UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF NEW YORK

VARIA HOLDINGS LLC, Plaintiff, v. APPLE INC., Defendant.	**Case No.:** 23-cv-7477 **JURY TRIAL DEMANDED**

COMPLAINT FOR PATENT INFRINGEMENT

Varia Holdings LLC ("Varia") hereby asserts claims against Apple Inc. for willful infringement of U.S. Patent Nos. 8,127,984 ("the '984 Patent"), 8,381,974 ("the '974 Patent"), and 9,405,947 ("the '947 Patent," and collectively the "Asserted Patents"). In support thereof, Varia alleges as follows:

I. THE PARTIES

1. Plaintiff Varia is a Delaware limited liability company originally based at 956 East 8th Street, Brooklyn, New York 11230 and now with an additional principal place of business at 1356 Broadway, New York, New York 10018.

2. Varia is the sole and exclusive rightful owner of the Asserted Patents on using near-field communication (NFC) to emulate radio-frequency identification (RFID) communications, and holds, *inter alia*, the sole and exclusive right to sue and collect damages for past infringement of the Asserted Patents.

3. Defendant Apple Inc. ("Apple") is a California corporation with its principal place of business at One Apple Park Way, Cupertino, California 95014. Apple may be served with process at least via its listed registered agent CT Corporation System, 330 N. Brand Blvd. STE #700, Glendale, CA 91203.

II. JURISDICTION AND VENUE

4. This is an action for patent infringement arising under the Patent Laws of the United States, 35 U.S.C. §§ 271 and 281, *et seq*.

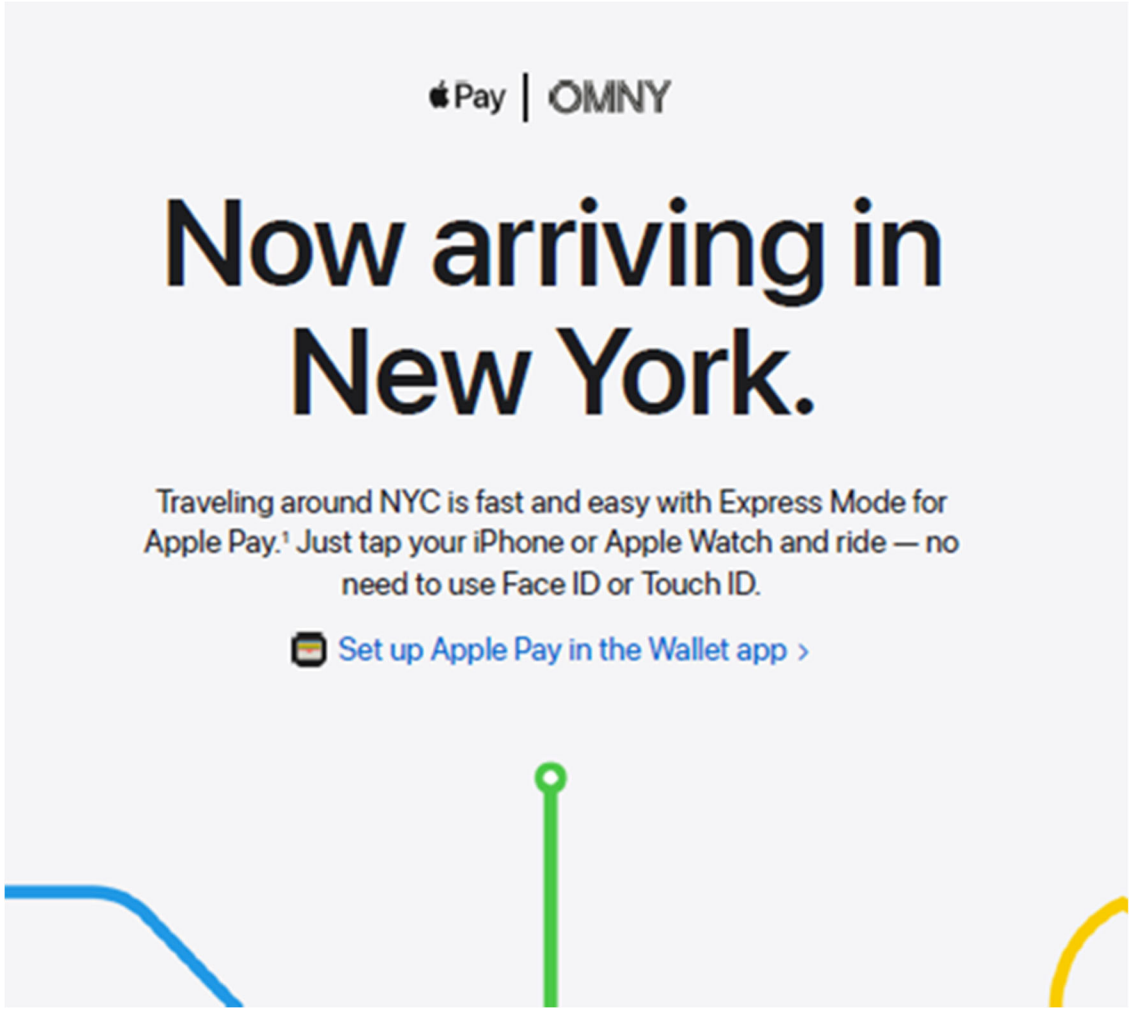
5. Subject matter jurisdiction is proper pursuant to 28 U.S.C. §§ 1331 and 1338.

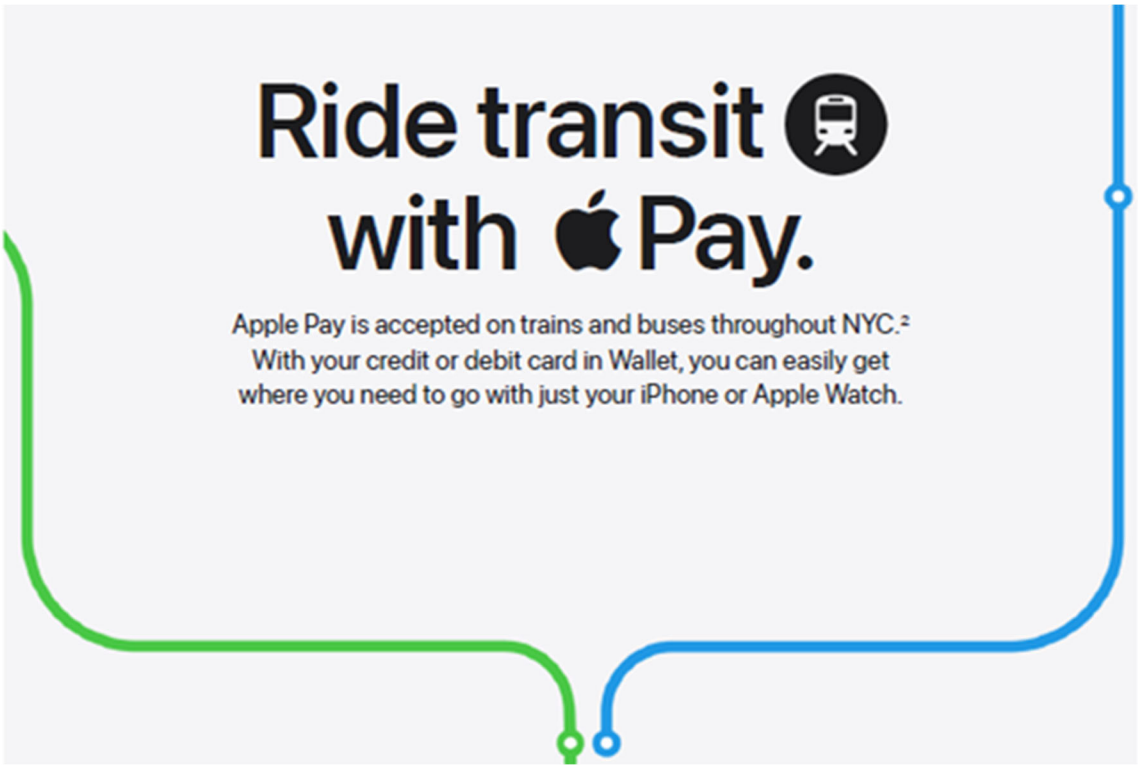
6. This Court has personal jurisdiction over Apple in this action. Apple has committed and continues to commit acts within the Eastern District of New York giving rise to this action, and has established minimum contacts with this forum such that the exercise of jurisdiction over Apple would not offend traditional notions of fair play and substantial justice. In particular, Apple has committed and continues to commit acts of direct and indirect infringement of the Asserted Patents in this District and has purposefully conducted and continues to purposefully conduct business in this District, as demonstrated by Apple's maintenance of regular and established places of business in this District, including multiple physical retail and customer service locations such as the ones located, for example, at 123 Flatbush Avenue, Brooklyn, NY 11217, 247 Bedford Avenue, Brooklyn, NY 11211, 90-15 Queens Blvd., Queens, NY 11373, and 1900 Northern Blvd., Manhasset, NY 11030, among others. Apple has previously submitted to the jurisdiction of this Court.

7. Venue in this District is proper under 28 U.S.C. §§ 1391 and 1400(b) because Defendant has committed and continues to commit acts of direct and indirect patent infringement, and has regular and established places of business, in this District. For example, Apple has provided and continues to provide infringing products and/or services to residents in this District, including its Apple Pay service. (*See* https://support.apple.com/en-us/HT207957).

8. In addition, Apple specifically markets its infringing RFID/NFC products and services to customers and end-users with the knowledge and specific intent to encourage and facilitate the use of such products and services in this particular District. For example, Apple

markets its infringing Apple Pay service for use on the New York City subway, a substantial portion of which is located in this District.





(*See* https://learn.wallet.apple/transit/new-york).

9. In addition, Apple maintains regular and established places of business in this District, including its physical retail and customer service locations, such as the ones located, for example, at 123 Flatbush Avenue, Brooklyn, NY 11217, 247 Bedford Avenue, Brooklyn, NY 11211, 90-15 Queens Blvd., Queens, NY 11373, and 1900 Northern Blvd., Manhasset, NY 11030, among others. On information and belief, Apple employs hundreds of employees across its physical retail and customer service locations in this District. Furthermore, Apple is registered to do business in New York.

III. THE ASSERTED PATENTS

10. The ’984 Patent, entitled “Emulated Radio Frequency Identification,” was lawfully issued by the United States Patent and Trademark Office (“USPTO”) on March 6, 2012. The ’984 Patent claims priority to U.S. Provisional Patent Application No. 60/478,245 (“the ’245

Provisional), filed on June 13, 2003. A true and correct copy of the ’984 Patent is attached as **Exhibit A**.

11. The ’984 Patent is valid and enforceable and was duly issued in full compliance with Title 35 of the United States Code.

12. Varia is the owner of all right, title, and interest in the ’984 Patent, including the right to sue for past infringement.

13. The ’974 Patent, entitled “Emulated Radio Frequency Identification,” was lawfully issued by the USPTO on February 26, 2013. The patent application that issued as the ’974 Patent is a continuation of the application that issued as the ’984 Patent. The ’974 Patent claims priority to the ’245 Provisional, filed on June 13, 2003. A true and correct copy of the ’974 Patent is attached as **Exhibit B**.

14. The ’974 Patent is valid and enforceable and was duly issued in full compliance with Title 35 of the United States Code.

15. Varia is the owner of all right, title, and interest in the ’974 Patent, including the right to sue for past infringement.

16. The ’947 Patent, entitled “Emulated Radio Frequency Identification,” was lawfully issued by the USPTO on August 2, 2016. The patent application that issued as the ’947 Patent is a continuation of the application that issued as the ’974 Patent. The ’947 Patent claims priority to the ’245 Provisional, filed on June 13, 2003. A true and correct copy of the ’947 Patent is attached as **Exhibit C**.

17. The ’947 Patent is valid and enforceable and was duly issued in full compliance with Title 35 of the United States Code.

18. Varia is the owner of all right, title, and interest in the ’947 Patent, including the right to sue for past infringement.

19. Varia asserts and alleges that Apple has infringed and continues to infringe at least one claim of each of the ’984, ’974, and ’947 Patents.

20. To the extent necessary, Varia has complied with all applicable requirements of 35 U.S.C. § 287 at all relevant times for each of the Asserted Patents. To the extent necessary, on information and belief, each prior owner of the Asserted Patents has complied with all applicable requirements of 35 U.S.C. § 287 at all relevant times for each of the Asserted Patents.

IV. BACKGROUND OF THE PATENTED TECHNOLOGY

A. Wildseed and Varia

21. In 2001, Eric Engstrom, one of the co-inventors of the Asserted Patents, formed Wildseed, Ltd. (“Wildseed”), a research-focused company that created foundational technology for mobile devices. (*See* https://www.seattlepi.com/business/article/AOL-buys-mobile-software-company-Wildseed-1180 138.php (“Wildseed makes a plastic covering for cell phones, dubbed the SmartSkin, which allows users to customize their phones with ring tones, games, music and other content. It currently sells 20 varieties, including specialized skins for hip-hop artist Nelly, Fender guitars and others.”); https://www.internetnews.com/it-management/aol-buys-wildseed-for-wireless/ (“Wildseed’s technologies include a mobile Linux-based operating system, which provides support for Game Boy Advanced games, MP3 and video playback, remote device management, and a fully ‘skinnable’ user interface for delivering both branded and themed user experiences, according to AOL.”)).

22. Wildseed worked to develop pioneering RFID/NFC technology, including the use of smartphones to emulate RFID tags. This included work by Wildseed as an independent company with thirty engineers working to develop next generation technology, as a subsidiary of

AOL working to leverage industry platforms to launch new innovations, and then as a part of the Varia family as Varia Mobil LLC ("Varia Mobil") and then Varia working to continue the history of innovation and development. Varia was the original owner and assignee of the Asserted Patents when they were granted by the United States Patent & Trademark Office.

B. RFID/NFC

23. Conventional RFID transponders included static identification codes that they would return in the presence of an RFID reader. Examples include identification tags for entry through secured doors, or credit cards with embedded RFID transponders for authorizing a financial transaction.

24. The nature of conventional RFID transponders required each to contain a unique and static code. It would have been contrary to the purpose of conventional RFID transponders to either include variable identification codes or to allow multiple tags to include the same identification.

25. The Asserted Patents describe and claim novel inventions directed to, *inter alia*, emulating an RFID transponder (such as a transponder/tag present in a physical RFID card, *e.g.*, identification cards, payment cards, access cards, etc.) on a modified mobile communications device without having to use a conventional RFID transponder. Leveraging existing transmission capabilities along with new components, the inventions of the Asserted Patents allow a smartphone to detect the presence of an RFID reader field, and then allow a user to specify a return signal with phone architecture and components rather than a transponder, thereby enabling the device to function as a contactless virtual wallet of RFID transponder tags, with the user being able to select any card or tag as desired. The inventions of the Asserted Patents are critically important to virtual wallet and contactless payment services, including the mobile payment service offered by Apple that incorporates the patented technology.

26. As explained in further detail below, the claims of the Asserted Patents cover specific improvements in the field of RFID exchange that go beyond what was well-understood, routine, and conventional to solve then-existing problems in the field.

27. At the time of the priority date of the Asserted Patents (June 2003)—prior to the release of the Defendant's first iPhone in June 2007—digital wallet services for mobile communications devices were non-existent.

28. The inventions claimed in the Asserted Patents directly addressed problems in the prior art. For example, prior art RFID systems required "a person to carry a number of physical keys and access/identification cards/tags." (Ex. A at 1:40-42). The inventions claimed in the Asserted Patents improved on conventional methods of RFID exchange by enabling an improved mobile communications device to ***emulate*** an RFID transponder, thereby allowing a device to create the appearance or effect of a conventional RFID transponder when no transponder is actually being used. By doing so, the inventions claimed in the Asserted Patents allow for one device to emulate the output of multiple tags and cards, and also enabled more sophisticated transactions that rely on the device's wireless/cloud connections, such as tokenized payment transactions.

29. The applicants for the Asserted Patents identified this aspect of the inventions as distinguishing the prior art during prosecution of the patents before the USPTO. For example, during prosecution of the '984 Patent, the applicants explained that prior art relied on by the Examiner involving a conventional RFID transponder failed to teach, *inter alia*, "an emulated RFID signal." Notably, the '984 Patent was issued by the USPTO after consideration of over 160 prior art references that are cited on the face of the patent.

30. Claims of the Asserted Patents expressly recite this inventive concept of emulating the output of a conventional RFID transponder on a mobile communications device when no

transponder is actually being used, including in specific manners, and the dependent claims cover further refinements to the claimed inventions, including additional limitations directed to, *inter alia*, how the RFID data and associated signaling attributes are provisioned to the mobile communications device. For example, claim 13 of the ’984 Patent recites, *inter alia*, “the mobile communication device having a transceiver configured to output, in a first state, RFID transponder data in a format compatible with said RFID reader upon the mobile communications device determining proximal presence of one or more RFID readers.” As a further example, claim 8 of the ’974 Patent recites, *inter alia*, “the mobile communication device having a transceiver configured to output, in a first state, RFID transponder data to be received by the proximal RFID reader upon the mobile communications device determining proximal presence of one or more RFID readers.” As a further example, claim 16 of the ’947 Patent recites, *inter alia*, “a storage medium including instructions, which, when executed by the processing circuitry cause the mobile communication device to: . . . output an RFID signal via the communication circuitry in response to detection of the proximal presence of the RFID reader external to the mobile communication device.”

31. The Asserted Patents cover another inventive concept which is that the claimed mobile communication device determines it is in the proximal presence or operational space of an RFID reader before it outputs an RFID signal. For example, the specification of the ’984 Patent states: “device 102 monitors for probing signals of an intended RFID reader 120 (or a type of RFID readers 120), to determine whether device 102 is within the operational space of such a RFID

reader 120, block 205. On so determining, device 102 outputs the designated RFID automatically, emulating a passive RFID transponder, block 206." (Ex. A at 4:66-5:4).[1]

32. The applicants for the Asserted Patents identified this aspect of the inventions as distinguishing the prior art during prosecution of the patents before the USPTO. For example, during the prosecution of the '947 Patent, the applicants explained that "conventional RFID transponders—whether passive or active—respond to any RFID probing signal that they can receive, without any regard for whether the tag is within the reader's operational space or not. More sensitive active tag receivers that are outside the intended operating space of the RFID reader will often detect RFID probing signals that were meant for conventional RFID transponders within the operational space, and therefore trigger unwanted RFID tag responses." Applicants additionally explained during prosecution of the '947 Patent that "Absent this step of determining whether the mobile device is in the operational space of the RFID reader, the mobile communication device may unintentionally communicate with an RFID reader that is not proximal to the device, thereby compromising the security of the RFID exchange. . . . If a mobile communication device were to respond to these probing signals, it could pose a large security risk and inadvertently overload and shut down the operation of nearby readers. For example, responding to an RFID probing signal outside of the operational space of an RFID reader could lead to a user to unintentionally unlock a door or make a mobile payment with their mobile communications device. Accordingly, it is important for a mobile communication device to determine whether it is in the operational space of an RFID reader before responding thereto in order to provide an adequate level of security."

[1] For simplicity, only citations to the '984 Patent are provided. The same cited language can be found in the related '974 and '947 Patents.

33. During prosecution of the Asserted Patents, the Examiner recognized that the prior art failed to teach limitations of the claims directed to this novel inventive concept of determining that the mobile communication device is in the proximal presence or operational space of an RFID reader before it outputs an RFID signal. For example, the Examiner stated that the prior art failed to teach, "the outputting of the RFID signal, in response to determining of being in the operational space of the RFID reader based on receipt of the probing signal," as recited in the independent claims of the '947 Patent. In addition, the Examiner stated that the prior art failed to teach, "RFID transponder data to be received by the proximal RFID reader upon the mobile communications device determining proximal presence of one or more readers," as recited in independent claim 8 of the '974 patent.

34. Claims of the Asserted Patents expressly recite this inventive concept of determining that the mobile communication device is in the proximal presence or operational space of an RFID reader before it outputs an RFID signal, including in specific manners, and the dependent claims cover further refinements to the claimed inventions, including additional limitations directed to, *inter alia*, how the RFID data and associated signaling attributes are provisioned to the mobile communications device. For example, claim 13 of the '984 Patent recites, *inter alia*, "the mobile communication device having a transceiver configured to output, in a first state, RFID transponder data in a format compatible with said RFID reader upon the mobile communications device determining proximal presence of one or more RFID readers." As a further example, claim 8 of the '974 Patent recites, *inter alia*, "the mobile communication device having a transceiver configured to output, in a first state, RFID transponder data to be received by the proximal RFID reader upon the mobile communications device determining proximal presence of one or more RFID readers." As a further example, claim 16 of the '947 Patent recites, *inter alia*,

"determining the mobile communication device is in an operational space of the RFID reader based on an RFID probing signal received by the mobile device from the RFID reader," and "output an RFID signal via the communication circuitry in response to detection of the proximal presence of the RFID reader external to the mobile communication device."

35. The Asserted Patents cover another inventive concept, which is that the claimed mobile communication device uses structure that is different from and improves upon the prior art. For example, Figure 1 of the '984 Patent is a "block diagram illustrating an overview of the present invention" (Ex. A at 3:24-25) that includes a "mobile communications device 102" (Ex. A at 3:27), wherein that device has a "primary function" (Ex. A at 3:28-29) to communicate with "another user" (Ex. A at 3:30) but the device is "additionally . . . equipped with hardware and/or software elements 106 to facilitate provision or transfer of a key/identifier in a form a radio frequency signal 110, which may be read e.g. by a radio frequency identifier (RFID) reader 120." (Ex. A at 3:34-39).[2] Prior art mobile devices lacked these additional elements and therefore could not emulate RFID.

36. Claims of the Asserted Patents expressly recite this inventive concept of using structure that is different from and improves upon the prior art, including in specific manners, and the dependent claims cover further refinements to the claimed inventions, including additional limitations directed to, *inter alia*, how the RFID data and associated signaling attributes are provisioned to the mobile communications device. For example, claim 13 of the '984 Patent recites, *inter alia*, "the mobile communication device having a transceiver configured to output, in a first state, RFID transponder data in a format compatible with said RFID reader upon the mobile

[2] For simplicity, only citations to the '984 Patent are provided. The same cited language can be found in the '974 and '947 Patents.

communications device determining proximal presence of one or more RFID readers." As a further example, claim 8 of the '974 Patent recites, *inter alia*, "the mobile communication device having a transceiver configured to output, in a first state, RFID transponder data to be received by the proximal RFID reader upon the mobile communications device determining proximal presence of one or more RFID readers." As a further example, claim 16 of the '947 Patent recites, *inter alia*, "a storage medium including instructions, which, when executed by the processing circuitry cause the mobile communication device to: . . . output an RFID signal via the communication circuitry in response to detection of the proximal presence of the RFID reader external to the mobile communication device."

37. The Asserted Patents cover another inventive concept, which is to "leverage on existing elements of mobile communication device 102, and supplement them, to enable mobile communication device 102 to be able to provide a RFID, emulating a RFID transponder, as well as facilitating user communication." (Ex. A at 3:50-55). It was unconventional, and not in the prior art, to leverage existing mobile communication device elements to emulate RFID.

38. Claims of the Asserted Patents expressly recite this inventive concept of leveraging existing mobile communication device elements to emulate RFID, including in specific manners, and the dependent claims cover further refinements to the claimed inventions, including additional limitations directed to, *inter alia*, how the RFID data and associated signaling attributes are provisioned to the mobile communications device. For example, claim 13 of the '984 Patent recites, *inter alia*, "the mobile communication device having a transceiver configured to output, in a first state, RFID transponder data in a format compatible with said RFID reader upon the mobile communications device determining proximal presence of one or more RFID readers." As a further example, Claim 8 of the '974 Patent recites, *inter alia*, "the mobile communication device having

a transceiver configured to output, in a first state, RFID transponder data to be received by the proximal RFID reader upon the mobile communications device determining proximal presence of one or more RFID readers." As a further example, claim 16 of the '947 Patent recites, *inter alia*, "a storage medium including instructions, which, when executed by the processing circuitry cause the mobile communication device to: . . . output an RFID signal via the communication circuitry in response to detection of the proximal presence of the RFID reader external to the mobile communication device."

39. In addition, the Asserted Patents describe how to implement these inventive concepts, including through use of novel, unconventional components implemented in a mobile communication device, as well as through conventional components used in an unconventional manner. For example, the '984 Patent specification discloses that "Except for transceivers 308, RFID feature 322, and the manner the various elements of FIG. 3 are used to practice the present invention, the other illustrated elements are known in the art, and accordingly will not be further described."[3] The '984 Patent specification concludes by again noting that its disclosed use of a mobile communication device to emulate RFID is inventive and unconventional: "Thus, it can be seen from the above descriptions a novel emulated RFID input method, using a mobile communication device, has been described." (Ex. A at 9:8-10).

40. For at least the foregoing reasons, the elements of the claims of the Asserted Patents, individually or as part of an ordered combination, cover non-routine, unconventional, inventive concepts that provide specific technical improvements to the problem of RFID emulation in an RFID exchange that were not resolved by the prior art.

[3] For simplicity, only citations to the '984 Patent are provided. The same cited language can be found in the '974 and '947 Patents.

C. Varia's Meeting With Apple

41. On March 20, 2013, after the '984 and '974 Patents had issued and while the application for the '947 Patent was pending, Varia representatives Michael Jemal, Steve Klein, and Eric Halber met with representatives from Apple at its Cupertino, California headquarters. The purpose of the meeting was to showcase Varia's technology to Apple and to discuss Apple's potential interest in utilizing Varia's patented RFID/NFC technology.

42. During the meeting with Apple, Varia presented a slide deck to Apple, which included several slides addressing the '984 and '974 Patents, their technology and value, and the potential for Apple to enter into a partnership to acquire the right to use this technology.

43. Specifically, Varia's 2013 presentation to Apple included a detailed discussion of the then-current RFID/NFC market in other countries, the then-existing market gap for NFC in the United States, and the technology companies that were attempting to kick-start the United States NFC market at the time, such as Samsung and Google. The presentation explained that Apple's iPhone 5 lacked hardware and software to utilize Varia's patented technology, but that the NFC payment infrastructure already existed in the marketplace based on contactless "smart card" payments and that eventually Apple would follow the market by adopting NFC technology for payments. The presentation also noted Apple's NFC-related patent applications and corporate acquisitions as evidence of Apple's preparation to utilize NFC technologies, which would infringe Varia's patents.

44. Additionally, Varia's presentation to Apple explained how to incorporate Varia's RFID/NFC technology into smartphones such as the iPhone, noting that NFC-enabled phones comply with ISO 14443 (the standards for NFC). Varia's presentation then walked through claim language of the Asserted Patents and explained how the claims could read on smartphones.

45. Varia's presentation also explained how its patents were different than the prior art, and that a third-party search had confirmed the validity of its patents.

46. After Varia showcased its core RFID/NFC technology and disclosed its patent coverage over the necessary technology to Apple, Varia offered an array of potential business arrangements so that Apple could use Varia's technology in later generations of iPhones.

47. Apple declined to license or purchase Varia's RFID/NFC technology, claiming that—while it lacked such technology itself—it was not planning on introducing such technology in future iPhones. Apple informed Varia that it had no interest in using RFID technology and would not incorporate RFID/NFC technology into any of its products.

D. <u>The Accused Products</u>

48. Despite informing Varia in March 2013 that Apple would not enter the RFID/NFC space and had no interest in the Asserted Patents, 18 months after the meeting with Varia's representatives, Apple launched the iPhone 6, which incorporated and infringed Varia's patented technology, including the very technology that Varia had showcased and taught to Apple in the 2013 meeting and presentation.

49. Apple now provides to its customers and end-users a RFID/NFC mobile payment service that replaces physical cards at contactless point-of-sale terminals. This mobile payment service is referred to as "Apple Pay." (*See* https://www.apple.com/apple-pay ("Apple Pay replaces your physical cards . . . . It's the simple way to pay every day," "Apple Pay works anywhere that takes contactless payments—from vending machines and grocery stores to taxis and subway stations," and "Apple Pay works right from your device, helping you avoid touching buttons and terminals, handling cards, and exchanging cash.")). Apple provides Apple Pay to customers and end-users in the United States, including customers and end-users in this District.

50. Apple mobile devices come preloaded with the Apple Wallet, a virtual wallet where users can load emulated RFID tags for debit cards, credit cards, transit cards, rewards cards, boarding passes, event tickets, digital keys, and ID cards. (*See, e.g.*, https://support.apple.com/guide/iphone/keep-cards-and-passes-in-wallet-iphc05dba539/16.0/ios/16.0). Apple's customers and end-users can then activate Apple Pay and start making contactless purchases using their mobile devices. (*See, e.g.*, https://support.apple.com/guide/iphone/use-apple-pay-for-contactless-payments-iphbd4cf42b4/ios).

51. Apple Pay uses near-field communication (NFC) technology to send payment data from the Apple device to a contactless point-of-sale terminal. (*See, e.g.*, https://support.apple.com/en-us/HT203027). As explained by Apple, "When you use Apple Pay in stores that accept contactless payments, Apple Pay uses Near Field Communication (NFC) technology between your device and the payment terminal. NFC is an industry-standard, contactless technology that's designed to work only across short distances. If your iPhone is on and detects an NFC field, it will present you with your default card." (*Id.*).

52. Upon information and belief, Apple Pay is available on a range of Apple devices, including but not limited to, at least all variants of the following Apple devices: iPhone 6, iPhone 6 Plus, iPhone 6S, iPhone 6S Plus, iPhone SE, iPhone 7, iPhone 7 Plus, iPhone 8, iPhone 8 Plus, iPhone X, iPhone 11, iPhone 12, iPhone 13, iPhone 14, iPhone 15, Watch Series 3, Watch Series 4, Watch Series 5, Watch SE (first generation), Watch Series 6, Watch Series 7, Watch Series SE (second generation), Watch Series 8, Watch Ultra, and Watch Series 9. (*See* https://support.apple.com/en-us/HT208531). As used herein, the "Accused Products" are Apple devices that implement the Apple Pay or other infringing RFID/NFC technology.

53. As described in detail below, the Accused Products embody inventions claimed in the Asserted Patents, and thus infringe the Asserted Patents.

E. Apple's Acts of Infringement

54. Apple has made, used, sold, offered to sell, and/or imported infringing products, and continues to do so, including the Accused Products.

55. By doing so, Apple has directly infringed, and continues to directly infringe, the Asserted Patents.

56. Apple has engaged and continues to engage in a pattern of conduct intended to induce and/or contribute to the infringement of others, such as its customers and end-users. These actions have included and include making, selling, offering to sell, and/or importing products that infringe the Asserted Patents.

57. Through its actions, Apple induces and/or contributes to the infringement of the Asserted Patents, and thus indirectly infringes the Asserted Patents.

58. There is an actual, substantial, and continuing justiciable controversy between Varia and Apple regarding Apple's infringement of the Asserted Patents. Absent a judgment from this Court, Apple will continue to infringe the Asserted Patents and continue to cause damage to Varia.

59. Apple has had actual knowledge of the '984 Patent since prior to the filing of this Complaint. For example, on March 20, 2013, Varia representatives met with Apple representatives at Apple's Cupertino, California headquarters. At that meeting, Varia presented several slides to Apple on Varia's RFID/NFC patent portfolio, including the '984 Patent.

60. Apple has had actual knowledge of the '974 Patent since prior to the filing of this Complaint. For example, on March 20, 2013, Varia representatives met with Apple representatives

at Apple's Cupertino California headquarters. At that meeting, Varia presented several slides to Apple on Varia's RFID/NFC patent portfolio, including the '974 Patent.

61. On information and belief, Apple has had knowledge of the '947 Patent since prior to the filing of this Complaint. For example, on March 20, 2013, Varia representatives met with Apple representatives at Apple's Cupertino, California headquarters. At that meeting, Varia presented several slides to Apple on Varia's RFID/NFC patent portfolio, including the '974 Patent. The slides that Varia presented to Apple expressly stated that two continuation applications had been filed on the '974 Patent. The patent application that eventually issued as the '947 Patent is a continuation of the application that issued as the '974 Patent, and is one of the two continuation applications expressly referenced in Varia's slide presentation to Apple.

62. On information and belief, Apple, as a large technology company, has had knowledge or should have had knowledge of the '947 patent, at least because it relates to the same field of subject matter as the '984 and '974 Patents. Additionally, the '947 Patent was pending at the time of the March 20, 2013 meeting and is related to the '984 and '974 Patents as all of these patents claim priority to the '245 Provisional, further indicating that Apple, as a large technology company, was aware or should have been aware of the '947 Patent because of its relation to patents that were presented to Varia by Apple at the March 20, 2013 meeting, as described above.

63. On information and belief, Apple, as a large technology company, has had knowledge or should have had knowledge of the Asserted Patents, at least because Apple was developing technology and applying for patents in the same field as the Asserted Patents.

64. On information and belief, in the course of developing technology and applying for patents in the same fields as the Asserted Patents, Apple, as a large technology company, routinely

monitored patents, patent applications, non-patent literature, and press related to those fields, including the Asserted Patents.

65. Despite informing Varia that Apple would not enter the RFID/NFC space and had no interest in Varia's patents, 18 months after the meeting with Varia's representatives, Apple launched the iPhone 6, which incorporates Varia's patented technology.

66. Although Apple has had knowledge or should have had knowledge of the Asserted Patents, at least for the reasons explained above and in any event through the filing and service of this Complaint, as well as the value of and benefits of the technology claimed by the Asserted Patents, Apple has engaged, and continues to engage, in behavior that, as a large technology company, it knew or should have known had a high likelihood of infringing the Asserted Patents, including by incorporating Varia's patented technology in the Accused Products. To the extent that Apple, as a large technology company, failed to investigate its infringement upon learning of the Asserted Patents, Apple has been willfully blind.

67. Apple's infringement of each Asserted Patent is and has been willful. Based on the facts set forth above, Apple intentionally copied Varia's patented technology as part of launching the infringing functionality in the Accused products or, at a minimum, launched the infringing functionality with full knowledge of the Asserted Patents and that its actions constituted an unjustifiably high risk of infringement of the Asserted Patents. Apple's knowledge of this risk of infringement was based on, *inter alia*, its direct discussions with Varia concerning the scope and technology of the Asserted Patents, and at least because of Apple's familiarity with the Asserted Patents and the fields to which they relate including as part of its development of the Accused Products, and its monitoring of patents, patent applications, non-patent literature, and press in the same fields as the Asserted Patents, including the Asserted Patents themselves.

68. Apple's conduct in copying Varia's patented technology, knowingly infringing Varia's patented technology, and/or disregarding an unjustifiably high risk of infringement renders Apple's infringement willful and egregious, particularly since Apple continues to commit its infringing acts while aware of the Asserted Patents.

69. Apple's acts of infringement have been willful as of the date it became aware of the patented technology/invention(s) and/or the Asserted Patents, and no later than the filing of this Complaint for patent infringement and/or the date of this Complaint for patent infringement was served on Apple.

V. COUNT I – INFRINGEMENT OF U.S. PATENT NO. 8,127,984

70. Varia realleges and incorporates by reference each of the preceding paragraphs.

71. Apple has and continues to directly and/or indirectly infringe one or more claims of the '984 patent, including without limitation at least claim 13, in this District and elsewhere in the United States.[4]

72. By way of example, the Accused Products infringe at least claim 13 of the '984 Patent for at least the reasons explained below.

73. Claim 13 of the '984 Patent, for example, recites[5]:

> (1.0) A method for providing a radio frequency identifier (RFID), from a switchable mobile communications device capable of RFID communication and voice call communication, the method comprising:
>
> (1.1) monitoring for proximal presence of a proximal RFID reader external to said mobile communication device by said mobile communication device,

[4] The identification of infringed claims for the '984 Patent in this Complaint is exemplary and not intended to be limiting. The Accused Products may infringe additional claims of the '984 Patent and any such additional claims will be identified in accordance with the rules and procedures of the Court, including the Local Patent Rules for the Southern and Eastern Districts of New York.

[5] The numbering provided in parentheses in the claim below (and other claims shown in this Complaint) is added only to assist with further explanation of how the Accused Products meet each element of the claim.

(1.2) the mobile device having a transceiver configured, to output, in a first state, RFID transponder data in a format compatible with said RFID reader upon the mobile communications device determining proximal presence of one or more RFID readers, the transceiver being also configured to output, in a second state, a voice call signal for transmission at least in part over a wireless network; and

(1.3) on detection of the RFID reader, outputting, by the transceiver, the RFID transponder data as a radio frequency signal, said data being output in said format employed by the RFID reader.

74. By way of example, the Accused Products infringe at least claim 13 of the '984 patent for the reasons explained below.

75. To the extent the preamble (identified as limitation 1.0 above) is limiting, the Accused Products perform a method for providing RFID from a switchable mobile communications device capable of RFID communication and voice call communication, such as an iPhone. For example, as reflected in Apple's product literature, the iPhone 7 is capable of voice call communication, such as traditional cellular telephone service (*e.g.*, via LTE, CDMA, UMTS, GSM), and/or audio calling services that use a Wi-Fi connection (*e.g.*, via FaceTime audio and Wi-Fi calling), as well as RFID communication (*e.g.*, via NFC). NFC is a subset of RFID. (*See* https://www.atlasrfidstore.com/rfid-insider/rfid-vs-nfc/ ("RFID is the process by which items are uniquely identified using radio waves, and NFC is a specialized subset within the family of RFID technology."); https://www.bluebite.com/nfc/rfid-vs-nfc ("Hierarchically, NFC is a subset of RFID.")).

Audio Calling[5]

- FaceTime audio
- Voice over LTE (VoLTE)[6]
- Wi-Fi calling[6]

Cellular and Wireless

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  TD-SCDMA 1900 (F), 2000 (A)
  CDMA EV-DO Rev. A (800, 1900, 2100 MHz)
  UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)
  GSM/EDGE (850, 900, 1800, 1900 MHz)
- **Model A1778**
  FDD-LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 18, 19, 20, 25, 26, 27, 28, 29, 30)

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  UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)
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- **All models**
  802.11ac Wi-Fi with MIMO
  Bluetooth 4.2 wireless technology
  NFC with reader mode
  Express Cards

(*See* iPhone 7 – Technical Specifications, https://support.apple.com/kb/SP743?locale=en_US).

76. With respect to limitation 1.1 identified above, the Accused Products monitor for the proximal presence of a proximal RFID reader (*e.g.*, a contactless point-of-sale terminal) external to said mobile communication device. For example, on information and belief, Apple Pay conforms to the EMV Contactless standard, which incorporates the ISO/IEC 14443 standard for proximity cards. (*See* https://web.archive.org/web/20190408221439/ https://support.apple.com/en-us/HT205645 ("Apple Pay conforms to the latest EMV standards for tokenizing transactions, which leads to a more secure payment experience.")). On information and belief, the Accused Products act as a proximity card (PICC) as defined by the ISO/IEC 14443 specification. On information and belief, the Accused Products, in accordance with the ISO/IEC 14443 standard, monitor for the proximal presence of a proximal RFID reader (*e.g.*, a coupling

device) by listening for commands and recognizing Request (REQA) and Wake Up (WUPA) commands from the RFID reader.

3.5
PICC
contactless integrated circuit card (3.3) or other object with which communication and power transfer are done by inductive coupling in proximity of a coupling device

Note 1 to entry: Commonly called a proximity card.

Source: ISO/IEC 14443-1:2018 — Cards and security devices for personal identification — Contactless proximity objects — Part 1: Physical characteristics.

6.3.2 IDLE state

Description:

In IDLE state, the PICC is powered. It listens for commands and shall recognize REQA and WUPA commands.

State exit conditions and transitions:

The PICC enters READY state after it has received a valid REQA or WUPA command and transmitted its ATQA.

Source: ISO/IEC 14443-3:2018 — Cards and security devices for personal identification — Contactless proximity objects — Part 3: Initialization and anticollision.

How to pay using Apple Pay in stores and other places

With your iPhone or Apple Watch, you can use Apple Pay in stores, restaurants, gas stations, taxis, or wherever else you see one of these symbols[1].

Pay with your iPhone

1. To use your default card:
   - If your iPhone has Face ID, double-click the side button. If prompted, authenticate with Face ID or enter your passcode to open Apple Wallet.
   - If your iPhone has Touch ID, double-click the Home button.
2. To use a different card, tap your default card to see your other cards. Tap a new card and authenticate.
3. Hold the top of your iPhone near the contactless reader until Done and a checkmark appear on the display.

Pay with your Apple Watch

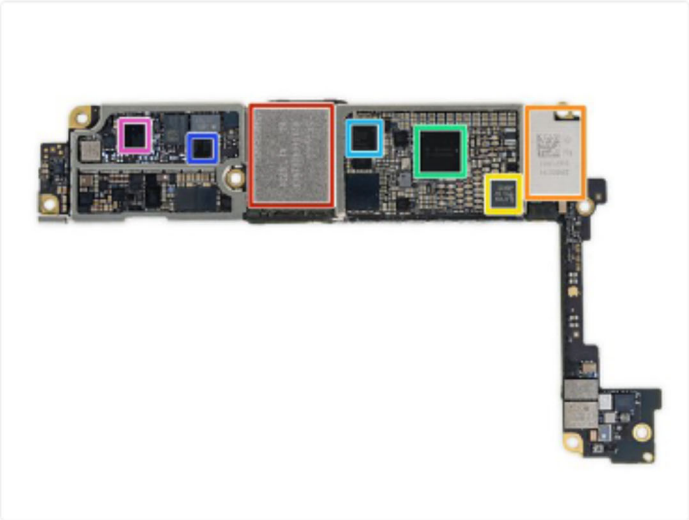
1. Double-click the side button.
2. Your default card opens automatically. Scroll down to choose another card.
3. Hold the display of your Apple Watch near the contactless reader until you feel a gentle tap and hear a beep.

Want to see your recent purchases? Learn how to check your Apple Pay transaction history.

(*See* https://support.apple.com/en-us/HT201239).

77. With respect to limitation 1.2 above, the Accused Products' transceiver is configured to output, in a first state, RFID transponder data in a format compatible with said RFID reader upon the mobile communications device determining proximal presence of one or more RFID readers, the Accused Products' transceiver being also configured to output, in a second state, a voice call signal for transmission at least in part over a wireless network. For example, on information and belief, the iPhone 7 has internal circuitry and components, including an NXP 67V04 NFC Controller, Qualcomm WTR4905 Multimode LTE Transceiver, and Qualcomm WTR3925 RF Transceiver (collectively, "transceiver"), that outputs, in a first state, RFID transponder data in a format compatible with said RFID reader (*e.g.*, a contactless point-of-sale

terminal) upon the mobile communications device determining proximal presence of one or more RFID readers, and in a second state, outputs a voice call signal for transmission at least in part over a wireless network (*e.g.*, via LTE, CDMA, UMTS, GSM). On information and belief, later versions of the iPhone included Snapdragon chipsets with combined telephony and RFID/NFC capabilities, and infringe for similar reasons.



- And on the flip side:
  - SK Hynix H23QEG8VG2ACS 32 GB Flash
  - Murata 339S00199 Wi-Fi/Bluetooth Module
  - NXP PN67V NFC Controller w/ Secure Element
  - Apple/Dialog Semiconductor 338S00225 Power Management IC
  - Qualcomm PMD9645 Power Management IC
  - Qualcomm WTR4905 Multimode LTE Transceiver
  - Qualcomm WTR3925 RF Transceiver

(*See* https://www.ifixit.com/Teardown/iPhone+7+Teardown/67382).

Cellular and Wireless

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  UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)
  GSM/EDGE (850, 900, 1800, 1900 MHz)
- **Model A1778**
  FDD-LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 18, 19, 20, 25, 26, 27, 28, 29, 30)

TD-LTE (Bands 38, 39, 40, 41)
UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)
GSM/EDGE (850, 900, 1800, 1900 MHz)

- **All models**

802.11ac Wi-Fi with MIMO
Bluetooth 4.2 wireless technology
NFC with reader mode
Express Cards

(*See* iPhone 7 – Technical Specifications, https://support.apple.com/kb/SP743?locale=en_US).

NFC controller

The NFC controller handles Near Field Communication protocols and routes communication between the Application Processor and the Secure Element, and between the Secure Element and the point-of-sale terminal.

(*See* https://help.apple.com/pdf/security/en_US/apple-platform-security-guide.pdf).

78. With respect to limitation 1.3 above, on detection of the RFID reader, the Accused Products output, by the transceiver, the RFID transponder data as a radio frequency signal, said data being output in said format employed by the RFID reader. For example, on information and belief, the Accused Products, acting in accordance with the format employed by the RFID reader (*e.g.*, the ISO/IEC 14443 standard) and on detection of the RFID reader (*e.g.*, IDLE state exit), transmit RFID transponder data (*e.g.*, Answer to Request or ATQA) as a radio frequency signal (*e.g.*, 13.56 MHz frequency).

6.3.2 IDLE state

Description:

In IDLE state, the PICC is powered. It listens for commands and shall recognize REQA and WUPA commands.

State exit conditions and transitions:

The PICC enters READY state after it has received a valid REQA or WUPA command and transmitted its ATQA.

(*Source*: ISO/IEC 14443-3:2018 — Cards and security devices for personal identification — Contactless proximity objects — Part 3: Initialization and anticollision).

6.2 Frequency

The frequency, f_c, of the RF operating field shall be 13,56 MHz ± 7 kHz.

(*Source*: ISO/IEC 14443-2:2020 — Cards and security devices for personal identification — Contactless proximity objects — Part 2: Radio frequency power and signal interface).

79. Each of the steps of claim 13 of the ’984 Patent, as well as each step of the other infringed method claims of the ’984 Patent, are performed directly by Apple, which, via the Accused Products, dictates the performance of each step of such claims.

80. To the extent any step of such claims is not directly performed by Apple, it is performed under the direction and control of Apple. Receipt of the benefits of the Accused Products, including to provide a customer or end-user with a secure, contactless mobile payment solution, are necessarily conditioned on performance of the claimed steps, and Apple establishes the manner and/or timing of such performance by directing and controlling the operation of the Accused Products.

81. For at least these reasons, Apple, by itself and/or through its subsidiaries, agents, and/or business partners, has directly infringed and continues to directly infringe, literally or under the doctrine of equivalents, one or more claims including at least claim 13 of the ’984 Patent pursuant to 35 U.S.C. § 271(a) by making, having made, using, selling, offering for sale, and/or importing products, systems, and methods, including the Accused Products, within the United States and within this District.

82. In addition to its direct infringement, Apple, by itself and/or through its subsidiaries, agents, and/or business partners, has induced and continues to induce the direct

infringement of the ’984 Patent by users of the Accused Products pursuant to 35 U.S.C. § 271(b) in the United States and within this District. For example, Apple has induced and continues to induce the direct infringement of the ’984 Patent by users of the Accused Products at least by making and providing Apple Pay, which infringes at least claim 13 of the ’984 Patent when used, and by activities related to selling, marketing, advertising, promotion, support, and distribution of the Accused Products. For example, Apple touts the benefits of, and encourages the use of Apple Pay by its customers and end users. (*See, e.g.*, https://learn.wallet.apple/transit/new-york).

83. On information and belief, Apple has had actual knowledge of the ’984 Patent prior to, and at least as of the filing of this Complaint, as detailed above. (*See supra* at § IV.E). On information and belief, Apple has engaged in infringing activities with knowledge, or willful blindness, and intent that such activities would cause and/or encourage direct infringement of the ’984 Patent.

84. Apple, by itself and/or through its subsidiaries, affiliates, agents, and/or business partners, has contributed to and continues to contribute to the direct infringement by users of the Accused Products of the claims of the ’984 Patent (including, without limitation, the claims addressed above) pursuant to 35 U.S.C. § 271(c) in the United States and within this District. For example, Apple has contributed to and continues to contribute to the direct infringement of the ’984 Patent at least by selling, offering to sell, and/or importing the Accused Products, or one or more components thereof in the United States with knowledge that the Accused Products and/or such components constitute a material part of the inventions claimed in the ’984 Patent, and that the Accused Products and/or such components have no substantial non-infringing use, and knowing that the Accused Products and/or such components are especially made or adapted for use in infringing one or more claims of the ’984 Patent.

85. As a consequence of each form of Apple's infringement, both literal and under the doctrine of equivalents, of the '984 Patent, Varia has been damaged in an amount not yet determined and is entitled to recover damages pursuant to 35 U.S.C. § 284.

86. On information and belief, as set forth in detail above, Apple's infringement of the '984 Patent has been and continues to be willful.

VI. COUNT II – INFRINGEMENT OF U.S. PATENT NO. 8,381,974

87. Varia realleges and incorporates by reference each of the preceding paragraphs.

88. Apple has and continues to directly and/or indirectly infringe one or more claims of the '974 patent, including without limitation at least claim 8, in this District and elsewhere in the United States.[6]

89. Claim 8 of the '974 Patent, for example, recites[7]:

> (1.0) A method for providing a radio frequency identifier (RFID), from a switchable mobile communications device capable of RFID communication an voice call communication, the method comprising:
>
> (1.1) monitoring, by the mobile communication device, for proximal presence of a proximal RFID reader,
>
> (1.2) the mobile communication device having a transceiver configured, to output, in a first state, RFID transponder data to be received by the proximal RFID reader upon the mobile communications device determining proximal presence of one or more RFID readers, the transceiver being also configured to output, in a second state, a voice call signal for transmission at least in part over a wireless network; and
>
> (1.3) on detection of the RFID reader, outputting, by the transceiver, the RFID transponder data as a radio frequency signal.

---

[6] The identification of infringed claims for the '974 Patent in this Complaint is exemplary and not intended to be limiting. The Accused Products may infringe additional claims of the '974 Patent and any such additional claims will be identified in accordance with the governing rules and procedures of the Court.

[7] The numbering provided in parentheses in the claim below (and other claims shown in this Complaint) is added only to assist with further explanation of how the Accused Products meet each element of the claim.

90. By way of example, the Accused Products infringe at least claim 8 of the '974 patent for the reasons explained below.

91. To the extent the preamble (identified as limitation 1.0 above) is limiting, the Accused Products perform a method for providing RFID from a switchable mobile communications device capable of RFID communication and voice call communication, such as an iPhone. For example, as reflected in Apple's product literature, the iPhone 7 is capable of voice call communication, such as traditional cellular telephone service (*e.g.*, via LTE, CDMA, UMTS, GSM), and/or audio calling services that use a Wi-Fi connection (*e.g.*, via FaceTime audio and Wi-Fi calling), as well as RFID communication (*e.g.*, via NFC). NFC is a subset of RFID. (*See* https://www.atlasrfidstore.com/rfid-insider/rfid-vs-nfc/ ("RFID is the process by which items are uniquely identified using radio waves, and NFC is a specialized subset within the family of RFID technology."); https://www.bluebite.com/nfc/rfid-vs-nfc ("Hierarchically, NFC is a subset of RFID.")).

Audio Calling[5]

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- Voice over LTE (VoLTE)[6]
- Wi-Fi calling[6]

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- **Model A1778**[v]
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TD-LTE (Bands 38, 39, 40, 41)
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802.11ac Wi-Fi with MIMO
Bluetooth 4.2 wireless technology
NFC with reader mode
Express Cards

(*See* iPhone 7 – Technical Specifications, https://support.apple.com/kb/SP743?locale=en_US).

92. With respect to limitation 1.1 identified above, the Accused Products monitor for proximal presence of a proximal RFID reader (*e.g.*, a contactless point-of-sale terminal). For example, on information and belief, Apple Pay conforms to the EMV Contactless standard, which incorporates the ISO/IEC 14443 standard for proximity cards. (*See* https://web.archive.org/web/20190408221439/https://support.apple.com/en-us/HT205645 ("Apple Pay conforms to the latest EMV standards for tokenizing transactions, which leads to a more secure payment experience.")). On information and belief, the Accused Products act as a proximity card (PICC) as defined by the ISO/IEC 14443 specification. On information and belief, the Accused Products, in accordance with the ISO/IEC 14443 standard, monitor for the proximal presence of a proximal RFID reader (*e.g.*, a coupling device) by listening for commands and recognizing Request (REQA) and Wake Up (WUPA) commands from the RFID reader.

3.5
PICC
contactless integrated circuit card (3.3) or other object with which communication and power transfer are done by inductive coupling in proximity of a coupling device

Note 1 to entry: Commonly called a proximity card.

(*Source*: ISO/IEC 14443-1:2018 — Cards and security devices for personal identification — Contactless proximity objects — Part 1: Physical characteristics).

6.3.2 IDLE state

Description:

In IDLE state, the PICC is powered. It listens for commands and shall recognize REQA and WUPA commands.

State exit conditions and transitions:

The PICC enters READY state after it has received a valid REQA or WUPA command and transmitted its ATQA.

(*Source*: ISO/IEC 14443-3:2018 — Cards and security devices for personal identification — Contactless proximity objects — Part 3: Initialization and anticollision).

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With your iPhone or Apple Watch, you can use Apple Pay in stores, restaurants, gas stations, taxis, or wherever else you see one of these symbols[1].

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   - If your iPhone has Touch ID, double-click the Home button.
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3. Hold the top of your iPhone near the contactless reader until Done and a checkmark appear on the display.

Pay with your Apple Watch

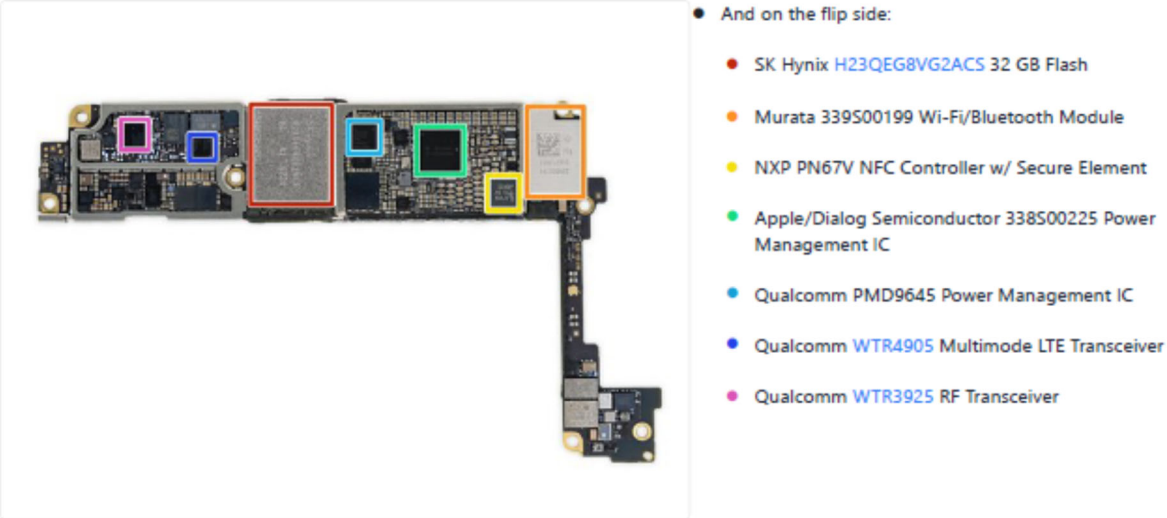
1. Double-click the side button.
2. Your default card opens automatically. Scroll down to choose another card.
3. Hold the display of your Apple Watch near the contactless reader until you feel a gentle tap and hear a beep.

Want to see your recent purchases? Learn how to check your Apple Pay transaction history.

(*See* https://support.apple.com/en-us/HT201239).

93. With respect to limitation 1.2 above, the Accused Products' transceiver is configured to output, in a first state, RFID transponder data to be received by the proximal RFID

reader upon the mobile communications device determining proximal presence of one or more RFID readers, the Accused Products' transceiver being also configured to output, in a second state, a voice call signal for transmission at least in part over a wireless network. For example, on information and belief, the iPhone 7 has internal circuitry and components, including an NXP 67V04 NFC Controller, Qualcomm WTR4905 Multimode LTE Transceiver, and Qualcomm WTR3925 RF Transceiver (collectively, "transceiver"), that outputs, in a first state, RFID transponder data upon the mobile communications device determining proximal presence of one or more RFID readers (*e.g.*, contactless point-of-sale terminals), and in a second state, outputs a voice call signal for transmission at least in part over a wireless network (*e.g.*, via LTE, CDMA, UMTS, GSM). On information and belief, later versions of the iPhone included Snapdragon chipsets with combined telephony and RFID/NFC capabilities, and infringe for similar reasons.



(*See* https://www.ifixit.com/Teardown/iPhone+7+Teardown/67382).

Cellular and Wireless

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- **Model A1778**
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  TD-LTE (Bands 38, 39, 40, 41)
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  802.11ac Wi-Fi with MIMO
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  NFC with reader mode
  Express Cards

(*See* iPhone 7 – Technical Specifications, https://support.apple.com/kb/SP743?locale=en_US).

NFC controller

The NFC controller handles Near Field Communication protocols and routes communication between the Application Processor and the Secure Element, and between the Secure Element and the point-of-sale terminal.

(*See* https://help.apple.com/pdf/security/en_US/apple-platform-security-guide.pdf).

94. With respect to limitation 1.3 above, on detection of the RFID reader, the Accused Products output, by the transceiver, the RFID transponder data as a radio frequency signal. For example, on information and belief, the Accused Products, acting in accordance with the format employed by the RFID reader (*e.g.*, the ISO/IEC 14443 standard) and on detection of the RFID reader (*e.g.*, IDLE state exit), transmit RFID transponder data (*e.g.*, Answer to Request or ATQA) as a radio frequency signal (*e.g.*, 13.56 MHz frequency).

6.3.2 IDLE state

Description:

In IDLE state, the PICC is powered. It listens for commands and shall recognize REQA and WUPA commands.

State exit conditions and transitions:

The PICC enters READY state after it has received a valid REQA or WUPA command and transmitted its ATQA.

(*Source*: ISO/IEC 14443-3:2018 — Cards and security devices for personal identification — Contactless proximity objects — Part 3: Initialization and anticollision).

6.2 Frequency

The frequency, f_c, of the RF operating field shall be 13,56 MHz ± 7 kHz.

(*Source*: ISO/IEC 14443-2:2020 — Cards and security devices for personal identification — Contactless proximity objects — Part 2: Radio frequency power and signal interface).

95. Each of the steps of claim 8 of the '974 Patent, as well as each step of the other infringed method claims of the '974 Patent, are performed directly by Apple, which, via the Accused Products, dictates the performance of each step of such claims.

96. To the extent any step of such claims is not directly performed by Apple, it is performed under the direction and control of Apple. Receipt of the benefits of the Accused Products, including to provide a customer or end-user with a secure, contactless mobile payment solution, are necessarily conditioned on performance of the claimed steps, and Apple establishes the manner and/or timing of such performance by directing and controlling the operation of the Accused Products.

97. For at least these reasons, Apple, by itself and/or through its subsidiaries, agents, and/or business partners, has directly infringed and continues to directly infringe, literally or under the doctrine of equivalents, one or more claims including at least claim 8 of the '974 Patent pursuant to 35 U.S.C. § 271(a) by making, having made, using, selling, offering for sale, and/or

importing products, systems, and methods, including the Accused Products, within the United States and within this District.

98. In addition to its direct infringement, Apple, by itself and/or through its subsidiaries, agents, and/or business partners, has induced and continues to induce the direct infringement of the ’974 Patent by users of the Accused Products pursuant to 35 U.S.C. § 271(b) in the United States and within this District. For example, Apple has induced and continues to induce the direct infringement of the ’974 Patent by users of the Accused Products at least by making and providing Apple Pay, which infringes at least claim 8 of the ’974 Patent when used, and by activities related to selling, marketing, advertising, promotion, support, and distribution of the Accused Products. For example, Apple touts the benefits of, and encourages the use of Apple Pay by its customers and end users. (*See, e.g.*, *See* https://learn.wallet.apple/transit/new-york).

99. On information and belief, Apple has had actual knowledge of the ’974 Patent prior to, and at least as of the filing of this Complaint, as detailed above. (*See supra* at § IV.E). On information and belief, Apple has engaged in infringing activities with knowledge, or willful blindness, and intent that such activities would cause and/or encourage direct infringement of the ’974 Patent.

100. Apple, by itself and/or through its subsidiaries, affiliates, agents, and/or business partners, has contributed to and continues to contribute to the direct infringement by users of the Accused Products of the claims of the ’974 Patent (including, without limitation, the claims addressed above) pursuant to 35 U.S.C. § 271(c) in the United States and within this District. For example, Apple has contributed to and continues to contribute to the direct infringement of the ’974 Patent at least by selling, offering to sell, and/or importing the Accused Products, or one or more components thereof in the United States with knowledge that the Accused Products and/or

such components constitute a material part of the inventions claimed in the ’974 Patent, and that the Accused Products and/or such components have no substantial non-infringing use, and knowing that the Accused Products and/or such components are especially made or adapted for use in infringing one or more claims of the ’974 Patent.

101. As a consequence of each form of Apple’s infringement, both literal and under the doctrine of equivalents, of the ’974 Patent, Varia has been damaged in an amount not yet determined and is entitled to recover damages pursuant to 35 U.S.C. § 284.

102. On information and belief, as set forth in detail above, Apple’s infringement of the ’974 Patent has been and continues to be willful.

VII. COUNT III – INFRINGEMENT OF U.S. PATENT NO. 9,405,947

103. Varia realleges and incorporates by reference each of the preceding paragraphs.

104. Apple has and continues to directly and/or indirectly infringe one or more claims of the ’947 patent, including without limitation at least claim 16, in this District and elsewhere in the United States.[8]

105. Claim 16 of the ’947 Patent, for example, recites[9]:

(1.0) A mobile communication device comprising:

(1.1) communication circuitry configured to output voice call signals in a first radio frequency range over a wireless network and output radio frequency identification (RFID) signals in a second radio frequency range, which is different than the first radio frequency range;

(1.2) processing circuitry; and

[8] The identification of infringed claims for the ’947 Patent in this Complaint is exemplary and not intended to be limiting. The Accused Products may infringe additional claims of the ’947 Patent and any such additional claims will be identified in accordance with the governing rules and procedures of the Court.

[9] The numbering provided in parentheses in the claim below (and other claims shown in this Complaint) is added only to assist with further explanation of how the Accused Products meet each element of the claim.

(1.3) a storage medium including instructions, which, when executed by the processing circuitry cause the mobile communication device to:

(1.4) monitor for a proximal presence of an RFID reader external to the mobile communication device via the communication circuitry, the monitoring comprising determining the mobile communication device is in an operational space of the RFID reader based on an RFID probing signal received by the mobile device from the RFID reader;

(1.5) output a voice call signal for transmission over a wireless network via the communication circuitry in the first radio frequency range; and

(1.6) output an RFID signal via the communication circuitry in response to detection of the proximal presence of the RFID reader external to the mobile communication device based on receipt of the RFID probing signal, wherein the RFID signal is putout in the second radio frequency range.

106. By way of example, the Accused Products infringe at least claim 16 of the '947 patent for the reasons explained below.

107. To the extent the preamble (identified as limitation 1.0 above) is limiting, the Accused Products are mobile communication devices. For example, as reflected in Apple's product literature, the iPhone 7 is capable of voice call communication, such as traditional cellular telephone service (*e.g.*, via LTE, CDMA, UMTS, GSM), and/or audio calling services that use a Wi-Fi connection (*e.g.*, via FaceTime audio and Wi-Fi calling).

Audio Calling[5]

- FaceTime audio
- Voice over LTE (VoLTE)[6]
- Wi-Fi calling[6]

Cellular and Wireless

- **Model A1660**
  FDD-LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 18, 19, 20, 25, 26, 27, 28, 29, 30)
  TD-LTE (Bands 38, 39, 40, 41)
  TD-SCDMA 1900 (F), 2000 (A)
  CDMA EV-DO Rev. A (800, 1900, 2100 MHz)
  UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)
  GSM/EDGE (850, 900, 1800, 1900 MHz)
- **Model A1778**
  FDD-LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 18, 19, 20, 25, 26, 27, 28, 29, 30)

  TD-LTE (Bands 38, 39, 40, 41)
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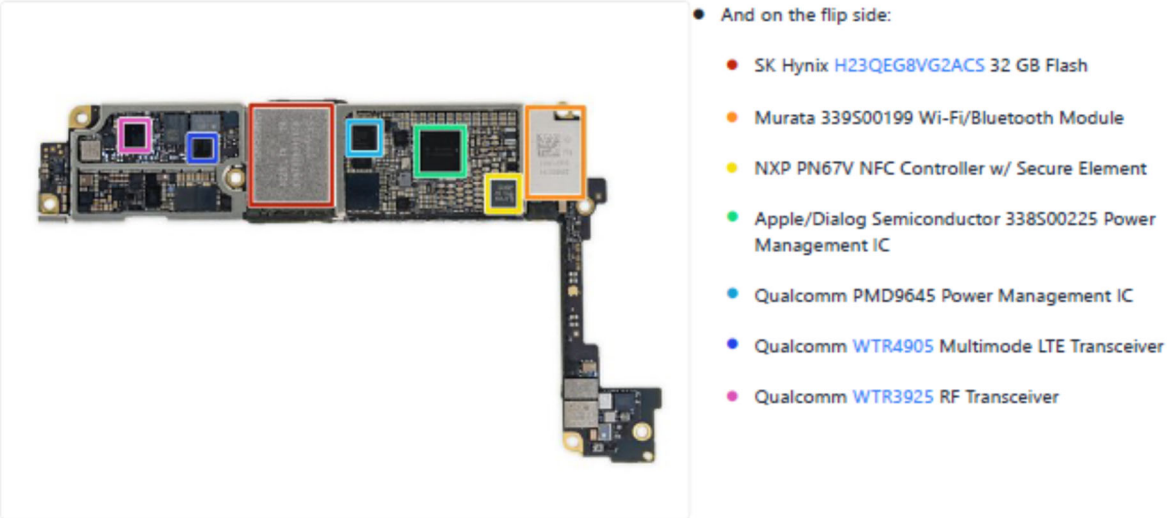
- **All models**
  802.11ac Wi-Fi with MIMO
  Bluetooth 4.2 wireless technology
  NFC with reader mode
  Express Cards

(*See* iPhone 7 – Technical Specifications, https://support.apple.com/kb/SP743?locale=en_US).

108. With respect to limitation 1.1 above, the Accused Products have communication circuitry configured to output voice call signals in a first radio frequency range over a wireless network and output radio frequency identification (RFID) signals in a second radio frequency range, which is different than the first radio frequency range. For example, on information and belief, the iPhone 7 has communication circuity including the sub-components identified by their chip markings as: NXP 67V04 NF Controller, Qualcomm WTR4905 Multimode LTE Transceiver, and Qualcomm WTR3925 RF Transceiver. On information and belief, the communication circuitry of the iPhone 7 is configured to output voice call signals in a first radio frequency range over a wireless network (*e.g.*, 850, 900, 1800, 1900 Mhz for GSM/EDGE). On information and belief, the communication circuitry of the iPhone 7 is also configured to output voice call signals

that are signals for audio calling services that use a Wi-Fi connection or a high-speed cellular connection (*e.g.*, FaceTime Audio, Voice over LTE (VoLTE), and Wi-Fi calling). On information and belief, communication circuitry of the iPhone 7 is configured to output RFID signals, because the iPhone is capable of Near Field Communication (NFC), as evidenced by, *e.g.*, technical specifications of the iPhone 7 that specify NFC with reader mode feature. NFC is a RFID-based technology for data exchange using radio waves. (*See* https://www.atlasrfidstore.com/rfid-insider/rfid-vs-nfc/ ("RFID is the process by which items are uniquely identified using radio waves, and NFC is a specialized subset within the family of RFID technology."); https://www.bluebite.com/nfc/rfid-vs-nfc ("Hierarchically, NFC is a subset of RFID.")). On information and belief, the communication circuitry of the iPhone 7, acting in accordance with the ISO/IEC 14443 standard, outputs RFID signals in a second radio frequency range (*e.g.*, 13.56 MHz frequency), which is different than the first radio frequency range. On information and belief, later versions of the iPhone included Snapdragon chipsets with combined telephony and RFID/NFC capabilities, and infringe for similar reasons.



(*See* https://www.ifixit.com/Teardown/iPhone+7+Teardown/67382).

Audio Calling[5]

- FaceTime audio
- Voice over LTE (VoLTE)[6]
- Wi-Fi calling[6]

Cellular and Wireless

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  TD-LTE (Bands 38, 39, 40, 41)
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  802.11ac Wi-Fi with MIMO
  Bluetooth 4.2 wireless technology
  NFC with reader mode
  Express Cards

(*See* iPhone 7 – Technical Specifications, https://support.apple.com/kb/SP743?locale=en_US).

6.2 Frequency

The frequency, f_c, of the RF operating field shall be 13,56 MHz ± 7 kHz.

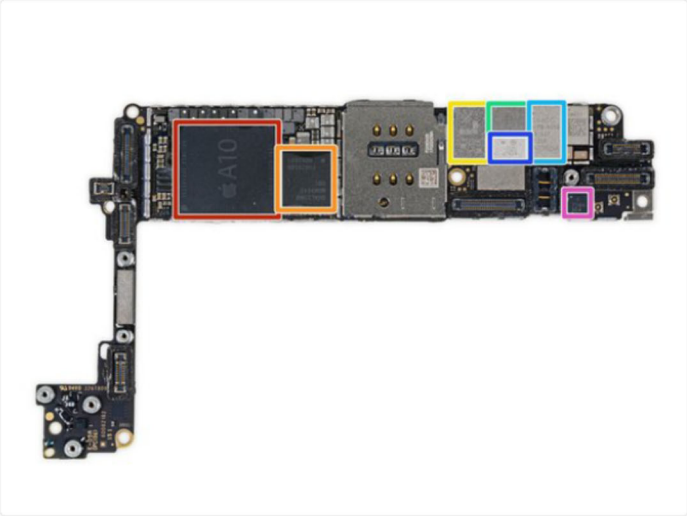
(*Source*: ISO/IEC 14443-2:2020 — Cards and security devices for personal identification — Contactless proximity objects — Part 2: Radio frequency power and signal interface).

109. With respect to limitation 1.2 above, the Accused Products have processing circuitry. For example, on information and belief, the iPhone 7 has processing circuitry (*e.g.*, A10 Fusion chip), as shown below.

Chip

- A10 Fusion chip

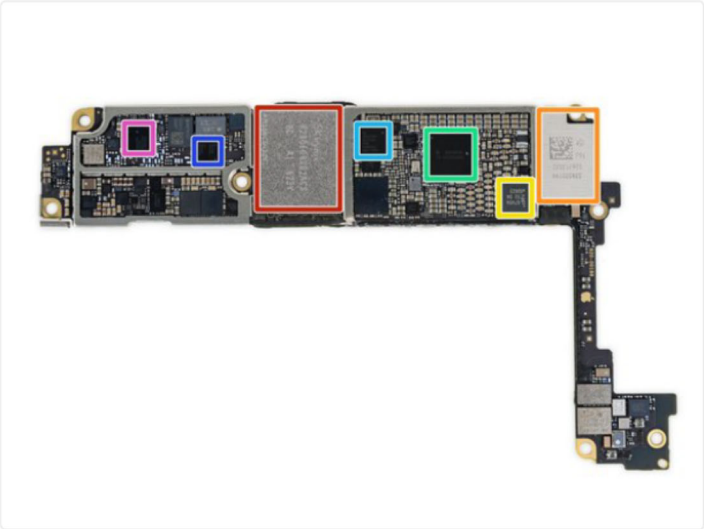
(*See* iPhone 7 – Technical Specifications, https://support.apple.com/kb/SP743?locale=en_US).



- It wouldn't be a teardown without a ton of silicon! Here's what we uncover on the logic board:
  - Apple A10 Fusion APL1W24 SoC + Samsung 2 GB LPDDR4 RAM (as denoted by the markings K3RG1G10CM-YGCH)
  - Qualcomm MDM9645M LTE Cat. 12 Modem
  - Skyworks SKY78100-20 Power Amplifier Module
  - Avago AFEM-8065 Power Amplifier Module
  - Avago AFEM-8055 Power Amplifier Module
  - Murata 025 Antenna Switch Module (likely)
  - Invensense Accelerometer

(*See* https://www.ifixit.com/Teardown/iPhone+7+Teardown/67382).

110. With respect to limitation 1.3 above, the Accused Products include a storage medium including instructions, which, when executed by the processing circuitry cause the mobile communication device to perform the instructions discussed below. For example, on information and belief, the iPhone 7 has a storage medium (*e.g.*, SK Hynix 32 GB flash memory), as shown below, that includes instructions (*e.g.*, iOS operating system), which when executed by the processing circuitry (*e.g.*, A10 fusion chip) cause the iPhone to perform the instructions discussed below.



- And on the flip side:
  - SK Hynix H23QEG8VG2ACS 32 GB Flash
  - Murata 339S00199 Wi-Fi/Bluetooth Module
  - NXP PN67V NFC Controller w/ Secure Element
  - Apple/Dialog Semiconductor 338S00225 Power Management IC
  - Qualcomm PMD9645 Power Management IC
  - Qualcomm WTR4905 Multimode LTE Transceiver
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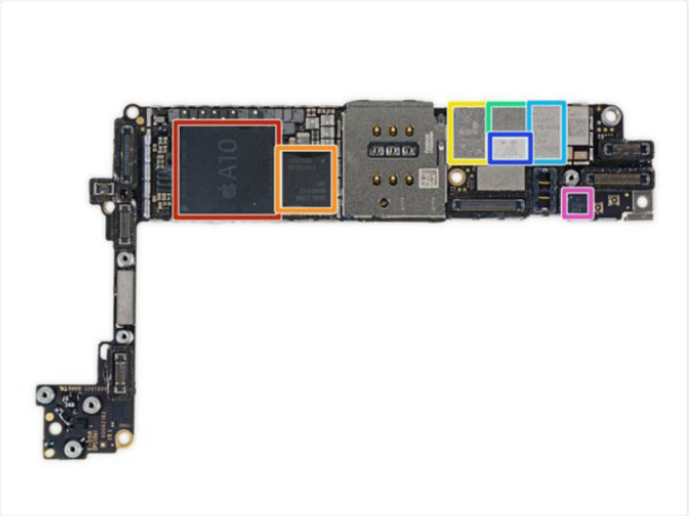

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  - Murata 025 Antenna Switch Module (likely)
  - Invensense Accelerometer

(*See* https://www.ifixit.com/Teardown/iPhone+7+Teardown/67382).

111. With respect to limitation 1.4 above, the Accused Products monitor for a proximal presence of an RFID reader external to the mobile communication device via the communication circuitry, the monitoring comprising determining the mobile communication device is in an operational space of the RFID reader based on an RFID probing signal received by the mobile device from the RFID reader. For example, on information and belief, the Apple Pay conforms to the EMV Contactless standard, which incorporates the ISO/IEC 14443 standard for proximity

cards. (*See* https://web.archive.org/web/20190408221439/https://support.apple.com/en-us/HT205645 ("Apple Pay conforms to the latest EMV standards for tokenizing transactions, which leads to a more secure payment experience.")). On information and belief, the Accused Products act as a proximity card (PICC) as defined by the ISO/IEC 14443 specification. On information and belief, the Accused Products, in accordance with the ISO/IEC 14443 standard, monitor for the proximal presence of an RFID reader external to the mobile communication device (*e.g.*, a contactless point-of-sale terminal) via the communication circuitry (*e.g.*, NXP 67V04 NFC Controller) by listening for commands and recognizing Request (REQA) and Wake Up (WUPA) commands from the RFID reader. On information and belief, the Accused Products determine that they are in an operational space (*e.g.*, operating field) of the RFID reader (*e.g.*, proximity coupling device "PCD") based on an RFID probing signal (*e.g.*, REQA and WUPA commands) received by the mobile device from the RFID reader.

3.5
PICC
contactless integrated circuit card (3.3) or other object with which communication and power transfer are done by inductive coupling in proximity of a coupling device

Note 1 to entry: Commonly called a proximity card.

(*Source*: ISO/IEC 14443-1:2018 — Cards and security devices for personal identification — Contactless proximity objects — Part 1: Physical characteristics).

5.2.1 Polling

In order to detect PICCs which are in the operating field, the PCD shall send repeated request commands. The PCD shall send REQA (or WUPA) and REQB (or WUPB) in any sequence using an equal or configurable duty cycle when polling Type A and Type B. In addition, the PCD may send other commands as described in Annex C.

6.4.1 REQA and WUPA commands

The REQA and WUPA commands are sent by the PCD to probe the field for PICCs of Type A. They are transmitted within a short frame. See Figure 7 to check in which cases PICCs actually have to answer to these respective commands.

Particularly, the WUPA command is sent by the PCD to put PICCs which have entered HALT state back into READY* state. They shall then participate in further anticollision and selection procedures.

(*Source*: ISO/IEC 14443-3:2018 — Cards and security devices for personal identification — Contactless proximity objects — Part 3: Initialization and anticollision).

112. With respect to limitation 1.5 above, the Accused Products output a voice call signal for transmission over a wireless network via the communication circuitry in the first radio frequency range. For example, on information and belief, the iPhone 7 outputs a voice call signal (*e.g.*, cellular and/or wireless) for transmission over a wireless network via the communication circuitry (*e.g.*, Qualcomm WTR4905 Multimode LTE Transceiver, Qualcomm WTR3925 RF Transceiver) in the first radiofrequency range (*e.g.*, GSM/EDGE 850 MHz). On information and belief, later versions of the iPhone included Snapdragon chipsets with combined telephony and RFID/NFC capabilities, and infringe for similar reasons.

Cellular and Wireless

- **Model A1660**
  FDD-LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 18, 19, 20, 25, 26, 27, 28, 29, 30)
  TD-LTE (Bands 38, 39, 40, 41)
  TD-SCDMA 1900 (F), 2000 (A)
  CDMA EV-DO Rev. A (800, 1900, 2100 MHz)
  UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)
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- **Model A1778**
  FDD-LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 18, 19, 20, 25, 26, 27, 28, 29, 30)

TD-LTE (Bands 38, 39, 40, 41)
UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)
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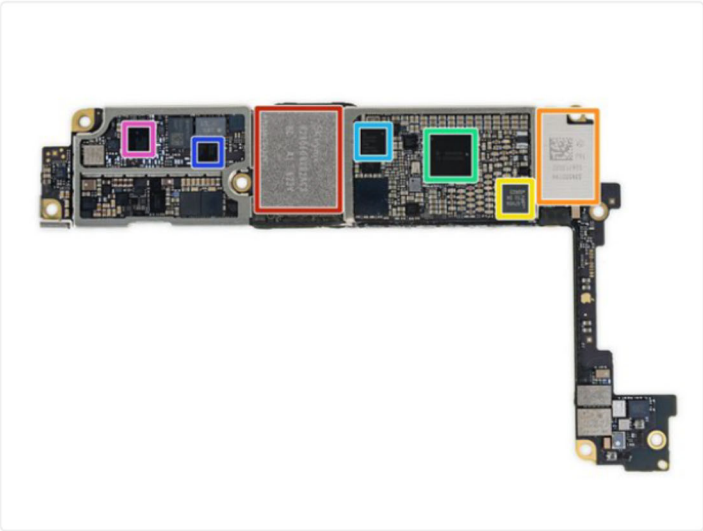
- **All models**

802.11ac Wi-Fi with MIMO
Bluetooth 4.2 wireless technology
NFC with reader mode
Express Cards

(*See* iPhone 7 – Technical Specifications, https://support.apple.com/kb/SP743?locale=en_US).



- And on the flip side:
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  - NXP PN67V NFC Controller w/ Secure Element
  - Apple/Dialog Semiconductor 338S00225 Power Management IC
  - Qualcomm PMD9645 Power Management IC
  - Qualcomm WTR4905 Multimode LTE Transceiver
  - Qualcomm WTR3925 RF Transceiver

(*See* https://www.ifixit.com/Teardown/iPhone+7+Teardown/67382).

113. With respect to limitation 1.6 above, the Accused Products output an RFID signal via the communication circuitry in response to detection of the proximal presence of the RFID reader external to the mobile communication device based on receipt of the RFID probing signal, wherein the RFID signal is putout in the second radio frequency range. For example, on information and belief, the iPhone 7, acting in accordance with the ISO/IEC 14443 standard, outputs an RFID signal (*e.g.*, Answer to Request or ATQA) via the communication circuitry (*e.g.*, NXP 67V04 NFC Controller) in response to detection of the proximal presence (*e.g.*, IDLE state exit) of the RFID reader external to the mobile communication device based upon receipt of the

RFID probing signal (*e.g.*, REQA and WUPA commands). On information and belief, the RFID signal is output in the second radio frequency range (*e.g.*, 13.56 MHz frequency). On information and belief, later versions of the iPhone included Snapdragon chipsets with combined telephony and RFID/NFC capabilities, and infringe for similar reasons.

6.3.2 IDLE state

Description:

In IDLE state, the PICC is powered. It listens for commands and shall recognize REQA and WUPA commands.

State exit conditions and transitions:

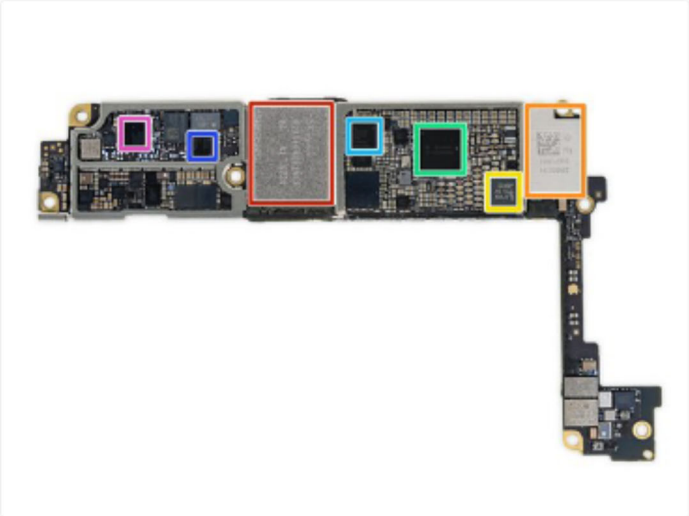
The PICC enters READY state after it has received a valid REQA or WUPA command and transmitted its ATQA.

(*Source*: ISO/IEC 14443-3:2018 — Cards and security devices for personal identification — Contactless proximity objects — Part 3: Initialization and anticollision).

6.2 Frequency

The frequency, f_c, of the RF operating field shall be 13,56 MHz ± 7 kHz.

(*Source*: ISO/IEC 14443-2:2020 — Cards and security devices for personal identification — Contactless proximity objects — Part 2: Radio frequency power and signal interface).



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NFC controller

The NFC controller handles Near Field Communication protocols and routes communication between the Application Processor and the Secure Element, and between the Secure Element and the point-of-sale terminal.

(*See* https://help.apple.com/pdf/security/en_US/apple-platform-security-guide.pdf).

114. As another example, claim 1 of the '947 Patent recites:

(1.0) A method for operating a mobile communication device comprising:

(1.1) receiving, by the mobile communication device, a radio frequency identification (RFID) probing signal from an RFID reader external to the mobile communication device;

(1.2) executing, on processing circuitry in the mobile communication device, instructions stored in a memory in the mobile communication device, the instructions configured to cause the mobile communication device to:

(1.3) output an RFID signal and output a voice call signal,

(1.4) wherein the RFID signal is output in response to the mobile communication device determining the mobile communication device is in an operational space of the RFID reader based upon receipt of the RFID probing signal, and

(1.5) wherein the voice call signal is output over a wireless network and within a radio frequency range that is different than a radio frequency range used to output the RFID signal.

115. By way of example, the Accused Products infringe at least claim 1 of the '947 patent for the reasons explained below.

116. To the extent the preamble (identified as limitation 1.0 above) is limiting, the Accused Products are mobile communication devices. For example, as reflected in Apple's product literature, the iPhone 7 is capable of voice call communication, such as traditional cellular telephone service (*e.g.*, via LTE, CDMA, UMTS, GSM), and/or audio calling services that use a Wi-Fi connection (*e.g.*, via FaceTime audio and Wi-Fi calling).

Audio Calling[5]

- FaceTime audio
- Voice over LTE (VoLTE)[6]
- Wi-Fi calling[6]

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  NFC with reader mode
  Express Cards

(*See* iPhone 7 – Technical Specifications, https://support.apple.com/kb/SP743?locale=en_US).

117. With respect to limitation 1.1 above, the Accused Products receive an RFID probing signal from an RFID reader external to the mobile communication device. For example, on information and belief, Apple Pay conforms to the EMV Contactless standard, which incorporates the ISO/IEC 14443 standard for proximity cards. (*See* https://web.archive.org/web/20190408221439/https://support.apple.com/en-us/HT205645 ("Apple Pay conforms to the latest EMV standards for tokenizing transactions, which leads to a more secure payment experience.")). On information and belief, the Accused Products act as a

proximity card (PICC) as defined by the ISO/IEC 14443 specification. On information and belief, the Accused Products, in accordance with the ISO/IEC 14443 standard, receive an RFID probing signal (*e.g.*, Request (REQA) and Wake Up (WUPA) commands) from an RFID reader external to the mobile communication device (*e.g.*, a coupling device).

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PICC
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Note 1 to entry: Commonly called a proximity card.

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6.4.1 REQA and WUPA commands

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(*Source*: ISO/IEC 14443-3:2018 — Cards and security devices for personal identification — Contactless proximity objects — Part 3: Initialization and anticollision).

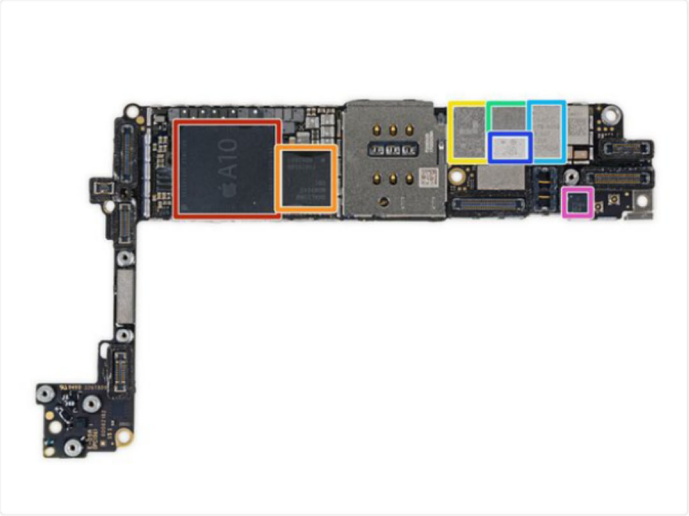
118. With respect to limitation 1.2 above, the Accused Products include processing circuitry and a memory, including instructions configured to cause the mobile communication device to perform the instructions discussed below. For example, on information and belief, the iPhone 7 has processing circuitry (*e.g.*, A10 Fusion chip), as shown below. On information and belief, the iPhone 7 has a memory (*e.g.*, SK Hynix 32 GB flash memory), as shown below,

including instructions (*e.g.*, iOS operating system), configured to cause the iPhone to perform the instructions discussed below.

Chip

- A10 Fusion chip

(*See* iPhone 7 – Technical Specifications, https://support.apple.com/kb/SP743?locale=en_US).



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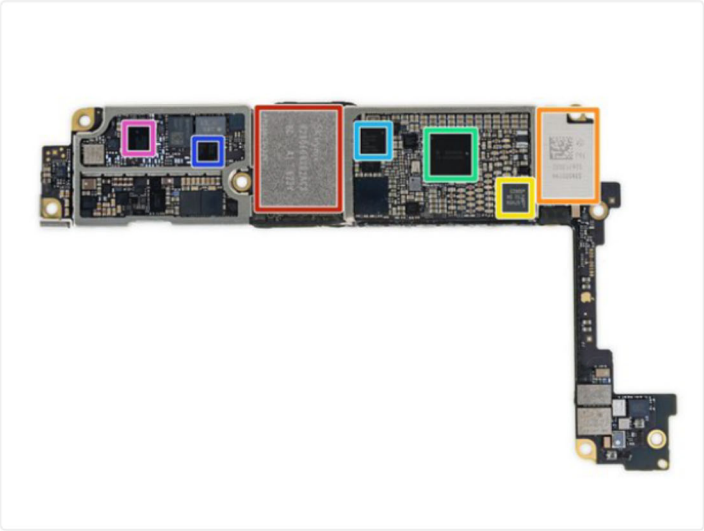

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  - Qualcomm WTR3925 RF Transceiver

(*See* https://wwsw.ifixit.com/Teardown/iPhone+7+Teardown/67382).

119. With respect to limitation 1.3 above, the Accused Products output an RFID signal and output a voice call signal. For example, on information and belief, the iPhone 7 is configured to output RFID signals, because the iPhone is capable of Near Field Communication (NFC), as evidenced by, *e.g.*, technical specifications of the iPhone 7 that specify NFC with reader mode feature. NFC is a RFID-based technology for data exchange using radio waves. (*See* https://www.atlasrfidstore.com/rfid-insider/rfid-vs-nfc/ ("RFID is the process by which items are uniquely identified using radio waves, and NFC is a specialized subset within the family of RFID technology."); https://www.bluebite.com/nfc/rfid-vs-nfc ("Hierarchically, NFC is a subset of RFID.")). On information and belief, the iPhone 7 is configured to output voice call signals over a wireless network (*e.g.*, 850, 900, 1800, 1900 Mhz for GSM/EDGE). On information and belief, the iPhone 7 is also configured to output voice call signals that are signals for audio calling services that use a Wi-Fi connection or a high-speed cellular connection (*e.g.*, FaceTime Audio, Voice over LTE (VoLTE), and Wi-Fi calling).

Audio Calling[5]

- FaceTime audio
- Voice over LTE (VoLTE)[6]
- Wi-Fi calling[6]

Cellular and Wireless

- **Model A1660**
  FDD-LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 18, 19, 20, 25, 26, 27, 28, 29, 30)
  TD-LTE (Bands 38, 39, 40, 41)
  TD-SCDMA 1900 (F), 2000 (A)
  CDMA EV-DO Rev. A (800, 1900, 2100 MHz)
  UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)
  GSM/EDGE (850, 900, 1800, 1900 MHz)
- **Model A1778**
  FDD-LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 18, 19, 20, 25, 26, 27, 28, 29, 30)

TD-LTE (Bands 38, 39, 40, 41)
UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)
GSM/EDGE (850, 900, 1800, 1900 MHz)

- **All models**

802.11ac Wi-Fi with MIMO
Bluetooth 4.2 wireless technology
NFC with reader mode
Express Cards

(*See* iPhone 7 – Technical Specifications, https://support.apple.com/kb/SP743?locale=en_US).

120. With respect to limitation 1.4 above, the Accused Products output an RFID signal in response to the mobile communication device determining the mobile communication device is in an operational space of the RFID reader based upon receipt of the RFID probing signal. For example, on information and belief, the Apple Pay conforms to the EMV Contactless standard, which incorporates the ISO/IEC 14443 standard for proximity cards. (*See* https://web.archive.org/web/20190408221439/https://support.apple.com/en-us/HT205645 ("Apple Pay conforms to the latest EMV standards for tokenizing transactions, which leads to a more secure payment experience.")). On information and belief, the Accused Products act as a proximity card (PICC) as defined by the ISO/IEC 14443 specification. On information and belief, the Accused Products, in accordance with the ISO/IEC 14443 standard, determine that they are in an operational space (*e.g.*, operating field) of the RFID reader (*e.g.*, proximity coupling device "PCD") based upon receipt of an RFID probing signal (*e.g.*, REQA and WUPA commands) received by the mobile device from the RFID reader. On information and belief, the iPhone 7, acting in accordance with the ISO/IEC 14443 standard, outputs an RFID signal (*e.g.*, Answer to Request or ATQA) in response.

3.5
PICC
contactless integrated circuit card (3.3) or other object with which communication and power transfer are done by inductive coupling in proximity of a coupling device

Note 1 to entry: Commonly called a proximity card.

(*Source*: ISO/IEC 14443-1:2018 — Cards and security devices for personal identification — Contactless proximity objects — Part 1: Physical characteristics).

5.2.1 Polling

In order to detect PICCs which are in the operating field, the PCD shall send repeated request commands. The PCD shall send REQA (or WUPA) and REQB (or WUPB) in any sequence using an equal or configurable duty cycle when polling Type A and Type B. In addition, the PCD may send other commands as described in Annex C.

6.4.1 REQA and WUPA commands

The REQA and WUPA commands are sent by the PCD to probe the field for PICCs of Type A. They are transmitted within a short frame. See Figure 7 to check in which cases PICCs actually have to answer to these respective commands.

Particularly, the WUPA command is sent by the PCD to put PICCs which have entered HALT state back into READY* state. They shall then participate in further anticollision and selection procedures.

(*Source*: ISO/IEC 14443-3:2018 — Cards and security devices for personal identification — Contactless proximity objects — Part 3: Initialization and anticollision).

6.3.2 IDLE state

Description:

In IDLE state, the PICC is powered. It listens for commands and shall recognize REQA and WUPA commands.

State exit conditions and transitions:

The PICC enters READY state after it has received a valid REQA or WUPA command and transmitted its ATQA.

Source: ISO/IEC 14443-3:2018 — Cards and security devices for personal identification — Contactless proximity objects — Part 3: Initialization and anticollision.

121. With respect to limitation 1.5 above, the Accused Products output a voice call signal over a wireless network and within a radio frequency range that is different than a radio frequency range used to output the RFID signal. For example, on information and belief, the iPhone 7, acting

in accordance with the ISO/IEC 14443 standard, outputs an RFID signal within a radio frequency range (*e.g.*, 13.56 MHz frequency). On information and belief, the iPhone 7 outputs a voice call signal (*e.g.*, cellular and/or wireless) over a wireless network within a radio frequency range (e.g., GSM/EDGE 850 MHz) that is different than a radio frequency range used to output the RFID signal.

Cellular and Wireless

- **Model A1660**
  FDD-LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 18, 19, 20, 25, 26, 27, 28, 29, 30)
  TD-LTE (Bands 38, 39, 40, 41)
  TD-SCDMA 1900 (F), 2000 (A)
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  UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)
  GSM/EDGE (850, 900, 1800, 1900 MHz)
- **All models**
  802.11ac Wi-Fi with MIMO
  Bluetooth 4.2 wireless technology
  NFC with reader mode
  Express Cards

(*See* iPhone 7 – Technical Specifications, https://support.apple.com/kb/SP743?locale=en_US).

6.2 Frequency

The frequency, f_c, of the RF operating field shall be 13,56 MHz ± 7 kHz.

(*Source*: ISO/IEC 14443-2:2020 — Cards and security devices for personal identification — Contactless proximity objects — Part 2: Radio frequency power and signal interface).

122. Each of the steps of claim 1 of the ’947 Patent, as well as each step of the other infringed method claims of the ’947 Patent, are performed directly by Apple which via the Accused Products, dictates the performance of each step of such claims.

123. To the extent any step of such claims is not directly performed by Apple, it is performed under the direction and control of Apple. Receipt of the benefits of the Accused Products, including to provide a customer or end-user with a secure, contactless mobile payment solution, are necessarily conditioned on performance of the claimed steps, and Apple establishes the manner and/or timing of such performance by directing and controlling the operation of the Accused Products.

124. For at least these reasons, Apple, by itself and/or through its subsidiaries, agents, and/or business partners, has directly infringed and continues to directly infringe, literally or under the doctrine of equivalents, one or more claims including at least claims 1 and 16 of the ’947 Patent pursuant to 35 U.S.C. § 271(a) by making, having made, using, selling, offering for sale, and/or importing products, systems, and methods, including the Accused Products, within the United States and within this District.

125. In addition to its direct infringement, Apple, by itself and/or through its subsidiaries, agents, and/or business partners, has induced and continues to induce the direct infringement of the ’947 Patent by users of the Accused Products pursuant to 35 U.S.C. § 271(b) in the United States and within this District. For example, Apple has induced and continues to induce the direct infringement of the ’947 Patent by users of the Accused Products at least by making and providing Apple Pay, which infringes at least claims 1 and 16 of the ’947 Patent when used, and by activities related to selling, marketing, advertising, promotion, support, and distribution of the Accused Products. For example, Apple touts the benefits of, and encourages the

use of, Apple Pay by its customers and end users. (*See, e.g.*, https://learn.wallet.apple/transit/new-york).

126. On information and belief, Apple has had actual knowledge of the ’947 Patent prior to, and at least as of the filing of this Complaint, as detailed above. (*See supra* at § IV.E). On information and belief, Apple has engaged in infringing activities with knowledge, or willful blindness, and intent that such activities would cause and/or encourage direct infringement of the ’947 Patent.

127. Apple, by itself and/or through its subsidiaries, affiliates, agents, and/or business partners, has contributed to and continues to contribute to the direct infringement by users of the Accused Products of the claims of the ’947 Patent (including, without limitation, the claims addressed above) pursuant to 35 U.S.C. § 271(c) in the United States and within this District. For example, Apple has contributed to and continues to contribute to the direct infringement of the ’947 Patent at least by selling, offering to sell, and/or importing the Accused Products, or one or more components thereof in the United States with knowledge that the Accused Products and/or such components constitute a material part of the inventions claimed in the ’947 Patent, and that the Accused Products and/or such components have no substantial non-infringing use, and knowing that the Accused Products and/or such components are especially made or adapted for use in infringing one or more claims of the ’947 Patent.

128. As a consequence of each form of Apple’s infringement, both literal and under the doctrine of equivalents, of the ’947 Patent, Varia has been damaged in an amount not yet determined and is entitled to recover damages pursuant to 35 U.S.C. § 284.

129. On information and belief, as set forth in detail above, Apple’s infringement of the ’947 Patent has been and continues to be willful.

JURY DEMAND

130. Pursuant to Rule 38(b), Fed. R. Civ. P., Varia respectfully demands a trial by jury for all issues so triable.

PRAYER FOR RELIEF

WHEREFORE, Varia respectfully requests that the Court enter judgment against Apple:

131. determining that Apple has infringed, and continues to infringe, one or more claims of the ’984 Patent;

132. ordering Apple to account for and pay to Varia all damages suffered by Varia as a consequence of Apple’s infringement of the ’984 Patent, together with pre- and post-judgment interest and costs as fixed by the Court;

133. declaring that Apple’s infringement of the ’984 Patent was and is willful and trebling Varia’s damages under 35 U.S.C. § 284 on that ground;

134. determining that Apple has infringed, and continues to infringe, one or more claims of the ’974 Patent;

135. ordering Apple to account for and pay to Varia all damages suffered by Varia as a consequence of Apple’s infringement of the ’974 Patent, together with pre- and post-judgment interest and costs as fixed by the Court;

136. declaring that Apple’s infringement of the ’974 Patent was and is willful and trebling Varia’s damages under 35 U.S.C. § 284 on that ground;

137. determining that Apple has infringed, and continues to infringe, one or more claims of the ’947 Patent;

138. ordering Apple to account for and pay to Varia all damages suffered by Varia as a consequence of Apple’s infringement of the ’947 Patent, together with pre- and post-judgment interest and costs as fixed by the Court;

139. declaring that Apple's infringement of the '947 Patent was and is willful and trebling Varia's damages under 35 U.S.C. § 284 on that ground;

140. ordering that Apple be ordered to pay supplemental damages to Varia, including interest, with an accounting, as needed, of all infringement and/or damages not presented at trial;

141. declaring that this case is exceptional and awarding Varia its costs and attorney's fees in accordance with 35 U.S.C. § 285; and

142. granting Varia such other and further relief as the Court may deem just and proper.

Dated: October 5, 2023
New York, New York

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