

1 David A. Nelson (*pro hac vice* forthcoming)  
2 (Ill. Bar No. 6209623)  
3 davenelson@quinnemanuel.com  
4 QUINN EMANUEL URQUHART & SULLIVAN, LLP  
5 500 West Madison St., Suite 2450  
6 Chicago, Illinois 60661  
7 Telephone: (312) 705-7400

8 Karen P. Hewitt (SBN 145309)  
9 kphewitt@jonesday.com  
10 Randall E. Kay (SBN 149369)  
11 rekay@jonesday.com  
12 JONES DAY  
13 4655 Executive Drive, Suite 1500  
14 San Diego, California 92121  
15 Telephone: (858) 314-1200

16 Evan R. Chesler (*pro hac vice* forthcoming)  
17 (N.Y. Bar No. 1475722)  
18 echesler@cravath.com  
19 CRAVATH, SWAINE & MOORE LLP  
20 Worldwide Plaza, 825 Eighth Avenue  
21 New York, NY 10019  
22 Telephone: (212) 474-1000

23 *Attorneys for Plaintiff*  
24 QUALCOMM INCORPORATED

25 UNITED STATES DISTRICT COURT  
26 SOUTHERN DISTRICT OF CALIFORNIA

27 QUALCOMM INCORPORATED,  
28 Plaintiff,  
v.  
APPLE INCORPORATED,  
Defendant.

Case No. '17CV2398 LAB MDD  
**COMPLAINT FOR PATENT  
INFRINGEMENT**  
**[DEMAND FOR A JURY  
TRIAL]**

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

4 NATURE OF THE ACTION

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

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

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

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

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

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

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

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

26  
27  
28 <sup>1</sup> <http://edition.cnn.com/1999/TECH/ptech/12/03/qualcomm.pdq/>.

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

11           9.       Rather than pay Qualcomm for the technology Apple uses, Apple has  
12 taken extraordinary measures to avoid paying Qualcomm for the fair value of  
13 Qualcomm’s patents. On January 20, 2017, Apple sued Qualcomm in this district,  
14 asserting an array of excuses to avoid paying fair-market, industry-standard rates for  
15 the use of certain of Qualcomm’s pioneering patents that are critical to a modern  
16 smartphone like the iPhone. *See* Case No. 3:17-cv-00108-GPC-MDD. Apple also  
17 encouraged the companies that manufacture the iPhone to breach their contracts  
18 with Qualcomm by refusing to pay for the Qualcomm technology in iPhones,  
19 something that those manufacturers had done for many years, without complaint,  
20 before Apple’s direction to stop. Further, Apple misled governmental agencies  
21  
22

---

23 <sup>2</sup> Interview with Steve Jobs, available at  
24 <https://www.youtube.com/watch?v=CW0DUg631qU> (“Picasso had a saying, ‘good  
25 artists copy, great artists steal.’ And we have always been shameless about stealing  
26 great ideas.”).

27 <sup>3</sup> April 2010 email from Apple’s iPhone Product Marketing Manager, Steve  
28 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).

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

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

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

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

16 PARTIES

17 13. Qualcomm is a Delaware corporation with its principal place of  
18 business at 5775 Morehouse Drive, San Diego, California. Since 1989, when  
19 Qualcomm publicly introduced Code Division Multiple Access (“CDMA”) as a  
20 commercially successful digital cellular communications standard, Qualcomm has  
21 been recognized as an industry leader and innovator in the field of mobile devices  
22 and cellular communications. Qualcomm owns more than 130,000 patents and  
23 patent applications around the world relating to cellular technologies and many  
24 other valuable technologies used by mobile devices. Qualcomm is a leader in the  
25 development and commercialization of wireless technologies and the owner of the  
26 world’s most significant portfolio of cellular technology patents. Qualcomm derives  
27 a substantial portion of its revenues and profits from licensing its intellectual  
28

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

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

9 JURISDICTION AND VENUE

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

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

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

23 STATEMENT OF FACTS

24 **Qualcomm Background**

25 18. Qualcomm was founded in 1985 when seven industry visionaries came  
26 together to discuss the idea of providing quality communications. For more than 30  
27 years, Qualcomm has been in the business of researching, designing, developing,  
28

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

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

10 20. Qualcomm is now one of the largest technology, semiconductor, and  
11 telecommunications companies in the United States. It employs over 18,000 people  
12 in the United States, 68 percent of whom are engineers, and it occupies more than  
13 92 buildings (totaling over 6.5 million sq. ft.) in seventeen states and the District of  
14 Columbia.

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

24 22. In addition to Qualcomm's investments in research and development  
25 internally, Qualcomm has a rich history of investing in and acquiring technologies  
26 developed by other industry leaders. By purchasing companies and patents from  
27 companies who desire to sell their innovations, Qualcomm fosters innovation by  
28



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

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

### 9 **Apple Background**

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

### 19 **Qualcomm's Technology Leadership**

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

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



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

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

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

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

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

16           31. As a final example, Qualcomm's innovations have enabled advanced  
17 mobile device features that generate high demand among users, including in the  
18 areas of photography and image processing. For instance, the '633 patent relates to  
19 depth-based image enhancement, and specifically the use of depth computed from  
20 two spatially offset images to enhance regions of a monocular image. Mobile  
21 devices with dual cameras, including certain Apple devices, use this invention to  
22 perform high quality simulations of photographic effects (such as the so-called  
23 "bokeh" effect) that can otherwise be generated only with bulky and expensive  
24 camera equipment. In fact, Apple's Senior Vice President of Worldwide Marketing  
25 described the iPhone 7 Plus's ability to "create a depth map of [an] image from [its]  
26  
27  
28

1 two cameras . . . and apply a beautiful blur to the background” as “a huge  
2 breakthrough in what can be done in a smartphone in photography.”<sup>4</sup>

### 3 **The Accused Devices**

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

### 6 **The Patents-in-Suit**

7 33. The following patents are infringed by Apple (“Patents-in-Suit”): U.S.  
8 Patent No. 9,154,356 (“the ’356 patent”), U.S. Patent No. 9,473,336 (“the ’336  
9 patent”), U.S. Patent No. 8,063,674 (“the ’674 patent”), U.S. Patent 7,693,002 (“the  
10 ’002 patent”), and U.S. Patent No. 9,552,633 (“the ’633 patent”).

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

### 16 **U.S. Patent No. 9,154,356**

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

22 36. The ’356 patent relates generally to RF transceivers using low noise  
23 amplifiers (LNAs) to support carrier aggregation. The ’356 patent discloses a multi-  
24 stage LNA circuit topology, where each amplifier stage can be independently  
25 controlled to receive and amplify a common input RF signal and provide an output  
26

27 \_\_\_\_\_  
28 <sup>4</sup> [https://singjupost.com/apple-iphone-7-keynote-september-2016-launch-event-  
full-transcript/8/](https://singjupost.com/apple-iphone-7-keynote-september-2016-launch-event-full-transcript/8/)

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

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

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

12 38. The '336 patent relates generally to RF transceivers for use with carrier  
13 aggregation technology. With the advent of carrier aggregation technology, RF  
14 transceivers in mobile devices must be designed to handle an increasing number of  
15 different frequencies in multiple communication bands. In many cases, receivers  
16 include multiple signal paths, which must be subject to stringent isolation  
17 requirements to prevent signal interference, which can make recovering information  
18 from a signal difficult or impossible. The '336 patent discloses a two-stage  
19 amplification of RF signals, where carrier signals are grouped into carrier groups  
20 including a respective portion of the carrier signals in a first stage amplifier module  
21 and provided to second stage amplifiers. The first stage amplifier includes multiple  
22 low noise amplifiers (LNAs) that generate amplified outputs each having a portion  
23 of the carrier signals and a routing module that provides the amplified outputs to  
24 different output ports. Second stage amplifiers then amplify the carrier groups to  
25 generate second stage output signals that may be output to different demodulation  
26 stages that demodulate a selected carrier signal. Without the invention of the '336  
27 patent, RF transceivers would not be able to address issues of interference without  
28

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



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

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

19         52. With respect to claim 10, each iPhone 7 transceiver further contains an  
20 input shunt switch with a large shunt resistor that is coupled to the first and second  
21 amplifier stages and configured to receive the input RF signal. On information and  
22 belief, the Apple iPhone 8, Apple iPhone 8 Plus, and Apple iPhone X each includes  
23 an infringing amplifier design. Thus, the accused devices infringe claim 10 of the  
24 '356 patent.

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

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

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

15 55. On information and belief, Apple is currently, and unless enjoined, will  
16 continue to, actively induce and encourage infringement of at least claims 17 and 18  
17 of the '356 patent. Apple has known of the '356 patent at least since the time this  
18 complaint was filed and served on Apple. On information and belief, Apple  
19 nevertheless actively encourages others to infringe the '356 patent. On information  
20 and belief, Apple knowingly induces infringement by others, including resellers,  
21 retailers, and end users of the accused devices. For example, Apple knows of the  
22 '356 patent and the aspects of the accused devices that constitute infringement of  
23 such patent, yet Apple instructs and assists others, such as resellers, retailers, and  
24 end users, in carrying out such infringement. Further, Apple possesses a specific  
25 intent to cause others, including resellers, retailers, and end users, to infringe the  
26 '356 patent. For example, Apple affirmatively intended to cause others to directly  
27 infringe the '356 patent through its instructions contained in its user manuals and  
28 marketing materials. These facts give rise to a reasonable inference that Apple

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

4       56. Apple also contributes to infringement of the '356 patent by selling for  
5 importation into the United States, importing into the United States, and/or selling  
6 within the United States after importation the accused devices and the non-staple  
7 constituent parts of those devices, which are not suitable for substantial non-  
8 infringing use and which embody a material part of the invention described in the  
9 '356 patent. These mobile electronic devices are known by Apple to be especially  
10 made or especially adapted for use in the infringement of the '356 patent. Apple  
11 also contributes to the infringement of the '356 patent by selling for importation into  
12 the United States, importing into the United States, and/or selling within the United  
13 States after importation components, such as the chipsets or software containing the  
14 infringing functionality, of the accused devices, which are not suitable for  
15 substantial non-infringing use and which embody a material part of the invention  
16 described in the '356 patent. These mobile devices are known by Apple to be  
17 especially made or especially adapted for use in the infringement of the '356 patent.  
18 Specifically, on information and belief, Apple sells the accused devices to resellers,  
19 retailers, and end users with knowledge that the devices are used for infringement.  
20 End users of those mobile electronic devices directly infringe the '356 patent.

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

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

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

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

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

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

9           62. Each of the Apple iPhone 8, Apple iPhone 8 Plus, and on information  
10 and belief, Apple iPhone X includes a first stage amplifier with multiple LNAs  
11 configured to amplify received carrier signals and generate amplified outputs each  
12 having a portion of the carrier signals. The first stage amplifier of the Apple iPhone  
13 8, Apple iPhone 8 Plus, and on information and belief, Apple iPhone X includes a  
14 routing module that provides the amplified outputs to different output ports. Each of  
15 the Apple iPhone 8, Apple iPhone 8 Plus, and on information and belief, Apple  
16 iPhone X further includes second stage amplifiers, each configured to amplify a  
17 respective first stage carrier group to generate second stage output signals that each  
18 may be output to a different demodulation stage.

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

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

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

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

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

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

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

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

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

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

8           71. The accused devices infringe at least claims 1, 5, 6, 7, 8, 12, 16, 17, 18,  
9 21, and 22 of the '674 patent.

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

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

1 network operative at a second supply voltage. The I/O network is coupled to the  
2 core network and control network and is configured to receive the control signal  
3 generated by the control network. Thus, the accused devices infringe claim 5 of the  
4 '674 patent.

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

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

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



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

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

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

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

19 80. On information and belief, Apple is currently, and unless enjoined, will  
20 continue to, actively induce and encourage infringement of at least claims 8, 12, and  
21 16 of the '674 patent. Apple has known of the '674 patent at least since the time  
22 this complaint was filed and served on Apple. On information and belief, Apple  
23 nevertheless actively encourages others to infringe the '674 patent. On information  
24 and belief, Apple knowingly induces infringement by others, including resellers,  
25 retailers, and end users of the accused devices. For example, Apple knows of the  
26 '674 patent and the aspects of the accused devices that constitute infringement of  
27 such patent, yet Apple instructs and assists others, such as resellers, retailers, and  
28 end users, in carrying out such infringement. Further, Apple possesses a specific

1 intent to cause others, including resellers, retailers, and end users, to infringe the  
2 '674 patent. For example, Apple affirmatively intended to cause others to directly  
3 infringe the '674 patent through its instructions contained in its user manuals and  
4 marketing materials. These facts give rise to a reasonable inference that Apple  
5 knowingly induces others, including resellers, retailers, and end users, to directly  
6 infringe the '674 patent, and that Apple possesses a specific intent to cause such  
7 infringement.

8       81. Apple also contributes to infringement of the '674 patent by selling for  
9 importation into the United States, importing into the United States, and/or selling  
10 within the United States after importation the accused devices and the non-staple  
11 constituent parts of those devices, which are not suitable for substantial non-  
12 infringing use and which embody a material part of the invention described in the  
13 '674 patent. These mobile electronic devices are known by Apple to be especially  
14 made or especially adapted for use in the infringement of the '674 patent. Apple  
15 also contributes to the infringement of the '674 patent by selling for importation into  
16 the United States, importing into the United States, and/or selling within the United  
17 States after importation components, such as the chipsets or software containing the  
18 infringing functionality, of the accused devices, which are not suitable for  
19 substantial non-infringing use and which embody a material part of the invention  
20 described in the '674 patent. These mobile devices are known by Apple to be  
21 especially made or especially adapted for use in the infringement of the '674 patent.  
22 Specifically, on information and belief, Apple sells the accused devices to resellers,  
23 retailers, and end users with knowledge that the devices are used for infringement.  
24 End users of those mobile electronic devices directly infringe the '674 patent.

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

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

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

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

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

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

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

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

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

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

10 90. With respect to claim 36, each of the wordline drivers in the memory  
11 unit of the accused devices is further associated with a corresponding wordline of  
12 the memory array. Specifically, in the accused devices, the wordline drivers have  
13 64 outputs corresponding to 64 wordlines in 8 sets, each set including 8 wordline  
14 drivers. Thus, the accused devices infringe claim 36 of the '002 patent.

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

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

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

28

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

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

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

17           97. With respect to claim 31, the first logic of the accused devices includes  
18 a conditional clock generator that receives the clock signal and selectively applies  
19 the clock signal to the selected clock output, and the first logic generates multiple  
20 conditional clock outputs, wherein one of the multiple conditional clock outputs is  
21 an active conditional clock output, the first logic to apply the active conditional  
22 clock output as the selected clock output. Thus, the accused devices infringe claim  
23 31 of the '002 patent.

24           98. With respect to claim 33, the first logic of the accused devices  
25 generates a plurality of conditional clock outputs, wherein one of the plurality of  
26 conditional clock outputs is active at a time, the first logic to apply the active  
27  
28

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

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

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

20 101. On information and belief, Apple is currently, and unless enjoined, will  
21 continue to, actively induce and encourage infringement of at least claims 7, 8, and  
22 9 of the '002 patent. Apple has known of the '002 patent at least since the time this  
23 complaint was filed and served on Apple. On information and belief, Apple  
24 nevertheless actively encourages others to infringe the '002 patent. On information  
25 and belief, Apple knowingly induces infringement by others, including resellers,  
26 retailers, and end users of the accused devices. For example, Apple knows of the  
27 '002 patent and the aspects of the accused devices that constitute infringement of  
28 such patent, yet Apple instructs and assists others, such as resellers, retailers, and

1 end users, in carrying out such infringement. Further, Apple possesses a specific  
2 intent to cause others, including resellers, retailers, and end users, to infringe the  
3 '002 patent. For example, Apple affirmatively intended to cause others to directly  
4 infringe the '002 patent through its instructions contained in its user manuals and  
5 marketing materials. These facts give rise to a reasonable inference that Apple  
6 knowingly induces others, including resellers, retailers, and end users, to directly  
7 infringe the '002 patent, and that Apple possesses a specific intent to cause such  
8 infringement.

9       102. Apple also contributes to infringement of the '002 patent by selling for  
10 importation into the United States, importing into the United States, and/or selling  
11 within the United States after importation the accused devices and the non-staple  
12 constituent parts of those devices, which are not suitable for substantial non-  
13 infringing use and which embody a material part of the invention described in the  
14 '002 patent. These mobile electronic devices are known by Apple to be especially  
15 made or especially adapted for use in the infringement of the '002 patent. Apple  
16 also contributes to the infringement of the '002 patent by selling for importation into  
17 the United States, importing into the United States, and/or selling within the United  
18 States after importation components, such as the chipsets or software containing the  
19 infringing functionality, of the accused devices, which are not suitable for  
20 substantial non-infringing use and which embody a material part of the invention  
21 described in the '002 patent. These mobile devices are known by Apple to be  
22 especially made or especially adapted for use in the infringement of the '002 patent.  
23 Specifically, on information and belief, Apple sells the accused devices to resellers,  
24 retailers, and end users with knowledge that the devices are used for infringement.  
25 End users of those mobile electronic devices directly infringe the '002 patent.

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



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

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

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

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

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

15           108. The accused devices contain dual rear-facing cameras that are spatially  
16 offset and that take images of the same scene from different viewpoints. The  
17 accused devices store and retrieve the images from memory in order to determine a  
18 depth map based on the images. The accused devices identify a portion of one of  
19 the images selected by a user, determine a region for enhancement surrounding the  
20 selected portion, wherein the region is continuous from the selected portion and has  
21 a depth within a threshold of the depth of the selected portion, and apply some  
22 enhancement to that region. For instance, the iPhone 7 Plus, in its "Portrait" mode,  
23 uses the depth map to enhance a user-selected portion of a scene, such as a  
24 foreground object, including by blurring the background of the scene and enhancing  
25 regions at the edge of the foreground. The capability to simulate the "bokeh" effect,  
26 which emphasizes a foreground object and blurs the background and typically  
27 requires the use of a bulky high-end camera, is a highly touted feature of the iPhone  
28 7 Plus, the iPhone 8 Plus, and the iPhone X.

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

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

27  
28 <sup>5</sup> <https://www.apple.com/apple-events/september-2016/> (73:06 to 73:37)

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

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

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

27

28 <sup>6</sup> <https://www.apple.com/apple-events/september-2016/> (73:06 to 73:37)

1 Apple iPhone 8 Plus and Apple iPhone X also include “Portrait” mode among their  
2 features and are devices that perform the same image enhancement described for the  
3 Apple iPhone 7 Plus. Thus, the accused devices infringe claim 22 of the ’633  
4 patent.

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

9 114. On information and belief, Apple is currently, and unless enjoined, will  
10 continue to, actively induce and encourage infringement of at least claims 1, 2, and  
11 3 of the ’633 patent. Apple has known of the ’633 patent at least since the time this  
12 complaint was filed and served on Apple. On information and belief, Apple  
13 nevertheless actively encourages others to infringe the ’633 patent. On information  
14 and belief, Apple knowingly induces infringement by others, including resellers,  
15 retailers, and end users of the accused devices. For example, Apple knows of the  
16 ’633 patent and the aspects of the accused devices that constitute infringement of  
17 such patent, yet Apple instructs and assists others, such as resellers, retailers, and  
18 end users, in carrying out such infringement. Further, Apple possesses a specific  
19 intent to cause others, including resellers, retailers, and end users, to infringe the  
20 ’633 patent. For example, Apple affirmatively intended to cause others to directly  
21 infringe the ’633 patent through its instructions contained in its user manuals and  
22 marketing materials. These facts give rise to a reasonable inference that Apple  
23 knowingly induces others, including resellers, retailers, and end users, to directly  
24 infringe the ’633 patent, and that Apple possesses a specific intent to cause such  
25 infringement.

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

1 constituent parts of those devices, which are not suitable for substantial non-  
2 infringing use and which embody a material part of the invention described in the  
3 '633 patent. These mobile electronic devices are known by Apple to be especially  
4 made or especially adapted for use in the infringement of the '633 patent. Apple  
5 also contributes to the infringement of the '633 patent by selling for importation into  
6 the United States, importing into the United States, and/or selling within the United  
7 States after importation components, such as the chipsets or software containing the  
8 infringing functionality, of the accused devices, which are not suitable for  
9 substantial non-infringing use and which embody a material part of the invention  
10 described in the '633 patent. These mobile devices are known by Apple to be  
11 especially made or especially adapted for use in the infringement of the '633 patent.  
12 Specifically, on information and belief, Apple sells the accused devices to resellers,  
13 retailers, and end users with knowledge that the devices are used for infringement.  
14 End users of those mobile electronic devices directly infringe the '633 patent.

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

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

20 PRAYER FOR RELIEF

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

- 23 (a) Declaring that Apple has infringed the Patents-in-Suit;  
24 (b) Awarding damages in an amount to be proven at trial, but in no event  
25 less than a reasonable royalty for its infringement including pre-judgment and post-  
26 judgment interest at the maximum rate permitted by law;

27  
28

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

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

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

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

10 Dated: November 29, 2017

By: s/ Randall E. Kay

Randall E. Kay

12 JONES DAY

13 Karen P. Hewitt (SBN 145309)

kphewitt@jonesday.com

14 Randall E. Kay (SBN 149369)

rekay@jonesday.com

15 4655 Executive Drive, Suite 1500

16 San Diego, California 92121

17 Telephone: (858) 314-1200

18 QUINN EMANUEL URQUHART &  
19 SULLIVAN, LLP

20 David A. Nelson (*pro hac vice* forthcoming)

(Ill. Bar No. 6209623)

davenelson@quinnemanuel.com

21 Stephen Swedlow (*pro hac vice* forthcoming)

22 (Ill. Bar No. 6234550)

stephenswedlow@quinnemanuel.com

23 500 West Madison St., Suite 2450

24 Chicago, Illinois 60661

25 Telephone: (312) 705-7400

26 Steven Cherny (*pro hac vice* forthcoming)

27 (N.Y. Bar No. 2483063)

Richard W. Erwine (*pro hac vice* forthcoming)

28 (N.Y. Bar No. 2753929)

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

richarderwine@quinnemanuel.com  
Alexander Rudis (*pro hac vice* forthcoming)  
(N.Y. Bar No. 4232591)  
alexanderrudis@quinnemanuel.com  
Patrick Curran (SBN 241630)  
patrickcurran@quinnemanuel.com  
51 Madison Avenue, 22nd Floor  
New York, NY 10010  
Telephone: (212) 849-7000

Sean S. Pak (SBN 219032)  
seanpak@quinnemanuel.com  
50 California Street, 22nd Floor  
San Francisco, CA 94111  
Telephone: (415) 875-6600

S. Alex Lasher (*pro hac vice* forthcoming)  
(D.C. Bar No. 486212)  
alexlasher@quinnemanuel.com  
777 6th Street NW, 11th Floor  
Washington, DC 20001  
Telephone: (202) 538-8000

CRAVATH, SWAINE & MOORE LLP  
Evan R. Chesler (*pro hac vice* forthcoming)  
(N.Y. Bar No. 1475722)  
echesler@cravath.com  
Keith R. Hummel (*pro hac vice* forthcoming)  
(N.Y. Bar No. 2430668)  
khummel@cravath.com  
Richard J. Stark (*pro hac vice* forthcoming)  
(N.Y. Bar No. 2472603)  
rstark@cravath.com  
Gary A. Bornstein (*pro hac vice* forthcoming)  
(N.Y. Bar No. 2916815)  
gbornstein@cravath.com  
J. Wesley Earnhardt (*pro hac vice* forthcoming)  
(N.Y. Bar No. 4331609)  
wearnhardt@cravath.com  
Yonatan Even (*pro hac vice* forthcoming)  
(N.Y. Bar No. 4339651 )



1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

yeven@cravath.com  
Vanessa A. Lavelly (*pro hac vice* forthcoming)  
(N.Y. Bar No. 4867412)  
vlavelly@cravath.com  
Worldwide Plaza, 825 Eighth Avenue  
New York, NY 10019  
Telephone: (212) 474-1000

NORTON ROSE FULBRIGHT US LLP  
Richard S. Zembek (*pro hac vice* forthcoming)  
(Tex. Bar No. 00797726)  
richard.zembek@nortonrosefulbright.com  
Eric B. Hall (*pro hac vice* forthcoming)  
(Tex. Bar No. 24012767)  
eric.hall@nortonrosefulbright.com  
Daniel S. Leventhal (*pro hac vice* forthcoming)  
(Tex. Bar No. 24050923)  
daniel.leventhal@nortonrosefulbright.com  
Talbot R. Hansum (*pro hac vice* forthcoming)  
(Tex. Bar No. 24084586)  
talbot.hansum@nortonrosefulbright.com  
Fulbright Tower  
1301 McKinney, Suite 5100  
Houston, TX 77010  
Telephone: (713) 651-5151

*Attorneys for Plaintiff*  
QUALCOMM INCORPORATED

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

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  
Randall E. Kay

JONES DAY  
Karen P. Hewitt (SBN 145309)  
kphewitt@jonesday.com  
Randall E. Kay (SBN 149369)  
rekay@jonesday.com  
4655 Executive Drive, Suite 1500  
San Diego, California 92121  
Telephone: (858) 314-1200

David A. Nelson (*pro hac vice* forthcoming)  
(Ill. Bar No. 6209623)  
davenelson@quinnemanuel.com  
QUINN EMANUEL URQUHART &  
SULLIVAN, LLP  
500 West Madison St., Suite 2450  
Chicago, Illinois 60661  
Telephone: (312) 705-7400

Evan R. Chesler (*pro hac vice* forthcoming)  
(N.Y. Bar No. 1475722)  
echesler@cravath.com  
CRAVATH, SWAINE & MOORE LLP  
Worldwide Plaza, 825 Eighth Avenue  
New York, NY 10019  
Telephone: (212) 474-1000

*Attorneys for Plaintiff*  
QUALCOMM INCORPORATED