IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

SATIUS HOLDING, INC., Plaintiff, v. SAMSUNG ELECTRONICS CO., LTD., and SAMSUNG ELECTRONICS AMERICA, INC., Defendants.	)	C.A. No. **DEMAND FOR JURY TRIAL**

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Satius Holding, Inc. ("Plaintiff" or "Satius") files this Complaint for Patent Infringement and Demand for Jury Trial against Defendants Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. (collectively, "Defendant" or "Samsung") and allege as follows:

THE PARTIES

1. Satius is a Delaware corporation having a principal place of business at 1000 North West Street, Suite 1241, Wilmington, DE 19801. Satius acquired United States Patent No. 6,711,385 (the "'385 Patent") from Satius, Inc. Satius, Inc. was established in January 1992 to develop, license, manufacture and market products that utilize the only coupler technology known to enable existing power lines to act as a multimedia highway for the simultaneous distribution of video, voice and high speed data.

2. Upon information and belief, Samsung Electronics Co., Ltd. ("Samsung Electronics") is a Korean corporation having its principal place of business at 250 2 Ka

Taepyung, Ro Chung Ku, Seoul, Korea M5 100742. Samsung Electronics produces and sells telecommunication, semiconductor, and mobile phone technologies.

3. Upon information and belief, Samsung Electronics America, Inc. ("SEA") is a New York corporation having its principal place of business at 85 Challenger Road, Ridgefield Park, New Jersey 07660. Upon information and belief, Samsung Electronics America, Inc. is a wholly-owned subsidiary of Samsung Electronics Co., Ltd. SEA manufactures, supplies and sells consumer electronics and products throughout the United States including mobile devices. In 2015, SEA merged with Samsung Telecommunications America LLC, a Delaware limited liability company, which developed and provided telecommunications products including Samsung mobile devices in the United States. Samsung Electronics and SEA work collectively in the designing, manufacturing, importing, distributing and selling of the infringing devices described more below.

JURISDICTION AND VENUE

4. This action for patent infringement arises under the patent laws of the United States, 35 U.S.C. §101 *et seq.* This court has original jurisdiction over this controversy pursuant to 28 U.S.C. §§1331 and 1338.

5. Venue is proper in this Court pursuant to 28 U.S.C. §§ 1391(b) and (c) and/or 1400(b).

6. This Court has personal jurisdiction over Defendant because Defendant regularly and continuously, either directly or through subsidiaries or intermediaries, conducts business in this District and has infringed, and continues to do so, in this District. In addition, the Court has personal jurisdiction over Defendant because minimum contacts have been established with the forum and the exercise of jurisdiction would not offend traditional notions of fair play and

substantial justice. For example, Defendant advertises active job listings in this District and knowingly makes, uses, offers for sale, sells, ships and provides products or services that infringe the '385 Patent in this District, as further described below.

SATIUS' INNOVATION

7. Satius' innovation in the '385 Patent provided a novel solution to antenna problems that smartphones previously and repeatedly encountered. In particular, prior to the '385 Patent, smartphones, tablets, and other devices transmitting signals for communications would not be able to obtain clear and consistent connections leading to call degradation as a result of reflected signal transmissions.

8. The '385 Patent discloses an apparatus for the communication of electric or electromagnetic signals over air which includes a transmitter or receiver and a coupler. The claimed coupler minimizes the impact of reflected call signals to improve call quality and resolve these previous and detrimental problems in communications. The coupler is able to provide these solutions by eliminating noise and matching the noise to the characteristic impedance of the air at a preselected frequency which in turn linearizes communication and allows for high-speed data and voice communication over long distances.

9. Without the technology of the Satius '385 Patent, a wireless phone is very likely to experience call degradation resulting from reflected signal transmissions. This is especially the case in large cities or other locations where tall buildings or structures are prevalent. Call signals transmitted from the wireless phone are literally reflected back to the phone, causing interference and degradation of call quality. The Satius '385 Patent discloses and claims a wireless device "coupler" that minimizes the impact of reflected call signals to improve call quality.

FACTUAL BACKGROUND

10. On March 23, 2004, the United States Patent and Trademark Office ("PTO") issued the '385 Patent titled COUPLER FOR WIRELESS COMMUNICATIONS. The '385 Patent listed Charles Abraham as the sole inventor and was assigned to Satius, Inc. A true and correct copy of the '385 Patent is attached to this Complaint as Exhibit 1 and is incorporated by reference herein.

11. On January 4, 2008, Satius, Inc. assigned the '385 Patent to Satius. Satius has been the sole owner of the '385 Patent since the aforementioned assignment.

SAMSUNG'S PRODUCTS

12. Defendant makes, uses, sells, offers for sale, and/or imports into the United States and this District products and services that provide for the communication of electric or electromagnetic signals over the air. Defendant's products include cellular mobile phones such as the Galaxy S9, Galaxy S9+, Galaxy S8, Galaxy S8+, Galaxy S8 Active, Galaxy S7, Galaxy S7 edge, Galaxy S7 active, Galaxy S6, Galaxy S6 edge, Galaxy S6 edge+, Galaxy S6 Active, Galaxy S5, Galaxy S5 Active, Galaxy S5 Mini, Galaxy S5 Sport, Galaxy S4, Galaxy S4 mini, Galaxy, S4 Active, Galaxy SIII, Galaxy SII, Galaxy Note8, Galaxy Note5, Galaxy Note4, Galaxy Note3, Galaxy Note II, Galaxy Note edge, Galaxy, Galaxy Core Prime (Cricket), Galaxy J3, Galaxy J7, Galaxy Mega, Galaxy Alpha, Galaxy Grand Prime, Galaxy Core Prime, and Galaxy Amp Prime (collectively, "Samsung Phones"), and tablets such as the Galaxy Tab S3, Galaxy Tab A, Galaxy Book, Galaxy View ("Samsung Tablets"). *See* Exhibit 2, https://www.samsung.com/us/mobile/phones/; *see also* Exhibit 3, https://www.samsung.com/us/mobile/tablets/.

13. The Samsung Phones and Samsung Tablets incorporate technologies including an impedance matching transmitter such as the Samsung Shannon 965, Qualcomm SDR845 RF transceiver, and Qualcomm TruSignal adaptive antenna as described in further detail below.

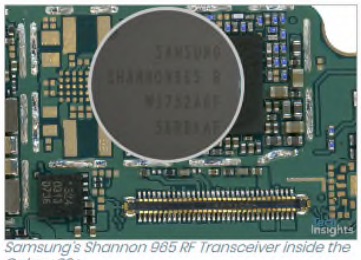
Samsung's Couplers

14. Samsung Phones and Samsung Tablets are able to achieve consistent call quality through use of an air-core or dielectric core coupler that eliminates noise and is matched to the characteristic impedance of the air at a preselected frequency.

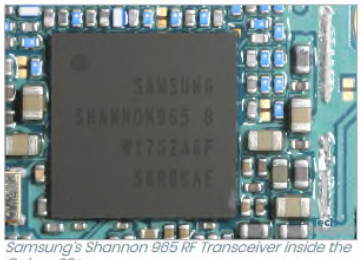
15. Samsung designs and makes the Shannon series RF transceivers, including the Samsung Shannon 965 and Samsung Shannon 955 models, which are RF transceivers found in at least the Galaxy S8 and Galaxy S9+ Samsung Phones, as shown below. The Samsung Shannon series RF transceivers include a transmitter and a coupler having a dielectric (non-magnetic) core that infringe the '385 Patent. The dielectric core found in the Samsung Shannon series RF transceivers allow Samsung to match the impedance of the transmitter to the impedance of the air to achieve reliable cellular service in the Samsung Phones and Samsung Tablets.

RF Transceiver

The Galaxy S9+ includes a new RF Transceiver, Samsung's Shannon 965. The Shannon 965 works with the LTE Cat.18 modem integrated in the Exynos 9810 to implement the 1.2Gbps download (peak) and 200Mbps upload (peak).



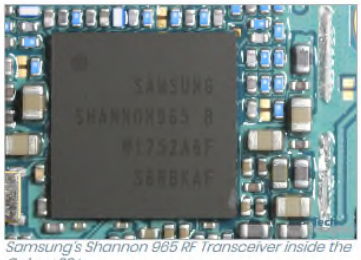
Samsung's Shannon 965 RF Transceiver inside the Galaxy S9+



Samsung's Shannon 965 RF Transceiver inside the Galaxy S9+

We now have the die photos of the Samsung Shannon 965 RF Transceiver, showing the die marking S5M9650X01. The die size (seal) is 5.96mm x 5.92mm = 35.28 mm², slightly larger than the previous Shannon 955 RF Transceiver in the Galaxy S8.

Samsung's Shannon 965 RF Transceiver inside the Galaxy S9+



Samsung's Shannon 965 RF Transceiver inside the Galaxy S9+

Exhibit 4, http://www.techinsights.com/about-techinsights/overview/blog/samsung-galaxy-s9-teardown/.

16. Samsung also purchases third-party RF transceivers, such as Qualcomm RF transceivers, that Samsung installs in its Samsung Phones and Samsung Tablets, as shown below:

Samsung Galaxy S9+ SM-G965F and SM-G965U Key Components Comparison

	SM-G965F	SM-G965U
Application Processor	Samsung Exynos 9810 + Samsung 6GB LPDDR4X SDRAM K3UH6H60AM-AGCJ	Qualcomm Snapdragon 845 + K3UH6H60AM-AGCJ
RF Transceiver	Samsung Shannon 965	Qualcomm SDR845
Power Management IC	Samsung Shannon 560	Qualcomm PM845, PM8005
Camera	Samsung S5K2L3	Sony IMX345
Envelope Tracking	Samsung Shannon 735	Qualcomm QET4100
Power Amplifiers and Front-Ends	Broadcom AFEM-9090, Murata fL05B	Broadcom AFEM-9096, Skyworks SKY78160-11
NFC	Samsung S3NRN82	NXP PN80T
GNSS	Broadcom BCM47752	Integrated in Qualcomm SDR845
Audio Codec	Cirrus Logic CS47L93	Qualcomm WCD9341

Exhibit 4, http://www.techinsights.com/about-techinsights/overview/blog/samsung-galaxy-s9-teardown/.

17. These third party RF transceivers, such as the Qualcomm SDR845 RF transceiver, include infringing couplers that embody the claimed invention. As shown below, the Qualcomm SDR845 includes a QAT3550 impedance tuner, which is a coupler that matches the impedance of the transmitter to the impedance of the air surrounding the device. Samsung incorporates Qualcomm's RF transceivers to achieve reliable cellular connectivity in a manner that infringes the '385 Patent.

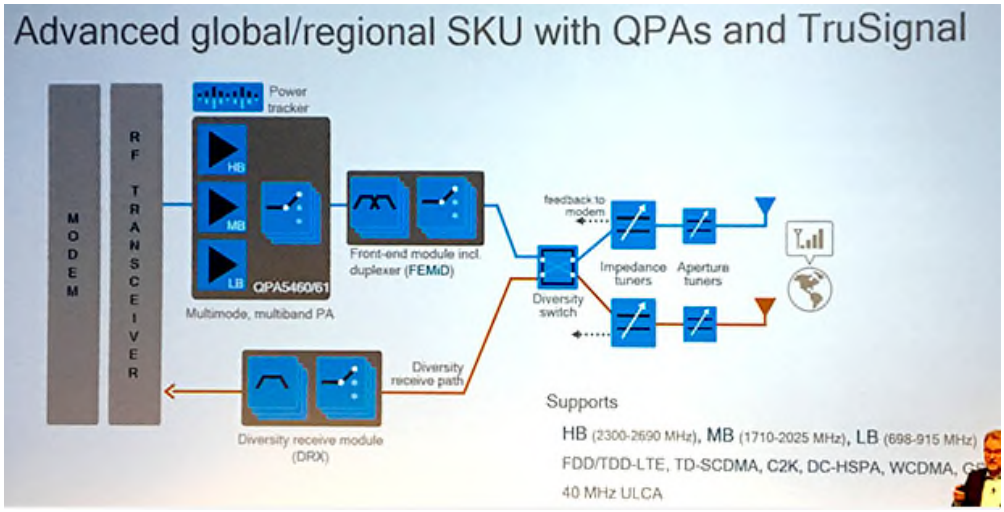
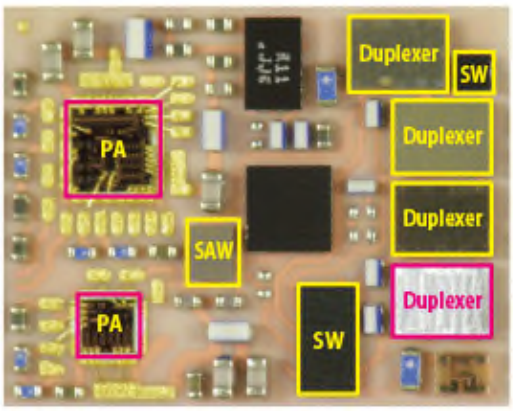


Exhibit 5, https://www.anandtech.com/show/11138/qualcomm-snapdragon-x20-lte-modem-gigabit-for-mobile-devices.

18. Samsung Phones and Samsung Tablets include non-magnetic cores to eliminate notches in the communication bandwidth cause by a mismatch in the impedance between the wireless transmitter and the impedance of the air surrounding the Samsung Phone or Samsung Tablet. As shown below, the Samsung Phones and Samsung Tablets include an impedance matching circuit having a non-magnetic (e.g., ceramic or dielectric) core.

When PA and DPX are used as individual components of a circuit, they are generally prepared as packaged products by including an additional 50 Ω impedance matching circuit in each device. In contrast, Murata's PAMid has self-manufactured PA and DPX already mounted on the LTCC substrate. Notice that this is done at a level of wafer specifically designed for the module. This allows us to resin-package an entire module all at once. The process helps us accomplish miniaturization as well as inexpensive manufacturing of the products. What is also important in implementing the miniaturization along with wafer-level devices is the LTCC substrate technology. The use of very thin ceramic sheets enables us to form more than twice as many layers as common resin substrates. Taking advantage of this manufacturing method, we have succeeded in building into the LTCC substrate filters attenuating higher harmonics and impedance matching circuits, realizing the world's smallest module.



LMTWHT Series (7.5*6.0 mm)
Inside the border: wafer-level devices

Exhibit 6, https://www.murata.com/en-us/about/newsroom/techmag/metamorphosis20/productsmarket/pamid.

COUNT I
(Direct Infringement of the '385 Patent)

19. Satius repeats, realleges, and incorporates by reference, as if fully set forth herein, the allegations of the preceding paragraphs.

20. Defendant has infringed and continues to infringe Claim 1 of the '385 Patent in violation of 35 U.S.C. § 271(a), recited below:

> A communications apparatus for transmitting electric or electromagnetic signals over air, the air having a characteristic impedance, the communications apparatus comprising:

> a transmitter having an output impedance, said transmitter for transmitting the electric or electromagnetic signals at a preselected frequency; and
>
> a coupler connected to the transmitter, said coupler comprising a transformer having a non-magnetic core, said transformer communicating the electric or electromagnetic signals to the air, said coupler matching the output impedance of the transmitter to the characteristic impedance of the air.

21. Defendant has infringed and continues to infringe Claim 11 of the '385 Patent in violation of 35 U.S.C. § 271(a), recited below:

> The communications apparatus of claim 1 wherein the transformer comprises:
>
> a first conductive plate;
>
> a second conductive plate placed underneath and spaced apart from the first conductive plate;
>
> wherein the first conductive plate is matched to the characteristic impedance of the air at a preselected bandwidth.

22. Defendant has infringed and continues to infringe Claim 18 of the '385 Patent in violation of 35 U.S.C. § 271(a), recited below:

> The communications apparatus of claim 11 wherein the first conductive plate and the second conductive plate are formed directly in a chip by deposition of metallic layers onto the chip.

23. Defendant's infringement is based upon literal infringement or infringement under the doctrine of equivalents, or both.

24. Defendant's acts of making, using, importing, selling, and/or offering for sale the infringing products and services have been without the permission, consent, authorization, or license of Satius.

25. Defendant's infringement includes, but is not limited to, the manufacture, use, sale, importation and/or offer for sale of Defendant's products and services, including the

Samsung Phones and Samsung Tablets and all other products and services that incorporate the technologies provided at least through the Qualcomm SDR845 RF transceiver, Qualcomm TruSignal adaptive antenna, and the Samsung Shannon 965 (collectively, the "'385 Accused Products").

26. The '385 Accused Products embody the patented invention of the '385 Patent and infringe the '385 Patent because they are communications apparatuses for transmitting electric or electromagnetic signals over air, the air having a characteristic impedance, the communications apparatus comprising: a transmitter having an output impedance, said transmitter for transmitting the electric or electromagnetic signals at a preselected frequency; a coupler connected to the transmitter, said coupler comprising a transformer having a non-magnetic core, said transformer communicating the electric or electromagnetic signals to the air, said coupler matching the output impedance of the transmitter to the characteristic impedance of the air.

27. By way of example, the Samsung Galaxy S9+ infringes at least claim 1 of the '385 Patent. The Samsung Galaxy S9+ is a communications apparatus that includes the Shannon 965 transceiver, which includes a transmitter and receiver that is coupled with an impedance matching antenna tuner that matches the air impedance with the impedance of the transmitter or receiver.

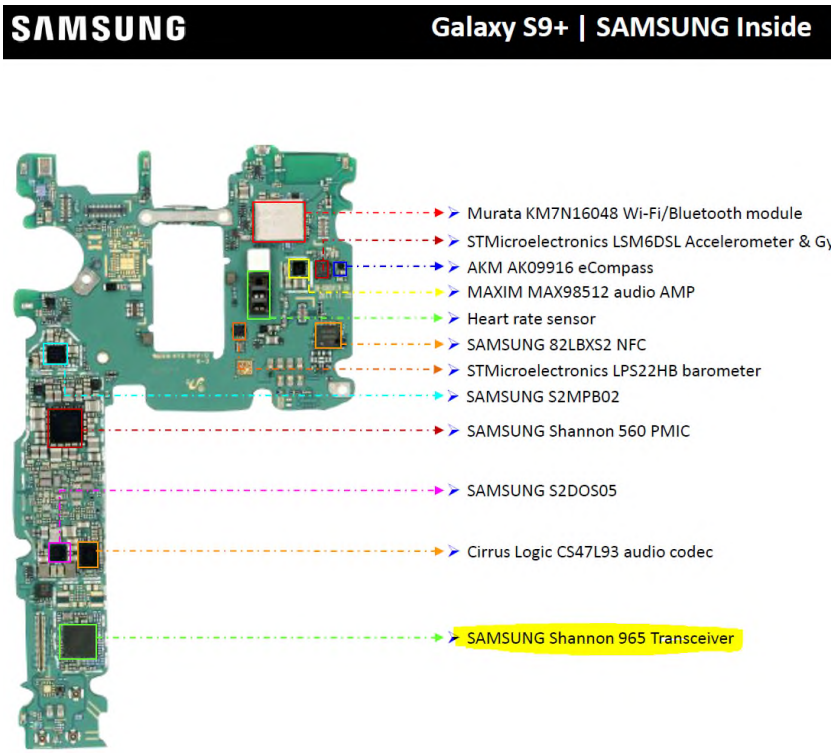


Exhibit 7, Introducing The Galaxy S9/S9+.pdf.

28. The Samsung Galaxy S9+ utilizes the Samsung Shannon 965 Transceiver to transmit electric or electromagnetic signals, such as cellular signals, over the air. As shown below, the Shannon 965 Transceiver is the Samsung Galaxy S9+'s "main antenna."

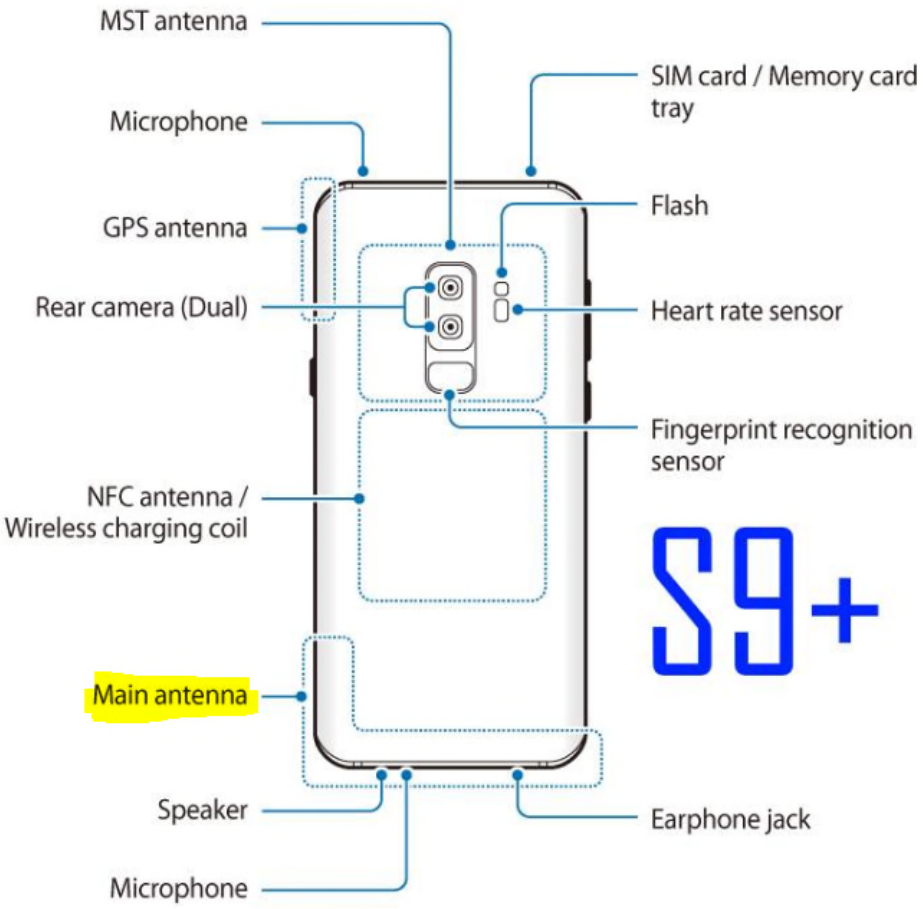


Exhibit 8, https://gadgetguideonline.com/s9/galaxy-s9-layout-and-layout-of-galaxy-s9/.

29. The Samsung Galaxy S9+, as shown below, includes the Samsung Shannon 965 transceiver that functions to transmit cellular signals over the air at a preselected frequency. The Samsung Shannon 965, like all radio frequency devices, operates specific output impedance. As shown below, the Samsung Shannon 965 is a transceiver controlled by Samsung Exynos 9 processor to transmit electric or electromagnetic signals over the air.

> We now see some other details about the Galaxy S9 internals. Teardown revealed that Samsung's latest flagship phones come with a new RF transceiver and redesigns it's power management integrated circuit. The RF module included in the Galaxy S9 Plus is the Shannon 965, which is Samsung's in-house chip that's compatible with the LTE Cat.18 modem part of Exynox 9810 silicon powering the global variants of the company's smartphones. In addition, the Shannon 560 is the company's new PMIC that succeeds the Shannon 555 found inside last year's Galaxy S8 and S8 Plus.

Exhibit 9, https://joltjournal.com/2018/03/11/samsung-galaxy-s9-teardown-reveals-new-rf-transceiver-and-power-management-integrated-circuit/.

30. The Samsung Galaxy S9+'s Shannon 965 Transceiver includes a coupler connected to the transmitter of the Shannon 965 that includes a transformer having a non-magnetic core (e.g., a ceramic core). The transformer in the Shannon 965 Transceiver is used to communicate electric or electromagnetic signals into the air. Additionally, the Shannon 965 Transceiver matches the output impedance of the transmitter to the characteristic impedance of the air to achieve clear and consistent connections with cellular towers and to improve call degradation that result from reflected signal transmissions, as shown below:

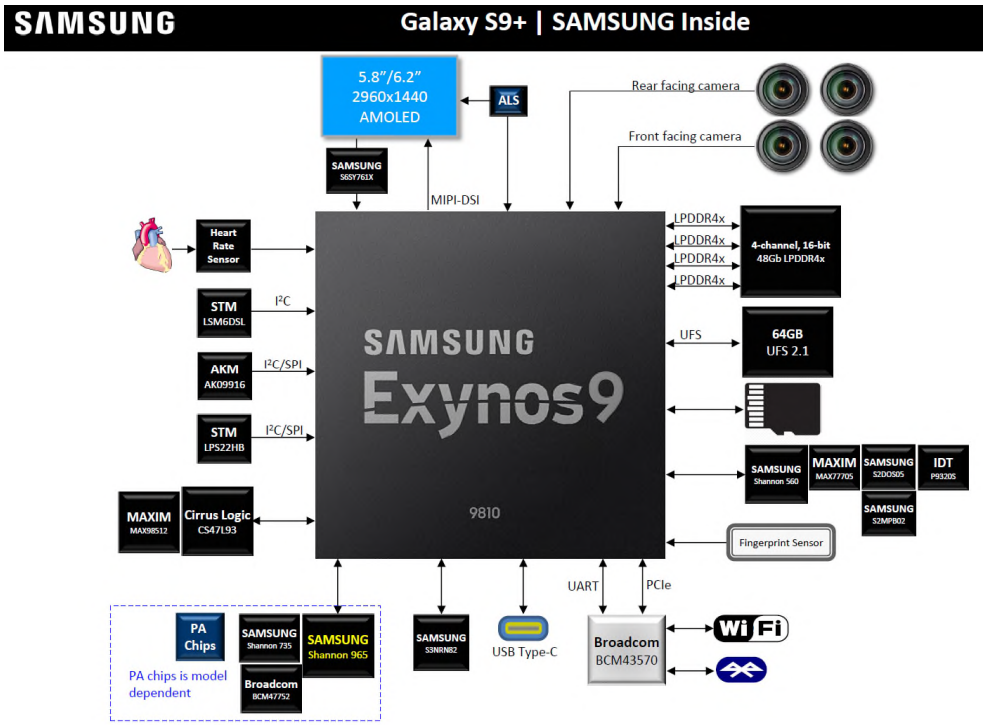
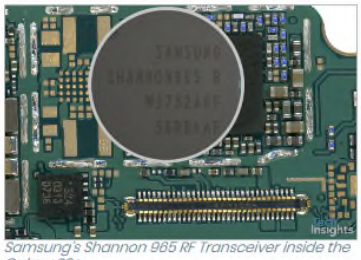


Exhibit 7, Introducing The Galaxy S9/S9+.pdf.

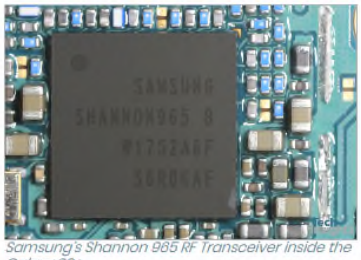
31. The Samsung Shannon 965 Transceiver includes a non-magnetic core that eliminates noise and matches the impedance of the air to the impedance of the wireless transmitter at a preselected frequency to eliminate notches in the communication bandwidth. As shown below, the Samsung Shannon 965 in built into the Galaxy S9+ and includes an impedance matching coupler with a non-magnetic core.

RF Transceiver

The Galaxy S9+ includes a new RF Transceiver, Samsung's Shannon 965. The Shannon 965 works with the LTE Cat.18 modem integrated in the Exynos 9810 to implement the 1.2Gbps download (peak) and 200Mbps upload (peak).



Samsung's Shannon 965 RF Transceiver inside the Galaxy S9+



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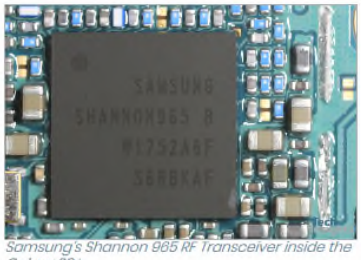

Samsung's Shannon 965 RF Transceiver inside the Galaxy S9+

Exhibit 4, http://www.techinsights.com/about-techinsights/overview/blog/samsung-galaxy-s9-teardown/.

32. As a result of Defendant's unlawful activities, Satius has suffered and will continue to suffer irreparable harm for which there is no adequate remedy at law. Defendant's continued infringement of the '385 Patent causes harm to Satius in the form of price erosion, loss of goodwill, damage to reputation, loss of business opportunities, inadequacy of money damages, and direct and indirect competition. Monetary damages are insufficient to compensate Satius for these harms. Accordingly, Satius is entitled to preliminary and/or permanent injunctive relief.

33. Defendant's infringement of the '385 Patent has injured and continues to injure Satius in an amount to be proven at trial, but not less than a reasonable royalty.

PRAYER FOR RELIEF

WHEREFORE, Satius prays for judgment and relief as follows:

A. An entry of judgment holding that Defendant has infringed and is infringing the '385 Patent.

B. A preliminary and permanent injunction against Defendant and its officers, employees, agents, servants, attorneys, instrumentalities, and/or those in privity with them, from continuing to infringe the'385 Patent and for all further and proper injunctive relief pursuant to 35 U.S.C. § 283;

C. An award to Satius of such damages as it shall prove at trial against Defendant that is adequate to fully compensate Satius for Defendant's infringement of the '385 Patent, said damages to be no less than a reasonable royalty;

D. A finding that this case is "exceptional" and an award to Satius of its costs and reasonable attorneys' fees, as provided by 35 U.S.C. § 285;

E. An accounting of all infringing sales and revenues, together with post judgment interest and prejudgment interest from the first date of infringement of the '385 Patent; and

F. Such further and other relief as the Court may deem proper and just.

JURY DEMAND

Satius demands a jury trial on all matters so triable.

POTTER ANDERSON & CORROON LLP

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Dated: June 5, 2018
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