UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

DAEDALUS PRIME LLC, Plaintiff, v. SAMSUNG ELECTRONICS CO., LTD; SAMSUNG ELECTRONICS AMERICA, INC.; and TAIWAN SEMICONDUCTOR MANUFACTURING CO. LIMITED, Defendants.	)	Civil Action No. 2:22cv352 **JURY TRIAL DEMANDED**

DAEDALUS PRIME LLC'S
COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Daedalus Prime LLC ("Daedalus" or "Plaintiff") brings this Complaint for Patent infringement ("Complaint") and for Jury Trial against Defendants Samsung Electronics Co., Ltd., Samsung Electronics America, Inc., (collectively "Samsung"), and Taiwan Semiconductor Manufacturing Company Limited ("TSMC") (collectively, "Defendants"). Daedalus alleges as follows:

THE PARTIES

1. Plaintiff Daedalus Prime LLC is a Delaware limited liability company having its principal place of business at 51 Pondfield Road, Suite 3, Bronxville, New York 10708, and registered agent located at 555 E. Loockerman Street, Suite 120, Dover, DE 19901.

2. Daedalus is the owner by way of assignment of U.S. Patent No. 8,775,833 ("the '833 Patent"), attached as Exhibit A, U.S. Patent No. 8,898,494 ("the '494 Patent"), attached as Exhibit B, U.S. Patent No. 10,049,080 ("the '080 Patent"), attached as Exhibit C, and U.S. Patent

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No. 10,705,588 ("the '588 Patent"), attached as Exhibit D, (together, the "CPU Patents"). Daedalus is the owner by way of assignment of U.S. Patent No. 9,831,306 ("the '306 Patent"), attached as Exhibit E, U.S. Patent No. 10,319,812 ("the '812 Patent"), attached as Exhibit F, U.S. Patent No. 10,700,178 ("the '178 Patent"), attached as Exhibit G, and U.S. Patent No. 11,251,281 ("the '281 Patent"), attached as Exhibit H, (together, the "Semic Patents"). All aforementioned patents are collectively the "Asserted Patents."

Samsung

3. Defendant Samsung Electronics Co., Ltd. ("SEC") is a Korean corporation having a principal place of business at 129 Samsung-Ro, Maetan-3dong, Yeongtong-Gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea. On information and belief, SEC manufactures, has manufactured, sells, offers to sell, and/or imports products throughout Texas, including in this judicial district, and introduces infringing products into the stream of commerce knowing that they would be sold in Texas and this judicial district.

4. Defendant Samsung Electronics America, Inc. ("SEA") is a New York corporation having a principal place of business at 85 Challenger Road, Ridgefield Park, New Jersey 07660. On information and belief, SEA is a wholly owned subsidiary of SEC. On information and belief, SEA manufactures, has manufactured, sells, offers to sell, and/or imports products throughout Texas, including in this judicial district, and introduces infringing products into the stream of commerce knowing that they would be sold in Texas and this judicial district. SEA has a business location in this District at 6625 Excellence Way, Plano, TX. 75023. *See* Samsung Locations, available at: https://www.sra.samsung.com/locations/ (accessed May 17, 2022). SEA may be served in Texas at least via its registered agent, CT Corporation System, 1999 Bryan Street, Suite 900, Dallas, Texas 75201.

5. SEC and SEA (together, "Samsung"), either themselves or through their subsidiaries, manufacture, have manufactured, use, sell, offer to sell, and/or import consumer electronics products such as smartphones, tablets, smartwatches, and semiconductor products such as integrated circuits that infringe, or were manufactured by processes that infringe, the CPU Patents and the Semic Patents, defined above. *See* Samsung Corporate Profile by Bloomberg, available at: https://www.bloomberg.com/profile/company/005930:KS (accessed May 17, 2022). Samsung makes and offers at least a range of Exynos processors that infringe the CPU Patents and the Semic Patents. *See* https://semiconductor.samsung.com/processor/ (accessed May 17, 2022).

6. Samsung incorporates infringing processors into downstream products that are made, used, sold, offered for sale, and/or imported throughout the United States, including within this district. These downstream products may include, but are not limited to, Samsung's Galaxy A71 smartphone with Qualcomm Snapdragon 765 chip (on information and belief, fabricated by Samsung's 7nm node), Samsung's Galaxy S21 FE 5G with Qualcomm Snapdragon 888 5G chip (on information and belief, fabricated by Samsung's 5nm node), Samsung's Galaxy S20 FE smartphone with Qualcomm Snapdragon 865 5G chip (on information and belief, fabricated by TSMC's 7nm node), and Samsung's Galaxy Watch4 smartwatch (on information and belief, fabricated by Samsung's 5nm node). *See* https://www.samsung.com/us/smartphones/galaxy-s21-5g/ (accessed May 17, 2022); https://www.boostmobile.com/phones/samsung-galaxy-a71-5g.html (accessed May 17, 2022); https://www.samsung.com/us/mobile/galaxy-s20-5g/s20-fe-5g/ (accessed May 17, 2022); https://www.walmart.com/browse/electronics/smart-watches/samsung/3944_1229723_8780847/YnJhbmQ6U0FNU1VORwieie (accessed May 25, 2022).

7. Thus, Samsung, in its consumer electronics products, incorporates at least Samsung chipsets fabricated by Samsung or TSMC. These products infringe, or are made by processes that infringe, the CPU Patents and the Semic Patents, and/or are incorporated into downstream products that are made, used, sold, offered for sale, and/or imported throughout the United States, including within this district.

TSMC

8. Defendant Taiwan Semiconductor Manufacturing Company Limited is a Taiwanese company having a principal place of business at No. 8, Li Hsin Road VI, Hsinchu Science Park, Hsinchu City 300-78, Taiwan, R.O.C. On information and belief, TSMC manufactures, has manufactured, sells, offers to sell, and/or imports products throughout Texas, including in this judicial district, and introduces infringing products into the stream of commerce knowing that they would be sold in Texas and this judicial district.

9. TSMC, either itself and/or through the activities of its subsidiaries, makes, uses, sells, offers for sale, and/or imports throughout the United States, including within this District, products, such as semiconductor devices and integrated circuits, that infringe the Semic Patents, defined above. TSMC's customers incorporate these products into downstream products that are made, used, sold, offered for sale, and/or imported throughout the United States, including within this District. These downstream products may include, but are not limited to, integrated circuits, smartphones, tablets, and smartwatches that include semiconductor devices and integrated circuits.

10. On information and belief, TSMC fabricates the Qualcomm Snapdragon 865 chip using TSMC's infringing 7nm node, which is incorporated into Defendant Samsung's Galaxy S20 FE smartphone.

JURISDICTION AND VENUE

11. This is an action for patent infringement arising under the patent laws of the United States, Title 35 of the United States Code. Accordingly, this Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

12. This Court has specific personal jurisdiction over Defendants, at least in part, because Defendants conduct business in this district, including the manufacture, use, sale, offer for sale, and/or importation of products that infringe, or made using processes that infringe, the CPU Patents (asserted against Samsung), and the Semic Patents (asserted against Samsung and TSMC), and other activities related the design, manufacture, distribution, and/or support of those products and processes.

13. Daedalus's causes of action arise, at least in part, from Defendants' contacts with and activities in the State of Texas and this district. Upon information and belief, each Defendant has committed acts of infringement within the State of Texas and this district by, *inter alia*, directly and/or indirectly making, having made, using, selling, offering to sell, and/or importing products that infringe one or more claims of the CPU Patents and Semic Patents.

14. In addition, upon information and belief, each Defendant has committed acts of infringement within the State of Texas and this district by, *inter alia*, directly and/or indirectly making, having made, using, selling, offering to sell, and/or importing products that infringe, or products manufactured by processes that infringe, one or more claims of the CPU Patents (asserted against Samsung), and/or the Semic Patents (asserted against Samsung and TSMC).

15. Defendants have committed acts within this district giving rise to this action, and have established sufficient minimum contacts with the State of Texas such that the exercise of jurisdiction would not offend traditional notions of fair play and substantial justice.

16. Venue is proper in this district pursuant to 28 U.S.C. §§ 1391(b), (c), and 1400(d).

Samsung

17. Venue in this district is proper under 28 U.S.C. § 1391(c)(3) and 28 U.S.C. § 1400(b) with respect to SEC. SEC is not a resident in the United States and may be sued in this district, because suits against foreign entities are proper in any judicial district where they are subject to personal jurisdiction. SEC has committed acts of patent infringement in this district.

18. Venue is proper for SEA because SEA: (1) either itself or through its subsidiaries has a regular and established place of business in this district (*see, e.g.*, ¶ 4, *supra*), and (2) has committed and continues to commit acts of patent infringement in this district by, *inter alia*, directly and/or indirectly making, having made, using, selling, offering to sell, and/or importing products that infringe one or more claims of the CPU Patents and the Semic Patents.

19. This Court has personal jurisdiction over SEC and SEA (together, "Samsung"). Samsung has conducted and does conduct business within the State of Texas. Samsung, directly or through corporate relatives, subsidiaries or intermediaries (including distributors, retailers, and others), ships, distributes, makes, has made, uses, offers for sale, sells, imports, and/or advertises (including by providing interactive web pages) its products and/or services in the United States and the Eastern District of Texas and/or contributes to or actively induces its customers to ship, distribute, make, have made, use, offer for sale, sell, import, and/or advertise (including the provision of interactive web pages) infringing products and/or services in the United States and the Eastern District of Texas.

20. Samsung, directly and through subsidiaries or intermediaries (including distributors, retailers, and others), has purposefully and voluntarily placed one or more of its infringing products and/or services, as described below, into the stream of commerce with the expectation that those products will be purchased and used by customers and/or consumers in the Eastern District of Texas. These infringing products and/or services have been and continue to be

made, used, sold, offered for sale, purchased, and/or imported by customers and/or consumers in the Eastern District of Texas.

21. On information and belief, Samsung has also placed integrated circuits using Samsung's process node technology and products containing these integrated circuits that infringe into the stream of commerce by shipping infringing products into Texas, shipping those products knowing that those products would be shipped into Texas, and/or shipping those products knowing that they would be incorporated into other infringing products that would be shipped into Texas.

TSMC

22. Venue in this district is proper under 28 U.S.C. § 1391(c)(3) and 28 U.S.C. § 1400(b) with respect to TSMC. TSMC is not a resident in the United States and may be sued in this district, because suits against foreign entities are proper in any judicial district where they are subject to personal jurisdiction. TSMC has committed acts of patent infringement in this district.

23. This Court has personal jurisdiction over TSMC. TSMC has conducted and does conduct business within the State of Texas. TSMC, directly or through corporate relatives, subsidiaries or intermediaries (including distributors, retailers, and others), ships, distributes, makes, has made, uses, offers for sale, sells, imports, and/or advertises (including by providing interactive web pages) its products and/or services in the United States and the Eastern District of Texas and/or contributes to or actively induces its customers to ship, distribute, make, have made, use, offer for sale, sell, import, and/or advertise (including the provision of interactive web pages) infringing products and/or services in the United States and the Eastern District of Texas.

24. TSMC, directly and through subsidiaries or intermediaries (including distributors, retailers, and others), has purposefully and voluntarily placed one or more of its infringing products and/or services, as described below, into the stream of commerce with the expectation that those products will be purchased and used by customers and/or consumers in the Eastern District of

Texas. These infringing products and/or services have been and continue to be made, used, sold, offered for sale, purchased, and/or imported by customers and/or consumers in the Eastern District of Texas. These infringing products, including those incorporated in the Samsung Galaxy S20 smartphones, are available, at least, at Best Buy locations throughout this district, including but not limited to: 422 W Loop 281 Ste 100, Longview, TX 75605.

25. On information and belief, TSMC has also placed integrated circuits using TSMC's process node technology and products containing these integrated circuits that infringe into the stream of commerce by shipping infringing products into Texas, shipping those products knowing that those products would be shipped into Texas, and/or shipping those products knowing that they would be incorporated into other infringing products that would be shipped into Texas.

JOINDER

26. Joinder of Defendants is proper under 35 U.S.C. § 299. The allegations of patent infringement contained herein arise out of the same series of transactions or occurrences relating to the importing (or having imported) into the United States and/or making (or having made), using (or inducing the use of), selling, or offering for sale within the United States, several of the same infringing products, including e.g., Samsung's consumer electronics products incorporating semiconductor devices fabricated by Samsung or TSMC.

27. Examples of these products include, but are not limited to, Samsung's Galaxy A71 smartphone with Qualcomm Snapdragon 765 chip (on information and belief, fabricated by Samsung's 7nm node), Samsung's Galaxy S21 FE 5G with Qualcomm Snapdragon 888 5G chip (on information and belief, fabricated by Samsung's 5nm node), and Samsung's Galaxy S20 FE smartphone with Qualcomm Snapdragon 865 5G chip (on information and belief, fabricated by TSMC's 7nm node). Thus, Samsung's family of smartphone, tablet, and smartwatch products, on information and belief contain Qualcomm or Samsung SoCs fabricated by Samsung or TSMC,

and are designed, made, imported, sold, offered for sale, and/or used in this district. *See* https://www.samsung.com/us/smartphones/galaxy-s21-5g/ (accessed May 17, 2022); https://www.boostmobile.com/phones/samsung-galaxy-a71-5g.html (accessed May 17, 2022); https://www.samsung.com/us/mobile/galaxy-s20-5g/s20-fe-5g/ (accessed May 17, 2022); https://www.walmart.com/browse/electronics/smart-watches/samsung/3944_1229723_8780847/YnJhbmQ6U0FNU1VORwieie (accessed May 25, 2022).

ALLEGATIONS OF PATENT INFRINGEMENT

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

29. As set forth below, the infringing products incorporate, without any license from Daedalus, semiconductor devices protected by patents owned by Daedalus. Daedalus respectfully seeks relief from this Court for Defendants' infringement.

Samsung

30. Samsung manufactures, has manufactured, uses, sells, offers to sell, imports, has imported, tests, designs, and/or markets in the United States semiconductor devices, integrated circuits, and products containing the same that infringe, or were manufactured using processes that infringe, the CPU Patents and the Semic Patents.

31. Samsung has directly infringed, and continues to directly infringe, the CPU Patents and the Semic Patents under 35 U.S.C. § 271(a) and (g) by making, using, selling and/or offering to sell, in this district and elsewhere in the United States, and/or importing into this district and elsewhere in the United States, certain infringing semiconductor devices, integrated circuits, and products containing the same which infringe the CPU Patents and the Semic Patents, as further described in detail in Counts I-VIII *infra*.

32. With notice of the CPU Patents and the Semic Patents, Samsung has proceeded to directly infringe by making, having made, using, testing, designing, selling, offering to sell, and/or importing in this district and elsewhere in the United States, semiconductor devices, integrated circuits, and products containing the same that infringe the CPU Patents and the Semic Patents. Samsung has been placed on actual notice of the CPU Patents and the Semic Patents at least as early as September 12, 2022, by way of a letter to Samsung dated September 9, 2022. Additionally, the filing of this Complaint also constitutes notice in accordance with 35 U.S.C. § 287.

33. Samsung has also indirectly infringed, and continues to indirectly infringe, the CPU Patents and the Semic Patents under 35 U.S.C. § 271(b) and (c). Samsung knew and intended to induce the infringement of the CPU Patents and the Semic Patents by its customers and/or other third parties. The infringing products have no substantial non-infringing use. After receiving actual notice of the CPU Patents and the Semic Patents, Samsung proceeded to actively induce infringement of the CPU Patents and the Semic Patents by inducing its customers and/or other third parties to make, use, sell, offer for sale, market, advertise, and/or import semiconductor devices, integrated circuits, and/or products containing the same that infringe the CPU Patents and the Semic Patents, as described in detail in Counts I-VIII *infra*.

34. Additionally, Samsung has indirectly infringed, and continues to indirectly infringe the CPU Patents and the Semic Patents under 35 U.S.C. § 271(c) by materially contributing to infringement of the CPU Patents and the Semic Patents by making, using, selling, offering for sale, advertising, marketing, and/or importing semiconductor devices and/or integrated circuits for use in products that infringe the CPU Patents and the Semic Patents, and by instructing those others to infringe the CPU Patents and the Semic Patents, as described in detail in Counts I-VIII *infra*.

35. Samsung's infringing products include, but are not limited to, all Samsung semiconductor devices, integrated circuits, including, but not limited to semiconductor products manufactured by Samsung using Samsung's 14nm and smaller technology nodes, and any products containing the same (including those of Samsung and Qualcomm), Samsung's Exynos SoCs (including those fabricated by Samsung or TSMC). The infringing products also include downstream products that incorporate such semiconductor devices that infringe (or were made by processes that infringe) the CPU Patents and the Semic Patents, such as smartphones, tablets, and smartwatches. Daedalus reserves the right to accuse any forthcoming Samsung technology or products not yet commercially available.

36. Samsung's acts of infringement have caused damage to Daedalus. Daedalus is entitled to recover from Samsung the damages incurred by Daedalus as a result of Samsung's wrongful acts.

TSMC

37. TSMC manufactures, has manufactured, uses, sells, offers to sell, imports, has imported, tests, designs, and/or markets in the United States semiconductor devices, integrated circuits, and products containing the same that infringe, or were manufactured using processes that infringe, the Semic Patents.

38. TSMC has directly infringed, and continues to directly infringe, the Semic Patents under 35 U.S.C. § 271(a) and (g) by making, using, selling and/or offering to sell, in this district and elsewhere in the United States, and/or importing into this district and elsewhere in the United States, certain infringing semiconductor devices, integrated circuits, and products containing the same which infringe the Semic Patents, as further described in detail in Counts V-VIII *infra*.

39. With notice of the Semic Patents, TSMC has proceeded to directly infringe by making, using, testing, designing, selling, offering to sell, and/or importing in this district and

elsewhere in the United States, semiconductor devices, integrated circuits, and products containing the same that infringe the Semic Patents. TSMC has been placed on actual notice of the Semic Patents at least as early as September 12, 2022, by way of a letter to TSMC dated September 9, 2022. Additionally, the filing of this Complaint also constitutes notice in accordance with 35 U.S.C. § 287.

40. TSMC has also indirectly infringed, and continues to indirectly infringe, the Semic Patents under 35 U.S.C. § 271(b) and (c). TSMC knew and intended to induce the infringement of the Semic Patents by its customers and/or other third parties. TSMC's infringing products have no substantial non-infringing use. After receiving actual notice of the Semic Patents, TSMC proceeded to actively induce infringement of the Semic Patents by inducing its customers and/or other third parties to make, use, sell, offer for sale, market, advertise, and/or import semiconductor devices, integrated circuits, and/or products containing the same that infringe (or were made by processes that infringe) the Semic Patents (e.g., semiconductor devices fabricated at TSMC's 7nm node), and integrated circuits containing the same (e.g., Qualcomm Snapdragon 865 5G chip), and consumer electronic devices such as Samsung's smartphones, tablets, and smartwatches incorporating the same, as described in detail in Counts V-VIII *infra*.

41. Additionally, TSMC has indirectly infringed, and continues to indirectly infringe the Semic Patents under 35 U.S.C. § 271(c) by materially contributing to infringement of the Semic Patents by making, using, selling, offering for sale, advertising, marketing, and/or importing semiconductor devices and/or integrated circuits for use in products that infringe the Semic Patents, and by instructing those others to infringe the Semic Patents, as described in detail in Counts V-VIII *infra*.

42. The infringing products include, but are not limited to, all TSMC semiconductor devices, integrated circuits, including, but not limited to semiconductor products manufactured by TSMC using TSMC's 16nm and smaller technology nodes, and any products containing the same. The infringing products also include downstream products that incorporate TSMC's semiconductor devices that infringe the Semic Patents, such as smartphones, tablets, and smartwatches. Daedalus reserves the right to accuse any forthcoming TSMC technology or products not yet commercially available.

43. TSMC's acts of infringement have caused damage to Daedalus. Daedalus is entitled to recover from TSMC the damages incurred by Daedalus as a result of TSMC's wrongful acts.

COUNT I
(SAMSUNG'S INFRINGEMENT OF U.S. PATENT NO. 8,775,833)

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

45. Plaintiff is the assignee and lawful owner of all right, title and interest in and to the '833 Patent. The '833 Patent is valid and enforceable.

46. The United States Patent No. 8,775,833 is entitled "Dynamically Allocating a Power Budget Over Multiple Domains of a Processor," and issued on July 8, 2014 to inventors Avinash N. Ananthakrishnan, Efraim Rotem, Doron Rajwan, Eliezer Weissmann, and Nadav Shulman. The '833 Patent issued from United States Patent Application No. 13/780,066 filed on February 28, 2013. The '833 Patent is a continuation of United States Patent Application No. 13/225,677, filed on September 6, 2011.

47. Defendant Samsung has directly infringed, and continues to directly infringe, the '833 Patent by making, having made, using, selling, offering for sale, and/or importing into the United States products that infringe the '833 Patent including, but not limited to integrated circuits

and products containing the same. The products that infringe one or more claims of the '833 Patent include, but are not limited to, at least the products identified herein. Further discovery may reveal additional infringing products and/or models.

48. For example, and without limitation, the infringing products infringe one or more claims of the '833 Patent, including but not limited to claim 1. Defendant Samsung's products fall within the scope of and include, either literally under the doctrine of equivalents, all of the elements of at least claim 1 of the '833 Patent.

49. With respect to an exemplary device, the Samsung Galaxy S21 FE 5G made or sold by Samsung, incorporating the Qualcomm Snapdragon 888 5G system-on-chip, directly infringes at least independent claim 1 of the '833 Patent.

50. The infringing products include all of the limitations of at least claim 1 of the '833 Patent. Specifically, the '833 Patent claims, e.g.: a processor comprising: a first domain and a second domain, each of the first and second domains to operate at an independent voltage and frequency; a memory controller coupled to the first and second domains; at least one interface; and first logic to dynamically allocate a power budget for the processor between the first and second domains at run time according to a first sharing policy value for the first domain and a second sharing policy value for the second domain, the first and second sharing policy values controllable by user-level software.

51. For example, the Samsung Galaxy S21 FE 5G smartphone contains the Qualcomm Snapdragon 888 SoC, comprising a Kryo 680 central processing unit (the "Kryo CPU") and Adreno 660 graphics processing unit (the "Adreno GPU"). *See* https://www.qualcomm.com/snapdragon/smartphones/samsung-galaxy-s21-fan-edition-5g (accessed May 17, 2022);

https://www.qualcomm.com/system/files/document/files/prod_brief_qcom_sd888_5g_1_0.pdf (accessed May 17, 2022). The Kryo CPU further comprises an ARM Cortex-X1 core, three ARM Cortex-A78 cores, and four ARM Cortex-A55 cores. *See* https://www.anandtech.com/show/16271/qualcomm-snapdragon-888-deep-dive (accessed May 17, 2022). Each of the ARM core and the Adreno GPU is operable at an independent voltage and frequency. *See* https://www.qualcomm.com/news/onq/2013/10/25/power-vs-performance-management-cpu; https://developer.qualcomm.com/qfile/33472/80-nb295-11_a.pdf (accessed May 17, 2022).

52. In addition, the exemplary Samsung Galaxy S21 FE 5G product includes a memory controller coupled to the first and second domains and at least one interface. For example, the Qualcomm Snapdragon 888 SoC includes a multimedia fabric, a fabric and memory controller, a system fabric, a Memory Management Unit, a system network-on-chip (NoC), and an AXI bus. *See* https://www.qualcomm.com/media/documents/files/the-qualcomm-difference.pdf (accessed May 17, 2022); https://developer.qualcomm.com/downloads/qualcomm-snapdragon-820e-processor-apq8096sge-clock-plan?referrer=node/35455 (accessed May 17, 2022).

53. Also, the exemplary Samsung Galaxy S21 FE 5G product includes a first logic to dynamically allocate a power budget for the processor between the first and second domains at run time according to a first sharing policy value for the first domain and a second sharing policy value for the second domain, the first and second sharing policy values controllable by user-level software. For example, the Qualcomm Snapdragon 888 SoC includes the Resource Power Manager-hardened (RPMh) architecture "for aggregating request and applying the result on the resource." *See* https://lwn.net/Articles/748981/ (accessed May 17, 2022). The Qualcomm Snapdragon 888 SoC also supports power optimization SDK to control CPU and GPU clock

frequency and a user space resource control scheme Perflock that "determines whether the request [from the user space] can be honored or not." *See* https://www.slideshare.net/QualcommDeveloperNetwork/balancing-power-performance-webinar (accessed May 17, 2022); https://developer.qualcomm.com/software/snapdragon-power-optimization-sdk/app-notes (accessed May 17, 2022). The exemplary Samsung Galaxy S21 FE 5G product also supports various user-controllable performance modes. *See* https://www.samsung.com/sg/support/mobile-devices/get-the-highest-quality-on-your-galaxy-phone-with-high-performance-mode/ (accessed May 17, 2022); https://www.androidpolice.com/2021/08/25/__trashed-3/ (accessed May 17, 2022); https://www.verizon.com/support/knowledge-base-240679/ (accessed May 17, 2022).

54. Defendant Samsung's acts of direct infringement of the '833 Patent are willful, and have caused and will continue to cause substantial damage and irreparable harm to Daedalus, and Daedalus has no adequate remedy at law.

55. In addition to directly infringing the '833 Patent, Samsung indirectly infringes the '833 Patent pursuant to 35 U.S.C. § 271(b) and (c).

56. Defendant Samsung has, and continues to, indirectly infringe the '833 Patent by actively inducing and contributing to the infringement of the '833 Patent by others, such as fabless companies, original equipment manufacturers, customers, resellers, and retailers who, for example, incorporate the products which infringe the '833 Patent into downstream products made, sold, offered for sale, and/or imported throughout the United States, including within this district. For example, Defendant Samsung hires permanent sales and/or marketing personnel located throughout the United States, and in this district. On information and belief, these sales and/or marketing activities are targeted to original equipment manufacturers, including original

equipment manufacturers based in the United States.

57. Defendant Samsung specifically intended these others, such as original equipment manufacturers, customers, resellers, and retailers, to infringe the '833 Patent and knew that these others perform acts that constituted direct infringement. For example, Defendant Samsung designed the products such that they would each infringe the '833 Patent if made, used, sold, offered for sale, or imported into the United States. Defendant Samsung provided, directly or indirectly, infringing products to others, such as, but not limited to, customers, knowing and intending that those others would use, sell, offer for sale, and/or import in and into the United States downstream products that include the infringing products, thereby directly infringing one or more claims of the '833 Patent.

58. Upon information and belief, Samsung knowingly and actively aided and abetted the direct infringement of the '833 Patent by instructing and encouraging its customers, purchasers, users, and developers to use the '833 Patent technology. These instructions of encouragement include, but are not limited to, using the infringing products as described in the claims of the '833 Patent, and advertising and promoting the use of the '833 Patent's claimed technology.

59. Samsung has also infringed, and continues to infringe, claims of the '833 Patent by offering to commercially distribute, commercially distributing, making and/or importing the infringing products, which are used in practicing the process, or using the systems, of the '833 Patent, and constitute a material part of the invention. Samsung knows the components in the infringing products are especially made or especially adapted for use in infringement of the '833 Patent, and are neither a staple article nor a commodity of commerce suitable for substantial non-infringing use. For example, the ordinary way of using the infringing products infringes the patent claims, and as such, is especially adapted for use in infringement as set forth above. Accordingly,

Samsung has been, and currently is, contributorily infringing the ’833 Patent, in violation of 35 U.S.C. § 271(c).

COUNT II
(SAMSUNG’S INFRINGEMENT OF U.S. PATENT NO. 8,898,494)

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

61. Plaintiff is the assignee and lawful owner of all right, title and interest in and to the ’494 Patent. The ’494 Patent is valid and enforceable.

62. United States Patent No. 8,898,494 is entitled “Power Budgeting Between a Processing Core, a Graphics Core, and a Bus on an Integrated Circuit When a Limit Is Reached,” and issued on November 25, 2014 to inventors Travis T. Schluessler and Russell J. Fenger. The ’494 Patent issued from United States Patent Application No. 13/398,641, which was filed on February 16, 2012, and is a continuation-in-part of United States Patent Application No. 13/327,670, filed on December 15, 2011.

63. Defendant Samsung has directly infringed, and continues to directly infringe, the ’494 Patent by making, having made, using, selling, offering for sale, and/or importing into the United States products that infringe the ’494 Patent including, but not limited to integrated circuits and products containing the same. The products that infringe one or more claims of the ’494 Patent include, but are not limited to, at least the products identified herein. Further discovery may reveal additional infringing products and/or models.

64. For example, and without limitation, the infringing products infringe one or more claims of the ’494 Patent, including but not limited to claim 1. The infringing products fall within the scope of and include, either literally under the doctrine of equivalents, all of the elements of at least claim 1 of the ’494 Patent.

65. With respect to an exemplary device, the Samsung Galaxy S21 FE 5G made or sold by Samsung, incorporating the Qualcomm Snapdragon 888 5G system-on-chip, directly infringes at least independent claim 1 of the '494 Patent.

66. The infringing products include all of the limitations of at least claim 1 of the '494 Patent. Specifically, the '494 Patent claims, e.g.: a processor comprising: an integrated circuit including: a first core; a cache memory; a communication bus coupled to the first core, the communication bus to connect the first core and the cache memory; a core workload monitor configured to determine a core workload for the first core; a bus workload monitor configured to determine a bus workload for the communication bus; and balancing control adapted to receive the bus workload from the bus workload monitor and to dynamically tune power allocation between the first core and the communication bus based on a power limit for the integrated circuit and a comparison between the bus workload and a bus workload threshold, the power limit corresponding to a maximum thermal dissipation capacity for the integrated circuit, wherein a power consumption of one of the first core and the communication bus is to be reduced, the power consumption reduction to be limited to maintain operation of the one of the first core and the communication bus above a low limit.

67. For example, the Samsung Galaxy S21 FE 5G smartphone contains the Qualcomm Snapdragon 888 5G SoC, comprising a Kryo 680 central processing unit (the "Kryo CPU") and Adreno 660 graphics processing unit (the "Adreno GPU"). *See* https://www.qualcomm.com/snapdragon/smartphones/samsung-galaxy-s21-fan-edition-5g (accessed May 17, 2022); https://www.qualcomm.com/system/files/document/files/prod_brief_qcom_sd888_5g_1_0.pdf (accessed May 17, 2022). The Kryo CPU further comprises an ARM Cortex-X1 core, three ARM

Cortex-A78 cores, and four ARM Cortex-A55 cores. *See* https://www.anandtech.com/show/16271/qualcomm-snapdragon-888-deep-dive (accessed May 17, 2022).

68. In addition, the exemplary Samsung Galaxy S21 FE 5G product includes a cache memory and a communication bus coupled to the first core, the communication bus to connect the first core and the cache memory. For example, the Qualcomm Snapdragon 888 5G SoC includes the ARM DynamIQ Shared Unit (DSU), a multimedia fabric, a fabric and memory controller, a system fabric, a Memory Management Unit, cache coherent interconnect, and non-coherent interconnect coupling the ARM cores and the Adreno GPU to L1, L2, L3, and system caches. *See* https://www.anandtech.com/show/16271/qualcomm-snapdragon-888-deep-dive (accessed May 17, 2022); https://www.qualcomm.com/media/documents/files/the-qualcomm-difference.pdf (accessed May 17, 2022); https://documentation-service.arm.com/static/5e7e1bd8b2608e4d7f0a35b4?token (accessed May 17, 2022); https://developer.arm.com/Processors/CoreLink%20CCI-550 (accessed May 17, 2022); https://www.anandtech.com/show/10339/arteris-announces-ncore-cachecoherent-interconnect (accessed May 17, 2022).

69. The exemplary Samsung Galaxy S21 FE 5G product also includes: a core workload monitor configured to determine a core workload for the first core; a bus workload monitor configured to determine a bus workload for the communication bus; and balancing control adapted to receive the bus workload from the bus workload monitor and to dynamically tune power allocation between the first core and the communication bus based on a power limit for the integrated circuit and a comparison between the bus workload and a bus workload threshold, the power limit corresponding to a maximum thermal dissipation capacity for the integrated circuit,

wherein a power consumption of one of the first core and the communication bus is to be reduced, the power consumption reduction to be limited to maintain operation of the one of the first core and the communication bus above a low limit. For example, the Qualcomm Snapdragon 888 5G SoC includes task schedulers to schedule tasks to CPU cores, the compute_work_load function to compute workload, and the CPUfreq framework to adjust the CPU frequency proportional to load and to compute workload. *See* https://developer.qualcomm.com/blog/impact-big-core-little-core-architecture-application-development (accessed May 17, 2022); https://android.googlesource.com/kernel/msm/+/refs/heads/android-msm-gar-3.18-oreo-wear-dr/drivers/devfreq/governor_msm_adreno_tz.c (accessed May 17, 2022); https://elixir.bootlin.com/linux/latest/source/drivers/cpufreq/cpufreq_ondemand.c (accessed May 17, 2022). The Qualcomm Snapdragon 888 5G SoC also includes the Applications Processor Subsystem (APSS) power infrastructure interface that "allows all the software drivers and middleware that control hardware to request the required power resources, for example, CPU, bus bandwidth, and so on." *See* https://developer.qualcomm.com/downloads/qualcomm-snapdragon-820e-processor-apq8096sge-clock-plan?referrer=node/35455 (accessed May 17, 2022). The Qualcomm Snapdragon 888 5G SoC further includes the Resource Power Manager-hardened (RPMh), which "aggregate[s] request and appl[ies] the result on the resource" and Bus Clock Manager (BCM), which "manages shared system resources by aggregating requests from multiple Resource State Coordinators." *See* https://lwn.net/Articles/748981/ (accessed May 17, 2022); https://www.kernel.org/doc/Documentation/devicetree/bindings/interconnect/qcom%2Csdm845.yaml (accessed May 17, 2022); https://mjmwired.net/kernel/Documentation/devicetree/bindings/interconnect/qcom,bcm-voter.yaml (accessed May 17, 2022). The Qualcomm Snapdragon 888 5G SoC also uses a device

frequency driver and associated bandwidth-frequency tables to update the interconnect bandwidth based on requests and a series of thresholds. *See* SM-G990U1_NA_12_Opensource.zip files: devfreq_icc.c, lahaina.dtsi, msm_lmh_dcvs.c, lahaina-gpu.dtsi, and kgsl_pwrctrl.c, available at https://opensource.samsung.com/downSrcCode (accessed May 17, 2022).

70. Defendant Samsung's acts of direct infringement of the '494 Patent are willful, and have caused and will continue to cause substantial damage and irreparable harm to Daedalus, and Daedalus has no adequate remedy at law.

71. In addition to directly infringing the '494 Patent, Samsung indirectly infringes the '494 Patent pursuant to 35 U.S.C. § 271(b) and (c).

72. Defendant Samsung has, and continues to, indirectly infringe the '494 Patent by actively inducing and contributing to the infringement of the '494 Patent by others, such as fabless companies, original equipment manufacturers, customers, resellers, and retailers who, for example, incorporate the products which infringe the '494 Patent into downstream products made, sold, offered for sale, and/or imported throughout the United States, including within this district. For example, Defendant Samsung hires permanent sales and/or marketing personnel located throughout the United States, and in this district. On information and belief, these sales and/or marketing activities are targeted to original equipment manufacturers, including original equipment manufacturers based in the United States.

73. Defendant Samsung specifically intended these others, such as original equipment manufacturers, customers, resellers, and retailers, to infringe the '494 Patent and knew that these others perform acts that constituted direct infringement. For example, Defendant Samsung designed the products such that they would each infringe the '494 Patent if made, used, sold, offered for sale, or imported into the United States. Defendant Samsung provided (directly or

indirectly) infringing products to others, such as, but not limited to, customers, knowing and intending that those others would use, sell, offer for sale, and/or import in and into the United States downstream products that include the infringing products, thereby directly infringing one or more claims of the ’494 Patent.

74. Upon information and belief, Samsung knowingly and actively aided and abetted the direct infringement of the ’494 Patent by instructing and encouraging its customers, purchasers, users, and developers to use the ’494 Patent technology. These instructions of encouragement include, but are not limited to, using the infringing products as described in the claims of the ’494 Patent, and advertising and promoting the use of the ’494 Patent’s claimed technology.

75. Samsung has also infringed, and continues to infringe, claims of the ’494 Patent by offering to commercially distribute, commercially distributing, making and/or importing the infringing products, which are used in practicing the process, or using the systems of the ’494 Patent, and constitute a material part of the invention. Samsung knows the components in the infringing products are especially made or especially adapted for use in infringement of the ’494 Patent, and are neither a staple article nor a commodity of commerce suitable for substantial non-infringing use. For example, the ordinary way of using the infringing products infringes the patent claims, and as such, is especially adapted for use in infringement as set forth above. Accordingly, Samsung has been, and currently is, contributorily infringing the ’494 Patent, in violation of 35 U.S.C. § 271(c).

COUNT III
(SAMSUNG’S INFRINGEMENT OF U.S. PATENT NO. 10,049,080)

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

77. Plaintiff is the assignee and lawful owner of all right, title and interest in and to the ’080 Patent. The ’080 Patent is valid and enforceable.

78. United States Patent No. 10,049,080 is entitled “Asymmetric Performance Multicore Architecture with Same Instruction Set Architecture,” and issued on August 14, 2018 to inventors Varghese George, Sanjeev S. Jahagirdar, and Deborah T. Marr. The ’080 Patent issued from United States Patent Application No. 15/431,527, which was filed on February 13, 2017, and is a continuation of United States Patent Application No. 13/335,257, filed on December 22, 2011 (now U.S. Patent No. 9,569,278).

79. Defendant Samsung has directly infringed, and continues to directly infringe, the ’080 Patent by making, using, selling, offering for sale, or importing into the United States products that infringe the ’080 Patent including, but not limited to integrated circuits and products containing the same. The products that infringe one or more claims of the ’080 Patent include, but are not limited to, at least the products identified herein. Further discovery may reveal additional infringing products and/or models.

80. For example, and without limitation, the infringing products infringe one or more claims of the ’080 Patent, including but not limited to claim 1. The infringing products fall within the scope of and include, either literally under the doctrine of equivalents, all of the elements of the at least claim 1 of the ’080 Patent.

81. With respect to an exemplary device, the Samsung Galaxy S21 FE 5G made or sold by Samsung, incorporating the Qualcomm Snapdragon 888 5G system-on-chip, directly infringes at least independent claim 1 of the ’080 Patent.

82. The infringing products include all of the limitations of at least claim 1 of the ’080 Patent. Specifically, the ’080 Patent claims, e.g.: a multi-core processor comprising: a first

plurality of cores and a second plurality of cores that support a same instruction set, wherein the second plurality of cores consume less power, for a same applied operating frequency and supply voltage, than the first plurality of cores; and power management hardware to, from a state where the first plurality of cores and the second plurality of cores are enabled, disable all of the first plurality of cores for a drop in demand below a threshold without disabling any of the second plurality of cores, wherein an operating system to execute on the multi-core processor is to monitor a demand for the multi-core processor and control the power management hardware based on the demand.

83. For example, the exemplary Samsung Galaxy S21 FE 5G smartphone contains the Qualcomm Snapdragon 888 5G SoC, comprising a Kryo 680 central processing unit (the "Kryo CPU"). *See* https://www.qualcomm.com/snapdragon/smartphones/samsung-galaxy-s21-fan-edition-5g (accessed May 17, 2022); https://www.qualcomm.com/system/files/document/files/prod_brief_qcom_sd888_5g_1_0.pdf (accessed May 17, 2022). The Kryo CPU further comprises an ARM Cortex-X1 core, three ARM Cortex-A78 cores, and four ARM Cortex-A55 cores. *See* https://www.anandtech.com/show/16271/qualcomm-snapdragon-888-deep-dive (accessed May 17, 2022).

84. The exemplary Samsung Galaxy S21 FE 5G product comprises a first plurality of cores and a second plurality of cores that support a same instruction set, wherein the second plurality of cores consume less power, for a same applied operating frequency and supply voltage, than the first plurality of cores. For example, the Qualcomm Snapdragon 888 5G SoC includes ARM's big cores, high performance cores, and LITTLE cores, power efficient cores, in the DynamIQ architecture, all of which support the same instruction set architecture. *See*

https://documentation-service.arm.com/static/60a54dfa982fc7708ac1c883?token (accessed May 17, 2022); https://developer.arm.com/ip-products/processors/cortex-a/cortex-a78 (accessed May 17, 2022); https://developer.arm.com/ip-products/processors/cortex-a/cortex-a55 (accessed May 17, 2022); https://www.makeuseof.com/what-is-the-biglittle-architecture (accessed May 17, 2022).

85. The exemplary Samsung Galaxy S21 FE 5G product also comprises power management hardware to, from a state where the first plurality of cores and the second plurality of cores are enabled, disable all of the first plurality of cores for a drop in demand below a threshold without disabling any of the second plurality of cores, wherein an operating system to execute on the multi-core processor is to monitor a demand for the multi-core processor and control the power management hardware based on the demand. For example, the Qualcomm Snapdragon 888 5G SoC includes the Resource Power Manager-hardened (RPMh) architecture, including a RPM core, a Cortex M3, a security controller, and a Master Power Management block. *See* https://lwn.net/Articles/748981/; https://developer.qualcomm.com/qfile/35457/lm80-p2751-1_e.pdf (accessed May 17, 2022); https://developer.qualcomm.com/qfile/35417/lm80-p0436-74_a_resource_power_manager_api_reference.pdf (accessed May 17, 2022). The Qualcomm Snapdragon 888 5G SoC also includes a task scheduler that can perform global task scheduling (GTS), which enables work to be allocated on any core, all cores, or any combination, with unused cores ae automatically turned off. *See* https://developer.qualcomm.com/blog/impact-big-core-little-core-architecture-application-development (accessed May 17, 2022); https://www.qualcomm.com/news/onq/2018/06/11/balancing-performance-and-power-consumption-biglittle (accessed May 17, 2022).

86. Defendant Samsung's acts of direct infringement of the '080 Patent are willful, and have caused and will continue to cause substantial damage and irreparable harm to Daedalus, and Daedalus has no adequate remedy at law.

87. In addition to directly infringing the '080 Patent, Samsung indirectly infringes the '080 Patent pursuant to 35 U.S.C. § 271(b) and (c).

88. Defendant Samsung has, and continues to, indirectly infringe the '080 Patent by actively inducing and contributing to the infringement of the '080 Patent by others, such as fabless companies, original equipment manufacturers, customers, resellers, and retailers who, for example, incorporate the products which infringe the '080 Patent into downstream products made, sold, offered for sale, and/or imported throughout the United States, including within this district. For example, Defendant Samsung hires permanent sales and/or marketing personnel located throughout the United States, and in this district. On information and belief, these sales and/or marketing activities are targeted to original equipment manufacturers, including original equipment manufacturers based in the United States.

89. Defendant Samsung specifically intended these others, such as original equipment manufacturers, customers, resellers, and retailers, to infringe the '080 Patent and knew that these others perform acts that constituted direct infringement. For example, Defendant Samsung designed the products such that they would each infringe the '080 Patent if made, used, sold, offered for sale, or imported into the United States. Defendant Samsung provided, directly or indirectly, infringing products to others, such as, but not limited to, customers, knowing and intending that those others would use, sell, offer for sale, and/or import in and into the United States downstream products that include the infringing products, thereby directly infringing one or more claims of the '080 Patent.

90. Upon information and belief, Samsung knowingly and actively aided and abetted the direct infringement of the ’080 Patent by instructing and encouraging its customers, purchasers, users, and developers to use the ’080 Patent technology. These instructions of encouragement include, but are not limited to, using the infringing products as described in the claims of the ’080 Patent, and advertising and promoting the use of the ’080 Patent’s claimed technology.

91. Samsung has also infringed, and continues to infringe, claims of the ’080 Patent by offering to commercially distribute, commercially distributing, making and/or importing the infringing products, which are used in practicing the process, or using the systems, of the ’080 Patent, and constitute a material part of the invention. Samsung knows the components in the infringing products are especially made or especially adapted for use in infringement of the ’080 Patent, and are neither a staple article nor a commodity of commerce suitable for substantial non-infringing use. For example, the ordinary way of using the infringing products infringes the patent claims, and as such, is especially adapted for use in infringement as set forth above. Accordingly, Samsung has been, and currently is, contributorily infringing the ’080 Patent, in violation of 35 U.S.C. § 271(c).

COUNT IV
(SAMSUNG’S INFRINGEMENT OF U.S. PATENT NO. 10,705,588)

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

93. Plaintiff is the assignee and lawful owner of all right, title and interest in and to the ’588 Patent. The ’588 Patent is valid and enforceable.

94. United States Patent No. 10,705,588 is entitled “Enabling a Non-Core Domain to Control Memory Bandwidth in a Processor” and issued on July 7, 2020 to inventors Avinash N. Ananthakrishnan, Inder M. Sodhi, Efraim Rotem, Doron Rajwan, Eliezer Weissmann, and Ryan

Wells. The ’588 Patent issued from United States Patent Application No. 16/249,103, which was filed on January 16, 2019, and is a continuation of United States Patent Application No. 15/381,241, filed on December 16, 2016 (now U.S. Patent 10,248,181), which is a continuation of United States Patent Application No. 15/138,505, filed on April 26, 2016 (now U.S. Patent No. 10,037,067), which is a continuation of United States Patent Application No. 14/451,807, filed on August 5, 2014 (now U.S. Patent No. 9,354,692), which is a continuation of United States Patent Application No. 13/282,896, filed on October 27, 2011 (now U.S. Patent No. 8,832,478).

95. Defendant Samsung has directly infringed, and continues to directly infringe, the ’588 Patent by making, having made, using, selling, offering for sale, and/or importing into the United States products that infringe the ’588 Patent including, but not limited to integrated circuits and products containing the same. The products that infringe one or more claims of the ’588 Patent include, but are not limited to, at least the products identified herein. Further discovery may reveal additional infringing products and/or models.

96. For example, and without limitation, the infringing products infringe one or more claims of the ’588 Patent, including but not limited to claim 1. The infringing products fall within the scope of and include, either literally under the doctrine of equivalents, all of the elements of at least claim 1 of the ’588 Patent.

97. With respect to an exemplary device, the Samsung Galaxy S21 FE 5G made or sold by Samsung, incorporating the Qualcomm Snapdragon 888 5G system-on-chip, directly infringes at least independent claim 1 of the ’588 Patent.

98. The infringing products include all of the limitations of at least claim 1 of the ’588 Patent. Specifically, the ’588 Patent claims, e.g.: a processor comprising: a plurality of cores including a first core operable at a first voltage and at a first frequency, and a second core operable

at a second voltage independent of the first voltage and at a second frequency different from the first frequency; graphics processing circuitry coupled to the plurality of cores to perform graphics operations, the graphics processing circuitry independently operable at a third frequency different from the first frequency and the second frequency; and an interconnect to couple the graphics processing circuitry to a memory device, the interconnect operable at a fourth frequency different from the first, second, and third frequencies.

99. For example, the exemplary Samsung Galaxy S21 FE 5G smartphone contains the Qualcomm Snapdragon 888 5G SoC, comprising a Kryo 680 central processing unit (the "Kryo CPU") coupled to the Adreno 660 graphics processing unit (the "Adreno GPU"). *See* https://www.qualcomm.com/snapdragon/smartphones/samsung-galaxy-s21-fan-edition-5g (accessed May 17, 2022); https://www.qualcomm.com/system/files/document/files/prod_brief_qcom_sd888_5g_1_0.pdf (accessed May 17, 2022). The Kryo CPU further comprises an ARM Cortex-X1 core, three ARM Cortex-A78 cores, and four ARM Cortex-A55 cores. *See* https://www.anandtech.com/show/16271/qualcomm-snapdragon-888-deep-dive (accessed May 17, 2022). Each of the ARM core and the Adreno GPU is operable at an independent voltage and frequency. *See* https://www.qualcomm.com/news/onq/2013/10/25/power-vs-performance-management-cpu; https://developer.qualcomm.com/qfile/33472/80-nb295-11_a.pdf (accessed May 17, 2022).

100. The exemplary Samsung Galaxy S21 FE 5G product also comprises an interconnect to couple the graphics processing circuitry to a memory device, the interconnect operable at a fourth frequency different from the first, second, and third frequencies. For example, the Qualcomm Snapdragon 888 5G SoC includes a multimedia fabric, a fabric and memory controller,

a system fabric, a Memory Management Unit, a cache coherent interconnect, and a non-coherent interconnect coupling the Adreno GPU to a memory device. *See* https://www.qualcomm.com/media/documents/files/the-qualcomm-difference.pdf (accessed May 17, 2022); https://developer.arm.com/Processors/CoreLink%20CCI-550 (accessed May 17, 2022); https://www.anandtech.com/show/10339/arteris-announces-ncore-cachecoherent-interconnect (accessed May 17, 2022).

101. Defendant Samsung's acts of direct infringement of the '588 Patent are willful, and have caused and will continue to cause substantial damage and irreparable harm to Daedalus, and Daedalus has no adequate remedy at law.

102. In addition to directly infringing the '588 Patent, Samsung indirectly infringes the '588 Patent pursuant to 35 U.S.C. § 271(b) and (c).

103. Defendant Samsung has, and continues to, indirectly infringe the '588 Patent by actively inducing and contributing to the infringement of the '588 Patent by others, such as fabless companies, original equipment manufacturers, customers, resellers, and retailers who, for example, incorporate the products which infringe the '588 Patent into downstream products made, sold, offered for sale, and/or imported throughout the United States, including within this district. For example, Defendant Samsung hires permanent sales and/or marketing personnel located throughout the United States, and in this district. On information and belief, these sales and/or marketing activities are targeted to original equipment manufacturers, including original equipment manufacturers based in the United States.

104. Defendant Samsung specifically intended these others, such as original equipment manufacturers, customers, resellers, and retailers, to infringe the '588 Patent and knew that these others perform acts that constituted direct infringement. For example, Samsung designed the

products such that they would each infringe the ’588 Patent if made, used, sold, offered for sale, or imported into the United States. Samsung provided, directly or indirectly, infringing products to others, such as, but not limited to, customers, knowing and intending that those others would use, sell, offer for sale, and/or import in and into the United States downstream products that include the infringing products, thereby directly infringing one or more claims of the ’588 Patent.

105. Upon information and belief, Samsung knowingly and actively aided and abetted the direct infringement of the ’588 Patent by instructing and encouraging its customers, purchasers, users, and developers to use the ’588 Patent technology. These instructions of encouragement include, but are not limited to, using the infringing products as described in the claims of the ’588 Patent, and advertising and promoting the use of the ’588 Patent’s claimed technology.

106. Samsung has also infringed, and continues to infringe, claims of the ’588 Patent by offering to commercially distribute, commercially distributing, making and/or importing the infringing products, which are used in practicing the process, or using the systems, of the ’588 Patent, and constitute a material part of the invention. Samsung knows the components in the infringing products are especially made or especially adapted for use in infringement of the ’588 Patent, and are neither a staple article nor a commodity of commerce suitable for substantial non-infringing use. For example, the ordinary way of using the infringing products infringes the patent claims, and as such, is especially adapted for use in infringement as set forth above. Accordingly, Samsung has been, and currently is, contributorily infringing the ’588 Patent, in violation of 35 U.S.C. § 271(c).

COUNT V
(SAMSUNG’S AND TSMC’S INFRINGEMENT OF U.S. PATENT NO. 9,831,306)

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

108. Plaintiff is the assignee and lawful owner of all right, title and interest in and to the ’306 Patent. The ’306 Patent is valid and enforceable.

109. The ’306 Patent is entitled “Self-Aligned Gate Edge and Local Interconnect and Method to Fabricate Same,” and issued on November 28, 2017 to inventors Milton Clair Webb, Mark Bohr, Tahir Ghani, and Szuya S. Liao. The ’306 Patent issued from United States Patent Application No. 15/024,750, which was filed on March 24, 2016, and is a continuation of PCT No. PCT/US2013/076673, filed on December 19, 2013.

110. Defendants Samsung and TSMC have directly infringed, and continue to directly infringe, the ’306 Patent by making, having made, using, selling, offering for sale, and/or importing into the United States products that infringe the ’306 Patent including, but not limited to semiconductor devices and products containing the same. The products that infringe one or more claims of the ’306 Patent include, but are not limited to, at least the products identified herein. Further discovery may reveal additional infringing products and/or models.

111. For example, and without limitation, the infringing products infringe one or more claims of the ’306 Patent, including but not limited to claim 26. The infringing products fall within the scope of and include, either literally under the doctrine of equivalents, all of the elements of at least claim 26 of the ’306 Patent.

112. With respect to exemplary devices, the Samsung Galaxy S20 FE 5G smartphone made or sold by Samsung, incorporating the TSMC-made Qualcomm Snapdragon 865 system-on-chip (the “TSMC SoC”) and the Samsung Galaxy S21 FE 5G smartphone made or sold by Samsung, incorporating the Samsung-made Qualcomm Snapdragon 888 5G system-on-chip (the “first Samsung SoC”), directly infringe at least independent claim 26 of the ’306 Patent.

113. The infringing products include all of the limitations of at least claim 26 of the '306 Patent. Specifically, the '306 Patent claims, e.g.: an integrated circuit structure, comprising: a first fin comprising silicon, the first fin having a longest dimension along a first direction; a second fin comprising silicon, the second fin having a longest dimension along the first direction; an isolation material between the first fin and the second fin; a first gate structure over the first fin, the first gate structure having a longest dimension along a second direction, the second direction orthogonal to the first direction, wherein the first gate structure comprises a first gate dielectric layer and a first gate electrode; a second gate structure over the second fin, the second gate structure having a longest dimension along the second direction, the second gate structure discontinuous with the first gate structure along the second direction, and the second gate structure having an edge facing an edge of the first gate structure along the second direction, wherein the second gate structure comprises a second gate dielectric layer and a second gate electrode; a gate edge isolation structure between and in contact with the edge of the first gate structure and the edge of the second gate structure along the second direction, the gate edge isolation structure over the isolation material; and a dielectric material laterally adjacent to the first and second gate structures along the first direction, the dielectric material laterally adjacent to the gate edge isolation structure along the first direction, and the dielectric material discrete from the gate edge isolation structure.

114. The TSMC SoC is manufactured by TSMC using its 7nm feature size manufacturing process. *See* https://www.anandtech.com/show/15306/qualcomm-announces-snapdragon-865-and-765-5g-for-all-in-2020-all-the-details (accessed May 17, 2022). TSMC's 7nm feature size manufacturing process produces a product that meets all of the limitations of at least claim 26 of the '306 Patent. For example, the TSMC SoC comprises a first and a second silicon fins, an isolation material between the first and second fins, and the first and second fins

having a longest dimension along a first direction. The TSMC SoC also includes a first and second gate structures over the first and second fin respectively, each comprising a gate dielectric layer and a gate electrode. The first and second gate structures have a longest dimension along a second direction, the second direction orthogonal to the first direction. The first and second gate structures are discontinuous with each other along the second direction and an edge of the first gate structure is facing an edge of the second gate structure in the second direction. The TSMC SoC further includes a gate edge isolation structure over the isolation material and is between and in contact with the edge of the first gate structure and the edge of the second gate structure. The TSMC SoC also includes a dielectric material that is discrete from the gate edge isolation structure, and is laterally adjacent to the first and second gate structures along the first direction, and laterally adjacent to the gate edge isolation structure along the first direction.

115. The first Samsung SoC is manufactured by Samsung using its 5nm feature size manufacturing process. *See* https://www.anandtech.com/show/16271/qualcomm-snapdragon-888-deep-dive (accessed May 17, 2022). Samsung's 5nm feature size manufacturing process produces a product that meets all of the limitations of at least claim 26 of the '306 Patent. For example, the first Samsung SoC comprises a first and a second silicon fins, an isolation material between the first and second fins, and the first and second fins having a longest dimension along a first direction. The first Samsung SoC also includes a first and second gate structures over the first and second fin respectively, each gate structure comprising a gate dielectric layer and a gate electrode. The first and second gate structures have a longest dimension along a second direction, the second direction orthogonal to the first direction. The first and second gate structures are discontinuous with each other along the second direction and an edge of the first gate structure is facing an edge of the second gate structure in the second direction. The first Samsung SoC further

includes a gate edge isolation structure over the isolation material and is between and in contact with the edge of the first gate structure and the edge of the second gate structure. The first Samsung SoC also includes a dielectric material that is discrete from the gate edge isolation structure and is laterally adjacent to the first and second gate structures along the first direction and laterally adjacent to the gate edge isolation structure along the first direction.

116. Defendants Samsung's and TSMC's acts of direct infringement of the '306 Patent are willful, and have caused and will continue to cause substantial damage and irreparable harm to Daedalus, and Daedalus has no adequate remedy at law.

117. In addition to directly infringing the '306 Patent, Samsung and TSMC indirectly infringe the '306 Patent pursuant to 35 U.S.C. § 271(b) and (c).

118. Defendants Samsung and TSMC have, and continue to, indirectly infringe the '306 Patent by actively inducing and contributing to the infringement of the '306 Patent by others, such as fabless companies, original equipment manufacturers, customers, resellers, and retailers who, for example, incorporate the products which infringe the '306 Patent into downstream products made, sold, offered for sale, and/or imported throughout the United States, including within this district. For example, Defendant Samsung hires permanent sales and/or marketing personnel located throughout the United States, and in this district. On information and belief, these sales and/or marketing activities are targeted to original equipment manufacturers, including original equipment manufacturers based in the United States.

119. Defendants Samsung and TSMC specifically intended these others, such as original equipment manufacturers, customers, resellers, and retailers, to infringe the '306 Patent and knew that these others perform acts that constituted direct infringement. For example, Defendants Samsung and TSMC designed the products such that they would each infringe the '306 Patent if

made, used, sold, offered for sale, or imported into the United States. Defendants Samsung and TSMC provided, directly or indirectly, infringing products to others, such as, but not limited to, customers, knowing and intending that those others would use, sell, offer for sale, and/or import in and into the United States downstream products that include the such products, thereby directly infringing one or more claims of the ’306 Patent.

120. Upon information and belief, Samsung and TSMC knowingly and actively aided and abetted the direct infringement of the ’306 Patent by instructing and encouraging its customers, purchasers, users, and developers to use the ’306 Patent technology. These instructions of encouragement include, but are not limited to, using the infringing products as described in the claims of the ’306 Patent, and advertising and promoting the use of the ’306 Patent’s claimed technology.

121. Samsung and TSMC have also infringed, and continue to infringe, claims of the ’306 Patent by offering to commercially distribute, commercially distributing, making and/or importing the infringing products, which are used in practicing the process, or using the systems, of the ’306 Patent, and constitute a material part of the invention. Samsung and TSMC know the components in the infringing products are especially made or especially adapted for use in infringement of the ’306 Patent, and are neither a staple article nor a commodity of commerce suitable for substantial non-infringing use. For example, the ordinary way of using the infringing products infringes the patent claims, and as such, is especially adapted for use in infringement as set forth above. Accordingly, Samsung and TSMC have been, and currently are, contributorily infringing the ’306 Patent, in violation of 35 U.S.C. § 271(c).

COUNT VI
(SAMSUNG'S AND TSMC'S INFRINGEMENT OF U.S. PATENT NO. 10,319,812)

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

123. Plaintiff is the assignee and lawful owner of all right, title and interest in and to the '812 Patent. The '812 Patent is valid and enforceable.

124. The '812 Patent is entitled "Self-Aligned Gate Edge and Local Interconnect and Method to Fabricate Same," and issued on June 11, 2019 to inventors Milton Clair Webb, Mark Bohr, Tahir Ghani, and Szuya S. Liao. The '812 Patent issued from United States Patent Application No. 15/789,315, which was filed on October 20, 2017, and is a continuation of United States Patent Application No. 15/024,750, filed as PCT No. PCT/US2013/076673 on December 19, 2013 (now U.S. Patent No. 9,831,306)

125. Defendants Samsung and TSMC have directly infringed, and continue to directly infringe, the '812 Patent by making, having made, using, selling, offering for sale, and/or importing into the United States products that infringe the '812 Patent including, but not limited to semiconductor devices and products containing the same. The products that infringe one or more claims of the '812 Patent include, but are not limited to, at least the products identified herein. Further discovery may reveal additional infringing products and/or models,

126. For example, and without limitation, the infringing products infringe one or more claims of the '812 Patent, including but not limited to claim 21. The infringing products fall within the scope of and include, either literally under the doctrine of equivalents, all of the elements of at least claim 21 of the '812 Patent.

127. With respect to exemplary devices, the Samsung Galaxy S20 FE 5G smartphone made or sold by Samsung, incorporating the TSMC-made Qualcomm Snapdragon 865 system-on-

chip (the "TSMC SoC") and the Samsung Galaxy S21 FE 5G smartphone made or sold by Samsung, incorporating the Samsung-made Qualcomm Snapdragon 888 5G system-on-chip (the "first Samsung SoC"), directly infringe at least independent claim 21 of the '812 Patent.

128. The infringing products include all of the limitations of at least claim 21 of the '812 Patent. Specifically, the '812 Patent claims, e.g.: a method of fabricating an integrated circuit structure, the method comprising: forming a first fin comprising silicon, the first fin having a longest dimension along a first direction; forming a second fin comprising silicon, the second fin having a longest dimension along the first direction; forming an isolation material between the first fin and the second fin; forming a first gate structure over the first fin, the first gate structure having a longest dimension along a second direction, the second direction orthogonal to the first direction, wherein the first gate structure comprises a first gate dielectric layer and a first gate electrode; forming a second gate structure over the second fin, the second gate structure having a longest dimension along the second direction, the second gate structure discontinuous with the first gate structure along the second direction, and the second gate structure having an edge facing an edge of the first gate structure along the second direction, wherein the second gate structure comprises a second gate dielectric layer and a second gate electrode; forming a gate edge isolation structure between and in contact with the edge of the first gate structure and the edge of the second gate structure along the second direction, the gate edge isolation structure over the isolation material; and forming a dielectric material laterally adjacent to the first and second gate structures along the first direction, the dielectric material laterally adjacent to the gate edge isolation structure along the first direction, and the dielectric material discrete from the gate edge isolation structure.

129. The TSMC SoC is manufactured by TSMC using its 7nm feature size manufacturing process. *See* https://www.anandtech.com/show/15306/qualcomm-announces-

snapdragon-865-and-765-5g-for-all-in-2020-all-the-details (accessed May 17, 2022). TSMC's 7nm feature size manufacturing process meets all of the limitations of at least claim 21 of the '812 Patent. For example, TSMC's 7nm feature size manufacturing process comprises forming first and second silicon fins, an isolation material between the first and second fins, and the fins having a longest dimension along a first direction. TSMC's 7nm feature size manufacturing process also includes forming first and second gate structures over the first and second fin respectively, each comprising a gate dielectric layer and a gate electrode. The first and second gate structures have a longest dimension along a second direction orthogonal to the first direction. The first and second gate structures are discontinuous with each other along the second direction and an edge of the first gate structure is facing an edge of the second gate structure in the second direction. TSMC's 7nm feature size manufacturing process further includes forming a gate edge isolation structure over the isolation material and is between and in contact with the edge of the first gate structure and the edge of the second gate structure. TSMC's 7nm feature size manufacturing process also includes forming a dielectric material that is discrete from the gate edge isolation structure and is laterally adjacent to the first and second gate structures along the first direction and laterally adjacent to the gate edge isolation structure along the first direction.

130. The first Samsung SoC is manufactured by Samsung using its 5nm feature size manufacturing process. *See* https://www.anandtech.com/show/16271/qualcomm-snapdragon-888-deep-dive (accessed May 17, 2022). Samsung's 5nm feature size manufacturing process meets all of the limitations of at least claim 21 of the '812 Patent. For example, Samsung's 5nm feature size manufacturing process comprises forming first and second silicon fins, an isolation material between the first and second fins, and the first and second fins having a longest dimension along a first direction. Samsung's 5nm feature size manufacturing process also includes forming

first and second gate structures over the first and second fin respectively, each gate structure comprising a gate dielectric layer and a gate electrode. The first and second gate structures having a longest dimension along a second direction, the second direction orthogonal to the first direction. The first and second gate structures are discontinuous with each other along the second direction and an edge of the first gate structure is facing an edge of the second gate structure in the second direction. Samsung's 5nm feature size manufacturing process further includes forming a gate edge isolation structure over the isolation material and is between and in contact with the edge of the first gate structure and the edge of the second gate structure. Samsung's 5nm feature size manufacturing process also includes forming a dielectric material that is discrete from the gate edge isolation structure and is laterally adjacent to the first and second gate structures along the first direction and laterally adjacent to the gate edge isolation structure along the first direction.

131. Defendants Samsung's and TSMC's acts of direct infringement of the '812 Patent are willful, and have caused and will continue to cause substantial damage and irreparable harm to Daedalus, and Daedalus has no adequate remedy at law.

132. In addition to directly infringing the '812 Patent, Samsung and TSMC indirectly infringe the '812 Patent pursuant to 35 U.S.C. § 271(b) and (c).

133. Defendants Samsung and TSMC have, and continue to, indirectly infringe the '812 Patent by actively inducing and contributing to the infringement of the '812 Patent by others, such as fabless companies, original equipment manufacturers, customers, resellers, and retailers who, for example, incorporate the products which infringe the '812 Patent into downstream products made, sold, offered for sale, and/or imported throughout the United States, including within this district. For example, Defendant Samsung hires permanent sales and/or marketing personnel located throughout the United States, and in this district. On information and belief, these sales

and/or marketing activities are targeted to original equipment manufacturers, including original equipment manufacturers based in the United States.

134. Defendants Samsung and TSMC specifically intended these others, such as original equipment manufacturers, customers, resellers, and retailers, to infringe the ’812 Patent and knew that these others perform acts that constituted direct infringement. For example, Defendants Samsung and TSMC designed the products such that they would each infringe the ’812 Patent if made, used, sold, offered for sale, or imported into the United States. Defendants Samsung and TSMC provided, directly or indirectly, infringing products to others, such as, but not limited to, customers, knowing and intending that those others would use, sell, offer for sale, and/or import in and into the United States downstream products that include the such products, thereby directly infringing one or more claims of the ’812 Patent.

135. Upon information and belief, Samsung and TSMC knowingly and actively aided and abetted the direct infringement of the ’812 Patent by instructing and encouraging its customers, purchasers, users, and developers to use the ’812 Patent technology. These instructions of encouragement include, but are not limited to, using the infringing products as described in the claims of the ’812 Patent, and advertising and promoting the use of the ’812 Patent’s claimed technology.

136. Samsung and TSMC have also infringed, and continue to infringe, claims of the ’812 Patent by offering to commercially distribute, commercially distributing, making and/or importing the infringing products, which are used in practicing the process, or using the systems, of the ’812 Patent, and constitute a material part of the invention. Samsung and TSMC know the components in the infringing products are especially made or especially adapted for use in infringement of the ’812 Patent, and are neither a staple article nor a commodity of commerce

suitable for substantial non-infringing use. For example, the ordinary way of using the infringing products infringes the patent claims, and as such, is especially adapted for use in infringement as set forth above. Accordingly, Samsung and TSMC have been, and currently are, contributorily infringing the '812 Patent, in violation of 35 U.S.C. § 271(c).

COUNT VII
(SAMSUNG'S AND TSMC'S INFRINGEMENT OF U.S. PATENT NO. 10,700,178)

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

138. Plaintiff is the assignee and lawful owner of all right, title and interest in and to the '178 Patent. The '178 Patent is valid and enforceable.

139. The '178 Patent is entitled "Contact Resistance Reduction Employing Germanium Overlayer Pre-Contact Metalization," and issued on June 30, 2020 to inventors Glenn A. Glass, Anand S. Murthy, and Tahir Ghani. The '178 Patent issued from United States Patent Application No. 16/416,445, which was filed on May 20, 2019 and is a continuation of United States Patent Application No. 15/339,308 filed on October 31, 2016 (now U.S. Patent 10,297,670), which is a continuation of United States Patent Application No. 14/673,143 filed on March 30, 2015 (now U.S. Patent 9,484,432), which is a continuation of United States Patent Application No. 13/990,224, filed as PCT No. PCT/US2011/054198 on September 30, 2011 (now U.S. Patent 8,994,104), which is a continuation-in-part of United States Patent Application No. 12/975,278 filed on Dec. 21, 2010 (now U.S. Patent 8,901,537).

140. Defendants Samsung and TSMC have directly infringed, and continue to directly infringe, the '178 Patent by making, having made, using, selling, offering for sale, and/or importing into the United States products that infringe the '178 Patent including, but not limited to semiconductor devices and products containing the same. The products that infringe one or

more claims of the ’178 Patent include, but are not limited to, at least the products identified herein. Further discovery may reveal additional infringing products and/or models.

141. For example, and without limitation, the infringing products infringe one or more claims of the ’178 Patent, including but not limited to claim 1. The infringing products fall within the scope of and include, either literally under the doctrine of equivalents, all of the elements of at least claim 1 of the ’178 Patent.

142. With respect to exemplary devices, the Samsung Galaxy S20 FE 5G smartphone made or sold by Samsung, incorporating the TSMC-made Qualcomm Snapdragon 865 system-on-chip (the “TSMC SoC”) and the Samsung Galaxy A71 5G smartphone made or sold by Samsung, incorporating the Samsung-made Qualcomm Snapdragon 765 5G system-on-chip (the “second Samsung SoC”), directly infringe at least independent claim 1 of the ’178 Patent.

143. The infringing products include all of the limitations of at least claim 1 of the ’178 Patent. Specifically, the ’178 Patent claims, e.g.: an integrated circuit structure, comprising: a fin comprising silicon; a gate electrode over the fin; a first source or drain region in the fin proximate a first side of the gate electrode, the first source or drain region comprising two or more facets and a top surface, wherein the first source or drain region comprises silicon and germanium having a germanium concentration graded to a concentration in excess of 50%; a first germanide layer over the top surface of the first source or drain region, the first germanide layer comprising silicon, germanium and titanium; a second source or drain region in the fin proximate a second side of the gate electrode opposite the first side, the second source or drain region comprising two or more facets and a top surface, wherein the second source or drain region comprises silicon and germanium having a germanium concentration graded to a concentration in excess of 50%; and a

second germanide layer over the top surface of the second source or drain region, the second germanide layer comprising silicon, germanium and titanium.

144. The TSMC SoC is manufactured by TSMC using its 7nm feature size manufacturing process. *See* https://www.anandtech.com/show/15178/qualcomm-announces-snapdragon-865-and-765-5g-for-all-in-2020-all-the-details (accessed May 17, 2022). TSMC's 7nm feature size manufacturing process produces a product that meets all of the limitations of at least claim 1 of the '178 Patent. For example, the TSMC SoC comprises a silicon fin, a gate electrode over the fin, a first source or drain region in the fin proximate a first side of the gate electrode. The first source or drain region comprising two or more facets and a top surface, wherein the first source or drain region comprises silicon and germanium having a germanium concentration graded to a concentration in excess of 50%. The integrated circuit further comprising a first germanide layer over the top surface of the first source or drain region, the first germanide layer comprising silicon, germanium and titanium. A second source or drain region in the fin proximate a second side of the gate electrode opposite the first side, the second source or drain region comprising two or more facets and a top surface, wherein the second source or drain region comprises silicon and germanium having a germanium concentration graded to a concentration in excess of 50%. The integrated circuit further comprising a second germanide layer over the top surface of the second source or drain region, the second germanide layer comprising silicon, germanium and titanium.

145. The second Samsung SoC is manufactured by Samsung using its 7nm feature size manufacturing process. *See* https://www.xda-developers.com/qualcomm-snapdragon-765-processor-specifications-features/. Samsung's 7nm feature size manufacturing process produces a product that meets all of the limitations of at least claim 1 of the '178 Patent. For example, the

second Samsung SoC comprises a silicon fin, a gate electrode over the fin, a first source or drain region in the fin proximate a first side of the gate electrode. The first source or drain region comprising two or more facets and a top surface, wherein the first source or drain region comprises silicon and germanium having a germanium concentration graded to a concentration in excess of 50%. The integrated circuit further comprising a first germanide layer over the top surface of the first source or drain region, the first germanide layer comprising silicon, germanium and titanium. A second source or drain region in the fin proximate a second side of the gate electrode opposite the first side, the second source or drain region comprising two or more facets and a top surface, wherein the second source or drain region comprises silicon and germanium having a germanium concentration graded to a concentration in excess of 50%. The integrated circuit further comprising a second germanide layer over the top surface of the second source or drain region, the second germanide layer comprising silicon, germanium and titanium. Defendants Samsung's and TSMC's acts of direct infringement of the '178 Patent are willful, and have caused and will continue to cause substantial damage and irreparable harm to Daedalus, and Daedalus has no adequate remedy at law.

146. In addition to directly infringing the '178 Patent, Samsung and TSMC indirectly infringe the '178 Patent pursuant to 35 U.S.C. § 271(b) and (c).

147. Defendants Samsung and TSMC have, and continue to, indirectly infringe the '178 Patent by actively inducing and contributing to the infringement of the '178 Patent by others, such as fabless companies, original equipment manufacturers, customers, resellers, and retailers who, for example, incorporate the products which infringe the '178 Patent into downstream products made, sold, offered for sale, and/or imported throughout the United States, including within this district. For example, Defendant Samsung hires permanent sales and/or marketing personnel

located throughout the United States, and in this district. On information and belief, these sales and/or marketing activities are targeted to original equipment manufacturers, including original equipment manufacturers based in the United States.

148. Defendants Samsung and TSMC specifically intended these others, such as original equipment manufacturers, customers, resellers, and retailers, to infringe the ’178 Patent and knew that these others perform acts that constituted direct infringement. For example, Defendants Samsung and TSMC designed the products such that they would each infringe the ’178 Patent if made, used, sold, offered for sale, or imported into the United States. Defendants Samsung and TSMC provided, directly or indirectly, infringing products to others, such as, but not limited to, customers, knowing and intending that those others would use, sell, offer for sale, and/or import in and into the United States downstream products that include the such products, thereby directly infringing one or more claims of the ’178 Patent.

149. Upon information and belief, Samsung and TSMC knowingly and actively aided and abetted the direct infringement of the ’178 Patent by instructing and encouraging its customers, purchasers, users, and developers to use the ’178 Patent technology. These instructions of encouragement include, but are not limited to, using the infringing products as described in the claims of the ’178 Patent, and advertising and promoting the use of the ’178 Patent’s claimed technology.

150. Samsung and TSMC have also infringed, and continue to infringe, claims of the ’178 Patent by offering to commercially distribute, commercially distributing, making and/or importing the infringing products, which are used in practicing the process, or using the systems, of the ’178 Patent, and constitute a material part of the invention. Samsung and TSMC know the components in the infringing products are especially made or especially adapted for use in

infringement of the ’178 Patent, and are neither a staple article nor a commodity of commerce suitable for substantial non-infringing use. For example, the ordinary way of using the infringing products infringes the patent claims, and as such, is especially adapted for use in infringement as set forth above. Accordingly, Samsung and TSMC have been, and currently are, contributorily infringing the ’178 Patent, in violation of 35 U.S.C. § 271(c).

COUNT VIII
(SAMSUNG’S AND TSMC’S INFRINGEMENT OF U.S. PATENT NO. 11,251,281)

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

152. Plaintiff is the assignee and lawful owner of all right, title and interest in and to the ’281 Patent. The ’281 Patent is valid and enforceable.

153. The ’281 Patent is entitled “Contact Resistance Reduction Employing Germanium Overlayer Pre-Contact Metalization,” and issued on February 15, 2022 to inventors Glenn A. Glass, Anand S. Murthy, and Tahir Ghani. The ’281 Patent issued from United States Patent Application No. 16/881,541, which was filed on May 22, 2020, and is a continuation of United States Patent Application No. 16/416,445, filed on May 20, 2019 (now U.S. Patent No. 10,700,178), which is a continuation of United States Patent Application No. 15/339,308, filed on October 31, 2016 (now U.S. Patent No. 10,297,670), which is a continuation of United States Patent Application No. 14/673,143, filed on March 30, 2015 (now U.S. Patent No. 9,484,432), which is a continuation of United States Patent Application No. 13/990,224, filed as PCT No. PCT/US2011/054198 on September 30, 2011 (now U.S. Patent No. 8,994,104), which is a continuation-in-part of United States Patent Application No. 12/975,278, filed on December 21, 2010 (now U.S. Patent No. 8,901,537).

154. Defendants Samsung and TSMC have directly infringed, and continue to directly infringe, the ’281 Patent by making, having made, using, selling, offering for sale, and/or importing into the United States products that infringe the ’281 Patent including, but not limited to semiconductor devices and products containing the same. The products that infringe one or more claims of the ’281 Patent include, but are not limited to, at least the products identified herein. Further discovery may reveal additional infringing products and/or models.

155. For example, and without limitation, the infringing products infringe one or more claims of the ’281 Patent, including but not limited to claim 1. The infringing products fall within the scope of and include, either literally under the doctrine of equivalents, all of the elements of at least claim 1 of the ’281 Patent.

156. With respect to exemplary devices, the Samsung Galaxy S20 FE 5G smartphone made or sold by Samsung, incorporating the TSMC-made Qualcomm Snapdragon 865 system-on-chip (the “TSMC SoC”) and the Samsung Galaxy A71 5G smartphone made or sold by Samsung, incorporating the Samsung-made Qualcomm Snapdragon 765 5G system-on-chip (the “second Samsung SoC”), directly infringe at least independent claim 1 of the ’281 Patent.

157. The infringing products include all of the limitations of at least claim 1 of the ’281 Patent. Specifically, the ’281 Patent claims, e.g.: an integrated circuit structure, comprising: a fin comprising silicon; a gate electrode over the fin, the gate electrode having a first side, and the gate electrode having a second side opposite the first side; a first dielectric spacer along the first side of the gate electrode; a first source or drain region in the fin proximate the first side of the gate electrode, a portion of the first source or drain region beneath the first dielectric spacer, wherein the first source or drain region comprises silicon and germanium having a germanium concentration graded to a concentration in excess of 50%; a second dielectric spacer along the

second side of the gate electrode; a second source or drain region in the fin proximate the second side of the gate electrode, a portion of the second source or drain region beneath the second dielectric spacer, wherein the second source or drain region comprises silicon and germanium having a germanium concentration graded to a concentration in excess of 50%; a dielectric layer over the first source or drain region and over the second source or drain region, the dielectric layer having a first opening exposing only a portion of the first source or drain region, and the dielectric layer having a second opening exposing only a portion of the second source or drain region; a first germanide layer in the first opening and over the portion of the first source or drain region, the first germanide layer comprising silicon, germanium and titanium; a second germanide layer in the second opening and over the portion of the second source or drain region, the second germanide layer comprising silicon, germanium and titanium; a first contact plug in the first opening and on the first germanide layer; and a second contact plug in the second opening and on the second germanide layer.

158. The TSMC SoC is manufactured by TSMC using its 7nm feature size manufacturing process. *See* https://www.anandtech.com/show/15178/qualcomm-announces-snapdragon-865-and-765-5g-for-all-in-2020-all-the-details (accessed May 17, 2022). TSMC's 7nm feature size manufacturing process produces a product that meets all of the limitations of at least claim 1 of the '281 Patent. For example, the TSMC SoC comprises a silicon fin, a gate electrode over the fin having a first side and a second side opposite the first side; and a first and second dielectric spacer. The first dielectric spacer is along the first side of the gate electrode; and a first source or drain region is in the fin proximate the first side of the gate electrode, with a portion of the first source or drain region beneath the first dielectric spacer, wherein the first source or drain region comprises silicon and germanium having a germanium concentration graded to a

concentration in excess of 50%. The second dielectric spacer is along the second side of the gate electrode, and a second source or drain region is in the fin proximate the second side of the gate electrode, with a portion of the second source or drain region beneath the second dielectric spacer, wherein the second source or drain region comprises silicon and germanium having a germanium concentration graded to a concentration in excess of 50%. Further, there is a dielectric layer over the first source or drain region and over the second source or drain region, the dielectric layer having a first opening exposing only a portion of the first source or drain region, and the dielectric layer having a second opening exposing only a portion of the second source or drain region. The TSMC SoC also includes a first germanide layer in the first opening and over the portion of the first source or drain region, the first germanide layer comprising silicon, germanium and titanium; and a second germanide layer in the second opening and over the portion of the second source or drain region, the second germanide layer comprising silicon, germanium and titanium. Moreover, the TSMC SoC includes a first contact plug in the first opening and on the first germanide layer; and a second contact plug in the second opening and on the second germanide layer.

159. The second Samsung SoC is manufactured by Samsung using its 7nm feature size manufacturing process. *See* https://www.xda-developers.com/qualcomm-snapdragon-765-processor-specifications-features/. Samsung's 7nm feature size manufacturing process produces a product that meets all of the limitations of at least claim 1 of the '281 Patent. For example, the second Samsung SoC comprises a silicon fin, a gate electrode over the fin having a first side and a second side opposite the first side; and a first and second dielectric spacer. The first dielectric spacer is along the first side of the gate electrode; and a first source or drain region is in the fin proximate the first side of the gate electrode, with a portion of the first source or drain region beneath the first dielectric spacer, wherein the first source or drain region comprises silicon and

germanium having a germanium concentration graded to a concentration in excess of 50%. The second dielectric spacer is along the second side of the gate electrode, and a second source or drain region is in the fin proximate the second side of the gate electrode, with a portion of the second source or drain region beneath the second dielectric spacer, wherein the second source or drain region comprises silicon and germanium having a germanium concentration graded to a concentration in excess of 50%. Further, there is a dielectric layer over the first source or drain region and over the second source or drain region, the dielectric layer having a first opening exposing only a portion of the first source or drain region, and the dielectric layer having a second opening exposing only a portion of the second source or drain region. The second Samsung SoC also includes a first germanide layer in the first opening and over the portion of the first source or drain region, the first germanide layer comprising silicon, germanium and titanium; and a second germanide layer in the second opening and over the portion of the second source or drain region, the second germanide layer comprising silicon, germanium and titanium. Moreover, the second Samsung SoC includes a first contact plug in the first opening and on the first germanide layer; and a second contact plug in the second opening and on the second germanide layer.

160. Defendants Samsung's and TSMC's acts of direct infringement of the '281 Patent are willful, and have caused and will continue to cause substantial damage and irreparable harm to Daedalus, and Daedalus has no adequate remedy at law.

161. In addition to directly infringing the '281 Patent, Samsung and TSMC indirectly infringe the '281 Patent pursuant to 35 U.S.C. § 271(b) and (c).

162. Defendants Samsung and TSMC have, and continue to, indirectly infringe the '281 Patent by actively inducing and contributing to the infringement of the '281 Patent by others, such as fabless companies, original equipment manufacturers, customers, resellers, and retailers who,

for example, incorporate the products which infringe the ’281 Patent into downstream products made, sold, offered for sale, and/or imported throughout the United States, including within this district. For example, Defendant Samsung hires permanent sales and/or marketing personnel located throughout the United States, and in this district. On information and belief, these sales and/or marketing activities are targeted to original equipment manufacturers, including original equipment manufacturers based in the United States.

163. Defendants Samsung and TSMC specifically intended these others, such as original equipment manufacturers, customers, resellers, and retailers, to infringe the ’281 Patent and knew that these others perform acts that constituted direct infringement. For example, Defendants Samsung and TSMC designed the products such that they would each infringe the ’281 Patent if made, used, sold, offered for sale, or imported into the United States. Defendants Samsung and TSMC provided, directly or indirectly, infringing products to others, such as, but not limited to, customers, knowing and intending that those others would use, sell, offer for sale, and/or import in and into the United States downstream products that include the such products, thereby directly infringing one or more claims of the ’281 Patent.

164. Upon information and belief, Samsung and TSMC knowingly and actively aided and abetted the direct infringement of the ’281 Patent by instructing and encouraging its customers, purchasers, users, and developers to use the ’281 Patent technology. These instructions of encouragement include, but are not limited to, using the infringing products as described in the claims of the ’281 Patent, and advertising and promoting the use of the ’281 Patent’s claimed technology.

165. Samsung and TSMC have also infringed, and continue to infringe, claims of the ’281 Patent by offering to commercially distribute, commercially distributing, making and/or

importing the infringing products, which are used in practicing the process, or using the systems, of the '281 Patent, and constitute a material part of the invention. Samsung and TSMC know the components in the infringing products are especially made or especially adapted for use in infringement of the '281 Patent, and are neither a staple article nor a commodity of commerce suitable for substantial non-infringing use. For example, the ordinary way of using the infringing products infringes the patent claims, and as such, is especially adapted for use in infringement as set forth above. Accordingly, Samsung and TSMC have been, and currently are, contributorily infringing the '281 Patent, in violation of 35 U.S.C. § 271(c).

PRAYER FOR RELIEF

WHEREFORE, Daedalus request the Court grant the relief set forth below:

A. Enter judgment that the Samsung has infringed, and continues to infringe, one or more claims of the CPU Patents and the Semic Patents, and that TSMC has infringed, and continues to infringe, one or more claims of the Semic Patents;

B. Enter judgment that Defendants' acts of patent infringement are willful;

C. Order Defendants to account for and pay damages caused to Daedalus by Defendants' unlawful acts of patent infringement;

D. Award Daedalus increased damages and attorney fees pursuant to 35 U.S.C. §§ 284 and 285;

E. Award Daedalus the interest and costs incurred in this action; and

F. Grant Daedalus such other and further relief, including equitable relief, as the Court deems just and proper.

DEMAND FOR JURY TRIAL

Pursuant to Fed. R. Civ. P. 38, Plaintiff demands a jury trial for all claims and issues deemed to be triable by a jury.

DATED: September 12, 2022

Respectfully submitted,

By /s/ Adam S. Rizk w/permission Claire Henry

Michael T. Renaud
James W. Wodarski
Michael J. McNamara
Adam S. Rizk
Suparna Datta
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