

**UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF TEXAS
WACO DIVISION**

ARIGNA TECHNOLOGY LIMITED,

Plaintiff,

vs.

SAMSUNG ELECTRONICS CO., LTD.;
SAMSUNG ELECTRONICS AMERICA,
INC.; APPLE INC.; GOOGLE LLC;
LENOVO GROUP LTD.; MICROSOFT
CORPORATION; ONEPLUS
TECHNOLOGY (SHENZHEN)
CO., LTD; TCL ELECTRONICS HOLDINGS
LTD; and TCL COMMUNICATION LTD.

Defendants.

Case No. 6:22-cv-151

JURY TRIAL DEMANDED

COMPLAINT FOR PATENT INFRINGEMENT

This is an action for patent infringement in which Arigna Technology Limited makes the following allegations against Defendants Samsung Electronics Co., Ltd.; Samsung Electronics America, Inc.; Apple Inc.; Google LLC; Lenovo Group Ltd.; Microsoft Corporation; OnePlus Technology (Shenzhen) Co., Ltd.; TCL Electronics Holdings Ltd.; and TCL Communication Ltd., each of whom is a manufacturer and/or distributor who, without authority, imports, makes, offers for sale and/or sells in the United States mobile devices and/or computers that infringe the Patent asserted in this matter.

PARTIES

Arigna

1. Plaintiff Arigna Technology Limited (“Plaintiff” or “Arigna”) is an Irish company conducting business at The Hyde Building, Carrickmines, Suite 23, Dublin 18, Ireland. Arigna owns a portfolio of patents that cover radio frequency amplifiers and circuits with applications in

a wide variety of consumer electronics products, including smartphones and laptops, as well as power semiconductors for applications in the communications, automotive, industrial automation, and energy industries. Arigna is the owner of all rights, title, and interest in and to United States Patent No. 7,183,835 (the “’835 Patent”).

Samsung

2. Defendant Samsung Electronics Co., Ltd. (“Samsung Electronics”) is a foreign corporation organized and existing under the laws of the Republic of Korea with its headquarters at 129 Samsung-Ro, Maetan-3dong, Yeongtong-gu, Suwon-si, Gyeonggi-do, South Korea. On information and belief, Samsung Electronics does business itself, or through its subsidiaries, affiliates, and agents, in the State of Texas and the Western District of Texas.

3. Defendant Samsung Electronics America, Inc. (“Samsung America”) is a corporation organized under the laws of the State of New York. Upon information and belief, Samsung America is a wholly owned subsidiary of Samsung Electronics. On information and belief, Samsung America has employees based in and does business across the State of Texas.

4. Samsung America maintains regular and established offices in the Western District of Texas, including at 12100 Samsung Blvd, Austin, Texas 78754; 3900 N. Capital of Texas Hwy, Austin, Texas; and 2800 Wells Branch Pkwy, Austin, Texas 78728.

5. Further, on information and belief, Samsung Electronics directs and controls the actions of Samsung America such that it too maintains regular and established offices in the Western District of Texas, including at 12100 Samsung Blvd, Austin, Texas 78754; 3900 N. Capital of Texas Hwy, Austin, Texas; and 2800 Wells Branch Pkwy, Austin, Texas 78728.

6. On information and belief, Samsung America employees in this District include

senior electrical engineers with experience working on semiconductor devices.¹ Additionally, Samsung's website lists numerous job openings in its Austin offices, including for hardware and electrical engineering roles. Given the location of such Samsung engineers in Austin, on information and belief, documents and witnesses relevant to this action are located in this District.

7. Samsung Electronics and Samsung America have and/or maintain authorized sellers and sales representatives that offer and sell products pertinent to this Complaint throughout the State of Texas, including this District, such as: AT&T Store at 4330 W. Waco Drive, Waco, Texas 76710; Verizon Authorized Retailer at 2812 W. Loop 340, Suite #H-12, Waco, Texas, 76711; Best Buy at 4627 S Jack Kultgen Expy, Waco, Texas 76706; and Amazon.com.

8. On information and belief, Samsung Electronics and Samsung America also own and operate a manufacturing facility and the Samsung Austin Research Center in Austin, Texas.² Samsung has further announced plans for a new \$17 billion semiconductor factor in Taylor, Texas, to build semiconductors used in smartphones and computers.³

9. Samsung Electronics and Samsung America have placed or contributed to placing infringing products like the Samsung Galaxy S20 Ultra 5G into the stream of commerce via established distribution channels knowing or understanding that such products would be sold and used in the United States, including in the Western District of Texas.

¹ See, e.g., LinkedIn, *Staff Engineer at Samsung Austin R&D Center (SARC)* (accessed Jan. 10, 2022), available at: https://www.linkedin.com/in/vinodkadur/?miniProfileUrn=urn%3Ali%3Afs_miniProfile%3AACoAAAGSV1cBnM3Ja_oLUk26eny-VKqcYCnKUxU; LinkedIn, *Physical Design Engineer at Samsung Electronics* (accessed Jan. 10, 2022), available at: https://www.linkedin.com/in/prithvikondur-9147bb40/?miniProfileUrn=urn%3Ali%3Afs_miniProfile%3AACoAAAipXmABDP0rh4sXK8TdmNh6Mu0ot1_H9AQ.

² Reuters, *Texas city to offer Samsung large property tax breaks to build \$17 bln chip plant* (Nov. 21, 2021), available at: <https://www.reuters.com/technology/texas-city-offer-samsung-large-property-tax-breaks-build-17-bln-chip-plant-2021-09-06/>.

³ CNBC, *Samsung plans to build a \$17 billion chip plant in Texas* (Nov. 24, 2021), available at: <https://www.cnbc.com/2021/11/24/samsung-announces-17-billion-chip-plant-in-texas.html>.

10. On information and belief, Samsung Electronics and Samsung America also have each derived substantial revenue from infringing acts in the Western District of Texas, including from the sale and use of infringing products like the Samsung Galaxy S20 Ultra 5G.

11. Defendant Samsung America merged with Samsung Telecommunications America LLC in January 2015. *Koninklijke KPN N.V. v. Samsung Telecommunications America LLC, et al.*, Case No. 2:14-cv-01165-JRG (E.D. Tex.) at Dkt. 34. Prior to that merger, Samsung Telecommunications America LLC was involved in the sales and distribution of Samsung-branded consumer electronics products in the United States.

12. On information and belief, Defendant Samsung America is liable for any act for which Samsung Telecommunications America LLC otherwise would be or would have been liable, including for any infringement alleged in this matter, and references herein to Samsung America should be understood to encompass such acts by Samsung Telecommunications America LLC.

13. This Complaint refers to Defendants Samsung Electronics and Samsung America collectively as “Samsung.” On information and belief, Samsung designs, manufactures, distributes, imports, offers for sale, and/or sells in the State of Texas and the Western District of Texas mobile devices and computers that infringe the Patent asserted in this matter.

Apple

14. Defendant Apple Inc. (“Apple”) is a corporation organized under the laws of the State of California with its headquarters at One Apple Park Way, Cupertino, California 95014. Apple imports, makes, markets, distributes, offers for sale, and sells mobile devices and computers under the Apple brand name in the United States.

15. Apple maintains regular and established offices in this District, including at 6900

W. Parmer Lane, Austin, Texas and 12545 Riata Vista Circle, Austin, Texas.⁴ Apple also owns and operates multiple retail stores in this District, including Apple stores in Austin and San Antonio.⁵

16. On information and belief, Apple has thousands of employees based in the Western District of Texas and does business in this District and across the State of Texas.⁶ Apple's employees in Austin include Hardware Engineers,⁷ Hardware Design Engineers,⁸ and Hardware Design Verification Engineers.⁹ Given the location of Apple hardware engineers in Austin, on information and belief, documents and witnesses relevant to this action are located in this District.

17. Apple's website lists numerous job openings in its Austin offices, including for hardware engineering roles. For example, Apple has open positions in Austin for a "Power Management Engineer – iPhone"; "Power Architect"; and "Cellular SoC Power Engineer."¹⁰ These roles promise, among other things, that candidates will "drive Wireless/Cellular SOC low power micro-architecture definition, implementation and analysis" and "be at the heart of the chip

⁴ Apple Newsroom, *Apple expands in Austin* (Nov. 20, 2019), available at: <https://www.apple.com/newsroom/2019/11/apple-expands-in-austin/>.

⁵ Apple, *Find a store* (accessed Jan. 10, 2022), available at <https://www.apple.com/retail/>.

⁶ *Id.*

⁷ See, e.g., LinkedIn, Hardware Engineer at Apple (accessed Feb. 8, 2022), available at: https://www.linkedin.com/in/rakesh-karmakar-94713113b/?miniProfileUrn=urn%3Ali%3Afs_miniProfile%3AACoAACIDOWcBVUjwDcr652z0ejpLVQQdzBLmsM4.

⁸ See, e.g., LinkedIn, Hardware Design Engineer at Apple (accessed Jan. 10, 2022), available at: https://www.linkedin.com/in/sandhya-krishnakumar/?miniProfileUrn=urn%3Ali%3Afs_miniProfile%3AACoAAACEyx0QBPPGR_8S1LGGCcq5BUtFLMvmHfx0.

⁹ See, e.g., LinkedIn, Hardware Design Verification Engineer at Apple (accessed Jan. 10, 2022), available at: https://www.linkedin.com/in/anand-saharan-41833485/?miniProfileUrn=urn%3Ali%3Afs_miniProfile%3AACoAABIGRFQBNeAsNiYgcVtOV-y8V8--mSPA9A.

¹⁰ Careers at Apple, *Power Management Engineer – iPhone* (accessed Jan. 10, 2022), available at: <https://jobs.apple.com/en-us/details/200300458/power-management-engineer-iphone?team=HRDWR>; Careers at Apple, *Power Architect* (accessed Jan. 10, 2022), available at: <https://jobs.apple.com/en-us/details/200259314/power-architect?team=HRDWR>; Careers at Apple, *Cellular SoC Power Engineer* (accessed Jan. 10, 2022), available at: <https://jobs.apple.com/en-us/details/200209663/cellular-soc-power-engineer?team=HRDWR>.

design verification effort.”¹¹

18. Apple has placed or contributed to placing infringing products like the iPhone 12 into the stream of commerce via established distribution channels knowing or understanding that such products would be sold and used in the United States, including in the Western District of Texas. Apple also has derived substantial revenue from infringing acts in the Western District of Texas, including from the sale and use of infringing products like the iPhone 12.

19. On information and belief, Apple designs, manufactures, distributes, imports, offers for sale, and/or sells in the State of Texas and the Western District of Texas mobile devices and computers that infringe the Patent asserted in this matter.

Google

20. Google is a corporation organized under the laws of the State of California with its headquarters at 1600 Amphitheatre Parkway, Mountain View, California 94043.

21. Google does business in this District and across the State of Texas. It has over 1,700 full-time employees in Texas. On information and belief, they are located predominantly in this District. Google “has proudly called Texas home for more than a decade with offices in Austin and Dallas, and a data center in Midlothian—a \$600M investment.”¹² Google maintains regular and established places of business in this District, including offices at 500 West 2nd Street, Suite 2900, Austin, Texas 78701 and 110 East Houston Street #300, San Antonio, Texas 78205, among other locations.¹³

¹¹ *Id.*

¹² Google, *Google is proud to call Texas home* (accessed Jan. 10, 2022), available at: <https://kstatic.googleusercontent.com/files/b008bec49e466217468bdb3fbb0a9e6146435f1a75c7eba13f30fb30c9a5871deb617df65cb75f4ca7b4fdb940d1f9c4c8b75088f4de2277c76940696d07a08c#:~:text=Google%20has%20proudly%20called%20Texas,Midlothian%E2%80%94a%20%24600M%20investment.&text=Texans%20are%20employed%20full%2Dtime%20at%20Google.>

¹³ Google, *Our offices* (accessed Jan. 10, 2022), available at https://about.google/intl/ALL_us/locations/?region=north-america.

22. According to Google, “Teams at Google Austin focus on Android, Google Cloud, Google Play, people operations, finance, legal, and engineering.”¹⁴ Google’s website lists job openings in Google’s Austin and San Antonio offices.¹⁵ Multiple job openings for engineering roles in Google’s Devices and Services group, including at senior levels, indicate that the employee can choose to work in Austin.¹⁶ Such openings, such as one for a “CPU Silicon Engineer, Design Verification, Devices and Services,” seek candidates with electrical engineering credentials to design “new technologies and hardware to make our user’s interaction with computing faster, more powerful, and seamless.”¹⁷ Given that Google offers hardware engineers the choice to work in Austin, on information and belief, documents and witnesses relevant to this action are located in this District.

23. Google also advertises job openings for engineers to work on “CPU Front End Design,” specifying Austin as one of the work locations.¹⁸ Google’s job postings indicate that candidates for such roles will “[d]evelop CPU frontend designs, emphasizing on microarchitecture and RTL design for the next generation CPU” and “[p]ropose performance enhancing

¹⁴ Google Economic Impact, Texas (accessed Jan. 10, 2022), available at: <https://economicimpact.google.com/state/tx/>.

¹⁵ Google Careers, *Jobs* (accessed Jan. 10, 2022), available at <https://careers.google.com/jobs/results/?company=Google&company=YouTube&hl=en&jlo=en-US&location=Austin,%20TX,%20USA&location=San%20Antonio,%20TX,%20USA>

¹⁶ Google Careers, Senior Engineering Manager, Compilers, Devices and Services (accessed Jan. 10, 2022), available at: <https://careers.google.com/jobs/results/104794466419647174-senior-engineering-manager-compilers-devices-and-services/?company=Google&company=YouTube&hl=en&jlo=en-US&location=Austin,%20TX,%20USA&location=San%20Antonio,%20TX,%20USA&skills=hardware%20engineering>.

¹⁷ Google Careers, *CPU Silicon Engineer, Design Verification, Devices and Services* (accessed Jan. 10, 2022), available at: <https://careers.google.com/jobs/results/126548485169128134-cpu-silicon-engineer-design-verification-devices-and-services/?company=Google&company=YouTube&hl=en&jlo=en-xan-gersonUS&location=Austin,%20TX,%20USA&location=San%20Antonio,%20TX,%20USA&skills=hardware%20engineering>.

¹⁸ Google Careers, *Senior Engineer, CPU Front End Design* (accessed Jan. 10, 2022), available at: <https://careers.google.com/jobs/results/143377253611250374-senior-engineer-cpu-front-end-design/?location=Texas,%20USA&q=engineer>.

microarchitecture features with efficiency in mind, and work with architects and performance teams for trade-off studies.”¹⁹ Given that Google is hiring such engineers and offering them the option to work in this District, witnesses with knowledge relevant to this action are likely to be located in this District.

24. On information and belief, Google’s in-house legal department also has a substantial presence in Austin, Texas. Given the location of Google legal personnel in Austin, on information and belief, documents, materials, and potential witnesses relevant to this action are located in this District.

25. Google has placed or contributed to placing infringing products, such as the Google Pixel 5, into the stream of commerce via established distribution channels knowing or understanding that such products would be sold and used in the United States, including in the Western District of Texas. Google also has derived substantial revenue from infringing acts in the Western District of Texas, including from the sale and use of infringing products such as the Google Pixel 5.

26. On information and belief, Google designs, manufactures, distributes, imports, offers for sale, and/or sells in the State of Texas and the Western District of Texas mobile devices that infringe the Patent asserted in this matter.

Lenovo

27. Defendant Lenovo Group Ltd. (“Lenovo”) is a foreign entity organized under the laws of the People’s Republic of China, with its principal place of business at 6 Chuang ye Road, Haidian District, Beijing 100085, China. On information and belief, Lenovo Group does business itself, or through its subsidiaries, affiliates, and agents, in the State of Texas and the Western

¹⁹ *Id.*

District of Texas.

28. Lenovo has placed or contributed to placing infringing products like the Lenovo ThinkPad X1 Fold Gen1 and Motorola Edge+ into the stream of commerce via established distribution channels knowing or understanding that such products would be sold and used in the United States, including in the Western District of Texas.

29. On information and belief, Lenovo has derived substantial revenue from infringing acts in the Western District of Texas, including from the sale and use of infringing products like the Lenovo ThinkPad X1 Fold Gen1 and Motorola Edge+.

30. On information and belief, Lenovo designs, manufactures, distributes, imports, offers for sale, and/or sells in the State of Texas and the Western District of Texas mobile devices and computers that infringe the Patent asserted in this matter.

Microsoft

31. Defendant Microsoft Corporation (“Microsoft”) is a corporation organized under the laws of the State of Washington with its headquarters at One Microsoft Way, Redmond, Washington 98052.

32. Microsoft has placed or contributed to placing infringing products like the Surface Pro X into the stream of commerce via established distribution channels knowing or understanding that such products would be sold and used in the United States, including in the Western District of Texas. Microsoft also has derived substantial revenue from infringing acts in the Western District of Texas, including from the sale and use of infringing products like the Surface Pro X.

33. Microsoft has employees based in the Western District of Texas and does business in this District and across the State of Texas. Microsoft maintains regular and established offices in this District, including at 10900 Stonelake Boulevard, Suite 225, Austin, Texas 78759 and

Concord Park II, 401 East Sonterra Boulevard, Suite 300, San Antonio, Texas 78258.²⁰

34. On information and belief, Microsoft designs, manufactures, distributes, imports, offers for sale, and/or sells in the State of Texas and the Western District of Texas mobile devices, such as computers and laptops, that infringe the Patent asserted in this matter.

OnePlus

35. Defendant OnePlus Technology (Shenzhen) Co., Ltd. (“OnePlus”) is a foreign entity organized under the laws of the People’s Republic of China with its principal place of business at 18F, Tairan Building, Block C, Tairan 8th Road, Chegongmiao, Futian District Shenzhen, Guangdong, 518040, China.

36. OnePlus is the head of an interrelated group of companies which together comprise one of the leading makers and sellers of smartphones and related devices. OnePlus’s privacy policy, for example, refers to OnePlus Technology (Shenzhen) Co., Ltd. and its affiliates as “we, us or OnePlus.”²¹

37. OnePlus and its affiliates, including but not limited to Shenzhen OnePlus Science & Technology Co., Ltd., OnePlus Mobile Communications (Guangdong) Co., Ltd., Shenzhen Yunling Trade Co., Ltd., and OnePlus (Beijing) Marketing Plan Co., Ltd. are part of the same corporate structure and distribution chain for the making, importing, offering to sell, selling, and using of the accused devices in the United States, including in the State of Texas generally and this District in particular.

38. OnePlus and its affiliates share the same management, common ownership, advertising platforms, facilities, distribution chains and platforms, and accused product lines and

²⁰ Microsoft, *Microsoft U.S. office locations* (accessed Jan. 10, 2022), available at: <https://www.microsoft.com/en-us/about/officelocator?Location=78759>.

²¹ OnePlus, *Privacy Policy* (accessed Jan. 10, 2022), available at: <https://www.oneplus.com/global/legal/privacy-policy>.

products involving related technologies. Thus, OnePlus and its affiliates operate as a unitary business and are jointly and severally liable for the acts of patent infringement alleged herein.

39. On information and belief, OnePlus does business itself, or through its subsidiaries, affiliates, and agents, in the State of Texas and the Western District of Texas. OnePlus has placed or contributed to placing infringing products such as the OnePlus 7, OnePlus 7 Pro, OnePlus Nord N10 5G, OnePlus Dual 5G AC2001, OnePlus 8, OnePlus 8 Pro, OnePlus 9, and OnePlus 9 Pro mobile devices into the stream of commerce via established distribution channels knowing or understanding that such products would be sold and used in the United States, including in the Western District of Texas. On information and belief, OnePlus has derived substantial revenue from infringing acts in the Western District of Texas, including from the sale and use of these infringing products.

40. On information and belief, OnePlus designs, manufactures, distributes, imports, offers for sale, and/or sells in the State of Texas and the Western District of Texas mobile devices that infringe the Patent asserted in this matter.

TCL

41. Defendant TCL Electronics Holdings Ltd. (“TCL Electronics”) is a foreign entity incorporated in the Cayman Islands with limited liability with its principal place of business at 7/F, TCL Building, 22 Science Park East Avenue, 22E Hong Kong Science Park, Hong Kong. On information and belief, TCL does business itself, or through its subsidiaries, affiliates, and agents, in the State of Texas and the Western District of Texas.

42. Defendant TCL Communication Ltd. (“TCL Communication”) is, on information and belief, a corporation organized and existing under the laws of Hong Kong, with its principal place of business located at 5/F, TCL Building, 22 Science Park East Avenue, 22E Hong Kong

Science Park, Hong Kong. On information and belief, TCL Communication does business itself, or through its subsidiaries, affiliates, and agents, in the State of Texas and the Western District of Texas. This Complaint refers to TCL Electronics and TCL Communication collectively as “TCL.”

43. TCL Electronics is the head of an interrelated group of companies which together comprise one of the leading makers and sellers of smartphones and related devices. TCL Electronics and TCL Communication (and their subsidiaries and affiliates) are part of the same corporate structure and distribution chain for the making, importing, offering to sell, selling, and using of the accused devices in the United States, including in the State of Texas generally and this District in particular. On information and belief, TCL Electronics and TCL Communication (and their affiliates) share the same management, common ownership, advertising platforms, facilities, distribution chains and platforms, and accused product lines and products involving related technologies. Thus, TCL Electronics and TCL Communication (and their affiliates and subsidiaries) operate as a unitary business and are jointly and severally liable for the acts of patent infringement alleged herein.

44. On information and belief, TCL Electronics and TCL Communication do business themselves, or through their subsidiaries, affiliates, and agents, in the State of Texas and the Western District of Texas. TCL has placed or contributed to placing infringing products, such as the TCL 20 Pro 5G mobile device, into the stream of commerce via established distribution channels knowing or understanding that such products would be sold and used in the United States, including in the Western District of Texas.

45. On information and belief, TCL has derived substantial revenue from infringing acts in the Western District of Texas, including from the sale and use of these infringing products like the TCL 20 Pro 5G.

46. On information and belief, TCL designs, manufactures, distributes, imports, offers for sale, and/or sells in the State of Texas and the Western District of Texas mobile devices that infringe the Patent asserted in this matter.

JURISDICTION AND VENUE

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

48. This Court has personal jurisdiction over each Defendant because each Defendant conducts business in and has committed acts of patent infringement in this District, the State of Texas, and elsewhere in the United States and has established minimum contacts with this forum state such that the exercise of jurisdiction over each Defendant would not offend the traditional notions of fair play and substantial justice. Upon information and belief, each Defendant transacts substantial business with entities and individuals in the State of Texas and the Western District of Texas, by among other things, importing, offering to sell, distributing, and selling products that infringe the Asserted Patent, including the infringing mobile devices and computers that each Defendant purposefully directs into the State of Texas and this District as alleged herein, as well as by providing service and support to customers in this District. Each Defendant places the accused mobile devices and computers into the stream of commerce via authorized and established distribution channels with the knowledge and expectation that they will be sold in the United States, including in the State of Texas and this District, and does not otherwise permit the sale of the accused products in the State of Texas, or in this District, outside of these established, authorized, and ratified distribution channels.

49. Venue is proper in this District pursuant to 28 U.S.C. §§ 1391(b)-(c) and 1400(b), because each Defendant either is a foreign corporation that is not a resident of the United States

and is subject to personal jurisdiction in this District, and thus is subject to venue in any judicial district including this District; resides in this District; and/or has committed acts of infringement in this District and has a regular and established place of business in this District.

50. Each Defendant is subject to this Court's jurisdiction pursuant to due process and/or the Texas Long Arm Statute due at least to each Defendant's substantial business in the State of Texas and this District, including through its past infringing activities, because each Defendant regularly does and solicits business herein, and/or because each Defendant has engaged in persistent conduct and/or has derived substantial revenues from goods and services provided to customers in the State of Texas and this District.

SINGLE ACTION

51. This suit is commenced against Defendants pursuant to 35 U.S.C. § 299 in a single action because (a) a right to relief is asserted against Defendants jointly, severally, or in the alternative with respect to or arising out of the same transaction, occurrence, or series of transactions or occurrences relating to the making, using, importing into the United States, offering for sale, and/or selling of the same accused products or processes and (b) questions of fact common to all Defendants will arise in the action.

52. Plaintiff is informed and believes, and on that basis alleges, that Defendants Samsung Electronics Co., Ltd.; Samsung Electronics America, Inc.; Apple Inc.; Google LLC; Lenovo Group Ltd.; Microsoft Corporation; OnePlus Technology (Shenzhen) Co., Ltd.; TCL Electronics Holdings Ltd. and TCL Communication Ltd. import, manufacture, offer for sale, and/or sell the same products and processes accused in this action, with respect to the Patent asserted in this action, including because, as alleged below, each Defendant designs, manufactures, assembles, imports, offers for sale, and/or sells mobile devices and computers that incorporate the

Qualcomm QET5100 semiconductor device.

THE ASSERTED PATENT

53. This complaint asserts a single cause of action for infringement of United States Patent No. 7,183,835 (the “’835 Patent” or “Asserted Patent”). The ’835 Patent is a valid and enforceable United States Patent, the entire right, title, and interest to which Arigna owns by assignment.

54. The ’835 Patent relates to power technology used in mobile devices and computers. On February 27, 2007, the U.S. Patent and Trademark Office duly and legally issued the ’835 Patent, which is entitled “Semiconductor Device Which Realizes a Short-Circuit Protection Function Without Shunt Resistor, and Semiconductor Device Module.” Plaintiff holds all rights and title to the Patent, including the sole and exclusive right to bring a claim for its infringement. A true and correct copy of the ’835 Patent is attached as **Exhibit A**.

55. The ’835 Patent generally claims a semiconductor device and semiconductor device module that provide short-circuit protection for an insulated gate type switching device, such as an Insulated Gate Bipolar Transistor (“IGBT”). The patent describes an Intelligent Power Module (“IPM”) package which consists of a semiconductor device having an insulated gate type switching device, such as an IGBT, and a control circuit controlling the drive of that switching device.

56. To the extent applicable, Plaintiff has complied with 35 U.S.C. § 287(a) with respect to the ’835 Patent.

57. Plaintiff owns all rights, title, and interest in and to the Asserted Patent and possesses all rights of recovery.

FACTUAL ALLEGATIONS

58. As referred to in this Complaint, and consistent with 35 U.S.C. § 100(c), the

“United States” means “the United States of America, its territories and possessions.”

59. None of the Defendants has any right to practice the intellectual property protected by the Asserted Patent.

60. Each Defendant makes, uses, offers to sell, sells, and/or imports into the United States, products made in accordance with the '835 Patent, including but not limited to the Galaxy S8, Galaxy S8+, Galaxy Note8, Galaxy S9, Galaxy S9+, Galaxy Note9, Galaxy Book2, Galaxy S21 Ultra 5G, Galaxy S21+ 5G, Galaxy S21 5G, Galaxy S20 5G, Galaxy S20+ 5G, Galaxy S20 Ultra 5G, Galaxy S20 FE 5G, Galaxy Book S, Galaxy Tab S7 5G, Galaxy Z Fold2 5G, Galaxy Z Fold3 5G, Galaxy Z Flip 5G, Galaxy A71 5G, Galaxy Note 10+, Galaxy Note 10+ 5G, Galaxy S10, Galaxy S10e, Galaxy S10 5G, Galaxy S10 lite, Galaxy S10 5G, Apple iPhone 13, Apple iPhone 13 mini, Apple iPhone 13 Pro, Apple iPhone 13 Pro Max, Apple iPhone 12 Pro Max, Apple iPhone 12 Pro, Apple iPhone 12 Mini, Apple iPhone 12, Apple iPhone 11, Apple iPhone 11 Pro, Apple iPhone 11 Pro Max, Apple iPhone XS Max, Apple iPhone XS, Apple iPhone XR, Apple iPad Pro 11, Apple iPad Pro 2019, Apple iPad Air 3, Apple iPad Mini 2019, Apple iPad Pro 12.9 5th Gen, Apple iPad Pro 11-inch 3rd Gen, Apple iPad mini 6th Gen, Google Pixel 2, Google Pixel 2 XL, Google Pixel 3, Google Pixel 3 XL, Google Pixel 4, Google Pixel 4a, Google Pixel 4 XL, Google Pixel 5, Google Pixel 5a, Google Pixel 6, Google Pixel 6 Pro, Lenovo ThinkPad X1 Fold Gen1, Lenovo Flex 5G Notebook, Lenovo YOGA 81JL C630-13Q50, Motorola Edge+, Motorola Moto MD1005G, Microsoft Surface Pro X, Microsoft Surface Duo 1930, Microsoft Surface Pro 7+, OnePlus 7, OnePlus 7 Pro, OnePlus Nord N10 5G, OnePlus Dual 5G AC2001, OnePlus 8, OnePlus 8 Pro, OnePlus 9, and OnePlus 9 Pro, and TCL 20 Pro 5G, TCL 10 5G, and TCL 10 5G UW, in addition to other mobile devices and computers.

COUNT 1
INFRINGEMENT OF U.S. PATENT NO. 7,183,835

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

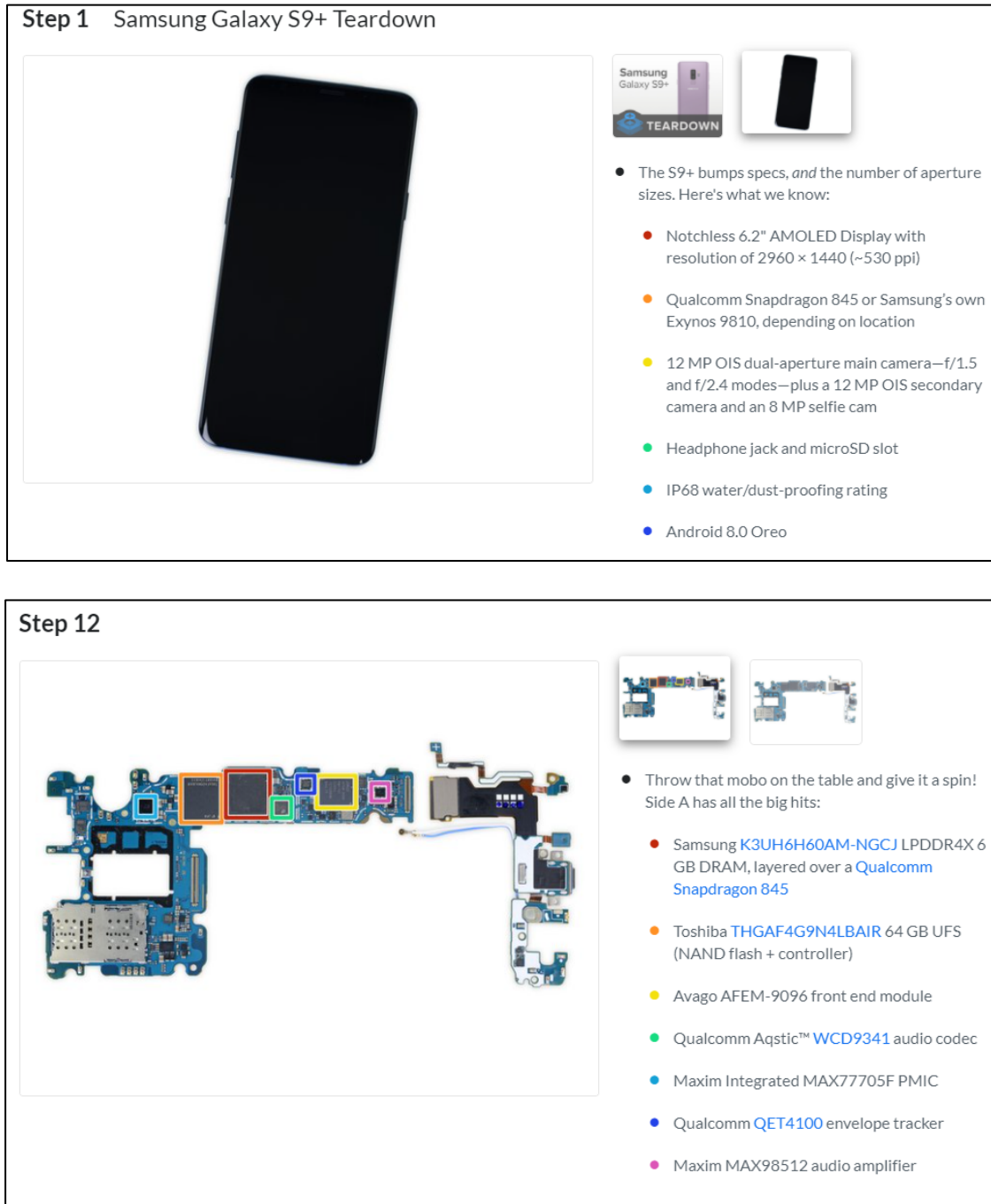
Samsung

62. Samsung has infringed and continues to infringe at least claim 1 of the '835 Patent in violation of 35 U.S.C. § 271, either literally or through the doctrine of equivalents, by making, using, selling, or offering for sale in the United States, and/or importing into the United States, without authorization, products that practice at least claim 1 of the '835 Patent. Samsung is liable for its infringement of the '835 Patent pursuant to 35 U.S.C. § 271(a), (b), and (c).

63. More specifically, Samsung designs, manufactures, assembles, imports, offers for sale, and/or sells mobile devices and computers that incorporate the Qualcomm QET4100 and/or QET5100 envelope tracking modules,²² which infringe at least independent claim 1 of the '835 Patent. For example, the QET4100 envelope tracking module comes pre-installed in the Samsung Galaxy S9+ device, as shown in Figure 1.²³ As another example, the QET5100 comes pre-installed in the Galaxy S20 5G device.

²² All references herein to the QET4100 and QET5100 include all model versions of each, such as the QET5100M, for example.

²³ IFixit, *Samsung Galaxy S9+ Teardown* (Mar. 16, 2018), available at <https://www.ifixit.com/Teardown/Samsung+Galaxy+S9++Teardown/104308>.

FIGURE 1

Source: iFIXIT.

64. Claim 1 is illustrative of the '835 Patent. It recites “[a] semiconductor device controlling a drive of an insulated gate transistor by generating a control output signal on a basis

of a control input signal, comprising: a driver outputting said control output signal and a short-circuit protection circuit detecting said control output signal and controlling and forcing said driver to stop said control output signal when a detecting voltage of said control output signal exceeds a predetermined reference voltage before a predetermined period passes after said control output signal indicates a conduction of said insulated gate transistor, wherein said short-circuit protection circuit includes: [1] pulse generation circuit receiving said control input signal and outputting a first pulse signal being significant only in said predetermined period according to a timing when said control input signal indicates the conduction of said insulated gate transistor; [2] a comparator receiving the detecting voltage of said control output signal, performing a comparison with said reference voltage and outputting a second pulse signal being significant during a period when the detecting voltage of said control output signal exceeds said reference voltage; and [3] a logical circuit receiving said first and second pulse signals and outputting a stop signal forcing said driver to stop said control output signal when said second pulse signal becomes significant during a period when said first pulse signal is significant.”

65. The Qualcomm QET4100 and QET5100, as incorporated into various of Samsung’s products, meet every element of this claim.²⁴ The QET4100 and QET5100 are semiconductor devices controlling a drive of an insulated gate transistor by generating a control output signal on a basis of a control input signal. For example, in the Accused Samsung Products, an insulated gate transistor is present in a power amplifier or other component external to the QET4100 and/or QET5100.

66. Both the QET4100 and QET5100 contain a driver outputting said control output signal. The QET4100 and QET5100 also both contain a short-circuit protection circuit, which

²⁴ This description of infringement is illustrative and not intended to be an exhaustive or limiting explanation of every manner in which Samsung’s products infringe the ’835 Patent.

detects the control output signal. For example, the short-circuit protection circuit in the QET4100 and QET5100 comprises a pulse generator and a comparator, among other components.

67. The short-circuit protection circuit controls and forces the driver to stop the control output signal when the detecting voltage of the control output signal exceeds a predetermined reference voltage within a predetermined period after the insulated gate transistor starts to conduct. For example, the short-circuit protection circuit in the QET4100 and QET5100 detects the control output signal and sends it to a comparator where it is compared with a predetermined reference voltage.

68. The short-circuit protection circuit in the QET4100 and QET5100 includes a pulse generation circuit which receives a control input signal and generates a first pulse signal which is significant only during a predetermined period after the insulated gate transistor starts to conduct.

69. A comparator in the short-circuit protection circuit in the QET4100 and QET5100 receives the detecting voltage of the control output signal, performs a comparison with the reference voltage, and outputs a second pulse signal that is significant when the detecting voltage of the control output signal exceeds the reference voltage.

70. The short-circuit protection circuit in the QET4100 and QET5100 also includes a logical circuit which receives the first and second pulse signals and outputs a stop signal forcing the driver to stop the control output signal when the second pulse signal becomes significant during a period when the first pulse signal is significant. For example, in the QET4100, an over-current flag, or OCF, is sent to stop the driver, thereby controlling and forcing the driver to stop the control output signal.

71. Samsung makes, uses, imports, offers for sale, and/or sells mobile devices and computers that incorporate the infringing QET4100 and/or QET5100 or substantially similar

envelope tracking modules, including but not limited to the Galaxy S8, Galaxy S8+, Galaxy Note8, Galaxy S9, Galaxy S9+, Galaxy Note9, Galaxy Book2, Galaxy S21 Ultra 5G, Galaxy S21+ 5G, Galaxy S21 5G, Galaxy S20 5G, Galaxy S20+ 5G, Galaxy S20 Ultra 5G, Galaxy S20 FE 5G, Galaxy Book S, Galaxy Tab S7 5G, Galaxy Z Fold2 5G, Galaxy Z Fold3 5G, Galaxy Z Flip 5G, Galaxy A71 5G, Galaxy Note 10+, Galaxy Note 10+ 5G, Galaxy S10, Galaxy S10e, Galaxy S10 5G, Galaxy S10 lite, and Galaxy S10 5G which infringe at least independent claim 1 of the '835 Patent.

72. Samsung has imported and sold, and continues to sell and offer for sale, these mobile devices in the United States, including through Samsung websites (Samsung.com) and Samsung authorized retailers in the Western District of Texas.

73. Samsung has committed and is committing the foregoing infringing activities without license from Arigna. Samsung's acts of infringement have damaged and are damaging Arigna, as owner and assignee of the '835 Patent. Arigna is entitled to recover from Samsung the damages it has sustained as a result of Samsung's wrongful acts in an amount subject to proof at trial. Samsung's infringement of Arigna's rights under the '835 Patent will continue to damage Arigna.

74. Samsung has had actual knowledge of the '835 Patent since at least January 6, 2022. On that date, Arigna served Samsung with a document production in a separate lawsuit that identified the '835 Patent and its assignment to Arigna. Samsung's continued infringement despite its knowledge of the '835 Patent and Arigna's infringement allegations has been intentional and deliberate and willful.

75. In addition, Samsung has indirectly infringed, and continues to indirectly infringe, the '835 Patent by actively inducing its infringement in violation of 35 U.S.C. § 271(b).

76. Samsung's authorized retailers, such as Best Buy, and wireless carriers, such as Verizon, directly infringe the '835 Patent by selling the accused Samsung devices to consumers. Consumers directly infringe the '835 Patent by using the accused Samsung devices.

77. Samsung knowingly induced and induces these acts of infringement with the specific intent to encourage them. Samsung has taken and takes active steps to encourage and facilitate direct infringement by these third parties, in this District and elsewhere in the United States, through its manufacture and sale of the infringing products, and through its creation and dissemination of promotional and marketing materials, supporting materials, instructions, product manuals, and/or technical information relating to the products with knowledge and specific intent that its efforts will result in the direct infringement of the '835 Patent by these third parties.

78. Such active steps include, for example, advertising and marketing the infringing products to resellers, wireless carriers, and consumers, obtaining FCC approval for such devices to be utilized in the United States, and distributing and selling such devices to consumers and resellers knowing that they would be marketed, offered for sale, and used in the United States. Samsung specifically advertises that the accused products use smartphone chipsets that provide greater "energy efficiency" to "support 5G connectivity."²⁵ The QET4100 and/or QET5100 necessarily operate in an infringing manner when the user of an accused Samsung product connects to such 5G networks and accordingly utilizes the power efficiency and short circuit protection functionalities of the QET4100 and/or QET5100. See also, e.g.:

²⁵ Samsung Newsroom, *Make Every Day Epic with Samsung Galaxy S21 and Galaxy S21+* (Jan. 15, 2021), available at: <https://news.samsung.com/global/make-every-day-epic-with-samsung-galaxy-s21-and-galaxy-s21plus>.

FIGURE 2



Source: Samsung.com

79. Samsung’s website further makes clear that consumers “don’t have to do anything to take advantage of the increased speed and connectivity” of 5G when they are using the accused Samsung products, such as the Galaxy S21 5G or the Galaxy S21 Ultra 5G.²⁶ Samsung user manuals for the accused products likewise facilitate infringement, instructing consumers about, among other things, how to “connect to mobile networks and use mobile data.”²⁷ By instructing third parties to turn on and use the infringing products for infringing purposes, such as to make and receive calls and send or receive data using 5G mobile networks, Samsung knowingly induces these third parties to commit infringing acts because the power efficiency and short-circuit protection functions of the QET4100 and/or QET5100 necessarily operate.

80. In addition, Samsung has indirectly infringed and continues to indirectly infringe the ’835 Patent as a contributory infringer in violation of 35 U.S.C. § 271(c) by selling or offering to sell in the United States, or importing into the United States, infringing products with knowledge that they are especially designed or adapted to operate in a manner that infringes the ’835 Patent and despite the fact that the infringing technology is not a staple article of commerce suitable for

²⁶ Samsung, *Use 5G on Galaxy phones and tablets* (accessed Jan. 10, 2022), available at: <https://www.samsung.com/us/support/answer/ANS00083184/>.

²⁷ Samsung Galaxy S21 5G User Manual.

substantial non-infringing use. Samsung knowingly incorporates the QET4100 and QET5100 into the accused Samsung products such that they operate in an infringing manner. By incorporating such devices into its products, Samsung contributes to infringing use as consumers make and receive calls and send and transmit data through mobile networks using the accused products, which lack substantially non-infringing uses because the accused products are designed and manufactured to operate as smartphones in a manner that infringes the '835 Patent.

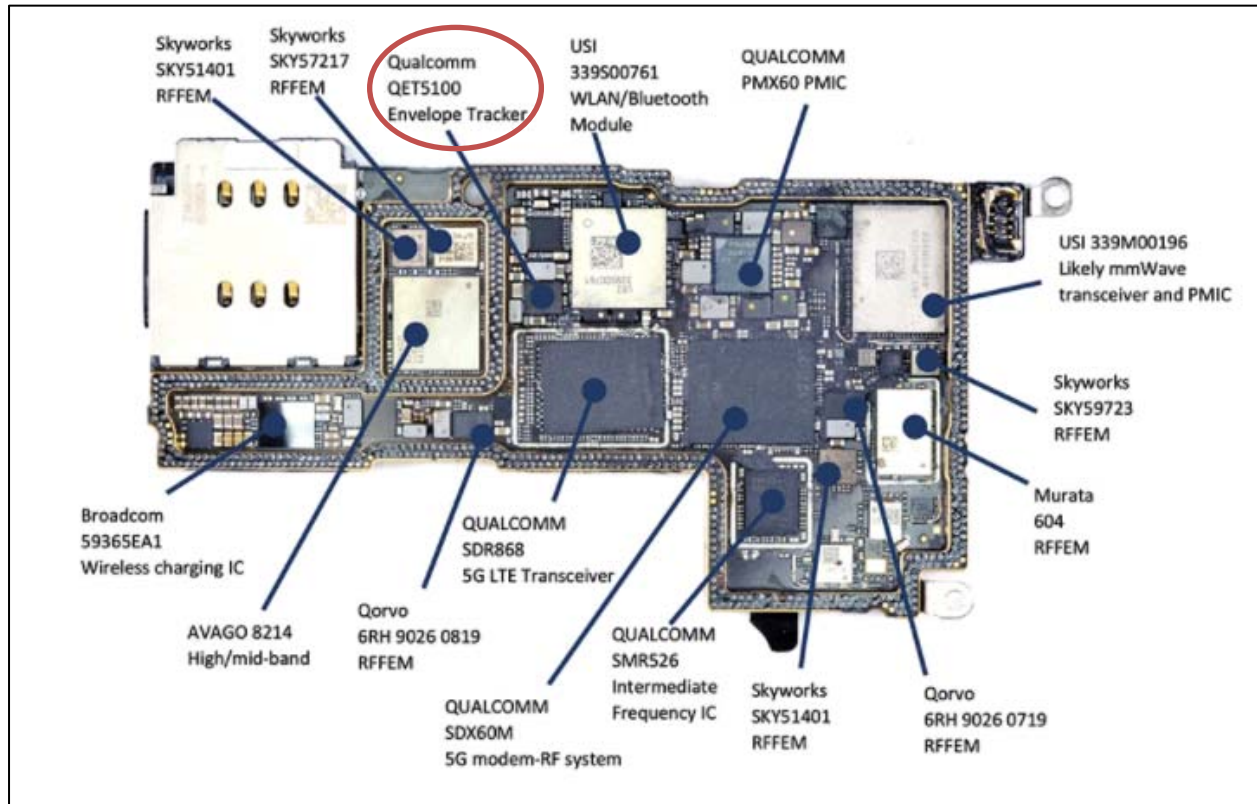
Apple

81. Apple has infringed and continues to infringe at least claim 1 of the '835 Patent in violation of 35 U.S.C. § 271, either literally or through the doctrine of equivalents, by making, using, selling, or offering for sale in the United States, and/or importing into the United States, without authorization, products that practice at least claim 1 of the '835 Patent. Apple is liable for its infringement of the '835 Patent pursuant to 35 U.S.C. § 271(a), (b), and (c).

82. More specifically, Apple designs, manufactures, assembles, imports, offers for sale, and/or sells mobile devices, computers, and components thereof that incorporate the Qualcomm QET5100 and/or other envelope tracking modules which infringe at least independent claim 1 of the '835 Patent. For example, the QET5100 envelope tracking module comes pre-installed in the Apple iPhone 13 Pro Max,²⁸ as shown in Figure 3, among other iPhones.²⁹

²⁸ See, e.g., UnitedLex, Apple iPhone 13 Pro Max Teardown Report, available at <https://unitedlex.com/insights/apple-iphone-13-pro-max-teardown-report>.

²⁹ See, e.g., UnitedLex, Apple iPhone 12 Pro 5G mmWave Report, available at <https://unitedlex.com/insights/apple-iphone-12-pro-5g-mmwave-report>.

FIGURE 3

Source: UnitedLex.

83. Claim 1 is illustrative of the '835 Patent. It recites “[a] semiconductor device controlling a drive of an insulated gate transistor by generating a control output signal on a basis of a control input signal, comprising: a driver outputting said control output signal and a short-circuit protection circuit detecting said control output signal and controlling and forcing said driver to stop said control output signal when a detecting voltage of said control output signal exceeds a predetermined reference voltage before a predetermined period passes after said control output signal indicates a conduction of said insulated gate transistor, wherein said short-circuit protection circuit includes: [1] pulse generation circuit receiving said control input signal and outputting a first pulse signal being significant only in said predetermined period according to a timing when said control input signal indicates the conduction of said insulated gate transistor; [2] a comparator

receiving the detecting voltage of said control output signal, performing a comparison with said reference voltage and outputting a second pulse signal being significant during a period when the detecting voltage of said control output signal exceeds said reference voltage; and [3] a logical circuit receiving said first and second pulse signals and outputting a stop signal forcing said driver to stop said control output signal when said second pulse signal becomes significant during a period when said first pulse signal is significant.”

84. The Qualcomm QET5100, as incorporated into various of Apple’s products, meets every element of this claim.³⁰ The QET5100 is a semiconductor device controlling a drive of an insulated gate transistor by generating a control output signal on a basis of a control input signal. For example, in the Accused Apple Products, an insulated gate transistor is present in a power amplifier or other component external to the QET5100.

85. The QET5100 contains a driver outputting a control output signal. The QET5100 also contains a short-circuit protection circuit, which detects the control output signal. For example, the short-circuit protection circuit in the QET5100 comprises a pulse generator and a comparator, among other components.

86. The short-circuit protection circuit controls and forces the driver to stop the control output signal when the detecting voltage of the control output signal exceeds a predetermined reference voltage within a predetermined period after the insulated gate transistor starts to conduct. For example, the short-circuit protection circuit in the QET5100 detects the control output signal and sends it to a comparator where it is compared with a predetermined reference voltage.

87. The short-circuit protection circuit in the QET5100 includes a pulse generation circuit which receives the control input signal and generates a first pulse signal which is significant

³⁰ This description of infringement is illustrative and not intended to be an exhaustive or limiting explanation of every manner in which Apple’s products infringe the ’835 Patent.

only during a predetermined period after the insulated gate transistor starts to conduct.

88. The short-circuit protection circuit in the QET5100 includes a comparator that receives the detecting voltage of the control output signal, performs a comparison with a reference voltage, and outputs a second pulse signal that is significant when the detecting voltage of the control output signal exceeds the reference voltage.

89. The short-circuit protection circuit in the QET5100 also includes a logical circuit which receives the first and second pulse signals and outputs a stop signal forcing the driver to stop the control output signal when the second pulse signal becomes significant during a period when the first pulse signal is significant. For example, in the QET4100, which is substantially similar to the QET5100, an over-current flag, or OCF, is sent to stop the driver, thereby controlling and forcing said driver to stop the control output signal.

90. Apple makes, uses, imports, offers for sale, and/or sells mobile devices that incorporate the infringing QET5100 or substantially similar envelope tracking modules, including but not limited to the iPhone 12, iPhone 12 Pro, iPhone 12 Pro Max, iPhone 12 mini, iPhone 13, iPhone 13 mini, iPhone 13 Pro, iPhone 13 Pro Max, and Apple iPad Pro 12.9 5th Gen.

91. The Qorvo QM81009, as incorporated into various of Apple's products, also meets every element of claim 1 of the '835 Patent.³¹ Like the QET4100 and QET5100, the QM81009 is a semiconductor device which controls the power supply to an insulated gate transistor in a power amplifier. The QM81009 controls the drive of an insulated gate transistor by generating a control output signal on a basis of a control input signal. The QM81009 contains a driver which outputs the control output signal.

92. A short-circuit protection circuit in the QM81009 detects the control output signal.

³¹ This description of infringement is illustrative and not intended to be an exhaustive or limiting explanation of every manner in which Apple's products infringe the '835 Patent.

The short-circuit protection circuit controls and forces the driver to stop the control output signal when the voltage of the control output signal exceeds a predetermined reference voltage within a predetermined period after the insulated gate transistor starts to conduct. The short-circuit protection circuit in the QM81009 detects the control output signal and sends it to a comparator where it is compared with the predetermined reference voltage.

93. The short-circuit protection circuit in the QM81009 includes a pulse generation circuit which receives the control input signal and generates a first pulse signal which is significant only during a predetermined period after the insulated gate transistor starts to conduct.

94. The short-circuit protection circuit in the QM81009 includes a comparator that receives the detecting voltage of the control output signal, performs a comparison with the reference voltage, and outputs a second pulse signal that is significant when the detecting voltage of the control output signal exceeds the reference voltage. For example, the comparator outputs an over-voltage flag signal in this circumstance.

95. The short-circuit protection circuit in the QM81009 also includes a logical circuit which receives the first and second pulse signals and outputs a stop signal forcing the driver to stop the control output signal when the second pulse signal becomes significant during a period when the first pulse signal is significant.

96. Apple makes, uses, imports, offers for sale, and/or sells mobile devices that incorporate Qorvo QM81009 envelope tracker modules or substantially similar envelope tracking modules (e.g., QM81013), including but not limited to the iPhone XS, iPhone XS Max, iPhone XR, iPad Pro 11, iPad Pro 2019, iPad Air 3rd Gen, iPad Mini 2019, iPhone 11, iPhone 11 Pro, and iPhone 11 Pro Max. For example, the QM81009 comes pre-installed in the iPhone XS Max.

97. Apple has imported and sold, and continues to sell and offer for sale, these

infringing mobile devices in the United States, including through the Apple website (Apple.com) and at Apple stores in Austin and San Antonio, among other places in the Western District of Texas.

98. Apple has committed and is committing the foregoing infringing activities without license from Arigna. Apple's acts of infringement have damaged and continue to damage Arigna, as owner and assignee of the '835 Patent. Arigna is entitled to recover from Apple the damages it has sustained as a result of Apple's wrongful acts in an amount subject to proof at trial. Apple's infringement of Arigna's rights under the '835 Patent will continue to damage Arigna.

99. Apple has had actual knowledge of the '835 Patent since at least January 6, 2022. On that date, Arigna served Apple with a document production in a separate lawsuit that identified the '835 Patent and its assignment to Arigna. Apple's continued infringement despite its knowledge of the '835 Patent and Arigna's infringement allegations has been intentional and deliberate and willful.

100. In addition, Apple indirectly infringed, and continues to indirectly infringe, the '835 Patent by actively inducing its infringement in violation of 35 U.S.C. § 271(b).

101. Apple's authorized retailers, such as Best Buy, and wireless carriers, such as Verizon, directly infringe the '835 Patent by selling the accused Apple devices to consumers. Consumers directly infringe the '835 Patent by using the accused Apple devices.

102. Apple knowingly induced and induces these acts of infringement with the specific intent to encourage them by taking active steps to encourage and facilitate direct infringement by these third parties, in this District and elsewhere in the United States, through its manufacture and sale of the infringing products, and through its creation and dissemination of promotional and marketing materials, supporting materials, instructions, product manuals, and/or technical

information relating to the products with knowledge and the specific intent that its efforts will result in the direct infringement of the '835 Patent by these third parties.

103. Such active steps include, for example, advertising and marketing the infringing products to resellers, wireless carriers, and consumers, obtaining FCC approval for such devices to be utilized in the United States, and distributing and selling such devices to consumers and resellers knowing that they would be marketed, offered for sale, and used in the United States. Apple specifically advertises that the “iPhone 13 models and iPhone 12 models work with the 5G cellular networks of certain carriers.”³² Further, Apple’s website informs consumers that “When you’re in an area with 5G coverage for your carrier and your 5G cellular plan has been activated, you’ll see a 5G icon in the status bar of your iPhone.”³³ The QET5100 and/or QM81009 necessarily operate in an infringing manner when the user of an accused Apple product connects to a mobile network and accordingly utilizes the power efficiency and short circuit protection functionalities of the QET5100 and/or QM81009.

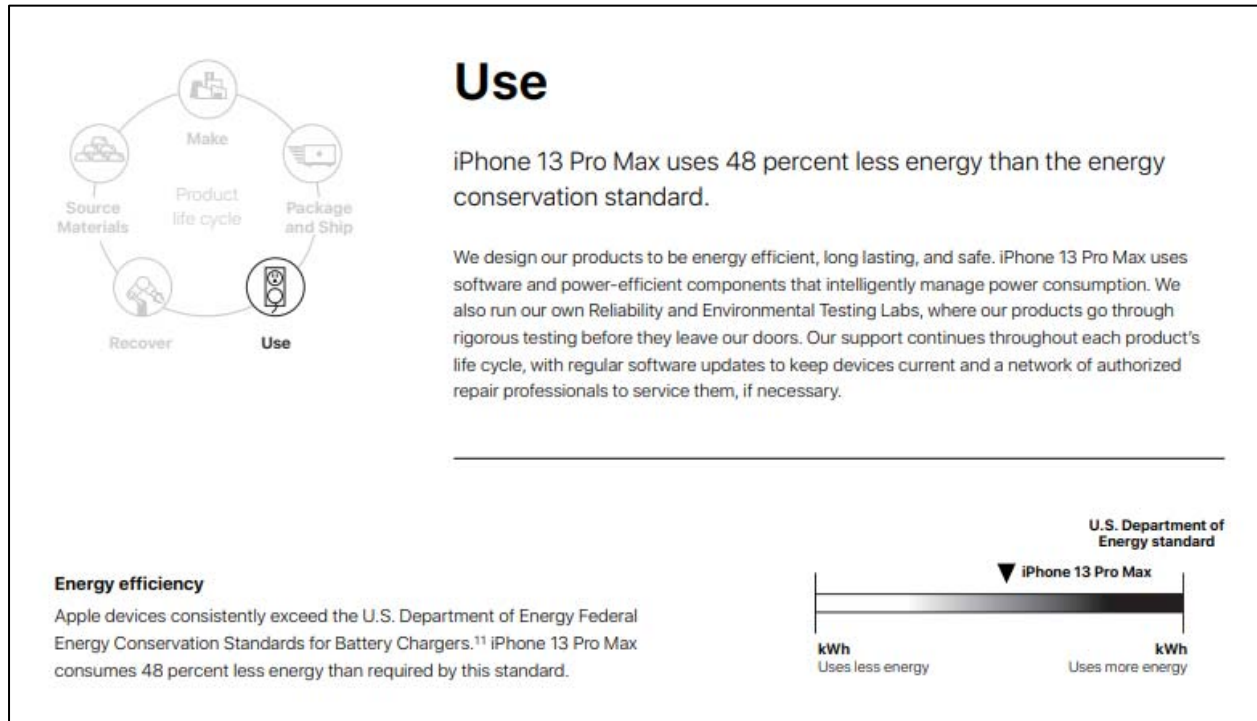
104. For example, Apple publicizes that the iPhone 13 Pro Max “uses software and power-efficient components that intelligently manage power consumption.”³⁴ See, e.g.:

³² Apple, *Use 5G with your iPhone* (accessed Nov. 23, 2021), available at: <https://support.apple.com/en-us/HT211828>.

³³ *Id.*

³⁴ Apple, *Product Environmental Report, iPhone 13 Pro Max* (Sept. 14, 2021), available at: https://www.apple.com/environment/pdf/products/iphone/iPhone_13_Pro_Max_PER_Sept2021.pdf.

FIGURE 4



Source: Apple.com.

105. Apple user guides for the accused products likewise facilitate infringement, instructing consumers about, among other things, how to “[s]et up cellular service on iPhone.”³⁵ By instructing third parties to turn on and use the accused products for infringing purposes, such as to make and receive calls and send and receive data using mobile networks, Apple knowingly induces these third parties to commit infringing acts because the power efficiency and short-circuit protection functions of the QET5100 and/or QM81009 necessarily operate.

106. In addition, Apple has indirectly infringed and continues to indirectly infringe the ’835 Patent as a contributory infringer in violation of 35 U.S.C. § 271(c) by selling or offering to sell in the United States, or importing into the United States, infringing products with knowledge

³⁵ iPhone User Guide, *Set up cellular service on iPhone* (accessed Nov. 23, 2021), available at: <https://support.apple.com/guide/iphone/set-up-cellular-service-iph3f11fba92/14.0/ios/14.0>.

that they are especially designed or adapted to operate in a manner that infringes the '835 Patent and despite the fact that the infringing technology is not a staple article of commerce suitable for substantial non-infringing use. Apple knowingly incorporates the QET5100 and QM81009 semiconductor devices into the accused Apple products such that they operate in an infringing manner. By incorporating such devices into its products, Apple contributes to infringing use as consumers make and receive calls and send and receive data through mobile networks using the accused products, which lack substantially non-infringing uses because the accused products are designed and manufactured to operate as smartphones in a manner that infringes the '835 Patent.

Google

107. Google has infringed and continues to infringe at least claim 1 of the '835 Patent in violation of 35 U.S.C. § 271, either literally or through the doctrine of equivalents, by making, using, selling, or offering for sale in the United States, and/or importing into the United States, without authorization, products that practice at least claim 1 of the '835 Patent. Google is liable for its infringement of the '835 Patent pursuant to 35 U.S.C. § 271(a), (b), and (c).

108. More specifically, Google designs, manufactures, assembles, imports, offers for sale, and/or sells mobile devices that incorporate the Qualcomm QET4100 and/or QET5100 envelope tracking modules, which infringe at least independent claim 1 of the '835 Patent. For example, the QET4100 envelope tracking module comes pre-installed in the Google Pixel 2 XL device, as shown in Figure 5.³⁶

³⁶ IFIXIT, *Google Pixel 2 XL Teardown* (Oct. 19, 2017), available at <https://www.ifixit.com/Teardown/Google+Pixel+2+XL+Teardown/98093>.

FIGURE 5

Source: iFIXIT.

109. Claim 1 is illustrative of the '835 Patent. It recites “[a] semiconductor device controlling a drive of an insulated gate transistor by generating a control output signal on a basis of a control input signal, comprising: a driver outputting said control output signal and a short-circuit protection circuit detecting said control output signal and controlling and forcing said driver to stop said control output signal when a detecting voltage of said control output signal exceeds a predetermined reference voltage before a predetermined period passes after said control output signal indicates a conduction of said insulated gate transistor, wherein said short-circuit protection circuit includes: [1] pulse generation circuit receiving said control input signal and outputting a first pulse signal being significant only in said predetermined period according to a timing when said control input signal indicates the conduction of said insulated gate transistor; [2] a comparator receiving the detecting voltage of said control output signal, performing a comparison with said reference voltage and outputting a second pulse signal being significant during a period when the

detecting voltage of said control output signal exceeds said reference voltage; and [3] a logical circuit receiving said first and second pulse signals and outputting a stop signal forcing said driver to stop said control output signal when said second pulse signal becomes significant during a period when said first pulse signal is significant.”

110. The Qualcomm QET4100 and QET5100, as incorporated into various of Google’s products, meet every element of this claim.³⁷ The QET4100 and QET5100 are semiconductor devices controlling a drive of an insulated gate transistor by generating a control output signal on a basis of a control input signal. For example, in the accused Google products, an insulated gate transistor is present in a power amplifier or other component external to the QET4100 and/or QET5100.

111. The QET4100 and QET5100 contain a driver outputting the control output signal. The QET4100 and QET5100 also contain a short-circuit protection circuit, which detects the control output signal. For example, the short-circuit protection circuit in the QET4100 and QET5100 comprises a pulse generator and a comparator, among other components.

112. The short-circuit protection circuit controls and forces the driver to stop the control output signal when the detecting voltage of the control output signal exceeds a predetermined reference voltage within a predetermined period after the insulated gate transistor starts to conduct. For example, the short-circuit protection circuit in the QET4100 and QET5100 detects the control output signal and sends it to a comparator where it is compared with a predetermined reference voltage.

113. The short-circuit protection circuit in the QET4100 and QET5100 includes a pulse generation circuit which receives the control input signal and generates a first pulse signal which

³⁷ This description of infringement is illustrative and not intended to be an exhaustive or limiting explanation of every manner in which Google’s products infringe the ’835 Patent.

is significant only during a predetermined period after the insulated gate transistor starts to conduct.

114. The short-circuit protection circuit in the QET4100 and QET5100 includes a comparator that receives the detecting voltage of the control output signal, performs a comparison with a reference voltage, and outputs a second pulse signal that is significant when the detecting voltage of the control output signal exceeds the reference voltage.

115. The short-circuit protection circuit in the QET4100 and QET5100 also includes a logical circuit which receives the first and second pulse signals and outputs a stop signal forcing the driver to stop the control output signal when the second pulse signal becomes significant during a period when the first pulse signal is significant. For example, in the QET4100, an over-current flag, or OCF, is sent to stop the driver, thereby controlling and forcing said driver to stop the control output signal.

116. Google makes, uses, imports, offers for sale, and/or sells mobile devices, computers, and components thereof that, on information and belief, incorporate the infringing QET4100 and/or QET5100 or substantially similar envelope tracking modules, including but not limited to the Pixel 2, Pixel 2 XL, Pixel 3, Pixel 3 XL, Pixel 4a, Pixel 4 XL, Pixel 5a, Pixel 5, Pixel 6 and Pixel 6 Pro.

117. Google has imported and sold, and continues to sell and offer for sale, these mobile devices in the United States, including through Google websites (store.google.com) and Google authorized retailers in the Western District of Texas.

118. Google has committed and is committing the foregoing infringing activities without license from Arigna. Google's acts of infringement have damaged and are damaging Arigna, as owner and assignee of the '835 Patent. Arigna is entitled to recover from Google the damages it

has sustained as a result of Google's wrongful acts in an amount subject to proof at trial. Google's infringement of Arigna's rights under the '835 Patent will continue to damage Arigna.

119. Google has had actual knowledge of the '835 Patent since at least January 6, 2022. On that date, Arigna served Google with a document production in a separate lawsuit that identified the '835 Patent and its assignment to Arigna. Google's continued infringement despite its knowledge of the '835 Patent and Arigna's infringement allegations has been intentional and deliberate and willful.

120. In addition, Google indirectly infringed, and continues to indirectly infringe, the '835 Patent by actively inducing its infringement in violation of 35 U.S.C. § 271(b).

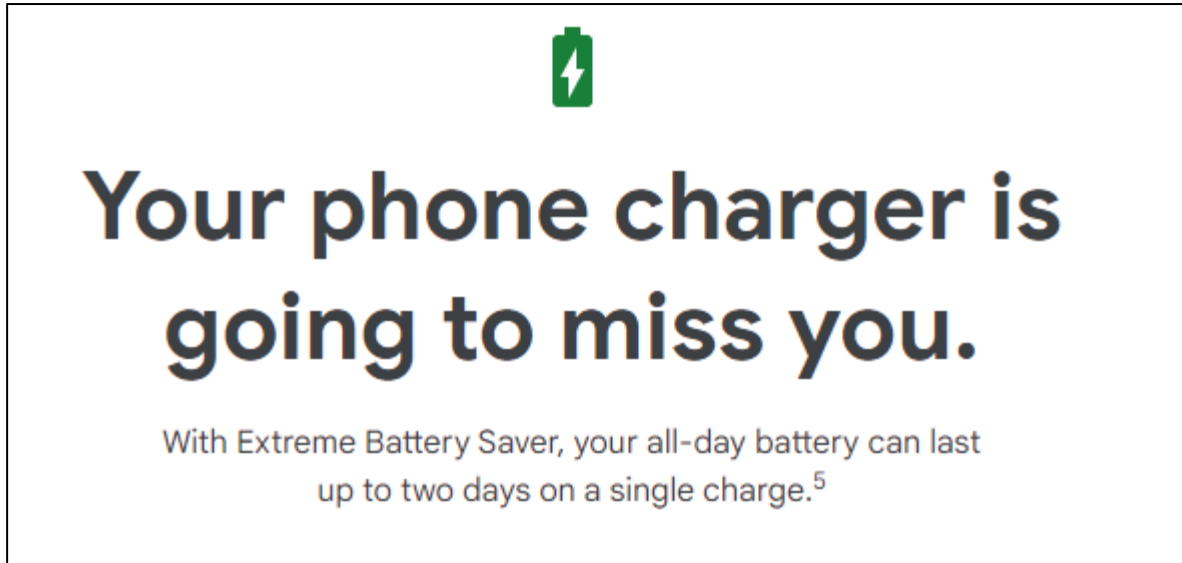
121. Google's authorized retailers, such as Best Buy, and wireless carriers, such as Verizon, directly infringe the '835 Patent by selling the accused Google devices to consumers. Consumers directly infringe the '835 Patent by using the accused Google devices.

122. Google knowingly induced and induces these acts of infringement with the specific intent to encourage them by taking active steps to encourage and facilitate direct infringement by these third parties, in this District and elsewhere in the United States, through its manufacture and sale of the infringing products, and through its creation and dissemination of promotional and marketing materials, supporting materials, instructions, product manuals, and/or technical information relating to the products with knowledge and the specific intent that its efforts will result in the direct infringement of the '835 Patent by these third parties.

123. Such active steps include, for example, advertising and marketing the infringing products to resellers, wireless carriers, and consumers, obtaining FCC approval for such devices to be utilized in the United States, and distributing and selling such devices to consumers and resellers knowing that they would be marketed, offered for sale, and used in the United States. For

example, Google touts that “Your phone charger is going to miss you” and that Pixel batteries “last all day.”³⁸ The QET4100 and/or QET5100 necessarily operate in an infringing manner when the user of an accused Google product connects to mobile networks and accordingly utilizes the power efficiency and short circuit protection functionalities of the QET4100 and/or QET5100.

FIGURE 6



Source: store.google.com

124. Google user guides for the accused products likewise facilitate infringement, instructing consumers about, among other things, how to “[c]onnect to mobile networks on a Pixel phone.”³⁹ By instructing third parties to turn on and use the accused products for infringing purposes, such as to make and receive calls and send and receive data using mobile networks, Google knowingly induces these third parties to commit infringing acts because the power efficiency and short-circuit protection functions of the QET4100 and/or QET5100 necessarily operate.

³⁸ Google, *Google Pixel 5a with 5G* (accessed Jan. 10, 2022), available at:

³⁹ Pixel Phone Help, *Connect to mobile networks on a Pixel phone* (accessed Nov. 23, 2021), available at: <https://support.google.com/pixelphone/answer/2926415?hl=en>.

125. In addition, Google has indirectly infringed and continues to indirectly infringe the '835 Patent as a contributory infringer in violation of 35 U.S.C. § 271(c) by selling or offering to sell in the United States, or importing into the United States, infringing products with knowledge that they are especially designed or adapted to operate in a manner that infringes the '835 Patent and despite the fact that the infringing technology is not a staple article of commerce suitable for substantial non-infringing use. Google knowingly incorporates the QET4100 and QET5100 into the accused Google products such that they operate in an infringing manner. By incorporating such devices into its products, Google contributes to infringing use as consumers make and receive calls and send and receive data through mobile networks using the accused products, which lack substantially non-infringing uses because the accused products are designed and manufactured to operate as smartphones in a manner that infringes the '835 Patent.

Lenovo

126. Lenovo has infringed and continues to infringe at least claim 1 of the '835 Patent in violation of 35 U.S.C. § 271, either literally or through the doctrine of equivalents, by making, using, selling, or offering for sale in the United States, and/or importing into the United States, without authorization, products that practice at least claim 1 of the '835 Patent. Lenovo is liable for its infringement of the '835 Patent pursuant to 35 U.S.C. § 271(a), (b), and (c).

127. More specifically, Lenovo designs, manufactures, assembles, imports, offers for sale, and/or sells mobile devices and computers that incorporate the Qualcomm QET4100 and QET5100 envelope tracking modules, including the QET5100M, which infringe at least independent claim 1 of the '835 Patent.

128. Claim 1 is illustrative of the '835 Patent. It recites “[a] semiconductor device controlling a drive of an insulated gate transistor by generating a control output signal on a basis

of a control input signal, comprising: a driver outputting said control output signal and a short-circuit protection circuit detecting said control output signal and controlling and forcing said driver to stop said control output signal when a detecting voltage of said control output signal exceeds a predetermined reference voltage before a predetermined period passes after said control output signal indicates a conduction of said insulated gate transistor, wherein said short-circuit protection circuit includes: [1] pulse generation circuit receiving said control input signal and outputting a first pulse signal being significant only in said predetermined period according to a timing when said control input signal indicates the conduction of said insulated gate transistor; [2] a comparator receiving the detecting voltage of said control output signal, performing a comparison with said reference voltage and outputting a second pulse signal being significant during a period when the detecting voltage of said control output signal exceeds said reference voltage; and [3] a logical circuit receiving said first and second pulse signals and outputting a stop signal forcing said driver to stop said control output signal when said second pulse signal becomes significant during a period when said first pulse signal is significant.”

129. The Qualcomm QET4100 and QET5100, as incorporated into various of Lenovo’s products, meet every element of this claim.⁴⁰ The QET4100 and QET5100 are semiconductor devices controlling a drive of an insulated gate transistor by generating a control output signal on a basis of a control input signal. For example, in the accused Lenovo products, an insulated gate transistor is present in a power amplifier or other component external to the QET4100 and/or QET5100.

130. The QET4100 and QET5100 contain a driver outputting said control output signal. The QET4100 and QET5100 also contain a short-circuit protection circuit, which detects the

⁴⁰ This description of infringement is illustrative and not intended to be an exhaustive or limiting explanation of every manner in which Lenovo’s products infringe the ’835 Patent.

control output signal. For example, the short-circuit protection circuit in the QET4100 and QET5100 comprises a pulse generator and a comparator, among other components.

131. The short-circuit protection circuit controls and forces the driver to stop the control output signal when the detecting voltage of the control output signal exceeds a predetermined reference voltage within a predetermined period after the insulated gate transistor starts to conduct. For example, the short-circuit protection circuit in the QET4100 and QET5100 detects the control output signal and sends it to a comparator where it is compared with a predetermined reference voltage.

132. The short-circuit protection circuit in the QET4100 and QET5100 includes a pulse generation circuit which receives the control input signal and generates a first pulse signal which is significant only during a predetermined period after the insulated gate transistor starts to conduct.

133. The short-circuit protection circuit in the QET4100 and QET5100 includes a comparator that receives the detecting voltage of the control output signal, performs a comparison with a reference voltage, and outputs a second pulse signal that is significant when the detecting voltage of the control output signal exceeds the reference voltage.

134. The short-circuit protection circuit in the QET4100 and QET5100 also includes a logical circuit which receives the first and second pulse signals and outputs a stop signal forcing the driver to stop the control output signal when the second pulse signal becomes significant during a period when the first pulse signal is significant. For example, in the QET4100, an over-current flag, or OCF, is sent to stop the driver, thereby controlling and forcing said driver to stop the control output signal.

135. Lenovo makes, uses, imports, offers for sale, and/or sells mobile devices and

computers that incorporate the infringing QET4100 or substantially similar envelope tracking modules, including but not limited to ThinkPad X1 Fold Gen1 laptops. Lenovo also makes, uses, imports, offers for sale, and/or sells mobile devices, computers, and components thereof that incorporate the infringing QET5100, or substantially similar envelope tracking modules, including but not limited to the Lenovo YOGA, Lenovo ThinkPad X1 Nano, Lenovo ThinkPad X1 Titanium Yoga, Lenovo Flex 5G Notebook, Motorola Edge+, and Motorola MD1005G.

136. Lenovo has imported and sold, and continues to sell and offer for sale, these mobile devices and computers in the United States, including through Lenovo websites (Lenovo.com and Motorola.com) and Lenovo authorized retailers in the Western District of Texas.

137. Lenovo has committed and is committing the foregoing infringing activities without license from Arigna. Lenovo's acts of infringement have damaged and are damaging Arigna, as owner and assignee of the '835 Patent. Arigna is entitled to recover from Lenovo the damages it has sustained as a result of Lenovo's wrongful acts in an amount subject to proof at trial. Lenovo's infringement of Arigna's rights under the '835 Patent will continue to damage Arigna.

138. Lenovo has had actual knowledge of the '835 Patent beginning no later than the filing of this Complaint. Lenovo's continued infringement following the filing of this Complaint, despite its knowledge of the '835 Patent and Arigna's infringement allegations, has been intentional and deliberate and willful.

139. In addition, Lenovo indirectly infringed, and continues to indirectly infringe, the '835 Patent by actively inducing its infringement in violation of 35 U.S.C. § 271(b).

140. Lenovo's authorized retailers and wireless carriers, such as Verizon, directly infringe the '835 Patent by selling the accused Lenovo devices to consumers. Consumers directly

infringe the '835 Patent by using the accused Lenovo devices.

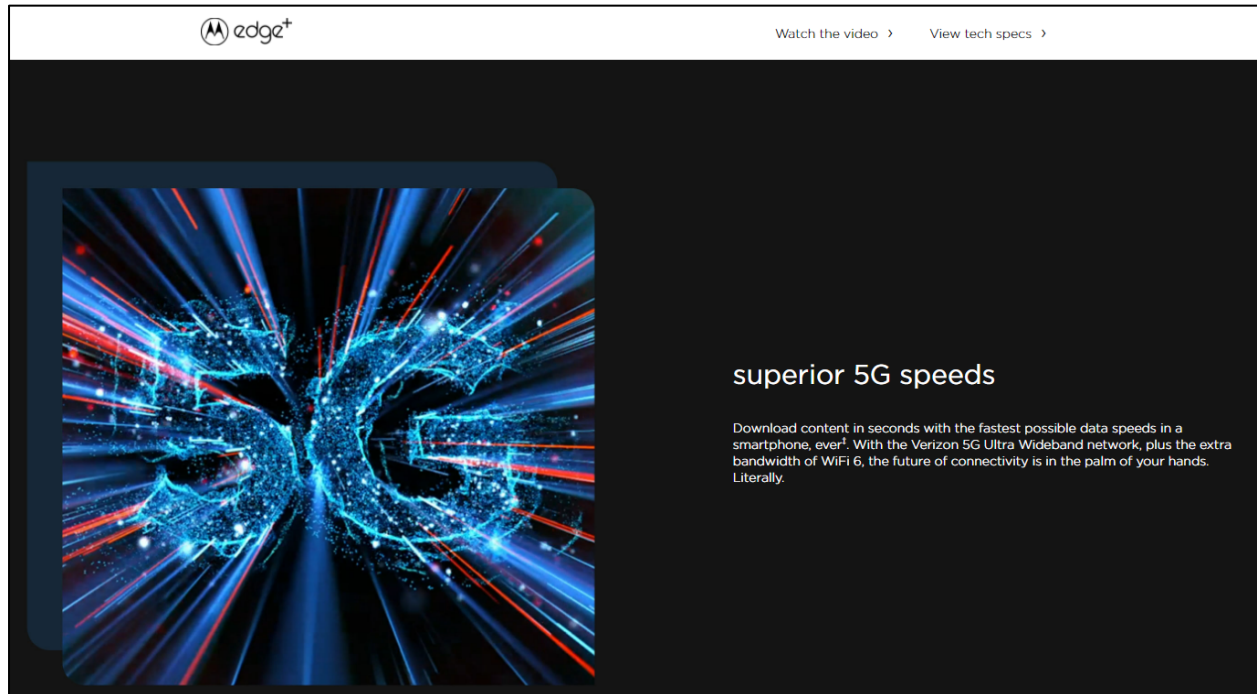
141. Lenovo knowingly induced and induces these acts of infringement with the specific intent to encourage them by taking active steps to encourage and facilitate direct infringement by these third parties, in this District and elsewhere in the United States, through its manufacture and sale of the infringing products, and through its creation and dissemination of promotional and marketing materials, supporting materials, instructions, product manuals, and/or technical information relating to the products with knowledge and the specific intent that its efforts will result in the direct infringement of the '835 Patent by these third parties.

142. Such active steps include, for example, advertising and marketing the infringing products to resellers, wireless carriers, and consumers, obtaining FCC approval for such devices to be utilized in the United States, and distributing and selling such devices to consumers and resellers knowing that they would be marketed, offered for sale, and used in the United States. For example, Lenovo advertises the Motorola Edge+ as offering consumers “superior 5G speeds.”⁴¹ It further promises: “Lightning-fast 5G on the motorola edge+ is capable of over 4 Gbps—speeds never seen before on a smartphone. Whether browsing, streaming, or gaming, you demand performance. No lag time, no interruptions.”⁴² Lenovo further touts the power efficiency of the Motorola Edge+, asserting that users can “go for multiple days on a single charge.”⁴³ The QET4100 and/or QET5100 necessarily operate in an infringing manner when the user of an accused Lenovo product connects to a 5G or other mobile network and accordingly utilizes the power efficiency and short circuit protection functionalities of the QET4100 and/or QET5100. See also, e.g.:

⁴¹ Motorola, *Motorola Edge+* (accessed Jan. 10, 2022), available at: <https://www.motorola.com/us/smartphones-motorola-edge-plus/p>.

⁴² *Id.*

⁴³ *Id.*

FIGURE 7

Source: Motorola.com

143. By instructing third parties to turn on and use the accused products for infringing purposes, such as to make and receive calls and transmit data over mobile networks, Lenovo knowingly induces these third parties to commit infringing acts because the power efficiency and short-circuit protection functions of the QET4100 and/or QET5100 necessarily operate.

144. In addition, Lenovo has indirectly infringed and continues to indirectly infringe the '835 Patent as a contributory infringer in violation of 35 U.S.C. § 271(c) by selling or offering to sell in the United States, or importing into the United States, infringing products with knowledge that they are especially designed or adapted to operate in a manner that infringes the '835 Patent and despite the fact that the infringing technology is not a staple article of commerce suitable for substantial non-infringing use. Lenovo knowingly incorporates the QET4100 and/or QET5100 semiconductor device into the accused Lenovo products such that they operate in an infringing manner. By incorporating such devices into its products, Lenovo contributes to infringing use as

consumers make and receive calls and send and receive data through mobile networks using the accused products, which lack substantially non-infringing uses because the accused products are designed and manufactured to operate as smartphones and computers in a manner that infringes the '835 Patent.

Microsoft

145. Microsoft has infringed and continues to infringe at least claim 1 of the '835 Patent in violation of 35 U.S.C. § 271, either literally or through the doctrine of equivalents, by making, using, selling, or offering for sale in the United States, and/or importing into the United States, without authorization, products that practice at least claim 1 of the '835 Patent. Microsoft is liable for its infringement of the '835 Patent pursuant to 35 U.S.C. § 271(a), (b), and (c).

146. More specifically, Microsoft designs, manufactures, assembles, imports, offers for sale, and/or sells mobile devices and computers, including laptops and tablets, that incorporate Qualcomm QET4100 and/or QET5100 envelope tracking modules, which infringe at least independent claim 1 of the '835 Patent.

147. Claim 1 is illustrative of the '835 Patent. It recites “[a] semiconductor device controlling a drive of an insulated gate transistor by generating a control output signal on a basis of a control input signal, comprising: a driver outputting said control output signal and a short-circuit protection circuit detecting said control output signal and controlling and forcing said driver to stop said control output signal when a detecting voltage of said control output signal exceeds a predetermined reference voltage before a predetermined period passes after said control output signal indicates a conduction of said insulated gate transistor, wherein said short-circuit protection circuit includes: [1] pulse generation circuit receiving said control input signal and outputting a first pulse signal being significant only in said predetermined period according to a timing when

said control input signal indicates the conduction of said insulated gate transistor; [2] a comparator receiving the detecting voltage of said control output signal, performing a comparison with said reference voltage and outputting a second pulse signal being significant during a period when the detecting voltage of said control output signal exceeds said reference voltage; and [3] a logical circuit receiving said first and second pulse signals and outputting a stop signal forcing said driver to stop said control output signal when said second pulse signal becomes significant during a period when said first pulse signal is significant.”

148. The Qualcomm QET4100 and QET5100, as incorporated into various of Microsoft’s products, meet every element of this claim.⁴⁴ The QET4100 and QET5100 are semiconductor devices controlling a drive of an insulated gate transistor by generating a control output signal on a basis of a control input signal. For example, in the accused Microsoft products, an insulated gate transistor is present in a power amplifier or other component external to the QET4100 and/or QET5100.

149. The QET4100 and QET5100 contain a driver outputting said control output signal. The QET4100 and QET5100 also contain a short-circuit protection circuit, which detects the control output signal. For example, the short-circuit protection circuit in the QET4100 and QET5100 comprises a pulse generator and a comparator, among other components.

150. The short-circuit protection circuit controls and forces the driver to stop the control output signal when the detecting voltage of the control output signal exceeds a predetermined reference voltage within a predetermined period after the insulated gate transistor starts to conduct. For example, the short-circuit protection circuit in the QET4100 and QET5100 detects the control output signal and sends it to a comparator where it is compared with a predetermined reference

⁴⁴ This description of infringement is illustrative and not intended to be an exhaustive or limiting explanation of every manner in which Microsoft’s products infringe the ’835 Patent.

voltage.

151. The short-circuit protection circuit in the QET4100 and QET5100 includes a pulse generation circuit which receives the control input signal and generates a first pulse signal which is significant only during a predetermined period after the insulated gate transistor starts to conduct.

152. The short-circuit protection circuit in the QET4100 and QET5100 includes a comparator that receives the detecting voltage of the control output signal, performs a comparison with a reference voltage, and outputs a second pulse signal that is significant when the detecting voltage of the control output signal exceeds the reference voltage.

153. The short-circuit protection circuit in the QET4100 and QET5100 also includes a logical circuit which receives the first and second pulse signals and outputs a stop signal forcing the driver to stop the control output signal when the second pulse signal becomes significant during a period when the first pulse signal is significant. For example, in the QET4100, an over-current flag, or OCF, is sent to stop the driver, thereby controlling and forcing said driver to stop the control output signal.

154. Microsoft makes, uses, imports, offers for sale, and/or sells mobile devices, computers, and components thereof that incorporate the infringing QET4100 envelope tracking module, including but not limited to the Surface Pro X. Microsoft also makes, uses, imports, offers for sale, and/or sells mobile devices, computers, and components thereof that incorporate the Qualcomm QET5100 envelope tracking module, or substantially similar envelope tracking modules, including but not limited to the Surface Pro 7+, Surface Duo 2, and Surface Duo 1930.

155. Microsoft has imported and sold, and continues to sell and offer for sale, these mobile devices and computers in the United States, including through Microsoft websites

(Microsoft.com) and Microsoft authorized retailers in the Western District of Texas.

156. Microsoft has committed and is committing the foregoing infringing activities without license from Arigna. Microsoft's acts of infringement have damaged and are damaging Arigna, as owner and assignee of the '835 Patent. Arigna is entitled to recover from Microsoft the damages it has sustained as a result of Microsoft's wrongful acts in an amount subject to proof at trial. Microsoft's infringement of Arigna's rights under the '835 Patent will continue to damage Arigna.

157. Microsoft has had actual knowledge of the '835 Patent beginning no later than the filing of this Complaint. Microsoft's continued infringement following the filing of this Complaint, despite its knowledge of the '835 Patent and Arigna's infringement allegations, has been intentional and deliberate and willful.

158. In addition, Microsoft indirectly infringed, and continues to indirectly infringe, the '835 Patent by actively inducing its infringement in violation of 35 U.S.C. § 271(b).

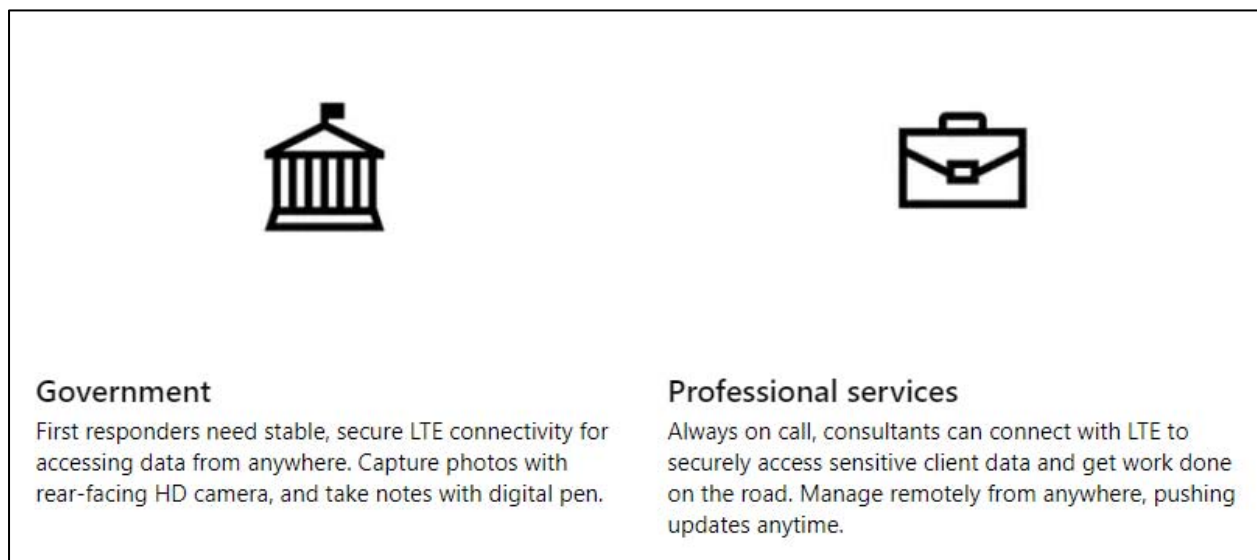
159. Microsoft's authorized retailers, such as Best Buy, directly infringe the '835 Patent by selling the accused Microsoft devices to consumers. Consumers directly infringe the '835 Patent by using the accused Microsoft devices.

160. Microsoft knowingly induced and induces these acts of infringement with the specific intent to encourage them by taking active steps to encourage and facilitate direct infringement by these third parties, in this District and elsewhere in the United States, through its manufacture and sale of the infringing products, and through its creation and dissemination of promotional and marketing materials, supporting materials, instructions, product manuals, and/or technical information relating to the products with knowledge and the specific intent that its efforts will result in the direct infringement of the '835 Patent by these third parties.

161. Such active steps include, for example, advertising and marketing the infringing products to resellers, wireless carriers, and consumers, obtaining FCC approval for such devices to be utilized in the United States, and distributing and selling such devices to consumers and resellers knowing that they would be marketed, offered for sale, and used in the United States. For example, Microsoft advertises that the Surface Pro X offers “Gigabit-speed LTE” that is “[r]eliable, secure, and always-connected.”⁴⁵ Microsoft further touts the power efficiency of the Surface Pro X, telling users to “Focus on your customers, not your battery life.”⁴⁶ The QET4100 and/or QET5100 necessarily operate in an infringing manner when the user of an accused Microsoft product connects to mobile networks and accordingly utilizes the power efficiency and short circuit protection functionalities of the QET4100 and/or QET5100.

162. Microsoft product websites for the accused products likewise facilitate infringement, instructing consumers about, among other things, how to use the devices’ “secure LTE connectivity” to perform specific tasks. See, e.g.:

FIGURE 8



⁴⁵ Microsoft, *Surface Pro X* (accessed Nov. 23, 2021), available at: <https://www.microsoft.com/en-us/surface/business/surface-pro-x>.

⁴⁶ *Id.*

Source: Microsoft.com

163. By instructing third parties to turn on and use the accused products for infringing purposes, such as to send and transmit data through mobile networks, Microsoft knowingly induces these third parties to commit infringing acts because the power efficiency and short-circuit protection functions of the QET4100 and/or QET5100 necessarily operate.

164. In addition, Microsoft has indirectly infringed and continues to indirectly infringe the '835 Patent as a contributory infringer in violation of 35 U.S.C. § 271(c) by selling or offering to sell in the United States, or importing into the United States, infringing products with knowledge that they are especially designed or adapted to operate in a manner that infringes the '835 Patent and despite the fact that the infringing technology is not a staple article of commerce suitable for substantial non-infringing use. Microsoft knowingly incorporates the QET4100 and QET5100 semiconductor devices into the accused Microsoft products such that they operate in an infringing manner. By incorporating such devices into its products, Microsoft contributes to infringing use as consumers send and receive data through mobile networks using the accused products, which lack substantially non-infringing uses because the accused products are designed and manufactured to operate as computers in a manner that infringes the '835 Patent.

OnePlus

165. OnePlus has infringed and continues to infringe at least claim 1 of the '835 Patent in violation of 35 U.S.C. § 271, either literally or through the doctrine of equivalents, by making, using, selling, or offering for sale in the United States, and/or importing into the United States, without authorization, products that practice at least claim 1 of the '835 Patent. OnePlus is liable for its infringement of the '835 Patent pursuant to 35 U.S.C. § 271(a), (b), and (c).

166. More specifically, OnePlus designs, manufactures, assembles, imports, offers for

sale, and/or sells mobile devices, computers, and components thereof that incorporate Qualcomm QET5100 envelope tracking modules, which infringe at least independent claim 1 of the '835 Patent.

167. Claim 1 is illustrative of the '835 Patent. It recites “[a] semiconductor device controlling a drive of an insulated gate transistor by generating a control output signal on a basis of a control input signal, comprising: a driver outputting said control output signal and a short-circuit protection circuit detecting said control output signal and controlling and forcing said driver to stop said control output signal when a detecting voltage of said control output signal exceeds a predetermined reference voltage before a predetermined period passes after said control output signal indicates a conduction of said insulated gate transistor, wherein said short-circuit protection circuit includes: [1] pulse generation circuit receiving said control input signal and outputting a first pulse signal being significant only in said predetermined period according to a timing when said control input signal indicates the conduction of said insulated gate transistor; [2] a comparator receiving the detecting voltage of said control output signal, performing a comparison with said reference voltage and outputting a second pulse signal being significant during a period when the detecting voltage of said control output signal exceeds said reference voltage; and [3] a logical circuit receiving said first and second pulse signals and outputting a stop signal forcing said driver to stop said control output signal when said second pulse signal becomes significant during a period when said first pulse signal is significant.”

168. The Qualcomm QET5100, as incorporated into various of OnePlus's products, meets every element of this claim.⁴⁷ The QET5100 is a semiconductor device controlling a drive of an insulated gate transistor by generating a control output signal on a basis of a control input

⁴⁷ This description of infringement is illustrative and not intended to be an exhaustive or limiting explanation of every manner in which OnePlus's products infringe the '835 Patent.

signal. For example, in the Accused OnePlus Products, an insulated gate transistor is present in a power amplifier or other component external to the QET5100.

169. The QET5100 contains a driver outputting said control output signal. The QET5100 also contains a short-circuit protection circuit, which detects the control output signal. For example, the short-circuit protection circuit in the QET5100 comprises a pulse generator and a comparator, among other components.

170. The short-circuit protection circuit controls and forces the driver to stop the control output signal when the detecting voltage of the control output signal exceeds a predetermined reference voltage within a predetermined period after the insulated gate transistor starts to conduct. For example, the short-circuit protection circuit in the QET5100 detects the control output signal and sends it to a comparator where it is compared with a predetermined reference voltage.

171. The short-circuit protection circuit in the QET5100 includes a pulse generation circuit which receives the control input signal and generates a first pulse signal which is significant only during a predetermined period after the insulated gate transistor starts to conduct.

172. The short-circuit protection circuit in the QET5100 includes a comparator that receives the detecting voltage of the control output signal, performs a comparison with a reference voltage, and outputs a second pulse signal that is significant when the detecting voltage of the control output signal exceeds the reference voltage.

173. The short-circuit protection circuit in the QET5100 also includes a logical circuit which receives the first and second pulse signals and outputs a stop signal forcing the driver to stop the control output signal when the second pulse signal becomes significant during a period when the first pulse signal is significant. For example, in the QET4100, which is substantially similar to the QET5100, an over-current flag, or OCF, is sent to stop the driver, thereby controlling

and forcing said driver to stop the control output signal.

174. OnePlus makes, uses, imports, offers for sale, and/or sells mobile devices, computers, and components thereof that incorporate the infringing QET5100 or substantially similar envelope tracking modules, including but not limited to the OnePlus 7, OnePlus 7 Pro, OnePlus Nord N10 5G, OnePlus Dual 5G AC2001, OnePlus 8, OnePlus 8 Pro, OnePlus 9, and OnePlus 9 Pro.

175. OnePlus has imported and sold and, on information and belief, continues to sell and offer for sale these mobile devices in the United States, including through OnePlus websites (OnePlus.com) and OnePlus authorized retailers in the Western District of Texas.

176. OnePlus has committed and is committing the foregoing infringing activities without license from Arigna. OnePlus's acts of infringement have damaged Arigna, as owner and assignee of the '835 Patent. Arigna is entitled to recover from OnePlus the damages it has sustained as a result of OnePlus's wrongful acts in an amount subject to proof at trial. OnePlus's infringement of Arigna's rights under the '835 Patent will continue to damage Arigna.

177. OnePlus has had actual knowledge of the '835 Patent beginning no later than the filing of this Complaint. OnePlus's continued infringement following the filing of this Complaint, despite its knowledge of the '835 Patent and Arigna's infringement allegations, has been intentional and deliberate and willful.

178. In addition, OnePlus indirectly infringed, and continues to indirectly infringe, the '835 Patent by actively inducing its infringement in violation of 35 U.S.C. § 271(b).

179. OnePlus's authorized retailers, such as Best Buy, and wireless carriers, such as T-Mobile, directly infringe the '835 Patent by selling the accused OnePlus devices to consumers. Consumers directly infringe the '835 Patent by using the accused OnePlus devices.

180. OnePlus knowingly induced and induces these acts of infringement with the specific intent to encourage them by taking active steps to encourage and facilitate direct infringement by these third parties, in this District and elsewhere in the United States, through its manufacture and sale of the infringing products, and through its creation and dissemination of promotional and marketing materials, supporting materials, instructions, product manuals, and/or technical information relating to the products with knowledge and the specific intent that its efforts will result in the direct infringement of the '835 Patent by these third parties.

181. Such active steps include, for example, advertising and marketing the infringing products to resellers, wireless carriers, and consumers, obtaining FCC approval for such devices to be utilized in the United States, and distributing and selling such devices to consumers and resellers knowing that they would be marketed, offered for sale, and used in the United States.

182. OnePlus user guides for the accused products likewise facilitate infringement, instructing consumers about, among other things, how to “turn mobile data on and off” and “customize mobile data settings.” The QET5100 necessarily operates in an infringing manner when the user of an accused OnePlus product connects to mobile networks and accordingly utilizes the power efficiency and short circuit protection functionalities of the QET5100. By instructing third parties to turn on and use the accused products for infringing purposes, such as to make and receive calls and send and receive data through mobile networks, OnePlus knowingly induces these third parties to commit infringing acts.

183. In addition, OnePlus has indirectly infringed and continues to indirectly infringe the '835 Patent as a contributory infringer in violation of 35 U.S.C. § 271(c) by selling or offering to sell in the United States, or importing into the United States, infringing products with knowledge that they are especially designed or adapted to operate in a manner that infringes the '835 Patent

and despite the fact that the infringing technology is not a staple article of commerce suitable for substantial non-infringing use. OnePlus knowingly incorporates the QET5100 semiconductor device into the accused OnePlus products such that they operate in an infringing manner. By incorporating such devices into its products, OnePlus contributes to infringing use as consumers make and receive calls and send and receive data through mobile networks using the accused products, which lack substantially non-infringing uses because the accused products are designed and manufactured to operate as smartphones in a manner that infringes the '835 Patent.

TCL

184. TCL has infringed and continues to infringe at least claim 1 of the '835 Patent in violation of 35 U.S.C. § 271, either literally or through the doctrine of equivalents, by making, using, selling, or offering for sale in the United States, and/or importing into the United States, without authorization, products that practice at least claim 1 of the '835 Patent. TCL is liable for its infringement of the '835 Patent pursuant to 35 U.S.C. § 271(a), (b), and (c).

185. More specifically, TCL designs, manufactures, assembles, imports, offers for sale, and/or sells mobile devices, computers, and components thereof that incorporate Qualcomm QET5100 envelope tracking modules, which infringe at least independent claim 1 of the '835 Patent.

186. Claim 1 is illustrative of the '835 Patent. It recites “[a] semiconductor device controlling a drive of an insulated gate transistor by generating a control output signal on a basis of a control input signal, comprising: a driver outputting said control output signal and a short-circuit protection circuit detecting said control output signal and controlling and forcing said driver to stop said control output signal when a detecting voltage of said control output signal exceeds a predetermined reference voltage before a predetermined period passes after said control output

signal indicates a conduction of said insulated gate transistor, wherein said short-circuit protection circuit includes: [1] pulse generation circuit receiving said control input signal and outputting a first pulse signal being significant only in said predetermined period according to a timing when said control input signal indicates the conduction of said insulated gate transistor; [2] a comparator receiving the detecting voltage of said control output signal, performing a comparison with said reference voltage and outputting a second pulse signal being significant during a period when the detecting voltage of said control output signal exceeds said reference voltage; and [3] a logical circuit receiving said first and second pulse signals and outputting a stop signal forcing said driver to stop said control output signal when said second pulse signal becomes significant during a period when said first pulse signal is significant.”

187. The Qualcomm QET5100, as incorporated into various of TCL’s products, meets every element of this claim.⁴⁸ The QET5100 is a semiconductor device controlling a drive of an insulated gate transistor by generating a control output signal on a basis of a control input signal. For example, in the Accused TCL Products, an insulated gate transistor is present in a power amplifier or other component external to the QET5100.

188. The QET5100 contains a driver outputting said control output signal. The QET5100 also contains a short-circuit protection circuit, which detects the control output signal. For example, the short-circuit protection circuit in the QET5100 comprises a pulse generator and a comparator, among other components.

189. The short-circuit protection circuit controls and forces the driver to stop the control output signal when the detecting voltage of the control output signal exceeds a predetermined reference voltage within a predetermined period after the insulated gate transistor starts to conduct.

⁴⁸ This description of infringement is illustrative and not intended to be an exhaustive or limiting explanation of every manner in which TCL’s products infringe the ’835 Patent.

For example, the short-circuit protection circuit in the QET5100 detects the control output signal and sends it to a comparator where it is compared with a predetermined reference voltage.

190. The short-circuit protection circuit in the QET5100 includes a pulse generation circuit which receives the control input signal and generates a first pulse signal which is significant only during a predetermined period after the insulated gate transistor starts to conduct.

191. The short-circuit protection circuit in the QET5100 includes a comparator that receives the detecting voltage of the control output signal, performs a comparison with a reference voltage, and outputs a second pulse signal that is significant when the detecting voltage of the control output signal exceeds the reference voltage.

192. The short-circuit protection circuit in the QET5100 also includes a logical circuit which receives the first and second pulse signals and outputs a stop signal forcing the driver to stop the control output signal when the second pulse signal becomes significant during a period when the first pulse signal is significant. For example, in the QET4100, which is substantially similar to the QET5100, an over-current flag, or OCF, is sent to stop the driver, thereby controlling and forcing said driver to stop the control output signal.

193. TCL makes, uses, imports, offers for sale, and/or sells mobile devices, computers, and components thereof that incorporate the infringing QET5100 or substantially similar envelope tracking modules, including but not limited to the TCL 20 Pro 5G, TCL 10 5G, and TCL 10 5G UW.

194. TCL has imported and sold and, on information and belief, continues to sell and offer for sale these mobile devices in the United States, including through TCL websites (tcl.com) and TCL authorized retailers in the Western District of Texas.

195. TCL has committed and is committing the foregoing infringing activities without

license from Arigna. TCL's acts of infringement have damaged and are damaging Arigna, as owner and assignee of the '835 Patent. Arigna is entitled to recover from TCL the damages it has sustained as a result of TCL's wrongful acts in an amount subject to proof at trial. TCL's infringement of Arigna's rights under the '835 Patent will continue to damage Arigna.

196. TCL has had actual knowledge of the '835 Patent beginning no later than the filing of this Complaint. TCL's continued infringement following the filing of this Complaint, despite its knowledge of the '835 Patent and Arigna's infringement allegations, has been intentional and deliberate and willful.

197. In addition, TCL indirectly infringed, and continues to indirectly infringe, the '835 Patent by actively inducing its infringement in violation of 35 U.S.C. § 271(b).

198. TCL's authorized retailers, such as Best Buy, and wireless carriers, such as T-Mobile, directly infringe the '835 Patent by selling the accused TCL devices to consumers. Consumers directly infringe the '835 Patent by using the accused TCL devices.

199. TCL knowingly induced and induces these acts of infringement with the specific intent to encourage them by taking active steps to encourage and facilitate direct infringement by these third parties, in this District and elsewhere in the United States, through its manufacture and sale of the infringing products, and through its creation and dissemination of promotional and marketing materials, supporting materials, instructions, product manuals, and/or technical information relating to the products with knowledge and the specific intent that its efforts will result in the direct infringement of the '835 Patent by these third parties.

200. Such active steps include, for example, advertising and marketing the infringing products to resellers, wireless carriers, and consumers, obtaining FCC approval for such devices to be utilized in the United States, and distributing and selling such devices to consumers and

resellers knowing that they would be marketed, offered for sale, and used in the United States.

201. TCL marketing materials for the accused products likewise facilitate infringement, instructing consumers, among other things, to “[h]arness the power of 5G connectivity” and take advantage of “energy-efficient features” in the TCL 20 Pro that promise “around the clock battery.”⁴⁹ The QET5100 necessarily operates in an infringing manner when the user of an accused TCL product connects to mobile networks and accordingly utilizes the power efficiency and short circuit protection functionalities of the QET5100. By instructing third parties to turn on and use the accused products for infringing purposes, such as to make and receive calls and send and receive data through mobile networks, TCL knowingly induces these third parties to commit infringing acts.

202. In addition, TCL has indirectly infringed and continues to indirectly infringe the ’835 Patent as a contributory infringer in violation of 35 U.S.C. § 271(c) by selling or offering to sell in the United States, or importing into the United States, infringing products with knowledge that they are especially designed or adapted to operate in a manner that infringes the ’835 Patent and despite the fact that the infringing technology is not a staple article of commerce suitable for substantial non-infringing use. TCL knowingly incorporates the QET5100 semiconductor device into the accused TCL products such that they operate in an infringing manner. By incorporating such devices into its products, TCL contributes to infringing use as consumers make and receive calls and send and receive data through mobile networks using the accused products, which lack substantially non-infringing uses because the accused products are designed and manufactured to operate as smartphones in a manner that infringes the ’835 Patent.

⁴⁹ TCL.com, *20 Pro 5G* (accessed Feb. 7, 2022), available at: <https://www.tcl.com/us/en/products/mobile/20-series/20-pro-5g-grey-moondundust-gray>.

DEMAND FOR JURY TRIAL

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

PRAYER FOR RELIEF

WHEREFORE, Plaintiff Arigna requests entry of judgment in its favor and against Defendants as follows:

- A. Declaring that Defendants Samsung, Apple, Google, Lenovo, Microsoft, OnePlus, and TCL have each infringed United States Patent No. 7,183,835;
- B. Declaring that Samsung's, Apple's, Google's, Lenovo's, Microsoft's, OnePlus's, and TCL's infringement of United States Patent No. 7,183,835 has been willful and deliberate, at least from the filing of this Complaint;
- C. Awarding damages to Plaintiff in an amount no less than a reasonable royalty for each Defendant's infringement of United States Patent No. 7,183,835, together with treble damages for willful infringement, prejudgment and post-judgment interest, and costs as permitted under 35 U.S.C. § 284;
- D. Awarding attorneys' fees pursuant to 35 U.S.C. § 285 or as otherwise permitted by law; and
- E. Ordering Defendants to pay supplemental damages to Arigna, including any ongoing royalties and interest, with an accounting, as needed; and
- F. Awarding such other costs and further relief as the Court may deem just and proper.

Dated: February 10, 2022

Respectfully submitted,

/s/ Charles L. Ainsworth

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