

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
TYLER DIVISION**

NuCurrent Inc.,

Plaintiff,

v.

Samsung Electronics Co., Ltd.; Samsung
Electronics America, Inc.,

Defendants.

Case No. 18-cv-00051

COMPLAINT

DEMAND FOR JURY TRIAL

Plaintiff NuCurrent, Inc. (“NuCurrent”), by and through its attorneys, and for its Complaint against Samsung Electronics Co., Ltd (“SEC”) and Samsung Electronics America, Inc. (“SEA,” together with SEC, “Samsung” or “Defendants”), and upon information and belief alleges as follows:

I. INTRODUCTION

This is an action for trade secret misappropriation and patent infringement relating to NuCurrent’s wireless power technology. NuCurrent is a Chicago-based company specializing in wireless charging solutions and high-efficiency antenna design. Founded in 2009 by a group of Northwestern University students who were exploring the development of wireless medical technologies, NuCurrent eventually shifted its focus to the next revolution in consumer electronics—wireless power supply, a budding technology sector estimated to generate over \$17 billion annually by 2020. NuCurrent has since established itself as a leader in this nascent industry, having received such accolades as being named one of the Top 50 Influencers in Wireless Power in 2013, a Chicago Innovations Awards Finalist in 2014, 2015, and 2017, and #1 on Crain’s Chicago Business Eureka Index 2015 for most innovative companies in Illinois. Today, NuCurrent’s business partners include numerous Fortune 500 companies and global suppliers of electrical components.

NuCurrent's early successes are owed in part to its robust intellectual property, including its proprietary antenna designs, confidential manufacturing and materials knowledge, and a wide array of patented technologies. NuCurrent also has taken great measures to protect its inventions and to safeguard its most top-secret innovations, which is a key part of NuCurrent's strategy to compete aggressively but fairly. This has allowed NuCurrent to confidently engage with potential industry partners without fear that its inventions will be misappropriated.

Unfortunately, one potential partner, Samsung, has done just that.

Under the guise of seeking a partnership with NuCurrent, Samsung invited NuCurrent executives to present its wireless charging technology at Samsung's Korean headquarters in 2015. Operating under the strict protections of a confidentiality agreement, NuCurrent shared its proprietary information to Samsung engineers and executives, including how to improve Samsung's Galaxy S6 wireless power solution with wireless charging antennas using NuCurrent's confidential designs, methodologies, and patented inventions. Rather than working together to incorporate NuCurrent's technology into Samsung's devices, Samsung instead took NuCurrent's intellectual property—without giving notice or gaining permission—and implemented it in Samsung's new smartphones, including the Galaxy S7 and S8. Samsung's calculated misappropriation of NuCurrent's technology cemented Samsung's first-mover advantage in the race to offer quality wireless smartphone charging. Samsung's misappropriation also netted it industry praise: “[W]here the Galaxy S6 does excel, the Galaxy S8 beats it . . . there's fast wireless charging whereas the Galaxy S6 took forever to fill up via this method.”¹

In light of Defendants' misappropriation and infringement of NuCurrent's wireless power technology, NuCurrent brings this Complaint to prevent any further misuse of its proprietary information, to prevent Defendants from harming NuCurrent's reputation by misusing its technology, and to obtain damages, including for Defendants' undeserved enrichment resulting from their unlawful conduct.

¹ <https://www.forbes.com/sites/gordonkelly/2017/04/05/galaxy-s8-vs-galaxy-s6-whats-the-difference/#4259995f3e50>

II. PARTIES

1. NuCurrent Inc. is an Illinois entity located at 641 West Lake Street, Suite 304, Chicago, IL 60601.

2. Samsung Electronics Company, Limited is a South Korean entity located at 129 Samsung-ro, Maetan-3dong, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-742 Korea.

3. Samsung Electronics America, Incorporated is a New York entity located at 85 Challenger Road, Ridgefield Park, New Jersey 07660. SEA is a wholly-owned subsidiary of SEC. SEA's registered agent for service of process in Texas is CT Corporation System, 1999 Bryan Street, Suite 900, Dallas, Texas 75201.

III. JURISDICTION AND VENUE

4. This Court has personal jurisdiction over Samsung consistent with the requirements of the Due Process Clause of the United States Constitution and the Texas Long Arm Statute. Samsung conducts business, maintains established places of business, and has committed acts of patent infringement and/or have induced and/or contributed to acts of patent infringement by others in the Eastern District of Texas, the state of Texas, and elsewhere in the United States. In addition, SEA's business operations relating to cell phones, which are among the devices accused of infringement in this Action, are conducted primarily at its Texas facilities.

5. This Court has original subject matter jurisdiction over NuCurrent's claims for patent infringement pursuant to the Federal Patent Act, 35 U.S.C. § 1 *et seq.* and 28 U.S.C. §§ 1331 and 1338(a). This Court has subject matter jurisdiction over NuCurrent's federal trade secret claim pursuant to 18 U.S.C. §§ 1836-39 *et seq.* ("Defend Trade Secrets Act") and 28 U.S.C. §§1331 and 1343. In addition to jurisdiction based upon a federal question, there is jurisdiction under 28 U.S.C. § 1332(a) because of diversity of citizenship in that Plaintiff is a citizen of the State of Illinois and Defendants are citizens of other states, and the amount in controversy is in excess of \$75,000, exclusive of interest and costs. This Court also has supplemental jurisdiction over the state law claims alleged in this Complaint pursuant to 28 U.S.C. § 1367.

6. Venue is proper in this judicial district for NuCurrent's claims for patent infringement pursuant to 28 U.S.C. §§ 1391(c) and 1400(b). Samsung has committed acts of infringement in this judicial district and maintains regular and established places of business in this judicial district at least at the following location: 1301 E. Lookout Drive, Richardson, TX 75080.

7. Venue is proper in this judicial district for NuCurrent's claims for trade secret misappropriation under the Defend Trade Secrets Act and Illinois Trade Secrets Act. Pursuant to 28 U.S.C. § 1391(c), Samsung is subject to personal jurisdiction in this district and therefore venue properly lies in this judicial district pursuant to 28 U.S.C. § 1391(b)(1). In addition, a substantial part of the events or omissions giving rise to the claims alleged in this Complaint occurred in this judicial district. Venue therefore lies in the United States District Court for the Eastern District of Texas pursuant to 28 U.S.C. § 1391(b)(2).

IV. FACTUAL ALLEGATIONS

A. NuCurrent Pioneers Wireless Charging Technology.

8. In 2009, a group of students at Northwestern University set out to address a problem that surgeons in the medical field faced when implanting spinal neurostimulators intended to block pain signals: unreliable power wires. The Northwestern team, through years of research and design, made progress in solving this problem by inventing a new and efficient wireless power-charging antenna. After gaining expertise in wireless technologies and antenna design, the medical-device startup soon explored the possibility that its antennas might have broader commercial appeal. Predicting an industry shift from wired charging to wireless power in consumer electronics, the team turned its focus to designing wireless charging antennas suitable for powering up cell phones and other mobile devices without plugging them in. They called their venture NuCurrent.

9. Starting in 2012, NuCurrent added more engineers and new advisors to their team. The company's innovation was quickly validated by early partnerships with Intel and Texas Instruments. During this time, NuCurrent also entered the marketplace. NuCurrent's high-

efficiency antennas supported wireless charging solutions across Wireless Power Consortium (Qi) and Power Matters Alliance (PMA) standards, and they were selected for the first commercially available Alliance for Wireless Power (A4WP) certified products.

10. NuCurrent also partnered with Gill Electronics Inc. to supply resonators for the TesLink™ Through Surface Transmitter—the first FCC and CE-approved commercial product in support of the A4WP Rezence™ standard. The Through Surface Transmitter is a tabletop wireless charging solution. *See, e.g.:*



Source: http://ofsbrandssitesbucket.s3.amazonaws.com/s3fspublic/OFS_WirelessCharging_Product%20Manual_12-1-16.pdf

11. NuCurrent's high-efficiency antennas were also selected as the Wireless Power Consortium's standard transmitter antenna for in-car charging.

12. In addition to attracting new customers, NuCurrent also garnered the interest of investors. In 2014, NuCurrent announced that the company had raised \$3.48 million from private investors, including Independence Equity, Hyde Park Angels, and Harvard Business School Angels, a necessary step to propel the company's commercial development and increase NuCurrent's global market share.

13. Industry groups, both local and worldwide, recognized NuCurrent's successes and

its immense potential. The company was named as one of the Top 50 Influencers in Wireless Power by Wireless Power World in 2013 and won the 2015 Chicago Innovation Award, for example. Other awards include:

- 2017 IoT Breakthrough Awards Winner
- 2017 Fourth Revolution Awards Finalist (Product Design of the Year)
- 2017 ITA CityLIGHTS Awards Finalist (Industry Disrupter)
- 2017 Timmy Awards Finalist (Best Technology Work Culture)
- 2017 Chicago Innovation Awards Finalist
- 2016 IoT Breakthrough Awards Winner
- 2016 Chicago Innovation 50 on Fire Winner
- Finalist for two 2016 ITA CityLIGHTS Awards
- Chicago Innovation's 16 Chicago Startups to Watch in 2016
- 2015 Chicago Innovation Awards Winner (Up-and-Comer Award)
- Named No. 1 on the 2015 Crain's Chicago Business Eureka Index
- Listed as one of top companies in patent quality score by Crain's Chicago;
- Finalist for two 2015 ITA CityLIGHTS Awards
- Chicago Innovation's 2015 10 Chicago Startups We're Watching This Summer
- 2014 Chicago Innovation Awards Finalist

14. International conferences across the globe such as Battery Power 2014, Wireless Power Conference 2015, and Wireless Power Consortium 2016 have asked NuCurrent representatives to share their insights with the industry. More recently, Dr. Vinit Singh, NuCurrent's former Chief Technology Officer and the named inventor on NuCurrent's patents, served as a keynote speaker at the 2017 IEEE Wireless Power Transfer Conference in Taipei.

15. NuCurrent continues its relentless innovation to this day. The company employs many engineers and salespeople, has worked with and for some of the largest technology companies in the world, and was recently awarded the 2017 Product Innovation Award for its printed antennas by FlexTech.

B. NuCurrent's Technology.

16. NuCurrent's proprietary designs, methodology, and manufacturing techniques produce the world's highest efficiency printed wireless power antennas.

17. Applications employing near-field wireless power and/or data transmission, such as commercial electronics, have been limited in achieving optimal performance because the wireless technology components such as antennas (also referred to coils or resonators) utilized in these systems have relatively low quality factors. Low quality factors are due mainly to higher resistive losses caused by a phenomenon known as the "skin effect." Skin effect is the tendency of an alternating electric current (AC) to distribute itself within a conductor such that the current density is more predominant near the surface of the conductor with the remaining conductor body unused relative to electrical current flow. Skin effect, which can cause energy loss, becomes more prevalent when operating frequency increases. At higher frequencies, current that normally flows through the entire cross section of the conductor becomes restricted to its surface. As a result, the effective resistance of the conductor is similar to that of a thinner conductor rather than of the actual diameter through which the current could be distributed. This is inefficient, results in energy loss, and in some cases renders particular applications unable to conduct an electrical signal at all.

18. NuCurrent's technology, including its Multi-Layer Multi-Turn ("MLMT") technology, mitigates typical high frequency effects like the skin effect. MLMT technology provides more surface area through which current flows, resulting in lower resistance inductors. Increased efficiency and durability, the ability to receive more power without generating excessive heat, faster charging and smaller form factor are some of the many benefits offered by NuCurrent's proprietary technology.

19. NuCurrent's technology also mitigates "proximity effects," *i.e.*, the phenomenon whereby the alternating flux in a conductor caused by the current of other nearby conductors produces a circulating current which increases resistance and results in increased power losses. NuCurrent's antennas make it possible for consumer electronics devices to charge with greater

efficiency and at increased distance, as well as offering superior alignment flexibility, lower heating, and faster charge times.

C. Samsung's Foray into Wireless Charging.

20. The wireless charging industry has expanded rapidly in the past five years. In 2013, revenue from shipments of wireless power transmitters and receivers was reportedly just \$216 million.² It is estimated that in 2018, that number will balloon to \$8.5 billion.³ By 2022, over \$22 billion.⁴ This explosion is fueled in part by market demand to eliminate power cords and the resulting introduction of wireless charging functionality in today's mobile devices like smartphones, tablets, portable computers, and wearables.

21. The race to meet market demand for wireless charging began as early as 2013, with major smartphone manufacturers including Nokia, LG, HTC, and Samsung integrating wireless charging features into their flagship product offerings. Since that time, iterations of new mobile devices and related accessories have flooded the wireless charging space. In the Fall of 2017, the leading domestic smartphone manufacturer, Apple Inc., released its first iPhones with wireless charging capabilities.

22. Samsung's first wireless power offering came in the form of a wireless charging accessory kit available as an add-on to its Galaxy S4 smartphone in 2013. The functionality was available to Samsung customers only if they purchased a separate charging accessory, removed the stock cover from the smartphone and replaced it with a new custom charging cover. This solution proved costly (roughly \$100 in addition to the cost of the Galaxy S4), and noticeably increased the thickness of the device. The add-on kit also reportedly took much longer to fully charge the device as compared to the traditional wired-charging method.

23. In an apparent attempt to address the shortfalls with its initial add-on kit solution, Samsung introduced the Galaxy S6 and S6 Edge smartphones in 2015. Unlike the earlier

² <https://technology.ihc.com/494741/global-market-revenue-for-wireless-charging-to-rise-by-nearly-factor-of-40-by-2018>

³ *Id.*

⁴ <https://www.grandviewresearch.com/press-release/global-wireless-charging-market>

generation Galaxy devices, the S6 and S6 Edge came embedded with a wireless charging coil directly in the smartphone, making wireless charging a basic option to Samsung's customers for the first time. While not required to purchase an add-on kit or disassemble their devices like in previous generations, Samsung's Galaxy S6 and S6 Edge customers still criticized the wireless charging functionality for suffering from similar drawbacks as earlier generation Galaxy devices. The wireless charging on the Galaxy S6 and S6 Edge remained limited—unable to efficiently handle higher currents and fast charging, for example. From a user's perspective, this meant that charging through the wireless method took noticeably longer than through traditional wired means. The S6 models also suffered from diminished charging functionality when placed too far from the wireless charging transmitter or placed out of perfect alignment.

24. The wireless charging solutions at that time were also expensive to produce. In addition to requiring technical improvements to reduce power losses and increase functionality, manufacturers desired designs that reduced the overall cost of providing the feature. To accomplish these tasks, Samsung called on NuCurrent.

D. Samsung Seeks Out NuCurrent to Improve Samsung's Wireless Charging.

25. In early 2015, Samsung sought the expertise of NuCurrent to help improve the wireless charging feature in Samsung's phones. After representatives from the two companies were introduced at the Las Vegas Consumer Electronics Show in early January of 2015, Samsung indicated an interest in exploring a business relationship with NuCurrent based on NuCurrent's reputation and expertise in wireless antenna design industry. NuCurrent agreed to do so, but only after confidentiality and non-disclosure agreements were executed.

26. NuCurrent and Samsung entered into a mutual confidentiality and non-disclosure agreement, effective January 13, 2015.

27. On January 30, 2015, a Samsung representative asked NuCurrent to share the list of patents NuCurrent holds covering NuCurrent's antenna technology. NuCurrent's CEO, Mr. Jacob Babcock, shared to Samsung a list of NuCurrent's patents and patent applications. Mr. Babcock also reinforced the purpose of the confidentiality agreement by stating that NuCurrent

“has a dedicated team of wireless power experts with over 30 years of combined experience in wireless power design. In other words, we have developed a lot of ‘trade secret’ and ‘know how’ that can help optimize and accelerate designs.”

28. On February 15, 2015, a Samsung representative emailed Mr. Babcock to ask for “Tech. information.” In response, Mr. Babcock informed Samsung that NuCurrent would share comparison data of a NuCurrent antenna design versus the current antenna design of one of Samsung’s antenna suppliers.

29. NuCurrent, in connection with a manufacturing partner Molex Inc., scheduled a trip to Korea to visit Samsung headquarters to present NuCurrent’s ideas for improving Samsung’s wireless charging antennas. Also during this time, NuCurrent began development and manufacturing of sample charging coils to share with Samsung.

E. Subject to Confidentiality Agreements, NuCurrent Shares Proprietary Trade Secrets to Defendants at Their Korean Headquarters.

30. On March 30, 2015, Mr. Babcock travelled to Samsung headquarters in Korea to conduct in-person meetings with Samsung engineers and executives.

31. Over the course of the next two days, Mr. Babcock and representatives from Samsung worked in close collaboration regarding Samsung’s wireless power charging products and NuCurrent’s antenna designs. During this time, Mr. Babcock educated Samsung representatives on NuCurrent’s intellectual property, including NuCurrent’s patented technology and design and manufacturing trade secrets.

32. Also during this time, Mr. Babcock delivered to Samsung two identical sample wireless power coils developed by NuCurrent:



NuCurrent Sample Coil Delivered to Samsung (Samsung privacy sticker attached)

33. NuCurrent prepared the above sample coil by redesigning and improving Samsung's own power coil, which Samsung had directed one of its local suppliers to share with NuCurrent. NuCurrent redesigned and improved the power coil using NuCurrent's intellectual property. In addition to permitting Samsung engineers to visually inspect the sample coils, Mr. Babcock shared information with Samsung engineers and executives about the design of the sample coils and about the proprietary technology and techniques used to create NuCurrent's sample coils. Mr. Babcock detailed to Samsung engineers the reasons why NuCurrent's sample coils outperformed Samsung's.

34. Representatives from Samsung took custody and control of the two NuCurrent sample coils.

35. Among other confidential and proprietary information shared with Samsung during this timeframe and in subsequent follow-up engagements, NuCurrent disclosed:

- a. a specialized layout of stackup copper traces in a wireless power coil;
- b. a specialized wireless power coil shape;
- c. a method for using multiple layers in a wireless power coil;
- d. dimensions of wireless power coil traces to optimize performance;
- e. dimensions of substrate thickness to optimize performance;

- f. dimensions of shielding and heat syncing material thickness to optimize performance;
- g. specialized manufacturing processes and materials including flex printed circuits;
- h. patented MLMT technology;
- i. methods for increasing wireless power coil diameter;
- j. cost-savings strategies related to wireless power coil design; and
- k. the complex interplay of all these variables relative to wireless power standards, set operating frequencies, and pre-defined mechanical envelopes.

36. Other confidential information disclosed by NuCurrent to Samsung during this time includes drawings, sketches, product specifications, and test data. While aspects of NuCurrent's intellectual property are protected by NuCurrent's patent rights, others have not been included in its patent filings because NuCurrent kept them as trade secrets as permitted under patent and trade secret law.

37. Following these initial meetings between NuCurrent and Samsung, the parties continued to work in close collaboration on wireless charging solutions. During this time, Defendants elicited further disclosure of NuCurrent's proprietary and confidential information pursuant to the confidentiality agreement in place.

38. During the summer of 2015, at the request of Samsung, NuCurrent prepared and delivered a second sample wireless power coil for Samsung using NuCurrent's intellectual property. NuCurrent and Samsung continued their discussions regarding NuCurrent's wireless power coil designs during this timeframe, and again at Samsung's request, NuCurrent shared certain design data and specifications.

39. Throughout the remainder of 2015 and into 2016, the parties continued their relationship under the confidentiality agreement, with Samsung's interest in and inquiries to NuCurrent increasing over time. Samsung began to routinely call upon NuCurrent for its expertise in wireless power and to provide new samples to Samsung under the confidentiality agreement. Samsung's United States technology sourcing team began contacting NuCurrent and

administering new projects for NuCurrent. In early 2016, Samsung's former Chief Technology Officer visited NuCurrent's offices in Chicago to meet with NuCurrent representatives.

40. NuCurrent performed this work, met with Samsung representatives, prepared data and samples, and disclosed its proprietary trade secrets and patented inventions in reliance upon the strict protections of the confidentiality agreement in place which forbid Samsung from, among other things, sharing, reverse-engineering, or using NuCurrent's protected property. It also did so with the expectation that, if Samsung wished to commercialize NuCurrent's technology, Samsung would be required to compensate NuCurrent. At no point during this time did Samsung confirm to NuCurrent that it was actually commercializing NuCurrent's technology in Samsung devices.

41. By spring of 2016, NuCurrent began to question whether the relationship would materialize into a commercial application. NuCurrent had contributed significant time and resources to the projects under the confidentiality agreement, but saw only marginal progress in its dealings with Samsung. In May of 2016, NuCurrent accepted Samsung's invitation to speak at a Samsung conference in Mountain View, California, but frustrated by what it perceived as a lack of commitment and investment in the project by Samsung, NuCurrent reminded Samsung representatives that no commercial progress had been made.

42. Samsung representatives appeared to dismiss NuCurrent's concerns and continued trickling small design projects to NuCurrent, leaving NuCurrent to suspect that Samsung had selected a different antenna design partner altogether, or alternatively, that Samsung had simply elected to continue developing its own wireless charging antenna designs in-house. Neither were the case.

43. Unbeknownst to NuCurrent, Samsung had already implemented NuCurrent's technology into Samsung's product offerings. By summer 2016, Samsung had sold millions of infringing products using NuCurrent's patented and trade secret. And Samsung had done so surreptitiously, without notice to, or authorization from NuCurrent.

44. Samsung's masquerading as an interested partner was merely a way to gain access

to, and then misappropriate, NuCurrent's intellectual property. After unlawfully purloining that property, Samsung then swiftly implemented NuCurrent's designs and technology into Samsung's product lines before the startup from Chicago knew what happened.

F. Defendants Misappropriated NuCurrent's Intellectual Property and First Incorporated It into the Galaxy Note 5 and Galaxy S6 Edge+.

45. Beginning as early as March of 2015, Samsung began executing its plan to purloin NuCurrent's intellectual property. Under the guise of a likely partnership, Samsung swiftly extracted NuCurrent's most secret and protected information, including highly sensitive designs, design considerations, design tradeoffs, and technical data. Almost immediately after acquiring NuCurrent's trade secrets, patented teachings, and technical know-how, Samsung implemented NuCurrent's protected technology into Samsung devices to vastly improve their wireless charging coils—starting with the Galaxy Note 5 and S6 Edge+—unlawfully and devoid of any attribution, payment, or notice to NuCurrent.

46. In August of 2015, only months after extracting critical information and samples from NuCurrent, Samsung released the Galaxy Note 5 and Galaxy S6 Edge+. Like the prior generation Galaxy S6, the Note 5 and S6 Edge+ included built-in wireless charging. Unlike the previous Galaxy S6's wireless solution, these new devices charged more efficiently and more quickly. The Note 5 and S6 Edge+ were also the first to support “fast wireless charging.” Defendants achieved these milestones, including fast wireless charging, only after their unauthorized adoption of NuCurrent's protected antenna design and know-how.

47. Comparisons of the wireless power coil in the Galaxy S6 to that of the Note 5 and S6 Edge+ reveal Defendants' first act of deliberate misappropriation. Unlike the wireless power coil in the Galaxy S6 (which was designed and manufactured prior to NuCurrent's involvement), the wireless power coil in the Note 5 and S6 Edge+ carefully emulates the sample coils that NuCurrent provided to Defendants. For instance, unlike the single conductor layer found in the Galaxy S6, the wireless power coil of the Note 5 and S6 Edge+ consist of two conductor layers connected electrically through vias—exactly as taught by NuCurrent's intellectual property.

Similarly, Defendants materially copied certain of NuCurrent's specialized layouts for stackup copper traces. The Note 5 and S6+ also utilized NuCurrent's substrate specifications for performance optimization and manufacturing enhancement. The Note 5 and S6+ also featured many of the proprietary yield benefits that NuCurrent taught Samsung. Samsung's new wireless power coils also infringed numerous NuCurrent patent claims covering its MLMT technology, intellectual properties that were shared to Samsung in early 2015 at Samsung's request. All of this information was shared by NuCurrent to Defendants under mutually agreed confidentiality and non-disclosure agreements that explicitly prohibited Defendants' disclosure, use, and reproduction of NuCurrent's proprietary technology.

48. Despite being built on the back of NuCurrent's intellectual property, Samsung was quick to take credit for its new and improved wireless charging features. For example, during its August 2015 "Unpacked" product launch event during which the Note 5 and S6 Edge+ were introduced to the public, Samsung touted the vast improvements it claimed to have made to its wireless charging feature and took full credit for those advances. Samsung's Senior Vice President of Product Marketing, Justin Denison, introduced Samsung's new, fast wireless charging:

Now, all of these features and services are great as long as your battery stays charged. That's why Samsung has led the way with . . . wireless charging built right into our devices. Today, we are going further. With the S6 Edge+ and the Note 5, ***we are bringing fast charging to wireless charging. Samsung is a pioneer here.***

* * *

We're not just trying to sell phones; we're advancing the market. Charging speeds are the fastest we've ever supported. With wireless charging, you can go from empty to full in two hours, which is an improvement of over sixty minutes or about thirty percent. ***We can charge phones faster this way than most phones out there can charge with a cable*** Charging your phone was a concern, now it's an afterthought. ***It's a real differentiator for us.***

* * *

If you want a phone that lets you get through your day without always having to worry about that little battery symbol, ***stick with us.*** . . . Our goal is to create an ecosystem where your battery can be charged wirelessly, anywhere.

* * *

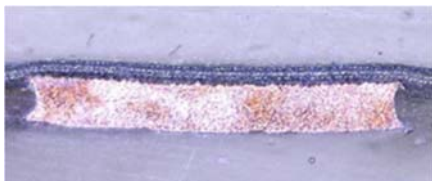
We're betting on a cord-free future. ***That's why the new Note and Edge+ come***

*with built-in, fast wireless charging.*⁵

49. Although Samsung claimed to “pioneer” fast wireless charging in the Note 5 and S6 Edge+, NuCurrent nevertheless remained unaware that Samsung’s purported *pioneering* resulted from its *pirateering* of NuCurrent’s intellectual property. Samsung remained silent as to its exploitation of NuCurrent’s property during the course of the parties’ dealings.

50. After subsequent Samsung product releases, NuCurrent engineers performed a routine inspection of industry devices that revealed a troubling reality—they visually observed that Samsung had apparently copied significant aspects of the antenna designs NuCurrent had prepared under the confidentiality agreement. Further testing and inspection uncovered that, beginning with the Note 5 and S6 Edge+ in August 2015, Samsung had undertaken an extensive effort to misappropriate vast amounts of the proprietary information shared by NuCurrent under the parties’ non-disclosure agreements, only to simply pass the technology off as its own.

51. For instance, after receipt of NuCurrent’s double-conductive layer sample coil and after learning of NuCurrent’s patented MLMT technology, Samsung adopted and implemented this technology in its August 2015 product releases:



Samsung Galaxy S6 Wireless Power Coil
Released June 2015
(Cross-section showing single conductive layer)



Samsung Note 5 Wireless Power Coil
Released August 2015
(Cross-section showing double conductive layer)

52. Inspection and analysis of Samsung’s subsequently released devices confirmed the same—that Defendants used and to this day are still using NuCurrent’s protected property in each new product release. *See, e.g.:*

⁵ Samsung Galaxy Unpacked 2015 presentation, available at <https://www.youtube.com/watch?v=i4ujl7qG2EI>.

Galaxy S7 Wireless Power Coil
(Spring 2016 Release)
(Cross-section showing double
conductive layer)



Galaxy S8 Wireless Power Coil
(Spring 2017 Release)
(Cross-section showing double
conductive layer)



53. Samsung continues to release next-generation wireless-charging products that unlawfully exploit NuCurrent's intellectual property in the same or similar ways as the Note 5 and S6 Edge+.

G. Samsung Also Misappropriated and Used NuCurrent's Trade Secret Information in the Samsung Galaxy S3 Watch.

54. The extent of Samsung's misappropriation does not begin and end with its smartphone product lines. Samsung's wireless charging features extend to other portable devices, including wristwatches. During the course of the parties' engagement, Samsung also solicited confidential and proprietary information from NuCurrent pertaining to wirelessly charging wearable devices, including Samsung's Gear Watch product line.

55. Samsung released its Gear S2 Watch in October 2015. The Gear S2 was the first Samsung smartwatch to feature a built-in wireless charging coil:



Source: <http://www.samsung.com/global/galaxy/gear-s2/>

56. Shortly after releasing the Gear S2, and in parallel to the work NuCurrent was performing with respect to Samsung's smartphones, Samsung solicited information and designs from NuCurrent related to Samsung's line of wearable device wireless charging coils.

57. During the early 2016 timeframe, at Samsung's direction, NuCurrent prepared a prototype wireless power coil designed for wearable devices. Operating again under the strict protections of the parties' confidentiality agreement, NuCurrent delivered its physical prototype to Samsung, and shared technical information and specifications pertaining to the prototype. The NuCurrent prototype outperformed the wireless charging coil of the Gear S2.

58. Through this disclosure of NuCurrent's custom physical prototype and related technical information, NuCurrent shared with Samsung certain of its confidential and proprietary information. Such information included, by way of example and not limitation, proprietary layout and stackup designs, dimensions, and coil structure. Subsequently, NuCurrent and Samsung held discussions centered around NuCurrent's work on the wearable prototype coil, and NuCurrent shared documentation with Samsung that further explained the proprietary features of NuCurrent's coil and the benefits associated with NuCurrent's design, including the benefit of enhanced charging speed. After receiving the prototype and learning of the proprietary design features and benefits, Samsung indicated to NuCurrent that it was not interested in pursuing further discussions or development of the project at that time.

59. Later that year, in November of 2016, Samsung released its next generation Gear Watch, the Samsung Gear S3. Samsung advertised the improvements made in the wireless charging feature, including the watch's enhanced charging speed.



Source: <http://www.samsung.com/global/galaxy/gear-s3/performance/>

60. Subsequent inspection of the Gear S3 wireless charging coil reveals that Samsung once again incorporated NuCurrent's proprietary and trade secret information into the product.

61. The Gear S3 wireless charging coil is identical in significant measure to the prototype shared by NuCurrent earlier that year. The Gear S3 coil duplicates NuCurrent's design and coil structure. The Gear S3 coil is nearly identical to NuCurrent's prototype's layout and dimensions—trade secret information held strictly in confidence by NuCurrent. Through use of NuCurrent's designs, Samsung achieved the benefit of faster wireless charging in the Gear S3—just as NuCurrent taught Samsung roughly six months before the Gear S3 was released. Once again, Samsung misappropriated NuCurrent's proprietary technology shared under the parties' confidentiality agreement without any attribution, payment, or notice to NuCurrent.

62. Defendants lured NuCurrent into disclosing its intellectual property based on a false promise of confidentiality and non-use. For months, Defendants continued to feign interest in future engagements with NuCurrent—apparently as a way to pacify NuCurrent and garner more of its proprietary information—while simultaneously developing and selling new consumer devices that incorporated NuCurrent's intellectual property.

63. During all relevant times herein, NuCurrent maintained in secret the proprietary and confidential information disclosed to Defendants. NuCurrent has derived and continues to derive significant value from the secrecy of its trade secrets. NuCurrent has taken reasonable steps to maintain the secrecy of the confidential information described herein, including for example, by requiring strict confidentiality provisions with actual or potential business partners, maintaining a trade secret protection program, and training employees on the importance of protecting proprietary information.

H. NuCurrent Has Been, and Will Be, Severely Harmed by Defendants' Infringement of NuCurrent's Patents and Misappropriation of NuCurrent's Confidential and Proprietary Trade Secret Information.

64. NuCurrent developed its patented inventions and trade secrets at great expense to NuCurrent, and through years of research and engineering. If Defendants are permitted to

continue their rampant infringement and misappropriation, NuCurrent will be severely and irreparably harmed.

65. The wireless charging industry is still in an early stage of development. While mainstays of the consumer handset market like Samsung will continue releasing new generations of smartphones and other consumer devices, the survival of wireless startups with specialized skills and knowledge—like NuCurrent—will turn on what happens in the next few years. Defendants’ exploitation of stolen intellectual property has already greatly harmed NuCurrent during this critical timeframe. NuCurrent has expended significant resources developing and protecting its proprietary technology, yet due to Samsung’s actions, NuCurrent has (unknowingly) been forced to compete in the market against its own inventions.

66. Left unchecked, Defendants’ unlawful conduct will cause even greater harm to NuCurrent’s business, its employees, and its business partners. NuCurrent’s ability to grow its commercial business will be stunted if it is forced to compete against its own inventions. Potential future partners may be reticent to pay fair value, or any value, for NuCurrent’s products and services if those products and services can instead be sourced from infringers who—not having expended the burden and cost of creating and developing the technology in the first place—can undercut NuCurrent’s offerings on price. Likewise, NuCurrent’s intellectual property will be devalued, and its ability to license its technology will be severely hindered if Samsung is not held accountable for its rampant infringement.

67. With this action, NuCurrent seeks to vindicate its rights, prevent any further infringement of its patents, preclude any further misuse of its confidential and proprietary trade secret information, and obtain damages, including for Defendants’ unjust enrichment resulting from their unlawful conduct.

FIRST CAUSE OF ACTION

Violation of Defend Trade Secrets Act, 18 U.S.C. § 1836(b)

68. NuCurrent incorporates all of the above paragraphs as though fully set forth herein.

69. NuCurrent owns and possesses certain confidential, proprietary, and trade secret information, as alleged above. NuCurrent's trade secret information related to its wireless power coil technology includes, for example, the following: processes for designing and implementing wireless power coils, wireless power coil designs, models, drawings, schematics, specifications, wireless power coil expertise, NuCurrent's confidential business information, pricing information, processes for reducing the costs associated with designing and implementing wireless power coils, and other technical information compiled by NuCurrent. This trade secret information is reflected in NuCurrent's coil circuit designs that Defendants obtained under the mutual confidentiality and non-disclosure agreements. Various aspects of the coil circuit designs are NuCurrent's trade secrets, including the overall coil circuit design, the stackup design, the dimensions of wireless power coils, and the business information involved in making intricate tradeoffs between multiple independent variables dictated by specific system requirements. NuCurrent's trade secret information also includes the materials, size, and orientation of wireless power coils that are used to receive and transmit wireless power to Samsung's products and the associated processes used to reduce costs and increase speed and/or efficiency. The compilations of materials that NuCurrent provided to Samsung under the non-disclosure agreements further represent trade secret compilations.

70. None of these trade secrets are disclosed in any published NuCurrent patents or patent applications. NuCurrent's asserted trade secrets are different than NuCurrent's patent rights. For example, NuCurrent's asserted patents pertain to NuCurrent's multi-layer-multi-turn inductors and methods for manufacturing those inductors, whereas NuCurrent's trade secrets include specific parameters and measurements, shapes, designs, and device-specific integration considerations that are not disclosed in any NuCurrent patents. Examples of trade secret information that are not covered or disclosed in NuCurrent's patents are described above such as the specific parameters for copper trace size and dimensions, stackup size, stackup ratios, and the interplay thereof.

71. NuCurrent's confidential, proprietary, and trade secret information relates to

products used, sold, shipped and/or ordered in, or intended to be used, sold, shipped and/ or ordered in, interstate or foreign commerce.

72. NuCurrent has taken reasonable measures to keep such information secret and confidential.

73. NuCurrent has at all times maintained stringent security measures to preserve the secrecy of its trade secrets. For example, NuCurrent requires all employees, contractors, vendors, potential business partners, and manufacturers to sign confidentiality agreements before any confidential or proprietary trade secret information is disclosed to them.

74. NuCurrent's confidential and proprietary trade secret information is not available for others in the wireless power industry, the mobile device industry, or any other industry to use through any legitimate means.

75. NuCurrent's confidential and proprietary trade secret information derives independent economic value from not being generally known to, and not being readily ascertainable through proper means by, another person who could obtain economic value from the disclosure or use of such information.

76. Defendants misappropriated NuCurrent's confidential and proprietary trade secret information in the improper and unlawful manner as alleged herein. Defendants' misappropriation of NuCurrent's confidential and proprietary trade secret information was and is intentional, knowing, willful, malicious, fraudulent, and oppressive. Defendants' misappropriation remains ongoing through Defendants continued disclosure and use of NuCurrent's confidential and proprietary trade secret information without the consent of NuCurrent.

77. Defendants have actually used NuCurrent's trade secret information in developing wireless charging for certain Samsung products including at least the Galaxy S6 Edge+, Galaxy S7, Galaxy S7 Edge, Galaxy S8, Galaxy S8+, Galaxy Note 5, Galaxy Note 7, Galaxy Note 8, and Gear S3 Watch, along with any further releases, special edition models or later models, or other products which are not colorably different than the aforementioned products. Defendants'

misappropriation and use of NuCurrent's trade secrets further has affected and continues to affect Defendants' business decisions and/or activities in developing wireless power products.

78. As a direct and proximate result of Defendants' conduct, NuCurrent has suffered and (if Defendants' conduct is not stopped, will continue to suffer) severe competitive harm, irreparable injury, and significant damages in an amount to be proven at trial. To the extent Defendants continue to use and disclose NuCurrent's trade secret information to other third parties, it risks destroying the value of NuCurrent's trade secrets, damaging the goodwill associated with NuCurrent's nascent business, and causing damages that cannot adequately be quantified and for which NuCurrent cannot adequately be compensated. This causes NuCurrent irreparable harm. Because NuCurrent's remedy at law is inadequate, NuCurrent seeks, in addition to damages, injunctive relief to recover and protect its confidential and proprietary trade secret information and to protect other legitimate business interests.

79. NuCurrent has been damaged by all of the foregoing and is entitled to an award of exemplary damages and attorney's fees.

SECOND CAUSE OF ACTION

Violation of Illinois Uniform Trade Secrets Act

80. NuCurrent incorporates all of the above paragraphs as though fully set forth herein.

81. The Illinois Trade Secrets Act, 765 ILCS 1065/1 *et seq.* ("ITSA") forbids the misappropriation of trade secrets.

82. NuCurrent owns valid and enforceable trade secrets that meet the requirements under ITSA, as alleged above. NuCurrent's trade secret information related to its wireless power coil technology includes, for example, the following: processes for designing and implementing wireless power coils, wireless power coil designs, models, drawings, schematics, specifications, wireless power coil expertise, NuCurrent's confidential business information, pricing information, processes for reducing the costs associated with designing and implementing wireless power coils, and other technical information compiled by NuCurrent. This trade secret

information is reflected in NuCurrent's coil circuit designs, verbal discussions had between the parties, written presentations made to Samsung, and specifications and data shared to Samsung under the confidentiality agreement. Various aspects of the coil circuit designs are NuCurrent's trade secrets, including the overall coil circuit design, the stackup design, the dimensions of wireless power coils, and the technical and business information involved in making intricate tradeoffs between multiple independent variables dictated by specific system requirements. NuCurrent's trade secret information also includes the materials, size, and orientation of wireless power coils that are used to receive and transmit wireless power to Samsung's products and the associated processes used to reduce costs. The compilations of materials that NuCurrent provided to Samsung under the non-disclosure agreements further represent trade secret compilations.

83. None of these trade secrets are publicly disclosed or published in NuCurrent patents or patent applications. NuCurrent's asserted trade secrets are different than NuCurrent's patent rights. For example, NuCurrent's asserted patents pertain to NuCurrent's multi-layer-multi-turn inductors and methods for manufacturing those inductors, whereas NuCurrent's trade secrets include specific parameters and measurements, shapes, designs, and device-specific integration considerations that are not disclosed in any NuCurrent patents. Examples of trade secret information that are not covered or disclosed in NuCurrent's patents are described above such as the specific parameters for copper trace size and dimensions, stackup size, stackup ratios, and the interplay thereof.

84. NuCurrent has taken reasonable measures to keep such information secret and confidential.

85. NuCurrent has at all times maintained stringent security measures to preserve the secrecy of its trade secrets. For example, NuCurrent requires all employees, contractors, vendors, potential business partners, and manufacturers to sign confidentiality agreements before any confidential or proprietary trade secret information is disclosed to them.

86. NuCurrent's confidential and proprietary trade secret information is not available

for others in the wireless power industry, the mobile device industry, or any other industry to use through any legitimate means.

87. NuCurrent's confidential and proprietary trade secret information derives independent economic value from not being generally known to, and not being readily ascertainable through proper means by, another person who could obtain economic value from the disclosure or use of such information.

88. Defendants misappropriated NuCurrent's confidential and proprietary trade secret information in the improper and unlawful manner as alleged herein. Defendants' misappropriation of NuCurrent's confidential and proprietary trade secret information was and is intentional, knowing, willful, malicious, fraudulent, and oppressive.

89. Defendants have actually used NuCurrent's trade secret information in developing wireless charging for certain Samsung products including at least the Galaxy S6 Edge+, Galaxy S7, Galaxy S7 Edge, Galaxy S8, Galaxy S8+, Galaxy Note 5, Galaxy Note 7, Galaxy Note 8, and Gear S3 Watch, along with any further releases, special edition models, later models, or other products which are not colorably different than the aforementioned products. Defendants' misappropriation and use of NuCurrent's trade secrets further has affected and continues to affect Defendants' business decisions and/or activities in developing wireless power products.

90. Defendants' misappropriation remains ongoing through Defendants continued disclosure and use of NuCurrent's confidential and proprietary trade secret information without the consent of NuCurrent.

91. As a direct and proximate result of Defendants' conduct, NuCurrent has suffered and (if Defendants' conduct is not stopped, will continue to suffer) severe competitive harm, irreparable injury, and significant damages in an amount to be proven at trial. To the extent Defendants continue to use and disclose NuCurrent's trade secret information to other third parties, it risks destroying the value of NuCurrent's trade secrets, damaging the goodwill associated with NuCurrent's nascent business, and causing damages that cannot adequately be quantified and for which NuCurrent cannot adequately be compensated. This causes NuCurrent

irreparable harm. Because NuCurrent's remedy at law is inadequate, NuCurrent seeks, in addition to damages, injunctive relief to recover and protect its confidential and proprietary trade secret information and to protect other legitimate business interests.

92. NuCurrent has been damaged by all of the foregoing and is entitled to an award of exemplary damages and attorney's fees.

THIRD CAUSE OF ACTION

Infringement of Patent No. 8,680,960

93. NuCurrent incorporates all of the above paragraphs as though fully set forth herein.

94. United States Patent No. 8,680,960 (the '960 patent), entitled "Multi-layer-multi-turn structure for high efficiency inductors," was duly and lawfully issued on March 25, 2014. A true and correct copy of the '960 patent is attached to this Complaint as Exhibit A.

95. NuCurrent is the owner of all rights, title, and interest in the '960 patent, including the right to bring this suit for injunctive relief and damages.

96. The '960 patent is valid and enforceable.

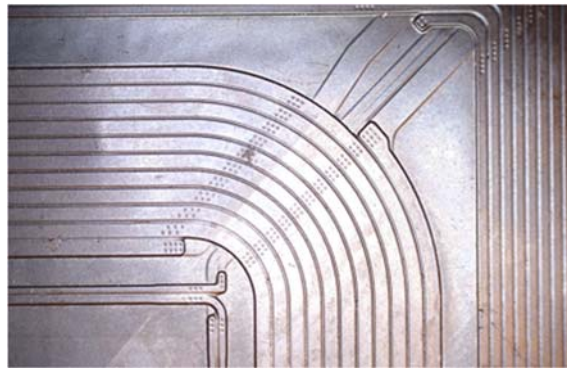
97. Defendants have infringed, and continue to infringe, literally and/or through the doctrine of equivalents, all claims of the '960 patent, including but not limited to claim 1, pursuant to 35 U.S.C. 271(a), by making, using, selling, offering to sell, and/or importing within the United States, without authority, certain Samsung products including the Galaxy S6 Edge+, Galaxy S7, Galaxy S7 Edge, Galaxy S8, Galaxy S8+, Galaxy Note 5, Galaxy Note 7, and Galaxy Note 8 along with any further releases, special edition models, later models, or other products that are not colorably different than the aforementioned products ("Products Accused of Patent Infringement").

98. The Products Accused of Patent Infringement contain an inductor for inductive wireless charging technology that allows users to wirelessly charge the Products Accused of Patent Infringement by simply placing them on a wireless charging transmitter. Defendants infringe at least claim 1 of the '960 patent for at least the following reasons:

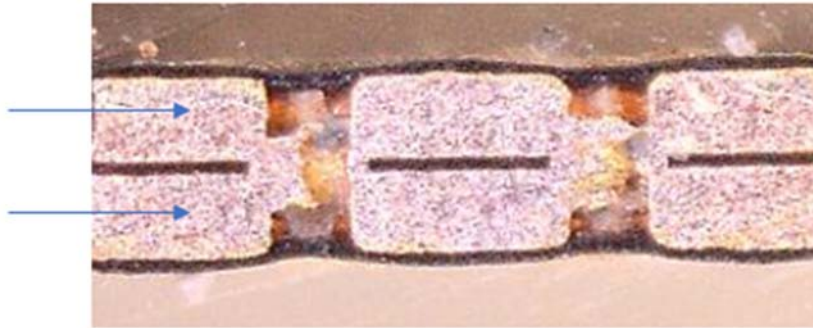
99. The Products Accused of Patent Infringement contain an inductor comprising a first conductor layer and a second conductor layer spaced apart from the first conductor layer. The inductors of the Products Accused of Patent Infringement consist of two layers of copper traces that each form copper wire coils that are spaced apart from one another. The first and second conductor layers, being made of copper, are electrically conductive. *See, e.g.:*



Wireless Power Coil Extracted from Samsung Note 5

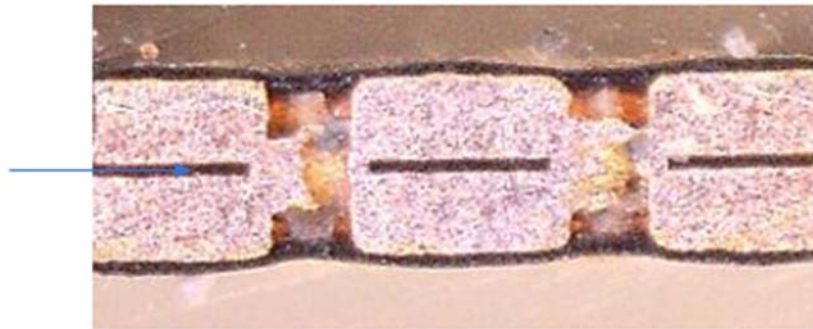


Section of Samsung Note 5 Wireless Power Coil



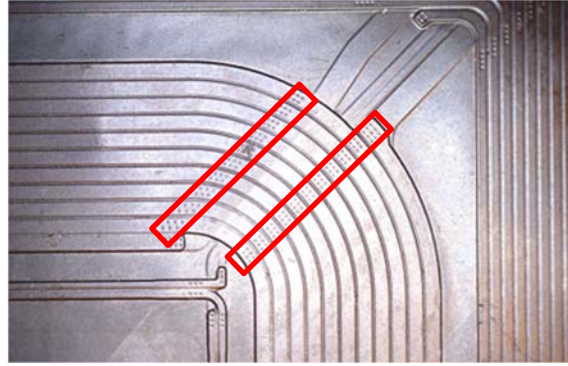
Samsung Note 5 Wireless Coil Cross-section (first and second conductor layers of copper)

100. The Products Accused of Patent Infringement contain an inductor comprising an insulator layer positioned in the space between the first and second conductor layers. The first and second conductor layers in the Products Accused of Patent Infringement are spaced apart by a layer of dielectric material. *See, e.g.:*

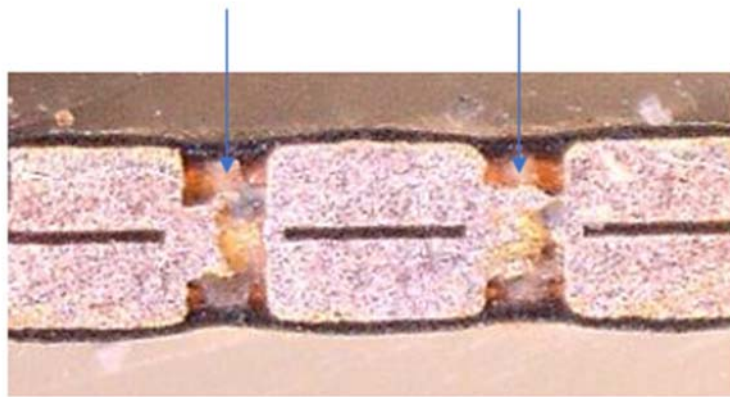


Samsung Note 5 Wireless Coil Cross-section (example section of insulator layer identified)

101. The Products Accused of Patent Infringement contain an inductor comprising at least one connector electrically connecting the first conductor layer and the second conductor layer. The first and second conductor layers in the Products Accused of Patent Infringement are electrically connected by pathways of copper, or vias, between the first and second conductor layers. *See, e.g.:*



Samsung Note 5 Wireless Coil (top view of connectors, connectors identified)



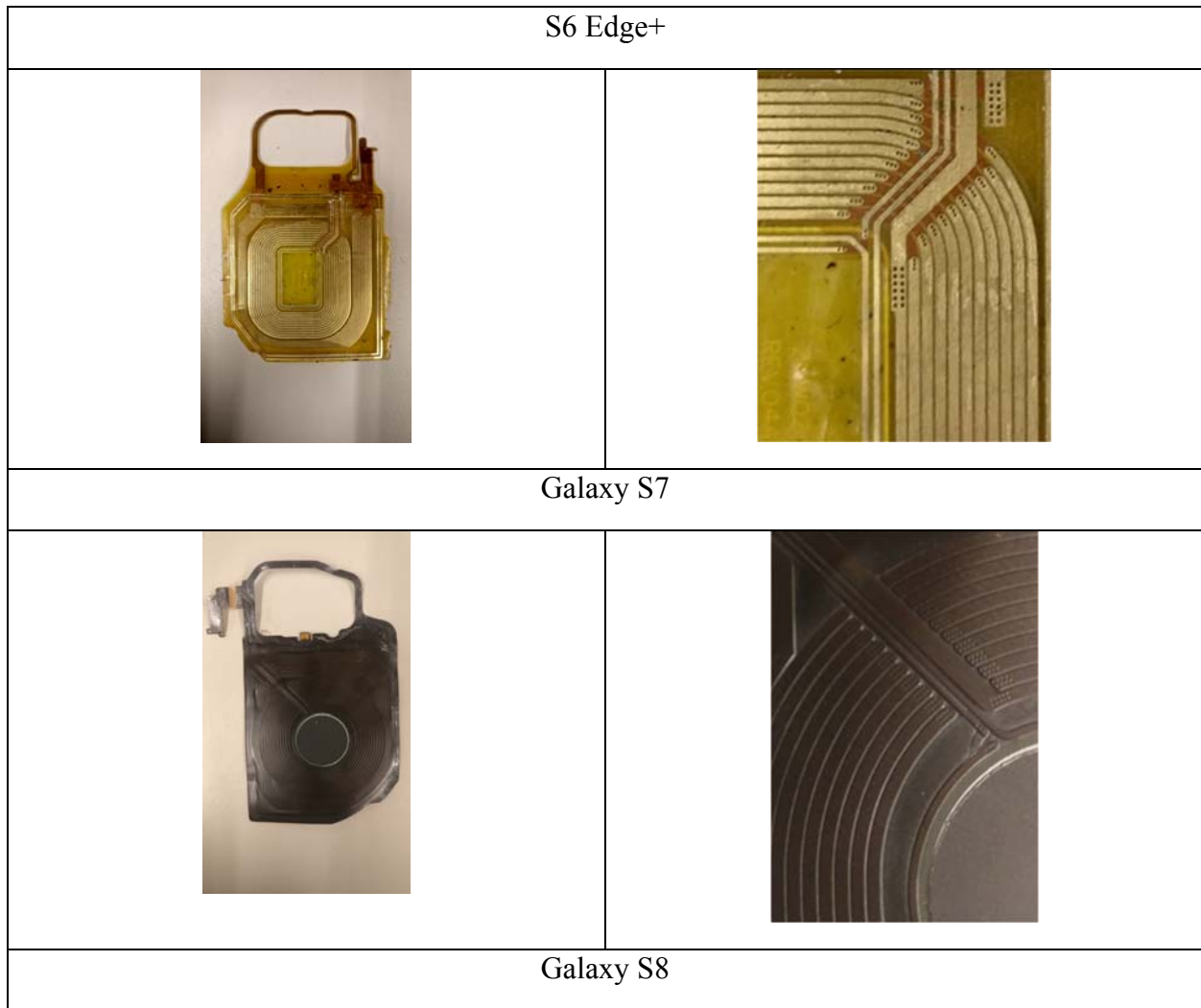
Samsung Note 5 Wireless Coil Cross-section (connectors identified)

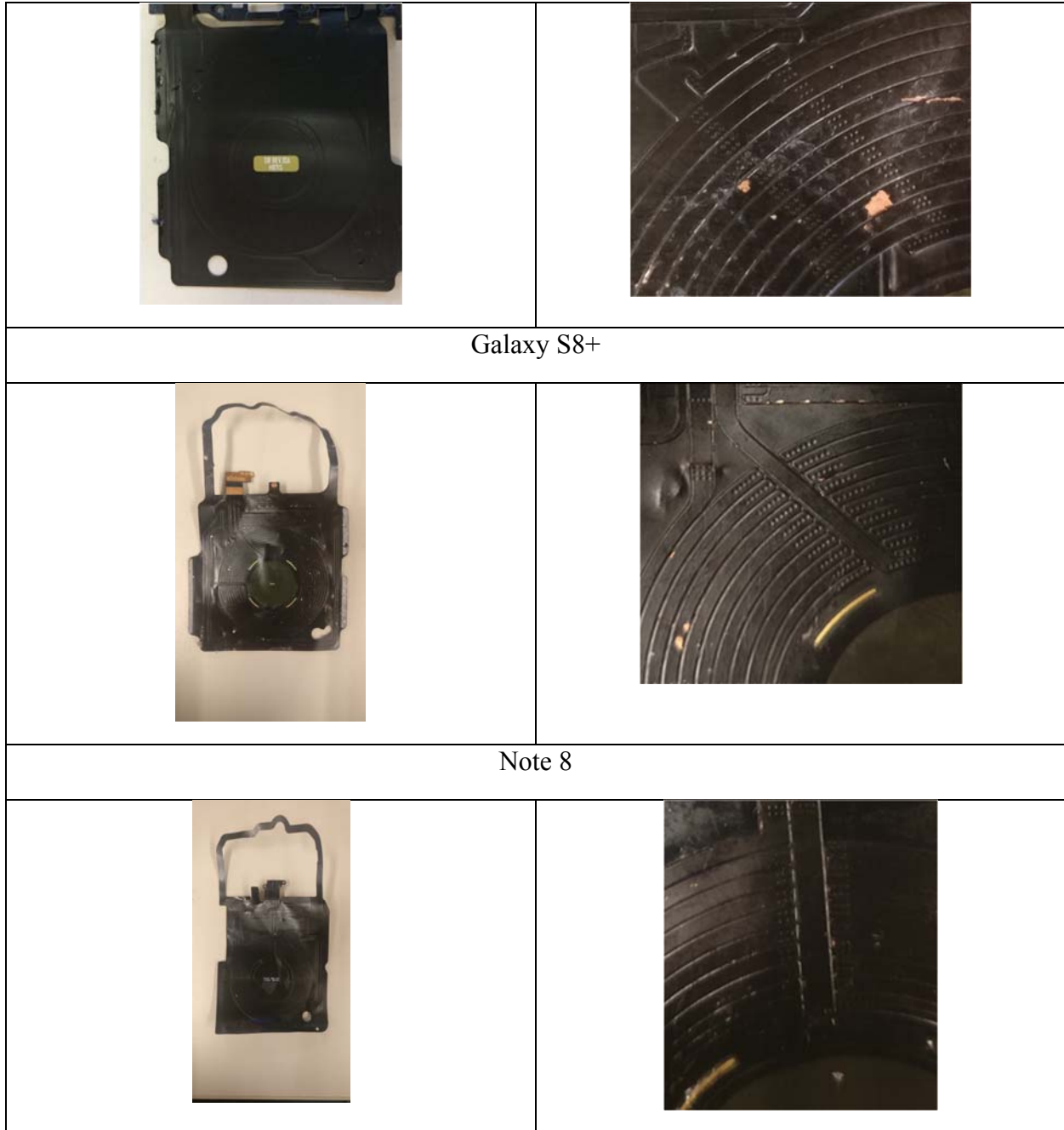
102. The Products Accused of Patent Infringement contain an inductor, wherein when an electrical current is propagated within at least the first conductor layer, a magnetic flux is generated within the inductor. An electrical current is propagated in at least the first conductor layer in the inductors of the Products Accused of Patent Infringement when, for example, the inductors of the Products Accused of Patent Infringement enter an electromagnetic field generated by a wireless power transmitter, such as a wireless charging pad. A magnetic flux is generated within the inductors of the Products Accused of Patent Infringement when said electrical current is propagated within them.

103. The Products Accused of Patent Infringement contain an inductor, wherein when a change in at least one of a frequency, a magnitude, or a waveform shape of the propagated electrical current occurs, an inductance is generated. The inductors of the Products Accused of Patent Infringement generate an inductance upon change of a frequency, a magnitude, or a

waveform shape. The wireless power coils contained in the Products Accused of Patent Infringement operate using inductive power transfer.

104. Beginning with its Fall 2015 product release (the Note 5 and S6 Edge+) and continuing through its most recent release, the Note 8 in Fall 2017, Samsung has infringed at least claim 1 of the '960 patent with each release of the Products Accused of Patent Infringement. *See, e.g.:*





105. The existence and location of vias on the wireless power coils of the Products Accused of Patent Infringement, as shown in the above photos, demonstrates Samsung's continued infringement of NuCurrent's patented MLMT technology, including claim 1 of the '960 patent. The existence and location of vias on the wireless power coils of the Products Accused of Patent Infringement, as shown in the above photos, also indicates that NuCurrent's

allegations with respect to Samsung's Note 5 are representative of all the Products Accused of Patent Infringement.

106. As described herein, Samsung has actual knowledge of the '960 patent or was willfully blind to the patent.

107. Samsung indirectly infringes the patents-in-suit by inducing infringement of others, such as its customers using the Products Accused of Patent Infringement, by, for example, encouraging those customers to sell the infringing inductors and/or use the infringing inductors described above. Samsung also induces infringement of its suppliers, including its wireless power antenna suppliers, by, for example, providing designs and specifications for those suppliers that require said suppliers to manufacture wireless power antennas in such a way as to constitute infringement of the patents-in-suit, as described above.

108. Samsung took the above actions intending to cause infringing acts by others.

109. Samsung was aware of the patents-in-suit and knew that others' actions, if taken, would constitute infringement of the patents-in-suit. Alternatively, Samsung believed there was a high probability that others would infringe the patents-in-suit but remained willfully blind to the infringing nature of others' actions.

110. Samsung therefore infringes the '960 patent under 35 U.S.C. 271(b).

111. Defendants have committed and continue to commit acts of contributory infringement by selling, offering to sell, and/or importing products including the Products Accused of Patent Infringement, knowing or willfully blind to the fact that these products constitute a material part of the invention, were especially made or especially adapted for use in an infringement of the '960 patent, and have no substantial non-infringing uses. Samsung therefore infringe the patents-in-suit under 35 U.S.C. 271(c).

112. Samsung's infringement of the patents-in-suit has been and continues to be willful, wanton, malicious, in bad-faith, deliberate, consciously wrongful, and/or flagrant.

113. For example, Samsung was aware of NuCurrent's patent rights, and knew that its actions (e.g., after learning of the patents-in-suit, redesigning its products in accordance with the

claims of the patents-in-suit) would constitute infringement of the patents-in-suit. Such conduct is exceptionally egregious and constitutes willful infringement of the patents-in-suit.

FOURTH CAUSE OF ACTION

Infringement of Patent No. 9,300,046

114. NuCurrent incorporates all of the above paragraphs as though fully set forth herein.

115. United States Patent No. 9,300,046 (the '046 patent), entitled "Method for manufacture of multi-layer-multi-turn high efficiency inductors," was duly and lawfully issued on March 29, 2016. A true and correct copy of the '046 patent is attached to this Complaint as Exhibit B.

116. NuCurrent is the owner of all rights, title, and interest in the '046 patent, including the right to bring this suit for injunctive relief and damages.

117. The '046 patent is valid and enforceable.

118. Defendants have infringed, and continue to infringe, literally and/or through the doctrine of equivalents, all claims of the '046 patent, including but not limited to claim 1, pursuant to 35 U.S.C. 271(a), by making, using, selling, offering to sell, and/or importing within the United States, without authority, certain Samsung products including the Products Accused of Patent Infringement.

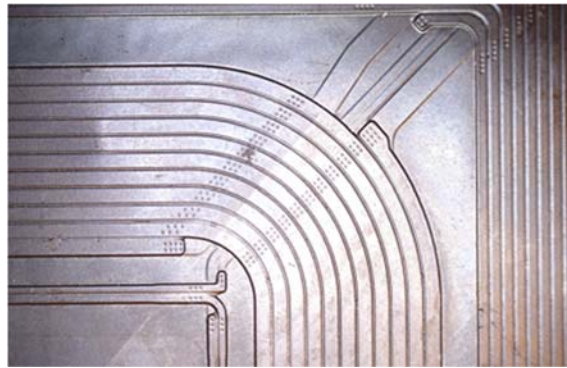
119. The Products Accused of Patent Infringement contain an inductor structure because they contain an inductor for inductive wireless charging technology. The inductor structures of the Products Accused of Patent Infringement are manufactured by a method comprising the following steps:

120. A first conductor layer and a second conductor layer are provided in the inductor structures of the Products Accused of Patent Infringement, the first conductor layer and the second conductor layer being electrically conductive. The inductor structures of the Products Accused of Patent Infringement consist of two layers of copper traces that each form copper wire coils. The first and second conductor layers, being made of copper, are electrically conductive.

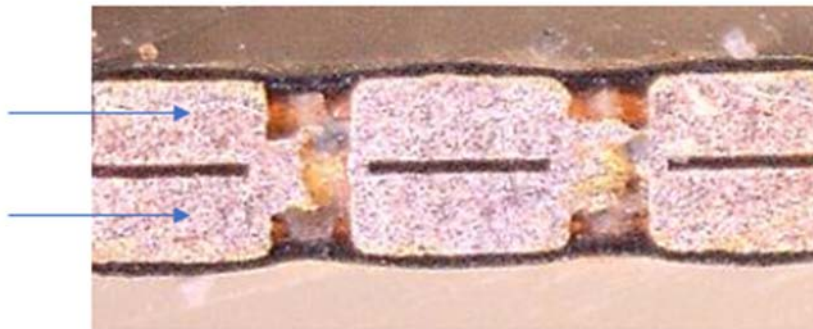
See, e.g.:



Wireless Power Coil Extracted from Samsung Note 5



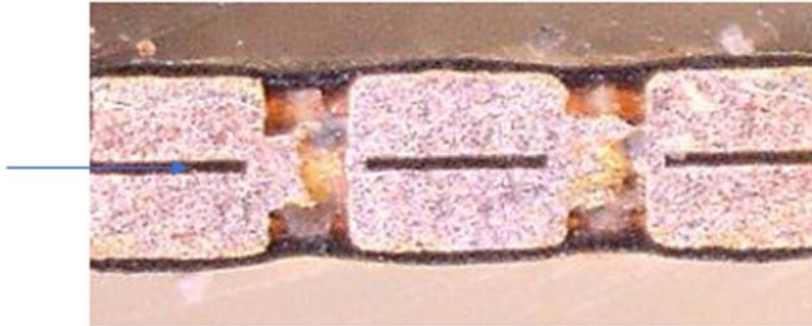
Section of Samsung Note 5 Wireless Power Coil



Samsung Note 5 Wireless Coil Cross-section (first and second conductor layers of copper)

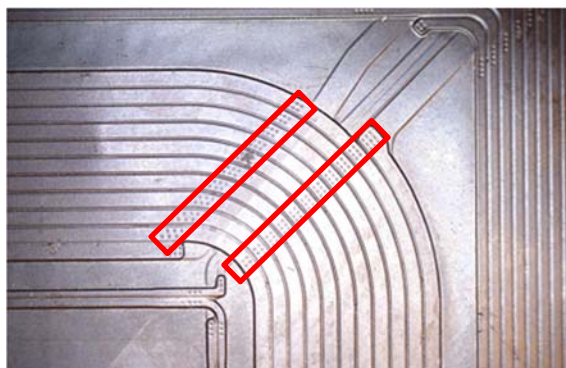
121. An insulator layer is positioned between the first conductor layer and the second conductor layer. The inductor structures of the Products Accused of Patent Infringement contain an

insulator layer positioned in the space between the first and second conductor layers, as the first and second conductor layers in the Products Accused of Patent Infringement are spaced apart by a layer of dielectric material. *See, e.g.:*

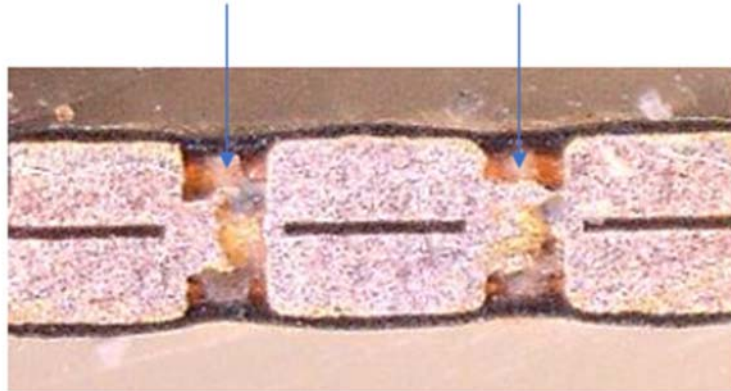


Samsung Note 5 Wireless Coil Cross-section (example section of insulator layer identified)

122. The first and second conductor layers are connected in an electrically parallel connection with at least two connectors, each connector having an electrical impedance. The first and second conductor layers in the Products Accused of Patent Infringement are electrically connected by pathways of copper, or vias, between the first and second conductor layers. The copper is an electrically conductive material that has an electrical impedance. *See, e.g.:*



Samsung Note 5 Wireless Coil (top view of connectors, connectors identified)

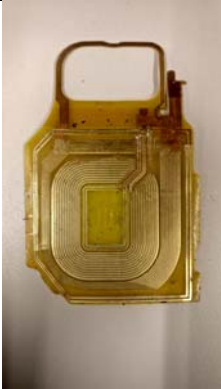
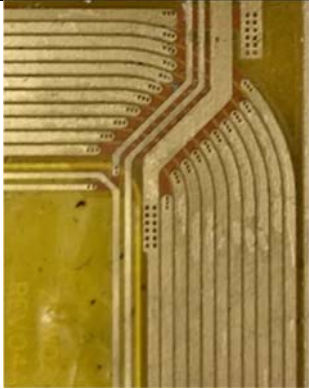






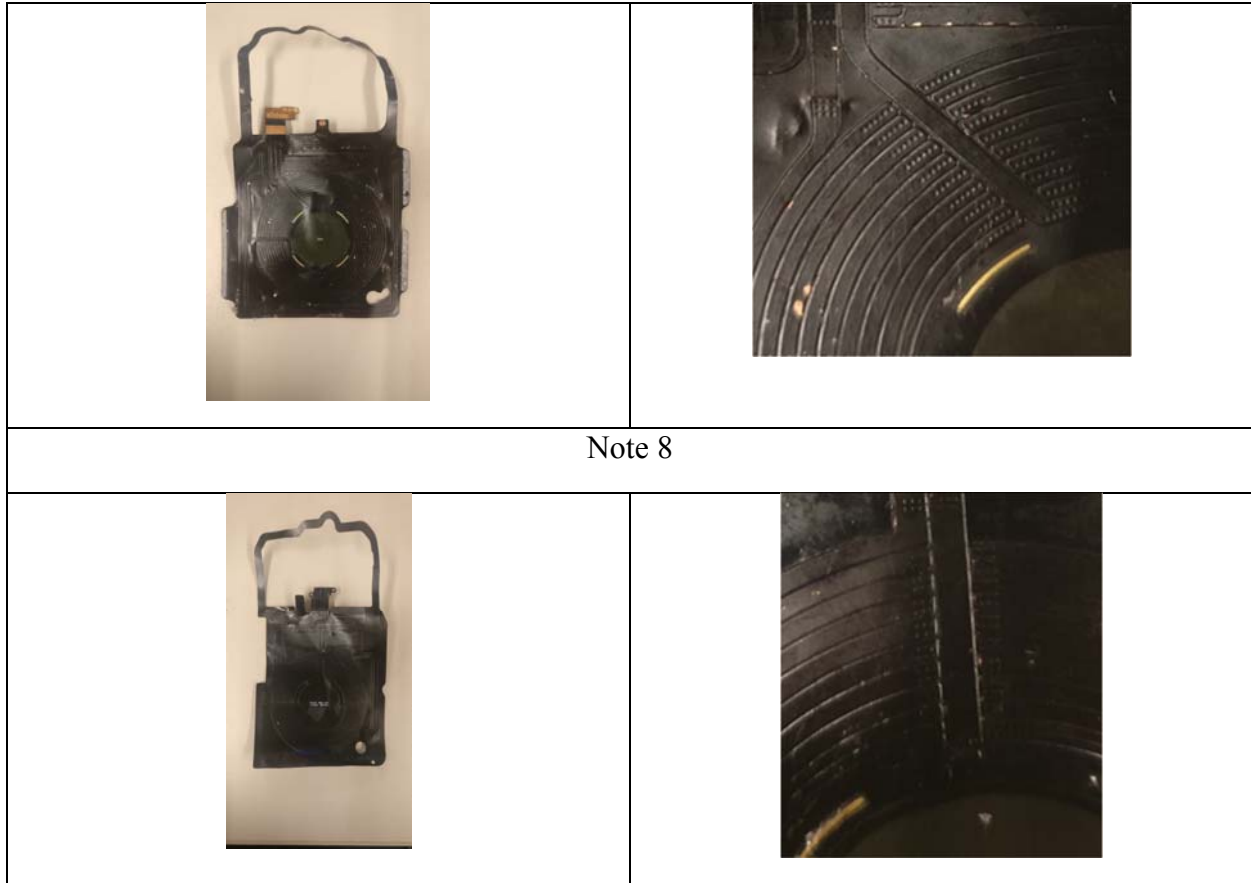
Samsung Note 5 Wireless Coil Cross-section (connectors identified)

123. The Products Accused of Patent Infringement contain an inductor structure that is manufactured wherein when an electrical current is propagated within at least the first conductor layer, a magnetic flux is generated within the inductor. An electrical current is propagated in at least the first conductor layer in the inductors of the Products Accused of Patent Infringement when, for example, the inductor structures of the Products Accused of Patent Infringement enter an electromagnetic field generated by a wireless power transmitter, such as a wireless charging pad. A magnetic flux is generated within the inductor structures of the Products Accused of Patent Infringement when said electrical current is propagated within them.

124. The Products Accused of Patent Infringement contain an inductor structure that is manufactured wherein when a change in at least one of a frequency, a magnitude, or a waveform shape of the propagated electrical current occurs, an inductance is generated. The inductor structures of the Products Accused of Patent Infringement generate an inductance upon change of a frequency, a magnitude, or a waveform shape. The wireless power coils contained in the Products Accused of Patent Infringement operate using inductive power transfer.

125. Beginning with its Fall 2015 product release (the Note 5 and S6 Edge+) and continuing through its most recent release, the Note 8 in Fall 2017, Samsung has infringed at least claim 1 of the '046 patent with each release of the Products Accused of Patent Infringement. *See, e.g.:*

S6 Edge+	
	
Galaxy S7	
	
Galaxy S8	
	
Galaxy S8+	



126. The existence and location of vias on the wireless power coils of the Products Accused of Patent Infringement, as shown in the above photos, demonstrates Samsung's continued infringement of NuCurrent's patented MLMT technology, including at least claim 1 of the '046 patent. The existence and location of vias on the wireless power coils of the Products Accused of Patent Infringement, as shown in the above photos, also indicates that NuCurrent's allegations with respect to Samsung's Note 5 are representative of all the Products Accused of Patent Infringement.

127. As described herein, Samsung has actual knowledge of the '046 patent or was willfully blind to the patent.

128. Samsung indirectly infringes the patents-in-suit by inducing infringement of others, such as its manufacturing partners, including its wireless power antenna suppliers during manufacturing of the Products Accused of Patent Infringement, by, for example, encouraging

those suppliers to manufacture the infringing inductor structures and/or use of the infringing inductor structures described above. Samsung provides designs and specifications for those suppliers that require said suppliers to manufacture wireless power antennas in such a way as to constitute infringement of the patents-in-suit, as described above. Samsung further encourages its customers to sell the infringing inductors and/or use the infringing inductors described above.

129. Samsung took the above actions intending to cause infringing acts by others.

130. Samsung was aware of the patents-in-suit and knew that others' actions, if taken, would constitute infringement of the patents-in-suit. Alternatively, Samsung believed there was a high probability that others would infringe the patents-in-suit but remained willfully blind to the infringing nature of others' actions.

131. Samsung therefore infringes the patents-in-suit under 35 U.S.C. 271(b).

132. Defendants have committed and continue to commit acts of contributory infringement by selling, offering to sell, and/or importing products including the Products Accused of Patent Infringement, knowing or willfully blind to the fact that these products constitute a material part of the invention, were especially made or especially adapted for use in an infringement of the '046 patent, and have no substantial non-infringing uses. Samsung therefore infringes the patents-in-suit under 35 U.S.C. 271(c).

133. Samsung imports, offers to sell, sells, and/or uses within the United States or into the United States without authority the Products Accused of Patent Infringement that are made by the processes claimed in the patents-in-suit, which products are not materially changed by a subsequent process and do not become a trivial and nonessential component of another product.

134. Samsung therefore infringes the patents-in-suit under 35 U.S.C. § 271(g).

135. Samsung's infringement of the patents-in-suit has been and continues to be willful, wanton, malicious, in bad-faith, deliberate, consciously wrongful, and/or flagrant.

136. For example, Samsung was aware of NuCurrent's patent rights, and knew that its actions (*e.g.*, after learning of the patents-in-suit, redesigning its products in accordance with the claims of the patents-in-suit) would constitute infringement of the patents-in-suit. Such conduct

is exceptionally egregious and constitutes willful infringement of the patents-in-suit.

FIFTH CAUSE OF ACTION

Infringement of Patent No. 8,698,591

137. NuCurrent incorporates all of the above paragraphs as though fully set forth herein.

138. United States Patent No. 8,698,591 (the '591 patent), entitled "Method for operation of multi-layer-multi-turn high efficiency inductors," was duly and lawfully issued on April 15, 2014. A true and correct copy of the '591 patent is attached to this Complaint as Exhibit C.

139. NuCurrent is the owner of all rights, title, and interest in the '591 patent, including the right to bring this suit for injunctive relief and damages.

140. The '591 patent is valid and enforceable.

141. Defendants have infringed, and continue to infringe, literally and/or through the doctrine of equivalents, all claims of the '591 patent, including but not limited to claim 1, pursuant to 35 U.S.C. 271(a), by making, using, selling, offering to sell, and/or importing within the United States, without authority, certain Samsung products including the Products Accused of Patent Infringement.

142. The Products Accused of Patent Infringement are capable of performing a method of operating an electrical circuit comprising the following steps:

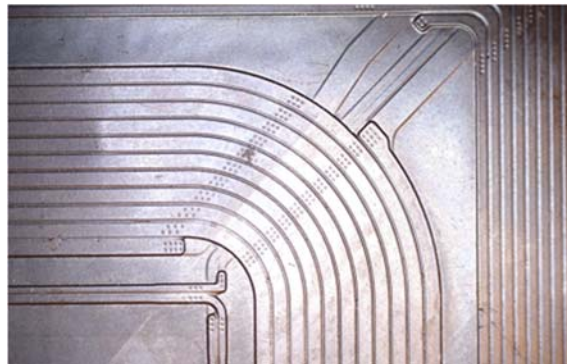
143. The Products Accused of Patent Infringement are capable of performing a method of providing a first electrical circuit electrically connectable to a power source. The Products Accused of Patent Infringement are equipped with a wireless power functionality capable of electrically connecting to a power source, *e.g.*, a wireless charging transmitter.

144. The electrical circuits of the Products Accused of Patent Infringement comprise at least an inductor, *e.g.*, a wireless power coil. The inductors of the Products Accused of Patent Infringement comprise first and second conductors that are spaced apart from one another, the first and second conductors being electrically conductive. The inductors of the Products Accused

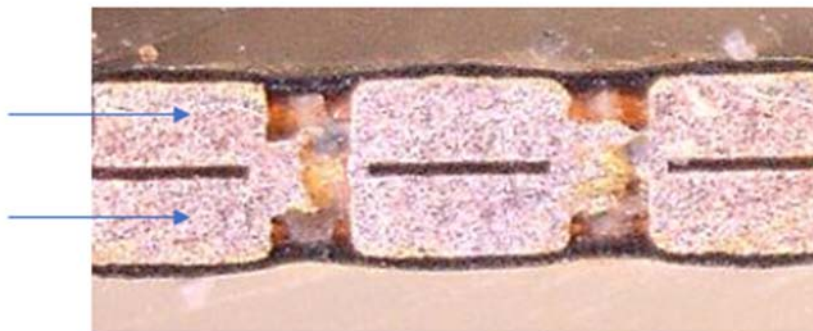
of Patent Infringement consist of two layers of copper traces that each form copper wire coils. The first and second conductor layers, being made of copper, are electrically conductive. *See, e.g.:*



Wireless Power Coil Extracted from Samsung Note 5

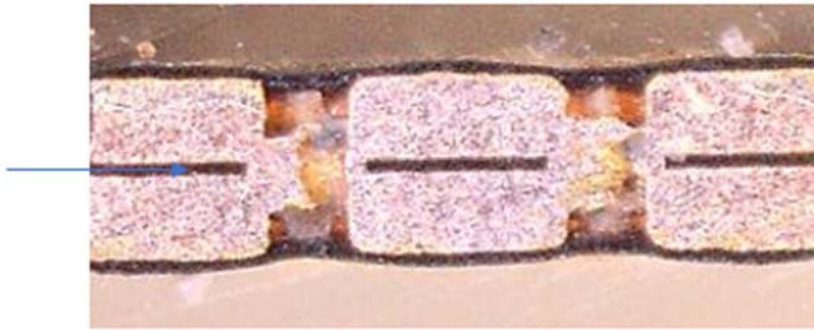


Section of Samsung Note 5 Wireless Power Coil



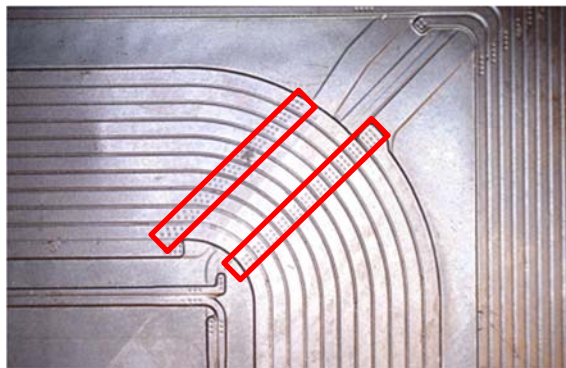
Samsung Note 5 Wireless Coil Cross-section (first and second conductor layers of copper)

145. An insulator layer is positioned between the first conductor layer and the second conductor layer. The inductors of the Products Accused of Patent Infringement contain an insulator layer positioned in the space between the first and second conductor layers, as the first and second conductor layers in the Products Accused of Patent Infringement are spaced apart by a layer of dielectric material. *See, e.g.:*

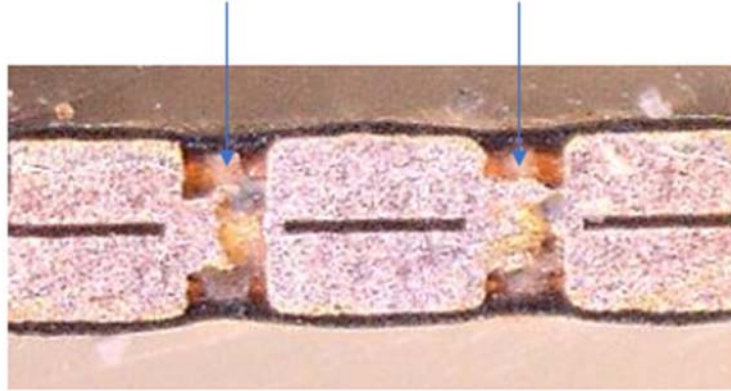


Samsung Note 5 Wireless Coil Cross-section (example section of insulator layer identified)

146. The first and second conductor layers are electrically connected by at least one connector. The first and second conductor layers in the Products Accused of Patent Infringement are electrically connected by pathways of copper, or vias, between the first and second conductor layers. *See, e.g.:*



Samsung Note 5 Wireless Coil (top view of connectors, connectors identified)



Samsung Note 5 Wireless Coil Cross-section (connectors identified)

147. The Products Accused of Patent Infringement are capable of performing a method of adjusting an input power level of the power source. For example, the Products Accused of Patent Infringement are capable of communicating information to a power transmitting device (*e.g.*, a charging pad) to adjust the power level of the transmitting device. During an initial configuration phase, the Products Accused of Patent Infringement send packets that identify the product and provide configuration and setup information to the power transmitter, causing the power transmitter's power level to adjust, for example, to start the device charging. Similarly, in the power-transfer phase, the Products Accused of Patent Infringement periodically send control error packets to the power transmitter to increase or decrease the power supply. As another example, to end the power transfer, the Products Accused of Patent Infringement communicate with the power transmitter to adjust the power transmitter's power level, to place it in a low-power state.

148. The Products Accused of Patent Infringement are capable of performing a method of adjusting an electrical circuit operating frequency to at least 3 kHz. For example, the Products Accused of Patent Infringement are capable of communicating information, such as error control packets or error control signals, to a power transmitting device (*e.g.*, a charging pad) to adjust the operating frequency of the electrical circuit. When more or less power is needed at the Products Accused of Patent Infringement, the frequency in the power transmitter's coil changes depending on power demands. During an initial configuration phase, the Products Accused of Patent

Infringement send packets that identify the product and provide configuration and setup information to the power transmitter, causing the power transmitter's power level to adjust to start the device charging. In the power-transfer phase, the Products Accused of Patent Infringement periodically send control error packets to the power transmitter to increase or decrease the power supply. To end the power transfer, the Products Accused of Patent Infringement send an "End Power" message or send no communications for 1.25 seconds—either of these events adjusts the power transmitter's power level, putting it in a low-power state.

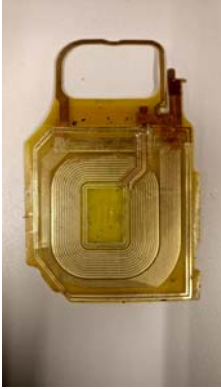
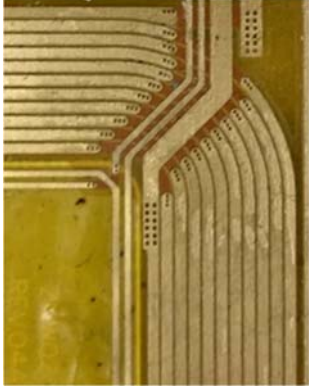




149. The Products Accused of Patent Infringement are capable of performing a method of propagating an electrical current within at least the first conductor. An electrical current is propagated in at least the first conductor layer in the inductors of the Products Accused of Patent Infringement when, for example, the inductors of the Products Accused of Patent Infringement enters an electromagnetic field generated by a wireless power transmitter, such as a wireless charging pad.

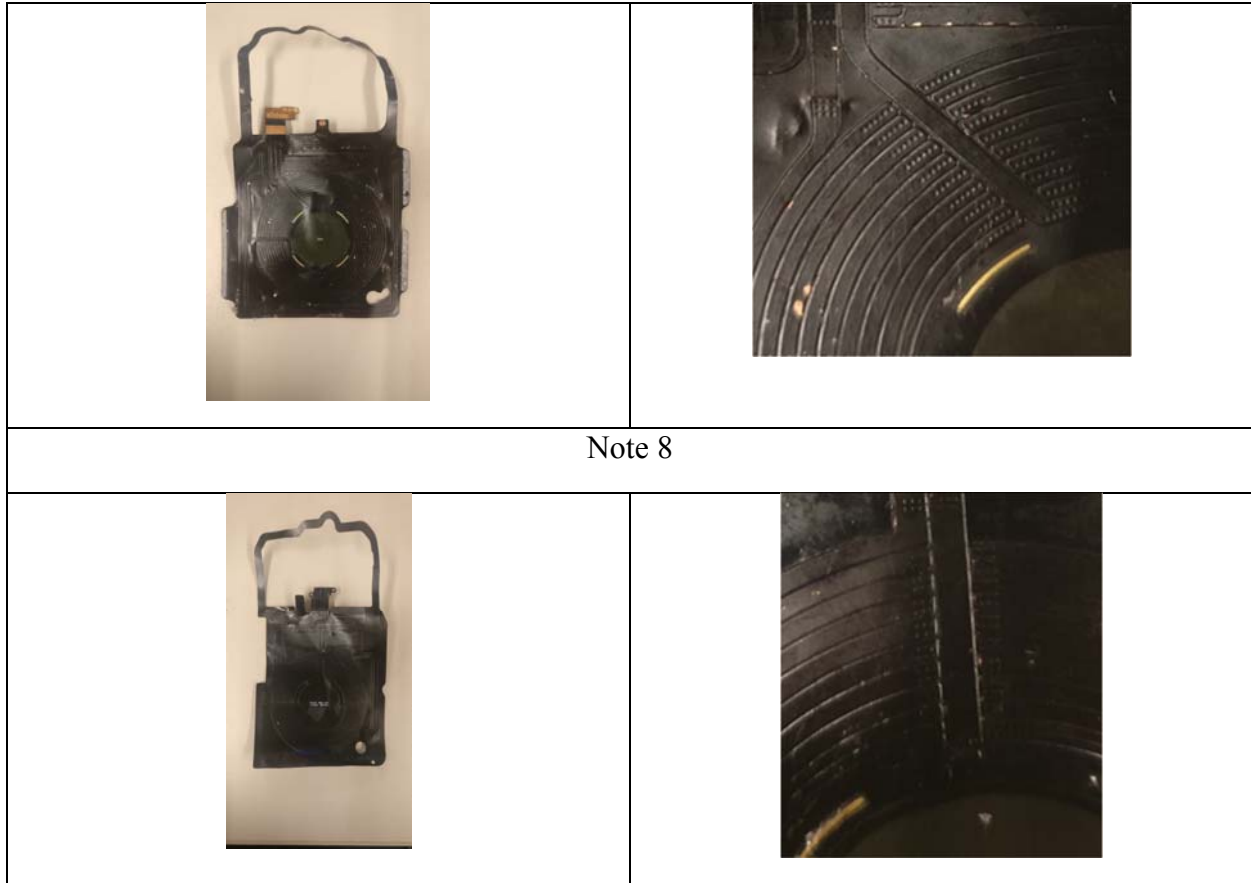
150. The Products Accused of Patent Infringement are capable of performing a method of changing at least one of a frequency, a magnitude, or a waveform shape of the propagated electrical current such that a magnetic flux within the inductor is generated. The inductors of the Products Accused of Patent Infringement generate an inductance upon change of a frequency, a magnitude, or a waveform shape. The wireless power coils contained in the Products Accused of Patent Infringement operate using inductive power transfer.

151. The Products Accused of Patent Infringement are capable of performing a method of selecting an adjustable inductor quality factor. The Products Accused of Patent Infringement are capable of communicating information, such as error control packets, to a power transmitting device (*e.g.*, a charging pad). For example, when the Products Accused of Patent Infringement detect an unmatched load, they will communicate an error control packet to the power transmitting device that will cause the power transmitting device to cycle frequencies in order to select a different Q factor.

152. Beginning with its Fall 2015 product release (the Note 5 and S6 Edge+) and

continuing through its most recent release, the Note 8 in Fall 2017, Samsung has infringed at least claim 1 of the '591 patent with each release of the Products Accused of Patent Infringement. *See, e.g.:*

S6 Edge+	
	
Galaxy S7	
	
Galaxy S8	
	
Galaxy S8+	



153. The existence and location of vias on the wireless power coils of the Products Accused of Patent Infringement, as shown in the above photos, demonstrates Samsung's continued infringement of NuCurrent's patented MLMT technology, including at least claim 1 of the '591 patent. The existence and location of vias on the wireless power coils of the Products Accused of Patent Infringement, as shown in the above photos, also indicates that NuCurrent's allegations with respect to Samsung's Note 5 are representative of all the Products Accused of Patent Infringement.

154. As described herein, Samsung has actual knowledge of the '591 patent or was willfully blind to the patent.

155. Samsung indirectly infringes the patents-in-suit by inducing infringement of others, such as its customers using the Products Accused of Patent Infringement, by, for example, encouraging those customers to sell the infringing inductors and/or use the infringing

inductors described above. Samsung also induces infringement of its suppliers, including its wireless power antenna suppliers, by, for example, providing designs and specifications for those suppliers that require said suppliers to manufacture wireless power antennas in such a way as to constitute infringement of the patents-in-suit, as described above.

156. Samsung took the above actions intending to cause infringing acts by others.

157. Samsung was aware of the patents-in-suit and knew that others' actions, if taken, would constitute infringement of the patents-in-suit. Alternatively, Samsung believed there was a high probability that others would infringe the patents-in-suit but remained willfully blind to the infringing nature of others' actions.

158. Samsung therefore infringes the patents-in-suit under 35 U.S.C. 271(b).

159. Defendants have committed and continue to commit acts of contributory infringement by selling, offering to sell, and/or importing products including the Products Accused of Patent Infringement, knowing or willfully blind to the fact that these products constitute a material part of the invention, were especially made or especially adapted for use in an infringement of the '591 patent, and have no substantial non-infringing uses. Samsung therefore infringes the patents-in-suit under 35 U.S.C. 271(c).

160. Samsung's infringement of the patents-in-suit has been and continues to be willful, wanton, malicious, in bad-faith, deliberate, consciously wrongful, and/or flagrant.

161. For example, Samsung was aware of NuCurrent's patent rights, and knew that its actions (*e.g.*, after learning of the patents-in-suit, redesigning its products in accordance with the claims of the patents-in-suit) would constitute infringement of the patents-in-suit. Such conduct is exceptionally egregious and constitutes willful infringement of the patents-in-suit.

SIXTH CAUSE OF ACTION

Infringement of Patent No. 8,710,948

162. NuCurrent incorporates all of the above paragraphs as though fully set forth herein.

163. United States Patent No. 8,710,948 (the '948 patent), entitled "Method for

operation of multi-layer-multi-turn high efficiency inductors,” was duly and lawfully issued on April 29, 2014. A true and correct copy of the ’948 patent is attached to this Complaint as Exhibit D.

164. NuCurrent is the owner of all rights, title, and interest in the ’948 patent, including the right to bring this suit for injunctive relief and damages.

165. The ’948 patent is valid and enforceable.

166. Defendants have infringed, and continue to infringe, literally and/or through the doctrine of equivalents, all claims of the ’948 patent, including but not limited to claim 1, pursuant to 35 U.S.C. 271(a), by making, using, selling, offering to sell, and/or importing within the United States, without authority, certain Samsung products including the Products Accused of Patent Infringement.

167. The Products Accused of Patent Infringement are capable of performing a method of operating an electrical circuit comprising the following steps:

168. The Products Accused of Patent Infringement are capable of performing a method of providing a first electrical circuit electrically connectable to a power source. The Products Accused of Patent Infringement are equipped with a wireless power functionality capable of electrically connecting to a power source, *e.g.*, a wireless charging transmitter.

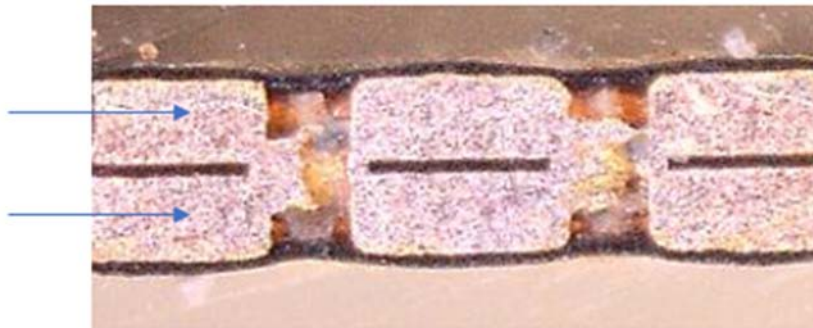
169. The electrical circuits of the Products Accused of Patent Infringement comprise at least an inductor, *e.g.*, a wireless power coil. The inductors of the Products Accused of Patent Infringement comprise first and second conductors that are spaced apart from one another, the first and second conductors being electrically conductive. The inductors of the Products Accused of Patent Infringement consist of two layers of copper traces that each form copper wire coils. The first and second conductor layers, being made of copper, are electrically conductive. *See, e.g.:*



Wireless Power Coil Extracted from Samsung Note 5



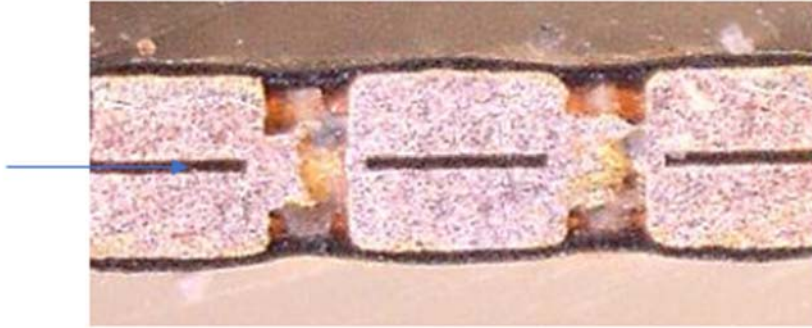
Section of Samsung Note 5 Wireless Power Coil



Samsung Note 5 Wireless Coil Cross-section (first and second conductor layers of copper)

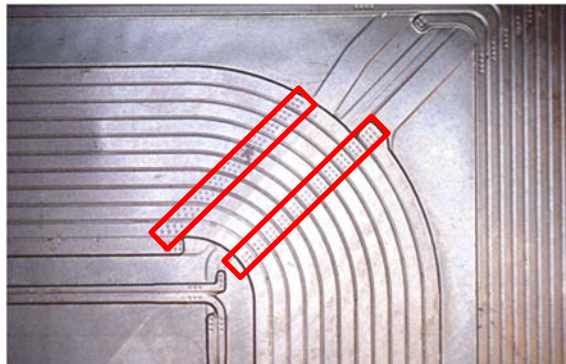
170. An insulator layer is positioned between the first conductor layer and the second conductor layer. The inductors of the Products Accused of Patent Infringement contain an insulator layer positioned in the space between the first and second conductor layers, as the first

and second conductor layers in the Products Accused of Patent Infringement are spaced apart by a layer of dielectric material. *See, e.g.:*

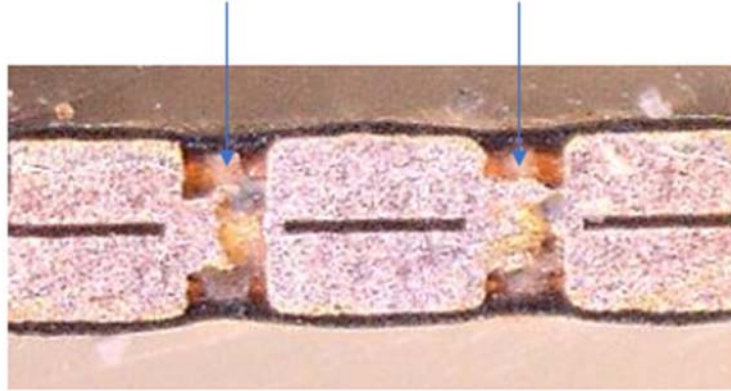


Samsung Note 5 Wireless Coil Cross-section (example section of insulator layer identified)

171. The first and second conductor layers are electrically connected by at least one connector. The first and second conductor layers in the Products Accused of Patent Infringement are electrically connected by pathways of copper, or vias, between the first and second conductor layers. *See, e.g.:*



Samsung Note 5 Wireless Coil (top view of connectors, connectors identified)



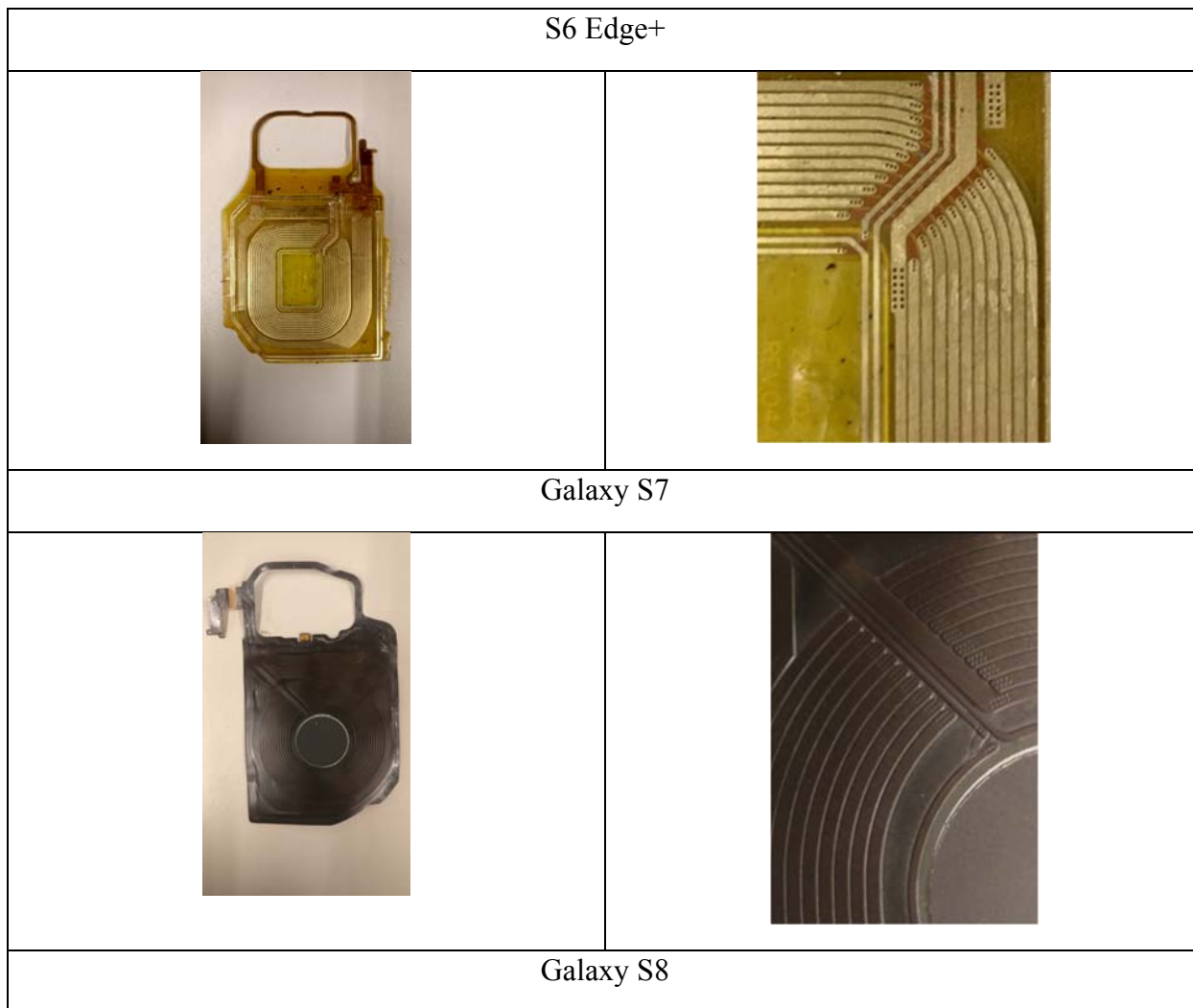
Samsung Note 5 Wireless Coil Cross-section (connectors identified)

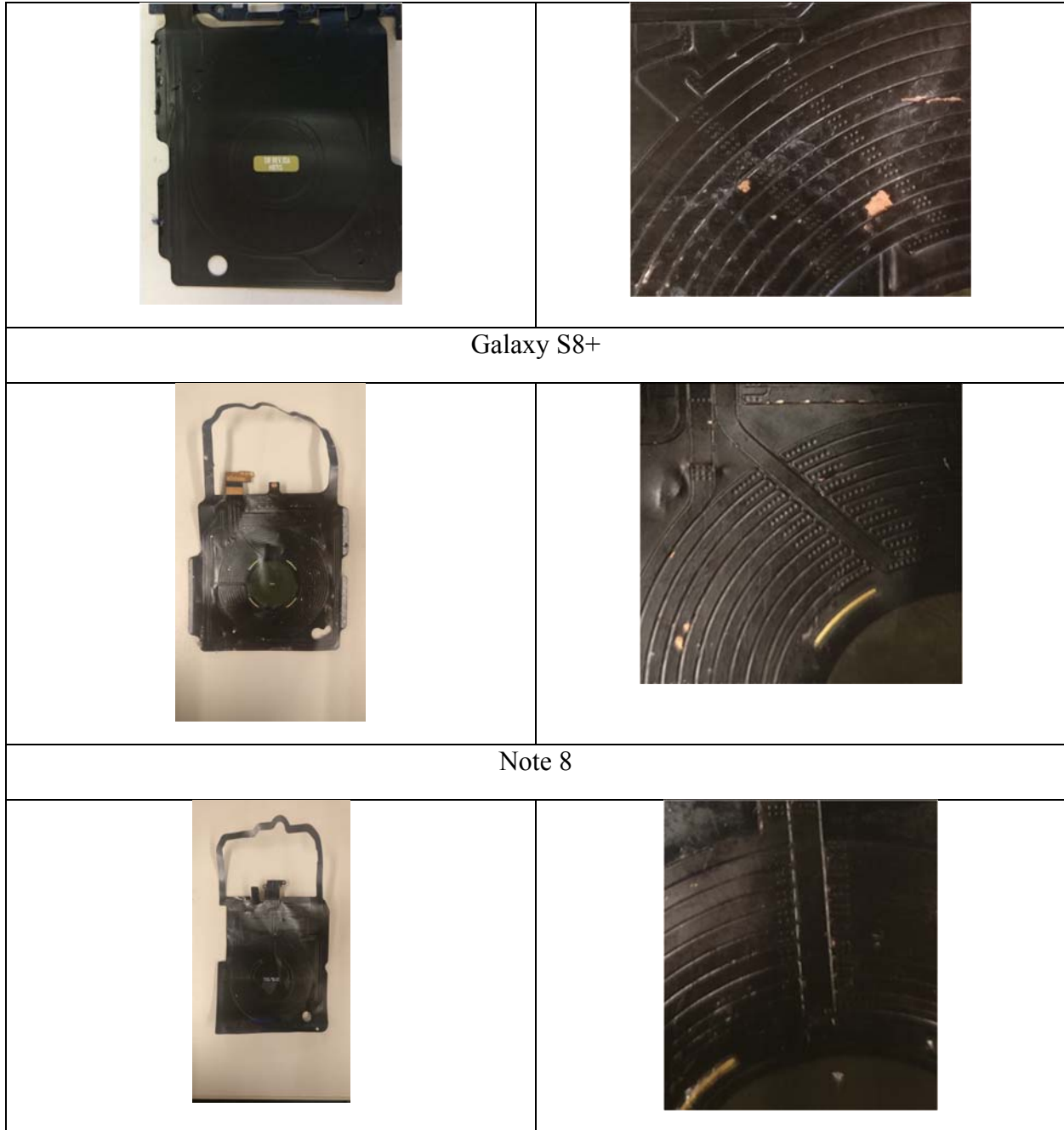
172. The Products Accused of Patent Infringement are capable of performing a method of adjusting a power level of the power source. For example, the Products Accused of Patent Infringement are capable of communicating information to a power transmitting device (e.g., a charging pad) to adjust the power level of the transmitting device. During an initial configuration phase, the Products Accused of Patent Infringement send packets that identify the product and provide configuration and setup information to the power transmitter, causing the power transmitter's power level to adjust, for example, to start the device charging. Similarly, in the power-transfer phase, the Products Accused of Patent Infringement periodically send control error packets to the power transmitter to increase or decrease the power supply. As another example, to end the power transfer, the Products Accused of Patent Infringement communicate with the power transmitter to adjust the power transmitter's power level, for example to place it in a low-power state.

173. The Products Accused of Patent Infringement are capable of performing a method of propagating an electrical current within at least the first conductor. An electrical current is propagated in at least the first conductor layer in the inductors of the Products Accused of Patent Infringement when, for example, the inductors of the Products Accused of Patent Infringement enter an electromagnetic field generated by a wireless power transmitter, such as a wireless charging pad. A magnetic flux is generated within the inductors of the Products Accused of Patent Infringement when said electrical current is propagated within them.

174. The Products Accused of Patent Infringement are capable of performing a method of changing at least one of a frequency, a magnitude, or a waveform shape of the propagated electrical current such that a magnetic flux within the inductor is generated. The inductors of the Products Accused of Patent Infringement generate an inductance upon change of a frequency, a magnitude, or a waveform shape. The wireless power coils contained in the Products Accused of Patent Infringement operate using inductive power transfer.

175. Beginning with its Fall 2015 product release (the Note 5 and S6 Edge+) and continuing through its most recent release, the Note 8 in Fall 2017, Samsung has infringed at least claim 1 of the '948 patent with each release of the Products Accused of Patent Infringement. *See, e.g.:*





176. The existence and location of vias on the wireless power coils of the Products Accused of Patent Infringement, as shown in the above photos, demonstrates Samsung's continued infringement of NuCurrent's patented MLMT technology, including at least claim 1 of the '948 patent. The existence and location of vias on the wireless power coils of the Products Accused of Patent Infringement, as shown in the above photos, also indicates that NuCurrent's

allegations with respect to Samsung's Note 5 are representative of all the Products Accused of Patent Infringement.

177. As described herein, Samsung has actual knowledge of the '948 patent or was willfully blind to the patent.

178. Samsung indirectly infringes the patents-in-suit by inducing infringement of others, such as its customers using the Products Accused of Patent Infringement, by, for example, encouraging those customers to sell the infringing inductors and/or use the infringing inductors described above. Samsung also induces infringement of its suppliers, including its wireless power antenna suppliers, by, for example, providing designs and specifications for those suppliers that require said suppliers to manufacture wireless power antennas in such a way as to constitute infringement of the patents-in-suit, as described above.

179. Samsung took the above actions intending to cause infringing acts by others.

180. Samsung was aware of the patents-in-suit and knew that others' actions, if taken, would constitute infringement of the patents-in-suit. Alternatively, Samsung believed there was a high probability that others would infringe the patents-in-suit but remained willfully blind to the infringing nature of others' actions.

181. Samsung therefore infringes the patents-in-suit under 35 U.S.C. 271(b).

182. Defendants have committed and continue to commit acts of contributory infringement by selling, offering to sell, and/or importing products including the Products Accused of Patent Infringement, knowing or willfully blind to the fact that these products constitute a material part of the invention, were especially made or especially adapted for use in an infringement of the '948 patent, and have no substantial non-infringing uses. Samsung therefore infringes the patents-in-suit under 35 U.S.C. 271(c).

183. Samsung's infringement of the patents-in-suit has been and continues to be willful, wanton, malicious, in bad-faith, deliberate, consciously wrongful, and/or flagrant.

184. For example, Samsung was aware of NuCurrent's patent rights, and knew that its actions (*e.g.*, after learning of the patents-in-suit, redesigning its products in accordance with the

claims of the patents-in-suit) would constitute infringement of the patents-in-suit. Such conduct is exceptionally egregious and constitutes willful infringement of the patents-in-suit.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff NuCurrent prays for the entry of a judgment from this Court:

1. Judgment in NuCurrent's favor and against Defendants on all causes of action alleged herein;
2. For damages in an amount to be further proven at trial, including:
 - a. Damages assessed against Defendants pursuant to the Defend Trade Secrets Act of 2016, 18 U.S.C. § 1831 *et seq.*;
 - b. Damages under the Illinois Trade Secret Act including compensatory damages, unjust enrichment or restitution damages, and reasonable royalty damages; and
 - c. Damages under 35 U.S.C. § 284, including enhancement and including supplemental damages for any continuing post-verdict infringement up until entry of final judgment, with an accounting, as needed;
3. For preliminary and permanent injunctive relief, preventing Defendants and their officers, directors, agents, servants, employees, attorneys, licensees, successors, assigns, and those in active concert or participation with any of them, from directly infringing, contributorily infringing, and inducing the infringement of patents-in-suit, and from any further misappropriation or unauthorized use of NuCurrent's trade secrets;
4. For judgment that this is an exceptional case under 35 U.S.C. § 285, and a judgment awarding to NuCurrent its attorney's fees incurred in prosecuting this action;
5. For costs of suit incurred herein, including all disbursements;
6. For pre-judgment and post-judgment interest on the damages awarded;

7. For an order requiring that, in the event a permanent injunction preventing future acts of infringement is not granted, NuCurrent be awarded an ongoing licensing fee; and

8. For such other and further relief (including any and all equitable relief) as the Court may deem to be just and proper.

DEMAND FOR JURY TRIAL

Pursuant to Rule 38 of the Federal Rules of Civil Procedure, Plaintiff demands a trial by jury on all issues triable of right by a jury.

DATED: February 5, 2018

Respectfully submitted,

CALDWELL CASSADY & CURRY



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NUCURRENT, INC.**