold, offered for sale, and/or imported by TSMC.

125. For example, Claim 1 is illustrative of the claims of the '180 Patent. It recites "[a] semiconductor device comprising:

> a high dielectric constant gate insulating film formed on an active region in a substrate;
>
> a gate electrode formed on the high dielectric constant gate insulating film;
>
> a insulating sidewall formed on each side surface of the gate electrode; and
>
> wherein the high dielectric constant gate insulating film is continuously formed so as to extend from under the gate electrode to under the insulating sidewall, and
>
> an end of the high dielectric constant gate insulating film under the insulating sidewall is

located at a predetermined distance from an outer end of the insulating sidewall toward the gate electrode."

126. The exemplar T2081 device manufactured by TSMC meets every element of this claim.[7]

127. The T2081 is a semiconductor device comprising a high dielectric constant gate insulating film formed on an active region in a substrate, a gate electrode formed on the high dielectric constant gate insulating film, and an insulating sidewall formed on each side surface of the gate electrode, wherein the high dielectric constant gate insulating film is continuously formed so as to extend from under the gate electrode to under the insulating sidewall.

128. In the T2081, an end of the high dielectric constant gate insulating film under the insulating sidewall is located at a predetermined distance from an outer end of the insulating sidewall toward the gate electrode.

129. Because the T2081 practices at least Claim 1 of the '180 Patent, all semiconductor devices manufactured according to TSMC's 28 nanometer process node likewise infringe because infringement occurs as a result of TSMC's manufacturing process at this node. For example, on information and belief, TSMC uses common MIS transistor structures for all semiconductor devices that it manufactures with its 28 nanometer process node such that all semiconductor devices manufactured at the 28 nanometer node invariably infringe at least Claim 1 of the '180 Patent in the same manner the T2081 does.

130. In addition to directly infringing the '180 Patent by making, using, selling, offering to sell, and/or importing Accused 28nm Instrumentalities into the United States, TSMC likewise has induced infringement of the '180 Patent under 35 U.S.C. § 271(b). TSMC has actively

[7] This description of infringement is illustrative and not intended to be an exhaustive or limiting explanation of every manner in which the T2081 device infringes.

encouraged its customers (*e.g.*, NXP Semiconductors) to directly infringe the '180 Patent by using, selling, offering for sale, and/or importing electronic devices and products containing the Accused 28nm Instrumentalities (*e.g.*, the T2081). TSMC actively encouraged its customers to employ TSMC's infringing process nodes to manufacture their semiconductor devices, electronic components, and products by and through TSMC's sales, engineering, and technical marketing efforts and staff. TSMC's sales engineers and technical marketing staff interface with TSMC's customers and potential customers to obtain "design wins" (*i.e.*, contracts with customers) to develop and manufacture infringing chips. In attempting to obtain these "design wins," TSMC's sales engineers and technical marketing staff tout the technological and economic benefits of the infringing chips and actively encourage use of the infringing chips. TSMC has known that their customers' acts constituted direct infringement of at least one claim of the '180 Patent since at least as of the filing of this Complaint. As a result of TSMC's active encouragement and intentional inducement, its customers have committed acts directly infringing the '180 Patent.

131. Moreover, TSMC intends to cause, and has taken affirmative steps to induce, infringement by customers and end-users by at least, *inter alia*, encouraging, promoting, instructing, and/or directing the infringing use of the Accused 28nm Instrumentalities. As discussed above, TSMC took direct steps to encourage, promote, instruct, and/or direct its customers and end-users use of the Accused 28nm Instrumentalities. Pushing its customers toward the 28 nanometer node benefitted TSMC significantly.

132. As detailed above, the T2081 and Accused 28nm Instrumentalities infringe at least Claim 1 of the '180 Patent. Accordingly, by encouraging, promoting, instructing, and/or directing users to use the T2081 and Accused 28nm Instrumentalities, TSMC is actively inducing infringement of the '180 Patent in violation of 35 U.S.C. § 271(b).

133. TSMC likewise is liable as a contributory infringer of the ’180 Patent under 35 U.S.C. § 271(c). TSMC has offered to sell and/or sold within the United States services for manufacturing and designs for the Accused 28nm Instrumentalities that practice the ’180 Patent. The Accused 28nm Instrumentalities comprise semiconductor devices, each of which constitutes a material part of the ’180 Patent’s invention that can be incorporated into electronic components and products.

134. For example, such manufacturing services and designs were offered for sale, sold, and marketed by and through TSMC’s sales, engineering, and technical marketing efforts and staff. Such efforts resulted in TSMC’s manufacturing of the infringing T2081 chip. Upon information and belief, TSMC’s customers do not manufacture the Accused 28nm Instrumentalities on their own, but contract with others, such as TSMC, to manufacture such devices. TSMC has known such Accused 28nm Instrumentalities to be especially adapted for practicing, and thus infringing, the ’180 Patent since at least the filing of this Complaint. The Accused 28nm Instrumentalities are not staple articles nor a commodity of commerce suitable for substantial non-infringing use because they cannot be used individually without incorporation into electronic components and products. Thus, TSMC is liable as a contributory infringer.

135. TSMC has had actual knowledge of the ’180 Patent since at least 2012, when the examiner cited U.S. Patent Application No. 2011/0147857, from which the ’180 Patent issued, as a reference in TSMC’s application for U.S. Patent No. 8,258,588. In addition, there are three family-to-family citations between the ’180 Patent family and the following TSMC patents, the earliest of which was issued in 2015: U.S. Patent Nos. 9,209,298, 10,050,147, 10,784,781. TSMC’s continued infringement following that date, despite its knowledge of the ’180 Patent, was intentional and deliberate and willful.

136. TSMC's direct, induced, contributory, and willful infringement of the '180 Patent has caused, and will continue to cause, substantial damage to AICP. Therefore, AICP is entitled to an award of damages adequate to compensate for TSMC's infringement, but not less than reasonable royalty, together with pre-and post-judgment interest, attorneys' fees, and costs as fixed by the Court under 35 U.S.C. §§ 284 and 285.

COUNT FIVE
INFRINGEMENT OF U.S. PATENT NO. 8,587,076

137. Plaintiff repeats and incorporates by reference each preceding paragraph as if fully set forth herein and further states:

138. TSMC has directly infringed and continues to directly infringe the '076 Patent under 35 §§ U.S.C. 271(a), either literally or through the doctrine of equivalents, by making, using, selling, offering to sell, and/or importing in or into the United States Accused 28nm Instrumentalities and other products made by practicing and by performing processes that result in practicing the '076 Patent as described below, including at least Claim 1. By way of example, such Accused 28nm Instrumentalities include the T2081 devices manufactured, used, sold, offered for sale, and/or imported by TSMC.

139. For example, Claim 1 is illustrative of the claims of the '076 Patent. It recites "[a] semiconductor device comprising:

> a gate insulating film formed on an active region in a substrate and including Hf;
>
> a gate electrode formed on the gate insulating film;
>
> a insulating sidewall formed on each side surface of the gate electrode; and
>
> wherein a width of the gate insulating film along a gate length is larger than a width of the gate electrode along the gate length, and
>
> an end of the gate insulating film under the insulating sidewall is retracted from an outer end of the insulating sidewall toward the gate electrode."

140. The exemplar T2081 device manufactured by TSMC meets every element of this claim.[8]

141. The T2081 is a semiconductor device comprising a gate insulating film formed on an active region in a substrate that includes Hf with a gate electrode formed on the gate insulating film and an insulating sidewall formed on each side surface of the gate electrode, wherein a width of the gate insulating film along a gate length is larger than a width of the gate electrode along the gate length.

142. In the T2081, an end of the gate insulating film under the insulating sidewall is retracted from an outer end of the insulating sidewall toward the gate electrode.

143. Because the T2081 practices at least Claim 1 of the ’076 Patent, all semiconductor devices manufactured according to TSMC’s 28 nanometer process node likewise infringe because infringement occurs as a result of TSMC’s manufacturing process at this node. For example, on information and belief, TSMC uses common MIS transistor structures for all semiconductor devices that it manufactures with its 28 nanometer process node such that all semiconductor devices manufactured at the 28 nanometer node invariably infringe at least Claim 1 of the ’076 Patent in the same manner the T2081 does.

144. In addition to directly infringing the ’076 Patent by making, using, selling, offering to sell, and/or importing Accused 28nm Instrumentalities into the United States, TSMC likewise has induced infringement of the ’076 Patent under 35 U.S.C. § 271(b). TSMC has actively encouraged its customers (*e.g.*, NXP Semiconductors) to directly infringe the ’076 Patent by using, selling, offering for sale, and/or importing electronic devices and products containing the Accused 28nm Instrumentalities (*e.g.*, the T2081). TSMC actively encouraged its customers to employ

[8] This description of infringement is illustrative and not intended to be an exhaustive or limiting explanation of every manner in which the T2081 device infringes.

TSMC's infringing process nodes to manufacture their semiconductor devices, electronic components, and products by and through TSMC's sales, engineering, and technical marketing efforts and staff. TSMC's sales engineers and technical marketing staff interface with TSMC's customers and potential customers to obtain "design wins" (*i.e.*, contracts with customers) to develop and manufacture infringing chips. In attempting to obtain these "design wins," TSMC's sales engineers and technical marketing staff tout the technological and economic benefits of the infringing chips and actively encourage use of the infringing chips. TSMC has known that their customers' acts constituted direct infringement of at least one claim of the '076 Patent since at least as of the filing of this Complaint. As a result of TSMC's active encouragement and intentional inducement, its customers have committed acts directly infringing the '076 Patent.

145. Moreover, TSMC intends to cause, and has taken affirmative steps to induce, infringement by customers and end-users by at least, *inter alia*, encouraging, promoting, instructing, and/or directing the infringing use of the Accused 28nm Instrumentalities. As discussed above, TSMC took direct steps to encourage, promote, instruct, and/or direct its customers and end-users use of the Accused 28nm Instrumentalities. Pushing its customers toward the 28 nanometer node benefitted TSMC significantly.

146. As detailed above, the T2081 and Accused 28nm Instrumentalities infringe at least Claim 1 of the '076 Patent. Accordingly, by encouraging, promoting, instructing, and/or directing users to use the T2081 and Accused 28nm Instrumentalities, TSMC is actively inducing infringement of the '076 Patent in violation of 35 U.S.C. § 271(b).

147. TSMC likewise is liable as a contributory infringer of the '076 Patent under 35 U.S.C. § 271(c). TSMC has offered to sell and/or sold within the United States services for manufacturing and designs for the Accused 28nm Instrumentalities that practice the '076 Patent.

The Accused 28nm Instrumentalities comprise semiconductor devices, each of which constitutes a material part of the ’076 Patent’s invention that can be incorporated into electronic components and products.

148. For example, such manufacturing services and designs were offered for sale, sold, and marketed by and through TSMC’s sales, engineering, and technical marketing efforts and staff. Such efforts resulted in TSMC’s manufacturing of the infringing T2081 chip. Upon information and belief, TSMC’s customers do not manufacture the Accused 28nm Instrumentalities on their own, but contract with others, such as TSMC, to manufacture such devices. TSMC has known such Accused 28nm Instrumentalities to be especially adapted for practicing, and thus infringing, the ’076 Patent since at least the filing of this Complaint. The Accused 28nm Instrumentalities are not staple articles nor a commodity of commerce suitable for substantial non-infringing use because they cannot be used individually without incorporation into electronic components and products. Thus, TSMC is liable as a contributory infringer.

149. TSMC has had actual knowledge of the ’076 Patent since at least 2012, when U.S. Patent Application No. 2012/0273903, from which the ’076 Patent issued, was published. During the prosecution of TSMC’s application for U.S. Patent No. 8,258,588, the examiner cited U.S. Patent Application No. 2011/0147857, from which the ’180 Patent issued, as a reference. The ’180 Patent and the ’076 Patent are members of the same patent family. There are three additional family-to-family citations between the ’076 Patent family and the following TSMC patents: U.S. Patent Nos. 9,209,298, 10,050,147, 10,784,781.

150. On information and belief and in accordance with TSMC’s patent-acquisition strategy described above, following the citation of U.S. Patent Application No. 2011/0147857, TSMC began monitoring and tracking the applications and patents in that family for potential

acquisition. U.S. Patent Application No. 2012/0273903 was published on November 1, 2012, after the issuance of TSMC's U.S. Patent No. 8,258,588. TSMC's continued infringement following that date, despite its knowledge of the '076 Patent, was intentional and deliberate and willful.

151. TSMC's direct, induced, contributory, and willful infringement of the '076 Patent has caused, and will continue to cause, substantial damage to AICP. Therefore, AICP is entitled to an award of damages adequate to compensate for TSMC's infringement, but not less than reasonable royalty, together with pre-and post-judgment interest, attorneys' fees, and costs as fixed by the Court under 35 U.S.C. §§ 284 and 285.

COUNT SIX
INFRINGEMENT OF U.S. PATENT NO. 8,796,779

152. Plaintiff repeats and incorporates by reference each preceding paragraph as if fully set forth herein and further states:

153. TSMC has directly infringed and continues to directly infringe the '779 Patent under 35 §§ U.S.C. 271(a), either literally or through the doctrine of equivalents, by making, using, selling, offering to sell, and/or importing in or into the United States Accused FinFET Instrumentalities and other products made by practicing and by performing processes that result in practicing the '779 Patent as described below, including at least Claim 1. By way of example, such Accused FinFET Instrumentalities include the Apple A15 Bionic semiconductor devices manufactured, used, sold, offered for sale, and/or imported by TSMC.

154. For example, Claim 1 is illustrative of the claims of the '779 Patent. It recites "[a] semiconductor device comprising:

> a first MIS transistor and a second MIS transistor of an identical conductivity type provided on an identical semiconductor substrate,
>
> wherein the first MIS transistor includes a first gate insulating film formed on a first active region in the semiconductor substrate and a first gate electrode formed

on the first gate insulating film,

the second MIS transistor includes a second gate insulating film formed on a second active region in the semiconductor substrate and a second gate electrode formed on the second gate insulating film,

the first gate insulating film includes a first interface layer being in contact with the semiconductor substrate and a first high dielectric constant insulating film formed on the first interface layer,

the second gate insulating film includes a second interface layer being in contact with the semiconductor substrate and a second high dielectric constant insulating film formed on the second interface layer,

each of the first interface layer has a thickness larger than that of the second interface layer, and each of the first interface layer and the second interface layer is made of a silicon dioxide film or a silicon oxynitride film."

155. The exemplar A15 Bionic device manufactured by TSMC meets every element of this claim.[9]

156. The A15 Bionic is a semiconductor device comprising a first MIS transistor and a second MIS transistor of an identical conductivity type provided on an identical semiconductor substrate. For example, the A15 Bionic comprises a first MIS transistor and second MIS transistor that are both PMOS transistors.

157. The first MIS transistor in the A15 Bionic includes a first gate insulating film formed on a first active region in the semiconductor substrate and a first gate electrode formed on the first gate insulating film.

158. The second MIS transistor in the A15 Bionic includes a includes a second gate insulating film formed on a second active region in the semiconductor substrate and a second gate electrode formed on the second gate insulating film.

159. The first gate insulating film in the A15 Bionic includes a first interface layer being

[9] This description of infringement is illustrative and not intended to be an exhaustive or limiting explanation of every manner in which the A15 Bionic device infringes.

in contact with the semiconductor substrate and a first high dielectric constant insulating film formed on the first interface layer.

160. The second gate insulating film includes a second interface layer being in contact with the semiconductor substrate and a second high dielectric constant insulating film formed on the second interface layer.

161. For example, in the A15 Bionic, the first high dielectric constant insulating film and second high dielectric constant insulating film consist of hafnium oxide.

162. In the A15 Bionic, each of the first interface layer has thickness, as measured in nanometers, that is larger than that of the second interface layer, and each of the first interface layer and the second interface layer is made of silicon dioxide film or a silicon oxynitride film. For example, in the A15 Bionic, the first and second interface layers are made of SiO_2.

163. Because the A15 Bionic practices at least Claim 1 of the ’779 Patent, all FinFET semiconductor devices manufactured by TSMC, including those manufactured at TSMC’s 5, 7, 14, 16, and 20 nanometer process nodes, likewise infringe because infringement occurs as a result of TSMC’s FinFET manufacturing process at these nodes. For example, on information and belief, TSMC uses common MIS transistor structures for all FinFET semiconductor devices that it manufactures at each applicable process node, such that all FinFET semiconductor devices invariably infringe at least Claim 1 of the ’779 Patent in the same manner the A15 Bionic does.

164. In addition to directly infringing the ’779 Patent by making, using, selling, offering to sell, and/or importing Accused FinFET Instrumentalities into the United States, TSMC likewise has induced infringement of the ’779 Patent under 35 U.S.C. § 271(b). TSMC has actively encouraged its customers (*e.g.*, Apple) to directly infringe the ’779 Patent by using, selling, offering for sale, and/or importing electronic devices and products containing the Accused FinFET

Instrumentalities (*e.g.*, the A15 Bionic). TSMC actively encouraged its customers to employ TSMC's infringing process nodes to manufacture their semiconductor devices, electronic components, and products by and through TSMC's sales, engineering, and technical marketing efforts and staff. TSMC's sales engineers and technical marketing staff interface with TSMC's customers and potential customers to obtain "design wins" (*i.e.*, contracts with customers) to develop and manufacture infringing chips. In attempting to obtain these "design wins," TSMC's sales engineers and technical marketing staff tout the technological and economic benefits of the infringing chips and actively encourage use of the infringing chips. TSMC has known that its customers' acts constituted direct infringement of at least one claim of the '779 Patent since at least as of the filing of this Complaint. As a result of TSMC's active encouragement and intentional inducement, its customers have committed acts directly infringing the '779 Patent.

165. Moreover, TSMC intends to cause, and has taken affirmative steps to induce, infringement by customers and end-users by at least, *inter alia*, encouraging, promoting, instructing, and/or directing the infringing use of the Accused FinFET Instrumentalities.

166. TSMC took direct steps to encourage, promote, instruct, and/or direct its customers and end-users use of the Accused FinFET Instrumentalities, just as it did with the Accused 28nm Instrumentalities. The same 2022 article reporting TSMC's message to its customers to move to its 28 nanometer process node reports: "As with the overall shift to 28nm, TSMC is looking to corral customers into using the newer, higher density process nodes. And, if not 28nm/22nm, then customers also have the option of transitioning into even more capable FinFET-based nodes . . . ."

167. The success of TSMC's intentional inducement efforts is evidenced by its partnerships with NXP, Cadence Design Systems, and Apple. As to NXP, according to TSMC's December 6, 2022 press release regarding the expansion of its production operations in Arizona,

TSMC and NXP were "partnering to bring 5nm technology to the automotive industry." Cadence Design Systems, Inc., in a April 22, 2019 press release, similarly "announced that it has collaborated with TSMC to enable customers' production delivery of next-generation system-on-chip (SoC) designs for mobile, high-performance computing (HPC), 5G and artificial intelligence (AI) applications on TSMC's 5nm FinFET process technology."

168. Apple has also partnered with TSMC, including in TSMC's recent efforts to establish a large manufacturing presence in the United States. When TSMC announced the construction of its first Arizona fab, its intention was to focus on its 5 nanometer node and help Apple domesticate part of its semiconductor supply chain. Speaking at TSMC's 2021 annual symposium, C.C. Wei confirmed that the first Arizona fab was planned to start volume production on TSMC's 5 nanometer node in 2024.

169. As detailed above, the A15 Bionic and Accused FinFET Instrumentalities infringe at least Claim 1 of the '779 Patent. Accordingly, by encouraging, promoting, instructing, and/or directing users to use the A15 Bionic and Accused FinFET Instrumentalities, TSMC is actively inducing infringement of the '779 Patent in violation of 35 U.S.C. § 271(b).

170. TSMC likewise is liable as a contributory infringer of the '779 Patent under 35 U.S.C. § 271(c). TSMC has offered to sell and/or sold within the United States services for manufacturing and designs for the Accused FinFET Instrumentalities that practice the '779 Patent. The Accused FinFET Instrumentalities comprise semiconductor devices, each of which constitutes a material part of the '779 Patent's invention that can be incorporated into electronic components and products.

171. For example, such manufacturing services and designs were offered for sale, sold, and marketed by and through TSMC's sales, engineering, and technical marketing efforts and staff.

Such efforts resulted in TSMC's manufacturing of the infringing A15 Bionic chip. Upon information and belief, TSMC's customers do not manufacture the Accused FinFET Instrumentalities on their own, but contract with others, such as TSMC, to manufacture such devices. TSMC has known such Accused FinFET Instrumentalities to be especially adapted for practicing, and thus infringing, the '779 Patent since at least the filing of this Complaint. The Accused FinFET Instrumentalities are not staple articles nor a commodity of commerce suitable for substantial non-infringing use because they cannot be used individually without incorporation into electronic components and products. Thus, TSMC is liable as a contributory infringer.

172. TSMC's direct, induced, contributory, and willful infringement of the '779 Patent has caused, and will continue to cause, substantial damage to AICP. Therefore, AICP is entitled to an award of damages adequate to compensate for TSMC's infringement, but not less than reasonable royalty, together with pre-and post-judgment interest, attorneys' fees, and costs as fixed by the Court under 35 U.S.C. §§ 284 and 285.

COUNT SEVEN
INFRINGEMENT OF U.S. PATENT NO. 8,907,425

173. Plaintiff repeats and incorporates by reference each preceding paragraph as if fully set forth herein and further states:

174. TSMC has directly infringed and continues to directly infringe the '425 Patent under 35 §§ U.S.C. 271(a), either literally or through the doctrine of equivalents, by making, using, selling, offering to sell, and/or importing in or into the United States Accused 28nm Instrumentalities and other products made by practicing and by performing processes that result in practicing the '425 Patent as described below, including at least claim 1. By way of example, such Accused 28nm Instrumentalities include the MediaTek Devices manufactured, used, sold, offered for sale, and/or imported by TSMC.

175. For example, Claim 1 is illustrative of the claims of the '425 Patent. It recites "[a] semiconductor device comprising:

a first MIS transistor, wherein:

the first MIS transistor includes:

> a first gate insulating film formed on a first active region in a semiconductor substrate,
>
> a first gate electrode formed on the first gate insulating film,
>
> a first sidewall spacer formed on a side surface of the first gate electrode,
>
> a first source/drain region of a first conductivity type which is formed in a trench provided in the first active region on a lateral side of the first sidewall spacer, and which includes a silicon compound layer causing a first stress in a gate length direction of a channel region in the first active region, and
>
> a stress insulating film which is formed on the first active region to cover the first gate electrode, the first side wall spacer, and the first source/drain region, and which causes a second stress opposite to the first stress,
>
> an uppermost surface of the silicon compound layer is located higher than a surface of the semiconductor substrate located directly under the first gate electrode,
>
> a first stress-relief film is formed in a space between the silicon compound layer and the first sidewall spacer,
>
> the first stress-relief film is formed on the side surface of the first gate electrode with the first sidewall spacer interposed therebetween, and
>
> the first stress-relief film is not in direct contact with the side surface of the first gate electrode."

176. The exemplar MediaTek Device manufactured by TSMC meets every element of this claim.[10]

177. The MediaTek Device is a semiconductor device comprising a first MIS transistor, wherein the first MIS transistor includes a first gate insulating film formed on a first active region

[10] This description of infringement is illustrative and not intended to be an exhaustive or limiting explanation of every manner in which the MediaTek Device infringes.

in a semiconductor substrate, a first gate electrode formed on the first gate insulating film, a first sidewall spacer formed on a side surface of the first gate electrode, and a first sidewall spacer formed on a side surface of the first gate electrode.

178. The first MIS transistor also includes a first source/drain region of a first conductivity type which is formed in a trench provided in the first active region on a lateral side of the first sidewall spacer, and which includes a silicon compound (SiGe) layer causing a first stress in a gate length direction of a channel region in the first active region.

179. The first MIS transistor also includes a stress insulating film which is formed on the first active region to cover the first gate electrode, the first side wall spacer, and the first source/drain region, and which causes a second stress opposite to the first stress.

180. The first MIS transistor also includes an uppermost surface of the silicon compound (SiGe) layer located higher than a surface of the semiconductor substrate located directly under the first gate electrode.

181. The first MIS transistor also includes a first stress-relief film formed in a space between the silicon compound layer and the first sidewall spacer. The first stress-relief film is formed on the side surface of the first gate electrode with the first sidewall spacer interposed therebetween, and the first stress-relief film is not in direct contact with the side surface of the first gate electrode.

182. Because the MediaTek Device practices at least Claim 1 of the ’425 Patent, all semiconductor devices manufactured according to TSMC’s 28 nanometer process node likewise infringe because infringement occurs as a result of TSMC’s manufacturing process at this node. For example, on information and belief, TSMC uses common MIS transistor structures for all semiconductor devices that it manufactures with its 28 nanometer process node such that all

semiconductor devices manufactured at the 28 nanometer node invariably infringe at least Claim 1 of the ’425 Patent in the same manner the MediaTek Device does.

183. In addition to directly infringing the ’425 Patent by making, using, selling, offering to sell, and/or importing Accused 28nm Instrumentalities into the United States, TSMC likewise has induced infringement of the ’425 Patent under 35 U.S.C. § 271(b). TSMC has actively encouraged its customers (*e.g.*, MediaTek) to directly infringe the ’425 Patent by using, selling, offering for sale, and/or importing electronic devices and products containing the Accused 28nm Instrumentalities (*e.g.*, the MediaTek Device). TSMC actively encouraged its customers to employ TSMC’s infringing process nodes to manufacture their semiconductor devices, electronic components, and products by and through TSMC’s sales, engineering, and technical marketing efforts and staff. TSMC’s sales engineers and technical marketing staff interface with TSMC’s customers and potential customers to obtain “design wins” (*i.e.*, contracts with customers) to develop and manufacture infringing chips. In attempting to obtain these “design wins,” TSMC’s sales engineers and technical marketing staff tout the technological and economic benefits of the infringing chips and actively encourage use of the infringing chips. TSMC has known that their customers’ acts constituted direct infringement of at least one claim of the ’425 Patent since at least as of the filing of this Complaint. As a result of TSMC’s active encouragement and intentional inducement, its customers have committed acts directly infringing the ’425 Patent.

184. Moreover, TSMC intends to cause, and has taken affirmative steps to induce, infringement by customers and end-users by at least, *inter alia*, encouraging, promoting, instructing, and/or directing the infringing use of the Accused 28nm Instrumentalities. As discussed above, TSMC took direct steps to encourage, promote, instruct, and/or direct its customers and end-users use of the Accused 28nm Instrumentalities. Pushing its customers toward

the 28 nanometer node benefitted TSMC significantly.

185. As detailed above, the MediaTek Device and Accused 28nm Instrumentalities infringe at least Claim 1 of the ’425 Patent. Accordingly, by encouraging, promoting, instructing, and/or directing users to use the MediaTek Device and Accused 28nm Instrumentalities, TSMC is actively inducing infringement of the ’425 Patent in violation of 35 U.S.C. § 271(b).

186. TSMC likewise is liable as a contributory infringer of the ’425 Patent under 35 U.S.C. § 271(c). TSMC has offered to sell and/or sold within the United States services for manufacturing and designs for the Accused 28nm Instrumentalities that practice the ’425 Patent. The Accused 28nm Instrumentalities comprise semiconductor devices, each of which constitutes a material part of the ’425 Patent’s invention that can be incorporated into electronic components and products.

187. For example, such manufacturing services and designs were offered for sale, sold, and marketed by and through TSMC’s sales, engineering, and technical marketing efforts and staff. Such efforts resulted in TSMC’s manufacturing of the infringing MediaTek Device. Upon information and belief, TSMC’s customers do not manufacture the Accused 28nm Instrumentalities on their own, but contract with others, such as TSMC, to manufacture such devices. TSMC has known such Accused 28nm Instrumentalities to be especially adapted for practicing, and thus infringing, the ’425 Patent since at least the filing of this Complaint. The Accused 28nm Instrumentalities are not staple articles nor a commodity of commerce suitable for substantial non-infringing use because they cannot be used individually without incorporation into electronic components and products. Thus, TSMC is liable as a contributory infringer.

188. TSMC has had actual knowledge of the ’425 Patent since at least 2017, when the examiner cited U.S. Patent Application No. 2012/0256266, from which the ’425 Patent issued, as

a reference during the prosecution of TSMC's U.S. Patent Application No. 14/941,669 (published as U.S. Patent Application No. 2017/0141228). TSMC's continued infringement following that date, despite its knowledge of the '425 Patent, was intentional and deliberate and willful.

189. TSMC's direct, induced, contributory, and willful infringement of the '425 Patent has caused, and will continue to cause, substantial damage to AICP. Therefore, AICP is entitled to an award of damages adequate to compensate for TSMC's infringement, but not less than reasonable royalty, together with pre-and post-judgment interest, attorneys' fees, and costs as fixed by the Court under 35 U.S.C. §§ 284 and 285.

DEMAND FOR JURY TRIAL

190. Plaintiff hereby demands a jury trial for all issues so triable.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff requests entry of judgment in its favor and against Defendant TSMC as follows:

A. Declaring that TSMC has directly infringed, either literally and/or under the doctrine of equivalents, and continues to directly infringe United States Patent Nos. 7,579,227, 7,923,764, 8,198,686, 8,253,180, 8,587,076, 8,796,779, and 8,907,425;

B. Declaring that TSMC has induced infringement and continues to induce infringement of United States Patent Nos. 7,579,227, 7,923,764, 8,198,686, 8,253,180, 8,587,076, 8,796,779, and 8,907,425;

C. Declaring that TSMC has contributorily infringed and continues to contributorily infringe United States Patent Nos. 7,579,227, 7,923,764, 8,198,686, 8,253,180, 8,587,076, 8,796,779, and 8,907,425;

D. Awarding lost profits and/or reasonable royalty damages, including treble damages for

willful infringement, to Plaintiff in an amount no less than a reasonable royalty for TSMC's infringement of the Asserted Patents, together with prejudgment and post-judgment interest and costs as permitted under 35 U.S.C. § 284;

E. Awarding attorneys' fees pursuant to 35 U.S.C. § 285 or as otherwise permitted by law;

F. Ordering TSMC to pay supplemental damages to Plaintiff, including any ongoing royalties and interest, with an accounting, as needed;

G. Enjoining TSMC from practicing the Asserted Patents; and

H. Awarding such other costs and further relief as the Court may deem just and proper.

Dated: August 1, 2024

Respectfully submitted,

/s/ Justin Nelson w/ permission Andrea Fair

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