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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

TECHNOLOGY PROPERTIES LIMITED LLC, *et al*,

Plaintiffs,

v.

SAMSUNG ELECTRONICS CO., LTD. and SAMSUNG ELECTRONICS AMERICA, INC.,

Defendants.

Case No. 3:12-cv-03877-VC (PSG)

PLAINTIFFS' RESPONSE TO SAMSUNG DEFENDANTS' MOTION TO STRIKE INFRINGEMENT CONTENTIONS OR ALTERNATIVELY TO COMPEL SUPPLEMENTAL INFRINGEMENT CONTENTIONS

Hearing:
Date: August 11, 2015
Time: 10:00 a.m.
Place: Courtroom 5, 4th Floor
Judge: Hon. Paul S. Grewal

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MEMORANDUM OF POINTS AND AUTHORITIES

I. INTRODUCTION

On January 20, 2015, Plaintiffs complied with Patent L.R. 3-1 by providing (i) infringement contentions that unambiguously identify accused products of Samsung and (ii) claim charts that detail how Samsung's products infringe the three patents-in-suit. DECL. OF BARRY J. BUMGARDNER IN SUPPORT OF PDS'S RESPONSE TO SAMSUNG DEFENDANTS' MOT. TO STRIKE INFRINGEMENT CONTENTIONS OR ALTERNATIVELY COMPEL SUPPLEMENTAL INFRINGEMENT CONTENTIONS ("DECL."), ¶¶ 3-4; Exs. 1-2.[1] For example, the "Accused Products" for Samsung are specifically identified in Table A.4, on pages 31 through 54 of Exhibit A of the Infringement Contentions (attached hereto as Exhibit 2). ("DECL."), ¶ 3; Ex. 2 at pp. 31-54.

On June 9, 2015, more than four months after receiving Plaintiffs' infringement contentions, Samsung filed its Motion to Strike, requesting that the Court effectively terminate this case based upon alleged deficiencies in Plaintiffs' Patent L.R. 3-1 disclosures. *See* DKT. NO. 58. In its Motion, Samsung repeatedly misrepresents the quality and detail of Plaintiffs' disclosures, as well as the past dealings between the parties concerning this issue. Samsung's Motion to Strike must be denied.

First, by way of background, Samsung cannot possibly claim that it lacks "reasonable notice" of Plaintiffs' Infringement Contentions as Samsung has been aware of the Plaintiffs' infringement position for years. Starting in 2012, Plaintiffs and Samsung were parties to an ITC investigation (Inv. No. 337-TA-853, the "ITC Proceeding") concerning U.S. Patent No. 5,809,336 (the "'336 Patent"), one of the three patents at issue in this case. DECL., ¶ 2. In March 2013, Plaintiffs and Samsung actually tried this dispute to the administrative law judge in the ITC. *Id*. In the ITC proceeding, Dr. Vojin Oklobdzija (current President of the IEEE Circuit and Systems Society) submitted a detailed expert report on behalf of Plaintiffs setting forth his

[1] In this Response, Plaintiffs refer to their infringement contentions served on Samsung in this case pursuant to Patent L.R. 3-1 as the "Infringement Contentions." The claim charts that accompanied the Contentions are referred to as the "Claim Charts." Exs. 3-5 filed with Mot. To Strike at Dkt. No. 58.

opinion that all modern, advanced microprocessors (including Samsung's) operate in the same manner with respect to features relevant to the '336 Patent claims at issue in this case. *Id.* Dr. Oklobdzija reiterated this same opinion at the ITC hearing, where he was subject to cross examination by Samsung's counsel.

In addition, a separate case was tried against HTC in this Court involving certain of the same Qualcomm microprocessors that were at issue in the ITC proceeding. (*HTC Corp. et al. v. Technology Properties Ltd. et al.*, Case No. 5:08-cv-00882, the "HTC Case"). In the HTC Case, Plaintiffs proceeded under the same infringement theory as they did against Samsung in the ITC Proceeding. DECL., ¶ 5. The transcript of Dr. Oklobdzija's trial testimony along with his detailed trial demonstratives are available to Samsung and have been produced by Plaintiffs. Further, Plaintiffs' infringement positions and Dr. Oklobdzija's infringement opinions against HTC were known to Samsung during the ITC Proceeding and they are substantially the same infringement theories Samsung dealt with in the ITC Proceeding. In light of these two proceedings and the hundreds (if not thousands) of pages of material in Samsung's possession detailing Plaintiffs' infringement position, Samsung is unquestionably aware of Plaintiffs' infringement theories that all of its Accused Products contain microprocessors that operate in the manner set forth in Plaintiffs' Infringement Contentions.

Second, Samsung produced relevant documents in the ITC Proceeding that Plaintiffs sought to use in their Infringement Contentions. DECL., ¶ 6. These documents would have provided at least some of the information Samsung now complains is absent. On November 3, 2014, Plaintiffs provided Samsung and the other defendants a draft "cross use" agreement that would have given Plaintiffs the ability to use the documents produced by Samsung in the ITC Proceeding in this case. DECL., ¶ 6; Ex. 3. On November 18, 2014, Plaintiffs, operating under the understanding that defendants were going to propose their own cross-use agreement, asked for a copy of defendants' agreement in hopes of finalizing it that week. *Id*. Two days later on November 20, 2014, Plaintiffs again asked defendants about the status of the agreement. *Id*.

On January 20, 2015, with no agreement in place, Plaintiffs submitted their Infringement Contentions without the benefit of using discovery already obtained from Samsung. On February

18, 2015, shortly after Plaintiffs served their Infringement Contentions, Defendants finally engaged with Plaintiffs regarding the negotiation of a cross use agreement. But by that time Plaintiffs' Infringement Contentions were already served and Plaintiffs had already destroyed Samsung's confidential information pursuant to the terms of the ITC protective order. *See* ITC Protective Order at Ex. 4.

Third, Samsung's position that Plaintiffs' Contentions are "predicated solely on a conclusory statement concerning Plaintiffs' 'information and belief'…" does not withstand scrutiny. *See* Mot. To Strike at 2:20-23; 12:7-19. As set forth below, Plaintiffs' Claim Charts do in fact detail Plaintiffs' infringement position and give multiple, detailed examples and citations to evidence in support of Plaintiffs' position that all of the Accused Products operate in the same manner with respect to the features relevant to the '336 Patent. Detailed Claim Charts are also provided for the other patents-in-suit, U.S. Patent Nos. 5,440,749 ("the '749 Patent") and 5,530,890 ("the '890 Patent") (collectively, the "Patents-in-Suit"). Although the Infringement Contentions do not cite to a Declaration of Dr. Oklobdzija, the Infringement Contentions rely upon the expert opinion of Dr. Oklobdzija, of which Samsung is unquestionably aware from the infringement opinions he provided against Samsung products in the ITC Investigation. Plaintiffs are more than willing to supplement the Infringement Contentions to expressly identify the expert report and testimony of Dr. Oklobdzija (information already in Samsung's possession).

Fourth, Plaintiffs exercised reasonable diligence in identifying specific microprocessors for each Accused Product. DECL., ¶ 8. However, some of the microprocessors could not be identified by Plaintiff after an exhaustive search of publicly available information. *Id*. For example, Samsung does not appear to publicly disclose the specific microprocessor used in all of its product lines. *Id*. However, characteristics of the Accused Products (e.g. Bluetooth capabilities) reveal that such devices must in fact contain a microprocessor possessing certain, relevant qualities. *Id*. And as already stated, Plaintiffs' expert's opinion is that these microprocessors operate in the same manner with respect to features relevant to the '336 Patent.

Fifth, with respect to the '890 and '749 Patents which expired in 2013 and 2012, respectively, Plaintiffs did not have access to information revealing when Samsung's Accused

Products were first made, used, sold or offered for sale. DECL., ¶ 11. Although Samsung's Motion to Strike focuses on the date Accused Products were "released", it is Plaintiffs' informed belief that such products are in fact made, used, sold, or offered for sale (e.g. phones offered for sale to wireless carriers) well before the public "release" date. Ex. 7 at p.1. This was explained to Samsung during the meet and confer process. *Id*. Plaintiffs offered to work with Samsung to remove any products that were not made, used, sold, or offered for sale within the United States from the suit. *Id*. Samsung, however, refused to work with Plaintiffs to remove any products it contends could not infringe during the time prior to the expiration of '890 and '749 Patents.

Samsung's Motion to Strike is a litigation tactic and must be denied. Plaintiffs' infringement positions are set forth in detail in its Infringement Contentions and, to the extent the Court finds otherwise, Plaintiffs should be given an opportunity to supplement such Contentions with information already in Samsung's possession and Samsung's non-public information obtained through discovery in this case.

II. LEGAL STANDARD

Patent Local Rule 3-1(c) states that a patentee must provide "[a] chart identifying specifically where each limitation of each asserted claim is found within each Accused Instrumentality." Patent L.R. 3-1(c). "[A]ll courts agree that the degree of specificity under Local Rule 3-1 must be sufficient to provide reasonable notice to the defendant why the plaintiff believes it has a 'reasonable chance of proving infringement.'" *Shared Memory Graphics LLC v. Apple, Inc.*, 812 F. Supp. 2d 1022, 1025 (N.D. Cal. 2010) (quoting *View Eng'g, Inc. v. Robotic Vision Sys., Inc.*, 208 F.3d 981, 986 (Fed. Cir. 2000)). The infringement contentions must be sufficient to raise a "reasonable inference that all the accused products infringe." *Antonious v. Spalding & Evenflo Cos., Inc.*, 275 F.3d 1066, 1075 (Fed. Cir. 2002)). While the patent rules do not "require the disclosure of specific evidence nor do they require a plaintiff to prove its infringement case [. . .] a patentee must nevertheless disclose what in each accused instrumentality it contends practices each and every limitation of each asserted claim to the extent appropriate information is reasonably available to it." *DCG Sys. v. Checkpoint Techs.*,

LLC, No. C 11-03792 PSG, 2012 U.S. Dist. LEXIS 53193, at *6 (N.D. Cal. Apr. 16, 2012) (internal quotations and citations omitted).

"A patentee is not required to provide a claim chart for each accused product if the chart provided is representative of the other accused products." *Infineon Technologies AG v. Volterra Semiconductor*, No. 11-cv-06239-MMC (DMR), 2013 U.S. Dist. LEXIS 109165, at *5, 15 (N.D. Cal. July 31, 2013) (citing *Renesas Tech. Corp. v. Nanya Tech. Corp.*, No. 03-cv-5709-JF (HRL), 2004 U.S. Dist. LEXIS 23601, at *9, 12 (N.D. Cal. Nov. 10, 2004) (Patent Local Rule 3-1 does not require a claim chart for every accused product; plaintiff need only provide enough information to "permit a reasonable inference that all accused products infringe."). Courts have consistently held that a patent owner can rely on a claim chart that is representative of other accused products, provided the infringement contentions give reasonable notice of the patent owner's theories of infringement. *See ASUS Computer Int'l v. Round Rock Research, LLC*, 2013 U.S. Dist. LEXIS 145824, at *8-9 (N.D. Cal. Oct. 8, 2013) (collecting cases). "Rule 3-1… requires Plaintiff to articulate how the accused products share the same, or substantially the same infringing [qualities] with any other product or with the… 'representative' product[]." *Silicon Labs., Inc. v. Cresta Tech. Corp.*, No. 5:14-cv-03227-PSG, 2015 U.S. Dist. LEXIS 22951, at *3 (N.D. Cal. Nov. 10, 2004) (citing *Bender v. Freescale Semiconductor, Inc.*, Case No. 09-cv-01156, 2010 U.S. Dist. LEXIS 91281, 2010 WL 1689465, at *3 (N.D. Cal. Apr. 26, 2010)).

III. ARGUMENT

Plaintiffs first provide an overview of the three patents-in-suit and the associated Infringement Contentions. Plaintiffs next address Samsung's alleged deficiencies in those Infringement Contentions.

A. Overview of the Patents-in-Suit and the Infringement Contentions

1. Summary of the Patents

The patents-in-suit issued from a common application filed August 3, 1989, by inventors Charles Moore and Russell Fish, III. DECL., ¶ 10. The '336 Patent has been the subject of six ex parte reexamination challenges before the United States Patent and Trademark Office, leading to

the issuance of two reexamination certificates, the first on December 15, 2009, and the second on November 23, 2010. *Id*. The '890 Patent has been the subject of its own reexamination challenge, which led the issuance of a reexamination certificate dated March 1, 2011. *Id*. The '336 and '890 Patents have been allowed over more than 600 prior art references cited collectively during reexamination. *Id*. In addition, the patents-in-suit have been licensed to over 100 companies, including notable technology companies such as Apple and Intel. *Id*. Finally, the Sh-Boom Processor, a chip created by Messrs. Moore and Fish that featured the technological advances described in the patents-in-suit, was featured in the IEEE article "25 Microchips That Shook the World - IEEE Spectrum." *Id*.; Ex. 6.

Turning now to Plaintiffs' Infringement Contentions, as an initial matter, the Accused Instrumentalities in the case are Samsung products, not individual microprocessors. Plaintiffs' Infringement Contentions specifically identify each Accused Instrumentality by name / model number. *See* Ex.2, pp. 31-54. Samsung does not allege that Plaintiffs have failed to properly identify the Accused Instrumentalities per Patent L.R. 3-1. *See* Mot. to Strike, p. 5 ("Exhibit A to Plaintiffs' Infringement Contentions contains multiple tables identifying allegedly accused products…. For Samsung, Table A.4 in Exhibit A identifies approximately 800 different products….").

Taking Claims 6 and 13 of the '336 Patent as an example, these claims recite a "microprocessor system" that comprises a central processing unit ("CPU") and an "off-chip clock." In turn, the CPU contains an "oscillator" and "input/output interface" ("I/O Interface"). Thus, as far as structural elements, Claims 6 and 13 require four primary ones: a CPU, an oscillator, an I/O interface, and an off-chip clock. Of course, there are additional limitations in Claims 6 and 13 (and the other asserted claims from the '336 Patent), but there are only four major structural components.

With respect to the "microprocessor system" limitation found in the preamble of Claims 6 and 13, Plaintiffs list in Exhibit A of the Infringement Contentions, by name and model number, the phones and other devices that correspond to the "microprocessor systems" portion of the claim. *See* Ex.2, pp. 31-54. These phones and other devices are referred to in the Infringement

Contentions as the "Accused Products." *See* Plaintiffs' Claim Charts, at p.1; Exs. 3-5 filed with Mot. To Strike at Dkt. No. 58. ("[E]ach Accused Product listed in the attached list of Accused Products (Ex. A.4), including phones, printers, and home entertainment systems, contains a microprocessor ("Accused Microprocessors")). Thus, the '336 Claim Chart specifically correlates the Accused Products listed in Exhibit A to the "microprocessor system" recited in the claims of the '336 Patent. *Id*.

Next, to the extent possible, Plaintiffs identified the microprocessor contained in the Accused Products. The microprocessors identified by Plaintiffs in Exhibit A of the Infringement Contentions correspond to the CPU limitation found in the '336 Claims, and the '336 Claim Chart reflects this association. *Id*. For some of the Accused Products, however, the specific type of microprocessor included in the Accused Product could not be determined through an exhaustive search of publicly available information. DECL., ¶ 8. For those Accused Products for which the microprocessor could not be determined, the Accused Product was evaluated to determine if it had characteristics that would indicate that it did in fact include a microprocessor. *Id*. The inclusion of a USB port or the ability to communicate using Wi-Fi, for example, was evaluated in determining whether to include a particular Accused Product in Exhibit A of the Infringement Contentions. *Id*. Notably, Samsung has not claimed that any of the Accused Products identified in Exhibit A of the Infringement Contentions lack a microprocessor that operates with the same infringing qualities as the other Accused Microprocessors.

Turning now to the "oscillator" limitation, Plaintiffs contend this limitation is met through the inclusion of an oscillator in the Accused Microprocessor's use of a phase lock loop ("PLL") clocking system. Specifically, the '336 Infringement Contentions state:

> [E]ach Accused Microprocessor in each Accused Product clocks its CPU at a clock rate, generating the signals used for timing the operation of the CPU, using PLL circuitry containing an entire oscillator disposed upon the integrated circuit substrate, connected to the CPU . . . . The presence of a PLL indicates the presence of a voltage or current controlled oscillator, which itself will include the claimed oscillator. The claimed oscillator is disposed upon the integrated circuit

> substrate, connected to the central processing unit, and is clocking the central processing unit. The oscillator is constructed of a second plurality of electronic devices.

See p. 7 of Ex. 3 filed with Mot. To Strike at Dkt. No. 58. As the quote from the '336 Claim Chart demonstrates, Plaintiffs specifically identified where the "oscillator" is located (in the PLL clocking circuitry on the Accused Microprocessor) and how it is implemented (in the form of a voltage or current controlled oscillator). *Id*.

The Claim Charts then go on to specifically examine some of the Accused Microprocessors for which information was available to Plaintiffs. *Id*. at pp. 7-20. For example, the Qualcomm MSM8600 and MSM8260 microprocessors are specifically referenced, as are the TI OMAP4460 and OMAP4430 microprocessors. *Id*. Plaintiffs' Infringement Contentions make clear that these Accused Microprocessors are representative of the other microprocessors contained in the Accused Products. *Id*.

Plaintiffs' claim that the Accused Microprocessors discussed in the claim chart are representative of all of the Accused Microprocessors is based on a number of factors. First, Plaintiffs cite to tens of thousands of pages of microprocessor user manuals in the Infringement Contentions. *Id*. at p. 19 ("See other microprocessor user guides at PDSND000001-PDSND012125; PDSND012126-PDSND048086; PDSND085767-PDSND088712 . . . ."). These manuals were examined in the preparation of the Infringement Contentions (and produced along with the Infringement Contentions) and support Plaintiffs' claim that the Accused Microprocessors discussed in the Claim Charts are representative of other Accused Microprocessors not specifically charted.

Second, Plaintiffs cite to publicly available sources of information that stand for the proposition that PLLs are "widely used" in digital logic devices. *Id*. *See* "https://en.wikipedia.org/wiki/Phase-locked_loop" ("[s]ince a single integrated circuit can provide a complete phase-locked-loop building block, the technique is widely used in modern electronic devices, with output frequencies from a fraction of a hertz up to many gigahertz.").

Further, this same source unambiguously states that "[a]ll phase-locked loops employ an oscillator element with variable frequency capability." *Id.*

Third, Plaintiffs' technical expert, Dr. Oklobdzija, was prepared to give testimony in the HTC Case about the widespread use of PLL in modern microprocessors:

> The '336 is a critical piece of the MMP Portfolio because nearly all high speed microprocessors must use the clocking scheme covered by the '336 patent. Although many lower speed microprocessors use external crystals to clock. Their CPU's, this is simply not possible for the high speed, high end microprocessors that are necessary for modern smartphones and other high performance wireless products. In order to achieve clock speeds in the multi-gigahertz range, it is essential to have a ring oscillator-based clocking system on the same silicon die as the CPU.

HTC Trial Transcript, at p. 583, lns. 15-24; Ex. 5.

While Samsung was not a formal participant in Plaintiffs' trial against HTC, it was a party to the ITC Proceeding where Dr. Oklobdzija voiced similar views about similar infringing qualities relevant to the '336 Patent. Thus, as discussed above, even outside of the Infringement Contentions, Samsung had knowledge that the inventions claimed in the '336 Patent are used extensively throughout the semiconductor industry.

As for the "off-chip clock" and "I/O interface," Plaintiffs' Infringement Contentions provide concrete examples of technologies that satisfy these claim limitations. For example, the Infringement Contentions contain technical diagrams that identify I/O interfaces found on the Qualcomm MSM7227 microprocessor and other Accused Microprocessors. *See* pp. 26-30 of Ex. 3 filed with Mot. To Strike at Dkt. No. 58. In these diagrams, a number of well-known I/O interfaces are identified (e.g., USB interface and camera interface). Finally, Plaintiffs' Infringement Contentions specifically discuss how the I/O interfaces previously identified are connected to an external clock. Id. at pp. 29-32.

As to the other language in Claims 6 and 13 that detail required characteristics of the recited structural elements (e.g., the CPU must operate at a frequency and be constructed of a

plurality of devices, the oscillator must clock the CPU at a clock rate, etc.), the Infringement Contentions discuss how the four recited structural limitations satisfy these limitations as well.

2. The '890 and '749 Patents

Samsung's Motion to Strike makes few specific complaints regarding the Infringement Contentions for the '890 and '749 Patents. Accordingly, the substance of these Patents' Infringement Contentions will only be briefly summarized. The '890 Patent claims two processing units on the same semiconductor substrate, whereas the '749 Patent's claims are directed to fetching multiple sequential instructions. The analysis presented in Plaintiffs' Claim Charts for these two patents relies heavily on information regarding ARM architecture. The term "ARM architecture" refers to the processor architecture and instruction set implanted by a particular ARM core. Because many (if not all) of the Accused Microprocessors in the Accused Products make use of ARM cores, Plaintiffs made use of the available literature regarding the ARM architectures embodied in the ARM cores contained in the Accused Processors. In addition to presenting information about ARM architecture, the '890 and '749 Claim Charts analyze documents specific to the Accused Microprocessors. (*See, e.g.*, pp. 2-6 of the '890 Claim Charts of Ex. 3 filed with Mot. To Strike at Dkt. No. 58 discussing features of representative Accused Microprocessors; *id*. at pp. 7-12 of the '890 Claim Chart discussing features of the ARMv7 architecture).

B. The Infringement Contentions Comply With Patent L.R. 3-1

1. Plaintiffs' Claim Charts Properly Read On All Accused Products

Samsung's allegation that Plaintiffs do not even chart an entire Accused Microprocessor in their Contentions is untrue. Plaintiffs' Infringement Contentions define the term "Accused Microprocessor" to include all of the different microprocessors contained in the Accused Products. *See* Plaintiffs' Claim Charts, at p.1 of Exs. 3-5 filed with Mot. To Strike at Dkt. No. 58. ("[E]ach Accused Product listed in the attached list of Accused Products (Ex. A.4), including phones, printers, and home entertainment systems, contains a microprocessor ("*Accused Microprocessors*")). (emphasis added). Plaintiffs subsequently explain how the Accused Microprocessors contain each element of each asserted claim. Taken literally, Samsung appears

to complain that Plaintiffs did not recite verbatim all of the dozens of Accused Microprocessors each time it used the phrase "Accused Microprocessor." In some instances, Plaintiffs' Infringement Contentions do not focus on a particular exemplary microprocessor in discussing how certain claim elements are met, but instead explain how the claim elements apply to all of the Accused Microprocessors. For example, on pp. 20-26 of the '336 Claim Chart, Plaintiffs discuss how the CPU processing frequency varies in the same way as the oscillator due to fabrication parameters (i.e., variances in the semiconductor manufacturing process). *See* Ex. 3 filed with Mot. To Strike at Dkt. No. 58. Plaintiffs' choice to refer to all of the accused microprocessors as "Accused Microprocessors" in this section and others is proper and refutes Samsung's claim that Plaintiffs did not "completely" chart any one microprocessor.

In light of the totality of the circumstances, any confusion expressed by Samsung is disingenuous. In the ITC Proceeding against Samsung, Dr. Oklobdzija submitted a detailed expert report on behalf of Plaintiffs setting forth his opinions that modern, advanced microprocessors (including Samsung's) share the same infringing qualities relevant to the '336 Patent claims at issue in this case. DECL., ¶ 2. Thus, Samsung has reasonable notice as to why Plaintiffs believe it has a "reasonable chance of proving infringement." *See Shared Memory*, 812 F. Supp. 2d 1022, 1025.

Next, Samsung claims that Plaintiffs failed to show how all of the Accused Products listed in Table A.4 share the same infringing qualities of the representative Accused Microprocessors referenced in the claim charts. Plaintiffs have met this burden. In footnote 1 of each Claim Chart, Plaintiffs state that the infringement by the Accused Products is largely based on the operation and implementation of their microprocessors, and that the Claim Charts provide examples that are representative of the operation of and implementation of the microprocessors they contain. *See* Plaintiffs' Claim Charts, at p.1; Exs. 3-5 filed with Mot. To Strike at Dkt. No. 58. The Claim Charts themselves are clear in identifying the same infringing qualities shared between the uncharted Accused Products and the representative products identified in the Claim Charts. For example, Plaintiffs contend that all of the Accused Microprocessors contain a CPU and oscillator contained within a PLL in the '336 Claim Chart. *See* '336 Claim Chart at pp. 7-20

of Ex. 3 filed with Mot. To Strike at Dkt. No. 58. The exemplary processors discussed in the claim charts are representative because they contain these structures, just as the other Accused Microprocessors do.

While Samsung can quibble with Plaintiffs' chosen language, the Infringement Contentions make clear that the Accused Microprocessors not specifically discussed in the claim charts share the same infringing qualities as the exemplary processors because they contain the same structural components as the exemplary processors, namely a CPU and oscillator. As for the other structural components of the '336 Patent (an I/O interface and off-chip clock), Plaintiffs point to a number of popular I/O interfaces that are driven by an off-chip clock and state that the other Accused Microprocessors share the same features and therefore infringe in the same manner. *See* '336 Claim Chart at pp. 26-30; Ex. 3 filed with Mot. To Strike at Dkt. No. 58. Indeed, Samsung is well aware of Plaintiffs' position and basis as to how all modern, advanced microprocessors (including Samsung's) share the same, or substantially the same infringing qualities relevant to the '336 Patent based on Dr. Oklobdzija's testimony and expert report submitted to Samsung in the ITC Proceeding against Samsung. "Patent Local Rule 3-1 does not require a claim chart for every accused product; plaintiff need only provide enough information to 'permit a reasonable inference that all accused products infringe.'" *Infineon*, 2013 U.S. Dist. LEXIS 109165, at *5 (citations omitted).

Regarding the '890 patent, Samsung singles out a particular ARM core used in a number of the Accused Products as evidence of Plaintiffs alleged failure to provide it with adequate Infringement Contentions. Specifically, Samsung states that Plaintiffs' Contentions "do not establish that TPL has a reasonable chance of succeeding in proving infringement of any product including only an ARM1176" because this ARM processor is a single core processor (as opposed to a two core processor). *See* Mot. To Strike at 10:26-11:21. Samsung greatly overplays its hand in making such a claim. First, nowhere in the Infringement Contentions do Plaintiffs accuse the ARM1176 core of infringement. Instead, the Infringement Contentions accuse a variety of processors that contain this particular ARM core. For example, the 32bit Samsung S3C6410 processor is found in at least 20 Accused Products. The Samsung S3C6410 processor is known

as a system-on-chip, meaning it contains a number of functional units in addition to the processor core itself. As described in the '890 claim chart, the S3C6410 contains a number of multimedia coprocessors that are likely to contain a second processing unit (*e.g.*, a DSP, which was identified for meeting this limitation in the '890 Claim Chart) thereby meeting the claim limitation that Samsung says is not met. *See* pp. 4-5 in Ex. 4 filed with Mot. To Strike at Dkt. No. 58.

Other than its failed argument regarding how the structure of an ARM1176 core could not infringe claim limitations of the '890 Patent, Samsung does not explain why Plaintiffs do not have a reasonable chance of proving infringement for any other limitations asserted against any other products. Rather, Plaintiffs' Infringement Contentions provide "reasonable notice to the defendant why the plaintiff believes it has a 'reasonable chance of proving infringement.'" *Shared Memory*, 812 F. Supp. 2d 1022, 1025 (N.D. Cal. 2010).

In support of Plaintiffs' position that the Infringement Contentions do provide Samsung "reasonable notice" is Samsung's silence on any particular technical deficiencies in the Contentions and Charts themselves. After months of examining Plaintiffs' Contentions, nowhere in Samsung's Motion to Strike is there a claim that the Accused Products do not contain a processor or make use of a PLL that contains an oscillator, for example.

Further, the Court should deny Samsung's Motion to Strike because Samsung generally cites to the entire Infringement Contentions as being deficient, rather than citing to particular claim elements that it believes is insufficiently linked to the Accused Products. *See Netlist, Inc. v. Smart Storage Sys.*, 2014 U.S. Dist. LEXIS 45670, at *15-*16 (N.D. Cal. Apr. 1, 2014) ("Rather than cite to a particular claim element that it believes is insufficiently linked to the accused product, [the alleged infringer] merely cites to the entire contentions and asserts that '[a] review' of the contentions 'confirms' that not every claim element is mapped on to the accused product.").

In *Asus v. Round Rock*, the alleged infringer failed to explain why the infringement contentions did not give notice of patentee's theories of infringement of representative products, and the Court held that the infringement contentions did provide adequate notice. *ASUS Computer Int'l v. Round Rock Research*, LLC, 2013 U.S. Dist. LEXIS 145824, at *3 (N.D. Cal.

Feb. 25, 2015). Here, Samsung has also failed to explain why Plaintiffs' Infringement Contentions fail to give notice of Plaintiffs' theories of infringement. Indeed, Samsung had prior knowledge of Plaintiffs' infringement positions based on the ITC Proceeding and HTC Case. Thus, the Court should find that Plaintiffs' Infringement Contentions do provide adequate notice of Plaintiffs' infringement theories for all of the Accused Products specifically identified in Table A.4 of Exhibit A of Plaintiffs' Infringement Contentions.

2. Plaintiffs' Claim Charts Provide More Than Conclusory Allegations Based On "Information And Belief" And One Skilled In The Art

Samsung complains that Plaintiffs improperly rely upon "information and belief" to establish specific claim limitations rather than evidence," and that "Plaintiffs also cite to generic articles and Wikipedia for conclusory statements about general technology." *See* Mot. To Strike at 12:7-19; 13:5-7. This position is both legally and factually misplaced.

In *Solannex, Inc. v. MiaSole, Inc.* (cited on page 8 of Mot. To Strike), the Court stated that a plaintiff cannot satisfy its Rule 3-1 obligations by responding with "***nothing more than a conclusion*** based 'on information and belief' that something exists or occurs." *Solannex, Inc. v. MiaSole, Inc.*, 2013 U.S. Dist LEXIS 56672, at *9 (N.D. Cal. Apr. 18, 2013) (emphasis added). As described in section 3(A) above, Plaintiffs' Contentions are based on far more than an unsupported conclusion. Indeed, Plaintiffs' Contentions were created with knowledge from (1) expert analysis and opinion of Dr. Oklobdzija, including his review and analysis of discovery from Samsung in the ITC Proceeding; (2) publicly available information of Samsung cited by Plaintiffs in the Infringement Contentions; (3) publicly available information of third parties concerning the design and operation of all or substantially all modern microprocessors; (4) reasonable conclusions regarding the same infringing qualities of the Accused Microprocessors of the Accused Products, drawn from Plaintiffs' and Plaintiffs' expert's analysis of the functionality of the Accused Products; and (5) specific analysis of several Accused Products and their Accused Microprocessors, as set forth in the Infringement Contentions.

Of course, Samsung is well aware of the basis for Plaintiffs' Infringement Contentions, having been through the ITC Proceeding regarding some of the same products and

microprocessors at issue in this case and being in possession of expert reporting and testimony of Dr. Oklobdzija regarding Plaintiffs' infringement theory regarding the '336 Patent. Moreover, it is difficult to understand how Samsung can complain regarding an alleged failure to cite to evidence when Samsung refused Plaintiffs' access to discovery produced in the ITC Proceeding. Further, case law confirms that Plaintiffs' Contentions must be based on information "reasonably available to it," and the Patent Local Rules do not "require the disclosure of specific evidence [or] require a plaintiff to prove its infringement case." *Solannex*, 2013 U.S. Dist LEXIS 56672, at *7 (citations omitted).

Next, Samsung incorrectly alleges that '336 elements 6.d and '890 element 12.b rely upon conclusory statements that a person of ordinary skill in the art would understand the Infringement Contentions. *See* Samsung's Mot. To Strike at 13:2-18. Rather, the '336 Claim Charts for '336 elements 6.d and '890 element 12.b identify both the representative infringing structure and operation of the Accused Products. The '336 Claim Chart utilizes six pages to explain how each Accused Microprocessor of each Accused Product performs the recited limitation of '336 element 6.d. The '890 Claim Chart for dependent claim limitation 12.b includes a diagram of the alleged infringing operation of a representative Accused Product that is further linked to literature illustrating how the recited claim limitation is alleged to perform.

For all the aforementioned reasons, Plaintiffs have sufficiently complied with Patent L.R. 3-1, because Plaintiffs have provided reasonable notice to Samsung why Plaintiffs believe it has a reasonable chance of proving infringement. *See Shared Memory Graphics*, 812 F. Supp. 2d at 1025.

C. Plaintiffs Properly Accused Products of Infringing Prior To The Expiration of the '749 Patent and '890 Patent

Samsung improperly alleges that Plaintiffs can only assert infringement of Samsung products that were "***released***" prior to the expiration dates of the '890 and '749 patents. *See* Samsung's Mot. To Strike at 13:19-14:21. (emphasis added). However, 35 U.S.C. § 271(1) states, "[w]hoever without authority ***makes, uses, offers to sell, or sells any patented invention, within the United States or imports*** into the United States any patented invention during the term of the patent therefor, infringes the patent." (emphasis added).

Plaintiffs repeat the same response it made to Samsung in Plaintiffs' letter to Samsung, dated March 19, 2015:

> You assert that certain Samsung products were not "released" until after the expiration of the '890 and '749 patents. However, you only cite to a third party website, not even Samsung's own records for a release date. Even assuming that the products had become available to end users on that date, we believe that the products would have been offered for sale to carriers such as AT&T, or at trade shows before then. Therefore, selling to end users is not necessarily the earliest act of infringement. Samsung is in the best position to verify the earliest possible date of infringement associated with the Accused products. If you give us a verified statement that certain accused products were not made, used, sold, offered for sale within the United States, including but not limited to offering for sale to carriers, or displaying at trade shows to solicit orders, or imported into the United States, including but not limited to importing for sale or for FCC submissions, before the expiration of the relevant patents, PDS will agree to no longer assert those patents against those products.

Plaintiffs' letter to Samsung, dated March 19, 2015, p. 1; Ex. 7.

Plaintiffs were diligent in identifying the date that Samsung's Accused Products could have infringed. DECL., ¶ 11. Certain Samsung products may be offered for sale several years prior to Samsung's release of the product. For example, a Samsung product offered for sale to a telecommunications carrier may go through a product release cycle that could take over two years based on the stringent specification and qualification standards required by certain carriers. *Id*. Thus, Plaintiffs were diligent and reasonable by only identifying Accused Products that could have infringed on a date prior to the expiration dates of the '890 and '749 patents. *Id*.

IV. CONCLUSION

For the reasons stated above, Plaintiffs submit that their Infringement Contentions are in conformance with the Patent Local Rules and should not be stricken. Moreover, the Infringement Contentions recite the same infringement theory that was presented to Samsung in the ITC Proceeding. Given the Infringement Contentions themselves and the other exposure Samsung has had to Plaintiffs' infringement theories, Samsung is on notice of Plaintiffs' positions regarding infringement in a manner that satisfies the letter and intent of the Patent Local Rules.

Dated: June 18, 2015

Respectfully Submitted,

/s/ Barry J. Bumgardner
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CERTIFICATE OF SERVICE

I, Barry J. Bumgardner, hereby declare:

I am employed in Tarrant County, State of Texas. I am over the age of 18 years and not a party to the within action. My business address is: Nelson Bumgardner, P.C., 3131 W. 7th Street, Suite 300, Fort Worth, Texas 76107.

On this date, I served: PLAINTIFFS' RESPONSE TO SAMSUNG DEFENDANTS' MOTION TO STRIKE INFRINGEMENT CONTENTIONS OR ALTERNATIVELY TO COMPEL SUPPLEMENTAL INFRINGMENT CONTENTIONS by forwarding the document(s) by electronic transmission on this date to the electronic mail addresses for counsel of record for SAMSUNG ELECTRONICS CO., LTD. and SAMSUNG ELECTRONICS AMERICA, INC., as identified below:

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Dated: June 18, 2015

By: /s/ *Barry J. Bumgardner*
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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

TECHNOLOGY PROPERTIES LIMITED LLC, *et al*,
Plaintiffs,

v.

SAMSUNG ELECTRONICS CO., LTD. and SAMSUNG ELECTRONICS AMERICA, INC.,
Defendants.

Case No. 3:12-cv-03877-VC (PSG)

DECLARATION OF BARRY J. BUMGARDNER IN SUPPORT OF PLAINTIFFS' RESPONSE TO SAMSUNG DEFENDANTS' MOTION TO STRIKE INFRINGEMENT CONTENTIONS OR ALTERNATIVELY TO COMPEL SUPPLEMENTAL INFRINGEMENT CONTENTIONS

Hearing:
Date: August 11, 2015
Time: 10:00 a.m.
Place: Courtroom 5, 4th Floor
Judge: Hon. Paul S. Grewal

I, Barry J. Bumgardner, submit this declaration in support of Plaintiffs' Response to Samsung Defendants' Motion to Strike Infringement Contentions or Alternatively to Compel Supplemental Infringement Contentions and declare as follows:

1. I am a partner at the law firm of Nelson Bumgardner, P.C., attorneys of record for PDS. If called as a witness, I could and would testify competently to the information set forth in this declaration.

2. Starting in 2012, Plaintiffs and Samsung were parties to an ITC investigation (Inv. No. 337-TA-853, the "ITC Proceeding") concerning U.S. Patent No. 5,809,336 (the "'336 Patent"), one of the three patents at issue in this case. In March 2013, Plaintiffs and Samsung actually tried this dispute to the administrative law judge in the ITC. Based on conversations with Dr. Oklobzija and prior counsel, I understand that in the ITC proceeding, Dr. Vojin Oklobdzija (current President of the IEEE Circuit and Systems Society) submitted a detailed expert report on behalf of Plaintiffs setting forth his opinion that all modern, advanced microprocessors (including Samsung's) operate in the same manner with respect to features relevant to the '336 Patent claims at issue in this case.

3. Attached as **Exhibit 1** hereto is a true and correct copy of the Cover Pleading of Plaintiffs Phoenix Digital Solutions LLC ("PDS"), Technology Properties Limited LLC, and Patriot Scientific Corporation's (collectively "Plaintiffs") Patent L.R. 3-1 Disclosure of Asserted Claims and Infringement Contentions, served to Samsung on January 20, 2015.

4. Attached as **Exhibit 2** hereto is a true and correct copy of Plaintiffs' Exhibit A to the Infringement Contentions. Exhibit A consists of seven separate tables, with each table specifically listing the "Accused Products" in the corresponding claim charts for the different defendants. The "Accused Products" for Samsung are specifically identified in Table A.4, on pages 31 through 54 of Exhibit A (attached hereto as Exhibit 2).

5. Based at least on conversations with Dr. Oklobzija and prior counsel for PDS, I understand that in the HTC Case, Plaintiffs proceeded under the same infringement theory as they did against Samsung in the ITC Proceeding.

6. Attached as **Exhibit 3** hereto is a true and correct copy of three emails sent from PDS counsel to Samsung counsel on November 3, 18, and 20 of 2014. The following statements made in this paragraph are based at least on conversations with prior counsel for PDS. Samsung produced relevant documents in the ITC Proceeding that Plaintiffs sought to use in their Infringement Contentions. These documents would have provided at least some of the information Samsung now complains is absent. On November 3, 2014, Plaintiffs provided Samsung and the other defendants a draft "cross use" agreement that would have given Plaintiffs the ability to use the documents produced by Samsung in the ITC Proceeding in this case. On November 18, 2014, Plaintiffs, operating under the understanding that defendants were going to propose their own cross-use agreement, asked for a copy of defendants' agreement in hopes of finalizing it that week. Two days later on November 20, 2014, Plaintiffs again asked defendants about the status of the agreement. On January 20, 2015, with no agreement in place, Plaintiffs submitted their Infringement Contentions without the benefit of using discovery already obtained from Samsung. On February 18, 2015, shortly after Plaintiffs served their Infringement Contentions, Defendants finally engaged with Plaintiffs regarding the negotiation of a cross use agreement.

7. Attached as **Exhibit 4** hereto is a true and correct copy of the protective order entered in the ITC Proceeding.

8. The following statements made in this paragraph are based at least on conversations with prior counsel of PDS, I understand that Plaintiffs exercised reasonable diligence in identifying specific microprocessors for each Accused Product. However, many of the microprocessors could not be identified by Plaintiff after an exhaustive search of publicly available information. For example, Samsung does not appear to publicly disclose the specific microprocessor used in all of its product lines. The inclusion of a USB port or the ability to communicate using Wi-Fi, for example, was evaluated in determining whether to include a particular Accused Product in Exhibit A of the Infringement Contentions. Thus, characteristics of the Accused Products (e.g. Bluetooth capabilities) reveal that such devices must in fact contain a microprocessor possessing certain, relevant qualities.

9. Attached as **Exhibit 5** hereto is a true and correct copy of the page 583 of the Trial Transcript from *HTC Corp. et al. v. Technology Properties Ltd. et al.*, Case No. 5:08-cv-00882.

10. The patents-in-suit issued from a common application filed August 3, 1989, by inventors Charles Moore and Russell Fish, III. The ’336 Patent has been the subject of six ex parte reexamination challenges before the United States Patent and Trademark Office, leading to the issuance of two reexamination certificates, the first on December 15, 2009, and the second on November 23, 2010. The ’890 Patent has been the subject of its own reexamination challenge, which led the issuance of a reexamination certificate dated March 1, 2011. The ’336 and ’890 Patents have been allowed over more than 600 prior art references cited collectively during reexamination. In addition, the patents-in-suit have been licensed to over 100 companies, including notable technology companies such as Apple and Intel. Finally, the Sh-Boom Processor, a chip created by Messrs. Moore and Fish that featured the technological advances described in the patents-in-suit, was featured in the IEEE article “25 Microchips That Shook the World - IEEE Spectrum,” attached hereto as **Exhibit 6**.

11. Attached as **Exhibit 7** hereto is a true and correct copy of a March 19, 2015, letter from Plaintiffs’ prior counsel to Samsung’s counsel in response to a letter from Samsung. Based

at least on conversations with prior counsel for PDS, I understand that Plaintiffs were diligent in identifying the date that Samsung's Accused Products could have infringed. Certain Samsung products may have been offered for sale several years prior to Samsung's release of the product. For example, a Samsung product offered for sale to a telecommunications carrier may go through a product release cycle that could take over two years based on the stringent specification and qualification standards required by certain carriers. Thus, I understand that Plaintiffs were diligent and reasonable by only identifying Accused Products that could have infringed on a date prior to the expiration dates of the '890 and '749 patents.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct. This declaration is executed on June 18, 2015 in Fort Worth, Texas.

Dated: June 18, 2015

By: /s/ *Barry J. Bumgardner*
Barry J. Bumgardner

Exhibit 1

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UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

TECHNOLOGY PROPERTIES LIMITED LLC, PHOENIX DIGITAL SOLUTIONS LLC, and PATRIOT SCIENTIFIC CORPORATION,

Plaintiffs,

vs.

BARNES & NOBLE, INC.,

Defendants.

Case No. 3:12-cv-03863-VC

PLAINTIFFS' PATENT L.R. 3-1 DISCLOSURE OF ASSERTED CLAIMS AND INFRINGEMENT CONTENTIONS

TECHNOLOGY PROPERTIES LIMITED LLC, PHOENIX DIGITAL SOLUTIONS LLC, and PATRIOT SCIENTIFIC CORPORATION, Plaintiffs, *vs.* HUAWEI TECHNOLOGIES CO., LTD. and HUAWEI NORTH AMERICA, Defendants.	Case No. 2:12-cv-03865-VC
TECHNOLOGY PROPERTIES LIMITED LLC, PHOENIX DIGITAL SOLUTIONS LLC, and PATRIOT SCIENTIFIC CORPORATION, Plaintiffs, *vs.* GARMIN LTD., GARMIN INTERNATIONAL, INC., AND GARMIN USA, INC., Defendants.	Case No. 3:12-cv-03870-VC
TECHNOLOGY PROPERTIES LIMITED LLC, PHOENIX DIGITAL SOLUTIONS LLC, and PATRIOT SCIENTIFIC CORPORATION, Plaintiffs, *vs.* ZTE CORPORATION and ZTE (USA) INC., Defendants.	Case No. 3:12-cv-03876-VC

TECHNOLOGY PROPERTIES LIMITED LLC, PHOENIX DIGITAL SOLUTIONS LLC, and PATRIOT SCIENTIFIC CORPORATION, Plaintiffs, *vs.* SAMSUNG ELECTRONICS CO., LTD. and SAMSUNG ELECTRONICS AMERICA, INC., Defendants.	Case No. 3:12-cv-03877-VC
TECHNOLOGY PROPERTIES LIMITED LLC, PHOENIX DIGITAL SOLUTIONS LLC, and PATRIOT SCIENTIFIC CORPORATION, Plaintiffs, *vs.* NOVATEL WIRELESS, INC., Defendant.	Case No. 3:12-cv-03879-VC
TECHNOLOGY PROPERTIES LIMITED LLC, PHOENIX DIGITAL SOLUTIONS LLC, and PATRIOT SCIENTIFIC CORPORATION, Plaintiffs, *vs.* LG ELECTRONICS, INC. and LG ELECTRONICS U.S.A., INC., Defendants.	Case No. CV 12-03880-VC

TECHNOLOGY PROPERTIES LIMITED LLC, PHOENIX DIGITAL SOLUTIONS LLC, and PATRIOT SCIENTIFIC CORPORATION, Plaintiffs, v. NINTENDO CO., LTD. and NINTENDO OF AMERICA INC., Defendants.	Case No. 3:12-cv-03881-VC

Pursuant to Patent Local Rule 3-1, Plaintiffs Technology Properties Limited LLC, Phoenix Digital Solutions LLC, and Patriot Scientific Corporation (collectively "PDS") hereby serve these Disclosures of Asserted Claims and Infringement Contentions on each of the following defendants below (collectively "Defendants") pursuant to Patent L.R. 3-1.[1]

Defendants	Case No.
1. Huawei Technologies Co Ltd, Huawei Device Co., Ltd., Huawei Device USA Inc., Futurewei Technologies, Inc. d/b/a Huawei Technologies (USA) (Collectively "Huawei")	12-cv-03865-VC
2. Garmin International Inc., Garmin USA Inc. (Collectively "Garmin")	12-cv-03870-VC
3. ZTE Corp., ZTE USA Inc. (Collectively "ZTE")	12-cv-03876-VC
4. Samsung Electronics Co., LTD, Samsung Electronics America Inc. (Collectively "Samsung")	12-cv-03877-VC
5. Novatel Wireless Inc.	12-cv-03879-VC
6. LG Electronics, Inc., LG Electronics U.S.A., Inc. (Collectively "LG")	12-cv-03880-VC
7. Nintendo Co., Ltd., Nintendo of America, Inc. (Collectively "Nintendo")	12-cv-03881-VC

PDS' discovery and investigation in this action is only in its early stages and is continuing, including information that PDS is seeking regarding every product made, used, sold, offered for sale, or imported into the United States by Defendants that utilizes a microprocessor.

[1] PDS has separately served its Disclosures of Asserted Claims and Infringement Contentions on Defendant Barnes & Noble Inc.

In particular, these contentions are based on information presently available to PDS. Accordingly, PDS reserves its right to supplement, amend, and augment the disclosures made herein as new, additional, or different information is learned and discovered.

(A) **Asserted Claims (Patent L.R. 3-1(a))**

PDS asserts the following claims of the patents-in suit under 35 U.S.C § 271(a), and (b):

- Claims 6, 7, 9, 13, 14, and 15 of U.S. Patent No. 5,809,336 (the "'336 patent");
- Claims 1, 7, 9, 11, 12, 13, 17 and 19 of U.S. Patent No. 5,530,890 (the "'890 patent"); and
- Claims 1, 43 and 59 of U.S. Patent No. 5,440,749 ("the '749 Patent")

Exemplar claim charts for the Accused Instrumentalities that infringe the asserted claims are produced herewith. The claim charts include a listing of the claim limitations for Claim 9 of the '749 patent because Claim 59 depends from Claim 9. However, PDS is not presently asserting Claim 9, and is only including it in the attached claim charts to show that all limitations of Claim 59 are met by the Accused Products.

This identification of asserted claims is based on information reasonably available to PDS at this time. PDS reserves the right to supplement its accused claims based on information developed in the course of this lawsuit through discovery or additional factual investigation, in view of the Court's claim construction order, or as other circumstances may require.

(B) Accused Instrumentalities (Patent L.R. 3-1(b))

The list of accused instrumentalities in this action includes those listed in Ex. A, and all models thereof.

This identification of Accused Instrumentalities is based on information reasonably available to PDS at this time. Accordingly, PDS reserves the right to supplement its listing of Accused Instrumentalities based on information developed in the course of this lawsuit through discovery or additional factual investigation, in view of the Court's claim construction order, or as other circumstances may require.

(C) Charts Identifying Where Each Element of Each Asserted Claim Is Found (Pat L.R. 3-1(c))

PDS produces herewith in its service email a URL to download supporting references and representative claim charts, which identify where each element of the asserted claims is found within one or more of the Accused Instrumentalities identified above.

These claim charts are based on information reasonably available to PDS at this time. PDS is likely to have additional contentions and evidentiary support regarding Defendants' infringement after a reasonable opportunity for further investigation and discovery. PDS reserves the right to supplement or amend these claim charts, or add additional claim charts, based on information developed in the course of this lawsuit through discovery or additional factual investigation, in view of the Court's claim construction order, or as other circumstances may require.

Claim Charts:

1. Huawei:

Attached hereto as Exhibit B-1 are charts identifying where each element of each asserted claim of the '336 patent may be found within Huawei's Accused Instrumentalities identified in Ex. A.

Attached hereto as Exhibit B-2 are charts identifying where each element of each asserted claim of the '890 patent may be found within Huawei's Accused Instrumentalities identified in Ex. A.

Attached hereto as Exhibit B-3 are charts identifying where each element of each asserted claim of the '749 patent may be found within Huawei's Accused Instrumentalities identified in Ex. A.

2. Garmin:

Attached hereto as Exhibit C-1 are charts identifying where each element of each asserted claim of the '336 patent may be found within Garmin's Accused Instrumentalities identified in Ex. A.

Attached hereto as Exhibit C-2 are charts identifying where each element of each asserted

claim of the ’890 patent may be found within Garmin’s Accused Instrumentalities identified in Ex. A.

Attached hereto as Exhibit C-3 are charts identifying where each element of each asserted claim of the ’749 patent may be found within Garmin’s Accused Instrumentalities identified in Ex. A.

3. ZTE:

Attached hereto as Exhibit D-1 are charts identifying where each element of each asserted claim of the ’336 patent may be found within ZTE’s Accused Instrumentalities identified in Ex. A.

Attached hereto as Exhibit D-2 are charts identifying where each element of each asserted claim of the ’890 patent may be found within ZTE’s Accused Instrumentalities identified in Ex. A.

Attached hereto as Exhibit D-3 are charts identifying where each element of each asserted claim of the ’749 patent may be found within ZTE’s Accused Instrumentalities identified in Ex. A.

4. Samsung:

Attached hereto as Exhibit E-1 are charts identifying where each element of each asserted claim of the ’336 patent may be found within Samsung’s Accused Instrumentalities identified in Ex. A.

Attached hereto as Exhibit E-2 are charts identifying where each element of each asserted claim of the ’890 patent may be found within Samsung’s Accused Instrumentalities identified in Ex. A.

Attached hereto as Exhibit E-3 are charts identifying where each element of each asserted claim of the ’749 patent may be found within Samsung’s Accused Instrumentalities identified in Ex. A.

5. Novatel:

Attached hereto as Exhibit F-1 are charts identifying where each element of each asserted claim of the ’336 patent may be found within Novatel’s Accused Instrumentalities identified in Ex. A.

Attached hereto as Exhibit F-2 are charts identifying where each element of each asserted claim of the ’890 patent may be found within Novatel’s Accused Instrumentalities identified in Ex. A.

Attached hereto as Exhibit F-3 are charts identifying where each element of each asserted claim of the ’749 patent may be found within Novatel’s Accused Instrumentalities identified in Ex. A.

6. LG:

Attached hereto as Exhibit G-1 are charts identifying where each element of each asserted claim of the ’336 patent may be found within LG’s Accused Instrumentalities identified in Ex. A.

Attached hereto as Exhibit G-2 are charts identifying where each element of each asserted claim of the ’890 patent may be found within LG’s Accused Instrumentalities identified in Ex. A.

Attached hereto as Exhibit G-3 are charts identifying where each element of each asserted claim of the ’749 patent may be found within LG’s Accused Instrumentalities identified in Ex. A.

7. Nintendo:

Attached hereto as Exhibit H-1 are charts identifying where each element of each asserted claim of the ’336 patent may be found within Nintendo’s Accused Instrumentalities identified in Ex. A.

Attached hereto as Exhibit H-2 are charts identifying where each element of each asserted claim of the ’890 patent may be found within Nintendo’s Accused Instrumentalities identified in Ex. A.

Attached hereto as Exhibit H-3 are charts identifying where each element of each asserted claim of the '749 patent may be found within Nintendo's Accused Instrumentalities identified in Ex. A.

PDS also intends to rely on the testimony of fact and expert witnesses and related documentary evidence in support of its infringement allegations.

(D) Indirect Infringement (Patent L.R. 3-1(d))

PDS alleges that Defendants directly infringes the patents-in-suit. PDS further alleges that Defendants induce their customers to infringe the patents-in-suit by instructing their customers to use the accused instrumentalities in an infringing manner. Acts of direct and indirect infringement related to the Accused Instrumentalities are discussed in detail in the claim charts identified above. PDS also intends to rely on the testimony of fact and expert witnesses and related documentary evidence in support of its infringement allegations.

(E) Literal Infringement of the Asserted Claims (Patent L.R. 3-1(e))

PDS contends that each element of the asserted claims is literally infringed by the Accused Instrumentalities. In the event that a claim element is not found to be literally present in the Accused Instrumentalities, PDS asserts that the Accused Instrumentalities infringe under the doctrine of equivalents.

(F) Priority Dates of the Asserted Patents (Patent L.R. 3-1(f))

Each asserted claim of the '336 patent claims a priority date of August 3, 1989, when the application that led to its issuance was filed.

Each asserted claim of the '890 patent claims a priority date of August 3, 1989, when Application No. 389,334 was filed.

Each asserted claim of the '749 Patent claims a priority date of August 3, 1989, when Application No. 389,334 was filed.

(G) Identification of PDS' Products that Incorporate or Reflect the Asserted Claims (Patent L.R. 3-1(g))

PDS has sold millions of dollars of products implementing the MMP Portfolio

technology, including the asserted claims. These products include:

- **'336 Patent**

Product Line	**Model #**	**'336 Asserted Claims Incorporated**
Intellasys	Seaforth 24A	6, 7, 9, 13, 14, and 15
Intellasys	Seaforth 40A	6, 7, 9, 13, 14, and 15
OnSpec	90C46D	6, 7, 9, 13, 14, and 15
OnSpec	XSil 268	6, 7, 9, 13, 14, and 15
OnSpec	XSil 248/248B	6, 7, 9, 13, 14, and 15
OnSpec	XSil 269-G	6, 7, 9, 13, 14, and 15
OnSpec	XSil 258	6, 7, 9, 13, 14, and 15
OnSpec	XSil 251/251-LF	6, 7, 9, 13, 14, and 15
OnSpec	XSil 259/259-LF	6, 7, 9, 13, 14, and 15
OnSpec	XSil 267	6, 7, 9, 13, 14, and 15
OnSpec	XSil 261-G	6, 7, 9, 13, 14, and 15
Indigita	iND60C32	6, 7, 9, 13, 14, and 15
Indigita	iND60C80	6, 7, 9, 13, 14, and 15
Indigita	iND60C70	6, 7, 9, 13, 14, and 15
Indigita	iND60C90	6, 7, 9, 13, 14, and 15

- **'890 Patent**

Product Line	**Model #**	**'890 Asserted Claims Incorporated**
Indigita	720-127 DEV BRD	1, 11, 12, 13, 17 and 19
Indigita	AVHD-160	1, 11, 12, 13, 17 and 19
Indigita	AVHD-250	1, 11, 12, 13, 17 and 19
Indigita	AVHD-40	1, 11, 12, 13, 17 and 19
Indigita	AVHD-500	1, 11, 12, 13, 17 and 19
Indigita	AVHD80	1, 11, 12, 13, 17 and 19
Indigita	AVHD80-RCA	1, 11, 12, 13, 17 and 19
Indigita	DVR2080	1, 11, 12, 13, 17 and 19
Indigita	DVR2160	1, 11, 12, 13, 17 and 19
Indigita	GEM DEVELOPMENT KIT	1, 11, 12, 13, 17 and 19
Indigita	IDT804PCI	1, 11, 12, 13, 17 and 19
Indigita	IDT832B	1, 11, 12, 13, 17 and 19
Indigita	IDT882PCI	1, 11, 12, 13, 17 and 19
Indigita	iND60C32	1, 11, 12, 13, 17 and 19
Indigita	iND60C32A	1, 11, 12, 13, 17 and 19
Indigita	iND60C70	1, 11, 12, 13, 17 and 19
Indigita	iND60C80	1, 11, 12, 13, 17 and 19
Indigita	iND60C90	1, 11, 12, 13, 17 and 19

- **'749 Patent**

Product Line	Model #	'749 Asserted Claims Incorporated
Indigita	720-127 DEV BRD	1, 43 and 59
Indigita	AVHD-160	1, 43 and 59
Indigita	AVHD-250	1, 43 and 59
Indigita	AVHD-40	1, 43 and 59
Indigita	AVHD-500	1, 43 and 59
Indigita	AVHD80	1, 43 and 59
Indigita	AVHD80-RCA	1, 43 and 59
Indigita	DVR2080	1, 43 and 59
Indigita	DVR2160	1, 43 and 59
Indigita	GEM DEVELOPMENT KIT	1, 43 and 59
Indigita	IDT804PCI	1, 43 and 59
Indigita	IDT832B	1, 43 and 59
Indigita	IDT882PCI	1, 43 and 59
Indigita	iND60C32	1, 43 and 59
Indigita	iND60C32A	1, 43 and 59
Indigita	iND60C70	1, 43 and 59
Indigita	iND60C80	1, 43 and 59
Indigita	iND60C90	1, 43 and 59
Indigita	SEA40C18	1, 43 and 59
Indigita	SEA40C18-A	1, 43 and 59
Indigita	Seaforth 24A (AR24-C18)	1, 43 and 59
Indigita	Seaforth 40A (AR40-C18)	1, 43 and 59
Indigita	SEK40C18	1, 43 and 59

PDS reserves the right to supplement these lists of products in view of the Court's claim construction ruling or as other circumstances may require.

(H) Willful Infringement (Patent L.R. 3-1(h))

PDS provided written notice of Defendants' infringement at least as early as on Jan. 14, 2010. Having this knowledge, Defendants continued to directly and indirectly infringe the asserted claims by importing, selling, offering for sale, using and inducing the use of the Accused Instrumentalities.

Dated: January 20, 2015

Respectfully submitted,

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PATRIOT SCIENTIFIC CORPORATION

Exhibit 2

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

TABLE A.1: HUAWEI

PRODUCT	MEMORY	PROCESSOR	CPU CORE	INSTRUCTION SET
Ascend D LTE (U9501L)	1024MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon S4 MSM8225	2x ARM Cortex-A5	ARMv7-A
Ascend D1 (U9500)	1024MiB RAM/7630MiB ROM	32bit Texas Instruments OMAP 4460	2x ARM Cortex-A9	ARMv7
Ascend D1 Quad/Ascend D quad (U9510)	1024MiB RAM/7630MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960	2x Qualcomm Krait	ARMv7
Ascend D1 Quad XL (T9510E)	1024MiB RAM/7630MiB ROM	32bit Huawei HiSilicon K3V2 Hi3620	4x ARM Cortex-A9 MPCore	ARMv7
Ascend D1 Quad XL/Ascend D quad XL (U9510E)	1024MiB RAM/7630MiB ROM	32bit Qualcomm Snapdragon S3 MSM8260	2x Qualcomm Scorpion	ARMv7
Ascend D1 XL (U9500E)	1024MiB RAM/7630MiB ROM	32bit Texas Instruments OMAP 4460	2x ARM Cortex-A9	ARMv7
Ascend D2-0082 HSPA	2048MiB RAM/30518MiB ROM	32bit Qualcomm Snapdragon S4 MSM8225	2x ARM Cortex-A5	ARMv7-A
Ascend D2-2010 CDMA	2048MiB RAM/30518MiB ROM	32bit Qualcomm MSM7227A	ARM Cortex-A5	ARMv7-A
Ascend D2-6070 TD-LTE	2048MiB RAM/15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930	4x ARM Cortex-A7 Mpcore	ARMv7
Ascend D2-6114 HW-03E/U9701L	2048MiB RAM/30518MiB ROM	32bit Huawei HiSilicon K3V2 Hi3620	4x ARM Cortex-A9 MPCore	ARMv7
Ascend G300 (U8815)	512MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon S2 MSM8255T	Qualcomm Scorpion	ARMv7
Ascend G300 NFC (U8815N)	512MiB RAM/MiB ROM	32bit Qualcomm Snapdragon S3 MSM8260	2x Qualcomm Scorpion	ARMv7
Ascend G305T (T8828)	512MiB RAM/3814MiB ROM	32bit Texas Instruments OMAP 4460	2x ARM Cortex-A9	ARMv7
Ascend G312 QWERTY U8730 (Buddy)	1024MiB RAM/3814MiB ROM	32bit MediaTek MT6575	ARM Cortex-A9	ARMv7
Ascend G330D (U8825D)	512MiB RAM/3814MiB ROM	32bit Huawei HiSilicon K3V2 Hi3620	4x ARM Cortex-A9 MPCore	ARMv7
Ascend G350-U00	512MiB RAM/1907MiB ROM	32bit Huawei HiSilicon K3V2 Hi3620	4x ARM Cortex-A9 MPCore	ARMv7
Ascend G500D U8832D (Panama)	512MiB RAM/3814MiB ROM	32bit Qualcomm MSM7227A	ARM Cortex-A5	ARMv7-A
Ascend G510 U8951	512MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960	2x Qualcomm Krait	ARMv7
Ascend G521-L076 TD-LTE	512MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
Ascend G525-U00	1024MiB RAM/3815MiB ROM	32bit Qualcomm Snapdragon 200 MSM8625Q	4x ARM Cortex-A5	ARMv7-A
Ascend G600 (U8950D)	768MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960	2x Qualcomm Krait	ARMv7
Ascend G610-C00	1024MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon S4 MSM8625	2x ARM Cortex-A5	ARMv7-A
Ascend G615	1024MiB RAM/7630MiB ROM	32bit Qualcomm Snapdragon S4 MSM8227	2x Qualcomm Krait	ARMv7
Ascend G620-A2 H891L LTE	1024MiB RAM/3814MiB ROM	32bit Huawei HiSilicon KIRIN925 Hi3830	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
Ascend G620-L72 TD-LTE	1024MiB RAM/MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
Ascend G620S-L02 LTE-A	1024MiB RAM/7629MiB ROM	32bit Huawei HiSilicon KIRIN910 Hi6620 V9R1	4x ARM Cortex-A9 MPCore	ARMv7
Ascend G620S-L03 LTE-A	1024MiB RAM/7629MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
Ascend G630-U20	1024MiB RAM/3815MiB ROM	32bit Qualcomm Snapdragon 400 MSM8928	4x ARM Cortex-A7 Mpcore	ARMv7

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU CORE	INSTRUCTION SET
Ascend G6-L11 4G LTE-A	1024MiB RAM/7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
Ascend G6-L22 4G LTE-A	1024MiB RAM/7629MiB ROM	32bit Huawei HiSilicon KIRIN910 Hi6620 V9R1	4x ARM Cortex-A9 MPCore	ARMv7
Ascend G6-L33 4G LTE-A	1024MiB RAM/7629MiB ROM	32bit Huawei HiSilicon KIRIN910 Hi6620 V9R1	4x ARM Cortex-A9 MPCore	ARMv7
Ascend G6-T00 TD	1024MiB RAM/7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
Ascend G6-U00	1024MiB RAM/7629MiB ROM	32bit Qualcomm Snapdragon 200 MSM8210	2x ARM Cortex-A7	ARMv7-A
Ascend G700-U00	2048MiB RAM/7630MiB ROM	32bit Huawei HiSilicon K3V2 Hi3620	4x ARM Cortex-A9 MPCore	ARMv7
Ascend G716-L070	1024MiB RAM/3815MiB ROM	32bit Huawei HiSilicon K3V2 Hi3620	4x ARM Cortex-A9 MPCore	ARMv7
Ascend G730-L072 LTE-A	1024MiB RAM/3815MiB ROM	32bit Huawei HiSilicon KIRIN910 Hi6620 V9R1	4x ARM Cortex-A9 MPCore	ARMv7
Ascend G730-L073 TD-LTE	1024MiB RAM/3815MiB ROM	32bit Huawei HiSilicon KIRIN910T Hi6620	4x ARM Cortex-A9 MPCore	ARMv7
Ascend G730-L075 TD-LTE	1024MiB RAM/3815MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
Ascend G730-T00	1024MiB RAM/3815MiB ROM	32bit Rockchip RK3168	2x ARM Cortex-A9	ARMv7-A
Ascend G730-U00	1024MiB RAM/3815MiB ROM			
Ascend G740-L00	1024MiB RAM/7630MiB ROM	32bit MediaTek MT6582	4x ARM Cortex-A7 Mpcore	ARMv7
Ascend G7-L01 LTE	2048MiB RAM/15259MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
Ascend G7-L03 LTE	2048MiB RAM/15259MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
Ascend G7-TL00 Dual SIM TD-LTE	2048MiB RAM/15259MiB ROM	32bit Huawei HiSilicon KIRIN920 Hi3630	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 MPcore	ARMv7
Ascend GX1 SC-CL00 TD-LTE Dual SIM	1024MiB RAM/7629MiB ROM	32bit Huawei HiSilicon KIRIN925 Hi3830	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
Ascend II M865	256MiB RAM/512MiB ROM	32bit Qualcomm MSM7227	ARM1136EJ-S	ARMv6
Ascend II NA	256MiB RAM/512MiB ROM	32bit Qualcomm Snapdragon S2 MSM8655T	Qualcomm Scorpion	ARMv7
Ascend M860/C8600	256MiB RAM/512MiB ROM	32bit Qualcomm MSM7225	ARM1136EJ-S	ARMv6
Ascend Mate 2 4G LTE MT2-L03	2048MiB RAM/15259MiB ROM	32bit MediaTek MT6582	4x ARM Cortex-A7 Mpcore	ARMv7
Ascend Mate 2 MT2-C00 CDMA	2048MiB RAM/15259MiB ROM	32bit Qualcomm Snapdragon S4 MSM8225	2x ARM Cortex-A5	ARMv7-A
Ascend Mate 2 MT2-U071	2048MiB RAM/15259MiB ROM	32bit Qualcomm Snapdragon 400 MSM8928	4x ARM Cortex-A7 Mpcore	ARMv7
Ascend Mate 2 TD-LTE MT2-L00	2048MiB RAM/15259MiB ROM	32bit Qualcomm Snapdragon 200 MSM8212	4x ARM Cortex-A7	ARMv7-A
Ascend Mate 2 TD-LTE MT2-L05	2048MiB RAM/15259MiB ROM	32bit Huawei HiSilicon K3V2 Hi3620	4x ARM Cortex-A9 MPCore	ARMv7
Ascend Mate 7 CDMA MT7-CL00 16GB	2048MiB RAM/15259MiB ROM	32bit Huawei HiSilicon KIRIN925 Hi3830	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
Ascend Mate 7 Dual SIM TD-LTE MT7-TL00	3072MiB RAM/30518MiB ROM	32bit MediaTek MT6582	4x ARM Cortex-A7 Mpcore	ARMv7

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU CORE	INSTRUCTION SET
Ascend Mate 7 Dual SIM TD-LTE MT7-TL10	3048MiB RAM/30518MiB ROM	32bit Huawei HiSilicon KIRIN910 Hi6620 V9R1	4x ARM Cortex-A9 MPCore	ARMv7
Ascend Mate 7 HSPA MT7-UL00	2048MiB RAM/15259MiB ROM	32bit MediaTek MT6582	4x ARM Cortex-A7 Mpcore	ARMv7
Ascend Mate 7 LTE-A MT7-L09	2048MiB RAM/15259MiB ROM	32bit Huawei HiSilicon KIRIN920 Hi3630	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 MPcore	ARMv7
Ascend Mate MT1-U06	2048MiB RAM/7630MiB ROM	32bit Qualcomm Snapdragon S4 MSM8225	2x ARM Cortex-A5	ARMv7-A
Ascend P1 (U9200)	1024MiB RAM/3814MiB ROM	32bit Qualcomm MSM7227A	ARM Cortex-A5	ARMv7-A
Ascend P1 LTE U9202L-1	1024MiB RAM/3814MiB ROM	32bit MediaTek MT6517		ARMv7
Ascend P1 LTE U9202L-2	1024MiB RAM/3814MiB ROM	32bit Huawei HiSilicon K3V2 Hi3620	4x ARM Cortex-A9 MPCore	ARMv7
Ascend P1 LTE U9202L-3	1024MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960	2x Qualcomm Krait	ARMv7
Ascend P1 S (U9200S)	1024MiB RAM/3814MiB ROM			
Ascend P1 TD (T9200)	1024MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon S2 MSM8255T	Qualcomm Scorpion	ARMv7
Ascend P1 XL (U9200E)	1024MiB RAM/3814MiB ROM	32bit Qualcomm MSM7627T	ARM1136EJ-S	ARMv6
Ascend P2	1024MiB RAM/15258MiB ROM	32bit MediaTek MT6589	4x ARM Cortex-A7	ARMv7
Ascend P2-6011 LTE	1024MiB RAM/15258MiB ROM	32bit Qualcomm Snapdragon 200 MSM8225Q	4x ARM Cortex-A5	ARMv7-A
Ascend P6 S LTE-A GL11S (Echo)	2048MiB RAM/15258MiB ROM	32bit Huawei HiSilicon KIRIN910 Hi6620 V9R1	4x ARM Cortex-A9 MPCore	ARMv7
Ascend P6 S P6S-U00 (Echo)	2048MiB RAM/15258MiB ROM	32bit Qualcomm Snapdragon 200 MSM8212	4x ARM Cortex-A7	ARMv7-A
Ascend P6-U06	2048MiB RAM/7630MiB ROM	32bit Huawei HiSilicon K3V2 Hi3620	4x ARM Cortex-A9 MPCore	ARMv7
Ascend P7 Arsenal Edition (Sophia)	2048MiB RAM/15259MiB ROM	32bit MediaTek MT6582	4x ARM Cortex-A7 Mpcore	ARMv7
Ascend P7 mini	1024MiB RAM/7629MiB ROM	32bit Huawei HiSilicon KIRIN910T Hi6620	4x ARM Cortex-A9 MPCore	ARMv7
Ascend P7-L00 (Sophia)	2048MiB RAM/15259MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
Ascend P7-L10 (Sophia)	2048MiB RAM/15259MiB ROM	32bit Huawei HiSilicon KIRIN910 Hi6620 V9R1	4x ARM Cortex-A9 MPCore	ARMv7
Ascend Q M660	/ MiB ROM	32bit Texas Instruments OMAP 4460	2x ARM Cortex-A9	ARMv7
Ascend W1-C00	512MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960	2x Qualcomm Krait	ARMv7
Ascend W1-U00	512MiB RAM/3814MiB ROM	32bit Huawei HiSilicon K3V2 Hi3620	4x ARM Cortex-A9 MPCore	ARMv7
Ascend W2-T00	512MiB RAM/7630MiB ROM	32bit Huawei HiSilicon K3V2E	4x ARM Cortex-A9 MPCore	ARMv7
Ascend W2-U00	512MiB RAM/7630MiB ROM	32bit MediaTek MT6582	4x ARM Cortex-A7 Mpcore	ARMv7
Ascend W2-U00 NA	512MiB RAM/7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930	4x ARM Cortex-A7 Mpcore	ARMv7
Ascend Y100 (U8185)	/ MiB ROM	32bit Qualcomm MSM7227A	ARM Cortex-A5	ARMv7-A
Ascend Y200 (U8655)	256MiB RAM/1024MiB ROM	32bit Qualcomm Snapdragon S3 MSM8660	2x Qualcomm Scorpion	ARMv7

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU CORE	INSTRUCTION SET
Ascend Y201 (U8666)	256MiB RAM/512MiB ROM	32bit Huawei HiSilicon K3V2 Hi3620	4x ARM Cortex-A9 MPCore	ARMv7
Ascend Y201 Pro (U8666E)	256MiB RAM/512MiB ROM	32bit Texas Instruments OMAP 4460	2x ARM Cortex-A9	ARMv7
Ascend Y210 (U8685D)	256MiB RAM/512MiB ROM	32bit Qualcomm MSM7227A	ARM Cortex-A5	ARMv7-A
Ascend Y300-0100 U8833 (Asura)	512MiB RAM/3815MiB ROM	32bit Huawei HiSilicon K3V2 Hi3620	4x ARM Cortex-A9 MPCore	ARMv7
Ascend Y300-0151 (Asura)	512MiB RAM/3815MiB ROM	32bit Huawei HiSilicon K3V2 Hi3620	4x ARM Cortex-A9 MPCore	ARMv7
Ascend Y300-F1/Ascend Y300 II	512MiB RAM/3815MiB ROM	32bit Qualcomm Snapdragon 200 MSM8212	4x ARM Cortex-A7	ARMv7-A
Ascend Y330-U01	512MiB RAM/3815MiB ROM	32bit MediaTek MT6582	4x ARM Cortex-A7 Mpcore	ARMv7
Ascend Y523-L076 TD-LTE	512MiB RAM/3815MiB ROM	32bit Huawei HiSilicon KIRIN910 Hi6620 V9R1	4x ARM Cortex-A9 MPCore	ARMv7
Ascend Y530	512MiB RAM/3815MiB ROM	32bit Qualcomm Snapdragon 400 MSM8628	4x ARM Cortex-A7 Mpcore	ARMv7
Ascend Y550-L01 LTE	1024MiB RAM/3815MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
Ascend Y550-L02 LTE	1024MiB RAM/3815MiB ROM	32bit Huawei HiSilicon KIRIN920 Hi3630	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 MPcore	ARMv7
Ascend Y550-L03 LTE	1024MiB RAM/3815MiB ROM	32bit Qualcomm Snapdragon 200 MSM8212	4x ARM Cortex-A7	ARMv7-A
Ascend Y635-CL00 CDMA	1024MiB RAM/3815MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
Boulder U8350	256MiB RAM/512MiB ROM	32bit Qualcomm Snapdragon S2 MSM8255	Qualcomm Scorpion	ARMv7
C8000	128MiB RAM/256MiB ROM			
C8100	128MiB RAM/256MiB ROM			
C8817E	1024MiB RAM/7629MiB ROM	32bit Huawei HiSilicon KIRIN910 Hi6620 V9R1	4x ARM Cortex-A9 MPCore	ARMv7
Deuce U8520	512MiB RAM/1908MiB ROM	32bit Qualcomm MSM7230	Qualcomm Scorpion	ARMv7
EE Eagle 4G LTE/Mediapad M1 8.0 S8-301L 16GB	1024MiB RAM/15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
EE Kestrel LTE-A	1024MiB RAM/7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
Fusion U8652 (Jengu)	256MiB RAM/512MiB ROM	32bit Qualcomm MSM7627	ARM1136EJ-S	ARMv6
H887L	1024MiB RAM/MiB ROM	32bit Qualcomm Snapdragon 400 MSM8230	2x Qualcomm Krait 200	ARMv7
Honor (U8860)	512MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon S2 MSM8255	Qualcomm Scorpion	ARMv7
Honor 2/Honor Quad (U9508)	2048MiB RAM/7630MiB ROM	32bit Huawei HiSilicon K3V2 Hi3620	4x ARM Cortex-A9 MPCore	ARMv7
Honor 3 HN3-U01	2048MiB RAM/7629MiB ROM	32bit Rockchip RK3168	2x ARM Cortex-A9	ARMv7-A
Honor 3C 4G LTE H30-L02	1024MiB RAM/7629MiB ROM	32bit Huawei HiSilicon KIRIN925 Hi3830	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
Honor 3C Dual SIM H30-U10	2048MiB RAM/7629MiB ROM	32bit MediaTek MT6592	8x ARM Cortex-A7	ARMv7
Honor 3C Dual SIM TD H30-T00	2048MiB RAM/7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8230	2x Qualcomm Krait 200	ARMv7
Honor 3C Play Dual SIM Hol-U10	1024MiB RAM/15259MiB ROM	32bit Huawei HiSilicon KIRIN920 Hi3630	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 MPcore	ARMv7
Honor 3C Play Dual SIM TD Hol-T10	1024MiB RAM/15259MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
Honor 3X Pro	2048MiB RAM/15259MiB ROM	32bit Huawei HiSilicon KIRIN910 Hi6620 V9R1	4x ARM Cortex-A9 MPCore	ARMv7
Honor 4X Che-A1 H892L CDMA	3072MiB RAM/15258MiB	32bit Huawei HiSilicon KIRIN925 Hi3830	4x ARM Cortex-A15 MPcore + 4x ARM	ARMv7

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU CORE	INSTRUCTION SET
	ROM		Cortex-A7 Mpcore	
Honor 6 Extreme Edition dual SIM	3072MiB RAM/30518MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
Honor 6 H60-L01 4G TD-LTE (Mulan)	3072MiB RAM/15258MiB ROM	32bit Huawei HiSilicon KIRIN910T Hi6620	4x ARM Cortex-A9 MPCore	ARMv7
Honor 6 H60-L02 Dual SIM TD-LTE (Mulan)	3072MiB RAM/15258MiB ROM	32bit MediaTek MT6582	4x ARM Cortex-A7 Mpcore	ARMv7
Honor 6 H60-L04 4G TD-LTE (Mulan)	3072MiB RAM/15259MiB ROM	32bit Huawei HiSilicon KIRIN925 Hi3830	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
Honor 6 H60-L11 4G TD-LTE (Mulan)	3072MiB RAM/30518MiB ROM	32bit Huawei HiSilicon KIRIN910 Hi6620 V9R1	4x ARM Cortex-A9 MPCore	ARMv7
Honor 6 H60-L12 Dual SIM TD-LTE (Mulan)	3072MiB RAM/30518MiB ROM	32bit Huawei HiSilicon KIRIN920 Hi3630	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 MPcore	ARMv7
Honor 6 HW-H60-J1 LTE-A/X3 (Mulan)	3072MiB RAM/30518MiB ROM	32bit Huawei HiSilicon KIRIN928	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
Honor 6 Plus PE-CL00 Dual SIM CDMA	3072MiB RAM/15258MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
Honor 6 Plus PE-TL00M Dual SIM TD-LTE	3072MiB RAM/15258MiB ROM	64bit Huawei Honor KIRIN620	8x ARM Cortex-A53 Mpcore	ARMv8-A (A32, A64)
Honor 6 Plus PE-TL10 Dual SIM TD-LTE 32GB	3072MiB RAM/30518MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
Honor 6 Plus PE-TL20 Dual SIM TD-LTE 16GB	3072MiB RAM/15258MiB ROM	32bit Huawei HiSilicon KIRIN925 Hi3830	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
Honor 6 Plus PE-UL00 Dual SIM TD-LTE/Honor 6X	3072MiB RAM/15258MiB ROM	32bit Huawei HiSilicon KIRIN925 Hi3830	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
Honor Holly Dual SIM Hol-U19	1024MiB RAM/15259MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
Honor Play 4 TD-LTE Dual SIM	1024MiB RAM/7629MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
Honor Play 4X TD-LTE Dual SIM	2048MiB RAM/7629MiB ROM	32bit Huawei HiSilicon KIRIN920 Hi3630	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 MPcore	ARMv7
Honor Spree 4x Dual SIM TD-LTE	1024MiB RAM/7629MiB ROM	32bit Huawei HiSilicon KIRIN925 Hi3830	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
Honor Tablet 8 3G	1024MiB RAM/15259MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
Honor U8860-51 (U8860)	512MiB RAM/3814MiB ROM	32bit Qualcomm MSM7627	ARM1136EJ-S	ARMv6
Honor X1/Mediapad X1 7.0 LTE-A 7D-504L	2048MiB RAM/15259MiB ROM	32bit Qualcomm Snapdragon 200 MSM8212	4x ARM Cortex-A7	ARMv7-A
Honor X1/Mediapad X1 7.0 TD-LTE	2048MiB RAM/15259MiB	32bit Huawei HiSilicon KIRIN910 Hi6620 V9R1	4x ARM Cortex-A9 MPCore	ARMv7

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU CORE	INSTRUCTION SET
7D-503L	ROM			
Honor X1/Mediapad X1 7.0 TD-LTE 7D-503LT	2048MiB RAM/15259MiB ROM			
Honor+ (T8950)	768MiB RAM/3814MiB ROM	32bit Huawei HiSilicon K3V2 Hi3620	4x ARM Cortex-A9 MPCore	ARMv7
Ideos S7-103	256MiB RAM/256+1908MiB ROM	32bit Qualcomm MSM7230	Qualcomm Scorpion	ARMv7
Ideos S7-104	256MiB RAM/256+7630MiB ROM	32bit Qualcomm MSM7625	ARM1136EJ-S	ARMv6
Ideos S7-105	512MiB RAM/256+7630MiB ROM	32bit Qualcomm Snapdragon S1 QSD8250	Qualcomm Scorpion	ARMv7
Ideos S7-201u Slim	512MiB RAM/512+7630MiB ROM	32bit Qualcomm MSM7225	ARM1136EJ-S	ARMv6
Ideos U8150	256MiB RAM/512MiB ROM	32bit Qualcomm MSM7225	ARM1136EJ-S	ARMv6
Ideos X1 U8180 (Gaga)	256MiB RAM/512MiB ROM	32bit Qualcomm Snapdragon S1 QSD8250	Qualcomm Scorpion	ARMv7
Ideos X3 U8510 (Blaze)	256MiB RAM/512MiB ROM	32bit Qualcomm MSM7230	Qualcomm Scorpion	ARMv7
Ideos X5 Pro	512MiB RAM/3814MiB ROM	32bit Qualcomm MSM7625	ARM1136EJ-S	ARMv6
Ideos X5 U8800	512MiB RAM/3814MiB ROM	32bit Qualcomm MSM7225	ARM1136EJ-S	ARMv6
Ideos X5 U8800H	512MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon S1 QSD8250	Qualcomm Scorpion	ARMv7
Ideos X6 (U9000)	512MiB RAM/1908MiB ROM	32bit Qualcomm MSM7227	ARM1136EJ-S	ARMv6
M835/C8500/C8511	256MiB RAM/512MiB ROM	32bit Qualcomm MSM7225	ARM1136EJ-S	ARMv6
M881/H881C (Asura)	512MiB RAM/3815MiB ROM	32bit Huawei HiSilicon K3V2 Hi3620	4x ARM Cortex-A9 MPCore	ARMv7
MediaPad 10 FHD LTE S10-101L 64GB	2048MiB RAM/61035MiB ROM	32bit Huawei HiSilicon K3V2 Hi3620	4x ARM Cortex-A9 MPCore	ARMv7
MediaPad 10 FHD S10-101u 16GB	2048MiB RAM/15258MiB ROM	32bit MediaTek MT6577	2x ARM Cortex-A9	ARMv7
MediaPad 10 FHD S10-101u 64GB	2048MiB RAM/61035MiB ROM	32bit Rockchip RK2818	ARM9	ARMv5
MediaPad 10 FHD WiFi S10-101w	2048MiB RAM/15258MiB ROM	32bit Texas Instruments OMAP 4460	2x ARM Cortex-A9	ARMv7
MediaPad 10 Link 3G S10-201u	1024MiB RAM/15258MiB ROM	32bit Huawei HiSilicon K3V2 Hi3620	4x ARM Cortex-A9 MPCore	ARMv7
MediaPad 10 Link 3G S10-202u	1024MiB RAM/15258MiB ROM	32bit Huawei HiSilicon K3V2 Hi3620	4x ARM Cortex-A9 MPCore	ARMv7
MediaPad 10 Link LTE-A S10-201L 16GB	1024MiB RAM/15258MiB ROM	32bit Huawei HiSilicon K3V2 Hi3620	4x ARM Cortex-A9 MPCore	ARMv7
MediaPad 10 Link LTE-A S10-201L 32GB	1024MiB RAM/30518MiB ROM	32bit Rockchip RK3168	2x ARM Cortex-A9	ARMv7-A
MediaPad 10 Link WiFi S10-201w	1024MiB RAM/15258MiB	32bit Qualcomm Snapdragon 400 MSM8230	2x Qualcomm Krait 200	ARMv7

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU CORE	INSTRUCTION SET
16GB	ROM			
MediaPad 7 Lite S7-931u	1024MiB RAM/7630MiB ROM	32bit Huawei HiSilicon K3V2 Hi3620	4x ARM Cortex-A9 MPCore	ARMv7
MediaPad 7 Vogue	1024MiB RAM/7629MiB ROM	32bit Huawei HiSilicon K3V2 Hi3620	4x ARM Cortex-A9 MPCore	ARMv7
MediaPad 7 Youth 3G 8GB S7-701u/S7-711u	1024MiB RAM/7629MiB ROM	32bit Rockchip RK3168	2x ARM Cortex-A9	ARMv7-A
MediaPad 7 Youth 3G 8GB S7-702u	1024MiB RAM/7630MiB ROM	32bit Huawei HiSilicon K3V2 Hi3620	4x ARM Cortex-A9 MPCore	ARMv7
MediaPad 7 Youth WiFi 4GB S7-701w	1024MiB RAM/3815MiB ROM	32bit Qualcomm Snapdragon S4 MSM8225	2x ARM Cortex-A5	ARMv7-A
MediaPad 7 Youth WiFi 8GB S7-701wa	1024MiB RAM/7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8230	2x Qualcomm Krait 200	ARMv7
MediaPad 7 Youth2 S7-721u	1024MiB RAM/3815MiB ROM	32bit Huawei HiSilicon KIRIN910 Hi6620 V9R1	4x ARM Cortex-A9 MPCore	ARMv7
MediaPad 7 Youth2 WiFi S7-721w	1024MiB RAM/3815MiB ROM	32bit Qualcomm Snapdragon 400 MSM8928	4x ARM Cortex-A7 Mpcore	ARMv7
Mediapad M1 8.0 3G S8-301u	1024MiB RAM/7629MiB ROM	32bit MediaTek MT6572	2x ARM Cortex-A7	ARMv7
Mediapad M1 8.0 LTE-A S8-301L	1024MiB RAM/7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
Mediapad M1 8.0 LTE-A S8-306L	1024MiB RAM/15258MiB ROM	32bit Huawei HiSilicon KIRIN920 Hi3630	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 MPcore	ARMv7
Mediapad M1 8.0 TD-LTE S8-303L	1024MiB RAM/15258MiB ROM	32bit Huawei HiSilicon KIRIN910 Hi6620 V9R1	4x ARM Cortex-A9 MPCore	ARMv7
Mediapad T1 8.0 3G S8-701u/Honor Pad T1	1024MiB RAM/7630MiB ROM	32bit Huawei HiSilicon KIRIN920 Hi3630	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 MPcore	ARMv7
Mediapad T1 8.0 4G LTE T1-821L	1024MiB RAM/15258MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
Mediapad T1 8.0 WiFi T1-821W	1024MiB RAM/15258MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
Mediapad X1 7.0 3G 7D-501u	2048MiB RAM/15259MiB ROM	32bit Huawei HiSilicon KIRIN910 Hi6620 V9R1	4x ARM Cortex-A9 MPCore	ARMv7
Mediapad X1 7.0 LTE-A 7D-501L	2048MiB RAM/15259MiB ROM	32bit MediaTek MT6582	4x ARM Cortex-A7 Mpcore	ARMv7
Mercury M886 (Glory)	512MiB RAM/1908MiB ROM	32bit Qualcomm Snapdragon S3 MSM8260	2x Qualcomm Scorpion	ARMv7
Premia 4G M931	1024MiB RAM/3815MiB ROM	32bit Qualcomm Snapdragon S4 MSM8225	2x ARM Cortex-A5	ARMv7-A
S7-301c MediaPad	1024MiB RAM/MiB ROM	32bit Qualcomm MSM7227A	ARM Cortex-A5	ARMv7-A
S7-301u MediaPad	1024MiB RAM/7630MiB ROM	32bit Qualcomm MSM7227	ARM1136EJ-S	ARMv6
S7-302u MediaPad 4G	1024MiB RAM/MiB ROM	32bit Qualcomm Snapdragon S2 MSM8255T	Qualcomm Scorpion	ARMv7
Shine U8836D	512MiB RAM/3814MiB ROM			
Sonic (U8650)	256MiB RAM/512MiB ROM	32bit Qualcomm MSM7225	ARM1136EJ-S	ARMv6
STREAM X GL07S	1024MiB RAM/30518MiB ROM	32bit Huawei HiSilicon K3V2 Hi3620	4x ARM Cortex-A9 MPCore	ARMv7
T8301	512MiB RAM/MiB ROM	32bit Qualcomm MSM7225A	ARM Cortex-A5	ARMv7-A

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU CORE	INSTRUCTION SET
U8100	256MiB RAM/512MiB ROM			
U8110	256MiB RAM/512MiB ROM	32bit Qualcomm MSM7200A	ARM1136EJ-S	ARMv6
U8230	128MiB RAM/256MiB ROM			
U8300	256MiB RAM/512MiB ROM	32bit Qualcomm Snapdragon S1 QSD8250	Qualcomm Scorpion	ARMv7
U8800 Impulse 4G	512MiB RAM/MiB ROM	32bit Qualcomm Snapdragon S2 MSM8255	Qualcomm Scorpion	ARMv7
Vision (U8850)	512MiB RAM/1908MiB ROM	32bit Qualcomm Snapdragon S2 MSM8255	Qualcomm Scorpion	ARMv7

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

TABLE A.2: GARMIN

Model Name	Device Type
Edge 500	Cycling Computer
Edge 1000	Cycling Computer
Edge 510	Cycling Computer
Edge 810	Cycling Computer
fēnix 2	
Forerunner 220	GPS Watch
Forerunner 610	GPS Watch
dēzl 560LMT	Portable GPS
dēzl 760LMT	Portable GPS
Edge 205	Cycling Computer
Edge 305	Cycling Computer
Edge 605	Cycling Computer
Edge 705	Cycling Computer
A50/Garminfone	Phone
Astro	Dog Tracker
Astro 220	Dog Tracker
Colorado 300	Portable GPS
Colorado 400c	Portable GPS
Colorado 400i	Portable GPS
Colorado 400t	Portable GPS
Dakota 20	Portable GPS
echoMAP 50dv	GPS Chart Plotter
echoMAP 50s	GPS Chart Plotter
echoMAP 70dv	GPS Chart Plotter
echoMAP 70s	GPS Chart Plotter
Edge 200	Cycling Computer
Edge 800	Cycling Computer
Edge Touring	Cycling Computer
Edge Touring Plus	Cycling Computer
eMap	Portable GPS Electronic Map
eTrex 10	Handheld GPS
eTrex 20	Handheld GPS
eTrex 30	Handheld GPS
eTrex HC	Handheld GPS
eTrex Legend HCx	Handheld GPS
eTrex Venture	Handheld GPS

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

Model Name	Device Type
eTrex Venture HC	Handheld GPS
eTrex Vista HCx	Handheld GPS
fēnix	
Forerunner 10	GPS Watch
Forerunner 110	GPS Watch
Forerunner 15	GPS Watch
Forerunner 205	GPS Watch
Forerunner 210	GPS Watch
Forerunner 305	GPS Watch
Forerunner 310XT	GPS Watch
Forerunner 405	GPS Watch
Forerunner 405CX	GPS Watch
Forerunner 50	GPS Watch
Forerunner 60	GPS Watch
Forerunner 70	GPS Watch
Forerunner 910XT	GPS Watch
Foretrex 301	Portable GPS
Foretrex 401	Portable GPS
G1000	
G1000 for Cessna CitationJet	
G1000 for King Air	
G1000H	
GPSMAP 176	GPS
GPSMAP 176C	GPS
GPSMAP 178 Sounder	GPS
GPSMAP 178C Sounder	GPS
GPSMAP 192C	GPS
GPSMAP 2006/2006C	GPS
GPSMAP 2010/2010C	GPS
GPSMAP 276C	GPS
GPSMAP 278	GPS
GPSMAP 292	GPS
GPSMAP 296	GPS
GPSMAP 298	GPS
GPSMAP 3205	GPS
GPSMAP 3206	GPS
GPSMAP 3210	GPS
GPSMAP 378	GPS

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

Model Name	Device Type
GPSMAP 392	GPS
GPSMAP 396	GPS
GPSMAP 398	GPS
GPSMAP 478	GPS
GPSMAP 492	GPS
GPSMAP 498	GPS
GPSMAP 520	GPS
GPSMAP 520/520s	GPS
GPSMAP 5208	GPS
GPSMAP 520s	GPS
GPSMAP 521	GPS
GPSMAP 5212	GPS
GPSMAP 5215	GPS
GPSMAP 521s	GPS
GPSMAP 525	GPS
GPSMAP 525/525s	GPS
GPSMAP 525s	GPS
GPSMAP 526	GPS
GPSMAP 526s	GPS
GPSMAP 527	GPS
GPSMAP 527xs	GPS
GPSMAP 530	GPS
GPSMAP 530/530s	GPS
GPSMAP 530s	GPS
GPSMAP 531	GPS
GPSMAP 531s	GPS
GPSMAP 535	GPS
GPSMAP 535/535s	GPS
GPSMAP 535s	GPS
GPSMAP 536	GPS
GPSMAP 536s	GPS
GPSMAP 540	GPS
GPSMAP 540/540s	GPS
GPSMAP 540s	GPS
GPSMAP 541	GPS
GPSMAP 541s	GPS
GPSMAP 545	GPS
GPSMAP 545/545s	GPS

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

Model Name	Device Type
GPSMAP 545s	GPS
GPSMAP 546	GPS
GPSMAP 546s	GPS
GPSMAP 547	GPS
GPSMAP 547xs	GPS
GPSMAP 550	GPS
GPSMAP 550s	GPS
GPSMAP 555	GPS
GPSMAP 555s	GPS
GPSMAP 556	GPS
GPSMAP 556s	GPS
GPSMAP 60C	GPS
GPSMAP 60CS	GPS
GPSMAP 60CSx	GPS
GPSMAP 60Cx	GPS
GPSMAP 62	GPS
GPSMAP 620	GPS
GPSMAP 640	GPS
GPSMAP 695	GPS
GPSMAP 696	GPS
GPSMAP 720	GPS
GPSMAP 720s	GPS
GPSMAP 721	GPS
GPSMAP 7212	GPS
GPSMAP 7215	GPS
GPSMAP 721xs	GPS
GPSMAP 740	GPS
GPSMAP 740s	GPS
GPSMAP 741	GPS
GPSMAP 741xs	GPS
GPSMAP 750	GPS
GPSMAP 750s	GPS
GPSMAP 76	GPS
GPSMAP 76C	GPS
GPSMAP 76CS	GPS
GPSMAP 76CSx	GPS
GPSMAP 78	GPS
GPSMAP 78s	GPS

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

Model Name	Device Type
GPSMAP 78sc	GPS
GPSMAP 8000V	GPS
GPSMAP 8008 MFD	GPS
GPSMAP 8012 MFD	GPS
GPSMAP 8015 MFD	GPS
GPSMAP 820	GPS
GPSMAP 8208 MFD	GPS
GPSMAP 820xs	GPS
GPSMAP 8212 MFD	GPS
GPSMAP 8215 MFD	GPS
GPSMAP 840xs	GPS
GPSMAP 96	GPS
GPSMAP 96c	GPS
HUD (Head-Up Display)	Heads Up Display/GPS
HUD+ (Head-Up Display)	Heads Up Display/GPS
Montana 600	GPS
Montana 600t Camo	GPS
Montana 650	GPS
Montana 650t	GPS
nüvi 1100	GPS
nüvi 1200/1210/1240/1250/1260	GPS
nüvi 1300/1340/1350/1355	GPS
nüvi 1310/1370/1375	GPS
nüvi 1390	GPS
nüvi 1410	GPS
nüvi 1420/1470	GPS
nüvi 1440/1450	GPS
nüvi 1480	GPS
nüvi 1490	GPS
nüvi 1490LMT	GPS
nüvi 1490TV	GPS
nüvi 1690	GPS
nüvi 2360LT	GPS
nüvi 2455LM	GPS
nüvi 2455LMT	GPS
nüvi 2457LMT	GPS
nüvi 2460LT	GPS
nüvi 2475LT	GPS

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

Model Name	Device Type
nüvi 2495LMT	GPS
nüvi 2497LMT	GPS
nüvi 2557LMT	GPS
nüvi 2598LMTHD	GPS
nüvi 30	GPS
nüvi 3450	GPS
nüvi 3450LM	GPS
nüvi 3490LMT	GPS
nüvi 3550LM	GPS
nüvi 3590LMT	GPS
nüvi 3597LMTHD	GPS
nüvi 3790T	GPS
nüvi 40	GPS
nüvi 50	GPS
nüvi 55	GPS
nüvi 56	GPS
nüvi 65LM	GPS
nüvi 65LMT	GPS
nüvi 66LM	GPS
nüvi 66LMT	GPS
Oregon 200	GPS
Oregon 300	GPS
Oregon 400c	GPS
Oregon 400i	GPS
Oregon 400t	GPS
Oregon 450	GPS
Oregon 450t	GPS
Oregon 550	GPS
Oregon 550t	GPS
Oregon 600	GPS
Oregon 600t	GPS
Oregon 650	GPS
Oregon 650t	GPS
quatix	GPS Watch
Rino 520	GPS + Radio
Rino 530	GPS + Radio
Rino 610	GPS + Radio
Rino 650	GPS + Radio

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

Model Name	Device Type
Rino 655t	GPS + Radio
RV 760LMT	RV GPS
RV 760LMT with Wireless Backup Camera	RV GPS
tactix	Tactical GPS Watch
VIRB Elite	Action Camera
Vivofit	Activity Tracker
zūmo 220	GPS for Motorcycles
zūmo 350LM	GPS for Motorcycles
zūmo 350LM	
zūmo 390LM	GPS for Motorcycles
zūmo 390LM	
zūmo 450	GPS for Motorcycles
zūmo 500, 550	GPS for Motorcycles
zūmo 590	GPS for Motorcycles
zūmo 590LM	GPS for Motorcycles
zūmo 590LM	
zūmo 660	GPS for Motorcycles
zūmo 660	
zūmo 660LM	GPS for Motorcycles
zūmo 660LM	
zūmo 665	GPS for Motorcycles
zūmo 665	
zūmo 665LM	GPS for Motorcycles
zūmo 665LM	
aera 500	Portable GPS
aera 510	Portable GPS
aera 550	Portable GPS
aera 560	Portable GPS
aera 795	Portable GPS
aera 796	Portable GPS
Alpha	Dog Tracker
Apollo GX50	GPS
Apollo GX55	GPS
Apollo GX60	GPS
Apollo GX65	GPS
Approach G3, North and Latin America	Golf GPS
Approach G5, North and Latin America	Golf GPS
Approach G6	Golf GPS

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

Model Name	Device Type
Approach G7	Golf GPS
Approach G8	Golf GPS
Approach S1	Golf GPS Watch
Approach S2	Golf GPS Watch
Approach S3	Golf GPS Watch
Approach S4	Golf GPS Watch
Approach S6	Golf GPS Watch
Astro 320	Dog Tracker
CNX 80	Pilots Portable GPS
D2	Pilots Watch
Dakota 10	Portable GPS
echo 100	Fish Tracker
echo 101	Fish Tracker
echo 150	Fish Tracker
echo 151	Fish Tracker
echo 151dv	Fish Tracker
echo 200	Fish Tracker
echo 201	Fish Tracker
echo 201dv	Fish Tracker
echo 300C	Fish Tracker
echo 301c	Fish Tracker
echo 301dv	Fish Tracker
echo 500C	Fish Tracker
echo 501c	Fish Tracker
echo 550C	Fish Tracker
echo 551c	Fish Tracker
echo 551dv	Fish Tracker
eTrex	Handheld GPS
eTrex "yellow"	Handheld GPS
eTrex Camo	Handheld GPS
eTrex Legend	Handheld GPS
eTrex Legend C	Handheld GPS
eTrex Legend Cx	Handheld GPS
eTrex Legend H	Handheld GPS
eTrex Mariner	Handheld GPS
eTrex Summit	Handheld GPS
eTrex Summit HC	Handheld GPS
eTrex Venture Cx	Handheld GPS

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

Model Name	Device Type
eTrex Vista	Handheld GPS
eTrex Vista C	Handheld GPS
eTrex Vista Cx	Handheld GPS
eTrex Vista H	Handheld GPS
Fishfinder 100	Portable Sonar
Fishfinder 100 Blue	Portable Sonar
Fishfinder 120	Portable Sonar
Fishfinder 140	Portable Sonar
Fishfinder 145	Portable Sonar
Fishfinder 160	Portable Sonar
Fishfinder 160 Blue	Portable Sonar
Fishfinder 160C	Portable Sonar
Fishfinder 240	Portable Sonar
Fishfinder 240 Blue	Portable Sonar
Fishfinder 250	Portable Sonar
Fishfinder 250C	Portable Sonar
Fishfinder 300C	Portable Sonar
Fishfinder 320C	Portable Sonar
Fishfinder 340C	Portable Sonar
Fishfinder 400C	Portable Sonar
Fishfinder 80	Portable Sonar
Fishfinder 85	Portable Sonar
Fishfinder 90	Portable Sonar
Fishfinder 95	Portable Sonar
Forerunner 101	GPS Watch
Forerunner 201	GPS Watch
Forerunner 301	GPS Watch
Forerunner 410	GPS Watch
Forerunner 620	GPS Watch
Foretrex 101	Portable GPS
Foretrex 201	Portable GPS
G2000	
G300 for Cessna SkyCatcher	
G3000	
G3X	
G500	
G5000	
G5000 for Beechjet	

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

Model Name	Device Type
G5000H	
G500H	
G60	
G600	
G900X	
G950	
Garmin Dash Cam 20	
Garmin Swim	
Geko 101	
Geko 201	
Geko 301	
GHC 10	
GHC 20	
GHC 20 Marine Autopilot Control Unit	
GHP 10	
GHP 10 Marine Autopilot System	
GHP 10V	
GHP 10V Marine Autopilot System	
GHP 12	
GHP 12 Autopilot System	
GHP 20 Marine Autopilot System for Steer-by-Wire	
GHP 20 Marine Autopilot System for Viking	
GHP 20 Marine Autopilot System for Yamaha Helm Master	
GHP 20 Marine Autopilot System with SmartPump	
GHP 20 Steer-by-Wire	
GHP 20 Viking	
GHP 20 with SmartPump	
GHP 20 Yamaha Helm Master	
GMM 150	
GMM 170	
GMM 190	
GMX 200	
GNC 250	
GNC 250XL	
GNC 300	
GNC 300XL	
GNC 300XL TSO	
GNC 420	

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

Model Name	Device Type
GNC 420w	
GNS 430	
GNS 430w	
GNS 480	
GNS 530	
GNS 530w	
GPS 12	
GPS 120	
GPS 120XL	
GPS 125 Sounder	
GPS 126	
GPS 128	
GPS 12CX	
GPS 12MAP	
GPS 12XL	
GPS 150	
GPS 150XL	
GPS 152	
GPS 152/152H	
GPS 152H	
GPS 152H™	
GPS 155 TSO	
GPS 155/165	
GPS 155XL	
GPS 155XL TSO	
GPS 165	
GPS 165 TSO	
GPS 38	
GPS 40	
GPS 400	
GPS 400w	
GPS 45	
GPS 48	
GPS 500	
GPS 500w	
GPS 60	
GPS 72	
GPS 72H	

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

Model Name	Device Type
GPS 75	
GPS 76	
GPS 76S	
GPS 89	
GPS 90	
GPS 92	
GPS II	
GPS II Plus	
GPS III	
GPS III Pilot	
GPS III Pilot™	
GPS III Plus	
GPS V	
GPSCOM 170	
GPSCOM 190	
GPSMAP 1020	GPS
GPSMAP 1020	GPS
GPSMAP 1020xs	GPS
GPSMAP 1040xs	GPS
GPSMAP 120/120XL	GPS
GPSMAP 130	GPS
GPSMAP 135 Sounder	GPS
GPSMAP 162	GPS
GPSMAP 168 Sounder	GPS
GPSMAP 172	GPS
GPSMAP 172C	GPS
GPSMAP 175	GPS
GPSMAP 180	GPS
GPSMAP 182/182C	GPS
GPSMAP 185 Sounder	GPS
GPSMAP 188/188c	GPS
GPSMAP 188/188C Sounder	GPS
GPSMAP 195	GPS
GPSMAP 196	GPS
GPSMAP 198c	GPS
GPSMAP 198C Sounder	GPS
GPSMAP 2006C	GPS
GPSMAP 2010C	GPS

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

Model Name	Device Type
GPSMAP 205	GPS
GPSMAP 210	GPS
GPSMAP 2106	GPS
GPSMAP 2110	GPS
GPSMAP 215	GPS
GPSMAP 220	GPS
GPSMAP 2206	GPS
GPSMAP 2210	GPS
GPSMAP 225	GPS
GPSMAP 230	GPS
GPSMAP 232	GPS
GPSMAP 235 Sounder	GPS
GPSMAP 238 Sounder	GPS
GPSMAP 295	GPS
GPSMAP 298 Sounder	GPS
GPSMAP 3006C	GPS
GPSMAP 3010C	GPS
GPSMAP 376C	GPS
GPSMAP 398 Sounder	GPS
GPSMAP 4008	GPS
GPSMAP 4010	GPS
GPSMAP 4012	GPS
GPSMAP 420	GPS
GPSMAP 420/420s	GPS
GPSMAP 4208	GPS
GPSMAP 420s	GPS
GPSMAP 421	GPS
GPSMAP 4210	GPS
GPSMAP 4212	GPS
GPSMAP 421s	GPS
GPSMAP 430	GPS
GPSMAP 430/430s	GPS
GPSMAP 430s	GPS
GPSMAP 430sx	GPS
GPSMAP 430x	GPS
GPSMAP 431	GPS
GPSMAP 431s	GPS
GPSMAP 440	GPS

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

Model Name	Device Type
GPSMAP 440/440s	GPS
GPSMAP 440s	GPS
GPSMAP 440sx	GPS
GPSMAP 440x	GPS
GPSMAP 441	GPS
GPSMAP 441s	GPS
GPSMAP 450	GPS
GPSMAP 450s	GPS
GPSMAP 495	GPS
GPSMAP 496	GPS
GPSMAP 498 Sounder	GPS
GPSMAP 5008	GPS
GPSMAP 5012	GPS
GPSMAP 5015	GPS
GPSMAP 60	GPS
GPSMAP 6008	GPS
GPSMAP 6012	GPS
GPSMAP 6208	GPS
GPSMAP 6212	GPS
GPSMAP 62s	GPS
GPSMAP 62sc	GPS
GPSMAP 62st	GPS
GPSMAP 62stc	GPS
GPSMAP 64	GPS
GPSMAP 64s	GPS
GPSMAP 64st	GPS
GPSMAP 7012	GPS
GPSMAP 7015	GPS
GPSMAP 76CS Plus	GPS
GPSMAP 76Cx	GPS
GPSMAP 76S	GPS
GPSMAP 8500 Black Box	GPS
GPSMAP 8530 Black Box	GPS
GTN 625	GPS/Nav/Comm Avionics
GTN 635	GPS/Nav/Comm Avionics
GTN 650	GPS/Nav/Comm Avionics
GTN 725	GPS/Nav/Comm Avionics
GTN 750	GPS/Nav/Comm Avionics

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

Model Name	Device Type
GTX 320	Transponder
GTX 320A	Transponder
HSVT	
HTAWS	Helicopter add-on for GTN Series
iQue 3600a	GPS/PDA (Discontinued)
MX20	
nüvi 2555LM	GPS
nüvi 2555LMT	GPS
nüvi 2577LT	GPS
nüvi 2595LMT	GPS
nüvi 2597LMT	GPS
nüvi 2757LM	GPS
nüvi 2797LMT	GPS
nüvi 2798LMT with Backup Camera	GPS
nüvi 40LM	GPS
nüvi 42	GPS
nüvi 42LM	GPS
nüvi 44	GPS
nüvi 44LM	GPS
nüvi 465LMT	GPS
nüvi 465T	GPS
nüvi 50LM	GPS
nüvi 52	GPS
nüvi 52LM	GPS
nüvi 54	GPS
nüvi 54LM	GPS
nüvi 55LM	GPS
nüvi 55LMT	GPS
nüvi 56LM	GPS
nüvi 56LMT	GPS
Rino 110	GPS + Radio
Rino 120	GPS + Radio
Rino 130	GPS + Radio
Rino 520HCx	GPS + Radio
Rino 530HCx	GPS + Radio
SVT for G1000	
SVT for G600/G500	
TR-1 Gladiator	Autopilot

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

Model Name	Device Type
TR-1 Gold Marine Autopilot	Autopilot

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

TABLE A.3: ZTE

PRODUCT	MEMORY	PROCESSOR	CPU CORE	INSTRUCTIONS SET
ZTE Q705U	1024MiB RAM/3815MiB ROM	32bit ARM Cortex-A7 MPCore	2x ARM Cortex-A7	ARMv7-A
ZTE T72	512MiB RAM/15258MiB ROM	32bit ARM Cortex-A8	ARM Cortex	ARMv7-A
ZTE PF112	7630MiB ROM/	32bit ARM Cortex-A9 MPCore	2x Cortex-A9	ARMv7-A
ZTE V81	1024MiB RAM/3814MiB ROM	32bit ARM Cortex-A9 MPCore	2x Cortex-A9	ARMv7-A
ZTE Q801T TD-LTE	1024MiB RAM/3815MiB ROM	32bit Leadcore InnoPower LC1810	2x Cortex-A9	ARMv7
ZTE Blade G Lux	512MiB RAM/3814MiB ROM	32bit MediaTek MT6572	2x ARM Cortex-A7	ARMv7
ZTE Blade Q	1024MiB RAM/3814MiB ROM	32bit MediaTek MT6572	2x ARM Cortex-A7	ARMv7
ZTE Blade Q Maxi	1024MiB RAM/3814MiB ROM	32bit MediaTek MT6572	2x ARM Cortex-A7	ARMv7
ZTE Blade Q Mini	1024MiB RAM/3814MiB ROM	32bit MediaTek MT6572	2x ARM Cortex-A7	ARMv7
ZTE Kis 3 Max	512MiB RAM/3814MiB ROM	32bit MediaTek MT6572	2x ARM Cortex-A7	ARMv7
ZTE U879	512MiB RAM/3814MiB ROM	32bit MediaTek MT6572	2x ARM Cortex-A7	ARMv7
ZTE V879	512MiB RAM/3814MiB ROM	32bit MediaTek MT6572	2x ARM Cortex-A7	ARMv7
ZTE Blade Super	1024MiB RAM/3814MiB ROM	32bit MediaTek MT6577	2x ARM Cortex-A9	ARMv7
ZTE Grand X 3G V970/V970M (ZTE Mimosa X)	512MiB RAM/3814MiB ROM	32bit MediaTek MT6577	2x ARM Cortex-A9	ARMv7
ZTE Grand X Pro V983	1024MiB RAM/3815MiB ROM	32bit MediaTek MT6577	2x ARM Cortex-A9	ARMv7
ZTE Grand X V970T (ZTE Mimosa X)	512MiB RAM/3814MiB ROM	32bit MediaTek MT6577	2x ARM Cortex-A9	ARMv7
ZTE V887	512MiB RAM/3814MiB ROM	32bit MediaTek MT6577	2x ARM Cortex-A9	ARMv7
ZTE V889M	512MiB RAM/3814MiB ROM	32bit MediaTek MT6577	2x ARM Cortex-A9	ARMv7
ZTE Blade Vec 3G	1024MiB RAM/7630MiB ROM	32bit MediaTek MT6582	4x ARM Cortex-A7 Mpcore	ARMv7
ZTE Blade L2	1024MiB RAM/3815MiB ROM	32bit MediaTek MT6582M	4x ARM Cortex-A7 Mpcore	ARMv7
ZTE V987	1024MiB RAM/3815MiB ROM	32bit MediaTek MT6589	4x ARM Cortex-A7	ARMv7
ZTE Blade Vec Pro	1024MiB RAM/7630MiB ROM	32bit MediaTek MT6592M	4x ARM Cortex-A7 Mpcore	ARMv7
ZTE Grand Era V985	1024MiB RAM/7630MiB ROM	32bit NVIDIA Tegra 3 AP33H	5x ARM Cortex-A9 MPCore	ARMv7-A
ZTE Grand Memo U9815 TD-LTE	2048MiB RAM/15258MiB ROM	32bit NVIDIA Tegra 3 T30L	5x ARM Cortex-A9 MPCore	ARMv7-A
ZTE Geek CDMA N988	2048MiB RAM/15258MiB ROM	32bit NVIDIA Tegra 4i SP3X	5x ARM Cortex-A9-R4 MPCore	ARMv7-A
ZTE Geek U988S	2048MiB RAM/15258MiB ROM	32bit NVIDIA Tegra 4i SP3X	5x ARM Cortex-A9-R4 MPCore	ARMv7-A
ZTE Open	256MiB RAM/512MiB ROM	32bit Qualcomm MSM7225A	ARM Cortex-A5	ARMv7-A
ZTE Skate Kis	512MiB RAM/512MiB ROM	32bit Qualcomm MSM7225A	ARM Cortex-A5	ARMv7-A
ZTE V790/Viettel V8403	512MiB RAM/1024MiB ROM	32bit Qualcomm MSM7225A	ARM Cortex-A5	ARMv7-A
ZTE V790 Kis	256MiB RAM/512MiB ROM	32bit Qualcomm MSM7225A	ARM Cortex-A5	ARMv7-A
ZTE Z660G Whirl	512MiB RAM/3815MiB ROM	32bit Qualcomm MSM7225A	ARM Cortex-A5	ARMv7-A
ZTE Z992 Avail 2	512MiB RAM/3815MiB ROM	32bit Qualcomm MSM7225A	ARM Cortex-A5	ARMv7-A
ZTE Z993 Prelude	512MiB RAM/3815MiB ROM	32bit Qualcomm MSM7225A	ARM Cortex-A5	ARMv7-A

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU CORE	INSTRUCTIONS SET
ZTE Avail Z990 (ZTE Roamer)	512MiB RAM/512MiB ROM	32bit Qualcomm MSM7227	ARM1136EJ-S	ARMv6
ZTE Libra	256MiB RAM/512MiB ROM	32bit Qualcomm MSM7227	ARM1136EJ-S	ARMv6
ZTE Light Tab (ZTE V9)	512MiB RAM/512MiB ROM	32bit Qualcomm MSM7227	ARM1136EJ-S	ARMv6
ZTE Lutea (ZTE Blade)	512MiB RAM/512MiB ROM	32bit Qualcomm MSM7227	ARM1136EJ-S	ARMv6
ZTE Micromax A60 (ZTE Penguin)	512MiB ROM/	32bit Qualcomm MSM7227	ARM1136EJ-S	ARMv6
ZTE Style Q	512MiB RAM/512MiB ROM	32bit Qualcomm MSM7227	ARM1136EJ-S	ARMv6
ZTE Blade II	512MiB RAM/1024MiB ROM	32bit Qualcomm MSM7227A	ARM Cortex-A5	ARMv7-A
ZTE Blade III	512MiB RAM/3814MiB ROM	32bit Qualcomm MSM7227A	ARM Cortex-A5	ARMv7-A
ZTE Kis Lite	256MiB RAM/512MiB ROM	32bit Qualcomm MSM7227A	ARM Cortex-A5	ARMv7-A
ZTE Nova V6500	256MiB RAM/512MiB ROM	32bit Qualcomm MSM7227A	ARM Cortex-A5	ARMv7-A
ZTE Orbit	256MiB RAM/3814MiB ROM	32bit Qualcomm MSM7227A	ARM Cortex-A5	ARMv7-A
ZTE Skate Acqua	512MiB RAM/3814MiB ROM	32bit Qualcomm MSM7227A	ARM Cortex-A5	ARMv7-A
ZTE Amigo	256MiB RAM/512MiB ROM	32bit Qualcomm MSM7227T	ARM1136EJ-S	ARMv6
ZTE Atlas W	512MiB RAM/512MiB ROM	32bit Qualcomm MSM7227T	ARM1136EJ-S	ARMv6
ZTE Blade S (ZTE Crescent)	512MiB RAM/512MiB ROM	32bit Qualcomm MSM7227T	ARM1136EJ-S	ARMv6
ZTE Light Tab Pro (ZTE V9C)	512MiB RAM/512MiB ROM	32bit Qualcomm MSM7227T	ARM1136EJ-S	ARMv6
ZTE Skate	512MiB RAM/512MiB ROM	32bit Qualcomm MSM7227T	ARM1136EJ-S	ARMv6
ZTE Tureis	256MiB RAM/512MiB ROM	32bit Qualcomm MSM7227T	ARM1136EJ-S	ARMv6
ZTE Z665C Valet	512MiB RAM/3815MiB ROM	32bit Qualcomm MSM7625A	ARM Cortex-A5	ARMv7-A
ZTE R750	512MiB RAM/512MiB ROM	32bit Qualcomm MSM7627	ARM1136EJ-S	ARMv6
ZTE Score M X500M	512MiB RAM/1024MiB ROM	32bit Qualcomm MSM7627	ARM1136EJ-S	ARMv6
ZTE Score X500	512MiB RAM/1024MiB ROM	32bit Qualcomm MSM7627	ARM1136EJ-S	ARMv6
ZTE Goove X501	512MiB RAM/1024MiB ROM	32bit Qualcomm MSM7627A	ARM1136EJ-S	ARMv6
ZTE Render N859	512MiB RAM/3814MiB ROM	32bit Qualcomm MSM7627A	ARM1136EJ-S	ARMv6
ZTE Grand X Z777	1024MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon 200 MSM8210	2x ARM Cortex-A7	ARMv7-A
ZTE Kis 3	512MiB RAM/3815MiB ROM	32bit Qualcomm Snapdragon 200 MSM8210	2x ARM Cortex-A7	ARMv7-A
ZTE Z730 Concord II	1024MiB RAM/3815MiB ROM	32bit Qualcomm Snapdragon 200 MSM8210	2x ARM Cortex-A7	ARMv7-A
ZTE Zinger	512MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon 200 MSM8210	2x ARM Cortex-A7	ARMv7-A
ZTE Grand X MAX	1024MiB RAM/7629MiB ROM	32bit Qualcomm Snapdragon 200 MSM8212	4x ARM Cortex-A7	ARMv7-A
ZTE Blade V	512MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon 200 MSM8225Q	4x ARM Cortex-A5	ARMv7-A
ZTE Optik 2 V72C	1024MiB RAM/7630MiB ROM	32bit Qualcomm Snapdragon 200 MSM8625Q	4x ARM Cortex-A5	ARMv7-A
ZTE Sonata 4G Z740G	1024MiB RAM/3815MiB ROM	32bit Qualcomm Snapdragon 400 MSM8230	2x Qualcomm Krait 200	ARMv7
ZTE Z740 Radiant	1024MiB RAM/2080MiB ROM	32bit Qualcomm Snapdragon 400 MSM8230	2x Qualcomm Krait 200	ARMv7
ZTE A880	1024MiB RAM/7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
ZTE Blade Apex 2/Orange Hi 4G/KPN Smart 400	1024MiB RAM/7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU CORE	INSTRUCTIONS SET
ZTE Blade Vec 4G LTE-A/Soshphone 4G/Orange Rono/Turkcell T50	1024MiB RAM/15259MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
ZTE Grand Memo II LTE	2048MiB RAM/15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
ZTE Grand X MAX+ 4G LTE	2048MiB RAM/15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
ZTE Imperial II 4G LTE	1024MiB RAM/7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
ZTE MF97A Sprint LivePro Smart Projector	1024MiB RAM/3815MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
ZTE N9515 Warp Sync TD-LTE	2048MiB RAM/7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
ZTE Nubia 5S mini LTE NX405H	2048MiB RAM/15259MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
ZTE Q801L TD-LTE	1024MiB RAM/MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
ZTE Q801U TD-LTE	1024MiB RAM/3815MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
ZTE Q802T TD-LTE	1024MiB RAM/MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
ZTE V5 Red Bull TD-LTE 8GB	2048MiB RAM/7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
ZTE V9820 TD-LTE	2048MiB RAM/7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
ZTE Z830 Compel LTE-A	1024MiB RAM/3815MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
ZTE Z970 ZMax LTE-A	2048MiB RAM/15259MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
ZTE Blade G LTE	1024MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930	4x ARM Cortex-A7 Mpcore	ARMv7
ZTE Grand S Flex	1024MiB RAM/15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930	4x ARM Cortex-A7 Mpcore	ARMv7
ZTE N9101 Imperial LTE	1024MiB RAM/3815MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930	4x ARM Cortex-A7 Mpcore	ARMv7
ZTE N9510 Boost Warp 4G	1024MiB RAM/7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930	4x ARM Cortex-A7 Mpcore	ARMv7
ZTE N9510C	1024MiB RAM/7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930	4x ARM Cortex-A7 Mpcore	ARMv7
ZTE N9520 Boost Max LTE	1024MiB RAM/7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930	4x ARM Cortex-A7 Mpcore	ARMv7
ZTE Source N9511	1024MiB RAM/3815MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930	4x ARM Cortex-A7 Mpcore	ARMv7
ZTE Z995C Overture LTE	1024MiB RAM/3815MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930	4x ARM Cortex-A7 Mpcore	ARMv7
ZTE Z998 (ZTE Mustang)	1024MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930	4x ARM Cortex-A7 Mpcore	ARMv7
ZTE Grand Memo CDMA	2048MiB RAM/15258MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064T	4x Qualcomm Krait 400	ARMv7
ZTE Grand Memo V9815	1024MiB RAM/15258MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064T	4x Qualcomm Krait 400	ARMv7
ZTE Nubia Z5S mini LTE	2048MiB RAM/30518MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064T	4x Qualcomm Krait 400	ARMv7
ZTE Nubia Z5S mini LTE NX404H	2048MiB RAM/MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064T	4x Qualcomm Krait 400	ARMv7
ZTE Nubia Z5S mini NX403A	2048MiB RAM/15258MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064T	4x Qualcomm Krait 400	ARMv7
ZTE Grand S II CDMA P897A21	2048MiB RAM/15258MiB ROM	32bit Qualcomm Snapdragon 800 MSM8674 v1	4x Qualcomm Krait 400	ARMv7
ZTE MF97B SPro2 Smart Projector	2048MiB RAM/15258MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974 v1	4x Qualcomm Krait 400	ARMv7
ZTE Grand S II Dual S252	2048MiB RAM/15258MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
ZTE Grand S II LTE-A	2048MiB RAM/15258MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AB v2	4x Qualcomm Krait 400	ARMv7

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU CORE	INSTRUCTIONS SET
ZTE Grand S Pro N9835	2048MiB RAM/7629MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AB v2	4x Qualcomm Krait 400	ARMv7
ZTE Nubia Z5S LTE 32GB	2048MiB RAM/30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AB v2	4x Qualcomm Krait 400	ARMv7
ZTE Nubia Z5S LTE 64GB	2048MiB RAM/61035MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AB v2	4x Qualcomm Krait 400	ARMv7
ZTE Star S2005 TD-LTE	2048MiB RAM/15258MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AB v2	4x Qualcomm Krait 400	ARMv7
ZTE Nubia Z7 Mini Dual SIM TD-LTE NX507J	2048MiB RAM/15258MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AA v3	4x Qualcomm Krait 400	ARMv7
ZTE Nubia W5	3072MiB RAM/61035MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AB v3	4x Qualcomm Krait 400	ARMv7
ZTE Star 2 TD-LTE	2048MiB RAM/15259MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AB v3	4x Qualcomm Krait 400	ARMv7
ZTE Nubia Z7 Dual SIM TD-LTE NX506J	3072MiB RAM/30518MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
ZTE Nubia Z7 Max Dual SIM TD-LTE NX505J	2048MiB RAM/30518MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
ZTE Star S2004 TD-LTE	3072MiB RAM/15258MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
ZTE Light Tab 2 (ZTE V9 Plus)	512MiB RAM/512+3814MiB ROM	32bit Qualcomm Snapdragon S2 MSM8255	Qualcomm Scorpion	ARMv7
ZTE Light Tab 2 (ZTE V9A)	1024MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon S2 MSM8255	Qualcomm Scorpion	ARMv7
ZTE Tania (ZTE Spirit)	512MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon S2 MSM8255	Qualcomm Scorpion	ARMv7
ZTE Fury N850	512MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon S2 MSM8655	Qualcomm Scorpion	ARMv7
ZTE N810 Virgin Mobile Reef	1024MiB RAM/3815MiB ROM	32bit Qualcomm Snapdragon S2 MSM8655	Qualcomm Scorpion	ARMv7
ZTE Warp N860	512MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon S2 MSM8655	Qualcomm Scorpion	ARMv7
ZTE Engage/Nova 4.0 V8000	1024MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon S2 MSM8655T	Qualcomm Scorpion	ARMv7
ZTE Warp Sequent N861	768MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon S2 MSM8655T	Qualcomm Scorpion	ARMv7
ZTE Light Tab V9S	1024MiB RAM/15258MiB ROM	32bit Qualcomm Snapdragon S3 MSM8260	2x Qualcomm Scorpion	ARMv7
ZTE Anthem 4G N910	512MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon S3 MSM8660	2x Qualcomm Scorpion	ARMv7
ZTE Optik V55	1024MiB RAM/15258MiB ROM	32bit Qualcomm Snapdragon S3 MSM8660	2x Qualcomm Scorpion	ARMv7
ZTE Blade G V880G	512MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon S4 MSM8225	2x ARM Cortex-A5	ARMv7-A
ZTE Blade III Pro V889F	512MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon S4 MSM8225	2x ARM Cortex-A5	ARMv7-A
ZTE N8000 Engage LT	1024MiB RAM/3815MiB ROM	32bit Qualcomm Snapdragon S4 MSM8225	2x ARM Cortex-A5	ARMv7-A
ZTE V8300	512MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon S4 MSM8225	2x ARM Cortex-A5	ARMv7-A
ZTE Velox V72A	1024MiB RAM/3815MiB ROM	32bit Qualcomm Snapdragon S4 MSM8225	2x ARM Cortex-A5	ARMv7-A
ZTE N800 Awe	1024MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon S4 MSM8625	2x ARM Cortex-A5	ARMv7-A

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU CORE	INSTRUCTIONS SET
ZTE N8300	512MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon S4 MSM8625	2x ARM Cortex-A5	ARMv7-A
ZTE Z750C Savvy	768MiB RAM/3815MiB ROM	32bit Qualcomm Snapdragon S4 MSM8625	2x ARM Cortex-A5	ARMv7-A
ZTE Z795G Solar	768MiB RAM/3815MiB ROM	32bit Qualcomm Snapdragon S4 MSM8625	2x ARM Cortex-A5	ARMv7-A
ZTE Z796C Majesty	768MiB RAM/3815MiB ROM	32bit Qualcomm Snapdragon S4 MSM8625	2x ARM Cortex-A5	ARMv7-A
ZTE EasyTouch 4G T82	1024MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960	2x Qualcomm Krait	ARMv7
ZTE Flash N9500	1024MiB RAM/7630MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960	2x Qualcomm Krait	ARMv7
ZTE Grand Era LTE V9800	1024MiB RAM/7630MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960	2x Qualcomm Krait	ARMv7
ZTE Grand X LTE T82	1024MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960	2x Qualcomm Krait	ARMv7
ZTE N9810 Supreme (ZTE Quantum)	1024MiB RAM/7629MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960	2x Qualcomm Krait	ARMv7
ZTE N9810 Vital (ZTE Quantum)	1024MiB RAM/7629MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960	2x Qualcomm Krait	ARMv7
ZTE T81	1024MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960	2x Qualcomm Krait	ARMv7
ZTE N9120 Avid 4G	512MiB RAM/3814MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960 Lite	2x Qualcomm Krait	ARMv7
ZTE Grand S V988 (ZTE Athena)	2048MiB RAM/15258MiB ROM	32bit Qualcomm Snapdragon S4 Pro APQ8064	4x Qualcomm Krait	ARMv7
ZTE Nubia Z5 mini CDMA NX402	2048MiB RAM/15258MiB ROM	32bit Qualcomm Snapdragon S4 Pro APQ8064	4x Qualcomm Krait	ARMv7
ZTE N958st V5 Max TD-LTE Dual SIM	2048MiB RAM/15258MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
ZTE Q802C CDMA	1024MiB RAM/7629MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
ZTE Q802D Dual CDMA	1024MiB RAM/7629MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
ZTE Speed CDMA	1024MiB RAM/7629MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
ZTE V5 Max TD-LTE Dual SIM	1024MiB RAM/7629MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
ZTE V5S TD-LTE	1024MiB RAM/7629MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
ZTE G719C Dual SIM TD-LTE	2048MiB RAM/7629MiB ROM	64bit Qualcomm Snapdragon 615 MSM8939	8x ARM Cortex-A53 Mpcore	ARMv8 (A32, A64)
ZTE G720C Dual SIM TD-LTE	2048MiB RAM/15259MiB ROM	64bit Qualcomm Snapdragon 615 MSM8939	8x ARM Cortex-A53 Mpcore	ARMv8 (A32, A64)
ZTE S6 Plus	2048MiB RAM/15258MiB ROM	64bit Qualcomm Snapdragon 615 MSM8939	8x ARM Cortex-A53 Mpcore	ARMv8 (A32, A64)
ZTE e811	/128MiB ROM			
ZTE Mercury	/MiB ROM			

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU CORE	INSTRUCTIONS SET
ZTE N600 Racer (ZTE Link)	128MiB RAM/256MiB ROM			
ZTE N850L Director	512MiB RAM/3814MiB ROM			
ZTE S8Q 8GB	1024MiB RAM/7629MiB ROM			
ZTE X950 (ZTE Smooth)	/MiB ROM			

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

TABLE A.4 SAMSUNG

PRODUCT	MEMORY	PROCESSOR	CPU Core	Instruction Set(s)
5.1CH Blu-Ray Home Theater System				
A3LDV300F		ZORAN ZR36474BGCG		
A3LEKGN120		ARM DRIM IV Engine		
A3LEVNXF1		ARM		
A3LEX2F		ARM DRIM		
A3LNX30		ARM DRIM IV Engine		
A3LSH100		ZORAN ZR36474BGCG		
A3LWB850F		ARM DRIM III Engine		
CLP-300 Series		Samsung Samsung CorrusM 170MHz		
CLP-300/XSG		Samsung CHORUSm 300Mhz		
CLP-310 Series		Samsung Samsung 360 MHz		
CLP-310/315/310N		Jupiter 375MHz		
CLP-315/XAZ		Samsung CHORUS3 360MHz		
CLP-315W		Chorus 360MHz		
CLP-31x Series		Samsung Jupiter 375MHz (CLP-310/315/310N)		
CLP-320/325 Series		Samsung Jupiter5 (360MHz,CLP-320/325/320N/325W)		
CLP-510/CLP-510N		Samsung Samsung SPGPm 120Mhz, 32-bit RISC core (ARM 946ES)		
CLP-510/XBH		Samsung Samsung SPGPm 120Mhz, 32-bit RISC core (ARM 946ES)		
CLP-550		Motorola Motorola SPC603e 266MHz		
CLP-610ND		Samsung Samsung CHORUS3 300 MHz		
CLX-2160/XAA		Samsung Samsung CHORUSm 300 Mhz		
CLX-2160N		Samsung CHORUSm 300 MHz		
CLX-3175FN		Samsung CHORUS3 (360Mhz) Proprietary SOC		
GT-18150				
GT-18350				
GT-19300		166 MHz		
GT-C5130				
GT-I18190				
GT-i5510		1GHz		
GT-i9010				
GT-i9100		Exynos 1.2 GHz Cortex-A9		
GT-I9300				
GT-I9500				

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU Core	Instruction Set(s)
GT-N7000/N7000L Common		1.5 GHz Qualcomm MSM8660 Snapdragon SoC S3		
GT-S5570		Qualcomm MSM7227 Snapdragon		
GT-S5750E/S5753E		HSDPA 3.6 900(option)/2100MHz		
GT-S8600		Qualcomm MSM8255		
HT-C5200				
ML-1610/XBH		Samsung 150MHz Jupiter4e CPU		
ML-1630W		Samsung Samsung 150Mhz		
ML-1700 Series		Samsung Jupiter Samsung Jupiter4 90MHz		
ML-1700 Series		Samsung Samsung Jupiter4 90MHz/Samsung SPGPm 166MHz		
ML-2010		Jupiter4e		
ML-2015/XEV		Samsung 150MHz Jupiter4e CPU		
ML-2250 Series		166MHz SPGPm		
ML-2250 Series		166MHz SPGPm		
ML-2251NP				
ML-2-2851ND		Samsung Samsung 400MHz		
ML-2550 Series		SPGPi + Power PC 266 MHz		
ML-2571N/FEV		Samsung 150MHz Jupiter4e CPU 400MHz SPGP V3 CPU		
ML-2850 Series		Samsung SPGPv3		
ML-2850 Series		Samsung 400MHz processor		
ML-331x/ML-371x Series		Samsung Samsung 375MHz/Samsung 600 MHz		
ML-3550N		Motorola POWER PC 603EI		
ML-4550 Series		Marvell Marvell Ferocen 2850 ARM		
ProXpress M337x/M387x/407x series		600 MHz		
Chromebook 2 XE503C32	4096MiB RAM/ 15259MiB ROM	32bit Samsung Exynos 5 Octa 5800	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
EK-GC100 Galaxy Camera	1024MiB RAM/ 7630MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
EK-GC200 Galaxy Camera 2	2048MiB RAM/ 7630MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
ET-G900VMKA Galaxy S 5 Developer Edition (Pacific)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
Galaxy S III London Olympic Games Premium Edition	1024MiB RAM/ MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
Galaxy V Duos	512MiB RAM/ 3814MiB ROM			
GT-B5620 OmniaPRO 5/GT-B6520 Omnia 652	256MiB RAM/ 512MiB ROM	32bit ARM 1136JF-S	ARM11	ARMv6
GT-B7300 OmniaLITE (Buckingham)	256MiB RAM/ 512MiB ROM	32bit Samsung S3C6410	ARM1176JZF-S	ARMv6
GT-B7320 OmniaPRO	256MiB RAM/ 256MiB ROM	32bit Qualcomm MSM7225, 528MHz	ARM1136EJ-S	ARMv6
GT-B7320L OmniaPRO	256MiB RAM/ 256MiB ROM	32bit Qualcomm MSM7225, 528MHz	ARM1136EJ-S	ARMv6

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU Core	Instruction Set(s)
GT-B7330 OmniaPRO	256MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7225, 528MHz	ARM1136EJ-S	ARMv6
GT-B7350 OmniaPRO 4	256MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7227, 600MHz	ARM1136EJ-S	ARMv6
GT-B7510 Galaxy Pro	512MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7227T		
GT-B7610 OmniaPRO (Louvre)	256MiB RAM/ 512+1908MiB ROM	32bit Samsung S3C6410	ARM1176JZF-S	ARMv6
GT-B7620 Giorgio Armani	256MiB RAM/ 512+7630MiB ROM	32bit Samsung S3C6410	ARM1176JZF-S	ARMv6
GT-B7800 Galaxy M Pro	MiB ROM/ 2.7" 480x320 LCD			
GT-B7810	512MiB RAM/ MiB ROM			
GT-C6620	128MiB RAM/ 128MiB ROM	32bit STMicroelectronics Nomadik STn8810	ARM926EJ	ARMv5TE
GT-C6625 Valencia	128MiB RAM/ 256MiB ROM	32bit STMicroelectronics Nomadik STn8810	ARM926EJ	ARMv5TE
GT-C6625v	128MiB RAM/ 256MiB ROM	32bit STMicroelectronics Nomadik STn8810	ARM926EJ	ARMv5TE
GT-i5500 Galaxy 5/Corby Smartphone	256MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7227, 600MHz	ARM1136EJ-S	ARMv6
GT-i5500 Galaxy Europa	256MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7227, 600MHz	ARM1136EJ-S	ARMv6
GT-i5500M Galaxy Europa	256MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7227, 600MHz	ARM1136EJ-S	ARMv6
GT-i5510 Galaxy 551	512MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7227, 600MHz	ARM1136EJ-S	ARMv6
GT-i5510M Galaxy 551	512MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7227, 600MHz	ARM1136EJ-S	ARMv6
GT-i5700 Galaxy Portal	256MiB RAM/ 512MiB ROM	32bit Samsung S3C6410	ARM1176JZF-S	ARMv6
GT-i5700 Galaxy Spica	256MiB RAM/ 512MiB ROM	32bit Samsung S3C6410	ARM1176JZF-S	ARMv6
GT-i5800 Galaxy 3/Galaxy Taos	256MiB RAM/ 512MiB ROM	32bit Samsung S5P6422	ARM1176JZF-S	ARMv6
GT-i5800 Galaxy 580	256MiB RAM/ 512MiB ROM	32bit Samsung S5P6422	ARM1176JZF-S	ARMv6
GT-i5801 Galaxy Apollo/Galaxy Naos	256MiB RAM/ 512MiB ROM	32bit Samsung S5P6422	ARM1176JZF-S	ARMv6
GT-i6410 M1	256MiB RAM/ 1024MiB ROM	32bit Texas Instruments OMAP 3430	ARM Cortex-A8	ARMv7
GT-i7110	128MiB RAM/ 256MiB ROM	32bit Texas Instruments OMAP 2430	ARM1136	ARMv6
GT-i7500 Galaxy	192MiB RAM/ 7630MiB ROM	32bit Qualcomm MSM7200A	ARM1136EJ-S	ARMv6
GT-i7500L Galaxy	192MiB RAM/ 7630MiB ROM	32bit Qualcomm MSM7200A	ARM1136EJ-S	ARMv6
GT-i8000 Omnia II/GT-i8000H M8 8GB	256MiB RAM/ 512+7836MiB ROM	32bit Samsung S3C6410	ARM1176JZF-S	ARMv6
GT-i8000 Omnia II M16 16GB	256MiB RAM/ 512+15672MiB ROM	32bit Samsung S3C6410	ARM1176JZF-S	ARMv6
GT-i8000 Omnia II M2 2GB	256MiB RAM/ 512+1908MiB ROM	32bit Samsung S3C6410	ARM1176JZF-S	ARMv6
GT-i8000L Omnia II M16 16GB	256MiB RAM/ 15612MiB ROM	32bit Samsung S3C6410	ARM1176JZF-S	ARMv6
GT-i8000L Omnia II M8 8GB	256MiB RAM/ 7836MiB ROM	32bit Samsung S3C6410	ARM1176JZF-S	ARMv6
GT-i8000T Omnia Icon M8 8GB	256MiB RAM/ 512+7836MiB ROM	32bit Samsung S3C6410	ARM1176JZF-S	ARMv6
GT-i8000U M2 2GB	256MiB RAM/ 512+1908MiB ROM	32bit Samsung S3C6410	ARM1176JZF-S	ARMv6
GT-i8150 Galaxy W (Ancora)	512MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon S2 MSM8255T	Qualcomm Scorpion	ARMv7
GT-i8160 Galaxy Ace 2	768MiB RAM/ 3814MiB ROM			
GT-i8190 Galaxy S III Mini 8GB (Golden)	1024MiB RAM/ 7630MiB ROM	32bit ST-Ericsson NovaThor U8420	2x ARM Cortex-A9	ARMv7
GT-i8190 Galaxy S III Mini Crystal Edition (Golden)	1024MiB RAM/ 15258MiB ROM	32bit ST-Ericsson NovaThor U8420	2x ARM Cortex-A9	ARMv7
GT-i8190 Galaxy S III Mini NFC 16GB (Golden)	1024MiB RAM/ 15258MiB ROM	32bit ST-Ericsson NovaThor U8420	2x ARM Cortex-A9	ARMv7

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU Core	Instruction Set(s)
GT-i8190 Galaxy S III Mini NFC 8GB (Golden)	1024MiB RAM/ 7630MiB ROM	32bit ST-Ericsson NovaThor U8420	2x ARM Cortex-A9	ARMv7
GT-i8190L Galaxy S III Mini (Golden)	1024MiB RAM/ 7630MiB ROM	32bit ST-Ericsson NovaThor U8420	2x ARM Cortex-A9	ARMv7
GT-i8190T Galaxy S III Mini NFC 16GB (Golden)	1024MiB RAM/ 15258MiB ROM	32bit ST-Ericsson NovaThor U8420	2x ARM Cortex-A9	ARMv7
GT-i8260 Galaxy Core	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon S4 MSM8225	2x ARM Cortex-A5	ARMv7-A
GT-i8262/GT-i8262D Galaxy Core Duos	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon S4 MSM8225	2x ARM Cortex-A5	ARMv7-A
GT-i8320 Protector	256MiB RAM/ 15360MiB ROM	32bit Texas Instruments OMAP 3430	ARM Cortex-A8	ARMv7
GT-i8350 Omnia W (Wembley)	512MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon S2 MSM8255T	Qualcomm Scorpion	ARMv7
GT-i8510 INNOV8 16GB	128MiB RAM/ 256+15258MiB ROM	32bit Texas Instruments OMAP 2430	ARM1136	ARMv6
GT-i8510 INNOV8 8GB	128MiB RAM/ 256+7630MiB ROM	32bit Texas Instruments OMAP 2430	ARM1136	ARMv6
GT-i8510L 8GB	128MiB RAM/ 256+7630MiB ROM	32bit Texas Instruments OMAP 2430	ARM1136	ARMv6
GT-i8520 Galaxy Beam 16GB/Halo	384MiB RAM/ 512+15360MiB ROM	32bit Texas Instruments OMAP 3440	ARM Cortex-A8	ARMv7
GT-i8530 Galaxy Beam	768MiB RAM/ 7630MiB ROM	32bit ST-Ericsson NovaThor U8500	2x ARM Cortex-A9	ARMv7
GT-i8550 Galaxy Win	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 200 MSM8225Q	4x ARM Cortex-A5	ARMv7-A
GT-i8550L Galaxy Win	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 200 MSM8225Q	4x ARM Cortex-A5	ARMv7-A
GT-i8552 Galaxy Win Duos/Galaxy Grand Quattro	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 200 MSM8625Q	4x ARM Cortex-A5	ARMv7-A
GT-i8700 Omnia 7	512+7600MiB ROM	32bit Qualcomm Snapdragon S1 QSD8250	Qualcomm Scorpion	ARMv7
GT-i8730 Galaxy Express	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930	4x ARM Cortex-A7 Mpcore	ARMv7
GT-i8730T Galaxy Express	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930	4x ARM Cortex-A7 Mpcore	ARMv7
GT-i8750 Ativ S 16GB	1024MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon S4 MSM8260A	2x Qualcomm Krait	ARMv7
GT-i8750 Ativ S 32GB	1024MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon S4 MSM8260A	2x Qualcomm Krait	ARMv7
GT-i8910 16GB/Omnia HD	256MiB RAM/ 256+15258MiB ROM	32bit Texas Instruments OMAP 3430	ARM Cortex-A8	ARMv7
GT-i8910 HD 8GB	256MiB RAM/ 256+7630MiB ROM	32bit Texas Instruments OMAP 3430	ARM Cortex-A8	ARMv7
GT-i9000 Galaxy S 16GB	512MiB RAM/ 15600MiB ROM	32bit Samsung-Intrinsity S5PC110	Samsung Hummingbird	ARMv7
GT-i9000 Galaxy S 8GB	512MiB RAM/ 7800MiB ROM	32bit Samsung-Intrinsity S5PC110	Samsung Hummingbird	ARMv7
GT-i9000M Galaxy S Vibrant	512MiB RAM/ 15600MiB ROM	32bit Samsung-Intrinsity S5PC110	Samsung Hummingbird	ARMv7
GT-i9001 Galaxy S Plus/Galaxy S 2011 Edition	512MiB RAM/ 7800MiB ROM	32bit Qualcomm Snapdragon S2 MSM8255T	Qualcomm Scorpion	ARMv7
GT-i9003 Galaxy SL	512MiB RAM/ 15600MiB ROM	32bit Texas Instruments OMAP 3630	ARM Cortex-A8	ARMv7
GT-i9010 Giorgio Armani Galaxy S	512MiB RAM/ 15600MiB ROM	32bit Samsung-Intrinsity S5PC110	Samsung Hummingbird	ARMv7
GT-i9020A Nexus S (Soju)	512MiB RAM/ 15258MiB ROM	32bit Samsung S5PC111 Exynos 3110	ARM Cortex-A8	ARMv7
GT-i9020T Nexus S (Soju)	512MiB RAM/ 15258MiB ROM	32bit Samsung S5PC111 Exynos 3110	ARM Cortex-A8	ARMv7
GT-i9023 Nexus S (Soju)	512MiB RAM/ 1908+15258MiB ROM	32bit Samsung S5PC111 Exynos 3110	ARM Cortex-A8	ARMv7
GT-i9070 Galaxy S Advance	768MiB RAM/ 7630MiB ROM	32bit ST-Ericsson NovaThor U8500	2x ARM Cortex-A9	ARMv7
GT-i9070P Galaxy S Advance NFC	768MiB RAM/ 7630MiB ROM	32bit ST-Ericsson NovaThor U8500	2x ARM Cortex-A9	ARMv7
GT-i9100 Galaxy S II 16GB	1024MiB RAM/ 15600MiB ROM	32bit Samsung S5PC210 Exynos 4 Dual 4210	2x ARM Cortex-A9	ARMv7
GT-i9100 Galaxy S II 32GB	1024MiB RAM/ 31000MiB ROM	32bit Samsung S5PC210 Exynos 4 Dual 4210	2x ARM Cortex-A9	ARMv7
GT-i9100 Galaxy S2 Crystal Edition	1024MiB RAM/ 31000MiB ROM	32bit Samsung S5PC210 Exynos 4 Dual 4210	2x ARM Cortex-A9	ARMv7

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU Core	Instruction Set(s)
GT-i9100G Galaxy S II	1024MiB RAM/ 15600MiB ROM	32bit Texas Instruments OMAP 4430	2x ARM Cortex-A9	ARMv7
GT-i9100L Galaxy S II LATAM	1024MiB RAM/ 15600MiB ROM	32bit Samsung S5PC210 Exynos 4 Dual 4210	2x ARM Cortex-A9	ARMv7
GT-i9100M Galaxy S II CA	1024MiB RAM/ 15600MiB ROM	32bit Samsung S5PC210 Exynos 4 Dual 4210	2x ARM Cortex-A9	ARMv7
GT-i9100P Galaxy S II NFC	1024MiB RAM/ 15600MiB ROM	32bit Samsung S5PC210 Exynos 4 Dual 4210	2x ARM Cortex-A9	ARMv7
GT-i9100T Galaxy S II AU	1024MiB RAM/ 15600MiB ROM	32bit Samsung S5PC210 Exynos 4 Dual 4210	2x ARM Cortex-A9	ARMv7
GT-i9103 Galaxy Z/Galaxy R	1024MiB RAM/ 7630MiB ROM	32bit NVIDIA Tegra 2 250 AP20H	2x ARM Cortex-A9	ARMv7-A
GT-i9158 Galaxy Mega 5.8	1536MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930AB	2x Qualcomm Krait	ARMv7
GT-i9158V Galaxy Mega Plus 4G TD-LTE	2048MiB RAM/ 7630MiB ROM			
GT-i9190 Galaxy S4 Mini 16GB (Serrano)	1536MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8230AB	2x Qualcomm Krait	ARMv7
GT-i9190 Galaxy S4 Mini 8GB (Serrano)	1536MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8230AB	2x Qualcomm Krait	ARMv7
GT-i9190 Galaxy S4 Mini La Fleur Edition (Serrano)	1536MiB RAM/ MiB ROM	32bit Qualcomm Snapdragon 400 MSM8230AB	2x Qualcomm Krait	ARMv7
GT-i9192 Galaxy S4 Mini Duos (Serrano)	1536MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8230AB	2x Qualcomm Krait	ARMv7
GT-i9195 Galaxy S4 Mini Black Edition (Serrano)	1536MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930AB	2x Qualcomm Krait	ARMv7
GT-i9195 Galaxy S4 Mini LTE (Serrano)	1536MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930AB	2x Qualcomm Krait	ARMv7
GT-i9195 Galaxy S4 Mini LTE 16GB (Serrano)	1536MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930AB	2x Qualcomm Krait	ARMv7
GT-i9197 Galaxy S4 Mini TD-LTE (Serrano)	1536MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930AB	2x Qualcomm Krait	ARMv7
GT-i9200 Galaxy Mega 6.3 16GB	1536MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8230AB	2x Qualcomm Krait	ARMv7
GT-i9200 Galaxy Mega 6.3 8GB	1536MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8230AB	2x Qualcomm Krait	ARMv7
GT-i9200X Galaxy Mega 6.3	1536MiB RAM/ MiB ROM	32bit Qualcomm Snapdragon 400 MSM8230AB	2x Qualcomm Krait	ARMv7
GT-i9205 Galaxy Mega 6.3 LTE 16GB	1536MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930AB	2x Qualcomm Krait	ARMv7
GT-i9205 Galaxy Mega 6.3 LTE 8GB	1536MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930AB	2x Qualcomm Krait	ARMv7
GT-i9210 Galaxy S II LTE EU (Celox)	1024MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon S3 APQ8060	2x Qualcomm Scorpion	ARMv7
GT-i9210T Galaxy S II 4G AU (Celox)	1024MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon S3 APQ8060	2x Qualcomm Scorpion	ARMv7
GT-i9220 Galaxy Note 16GB	1024MiB RAM/ 15258MiB ROM	32bit Samsung S5PC210 Exynos 4 Dual 4210	2x ARM Cortex-A9	ARMv7
GT-i9220 Galaxy Note 32GB	1024MiB RAM/ 30518MiB ROM	32bit Samsung S5PC210 Exynos 4 Dual 4210	2x ARM Cortex-A9	ARMv7
GT-i9228 Galaxy Note	1024MiB RAM/ 15258MiB ROM	32bit Samsung S5PC210 Exynos 4 Dual 4210	2x ARM Cortex-A9	ARMv7
GT-i9230 Galaxy Golden	1536MiB RAM/ 15259MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930AB	2x Qualcomm Krait	ARMv7
GT-i9235 Galaxy Golden LTE	1536MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930AB	2x Qualcomm Krait	ARMv7
GT-i9250 Galaxy Nexus 16 GB/Prime (Yakju)	1024MiB RAM/ 15258MiB ROM	32bit Texas Instruments OMAP 4460	2x ARM Cortex-A9	ARMv7
GT-i9250 Galaxy Nexus 32GB/Prime (Yakju)	1024MiB RAM/ 30518MiB ROM	32bit Texas Instruments OMAP 4460	2x ARM Cortex-A9	ARMv7
GT-i9250M Galaxy Nexus (Yakju)	1024MiB RAM/ 15258MiB ROM	32bit Texas Instruments OMAP 4460	2x ARM Cortex-A9	ARMv7
GT-i9260 Galaxy Premier 16GB (Superior)	1024MiB RAM/ 15258MiB ROM	32bit Texas Instruments OMAP 4470	2x ARM Cortex-A9	ARMv7
GT-i9295 Galaxy S4 Active (Fortius)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064AB	4x Qualcomm Krait 300	ARMv7
GT-i9300 Galaxy S III 16GB/Galaxy S3	1024MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
GT-i9300 Galaxy S III 32GB	1024MiB RAM/ 30518MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU Core	Instruction Set(s)
GT-i9300 Galaxy S III 64GB	1024MiB RAM/ 61035MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
GT-i9300 Galaxy S III La Fleur Edition	1024MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
GT-i9300I Galaxy SIII Neo+ Duos/Galaxy S3 Neo	1536MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8226	4x ARM Cortex-A7 Mpcore	ARMv7
GT-i9300T Galaxy S III	1024MiB RAM/ 30518MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
GT-i9305 Galaxy S III LTE EU	2048MiB RAM/ MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
GT-i9305T Galaxy S III 4G	2048MiB RAM/ MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
GT-i9500 Galaxy S 4 16GB (Altius)	2048MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 5 Octa 5410	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
GT-i9500 Galaxy S4 32GB (Altius)	2048MiB RAM/ 30518MiB ROM	32bit Samsung Exynos 5 Octa 5410	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
GT-i9500 Galaxy S4 64GB (Altius)	2048MiB RAM/ 61035MiB ROM	32bit Samsung Exynos 5 Octa 5410	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
GT-i9500 Galaxy S4 Crystal Edition (Altius)	2048MiB RAM/ 61035MiB ROM	32bit Samsung Exynos 5 Octa 5410	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
GT-i9500 Galaxy S4 La Fleur Edition (Altius)	2048MiB RAM/ 61035MiB ROM	32bit Samsung Exynos 5 Octa 5410	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
GT-i9505 Galaxy S4 Black Edition 32GB (Altius)	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064AB	4x Qualcomm Krait 300	ARMv7
GT-i9505 Galaxy S4 LTE/Galaxy S IV LTE 64GB (Altius)	2048MiB RAM/ 61035MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064AB	4x Qualcomm Krait 300	ARMv7
GT-i9505 Galaxy S4 LTE 16GB (Altius)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064AB	4x Qualcomm Krait 300	ARMv7
GT-i9505 Galaxy S4 LTE 32GB (Altius)	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064AB	4x Qualcomm Krait 300	ARMv7
GT-i9505G Galaxy S4 LTE Google Play (Altius)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064AB	4x Qualcomm Krait 300	ARMv7
GT-i9506 Galaxy S4 with LTE+/Galaxy S4 Advance 16GB	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
GT-i9506 Galaxy S4 with LTE+/Galaxy S4 Advance 32GB	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
GT-i9507 Galaxy S4 TDD LTE (Altius)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064AB	4x Qualcomm Krait 300	ARMv7
GT-i9507V Galaxy S4 TD-LTE (Altius)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064AB	4x Qualcomm Krait 300	ARMv7
GT-i9515 Galaxy S4 Value Edition (Altius)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064AB	4x Qualcomm Krait 300	ARMv7
GT-i9515L Galaxy S4 Value Edition/S4 VE (Altius)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064AB	4x Qualcomm Krait 300	ARMv7
GT-N5100 Galaxy Note 8.0/Galaxy Note 510 16GB (Kona)	2048MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
GT-N5100 Galaxy Note 8.0 32GB (Kona)	2048MiB RAM/ 30518MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
GT-N5105 Galaxy Note 8.0 LTE 32GB (Kona)	2048MiB RAM/ 30518MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
GT-N5110 Galaxy Note 8.0 WiFi/Galaxy Note 511 16GB (Kona)	2048MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU Core	Instruction Set(s)
GT-N5110 Galaxy Note 8.0 WiFi 32GB (Kona)	2048MiB RAM/ 30518MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
GT-N5120 Galaxy Note 8.0 LTE 16GB (Kona)	2048MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
GT-N7000/GT-N7000B Galaxy Note 16GB	1024MiB RAM/ 15258MiB ROM	32bit Samsung S5PC210 Exynos 4 Dual 4210	2x ARM Cortex-A9	ARMv7
GT-N7000 Galaxy Note 32GB	1024MiB RAM/ 30518MiB ROM	32bit Samsung S5PC210 Exynos 4 Dual 4210	2x ARM Cortex-A9	ARMv7
GT-N7005 Galaxy Note LTE	1024MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon S3 APQ8060	2x Qualcomm Scorpion	ARMv7
GT-N7100 Galaxy Note II 16GB	2048MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
GT-N7100 Galaxy Note II 32GB	2048MiB RAM/ 30518MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
GT-N7100 Galaxy Note II 64GB	2048MiB RAM/ 61035MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
GT-N7105 Galaxy Note II LTE 32GB	2048MiB RAM/ 30518MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
GT-N7105T Galaxy Note II LTE	2048MiB RAM/ 30518MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
GT-N8000/GT-N8005 Galaxy Note 800 16GB	2048MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
GT-N8000 Galaxy Note 10.1 3G/GT-N8005 Galaxy Note 800 3G 32GB	2048MiB RAM/ 30518MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
GT-N8000 Galaxy Note 10.1 3G 64GB/GT-N8005	2048MiB RAM/ 61035MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
GT-N8010 Galaxy Note 10.1 WiFi/GT-N8013 32GB	2048MiB RAM/ 30518MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
GT-N8010 Galaxy Note 10.1 WiFi 64GB	2048MiB RAM/ 61035MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
GT-P1000 Galaxy Tab 7.0 16GB	512MiB RAM/ 15600MiB ROM	32bit Samsung-Intrinsity S5PC110	Samsung Hummingbird	ARMv7
GT-P1000 Galaxy Tab 7.0 32GB	512MiB RAM/ 31200MiB ROM	32bit Samsung-Intrinsity S5PC110	Samsung Hummingbird	ARMv7
GT-P1000N Galaxy Tab 7.0	512MiB RAM/ 15600MiB ROM	32bit Samsung-Intrinsity S5PC110	Samsung Hummingbird	ARMv7
GT-P1010 Galaxy Tab 7.0 Wi-Fi 16GB	512MiB RAM/ 15258MiB ROM	32bit Texas Instruments OMAP 3621	ARM Cortex-A8	ARMv7
GT-P3100 Galaxy Tab 2 7.0 3G 16GB	1024MiB RAM/ 15258MiB ROM	32bit Texas Instruments OMAP 4430	2x ARM Cortex-A9	ARMv7
GT-P3100 Galaxy Tab 2 7.0 3G 32GB	1024MiB RAM/ 30518MiB ROM	32bit Texas Instruments OMAP 4430	2x ARM Cortex-A9	ARMv7
GT-P3105 Galaxy Tab 2 7.0 3G 16GB	1024MiB RAM/ 15258MiB ROM	32bit Texas Instruments OMAP 4430	2x ARM Cortex-A9	ARMv7
GT-P3110 Galaxy Tab 2 7.0 WiFi 16GB	1024MiB RAM/ 30518MiB ROM	32bit Texas Instruments OMAP 4430	2x ARM Cortex-A9	ARMv7
GT-P3113 Galaxy Tab 2 7.0 WiFi 8GB	1024MiB RAM/ 7630MiB ROM	32bit Texas Instruments OMAP 4430	2x ARM Cortex-A9	ARMv7
GT-P5100 Galaxy Tab 2 10.1 16GB	1024MiB RAM/ 15258MiB ROM	32bit Texas Instruments OMAP 4430	2x ARM Cortex-A9	ARMv7
GT-P5100 Galaxy Tab 2 10.1 32GB	1024MiB RAM/ 30518MiB ROM	32bit Texas Instruments OMAP 4430	2x ARM Cortex-A9	ARMv7
GT-P5110 Galaxy Tab 2 10.1 WiFi 16GB	1024MiB RAM/ 15258MiB ROM	32bit Texas Instruments OMAP 4430	2x ARM Cortex-A9	ARMv7
GT-P6200 Galaxy Tab 7.0 Plus 16GB	1024MiB RAM/ 15258MiB ROM	32bit Samsung S5PC210 Exynos 4 Dual 4210	2x ARM Cortex-A9	ARMv7
GT-P6201 Galaxy Tab 7.0 Plus N 16GB	1024MiB RAM/ 15258MiB ROM	32bit Samsung S5PC210 Exynos 4 Dual 4210	2x ARM Cortex-A9	ARMv7
GT-P6210 Galaxy Tab 7.0 Plus WiFi 16GB	1024MiB RAM/ 15258MiB ROM	32bit Samsung S5PC210 Exynos 4 Dual 4210	2x ARM Cortex-A9	ARMv7
GT-P6211 Galaxy Tab 7.0 Plus N WiFi 16GB	1024MiB RAM/ 15258MiB ROM	32bit Samsung S5PC210 Exynos 4 Dual 4210	2x ARM Cortex-A9	ARMv7
GT-P6800 Galaxy Tab 7.7 64GB	1024MiB RAM/ 61035MiB ROM	32bit Samsung S5PC210 Exynos 4 Dual 4210	2x ARM Cortex-A9	ARMv7
GT-P6810 Galaxy Tab 7.7 WiFi 16GB	1024MiB RAM/ 15258MiB ROM	32bit Samsung S5PC210 Exynos 4 Dual 4210	2x ARM Cortex-A9	ARMv7
GT-P7100 Galaxy Tab 10.1v 16GB	1024MiB RAM/ 15600MiB ROM	32bit NVIDIA Tegra 2 250 T20	2x ARM Cortex-A9	ARMv7-A

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU Core	Instruction Set(s)
GT-P7300 Galaxy Tab 8.9 16GB/Galaxy Tab 730	1024MiB RAM/ 30518MiB ROM	32bit NVIDIA Tegra 2 250 T20	2x ARM Cortex-A9	ARMv7-A
GT-P7300 Galaxy Tab 8.9 32GB/Galaxy Tab 730	1024MiB RAM/ 30518MiB ROM	32bit NVIDIA Tegra 2 250 T20	2x ARM Cortex-A9	ARMv7-A
GT-P7310 Galaxy Tab 8.9 Wi-Fi 16GB	1024MiB RAM/ 15600MiB ROM	32bit NVIDIA Tegra 2 250 T20	2x ARM Cortex-A9	ARMv7-A
GT-P7320 Galaxy Tab 8.9 LTE 16GB	1024MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon S3 APQ8060	2x Qualcomm Scorpion	ARMv7
GT-P7500 Galaxy Tab 10.1 16GB/Galaxy Tab 750 (Arnold)	1024MiB RAM/ 15258MiB ROM	32bit NVIDIA Tegra 2 250 T20	2x ARM Cortex-A9	ARMv7-A
GT-P7500 Galaxy Tab 10.1 32GB (Arnold)	1024MiB RAM/ 30518MiB ROM	32bit NVIDIA Tegra 2 250 T20	2x ARM Cortex-A9	ARMv7-A
GT-P7500 Galaxy Tab 10.1 64GB (Arnold)	1024MiB RAM/ 62000MiB ROM	32bit NVIDIA Tegra 2 250 T20	2x ARM Cortex-A9	ARMv7-A
GT-P7501 Galaxy Tab 10.1N 16GB	1024MiB RAM/ 15258MiB ROM	32bit NVIDIA Tegra 2 250 T20	2x ARM Cortex-A9	ARMv7-A
GT-P7510 Galaxy Tab 10.1 Wi-Fi 16GB	1024MiB RAM/ 15600MiB ROM	32bit NVIDIA Tegra 2 250 T20	2x ARM Cortex-A9	ARMv7-A
GT-P7510 Galaxy Tab 10.1 Wi-Fi 32GB	1024MiB RAM/ 31000MiB ROM	32bit NVIDIA Tegra 2 250 T20	2x ARM Cortex-A9	ARMv7-A
GT-P7560 Galaxy Tab 7.0 Plus 16GB	1024MiB RAM/ 15258MiB ROM	32bit Samsung S5PC210 Exynos 4 Dual 4210	2x ARM Cortex-A9	ARMv7
GT-P7560 Galaxy Tab 7.0 Plus 32GB	1024MiB RAM/ 30518MiB ROM	32bit Samsung S5PC210 Exynos 4 Dual 4210	2x ARM Cortex-A9	ARMv7
GT-P8510 Ativ Tab 32GB	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon S4 APQ8060A	2x Qualcomm Krait	ARMv7
GT-P8510 Ativ Tab 64GB	2048MiB RAM/ 61035MiB ROM	32bit Qualcomm Snapdragon S4 APQ8060A	2x Qualcomm Krait	ARMv7
GT-S5283B Galaxy Star Trios	512MiB RAM/ 3815MiB ROM	32bit Qualcomm MSM7225A	ARM Cortex-A5	ARMv7-A
GT-S5570 Galaxy Mini	384MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7227, 600MHz	ARM1136EJ-S	ARMv6
GT-S5660 Galaxy Gio	512MiB ROM	32bit Qualcomm MSM7227T	ARM1136EJ-S	ARMv6
GT-S5670 Galaxy Fit	512MiB ROM	32bit Qualcomm MSM7227, 600MHz	ARM1136EJ-S	ARMv6
GT-S5830 Galaxy Ace (Cooper)	384MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7227T	ARM1136EJ-S	ARMv6
GT-S5830T Galaxy Ace (Cooper)	384MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7227T	ARM1136EJ-S	ARMv6
GT-S6310 Galaxy Young	768MiB RAM/ 3814MiB ROM	32bit Qualcomm MSM7227A	ARM Cortex-A5	ARMv7-A
GT-S6310N Galaxy Young	768MiB RAM/ 3814MiB ROM	32bit Qualcomm MSM7227A	ARM Cortex-A5	ARMv7-A
GT-S6312 Galaxy Young Duos	768MiB RAM/ 3814MiB ROM	32bit Qualcomm MSM7227A	ARM Cortex-A5	ARMv7-A
GT-S6313T Galaxy Young Duos TV	768MiB RAM/ 3814MiB ROM	32bit Qualcomm MSM7225A	ARM Cortex-A5	ARMv7-A
GT-S6500 Galaxy Mini 2 (Jena)	384MiB RAM/ 3814MiB ROM	32bit Qualcomm MSM7227A	ARM Cortex-A5	ARMv7-A
GT-S7260 Galaxy Star Pro	512MiB RAM/ 3815MiB ROM			
GT-S7262 Galaxy Star Pro Duos	512MiB RAM/ 3815MiB ROM			
GT-S7275/GT-S7275R Galaxy Ace 3 LTE	1024MiB RAM/ 7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930	4x ARM Cortex-A7 Mpcore	ARMv7
GT-S7500 Galaxy Ace Plus	512MiB RAM/ 2860MiB ROM	32bit Qualcomm MSM7227A	ARM Cortex-A5	ARMv7-A
GT-S7500L Galaxy Ace Plus	512MiB RAM/ 3814MiB ROM	32bit Qualcomm MSM7227A	ARM Cortex-A5	ARMv7-A
GT-S7530 Omnia M/GT-S7530E	384MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon S2 MSM8255	Qualcomm Scorpion	ARMv7
GT-S7530L Omnia M	384MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon S2 MSM8255	Qualcomm Scorpion	ARMv7
GT-S7562 Galaxy S Duos	768MiB RAM/ 3814MiB ROM	32bit Qualcomm MSM7227A	ARM Cortex-A5	ARMv7-A
GT-S7710 Galaxy Xcover 2	1024MiB RAM/ 3814MiB ROM	32bit ST-Ericsson NovaThor U8420	2x ARM Cortex-A9	ARMv7
GT-S8500 Wave 2GB	1908MiB ROM	32bit Samsung-Intrinsity S5PC110	Samsung Hummingbird	ARMv7
GT-S8500 Wave 8GB	7800MiB ROM	32bit Samsung-Intrinsity S5PC110	Samsung Hummingbird	ARMv7

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU Core	Instruction Set(s)
GT-S8530 Galaxy Ace Hugo Boss Edition (Cooper)	384MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7227T	ARM1136EJ-S	ARMv6
SCH-i100 Gem	256MiB RAM/ 512MiB ROM	32bit Samsung S3C6410	ARM1176JZF-S	ARMv6
SCH-i110 Illusion	512MiB RAM/ 2048MiB ROM	32bit Samsung S5PC111 Exynos 3110	ARM Cortex-A8	ARMv7
SCH-i200 Galaxy Stellar 4G (Jasper)	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon S3 APQ8060	2x Qualcomm Scorpion	ARMv7
SCH-i220 Code	128MiB RAM/ 128MiB ROM			
SCH-i225 Exec	128MiB RAM/ 256MiB ROM			
SCH-I400 Galaxy S Continuum	384MiB RAM/ 512+1908MiB ROM	32bit Samsung-Intrinsity S5PC110	Samsung Hummingbird	ARMv7
SCH-i405 Stratosphere 4G (Aegis)	512MiB RAM/ 3814MiB ROM	32bit Samsung S5PC111 Exynos 3110	ARM Cortex-A8	ARMv7
SCH-i405U Galaxy Metrix 4G (Aegis)	512MiB RAM/ MiB ROM	32bit Samsung S5PC111 Exynos 3110	ARM Cortex-A8	ARMv7
SCH-i415 Galaxy Stratosphere II	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960	2x Qualcomm Krait	ARMv7
SCH-I435 Galaxy S4 Mini LTE (Serrano)	1536MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930AB	2x Qualcomm Krait	ARMv7
SCH-I500 Galaxy S Fascinate	512MiB RAM/ 1908MiB ROM	32bit Samsung-Intrinsity S5PC110	Samsung Hummingbird	ARMv7
SCH-I500 Galaxy S Mesmerize	512MiB RAM/ 1908MiB ROM	32bit Samsung-Intrinsity S5PC110	Samsung Hummingbird	ARMv7
SCH-i510 Droid Charge 4G LTE (Stealth)	512MiB RAM/ 1908MiB ROM	32bit Samsung S5PC111 Exynos 3110	ARM Cortex-A8	ARMv7
SCH-i515 Galaxy Nexus (Prime)	1024MiB RAM/ 30518MiB ROM	32bit Texas Instruments OMAP 4460	2x ARM Cortex-A9	ARMv7
SCH-i545 Galaxy S4 (Altius)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064AB	4x Qualcomm Krait 300	ARMv7
SCH-i545 Galaxy S4 32GB (Altius)	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064AB	4x Qualcomm Krait 300	ARMv7
SCH-i545L Galaxy S4 LTE (Altius)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064AB	4x Qualcomm Krait 300	ARMv7
SCH-i605 Galaxy Note II LTE	2048MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
SCH-i705 Galaxy Tab 2 7.0 4G LTE	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960 Lite	2x Qualcomm Krait	ARMv7
SCH-I759 Galaxy Infinite	768MiB RAM/ 3815MiB ROM	32bit Qualcomm Snapdragon S4 MSM8625	2x ARM Cortex-A5	ARMv7-A
SCH-i760	64MiB RAM/ 128MiB ROM	32bit Samsung SC32442	ARM920T	ARMv4T
SCH-i770 Saga	128MiB RAM/ 256MiB ROM	32bit Qualcomm MSM7500	ARM1136EJ-S	ARMv6
SCH-i869 Galaxy Win	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 200 MSM8225Q	4x ARM Cortex-A5	ARMv7-A
SCH-i899	256MiB RAM/ 512MiB ROM			
SCH-i915 Galaxy Tab 2 10.1 4G	1024MiB RAM/ MiB ROM			
SCH-i920 Omnia II 8GB	256MiB RAM/ 512+7680MiB ROM	32bit Samsung S3C6410	ARM1176JZF-S	ARMv6
SCH-i925 Galaxy Note 10.1 LTE	2048MiB RAM/ MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
SCH-i925U Galaxy Note 10.1 LTE	2048MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
SCH-i930 Ativ S/Ativ Odyssey	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960	2x Qualcomm Krait	ARMv7
SCH-M620	64MiB RAM/ 128MiB ROM	32bit Texas Instruments OMAP 1710	ARM926TEJ	ARMv5TEJ
SCH-M828C Galaxy Precedent	384MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7627T	ARM1136EJ-S	ARMv6
SCH-P709 Galaxy Mega 5.8	1536MiB RAM/ 7630MiB ROM			
SCH-R530 Galaxy S III LTE	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960	2x Qualcomm Krait	ARMv7
SCH-R530M Galaxy S III LTE	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960	2x Qualcomm Krait	ARMv7
SCH-R680 Repp	512MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7627T	ARM1136EJ-S	ARMv6

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU Core	Instruction Set(s)
SCH-R720 Admire	512MiB ROM/ 3.5" 320x480 LCD	800MHz CPU		
SCH-R720 Vitality	512MiB RAM/ 512MiB ROM			
SCH-R730 Transfix	512MiB ROM/ 3.5" 320x480 LCD	32bit Qualcomm MSM7627T	ARM1136EJ-S	ARMv6
SCH-R760 Galaxy S II CDMA	1024MiB RAM/ 15258MiB ROM	32bit Samsung S5PC210 Exynos 4 Dual 4210	2x ARM Cortex-A9	ARMv7
SCH-R820 Galaxy Admire 4G	512MiB RAM/ 1908MiB ROM			
SCH-R830 Galaxy Axiom	768MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960 Lite	2x Qualcomm Krait	ARMv7
SCH-R860 Ativ Odyssey	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960	2x Qualcomm Krait	ARMv7
SCH-R880 Acclaim	512MiB ROM/ 3.2" 320x480 LCD	800MHz CPU		
SCH-R910 Galaxy Indulge/Forte	512MiB RAM/ 1908MiB ROM	32bit Samsung S5PC111 Exynos 3110	ARM Cortex-A8	ARMv7
SCH-R915 Indulge	512MiB RAM/ 1908MiB ROM	32bit Samsung S5PC111 Exynos 3110	ARM Cortex-A8	ARMv7
SCH-R920 Galaxy Attain 4G	512MiB RAM/ 1908MiB ROM	32bit Qualcomm Snapdragon S2 MSM8655	Qualcomm Scorpion	ARMv7
SCH-R930 Galaxy S Aviator (Stealth)	512MiB RAM/ 1908MiB ROM	32bit Samsung S5PC111 Exynos 3110	ARM Cortex-A8	ARMv7
SCH-R940 Galaxy S Lightray 4G (Stealth)	512MiB RAM/ 1908MiB ROM	32bit Samsung S5PC111 Exynos 3110	ARM Cortex-A8	ARMv7
SCH-R950 Galaxy Note II LTE	2048MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
SCH-R960 Galaxy Mega 6.3 LTE	1536MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930AB	2x Qualcomm Krait	ARMv7
SCH-R970 Galaxy S IV LTE (Altius)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064AB	4x Qualcomm Krait 300	ARMv7
SCH-R970C Galaxy S 4 LTE (Altius)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064AB	4x Qualcomm Krait 300	ARMv7
SCH-R970X Galaxy S4 LTE (Altius)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064AB	4x Qualcomm Krait 300	ARMv7
SCH-S720C Galaxy Proclaim	512MiB RAM/ 2048MiB ROM	32bit Samsung S5PC111 Exynos 3110	ARM Cortex-A8	ARMv7
SCH-S738C Galaxy Centura	512MiB RAM/ 3814MiB ROM	32bit Qualcomm MSM7625A	ARM Cortex-A5	ARMv7-A
SCH-W789 Galaxy Folder (Hennessy)	1024MiB RAM/ 7629MiB ROM	32bit Qualcomm Snapdragon 200 MSM8625Q	4x ARM Cortex-A5	ARMv7-A
SGH-D720	32MiB RAM/ 64MiB ROM	32bit Texas Instruments OMAP 5910	ARM925T (TI-enhanced)	ARMv5
SGH-D730	32MiB RAM/ 64MiB ROM	32bit Texas Instruments OMAP 5910	ARM925T (TI-enhanced)	ARMv5
SGH-G810	128MiB RAM/ 256MiB ROM	32bit Texas Instruments OMAP 2430	ARM1136	ARMv6
SGH-i187 Ativ S Neo (Cronus LTE)	1024MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930	4x ARM Cortex-A7 Mpcore	ARMv7
SGH-i200	64MiB RAM/ 128MiB ROM	32bit STMicroelectronics Nomadik STn8810	ARM926EJ	ARMv5TE
SGH-i257 Galaxy S4 Mini (Serrano)	1536MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930AB	2x Qualcomm Krait	ARMv7
SGH-i317 Galaxy Note II LTE	2048MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
SGH-i317M Galaxy Note II LTE	2048MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
SGH-i337 Galaxy S 4 LTE (Altius)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064AB	4x Qualcomm Krait 300	ARMv7
SGH-i337 Galaxy S 4 LTE 32GB (Altius)	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064AB	4x Qualcomm Krait 300	ARMv7
SGH-i337M Galaxy S 4 LTE (Altius)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064AB	4x Qualcomm Krait 300	ARMv7
SGH-i337Z Galaxy S 4 LTE (Altius)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064AB	4x Qualcomm Krait 300	ARMv7
SGH-i400	64MiB RAM/ 128MiB ROM	32bit Texas Instruments OMAP 2430	ARM1136	ARMv6
SGH-i437 Galaxy Express	768MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960	2x Qualcomm Krait	ARMv7
SGH-i450	64MiB RAM/ 128MiB ROM	32bit Texas Instruments OMAP 2431	ARM1136	ARMv6
SGH-i467 Galaxy Note 8.0 LTE (Kona)	2048MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU Core	Instruction Set(s)
SGH-i467M Galaxy Note 8.0 LTE (Kona)	2048MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
SGH-i497 Galaxy Tab 2 10.1	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960	2x Qualcomm Krait	ARMv7
SGH-i520/SGH-i520v	64MiB RAM/ 128MiB ROM	32bit Texas Instruments OMAP 2430	ARM1136	ARMv6
SGH-i527 Galaxy Mega 6.3 LTE	1536MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930AB	2x Qualcomm Krait	ARMv7
SGH-i527M Galaxy Mega 6.3 LTE	1536MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930AB	2x Qualcomm Krait	ARMv7
SGH-i537 Galaxy S 4 Active (Fortius)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064AB	4x Qualcomm Krait 300	ARMv7
SGH-i550	128MiB RAM/ 256MiB ROM	32bit Texas Instruments OMAP 2430	ARM1136	ARMv6
SGH-i550w	128MiB RAM/ 256MiB ROM	32bit Texas Instruments OMAP 2430	ARM1136	ARMv6
SGH-i560/SGH-i560v	128MiB RAM/ 256MiB ROM	32bit Texas Instruments OMAP 2430	ARM1136	ARMv6
SGH-i577 Galaxy Exhilarate	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon S3 MSM8260	2x Qualcomm Scorpion	ARMv7
SGH-i600 HSDPA	64MiB RAM/ 128MiB ROM	32bit Texas Instruments OMAP 1710	ARM926TEJ	ARMv5TEJ
SGH-i607 BlackJack	64MiB RAM/ 128MiB ROM	32bit Texas Instruments OMAP 1710	ARM926TEJ	ARMv5TEJ
SGH-i616	128MiB RAM/ 256MiB ROM	32bit Texas Instruments OMAP 2420	ARM1136	ARMv6
SGH-i617 BlackJack II	128MiB RAM/ 256MiB ROM	32bit Texas Instruments OMAP 2420	ARM1136	ARMv6
SGH-i617 Jack	128MiB RAM/ 256MiB ROM	32bit Texas Instruments OMAP 2420	ARM1136	ARMv6
SGH-i617T	128MiB RAM/ 256MiB ROM	32bit Texas Instruments OMAP 2420	ARM1136	ARMv6
SGH-i627 Propel Pro	128MiB RAM/ 256MiB ROM	32bit Qualcomm MSM7201A	ARM1136EJ-S	ARMv6
SGH-i637 Jack	256MiB RAM/ 256MiB ROM	32bit Qualcomm MSM7225, 528MHz	ARM1136EJ-S	ARMv6
SGH-i667 Focus 2 (Mandel)	512MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon S2 MSM8255T	Qualcomm Scorpion	ARMv7
SGH-i677 Focus Flash	512MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon S2 MSM8255T	Qualcomm Scorpion	ARMv7
SGH-i717 Galaxy Note LTE	1024MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon S3 APQ8060	2x Qualcomm Scorpion	ARMv7
SGH-i717D Galaxy Note	1024MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon S3 APQ8060	2x Qualcomm Scorpion	ARMv7
SGH-i727 Galaxy S II Skyrocket	1024MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon S3 APQ8060	2x Qualcomm Scorpion	ARMv7
SGH-i727R Galaxy SII LTE (Celox)	1024MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon S3 APQ8060	2x Qualcomm Scorpion	ARMv7
SGH-i747 Galaxy S III LTE	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960	2x Qualcomm Krait	ARMv7
SGH-i747M Galaxy S III LTE 16GB	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960	2x Qualcomm Krait	ARMv7
SGH-i747M Galaxy S III LTE 32GB	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960	2x Qualcomm Krait	ARMv7
SGH-i757M Galaxy SII HD LTE (Dali)	1024MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon S3 APQ8060	2x Qualcomm Scorpion	ARMv7
SGH-i777 Galaxy S II (Singa)	1024MiB RAM/ 15258MiB ROM	32bit Samsung S5PC210 Exynos 4 Dual 4210	2x ARM Cortex-A9	ARMv7
SGH-i777 Saga	128MiB RAM/ 256MiB ROM	32bit Qualcomm MSM7500	ARM1136EJ-S	ARMv6
SGH-i827 Galaxy Appeal	512MiB RAM/ 3814MiB ROM	32bit Qualcomm MSM7225A	ARM Cortex-A5	ARMv7-A
SGH-i827D Galaxy Ace Q	512MiB RAM/ 3814MiB ROM	32bit Qualcomm MSM7225A	ARM Cortex-A5	ARMv7-A
SGH-i847 Rugby Smart	512MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon S2 MSM8255T	Qualcomm Scorpion	ARMv7
SGH-i857 DoubleTime (Habrok)	256MiB RAM/ 1024MiB ROM	32bit Qualcomm MSM7227T	ARM1136EJ-S	ARMv6
SGH-i897 Galaxy S Captivate	512MiB RAM/ 15600MiB ROM	32bit Samsung-Intrinsity S5PC110	Samsung Hummingbird	ARMv7
SGH-i907 Epix	128MiB RAM/ 256MiB ROM	32bit Qualcomm MSM6260	ARM926EJ-S	ARMv5TEJ
SGH-i917 Focus (Cetus)	256MiB RAM/ 512+7630MiB ROM	32bit Qualcomm Snapdragon S1 QSD8250	Qualcomm Scorpion	ARMv7

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU Core	Instruction Set(s)
SGH-i927 Captivate Glide (Gidim)	1024MiB RAM/ 1024+7630MiB ROM	32bit NVIDIA Tegra 2 250 AP20H	2x ARM Cortex-A9	ARMv7-A
SGH-i937 Focus S (Kupua)	15258MiB ROM	32bit Qualcomm Snapdragon S2 MSM8255T	Qualcomm Scorpion	ARMv7
SGH-i957 Galaxy Tab 8.9 4G LTE 64GB	1024MiB RAM/ 61035MiB ROM	32bit NVIDIA Tegra 2 3D T25	2x ARM Cortex-A9	ARMv7-A
SGH-i987 Galaxy Tab 7.0	640MiB RAM/ 512+17166MiB ROM	32bit Samsung-Intrinsity S5PC110	Samsung Hummingbird	ARMv7
SGH-i997 Galaxy S Infuse 4G	512MiB RAM/ 15258MiB ROM	32bit Samsung-Intrinsity S5PC110	Samsung Hummingbird	ARMv7
SGH-i997R Galaxy S Infuse 4G	512MiB RAM/ 15258MiB ROM	32bit Samsung-Intrinsity S5PC110	Samsung Hummingbird	ARMv7
SGH-iT999 Galaxy S III	2048MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
SGH-L870	128MiB RAM/ 256MiB ROM	32bit STMicroelectronics Nomadik STn8815P14	ARM926EJ-S	ARMv5TEJ
SGH-M819N Galaxy Mega 6.3 LTE	1536MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930AB	2x Qualcomm Krait	ARMv7
SGH-M919 Galaxy S4 (Altius)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064AB	4x Qualcomm Krait 300	ARMv7
SGH-M919V Galaxy S4 (Altius)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064AB	4x Qualcomm Krait 300	ARMv7
SGH-N044 Galaxy Nexus SC-04D (Yakju SC)	1024MiB RAM/ 30518MiB ROM	32bit Texas Instruments OMAP 4460	2x ARM Cortex-A9	ARMv7
SGH-N075T Galaxy J	3072MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AB v2	4x Qualcomm Krait 400	ARMv7
SGH-S970G Galaxy S 4 LTE (Altius)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064AB	4x Qualcomm Krait 300	ARMv7
SGH-T399 Galaxy Light (Garda)	1024MiB RAM/ 7630MiB ROM			
SGH-T499 Dart (Tass)	384MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7227, 600MHz	ARM1136EJ-S	ARMv6
SGH-T499Y Galaxy Mini (Tass)	384MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7227, 600MHz	ARM1136EJ-S	ARMv6
SGH-T589 Gravity SMART/Gravity Touch 2	384MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7227, 600MHz	ARM1136EJ-S	ARMv6
SGH-T589R Galaxy Q	256MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7227, 600MHz	ARM1136EJ-S	ARMv6
SGH-T599 Galaxy Exhibit	1024MiB RAM/ 15258MiB ROM	32bit ST-Ericsson NovaThor U8420	2x ARM Cortex-A9	ARMv7
SGH-T679 Exhibit II 4G (Ancora)	512MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon S2 MSM8255	Qualcomm Scorpion	ARMv7
SGH-T679M Galaxy W 4G (Ancora)	512MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon S2 MSM8255	Qualcomm Scorpion	ARMv7
SGH-T759 Exhibit 4G	512MiB RAM/ 1024MiB ROM	32bit Samsung-Intrinsity S5PC110	Samsung Hummingbird	ARMv7
SGH-T779 Galaxy Tab 2 10.1 4G	1024MiB RAM/ MiB ROM	32bit Texas Instruments OMAP 4430	2x ARM Cortex-A9	ARMv7
SGH-T859 Galaxy Tab 10.1 4G 16GB (Arnold)	1024MiB RAM/ 15258MiB ROM	32bit NVIDIA Tegra 2 250 T20	2x ARM Cortex-A9	ARMv7-A
SGH-T879 Galaxy Note	1024MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon S3 APQ8060	2x Qualcomm Scorpion	ARMv7
SGH-T889 Galaxy Note 2 LTE	2048MiB RAM/ 30518MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
SGH-T889V Galaxy Note 2	2048MiB RAM/ MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
SGH-T899M Ativ S LTE	1024MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon S1 QSD8650	Qualcomm Scorpion	ARMv7
SGH-t939 Behold II	320MiB RAM/ 512MiB ROM			
SGH-T959 Galaxy S Vibrant	512MiB RAM/ 15600MiB ROM	32bit Samsung-Intrinsity S5PC110	Samsung Hummingbird	ARMv7
SGH-T959D Galaxy S Fascinate 3G+	512MiB RAM/ 15600MiB ROM	32bit Samsung-Intrinsity S5PC110	Samsung Hummingbird	ARMv7
SGH-T959P Fascinate 4G	512MiB RAM/ 1024MiB ROM	32bit Samsung-Intrinsity S5PC110	Samsung Hummingbird	ARMv7
SGH-T959V Galaxy S 4G	512MiB RAM/ 1024MiB ROM	32bit Samsung-Intrinsity S5PC110	Samsung Hummingbird	ARMv7
SGH-T989 Galaxy SII Plus (Hercules)	1024MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon S3 APQ8060	2x Qualcomm Scorpion	ARMv7
SGH-T989D Galaxy S II X (Hercules)	1024MiB RAM/ 15600MiB ROM	32bit Qualcomm Snapdragon S3 APQ8060	2x Qualcomm Scorpion	ARMv7
SGH-Z600	64MiB RAM/ 128MiB ROM	32bit Texas Instruments OMAP 5910	ARM925T (TI-enhanced)	ARMv5

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU Core	Instruction Set(s)
SM-A3009 Galaxy A3 Duos TD-LTE	1024MiB RAM/ 15259MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-A300F Galaxy A3 LTE	1024MiB RAM/ 15259MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-A300FU Galaxy A3 LTE	1024MiB RAM/ 15259MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-A300G Galaxy A3 Duos LTE	1024MiB RAM/ 15259MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-A300H Galaxy A3 HSPA	1024MiB RAM/ 15259MiB ROM			
SM-A300H/DS Galaxy A3 Duos HSPA	1024MiB RAM/ 15259MiB ROM			
SM-A300M Galaxy A3 LTE	1024MiB RAM/ 15259MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-A300Y Galaxy A3 LTE	1024MiB RAM/ 15259MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-A300YZ Galaxy A3 LTE	1024MiB RAM/ 15259MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-A500F Galaxy A5 LTE	2048MiB RAM/ 15258MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-A500FD Galaxy A5 Duos LTE	2048MiB RAM/ 15258MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-A500FU Galaxy A5 LTE	2048MiB RAM/ 15258MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-A500G Galaxy A5 Duos LTE	2048MiB RAM/ 15258MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-A500H Galaxy A5 HSPA	2048MiB RAM/ 15258MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-A500K Galaxy A5 LTE	2048MiB RAM/ 15258MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-A500L Galaxy A5 LTE	2048MiB RAM/ 15258MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-A500M Galaxy A5 TD-LTE	2048MiB RAM/ 15258MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-A500S Galaxy A5 LTE	2048MiB RAM/ 15258MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-A500Y Galaxy A5 LTE	2048MiB RAM/ 15258MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-A500YZ Galaxy A5 LTE	2048MiB RAM/ 15258MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32,

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU Core	Instruction Set(s)
				A64)
SM-A7000 Galaxy A7 Duos TD-LTE	2048MiB RAM/ 15258MiB ROM	64bit Qualcomm Snapdragon 615 MSM8939	8x ARM Cortex-A53 Mpcore	ARMv8 (A32, A64)
SM-A7009 Galaxy A7 Duos TD-LTE	2048MiB RAM/ 15258MiB ROM	64bit Qualcomm Snapdragon 615 MSM8939	8x ARM Cortex-A53 Mpcore	ARMv8 (A32, A64)
SM-A700F Galaxy A7 LTE-A	2048MiB RAM/ 15258MiB ROM	64bit Qualcomm Snapdragon 615 MSM8939	8x ARM Cortex-A53 Mpcore	ARMv8 (A32, A64)
SM-A700FD Galaxy A7 Duos LTE	2048MiB RAM/ 15258MiB ROM	64bit Qualcomm Snapdragon 615 MSM8939	8x ARM Cortex-A53 Mpcore	ARMv8 (A32, A64)
SM-A700H Galaxy A7 HSPA	2048MiB RAM/ 15258MiB ROM	64bit Samsung Exynos 5 Octa 5433	4x ARM Cortex-A57 MPcore + 4x ARM Cortex-A53 Mpcore	ARMv8-A (A32, A64)
SM-A700K Galaxy A7 LTE	2048MiB RAM/ 15258MiB ROM	64bit Qualcomm Snapdragon 615 MSM8939	8x ARM Cortex-A53 Mpcore	ARMv8 (A32, A64)
SM-A700L Galaxy A7 LTE	2048MiB RAM/ 15258MiB ROM	64bit Qualcomm Snapdragon 615 MSM8939	8x ARM Cortex-A53 Mpcore	ARMv8 (A32, A64)
SM-A700S Galaxy A7 LTE	2048MiB RAM/ 15258MiB ROM	64bit Qualcomm Snapdragon 615 MSM8939	8x ARM Cortex-A53 Mpcore	ARMv8 (A32, A64)
SM-A700YD Galaxy A7 Duos LTE	2048MiB RAM/ 15258MiB ROM	64bit Qualcomm Snapdragon 615 MSM8939	8x ARM Cortex-A53 Mpcore	ARMv8 (A32, A64)
SM-C101 Galaxy S4 Zoom/SM-C1010	1536MiB RAM/ 7630MiB ROM	32bit Samsung Exynos 4 Dual 4212	2x ARM Cortex-A9	ARMv7
SM-C105 Galaxy S4 Zoom LTE	1536MiB RAM/ 7630MiB ROM	32bit Samsung Exynos 4 Dual 4212	2x ARM Cortex-A9	ARMv7
SM-C105A Galaxy S4 Zoom LTE	1536MiB RAM/ 7630MiB ROM	32bit Samsung Exynos 4 Dual 4212	2x ARM Cortex-A9	ARMv7
SM-C111 Galaxy K zoom 3G	2048MiB RAM/ 7630MiB ROM	32bit Samsung Exynos 5 Hexa 5260	2x ARM Cortex-A15	ARMv7
SM-C115 Galaxy K zoom LTE-A	2048MiB RAM/ 7630MiB ROM	32bit Samsung Exynos 5 Hexa 5260	2x ARM Cortex-A15	ARMv7
SM-C115M Galaxy K zoom LTE-A	2048MiB RAM/ 7630MiB ROM	32bit Samsung Exynos 5 Hexa 5260	2x ARM Cortex-A15	ARMv7
SM-E500F/DS Galaxy E5 Duos 4G LTE	1536MiB RAM/ 15258MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-E700F/DS Galaxy E7 Duos 4G LTE	2048MiB RAM/ 15258MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-E700M/DS Galaxy E7 Duos 4G LTE	2048MiB RAM/ 15258MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-G110B Galaxy Pocket 2 Duos	512MiB RAM/ 3814MiB ROM	32bit ARM Cortex-A7 MPCore	2x ARM Cortex-A7	ARMv7-A
SM-G130E Galaxy Star 2 Duos	512MiB RAM/ 3815MiB ROM	32bit Spreadtrum SC6815A	ARM Cortex-A7 Mpcore	ARMv7-A
SM-G130H Galaxy Young 2 Duos	512MiB RAM/ 3814MiB ROM	32bit Spreadtrum SC6815A	ARM Cortex-A7 Mpcore	ARMv7-A
SM-G130HN Galaxy Young 2 Duos NFC	512MiB RAM/ 3814MiB ROM	32bit Spreadtrum SC6815A	ARM Cortex-A7 Mpcore	ARMv7-A
SM-G310A Galaxy Ace 4 LTE/SM-G310AZ	1024MiB RAM/ 3815MiB ROM			
SM-G310R5 GreatCall Touch3/Jitterbug Touch	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 200 MSM8610	2x ARM Cortex-A7	ARMv7-A

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU Core	Instruction Set(s)
3				
SM-G3139D Galaxy Ace 4 CDMA	1024MiB RAM/ 3815MiB ROM			
SM-G313H Galaxy Ace NXT Duos/SM-G313H/DS Galaxy Ace 4 Lite	512MiB RAM/ 3815MiB ROM	32bit Spreadtrum SC7715	ARM Cortex-A7	ARMv7-A
SM-G350E Galaxy Star Advance	512MiB RAM/ 3815MiB ROM			
SM-G3518 Galaxy Core TD-LTE	1024MiB RAM/ 7630MiB ROM			
SM-G3556D Galaxy Core 2 Duos	512MiB RAM/ 3815MiB ROM			
SM-G3558 Galaxy Core 2 TD	512MiB RAM/ 3815MiB ROM			
SM-G3559 Galaxy Core 2 CDMA	512MiB RAM/ 3815MiB ROM			
SM-G355H Galaxy Core 2 Duos	512MiB RAM/ 3815MiB ROM			
SM-G355HN Galaxy Core 2	768MiB RAM/ 3815MiB ROM			
SM-G3568V Galaxy Core Mini 4G TD-LTE	1536MiB RAM/ 7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
SM-G357FZ Galaxy Ace Style LTE/Galaxy Ace 4	1024MiB RAM/ 7630MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-G357M Galaxy Ace Style LTE/Galaxy Ace 4	1024MiB RAM/ 7630MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-G3586H Galaxy Core Lite 4G LTE	1024MiB RAM/ 7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
SM-G3586V Galaxy Core Lite 4G LTE	1024MiB RAM/ 7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
SM-G3588V Galaxy Core Lite 4G TD-LTE	1024MiB RAM/ 7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
SM-G360F Galaxy Core Prime LTE	1024MiB RAM/ 7629MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-G360G Galaxy Core Prime TD-LTE	1024MiB RAM/ 7629MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-G360GY Galaxy Core Prime TD-LTE	1024MiB RAM/ 7629MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-G360H/DS Galaxy Core Prime Duos	1024MiB RAM/ 7629MiB ROM	32bit Spreadtrum SC8830A	4x ARM Cortex-A7 Mpcore	ARMv7-A
SM-G360M Galaxy Core Prime TD-LTE	1024MiB RAM/ 7629MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-G360P Galaxy Prevail LTE/Galaxy Core Prime TD-LTE	1024MiB RAM/ 7629MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-G360V Galaxy Core Prime	1024MiB RAM/ 7629MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-G3815 Galaxy Express 2	1536MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930AB	2x Qualcomm Krait	ARMv7
SM-G3858 Galaxy Beam 2 TD	1024MiB RAM/ MiB ROM			
SM-G3868V	1536MiB RAM/ MiB ROM			
SM-G386F Galaxy Core LTE/Galaxy Core 4G (Afyon)	1024MiB RAM/ 7630MiB ROM			

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU Core	Instruction Set(s)
SM-G386T Galaxy Avant/SM-G386T1 (Afyon)	1536MiB RAM/ 15258MiB ROM			
SM-G510F Galaxy Core Max LTE	1024MiB RAM/ 7629MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-G5308 Galaxy Grand Prime TD-LTE (Fortuna)	1024MiB RAM/ 7629MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-G530FZ Galaxy Grand Prime Duos LTE (Fortuna)	1024MiB RAM/ 7629MiB ROM	64bit Qualcomm Snapdragon 410 MSM8216	4x ARM Cortex-A53 Mpcore	ARMv8 (A32, A64)
SM-G530H Galaxy Grand Prime Duos (Fortuna)	1024MiB RAM/ 7629MiB ROM	64bit Qualcomm Snapdragon 410 MSM8216	4x ARM Cortex-A53 Mpcore	ARMv8 (A32, A64)
SM-G530M Galaxy Grand Prime LTE (Fortuna)	1024MiB RAM/ 7629MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-G530Y Galaxy Grand Prime 4G LTE (Fortuna)	1024MiB RAM/ 7629MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-G7102 Galaxy Grand 2 Duos	1536MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8226	4x ARM Cortex-A7 Mpcore	ARMv7
SM-G7102T Galaxy Grand 2 Duos	1536MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8226	4x ARM Cortex-A7 Mpcore	ARMv7
SM-G7105 Galaxy Grand 2 LTE	1536MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
SM-G7105L Galaxy Grand 2 LTE	1536MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
SM-G720AX Galaxy Grand 3 LTE	1536MiB RAM/ 15258MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-G720N0 Galaxy Grand Max LTE	1536MiB RAM/ 15258MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
SM-G730A Galaxy S III Mini LTE	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960 Lite	2x Qualcomm Krait	ARMv7
SM-G730V Galaxy S III Mini LTE	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960 Lite	2x Qualcomm Krait	ARMv7
SM-G730W8 Galaxy S III Mini LTE	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960 Lite	2x Qualcomm Krait	ARMv7
SM-G750A Galaxy Mega 2 4G LTE (Vasta)	1536MiB RAM/ 15258MiB ROM			
SM-G750F Galaxy Mega 2 LTE-A (Vasta)	1536MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 4 Quad 4415	4x ARM Cortex-A9 Mpcore	ARMv7
SM-G750H Galaxy Mega 2 Duos (Vasta)	1536MiB RAM/ 7630MiB ROM	64bit Qualcomm Snapdragon 410 MSM8216	4x ARM Cortex-A53 Mpcore	ARMv8 (A32, A64)
SM-G800A Galaxy S5 Mini LTE-A (Atlantic)	1536MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 3 Quad 3470	4x ARM Cortex-A7 Mpcore	ARMv7
SM-G800F Galaxy S5 Dx LTE-A/Galaxy S5 Mini (Atlantic)	1536MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 3 Quad 3470	4x ARM Cortex-A7 Mpcore	ARMv7
SM-G800H Galaxy S5 Mini HSPA (Atlantic)	1536MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 3 Quad 3470	4x ARM Cortex-A7 Mpcore	ARMv7
SM-G800H/DS Galaxy S5 Mini Duos (Atlantic)	1536MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 3 Quad 3470	4x ARM Cortex-A7 Mpcore	ARMv7
SM-G800M Galaxy S5 Mini LTE-A (Atlantic)	1536MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 3 Quad 3470	4x ARM Cortex-A7 Mpcore	ARMv7
SM-G800R4 Galaxy S5 Mini LTE-A (Atlantic)	1536MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 3 Quad 3470	4x ARM Cortex-A7 Mpcore	ARMv7
SM-G800Y Galaxy S5 Mini LTE-A (Atlantic)	1536MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 3 Quad 3470	4x ARM Cortex-A7 Mpcore	ARMv7
SM-G850A Galaxy Alpha LTE-A	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU Core	Instruction Set(s)
SM-G850F Galaxy Alpha LTE-A/Galaxy Alpha 4G+	2048MiB RAM/ 30518MiB ROM	32bit Samsung Exynos 5 Octa 5430		
SM-G850T Galaxy Alpha LTE-A	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
SM-G860P Galaxy S5 Sport TD-LTE	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
SM-G870A Galaxy S5 Active LTE-A	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
SM-G870F Galaxy S5 Active LTE-A	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
SM-G870W Galaxy S5 Active LTE-A	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
SM-G9009D Galaxy S5 Duos (Pacific)	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
SM-G900A Galaxy S5 LTE-A (Pacific)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
SM-G900F Galaxy S5 LTE-A 16GB (Pacific)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
SM-G900FD Galaxy S5 Duos LTE-A (Pacific)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
SM-G900FG Galaxy S5 Google Play Edition (Pacific)	2048MiB RAM/ MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
SM-G900H Galaxy S5 HSPA 16GB (Pacific)	2048MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 5 Octa 5422	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-G900I Galaxy S5 4G LTE 16GB (Pacific)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
SM-G900M Galaxy S5 LTE-A (Pacific)	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
SM-G900MD Galaxy S5 Duos 4G LTE-A (Pacific)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
SM-G900P Galaxy S5 LTE-A (Pacific)	2048MiB RAM/ MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
SM-G900R4 Galaxy S5 LTE-A (Pacific)	2048MiB RAM/ MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
SM-G900R7 Galaxy S5 LTE-A (Pacific)	2048MiB RAM/ MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
SM-G900T Galaxy S5 LTE-A (Pacific)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
SM-G900V Galaxy S5 LTE-A (Pacific)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
SM-G900W8 Galaxy S5 LTE-A (Pacific)	2048MiB RAM/ MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
SM-G901F Galaxy S5 4G+ LTE-A/Galaxy S 5 Plus	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 805 APQ8084	4x Qualcomm Krait 450	ARMv7-A
SM-G9105 Galaxy Round LTE	3072MiB RAM/ MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AB v2	4x Qualcomm Krait 400	ARMv7
SM-N750 Galaxy Note 3 Neo 3G/Note3 Lite	2048MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 5 Hexa 5260	2x ARM Cortex-A15	ARMv7
SM-N7500Q Galaxy Note 3 Neo 3G	2048MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 5 Hexa 5260	2x ARM Cortex-A15	ARMv7
SM-N7502 Galaxy Note 3 Neo Duos	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8228	4x ARM Cortex-A7 Mpcore	ARMv7
SM-N7505 Galaxy Note 3 Neo LTE+	2048MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 5 Hexa 5260	2x ARM Cortex-A15	ARMv7
SM-N7505L Galaxy Note 3 Neo LTE+	2048MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 5 Hexa 5260	2x ARM Cortex-A15	ARMv7
SM-N7507 Galaxy Note 3 Neo 4G LTE	2048MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 5 Hexa 5260	2x ARM Cortex-A15	ARMv7
SM-N900 Galaxy Note 3 32GB/SM-N900X	3072MiB RAM/ 30518MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-N900 Galaxy Note 3 64GB	3072MiB RAM/ 61035MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-N9000Q Galaxy Note 3	3072MiB RAM/ 30518MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7	ARMv7

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU Core	Instruction Set(s)
			Mpcore	
SM-N9005 Galaxy Note 3 LTE 32GB	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AB v2	4x Qualcomm Krait 400	ARMv7
SM-N9005 Galaxy Note 3 Olympic Games Edition	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AB v2	4x Qualcomm Krait 400	ARMv7
SM-N9007 Galaxy Note3 TD-LTE	3072MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AB v2	4x Qualcomm Krait 400	ARMv7
SM-N900A Galaxy Note 3 LTE 32GB	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AB v2	4x Qualcomm Krait 400	ARMv7
SM-N900P Galaxy Note 3 LTE	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AB v2	4x Qualcomm Krait 400	ARMv7
SM-N900R4 Galaxy Note 3 LTE	3072MiB RAM/ MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AB v2	4x Qualcomm Krait 400	ARMv7
SM-N900T Galaxy Note 3 LTE	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AB v2	4x Qualcomm Krait 400	ARMv7
SM-N900U Galaxy Note 3 4G LTE 32GB	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AB v2	4x Qualcomm Krait 400	ARMv7
SM-N900V Galaxy Note 3 LTE	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AB v2	4x Qualcomm Krait 400	ARMv7
SM-N900W8 Galaxy Note 3 LTE	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AB v2	4x Qualcomm Krait 400	ARMv7
SM-N910A Galaxy Note 4 LTE-A (Muscat)	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 805 APQ8084 Pro	4x Qualcomm Krait 450	ARMv7-A
SM-N910F Galaxy Note 4 LTE-A (Muscat)	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 805 APQ8084 Pro	4x Qualcomm Krait 450	ARMv7-A
SM-N910G Galaxy Note 4 TD-LTE (Muscat)	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 805 APQ8084 Pro	4x Qualcomm Krait 450	ARMv7-A
SM-N910H Galaxy Note 4 HSPA (Muscat)	3072MiB RAM/ 30518MiB ROM	64bit Samsung Exynos 5 Octa 5433	4x ARM Cortex-A57 MPcore + 4x ARM Cortex-A53 Mpcore	ARMv8-A (A32, A64)
SM-N910P Galaxy Note 4 LTE-A (Muscat)	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 805 APQ8084 Pro	4x Qualcomm Krait 450	ARMv7-A
SM-N910R4 Galaxy Note 4 LTE-A (Muscat)	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 805 APQ8084 Pro	4x Qualcomm Krait 450	ARMv7-A
SM-N910T Galaxy Note 4 LTE-A (Muscat)	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 805 APQ8084 Pro	4x Qualcomm Krait 450	ARMv7-A
SM-N910U Galaxy Note 4 LTE-A (Muscat)	3072MiB RAM/ 30518MiB ROM	64bit Samsung Exynos 5 Octa 5433	4x ARM Cortex-A57 MPcore + 4x ARM Cortex-A53 Mpcore	ARMv8-A (A32, A64)
SM-N910V Galaxy Note 4 LTE-A (Muscat)	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 805 APQ8084 Pro	4x Qualcomm Krait 450	ARMv7-A
SM-N910VMKEVZW Galaxy Note 4 LTE-A Developer Edition (Muscat)	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 805 APQ8084 Pro	4x Qualcomm Krait 450	ARMv7-A
SM-N910W8 Galaxy Note 4 LTE-A (Muscat)	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 805 APQ8084 Pro	4x Qualcomm Krait 450	ARMv7-A
SM-N9150 Galaxy Note Edge TD-LTE	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 805 APQ8084 Pro	4x Qualcomm Krait 450	ARMv7-A
SM-N915A Galaxy Note Edge 4G LTE	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 805 APQ8084 Pro	4x Qualcomm Krait 450	ARMv7-A
SM-N915F Galaxy Note Edge LTE-A 32GB	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 805 APQ8084 Pro	4x Qualcomm Krait 450	ARMv7-A
SM-N915FY Galaxy Note Edge LTE Cat. 6	3072MiB RAM/ MiB ROM	32bit Qualcomm Snapdragon 805 APQ8084 Pro	4x Qualcomm Krait 450	ARMv7-A
SM-N915G Galaxy Note Edge TD-LTE	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 805 APQ8084 Pro	4x Qualcomm Krait 450	ARMv7-A
SM-N915P Galaxy Note Edge 4G TD-LTE	3072MiB RAM/ MiB ROM	32bit Qualcomm Snapdragon 805 APQ8084 Pro	4x Qualcomm Krait 450	ARMv7-A
SM-N915R4 Galaxy Note Edge 4G LTE	3072MiB RAM/ MiB ROM	32bit Qualcomm Snapdragon 805 APQ8084 Pro	4x Qualcomm Krait 450	ARMv7-A
SM-N915V Galaxy Note Edge XLTE	3072MiB RAM/ MiB ROM	32bit Qualcomm Snapdragon 805 APQ8084 Pro	4x Qualcomm Krait 450	ARMv7-A
SM-P600 Galaxy Note 10.1 2014 WiFi 16GB	3072MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-P600 Galaxy Note 10.1 2014 WiFi 32GB	3072MiB RAM/ 30518MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7	ARMv7

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU Core	Instruction Set(s)
			Mpcore	
SM-P600 Galaxy Note 10.1 2014 WiFi 64GB	3072MiB RAM/ 61035MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-P601 Galaxy Note 10.1 2014 3G 16GB	3072MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-P601 Galaxy Note 10.1 2014 3G 32GB	3072MiB RAM/ 30518MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-P601 Galaxy Note 10.1 2014 3G 64GB	3072MiB RAM/ 61035MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-P602 Galaxy Note 10.1 2014 Edition 3G	3072MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-P605 Galaxy Note 10.1 2014 LTE-A 16GB	3072MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
SM-P605 Galaxy Note 10.1 2014 LTE-A 32GB	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
SM-P605 Galaxy Note 10.1 2014 LTE-A 64GB	3072MiB RAM/ 61035MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
SM-P605M Galaxy Note 10.1 2014 LTE-A	3072MiB RAM/ MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
SM-P605V Galaxy Note 10.1 2014 LTE-A	3072MiB RAM/ MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
SM-P607T Galaxy Note 10.1 2014 LTE-A	3072MiB RAM/ MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
SM-P900 Galaxy NotePRO 12.2 WiFi 32GB	3072MiB RAM/ 30518MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-P900 Galaxy NotePRO 12.2 WiFi 64GB	3072MiB RAM/ 61035MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-P901 Galaxy NotePRO 12.2 3G 32GB	3072MiB RAM/ 30518MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-P901 Galaxy NotePRO 12.2 3G 64GB	3072MiB RAM/ 61035MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-P902 Galaxy NotePRO 12.2 3G	3072MiB RAM/ 30518MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-P905 Galaxy NotePRO 12.2 LTE-A 32GB	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
SM-P905 Galaxy NotePRO 12.2 LTE-A 64GB	3072MiB RAM/ 61035MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
SM-P905M Galaxy NotePRO 12.2 LTE-A	3072MiB RAM/ MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
SM-P905V Galaxy NotePRO 12.2 LTE-A 64GB	3072MiB RAM/ 61035MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
SM-P907A Galaxy NotePRO 12.2 LTE-A	3072MiB RAM/ MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
SM-R350 Gear Fit	/ MiB ROM			
SM-R380 Gear 2	512MiB RAM/ 3814MiB ROM	32bit Samsung Exynos 3 Dual 3250	2x ARM Cortex-A7	ARMv7
SM-R381 Gear 2 Neo	512MiB RAM/ 3814MiB ROM	32bit Samsung Exynos 3 Dual 3250	2x ARM Cortex-A7	ARMv7
SM-R382 Gear Live	512MiB RAM/ 3814MiB ROM			
SM-R750 Gear S 3G	512MiB RAM/ 3815MiB ROM	32bit ARM Cortex-A7 MPCore	2x ARM Cortex-A7	ARMv7-A

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU Core	Instruction Set(s)
SM-R750B Gear S 3G	512MiB RAM/ 3815MiB ROM	32bit ARM Cortex-A7 MPCore	2x ARM Cortex-A7	ARMv7-A
SM-R750D Gear S 3G	512MiB RAM/ 3815MiB ROM	32bit Qualcomm Snapdragon 400 MSM8226	4x ARM Cortex-A7 Mpcore	ARMv7
SM-R750P Gear S CDMA	512MiB RAM/ 3815MiB ROM	32bit ARM Cortex-A7 MPCore	2x ARM Cortex-A7	ARMv7-A
SM-R750R4 Gear S CDMA	512MiB RAM/ 3815MiB ROM	32bit ARM Cortex-A7 MPCore	2x ARM Cortex-A7	ARMv7-A
SM-R750V Gear S CDMA	512MiB RAM/ 3815MiB ROM	32bit ARM Cortex-A7 MPCore	2x ARM Cortex-A7	ARMv7-A
SM-S890L Galaxy S4 Mini LTE (Serrano)	1536MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930AB	2x Qualcomm Krait	ARMv7
SM-S975L Galaxy S 4 LTE (Altius)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064AB	4x Qualcomm Krait 300	ARMv7
SM-T215 Galaxy Tab 3 7.0 4G LTE	1536MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930AB	2x Qualcomm Krait	ARMv7
SM-T217A Galaxy Tab 3 7.0 4G LTE	1536MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930AB	2x Qualcomm Krait	ARMv7
SM-T217S Galaxy Tab 3 7.0 4G LTE	1536MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930AB	2x Qualcomm Krait	ARMv7
SM-T217T Galaxy Tab 3 7.0 4G LTE	1536MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930AB	2x Qualcomm Krait	ARMv7
SM-T237P Galaxy Tab4 7.0 LTE (Degas)	1024MiB RAM/ 7629MiB ROM			
SM-T2556 Galaxy TabQ/Galaxy Mega 7.0	1536MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
SM-T310 Galaxy Tab 3 8.0 WiFi 16GB	1536MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 4 Dual 4212	2x ARM Cortex-A9	ARMv7
SM-T310 Galaxy Tab 3 8.0 WiFi 32GB	1536MiB RAM/ 30518MiB ROM	32bit Samsung Exynos 4 Dual 4212	2x ARM Cortex-A9	ARMv7
SM-T311 Galaxy Tab 3 8.0 3G 16GB	1536MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 4 Dual 4212	2x ARM Cortex-A9	ARMv7
SM-T311 Galaxy Tab 3 8.0 3G 32GB	1536MiB RAM/ 30518MiB ROM	32bit Samsung Exynos 4 Dual 4212	2x ARM Cortex-A9	ARMv7
SM-T315 Galaxy Tab 3 8.0 LTE 16GB	1536MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 4 Dual 4212	2x ARM Cortex-A9	ARMv7
SM-T315T Galaxy Tab 3 8.0 LTE 16GB	1536MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 4 Dual 4212	2x ARM Cortex-A9	ARMv7
SM-T320 Galaxy TabPRO 8.4 WiFi/SM-T320X Galaxy Tab PRO 8.4 16GB	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 800 APQ8074 v1	4x Qualcomm Krait 400	ARMv7
SM-T320 Galaxy TabPRO 8.4 WiFi/SM-T320X Galaxy Tab PRO 8.4 32GB	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 APQ8074 v1	4x Qualcomm Krait 400	ARMv7
SM-T325 Galaxy TabPRO 8.4 LTE-A 16GB	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
SM-T325 Galaxy TabPRO 8.4 LTE-A 32GB	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
SM-T327A Galaxy TabPRO 8.4 LTE-A	2048MiB RAM/ MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
SM-T330 Galaxy Tab4 8.0 WiFi (Millet)	1536MiB RAM/ 15258MiB ROM	32bit ARM Cortex-A7 MPCore	2x ARM Cortex-A7	ARMv7-A
SM-T331 Galaxy Tab4 8.0 3G (Millet)	1536MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8226	4x ARM Cortex-A7 Mpcore	ARMv7
SM-T335 Galaxy Tab4 8.0 LTE-A (Millet)	1536MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
SM-T337A Galaxy Tab 4 8.0 LTE-A (Millet)	1536MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
SM-T337T Galaxy Tab 4 8.0 LTE (Millet)	1536MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
SM-T337V Galaxy Tab 4 8.0 LTE-A (Millet)	1536MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
SM-T360 Galaxy Tab Active WiFi	1536MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 APQ8026	4x ARM Cortex-A7 Mpcore	ARMv7
SM-T365 Galaxy Tab Active LTE-A	1536MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
SM-T520 Galaxy TabPRO 10.1 WiFi 16GB (Picasso)	2048MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-T520 Galaxy TabPRO 10.1 WiFi 32GB	2048MiB RAM/ 30518MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7	ARMv7

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU Core	Instruction Set(s)
(Picasso)			Mpcore	
SM-T525 Galaxy TabPRO 10.1 LTE-A 16GB (Picasso)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
SM-T525 Galaxy TabPRO 10.1 LTE-A 32GB (Picasso)	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
SM-T527P Galaxy TabPRO 10.1 TD-LTE (Picasso)	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
SM-T530 Galaxy Tab 4 Education	1536MiB RAM/ 15259MiB ROM	32bit ARM Cortex-A7 MPCore	2x ARM Cortex-A7	ARMv7-A
SM-T530 Galaxy Tab 4 NOOK 10.1	1536MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 APQ8026	4x ARM Cortex-A7 Mpcore	ARMv7
SM-T530 Galaxy Tab4 10.1 WiFi	1536MiB RAM/ 15258MiB ROM	32bit ARM Cortex-A7 MPCore	2x ARM Cortex-A7	ARMv7-A
SM-T531 Galaxy Tab4 10.1 3G	1536MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8226	4x ARM Cortex-A7 Mpcore	ARMv7
SM-T535 Galaxy Tab4 10.1 LTE-A	1536MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
SM-T537A Galaxy Tab4 10.1 LTE-A	1536MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
SM-T537R4 Galaxy Tab4 10.1 LTE-A	1536MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
SM-T537V Galaxy Tab4 10.1 XLTE	1536MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
SM-T700 Galaxy Tab S 8.4-inch WiFi 16GB (Klimt)	2048MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-T700 Galaxy Tab S 8.4-inch WiFi 32GB (Klimt)	2048MiB RAM/ 30518MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-T705 Galaxy Tab S 8.4-inch LTE-A 16GB (Klimt)	3072MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-T705 Galaxy Tab S 8.4-inch LTE-A 32GB (Klimt)	3072MiB RAM/ 30518MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-T705M Galaxy Tab S 8.4-inch LTE-A (Klimt)	3072MiB RAM/ 30518MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-T705Y Galaxy Tab S 8.4-inch LTE-A (Klimt)	3072MiB RAM/ MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-T707A Galaxy Tab S 8.4-inch LTE-A (Klimt)	3072MiB RAM/ MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-T707V Galaxy Tab S 8.4-inch XLTE (Klimt)	3072MiB RAM/ MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-T800 Galaxy Tab S 10.5-inch WiFi 16GB (Chagall)	3072MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-T800 Galaxy Tab S 10.5-inch WiFi 32GB (Chagall)	3072MiB RAM/ 30518MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-T805 Galaxy Tab S 10.5-inch LTE-A 16GB (Chagall)	3072MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU Core	Instruction Set(s)
SM-T805 Galaxy Tab S 10.5-inch LTE-A 32GB (Chagall)	3072MiB RAM/ 30518MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-T805M Galaxy Tab S 10.5-inch LTE-A (Chagall)	3072MiB RAM/ 30518MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-T805Y Galaxy Tab S 10.5-inch LTE-A (Chagall)	3072MiB RAM/ MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-T807A Galaxy Tab S 10.5-inch LTE-A (Chagall)	3072MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-T807P Galaxy Tab S 10.5-inch TD-LTE (Chagall)	3072MiB RAM/ 15258MiB ROM			
SM-T807R4 Galaxy Tab S 10.5-inch LTE-A (Chagall)	3072MiB RAM/ MiB ROM			
SM-T807T Galaxy Tab S 10.5-inch LTE-A (Chagall)	3072MiB RAM/ MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-T807V Galaxy Tab S 10.5-inch XLTE (Chagall)	3072MiB RAM/ 15258MiB ROM			
SM-T900 Galaxy TabPRO 12.2 WiFi 32GB	3072MiB RAM/ 30518MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-T900 Galaxy TabPRO 12.2 WiFi 64GB	3072MiB RAM/ 61035MiB ROM	32bit Samsung Exynos 5 Octa 5420	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
SM-T905 Galaxy TabPRO 12.2 LTE-A 32GB	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
SM-T905 Galaxy TabPRO 12.2 LTE-A 64GB	3072MiB RAM/ 61035MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
SM-V700 Galaxy Gear	512MiB RAM/ 3814MiB ROM			
SM-W750V Ativ SE (Huron)	2048MiB RAM/ 15259MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
SM-Z130H/DS Z1 Duos	768MiB RAM/ 3814MiB ROM	32bit Spreadtrum SC7727S	2x ARM Cortex-A7	ARMv7-A
SPH-D600 Conquer 4G	512MiB RAM/ 1024MiB ROM	32bit Qualcomm Snapdragon S2 MSM8655	Qualcomm Scorpion	ARMv7
SPH-D700 Galaxy S Epic 4G	512MiB RAM/ 512MiB ROM	32bit Samsung-Intrinsity S5PC110	Samsung Hummingbird	ARMv7
SPH-D710 Galaxy S II 4G (Within)	1024MiB RAM/ 15258MiB ROM	32bit Samsung S5PC210 Exynos 4 Dual 4210	2x ARM Cortex-A9	ARMv7
SPH-D710 Galaxy S2 Epic Touch 4G (Within)	1024MiB RAM/ 15258MiB ROM	32bit Samsung S5PC210 Exynos 4 Dual 4210	2x ARM Cortex-A9	ARMv7
SPH-D720 Nexus S 4G (Soju)	512MiB RAM/ 15258MiB ROM	32bit Samsung S5PC111 Exynos 3110	ARM Cortex-A8	ARMv7
SPH-i325 ACE	64MiB RAM/ 128MiB ROM	32bit Qualcomm MSM6500		
SPH-i350 Intrepid	256MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7600		
SPH-i800 Ativ S Neo (Cronus LTE)	1024MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930	4x ARM Cortex-A7 Mpcore	ARMv7
SPH-L300 Galaxy Victory 4G LTE (Gogh)	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960 Lite	2x Qualcomm Krait	ARMv7
SPH-L520 Galaxy S4 Mini TD-LTE (Serrano)	1536MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930AB	2x Qualcomm Krait	ARMv7
SPH-L600 Galaxy Mega 6.3 TD-LTE	1536MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930AB	2x Qualcomm Krait	ARMv7
SPH-L700 Galaxy Nexus 4G LTE (Prime)	1024MiB RAM/ 30518MiB ROM	32bit Texas Instruments OMAP 4460	2x ARM Cortex-A9	ARMv7

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU Core	Instruction Set(s)
SPH-L710 Galaxy S III LTE	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960	2x Qualcomm Krait	ARMv7
SPH-L710T Galaxy S III TD-LTE	2048MiB RAM/ 15258MiB ROM			
SPH-L720 Galaxy S4 (Altius)	2048MiB RAM/ MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064AB	4x Qualcomm Krait 300	ARMv7
SPH-L720T Galaxy S4 TD-LTE (Altius)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064AB	4x Qualcomm Krait 300	ARMv7
SPH-L900 Galaxy Note II LTE	2048MiB RAM/ 15258MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
SPH-M580 Replenish	512MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7627	ARM1136EJ-S	ARMv6
SPH-M6200 Ultra Messaging	64MiB RAM/ 128MiB ROM	32bit Texas Instruments OMAP 1710	ARM926TEJ	ARMv5TEJ
SPH-M820 Galaxy Prevail	384MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7627T	ARM1136EJ-S	ARMv6
SPH-M830 Galaxy Rush	768MiB RAM/ 1908MiB ROM	32bit Qualcomm MSM7627A	ARM1136EJ-S	ARMv6
SPH-M8400 Show OMNIA	256MiB RAM/ 512+3814MiB ROM	32bit Samsung S3C6410	ARM1176JZF-S	ARMv6
SPH-M900 Moment	288MiB RAM/ 512+64MiB ROM	32bit Samsung S3C6410	ARM1176JZF-S	ARMv6
SPH-M910 Intercept	256MiB RAM/ 512MiB ROM	32bit Samsung S3C6410	ARM1176JZF-S	ARMv6
SPH-M920 Transform	256MiB RAM/ 512MiB ROM	32bit Samsung S3C6410	ARM1176JZF-S	ARMv6
SPH-M930 Transform Ultra	512MiB RAM/ 1024MiB ROM	32bit Qualcomm Snapdragon S2 MSM8655	Qualcomm Scorpion	ARMv7
SPH-M950 Galaxy Reverb	768MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon S2 MSM8655T	Qualcomm Scorpion	ARMv7
SPH-P100 Galaxy Tab 7.0	640MiB RAM/ 512+1908MiB ROM	32bit Samsung-Intrinsity S5PC110	Samsung Hummingbird	ARMv7
SPH-P600 Galaxy Note 10.1 LTE	2048MiB RAM/ MiB ROM	32bit Samsung Exynos 4 Quad 4412	4x ARM Cortex-A9 Mpcore	ARMv7
SWD-M100 Mondi	256MiB RAM/ 3814MiB ROM			
YP-G1CW/YP-G1CB Galaxy S WiFi 4.0 8GB	512MiB RAM/ 7630MiB ROM	32bit Samsung-Intrinsity S5PC110	Samsung Hummingbird	ARMv7
YP-G1EW/YP-G1EB Galaxy S WiFi 4.0 16GB	512MiB RAM/ 15258MiB ROM	32bit Samsung-Intrinsity S5PC110	Samsung Hummingbird	ARMv7
YP-G70CW/YP-G70CB Galaxy S WiFi 5.0 8GB	512MiB RAM/ 7630MiB ROM	32bit Samsung-Intrinsity S5PC110	Samsung Hummingbird	ARMv7
YP-G70EW/YP-G70EB Galaxy S WiFi 5.0 16GB	512MiB RAM/ 15258MiB ROM	32bit Samsung-Intrinsity S5PC110	Samsung Hummingbird	ARMv7
YP-GI1CW/YP-GI1CB/Galaxy Player 4.2/Galaxy S WiFi 4.2 8GB	512MiB RAM/ 7630MiB ROM	32bit Samsung S5PC111 Exynos 3110	ARM Cortex-A8	ARMv7
YP-GI1EW/YP-GI1EB Galaxy Player 4.2 16GB	512MiB RAM/ 15258MiB ROM	32bit Samsung S5PC111 Exynos 3110	ARM Cortex-A8	ARMv7
YP-GP50 Galaxy Play 50/Galaxy Rossi 8GB	256MiB RAM/ 7800MiB ROM	32bit Samsung S3C6410	ARM1176JZF-S	ARMv6
YP-GP50 Galaxy Player 50/Galaxy Rossi 16GB	256MiB RAM/ 15600MiB ROM	32bit Samsung S3C6410	ARM1176JZF-S	ARMv6
YP-GS1CB/YP-GS1CW/Galaxy Player 3.6/Galaxy S WiFi 3.6 8GB	512MiB RAM/ 7630MiB ROM	32bit Texas Instruments OMAP 3620	ARM Cortex-A8	ARMv7
YP-GS1EB/YP-GS1EW Galaxy Player 3.6 16GB	512MiB RAM/ 15258MiB ROM	32bit Texas Instruments OMAP 3620	ARM Cortex-A8	ARMv7
Z SM-Z9005 (Redwood)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
SCX-4100		Samsung Samsung Chorus2 16Bit RISC		
SCX-4100		Samsung Chorus2 (16Bit RISC)		
SCX-4200		Samsung Chorus2 CPU : Use 16/32 Bit		
SCX-4216F Series				
SCX-4300 Series		Samsung 16/32 Bit RISC Processor) Chorus 2		
SCX-4521F Series		Samsung Chorus-2 (66MHz)		

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU Core	Instruction Set(s)
SCX-4824FN/XBH		Samsung Chorus3 360 MHz		
SCX-6345N/XAA		SPGPv3(400MHz) + CIP4e		
SCX-6345N/XEE		SPGPv3(400MHz) + CIP4e		
SCX-6545N		Orion Orion2(500MHz) + CIP5+Hyper3		
SF-565P		SPGPm		
SF-565PR/XIP		SPGP		
SF-6800		?? ??		
sgh-I770				
SGH-S100				
SGH-T400				
SGH-X400				
SGH-X700				
SGH-Z240				
SRP-270				
SRP-350				
SS-1450		66 MHz		

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

TABLE A.5: NOVATEL

PRODUCT	TRADE NAME	PROCESSOR	PRIMARY CPU	INSTRUCTION SET
PKRNVWE396	Expedite E396	Qualcomm Gobi 3000		
NBZNRM-MC545	Ovation MC545	Qualcomm MDM8__		
PKRNVWMC679	Ovation MC679	Qualcomm MDM9200	Cortex A5	ARMv7
PKRNVWE371	Expedite E371	Qualcomm MDM9200	Cortex A5	ARMv7
PKRNVWMIFI5792	MiFi 5792/MiFi 2 LTE Touchscreen Mobile Hotspot	Qualcomm MDM9215	Cortex A5	ARMv7
PKRNVWMC551	Ovation MC551	Qualcomm MDM9600	Cortex A5	ARMv7
PKRNVWE362	Expedite E362	Qualcomm MDM9600	Cortex A5	ARMv7
PKRNVWMC551S	MC551S USB Modem	Qualcomm MDM9600	Cortex A5	ARMv7
PKRNVWMIFI5510	MiFi 5510 3G/4G Mobile Hotspot	Qualcomm MDM9615	Cortex A5	ARMv7
PKRNVWMIFI5580	MiFi 500 LTE Mobile Hotspot	Qualcomm MDM9615	Cortex A5	ARMv7
PKRNVWMIFI6620	PKRNVWMIFI6621	Qualcomm MDM9625	Cortex A5	ARMv7
PKRNVWMIFI4082	MiFi 4082 3G/4G Mobile Hotspot	Qualcomm MSM----		
NBZNRM-MIFI3352	MiFi 3352 3G Mobile Hotspot	Qualcomm MSM7225	ARM1136EJ-S	ARMv6
NBZNRM-MIFI2352R	MiFi 2352	Qualcomm MSM7225	ARM1136EJ-S	ARMv6
NBZNRM-MIFI2372R	MiFi 2372	Qualcomm MSM7225	ARM1136EJ-S	ARMv6
PKRNVWMIFI4510	MiFi 4510 3G/4G Mobile Hotspot	Qualcomm MSM9600	Cortex A5	ARMv7
PKRNVWMIFI4620	MiFi 4620L 3G/4G Mobile Hotspot	Qualcomm MSM9600	Cortex A5	ARMv7
PKRNVWGSM0508	Expedite L10-G	Mediatek MT6250D		
NBZNRM-MC547	Ovation MC547	Qualcomm PM8026		
PKRNVWMC760	Ovation MC760	Qualcomm QSC6066		
PKRNVWMIFI2200	MiFi 2200 3G Mobile Hotspot	Qualcomm QSC6085		
PKRNVWCC760	Merlin CC760/C777	Qualcomm QSC6085		
PKRNVWMC550	MC550 Modem	Qualcomm QSC6085		

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

TABLE A.6: LG

PRODUCT	MEMORY	PROCESSOR	CPU CORE	INSTRUCTION SET(S)
22LY340C				
26LT670H				
29LY340C				
32LD650H				
32LD655H				
32LD665H				
32LH250H				
32LH255H				
32LM6200				
32LN541C				
32LN549E				
32LN5700		Dual Core Processor		
32LN5700		Dual Core Processor		
32LT560E				
32LT670H				
32LV555H				
32LY340C				
32LY750H				
37LD650H				
37LD655H				
37LD665H				
37LT560E				
37LT670H				
37LT770H				
37LV555H				
39LN549E				
39LN5700		Dual Core Processor		
39LY340C				
39LY750H				
42CQ610H				
42GA6400		Dual Core Processor		
42GA6400		Dual Core Processor		
42LA6200		Dual Core Processor		
42LB6300				
42LD650H				

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU CORE	INSTRUCTION SET(S)
42LD655H				
42LD665H				
42LM6200				
42LN541C				
42LN549E				
42LN5700		Dual Core Processor		
42LT560E				
42LT670H				
42LT770H				
42LV555H				
42LY340C				
42LY750H				
42PM4700				
47G2		LG L9 Dual Core Processor		
47LA6900		Dual Core Processor		
47LA7400		Dual Core Processor		
47LB6300				
47LD650H				
47LM6200				
47LM6700				
47LM8600				
47LM9600				
47LN541C				
47LN549E				
47LN5750		Dual Core Processor		
47LN5790		Dual Core Processor		
47LT560E				
47LT770H				
47LV555H				
47LY340C				
47LY750H				
50LA6200		Dual Core Processor		
50LA6970		Dual Core Processor		
50LB6300				
50LN5600		Dual Core Processor		
50PM4700				
50PM6700				

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU CORE	INSTRUCTION SET(S)
50PM9700				
50PM9700				
55EA8800				
55EA9800		Dual Core Processor		
55GA6450		Dual Core Processor		
55GA7900		Dual Core Processor		
55LA6200		Dual Core Processor		
55LA8600		Dual Core Processor		
55LA9650		Dual Core Processor		
55LA9700		Dual Core Processor		
55LB6300				
55LD650H				
55LM6200				
55LM6700				
55LM8600		Dual Core Processor		
55LM9600				
55LN541C				
55LN549E				
55LN5600		Dual Core Processor		
55LS675H				
55LV555H				
55LY340C				
55LY750H				
60LA8600		Dual Core Processor		
60LB6300				
60LM7200				
60LN5400				
60LN549E				
60LS5700				
60LS5750				
60LY340C				
60PH6700				
60PM6700				
60PM9700				
60PM9700				
65LA9650		Dual Core Processor		
65LA9700		Dual Core Processor		

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU CORE	INSTRUCTION SET(S)
65LB6300				
65LM6200				
65LY340C				
84LM9600		Dual Core Processor		
BD670				
BD690				
BD690				
LG Ally VS740	256MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7627	ARM1136EJ-S	ARMv6
LG Arena KM900	128MiB RAM/ 256+7630MiB ROM			
LG AS680 Optimus 2	512MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7627T	ARM1136EJ-S	ARMv6
LG AS695 Optimus Plus	512MiB RAM/ 3814MiB ROM	32bit Qualcomm MSM7627A	ARM1136EJ-S	ARMv6
LG AS740 Axis	256MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7627	ARM1136EJ-S	ARMv6
LG AS876 F90 LTE	1024MiB RAM/ 7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
LG au Fx0 LGL25	1536MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
LG C550 Optimus Chat	512MiB RAM/ MiB ROM	32bit Qualcomm MSM7227	ARM1136EJ-S	ARMv6
LG C570 Hotmail Phone/C570g	128MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7225	ARM1136EJ-S	ARMv6
LG C660 Optimus Pro	256MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7227T	ARM1136EJ-S	ARMv6
LG C729 DoublePlay	512MiB RAM/ 1908MiB ROM	32bit Qualcomm Snapdragon S2 MSM8255	Qualcomm Scorpion	ARMv7
LG C800G Eclypse 4G	512MiB RAM/ 1024MiB ROM	32bit Qualcomm Snapdragon S2 MSM8255	Qualcomm Scorpion	ARMv7
LG C900 Optimus 7Q (LG Pacific)	256MiB RAM/ 512+15258MiB ROM	32bit Qualcomm Snapdragon S1 QSD8250	Qualcomm Scorpion	ARMv7
LG C900k Quantum (LG Pacific)	256MiB RAM/ 512+15258MiB ROM	32bit Qualcomm Snapdragon S1 QSD8250	Qualcomm Scorpion	ARMv7
LG D100 L Series III L20	512MiB RAM/ 3814MiB ROM	32bit MediaTek MT6572M	2x ARM Cortex-A7	ARMv7
LG D105 L Series III L20 Dual	512MiB RAM/ 3814MiB ROM	32bit MediaTek MT6572M	2x ARM Cortex-A7	ARMv7
LG D120 L Series III L30 Sporty	512MiB RAM/ 3814MiB ROM	32bit MediaTek MT6572M	2x ARM Cortex-A7	ARMv7
LG D125 L Series III L30 Dual	512MiB RAM/ 3814MiB ROM	32bit MediaTek MT6572M	2x ARM Cortex-A7	ARMv7
LG D150 L Series III L35	512MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon 200 MSM8210	2x ARM Cortex-A7	ARMv7-A
LG D160 L Series III L40/D160TR L40	512MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon 200 MSM8210	2x ARM Cortex-A7	ARMv7-A
LG D160F L Series III L40	512MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon 200 MSM8210	2x ARM Cortex-A7	ARMv7-A
LG D170 L Series III L40 Dual	512MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon 200 MSM8210	2x ARM Cortex-A7	ARMv7-A
LG D213N L Series III L50 Sporty	512MiB RAM/ 3814MiB ROM	32bit MediaTek MT6572	2x ARM Cortex-A7	ARMv7
LG D227 L Series III L50 Sporty TV Dual	512MiB RAM/ 3814MiB ROM	32bit MediaTek MT6572	2x ARM Cortex-A7	ARMv7
LG D280N L Series III L65	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon 200 MSM8210	2x ARM Cortex-A7	ARMv7-A
LG D285 L Series III L65 Dual	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon 200 MSM8210	2x ARM Cortex-A7	ARMv7-A
LG D290 L Fino	1024MiB RAM/ 3815MiB ROM	32bit Qualcomm Snapdragon 200 MSM8212	4x ARM Cortex-A7	ARMv7-A
LG D290N L Fino	1024MiB RAM/ 3815MiB ROM	32bit Qualcomm Snapdragon 200 MSM8212	4x ARM Cortex-A7	ARMv7-A
LG D295 G2 Lite Dual/D295f L Fino	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon 200 MSM8212	4x ARM Cortex-A7	ARMv7-A
LG D300 Fireweb	512MiB RAM/ 3814MiB ROM	32bit Qualcomm MSM7227A	ARM Cortex-A5	ARMv7-A

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU CORE	INSTRUCTION SET(S)
LG D315 F70 LTE	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
LG D315K F70 TD-LTE	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
LG D320 L Series III L70/D320TR L70 (LG W5)	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon 200 MSM8210	2x ARM Cortex-A7	ARMv7-A
LG D320F8/D320G8 L Series III L70 (LG W5)	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon 200 MSM8210	2x ARM Cortex-A7	ARMv7-A
LG D320N L Series III L70 (LG W5)	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon 200 MSM8210	2x ARM Cortex-A7	ARMv7-A
LG D325 L Series III L70 Dual (LG W5)	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon 200 MSM8210	2x ARM Cortex-A7	ARMv7-A
LG D329 L Series III L70 (LG W5)	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon 200 MSM8210	2x ARM Cortex-A7	ARMv7-A
LG D331 L Bello	1024MiB RAM/ 7629MiB ROM	32bit MediaTek MT6582	4x ARM Cortex-A7 Mpcore	ARMv7
LG D335 L Bello Dual	1024MiB RAM/ 7629MiB ROM	32bit MediaTek MT6582	4x ARM Cortex-A7 Mpcore	ARMv7
LG D337 L Prime Dual	1024MiB RAM/ 7629MiB ROM	32bit MediaTek MT6582	4x ARM Cortex-A7 Mpcore	ARMv7
LG D340 L Series III L70 Tri	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon 200 MSM8210	2x ARM Cortex-A7	ARMv7-A
LG D370 L Series III L80 (LG W6)	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon 200 MSM8210	2x ARM Cortex-A7	ARMv7-A
LG D373 L Series III L80 (LG W6)	1024MiB RAM/ 7629MiB ROM	32bit Qualcomm Snapdragon 200 MSM8210	2x ARM Cortex-A7	ARMv7-A
LG D375 L Series III L80 Dual TV (LG W6)	1024MiB RAM/ 7629MiB ROM	32bit Qualcomm Snapdragon 200 MSM8210	2x ARM Cortex-A7	ARMv7-A
LG D380 L Series III L80 Dual (LG W6)	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon 200 MSM8210	2x ARM Cortex-A7	ARMv7-A
LG D385 L Series III L80 TV Dual (LG W6)	1024MiB RAM/ 7629MiB ROM	32bit Qualcomm Snapdragon 200 MSM8210	2x ARM Cortex-A7	ARMv7-A
LG D390 F60 4G LTE	1024MiB RAM/ 3814MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
LG D390N F60 4G LTE	1024MiB RAM/ 3814MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
LG D392 F60 4G LTE Dual	1024MiB RAM/ 3814MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
LG D400HN L Series III L90 (LG W7)	1024MiB RAM/ 7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8226	4x ARM Cortex-A7 Mpcore	ARMv7
LG D405 L Series III L90/D405N/D405TR (LG W7)	1024MiB RAM/ 7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8226	4x ARM Cortex-A7 Mpcore	ARMv7
LG D410 L Series III L90 Dual (LG W7)	1024MiB RAM/ 7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8226	4x ARM Cortex-A7 Mpcore	ARMv7
LG D415 Optimus L90/L Series III L90 (LG W7)	1024MiB RAM/ 7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8226	4x ARM Cortex-A7 Mpcore	ARMv7
LG D486 Wine Smart	1024MiB RAM/ 3815MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
LG D500 Optimus F6	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930	4x ARM Cortex-A7 Mpcore	ARMv7
LG D505 Optimus F6	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930	4x ARM Cortex-A7 Mpcore	ARMv7
LG D520 Optimus F3Q 4G LTE (LG FX3)	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930	4x ARM Cortex-A7 Mpcore	ARMv7
LG D605 Optimus L9 II	1024MiB RAM/ 7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8230	2x Qualcomm Krait 200	ARMv7
LG D610 G2 Mini 3G/D610TR	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8226	4x ARM Cortex-A7 Mpcore	ARMv7
LG D610AR G2 Mini 3G	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8226	4x ARM Cortex-A7 Mpcore	ARMv7
LG D618 G2 Mini 3G Dual SIM	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8226	4x ARM Cortex-A7 Mpcore	ARMv7
LG D620 G2 Mini LTE-A	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
LG D620K G2 Mini LTE-A	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
LG D625 G2 Mini LTE-A LATAM	1024MiB RAM/ 7630MiB ROM	32bit NVIDIA Tegra 4i SP3X	5x ARM Cortex-A9-R4 MPCore	ARMv7-A

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU CORE	INSTRUCTION SET(S)
LG D631 G Vista/G Pro 2 Lite LTE-A (LG B1 Lite)	1536MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
LG D680 G Pro Lite/D682/D682TR/D683	1024MiB RAM/ 7630MiB ROM	32bit MediaTek MT6577	2x ARM Cortex-A9	ARMv7
LG D685 G Pro Lite Dual/D686	1024MiB RAM/ 7630MiB ROM	32bit MediaTek MT6577	2x ARM Cortex-A9	ARMv7
LG D690 G3 Stylus	1024MiB RAM/ 7630MiB ROM	32bit MediaTek MT6582	4x ARM Cortex-A7 Mpcore	ARMv7
LG D690N G3 Stylus	1024MiB RAM/ 7630MiB ROM	32bit MediaTek MT6582	4x ARM Cortex-A7 Mpcore	ARMv7
LG D693N G3 Stylus	1024MiB RAM/ 7630MiB ROM	32bit MediaTek MT6582	4x ARM Cortex-A7 Mpcore	ARMv7
LG D722 G3 Mini LTE-A/D722v G3 S (LG B2 Mini)	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
LG D722J G3 Beat LTE (LG B2 Mini)	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
LG D722K G3 Beat TD-LTE (LG B2 Mini)	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
LG D724 G3s Dual (LG B2 Mini)	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8226	4x ARM Cortex-A7 Mpcore	ARMv7
LG D725 G3 Vigor/G3 S LTE-A (LG B2 Mini)	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
LG D820 Nexus 5 NA TD-LTE 16GB	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
LG D821 Nexus 5 LTE-A 16GB	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
LG D821 Nexus 5 LTE-A 32GB	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
LG D830 G Pro 2 LTE-A (LG B1)	3072MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AB v2	4x Qualcomm Krait 400	ARMv7
LG D838 G Pro 2 LTE-A (LG B1)	3072MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AB v2	4x Qualcomm Krait 400	ARMv7
LG D950 G Flex	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
LG D951 G Flex	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8274AB v2	4x Qualcomm Krait 400	ARMv7
LG D955 G Flex	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
LG D956 G Flex	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
LG D958 G Flex	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
LG D959 G Flex	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
LG E400 Optimus L3	384MiB RAM/ 1024MiB ROM	32bit Qualcomm MSM7225A	ARM Cortex-A5	ARMv7-A
LG E405 Optimus L3 Dual/Optimus L2	384MiB RAM/ 1024MiB ROM	32bit Qualcomm MSM7225A	ARM Cortex-A5	ARMv7-A
LG E410 Optimus L1 II	512MiB RAM/ 3814MiB ROM	32bit Qualcomm MSM7225A	ARM Cortex-A5	ARMv7-A
LG E410I Optimus L1 II	512MiB RAM/ 3814MiB ROM	32bit Qualcomm MSM7225A	ARM Cortex-A5	ARMv7-A
LG E420 Optimus L1 II Dual	512MiB RAM/ 3814MiB ROM	32bit Qualcomm MSM7225A	ARM Cortex-A5	ARMv7-A
LG E425/E425G Optimus L3 II/Optimus L3X	512MiB RAM/ 3814MiB ROM	32bit Qualcomm MSM7225A	ARM Cortex-A5	ARMv7-A
LG E425f Optimus L3 II	512MiB RAM/ 3814MiB ROM	32bit Qualcomm MSM7225A	ARM Cortex-A5	ARMv7-A
LG E430 Optimus L3 II	512MiB RAM/ 3814MiB ROM	32bit Qualcomm MSM7225A	ARM Cortex-A5	ARMv7-A
LG E435/E435G/E435k Optimus L3 II Dual/Optimus L2 II	512MiB RAM/ 3815MiB ROM	32bit Qualcomm MSM7225A	ARM Cortex-A5	ARMv7-A
LG E435f Optimus L3 II Dual	512MiB RAM/ 3815MiB ROM	32bit Qualcomm MSM7225A	ARM Cortex-A5	ARMv7-A
LG E440/E440G Optimus L4 II/Optimus L4X	512MiB RAM/ 3815MiB ROM	32bit MediaTek MT6575	ARM Cortex-A9	ARMv7
LG E445/E445f Optimus L4 II Dual	512MiB RAM/ 3815MiB ROM	32bit MediaTek MT6575	ARM Cortex-A9	ARMv7
LG E450 Optimus L5 II/E460 Optimus L5X	512MiB RAM/ 3814MiB ROM	32bit MediaTek MT6575	ARM Cortex-A9	ARMv7
LG E455 Optimus L5 II Dual	512MiB RAM/ 3814MiB ROM	32bit MediaTek MT6575	ARM Cortex-A9	ARMv7

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU CORE	INSTRUCTION SET(S)
LG E470f Optimus L4 II Tri	512MiB RAM/ 3815MiB ROM	32bit MediaTek MT6575	ARM Cortex-A9	ARMv7
LG E475 Optimus L1 II Tri	512MiB RAM/ 3814MiB ROM	32bit Qualcomm MSM7225A	ARM Cortex-A5	ARMv7-A
LG E510 Optimus Hub (LG Univa)	512MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7227T	ARM1136EJ-S	ARMv6
LG E610 Optimus L5	512MiB RAM/ 3814MiB ROM	32bit Qualcomm MSM7225A	ARM Cortex-A5	ARMv7-A
LG E612 Optimus L5	512MiB RAM/ 3814MiB ROM	32bit Qualcomm MSM7225A	ARM Cortex-A5	ARMv7-A
LG E615 Optimus L5 Dual	512MiB RAM/ 3814MiB ROM	32bit Qualcomm MSM7225A	ARM Cortex-A5	ARMv7-A
LG E720 Optimus Chic	/ 512MiB ROM	32bit Qualcomm MSM7227	ARM1136EJ-S	ARMv6
LG E730 Optimus Sol (LG Victor)	512MiB RAM/ 1908MiB ROM	32bit Qualcomm Snapdragon S2 MSM8255	Qualcomm Scorpion	ARMv7
LG E740 Miracle (LG Fantasy)	/ 7630MiB ROM	32bit Qualcomm Snapdragon S2 MSM8255	Qualcomm Scorpion	ARMv7
LG E900 Optimus 7	512MiB RAM/ 512+15258MiB ROM	32bit Qualcomm Snapdragon S1 QSD8250	Qualcomm Scorpion	ARMv7
LG E900H Optimus 7	512MiB RAM/ 512+15258MiB ROM	32bit Qualcomm Snapdragon S1 QSD8250	Qualcomm Scorpion	ARMv7
LG E906 Jil Sander	512MiB RAM/ 512+15258MiB ROM	32bit Qualcomm Snapdragon S2 MSM8255	Qualcomm Scorpion	ARMv7
LG E940 Optimus G Pro (LG Gee FHD)	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon S4 Pro APQ8064	4x Qualcomm Krait	ARMv7
LG E960 Nexus 4 (LG Mako)	2048MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon S4 Pro APQ8064	4x Qualcomm Krait	ARMv7
LG E960 Nexus 4 16GB (LG Mako)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon S4 Pro APQ8064	4x Qualcomm Krait	ARMv7
LG E970 Optimus G 4G LTE (LG Gee)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon S4 Pro APQ8064	4x Qualcomm Krait	ARMv7
LG E971 Optimus G 2600 4G LTE (LG Gee)	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon S4 Pro APQ8064	4x Qualcomm Krait	ARMv7
LG E973 Optimus G 4G LTE (LG Gee)	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon S4 Pro APQ8064	4x Qualcomm Krait	ARMv7
LG E975 Optimus G 4G LTE (LG Gee)	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon S4 Pro APQ8064	4x Qualcomm Krait	ARMv7
LG E975K Optimus G 4G LTE (LG Gee)	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon S4 Pro APQ8064	4x Qualcomm Krait	ARMv7
LG E975W Optimus GJ (LG Gee B)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon S4 Pro APQ8064	4x Qualcomm Krait	ARMv7
LG E976 Optimus G 4G LTE (LG Gee)	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon S4 Pro APQ8064	4x Qualcomm Krait	ARMv7
LG E977 Optimus G 4G LTE (LG Gee)	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon S4 Pro APQ8064	4x Qualcomm Krait	ARMv7
LG E980 Optimus G Pro 5.5 4G LTE	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064T	4x Qualcomm Krait 400	ARMv7
LG E986 Optimus G Pro 5.5 4G LTE	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064T	4x Qualcomm Krait 400	ARMv7
LG E988 Optimus G Pro 5.5 4G LTE	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064T	4x Qualcomm Krait 400	ARMv7
LG E989 Optimus G Pro 5.5	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064T	4x Qualcomm Krait 400	ARMv7
LG F100L Optimus Vu/Optimus Sketch	1024MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon S3 MSM8660	2x Qualcomm Scorpion	ARMv7
LG F100S Optimus Vu	1024MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon S3 APQ8060	2x Qualcomm Scorpion	ARMv7
LG F-160L Optimus LTE 2/LTE2	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960	2x Qualcomm Krait	ARMv7
LG F220K Optimus GK	2048MiB RAM/ 15259MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064T	4x Qualcomm Krait 400	ARMv7
LG F370K F70	1024MiB RAM/ 7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
LG F370L F70	1024MiB RAM/ 7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
LG F370S F70	1024MiB RAM/ 7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
LG F490K G3 Screen LTE-A (LG Liger)	2048MiB RAM/ 30518MiB ROM	32bit LG Nuclun LG7111	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7 Mpcore	ARMv7
LG F490L G3 Screen LTE-A (LG Liger)	2048MiB RAM/ 30518MiB ROM	32bit LG Nuclun LG7111	4x ARM Cortex-A15 MPcore + 4x ARM Cortex-A7	ARMv7

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU CORE	INSTRUCTION SET(S)
			Mpcore	
LG F60S TD-LTE 402LG/YS1401	1024MiB RAM/ 3814MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
LG F90 LTE	512MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
LG Fathom VS750	256MiB RAM/ 512MiB ROM	32bit Qualcomm Snapdragon S1 QSD8650	Qualcomm Scorpion	ARMv7
LG G2 3G D806	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8274 v1	4x Qualcomm Krait 400	ARMv7
LG G2 D800 4G LTE	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
LG G2 D801 4G LTE	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
LG G2 D802 4G LTE 16GB	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
LG G2 D802 4G LTE 32GB	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
LG G2 D802TA TD-LTE	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
LG G2 D803 4G LTE	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
LG G2 D805 4G LTE	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
LG G3 D850 LTE-A (LG B2)	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
LG G3 D851 LTE-A (LG B2)	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
LG G3 D852G 3G (LG B2)	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 801 MSM8274AC v3	4x Qualcomm Krait 400	ARMv7
LG G3 D855 TD-LTE 16GB (LG B2)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
LG G3 D855 TD-LTE 32GB (LG B2)	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
LG G3 D855K TD-LTE (LG B2)		32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
LG G3 D855P LTE-A/D855AR (LG B2)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
LG G3 F460K LTE-A Cat. 6	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 805 APQ8084	4x Qualcomm Krait 450	ARMv7-A
LG G3 F460L LTE-A Cat. 6	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 805 APQ8084	4x Qualcomm Krait 450	ARMv7-A
LG G3 F460S LTE-A Cat. 6	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 805 APQ8084	4x Qualcomm Krait 450	ARMv7-A
LG G3 LS990 TD-LTE (LG B2)	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
LG G3 US990 LTE-A/AS990 (LG B2)	3072MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
LG G3 VS985 LTE-A (LG B2)	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
LG GM550	128MiB RAM/ 256MiB ROM			
LG GM730 (LG Eigen)	256MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7201A	ARM1136EJ-S	ARMv6
LG GM730f	256MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7201A	ARM1136EJ-S	ARMv6
LG GM750 (LG Layla)	256MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7201A	ARM1136EJ-S	ARMv6
LG Google Nexus 5 LTE-A EM01L	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
LG GT500/GT505	128MiB RAM/ 256MiB ROM			
LG GT810H	128MiB RAM/ 256MiB ROM	32bit Qualcomm MSM7201A	ARM1136EJ-S	ARMv6
LG GW550	/ 256MiB ROM			
LG GW620f (LG Etna)	256MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7200A	ARM1136EJ-S	ARMv6
LG GW820 eXpo (LG Monaco)	256MiB RAM/ 512MiB ROM	32bit Qualcomm Snapdragon S1 QSD8650	Qualcomm Scorpion	ARMv7
LG GW825 IQ (LG Monaco)	256MiB RAM/ 512MiB ROM	32bit Qualcomm Snapdragon S1 QSD8650	Qualcomm Scorpion	ARMv7

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU CORE	INSTRUCTION SET(S)
LG GW880	/ 512MiB ROM			
LG GW910 (LG Panther)	512MiB RAM/ MiB ROM	32bit Qualcomm Snapdragon S1 QSD8250	Qualcomm Scorpion	ARMv7
LG Incite CT810	128MiB RAM/ 256MiB ROM	32bit Qualcomm MSM7201A	ARM1136EJ-S	ARMv6
LG InTouch Max GW620 (LG Etna)	256MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7200A	ARM1136EJ-S	ARMv6
LG InTouch Max GW620 US (LG Etna)	256MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7200A	ARM1136EJ-S	ARMv6
LG KS10	64MiB RAM/ 256MiB ROM	32bit STMicroelectronics Nomadik STn8810	ARM926EJ	ARMv5TE
LG KS1302 au isai FL LGL24	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 801 MSM8974AC v3	4x Qualcomm Krait 400	ARMv7
LG KS20	128MiB RAM/ 256MiB ROM	32bit Qualcomm MSM7200	ARM1136EJ-S	ARMv6
LG KT610	/ 256MiB ROM	128MiB RAM		
LG KT615	128MiB RAM/ 256MiB ROM			
LG L45C Optimus Net	512MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7627T	ARM1136EJ-S	ARMv6
LG L55C Optimus Q (LG Gelato Q)	/ 512MiB ROM	32bit Qualcomm MSM7627T	ARM1136EJ-S	ARMv6
LG LG730 Venice	768MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon S2 MSM8655	Qualcomm Scorpion	ARMv7
LG LN400	64MiB RAM/ 64MiB ROM	32bit Samsung S3C2410	ARM920T	ARMv4T
LG LN500/LN505/LN510/LN515	64MiB RAM/ 512MiB ROM	32bit Centrality Atlas II	ARM926EJ-S	ARMv5TEJ
LG LN550/LN555	64MiB RAM/ 32MiB ROM	32bit Centrality Atlas II	ARM926EJ-S	ARMv5TEJ
LG LN600	64MiB RAM/ 32MiB ROM	32bit Samsung S3C2410	ARM920T	ARMv4T
LG LN700/LN704/LN705/LN710/LN715	64MiB RAM/ 64MiB ROM	32bit Centrality Atlas II	ARM926EJ-S	ARMv5TEJ
LG LN730	64MiB RAM/ 1024MiB ROM	32bit Centrality Atlas II	ARM926EJ-S	ARMv5TEJ
LG LN735	64MiB RAM/ 1908MiB ROM	32bit Centrality Atlas II	ARM926EJ-S	ARMv5TEJ
LG LN740	64MiB RAM/ 1908MiB ROM	32bit Centrality Atlas II	ARM926EJ-S	ARMv5TEJ
LG LN790	64MiB RAM/ 1908MiB ROM	32bit Nokia Rapido Y	ARM11	ARMv6
LG LN800	64MiB RAM/ 32MiB ROM	32bit Centrality Atlas II	ARM926EJ-S	ARMv5TEJ
LG LN800T	64MiB RAM/ 32MiB ROM	32bit Centrality Atlas II	ARM926EJ-S	ARMv5TEJ
LG LN830/LN830R	64MiB RAM/ 1908MiB ROM	32bit Samsung S3C2443	ARM920T	ARMv4T
LG LN835/LN835R	64MiB RAM/ 1908MiB ROM	32bit Samsung S3C2443	ARM920T	ARMv4T
LG LN840/LN840R	64MiB RAM/ 1908MiB ROM	32bit Samsung S3C2443	ARM920T	ARMv4T
LG LN845/LN845R	64MiB RAM/ 1908MiB ROM	32bit Samsung S3C2443	ARM920T	ARMv4T
LG LN855/LN855R	64MiB RAM/ 1908MiB ROM	32bit Samsung S3C2443	ARM920T	ARMv4T
LG LS660 Tribute 4G TD-LTE/LS660P	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
LG LS670 Optimus S	512MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7627	ARM1136EJ-S	ARMv6
LG LS696/VM696 Optimus Elite	512MiB RAM/ 1024MiB ROM	32bit Qualcomm MSM7627A	ARM1136EJ-S	ARMv6
LG LS700 Optimus Slider (LG Gelato Q)	/ 512MiB ROM	32bit Qualcomm MSM7627T	ARM1136EJ-S	ARMv6
LG LS720 Optimus F3 4G LTE	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960 Lite	2x Qualcomm Krait	ARMv7
LG LS740 Volt 4G TD-LTE/F90	1024MiB RAM/ 7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
LG LS840 Viper 4G LTE	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon S3 MSM8660	2x Qualcomm Scorpion	ARMv7
LG LS855 Marquee	512MiB RAM/ MiB ROM	32bit Texas Instruments OMAP 3630	ARM Cortex-A8	ARMv7

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU CORE	INSTRUCTION SET(S)
LG LS860 Mach 4G LTE (LG Cayenne)	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960 Lite	2x Qualcomm Krait	ARMv7
LG LS885 G3 Vigor TD-LTE (LG B2 Mini)	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
LG LS970 Optimus G/Eclipse 4G (LG Gee)	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon S4 Pro APQ8064	4x Qualcomm Krait	ARMv7
LG LS975 Optimus G	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon S4 Pro APQ8064	4x Qualcomm Krait	ARMv7
LG LS980 G2 TD-LTE	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
LG LS995 G Flex TD-LTE	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
LG LW690 Optimus C	512MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7627	ARM1136EJ-S	ARMv6
LG LW770 Optimus Regard	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960 Lite	2x Qualcomm Krait	ARMv7
LG LW870	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960 Lite	2x Qualcomm Krait	ARMv7
LG MS323 L Series III L70 (LG W5)	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon 200 MSM8210	2x ARM Cortex-A7	ARMv7-A
LG MS395 F60 4G LTE	1024MiB RAM/ 3814MiB ROM	64bit Qualcomm Snapdragon 410 MSM8916	4x ARM Cortex-A53 MPcore	ARMv8 (A32, A64)
LG MS500 Optimus F6	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930	4x ARM Cortex-A7 Mpcore	ARMv7
LG MS659 Optimus F3 4G LTE	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930	4x ARM Cortex-A7 Mpcore	ARMv7
LG MS690 Optimus M	512MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7627	ARM1136EJ-S	ARMv6
LG MS695 Optimus M+	512MiB RAM/ 3814MiB ROM	32bit Qualcomm MSM7627A	ARM1136EJ-S	ARMv6
LG MS770 Motion 4G	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960 Lite	2x Qualcomm Krait	ARMv7
LG MS840 Connect 4G (LG Cayman)	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon S3 MSM8660	2x Qualcomm Scorpion	ARMv7
LG MS870 Spirit 4G	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960 Lite	2x Qualcomm Krait	ARMv7
LG MS910 Esteem 4G (LG Bryce)	512MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon S2 MSM8655	Qualcomm Scorpion	ARMv7
LG N10	64MiB RAM/ 1024MiB ROM	32bit Samsung S3C2443	ARM920T	ARMv4T
LG N10T	64MiB RAM/ 1024MiB ROM	32bit Samsung S3C2443	ARM920T	ARMv4T
LG Optimus Exceed 2	MiB ROM/ 4" LCD	1200MHz CPU		
LG Optimus F7 LG870	1024MiB RAM/ 7629MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960	2x Qualcomm Krait	ARMv7
LG Optimus F7 US780	2048MiB RAM/ 7629MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960	2x Qualcomm Krait	ARMv7
LG Optimus GT540 (LG Swift)	256MiB RAM/ 256MiB ROM	32bit Qualcomm MSM7227	ARM1136EJ-S	ARMv6
LG Optimus White Edition	512MiB RAM/ 1908MiB ROM	32bit Texas Instruments OMAP 3630	ARM Cortex-A8	ARMv7
LG Optimus Zone 2/L Series III L40 CDMA	512MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon 200 MSM8210	2x ARM Cortex-A7	ARMv7-A
LG P350 Pecan/Optimus Me	256MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7227	ARM1136EJ-S	ARMv6
LG P490L G Pad 8.0 4G LTE	1024MiB RAM/ 15259MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
LG P500 Optimus One	512MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7227	ARM1136EJ-S	ARMv6
LG P509 Optimus T/P504	512MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7227	ARM1136EJ-S	ARMv6
LG P655H Optimus F3 4G LTE	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930	4x ARM Cortex-A7 Mpcore	ARMv7
LG P690 Optimus Net (LG Gelato)	512MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7227T	ARM1136EJ-S	ARMv6
LG P692 Optimus Net (LG Gelato)	512MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7227T	ARM1136EJ-S	ARMv6
LG P698 Optimus Link/Optimus Net Dual	512MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7227T	ARM1136EJ-S	ARMv6
LG P700 Optimus L7/P705	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm MSM7227A	ARM Cortex-A5	ARMv7-A

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU CORE	INSTRUCTION SET(S)
LG P710 Optimus L7II/P713 Optimus L7 II	768MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon S4 MSM8225	2x ARM Cortex-A5	ARMv7-A
LG P714 Optimus L7 II/Optimus L7X	768MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon S4 MSM8225	2x ARM Cortex-A5	ARMv7-A
LG P715 Optimus L7 II Dual	768MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon S4 MSM8225	2x ARM Cortex-A5	ARMv7-A
LG P716 Optimus L7 II Dual	768MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon S4 MSM8225	2x ARM Cortex-A5	ARMv7-A
LG P720 Optimus 3D Max/P725 (LG CX2)	1024MiB RAM/ 7630MiB ROM	32bit Texas Instruments OMAP 4430	2x ARM Cortex-A9	ARMv7
LG P720H Optimus 3D Max (LG CX2)	1024MiB RAM/ 7630MiB ROM	32bit Texas Instruments OMAP 4430	2x ARM Cortex-A9	ARMv7
LG P760 Optimus L9	1024MiB RAM/ 3814MiB ROM	32bit Texas Instruments OMAP 4430	2x ARM Cortex-A9	ARMv7
LG P765 Optimus L9	1024MiB RAM/ 3814MiB ROM	32bit Texas Instruments OMAP 4430	2x ARM Cortex-A9	ARMv7
LG P768 Optimus L9/P768E	1024MiB RAM/ 3814MiB ROM	32bit Texas Instruments OMAP 4430	2x ARM Cortex-A9	ARMv7
LG P768f Optimus L9	1024MiB RAM/ 3814MiB ROM	32bit Texas Instruments OMAP 4430	2x ARM Cortex-A9	ARMv7
LG P768G Optimus L9	1024MiB RAM/ 3814MiB ROM	32bit Texas Instruments OMAP 4430	2x ARM Cortex-A9	ARMv7
LG P768N Optimus L9	1024MiB RAM/ 3814MiB ROM	32bit Texas Instruments OMAP 4430	2x ARM Cortex-A9	ARMv7
LG P769 Optimus L9	1024MiB RAM/ 3814MiB ROM	32bit Texas Instruments OMAP 4430	2x ARM Cortex-A9	ARMv7
LG P870 Escape 4G	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon S3 APQ8060	2x Qualcomm Scorpion	ARMv7
LG P875 Optimus F5	1024MiB RAM/ 7629MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960 Lite	2x Qualcomm Krait	ARMv7
LG P875H Optimus F5	1024MiB RAM/ 7629MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960 Lite	2x Qualcomm Krait	ARMv7
LG P880 Optimus 4X HD (LG X3)	1024MiB RAM/ 15258MiB ROM	32bit NVIDIA Tegra 3 AP33H	5x ARM Cortex-A9 MPCore	ARMv7-A
LG P880G Optimus 4X HD (LG X3)	1024MiB RAM/ 15258MiB ROM	32bit NVIDIA Tegra 3 AP33H	5x ARM Cortex-A9 MPCore	ARMv7-A
LG P895 Optimus Vu	1024MiB RAM/ 30518MiB ROM	32bit NVIDIA Tegra 3 AP30H	5x ARM Cortex-A9 MPCore	ARMv7-A
LG P920 Optimus 3D	512MiB RAM/ 7630MiB ROM	32bit Texas Instruments OMAP 4430	2x ARM Cortex-A9	ARMv7
LG P920H Optimus 3D	512MiB RAM/ 7630MiB ROM	32bit Texas Instruments OMAP 4430	2x ARM Cortex-A9	ARMv7
LG P925 Thrill 4G	512MiB RAM/ 7630MiB ROM	32bit Texas Instruments OMAP 4430	2x ARM Cortex-A9	ARMv7
LG P929 Thrill 4G	512MiB RAM/ 7630MiB ROM	32bit Texas Instruments OMAP 4430	2x ARM Cortex-A9	ARMv7
LG P930 Nitro HD	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon S3 APQ8060	2x Qualcomm Scorpion	ARMv7
LG P935 Optimus 4G LTE/P930	1024MiB RAM/ 1908MiB ROM	32bit Qualcomm Snapdragon S3 APQ8060	2x Qualcomm Scorpion	ARMv7
LG P936 Optimus True HD LTE	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon S3 APQ8060	2x Qualcomm Scorpion	ARMv7
LG P940 Prada 3.0 (LG K2)	1024MiB RAM/ 512+7630MiB ROM	32bit Texas Instruments OMAP 4430	2x ARM Cortex-A9	ARMv7
LG P940H Prada 3.0 (LG K2)	1024MiB RAM/ 512+7630MiB ROM	32bit Texas Instruments OMAP 4430	2x ARM Cortex-A9	ARMv7
LG P970 Optimus Black/Optimus Schwarz	512MiB RAM/ 1908MiB ROM	32bit Texas Instruments OMAP 3630	ARM Cortex-A8	ARMv7
LG P970H Optimus Black	512MiB RAM/ 1908MiB ROM	32bit Texas Instruments OMAP 3630	ARM Cortex-A8	ARMv7
LG P990 Optimus 2X (LG Star)	512MiB RAM/ 7630MiB ROM	32bit NVIDIA Tegra 2 250 AP20H	2x ARM Cortex-A9	ARMv7-A
LG UK410 G Pad 7.0 LTE (LG E7)	1024MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
LG UN270 Attune	/ 512MiB ROM	32bit Qualcomm MSM7627	ARM1136EJ-S	ARMv6
LG US670 Optimus U	512MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7627	ARM1136EJ-S	ARMv6
LG US730 Splendor	1024MiB RAM/ 1908MiB ROM	32bit Qualcomm Snapdragon S2 MSM8655	Qualcomm Scorpion	ARMv7
LG US740 Apex	256MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7627	ARM1136EJ-S	ARMv6
LG V400 G Pad 7.0 (LG E7)	1024MiB RAM/ 7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8226	4x ARM Cortex-A7 Mpcore	ARMv7

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU CORE	INSTRUCTION SET(S)
LG V410 G Pad 7.0 LTE (LG E7)	1024MiB RAM/ 7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
LG V480 G Pad 8.0 WiFi	1024MiB RAM/ 15259MiB ROM	32bit Qualcomm Snapdragon 400 APQ8026	4x ARM Cortex-A7 Mpcore	ARMv7
LG V490 G Pad 8.0 4G LTE	1024MiB RAM/ 15259MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
LG V500 G Pad 8.3 WiFi	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064T	4x Qualcomm Krait 400	ARMv7
LG V507L G Pad 8.3 4G LTE	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064T	4x Qualcomm Krait 400	ARMv7
LG V510 G Pad 8.3 WiFi Google Play Edition	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064T	4x Qualcomm Krait 400	ARMv7
LG V700 G Pad 10.1 WiFi	1024MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 APQ8026	4x ARM Cortex-A7 Mpcore	ARMv7
LG V900 Optimus Pad	1024MiB RAM/ 30518MiB ROM	32bit NVIDIA Tegra 2 250 T20	2x ARM Cortex-A9	ARMv7-A
LG V909 Optimus Pad/G-Slate	1024MiB RAM/ 30518MiB ROM	32bit NVIDIA Tegra 2 250 T20	2x ARM Cortex-A9	ARMv7-A
LG VK410 G Pad 7.0 LTE-A (LG E7)	1024MiB RAM/ 7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
LG VK700 G Pad 10.1 4G LTE	1024MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
LG VK810 G Pad 8.3 4G LTE	2048MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon 600 APQ8064T	4x Qualcomm Krait 400	ARMv7
LG VM670 Optimus V	512MiB RAM/ 512MiB ROM	32bit Qualcomm MSM7627	ARM1136EJ-S	ARMv6
LG VM701 Optimus Slider (LG Gelato Q)	/ 512MiB ROM	32bit Qualcomm MSM7627T	ARM1136EJ-S	ARMv6
LG VM720 Optimus F3 4G LTE	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960 Lite	2x Qualcomm Krait	ARMv7
LG VN270 Cosmos Touch	/ MiB ROM	32bit Qualcomm MSM7627	ARM1136EJ-S	ARMv6
LG VN360 Exalt	/ MiB ROM			
LG VS410PP Optimus Zone/Optimus L3	512MiB RAM/ 3814MiB ROM	32bit Qualcomm MSM7625A	ARM Cortex-A5	ARMv7-A
LG VS660 Vortex	MiB ROM/ 3.2" 320x480 color transflective TFT LCD	32bit Qualcomm MSM7627	ARM1136EJ-S	ARMv6
LG VS700 Enlighten (LG Gelato Q)	/ 512MiB ROM	32bit Qualcomm MSM7627T	ARM1136EJ-S	ARMv6
LG VS810PP L Fino LTE	1024MiB RAM/ 3815MiB ROM	32bit Qualcomm Snapdragon 200 MSM8212	4x ARM Cortex-A7	ARMv7-A
LG VS840 Lucid 4G (LG Cayman)	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon S3 MSM8660	2x Qualcomm Scorpion	ARMv7
LG VS840PP Optimus Exceed	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon S3 MSM8660	2x Qualcomm Scorpion	ARMv7
LG VS870 Lucid 2	1024MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960 Lite	2x Qualcomm Krait	ARMv7
LG VS876 Lucid 3/F90 LTE	1024MiB RAM/ 7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
LG VS880 G Vista/G Pro 2 Lite LTE-A (LG B1 Lite)	1536MiB RAM/ 7630MiB ROM	32bit Qualcomm Snapdragon 400 MSM8926	4x ARM Cortex-A7 MPcore	ARMv7
LG VS890 Enact (LG FX3)	1024MiB RAM/ 7629MiB ROM	32bit Qualcomm Snapdragon 400 MSM8930	4x ARM Cortex-A7 Mpcore	ARMv7
LG VS910 Revolution 4G	512MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon S2 MSM8655	Qualcomm Scorpion	ARMv7
LG VS920 Spectrum 4G	1024MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon S3 MSM8660	2x Qualcomm Scorpion	ARMv7
LG VS930 Spectrum 2/Optimus LTE 2	1024MiB RAM/ 15258MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960	2x Qualcomm Krait	ARMv7
LG VS950 Intuition/Optimus Vu	1024MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon S4 MSM8960	2x Qualcomm Krait	ARMv7
LG VS980 G2 4G LTE	2048MiB RAM/ 30518MiB ROM	32bit Qualcomm Snapdragon 800 MSM8974AA v2	4x Qualcomm Krait 400	ARMv7
LG W100 G Watch	512MiB RAM/ 3815MiB ROM	32bit Qualcomm Snapdragon 400 APQ8026	4x ARM Cortex-A7 Mpcore	ARMv7
LG W110 G Watch R	512MiB RAM/ 3815MiB ROM	32bit Qualcomm Snapdragon 400 APQ8026	4x ARM Cortex-A7 Mpcore	ARMv7
LG W120L Audi G Watch	MiB ROM	32bit Qualcomm Snapdragon 400 MSM8626	4x ARM Cortex-A7 Mpcore	ARMv7
LG X132 L Series III L45 Dual	512MiB RAM/ 3814MiB ROM	32bit Qualcomm Snapdragon 200 MSM8210	2x ARM Cortex-A7	ARMv7-A

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

PRODUCT	MEMORY	PROCESSOR	CPU CORE	INSTRUCTION SET(S)
LG X145 L Series III L60 Dual	512MiB RAM/ 3814MiB ROM	32bit MediaTek MT6572	2x ARM Cortex-A7	ARMv7
LG X147 L Series III L60 Dual	512MiB RAM/ 3814MiB ROM	32bit MediaTek MT6572	2x ARM Cortex-A7	ARMv7
ST600				
STB-2000				

EXHIBIT A
PLAINTIFFS' INFRINGEMENT CONTENTIONS

TABLE A.7: NINTENDO

PRODUCT	PROCESSOR	890 Not Accused
Wii	IBM PowerPC-Based "Broadway"	x
Wii U	1.24 GHz Tri-Core IBM PowerPC "Espresso"	x
Nintendo DS	ARM7TDM, ARM7(touch screen); ARM946E-S, ARM9 (upper screen)	x
Nintendo DS Lite	ARM7(touch screen) ARM9 (upper screen)	x
Nintendo DSi	ARM7(touch screen) ARM9 (upper screen)	x
Nintendo DSi XL	ARM7(touch screen) ARM9 (upper screen)	x
Nintendo 3DS	Dual-Core ARM11 MPCore, single-core ARM9 - Nintendo 1048 0H ARM CPU	
Nintendo 3DS XL	Dual-Core ARM11 MPCore, single-core ARM9	
Nintendo 2DS	Dual-Core ARM11 MPCore	
Game Boy Micro	32-bit ARM7TDMI (16.78 MHz)	x

Exhibit 3

From: Shelley K. Mack
To: Vinh Pham; TPLv.ZTE-NDCalBrinksGilson@brinksgilson.com; smiller@sheppardmullin.com; wfrankel@brinksgilson.com; Samsung-TPL-NDCA@dlapiper.com; aaron.wainscoat@dlapiper.com; Andrew.Valentine@dlapiper.com; Carrie Williamson; erik.fuehrer@dlapiper.com; mark.fowler@dlapiper.com; Novatel_TPL_NDCA@klgates.com; mike.bettinger@klgates.com; irene.yang@klgates.com; Nintendo-TPL@cooley.com; stephen.smith@cooley.com; tfriel@cooley.com; mbrigham@cooley.com; Christian A. Chu; Michael McKeon; wabrams@steptoe.com; mhector@steptoe.com; tbickham@steptoe.com; GRP-Garmin-TPL@paulweiss.com; abrown@paulweiss.com; DBall@paulweiss.com; adam.seitz@eriseip.com; masur@turnerboyd.com; BN-853@quinnemanuel.com; MichaelOConnor@quinnemanuel.com; davideiseman@quinnemanuel.com
Cc: TPL-MMP-CAND
Subject: RE: Phoenix Digital Solutions Cases--Proposed Cross-Use Agreement
Date: Wednesday, February 18, 2015 7:17:16 PM
Attachments: 2015-02-18 PROPOSED CROSS-USE AGREEMENT.docx

Vinh –

In response to TPL's request that the parties enter into a cross-use agreement, attached is a draft version reflecting language to which all defendants (except Barnes & Noble, with whom TPL has a separate cross-use agreement) are willing to agree. Please let us know if this draft agreement is acceptable to TPL.

Best Regards,

Shelley

Shelley K. Mack :: Principal :: Fish & Richardson P.C.
500 Arguello Street Suite 500, Redwood City, CA 94063
650 839 5010 direct :: 650 839 5070 main :: 650 839 5071 fax

From: Vinh Pham [mailto:vpham@agilityiplaw.com]
Sent: Thursday, November 20, 2014 2:46 PM
To: TPLv.ZTE-NDCalBrinksGilson@brinksgilson.com; smiller@sheppardmullin.com; wfrankel@brinksgilson.com; Samsung-TPL-NDCA@dlapiper.com; aaron.wainscoat@dlapiper.com; Andrew.Valentine@dlapiper.com; Carrie Williamson; erik.fuehrer@dlapiper.com; mark.fowler@dlapiper.com; Novatel_TPL_NDCA@klgates.com; mike.bettinger@klgates.com; irene.yang@klgates.com; Nintendo-TPL@cooley.com; stephen.smith@cooley.com; tfriel@cooley.com; mbrigham@cooley.com; Christian A. Chu; Michael McKeon; Shelley K. Mack; wabrams@steptoe.com; mhector@steptoe.com; tbickham@steptoe.com; GRP-Garmin-TPL@paulweiss.com; abrown@paulweiss.com; DBall@paulweiss.com; adam.seitz@eriseip.com; masur@turnerboyd.com; BN-853@quinnemanuel.com; MichaelOConnor@quinnemanuel.com; davideiseman@quinnemanuel.com
Cc: TPL-MMP-CAND
Subject: RE: Phoenix Digital Solutions Cases--Proposed Cross-Use Agreement
Importance: High

Counsel,

With the holiday fast approaching, can we get a response to the email below so that we can finalize our cross-use agreement this week?

Thanks,

Vinh

From: Vinh Pham
Sent: Tuesday, November 18, 2014 2:30 PM
To: TPLv.ZTE-NDCalBrinksGilson@brinksgilson.com; smiller@sheppardmullin.com; wfrankel@brinksgilson.com; Samsung-TPL-NDCA@dlapiper.com; aaron.wainscoat@dlapiper.com; andrew.valentine@dlapiper.com; Carrie.williamson@dlapiper.com; Erik.fuehrer@dlapiper.com; Mark.fowler@dlapiper.com; Novatel_TPL_NDCA@klgates.com; mike.bettinger@klgates.com; Irene.yang@klgates.com; Nintendo-TPL@cooley.com; stephen.smith@cooley.com; tfriel@cooley.com; mbrigham@cooley.com; chu@fr.com; mckeon@fr.com; mack@fr.com; wabrams@steptoe.com; mhector@steptoe.com; tbickham@steptoe.com; GRP-Garmin-TPL@paulweiss.com; abrown@paulweiss.com; dball@paulweiss.com; adam.seitz@eriseip.com; masur@turnerboyd.com; BN-853@quinnemanuel.com; MichaelOConnor@quinnemanuel.com; davideiseman@quinnemanuel.com
Cc: TPL-MMP-CAND
Subject: FW: Phoenix Digital Solutions Cases--Proposed Cross-Use Agreement

Counsel,

We understand that Defendants will be sending us a joint draft cross-use agreement. Now that the stays have been lifted, can we expect a draft by Thursday so that we can finalize it this week?

Thanks,

Vinh Pham
Agility IP Law
149 Commonwealth Dr.
Menlo Park, CA 94025
650-318-6342

vpham@agilityiplaw.com

From: Jed Phillips
Sent: Monday, November 03, 2014 5:31 PM
To: Jed Phillips
Cc: Bickham, Timothy (tbickham@steptoe.com); 'TPLv.ZTE-NDCalBrinksGilson@brinksgilson.com'; 'martinfineman@dwt.com'; 'smiller@sheppardmullin.com'; 'cmcmahon@brinkshofer.com'; 'aaron.wainscoat@dlapiper.com'; 'andrew.valentine@dlapiper.com'; 'Carrie.williamson@dlapiper.com'; 'Erik.fuehrer@dlapiper.com'; 'Mark.fowler@dlapiper.com'; 'mike.bettinger@klgates.com'; 'Irene.yang@klgates.com'; 'stephen.smith@cooley.com'; 'tfriel@cooley.com'; 'mbrigham@cooley.com'; 'chu@fr.com'; 'mckeon@fr.com'; 'mack@fr.com'; 'hlin@steptoe.com'; 'Davideisemann@quinnemanuel.com'; 'masur@turnerboyd.com'
Subject: Phoenix Digital Solutions Cases--Proposed Cross-Use Agreement

Counsel,

To reduce unnecessary expense and streamline matters in the Northern District proceedings, we'd like to propose that the parties enter into cross-use agreements covering the confidential materials exchanged during the ITC investigation. For discussion purposes, below is some language to which plaintiffs and some defendants have agreed.

Best,

Jed Phillips

[PROPOSED AGREEMENT REGARDING CROSS-USE OF DOCUMENTS AND DISCOVERY]

1. The Parties agree that Documents and Discovery (as defined below in paragraph 2) produced in the ITC Investigation No. 337-TA-853 (the "ITC Investigation") as of the Effective Date shall be deemed produced and usable in Technology Properties Limited LLC et al. v. [DEFENDANT] [N.D. CASE NUMBER] (the "District Court Action"), with confidentiality preserved (i.e., all Documents and Discovery produced in the ITC Investigation designated as "Confidential Business Information" shall be deemed to be designated as "Highly Confidential – Attorneys' Eyes Only" in the District Court Action), all objections of the originally producing Party preserved, and subject to the rights of the Parties to object on any available grounds to the admissibility of such Documents and Discovery. Such Documents and Discovery deemed produced in the District Court Action shall be subject to any applicable protective order and/or any other applicable orders or stipulations in the District Court Action for purpose of use in the District Court Action. Nothing herein shall prevent any party from seeking additional protection from the applicable court or tribunal for any particular materials.

2. "Documents and Discovery" produced shall be interpreted to include:

   a. deposition and hearing transcripts;
   b. all documents and things produced during the course of discovery; and
   c. any written discovery responses by the Parties, such as responses to interrogatories and requests for admission.

3. The Parties may rely in the District Court Action upon the Documents and Discovery produced in the ITC Investigation by referencing the Bates number used in the ITC Investigation. The Parties are not obligated to reproduce or designate such Documents and Discovery with a Bates number specific to the District Court Action.

Jed Phillips
Agility IP Law
149 Commonwealth Drive
Menlo Park, CA 94025
Tel: 650.318.3481
www.AgilityIPLaw.com

Exhibit 4

UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

In the Matter of	
CERTAIN WIRELESS CONSUMER ELECTRONICS DEVICES AND COMPONENTS THEREOF	**Inv. No. 337-TA-853**

ORDER NO. 1: PROTECTIVE ORDER

(August 24, 2012)

WHEREAS, documents and information may be sought, produced or exhibited by and among the parties to the above captioned proceeding, which materials relate to trade secrets or other confidential research, development or commercial information, as such terms are used in the Commission's Rules, 19 C.F.R. § 210.5;

IT IS HEREBY ORDERED THAT:

1. Confidential business information is information which concerns or relates to the trade secrets, processes, operations, style of work, or apparatus, or to the production, sales, shipments, purchases, transfers, identification of customers, inventories, amount or source of any income, profits, losses, or expenditures of any person, firm, partnership, corporation, or other organization, or other information of commercial value, the disclosure of which is likely to have the effect of either (i) impairing the Commission's ability to obtain such information as is necessary to perform its statutory functions; or (ii) causing substantial harm to the competitive position of the person, firm, partnership, corporation, or other organization from which the information was obtained, unless the Commission is required by law to disclose such

information. The term "confidential business information" includes "proprietary information" within the meaning of section 777(b) of the Tariff Act of 1930 (19 U.S.C. § 1677f(b)).

2(a). Any information submitted, in pre hearing discovery or in a pleading, motion, or response to a motion either voluntarily or pursuant to order, in this investigation, which is asserted by a supplier to contain or constitute confidential business information shall be so designated by such supplier in writing, or orally at a deposition, conference or hearing, and shall be segregated from other information being submitted. Documents shall be clearly and prominently marked on their face with the legend: "CONFIDENTIAL BUSINESS INFORMATION, SUBJECT TO PROTECTIVE ORDER," or a comparable notice. Such information, whether submitted in writing or in oral testimony, shall be treated in accordance with the terms of this protective order.

(b). The Administrative Law Judge or the Commission may determine that information alleged to be confidential is not confidential, or that its disclosure is necessary for the proper disposition of the proceeding, before, during or after the close of a hearing herein. If such a determination is made by the Administrative Law Judge or the Commission, opportunity shall be provided to the supplier of such information to argue its confidentiality prior to the time of such ruling.

3. In the absence of written permission from the supplier or an order by the Commission or the Administrative Law Judge, any confidential documents or business information submitted in accordance with the provisions of paragraph 2 above shall not be disclosed to any person other than: (i) outside counsel for parties to this investigation, including necessary secretarial and support personnel assisting such counsel; (ii) qualified persons taking testimony involving such documents or information and necessary stenographic and clerical personnel thereof; (iii)

technical experts and their staff who are employed for the purposes of this litigation (unless they are otherwise employed by, consultants to, or otherwise affiliated with a non-governmental party, or are employees of any domestic or foreign manufacturer, wholesaler, retailer, or distributor of the products, devices or component parts which are the subject of this investigation); (iv) the Commission, the Administrative Law Judge, the Commission staff, and personnel of any governmental agency as authorized by the Commission; and (v) the Commission, its employees, and contract personnel who are acting in the capacity of Commission employees, for developing or maintaining the records of this investigation or related proceedings for which this information is submitted, or in internal audits and investigations relating to the programs and operations of the Commission pursuant to 5 U.S.C. Appendix 3.[1]

4. Confidential business information submitted in accordance with the provisions of paragraph 2 above shall not be made available to any person designated in paragraph 3(i)[2] and (iii) unless he or she shall have first read this order and shall have agreed, by letter filed with the Secretary of this Commission: (i) to be bound by the terms thereof; (ii) not to reveal such confidential business information to anyone other than another person designated in paragraph 3; and (iii) to utilize such confidential business information solely for purposes of this investigation.

5. If the Commission or the Administrative Law Judge orders, or if the supplier and all parties to the investigation agree, that access to, or dissemination of information submitted as confidential business information shall be made to persons not included in paragraph 3 above, such matter shall only be accessible to, or disseminated to, such persons based upon the conditions pertaining to, and obligations arising from this order, and such persons shall be

[1] *See* Commission Administrative Order 97-06 (Feb. 4, 1997).
[2] Necessary secretarial and support personnel assisting counsel need not sign onto the protective order themselves because they are covered by counsel's signing onto the protective order.

considered subject to it, unless the Commission or the Administrative Law Judge finds that the information is not confidential business information as defined in paragraph 1 thereof.

6. Any confidential business information submitted to the Commission or the Administrative Law Judge in connection with a motion or other proceeding within the purview of this investigation shall be submitted under seal pursuant to paragraph 2 above. Any portion of a transcript in connection with this investigation containing any confidential business information submitted pursuant to paragraph 2 above shall be bound separately and filed under seal. When any confidential business information submitted in accordance with paragraph 2 above is included in an authorized transcript of a deposition or exhibits thereto, arrangements shall be made with the court reporter taking the deposition to bind such confidential portions and separately label them "CONFIDENTIAL BUSINESS INFORMATION, SUBJECT TO PROTECTIVE ORDER." Before a court reporter or translator receives any such information, he or she shall have first read this order and shall have agreed in writing to be bound by the terms thereof. Alternatively, he or she shall sign the agreement included as Attachment A hereto. Copies of each such signed agreement shall be provided to the supplier of such confidential business information and the Secretary of the Commission.

7. The restrictions upon, and obligations accruing to, persons who become subject to this order shall not apply to any information submitted in accordance with paragraph 2 above to which the person asserting the confidential status thereof agrees in writing, or the Commission or the Administrative Law Judge rules, after an opportunity for hearing, was publicly known at the time it was supplied to the receiving party or has since become publicly known through no fault of the receiving party.

8. The Commission, the Administrative Law Judge, and the Commission investigative attorney acknowledge that any document or information submitted as confidential business information pursuant to paragraph 2 above is to be treated as such within the meaning of 5 U.S.C. § 552(b)(4) and 18 U.S.C. § 1905, subject to a contrary ruling, after hearing, by the Commission or its Freedom of Information Act Officer, or the Administrative Law Judge. When such information is made part of a pleading or is offered into the evidentiary record, the data set forth in 19 C.F.R. § 201.6 must be provided except during the time that the proceeding is pending before the Administrative Law Judge. During that time, the party offering the confidential business information must, upon request, provide a statement as to the claimed basis for its confidentiality.

9. Unless a designation of confidentiality has been withdrawn, or a determination has been made by the Commission or the Administrative Law Judge that information designated as confidential, is no longer confidential, the Commission, the Administrative Law Judge, and the Commission investigative attorney shall take all necessary and proper steps to preserve the confidentiality of, and to protect each supplier's rights with respect to, any confidential business information designated by the supplier in accordance with paragraph 2 above, including, without limitation: (a) notifying the supplier promptly of (i) any inquiry or request by anyone for the substance of or access to such confidential business information, other than those authorized pursuant to this order, under the Freedom of Information Act, as amended (5 U.S.C. § 552) and (ii) any proposal to redesignate or make public any such confidential business information; and (b) providing the supplier at least seven days after receipt of such inquiry or request within which to take action before the Commission, its Freedom of Information Act Officer, or the

Administrative Law Judge, or otherwise to preserve the confidentiality of and to protect its rights in, and to, such confidential business information.

10. If while an investigation is before the Administrative Law Judge, a party to this order who is to be a recipient of any business information designated as confidential and submitted in accordance with paragraph 2 disagrees with respect to such a designation, in full or in part, it shall notify the supplier in writing, and they will thereupon confer as to the status of the subject information proffered within the context of this order. If prior to, or at the time of such a conference, the supplier withdraws its designation of such information as being subject to this order, but nonetheless submits such information for purposes of the investigation; such supplier shall express the withdrawal, in writing, and serve such withdrawal upon all parties and the Administrative Law Judge. If the recipient and supplier are unable to concur upon the status of the subject information submitted as confidential business information within ten days from the date of notification of such disagreement, any party to this order may raise the issue of the designation of such a status to the Administrative Law Judge who will rule upon the matter. The Administrative Law Judge may sua sponte question the designation of the confidential status of any information and, after opportunity for hearing, may remove the confidentiality designation.

11. No less than 10 days (or any other period of time designated by the Administrative Law Judge) prior to the initial disclosure to a proposed expert of any confidential information submitted in accordance with paragraph 2, the party proposing to use such expert shall submit in writing the name of such proposed expert and his or her educational and detailed employment history to the supplier. If the supplier objects to the disclosure of such confidential business information to such proposed expert as inconsistent with the language or intent of this order or on other grounds, it shall notify the recipient in writing of its objection and the grounds therefore

prior to the initial disclosure. If the dispute is not resolved on an informal basis within ten days of receipt of such notice of objections, the supplier shall submit immediately each objection to the Administrative Law Judge for a ruling. If the investigation is before the Commission the matter shall be submitted to the Commission for resolution. The submission of such confidential business information to such proposed expert shall be withheld pending the ruling of the Commission or the Administrative Law Judge. The terms of this paragraph shall be inapplicable to experts within the Commission or to experts from other governmental agencies who are consulted with or used by the Commission.

12. If confidential business information submitted in accordance with paragraph 2 is disclosed to any person other than in the manner authorized by this protective order, the party responsible for the disclosure must immediately bring all pertinent facts relating to such disclosure to the attention of the supplier and the Administrative Law Judge and, without prejudice to other rights and remedies of the supplier, make every effort to prevent further disclosure by it or by the person who was the recipient of such information.

13. Nothing in this order shall abridge the right of any person to seek judicial review or to pursue other appropriate judicial action with respect to any ruling made by the Commission, its Freedom of Information Act Officer, or the Administrative Law Judge concerning the issue of the status of confidential business information.

14. Upon final termination of this investigation, each recipient of confidential business information that is subject to this order shall assemble and return to the supplier all items containing such information submitted in accordance with paragraph 2 above, including all copies of such matter which may have been made. Alternatively, the parties subject to this order may, with the written consent of the supplier, destroy all items containing confidential business

information and certify to the supplier (or his counsel) that such destruction has taken place. This paragraph shall not apply to the Commission, including its investigative attorney, and the Administrative Law Judge, which shall retain such material pursuant to statutory requirements and for other recordkeeping purposes, but may destroy those additional copies in its possession which it regards as surplusage.

Notwithstanding the above paragraph, confidential business information may be transmitted to a district court pursuant to Commission Rule 210.5(c).

15. If any confidential business information which is supplied in accordance with paragraph 2 above is supplied by a nonparty to this investigation, such a nonparty shall be considered a "supplier" as that term is used in the context of this order.

16. Each nonparty supplier shall be provided a copy of this order by the party seeking information from said supplier.

17. The Secretary shall serve a copy of this order upon all parties.

Theodore R. Essex
Administrative Law Judge

Attachment A

NONDISCLOSURE AGREEMENT FOR REPORTER/STENOGRAPHER/TRANSLATOR

I, _____, do solemnly swear or affirm that I will not divulge any information communicated to me in any confidential portion of the investigation or hearing in the matter of *Certain Wireless Consumer Electronics Devices and Components Thereof,* Investigation No. 337-TA-853, except as permitted in the protective order issued in this case. I will not directly or indirectly use, or allow the use of such information for any purpose other than that directly associated with my official duties in this case.

Further, I will not by direct action, discussion, recommendation, or suggestion to any person reveal the nature or content of any information communicated during any confidential portion of the investigation or hearing in this case.

I also affirm that I do not hold any position or official relationship with any of the participants in said investigation.

I am aware that the unauthorized use or conveyance of information as specified above is a violation of the Federal Criminal Code and punishable by a fine of up to $10,000, imprisonment of up to ten (10) years, or both.

Signed _____

Dated _____

Firm or affiliation _____

CERTAIN WIRELESS CONSUMER ELECTRONICS DEVICES AND COMPONENTS THEREOF **Inv. No. 337-TA-853**

PUBLIC CERTIFICATE OF SERVICE

I, Lisa R. Barton, hereby certify that the attached **ORDER** has been served by hand upon, the Commission Investigative Attorney, Matthew N. Bathon, Esq., and the following parties as indicated on **August 24, 2012.**

Lisa R. Barton, Acting Secretary
U.S. International Trade Commission
500 E Street, SW, Room 112
Washington, DC 20436

On Behalf of Complainants Technology Properties Limited LLC, Phoenix Digital Solutions LLC and Patriot Scientific Corporation :

James C. Otteson, Esq.
AGILITY IP LAW, LLP
149 Commonwealth Drive
Menlo Park, CA 94025

( ) Via Hand Delivery
( ) Via Overnight Delivery
(✓) Via First Class Mail
( ) Other:_____

On Behalf of Respondents Acer Inc., Acer America Corporation, Amazon.com Inc. and Novatel, Inc.:

Eric C. Rusnak, Esq.
K&L GATES LLP
1601 K Street, NW
Washington, DC 20006-1600

( ) Via Hand Delivery
( ) Via Overnight Delivery
(✓) Via First Class Mail
( ) Other:_____

On Behalf of Respondents Garmin Ltd., Garmin International, Inc. and Garmin USA, Inc. :

Louis S. Mastriani, Esq.
ADDUCI, MASTRIANI & SCHAUMBERG LLP
1133 Connecticut Avenue, NW, 12th Floor
Washington, DC 20036

( ) Via Hand Delivery
( ) Via Overnight Delivery
(✓) Via First Class Mail
( ) Other:_____

On Behalf of Respondent Barnes & Noble, Inc.:

Paul F. Brinkman, Esq.
QUINN EMANUEL URQUHART & SULLIVAN LLP
1299 Pennsylvania Avenue NW, Suite 825
Washington, DC 20004

( ) Via Hand Delivery
( ) Via Overnight Delivery
(✓) Via First Class Mail
( ) Other:_____

On Behalf of Respondent Huawei Technologies Co., Ltd.:

Timothy C. Bickham, Esq.
STEPTOE & JOHNSON LLP
1330 Connecticut Avenue, N.W.
Washington, DC 20036

( ) Via Hand Delivery
( ) Via Overnight Delivery
(✓) Via First Class Mail
( ) Other:_____

On Behalf of ZTE Corporation and ZTE (USA) Inc.:

Jay H. Reiziss, Esq.
BRINKS, HOFER, GILSON & LIONE
1850 K Street, NW
Washington, DC 20006-2219

( ) Via Hand Delivery
( ) Via Overnight Delivery
(✓) Via First Class Mail
( ) Other:_____

Respondents:

HTC Corporation
23 Xinghua Road
Taoyuan 330, Taiwan

( ) Via Hand Delivery
( ) Via Overnight Delivery
(✓) Via First Class Mail
( ) Other:_____

HTC America
13920 SE Eastgate Way, Suite 200
Bellevue, WA 98005

( ) Via Hand Delivery
( ) Via Overnight Delivery
(✓) Via First Class Mail
( ) Other:_____

Huawei North America
5700 Tennyson Parkway, Suite 500
Plano, TX 75024

( ) Via Hand Delivery
( ) Via Overnight Delivery
(✓) Via First Class Mail
( ) Other:_____

Kyocera Corporation
6 Takeda Tobadono-cho, Fushmi-ku
Kyoto 612-8501, Japan

( ) Via Hand Delivery
( ) Via Overnight Delivery
(✓) Via First Class Mail
( ) Other:_____

Kyocera Communications, Inc.
9520 Towne Centre Drive
San Diego, CA 92121

( ) Via Hand Delivery
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( ) Other:_____

LG Electronics, Inc.
LG Twin Towers, 20 Yeouido-dong
Yeongdeungpo-pgu
Seoul 150-721, Republic of Korea

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( ) Via Overnight Delivery
(✓) Via First Class Mail
( ) Other:_____

CERTAIN WIRELESS CONSUMER ELECTRONICS DEVICES AND COMPONENTS THEREOF **Inv. No. 337-TA-853**

Certificate of Service – Page 3

Respondents (cont.):

LG Electronics U.S.A., Inc.
1000 Sylvan Avenue
Englewood Cliffs, NJ 07632

( ) Via Hand Delivery
( ) Via Overnight Delivery
(✓) Via First Class Mail
( ) Other:_____

Nintendo Co., Ltd.
11-1 Kamitoba Hokotate-Cho, Minami-Ku
Kyoto 601-8501, Japan

( ) Via Hand Delivery
( ) Via Overnight Delivery
(✓) Via First Class Mail
( ) Other:_____

Nintendo of America, Inc.
4600 150th Avenue, NE
Redmond, WA 98052

( ) Via Hand Delivery
( ) Via Overnight Delivery
(✓) Via First Class Mail
( ) Other:_____

Samsung Electronics Co., Ltd.
Samsung Main Building
250, Taepyeongno 2-ga, Jung-gu
Seoul 100-742, Republic of Korea

( ) Via Hand Delivery
( ) Via Overnight Delivery
(✓) Via First Class Mail
( ) Other:_____

Samsung Electronics America, Inc.
105 Challenger Road
Ridgefield Park, NJ 07660

( ) Via Hand Delivery
( ) Via Overnight Delivery
(✓) Via First Class Mail
( ) Other:_____

Sierra Wireless, Inc.
13811 Wireless Way, Richmond
British Columbia V6V 3A4
Canada

( ) Via Hand Delivery
( ) Via Overnight Delivery
(✓) Via First Class Mail
( ) Other:_____

Sierra Wireless America, Inc.
2200 Faraday Avenue, Suite 150
Carlsbad, CA 92008

( ) Via Hand Delivery
( ) Via Overnight Delivery
(✓) Via First Class Mail
( ) Other:_____

CERTAIN WIRELESS CONSUMER ELECTRONICS DEVICES AND COMPONENTS THEREOF **Inv. No. 337-TA-853**

Certificate of Service – Page 4

Public:

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LEXIS-NEXIS
9443 Springboro Pike
Miamisburg, OH 45342

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( ) Other:_____

Kenneth Clair
THOMSON WEST
1100 13th Street, NW, Suite 200
Washington, DC 20005

( ) Via Hand Delivery
( ) Via Overnight Delivery
(✓) Via First Class Mail
( ) Other:_____

Exhibit 5

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

SAN JOSE DIVISION

HTC CORPORATION AND HTC AMERICA, INC., PLAINTIFF, VS. TECHNOLOGY PROPERTIES LIMITED, PATRIOT SCIENTIFIC CORPORATION AND ALLIACENSE LIMITED, DEFENDANT.	C-08-00882 PSG SAN JOSE, CALIFORNIA SEPTEMBER 23, 2013 VOLUME 1 PAGES 1-226

TRANSCRIPT OF PROCEEDINGS
BEFORE THE HONORABLE PAUL S. GREWAL
UNITED STATES MAGISTRATE JUDGE

A P P E A R A N C E S:

FOR THE PLAINTIFF: COOLEY LLP
BY: HEIDI KEEFE
RON LEMIEUX
3175 HANOVER STREET
PALO ALTO, CALIFORNIA 94304

APPEARANCES CONTINUED ON NEXT PAGE

OFFICIAL COURT REPORTER: LEE-ANNE SHORTRIDGE, CSR, CRR
CERTIFICATE NUMBER 9595

PROCEEDINGS RECORDED BY MECHANICAL STENOGRAPHY
TRANSCRIPT PRODUCED WITH COMPUTER

MR. SMITH: THANK YOU, YOUR HONOR.

MR. MARSH: THANK YOU, YOUR HONOR.

(RECESS FROM 2:45 P.M. UNTIL 3:05 P.M.)

(JURY OUT AT 3:05 P.M.)

THE COURT: ALL RIGHT. PLEASE REMAIN STANDING WHILE MR. RIVERA RETRIEVES THE JURY.

MR. RIVERA.

DO WE HAVE AN ISSUE?

MR. MARSH: YOUR HONOR, WE DO HAVE AN ISSUE. I'M SORRY WE WEREN'T ABLE TO ALERT MR. RIVERA BECAUSE HE WAS IN THE BACK.

SO WHEN YOU LAST LEFT US, THE QUESTION WAS ASKED WHETHER DR. OKLOBDZIJA HAD EXPRESSED AN OPINION IN HIS EXPERT REPORT, AND WHAT HE SAID IN HIS EXPERT REPORT, AND HE DID EXPRESS AN OPINION ON THIS, IS "THE '336 IS A CRITICAL PIECE OF THE MMP PORTFOLIO BECAUSE NEARLY ALL HIGH SPEED MICROPROCESSORS MUST USE THE CLOCKING SCHEME COVERED BY THE '336 PATENT. ALTHOUGH MANY LOWER SPEED MICROPROCESSORS USE EXTERNAL CRYSTALS TO CLOCK THEIR CPU'S, THIS IS SIMPLY NOT POSSIBLE FOR THE HIGH SPEED, HIGH END MICROPROCESSORS THAT ARE NECESSARY FOR MODERN SMARTPHONES AND OTHER HIGH PERFORMANCE WIRELESS PRODUCTS. IN ORDER TO ACHIEVE CLOCK SPEEDS IN THE MULTI GIGAHERTZ RANGE, IT IS ESSENTIAL TO HAVE A RING OSCILLATOR-BASED CLOCKING SYSTEM ON THE SAME SILICON DIE AS THE CPU."

THE COURT: ALL RIGHT. HE SAYS "NEARLY ALL";

Exhibit 6

25 Microchips That Shook the World

A list of some of the most innovative, intriguing, and inspiring integrated circuits

By Brian Santo
Posted 1 May 2009 | 13:30 GMT

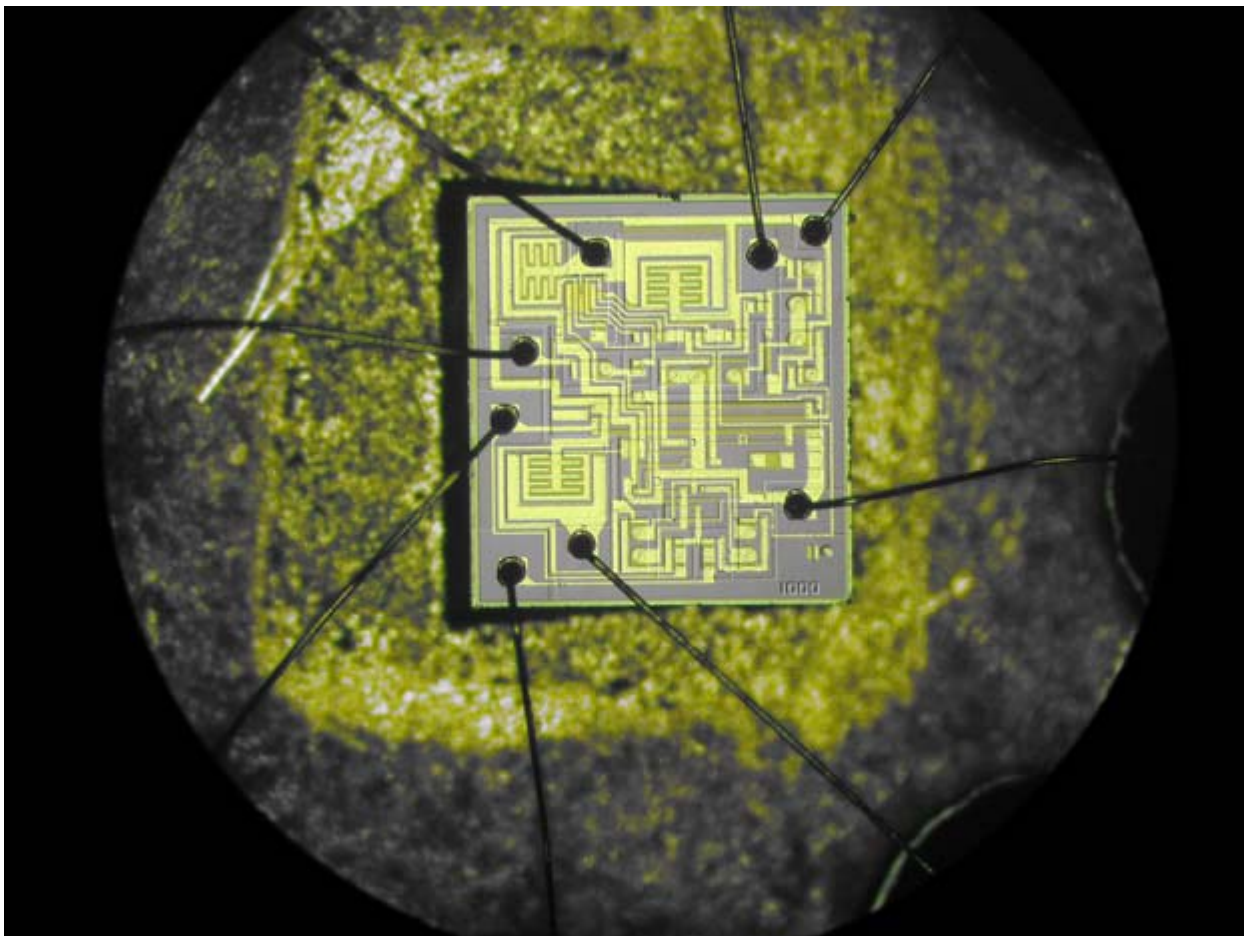


Photo: Hans Camenzind

This is part of IEEE Spectrum's Special Report: 25 Microchips That Shook the World (/25chips).

In microchip design, as in life, small things sometimes add up to big things. Dream up a clever microcircuit, get it sculpted in a sliver of silicon, and your little creation may unleash a technological revolution. It happened with the Intel 8088 microprocessor. And the Mostek MK4096 4-kilobit DRAM. And the Texas Instruments TMS32010 digital signal processor.

Among the many great chips that have emerged from fabs during the half-century reign of the integrated circuit, a small group stands out. Their designs proved so cutting-edge, so out of the box, so ahead of their time, that we are left groping for more technology clichés to describe them. Suffice it to say that they gave us the technology that made our brief, otherwise tedious existence in this universe worth living.

We've compiled here a list of 25 ICs that we think deserve the best spot on the mantelpiece of the house that Jack Kilby and Robert Noyce built. Some have become enduring objects of worship among the chiperati: the Signetics 555 timer, for example. Others, such as the Fairchild 741 operational amplifier, became textbook design examples. Some, like Microchip Technology's PIC microcontrollers, have sold billions, and are still doing so. A precious few, like Toshiba's flash memory, created whole new markets. And one, at least, became a geeky reference in popular culture. Question: What processor powers Bender, the alcoholic, chain-smoking, morally reprehensible robot in "Futurama"? Answer: MOS Technology's 6502.

What these chips have in common is that they're part of the reason why engineers don't get out enough.

Of course, lists like this are nothing if not contentious. Some may accuse us of capricious choices and blatant omissions (and, no, it won't be the first time). Why Intel's 8088 microprocessor and not the 4004 (the first) or the 8080 (the famed)? Where's the radiation-hardened military-grade RCA 1802 processor that was the brains of numerous spacecraft?

If you take only one thing away from this introduction, let it be this: Our list is what remained after weeks of raucous debate between the author, his trusted sources, and several editors of *IEEE Spectrum*. We never intended to compile an exhaustive reckoning of every chip that was a commercial success or a major technical advance. Nor could we include chips that were great but so obscure that only the five engineers who designed them would remember them. We focused on chips that proved unique, intriguing, awe-inspiring. We wanted chips of varied types, from both big and small companies, created long ago or more recently. Above all, we sought ICs that had an impact on the lives of lots of people—chips that became part of earthshaking gadgets, symbolized technological trends, or simply delighted people.

For each chip, we describe how it came about and why it was innovative, with comments from the engineers and executives who architected it. And because we're not the *IEEE Annals of the History of Computing* , we didn't order the 25 chips chronologically or by type or importance; we arbitrarily scattered them on these pages in a way we think makes for a good read. History is messy, after all.

As a bonus, we asked eminent technologists about their favorite chips (/may09/8749). Ever wonder which IC has a special place in the hearts of both Gordon Moore, of Intel, and Morris Chang, founder of Taiwan Semiconductor Manufacturing Company? (Hint: It's a DRAM chip.)

We also want to know what you think. Is there a chip whose absence from our list sent you into paroxysms of rage? Take a few deep breaths, have a nice cup of chamomile tea, and then join the discussion (http://blogs.spectrum.ieee.org/articles/2009/04/tell_us_about_your_favorite_microchip.html).

Signetics NE555 Timer (1971)

It was the summer of 1970 and chip designer Hans Camenzind could tell you a thing or two about Chinese restaurants: His small office was squeezed between two of them in downtown Sunnyvale, Calif. Camenzind was working as a consultant to Signetics, a local semiconductor firm. The economy was tanking. He was making less than US $15 000 a year and had a wife and four children at home. He really needed to invent something good.

And so he did. One of the greatest chips of all time, in fact. The 555 was a simple IC that could function as a timer or an oscillator. It would become a best seller in analog semiconductors, winding up in kitchen appliances, toys, spacecraft, and a few thousand other things.

“And it almost didn’t get made,” recalls Camenzind, who at 75 is still designing chips, albeit nowhere near a Chinese restaurant.

The idea for the 555 came to him when he was working on a kind of system called a phase-locked loop. With some modifications, the circuit could work as a simple timer: You’d trigger it and it would run for a certain period. Simple as it may sound, there was nothing like that around.

At first, Signetics’s engineering department rejected the idea. The company was already selling components that customers could use to make timers. That could have been the end of it. But Camenzind insisted. He went to Art Fury, Signetics marketing manager. Fury liked it.

Camenzind spent nearly a year testing breadboard prototypes, drawing the circuit components on paper, and cutting sheets of Rubylitha masking film. “It was all done by hand, no computer,” he says. His final design had 23 transistors, 16 resistors, and 2 diodes.

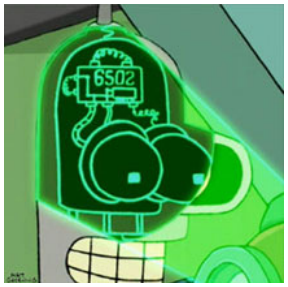
When the 555 hit the market in 1971, it was a sensation. In 1975 Signetics was absorbed by Philips Semiconductors, now NXP, which says that many billions have been sold. Engineers still use the 555 to create useful electronic modulesas well as less useful things like “Knight Rider”–style lights for car grilles.

Photo: Universal/The Kobal Collection

Texas Instruments TMC0281 Speech Synthesizer (1978)

If it weren’t for the TMC0281, E.T. would’ve never been able to “phone home.” That’s because the TMC0281, the first single-chip speech synthesizer, was the heart (or should we say the mouth?) of Texas Instruments’ Speak & Spell learning toy. In the Steven Spielberg movie, the flat-headed alien uses it to build his interplanetary communicator. (For the record, E.T. also uses a coat hanger, a coffee can, and a circular saw.)

The TMC0281 conveyed voice using a technique called linear predictive coding; the sound came out as a combination of buzzing, hissing, and popping. It was a surprising solution for something deemed “impossible to do in an integrated circuit,” says Gene A. Frantz, one of the four engineers who designed the toy and is still at TI. Variants of the chip were used in Atari arcade games and Chrysler’s K-cars. In 2001, TI sold its speech-synthesis chip line to Sensory, which discontinued it in late 2007. But if you ever need to place a long, very-long-distance phone call, you can find Speak & Spell units in excellent condition on eBay for about US $50.



MOS Technology 6502 Microprocessor (1975)

When the chubby-faced geek stuck that chip on the computer and booted it up, the universe skipped a beat. The geek was Steve Wozniak, the computer was the Apple I, and the chip was the 6502, an 8-bit microprocessor developed by MOS Technology. The chip went on to become the main brains of ridiculously seminal computers like the Apple II, the Commodore PET, and the BBC Micro, not to mention game systems like the Nintendo and Atari. Chuck Peddle, one of the chip’s creators, recalls when they introduced the 6502 at a trade show in 1975. “We had two glass jars filled with chips,”

Illustration: "Futurama" TM and © 2009 Twentieth Century Fox Film Corporation. All Rights Reserved.

he says, "and I had my wife sit there selling them." Hordes showed up. The reason: The 6502 wasn't just faster than its competitors—it was also way cheaper, selling for US $25 while Intel's 8080 and Motorola's 6800 were both fetching nearly $200.

The breakthrough, says Bill Mensch, who created the 6502 with Peddle, was a minimal instruction set combined with a fabrication process that "yielded 10 times as many good chips as the competition." The 6502 almost single-handedly forced the price of processors to drop, helping launch the personal computer revolution. Some embedded systems still use the chip. More interesting perhaps, the 6502 is the electronic brain of Bender, the depraved robot in "Futurama," as revealed in a 1999 episode.

[See "The Truth About Bender's Brain (/may09/8849)," in this issue, where David X. Cohen, the executive producer and head writer for "Futurama," explains how the choice of the 6502 came about.]

Photo: Janet M. Baker

Texas Instruments TMS32010 Digital Signal Processor (1983)

The big state of Texas has given us many great things, including the 10-gallon hat, chicken-fried steak, Dr Pepper, and perhaps less prominently, the TMS32010 digital signal processor chip. Created by Texas Instruments, the TMS32010 wasn't the first DSP (that'd be Western Electric's DSP-1, introduced in 1980), but it was surely the fastest. It could compute a multiply operation in 200 nanoseconds, a feat that made engineers all tingly. What's more, it could execute instructions from both on-chip ROM and off-chip RAM, whereas competing chips had only canned DSP functions. "That made program development [for the TMS32010] flexible, just like with microcontrollers and microprocessors," says Wanda Gass, a member of the DSP design team, who is still at TI. At US $500 apiece, the chip sold about 1000 units the first year. Sales eventually ramped up, and the DSP became part of modems, medical devices, and military systems. Oh, and another application: Worlds of Wonder's Julie, a Chucky-style creepy doll that could sing and talk ("Are we making too much noise?"). The chip was the first in a large DSP family that made—and continues to make—TI's fortune.

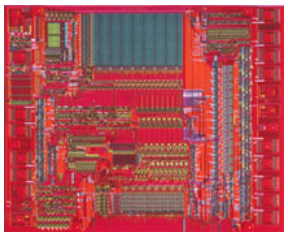


Image: Microchip Technology

Microchip Technology PIC 16C84 Microcontroller (1993)

Back in the early 1990s, the huge 8-bit microcontroller universe belonged to one company, the almighty Motorola. Then along came a small contender with a nondescript name, Microchip Technology. Microchip developed the PIC 16C84, which incorporated a type of memory called EEPROM, for electrically erasable programmable read-only memory. It didn't need UV light to be erased, as did its progenitor, EPROM. "Now users could change their code on the fly," says Rod Drake, the chip's lead designer and now a director at Microchip. Even better, the chip cost less than US $5, or a quarter the cost of existing alternatives, most of them from, yes, Motorola. The 16C84 found use in smart cards, remote controls, and wireless car keys. It was the beginning of a line of microcontrollers that became electronics superstars among Fortune 500 companies and weekend hobbyists alike. Some 6 billion have been sold, used in things like industrial controllers, unmanned aerial vehicles, digital pregnancy tests, chip-controlled fireworks, LED jewelry, and a septic-tank monitor named the Turd Alert.

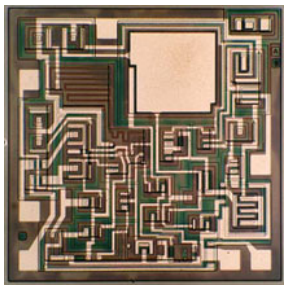


Image: David Fullagar

Fairchild Semiconductor µA741 Op-Amp (1968)

Operational amplifiers are the sliced bread of analog design. You can always use some, and you can slap them together with almost anything and get something satisfying. Designers use them to make audio and video preamplifiers, voltage comparators, precision rectifiers, and many other systems that are part of everyday electronics.

In 1963, a 26-year-old engineer named Robert Widlar designed the first monolithic op-amp IC, the µA702, at Fairchild Semiconductor. It sold for US $300 a pop. Widlar followed up with an improved design, the µA709, cutting the cost to $70 and making the chip a huge commercial success. The story goes that the freewheeling Widlar asked for a raise. When he didn't get it, he quit. National Semiconductor was only too happy to hire a guy who was then helping establish the discipline of analog IC design. In 1967, Widlar created an ever better op-amp for National, the LM101.

While Fairchild managers fretted about the sudden competition, over at the company's R&D lab a recent hire, David Fullagar, scrutinized the LM101. He realized that the chip, however brilliant, had a couple of drawbacks. To avoid certain frequency distortions, engineers had to attach an external capacitor to the chip. What's more, the IC's input stage, the so-called front end, was for some chips overly sensitive to noise, because of quality variations in the semiconductors.

"The front end looked kind of kludgy," he says.

Fullagar embarked on his own design. He stretched the limits of semiconductor manufacturing processes at the time, incorporating a 30-picofarad capacitor into the chip. Now, how to improve the front end? The solution was profoundly simple—"it just came to me, I don't know, driving to Tahoe"—and consisted of a couple of extra transistors. That additional circuitry made the amplification smoother and consistent from chip to chip.

Fullagar took his design to the head of R&D at Fairchild, a guy named Gordon Moore, who sent it to the company's commercial division. The new chip, the µA741, would become *the* standard for op-amps. The IC—and variants created by Fairchild's competitors—have sold in the hundreds of millions. Now, for $300—the price tag of that primordial 702 op-amp—you can get about a thousand of today's 741 chips.

Intersil ICL8038 Waveform Generator (circa 1983*)

Critics scoffed at the ICL8038's limited performance and propensity for behaving erratically. The chip, a generator of sine, square, triangular, sawtooth, and pulse waveforms, was indeed a bit temperamental. But engineers soon learned how to use the chip reliably, and the 8038 became a major hit, eventually selling into the hundreds of millions and finding its way into countless applications—like the famed Moog music synthesizers and the "blue boxes" that "phreakers" used to beat the phone companies in the 1980s. The part was so popular the company put out a document titled "Everything You Always Wanted to Know About the ICL8038." Sample question: "Why does connecting pin 7 to pin 8 give the best temperature performance?" Intersil discontinued the 8038 in 2002, but hobbyists still seek it today to make things like homemade function generators and theremins.

** Neither Intersil's PR department nor the company's last engineer working with the part knows the precise introduction date. Do you? (http://blogs.spectrum.ieee.org/articles/2009/04/tell_us_about_your_favorite_microchip.html)*

Western Digital WD1402A UART (1971)

Gordon Bell is famous for launching the PDP series of minicomputers at Digital Equipment Corp. in the 1960s. But he also invented a lesser known but no less significant piece of technology: the universal asynchronous receiver/transmitter, or UART. Bell needed some circuitry to connect a Teletype to a PDP-1, a task that required converting parallel signals into serial signals and vice versa. His implementation used some 50 discrete components. Western Digital, a small company making calculator chips, offered to create a single-chip UART. Western Digital founder Al Phillips still remembers when his vice president of engineering showed him the Rubylith sheets with the design, ready for fabrication. “I looked at it for a minute and spotted an open circuit,” Phillips says. “The VP got hysterical.” Western Digital introduced the WD1402A around 1971, and other versions soon followed. Now UARTs are widely used in modems, PC peripherals, and other equipment.

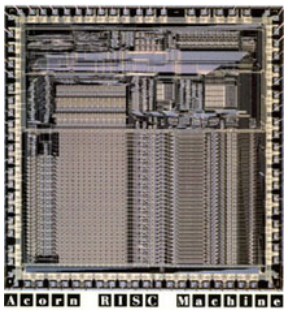


Photo: Acorn Computers

Acorn Computers ARM1 Processor (1985)

In the early 1980s, Acorn Computers was a small company with a big product. The firm, based in Cambridge, England, had sold over 1.5 million BBC Micro desktop computers. It was now time to design a new model, and Acorn engineers decided to create their own 32-bit microprocessor. They called it the Acorn RISC Machine, or ARM. The engineers knew it wouldn’t be easy; in fact, they half expected they’d encounter an insurmountable design hurdle and have to scrap the whole project. “The team was so small that every design decision had to favor simplicity—or we’d never finish it!” says codesigner Steve Furber, now a computer engineering professor at the University of Manchester. In the end, the simplicity made all the difference. The ARM was small, low power, and easy to program. Sophie Wilson, who designed the instruction set, still remembers when they first tested the chip on a computer. “We did ‘PRINT PI’ at the prompt, and it gave the right answer,” she says. “We cracked open the bottles of champagne.” In 1990, Acorn spun off its ARM division, and the ARM architecture went on to become the dominant 32-bit embedded processor. More than 10 billion ARM cores have been used in all sorts of gadgetry, including one of Apple’s most humiliating flops, the Newton handheld, and one of its most glittering successes, the iPhone.

Photo: Kodak

Kodak KAF-1300 Image Sensor (1986)

Launched in 1991, the Kodak DCS 100 digital camera cost as much as US $13 000 and required a 5-kilogram external data storage unit that users had to carry on a shoulder strap. The sight of a person lugging the contraption? *Not* a Kodak moment. Still, the camera’s electronics—housed inside a Nikon F3 body—included one impressive piece of hardware: a thumbnail-size chip that could capture images at a resolution of 1.3 megapixels, enough for sharp 5-by-7-inch prints. “At the time, 1 megapixel was a magic number,” says Eric Stevens, the chip’s lead designer, who still works for Kodak. The chip—a true two-phase charge-coupled device—became the basis for future CCD sensors, helping to kick-start the digital photography revolution. What, by the way, was the very first photo made with the KAF-1300? “Uh,” says Stevens, “we just pointed the sensor at the wall of the laboratory.”

Photo: Adam Nadel/AP Photo

IBM Deep Blue 2 Chess Chip (1997)

On one side of the board, 1.5 kilograms of gray matter. On the other side, 480 chess chips. Humans finally fell to computers in 1997, when IBM's chess-playing computer, Deep Blue, beat the reigning world champion, Garry Kasparov. Each of Deep Blue's chips consisted of 1.5 million transistors arranged into specialized blockslike a move-generator logic array—as well as some RAM and ROM. Together, the chips could churn through 200 million chess positions per second. That brute-force power, combined with clever game-evaluation functions, gave Deep Blue decisive—Kasparov called them "uncomputerlike"—moves. "They exerted great psychological pressures," recalls Deep Blue's mastermind, Feng-hsiung Hsu, now at Microsoft.

Image: *IEEE Spectrum*/AP Photo

Transmeta Corp. Crusoe Processor (2000)

With great power come great heat sinks. And short battery life. And crazy electricity consumption. Hence Transmeta's goal of designing a low-power processor that'd put those hogs offered by Intel and AMD to shame. The plan: Software would translate x86 instructions on the fly into Crusoe's own machine code, whose higher level of parallelism would save time and power. It was hyped as the greatest thing since sliced silicon, and for a while, it was. "Engineering Wizards Conjure Up Processor Gold" was how *IEEE Spectrum*'s May 2000 cover put it. Crusoe and its successor, Efficeon, "proved that dynamic binary translation was commercially viable," says David Ditzel, Transmeta's cofounder, now at Intel. Unfortunately, he adds, the chips arrived several years before the market for low-power computers took off. In the end, while Transmeta did not deliver on its promises, it did force Intel and AMD—through licenses and lawsuits—to chill out.

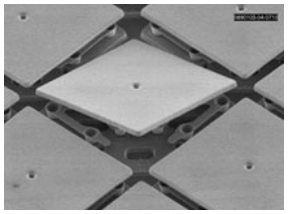


Photo: Texas Instruments

Texas Instruments Digital Micromirror Device (1987)

On 18 June 1999, Larry Hornbeck took his wife, Laura, on a date. They went to watch *Star Wars: Episode 1—The Phantom Menace* at a theater in Burbank, Calif. Not that the graying engineer was an avid Jedi fan. The reason they were there was actually the projector. It used a chip—the digital micromirror device—that Hornbeck had invented at Texas Instruments. The chip uses millions of hinged microscopic mirrors to direct light through a projection lens. The screening was "the first digital exhibition of a major motion picture," says Hornbeck, a TI Fellow. Now movie projectors using this digital light-processing technology—or DLP, as TI branded it—are used in thousands of theaters. It's also used in rear-projection TVs, office projectors, and tiny projectors for cellphones. "To paraphrase Houdini," Hornbeck says, "micromirrors, gentlemen. The effect is created with micromirrors."

Intel 8088 Microprocessor (1979)

Was there any one chip that propelled Intel into the Fortune 500? Intel says there was: the 8088. This was the 16-bit CPU that IBM chose for its original PC line, which went on to dominate the desktop computer market.

In an odd twist of fate, the chip that established what would become known as the x86 architecture didn't have a name appended with an "86." The 8088 was basically just a slightly modified 8086, Intel's first 16-bit CPU. Or as Intel engineer Stephen Morse once put it, the 8088 was "a castrated version of the 8086." That's because the new chip's main innovation wasn't exactly a step forward in technical terms: The 8088 processed data in 16-bit words, but it used an 8-bit external data bus.

Intel managers kept the 8088 project under wraps until the 8086 design was mostly complete. "Management didn't want to delay the 8086 by even a day by even telling us they had the 8088 variant in mind," says Peter A. Stoll, a lead engineer for the 8086 project who did some work on the 8088—a "one-day task force to fix a microcode bug that took three days."

It was only after the first functional 8086 came out that Intel shipped the 8086 artwork and documentation to a design unit in Haifa, Israel, where two engineers, Rafi Retter and Dany Star, altered the chip to an 8-bit bus.

The modification proved to be one of Intel's best decisions. The 29 000-transistor 8088 CPU required fewer, less expensive support chips than the 8086 and had "full compatibility with 8-bit hardware, while also providing faster processing and a smooth transition to 16-bit processors," as Intel's Robert Noyce and Ted Hoff wrote in a 1981 article for IEEE Micro magazine.

The first PC to use the 8088 was IBM's Model 5150, a monochrome machine that cost US $3000.Now almost all the world's PCs are built around CPUs that can claim the 8088 as an ancestor. Not bad for a castrated chip.

Photo: Eirik Solheim/Eirikso.com<

Micronas Semiconductor MAS3507 MP3 Decoder (1997)

Before the iPod, there was the Diamond Rio PMP300. Not that you'd remember. Launched in 1998, the PMP300 became an instant hit, but then the hype faded faster than Milli Vanilli. One thing, though, was notable about the player. It carried the MAS3507 MP3 decoder chip—a RISC-based digital signal processor with an instruction set optimized for audio compression and decompression. The chip, developed by Micronas, let the Rio squeeze about a dozen songs onto its flash memory—laughable today but at the time just enough to compete with portable CD players. Quaint, huh? The Rio and its successors paved the way for the iPod, and now you can carry thousands of songs—and all of Milli Vanilli's albums and music videos—in your pocket.

Photo: Mostek

Mostek MK4096 4-Kilobit DRAM (1973)

Mostek wasn't the first to put out a DRAM. Intel was. But Mostek's 4-kilobit DRAM chip brought about a key innovation, a circuitry trick called address multiplexing, concocted by Mostek cofounder Bob Proebsting. Basically, the chip used the same pins to access the memory's rows and columns by multiplexing the addressing signals. As a result, the chip wouldn't require more pins as memory density increased and could be made for less money. There was just a little compatibility problem. The 4096 used 16 pins, whereas the memories made by Texas Instruments, Intel, and Motorola had 22 pins. What followed was one of the most epic face-offs in DRAM history. With Mostek betting its future on the chip, its executives set out to proselytize customers, partners, the press, and even its staff. Fred K. Beckhusen, who as a recent hire was drafted to test

the 4096 devices, recalls when Proebsting and chief executive L.J. Sevin came to his night shift to give a seminar—at 2 a.m. “They boldly predicted that in six months no one would hear or care about 22-pin DRAM,” Beckhusen says. They were right. The 4096 and its successors became the dominant DRAM for years.

Xilinx XC2064 FPGA (1985)

Back in the early 1980s, chip designers tried to get the most out of each and every transistor on their circuits. But then Ross Freeman had a pretty radical idea. He came up with a chip packed with transistors that formed loosely organized logic blocks that in turn could be configured and reconfigured with software. Sometimes a bunch of transistors wouldn’t be used—heresy!—but Freeman was betting that Moore’s Law would eventually make transistors really cheap. It did. To market the chip, called a field-programmable gate array, or FPGA, Freeman cofounded Xilinx. (Apparently, a weird concept called for a weird company name.) When the company’s first product, the XC2064, came out in 1985, employees were given an assignment: They had to draw by hand an example circuit using XC2064’s logic blocks, just as Xilinx customers would. Bill Carter, a former chief technology officer, recalls being approached by CEO Bernie Vonderschmitt, who said he was having “a little difficulty doing his homework.” Carter was only too happy to help the boss. “There we were,” he says, “with paper and colored pencils, working on Bernie’s assignment!” Today FPGAs—sold by Xilinx and others—are used in just too many things to list here. Go reconfigure!

Photo: CPU-World.com

Zilog Z80 Microprocessor (1976)

Federico Faggin knew well the kind of money and man-hours it took to market a microprocessor. While at Intel, he had contributed to the designs of two seminal specimens: the primordial 4004, and the 8080, of Altair fame. So when he founded Zilog with former Intel colleague Ralph Ungermann, they decided to start with something simpler: a single-chip microcontroller.

Faggin and Ungermann rented an office in downtown Los Altos, Calif., drafted a business plan, and went looking for venture capital. They ate lunch at a nearby Safeway supermarket—“Camembert cheese and crackers,” he recalls.

But the engineers soon realized that the microcontroller market was crowded with very good chips. Even if theirs was better than the others, they’d see only slim profits—and continue lunching on cheese and crackers. Zilog had to aim higher on the food chain, so to speak, and the Z80 microprocessor project was born.

The goal was to outperform the 8080 and also offer full compatibility with 8080 software, to lure customers away from Intel. For months, Faggin, Ungermann, and Masatoshi Shima, another ex-Intel engineer, worked 80-hour weeks hunched over tables, drawing the Z80 circuits. Faggin soon learned that when it comes to microchips, small is beautifulbut it can hurt your eyes.

“By the end I had to get glasses,” he says. “I became nearsighted.”

The team toiled through 1975 and into 1976. In March of that year, they finally had a prototype chip. The Z80 was a contemporary of MOS Technology’s 6502, and like that chip, it stood out not only for its elegant design but also for being dirt cheap (about US $25). Still, getting the product out the door took a lot of convincing. “It was just an intense time,” says Faggin, who developed an ulcer as well.

But the sales eventually came through. The Z80 ended up in thousands of products, including the Osborne I (the first portable, or "luggable," computer), and the Radio Shack TRS-80 and MSX home computers, as well as printers, fax machines, photocopiers, modems, and satellites. Zilog still makes the Z80, which is popular in some embedded systems. In a basic configuration today it costs $5.73—not even as much as a cheese-and-crackers lunch.

Photo: Robert Garner

Sun Microsystems SPARC Processor (1987)

There was a time, long ago (the early 1980s), when people wore neon-colored leg warmers and watched "Dallas," and microprocessor architects sought to increase the complexity of CPU instructions as a way of getting more accomplished in each compute cycle. But then a group at the University of California, Berkeley, always a bastion of counterculture, called for the opposite: Simplify the instruction set, they said, and you'll process instructions at a rate so fast you'll more than compensate for doing less each cycle. The Berkeley group, led by David Patterson, called their approach RISC, for reduced-instruction-set computing.

As an academic study, RISC sounded great. But was it marketable? Sun Microsystems bet on it. In 1984, a small team of Sun engineers set out to develop a 32-bit RISC processor called SPARC (for Scalable Processor Architecture). The idea was to use the chips in a new line of workstations. One day, Scott McNealy, then Sun's CEO, showed up at the SPARC development lab. "He said that SPARC would take Sun from a $500-million-a-year company to a billion-dollar-a-year company," recalls Patterson, a consultant to the SPARC project.

If that weren't pressure enough, many outside Sun had expressed doubt the company could pull it off. Worse still, Sun's marketing team had had a terrifying realization: SPARC spelled backward was…CRAPS! Team members had to swear they would not utter that word to anyone even inside Sun—lest the word get out to archrival MIPS Technologies, which was also exploring the RISC concept.

The first version of the minimalist SPARC consisted of a "20 000-gate-array processor without even integer multiply/divide instructions," says Robert Garner, the lead SPARC architect and now an IBM researcher. Yet, at 10 million instructions per second, it ran about three times as fast as the complex-instruction-set computer (CISC) processors of the day.

Sun would use SPARC to power profitable workstations and servers for years to come. The first SPARC-based product, introduced in 1987, was the Sun-4 line of workstations, which quickly dominated the market and helped propel the company's revenues past the billion-dollar mark—just as McNealy had prophesied.

Tripath Technology TA2020 AudioAmplifier (1998)

There's a subset of audiophiles who insist that vacuum tube–based amplifiers produce the best sound and always will. So when some in the audio community claimed that a solid-state class-D amp concocted by a Silicon Valley company called Tripath Technology delivered sound as warm and vibrant as tube amps, it was a big deal. Tripath's trick was to use a 50-megahertz sampling system to drive the amplifier. The company boasted that its TA2020 performed better and cost much less than any comparable solid-state amp. To show off the chip at trade shows, "we'd play that song—that very romantic one from *Titanic* ," says Adya Tripathi, Tripath's founder. Like most class-D amps, the 2020 was very power efficient; it didn't require a heat sink and could use a compact package. Tripath's low-end, 15-watt version of the TA2020 sold for US $3 and was used in boom boxes and ministereos. Other versions—the most powerful had a 1000-W output—were used in home theaters, high-end audio systems, and TV sets by Sony, Sharp, Toshiba, and others. Eventually, the big semiconductor companies caught up, creating similar chips and sending Tripath into oblivion. Its chips, however, developed a devoted cult following. Audio-amp kits and products based on the TA2020 are still available from such companies as 41 Hz Audio, Sure Electronics, and Winsome Labs.

Photo: Peter Chow

Amati Communications Overture ADSL Chip Set (1994)

Remember when DSL came along and you chucked that pathetic 56.6-kilobit-per-second modem into the trash? You and the two-thirds of the world's broadband users who use DSL should thank Amati Communications, a start-up out of Stanford University. In the 1990s, it came up with a DSL modulation approach called discrete multitone, or DMT. It's basically a way of making one phone line look like hundreds of subchannels and improving transmission using an inverse Robin Hood strategy. "Bits are robbed from the poorest channels and given to the wealthiest channels," says John M. Cioffi, a cofounder of Amati and now an engineering professor at Stanford. DMT beat competing approaches—including ones from giants like AT&T—and became a global standard for DSL. In the mid-1990s, Amati's DSL chip set (one analog, two digital) sold in modest quantities, but by 2000, volume had increased to millions. In the early 2000s, sales exceeded 100 million chips per year. Texas Instruments bought Amati in 1997.


Photo: Computer History Museum

Motorola MC68000 Microprocessor (1979)

Motorola was late to the 16-bit microprocessor party, so it decided to arrive in style. The hybrid 16-bit/32-bit MC68000 packed in 68 000 transistors, more than double the number of Intel's 8086. It had internal 32-bit registers, but a 32-bit bus would

have made it prohibitively expensive, so the 68000 used 24-bit address and 16-bit data lines. The 68000 seems to have been the last major processor designed using pencil and paper. “I circulated reduced-size copies of flowcharts, execution-unit resources, decoders, and control logic to other project members,” says Nick Tredennick, who designed the 68000’s logic. The copies were small and difficult to read, and his bleary-eyed colleagues found a way to make that clear. “One day I came into my office to find a credit-card-size copy of the flowcharts sitting on my desk,” Tredennick recalls. The 68000 found its way into all the early Macintosh computers, as well as the Amiga and the Atari ST. Big sales numbers came from embedded applications in laser printers, arcade games, and industrial controllers. But the 68000 was also the subject of one of history’s greatest near misses, right up there with Pete Best losing his spot as a drummer for the Beatles. IBM wanted to use the 68000 in its PC line, but the company went with Intel’s 8088 because, among other things, the 68000 was still relatively scarce. As one observer later reflected, had Motorola prevailed, the Windows-Intel duopoly known as Wintel might have been Winola instead.

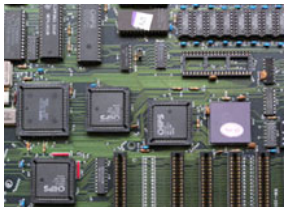


Photo: Ravi Bhatnagar

Chips & Technologies AT Chip Set (1985)

By 1984, when IBM introduced its 80286 AT line of PCs, the company was already emerging as the clear winner in desktop computersand it intended to maintain its dominance. But Big Blue’s plans were foiled by a tiny company called Chips & Technologies, in San Jose, Calif. C&T developed five chips that duplicated the functionality of the AT motherboard, which used some 100 chips. To make sure the chip set was compatible with the IBM PC, the C&T engineers figured there was just one thing to do. “We had the nerve-racking but admittedly entertaining task of playing games for weeks,” says Ravi Bhatnagar, the chip-set lead designer and now a vice president at Altierre Corp., in San Jose, Calif. The C&T chips enabled manufacturers like Taiwan’s Acer to make cheaper PCs and launch the invasion of the PC clones. Intel bought C&T in 1997.

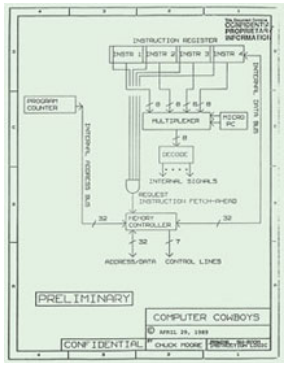


Photo: Chuck Moore

Computer Cowboys Sh-Boom Processor (1988)

Two chip designers walk into a bar. They are Russell H. Fish III and Chuck H. Moore, and the bar is called Sh-Boom. No, this is not the beginning of a joke. It’s actually part of a technology tale filled with discord and lawsuits, lots of lawsuits. It all started in 1988 when Fish and Moore created a bizarre processor called Sh-Boom. The chip was so streamlined it could run faster than the clock on the circuit board that drove the rest of the computer. So the two designers found a way to have the processor run its own superfast internal clock while still staying synchronized with the rest of the computer. Sh-Boom was never a commercial success, and after patenting its innovative parts, Moore and Fish moved on. Fish later sold his patent rights to a Carlsbad, Calif.–based firm, Patriot Scientific, which remained a profitless speck of a company until its executives had a revelation: In the years since Sh-Boom’s invention, the speed of processors had by far surpassed that of motherboards, and so practically every maker of computers and consumer electronics wound up using a solution just like the one Fish and Moore had patented. *Ka-ching!* Patriot fired a barrage of lawsuits against U.S. and Japanese companies. Whether these companies’ chips depend on the Sh-Boom ideas is a matter of controversy. But since 2006, Patriot and Moore have reaped over US $125 million in

licensing fees from Intel, AMD, Sony, Olympus, and others. As for the name Sh-Boom, Moore, now at IntellaSys, in Cupertino, Calif., says: “It supposedly derived from the name of a bar where Fish and I drank bourbon and scribbled on napkins. There’s little truth in that. But I did like the name he suggested.”

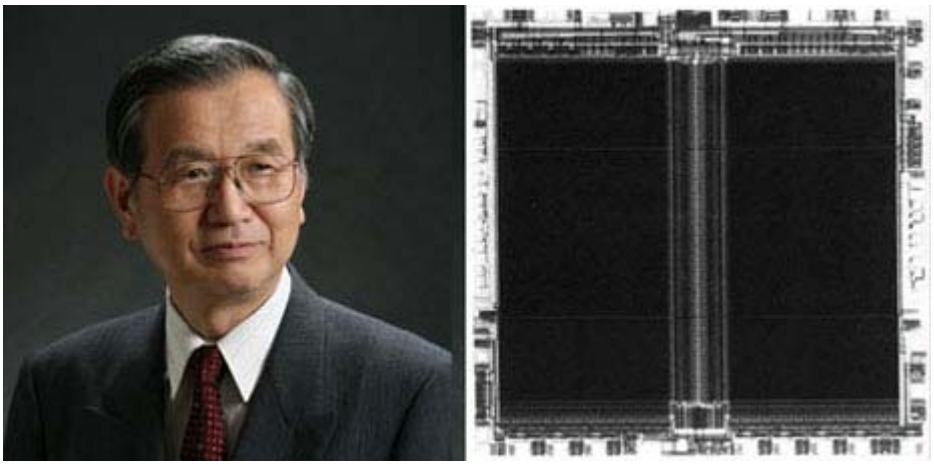


Photo: Fujio Masuoka (2)

Toshiba NAND Flash Memory (1989)

The saga that is the invention of flash memory began when a Toshiba factory manager named Fujio Masuoka decided he’d reinvent semiconductor memory. We’ll get to that in a minute. First, a bit (groan) of history is in order.

Before flash memory came along, the only way to store what then passed for large amounts of data was to use magnetic tapes, floppy disks, and hard disks. Many companies were trying to create solid-state alternatives, but the choices, such as EPROM (or erasable programmable read-only memory, which required ultraviolet light to erase the data) and EEPROM (the extra E stands for “electrically,” doing away with the UV) couldn’t store much data economically.

Enter Masuoka-san at Toshiba. In 1980, he recruited four engineers to a semisecret project aimed at designing a memory chip that could store lots of data and would be affordable. Their strategy was simple. “We knew the cost of the chip would keep going down as long as transistors shrank in size,” says Masuoka, now CTO of Unisantis Electronics, in Tokyo.

Masuoka’s team came up with a variation of EEPROM that featured a memory cell consisting of a single transistor. At the time, conventional EEPROM needed two transistors per cell. It was a seemingly small difference that had a huge impact on cost.

In search of a catchy name, they settled on “flash” because of the chip’s ultrafast erasing capability. Now, if you’re thinking Toshiba rushed the invention into production and watched as the money poured in, you don’t know much about how huge corporations typically exploit internal innovations. As it turned out, Masuoka’s bosses at Toshiba told him to, well, erase the idea.

He didn't, of course. In 1984 he presented a paper on his memory design at the IEEE International Electron Devices Meeting, in San Francisco. That prompted Intel to begin development of a type of flash memory based on NOR logic gates. In 1988, the company introduced a 256-kilobit chip that found use in vehicles, computers, and other mass-market items, creating a nice new business for Intel.

That's all it took for Toshiba to finally decide to market Masuoka's invention. His flash chip was based on NAND technology, which offered greater storage densities but proved trickier to manufacture. Success came in 1989, when Toshiba's first NAND flash hit the market. And just as Masuoka had predicted, prices kept falling.

Digital photography gave flash a big boost in the late 1990s, and Toshiba became one of the biggest players in a multibillion-dollar market. At the same time, though, Masuoka's relationship with other executives soured, and he quit Toshiba. (He later sued for a share of the vast profits and won a cash payment.)

Now NAND flash is a key piece of every gadgetcellphones, cameras, music players, and of course, the USB drives that techies love to wear around their necks. "Mine has 4 gigabytes," Masuoka says.

With additional reporting by Sally Adee, Erico Guizzo, and Samuel K. Moore.

For more articles, go to Special Report: 25 Microchips That Shook the World (/25chips).

To Probe Further

For a selection of 70 seminal technologies presented at the IEEE International Solid-State Circuits Conference over the past 50 years, go to the ISSCC 50th Anniversary Virtual Museum (http://sscs.org/History/isscc50/index.html).

The IEEE Global History Network (http://www.ieeeghn.org) maintains a Web site filled with historical articles, documents, and oral histories.

For a timeline and a glossary on semiconductor technology, visit "The Silicon Engine," (http://www.computerhistory.org/semiconductor/) an online exhibit prepared by the Computer History Museum.

"The Chip Collection" (http://smithsonianchips.si.edu) on the Smithsonian Institution's Web site contains a vast assortment of photos and documents about the evolution of the integrated circuit.

Mark Smotherman at Clemson University, in South Carolina, maintains a comprehensive list of computer architects and their contributions (http://www.cs.clemson.edu/~mark/architects.html).

For technical details and history on more than 60 processors, see John Bayko's "Great Microprocessors of the Past and Present." (http://jbayko.sasktelwebsite.net/cpu.html)

Exhibit 7

AGILITY IP LAW
IP LITIGATION EXPERTS

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March 19, 2015

Via E-Mail
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Re: ***Technology Properties Limited LLC, et al. v. Samsung Electronics Co., Ltd., et al.: Plaintiffs' Infringement Contentions***

Counsel,

I am responding to your March 10, 2015 letter regarding Plaintiffs (collectively "PDS")'s Infringement Contentions (the "Contentions"). Contrary to your assertions, the Contentions satisfy the notice requirements under the patent local rules.

1. Claim 1 of the '890 patent is not asserted.

We confirm that PDS does not assert canceled claim 1 of the '890 Patent. However, we include claim 1 in the claim chart because asserted claim 7 depends on claim 1.

2. Claims 1, 43, and 59 of the '749 patent are not indefinite.

As explained in our March 13, 2015 response to Defendants' February 20, 2015 letter, claims 1, 43, and 59 of the '749 patent are not indefinite. Therefore, PDS will not withdraw the infringement contentions based on the '749 patent.

3. Defendants are in the best position to verify the earliest possible date of infringement associated with Accused Products.

You assert that certain Samsung products were not "released" until after the expiration of the '890 and '749 patents. However, you only cite to a third party website, not even Samsung's own records for a release date." Even assuming that the products had become available to end users on that date, we believe that the products would have been offered for sale to carriers such as AT&T, or at trade shows before then. Therefore, selling to end users is not necessarily the earliest act of infringement. Samsung is in the best position to verify the earliest possible date of infringement associated with the Accused Products. If you give us a verified statement that certain accused products were not made, used, sold, offered for sale within the United States, including but not limited to offering for sale to carriers, or displaying at trade shows to solicit orders, or imported into the United States, including but not limited to importing for sale or for FCC submissions, before the expiration of the relevant patents, PDS will agree to no longer assert those patents against those products.

4. The infringement contentions sufficiently identify Accused Products.

You contend that certain accused products were insufficiently identified because they were were not identified by product names. It is unclear how you distinguish a part or product number from a product name. You cite to no authority requiring infringement contentions to identify accused products using only one method and not the other. In any event, PDS has sufficiently identified the accused products in the same manner that Samsung itself or a retailer identifies the products publicly.

5. The claim charts are sufficient.

Contrary to your assertion, PDS does not need to produce one claim chart for each accused product. PDS stated in its claim charts that infringement by the Accused Products is largely based on the operation and implementation of the microprocessors they contain. *See* footnote 1 in each chart. PDS identified the microprocessors in a large number of the Accused Products (*see* Ex. A to the claim charts). PDS therefore provided the basis to contend that each remaining accused electronic device also contains at least one microprocessor.

PDS also provided the analysis and basis for its belief that these microprocessors were implemented similarly and would operate similarly with respect to the features relevant to the asserted claims. *E.g.*, http://en.wikipedia.org/wiki/Phase-locked_loop, *Design of High-Performance Microprocessor Circuits* pp. 98, 101 (Anatha Chandrakasan et al. eds., IEEE Press, 2001) [Models of Process Variations in Device and Interconnect (Duane Boning and Sani Nassif)] (TPL853_02927444 – TPL853_02927464), http://en.wikipedia.org/wiki/USB, http://www.usb.org/developers/docs/, http://en.wikipedia.org/wiki/Ring_oscillator. For the '749 patent, PDS also stated that infringement by the Accused Products is based on the operation and implementation of the ARM core or a similar core, *regardless of the processor manufacturer*. *See, e.g.*, http://en.wikipedia.org/wiki/Comparison_of_ARMv7-A_cores and sources cited on that page. Your letter alleges that the ARM processing cores found in the Accused Products contain several different design generations. But you do not explain how such differences are relevant to the patent claims at issue. On the other hand, each PDS claim chart provided examples of *relevant* operations that are representative of the operations of the processors in each of the Accused Products. That is sufficient to satisfy the notice requirements under the patent local rules.

You cite to *Network Prot. Sciences, LLC v. Fortinet, Inc.*, No. C 12-01106 WHA, 2013 WL 5402089 (N.D. Cal. Sept. 26, 2013). But that case actually supports PDS's position that representative infringement contentions suffice where, as here, there is "adequate analysis showing that the accused products share the same critical characteristics." *Id.* at *3. There, the court held that "[the plaintiff's] typicality showing was sufficient under our local rules subject to proof at trial." *Id.* As shown above, PDS's typicality showing in this case is also sufficient under the local rules subject to proof at trial.

You accuse PDS of making unsupported allegations regarding the Accused Products. Not true. Unlike the plaintiff in *CSR Tech. Inc. v. Freescale Semiconductor, Inc.*, No. C-12-02619 RS (JSC) (N.D. Cal. Feb. 8, 2013), PDS has provided "reasonable notice" to Samsung why PDS believes that it has a "reasonable chance of proving infringement." For example, PDS provided numerous citations to public ARM documents to support its contentions. *See France Telecom, S.A. v. Marvell Semiconductor*, Inc., No. 12-cv-04967-WHA at 4 (N.D. Cal. May 3, 2013) (France Telecom may rely on industry standards to disclose its theory of infringement) (citing *Fujitsu v. Netgear*, 620 F.3d 1321 (Fed. Cir. 2010)).

Your citation to *Bender v. Freescale Semiconductor, Inc.*, No. C 09-1156 PHJ MEJ, 2010 WL 1689465 (N.D. Cal. Apr. 26, 2010) is also inapposite. Unlike the plaintiff in that case, PDS has identified "with the required precision where the infringing component is located." PDS did not "merely [allude] to the fact that any electrical engineer would understand the infringement contentions." *Id*. at 4. In addition, you do not cite to any authority that prohibits citing to Wikipedia pages in infringement contentions. The time to challenge the admissibility of such evidence is at trial.

In short, we disagree with your characterizations of the Contentions. PDS has provided adequate notice of its infringement theories. We believe that any further delay of Samsung's Patent L.R. 3-3, and 3-4 disclosure or discovery responses is unwarranted.

We are open to meet and confer on the phone next week. Please let us know your availability.

Sincerely,

AGILITY IP LAW, LLC

/s/ Vinh Pham

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

TECHNOLOGY PROPERTIES LIMITED LLC, *et al*,
Plaintiffs,

v.

SAMSUNG ELECTRONICS CO., LTD. and SAMSUNG ELECTRONICS AMERICA, INC.,
Defendants.

Case No. 3:12-cv-03877-VC (PSG)

[PROSPOSED] ORDER DENYING SAMSUNG DEFENDANTS' MOTION TO STRIKE INFRINGEMENT CONTENTIONS OR ALTERNATIVELY TO COMPEL SUPPLEMENTAL INFRINGEMENT CONTENTIONS

Hearing:
Date: August 11, 2015
Time: 10:00 a.m.
Place: Courtroom 5, 4th Floor
Judge: Hon. Paul S. Grewal

Defendants Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. ("Samsung"); have moved to strike Plaintiffs' January 20, 2015 Infringement Contentions. Having considered Defendants' motion, the papers in support and opposition, and all other matters presented to the Court, and for good cause shown,

THIS COURT RECOMMENDS THAT:

Defendants' Motion be DENIED.

IT IS SO ORDERED.

Dated:

_____
Hon. Paul S. Grewal
United States Magistrate Judge