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UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

29 QUALCOMM INCORPORATED,

Case No. 3:17-CV-01375-DMS-MDD

30 Plaintiff,

**DEFENDANT APPLE INC.'S FIRST
31 AMENDED ANSWER AND
32 COUNTERCLAIMS**

33 v.

34 APPLE INC.,

35 Defendant.

APPLE INC.,

Counterclaim-Plaintiff,

V.

QUALCOMM INCORPORATED and
QUALCOMM TECHNOLOGIES,
INC.,

Counterclaim-Defendants.

Defendant Apple Inc. (“Apple”) files its First Amended Answer and Counterclaims to Plaintiff Qualcomm Inc. (“Qualcomm” or “Plaintiff”) First Amended Complaint (“Complaint”). Apple brings its claims for infringement against Qualcomm Inc. and Qualcomm Technologies, Inc.

INTRODUCTORY STATEMENT

Apple has a long history as a leading innovator in computing technology. Apple designs, manufactures, and markets mobile communication and media devices, personal computers, and portable digital media players, as well as related software, accessories, and content. Apple's success has been driven by its creative achievement, technical innovation, differentiated technology, and astute business judgment.

In 2007, Apple introduced the iPhone which revolutionized the industry by combining what existed in multiple devices into a single device: the iPhone includes your phone, camera, music player, video player, and internet browser all in one. Apple did this by developing a sophisticated mobile product with a multi-touch screen that allows users to control it with a single finger; with mobile computing functionality to run diverse applications, and gain full access to the internet with a single touch. Apple's iPhone is the reason consumers fell in love with smartphones and this continues to push Apple to create and innovate with new products and technologies, such as iPhone X Face ID. Qualcomm's paid advertising makes wildly inflated claims about its role in the development of the smartphone, but the facts show that it was Apple that put an easy-to-use computer-phone in the palm of people's hands, not Qualcomm.

As Apple's products became increasingly powerful, Apple foresaw the importance of reducing power consumption to maintain mobility. To provide powerful functionality in a small and lightweight device with extended battery life, Apple relied on its hardware and software innovations to minimize power

1 consumption and improve the battery life of its devices. Apple's innovation in this
2 area pre-dates the iPhone and includes innovations borne out of work on general
3 purpose computers. The United States Patent Office recognized Apple's
4 innovations by granting Apple numerous patents for its power efficiency
5 innovations. Qualcomm also recognized the value of Apple's innovations, and
6 Qualcomm has included inventions from eight of Apple's fundamental power
7 management patents in its products, including Qualcomm's Snapdragon 800 and
8 820 processors. These patents enable extended battery life by (1) supplying power
9 only where it is needed; (2) supplying power only at the level needed; and
10 (3) enabling quick powering up and down. The Qualcomm Snapdragon 800 and
11 820 infringe these patents and are used in many smartphones.

12 This case presents a tale of two companies. On one hand we have Apple who
13 literally created the modern smartphone as a product category, with the iPhone's
14 cutting edge design, easy connectivity, superlative battery life, and interactive
15 applications that make the smartphone the smartphone. On the other we have
16 Qualcomm, who developed rudimentary telephone technology that carried voice
17 calls in the early days of feature phones, but whose technology is dated. This is
18 borne out in the patents each party places before this Court. Apple's patents are
19 critical to what consumers value in a handset – cutting edge functionality with
20 superior battery life. Qualcomm instead asserts weak patents that nibble at the
21 edges of the smartphone platform and cover concepts that Apple simply does not
22 use. Notably, just weeks after the its complaint was filed, Qualcomm withdrew one
23 of its patents, despite placing billboards and radio ads declaring to the world that
24 this patent was somehow critically important. Moreover, Qualcomm's patents were
25 filed late into the modern smartphone era and are likely invalid.

26 Qualcomm has struggled mightily to maintain its monopoly position through
27 intimidation, litigation, and manipulation, for all the reasons set forth in the co-
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1 pending matter before this Court, 3:01-cv-108-GPC-MDD. The weak patents
2 Qualcomm asserts here for the first time appear to be a blatant effort to take credit
3 for the innovation of others. Notably, all of Qualcomm's asserted patents were filed
4 and prosecuted well after the iPhone was introduced. Put plainly, Qualcomm saw
5 the unique features and success of the iPhone, and then pursued patents trying to
6 cover the Apple product much like a common patent troll.

7 **ANSWER**

8 Apple responds to the allegations contained in the numbered paragraphs of
9 Qualcomm's Complaint below. Apple denies the allegations and characterizations
10 in Qualcomm's Complaint unless expressly admitted in the following paragraphs.

11 **NATURE OF THE ACTION¹**

12 1. Apple denies the allegations and characterizations in Paragraph 1 of the
13 Complaint, but states that Qualcomm purports to seek relief through its Complaint.

14 2. Apple admits that Qualcomm contributed to the development of
15 standards related to how cellular phones connect to voice and data networks. Apple
16 is without knowledge or information sufficient to form a belief as to the truth of the
17 allegations in Paragraph 2 of the Complaint, and therefore denies them. Except as
18 specifically admitted, Apple denies the allegations and characterizations contained
19 in Paragraph 2.

20 3. Apple admits that Qualcomm contributed to the development of
21 standards related to how cellular phones connect to voice and data networks. To the
22 extent Paragraph 3 of the Complaint purports to describe matters within
23 Qualcomm's knowledge and control, such as its design and development efforts

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25 ¹ Apple repeats the headings set forth in the Complaint in order to simplify
26 comparison of the Complaint and this Response. In doing so, Apple makes no
27 admissions regarding the substance of the headings or any other allegations of the
28 Complaint. Unless otherwise stated, to the extent that a particular heading can be
construed as an allegation, Apple specifically denies all such allegations.

1 since 1985, Apple is without knowledge or information sufficient to form a belief as
2 to the truth of the allegations and characterizations contained in Paragraph 3, and
3 therefore denies them. Except as specifically admitted, Apple denies the allegations
4 and characterizations contained in Paragraph 3.

5 4. To the extent Paragraph 4 of the Complaint purports to describe matters
6 within Qualcomm's knowledge and control, such as Qualcomm's investments, the
7 number of patents and patent applications Qualcomm owns, the reasons for such
8 ownership, and the number of Qualcomm's licensees, Apple is without knowledge
9 or information sufficient to form a belief as to the truth of the allegations in
10 Paragraph 4, and therefore denies them. Apple denies the remaining allegations and
11 characterizations contained in Paragraph 4.

12 5. Apple admits that it sells mobile electronic products globally, but states
13 that Apple's success is driven by its own creative achievement, technical innovation,
14 differentiated technology, and astute business judgment. Apple admits that
15 Qualcomm has made claims regarding the scope of its alleged patented
16 technologies, but has not proven such allegations, as is its burden. Given
17 Qualcomm's failure to make such a showing, Apple is without knowledge or
18 information sufficient to form a belief as to the truth of those allegations and
19 characterizations contained in Paragraph 5 of the Complaint, and therefore denies
20 them. In addition, to the extent Paragraph 5 purports to describe matters outside
21 Apple's knowledge and control, such as the nature of Qualcomm and third-party
22 smartphones, Apple is without knowledge or information sufficient to form a belief
23 as to the truth of those allegations, and therefore denies them.² Except as

26 ² To the extent any response is required to Footnote 1 of the Complaint, Apple is
27 without knowledge or information sufficient to form a belief as to the truth of the
28 allegations and characterizations contained in Footnote 1, and therefore denies them.

1 specifically admitted, Apple denies the allegations and characterizations contained
2 in Paragraph 5.

3 6. Apple admits that Qualcomm has made claims regarding the scope of
4 its alleged patented technologies, but has not proven such allegations, as is its
5 burden. To the extent “patented features” refers to the patents Qualcomm has
6 asserted in this case, Apple denies any claim of infringement as to these patents,
7 which do not “enable” or “enhance” any features of the iPhone 7. In addition, to the
8 extent Paragraph 6 purports to describe matters outside Apple’s knowledge and
9 control, such as the practices of other major mobile device makers, Apple is without
10 knowledge or information sufficient to form a belief as to the truth of the allegations
11 and characterizations relating to Qualcomm’s patent portfolio in Paragraph 6 of the
12 Complaint, and therefore denies them. Except as specifically admitted, Apple
13 denies the allegations and characterizations contained in Paragraph 6.

14 7. Apple denies the allegations and characterizations contained in
15 Paragraph 7 of the Complaint.

16 8. Apple admits that it designs and sells cellular-enabled devices, that it is
17 a profitable company, and that its iPhones and other products are commercially
18 successful, but states that Apple’s and its products’ commercial success are due to
19 Apple’s own creative achievement, technical innovation, differentiated technology,
20 and astute business judgment. Apple admits that Qualcomm purports to quote
21 individual, isolated, statements of former Apple employees, and refers to the
22 referenced 1994 interview of Mr. Jobs and article of Mr. Merritt for their contents

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1 and context.^{3, 4} Except as specifically admitted, Apple denies the allegations and
2 characterizations contained in Paragraph 8 of the Complaint.

3 9. Apple admits that it sued Qualcomm in this District, *see Apple Inc. v.*
4 *Qualcomm Incorporated*, Case No. 3:17-cv-00108-GPC-MDD, asking the Court to
5 put an end to Qualcomm's illegal, abusive, and anticompetitive business practices.
6 Apple refers to its First Amended Complaint in that action for its content and
7 context. Apple admits that Qualcomm has entered into confidential licenses with
8 specific Apple contract manufacturers ("CMs"). Except as specifically admitted,
9 Apple denies the allegations and characterizations in Paragraph 9 of the Complaint.

10 10. To the extent Paragraph 10 of the Complaint implicates legal
11 conclusions, no response is required. Apple admits that Qualcomm has declared
12 patents as allegedly essential to cellular standards and to other standards, but has not
13 proven such allegations, as is its burden. Apple admits that Qualcomm has alleged
14 that it owns patents that are not essential to any industry standards but Qualcomm
15 has not proven such allegations, as is its burden. Given Qualcomm's failure to make
16 such a showing, Apple is without knowledge or information sufficient to form a
17 belief as to the truth of those allegations, and therefore denies them. To the extent
18 Paragraph 10 purports to describe matters within Qualcomm's knowledge and
19 control, such as the alleged details of patents Qualcomm owns, Apple is without
20 knowledge or information sufficient to form a belief as to the truth of the allegations
21 and characterizations contained in Paragraph 10, and therefore denies them. Except

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³ To the extent any response is required to Footnote 2 of the Complaint, Apple
24 refers to the 1994 interview of Mr. Jobs for its content and context. Apple denies
25 the remaining allegations and characterizations contained in this Footnote.

26 ⁴ To the extent any response is required to Footnote 3 of the Complaint, Apple
27 refers to the article of Mr. Merritt for its contents and context. Apple denies the
remaining allegations and characterizations contained in this Footnote.

as specifically admitted, Apple denies the allegations and characterizations contained in Paragraph 10.

11. To the extent Paragraph 11 of the Complaint implicates legal conclusions, no response is required. Apple admits that Qualcomm asserts five patents in this case,⁵ which it claims are non-standard-essential, but has not proven such allegations as is its burden. Given Qualcomm’s failure to make such a showing, Apple is without knowledge or information sufficient to form a belief as to the truth of those allegations, and therefore denies them. Apple denies that it infringes any valid and enforceable claim of the Asserted Patents. Except as specifically admitted, Apple denies the allegations and characterizations in Paragraph 11.

12. Apple admits that Qualcomm has previously ostensibly offered Apple a direct license to certain patents, but such offers have never been on reasonable terms. Apple denies that Qualcomm has offered Apple a license specifically directed to any of the five Asserted Patents. Apple admits that Qualcomm purports to seek relief through its Complaint. Except as specifically admitted, Apple denies the allegations and characterizations in Paragraph 12 of the Complaint.

PARTIES

13. Apple admits that Qualcomm Incorporated is a publicly-traded corporation organized and existing under the laws of the State of Delaware, with its principal place of business located at 5775 Morehouse Drive, San Diego, California 92121. Apple admits that Qualcomm contributed to the development of standards related to how cellular phones connect to voice and data networks. Apple admits that Qualcomm has alleged that it owns patents that supposedly reflect valuable

⁵ Those patents are U.S. Patent No. 8,633,936 (“the ’936 patent”), U.S. Patent No. 8,698,558 (“the ’558 patent”), U.S. Patent No. 8,838,949 (“the ’949 patent”), U.S. Patent No. 9,535,490 (“the ’490 patent”), and U.S. Patent No. 9,608,675 (“the ’675 patent”) (collectively, “the Asserted Patents”).

1 cellular technologies, but Qualcomm has not proven such allegations, as is its
2 burden. Given Qualcomm's failure to make such a showing, Apple is without
3 knowledge or information sufficient to form a belief as to the truth of the allegations
4 and characterizations relating to Qualcomm's patent portfolio in Paragraph 13 of the
5 Complaint, and therefore denies them. To the extent Paragraph 13 purports to
6 describe matters within Qualcomm's knowledge and control, such as the number of
7 patents and patent applications Qualcomm owns, the subject matter of such patents,
8 the sources of Qualcomm's revenue and profit, and Qualcomm's sales volume,
9 Apple is without knowledge or information sufficient to form a belief as to the truth
10 of the allegations in Paragraph 13, and therefore denies them. Except as specifically
11 admitted, Apple denies the allegations and characterizations contained in Paragraph
12 13.

13 14. Apple admits that it is a California corporation with a principal place of
14 business at 1 Infinite Loop, Cupertino, California, 95014. Apple admits that it
15 designs and sells certain mobile electronic products globally. Apple denies that any
16 of its products infringes any of the Asserted Patents. Except as specifically
17 admitted, Apple denies the allegations and characterizations contained in Paragraph
18 14 of the Complaint.

19 **JURISDICTION AND VENUE**

20 15. Apple admits that this Court has subject matter jurisdiction.

21 16. Apple does not contest personal jurisdiction over Apple by this Court
22 in this action. Apple admits that it is incorporated in California.

23 17. Qualcomm's venue allegation calls for a legal conclusion and therefore
24 no answer is required. Apple admits that it is incorporated in California, and that it
25 sells mobile devices at Apple Stores at 7007 Friars Rd., San Diego, CA 92108 and at
26 4505 La Jolla Village Dr., San Diego, CA 92122. Apple denies that it has infringed
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1 any of the Asserted Patents. Except as specifically admitted, Apple denies the
2 allegations and characterizations contained in Paragraph 17 of the Complaint.

3 **STATEMENT OF FACTS**

4 **Qualcomm Background**

5 18. Apple is without knowledge or information sufficient to form a belief
6 as to the truth of the allegations and characterizations of Qualcomm in Paragraph 18
7 of the Complaint, and therefore denies them.

8 19. Apple admits that Qualcomm contributed to the development of certain
9 standards related to how cellular phones connect to voice and data networks. Apple
10 admits that cell phones deliver voice and data service and mobile computing to
11 many consumers around the world. Except as specifically admitted, Apple denies
12 the allegations and characterizations contained in Paragraph 19 of the Complaint.

13 20. Apple is without knowledge or information sufficient to form a belief
14 as to the truth of the allegations and characterizations contained in Paragraph 20 of
15 the Complaint, and therefore denies them.

16 21. Apple admits that Qualcomm contributed to the development of certain
17 standards related to how cellular phones connect to voice and data networks. To the
18 extent Paragraph 21 of the Complaint purports to describe matters within
19 Qualcomm's knowledge and control, such as Qualcomm's investments and internal
20 development projects, Apple is without knowledge or information sufficient to form
21 a belief as to the truth of the allegations and characterizations contained in
22 Paragraph 21, and therefore denies them. Except as specifically admitted, Apple
23 denies the allegations and characterizations contained in Paragraph 21.

24 22. Apple is without knowledge or information sufficient to form a belief
25 as to the truth of the allegations and characterizations of matters contained in
26 Paragraph 22 of the Complaint, and therefore denies them.

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1 23. Apple admits that Qualcomm has made claims regarding the scope of
2 its alleged patented technologies, but has not proven such allegations, as is its
3 burden. Given Qualcomm’s failure to make such a showing, Apple is without
4 knowledge or information sufficient to form a belief as to the truth of the allegations
5 and characterizations relating to Qualcomm’s patent portfolio in Paragraph 23 of the
6 Complaint, and therefore denies them. To the extent Paragraph 23 purports to
7 describe matters within Qualcomm’s knowledge and control, such as the number of
8 Qualcomm’s licensees, Apple is without knowledge or information sufficient to
9 form a belief as to the truth of the allegations and characterizations contained in
10 Paragraph 23, and therefore denies them. Except as specifically admitted, Apple
11 denies the allegations and characterizations in Paragraph 23.

Apple Background

13 24. Apple admits that it sells mobile electronic products globally, that it is a
14 profitable company, and that its iPhones and other products are commercially
15 successful, and states that Apple’s and its products’ commercial success are due to
16 Apple’s own creative achievement, technical innovation, differentiated technology,
17 and astute business judgment. To the extent Paragraph 24 of the Complaint purports
18 to describe matters outside Apple’s knowledge and control, such as the money and
19 influence possessed by “many countries,” Apple is without knowledge or
20 information sufficient to form a belief as to the truth of the allegations and
21 characterizations in Paragraph 24 and therefore denies them. Except as specifically
22 admitted, Apple denies the allegations and characterizations contained in Paragraph
23 24.

Qualcomm's [Alleged] Technology Leadership

25 25. Apple admits that Qualcomm has made claims regarding the scope of
26 its alleged patented technologies, and claims that the Asserted Patents are non-
27 standard essential, but has not proven such allegations, as is its burden. Given

1 Qualcomm's failure to make such a showing, Apple is without knowledge or
2 information sufficient to form a belief as to the truth of the allegations and
3 characterizations relating to Qualcomm's patent portfolio in Paragraph 25 of the
4 Complaint, and therefore denies them. Except as specifically admitted, Apple
5 denies the allegations and characterizations in Paragraph 25.

6 26. To the extent Paragraph 26 of the Complaint implicates legal
7 conclusions, no response is required. Apple admits that cellular communications
8 technology, like all technology, poses certain engineering challenges. Except as
9 specifically admitted, Apple is currently without knowledge or information
10 sufficient to form a belief as to the truth of the allegations and characterizations
11 contained in Paragraph 26, and therefore denies them.

12 27. To the extent Paragraph 27 of the Complaint implicates legal
13 conclusions, no response is required. Apple states that "envelope tracking" is a
14 conventional power-saving feature that is included in Qualcomm baseband
15 processor chipsets. Except as specifically admitted, Apple is currently without
16 knowledge or information sufficient to form a belief as to the truth of the allegations
17 and characterizations contained in Paragraph 27, and therefore denies them.

18 28. To the extent Paragraph 28 of the Complaint implicates legal
19 conclusions, no response is required. Apple states that Carrier Aggregation is an
20 optional feature within the LTE standard that allows multiple component carriers to
21 be combined to act as if they are all one channel. Apple refers to its September
22 2014 Special Event for its contents and context. Except as specifically admitted,
23 Apple is currently without knowledge or information sufficient to form a belief as to
24 the truth of the allegations and characterizations contained in Paragraph 28, and
25 therefore denies them.⁶

26 ⁶ To the extent a response is required to Footnote 4 of the Complaint, the cited
27 webpage is outside Apple's control and Apple is without knowledge of information
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1 29. To the extent Paragraph 29 of the Complaint purports to describe
2 matters within Qualcomm's knowledge and control, such as Qualcomm's graphics
3 processing units, Apple is without knowledge or information sufficient to form a
4 belief as to the truth of the allegations and characterizations contained in Paragraph
5 29, and therefore denies them.⁷ Apple states that it aims to improve all aspects of its
6 mobile devices in order to meet the increasing demands of its users, including but
7 not limited to battery life as well as the performance GPUs in its mobile devices.
8 Except as specifically admitted, Apple denies the allegations and characterizations
9 in Paragraph 29.

10 30. To the extent Paragraph 30 of the Complaint implicates legal
11 conclusions, no response is required. Apple admits that Qualcomm has made claims
12 regarding the scope of its alleged patented technologies, but has not proven such
13 allegations, as is its burden. Given Qualcomm's failure to make such a showing,
14 Apple is without knowledge or information sufficient to form a belief as to the truth
15 of the allegations and characterizations relating to Qualcomm's patent portfolio in
16 Paragraph 30, and therefore denies them. Apple refers to the March 23, 2017
17 *Forbes* article for its contents and context. Apple denies that any of its products

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sufficient to form a belief as to the truth of the allegations and characterizations
24 contained therein.

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⁷ To the extent a response is required to Footnote 5 of the Complaint, the cited
26 webpage is outside Apple's control and Apple is without knowledge of information
27 sufficient to form a belief as to the truth of the allegations and characterizations
contained therein.

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1 infringes any of the Asserted Patents. Except as specifically admitted, Apple denies
2 the allegations and characterizations in Paragraph 30.^{8,9}

3 31. To the extent Paragraph 31 of the Complaint implicates legal
4 conclusions, no response is required. To the extent Paragraph 31 purports to
5 describe matters within Qualcomm’s knowledge and control, such as Qualcomm’s
6 investments, Apple is without knowledge or information sufficient to form a belief
7 as to the truth of the allegations in Paragraph 31, and therefore denies them. Apple
8 admits that storage is one of the factors that affects the cost of its mobile devices.
9 Apple refers to its website for its contents and context.¹⁰ Except as specifically
10 admitted, Apple denies the allegations and characterizations in Paragraph 31.

11 32. To the extent Paragraph 32 of the Complaint implicates legal
12 conclusions, no response is required. To the extent Paragraph 32 purports to
13 describe matters within Qualcomm’s knowledge and control, such as Qualcomm’s
14 investments, Apple is without knowledge or information sufficient to form a belief
15 as to the truth of the allegations in Paragraph 32, and therefore denies them. Apple
16 admits that, when it introduced the iPhone 7 and iPhone 7 Plus, Apple stated that
17 they had the best battery life ever in an iPhone. Apple states that it improves power
18 consumption and battery life by improving all aspects of its mobile devices,
19 including numerous optimizations of the hardware and software in its mobile

20 ⁸ To the extent a response is required to Footnote 6 of the Complaint, the cited
21 webpage is outside Apple’s control and Apple is without knowledge of information
22 sufficient to form a belief as to the truth of the allegations and characterizations
23 contained therein.

24 ⁹ To the extent a response is required to Footnote 7 of the Complaint, the cited
25 webpage is outside Apple’s control and Apple is without knowledge of information
26 sufficient to form a belief as to the truth of the allegations and characterizations
27 contained therein.

28 ¹⁰ To the extent any response is required to Footnote 8 of the Complaint, Apple
29 refers to its website for its contents and context. Except as specifically admitted,
30 Apple denies any allegations and characterizations in Footnote 8.

1 devices. Except as specifically admitted, Apple denies the allegations and
2 characterizations in Paragraph 32.

3 **The Accused Devices**

4 33. To the extent Paragraph 33 of the Complaint implicates legal
5 conclusions, no response is required. Apple admits that Qualcomm accuses certain
6 Apple products of infringing the Asserted Patents. Apple denies that any of its
7 products practices or infringes any of the Asserted Patents. Except as specifically
8 admitted, Apple denies the allegations and characterizations in Paragraph 33.

9 **The [Qualcomm] Patents-in-Suit**

10 34. To the extent Paragraph 34 of the Complaint implicates legal
11 conclusions, no response is required. Apple admits that Qualcomm identifies U.S.
12 Patent No. 8,633,936 (“the ’936 patent”), U.S. Patent No. 8,698,558 (“the ’558
13 patent”), U.S. Patent No. 8,838,949 (“the ’949 patent”), U.S. Patent No. 9,535,490
14 (“the ’490 patent”), and U.S. Patent No. 9,608,675 (“the ’675 patent”) as the
15 Asserted Patents. Apple denies that Apple or any of its products infringes any of the
16 Asserted Patents. Except as specifically admitted, Apple denies the allegations and
17 characterizations in Paragraph 34.

18 35. Apple denies the allegations and characterizations in Paragraph 35.

19 **U.S. Patent No. 8,633,936**

20 36. Apple admits that the first page of the ’936 patent lists an issue date of
21 January 21, 2014, and identifies Qualcomm as assignee. Apple admits that
22 Qualcomm purports to have attached a copy of the ’936 patent as Exhibit A to the
23 Complaint. Apple denies that the ’936 patent is valid and enforceable. Apple
24 denies that Apple or any of its products infringes any asserted claim of the ’936
25 patent. Except as specifically admitted, Apple is currently without knowledge or
26 information sufficient to form a belief as to the truth of any allegations and

1 characterizations contained in Paragraph 36 of the Complaint, and therefore denies
2 them.

3 37. To the extent Paragraph 37 of the Complaint implicates legal
4 conclusions, no response is required. Apple denies the allegations and
5 characterizations contained in Paragraph 37 to the extent Qualcomm purports to
6 attribute to the '936 patent anything not claimed therein. Apple denies that the
7 allegations and characterizations contained in Paragraph 37 constitute a complete
8 and accurate description of the '936 patent. Apple further denies the allegations and
9 characterizations contained in Paragraph 37 to the extent the allegations relate in any
10 way to a proposed construction of any claim of the Asserted Patents. Apple further
11 denies that the '936 patent discloses anything novel or nonobvious. Apple denies
12 any remaining allegations and characterizations contained in Paragraph 37.

U.S. Patent No. 8,698,558

14 38. Apple admits that the first page of the '558 patent lists an issue date of
15 April 15, 2014, and identifies Qualcomm as assignee. Apple admits that Qualcomm
16 purports to have attached a copy of the '558 patent as Exhibit B to the Complaint.
17 Apple denies that the '558 patent is valid and enforceable. Apple denies that Apple
18 or any of its products infringes any asserted claim of the '558 patent. Except as
19 specifically admitted, Apple is currently without knowledge or information
20 sufficient to form a belief as to the truth of any allegations and characterizations
21 contained in Paragraph 38 of the Complaint, and therefore denies them.

22 39. To the extent Paragraph 39 of the Complaint implicates legal
23 conclusions, no response is required. Apple denies the allegations and
24 characterizations contained in Paragraph 39 to the extent Qualcomm purports to
25 attribute to the '558 patent anything not claimed therein. Apple states that
26 "envelope tracking" is a conventional and well-known power-saving feature. Apple
27 denies that the allegations and characterizations contained in Paragraph 39 constitute

1 a complete or accurate description of the '558 patent. Apple further denies the
2 allegations and characterizations contained in Paragraph 39 to the extent the
3 allegations relate in any way to a proposed construction of any claim of the Asserted
4 Patents. Apple further denies that the '558 patent discloses anything novel or
5 nonobvious. Except as specifically admitted, Apple denies any remaining
6 allegations and characterizations contained in Paragraph 39.

7 **U.S. Patent No. 8,838,949**

8 40. Apple admits that the first page of the '949 patent lists an issue date of
9 September 16, 2014, and identifies Qualcomm as assignee. Apple admits that
10 Qualcomm purports to have attached a copy of the '949 patent as Exhibit C to the
11 Complaint. Apple denies that the '949 patent is valid and enforceable. Apple
12 denies that Apple or any of its products infringes any of the '949 patent. Except as
13 specifically admitted, Apple is currently without knowledge or information
14 sufficient to form a belief as to the truth of any allegations and characterizations
15 contained in Paragraph 40 of the Complaint, and therefore denies them.

16 41. To the extent Paragraph 41 of the Complaint implicates legal
17 conclusions, no response is required. Apple denies the allegations and
18 characterizations contained in Paragraph 41 to the extent Qualcomm purports to
19 attribute to the '949 patent anything not claimed therein. Apple denies that the
20 allegations and characterizations contained in Paragraph 41 constitute a complete
21 and accurate description of the '949 patent. Apple further denies the allegations and
22 characterizations contained in Paragraph 41 to the extent the allegations relate in any
23 way to a proposed construction of any claim of the Asserted Patents. Apple further
24 denies that the '949 patent discloses anything novel or nonobvious. Apple denies
25 any remaining allegations and characterizations contained in Paragraph 41.

26 **U.S. Patent No. 9,535,490**

1 42. Apple admits that the first page of the '490 patent lists an issue date of
2 January 3, 2017, and identifies Qualcomm as assignee. Apple admits that
3 Qualcomm purports to have attached a copy of the '490 patent as Exhibit D to the
4 Complaint. Apple denies that the '490 patent is valid and enforceable. Apple
5 denies that Apple or any of its products infringes any asserted claim of the '490
6 patent. Except as specifically admitted, Apple is currently without knowledge or
7 information sufficient to form a belief as to the truth of any allegations and
8 characterizations contained in Paragraph 42 of the Complaint, and therefore denies
9 them.

10 43. To the extent Paragraph 43 of the Complaint implicates legal
11 conclusions, no response is required. Apple denies the allegations and
12 characterizations contained in Paragraph 43 to the extent Qualcomm purports to
13 attribute to the '490 patent anything not claimed therein. Apple denies that the
14 allegations and characterizations contained in Paragraph 43 constitute a complete
15 and accurate description of the '490 patent. Apple further denies the allegations and
16 characterizations contained in Paragraph 43 to the extent the allegations relate in any
17 way to a proposed construction of any claim of the Asserted Patents. Apple further
18 denies that the '490 patent discloses anything novel or nonobvious. Apple denies
19 any remaining allegations and characterizations contained in Paragraph 43.

U.S. Patent No. 9,608,675

21 44. Apple admits that the first page of the '675 patent lists an issue date of
22 March 28, 2017, and identifies Qualcomm as assignee. Apple admits that
23 Qualcomm purports to have attached a copy of the '675 patent as Exhibit E to the
24 Complaint. Apple denies that the '675 patent is valid and enforceable. Apple
25 denies that Apple or any of its products infringes any asserted claim of the '675
26 patent. Except as specifically admitted, Apple is currently without knowledge or
27 information sufficient to form a belief as to the truth of any allegations and

1 characterizations contained in Paragraph 44 of the Complaint, and therefore denies
2 them.

3 45. To the extent Paragraph 45 of the Complaint implicates legal
4 conclusions, no response is required. Apple denies the allegations and
5 characterizations contained in Paragraph 45 to the extent Qualcomm purports to
6 attribute to the '675 patent anything not claimed therein. Apple denies that the
7 allegations and characterizations contained in Paragraph 45 constitute a complete
8 and accurate description of the '675 patent. Apple further denies the allegations and
9 characterizations contained in Paragraph 45 to the extent the allegations relate in any
10 way to a proposed construction of any claim of the Asserted Patents. Apple further
11 denies that the '675 patent discloses anything novel or nonobvious. Apple denies
12 any remaining allegations and characterizations contained in Paragraph 45.

COUNT 1

([ALLEGED] PATENT INFRINGEMENT – U.S. PATENT NO. 8,633,936)

15 46. Paragraphs 1–45 of Apple’s Answer are incorporated by reference as if
16 set forth in full herein; Apple repeats and incorporates its Answer to Paragraphs 1–
17 45.

18 47. To the extent Paragraph 47 of the Complaint implicates legal
19 conclusions, no response is required. To the extent that a response is required,
20 Apple denies the allegations and characterizations contained in Paragraph 47 of the
21 Complaint, including because Apple does not infringe the '936 patent and because
22 Apple is without knowledge or information sufficient to form a belief as to the truth
23 of the remaining allegations and characterizations in Paragraph 47.

24 48. Apple denies the allegations and characterizations contained in
25 Paragraph 48 of the Complaint.

26 49. To the extent Paragraph 49 of the Complaint implicates legal
27 conclusions, no response is required. Apple admits that the accused devices contain

1 at least one GPU. Except as specifically admitted and to the extent that a response
2 is required, Apple denies the allegations and characterizations contained in
3 Paragraph 49 of the Complaint.

4 50. Apple denies the allegations and characterizations contained in
5 Paragraph 50 of the Complaint.

6 51. To the extent Paragraph 51 of the Complaint implicates legal
7 conclusions, no response is required. Apple admits that the Apple A10 within the
8 accused devices incorporates at least one GPU that receives and executes
9 instructions. Except as specifically admitted and to the extent that a response is
10 required, Apple denies the allegations and characterizations contained in Paragraph
11 51 of the Complaint.

12 52. To the extent Paragraph 52 of the Complaint implicates legal
13 conclusions, no response is required. To the extent that a response is required,
14 Apple denies the allegations and characterizations contained in Paragraph 52 of the
15 Complaint.

16 53. To the extent Paragraph 53 of the Complaint implicates legal
17 conclusions, no response is required. To the extent that a response is required,
18 Apple denies the allegations and characterizations contained in Paragraph 53 of the
19 Complaint.

20 54. To the extent Paragraph 54 of the Complaint implicates legal
21 conclusions, no response is required. To the extent that a response is required,
22 Apple denies the allegations and characterizations contained in Paragraph 54 of the
23 Complaint.

24 55. To the extent Paragraph 55 of the Complaint implicates legal
25 conclusions, no response is required. To the extent that a response is required,
26 Apple denies the allegations and characterizations contained in Paragraph 55 of the
27 Complaint.

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1 56. To the extent Paragraph 56 of the Complaint implicates legal
2 conclusions, no response is required. To the extent that a response is required,
3 Apple denies the allegations and characterizations contained in Paragraph 56 of the
4 Complaint.

5 57. To the extent Paragraph 57 of the Complaint implicates legal
6 conclusions, no response is required. To the extent that a response is required,
7 Apple denies the allegations and characterizations contained in Paragraph 57 of the
8 Complaint.

9 58. To the extent Paragraph 58 of the Complaint implicates legal
10 conclusions, no response is required. To the extent that a response is required,
11 Apple denies the allegations and characterizations contained in Paragraph 58 of the
12 Complaint.

13 59. To the extent Paragraph 59 of the Complaint implicates legal
14 conclusions, no response is required. To the extent that a response is required,
15 Apple denies the allegations and characterizations contained in Paragraph 59 of the
16 Complaint.

17 60. To the extent Paragraph 60 of the Complaint implicates legal
18 conclusions, no response is required. To the extent that a response is required,
19 Apple denies the allegations and characterizations contained in Paragraph 60 of the
20 Complaint.

21 61. To the extent Paragraph 61 of the Complaint implicates legal
22 conclusions, no response is required. To the extent that a response is required,
23 Apple denies the allegations and characterizations contained in Paragraph 61 of the
24 Complaint.

25 62. To the extent Paragraph 62 of the Complaint implicates legal
26 conclusions, no response is required. To the extent that a response is required,
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1 Apple denies the allegations and characterizations contained in Paragraph 62 of the
2 Complaint.

3 63. To the extent Paragraph 63 of the Complaint implicates legal
4 conclusions, no response is required. To the extent that a response is required,
5 Apple denies the allegations and characterizations contained in Paragraph 63 of the
6 Complaint.

7 64. To the extent Paragraph 64 of the Complaint implicates legal
8 conclusions, no response is required. To the extent that a response is required,
9 Apple denies the allegations and characterizations contained in Paragraph 64 of the
10 Complaint.

11 65. To the extent Paragraph 65 of the Complaint implicates legal
12 conclusions, no response is required. Apple admits that the Apple A10 within the
13 accused devices incorporates at least one GPU. Except as specifically admitted and
14 to the extent that a response is required, Apple denies the allegations and
15 characterizations contained in Paragraph 65 of the Complaint.

16 66. To the extent Paragraph 66 of the Complaint implicates legal
17 conclusions, no response is required. Apple admits that the accused iPhone7 and
18 iPhone 7 Plus devices are wireless communications handsets. Except as specifically
19 admitted and to the extent that a response is required, Apple denies the allegations
20 and characterizations contained in Paragraph 66 of the Complaint.

21 67. To the extent Paragraph 67 of the Complaint implicates legal
22 conclusions, no response is required. Apple admits that the Apple A10 within the
23 accused devices incorporates at least one GPU. Except as specifically admitted and
24 to the extent that a response is required, Apple denies the allegations and
25 characterizations contained in Paragraph 67 of the Complaint.

26 68. To the extent Paragraph 68 of the Complaint implicates legal
27 conclusions, no response is required. To the extent that a response is required,
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1 Apple denies the allegations and characterizations contained in Paragraph 68 of the
2 Complaint.

3 69. To the extent Paragraph 69 of the Complaint implicates legal
4 conclusions, no response is required. To the extent that a response is required,
5 Apple denies the allegations and characterizations contained in Paragraph 69 of the
6 Complaint.

7 70. To the extent Paragraph 70 of the Complaint implicates legal
8 conclusions, no response is required. To the extent that a response is required,
9 Apple denies the allegations and characterizations contained in Paragraph 70 of the
10 Complaint.

11 71. To the extent Paragraph 71 of the Complaint implicates legal
12 conclusions, no response is required. To the extent that a response is required,
13 Apple denies the allegations and characterizations contained in Paragraph 71 of the
14 Complaint.

15 72. To the extent Paragraph 72 of the Complaint implicates legal
16 conclusions, no response is required. To the extent that a response is required,
17 Apple denies the allegations and characterizations contained in Paragraph 72 of the
18 Complaint.

19 73. To the extent Paragraph 73 of the Complaint implicates legal
20 conclusions, no response is required. To the extent that a response is required,
21 Apple denies the allegations and characterizations contained in Paragraph 73 of the
22 Complaint.

23 74. To the extent Paragraph 74 of the Complaint implicates legal
24 conclusions, no response is required. To the extent that a response is required,
25 Apple denies the allegations and characterizations contained in Paragraph 74 of the
26 Complaint.

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1 75. To the extent Paragraph 75 of the Complaint implicates legal
2 conclusions, no response is required. Apple admits that it learned of the '936 patent
3 as of July 6, 2017, when Qualcomm filed this lawsuit. Apple admits that it tests,
4 demonstrates, or otherwise operates the accused iPhone 7 and iPhone 7 Plus devices
5 in the United States. Apple admits that its customers and end users of the accused
6 devices operate the accused devices in the United States. Apple admits that it
7 provides user manuals for the accused devices. To the extent Apple is without
8 knowledge or information sufficient to form a belief as to the truth of any of the
9 allegations in Paragraph 75, for example, because they implicate information in the
10 possession and control of end users, Apple denies those allegations on that basis.
11 Except as specifically admitted, Apple denies the allegations and characterizations
12 contained in Paragraph 75 of the Complaint.

13 76. To the extent Paragraph 76 of the Complaint implicates legal
14 conclusions, no response is required. Apple admits that it imports and sells its
15 iPhone 7 and iPhone 7 Plus devices into the United States. Apple admits that it sells
16 the accused devices to resellers, retailers, and end users. Except as specifically
17 admitted, Apple denies the allegations and characterizations contained in Paragraph
18 76 of the Complaint.

19 77. Apple denies the allegations and characterizations contained in
20 Paragraph 77 of the Complaint.

21 78. Apple denies the allegations and characterizations contained in
22 Paragraph 78 of the Complaint.

COUNT 2

(ALLEGED) PATENT INFRINGEMENT – U.S. PATENT NO. 8,698,558

25 79. Paragraphs 1–78 of Apple’s Answer are incorporated by reference as if
26 set forth in full herein; Apple repeats and incorporates its Answer to Paragraphs 1–
27 78.

1 80. To the extent Paragraph 80 of the Complaint implicates legal
2 conclusions, no response is required. To the extent that a response is required,
3 Apple denies the allegations and characterizations contained in Paragraph 80 of the
4 Complaint, including because Apple does not infringe the '558 patent and because
5 Apple is without knowledge or information sufficient to form a belief as to the truth
6 of the remaining allegations and characterizations in Paragraph 80.

7 81. Apple denies the allegations and characterizations contained in
8 Paragraph 81 of the Complaint.

9 82. To the extent Paragraph 82 of the Complaint implicates legal
10 conclusions, no response is required. To the extent that a response is required,
11 Apple admits that certain of its iPhone 7 and iPhone 7 Plus devices contain the
12 QM81003M part but denies all other allegations and characterizations contained in
13 Paragraph 82 of the Complaint, including on information and belief. To the extent
14 Apple is without knowledge or information sufficient to form a belief as to the truth
15 of any of the allegations in Paragraph 82, Apple denies those allegations on that
16 basis.

17 83. To the extent Paragraph 83 of the Complaint implicates legal
18 conclusions, no response is required. To the extent that a response is required,
19 Apple admits that its iPhone 7 and iPhone 7 Plus devices contain a power amplifier
20 but denies all other allegations and characterizations contained in Paragraph 83 of
21 the Complaint, including on information and belief. To the extent Apple is without
22 knowledge or information sufficient to form a belief as to the truth of any of the
23 allegations in Paragraph 83, Apple denies those allegations on that basis.

24 84. To the extent Paragraph 84 of the Complaint implicates legal
25 conclusions, no response is required. To the extent that a response is required,
26 Apple denies the allegations and characterizations contained in Paragraph 84 of the
27 Complaint, including on information and belief. To the extent Apple is without
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1 knowledge or information sufficient to form a belief as to the truth of any of the
2 allegations in Paragraph 84, Apple denies those allegations on that basis.

3 85. To the extent Paragraph 85 of the Complaint implicates legal
4 conclusions, no response is required. To the extent that a response is required,
5 Apple denies the allegations and characterizations contained in Paragraph 85 of the
6 Complaint, including on information and belief. To the extent Apple is without
7 knowledge or information sufficient to form a belief as to the truth of any of the
8 allegations in Paragraph 85, Apple denies those allegations on that basis.

9 86. To the extent Paragraph 86 of the Complaint implicates legal
10 conclusions, no response is required. To the extent that a response is required,
11 Apple denies the allegations and characterizations contained in Paragraph 86 of the
12 Complaint, including on information and belief. To the extent Apple is without
13 knowledge or information sufficient to form a belief as to the truth of any of the
14 allegations in Paragraph 86, Apple denies those allegations on that basis.

15 87. To the extent Paragraph 87 of the Complaint implicates legal
16 conclusions, no response is required. To the extent that a response is required,
17 Apple denies the allegations and characterizations contained in Paragraph 87 of the
18 Complaint, including on information and belief. To the extent Apple is without
19 knowledge or information sufficient to form a belief as to the truth of any of the
20 allegations in Paragraph 87, Apple denies those allegations on that basis.

21 88. To the extent Paragraph 88 of the Complaint implicates legal
22 conclusions, no response is required. To the extent that a response is required,
23 Apple denies the allegations and characterizations contained in Paragraph 88 of the
24 Complaint, including on information and belief. To the extent Apple is without
25 knowledge or information sufficient to form a belief as to the truth of any of the
26 allegations in Paragraph 88, Apple denies those allegations on that basis.

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1 89. To the extent Paragraph 89 of the Complaint implicates legal
2 conclusions, no response is required. To the extent that a response is required,
3 Apple admits that its iPhone 7 and iPhone 7 Plus devices contain a power amplifier
4 but denies all other allegations and characterizations contained in Paragraph 89 of
5 the Complaint, including on information and belief. To the extent Apple is without
6 knowledge or information sufficient to form a belief as to the truth of any of the
7 allegations in Paragraph 89, Apple denies those allegations on that basis.

8 90. To the extent Paragraph 90 of the Complaint implicates legal
9 conclusions, no response is required. To the extent that a response is required,
10 Apple denies the allegations and characterizations contained in Paragraph 90 of the
11 Complaint, including on information and belief. To the extent Apple is without
12 knowledge or information sufficient to form a belief as to the truth of any of the
13 allegations in Paragraph 90, Apple denies those allegations on that basis.

14 91. To the extent Paragraph 91 of the Complaint implicates legal
15 conclusions, no response is required. To the extent that a response is required,
16 Apple denies the allegations and characterizations contained in Paragraph 91 of the
17 Complaint, including on information and belief. To the extent Apple is without
18 knowledge or information sufficient to form a belief as to the truth of any of the
19 allegations in Paragraph 91, Apple denies those allegations on that basis.

20 92. To the extent Paragraph 92 of the Complaint implicates legal
21 conclusions, no response is required. To the extent that a response is required,
22 Apple denies the allegations and characterizations contained in Paragraph 92 of the
23 Complaint, including on information and belief. To the extent Apple is without
24 knowledge or information sufficient to form a belief as to the truth of any of the
25 allegations in Paragraph 92, Apple denies those allegations on that basis.

26 93. To the extent Paragraph 93 of the Complaint implicates legal
27 conclusions, no response is required. To the extent that a response is required,

1 Apple denies the allegations and characterizations contained in Paragraph 93 of the
2 Complaint, including on information and belief. To the extent Apple is without
3 knowledge or information sufficient to form a belief as to the truth of any of the
4 allegations in Paragraph 93, Apple denies those allegations on that basis.

5 94. To the extent Paragraph 94 of the Complaint implicates legal
6 conclusions, no response is required. To the extent that a response is required,
7 Apple denies the allegations and characterizations contained in Paragraph 94 of the
8 Complaint, including on information and belief. To the extent Apple is without
9 knowledge or information sufficient to form a belief as to the truth of any of the
10 allegations in Paragraph 94, Apple denies those allegations on that basis.

11 95. To the extent Paragraph 95 of the Complaint implicates legal
12 conclusions, no response is required. To the extent that a response is required,
13 Apple denies the allegations and characterizations contained in Paragraph 95 of the
14 Complaint, including on information and belief. To the extent Apple is without
15 knowledge or information sufficient to form a belief as to the truth of any of the
16 allegations in Paragraph 95, Apple denies those allegations on that basis.

17 96. To the extent Paragraph 96 of the Complaint implicates legal
18 conclusions, no response is required. To the extent that a response is required,
19 Apple denies the allegations and characterizations contained in Paragraph 96 of the
20 Complaint, including on information and belief. To the extent Apple is without
21 knowledge or information sufficient to form a belief as to the truth of any of the
22 allegations in Paragraph 96, Apple denies those allegations on that basis.

23 97. To the extent Paragraph 97 of the Complaint implicates legal
24 conclusions, no response is required. To the extent that a response is required,
25 Apple admits that its iPhone 7 and iPhone 7 Plus devices contain a power amplifier
26 but denies all other allegations and characterizations contained in Paragraph 97 of
27 the Complaint, including on information and belief. To the extent Apple is without
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1 knowledge or information sufficient to form a belief as to the truth of any of the
2 allegations in Paragraph 97, Apple denies those allegations on that basis.

3 98. To the extent Paragraph 98 of the Complaint implicates legal
4 conclusions, no response is required. Apple admits that it learned of the '558 patent
5 as of July 6, 2017, when Qualcomm filed this lawsuit. Apple admits that it tests,
6 demonstrates, or otherwise operates the accused iPhone 7 and iPhone 7 Plus devices
7 in the United States. Apple admits that its customers and end users of the accused
8 devices operate the accused devices in the United States. Apple admits that it
9 provides user manuals for the accused devices. To the extent Apple is without
10 knowledge or information sufficient to form a belief as to the truth of any of the
11 allegations in Paragraph 98, for example, because they implicate information in the
12 possession and control of end users, Apple denies those allegations on that basis.
13 Except as specifically admitted, Apple denies the allegations and characterizations
14 contained in Paragraph 98 of the Complaint.

15 99. To the extent Paragraph 99 of the Complaint implicates legal
16 conclusions, no response is required. Apple admits that it imports and sells its
17 iPhone 7 and iPhone 7 Plus devices into the United States. Apple admits that it sells
18 the accused devices to resellers, retailers, and end users. Except as specifically
19 admitted, Apple denies the allegations and characterizations contained in Paragraph
20 99 of the Complaint.

21 100. Apple denies the allegations and characterizations contained in
22 Paragraph 100 of the Complaint.

23 101. Apple denies the allegations and characterizations contained in
24 Paragraph 101 of the Complaint.

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COUNT 3

([ALLEGED] PATENT INFRINGEMENT – U.S. PATENT NO. 8,838,949)

102. Paragraphs 1–101 of Apple’s Answer are incorporated by reference as if set forth in full herein; Apple repeats and incorporates its Answer to Paragraphs 1–101.

103. To the extent Paragraph 103 of the Complaint implicates legal conclusions, no response is required. To the extent that a response is required, Apple denies the allegations and characterizations contained in Paragraph 103 of the Complaint, including because Apple does not infringe the '949 patent and because Apple is without knowledge or information sufficient to form a belief as to the truth of the remaining allegations and characterizations in Paragraph 103.

104. Apple denies the allegations and characterizations contained in Paragraph 104 of the Complaint.

105. To the extent Paragraph 105 of the Complaint implicates legal conclusions, no response is required. To the extent that a response is required, Apple denies the allegations and characterizations contained in Paragraph 105 of the Complaint, including on information and belief. To the extent Apple is without knowledge or information sufficient to form a belief as to the truth of any of the allegations in Paragraph 105, Apple denies those allegations on that basis.

106. To the extent Paragraph 106 of the Complaint implicates legal conclusions, no response is required. To the extent that a response is required, Apple denies the allegations and characterizations contained in Paragraph 106 of the Complaint, including on information and belief. To the extent Apple is without knowledge or information sufficient to form a belief as to the truth of any of the allegations in Paragraph 106, Apple denies those allegations on that basis.

107. To the extent Paragraph 107 of the Complaint implicates legal conclusions, no response is required. To the extent that a response is required,

1 Apple admits that its iPhone 7 and iPhone 7 Plus devices contain an application
2 processor and a baseband processor. Except as specifically admitted, Apple denies
3 the allegations and characterizations contained in Paragraph 107 of the Complaint,
4 including on information and belief. To the extent Apple is without knowledge or
5 information sufficient to form a belief as to the truth of any of the allegations in
6 Paragraph 107, Apple denies those allegations on that basis.

7 108. To the extent Paragraph 108 of the Complaint implicates legal
8 conclusions, no response is required. To the extent that a response is required,
9 Apple denies the allegations and characterizations contained in Paragraph 108 of the
10 Complaint, including on information and belief. To the extent Apple is without
11 knowledge or information sufficient to form a belief as to the truth of any of the
12 allegations in Paragraph 108, Apple denies those allegations on that basis.

13 109. To the extent Paragraph 109 of the Complaint implicates legal
14 conclusions, no response is required. To the extent that a response is required,
15 Apple denies the allegations and characterizations contained in Paragraph 109 of the
16 Complaint, including on information and belief. To the extent Apple is without
17 knowledge or information sufficient to form a belief as to the truth of any of the
18 allegations in Paragraph 109, Apple denies those allegations on that basis.

19 110. To the extent Paragraph 110 of the Complaint implicates legal
20 conclusions, no response is required. To the extent that a response is required,
21 Apple denies the allegations and characterizations contained in Paragraph 110 of the
22 Complaint, including on information and belief. To the extent Apple is without
23 knowledge or information sufficient to form a belief as to the truth of any of the
24 allegations in Paragraph 110, Apple denies those allegations on that basis.

25 111. To the extent Paragraph 111 of the Complaint implicates legal
26 conclusions, no response is required. To the extent that a response is required,
27 Apple denies the allegations and characterizations contained in Paragraph 111 of the
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1 Complaint, including on information and belief. To the extent Apple is without
2 knowledge or information sufficient to form a belief as to the truth of any of the
3 allegations in Paragraph 111, Apple denies those allegations on that basis.

4 112. To the extent Paragraph 112 of the Complaint implicates legal
5 conclusions, no response is required. To the extent that a response is required,
6 Apple denies the allegations and characterizations contained in Paragraph 112 of the
7 Complaint, including on information and belief. To the extent Apple is without
8 knowledge or information sufficient to form a belief as to the truth of any of the
9 allegations in Paragraph 112, Apple denies those allegations on that basis.

10 113. To the extent Paragraph 113 of the Complaint implicates legal
11 conclusions, no response is required. To the extent that a response is required,
12 Apple denies the allegations and characterizations contained in Paragraph 113 of the
13 Complaint, including on information and belief. To the extent Apple is without
14 knowledge or information sufficient to form a belief as to the truth of any of the
15 allegations in Paragraph 113, Apple denies those allegations on that basis.

16 114. To the extent Paragraph 114 of the Complaint implicates legal
17 conclusions, no response is required. To the extent that a response is required,
18 Apple denies the allegations and characterizations contained in Paragraph 114 of the
19 Complaint, including on information and belief. To the extent Apple is without
20 knowledge or information sufficient to form a belief as to the truth of any of the
21 allegations in Paragraph 114, Apple denies those allegations on that basis.

22 115. To the extent Paragraph 115 of the Complaint implicates legal
23 conclusions, no response is required. To the extent that a response is required,
24 Apple denies the allegations and characterizations contained in Paragraph 115 of the
25 Complaint, including on information and belief. To the extent Apple is without
26 knowledge or information sufficient to form a belief as to the truth of any of the
27 allegations in Paragraph 115, Apple denies those allegations on that basis.

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1 116. To the extent Paragraph 116 of the Complaint implicates legal
2 conclusions, no response is required. To the extent that a response is required,
3 Apple denies the allegations and characterizations contained in Paragraph 116 of the
4 Complaint, including on information and belief. To the extent Apple is without
5 knowledge or information sufficient to form a belief as to the truth of any of the
6 allegations in Paragraph 116, Apple denies those allegations on that basis.

7 117. To the extent Paragraph 117 of the Complaint implicates legal
8 conclusions, no response is required. Apple admits that it learned of the '949 patent
9 as of July 6, 2017, when Qualcomm filed this lawsuit. Apple admits that it tests,
10 demonstrates, or otherwise operates the accused iPhone 7 and iPhone 7 Plus devices
11 in the United States. Apple admits that its customers and end users of the accused
12 devices operate the accused devices in the United States. Apple admits that it
13 provides user manuals for the accused devices. To the extent Apple is without
14 knowledge or information sufficient to form a belief as to the truth of any of the
15 allegations in Paragraph 117, for example, because they implicate information in the
16 possession and control of end users, Apple denies those allegations on that basis.
17 Except as specifically admitted, Apple denies the allegations and characterizations
18 contained in Paragraph 117 of the Complaint.

19 118. To the extent Paragraph 118 of the Complaint implicates legal
20 conclusions, no response is required. Apple admits that it imports and sells its
21 iPhone 7 and iPhone 7 Plus devices into the United States. Apple admits that it sells
22 the accused devices to resellers, retailers, and end users. Except as specifically
23 admitted, Apple denies the allegations and characterizations contained in Paragraph
24 118 of the Complaint.

25 119. Apple denies the allegations and characterizations contained in
26 Paragraph 119 of the Complaint.

1 120. Apple denies the allegations and characterizations contained in
2 Paragraph 120 of the Complaint.

COUNT 4

(ALLEGED) PATENT INFRINGEMENT – U.S. PATENT NO. 9,535,490

5 121. Paragraphs 1–120 of Apple’s Answer are incorporated by reference as
6 if set forth in full herein; Apple repeats and incorporates its Answer to Paragraphs
7 1–120.

8 122. To the extent Paragraph 122 of the Complaint implicates legal
9 conclusions, no response is required. To the extent that a response is required,
10 Apple denies the allegations and characterizations contained in Paragraph 122 of the
11 Complaint, including because Apple does not infringe the '490 patent and because
12 Apple is without knowledge or information sufficient to form a belief as to the truth
13 of the remaining allegations and characterizations in Paragraph 122.

14 123. Apple denies the allegations and characterizations contained in
15 Paragraph 123 of the Complaint.

16 124. To the extent Paragraph 124 of the Complaint implicates legal
17 conclusions, no response is required. To the extent that a response is required,
18 Apple denies the allegations and characterizations contained in Paragraph 124 of the
19 Complaint, including on information and belief. To the extent Apple is without
20 knowledge or information sufficient to form a belief as to the truth of any of the
21 allegations in Paragraph 124, Apple denies those allegations on that basis.

22 125. To the extent Paragraph 125 of the Complaint implicates legal
23 conclusions, no response is required. To the extent that a response is required,
24 Apple denies the allegations and characterizations contained in Paragraph 125 of the
25 Complaint, including on information and belief. To the extent Apple is without
26 knowledge or information sufficient to form a belief as to the truth of any of the
27 allegations in Paragraph 125, Apple denies those allegations on that basis.

1 126. Apple admits that its iPhone 7 and iPhone 7 Plus devices contain an
2 application processor. To the extent Paragraph 126 of the Complaint implicates
3 legal conclusions, no response is required. To the extent that a response is required,
4 except as specifically admitted, Apple denies the allegations and characterizations
5 contained in Paragraph 126 of the Complaint, including on information and belief.
6 To the extent Apple is without knowledge or information sufficient to form a belief
7 as to the truth of any of the allegations in Paragraph 126, Apple denies those
8 allegations on that basis.

9 127. To the extent Paragraph 127 of the Complaint implicates legal
10 conclusions, no response is required. To the extent that a response is required,
11 Apple denies the allegations and characterizations contained in Paragraph 127 of the
12 Complaint, including on information and belief. To the extent Apple is without
13 knowledge or information sufficient to form a belief as to the truth of any of the
14 allegations in Paragraph 127, Apple denies those allegations on that basis.

15 128. To the extent Paragraph 128 of the Complaint implicates legal
16 conclusions, no response is required. To the extent that a response is required,
17 Apple denies the allegations and characterizations contained in Paragraph 128 of the
18 Complaint, including on information and belief. To the extent Apple is without
19 knowledge or information sufficient to form a belief as to the truth of any of the
20 allegations in Paragraph 128, Apple denies those allegations on that basis.

21 129. To the extent Paragraph 129 of the Complaint implicates legal
22 conclusions, no response is required. To the extent that a response is required,
23 Apple denies the allegations and characterizations contained in Paragraph 129 of the
24 Complaint, including on information and belief. To the extent Apple is without
25 knowledge or information sufficient to form a belief as to the truth of any of the
26 allegations in Paragraph 129, Apple denies those allegations on that basis.

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1 130. To the extent Paragraph 130 of the Complaint implicates legal
2 conclusions, no response is required. To the extent that a response is required,
3 Apple denies the allegations and characterizations contained in Paragraph 130 of the
4 Complaint, including on information and belief. To the extent Apple is without
5 knowledge or information sufficient to form a belief as to the truth of any of the
6 allegations in Paragraph 130, Apple denies those allegations on that basis.

7 131. To the extent Paragraph 131 of the Complaint implicates legal
8 conclusions, no response is required. To the extent that a response is required,
9 Apple denies the allegations and characterizations contained in Paragraph 131 of the
10 Complaint, including on information and belief. To the extent Apple is without
11 knowledge or information sufficient to form a belief as to the truth of any of the
12 allegations in Paragraph 131, Apple denies those allegations on that basis.

13 132. To the extent Paragraph 132 of the Complaint implicates legal
14 conclusions, no response is required. To the extent that a response is required,
15 Apple denies the allegations and characterizations contained in Paragraph 132 of the
16 Complaint, including on information and belief. To the extent Apple is without
17 knowledge or information sufficient to form a belief as to the truth of any of the
18 allegations in Paragraph 132, Apple denies those allegations on that basis.

19 133. To the extent Paragraph 133 of the Complaint implicates legal
20 conclusions, no response is required. To the extent that a response is required,
21 Apple denies the allegations and characterizations contained in Paragraph 133 of the
22 Complaint, including on information and belief. To the extent Apple is without
23 knowledge or information sufficient to form a belief as to the truth of any of the
24 allegations in Paragraph 133, Apple denies those allegations on that basis.

25 134. To the extent Paragraph 134 of the Complaint implicates legal
26 conclusions, no response is required. Apple admits that it learned of the '490 patent
27 as of July 6, 2017, when Qualcomm filed this lawsuit. Apple admits that it tests,
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demonstrates, or otherwise operates the accused iPhone 7 and iPhone 7 Plus devices in the United States. Apple admits that its customers and end users of the accused devices operate the accused devices in the United States. Apple admits that it provides user manuals for the accused devices. To the extent Apple is without knowledge or information sufficient to form a belief as to the truth of any of the allegations in Paragraph 134, for example, because they implicate information in the possession and control of end users, Apple denies those allegations on that basis. Except as specifically admitted, Apple denies the allegations and characterizations contained in Paragraph 134 of the Complaint.

135. To the extent Paragraph 135 of the Complaint implicates legal conclusions, no response is required. Apple admits that it imports and sells its iPhone 7 and iPhone 7 Plus devices into the United States. Apple admits that it sells the accused devices to resellers, retailers, and end users. Except as specifically admitted, Apple denies the allegations and characterizations contained in Paragraph 135 of the Complaint.

136. Apple denies the allegations and characterizations contained in Paragraph 136 of the Complaint.

137. Apple denies the allegations and characterizations contained in Paragraph 137 of the Complaint.

COUNT 5

([ALLEGED] PATENT INFRINGEMENT – U.S. PATENT NO. 9,608,675)

138. Paragraphs 1–137 of Apple’s Answer are incorporated by reference as if set forth in full herein; Apple repeats and incorporates its Answer to Paragraphs 1–137.

139. To the extent Paragraph 139 of the Complaint implicates legal conclusions, no response is required. To the extent that a response is required, Apple denies the allegations and characterizations contained in Paragraph 139 of the

1 Complaint, including because Apple does not infringe the '675 patent and because
2 Apple is without knowledge or information sufficient to form a belief as to the truth
3 of the remaining allegations and characterizations in Paragraph 139.

4 140. Apple denies the allegations and characterizations contained in
5 Paragraph 140 of the Complaint.

6 141. To the extent Paragraph 141 of the Complaint implicates legal
7 conclusions, no response is required. To the extent that a response is required,
8 Apple admits that its iPhone 7 and iPhone 7 Plus devices contain a power amplifier
9 but denies all other allegations and characterizations contained in Paragraph 141 of
10 the Complaint, including on information and belief. To the extent Apple is without
11 knowledge or information sufficient to form a belief as to the truth of any of the
12 allegations in Paragraph 141, Apple denies those allegations on that basis.

13 142. To the extent Paragraph 142 of the Complaint implicates legal
14 conclusions, no response is required. To the extent that a response is required,
15 Apple denies the allegations and characterizations contained in Paragraph 142 of the
16 Complaint, including on information and belief. To the extent Apple is without
17 knowledge or information sufficient to form a belief as to the truth of any of the
18 allegations in Paragraph 142, Apple denies those allegations on that basis.

19 143. To the extent Paragraph 143 of the Complaint implicates legal
20 conclusions, no response is required. To the extent that a response is required,
21 Apple denies the allegations and characterizations contained in Paragraph 143 of the
22 Complaint, including on information and belief. To the extent Apple is without
23 knowledge or information sufficient to form a belief as to the truth of any of the
24 allegations in Paragraph 143, Apple denies those allegations on that basis.

25 144. To the extent Paragraph 144 of the Complaint implicates legal
26 conclusions, no response is required. To the extent that a response is required,
27 Apple denies the allegations and characterizations contained in Paragraph 144 of the
28

1 Complaint, including on information and belief. To the extent Apple is without
2 knowledge or information sufficient to form a belief as to the truth of any of the
3 allegations in Paragraph 144, Apple denies those allegations on that basis.

4 145. To the extent Paragraph 145 of the Complaint implicates legal
5 conclusions, no response is required. To the extent that a response is required,
6 Apple denies the allegations and characterizations contained in Paragraph 145 of the
7 Complaint, including on information and belief. To the extent Apple is without
8 knowledge or information sufficient to form a belief as to the truth of any of the
9 allegations in Paragraph 145, Apple denies those allegations on that basis.

10 146. To the extent Paragraph 146 of the Complaint implicates legal
11 conclusions, no response is required. To the extent that a response is required,
12 Apple denies the allegations and characterizations contained in Paragraph 146 of the
13 Complaint, including on information and belief. To the extent Apple is without
14 knowledge or information sufficient to form a belief as to the truth of any of the
15 allegations in Paragraph 146, Apple denies those allegations on that basis.

16 147. To the extent Paragraph 147 of the Complaint implicates legal
17 conclusions, no response is required. To the extent that a response is required,
18 Apple denies the allegations and characterizations contained in Paragraph 147 of the
19 Complaint, including on information and belief. To the extent Apple is without
20 knowledge or information sufficient to form a belief as to the truth of any of the
21 allegations in Paragraph 147, Apple denies those allegations on that basis.

22 148. To the extent Paragraph 148 of the Complaint implicates legal
23 conclusions, no response is required. To the extent that a response is required,
24 Apple denies the allegations and characterizations contained in Paragraph 148 of the
25 Complaint, including on information and belief. To the extent Apple is without
26 knowledge or information sufficient to form a belief as to the truth of any of the
27 allegations in Paragraph 148, Apple denies those allegations on that basis.

28

1 149. To the extent Paragraph 149 of the Complaint implicates legal
2 conclusions, no response is required. To the extent that a response is required,
3 Apple denies the allegations and characterizations contained in Paragraph 149 of the
4 Complaint, including on information and belief. To the extent Apple is without
5 knowledge or information sufficient to form a belief as to the truth of any of the
6 allegations in Paragraph 149, Apple denies those allegations on that basis.

7 150. To the extent Paragraph 150 of the Complaint implicates legal
8 conclusions, no response is required. To the extent that a response is required,
9 Apple denies the allegations and characterizations contained in Paragraph 150 of the
10 Complaint, including on information and belief. To the extent Apple is without
11 knowledge or information sufficient to form a belief as to the truth of any of the
12 allegations in Paragraph 150, Apple denies those allegations on that basis.

13 151. To the extent Paragraph 151 of the Complaint implicates legal
14 conclusions, no response is required. To the extent that a response is required,
15 Apple denies the allegations and characterizations contained in Paragraph 151 of the
16 Complaint, including on information and belief. To the extent Apple is without
17 knowledge or information sufficient to form a belief as to the truth of any of the
18 allegations in Paragraph 151, Apple denies those allegations on that basis.

19 152. Apple denies the allegations and characterizations contained in
20 Paragraph 152 of the Complaint.

21 153. Apple denies the allegations and characterizations contained in
22 Paragraph 153 of the Complaint.

PRAYER FOR RELIEF

24 Apple denies that Qualcomm is entitled to any relief whatsoever, whether as
25 sought in the Prayer for Relief of its First Amended Complaint for Patent
26 Infringement or otherwise, in connection with this civil action.

AFFIRMATIVE DEFENSES

Pursuant to Federal Rule of Civil Procedure 8(c), Apple, without waiver, limitation, or prejudice, hereby asserts the following affirmative defenses:

FIRST DEFENSE

154. Qualcomm's claims are barred in whole or in part because Apple has not directly infringed, induced infringement, or contributed to infringement, and does not directly infringe, induce infringement, or contribute to infringement, of any valid and enforceable claim of the Asserted Patents, either literally or under the doctrine of equivalents, and has not otherwise committed any acts in violation of 35 U.S.C. § 271.

SECOND DEFENSE

155. Qualcomm's claims are barred in whole or in part because each asserted claim of the Asserted Patents is invalid for failure to comply with the requirements of 35 U.S.C. §§ 101, 102, 103, 112, and/or of any other applicable statutory provisions of Title 35 of the United States Code. With respect to each Asserted Patent, Apple provides an identification of prior art that supports this additional defense in Exhibit A attached hereto. The prior art provided in Exhibit A is exemplary only and should not be construed as limiting in any way the defenses that Apple will present in this case. In addition, Paragraphs 22, 30, 52, 60, and 68 of Apple's Counterclaims are incorporated by reference as if set forth in full herein.

THIRD DEFENSE

156. Qualcomm's claims are barred in whole or in part by reason of estoppel.

157. Qualcomm is estopped from construing any valid claim of the Asserted Patents to be infringed or to have been infringed, either literally or by application of the doctrine of equivalents, by any product made, used, imported, sold, or offered for sale by Apple in view of prior art and/or because of admissions, representations,

1 and/or statements made to the Patent Office during prosecution of any application
2 leading to the issuance of the Asserted Patents or any related patent, because of
3 disclosure or language in the specifications of the Asserted Patents, and/or because
4 of limitations in the claims of the Asserted Patents.

5 **FOURTH DEFENSE**

6 158. Qualcomm's claims are barred in whole or in part as a result of patent
7 exhaustion and/or a license to the Asserted Patents.

8 159. For example, Apple is licensed to the extent any agreement between
9 Qualcomm and an Apple contract manufacturer extends to Apple or any accused
10 products. Further, to the extent the claims of one or more of the '936, '558, '949,
11 '490, and '675 patents are licensed by an Apple contract manufacturer and/or
12 substantially embodied in an end product or component purchased by Apple from a
13 seller authorized by Qualcomm, Qualcomm's patent rights are exhausted. The
14 allegations set forth herein are made on information and belief of Apple and are
15 subject to the discovery of additional evidence.

16 **FIFTH DEFENSE**

17 160. Qualcomm's claims are barred in whole or in part by reason of the
18 equitable doctrine of patent misuse.

19 161. For example, Qualcomm has sought to enforce the Asserted Patents in
20 an investigation before the United States International Trade Commission ("ITC"),
21 *Certain Mobile Electronic Devices and Radio Frequency and Processing*
22 *Components Thereof*, Inv. No. 337-TA-1065 ("1065 Investigation"). On
23 information and belief, Qualcomm filed the Complaint in this case
24 contemporaneously with its Complaint in the 1065 Investigation as part of a unified
25 strategy.

26 162. On information and belief, Qualcomm is seeking to use the threat of an
27 exclusion order based on the Asserted Patents in the 1065 Investigation—and all the
28

1 harmful effects on competition that result from this threat and would result from an
2 exclusion order—as an end-run around a pending FTC action¹¹ and other
3 competition agency enforcement actions as well as private litigations challenging
4 Qualcomm’s continuing anticompetitive conduct, and to coerce Apple to take a
5 portfolio license from Qualcomm on unfair and unreasonable terms. Qualcomm
6 seeks to extend its monopoly over premium LTE baseband chipsets by using the
7 ITC’s authority to exclude its only remaining competitor, Intel. By asking the ITC
8 to exclude only a subset of the allegedly infringing Apple products with baseband
9 chipsets purchased from Intel, the net effect of Qualcomm’s action is to restrain
10 competition and extend its monopoly through exclusionary and anticompetitive
11 means.¹² The selective exclusion order Qualcomm requests would grant it a
12 monopoly by fiat, and effectively strip agencies and courts of authority to challenge
13 Qualcomm’s misuse of its patents and anticompetitive conduct. This overextension
14 of patent rights constitutes patent misuse, and further renders Qualcomm’s Asserted
15 Patents unenforceable.

163. On information and belief, Qualcomm has engaged in illegal tying by
17 conditioning the sale of its baseband chipsets on the purchase of a license to, *inter*
18 *alia*, a portfolio of hundreds of patents that include the Asserted Patents. *See*
19 Answer at ¶ 403, *Qualcomm Incorporated v. Compal Electronics Inc.*, No. 3:17-cv-
20 01010-GPC-MDD (S.D. Cal. July 18, 2017), ECF No. 84 (“CMs’ Answer”)
21 (“Qualcomm also requires users to license its NEPs to purchase modem chips.”).
22 Specifically, Qualcomm conditioned sales of baseband chipsets—over which it
23 holds monopoly power—on OEMs agreeing to license the Asserted Patents and
24 other patents, with the effect of excluding competition and maintaining its monopoly
25

26 ¹¹ *FTC v. Qualcomm Inc.*, No. 5:17-cv-00220-LHK (N.D. Cal.).

27 ¹² To the extent that the relief in this case were limited to products containing Intel
28 chipsets, the same anticompetitive effects would result.

1 in markets for CDMA and premium LTE baseband chipsets. In sum, Qualcomm is
2 using its market and monopoly power to broaden the scope of its patent rights as to,
3 *inter alia*, the Asserted Patents by forcing customers to take and pay for a license
4 they do not otherwise want and/or need in order to purchase its baseband chipsets.

5 164. Furthermore, Qualcomm has conditioned licenses to its cellular
6 standard-essential patents (“SEPs”) on the purchase of a license to, *inter alia*, the
7 Asserted Patents. *See* CMs’ Answer at ¶ 333 (describing Qualcomm’s restraints of
8 trade as including “tying or bundling together SEP licenses, non-SEP licenses, . . . ”).
9 Qualcomm also has required others to grant Qualcomm cross-licenses to their
10 patents in order to be allowed to purchase Qualcomm’s baseband chipsets and a
11 license to its SEPs, and its NEPs, including the Asserted Patents. *See* Complaint at
12 ¶ 77(d), *FTC v. Qualcomm Inc.*, No. 5:17-cv-00220-LHK (N.D. Cal. Jan. 17, 2017),
13 (“Qualcomm has required OEMs to grant Qualcomm cross-licenses (in some cases,
14 to both SEPs and non-SEPs), often with pass-through rights to other OEMs, and has
15 failed to adjust its royalty rate to account for the value of OEMs’ cross-licensed
16 patents.”); CMs’ Answer at 116 (“In exchange [for certain rights to certain
17 Qualcomm patents, including SEPs and NEPs, Wistron] . . . provide[s] a . . . cross-
18 license to Wistron’s intellectual property related to certain technology.”); *id.* at ¶
19 111 (same for Hon Hai); *id.* at ¶ 122 (same for Pegatron).

20 165. These various conditions and arrangements have significant
21 anticompetitive effects, including maintaining Qualcomm’s monopoly in CDMA
22 and premium LTE baseband chipsets, has excluded competition, raised prices of
23 baseband chipsets, and harmed consumers. The Asserted Patents are part and parcel
24 of Qualcomm’s overall anticompetitive scheme and overextension of patent rights.

25 166. Qualcomm’s conduct in the ITC and here is a continuing and integral
26 part of Qualcomm’s overall practice of engaging in anticompetitive conduct to
27 eliminate challengers to its monopoly positions in premium LTE and CDMA chipset

1 markets. By seeking to exclude from the United States only those challenged Apple
2 products that contain chipsets supplied by a Qualcomm competitor—
3 notwithstanding that all the challenged Apple products purportedly infringe
4 Qualcomm Asserted Patents—Qualcomm is conditioning freedom from its patent
5 assertions on customers buying Qualcomm chipsets.

6 167. As a result of at least the aforementioned activity, Qualcomm is guilty
7 of patent misuse and the Asserted Patents are unenforceable.

8 **SIXTH DEFENSE**

9 168. Qualcomm's claims are barred in whole or in part by reason of
10 equitable doctrine of unclean hands.

11 169. Qualcomm comes to the Court with unclean hands, for example,
12 because it has engaged in a continuing anticompetitive scheme to maintain its
13 monopoly in premium LTE baseband chipsets, including through its illegal “No
14 License, No Chips” policy and exclusionary royalty discounts. *See Complaint, FTC*
15 *v. Qualcomm Inc.*, No. 5:17-cv-00220-LHK (N.D. Cal. Jan. 17, 2017).

16 170. Furthermore, Qualcomm has unclean hands by seeking to enforce the
17 Asserted Patents in the 1065 Investigation as an end-run around an existing FTC
18 action and seeking to invoke the ITC's authority to exclude Qualcomm's only
19 remaining premium LTE chipset competitor, Intel, as retaliation against Apple for
20 daring to purchase some of its premium LTE baseband chipset requirements from
21 Intel and challenging Qualcomm's misconduct in court. Tellingly, Qualcomm has
22 asked the ITC to exclude only allegedly infringing Apple products that contain Intel
23 chipsets, further demonstrating that Qualcomm's purpose in bringing the 1065
24 Investigation is to improperly further its monopoly, rather than to seek to prevent the
25 unlawful importation of allegedly infringing articles allegedly disrupting a domestic
26 industry and improperly restraining trade in the United States. To the extent that the
27
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1 relief in this case were limited to products containing Intel chipsets, the same
2 anticompetitive effects would result.

3 171. Qualcomm's unclean hands should therefore bar Qualcomm from
4 obtaining any relief from this Court.

5 **SEVENTH DEFENSE**

6 172. The '558 patent is unenforceable due to inequitable conduct by
7 Qualcomm's patent prosecution counsel in failing to discharge their duty of candor
8 to the United States Patent and Trademark Office ("USPTO"). On information and
9 belief, Qualcomm's patent prosecution counsel, including attorney Shelton Austin,
10 knowingly made affirmative misrepresentations of material information to the
11 USPTO with a specific intent to deceive the USPTO.

12 173. On November 23, 2012, the examiner indicated that dependent claim
13 18 of U.S. Patent Application No. 13/167,659 would be allowable if written in
14 independent form. On February 22, 2013, Qualcomm's patent prosecution counsel,
15 William M. Hooks, amended claim 18, incorporating the subject matter of claim 16
16 and adding a new limitation: "a power amplifier operative to receive an envelope
17 signal and provide a second supply current based on the envelope signal." At the
18 same time, Mr. Hooks submitted an Information Disclosure Statement including,
19 *inter alia*, DAEHYUN KANG ET AL: "A Multimode/Multiband Power Amplifier
20 With a Boosted Supply Modulator," IEEE TRANSACTIONS ON MICROWAVE
21 THEORY AND TECHNIQUES, IEEE SERVICE CENTER, PISCATAWAY, NJ,
22 US, vol. 58, no. 10, 1 October 2010 (2010-10-01), pages 2598-2608, XP011317521,
23 ISSN: 0018-9480 ("Kang"). The '558 patent issued on April 15, 2014, with claim
24 18 renumbered as claim 12.

25 174. On April 27, 2017, Qualcomm's patent prosecution counsel
26 (specifically, Mr. Austin) submitted a request for a certificate of correction, asking
27 the USPTO to strike the following limitation from claim 12: "a power amplifier

1 operative to receive an envelope signal and provide a second supply current based
2 on the envelope signal.” Mr. Austin falsely misrepresented to the USPTO that
3 corrected claim 12 did not require reexamination because “the Examiner of record
4 indicated that the combined subject matter of original claims 16 and 18 is
5 allowable.” On information and belief, Mr. Austin made this misrepresentation
6 knowing that the Examiner of record could not have reviewed the February 22, 2013
7 IDS (including the Kang reference) when the Examiner made the indication of
8 allowability on November 23, 2012.

9 175. This misrepresentation was material because the Kang reference
10 invalidates corrected claim 12. Upon information and belief, the USPTO relied on
11 Mr. Austin’s material misrepresentation in issuing a certificate of correction on June
12 27, 2017, modifying claim 12 as Qualcomm requested. As a result of Mr. Austin’s
13 material misrepresentation, no one at the USPTO ever examined corrected claim 12
14 in light of the Kang reference.

15 **EIGHTH DEFENSE**

16 176. The June 27, 2017 Certificate of Correction to the ’558 patent is invalid
17 for impermissible broadening, including because corrected claims 12-14 are broader
18 than original claims 12-14, and because the presence of any clerical or typographical
19 error in the original claims 12-14, and how to correct that error, were not clearly
20 evident to one of skill in the art.

21 **NINTH DEFENSE**

22 177. Qualcomm’s remedies are limited under 28 U.S.C. § 1498(a). Apple is
23 not liable to the extent the accused products were used or manufactured by or for the
24 United States, or to the extent accused activities were undertaken on behalf of the
25 United States, according to at least 28 U.S.C. § 1498.

TENTH DEFENSE

178. To the extent that Qualcomm and any predecessors in interest to the Asserted Patents failed to properly mark any of their relevant products or materials as required by 35 U.S.C. § 287, or otherwise give proper notice that Apple's actions allegedly infringe the Asserted Patents, Apple is not liable to Qualcomm for the acts alleged to have been performed before it received actual notice that it was allegedly infringing the Asserted Patents.

ELEVENTH DEFENSE

179. Qualcomm's Complaint fails to state a claim upon which relief can be granted because, among other things, Qualcomm has not stated a plausible allegation that Apple induces or contributes to the infringement of any claim of the '675 patent, and Qualcomm has not alleged that Apple had the requisite knowledge of the '675 patent or of any alleged infringement.

RESERVATION OF ALL AFFIRMATIVE DEFENSES

180. Apple hereby gives notice that it intends to rely upon any other matter constituting an avoidance or affirmative defense as set forth in Rule 8(c) of the Federal Rules of Civil Procedure, and that it reserves the right to seek leave to amend this Answer to add to, amend, withdraw, or modify these defenses as its investigation continues and as discovery may require.

COUNTERCLAIMS

Counterclaimant Apple Inc. (“Apple”), through its undersigned counsel, counterclaims and alleges against Qualcomm Incorporated and Qualcomm Technologies, Inc. as follows:

PARTIES

1. Apple is a California corporation having its principal place of business at 1 Infinite Loop, Cupertino, California 95014. Apple designs, manufactures, and

markets mobile communication and media devices, personal computers, and portable music players, as well as related software, accessories, and content.

2. Qualcomm Incorporated is a Delaware corporation having its principal place of business at 5775 Morehouse Drive, San Diego, California 92121. Qualcomm a global semiconductor company that designs and markets wireless telecommunications products and services.

3. Qualcomm includes Qualcomm Incorporated, Qualcomm Technology Licensing (“QTL”); Qualcomm Technologies, Inc. (“QTI”); Qualcomm CDMA Technologies (“QCT”); and Qualcomm CDMA Technologies Asia Pacific Pte. Ltd. (“QCTAP”). QTI is wholly owned by Qualcomm Incorporated, and both QCT and QCTAP are operated by QTI and its subsidiaries.

4. Qualcomm Technologies, Inc. (“QTI”) is a Delaware corporation having its principal place of business at 5775 Morehouse Drive, San Diego, California 92121.

5. Qualcomm and QTI have offices and employees in this District and regularly conduct business in this District.

JURISDICTION

6. Apple brings these counterclaims under, *inter alia*, the patent laws of the United States, 35 U.S.C. § 1 *et seq.*; and the Declaratory Judgment Act, 28 U.S.C. §§ 2201 and 2202. Accordingly, this Court has subject matter jurisdiction under 28 U.S.C. §§ 1331 (federal question), 1338(a) (patents), and 2201 and 2202 (declaratory judgment).

7. Qualcomm is subject to the personal jurisdiction of this Court for at least the reason that, in filing its Complaint, Qualcomm has submitted to the personal jurisdiction of this Court. Qualcomm and QTI are further subject to the personal jurisdiction of this Court for at least the reasons that their principal place of

1 business is in this District, they have offices and employees in this District, and
2 regularly conduct business in this District.

3 8. To the extent that venue is proper for Qualcomm's claims, venue is also
4 proper for these counterclaims under 28 U.S.C. §§ 1391(b) and 1391(c). Venue for
5 the patent infringement counterclaims is also proper under 28 U.S.C. § 1400(b).
6 Qualcomm has consented to venue in this District by bringing this action.

7

8 **DECLARATORY JUDGMENT COUNTERCLAIMS**

9 **QUALCOMM'S PATENTS-IN-SUIT**

10 9. Qualcomm purports to be the owner of U.S. Patent No. 8,633,936 ("the
11 '936 patent"). The first page of the '936 patent lists an issue date of January 21,
12 2014, and identifies Qualcomm as assignee. Qualcomm purports to have attached a
13 copy of the '936 patent as Exhibit A to the Complaint.

14 10. Qualcomm purports to be the owner of U.S. Patent No. 8,698,558 ("the
15 '558 patent"). The first page of the '558 patent lists an issue date of April 15, 2014,
16 and identifies Qualcomm as assignee. Qualcomm purports to have attached a copy
17 of the '558 patent as Exhibit B to the Complaint.

18 11. Qualcomm purports to be the owner of U.S. Patent No. 8,838,949 ("the
19 '949 patent"). The first page of the '949 patent lists an issue date of September 16,
20 2014, and identifies Qualcomm as assignee. Qualcomm purports to have attached a
21 copy of the '949 patent as Exhibit C to the Complaint.

22 12. Qualcomm purports to be the owner of U.S. Patent No. 9,535,490 ("the
23 '490 patent"). The first page of the '490 patent lists an issue date of January 3,
24 2017, and identifies Qualcomm as assignee. Qualcomm purports to have attached a
25 copy of the '490 patent as Exhibit D to the Complaint.

26 13. Qualcomm purports to be the owner of U.S. Patent No. 9,608,675 ("the
27 '675 patent"). The first page of the '675 patent lists an issue date of March 28,

28

1 2017, and identifies Qualcomm as assignee. Qualcomm purports to have attached a
2 copy of the '675 patent as Exhibit E to the Complaint.

3 14. Qualcomm has alleged that acts by Apple infringe the '936, '558, '949,
4 '490, and '675 patents (collectively, "the Asserted Patents").

5 15. Accordingly, an actual controversy exists between Apple and
6 Qualcomm regarding the alleged infringement, validity, enforceability of the
7 Asserted Patents. This controversy is of sufficient immediacy and reality to warrant
8 the issuance of a Declaratory Judgment.

9 **COUNT I**

10 **Declaration of Noninfringement of U.S. Patent No. 8,633,936**

11 16. Apple restates and incorporates by reference each of the allegations set
12 forth above.

13 17. Qualcomm purports to charge Apple with infringement of the '936
14 patent in its Complaint. (Dkt. 14 [First Amended Complaint] at Count 1.)

15 18. No asserted claim of the '936 patent has been or is infringed, either
16 directly, contributorily, or by inducement, literally or under the doctrine of
17 equivalents, by Apple or the purchasers of Apple's products through the
18 manufacture, use, importation, sale, and/or offer for sale of Apple's products.

19 19. For example, Qualcomm purports to charge Apple with infringement of
20 Claims 1, 10, 19, 29, 38, 49, 55, and 67 of the '936 patent. Claims 1, 10, 19, 29, 38,
21 49, 55, and 67 of the '936 patent read as follows (claim element enumeration added
22 for convenience):

23 Claim 1	
24 [a]	A method comprising:
25 [b]	receiving a graphics instruction for execution within a programmable 26 streaming processor;

[c]	receiving an indication of a data precision for execution of the graphics instruction, wherein the indication of the data precision is contained within the graphics instruction, wherein the graphics instruction is a first executable instruction generated by a compiler that compiles graphics application instructions;
[d]	receiving a conversion instruction that, when executed by the programmable streaming processor, converts graphics data, associated with the graphics instruction, from a first data precision to converted graphics data having the indicated data precision, and wherein the conversion instruction is different than the graphics instruction, wherein the conversion instruction is generated by the compiler;
[e]	selecting one of a plurality of execution units within the processor based on the indicated data precision; and
[f]	using the selected execution unit to execute the graphics instruction with the indicated data precision using the converted graphics data associated with the graphics instruction.

Claim 10

[a]	A non-transitory computer-readable storage medium comprising instructions for causing a programmable streaming processor to:
[b]	receive a graphics instruction for execution within the programmable streaming processor;
[c]	receive an indication of a data precision for execution of the graphics instruction, wherein the indication of the data precision is contained within the graphics instruction, wherein the graphics instruction is a first executable instruction generated by a compiler that compiles graphics application instructions;

1	[d]	receive a conversion instruction that, when executed by the programmable 2 streaming processor, converts graphics data, associated with the graphics 3 instruction, from a first data precision to converted graphics data having the 4 indicated data precision, and wherein the conversion instruction is different 5 than the graphics instruction, wherein the conversion instruction is generated 6 by the compiler;
7	[e]	select one of a plurality of execution units within the processor based on the 8 indicated data precision; and
9	[f]	use the selected execution unit to execute the graphics instruction with the 10 indicated data precision using the converted graphics data associated with 11 the graphics instruction.

12

13 **Claim 19**

14	[a]	A device comprising:
15	[b]	a controller configured to receive a graphics instruction for execution within 16 a programmable streaming processor, wherein the indication of the data 17 precision is contained within the graphics instruction and wherein the 18 graphics instruction is a first executable instruction generated by a compiler 19 that compiles graphics application instructions, to receive an indication of a 20 data precision for execution of the graphics instruction, and to receive a 21 conversion instruction that, when executed by the programmable streaming 22 processor, converts graphics data associated with the graphics instruction, 23 from a first data precision to converted graphics data having a second data 24 precision, wherein the conversion instruction is different than the graphics 25 instruction and wherein the conversion instruction is generated by the 26 compiler; and
27	[c]	a plurality of execution units within the processor,

1 [d] wherein the controller is configured to select one of the execution units
2 based on the indicated data precision and cause the selected execution unit to
3 execute the graphics instruction with the indicated data precision using the
4 converted graphics data associated with the graphics instruction.

5

6 **Claim 29**

7 [a] A device comprising:
8
9 [b] means for receiving a graphics instruction for execution within a
10 programmable streaming processor;
11
12 [c] means for receiving an indication of a data precision for execution of the
13 graphics instruction, wherein the indication of the data precision is contained
14 within the graphics instruction, wherein the graphics instruction is a first
15 executable instruction generated by a compiler that compiles graphics
16 application instructions;
17
18 [d] means for receiving a conversion instruction that, when executed by the
19 programmable streaming processor, converts graphics data, associated with
20 the graphics instruction, from a first data precision to converted graphics
21 data having the indicated data precision, and wherein the conversion
22 instruction is different than the graphics instruction, wherein the conversion
23 instruction is generated by the compiler;
24
25 [e] means for selecting one of a plurality of execution units within the processor
26 based on the indicated data precision; and
27
28 [f] means for using the selected execution unit to execute the graphics
instruction with the indicated data precision using the converted graphics
data associated with the graphics instruction.

1

Claim 38	
2	[a] A device comprising:
3	[b] a programmable streaming processor; and
4	[c] at least one memory module coupled to the programmable streaming
5	processor,
6	[d] wherein the programmable streaming processor comprises:
7	[e] a controller configured to receive a graphics instruction for execution from
8	the at least one memory module, to receive an indication of a data precision
9	for execution of the graphics instruction, wherein the indication of the data
10	precision is contained within the graphics instruction and wherein the
11	graphics instruction is a first executable instruction generated by a compiler
12	that compiles graphics application instructions, and to receive a conversion
13	instruction that, when executed by the processor, converts graphics data,
14	associated with the graphics instruction, to converted graphics data, wherein
15	the graphics data has a first data precision and the converted graphics data
16	has the indicated data precision, and wherein the conversion instruction is
17	different than the graphics instruction and wherein the conversion instruction
18	is generated by the compiler; and
19	[f] a plurality of execution units that are configured to execute instructions,
20	[g] wherein the controller is configured to select one of the execution units
21	based on the indicated data precision and cause the selected execution unit to
22	execute the graphics instruction with the indicated data precision using the
23	converted graphics data associated with the graphics instruction.
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Claim 49	
26	[a] A method comprising:
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- [b] analyzing, by a compiler executed by a processor, a plurality of application instructions for a graphics application;
- [c] for each application instruction that specifies a first data precision level for its execution, generating, by the compiler, one or more corresponding compiled instructions that each indicate the first data precision level for its execution, wherein the first precision level comprises a full data precision level; and
- [d] generating, by the compiler, one or more conversion instructions to convert graphics data from a second, different data precision level to the first data precision level when the one or more compiled instructions are executed.

Claim 55

[a]	A non-transitory computer-readable storage medium comprising instructions for causing a processor to:
[b]	analyze, by a compiler executed by the processor, a plurality of application instructions for a graphics application;
[c]	for each application instruction that specifies a first data precision level for its execution, generate, by the compiler, one or more corresponding compiled instructions that each indicate the first data precision level for its execution, wherein the first precision level comprises a full data precision level; and
[d]	generate, by the compiler, one or more conversion instructions to convert graphics data from a second, different data precision level to the first data precision level when the one or more compiled instructions are executed.

Claim 67

[a] A non-transitory computer-readable data storage medium comprising:

1	[b] one or more first executable instructions generated by a compiler, wherein 2 the one or more first executable instructions, when executed by a 3 programmable streaming processor, support one or more functions of a 4 graphics application, wherein each of the first executable instructions 5 indicates a first data precision level for its execution;
6	[c] one or more second executable instructions generated by a compiler, 7 wherein the one or more second executable instructions, when executed by 8 the programmable streaming processor, support one or more functions of the 9 graphics application, wherein each of the second executable instructions 10 indicates a second data precision level different from the first data precision 11 level for its execution, wherein the first precision level comprises a full data 12 precision level; and
13	[d] one or more third executable instructions generated by a compiler, wherein 14 the one or more third executable instructions, when executed by the 15 programmable streaming processor, support one or more functions of the 16 graphics application, wherein each of the third executable instructions 17 converts graphics data from the second data precision level to the first data 18 precision level when the one or more first executable instructions are 19 executed by a programmable streaming processor.

20. Claims 1, 10, 19, 29, 38, 49, 55, and 67 of the '936 patent have not
21 been infringed, and are not infringed, either directly, contributorily, or by
22 inducement, literally or under the doctrine of equivalents, by Apple or the
23 purchasers of Apple's products through the manufacture, use, importation, sale,
24 and/or offer for sale of Apple's products, at least because, by way of non-limiting
25 example, Apple's products do not satisfy the following claim limitations: 1[c];
26 19[b]; 29[d]; 38[e]; 49[c]; 55[c]; 67[d].

21. Pursuant to the Declaratory Judgment Act, 28 U.S.C. § 2201 et seq., Apple requests the declaration of the Court that Apple does not infringe and has not infringed any claim of the '936 patent.

COUNT II

Declaration of Invalidity of U.S. Patent No. 8,633,936

6 22. The asserted claims of the '936 patent fail to meet the conditions of
7 patentability and/or otherwise comply with one or more provisions of 35 U.S.C. §§
8 101 et seq., including 35 U.S.C. §§ 101, 102, 103, and/or 112. By way of non-
9 limiting example, claims 1, 10, 19, 29, 38, 49, 55, and 67 of the '936 patent are
10 anticipated and/or rendered obvious in view of at least one or more of the references
11 cited in Exhibit A, attached hereto, each of which is prior art to the '936 patent. The
12 prior art provided in Exhibit A is exemplary only and should not be construed as
13 limiting in any way the defenses that Apple will present in this case.

14 23. Pursuant to the Federal Declaratory Judgment Act, 28 U.S.C. § 2201 et
15 seq., Apple requests the declaration of the Court that one or more claims of the '936
16 patent is invalid.

COUNT III

Declaration of Noninfringement of U.S. Patent No. 8,698,558

19 24. Apple restates and incorporates by reference each of the allegations set
20 forth above.

21 25. Qualcomm purports to charge Apple with infringement of the '558
22 patent in its Complaint. (Dkt. 14 [First Amended Complaint] at Count 2.)

23 26. No asserted claim of the '558 patent has been or is infringed, either
24 directly, contributorily, or by inducement, literally or under the doctrine of
25 equivalents, by Apple or the purchasers of Apple's products through the
26 manufacture, use, importation, sale, and/or offer for sale of Apple's products.

27. For example, Qualcomm purports to charge Apple with infringement of Claims 1, 6, 8, 10, 12, and 15 of the '558 patent. Claims 1, 6, 8, 10, 12, and 15 of the '558 patent read as follows (claim element enumeration added for convenience):

Claim 1

[a]	An apparatus comprising:
[b]	a boost converter operative to receive a first supply voltage and generate a boosted supply voltage having a higher voltage than the first supply voltage; and
[c]	an envelope amplifier operative to receive an envelope signal and the boosted supply voltage and generate a second supply voltage based on the envelope signal and the boosted supply voltage, wherein
[d]	the envelope amplifier is operative to further receive the first supply voltage and generate the second supply voltage based on the first supply voltage and
[e]	generate the second supply voltage based on the first supply voltage or the boosted supply voltage, and further wherein
[f]	the envelope amplifier comprises an operational amplifier (op-amp) operative to receive the envelope signal and provide an amplified signal,
[g]	a driver operative to receive the amplified signal and provide a first control signal and a second control signal,
[h]	a P-channel metal oxide semiconductor (PMOS) transistor having a gate receiving the first control signal, a source receiving the boosted supply voltage or the first supply voltage, and a drain providing the second supply voltage, and
[i]	an N-channel metal oxide semiconductor (NMOS) transistor having a gate receiving the second control signal, a drain providing the second supply voltage, and a source coupled to circuit ground.

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Claim 6	
2	[a] An apparatus for wireless communication, comprising:
3	[b] a power amplifier operative to receive and amplify an input radio frequency
4	(RF) signal and provide an output RF signal; and
5	[c] a supply generator operative to receive an envelope signal and a first supply
6	voltage,
7	[d] to generate a boosted supply voltage having a higher voltage than the first
8	supply voltage, and
9	[e] to generate a second supply voltage for the power amplifier based on the
10	envelope signal and the boosted supply voltage, wherein
11	[f] the supply generator incorporates an operational amplifier (op-amp)
12	operative to receive the envelope signal and provide an amplified signal,
13	[g] a driver operative to receive the amplified signal and provide a first control
14	signal and a second control signal,
15	[h] a P-channel metal oxide semiconductor (PMOS) transistor having a gate
16	receiving a first control signal, a source receiving the boosted supply voltage
17	or the first supply voltage, and a drain providing the second supply voltage,
18	and
19	[i] an N-channel metal oxide semiconductor (NMOS) transistor having a gate
20	receiving the second control signal, a drain providing the second supply
21	voltage, and a source coupled to circuit ground.
22	

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Claim 8	
24	[a] A method of generating supply voltages, comprising:
25	[b] generating a boosted supply voltage based on a first supply voltage, the
26	boosted supply voltage having a higher voltage than the first supply voltage;
27	and
28	

1	[c]	generating a second supply voltage based on an envelope signal and the 2 boosted supply voltage, wherein
3	[d]	the second supply voltage is generated by an envelope amplifier that 4 produces the second supply voltage using an operational amplifier (op-amp) 5 that receives the envelope signal and provides an amplified signal,
6	[e]	a driver that receives the amplified signal and provides a first control signal 7 and a second control signal,
8	[f]	a P-channel metal oxide semiconductor (PMOS) transistor that receives the 9 first control signal, a source that receives the boosted supply voltage or the 10 first supply voltage, and a drain providing the second supply voltage and
11	[g]	an N-channel metal oxide semiconductor (NMOS) transistor that receives 12 the second control signal at a gate and provides a second supply voltage 13 through a drain, and a source for circuit grounding

14

15 **Claim 10**

16	[a]	An apparatus for generating supply voltages, comprising:
17	[b]	means for generating a boosted supply voltage based on a first supply 18 voltage, the boosted supply voltage having a higher voltage than the first 19 supply voltage; and
20	[c]	means for generating a second supply voltage based on the envelope signal 21 and the boosted supply voltage, wherein
22	[d]	the means for generating the second supply voltage incorporates an envelope 23 amplifier that produces the second supply voltage using an operational 24 amplifier (op-amp) that receives the envelope signal and provides an 25 amplified signal,
26	[e]	a driver that receives the amplified signal and provides a first control signal 27 and a second control signal,

[f]	a P-channel metal oxide semiconductor (PMOS) transistor that receives the first control signal, a source that receives the boosted supply voltage or the first supply voltage, and a drain providing the second supply voltage and
[g]	an N-channel metal oxide semiconductor (NMOS) transistor that receives the second control signal at a gate and provides a second supply voltage through a drain, and a source for circuit grounding.

Claim 12

9	[a] An apparatus comprising:
10	[b] a switcher operative to receive a first supply voltage and provide a first supply current;
11	[c] an envelope amplifier operative to receive an envelope signal and provide a second supply current based on the envelope signal; and
12	[d] a power amplifier operative to receive a total supply current comprising the first supply current and the second supply current, wherein
13	[e] the switcher comprises a current sense amplifier operative to sense the first supply current, or the second supply current, or the total supply current and provide a sensed signal,
14	[f] a driver operative to receive the sensed signal and provide a first control signal and a second control signal,
15	[g] a P-channel metal oxide semiconductor (PMOS) transistor having a gate receiving the first control signal, a source receiving the first supply voltage, and a drain providing a switching signal for an inductor providing the first supply current, and
16	[h] an N-channel metal oxide semiconductor (NMOS) transistor having a gate receiving the second control signal, a drain providing the switching signal, and a source coupled to circuit ground.

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Claim 15	
[a]	An apparatus comprising:
[b]	an inductor operative to receive a switching signal and provide a supply current; and
[c]	a switcher operative to sense an input current and generate the switching signal to charge and discharge the inductor to provide the supply current, the switcher adding an offset to the input current to generate a larger supply current via the inductor than without the offset, wherein
[d]	the switcher comprises a summer operative to sum the input current and an offset current and provide a summed current,
[e]	a current sense amplifier operative to receive the summed current and provide a sensed signal, and
[f]	a driver operative to receive the sensed signal and provide at least one control signal used to generate the switching signal for the inductor.

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29. Claims 1, 6, 8, 10, 12, and 15 of the '558 patent have not been, and are not infringed, either directly, contributorily, or by inducement, literally or under the doctrine of equivalents, by Apple or the purchasers of Apple's products through the manufacture, use, importation, sale, and/or offer for sale of Apple's products, at least because, by way of non-limiting example, on information and belief Apple's products do not satisfy the following claim limitations: 1[h]; 6[h]; 8[f]; 10[f]; 12[e]; 15[c].

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COUNT IV

Declaration of Invalidity of U.S. Patent No. 8,698,558

3 30. The asserted claims of the '558 patent fail to meet the conditions of
4 patentability and/or otherwise comply with one or more provisions of 35 U.S.C. §§
5 101 et seq., including 35 U.S.C. §§ 101, 102, 103, and/or 112. By way of non-
6 limiting example, claims 1, 6, 8, 10, 12, and 15 of the '558 patent are anticipated
7 and/or rendered obvious in view of at least one or more of the references cited in
8 Exhibit A, attached hereto, each of which is prior art to the '558 patent. The prior
9 art provided in Exhibit A is exemplary only and should not be construed as limiting
10 in any way the defenses that Apple will present in this case.

11 31. Pursuant to the Federal Declaratory Judgment Act, 28 U.S.C. § 2201 et
12 seq., Apple requests the declaration of the Court that one or more claims of the '558
13 patent is invalid.

COUNT V

Declaration of Unenforceability of U.S. Patent No. 8,698,558

16 32. The '558 patent is unenforceable due to inequitable conduct by
17 Qualcomm's patent prosecution counsel in failing to discharge their duty of candor
18 to the United States Patent and Trademark Office ("USPTO").

19 33. On information and belief, Qualcomm's patent prosecution counsel,
20 including attorney Shelton Austin, knowingly made affirmative misrepresentations
21 of material information to the USPTO with a specific intent to deceive the USPTO.

34. On November 23, 2012, the examiner indicated that dependent claim 18 of U.S. Patent Application No. 13/167,659 would be allowable if written in independent form.

25 35. On February 22, 2013, Qualcomm's patent prosecution counsel,
26 William M. Hooks, amended claim 18, incorporating the subject matter of claim 16

1 and adding a new limitation: “a power amplifier operative to receive an envelope
2 signal and provide a second supply current based on the envelope signal.”

3 36. At the same time, Mr. Hooks submitted an Information Disclosure
4 Statement including, *inter alia*, DAEHYUN KANG ET AL: “A
5 Multimode/Multiband Power Amplifier With a Boosted Supply Modulator”, IEEE
6 TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES, IEEE
7 SERVICE CENTER, PISCATAWAY, NJ, US, vol. 58, no. 10, 1 October 2010
8 (2010-10-01), pages 2598-2608, XP011317521, ISSN: 0018-9480 (“Kang”).

9 37. The ’558 patent issued on April 15, 2014, with claim 18 renumbered as
10 claim 12.

11 38. On April 27, 2017, Qualcomm’s patent prosecution counsel
12 (specifically, Mr. Austin) submitted a request for a certificate of correction, asking
13 the USPTO to strike the following limitation from claim 12: “a power amplifier
14 operative to receive an envelope signal and provide a second supply current based
15 on the envelope signal.”

16 39. Mr. Austin falsely misrepresented to the USPTO that corrected claim
17 12 did not require reexamination because “the Examiner of record indicated that the
18 combined subject matter of original claims 16 and 18 is allowable.”

19 40. On information and belief, Mr. Austin made this misrepresentation
20 knowing that the Examiner of record could not have reviewed the February 22, 2013
21 IDS (including the Kang reference) when the Examiner made the indication of
22 allowability on November 23, 2012.

23 41. This misrepresentation was material because the Kang reference
24 invalidates corrected claim 12.

25 42. Upon information and belief, the USPTO relied on Mr. Austin’s
26 material misrepresentation in issuing a certificate of correction on June 27, 2017,
27 modifying claim 12 as Qualcomm requested.

43. As a result of Shelton Austin's material misrepresentation, no one at the USPTO ever examined corrected claim 12 in light of the Kang reference.

44. Pursuant to the Federal Declaratory Judgment Act, 28 U.S.C. § 2201 et seq., Apple requests the declaration of the Court that the '558 patent is unenforceable due to inequitable conduct.

COUNT VI

Declaration of Invalidity of Certificate of Correction of U.S. Patent No.

8,698,558

45. Pursuant to the Federal Declaratory Judgment Act, 28 U.S.C. § 2201 et seq., Apple requests the declaration of the Court that the June 27, 2017 Certificate of Correction to the '558 patent is invalid for impermissible broadening, including because corrected claims 12-14 are broader than original claims 12-14, and because the presence of any clerical or typographical error in the original claims 12-14, and how to correct that error, were not clearly evident to one of skill in the art.

COUNT VII

Declaration of Noninfringement of U.S. Patent No. 8,838,949

46. Apple restates and incorporates by reference each of the allegations set forth above.

47. Qualcomm purports to charge Apple with infringement of the '949 patent in its Complaint. (Dkt. 14 [First Amended Complaint] at Count 3.)

48. No asserted claim of the '949 patent has been or is infringed, either directly, contributorily, or by inducement, literally or under the doctrine of equivalents, by Apple or the purchasers of Apple's products through the manufacture, use, importation, sale, and/or offer for sale of Apple's products.

49. For example, Qualcomm purports to charge Apple with infringement of Claims 1, 10, 16, 20, and 22 of the '949 patent. Claims 1, 10, 16, 20, and 22 of the '949 patent read as follows (claim element enumeration added for convenience):

1

Claim 1	
2	[a] A multi-processor system comprising:
3	[b] a secondary processor comprising:
4	[c] system memory and a hardware buffer for receiving an image header and at
5	least one data segment of an executable software image, the image header
6	and each data segment being received separately, and
7	[d] a scatter loader controller configured:
8	[e] to load the image header; an
9	[f] to scatter load each received data segment based at least in part on the loaded
10	image header, directly from the hardware buffer to the system memory;
11	[g] a primary processor coupled with a memory, the memory storing the
12	executable software image for the secondary processor; and
13	[h] an interface communicatively coupling the primary processor and the
14	secondary processor, the executable software image being received by the
15	secondary processor via the interface.

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Claim 10	
18	[a] A method comprising:
19	[b] receiving at a secondary processor, from a primary processor via an inter-
20	chip communication bus, an image header for an executable software image
21	for the secondary processor that is stored in memory coupled to the primary
22	processor, the executable software image comprising the image header and
23	at least one data segment, the image header and each data segment being
24	received separately;
25	[c] processing, by the secondary processor, the image header to determine at
26	least one location within system memory to which the secondary processor
27	is coupled to store each data segment;

[d]	receiving at the secondary processor, from the primary processor via the inter-chip communication bus, each data segment; and
[e]	scatter loading, by the secondary processor, each data segment ready to the determined at least one location within the system memory, and each data segment being scatter loaded based at least in part on the processed image header.

Claim 16

9	[a] An apparatus comprising:
10	[b] means for receiving at a secondary processor, from a primary processor via an inter-chip communication bus, an image header for an executable software image for the secondary processor that is stored in memory coupled to the primary processor, the executable software image comprising the image header and at least one data segment, the image header and each data segment being received separately;
11	[c] means for processing, by the secondary processor, the image header to determine at least one location within system memory to which the secondary processor is coupled to store each data segment;
12	[d] means for receiving at the secondary processor, from the primary processor via the inter-chip communication bus, each data segment; and
13	[e] means for scatter loading, by the secondary processor, each data segment directly to the determined at least one location within the system memory, and each data segment being scatter loaded based at least in part on the processed image header.
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Claim 20

27 [a] A multi-processor system comprising:

1	[b]	a primary processor coupled with a first non-volatile memory, the first non-volatile memory coupled to the primary processor and storing executable images and file systems for the primary and secondary processors;
2	[c]	a secondary processor not directly coupled to the first non-volatile memory; and
3	[d]	an interface communicatively coupling the primary processor and the secondary processor, an executable software image being received by the secondary processor via the interface, the executable software image comprising an image header and at least one data segment, the image header and each data segment being received separately, and the image header being used to scatter load each received data segment directly to a system memory of the secondary processor.

13	Claim 22	
14	[a]	A method comprising:
15	[b]	sending, from a memory coupled to a primary processor, an executable software image for a secondary processor, via an interface communicatively coupling the primary processor and secondary processor, the executable software image comprising an image header and at least one data segment;
16	[c]	receiving, at the secondary processor, the image header and each data segment of the executable software image, the image header and each data segment being received separately, and the image header being used to scatter load each received data segment directly to a system memory of the secondary processor; and
17	[d]	executing, at the secondary processor, the executable software image.

26 50. Claims 1, 10, 16, 20, and 22 of the '949 patent have not been infringed,
27 and are not infringed, either directly, contributorily, or by inducement, literally or
28

1 under the doctrine of equivalents, by Apple or the purchasers of Apple's products
2 through the manufacture, use, importation, sale, and/or offer for sale of Apple's
3 products, at least because, by way of non-limiting example, Apple's products do not
4 satisfy the following claim limitations: 1[c]; 10[b]; 16[b]; 20[d]; 22[c].

5 51. Pursuant to the Declaratory Judgment Act, 28 U.S.C. § 2201 et seq.,
6 Apple requests the declaration of the Court that Apple does not infringe and has not
7 infringed any claim of the '949 patent.

COUNT VIII

Declaration of Invalidity of U.S. Patent No. 8,838,949

10 52. The asserted claims of the '949 patent fail to meet the conditions of
11 patentability and/or otherwise comply with one or more provisions of 35 U.S.C. §§
12 101 et seq., including 35 U.S.C. §§ 101, 102, 103, and/or 112. By way of non-
13 limiting example, claims 1, 10, 16, 20, and 22 of the '949 patent are anticipated
14 and/or rendered obvious in view of at least one or more of the references cited in
15 Exhibit A, attached hereto, each of which is prior art to the '949 patent. The prior art
16 provided in Exhibit A is exemplary only and should not be construed as limiting in
17 any way the defenses that Apple will present in this case.

18 53. Pursuant to the Federal Declaratory Judgment Act, 28 U.S.C. § 2201 et
19 seq., Apple requests the declaration of the Court that one or more claims of the '949
20 patent is invalid.

COUNT IX

Declaration of Noninfringement of U.S. Patent No. 9,535,490

23 54. Apple restates and incorporates by reference each of the allegations set
24 forth above.

25 55. Qualcomm purports to charge Apple with infringement of the '490
26 patent in its Complaint. (Dkt. 14 [First Amended Complaint] at Count 4.)

56. No asserted claim of the '490 patent has been, or is infringed, either directly, contributorily, or by inducement, literally or under the doctrine of equivalents, by Apple or the purchasers of Apple's products through the manufacture, use, importation, sale, and/or offer for sale of Apple's products.

57. For example, Qualcomm purports to charge Apple with infringement of Claims 1, 16, and 31 of the '490 patent. Claims 1, 16, and 31 of the '490 patent read as follows (claim element enumeration added for convenience):

Claim 1

[a]	A mobile terminal comprising:
[b]	a modem timer;
[c]	a modem processor, the modem processor configured to hold modem processor to application processor data until expiration of the modem timer;
[d]	an application processor;
[e]	an interconnectivity bus communicatively coupling the application processor to the modem processor; and
[f]	the application processor configured to hold application processor to modem processor data until triggered by receipt of the modem processor to application processor data from the modem processor through the interconnectivity bus after which the application processor to modem processor data is sent to the modem processor through the interconnectivity bus responsive to the receipt of the modem processor to application processor data from the modem processor through the interconnectivity bus.

Claim 16	
[a]	A method of controlling power consumption in a computing device, comprising:

1	[b]	holding data received by a modem processor from a remote network until expiration of a downlink timer;
2	[c]	passing the data received by the modem processor to an application processor over an interconnectivity bus; and
3	[d]	holding application data generated by an application associated with the application processor until receipt of the data from the modem processor or expiration of an uplink timer, whichever occurs first,
4	[e]	wherein receipt of the data from the modem processor triggers passing the data received by the application processor to the modem processor over the interconnectivity bus before the interconnectivity bus transitions from an active power state to a low power state.

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Claim 31

14	[a]	A mobile terminal comprising:
15	[b]	a modem timer;
16	[c]	a modem processor, the modem processor configured to hold modem processor to application processor data until expiration of the modem timer;
17	[d]	an application processor;
18	[e]	an interconnectivity bus communicatively coupling the application processor to the modem processor; and
19	[f]	the application processor configured to hold application processor to modem processor data until the modem processor pulls data from the application processor after transmission of the modem processor to application processor data,
20	[g]	wherein the modem processor is further configured pull data from the application processor after transmission of the modem processor to

application processor data and before the interconnectivity bus transitions from an active power state to a low power state.

58. Claims 1, 16, and 31 of the '490 patent have not been infringed, and are not infringed, either directly, contributorily, or by inducement, literally or under the doctrine of equivalents, by Apple or the purchasers of Apple's products through the manufacture, use, importation, sale, and/or offer for sale of Apple's products, at least because, by way of non-limiting example, Apple's products do not satisfy the following claim limitations: 1[f]; 16[e]; 31[g].

59. Pursuant to the Declaratory Judgment Act, 28 U.S.C. § 2201 et seq., Apple requests the declaration of the Court that Apple does not infringe and has not infringed any claim of the '490 patent.

COUNT X

Declaration of Invalidity of U.S. Patent No. 9,535,490

60. The asserted claims of the '490 patent fail to meet the conditions of patentability and/or otherwise comply with one or more provisions of 35 U.S.C. §§ 101 et seq., including 35 U.S.C. §§ 101, 102, 103, and/or 112. By way of non-limiting example, claims 1, 16, and 31 of the '490 patent are anticipated and/or rendered obvious in view of at least one or more of the references cited in Exhibit A, attached hereto, each of which is prior art to the '490 patent. The prior art provided in Exhibit A is exemplary only and should not be construed as limiting in any way the defenses that Apple will present in this case.

61. Pursuant to the Federal Declaratory Judgment Act, 28 U.S.C. § 2201 et seq., Apple requests the declaration of the Court that one or more claims of the '490 patent is invalid.

COUNT XI

Declaration of Noninfringement of U.S. Patent No. 9,608,675

62. Apple restates and incorporates by reference each of the allegations set forth above.

63. Qualcomm purports to charge Apple with infringement of the '675 patent in its Complaint. (Dkt. 14 [First Amended Complaint] at Count 5.)

64. No asserted claim of the '675 patent has been or is infringed, either directly, contributorily, or by inducement, literally or under the doctrine of equivalents, by Apple or the purchasers of Apple's products through the manufacture, use, importation, sale, and/or offer for sale of Apple's products.

65. For example, Qualcomm purports to charge Apple with infringement of Claim 1 of the '675 patent. Claim 1 of the '675 patent reads as follows (claim element enumeration added for convenience):

Claim 1

[a]	An apparatus comprising:
[b]	a power tracker configured to determine a single power tracking signal based on a plurality of inphase (I) and quadrature (Q) components of a plurality of carrier aggregated transmit signals being sent simultaneously,
[c]	wherein the power tracker receives the plurality of I and Q components corresponding to the plurality of carrier aggregated transmit signals and generates the single power tracking signal based on a combination of the plurality of I and Q components,
[d]	wherein the plurality of carrier aggregated transmit signals comprise Orthogonal Frequency Division Multiplexing (OFDM) or Single Carrier Frequency Division Multiple Access (SC-FDMA) signals;
[e]	a power supply generator configured to generate a single power supply voltage based on the single power tracking signal; and

1 [f] a power amplifier configured to receive the single power supply voltage and
2 the plurality of carrier aggregated transmit signals being sent simultaneously
3 to produce a single output radio frequency (RF) signal.

4 66. Claim 1 of the '675 patent has not been infringed, and is not infringed,
5 either directly, contributorily, or by inducement, literally or under the doctrine of
6 equivalents, by Apple or the purchasers of Apple's products through the
7 manufacture, use, importation, sale, and/or offer for sale of Apple's products, at
8 least because, by way of non-limiting example, Apple's products do not satisfy the
9 following claim limitation: 1[c].

10 67. Pursuant to the Declaratory Judgment Act, 28 U.S.C. § 2201 et seq.,
11 Apple requests the declaration of the Court that Apple does not infringe and has not
12 infringed any claim of the '675 patent.

13 **COUNT XII**

14 **Declaration of Invalidity of U.S. Patent No. 9,608,675**

15 68. The asserted claims of the '675 patent fail to meet the conditions of
16 patentability and/or otherwise comply with one or more provisions of 35 U.S.C. §§
17 101 et seq., including 35 U.S.C. §§ 101, 102, 103, and/or 112. By way of non-
18 limiting example, claim 1 of the '675 patent is anticipated and/or rendered obvious
19 in view of at least one or more of the references cited in Exhibit A, attached hereto,
20 each of which is prior art to the '675 patent. The prior art provided in Exhibit A is
21 exemplary only and should not be construed as limiting in any way the defenses that
22 Apple will present in this case.

23 69. Pursuant to the Federal Declaratory Judgment Act, 28 U.S.C. § 2201 et
24 seq., Apple requests the declaration of the Court that one or more claims of the '675
25 patent is invalid.

APPLE'S INFRINGEMENT COUNTERCLAIMS

APPLE'S INNOVATION

70. Apple designs, manufacturers, and markets mobile communication and media devices, personal computers, and portable digital media players, as well as related software, accessories, and content. Apple's success has been driven by its creative achievement, technical innovation, differentiated technology, and astute business judgment.

71. Apple has a long history as a leading innovator in computing technology. Apple foresaw the importance of reducing power consumption in computing devices as they became increasingly mobile. In 2007, Apple revolutionized the telecommunications industry when it introduced the iPhone. The iPhone combined in one device sophisticated mobile phone functions, a multi-touch screen that allows users to control the phone with their fingers, mobile computing functionality to run diverse applications, and functionality to gain full access to the internet. To provide this powerful functionality in such a small and lightweight device while making battery life useful, Apple relied on its hardware and software innovations to minimize power consumption. Apple has continuously improved the power consumption and battery life of its devices.

72. The United States Patent Office has granted Apple numerous patents for its power efficiency innovations. Apple began seeking those patents years before Qualcomm began seeking the patents it asserts against Apple in this case.

73. Qualcomm and QTI infringe the following patents related to power efficiency owned by Apple (collectively, the “Apple Patents-in-Suit”): U.S. Patent No. 7,355,905 (“the ’905 patent”); U.S. Patent No. 7,760,559 (“the ’559 patent”); U.S. Patent No. 8,098,534 (“the ’534 patent”); U.S. Patent No. 7,383,453 (“the ’453 patent”); U.S. Patent No. 8,433,940 (“the ’940 patent”); U.S. Patent No. 8,443,216 (“the ’216 patent”); U.S. Patent No. 8,271,812 (“the ’812 patent”); and U.S. Patent

1 No. 8,656,196 (“the ‘196 patent”). The Apple Patents-in-Suit enable extended
2 battery life by (1) supplying power only where it is needed; (2) supplying power
3 only at the level needed; and (3) enabling quick powering up and down.

4 **U.S. Patent Nos. 7,355,905, 7,760,559, and 8,098,534**

5 74. The ‘905 patent was duly and legally issued on April 8, 2008. The
6 ‘559 patent was duly and legally issued on July 20, 2010. The ‘534 patent was duly
7 and legally issued on January 17, 2012. Apple is the assignee and sole owner of all
8 right, title, and interest in each of the ‘905, ‘559, and ‘534 patents. Each of the ‘905,
9 ‘559, and ‘534 patents is valid and enforceable. A copy of the ‘905 patent is
10 attached as Exhibit B, a copy of the ‘559 patent is attached as Exhibit C, and a copy
11 of the ‘534 patent is attached as Exhibit D.

12 75. Integrated circuits include different types of circuits. Different circuits
13 on an integrated circuit can have different voltage requirements. For example,
14 memory circuits require higher minimum voltage supplies than logic circuits. If the
15 voltage supplied to memory circuits is lowered to match the voltage supplied to
16 logic circuits then the memory becomes unreliable.

17 76. The ‘905, ‘559, and ‘534 patents generally relate to supplying each area
18 of the processor with only the minimum voltage needed by that area while still
19 allowing the different areas to communicate with each other, resulting in decreased
20 power consumption while providing reliable memory.

21 **U.S. Patent Nos. 7,383,453 and 8,433,940**

22 77. The ‘453 patent was duly and legally issued on June 3, 2008.
23 Certificates of Correction issued on January 13, 2009, February 17, 2009, and June
24 8, 2010. An Ex Parte Reexamination Certificate (8285th) for the ‘453 patent issued
25 on May 31, 2011. The ‘940 patent was duly and legally issued on April 30, 2013.
26 Apple is the assignee and sole owner of all right, title, and interest in each of the
27 ‘453 and ‘940 patents. Each of the ‘453 and ‘940 patents is valid and enforceable.

1 A copy of the '453 patent is attached as Exhibit E and a copy of the '940 patent is
2 attached as Exhibit F.

3 78. The '453 and '940 patents generally relate to providing power saving
4 modes where portions of the processor can be turned off when not needed, using
5 power only when it is needed and thereby causing batteries to last longer

6 **U.S. Patent Nos. 8,443,216, 8,271,812, and 8,656,196**

7 79. The '216 patent was duly and legally issued on May 14, 2013. The
8 '812 patent was duly and legally issued on September 18, 2012. The '196 patent
9 was duly and legally issued on February 18, 2014. Apple is the assignee and sole
10 owner of all right, title, and interest in each of the '216, '812, and '196 patents.
11 Each of the '216, '812, and '196 patents is valid and enforceable. A copy of the
12 '216 patent is attached as Exhibit G, a copy of the '812 patent is attached as Exhibit
13 H, and a copy of the '196 patent is attached as Exhibit I.

14 80. To conserve power, processors can go into an idle state. Entering and
15 exiting that state requires time and can create delay. That delay can discourage
16 entry into an idle state.

17 81. The '216, '812, and '196 patents generally relate to making moving
18 into and out of power saving modes quicker, and with minimal processing delay.

19 **QUALCOMM'S ACCUSED PRODUCTS**

20 82. As set forth below, Qualcomm and QTI have been and are still
21 infringing, contributing to infringement, and/or inducing others to infringe the Apple
22 Patents-in-Suit by using, offering for sale, selling, or importing devices that practice
23 the Apple Patents-in-Suit. Specifically, at least Snapdragon 800 and 820 processors
24 practice one or more of the eight Apple Patents-in-Suit. Snapdragon 800 and 820
25 processors are used in many smartphones.

COUNT XIII

Patent Infringement – U.S. Patent No. 7,355,905

83. Apple restates and incorporates by reference each of the allegations set forth above.

84. Apple is the assignee and sole owner of all right, title, and interest in the '905 patent, entitled "Integrated Circuit with Separate Supply Voltage for Memory that Is Different from Logic Circuit Supply Voltage," which was duly and legally issued on April 8, 2008. A true and correct copy of the '905 patent is attached hereto as Exhibit B.

85. Qualcomm and QTI became aware of the '905 patent at least as of the filing of this counterclaim by Apple.

86. Upon information and belief, Qualcomm and QTI have been and are now directly infringing the '905 patent in this District and elsewhere by making, using, selling, offering to sell, and/or importing into the United States products that infringe one or more claims of the '905 patent. Qualcomm's and QTI's infringing acts include, but are not limited to, making, using, selling, offering to sell, and/or importing into the United States at least Snapdragon 800 and 820 processors. Qualcomm's and QTI's infringing acts have been without the permission, consent, authorization, or license of Apple.

87. Qualcomm's and QTI's infringement is literal or under the doctrine of equivalents, or both.

88. At least Qualcomm's and QTI's Snapdragon 800 and 820 processors infringe at least claim 1 of the '905 patent.

89. As an example, independent claim 1 of the '905 patent reads as follows (claim element enumeration added for convenience):

Claim 1	
[a]	An integrated circuit comprising:

1 2 3 4 5 6 7 8 9 10 11	[b] at least one logic circuit supplied by a first supply voltage received on a first input to the integrated circuit; and
[c]	at least one memory circuit coupled to the logic circuit and supplied by a second supply voltage received on a second input to the integrated circuit, and
[d]	wherein the memory circuit is configured to be read and written responsive to the logic circuit even if the first supply voltage is less than the second supply voltage during use, and
[e]	wherein the memory circuit comprises at least one memory array, and wherein the memory array comprises a plurality of memory cells that are continuously supplied by the second supply voltage during use.

12 90. Snapdragon 800 and 820 processors are integrated circuits.

13 91. Snapdragon 800 and 820 processors comprise at least one logic circuit
14 supplied by a first supply voltage received on a first input to the integrated circuit.
15 For example, Snapdragon 800 and 820 processors include an embedded 6T SRAM
16 that comprises a logic circuit. The logic circuit is supplied by a first supply voltage
17 received on a first input to the integrated circuit.

18 92. Snapdragon 800 and 820 processors comprise at least one memory
19 circuit coupled to the logic circuit and supplied by a second supply voltage received
20 on a second input to the integrated circuit. For example, Snapdragon 800 and 820
21 processors include an embedded 6T SRAM that comprises a memory circuit. It is
22 supplied by a second supply voltage received on a second input to the integrated
23 circuit.

24 93. The memory circuit of Snapdragon 800 and 820 processors is
25 configured to be read and written responsive to the logic circuit even if the first
26 supply voltage is less than the second supply voltage during use. For example, the
27 memory circuits of Snapdragon 800 and 820 processors include a level shifter so

1 that the memory circuit is responsive to the logic circuit even if the first supply
2 voltage is less than the second supply voltage during use.

3 94. The memory circuit of Snapdragon 800 and 820 processors comprises
4 at least one memory array and wherein the memory array comprises a plurality of
5 memory cells that are continuously supplied by the second supply voltage during
6 use. For example, the memory circuits of Snapdragon 800 and 820 processors
7 comprise a 6T SRAM array which is comprised of a plurality of 6T SRAM cells that
8 are continuously supplied by the second supply voltage during use.

9 95. Qualcomm's and QTI's acts of infringement have injured and damaged
10 Apple.

COUNT XIV

Patent Infringement – U.S. Patent No. 7,760,559

13 96. Apple restates and incorporates by reference each of the allegations set
14 forth above.

15 97. Apple is, and has been since its issuance, the assignee and sole owner
16 of all right, title, and interest in the '559 patent, entitled "Integrated Circuit with
17 Separate Supply Voltage for Memory that Is Different from Logic Circuit Supply
18 Voltage," which was duly and legally issued on July 20, 2010. A true and correct
19 copy of the '559 patent is attached hereto as Exhibit C.

20 98. Qualcomm and QTI became aware of the '559 patent at least as of the
21 filing of this counterclaim by Apple.

22 99. Upon information and belief, Qualcomm and QTI have been and are
23 now directly infringing the '559 patent in this District and elsewhere by making,
24 using, selling, offering to sell, and/or importing into the United States products that
25 infringe one or more claims of the '559 patent. Qualcomm's and QTI's infringing
26 acts include, but are not limited to, making, using, selling, offering to sell, and/or
27 importing into the United States at least Snapdragon 800 and 820 processors.

1 Qualcomm's and QTI's infringing acts have been without the permission, consent,
2 authorization, or license of Apple.

3 100. Qualcomm's and QTI's infringement is literal or under the doctrine of
4 equivalents, or both.

5 101. At least Qualcomm's and QTI's Snapdragon 800 and 820 processors
6 infringe at least claim 1 of the '559 patent.

7 102. As an example, independent claim 1 of the '559 patent reads as follows
8 (claim element enumeration added for convenience):

Claim 1	
[a]	An integrated circuit comprising:
[b]	at least one logic circuit operating in a first voltage domain during use, the first voltage domain receiving power from at least one first input to the integrated circuit during use; and
[c]	at least one memory circuit coupled to the logic circuit, wherein the at least one memory circuit comprises a plurality of static random access memory (SRAM) cells operating in a second voltage domain during use, the second voltage domain receiving power from at least one second input to the integrated circuit during use;
[d]	wherein the memory circuit is configured to be read and written responsive to the logic circuit with the first voltage domain having a lower voltage than the second voltage domain.

23 103. Snapdragon 800 and 820 processors are integrated circuits.

24 104. Snapdragon 800 and 820 processors comprise at least one logic circuit
25 operating in a first voltage domain during use, the first voltage domain receiving
26 power from at least one first input to the integrated circuit during use. For example,
27 Snapdragon 800 and 820 processors comprise an embedded 6T SRAM that
28 comprises a logic circuit. The logic circuit operates in a first voltage domain during

1 use, the first voltage domain receiving power from at least one first input to the
2 integrated circuit during use.

3 105. Snapdragon 800 and 820 processors comprise at least one memory
4 circuit coupled to the logic circuit, wherein the at least one memory circuit
5 comprises a plurality of static random access memory (SRAM) cells operating in a
6 second voltage domain during use, the second voltage domain receiving power from
7 at least one second input to the integrated circuit during use. For example,
8 Snapdragon 800 and 820 processors comprise an embedded 6T SRAM that
9 comprises a memory circuit which is comprised of a plurality of 6T SRAM cells
10 operating in a second voltage domain during use, the second voltage domain
11 receiving power from at least one second input to the integrated circuit during use.

12 106. The memory circuit of Snapdragon 800 and 820 processors is
13 configured to be read and written responsive to the logic circuit with the first voltage
14 domain having a lower voltage than the second voltage domain. For example, the
15 memory circuit of the 6T SRAM is configured to be read and written responsive to
16 the logic circuit with the first voltage domain having a lower voltage than the second
17 voltage domain.

18 107. Qualcomm's and QTI's acts of infringement have injured and damaged
19 Apple.

20 **COUNT XV**

21 **Patent Infringement – U.S. Patent No. 8,098,534**

22 108. Apple restates and incorporates by reference each of the allegations set
23 forth above.

24 109. Apple is, and has been since its issuance, the assignee and sole owner
25 of all right, title, and interest in the '534 patent, entitled "Integrated Circuit with
26 Separate Supply Voltage for Memory that Is Different from Logic Circuit Supply

1 Voltage," which was duly and legally issued on January 17, 2012. A true and
2 correct copy of the '534 patent is attached hereto as Exhibit D.

3 110. Qualcomm and QTI became aware of the '534 patent at least as of the
4 filing of this counterclaim by Apple.

5 111. Upon information and belief, Qualcomm and QTI have been and are
6 now directly infringing the '534 patent in this District and elsewhere by making,
7 using, selling, offering to sell, and/or importing into the United States products that
8 infringe one or more claims of the '534 patent. Qualcomm's and QTI's infringing
9 acts include, but are not limited to, making, using, selling, offering to sell, and/or
10 importing into the United States at least Snapdragon 800 and 820 processors.
11 Qualcomm's and QTI's infringing acts have been without the permission, consent,
12 authorization, or license of Apple.

13 112. Qualcomm's and QTI's infringement is literal or under the doctrine of
14 equivalents, or both.

15 113. At least Qualcomm's and QTI's Snapdragon 800 and 820 processors
16 infringe at least claim 1 of the '534 patent.

17 114. As an example, independent claim 1 of the '534 patent reads as follows
18 (claim element enumeration added for convenience):

Claim 1	
[a]	An integrated circuit comprising:
[b]	at least one logic circuit supplied by a first supply voltage during use, wherein a first voltage domain corresponds to the first supply voltage; and
[c]	at least one memory circuit coupled to the logic circuit and supplied by a second supply voltage during use, wherein a second voltage domain corresponds to the second supply voltage, and
[d]	wherein the memory circuit comprises one or more circuits that interface with the logic circuit, and wherein the one or more circuits are configured to

1	level shift at least one signal between the first voltage domain and the
2	second voltage domain, and
3	[e] wherein a magnitude of the first supply voltage is less than a magnitude of
4	the second supply voltage at least a portion of the time during use, and
5	[f] wherein the logic circuit is configured to read and write the memory circuit.

6 115. Snapdragon 800 and 820 processors are integrated circuits.

7 116. Snapdragon 800 and 820 processors comprise at least one logic circuit
8 supplied by a first supply voltage during use, wherein a first voltage domain
9 corresponds to the first supply voltage. For example, Snapdragon 800 and 820
10 processors comprise an embedded 6T SRAM that comprises a logic circuit. The
11 logic circuit is supplied by a first supply voltage during use, wherein a first voltage
12 domain corresponds to the first supply voltage.

13 117. Snapdragon 800 and 820 processors comprise at least one memory
14 circuit coupled to the logic circuit and supplied by a second supply voltage during
15 use, wherein a second voltage domain corresponds to the second supply voltage.
16 For example, Snapdragon 800 and 820 processors comprise an embedded 6T SRAM
17 that comprises a memory circuit which is coupled to the logic circuit and supplied
18 by a second supply voltage during use, wherein a second voltage domain
19 corresponds to the second supply voltage.

20 118. The memory circuits of Snapdragon 800 and 820 processors comprise
21 one or more circuits that interface with the logic circuit, and wherein the one or
22 more circuits are configured to level shift at least one signal between the first
23 voltage domain and the second voltage domain. For example, the memory circuit
24 comprises a level shifter that interfaces with the logic circuit and is configured to
25 level shift at least one signal between the first voltage domain and the second
26 voltage domain.

119. For Snapdragon 800 and 820 processors, a magnitude of the first supply voltage is less than a magnitude of the second supply voltage at least a portion of the time during use.

120. The logic circuit of Snapdragon 800 and 820 processors is configured to read and write the memory circuit.

121. Qualcomm's and QTI's acts of infringement have injured and damaged Apple.

COUNT XVI

Patent Infringement – U.S. Patent No. 7,383,453

122. Apple restates and incorporates by reference each of the allegations set forth above.

123. Apple is, and has been since its issuance, the assignee and sole owner of all right, title, and interest in the '453 patent, entitled "Conserving Power by Reducing Voltage Supplied to an Instruction-Processing Portion of a Processor," which was duly and legally issued on June 3, 2008. A true and correct copy of the '453 patent is attached hereto as Exhibit E.

124. Qualcomm and QTI became aware of the '453 patent at least as of the filing of this counterclaim by Apple.

125. Upon information and belief, Qualcomm and QTI have been and are now directly infringing the '453 patent in this District and elsewhere by making, using, selling, offering to sell, and/or importing into the United States products that infringe one or more claims of the '453 patent. Qualcomm's and QTI's infringing acts include, but are not limited to, making, using, selling, offering to sell, and/or importing into the United States at least Snapdragon 820 processors. Qualcomm's and QTI's infringing acts have been without the permission, consent, authorization, or license of Apple.

1 126. Qualcomm's and QTI's infringement is literal or under the doctrine of
2 equivalents, or both.

3 127. At least Qualcomm's and QTI's Snapdragon 820 processors infringe at
4 least claim 1 of the '453 patent.

5 128. As an example, independent claim 1 of the '453 patent reads as follows
6 (claim element enumeration added for convenience):

Claim 1	
[a]	An instruction-processing system with minimized static power leakage, the instruction-processing system comprising:
[b]	a core with instruction-processing circuitry;
[c]	an area coupled to the core;
[d]	a core voltage provided to the core; and
[e]	an area voltage provided to the area;
[f]	wherein in a normal operation mode:
[f1]	clock signal to the core is active;
[f2]	the core voltage is a first value that is sufficient to maintain the state information of the instruction-processing circuitry;
[f3]	the core is active;
[f4]	the area voltage is a second value that is sufficient to maintain the data stored in the area; and
[f5]	the area is active;
[g]	wherein in a first power-saving mode that can be exited upon receipt of an interrupt signal:
[g1]	the clock signal to the core is inactive;
[g2]	the core voltage is sufficient to maintain the state information of the instruction-processing circuitry; and

1	[g3]	the area voltage is sufficient to maintain the data stored in the area;
2	[h]	wherein in a second power-saving mode that can be exited upon receipt of a signal that is not an interrupt signal:
3	[h1]	the clock signal to the core is inactive;
4	[h2]	the core voltage is less than the first value; and
5	[h3]	the area voltage is sufficient to maintain the data stored in the area.

7 129. Snapdragon 820 processors are ARMv8 compliant.

8 130. Snapdragon 820 processors contain an instruction-processing system
9 with minimized static power leakage.

10 131. Snapdragon 820 processors contain a core with instruction-processing
11 circuitry. For example, Snapdragon 820 processors include Kryo cores with at least
12 an integer core.

13 132. Snapdragon 820 processors contain an area coupled to the core. For
14 example, Snapdragon 820 processors have L2 cache RAM and L2 control blocks
15 coupled to the core.

16 133. Snapdragon 820 processors contain a core voltage provided to the core.
17 For example, a VREG Output is used to supply voltage to the core.

18 134. Snapdragon 820 processors contain an area voltage provided to the
19 area. For example, a VREG Output is used to supply voltage to the area.

20 135. Snapdragon 820 processors contain a normal operation mode wherein
21 the clock signal to the core is active, the core voltage is a first value that is sufficient
22 to maintain the state information of the instruction-processing circuitry, and the core
23 is active. For example, Snapdragon 820 processors have a “normal” mode, where
24 the clock signal to the core is active and all of the core functionality is available
25 such that the core voltage is sufficient to maintain the state information of the
26 instruction-processing circuitry and the core is active.

1 136. Snapdragon 820 processors' normal operation mode also contains an
2 area voltage that is a second value and sufficient to maintain the data stored in the
3 area and the area is active. For example, in the normal state, the L2 RAM and L2
4 control blocks are active and fully powered up such that the voltage is sufficient to
5 maintain the data stored.

6 137. Snapdragon 820 processors have a first power-saving mode that can be
7 exited upon receipt of an interrupt signal. In this first power-savings, the clock
8 signal to the core is inactive, the core voltage is sufficient to maintain the state
9 information of the instruction-processing circuitry, and the area voltage is sufficient
10 to maintain the data stored in the area. For example, Snapdragon 820 processors
11 have “wait for event” mode. In this state, the clocks in the core are disabled while
12 the core and the L2 RAM and L2 control blocks are kept powered up such that
13 voltage is sufficient to maintain state information and data. Receipt of interrupt
14 signals such as a physical IRQ interrupt can cause the processor to exit this first
15 power-saving mode.

16 138. Snapdragon 820 processors contain a second power-saving mode that
17 can be exited upon receipt of a signal that is not an interrupt signal. In this second
18 power-saving mode, the clock signal to the core is inactive, the core voltage is less
19 than the value in the normal operation mode, and the area voltage is sufficient to
20 maintain the data stored in the area. For example, Snapdragon 820 processors
21 include a “retention” mode that can be exited upon receipt of, for example, the
22 CPUQACTIVE signal. CPUQACTIVE is not an interrupt signal. When
23 Snapdragon 820 is in “retention,” clocks to a core are stopped, voltage to the core is
24 reduced from normal, and the L2 RAM and L2 control blocks are fully powered on
25 such that the voltage is sufficient to maintain data stored in the area.

26 139. Qualcomm's and QTI's acts of infringement have injured and damaged
27 Apple.

COUNT XVII

Patent Infringement – U.S. Patent No. 8,433,940

140. Apple restates and incorporates by reference each of the allegations set forth above.

141. Apple is, and has been since its issuance, the assignee and sole owner of all right, title, and interest in the '940 patent, entitled "Conserving Power by Reducing Voltage Supplied to an Instruction-Processing Portion of a Processor," which was duly and legally issued on April 30, 2013. A true and correct copy of the '940 patent is attached hereto as Exhibit F.

142. Qualcomm and QTI became aware of the '940 patent at least as of the filing of this counterclaim by Apple.

143. Upon information and belief, Qualcomm and QTI have been and are now directly infringing the '940 patent in this District and elsewhere by making, using, selling, offering to sell, and/or importing into the United States products that infringe one or more claims of the '940 patent. Qualcomm's and QTI's infringing acts include, but are not limited to, making, using, selling, offering to sell, and/or importing into the United States at least Snapdragon 820 processors. Qualcomm's and QTI's infringing acts have been without the permission, consent, authorization, or license of Apple.

144. Qualcomm's and QTI's infringement is literal or under the doctrine of equivalents, or both.

145. At least Qualcomm's and QTI's Snapdragon 820 processors infringe at least claim 9 of the '940 patent.

146. As an example, independent claim 9 of the '940 patent reads as follows (claim element enumeration added for convenience):

Claim 9

[a] A processor, comprising:

1	[b]	a non-core power area, comprising: an interrupt processor; a real-time
2		clock; and clock distribution circuitry; and an L2 cache; cache tags; snoop
3		circuitry;

4	[c]	a core power area coupled to the non-core power area, comprising: one or
5		more L1 caches; an arithmetic logic unit; one or more register files; and
6		one or more pipelines;

7	[d]	wherein, in predetermined operating modes, the non-core power area is
8		configured to be operable while the core power area is halted.

9 147. Snapdragon 820 processors are ARMv8 compliant processors.

10 148. Snapdragon 820 processors contain a non-core power area comprising
 11 an interrupt processor; a real-time clock; and clock distribution circuitry; and an L2
 12 cache; cache tags; snoop circuitry. For example, the non-processor power domain
 13 for the ARMv8 compliant Snapdragon 820 includes, among other things, an
 14 interrupt processor, timers, L2 cache RAM, L2 Snoop Tag RAM, and L2 cache
 15 control.

16 149. Snapdragon 820 processors contain a core power area coupled to the
 17 non-core power area, comprising one or more L1 caches, an arithmetic logic unit,
 18 one or more register files, and one or more pipelines. For example, the processor
 19 power domain for the ARMv8 compliant Snapdragon 820 processors includes,
 20 among other things, an instruction cache, data cache, an integer execute unit,
 21 register files, and various pipelines connecting these components.

22 150. Snapdragon 820 processors include predetermined operating modes
 23 where, the non-core power area is configured to be operable while the core power
 24 area is halted. For example, in the ARMv8 compliant Snapdragon 820 defined
 25 “wait for event” and “retention” modes, the core power area may be halted while the
 26 non-core power area is fully powered and operable.

1 151. Qualcomm's and QTI's acts of infringement have injured and damaged
2 Apple.

COUNT XVIII

Patent Infringement – U.S. Patent No. 8,443,216

5 152. Apple restates and incorporates by reference each of the allegations set
6 forth above.

7 153. Apple is, and has been since its issuance, the assignee and sole owner
8 of all right, title, and interest in the '216 patent, entitled "Hardware Automatic
9 Performance State Transitions in System on Processor Sleep and Wake Events,"
10 which was duly and legally issued on May 14, 2013. A true and correct copy of the
11 '216 patent is attached hereto as Exhibit G.

12 154. Qualcomm and QTI became aware of the '216 patent at least as of the
13 filing of this counterclaim by Apple.

14 155. Upon information and belief, Qualcomm and QTI have been and are
15 now directly infringing the '216 patent in this District and elsewhere by making,
16 using, selling, offering to sell, and/or importing into the United States products that
17 infringe one or more claims of the '216 patent. Qualcomm's and QTI's infringing
18 acts include, but are not limited to, making, using, selling, offering to sell, and/or
19 importing into the United States at least Snapdragon 820 processors. Qualcomm's
20 and QTI's infringing acts have been without the permission, consent, authorization,
21 or license of Apple.

22 156. Qualcomm's and QTI's infringement is literal or under the doctrine of
23 equivalents, or both.

24 157. At least Qualcomm's and QTI's Snapdragon 820 processors infringe at
25 least claim 1 of the '216 patent.

26 158. As an example, independent claim 1 of the '216 patent reads as follows
27 (claim element enumeration added for convenience):

1		Claim 1
2	[a]	An apparatus comprising:
3	[b]	a plurality of components, each component included in one of a plurality of performance domains;
4	[c]	a processor included in a first performance domain of the plurality of performance domains; and
5	[d]	a power management unit configured to establish a performance state in each of the plurality of performance domains, and
6	[e]	wherein the power management unit is configured to transition a second performance domain of the plurality of performance domains to a first performance state programmed into the power management unit responsive to the first performance domain including the processor transitioning to a second performance state, wherein the first performance state is associated with the second performance state in the power management unit.

15
16 159. Snapdragon 820 processors are ARMv8 compliant apparatuses.

17 160. Snapdragon 820 processors contain a plurality of components, each
18 component included in one of a plurality of performance domains. For example, the
19 Snapdragon 820 processors include separate power domains for each of their four
20 cores and for the L2 cache among other things.

21 161. Snapdragon 820 processors contain a processor included in a first
22 performance domain of the plurality of performance domains. For example, in the
23 Snapdragon 820 processors, each core is located in a power domain.

24 162. Snapdragon 820 processors include a power management unit
25 configured to establish a performance state in each of the plurality of performance
26 domains. For example, the Snapdragon 820 processors include a Resource Power
27 Manager (“RPM”) system and the MSM power manager (“MPM”).

163. The power management units of Snapdragon 820 processors are
1 configured to transition a second performance domain of the plurality of
2 performance domains to a first performance state programmed into the power
3 management unit responsive to the first performance domain including the processor
4 transitioning to a second performance state, wherein the first performance state is
5 associated with the second performance state in the power management unit. For
6 example, the power management unit is configured to transition the L2 cache from a
7 normal mode to a WFI low-power state responsive to the cores entering a WFI low-
8 power state wherein the L2 cache's WFI low-power state is associated with the
9 cores' WFI low-power state.

11 164. Qualcomm's and QTI's acts of infringement have injured and damaged
12 Apple.

COUNT XIX

Patent Infringement – U.S. Patent No. 8,271,812

15 165. Apple restates and incorporates by reference each of the allegations set
16 forth above.

17 166. Apple is, and has been since its issuance, the assignee and sole owner
18 of all right, title, and interest in the '812 patent, entitled "Hardware Automatic
19 Performance State Transitions in System on Processor Sleep and Wake Events,"
20 which was duly and legally issued on September 18, 2012. A true and correct copy
21 of the '812 patent is attached hereto as Exhibit H.

22 167. Qualcomm and QTI became aware of the '812 patent at least as of the
23 filing of this counterclaim by Apple.

24 168. Upon information and belief, Qualcomm and QTI have been and are
25 now directly infringing the '812 patent in this District and elsewhere by making,
26 using, selling, offering to sell, and/or importing into the United States products that
27 infringe one or more claims of the '812 patent. Qualcomm's and QTI's infringing

1 acts include, but are not limited to, making, using, selling, offering to sell, and/or
2 importing into the United States at least Snapdragon 820 processors. Qualcomm's
3 and QTI's infringing acts have been without the permission, consent, authorization,
4 or license of Apple.

5 169. Qualcomm's and QTI's infringement is literal or under the doctrine of
6 equivalents, or both.

7 170. At least Qualcomm's and QTI's Snapdragon 820 processors infringe at
8 least claim 8 of the '812 patent.

9 171. As an example, independent claim 8 of the '812 patent reads as follows
10 (claim element enumeration added for convenience):

Claim 8	
[a]	An apparatus comprising:
[b]	a plurality of components, each component included in one of a plurality of performance domains; and
[c]	a power management unit configured to establish a performance state in each of the plurality of performance domains,
[d]	and wherein the power management unit is configured to transition at least a first performance domain of the plurality of performance domains to a first performance state programmed into the power management unit responsive to a processor transitioning to a wakeup state, wherein the processor is transitioning from a sleep state,
[e]	and wherein the wakeup state is different from a prior performance state at which the processor was operating prior to entering the sleep state.

172. Snapdragon 820 processors are ARMv8 compliant apparatuses.

173. Snapdragon 820 processors contain a plurality of components, each component included in one of a plurality of performance domains. For example, the

1 Snapdragon processors include separate power domains for each of its four cores
2 and for the L2 cache among other things.

3 174. Snapdragon 820 processors includes a power management unit
4 configured to establish a performance state in each of the plurality of performance
5 domains. For example, the Snapdragon processors include a Resource Power
6 Manager (“RPM”) system and the MSM power manager (“MPM”).

7 175. The power management units of Snapdragon 820 processors are
8 configured to transition at least a first performance domain of the plurality of
9 performance domains to a first performance state programmed into the power
10 management unit responsive to a processor transitioning to a wakeup state from a
11 sleep state. For example, if a core has been placed in a retention state and a snoop
12 occurs to access the cache, the clocks in the core are restarted to allow the snoop
13 request to proceed.

14 176. For Snapdragon 820 processors, the wakeup state is different from a
15 prior performance state at which the processor was operating prior to entering the
16 sleep state. For example, if the core was operating in a standby state prior to
17 entering the sleep state, the wakeup state is different from that prior performance
18 state.

19 177. Qualcomm’s and QTI’s acts of infringement have injured and damaged
20 Apple.

21 **COUNT XX**

22 **Patent Infringement – U.S. Patent No. 8,656,196**

23 178. Apple restates and incorporates by reference each of the allegations set
24 forth above.

25 179. Apple is, and has been since its issuance, the assignee and sole owner
26 of all right, title, and interest in the ’196 patent, entitled “Hardware Automatic
27 Performance State Transitions in System on Processor Sleep and Wake Events,”

1 which was duly and legally issued on February 18, 2014. A true and correct copy of
2 the '196 patent is attached hereto as Exhibit I.

3 180. Qualcomm and QTI became aware of the '196 patent at least as of the
4 filing of this counterclaim by Apple.

5 181. Upon information and belief, Qualcomm and QTI's have been and are
6 now directly infringing the '196 patent in this District and elsewhere by making,
7 using, selling, offering to sell, and/or importing into the United States products that
8 infringe one or more claims of the '196 patent. Qualcomm's and QTI's infringing
9 acts include, but are not limited to, making, using, selling, offering to sell, and/or
10 importing into the United States at least Snapdragon 820 processors. Qualcomm's
11 and QTI's infringing acts have been without the permission, consent, authorization,
12 or license of Apple.

13 182. Qualcomm's and QTI's infringement is literal or under the doctrine of
14 equivalents, or both.

15 183. At least Qualcomm's and QTI's Snapdragon 820 processors infringe at
16 least claim 1 of the '196 patent.

17 184. As an example, independent claim 1 of the '196 patent reads as follows
18 (claim element enumeration added for convenience):

Claim 1	
[a]	An apparatus comprising:
[b]	a plurality of components, each component included in one of a plurality of performance domains;
[c]	a power management unit comprising a plurality of configuration registers,
[d]	wherein the plurality of configuration registers are programmed with data identifying performance states for the plurality of performance domains, wherein at least two performance states are identified for each performance domain of the plurality of performance domains, and

1 [e] wherein the power management unit is configured to establish a selected
2 performance state of the at least two performance states in each of the
3 plurality of performance domains responsive to an event that is
4 asynchronous to the programming of the plurality of configuration registers.

5 185. Snapdragon 820 processors are ARMv8 compliant apparatuses.

6 186. Snapdragon 820 processors contain a plurality of components, each
7 component included in one of a plurality of performance domains. For example, the
8 Snapdragon 820 processors include separate power domains for each of its four
9 cores and for the L2 cache among other things.

10 187. Snapdragon 820 processors include a power management unit
11 comprising a plurality of configuration registers. For example, the Snapdragon 820
12 processors include a Resource Power Manager (“RPM”) system and the MSM
13 power manager (“MPM”). The power management unit comprises a plurality of
14 configuration registers.

15 188. The configuration registers in the power management unit in
16 Snapdragon 820 processors are programmed with data identifying performance
17 states for the plurality of performance domains, wherein at least two performance
18 states are identified for each performance domain of the plurality of performance
19 domains. For example, the configuration registers are programmed with data
20 identifying performance states such as wakeup, interrupt, and retention states.

21 189. The power management units of Snapdragon 820 processors are
22 configured to establish a selected performance state of the at least two performance
23 states in each of the plurality of performance domains responsive to an event that is
24 asynchronous to the programming of the plurality of configuration registers. For
25 example, if a core is in a retention state and a snoop occurs to access the cache, the
26 clocks in that core are restarted to allow the snoop request to proceed.

1 190. Qualcomm's and QTI's acts of infringement have injured and damaged
2 Apple.

JURY DEMAND

4 Apple demands a trial by jury on all issues so triable.

PRAYER FOR RELIEF

6 WHEREFORE, Apple prays for relief, as follows:

7 A. A declaration that Apple has not infringed and does not infringe any
8 valid and enforceable claim of the '936, '558, '949, '490, and '675 patents;

9 B. A declaration that the '936, '558, '949, '490, and '675 patents are
10 invalid;

11 C. A declaration that the '558 patent is unenforceable due to inequitable
12 conduct;

13 D. A declaration that the certificate of correction to the '558 patent is
14 invalid;

15 E. As an alternative, for any of the '936, '558, '949, '490, or '675 patents
16 found to be actually infringed by Apple and not invalid, unenforceable or already
17 licensed, and to the extent that the jury does not award a paid-up royalty for such
18 patent(s), a determination of a prospective royalty (*see Paice LLC v. Toyota Motor*
19 *Corp.*, 503 F.3d 1293 (Fed. Cir. 2007));

20 F. An order barring Qualcomm and its officers, agents, servants,
21 employees, attorneys, and others in active concert or participation with them from
22 asserting infringement or instituting or continuing any legal action for infringement
23 of the '936, '558, '949, '490, or '675 patents against Apple or its suppliers,
24 manufacturers, distributors, resellers of its products, customers, or end users of its
25 products;

26 G. A declaration that Qualcomm and QTI have infringed the '905, '559,
27 '534, '453, '940, '216, '812, and '196 patents.

H. An award of damages in an amount to be proven at trial, but in no event less than reasonable royalty, for Qualcomm’s and QTI’s infringement, of the ’905, ’559, ’534, ’453, ’940, ’216, ’812, and ’196 patents, including pre-judgment and post-judgment interest at the maximum rate permitted by law and to the extent that the jury does not award a paid-up royalty for such patent(s), a determination of a prospective royalty (*see Paice LLC v. Toyota Motor Corp.*, 503 F.3d 1293 (Fed. Cir. 2007));

I. An award of expenses, costs, and disbursement in this action, including prejudgment interest;

J. An order declaring that this is an exceptional case and awarding Apple its reasonable attorney fees under 35 U.S.C. § 285; and

K. Such other and additional relief as this Court may deem just and proper.

Dated: November 29, 2017

APPLE INC.

By: /s/ Juanita R. Brooks

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that a true and correct copy of the above and foregoing document has been served on November 29, 2017 to all counsel of record who are deemed to have consented to electronic service via the Court's CM/ECF system per Civil Local Rule 5.4. Any other counsel of record will be served by electronic mail, facsimile and/or overnight delivery.

Executed on November 29, 2017.

/s/ Juanita R. Brooks
Juanita R. Brooks