

Plaintiff Rensselaer Polytechnic Institute (hereinafter “Rensselaer” or “Plaintiff”) brings this Complaint for Patent Infringement arising under the Patent Laws of the United States of America, 35 U.S.C. §§ 100 *et seq.*, against Samsung Electronics America, Inc. (“Samsung America”) and Samsung Electronics Co., Ltd. (“Samsung Electronics”) (collectively “Samsung” or “Defendants”) and states as follows:

THE PARTIES

1. Rensselaer is a private research university with its principal location at 110 8th Street, Troy, New York 12180. It is the owner of U.S. Patent No. 6,906,339 and U.S. Patent No. 7,253,119 (collectively the “Asserted Patents”).

2. On information and belief, Samsung America is a corporation and organized under the laws of the State of New York with a principal place of business located at 85 Challenger Road, Ridgefield Park, New Jersey 07660.

3. On information and belief, Samsung Electronics is a company organized and existing under the laws of the Republic of Korea with its principal place of business located at 129 Samsung-ro, Yeontong-gu, Suwon-si, Gyeonggi-do, 443-742 in the Republic of Korea and is the parent company of Samsung America.

4. On information and belief, Samsung has sold and continues to sell QLED-type televisions in the United States, including New Jersey, that infringe at least one claim of each of the Asserted Patents.

JURISDICTION AND VENUE

5. This action arises under the patent laws of the United States, 35 U.S.C. §§ 100 *et seq.*, and the Court has subject matter jurisdiction over this action pursuant to

28 U.S.C. §§ 1331, 1332 and 1338(a).

6. This Court has personal jurisdiction over each of the Defendants consistent with the requirements of the Due Process Clause of the United States Constitution and the New Jersey Long Arm Statute. On information and belief, each Defendant has regularly and systematically transacted business in New Jersey, directly or through subsidiaries or intermediaries, and/or committed acts of patent infringement in New Jersey as alleged more particularly below. On information and belief, Samsung America has a principal place of business in Ridgefield Park, New Jersey, and each Defendant has also placed infringing QLED-type television products into the stream of commerce by shipping those products into New Jersey and/or by knowing that the products would be shipped into New Jersey.

7. Venue is proper in this judicial district pursuant to 28 U.S.C. §§ 1391 and 1400(b) because Samsung America has a regular and established place of business and has committed acts of infringement in this district. On information and belief, Samsung America has a principal place of business at 85 Challenger Road, Ridgefield Park, New Jersey 07660. With respect to Samsung Electronics, a Korean company, venue is proper in this judicial district because actions against foreign entities are proper in any judicial district.

THE ASSERTED PATENTS AND BACKGROUND

8. On September 4, 2002, Rensselaer filed a patent application with the United States Patent and Trademark Office for an invention by Partha Dutta for a new,

useful, and nonobvious type of semiconductor nanoparticle and its method of manufacture.

9. On the basis of that application, on June 14, 2005, U.S. Patent No. 6,906,339 (the “ ‘339 patent”) issued to Rensselaer for an invention entitled Passivated Nanoparticles, Method of Fabrication Thereof, and Devices Incorporating Nanoparticles related to semiconductor nanoparticles. A true and accurate copy of the ‘339 patent is attached as Exhibit A. Rensselaer has owned the ‘339 patent throughout the period of Defendants’ infringing acts and still owns the patent.

10. On May 9, 2005, Rensselaer filed a divisional patent application with the United States Patent and Trademark Office, related to the ‘339 patent, for another invention by Partha Dutta for a new, useful, and nonobvious method of manufacture of semiconductor nanoparticles.

11. On the basis of that application, on August 7, 2007, U.S. Patent No. 7,253,119 (the “ ‘119 patent”), issued to Rensselaer for an invention entitled Passivated Nanoparticles, Method of Fabrication Thereof, and Devices Incorporating Nanoparticles related to a method of making semiconductor nanoparticles. A true and accurate copy of the ‘119 patent is attached as Exhibit B. Rensselaer has owned the ‘119 patent throughout the period of Defendants’ infringing acts and still owns the patent.

12. On information and belief, Samsung introduced QLED-type televisions using Quantum Dot semiconductor nanoparticles at least as early as the Consumer Electronics Show in 2015. See https://en.wikipedia.org/wiki/Quantum_dot_display;

<https://www.consumerreports.org/cro/news/2015/01/samsung-joins-the-quantum-dot-crowd-at-ces-2015-with-super-suhd-tvs/index.htm>.

13. On information and belief, since 2015 Samsung has imported and sold and offered to sell more than one hundred thirty (130) different models of QLED-type televisions in the United States that contain Quantum Dot semiconductor nanoparticles. A list of the Samsung QLED-type television model numbers (the “Accused Products”) is attached as Exhibit C.

14. On information and belief, the Accused Products all use a plurality of semiconductor nanoparticles, “Quantum Dots,” to display colors.

QLED will change your expectations of what a TV can do

QLED (or “Quantum dot LED”) offers an unparalleled visual and auditory adventure from the comfort of your living room. Available in 4K or 8K and from 32” all the way to 98”, the QLED series was designed with options to fit any space and budget.

<https://www.samsung.com/us/televisions-home-theater/tvs/qled-tv/technology/>.

COUNT I – Infringement of U.S. Patent No. 6,906,339

15. Plaintiff incorporates by reference Paragraphs 1 through 14 of the Complaint.

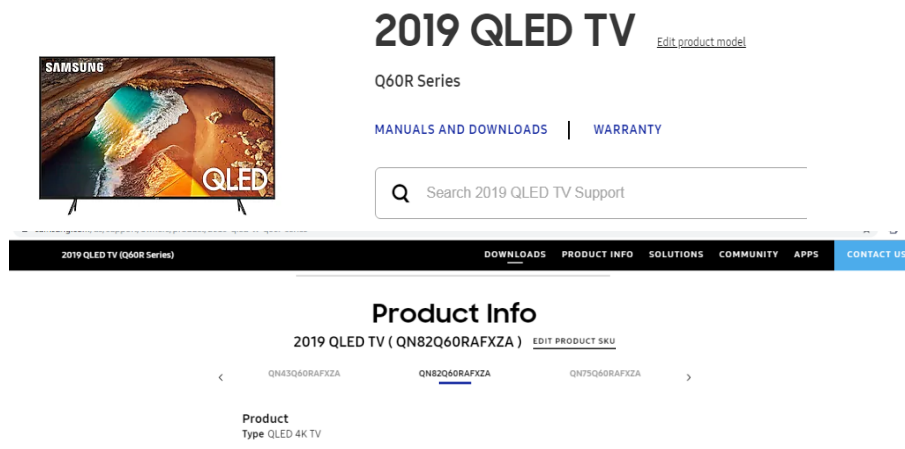
16. Defendants have infringed and are still infringing the ‘339 patent by making, using, selling, offering for sale, and importing the Accused Products that embody the patented invention and will continue to do so unless enjoined by this Court.

17. The Accused Products embody the patented invention and infringe, either literally or equivalently, each and every element of at least one or more claims of the '339 patent, including but not limited to claim 1.

18. Claim 1 of the '339 patent requires:

A plurality of semiconductor nanoparticles having an average size between about 2 nm and about 100 nm with a size standard deviation of less than 60 percent of the average nanoparticle size determined by photon correlated spectroscopy (PCS) method, wherein the nanoparticles have an elementally passivated surface comprising a passivating element.

19. An exemplar of the Accused Products in the Samsung QLED-style television is Model Number QN65Q60RAFXZA (the "60R Model"). The 60R Model uses Quantum Dot semiconductor nanoparticles for generating color in its video display.



The screenshot shows the Samsung website's product page for the 2019 QLED TV. At the top left, there is a small image of a Samsung QLED TV screen displaying a colorful abstract pattern. To the right of the image, the text reads "2019 QLED TV" in a large, bold font, with a link "Edit product model" next to it. Below this, it says "Q60R Series". There are two links: "MANUALS AND DOWNLOADS" and "WARRANTY". A search bar contains the text "Search 2019 QLED TV Support". A navigation bar at the bottom of the page includes links for "2019 QLED TV (Q60R Series)", "DOWNLOADS", "PRODUCT INFO", "SOLUTIONS", "COMMUNITY", "APPS", and "CONTACT US". Below the navigation bar, the "Product Info" section is visible, showing "2019 QLED TV (QN82Q60RAFXZA)" with an "EDIT PRODUCT SKU" link. A breadcrumb trail shows "QN63Q60RAFXZA" > "QN82Q60RAFXZA" > "QN79Q60RAFXZA". The "Product" section indicates "Type QLED 4K TV".

Video
Screen Size 81.5" Measured Diagonally ⓘ
Resolution 3,840 x 2,160 ⓘ
Motion Rate 240
Color 100% Color Volume with Quantum Dot
HDR (High-Dynamic Range) Quantum HDR 4X
Picture Engine Quantum Processor 4K
Quantum Dot Color Yes

<https://www.samsung.com/us/support/owners/product/2019-qlcd-tv-q60r-series>.

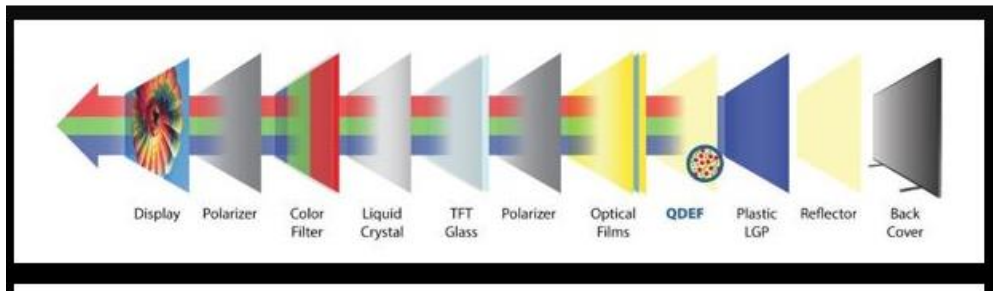
20. The packaging label for the 60R model states:

“100% COLOR VOLUME WITH QUANTUM DOT

Over a billion shades of brilliant color—powered by Quantum Dots—deliver our
most realistic picture”



21. On information and belief, the 60R model and the other Accused Products include a quantum-dot enhancement film (“QDEF”) that contains Quantum Dots.



<https://www.displaydaily.com/article/display-daily/quantum-dot-architectures-the-horizon-comes-closer>.

22. On information and belief, the QDEF of the 60R model uses two sizes of Quantum Dot semiconductor nanoparticles.

23. On information and belief, the Quantum Dot semiconductor nanoparticles used in the 60R Model and the other Accused Products have an average size between about 2 nm and about 100 nm with a size standard deviation of less than 60 percent of the average nanoparticle size determined by photon correlated spectroscopy (“PCS”) method.

24. On information and belief, Defendants know and have known how to elementally passivate Quantum Dot semiconductor nanoparticles and are and have been elementally passivating Quantum Dots in their QLED televisions. ACS Nano Article attached as Exhibit D, available at <https://sci-hub.tw/10.1021/acsnano.8b06692>.

25. On information and belief, the Quantum Dot semiconductor nanoparticles used in the 60R Model are nanoparticles having an elementally passivated surface comprising a passivating element.

COUNT II – Infringement of U.S. Patent No. 7,253,119

26. Plaintiff incorporates by reference Paragraphs 1 through 25 of the Complaint.

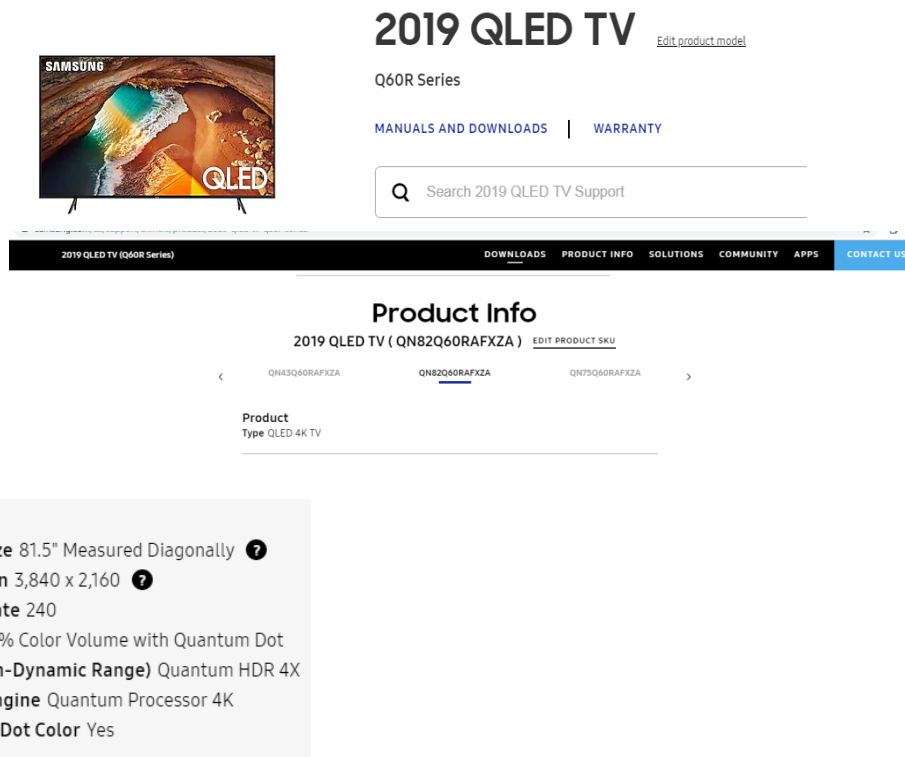
27. Defendants have infringed and are still infringing the '119 patent by making, using, selling, offering for sale and importing the Accused Products that embody the patented invention and will continue to do so unless enjoined by this Court.

28. The Accused Products embody the patented invention and infringe, either literally or equivalently, each and every element of at least one or more claims of the '119 patent, including but not limited to claim 1 by including components that are made according to the patented method.

29. Claim 1 of the '119 patent requires:

A method of making semiconductor nanoparticles, comprising: forming semiconductor nanoparticles of a first size in an aqueous solution; and providing an etching liquid into the solution to etch the semi-conductor nanoparticles of the first size to a second size smaller than the first size; wherein the solution contains a passivating element which binds to dangling bonds on a surface of the nanoparticles to passivate the surface of nanoparticles.

30. An exemplar of the Accused Products in the Samsung QLED-style is the 60R Model. The 60R Model uses Quantum Dot semiconductor nanoparticles for generating color in its video display.



The screenshot shows the Samsung website's product page for the 2019 QLED TV Q60R Series. At the top left is a product image of a Samsung QLED TV displaying a vibrant, colorful abstract scene. To the right of the image, the text reads "2019 QLED TV" in large bold letters, with a link "Edit product model" below it. Underneath, it says "Q60R Series" and provides links for "MANUALS AND DOWNLOADS" and "WARRANTY". A search bar contains the text "Search 2019 QLED TV Support". A navigation bar at the bottom of the page includes links for "2019 QLED TV (Q60R Series)", "DOWNLOADS", "PRODUCT INFO", "SOLUTIONS", "COMMUNITY", "APPS", and "CONTACT US". Below the navigation bar, the "Product Info" section is visible, showing the model "2019 QLED TV (QN82Q60RAFXZA)" and a list of other models: "QN43Q60RAFXZA", "QN82Q60RAFXZA" (which is underlined), and "QN79Q60RAFXZA". Below this list, it specifies "Product Type QLED 4K TV".

Video
Screen Size 81.5" Measured Diagonally [?]
Resolution 3,840 x 2,160 [?]
Motion Rate 240
Color 100% Color Volume with Quantum Dot
HDR (High-Dynamic Range) Quantum HDR 4X
Picture Engine Quantum Processor 4K
Quantum Dot Color Yes

<https://www.samsung.com/us/support/owners/product/2019-qled-tv-q60r-series>.

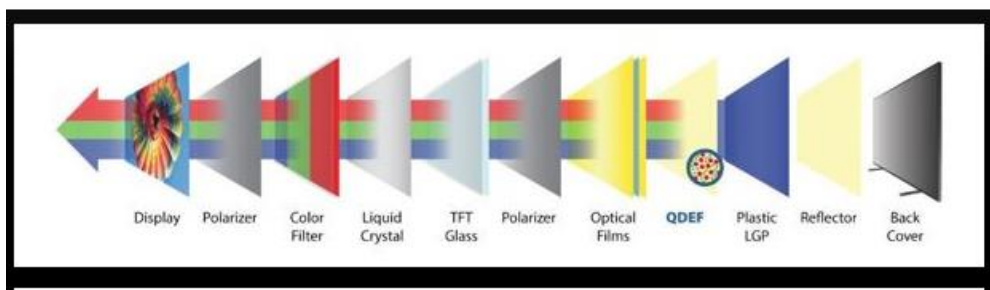
31. The packaging label for the 60R model states:

“100% COLOR VOLUME WITH QUANTUM DOT

Over a billion shades of brilliant color-powered by Quantum Dots-deliver our
most realistic picture”



32. On information and belief, the 60R Model and the other Accused Products include a QDEF that contains Quantum Dots.



<https://www.displaydaily.com/article/display-daily/quantum-dot-architectures-the-horizon-comes-closer>.

33. On information and belief, Defendants know and have known a method for passivating dangling bonds of Quantum Dot semiconductor nanoparticles and are and have been using Quantum Dots in their QLED televisions that have been made according to this method. Exhibit D.

34. On information and belief, the Quantum Dot semiconductor nanoparticles used in the 60R Model and the other Accused Products are and were made by forming semiconductor nanoparticles of a first size in an aqueous solution, and providing an etching liquid into the solution to etch the semi-conductor nanoparticles of the first size to a second size smaller than the first size, wherein the solution contains a passivating

element, which binds to dangling bonds on a surface of the nanoparticles to passivate the surface of nanoparticles. Exhibit D.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff Rensselaer Polytechnic Institute seeks and requests the following relief against Defendants Samsung Electronics America, Inc. and Samsung Electronics Co., Ltd.:

- A. A judgment in favor of Plaintiff that Defendants have infringed, either literally or under the doctrine of equivalents, at least one or more claims of the Asserted Patents;
- B. A permanent injunction prohibiting defendants from further acts of infringement of the Asserted Patents;
- C. An award of monetary damages to which Plaintiff is entitled under 35 U.S.C. § 284 for Defendants' past infringement and any continuing infringement post trial up until the date a final judgment is entered, including both compensatory and future damages;
- D. An award of prejudgment and post judgment interest;
- E. An accounting and/or supplemental damages for all damages occurring after any discovery cutoff through final judgment; and
- F. Such other and further relief in law or equity as the Court may deem appropriate and just under the circumstances.

DEMAND FOR JURY TRIAL

Plaintiff Rensselaer Polytechnic Institute requests trial by jury of all claims and issues so triable under law.

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Attorneys for Rensselaer Polytechnic Institute

RULE 201.1 CERTIFICATION

I certify under penalty of perjury that the damages recoverable exceed the sum of \$150,000 exclusive of interests and costs and any claims of punitive damages the matter in controversy is not the subject of any other action pending in any court or in any pending arbitration or administrative proceeding.

Dated: November 12, 2019

/s/ Eric I. Abraham
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Attorneys for Rensselaer Polytechnic Institute

RULE 11.2 CERTIFICATION

I hereby certify that, to the best of my knowledge, the matter in controversy is not the subject of any pending or anticipated litigation in any court or arbitration proceeding, nor are there any non-parties known to Plaintiff that should be joined to this action. In addition, I recognize a continuing obligation during the course of this litigation to file and to serve on all other parties and with the Court an amended certification if there is a change in the facts stated in this original certification.

Dated: November 12, 2019

/s/ Eric I. Abraham
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