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Attorneys for Plaintiff
QUALCOMM INCORPORATED

UNITED STATES DISTRICT COURT

SOUTHERN DISTRICT OF CALIFORNIA

QUALCOMM INCORPORATED, Plaintiff, v. APPLE INCORPORATED, Defendant.	Case No. '17CV2398 LAB MDD **COMPLAINT FOR PATENT INFRINGEMENT** **[DEMAND FOR A JURY TRIAL]**

Plaintiff Qualcomm Incorporated ("Qualcomm"), by its undersigned attorneys, alleges, with knowledge with respect to its own acts and on information and belief as to other matters, as follows:

NATURE OF THE ACTION

1. Qualcomm brings this action to compel Apple to cease infringing Qualcomm's patents and to compensate Qualcomm for Apple's extensive infringement of several patented Qualcomm technologies.

2. Qualcomm is one of the world's leading technology companies and a pioneer in the mobile phone industry. Its inventions form the very core of modern mobile communication and enable modern consumer experiences on mobile devices and cellular networks.

3. Since its founding in 1985, Qualcomm has been designing, developing, and improving mobile communication devices, systems, networks, and products. It has invented technologies that transform how the world communicates. Qualcomm developed fundamental technologies at the heart of 2G, 3G, and 4G cellular communications, is one of a handful of companies leading the development of the next-generation 5G standard, and has developed numerous innovative features used in virtually every modern cell phone.

4. Qualcomm also invests in technologies developed by other companies and has acquired companies (and their patented innovative technologies) as part of its emphasis on supporting innovation. Qualcomm's patent portfolio currently includes more than 130,000 issued patents and patent applications worldwide. Hundreds of mobile device suppliers around the world have taken licenses from Qualcomm.

5. Apple is the world's most profitable seller of mobile devices. Its iPhones and other products enjoy enormous commercial success. But without the innovative technology covered by Qualcomm's patent portfolio, Apple's products would lose much of their consumer appeal. Apple was a relatively late entrant in the

mobile device industry, and its mobile devices rely heavily on the inventions of Qualcomm and other companies that Qualcomm has invested in. Nearly a decade before Apple released the iPhone, Qualcomm unveiled its own full-feature, top-of-the-line smartphone. According to CNN's 1999 holiday buying guide, Qualcomm's pdQ 1900 "lets you make calls, keep records, send email, browse the web and run over a thousand different applications, all while on the go. Although a cell phone, it is one of the first truly portable, mobile and multipurpose Internet devices."[1] While Qualcomm no longer markets phones directly to consumers, it continues to lead the development of cutting-edge technologies that underpin a wide range of important wireless-device features. Other companies, like Apple, now manufacture and market phones that feature Qualcomm's innovations and the innovations of other technology pioneers that Qualcomm invested in.

6. Qualcomm's innovations in the mobile space have influenced all modern smartphones, and Apple—like other major mobile device makers—utilizes Qualcomm's technologies. Qualcomm's patented features enable and enhance popular features that drive consumer demand, for example: power-efficient radio frequency (RF) transceiver technologies that support enhanced carrier aggregation, improve battery life, and reduce signal interference; innovative designs for components of processors and memory arrays that decrease power consumption and improve device performance; and advanced image processing techniques that allow users to recreate photographic effects that typically require bulky and expensive camera equipment , among many others.

7. In short, Qualcomm invented many core technologies that make the iPhone (and other smartphones and mobile devices) desirable to consumers in their daily lives.

[1] http://edition.cnn.com/1999/TECH/ptech/12/03/qualcomm.pdq/.

8. While Apple built the most successful consumer products in history by relying significantly on technologies pioneered by Qualcomm, Apple refuses to pay for those technologies. Apple's founder boasted that Apple "steals" the great ideas of others—specifically, that "we have always been shameless about stealing great ideas."[2] Apple employees likewise admit that Apple—a relatively late entrant in the mobile space—did not invent many of the iPhone's features. Instead, Apple incorporated, marketed, and commercialized the work of others: "I don't know how many things we can come up with that you could legitimately claim we did first. . . . We had the first commercially successful version of many features but that's different than launching something to market first."[3]

9. Rather than pay Qualcomm for the technology Apple uses, Apple has taken extraordinary measures to avoid paying Qualcomm for the fair value of Qualcomm's patents. On January 20, 2017, Apple sued Qualcomm in this district, asserting an array of excuses to avoid paying fair-market, industry-standard rates for the use of certain of Qualcomm's pioneering patents that are critical to a modern smartphone like the iPhone. *See* Case No. 3:17-cv-00108-GPC-MDD. Apple also encouraged the companies that manufacture the iPhone to breach their contracts with Qualcomm by refusing to pay for the Qualcomm technology in iPhones, something that those manufacturers had done for many years, without complaint, before Apple's direction to stop. Further, Apple misled governmental agencies

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[2] Interview with Steve Jobs, available at https://www.youtube.com/watch?v=CW0DUg63lqU ("Picasso had a saying, 'good artists copy, great artists steal.' And we have always been shameless about stealing great ideas.").

[3] April 2010 email from Apple's iPhone Product Marketing Manager, Steve Sinclair, reported in: Rick Merritt, *Schiller 'shocked at 'copycat' Samsung phone*, Embedded (Aug. 3, 2012), http://www.embedded.com/print/4391702 (April 21, 2017 snapshot of page, accessed via Google's cache).

around the world into investigating Qualcomm in an effort to indirectly exert leverage over Qualcomm.

10. Many of Qualcomm's patents are essential to certain cellular or other standards ("Standard Essential Patents"), such that the use of an underlying technological standard would require use of the patent. Qualcomm also owns a wide range of non-standard-essential patents for inventions in various technologies related to mobile devices.

11. In this suit, Qualcomm asserts a set of non-standard-essential patents infringed by Apple's mobile electronic devices. The patents asserted in this suit represent only a small fraction of the Qualcomm non-standard-essential patents that Apple uses without a license.

12. Qualcomm repeatedly offered to license its patents to Apple. But Apple has repeatedly refused offers to license Qualcomm's patents on reasonable terms. Qualcomm therefore seeks to enforce its rights in the patents identified below and to address and remedy Apple's flagrant infringement of those patents.

PARTIES

13. Qualcomm is a Delaware corporation with its principal place of business at 5775 Morehouse Drive, San Diego, California. Since 1989, when Qualcomm publicly introduced Code Division Multiple Access ("CDMA") as a commercially successful digital cellular communications standard, Qualcomm has been recognized as an industry leader and innovator in the field of mobile devices and cellular communications. Qualcomm owns more than 130,000 patents and patent applications around the world relating to cellular technologies and many other valuable technologies used by mobile devices. Qualcomm is a leader in the development and commercialization of wireless technologies and the owner of the world's most significant portfolio of cellular technology patents. Qualcomm derives a substantial portion of its revenues and profits from licensing its intellectual

property. Qualcomm is also a world leader in the sale of chips, chipsets, and associated software for mobile phones and other wireless devices.

14. Apple is a corporation organized and existing under the laws of the State of California, with its principal place of business at 1 Infinite Loop, Cupertino, California. Apple designs, manufactures, and sells throughout the world a wide range of products, including mobile devices that incorporate Qualcomm's multi-touch-gesture, autofocus, multitasking-interface, quick-charging, and machine-learning patents.

JURISDICTION AND VENUE

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

16. This Court has personal jurisdiction over Apple because it is organized and exists under the laws of California.

17. Venue is proper in this District pursuant to 28 U.S.C. § 1391(b) and (c) and 28 U.S.C. § 1400(b). Venue is appropriate under 28 U.S.C. § 1400(b) at least because Apple is incorporated in California and because Apple has committed acts of infringement and has a regular and established place of business in this district. Apple's acts of infringement in this district include but are not limited to sales of the Accused Products at Apple Store locations in this district, including but not limited to 7007 Friars Road, San Diego, CA 92108 and 4505 La Jolla Village Drive, San Diego, CA 92122.

STATEMENT OF FACTS

Qualcomm Background

18. Qualcomm was founded in 1985 when seven industry visionaries came together to discuss the idea of providing quality communications. For more than 30 years, Qualcomm has been in the business of researching, designing, developing,

and selling innovative semiconductor and cellular technology and products for the telecommunications and mobile technology industries.

19. When Qualcomm was founded, cellular phones were cumbersome, heavy, and expensive devices that supplied inconsistent voice communications—audio quality was poor, users sometimes heard portions of others' calls, handoffs were noisy, and calls frequently dropped. Qualcomm played a central role in the revolutionary transformation of cellular communications technologies. Today, cellular devices are remarkably powerful and can deliver reliable voice service and lightning-fast data to billions of consumers around the world at affordable prices.

20. Qualcomm is now one of the largest technology, semiconductor, and telecommunications companies in the United States. It employs over 18,000 people in the United States, 68 percent of whom are engineers, and it occupies more than 92 buildings (totaling over 6.5 million sq. ft.) in seventeen states and the District of Columbia.

21. Qualcomm's industry-leading research and development efforts, focused on enabling cellular systems and products, are at the core of Qualcomm's business. Since its founding, Qualcomm has invested tens of billions of dollars in research and development related to cellular, wireless communications, and mobile processor technology. Qualcomm's massive research and development investments have produced numerous innovations. Because of this ongoing investment, Qualcomm continues to drive the development and commercialization of successive generations of mobile technology and is one of a handful of companies leading the development of the next-generation 5G standard.

22. In addition to Qualcomm's investments in research and development internally, Qualcomm has a rich history of investing in and acquiring technologies developed by other industry leaders. By purchasing companies and patents from companies who desire to sell their innovations, Qualcomm fosters innovation by

enabling those companies to realize a return on their research and development investments and, therefore, incentivizes additional research and development.

23. As a result of the strength and value of Qualcomm's patent portfolio, virtually every major handset manufacturer in the world has taken a royalty-bearing license to Qualcomm's patent portfolio. The licenses to Qualcomm's patents allow manufacturers to use numerous forms of critical and innovative Qualcomm technology without having to bear the multi-billion dollar, multi-year costs of developing those innovations themselves.

Apple Background

24. Apple has built the most profitable company in the world, thanks in large part to products that rely on Qualcomm's patented technologies. With a market capitalization of more than $700 billion, $246 billion in cash reserves, and a global sphere of influence, Apple has more money and more influence than many countries. Relying heavily on Qualcomm technology and technology Qualcomm has acquired, Apple has become the dominant player in mobile device sales. Apple's dominance has grown every year since the iPhone's launch in 2007. In recent years, Apple has captured upwards of *90 percent of all profits* in the smartphone industry.

Qualcomm's Technology Leadership

25. The asserted patents reflect the breadth of Qualcomm's dedication and investment in research and development relating to wireless technology and mobile electronic devices. Qualcomm invented numerous proprietary solutions that are used to optimize products around the globe. Many of these inventions are reflected in Qualcomm's non-standard-essential patents, such as the patents asserted in this case.

26. As mobile electronic devices have become more powerful with greater functionality, device manufacturers have faced numerous problems with power consumption, signal interference, and the performance and efficiency of processors

and memory arrays, among others. Device manufacturers have also sought to provide more advanced features to users, particularly with regard to photography and image processing.

27. The asserted patents disclose and claim Qualcomm technologies that address many of these needs, including RF transceiver technologies that reduce power consumption and signal interference, power-efficient and high-performance architectures for processor and memory components, and advanced image processing techniques to recreate the popular "bokeh" photographic effect using a dual-camera mobile electronic device.

28. For example, Apple has touted the capability of its newest mobile electronic devices to support "carrier aggregation" technology. This means that a mobile device can receive portions of a single input on multiple carriers at the same time to increase the bandwidth of a user. Qualcomm has pioneered and patented technologies that allow mobile electronic devices to support carrier aggregation while maintaining high power efficiency. These include the '356 patent, which relates to the use of low noise amplifiers (LNAs) to flexibly receive and amplify RF signals. As a result of the invention of the '356 patent, mobile devices can consume less power and significantly reduce the number of receiver input signal paths for a RF transceiver when deploying carrier aggregation technology.

29. As another example, Qualcomm has pioneered techniques that allow mobile electronic devices to support carrier aggregation technology while avoiding signal interferences that can make it difficult or impossible to recover information from a signal. The '336 patent describes a technique of grouping and amplifying RF signals in two stages that reduces signal interference without increasing the complexity of signal routing pathways. As a result of the invention of the '336 patent, RF transceivers in mobile devices can support carrier aggregation and address signal interference without increasing routing complexity, which increases cost and can negatively impact performance.

30. Qualcomm has also invested substantially in developing innovative designs for mobile device processors and memory arrays that enhance device performance and lower power consumption. For example, the '674 patent relates to an improved design for the power on / off control network (POC network) component of a device's processor. The POC network communicates to input/output (I/O) circuits whether core devices are on or off, which is desirable in order to have I/O devices operate effectively. The '674 patent describes a POC network design that reduces the leakage of electrical current while improving the system's speed of detection of on / off states. The invention of the '674 patent thus improves processor performance while reducing power consumption and improving battery life for the device. As another example, in the '002 patent Qualcomm disclosed an improved memory array design that reduces the power consumption due to generating clock signals. As a result of the invention of the '002 patent, mobile devices can operate with lower power consumption and higher speed, which improves the devices' battery life and efficiency.

31. As a final example, Qualcomm's innovations have enabled advanced mobile device features that generate high demand among users, including in the areas of photography and image processing. For instance, the '633 patent relates to depth-based image enhancement, and specifically the use of depth computed from two spatially offset images to enhance regions of a monocular image. Mobile devices with dual cameras, including certain Apple devices, use this invention to perform high quality simulations of photographic effects (such as the so-called "bokeh" effect) that can otherwise be generated only with bulky and expensive camera equipment. In fact, Apple's Senior Vice President of Worldwide Marketing described the iPhone 7 Plus's ability to "create a depth map of [an] image from [its]

two cameras . . . and apply a beautiful blur to the background" as "a huge breakthrough in what can be done in a smartphone in photography."[4]

The Accused Devices

32. As set forth below, a variety of Apple's devices—including certain of Apple's iPhones—practice one or more of the Patents-in-Suit.

The Patents-in-Suit

33. The following patents are infringed by Apple ("Patents-in-Suit"): U.S. Patent No. 9,154,356 ("the '356 patent"), U.S. Patent No. 9,473,336 ("the '336 patent"), U.S. Patent No. 8,063,674 ("the '674 patent"), U.S. Patent 7,693,002 ("the '002 patent"), and U.S. Patent No. 9,552,633 ("the '633 patent").

34. As described below, Apple has been and is still infringing, contributing to infringement, and/or inducing others to infringe the Patents-in-Suit by making, using, offering for sale, selling, or importing devices that practice the Patents-in-Suit. Apple's acts of infringement have occurred within this District and elsewhere throughout the United States.

U.S. Patent No. 9,154,356

35. The '356 patent was duly and legally issued on October 6, 2015 to Qualcomm, which is the owner of the '356 patent and has the full and exclusive right to bring actions and recover damages for Apple's infringement of the '356 patent. The '356 patent is valid and enforceable. A copy of the '356 patent is attached hereto as Exhibit A.

36. The '356 patent relates generally to RF transceivers using low noise amplifiers (LNAs) to support carrier aggregation. The '356 patent discloses a multi-stage LNA circuit topology, where each amplifier stage can be independently controlled to receive and amplify a common input RF signal and provide an output

[4] https://singjupost.com/apple-iphone-7-keynote-september-2016-launch-event-full-transcript/8/

RF signal to a separate load circuit. The topology flexibly supports multiple I/Q mixer/downconverter loads for a corresponding number of component carriers at different frequencies. As a result of the invention of the '356 patent, mobile devices can more efficiently deploy carrier aggregation technology and have longer battery life.

U.S. Patent No. 9,473,336

37. The '336 patent was duly and legally issued on October 18, 2016 to Qualcomm, which is the owner of the '336 patent and has the full and exclusive right to bring action and recover damages for Apple's infringement of the '336 patent. The '336 patent is valid and enforceable. A copy of the '336 patent is attached hereto as Exhibit B.

38. The '336 patent relates generally to RF transceivers for use with carrier aggregation technology. With the advent of carrier aggregation technology, RF transceivers in mobile devices must be designed to handle an increasing number of different frequencies in multiple communication bands. In many cases, receivers include multiple signal paths, which must be subject to stringent isolation requirements to prevent signal interference, which can make recovering information from a signal difficult or impossible. The '336 patent discloses a two-stage amplification of RF signals, where carrier signals are grouped into carrier groups including a respective portion of the carrier signals in a first stage amplifier module and provided to second stage amplifiers. The first stage amplifier includes multiple low noise amplifiers (LNAs) that generate amplified outputs each having a portion of the carrier signals and a routing module that provides the amplified outputs to different output ports. Second stage amplifiers then amplify the carrier groups to generate second stage output signals that may be output to different demodulation stages that demodulate a selected carrier signal. Without the invention of the '336 patent, RF transceivers would not be able to address issues of interference without

increasing the routing complexity of the design, which increases cost and can impact performance.

U.S. Patent No. 8,063,674

39. The '674 patent was duly and legally issued on November 22, 2011 to Qualcomm, which is the owner of the '674 patent and has the full and exclusive right to bring action and recover damages for Apple's infringement of the '674 patent. The '674 patent is valid and enforceable. A copy of the '674 patent is attached hereto as Exhibit C.

40. The '674 patent relates generally to an improved power up / power down detector for computing devices with integrated circuits requiring multiple voltages. The power on / power off control (POC network) of a device is a component of a processor that communicates to input/output (I/O) circuits whether core devices are on or off, which is desirable in order to have I/O devices operate effectively. The '674 patent describes an improved design for a POC network architecture that uses power up / down detectors to detect the on / off state of the core devices on the POC network, processing circuitry to generate signals depending on their power state, and feedback circuits to adjust electrical current capacity in the POC network in order to reduce the leakage of that current while improving the speed with which the system detects the on/off state of the core devices. The invention of the '674 patent thereby improves the performance of the POC network and processor while also reducing power consumption and improving the battery life of the computing device.

U.S. Patent No. 7,693,002

41. The '002 patent was duly and legally issued on April 6, 2010 to Qualcomm, which is the owner of the '002 patent and has the full and exclusive right to bring action and recover damages for Apple's infringement of the '002 patent. The '002 patent is valid and enforceable. A copy of the '002 patent is attached hereto as Exhibit D.

42. The '002 patent relates generally to an improved memory array design that saves power. Specifically, the '002 patent discloses improved designs for wordline drivers, which are components connected to memory arrays. The design allows for the selective application of clock signals to activate groups of wordline drivers, which reduces the power consumption due to generating clock signals relative to previous designs. As a result of the invention of the '002 patent, computing devices can operate with lower power consumption and higher speed, which in turn prolongs the battery life and efficiency of those devices.

U.S. Patent No. 9,552,633

43. The '633 patent was duly and legally issued on January 24, 2017 to Qualcomm, which is the owner of the '633 patent and has the full and exclusive right to bring action and recover damages for Apple's infringement of the '633 patent. The '633 patent is valid and enforceable. A copy of the '633 patent is attached hereto as Exhibit E.

44. The '633 patent relates generally to depth-based image enhancement, and specifically the use of depth computed from multiple images. The '633 patent discloses using two images to generate a depth map and enhance a portion of the scene. As a result of the invention of the '633 patent, mobile device cameras are now able to perform a high quality simulation of the "bokeh effect," a popular artistic photography effect that emphasizes a portion of the scene, giving a 3D effect to the photograph without the use of bulky and expensive high-end cameras and lenses.

COUNT 1 (PATENT INFRINGEMENT – U.S. PATENT NO. 9,154,356)

45. Qualcomm repeats and re-alleges the allegations of paragraphs 1 through 44 above as if fully set forth herein.

46. Qualcomm is the lawful owner of the '356 patent and has the full and exclusive right to bring actions and recover damages for Apple's infringement of said patent.

47. In violation of 35 U.S.C. § 271, Apple has been and is still infringing, contributing to infringement, and/or inducing others to infringe the '356 patent by making, using, offering for sale, selling, or importing mobile devices that practice the patent, including but not limited to the Apple iPhone 7, Apple iPhone 7 Plus, and on information and belief, Apple iPhone 8, Apple iPhone 8 Plus, and Apple iPhone X.

48. Each of the Apple iPhone 7 and Apple iPhone 7 Plus, and on information and belief, Apple iPhone 8, Apple iPhone 8 Plus, and Apple iPhone X is equipped with RF transceivers that contain multi-stage low noise amplifiers (LNAs) with at least a first amplifier stage and a second amplifier stage, each of which is configured to be independently enabled or disabled, to receive and amplify an input RF signal in carrier aggregation, and to provide an output RF signal, where the output signals of the different amplifier stages include distinct carriers.

49. The accused devices infringe at least claims 1, 7, 8, 10, 11, 17, and 18 of the '356 patent.

50. The accused devices infringe claims 1 and 17 of the '356 patent as follows. Each of the Apple iPhone 7 and Apple iPhone 7 Plus is an apparatus that contains two multimode RF transceivers, such as, for example, Intel PMB5750 Multimode RF Transceivers (the "iPhone 7 transceivers"). Each iPhone 7 transceiver includes a first amplifier stage with circuitry that allows the first amplifier stage to be independently enabled or disabled. The first amplifier stage receives and amplifies an input RF signal and provides an output RF signal to a load circuit comprising an I/Q mixer core. Each iPhone 7 transceiver also includes a second amplifier stage with separate enable circuitry, which receives and amplifies the input RF signal and provides a second output RF signal to a second load circuit

comprising an I/Q mixer core. As the Apple iPhone 7 and Apple iPhone 7 Plus each supports LTE downlink carrier aggregation across many operating bands and carriers, the input RF signal employs carrier aggregation comprising transmissions sent on multiple carriers at different frequencies. The first output RF signal provided by the first amplifier stage includes at least a first carrier of the multiple carriers, and the second output RF signal provided by the second amplifier stage includes at least a second carrier of the multiple carriers that is different from the first carrier. On information and belief, the Apple iPhone 8, Apple iPhone 8 Plus, and Apple iPhone X each includes an infringing amplifier design. Thus, the accused devices infringe claims 1 and 17 of the '356 patent.

51. With respect to claims 7 and 8, each iPhone 7 transceiver further contains a feedback circuit including a resistor and a capacitive network that is coupled between the output and input of the first amplifier stage, as well as a second feedback circuit including a resistor and a capacitive network that is coupled between the output and input of the second amplifier stage. On information and belief, the Apple iPhone 8, Apple iPhone 8 Plus, and Apple iPhone X each includes an infringing amplifier design. Thus, the accused devices infringe claims 7 and 8 of the '356 patent.

52. With respect to claim 10, each iPhone 7 transceiver further contains an input shunt switch with a large shunt resistor that is coupled to the first and second amplifier stages and configured to receive the input RF signal. On information and belief, the Apple iPhone 8, Apple iPhone 8 Plus, and Apple iPhone X each includes an infringing amplifier design. Thus, the accused devices infringe claim 10 of the '356 patent.

53. With respect to claim 11, each iPhone 7 transceiver further includes an input matching circuit coupled to the first and second amplifier stages and configured to receive a receiver input signal and provide the input RF signal. Each of the first and second amplifier stages in the iPhone 7 transceiver has a common

receiver input signal coupled to an input matching circuit with both a series inductor and shunt inductor to ground potential on the main circuit board adjacent to the corresponding transceiver input. On information and belief, the Apple iPhone 8, Apple iPhone 8 Plus, and Apple iPhone X each includes an infringing amplifier design. Thus, the accused devices infringe claim 11 of the '356 patent.

54. With respect to claim 18, the first amplifier stage of each iPhone 7 transceiver can be enabled with an enable signal to obtain the first output RF signal, and the second amplifier stage can be enabled with a second enable signal to obtain the second output RF signal. As the amplifier stages can be independently enabled or disabled, the first amplifier stage can also be enabled with the first enable signal while the second amplifier stage is not enabled in order to obtain the first output RF signal but not the second output RF signal. On information and belief, the Apple iPhone 8, Apple iPhone 8 Plus, and Apple iPhone X each performs the infringing method. Thus, the accused devices infringe claim 18 of the '356 patent.

55. On information and belief, Apple is currently, and unless enjoined, will continue to, actively induce and encourage infringement of at least claims 17 and 18 of the '356 patent. Apple has known of the '356 patent at least since the time this complaint was filed and served on Apple. On information and belief, Apple nevertheless actively encourages others to infringe the '356 patent. On information and belief, Apple knowingly induces infringement by others, including resellers, retailers, and end users of the accused devices. For example, Apple knows of the '356 patent and the aspects of the accused devices that constitute infringement of such patent, yet Apple instructs and assists others, such as resellers, retailers, and end users, in carrying out such infringement. Further, Apple possesses a specific intent to cause others, including resellers, retailers, and end users, to infringe the '356 patent. For example, Apple affirmatively intended to cause others to directly infringe the '356 patent through its instructions contained in its user manuals and marketing materials. These facts give rise to a reasonable inference that Apple

knowingly induces others, including resellers, retailers, and end users, to directly infringe the '356 patent, and that Apple possesses a specific intent to cause such infringement.

56. Apple also contributes to infringement of the '356 patent by selling for importation into the United States, importing into the United States, and/or selling within the United States after importation the accused devices and the non-staple constituent parts of those devices, which are not suitable for substantial non-infringing use and which embody a material part of the invention described in the '356 patent. These mobile electronic devices are known by Apple to be especially made or especially adapted for use in the infringement of the '356 patent. Apple also contributes to the infringement of the '356 patent by selling for importation into the United States, importing into the United States, and/or selling within the United States after importation components, such as the chipsets or software containing the infringing functionality, of the accused devices, which are not suitable for substantial non-infringing use and which embody a material part of the invention described in the '356 patent. These mobile devices are known by Apple to be especially made or especially adapted for use in the infringement of the '356 patent. Specifically, on information and belief, Apple sells the accused devices to resellers, retailers, and end users with knowledge that the devices are used for infringement. End users of those mobile electronic devices directly infringe the '356 patent.

57. Apple's acts of infringement have occurred within this District and elsewhere throughout the United States.

58. Qualcomm has been damaged and will suffer additional damages and irreparable harm unless Apple is enjoined from further infringement. Qualcomm will prove its irreparable harm and damages at trial.

COUNT 2 (PATENT INFRINGEMENT – U.S. PATENT NO. 9,473,336)

59. Qualcomm repeats and re-alleges the allegations of paragraphs 1 through 58 above as if fully set forth herein.

60. Qualcomm is the lawful owner of the '336 patent, and has the full and exclusive right to bring actions and recover damages for Apple's infringement of said patent.

61. In violation of 35 U.S.C. § 271, Apple has been and is still infringing, contributing to infringement, and/or inducing others to infringe the '336 patent by making, using, offering for sale, selling, or importing mobile devices that practice the patent, including but not limited to, the Apple iPhone 8, Apple iPhone 8 Plus, and on information and belief, Apple iPhone X.

62. Each of the Apple iPhone 8, Apple iPhone 8 Plus, and on information and belief, Apple iPhone X includes a first stage amplifier with multiple LNAs configured to amplify received carrier signals and generate amplified outputs each having a portion of the carrier signals. The first stage amplifier of the Apple iPhone 8, Apple iPhone 8 Plus, and on information and belief, Apple iPhone X includes a routing module that provides the amplified outputs to different output ports. Each of the Apple iPhone 8, Apple iPhone 8 Plus, and on information and belief, Apple iPhone X further includes second stage amplifiers, each configured to amplify a respective first stage carrier group to generate second stage output signals that each may be output to a different demodulation stage.

63. The accused devices infringe at least claim 4 of the '336 patent.

64. The accused devices infringe claim 4 of the '336 patent as follows. Each of the Apple iPhone 8 and Apple iPhone 8 Plus includes a first stage amplifier configured to amplify received carrier signals to generate at least one first stage carrier group. On information and belief, the first stage amplifier includes a first low noise amplifier (LNA) configured to amplify the received carrier signals to generate a first amplified output and a second amplified output. On information and belief, the first amplified output has a first portion of the carrier signals and the second amplified output has a second portion of the carrier signals. On information and belief, the first stage amplifier further includes a second LNA configured to

amplify the received carrier signals to generate a third amplified output and a fourth amplified output. On information and belief, the third amplified output has the first portion of the carrier signals and the fourth amplified output has the second portion of the carrier signals. On information and belief, the first stage amplifier further includes a routing module configured to route one of the first, second, third, and fourth amplified outputs to a first output port and to route one of the first, second, third, and fourth amplified outputs to a second output port. Each of the Apple iPhone 8 and Apple iPhone 8 Plus further includes second stage amplifiers configured to amplify the at least one first stage carrier group, each second stage amplifier configured to amplify a respective first stage carrier group to generate second stage output signals. On information and belief, the Apple iPhone X includes an infringing amplifier design. Thus, the accused devices infringe claim 4 of the '336 patent.

65. Apple's acts of infringement have occurred within this District and elsewhere throughout the United States.

66. Qualcomm has been damaged and will suffer additional damages and irreparable harm unless Apple is enjoined from further infringement. Qualcomm will prove its irreparable harm and damages at trial.

COUNT 3 (PATENT INFRINGEMENT – U.S. PATENT NO. 8,063,674)

67. Qualcomm repeats and re-alleges the allegations of paragraphs 1 through 66 above as if fully set forth herein.

68. Qualcomm is the lawful owner of the '674 patent and has the full and exclusive right to bring actions and recover damages for Apple's infringement of said patent.

69. In violation of 35 U.S.C. § 271, Apple has been and is still infringing, contributing to infringement, and/or inducing others to infringe the '674 patent by making, using, offering for sale, selling, or importing devices that practice the patent, including but not limited to the Apple iPhone 7 and Apple iPhone 7 Plus.

70. The accused devices include a multiple supply voltage device with a power-on-control (POC) network that includes a power up/down detector configured to detect a power state of the core network, processing circuitry coupled to the power up/down detector and configured to generate a control signal based on the power state, and at least one feedback circuit coupled to the power up/down detector and configured to provide feedback signals to adjust a current capacity of the power up/down detector.

71. The accused devices infringe at least claims 1, 5, 6, 7, 8, 12, 16, 17, 18, 21, and 22 of the '674 patent.

72. The accused devices infringe claim 1 of the '674 patent as follows. Each of the Apple iPhone 7 and Apple iPhone 7 Plus includes the Apple A10 processor, which includes a multiple supply voltage device. The A10 processor includes a core network at a first voltage and a control network coupled to the core network wherein the control network transmits a control signal. The control network of the A10 processor includes an up/down detector that detects a power state of the core network, processing circuitry coupled to the up/down detector that generates the control signal based on the power state of the core network, and at least one feedback circuit coupled to the up/down detector that provides feedback signals to adjust a current capacity of the up/down detector. The control network of the A10 processor further includes a first transistor coupled to a second supply voltage that switches on when the first supply voltage is powered down and switches off when the first supply voltage is powered on, a second transistor coupled in series with the first transistor that switches on when the first supply voltage is powered on and switches off when the first supply voltage is powered down, and a third transistor coupled in series between the first and second transistor. Thus, the accused devices infringe claim 1 of the '674 patent.

73. With respect to claim 5, the multiple supply voltage device of each of the Apple iPhone 7 and Apple iPhone 7 Plus further includes an input/output (I/O)

network operative at a second supply voltage. The I/O network is coupled to the core network and control network and is configured to receive the control signal generated by the control network. Thus, the accused devices infringe claim 5 of the '674 patent.

74. With respect to claim 12, on information and belief, the accused devices further detect a power-down of a second supply voltage by receiving a logic-low signal at a control gate of the first and second transistors, wherein the first transistor switches on and the second transistor switches off in response to the logic-low signal, and transmitting a detection signal to a signal processor from the first transistor based on the received logic-low signal. Thus, the accused devices infringe claim 12 of the '674 patent.

75. With respect to claim 16, the accused devices apply the multiple supply voltage device in the Apple iPhone 7 and Apple iPhone 7 Plus, each of which is an electronic device that is at least a music player, video player, entertainment unit, navigation device, communications device, personal digital assistant (PDA), and/or a computer, and into which a semiconductor device is integrated. Thus, the accused devices infringe claim 16 of the '674 patent.

76. With respect to claims 8 and 17, the accused devices include a system with means for reducing, and perform a method for reducing, power consumption in a power on/off control (POC) network of a multiple supply voltage device. As described for the multiple supply voltage device included in the Apple iPhone 7 and Apple iPhone 7 Plus, the control network in the A10 processor detects a power-on or power-down of a second supply voltage while a first supply voltage is already on and respectively decreases or increases a current capacity of a power on/off detector in response to the power-on or power-down detection. The control network receives a logic-high signal at a control gate of a first transistor that switches off in response, a second transistor that switches on in response, and a third transistor coupled in series between the first and second transistors. On information and belief, the

control network transmits a detection signal to a signal processor from the second transistor based on receiving the logic-high signal. Thus, the accused devices infringe claims 8 and 17 of the '674 patent.

77. With respect to claim 18, on information and belief, the accused devices include a feedback circuit coupled to an up/down detector which provides a feedback signal associated with a detected power-on or power-down and uses that signal in adjusting a current capacity of the up/down detector. Thus, the accused devices infringe claim 18 of the '674 patent.

78. With respect to claims 6 and 21, the multiple supply voltage device in each of the Apple iPhone 7 and Apple iPhone 7 Plus is further integrated into a semiconductor die. Thus, the accused devices infringe claims 6 and 21 of the '674 patent.

79. With respect to claims 7 and 22, the semiconductor die into which the multiple supply voltage device is integrated is further incorporated in the Apple iPhone 7 and Apple iPhone 7 Plus, each of which is at least a mobile phone, personal data assistant (PDA), navigation device, music player, video player, entertainment unit, and/or computer. Thus, the accused devices infringe claims 7 and 22 of the '674 patent.

80. On information and belief, Apple is currently, and unless enjoined, will continue to, actively induce and encourage infringement of at least claims 8, 12, and 16 of the '674 patent. Apple has known of the '674 patent at least since the time this complaint was filed and served on Apple. On information and belief, Apple nevertheless actively encourages others to infringe the '674 patent. On information and belief, Apple knowingly induces infringement by others, including resellers, retailers, and end users of the accused devices. For example, Apple knows of the '674 patent and the aspects of the accused devices that constitute infringement of such patent, yet Apple instructs and assists others, such as resellers, retailers, and end users, in carrying out such infringement. Further, Apple possesses a specific

intent to cause others, including resellers, retailers, and end users, to infringe the '674 patent. For example, Apple affirmatively intended to cause others to directly infringe the '674 patent through its instructions contained in its user manuals and marketing materials. These facts give rise to a reasonable inference that Apple knowingly induces others, including resellers, retailers, and end users, to directly infringe the '674 patent, and that Apple possesses a specific intent to cause such infringement.

81. Apple also contributes to infringement of the '674 patent by selling for importation into the United States, importing into the United States, and/or selling within the United States after importation the accused devices and the non-staple constituent parts of those devices, which are not suitable for substantial non-infringing use and which embody a material part of the invention described in the '674 patent. These mobile electronic devices are known by Apple to be especially made or especially adapted for use in the infringement of the '674 patent. Apple also contributes to the infringement of the '674 patent by selling for importation into the United States, importing into the United States, and/or selling within the United States after importation components, such as the chipsets or software containing the infringing functionality, of the accused devices, which are not suitable for substantial non-infringing use and which embody a material part of the invention described in the '674 patent. These mobile devices are known by Apple to be especially made or especially adapted for use in the infringement of the '674 patent. Specifically, on information and belief, Apple sells the accused devices to resellers, retailers, and end users with knowledge that the devices are used for infringement. End users of those mobile electronic devices directly infringe the '674 patent.

82. Apple's acts of infringement have occurred within this District and elsewhere throughout the United States.

83. Qualcomm has been damaged and will suffer additional damages and irreparable harm unless Apple is enjoined from further infringement. Qualcomm will prove its irreparable harm and damages at trial.

COUNT 4 (PATENT INFRINGEMENT – U.S. PATENT NO. 7,693,002)

84. Qualcomm repeats and re-alleges the allegations of paragraphs 1 through 83 above as if fully set forth herein.

85. Qualcomm is the lawful owner of the '002 patent and has the full and exclusive right to bring actions and recover damages for Apple's infringement of said patent.

86. In violation of 35 U.S.C. § 271, Apple has been and is still infringing, contributing to infringement, and/or inducing others to infringe the '002 patent by making, using, offering for sale, selling, or importing devices that practice the patent, including but not limited to the Apple iPhone 7 and Apple iPhone 7 Plus.

87. The accused devices include memory units with a first logic and a second logic, where the first logic receives a clock signal and a first portion of a memory address of a memory array, decodes the first portion of the memory address, and selectively applies the clock signal to a selected group of wordline drivers associated with the memory array, and the second logic decodes a second portion of the memory address and selectively activates a particular wordline driver of the selected group of wordline drivers according to the second portion of the memory address.

88. The accused devices infringe at least claims 1, 2, 3, 4, 7, 8, 9, 11, 17, 20, 21, 22, 23, 31, 32, 33, and 36 of the '002 patent.

89. The accused devices infringe claims 1, 7, and 11 of the '002 patent as follows. The Apple iPhone 7 and Apple iPhone 7 Plus each includes the Apple A10 processor, which is a circuit device that includes at least one SRAM memory unit. The memory unit of the A10 processor includes first logic to receive a clock signal and a first portion of a memory address of a memory array. This first logic decodes

the first portion of the memory address and applies the clock signal to a selected clock output of eight potential outputs associated with a selected group of a plurality of wordline drivers that are associated with the memory array, based on the first portion of the memory address. The A10 SRAM memory unit also includes a second logic that decodes a second portion of the memory address and selectively activates a particular wordline driver of the selected group of wordline drivers according to the second portion of the memory address via one of its eight potential output lines. Thus, the accused devices infringe claims 1, 7, and 11 of the '002 patent.

90. With respect to claim 36, each of the wordline drivers in the memory unit of the accused devices is further associated with a corresponding wordline of the memory array. Specifically, in the accused devices, the wordline drivers have 64 outputs corresponding to 64 wordlines in 8 sets, each set including 8 wordline drivers. Thus, the accused devices infringe claim 36 of the '002 patent.

91. With respect to claim 8, the accused devices further receive the clock signal and selectively apply the clock signal to one of a plurality of clock outputs according to the first portion of the memory address. Thus, the accused devices infringe claim 8 of the '002 patent.

92. With respect to claim 9, the accused devices further determine a clock output according to the first portion of the memory address. Specifically, the conditional clock generator of the accused devices determines a clock output according to the first portion of the memory address. Thus, the accused devices infringe claim 9 of the '002 patent.

93. With respect to claims 2 and 21, the first logic of the accused devices further includes a conditional clock generator that receives the clock signal and selectively applies the clock signal to the selected clock output. Thus, the accused devices infringe claims 2 and 21 of the '002 patent.

94. With respect to claim 32, the first logic of the accused devices includes a conditional clock generator that receives the clock signal and further selectively applies the clock signal to the selected clock output according to one of the first portion and the second portion of the memory address. Thus, the accused devices infringe claim 32 of the '002 patent.

95. With respect to claims 3 and 22, the first logic of the accused devices includes a conditional clock generator that receives the clock signal and further selectively applies the clock signal to the selected clock output according to the first portion of the memory address. Thus, the accused devices infringe claims 3 and 22, of the '002 patent.

96. With respect to claims 4 and 23, the first logic of the accused devices further includes a decoder that decodes at least two address bits to determine the first portion of the memory address. Specifically, the first logic of the accused devices includes a decoder that decodes three address bits to determine the first portion of the memory address. Thus, the accused devices infringe claims 4 and 23 of the '002 patent.

97. With respect to claim 31, the first logic of the accused devices includes a conditional clock generator that receives the clock signal and selectively applies the clock signal to the selected clock output, and the first logic generates multiple conditional clock outputs, wherein one of the multiple conditional clock outputs is an active conditional clock output, the first logic to apply the active conditional clock output as the selected clock output. Thus, the accused devices infringe claim 31 of the '002 patent.

98. With respect to claim 33, the first logic of the accused devices generates a plurality of conditional clock outputs, wherein one of the plurality of conditional clock outputs is active at a time, the first logic to apply the active

conditional clock output as the selected clock output. Thus, the accused devices infringe claim 33 of the '002 patent.

99. With respect to claim 17, the memory unit in the A10 processor of each of the Apple iPhone 7 and Apple iPhone 7 Plus includes an address input that includes two portions, a plurality of clock outputs, and a group of wordline drivers coupled to a wordline of a memory array, each wordline driver of the group of wordline drivers coupled to the address input and coupled to a respective clock output of the plurality of clock outputs. Each of the accused devices further includes logic comprising first logic and second logic. The first logic receives a clock signal and a first portion of a memory address of a memory array. This first logic decodes the first portion of the memory address and applies the clock signal to a selected clock output of eight potential outputs. The second logic decodes a second portion of the memory address and selectively activates a particular wordline driver of the selected group of wordline drivers according to the second portion of the memory address via one of its eight potential output lines. Thus, the accused devices infringe claim 17 of the '002 patent.

100. With respect to claim 20, the logic of the accused devices further includes a conditional clock generator. Thus, the accused devices infringe claim 20 of the '002 patent.

101. On information and belief, Apple is currently, and unless enjoined, will continue to, actively induce and encourage infringement of at least claims 7, 8, and 9 of the '002 patent. Apple has known of the '002 patent at least since the time this complaint was filed and served on Apple. On information and belief, Apple nevertheless actively encourages others to infringe the '002 patent. On information and belief, Apple knowingly induces infringement by others, including resellers, retailers, and end users of the accused devices. For example, Apple knows of the '002 patent and the aspects of the accused devices that constitute infringement of such patent, yet Apple instructs and assists others, such as resellers, retailers, and

end users, in carrying out such infringement. Further, Apple possesses a specific intent to cause others, including resellers, retailers, and end users, to infringe the '002 patent. For example, Apple affirmatively intended to cause others to directly infringe the '002 patent through its instructions contained in its user manuals and marketing materials. These facts give rise to a reasonable inference that Apple knowingly induces others, including resellers, retailers, and end users, to directly infringe the '002 patent, and that Apple possesses a specific intent to cause such infringement.

102. Apple also contributes to infringement of the '002 patent by selling for importation into the United States, importing into the United States, and/or selling within the United States after importation the accused devices and the non-staple constituent parts of those devices, which are not suitable for substantial non-infringing use and which embody a material part of the invention described in the '002 patent. These mobile electronic devices are known by Apple to be especially made or especially adapted for use in the infringement of the '002 patent. Apple also contributes to the infringement of the '002 patent by selling for importation into the United States, importing into the United States, and/or selling within the United States after importation components, such as the chipsets or software containing the infringing functionality, of the accused devices, which are not suitable for substantial non-infringing use and which embody a material part of the invention described in the '002 patent. These mobile devices are known by Apple to be especially made or especially adapted for use in the infringement of the '002 patent. Specifically, on information and belief, Apple sells the accused devices to resellers, retailers, and end users with knowledge that the devices are used for infringement. End users of those mobile electronic devices directly infringe the '002 patent.

103. Apple's acts of infringement have occurred within this District and elsewhere throughout the United States.

104. Qualcomm has been damaged and will suffer additional damages and irreparable harm unless Apple is enjoined from further infringement. Qualcomm will prove its irreparable harm and damages at trial.

COUNT 5 (PATENT INFRINGEMENT – U.S. PATENT NO. 9,552,633)

105. Qualcomm repeats and re-alleges the allegations of paragraphs 1 through 104 above as if fully set forth herein.

106. Qualcomm is the lawful owner of the '633 patent and has the full and exclusive right to bring actions and recover damages for Apple's infringement of said patent.

107. In violation of 35 U.S.C. § 271, Apple has been and is still infringing, contributing to infringement, and/or inducing others to infringe the '633 patent by making, using, offering for sale, selling, or importing mobile devices that practice the patent, including but not limited to the Apple iPhone 7 Plus, Apple iPhone 8 Plus, and Apple iPhone X.

108. The accused devices contain dual rear-facing cameras that are spatially offset and that take images of the same scene from different viewpoints. The accused devices store and retrieve the images from memory in order to determine a depth map based on the images. The accused devices identify a portion of one of the images selected by a user, determine a region for enhancement surrounding the selected portion, wherein the region is continuous from the selected portion and has a depth within a threshold of the depth of the selected portion, and apply some enhancement to that region. For instance, the iPhone 7 Plus, in its "Portrait" mode, uses the depth map to enhance a user-selected portion of a scene, such as a foreground object, including by blurring the background of the scene and enhancing regions at the edge of the foreground. The capability to simulate the "bokeh" effect, which emphasizes a foreground object and blurs the background and typically requires the use of a bulky high-end camera, is a highly touted feature of the iPhone 7 Plus, the iPhone 8 Plus, and the iPhone X.

109. The accused devices infringe at least claims 1, 2, 3, 10, 11, 12, 18, 22, 23, and 24 of the '633 patent.

110. The accused devices infringe claims 1, 10, and 18 of the '633 patent at least as follows. The Apple iPhone 7 Plus is a mobile computing device equipped with two rear-facing cameras–a wide-angle camera and a telephoto camera located side by side–which capture a left image and a right image of the same scene from different viewpoints due to their relative offset with a small horizontal distance. The device includes an apparatus for enhancing images and a non-transitory computer readable medium comprising code that controls the image enhancement apparatus. The device is also equipped with a memory unit for storing images, including three gigabytes mobile LPDDR4 SDRAM memory. When using the Camera application in "Portrait" mode, the device's image enhancement apparatus retrieves the left image and right image stored in a memory unit and determines a depth map based on a difference in spatial orientation between the two images using the Apple Image Signal Processor (ISP) and software. Using the device's display, the user can view a live preview of the "depth effect" generated with the two images, point the device in different directions while observing a scene, and select a portion of the scene of a first depth.[5] The apparatus identifies the user selected portion of the scene and uses the depth map to determine an enhancement region surrounding the selected portion, wherein the region is continuous from the selected portion and has a depth within a threshold of the first depth, such as the edge region of a selected foreground object. Finally, the apparatus enhances the enhancement region, such as by applying a blur effect that blends the edge of a selected foreground object into a blurred background. The Apple iPhone 8 Plus and Apple iPhone X also include "Portrait" mode among their features and include an apparatus and/or non-transitory computer-readable medium that performs the same infringing image enhancement described

[5] https://www.apple.com/apple-events/september-2016/ (73:06 to 73:37)

for the Apple iPhone 7 Plus. Thus, the accused devices infringe claims 1, 10, and 18 of the '633 patent.

111. With respect to claims 2, 3, 11, and 12, the accused devices further alter the left or right image by degrading a portion of the image not selected by the user, for example by applying a blur effect to that portion of the image. Thus, the accused devices infringe claims 2, 3, 11, and 12 of the '633 patent.

112. With respect to claim 22, the Apple iPhone 7 Plus contains a memory unit configured to store the left and right images, including for example three gigabytes mobile LPDDR4 SDRAM memory, a coder configured to retrieve the images and determine a depth map based on a difference in spatial orientation between the images, and a processor coupled to the coder, including for example the ISP, which is configured to identify the user-selected portion of the scene, determine the enhancement region surrounding the user-selected portion, and enhance the enhancement region. When using the accused devices in "Portrait" mode, the coder retrieves the left image and right image stored in a memory unit and determines a depth map based on a difference in spatial orientation between the two images. Using the device's display, the user can view a live preview of the "depth effect" generated with the two images, point the device in different directions while observing a scene, select a portion of the scene of a first depth, and capture the picture accordingly.[6] The processor coupled to the coder identifies the user-selected portion of the scene and uses the depth map to determine an enhancement region surrounding the selected portion of the left or right image, wherein the region is continuous from the selected portion and has a depth within a threshold of the first depth, such as the edge region of a selected foreground object. Finally, the processor enhances the enhancement region, such as by applying a blur effect that blends the edge of a selected foreground object into a blurred background. The

[6] https://www.apple.com/apple-events/september-2016/ (73:06 to 73:37)

Apple iPhone 8 Plus and Apple iPhone X also include "Portrait" mode among their features and are devices that perform the same image enhancement described for the Apple iPhone 7 Plus. Thus, the accused devices infringe claim 22 of the '633 patent.

113. With respect to claims 23 and 24, the processor of the accused devices is further configured to alter the left or right image by degrading a portion of the image not selected by the user, including by applying a blur effect to that portion of the image. Thus, the accused devices infringe claims 23 and 24 of the '633 patent.

114. On information and belief, Apple is currently, and unless enjoined, will continue to, actively induce and encourage infringement of at least claims 1, 2, and 3 of the '633 patent. Apple has known of the '633 patent at least since the time this complaint was filed and served on Apple. On information and belief, Apple nevertheless actively encourages others to infringe the '633 patent. On information and belief, Apple knowingly induces infringement by others, including resellers, retailers, and end users of the accused devices. For example, Apple knows of the '633 patent and the aspects of the accused devices that constitute infringement of such patent, yet Apple instructs and assists others, such as resellers, retailers, and end users, in carrying out such infringement. Further, Apple possesses a specific intent to cause others, including resellers, retailers, and end users, to infringe the '633 patent. For example, Apple affirmatively intended to cause others to directly infringe the '633 patent through its instructions contained in its user manuals and marketing materials. These facts give rise to a reasonable inference that Apple knowingly induces others, including resellers, retailers, and end users, to directly infringe the '633 patent, and that Apple possesses a specific intent to cause such infringement.

115. Apple also contributes to infringement of the '633 patent by selling for importation into the United States, importing into the United States, and/or selling within the United States after importation the accused devices and the non-staple

constituent parts of those devices, which are not suitable for substantial non-infringing use and which embody a material part of the invention described in the '633 patent. These mobile electronic devices are known by Apple to be especially made or especially adapted for use in the infringement of the '633 patent. Apple also contributes to the infringement of the '633 patent by selling for importation into the United States, importing into the United States, and/or selling within the United States after importation components, such as the chipsets or software containing the infringing functionality, of the accused devices, which are not suitable for substantial non-infringing use and which embody a material part of the invention described in the '633 patent. These mobile devices are known by Apple to be especially made or especially adapted for use in the infringement of the '633 patent. Specifically, on information and belief, Apple sells the accused devices to resellers, retailers, and end users with knowledge that the devices are used for infringement. End users of those mobile electronic devices directly infringe the '633 patent.

116. Apple's acts of infringement have occurred within this District and elsewhere throughout the United States.

117. Qualcomm has been damaged and will suffer additional damages and irreparable harm unless Apple is enjoined from further infringement. Qualcomm will prove its irreparable harm and damages at trial.

PRAYER FOR RELIEF

WHEREFORE, Qualcomm respectfully requests that the Court enter judgment as follows:

(a) Declaring that Apple has infringed the Patents-in-Suit;

(b) Awarding damages in an amount to be proven at trial, but in no event less than a reasonable royalty for its infringement including pre-judgment and post-judgment interest at the maximum rate permitted by law;

(c) Ordering a permanent injunction enjoining Apple, its officers, agents, servants, employees, attorneys, and all other persons in active concert or participation with Apple from infringing the Patents-in-Suit;

(d) Ordering an award of reasonable attorneys' fees to Qualcomm as provided by 35 U.S.C. § 285;

(e) Awarding expenses, costs, and disbursements in this action, including prejudgment interest; and

(f) Awarding such other and further relief as the Court deems just and proper.

Dated: November 29, 2017 By: *s/ Randall E. Kay*
Randall E. Kay

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DEMAND FOR JURY TRIAL

Pursuant to Rule 38(b) of the Federal Rules of Civil Procedure, Qualcomm demands a jury trial on all issues triable by jury.

Dated: November 29, 2017 By: *s/ Randall E. Kay*
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