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16 Attorneys for Plaintiff,  
17 SEoul SEMICONDUCTOR CO., LTD., a Korean  
18 corporation, SEoul VIOSYS CO., LTD., a Korean  
19 corporation,

20 **UNITED STATES DISTRICT COURT**  
21 **CENTRAL DISTRICT OF CALIFORNIA**

22 SEoul SEMICONDUCTOR CO.,  
23 LTD., a Korean corporation, SEoul  
24 VIOSYS CO., LTD., a Korean  
25 corporation,

26 Plaintiff,

27 v.

28 FEIT ELECTRIC CO., INC.,  
Defendant.

Case No. \_\_\_\_\_

**COMPLAINT FOR PATENT  
INFRINGEMENT**

**DEMAND FOR JURY TRIAL**

1 Plaintiffs Seoul Semiconductor Co., Ltd. (“Seoul Semiconductor”) and Seoul  
2 Viosys Co., Ltd. (“Seoul Viosys”), (collectively the “Seoul Plaintiffs”) for their  
3 Complaint against Defendant Feit Electric Co., Inc. (“Feit”) allege as follows:

4 **INTRODUCTION**

5 1. The Seoul Plaintiffs bring this patent infringement action to protect  
6 their valuable patented technology relating to light emitting diodes (“LEDs”) and  
7 LED lighting. An LED is a semiconductor device that converts electrical energy  
8 into light. LEDs have many advantages over conventional light sources, including  
9 lower energy consumption, longer lifetime, and smaller size.

10 2. Seoul Semiconductor was founded in 1992 with approximately 30  
11 employees in a small space of a commercial building in Bongchen-dong, Seoul,  
12 Korea. From those initial 30 employees, Seoul Semiconductor has grown into one  
13 of the largest manufacturers of LEDs in the world. It’s subsidiary, Seoul Viosys, is  
14 also a leading company in the LED industry.

15 3. The Seoul Plaintiffs’ success is in large part due to their significant  
16 investment in innovation and respect for intellectual property. Seoul Semiconductor  
17 has invested in research and development (“R&D”) for decades. Seoul  
18 Semiconductor invests over 10% of sales revenue into R&D and owns one of the  
19 largest LED patent portfolios in the world, which includes more than 10,000 patents  
20 worldwide.

21 **THE PARTIES**

22 4. Plaintiff Seoul Semiconductor is a company organized and existing  
23 under the laws of the Republic of Korea, with its principal place of business at 1B-  
24 25, 727, Wonsi-dong, Danwon-gu, Ansan-city, Gyeonggi-do, Korea 425-851.

25 5. Plaintiff Seoul Viosys is a company organized and existing under the  
26 laws of the Republic of Korea, with its principal place of business at 65-16,  
27 Sandan-ro 163 beon-gil, Danwon-gu, Ansan-city, Gyeonggi-do, Korea 425-851.  
28 Seoul Viosys is a subsidiary of Seoul Semiconductor.



1 United States Patent No. 9,799,800 entitled “Light Emitting Device and Method of  
2 Fabricating the Same” (“the ’800 patent”), including the right to sue and to recover  
3 for infringement thereof. The ’800 patent was duly and legally issued on October  
4 24, 2017, by the United States Patent and Trademark Office to Jang et al. A copy of  
5 the ’800 patent is attached hereto as Exhibit 3.

6 13. Seoul Viosys is the lawful owner of all right, title, and interest in  
7 United States Patent No. 9,929,314 entitled “Light Emitting Diode Chip Having  
8 Electrode Pad” (“the ’314 patent”), including the right to sue and to recover for  
9 infringement thereof. The ’314 patent was duly and legally issued on March 27,  
10 2018, by the United States Patent and Trademark Office to Kim et al. A copy of the  
11 ’314 patent is attached hereto as Exhibit 4.

12 14. Seoul Viosys is the lawful owner of all right, title, and interest in  
13 United States Patent No. 9,577,157 entitled “Light Emitting Diode Chip Having  
14 Distributed Bragg Reflector and Method of Fabricating the Same” (“the ’157  
15 patent”), including the right to sue and to recover for infringement thereof. The  
16 ’157 patent was duly and legally issued on February 21, 2017, by the United States  
17 Patent and Trademark Office to Lee et al. A copy of the ’157 patent is attached  
18 hereto as Exhibit 5.

19 15. Seoul Viosys is the lawful owner of all right, title, and interest in  
20 United States Patent No. 10,217,912 entitled “Light Emitting Diode Module For  
21 Surface Mount Technology and Method of Manufacturing the Same” (“the ’912  
22 patent”), including the right to sue and to recover for infringement thereof. The  
23 ’912 patent was duly and legally issued on February 26, 2019, by the United States  
24 Patent and Trademark Office to Chae et al. A copy of the ’912 patent is attached  
25 hereto as Exhibit 6.

26 16. Seoul Semiconductor is the lawful owner of all right, title, and interest  
27 in United States Patent No. 10,916,684 entitled “Light Emitting Device Including  
28 RGB Light Emitting Diodes and Phosphor” (“the ’684 patent”), including the right

1 to sue and to recover for infringement thereof. The '684 patent was duly and legally  
2 issued on February 9, 2021, by the United States Patent and Trademark Office to  
3 Lee et al. A copy of the '684 patent is attached hereto as Exhibit 7.

4 17. Seoul Semiconductor is the lawful owner of all right, title, and interest  
5 in United States Patent No. 7,906,789 entitled "Warm White Light Emitting  
6 Apparatus and Back Light Module Comprising the Same" ("the '789 patent"),  
7 including the right to sue and to recover for infringement thereof. The '789 patent  
8 was duly and legally issued on March 15, 2011, by the United States Patent and  
9 Trademark Office to Jung et al. A copy of the '789 patent is attached hereto as  
10 Exhibit 8.

11 18. Seoul Semiconductor is the lawful owner of all right, title, and interest  
12 in United States Patent No. 10,134,967 entitled "Light Emitting Device" ("the '967  
13 patent"), including the right to sue and to recover for infringement thereof. The  
14 '967 patent was duly and legally issued on November 20, 2018, by the United  
15 States Patent and Trademark Office to Seo et al. A copy of the '967 patent is  
16 attached hereto as Exhibit 9.

17 19. Seoul Semiconductor is the lawful owner of all right, title, and interest  
18 in United States Patent No. 10,510,933 entitled "Light Emitting Diode Package and  
19 Manufacturing Method Thereof" ("the '933 patent"), including the right to sue and  
20 to recover for infringement thereof. The '933 patent was duly and legally issued on  
21 December 17, 2019, by the United States Patent and Trademark Office to Oh et al.  
22 A copy of the '933 patent is attached hereto as Exhibit 10.

23 20. Seoul Viosys is the lawful owner of all right, title, and interest in  
24 United States Patent No. 9,627,435 entitled "Light emitting device" ("the '435  
25 patent"), including the right to sue and to recover for infringement thereof. The  
26 '435 patent was duly and legally issued on April 18, 2017, by the United States  
27 Patent and Trademark Office to Lee et al. A copy of the '435 patent is attached  
28 hereto as Exhibit 11.

1           21. Seoul Viosys is the lawful owner of all right, title, and interest in  
2 United States Patent No. 8,716,946 entitled “Light Emitting Device for AC Power  
3 Operation” (“the ’946 patent”), including the right to sue and to recover for  
4 infringement thereof. The ’946 patent was duly and legally issued on May 6, 2014,  
5 by the United States Patent and Trademark Office to Lee et al. A copy of the ’946  
6 patent is attached hereto as Exhibit 12.

7                                   **WILLFULNESS**

8           22. On or about September 28, 2017, Seoul Semiconductor’s counsel sent  
9 a letter to Feit’s Executive Vice President, Alan Feit, notifying him that Feit was  
10 manufacturing and selling various LED products that Seoul Semiconductor  
11 believed to infringe its patent rights. The letter included an example of an  
12 infringing product and patents. This letter followed oral discussions between Seoul  
13 Semiconductor personnel and Feit, in which Seoul Semiconductor had discussed its  
14 concerns that Feit was selling products that infringed Seoul Semiconductor’s  
15 portfolio of patents.

16           23. On or about December 22, 2017, Seoul Semiconductor sent a letter to  
17 Costco Wholesale Corporation (“Costco”) notifying Costco that it was selling  
18 products that were infringing Seoul Semiconductor’s patents.

19           24. On or about January 26, 2018, Feit’s general counsel responded to the  
20 Costco letter, acknowledging receipt of Seoul Semiconductor’s warning letter  
21 regarding infringement of Seoul Semiconductor’s patents by a Feit product (product  
22 # 1161796 - CEA 1940/CL/LED/6). The response was on Feit’s letterhead, and  
23 Feit’s general counsel explained that Seoul Semiconductor’s December 2017 letter  
24 had been “referred to Feit Electric Company, Inc. for response.”

25           25. On or about June 5, 2018, Seoul Semiconductor sent another letter to  
26 Costco notifying it that it was investigating the sale of additional products sold by  
27 Costco that Seoul Semiconductor believed to infringe its patents. Seoul  
28 Semiconductor explained that it had invested significant time and monies in

1 developing its patent portfolios and could not stand by while those rights were  
2 infringed.

3 26. On or about July 9, 2018, outside counsel for Feit responded to Seoul  
4 Semiconductor's June 2018 letter to Costco, again acknowledging receipt of the  
5 letter, stating that it would address communications related to infringement of Feit  
6 products, but refusing to facilitate requested meeting between Costco and Seoul  
7 Semiconductor. In the letter, Feit's counsel stated that he represented Feit, as well  
8 as Costco to the extent that Feit Electric products were involved.

9 27. On or about July 13, 2018, Seoul Semiconductor wrote to Costco again  
10 and warned that it was selling products that infringed Seoul Semiconductor's  
11 patents. Seoul Semiconductor included images and claim charts showing examples  
12 of infringement.

13 28. On or about August 16, 2018, Feit's counsel acknowledged receipt of  
14 Seoul Semiconductor's July 13 letter. Feit questioned whether some of Feit's  
15 products might utilize Seoul Semiconductor products, despite Seoul Semiconductor  
16 having notified Feit in May 2018 that it would no longer do business with or sell  
17 any components to Feit, and despite, on information and belief, Feit having a long  
18 history of using multiple LED suppliers for components in its products.

19 29. On or about August 29, 2018, Seoul Semiconductor's counsel sent a  
20 letter to Feit's counsel expressing disappointment that Feit was obstructing a  
21 business meeting between Seoul Semiconductor and Costco to try to resolve Seoul  
22 Semiconductor's infringement concerns. Seoul Semiconductor's counsel noted that  
23 Seoul Semiconductor had already met and communicated numerous times with Feit  
24 in an attempt to resolve issues, which had been unsuccessful. Seoul Semiconductor  
25 did not receive any response to this letter.

26 30. On or about August 1, 2019, Seoul Semiconductor's counsel sent a  
27 letter to Feit's counsel, again suggesting that a meeting be set up to resolve these  
28 infringement concerns that would not exclude Costco. Seoul Semiconductor

1 notified Feit that it had investigated another Feit LED bulb, product # 1200267, that  
2 was also infringing Seoul Semiconductor’s patents, including the ‘157 patent.  
3 Seoul Semiconductor did not receive any response to this letter.

4 31. On or about December 4, 2019, Seoul Semiconductor’s counsel sent  
5 another letter to Feit’s counsel, reminding it of its prior warning letters, noting the  
6 infringement of Seoul Semiconductor’s patents, including the ‘157 patent, and  
7 requesting that Feit cease and desist from selling products that infringe Seoul  
8 Semiconductor’s patents. Seoul Semiconductor also requested that Feit provide  
9 information on the suppliers for the LED components in the infringing products.

10 32. On or about January 31, 2020, Feit’s counsel acknowledged receipt of  
11 Seoul Semiconductor’s letter and its warnings of patent infringement, including  
12 with respect to Seoul Semiconductor’s ‘157 patent. Feit claimed, again without  
13 evidence, that the products were utilizing Seoul Semiconductor products, despite  
14 Seoul Semiconductor having ceased sales to Feit two years prior and despite Feit’s  
15 history of using multiple suppliers. Feit also stated that Seoul Semiconductor  
16 should resolve any infringement concerns with Feit’s LED suppliers, but tellingly,  
17 Feit refused to provide any identification of the suppliers for its products, claiming  
18 that was “highly confidential,” despite Seoul Semiconductor agreeing in its prior  
19 letter to enter into a confidentiality agreement for the exchange of such information.

20 33. On or about February 17, 2020, Seoul Semiconductor’s counsel wrote  
21 again to Feit’s counsel. Seoul Semiconductor reiterated its prior patent  
22 infringement concerns and noted that it had investigated two additional Feit  
23 products (Feit bulb # 1319342 and Feit bulb # 1279279) and found them to be  
24 infringing Seoul Semiconductor’s patents as well, including Seoul Semiconductor’s  
25 ‘157 patent, ‘912 patent, and ‘210 patent. Seoul Semiconductor asked that Feit  
26 cease selling products that infringe its patents. Seoul Semiconductor did not  
27 receive any response to this letter.

28 34. On or about April 6, 2016, Seoul Semiconductor’s counsel wrote to



1 Feit's counsel, reminding Feit of its prior notice letters and noting that it had not  
2 received any response to the February 2020 letter. Seoul Semiconductor asked Feit  
3 again to stop selling products that infringe Seoul Semiconductor's patents. Seoul  
4 Semiconductor did not receive any response to this letter.

5 35. On or about May 15, 2020, Seoul Semiconductor's counsel wrote  
6 again to Feit's counsel, notifying it that Feit was selling LED lighting products that  
7 infringe Seoul Semiconductor's patents. Seoul Semiconductor asked Feit again to  
8 stop selling products that infringe Seoul Semiconductor's patents. Seoul  
9 Semiconductor did not receive any response to this letter.

10 36. On or about June 30, 2020, Seoul Semiconductor's counsel wrote  
11 again to Feit's counsel, notifying it that Feit was selling LED lighting products that  
12 infringe Seoul Semiconductor's patents and requesting a response to its letters.  
13 Seoul Semiconductor asked Feit again to stop selling products that infringe Seoul  
14 Semiconductor's patents. Seoul Semiconductor did not receive any response to this  
15 letter.

16 37. On or about August 14, 2020, Seoul Semiconductor's counsel wrote  
17 again to Feit's counsel, notifying it that Feit was selling LED lighting products that  
18 infringe Seoul Semiconductor's patents and requesting a response to its letters.  
19 Seoul Semiconductor asked Feit again to stop selling products that infringe Seoul  
20 Semiconductor's patents. Seoul Semiconductor did not receive any response to this  
21 letter.

22 38. On or about September 22, 2020, Seoul Semiconductor's counsel  
23 wrote again to Feit's counsel, notifying it that Feit was selling LED lighting  
24 products that infringe Seoul Semiconductor's patents and requesting a response to  
25 its letters. Seoul Semiconductor asked Feit again to stop selling products that  
26 infringe Seoul Semiconductor's patents. Seoul Semiconductor did not receive any  
27 response to this letter.

28 39. On or about December 14, 2020, Seoul Semiconductor wrote to Feit's

1 counsel and notified it that had discovered additional products infringing Seoul  
2 Semiconductor's patents, including Seoul Semiconductor's '157 patent, '912  
3 patent, and '210 patent. Seoul Semiconductor did not receive any response to this  
4 letter.

5 40. On or about February 1, 2021, Seoul Semiconductor's counsel wrote  
6 again to Feit's counsel, notifying it that Feit was selling LED lighting products that  
7 infringe Seoul Semiconductor's patents and requesting a response to its letters.  
8 Seoul Semiconductor asked Feit again to stop selling products that infringe Seoul  
9 Semiconductor's patents. Seoul Semiconductor did not receive any response to this  
10 letter.

11 41. On or about March 10, 2021, Seoul Semiconductor's counsel wrote  
12 again to Feit's counsel asking it to respond to its prior letters. Seoul Semiconductor  
13 did not receive any response to this letter.

14 42. On or about February 1, 2021, Seoul Semiconductor's counsel wrote  
15 again to Feit's counsel, asking Feit again to stop selling products that infringe Seoul  
16 Semiconductor's patents. Seoul Semiconductor did not receive any response to this  
17 letter.

18 43. On or about June 2, 2021, Seoul Semiconductor's counsel wrote again  
19 to Feit's counsel, asking Feit again to stop selling products that infringe Seoul  
20 Semiconductor's patents. Seoul Semiconductor did not receive any response to this  
21 letter.

22 44. On or about August 31, 2021, having received no response for many  
23 months to its letters, Seoul Semiconductor's counsel wrote to Costco, notifying it  
24 that continued sales of products infringing Seoul's patents constituted patent  
25 infringement. Seoul Semiconductor asked that Costco and Feit stop selling  
26 products that infringe Seoul Semiconductor's patents.

27 45. On or about October 28, 2021, Feit's counsel wrote to Seoul  
28 Semiconductor's counsel confirming its receipt of the August 31, 2021 letter,

1 claiming to be confused about whether Feit products were accused of infringement  
2 by Seoul Semiconductor.

3 46. On or about December 16, 2021, Seoul Semiconductor’s counsel wrote  
4 to Feit’s counsel and reminded him that Seoul Semiconductor had repeatedly  
5 notified Feit about infringement of Seoul Semiconductor’s patents by various Feit  
6 products, including, but not limited to, the ‘912 patent, ‘157 patent, and ‘210 patent.

7 47. On or about February 1, 2021, Seoul Semiconductor’s counsel wrote  
8 again to Feit’s counsel, asking Feit again to stop selling products that infringe Seoul  
9 Semiconductor’s patents. Seoul Semiconductor did not receive any response to this  
10 letter. Seoul Semiconductor noted that continued sale of infringing products could  
11 constitute willful patent infringement. Seoul Semiconductor asked that Feit stop  
12 selling products that infringe Seoul Semiconductor’s patents. Seoul never received  
13 any response to this letter.

14 48. In addition to the numerous notice letters that Seoul Semiconductor  
15 sent to Feit regarding products that Feit was selling through Costco stores, Feit was  
16 also aware of notice letters regarding Feit products being sold through Target  
17 Corporation stores.

18 49. On or about November 15, 2017, Seoul Semiconductor’s counsel sent  
19 a letter to Don H. Liu, the Executive Vice President and Chief Legal Officer, of  
20 Target Corporation (“Target”), regarding Up & Up products that infringe Seoul  
21 Semiconductor’s patents, including its ‘946 patent. Seoul Semiconductor requested  
22 that Target cease offering or selling products that infringe Seoul Semiconductor’s  
23 patents.

24 50. On or about December 27, 2017, Jennifer King, a paralegal at Target,  
25 notified Seoul Semiconductor’s counsel that the vendor who supplied the accused  
26 items to Target was Feit.

27 51. On or about June 5, 2018, having received no substantive response to  
28 its prior letter, Seoul Semiconductor sent a letter to Don H. Liu, the Executive Vice

1 President and Chief Legal Officer, of Target Corporation (“Target”), regarding Up  
2 & Up products that infringe Seoul Semiconductor’s patents, including its ‘946  
3 patent. Seoul Semiconductor requested a meeting with Target to discuss and  
4 resolve these concerns of patent infringement.

5 52. On or about July 13, 2018, a paralegal from Target, Jennifer King,  
6 emailed Seoul Semiconductor to identify Feit as the manufacturer of the products  
7 noticed in Seoul Semiconductor’s June 2018 letter, suggesting that Feit would  
8 resolve the infringement concerns directly.

9 53. On or about July 13, 2018, Seoul Semiconductor responded to Target’s  
10 email, noting Feit’s historical lack of success in attempting to resolve patent  
11 infringement concerns with Seoul Semiconductor. Seoul Semiconductor also  
12 provided a claim chart showing the infringement of the Up & Up product  
13 manufactured by Feit.

14 54. On or about July 18, 2018, Feit’s counsel responded to Seoul  
15 Semiconductor, acknowledging receipt of Seoul Semiconductor’s June 5, 2018  
16 letter. Feit’s counsel stated that his firm represented Feit, as well as Target to the  
17 extent that Feit products were involved. Feit’s counsel claimed that Feit did not  
18 have enough information to analyze the infringement but refused to facilitate any  
19 meeting with Target and Seoul Semiconductor. Feit declined to respond  
20 substantively to any of Seoul Semiconductor’s infringement concerns or the claim  
21 chart that Seoul Semiconductor had provided.

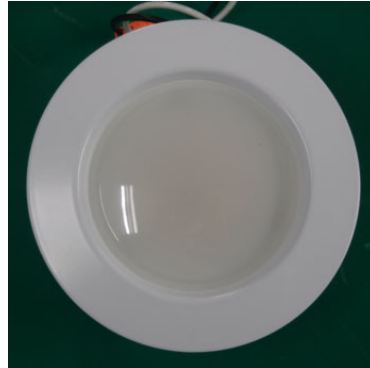
22 **EXAMPLE PRODUCTS**

23 55. FEIT sells the FEIT T48/840/LED/2 LED lighting device. An image of  
24 the FEIT T48/840/LED/2 LED lighting device is provided below.



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56. FEIT sells the FEIT LEDR4/RGBW/AG LED lighting device. An image of the FEIT LEDR4/RGBW/AG LED lighting device is provided below.



57. FEIT sells the FEIT G3060/RGBW/FIL/AG LED bulb. An image of the FEIT G3060/RGBW/FIL/AG LED bulb is provided below.



58. FEIT sells the FEIT A800830/10KLED/2/CAN LED bulb. An image of the FEIT A800830/10KLED/2/CAN LED bulb is provided below.



1 59. FEIT sells the FEIT BP7C7/850/LED/4 LED bulb. An image of the  
2 FEIT BP7C7/850/LED/4 LED bulb is provided below.



11 60. FEIT sells the FEIT BPG1640/927CA/FIL/2 (C) LED bulb. An image  
12 of the FEIT BPG1640/927CA/FIL/2 (C) LED bulb is provided below.



19  
20 **COUNT 1**

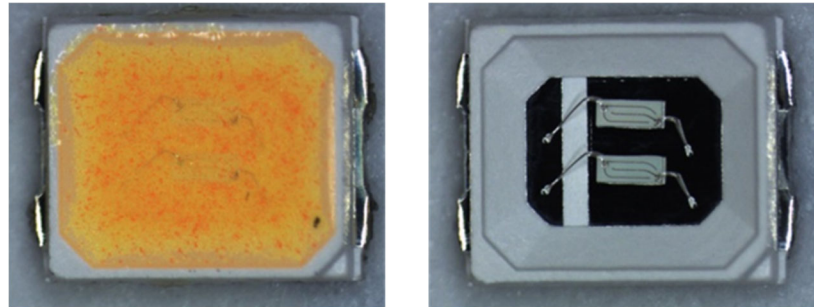
21 **INFRINGEMENT OF U.S. PATENT NO. 9,716,210**

22 **EXEMPLARY CLAIM 1**

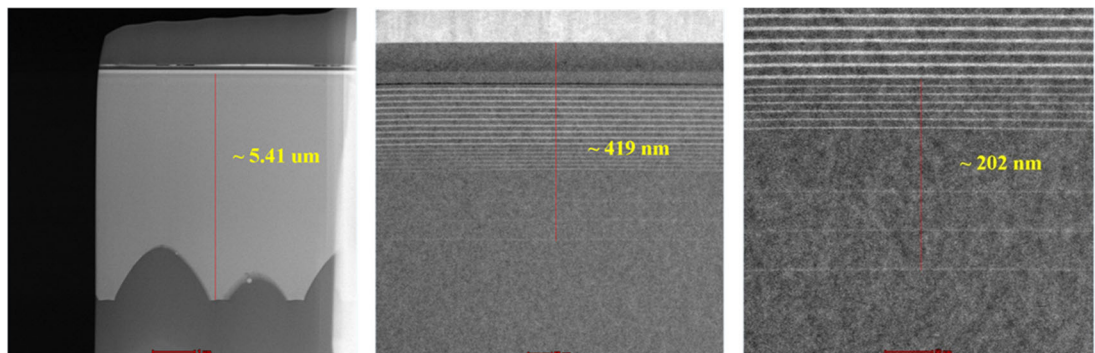
23 61. FEIT has infringed and continues to infringe one or more claims of the  
24 '210 patent, including but not limited to exemplary claim 1, in violation of 35  
25 U.S.C. § 271(a), at least by without authority making, using, offering to sell and/or  
26 selling the FEIT T48/840/LED/2 LED lighting device within the United States.

27 62. The FEIT T48/840/LED/2 LED includes a plurality of LED packages,  
28 each of which includes light emitting diodes (LEDs). Optical microscope images of

1 an LED package from the FEIT T48/840/LED/2 LED are reproduced below before  
2 and after removal of an encapsulant. As shown in the image below right, the LED  
3 package includes two light emitting diode devices.



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9 63. Below are three Transmission Electron Microscope (“TEM”) images  
10 of the epi-structure of the LED chip. The image to the left shows the entire epi-  
11 structure above a patterned sapphire substrate. The image below middle enlarges  
12 the region of the epi-structure around the multi-quantum well active layer. The  
13 image below right further enlarges the region under the active region. The epi-  
14 structure includes from top to bottom in relevant part a p-type contact layer, a  
15 multi-quantum well active region, and an n-type contact layer. The active region,  
16 which appears as a relatively bright repeating pattern of indium doped layers  
17 separated by relatively dark barrier layers near the center of the center image below.  
18 Below the active region is a superlattice layer, which includes a plurality of layers,  
19 and appears as a relatively faint and closely spaced pattern. Below the superlattice  
20 is a spacer layer, which includes a plurality of layers, and appears as a relatively  
21 faint and widely spaced pattern.

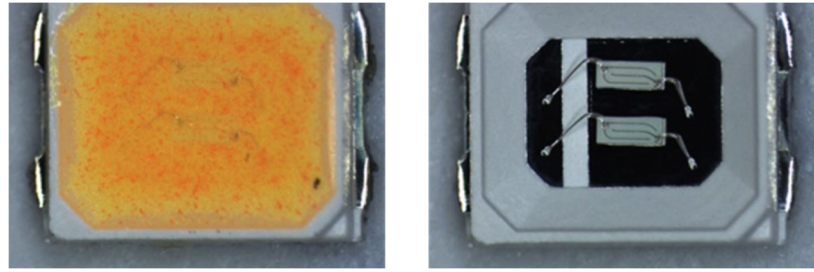


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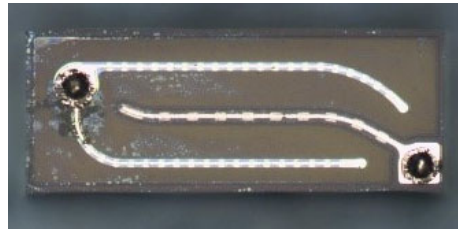




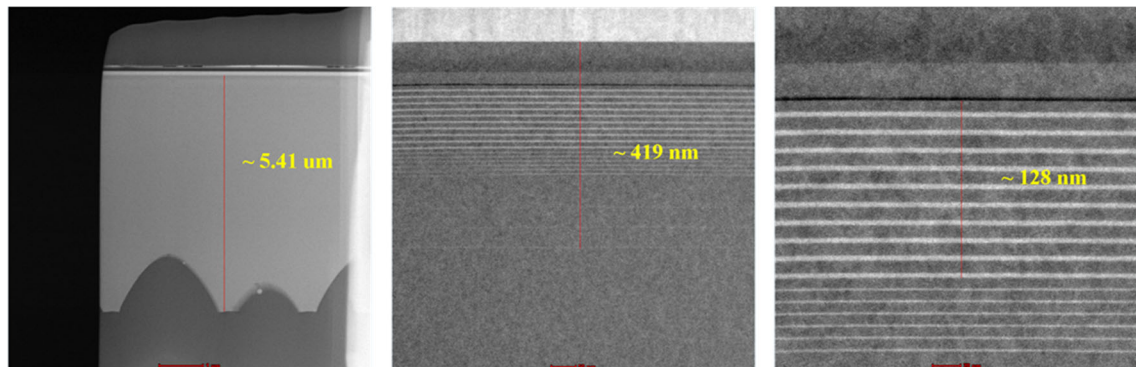
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70. An optical image of an LED chip from the FEIT T48/840/LED/2 LED lighting device is reproduced below.



71. Below are three TEM images of the epitaxial structure of the LED chip. The image to the left shows the entire epitaxial structure above a patterned sapphire substrate. The image below middle enlarges the region of the epitaxial structure around the multi-quantum well active layer. The image below right enlarges the multi-quantum well. The LED chip includes from bottom to top in relevant part a substrate, an n-type semiconductor layer, a multi-quantum well structure, and a p-type semiconductor layer. The multi-quantum well structure comprises brightly colored wells separated by darker barriers.



72. The well layers within the multi-quantum well include indium. In addition, the concentration of indium varies across the layer, with areas of relatively high indium concentration transitioning to areas of lower indium concentration. The

1 regions of relatively higher indium concentration correspond to carrier trap  
2 portions. And the transition from relatively lower to relatively higher indium  
3 concentration corresponds to a related drop in the band-gap energy.

4 73. FEIT’s infringement has caused and is continuing to cause damage and  
5 irreparable injury to Plaintiffs. Plaintiffs will continue to suffer damage and  
6 irreparable injury unless and until that infringement is enjoined by this Court, as a  
7 remedy at law alone would be inadequate.

8 74. Plaintiffs are entitled to injunctive relief and damages in accordance  
9 with 35 U.S.C. §§ 271, 281, 283, and 284.

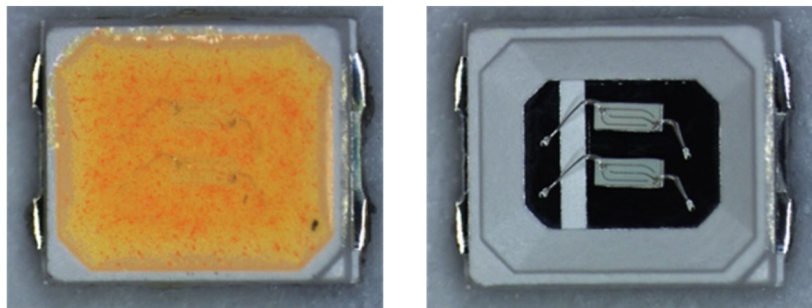
10 **COUNT 3**

11 **INFRINGEMENT OF U.S. PATENT NO. 9,799,800**

12 **EXEMPLARY CLAIM 1**

13 75. FEIT has infringed and continues to infringe one or more claims of the  
14 ’800 patent, including but not limited to exemplary claim 1, in violation of 35  
15 U.S.C. § 271(a), at least by without authority making, using, offering to sell and/or  
16 selling the FEIT T48/840/LED/2 LED lighting device within the United States.

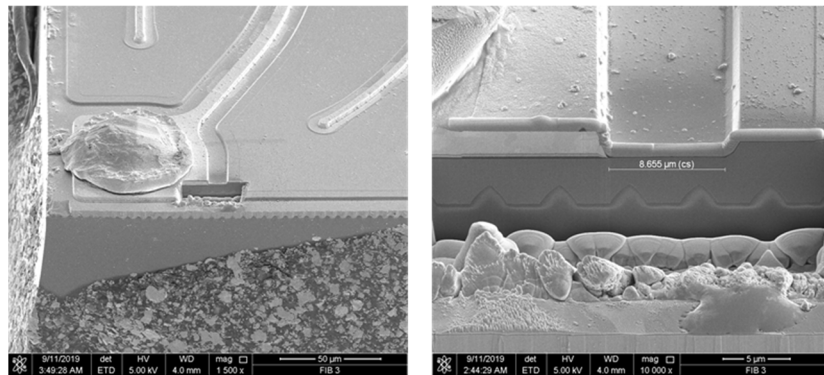
17 76. The FEIT T48/840/LED/2 LED includes a plurality of LED packages,  
18 each of which includes light emitting devices. Optical microscope images of an  
19 LED package from the FEIT T48/840/LED/2 LED are reproduced below before  
20 and after removal of an encapsulant. As shown in the image below right, the LED  
21 package includes two light emitting devices.



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28 77. Below are two Scanning Electron Microscope (“SEM”) images of an

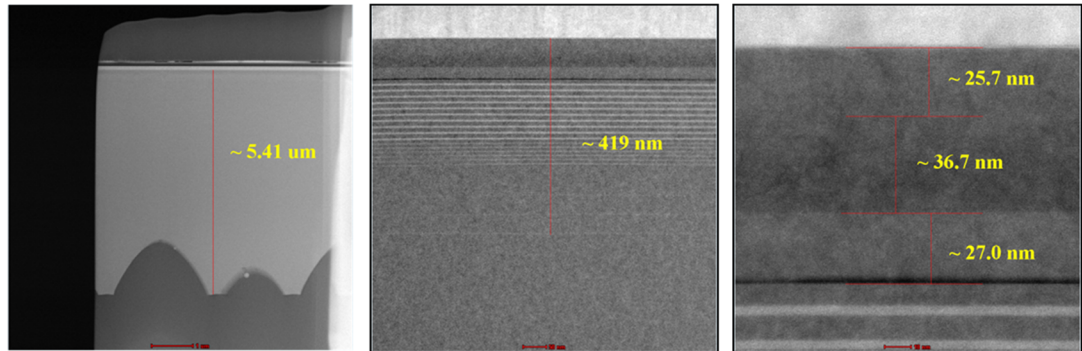
1 LED chip from the FEIT T48/840/LED/2 LED lighting device. The images were  
2 created after the creation of a hole in the LED using a Focused Ion Beam (“FIB”).  
3 The structure shown on the left side of the first image is an n-pad, which sits on top  
4 of and in contact with an n-type semiconductor layer. Above the n-type  
5 semiconductor layer are an active layer, an electron blocking layer and a p-type  
6 semiconductor layer. The active layer comprises a multi-quantum well, with the  
7 layers distinguishable by differing indium concentrations. Between the active layer  
8 and the p-type layer is an electron blocking layer, which is distinguishable by being  
9 relatively free of both magnesium and indium.



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16 78. The p-type semiconductor layer of the LED chip comprises a number  
17 of layers. From top to bottom, the layers include a p-type contact layer, a hole  
18 transport layer, and a hole injection layer. The p-type contact layer is  
19 distinguishable by a relatively high level of magnesium doping near the surface of  
20 the LED chip. Next, a hole transport layer has varying levels of the magnesium  
21 doping, a first layer with relatively low magnesium doping, an intermediate layer  
22 with relatively high magnesium doping, and second layer with relatively low  
23 magnesium doping. The level of magnesium within the first layer with relatively  
24 low level doping increases at both ends and decreases toward the middle. The hole  
25 injection layer is again distinguishable based on its level of magnesium doping.

26 79. Three TEM images of the LED chip are reproduced below. The image  
27 below left shows the full epi-structure above a patterned sapphire substrate. The  
28 center image indicates a plurality of layers including from bottom to top an n-type

1 semiconductor layer, a multi-quantum well active layer, and a p-type  
2 semiconductor layer. The image below right focusses in on the p-type  
3 semiconductor layer and a portion of the multi-quantum well active layer. As the  
4 image shows, the p-type semiconductor layer includes a number of layers as  
5 described above, with the relative brightness of each layer correlating with the  
6 dopant concentration.



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13 80. FEIT's infringement has caused and is continuing to cause damage and  
14 irreparable injury to Plaintiffs. Plaintiffs will continue to suffer damage and  
15 irreparable injury unless and until that infringement is enjoined by this Court, as a  
16 remedy at law alone would be inadequate.

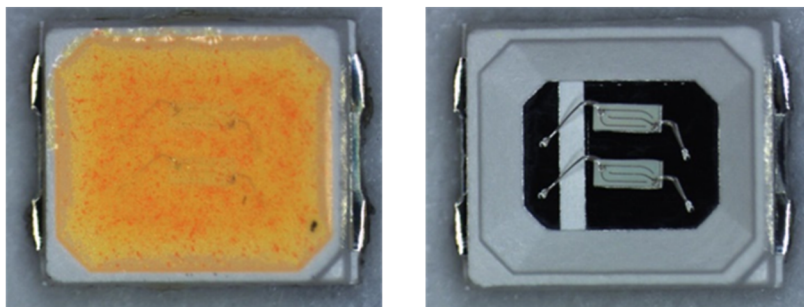
17 81. Plaintiffs are entitled to injunctive relief and damages in accordance  
18 with 35 U.S.C. §§ 271, 281, 283, and 284.

19 **COUNT 4**  
20 **INFRINGEMENT OF U.S. PATENT NO. 9,929,314**  
21 **EXEMPLARY CLAIM 1**

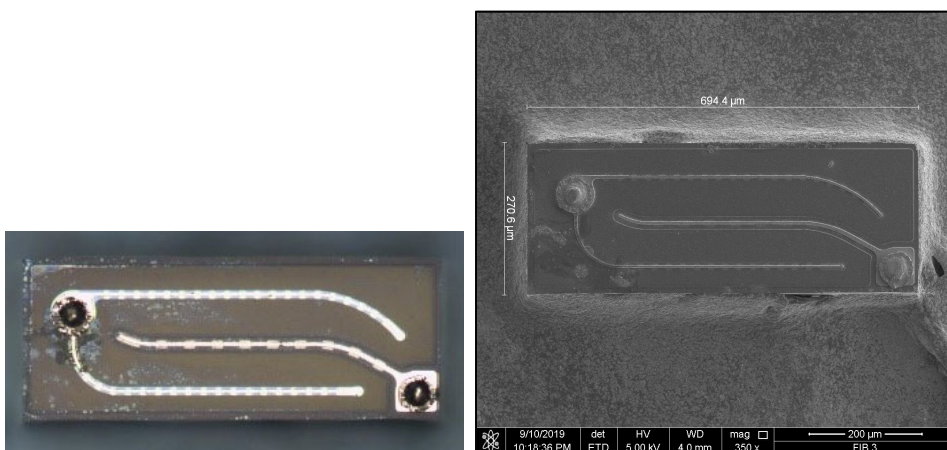
22 82. FEIT has infringed and continues to infringe one or more claims of the  
23 '314 patent, including but not limited to exemplary claim 1, in violation of 35  
24 U.S.C. § 271(a), at least by without authority making, using, offering to sell and/or  
25 selling the FEIT T48/840/LED/2 LED lighting device within the United States.

26 83. The FEIT T48/840/LED/2 LED includes a plurality of LED packages,  
27 each of which includes light emitting diode devices. Optical microscope images of  
28 an LED package from the FEIT T48/840/LED/2 LED are reproduced below before

1 and after removal of an encapsulant. As shown in the image below right, the LED  
2 package includes two light emitting diode devices.



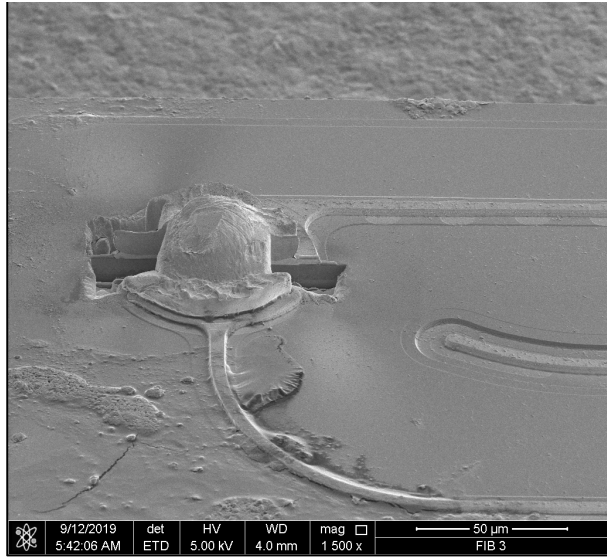
8 84. Optical and SEM images of an LED device from the FEIT  
9 T48/840/LED/2 LED are reproduced below.



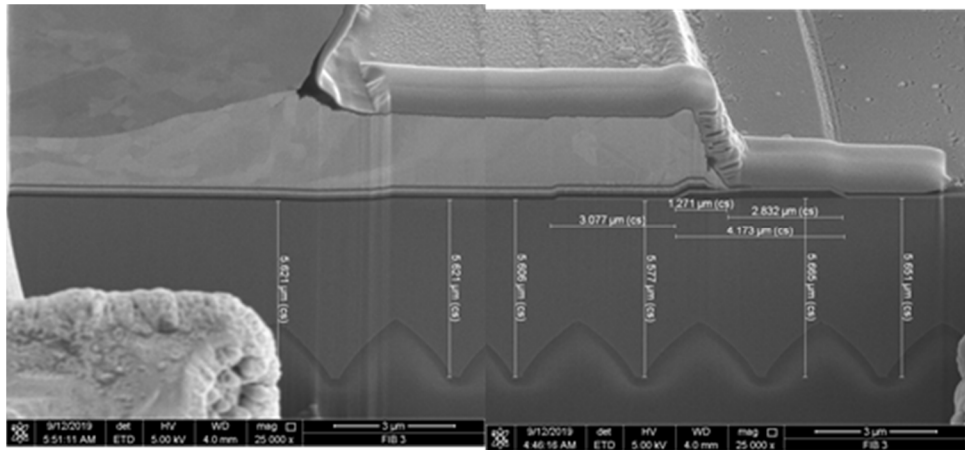
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18 85. Below is an SEM image of the device after a hole was milled using a  
19 FIB. The hole was milled adjacent to a p-type contact on the upper surface of the  
20 device.

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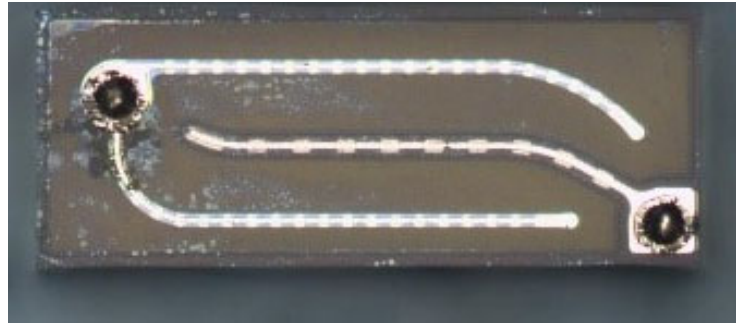


86. Below is a composite image of the inner surface of the milled hole showing the layer structure of the device, which includes from bottom to top: a patterned substrate and a light emitting structure disposed over the substrate. The light emitting structure includes from bottom to top, a first (n-type) semiconductor layer, an active layer, and a second (p-type) semiconductor layer.

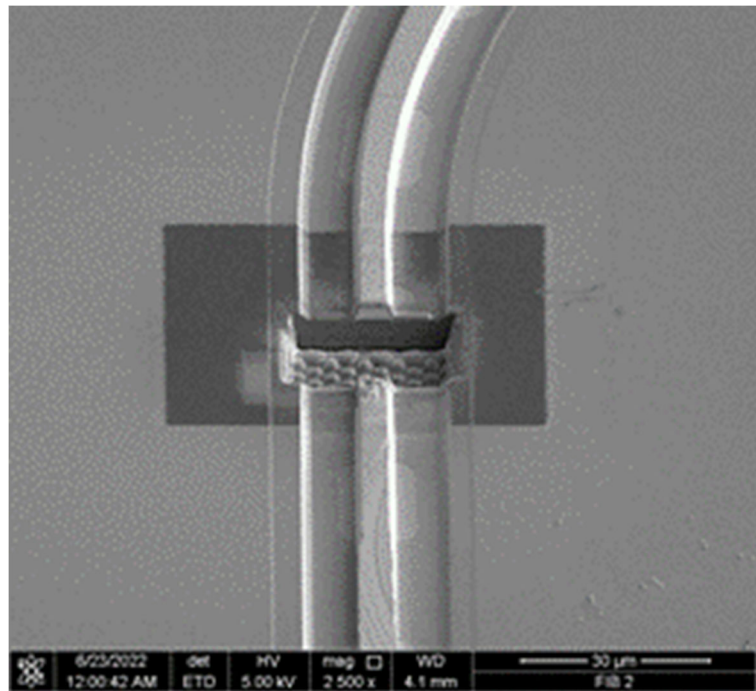


87. Returning to the optical microscope image from above (reproduced again below for convenience), the first electrode pad, which is disposed over the first (n-type) semiconductor layer is shown on the bottom right. A first extension is shown extending from the first electrode pad.

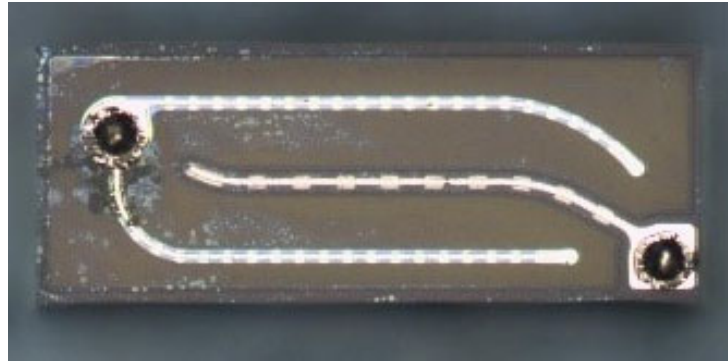
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88. The image below shows a hole milled into the first extension using a FIB. The hole is milled through the middle of a set of three faint ovals visible in the image below. The ovals also appear as bright slightly wider regions around the first extension in the optical microscope image above. The ovals indicate regions within which the first extension includes first portions that are in contact with the underlying first (n-type) semiconductor layers. The areas outside of ovals indicate second portions that are not in contact with the first (n-type) semiconductor layer. Those regions can also be seen in the optical microscope image above as relatively narrow portions of the first extension between the ovals described above. As the images also show, the first portions and one of the second portions are alternately disposed along the first extension.



1 89. Returning again to the optical microscope image from above  
2 (reproduced again below for convenience), the second electrode pad, which is  
3 disposed over a transparent electrode layer and a second (p-type) semiconductor  
4 layer is shown near the top left. A second extension comprising two portions is  
5 shown extending from second first electrode pad.



12 90. FEIT's infringement has caused and is continuing to cause damage and  
13 irreparable injury to Plaintiffs. Plaintiffs will continue to suffer damage and  
14 irreparable injury unless and until that infringement is enjoined by this Court, as a  
15 remedy at law alone would be inadequate.

16 91. Plaintiffs are entitled to injunctive relief and damages in accordance  
17 with 35 U.S.C. §§ 271, 281, 283, and 284.

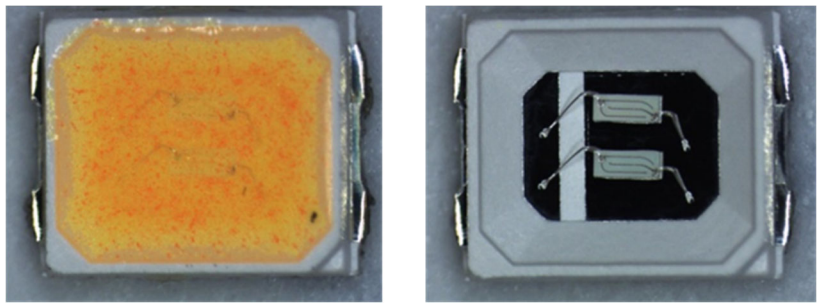
18 **COUNT 5**  
19 **INFRINGEMENT OF U.S. PATENT NO. 9,577,157**  
20 **EXEMPLARY CLAIM 1**

21 92. FEIT has infringed and continues to infringe one or more claims of the  
22 '157 patent, including but not limited to exemplary claim 1, in violation of 35  
23 U.S.C. § 271(a), at least by without authority making, using, offering to sell and/or  
24 selling the FEIT T48/840/LED/2 LED lighting device within the United States.

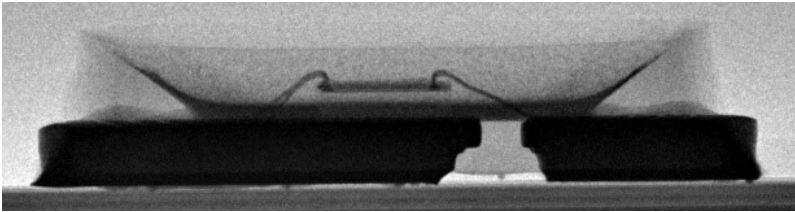
25 93. The FEIT T48/840/LED/2 LED lighting device includes a plurality of  
26 LED packages, each of which includes light emitting diodes. The image of an LED  
27 package from the FEIT T48/840/LED/2 LED lighting device is reproduced below  
28 left. The image below right shows LED chips within the package.



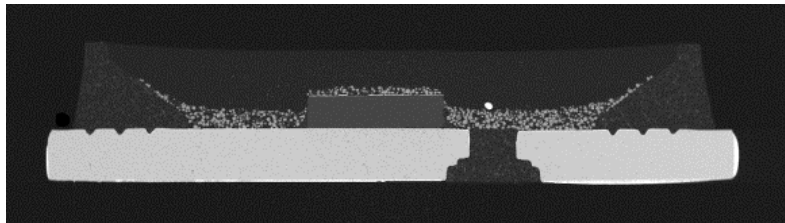
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94. An X-ray side view image of the package is reproduced below. The image shows the body, leads, and a mounting surface upon which an LED chip is disposed. The LED chip is shown covered by a member comprised of resin, which appears yellow in the image above left.

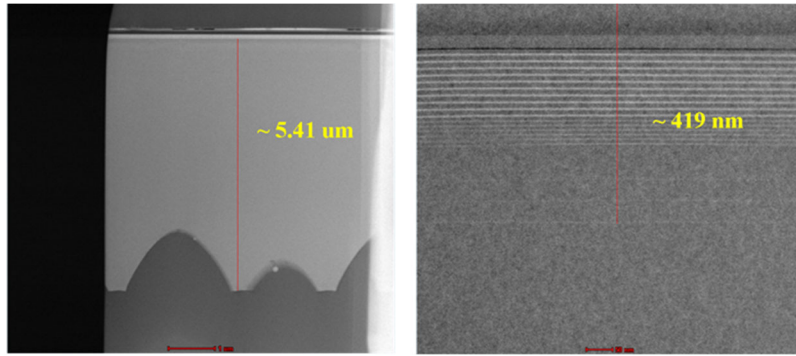


95. The image at bottom shows a SEM image of a cross-section through the package. The image shows the resin member contains phosphor particles, which can be seen as relatively bright spots within the darker resin.

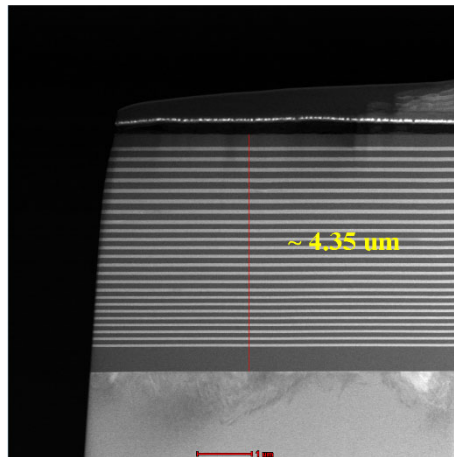


96. Two TEM images of a light emitting structure from the FEIT T48/840/LED/2 LED lighting device are reproduced below. The image below left shows the entire vertical epi-structure formed above a patterned sapphire substrate. The image below right shows a portion of the epi-structure including from bottom to top, a portion of the n-type semiconductor layer, a multi-quantum well active layer, and a p-type semiconductor layer.

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97. The image below is a TEM image created of a slice taken from the back surface of the light emitting diode device. The image is focused on a layer structure formed below the back surface of the substrate (which appears at the top of the image below). The layer structure shown in the image below includes, in relevant part starting from the bottom, the substrate, and a DBR. As shown in the below image, the DBR comprises two portions., an upper portion comprising relatively thick layers of silicon dioxide (“SiO<sub>2</sub>”) and titanium dioxide (“TiO<sub>2</sub>”) and a lower portion comprising relatively thin layers of SiO<sub>2</sub> and TiO<sub>2</sub>. The relatively dark layers comprise SiO<sub>2</sub> and the relatively bright layers comprise TiO<sub>2</sub>. The optical thickness of the layers comprising the upper portion are greater than the optical thickness of the layers comprising the lower portion.



98. FEIT’s infringement has caused and is continuing to cause damage and irreparable injury to Plaintiffs. Plaintiffs will continue to suffer damage and irreparable injury unless and until that infringement is enjoined by this Court, as a

1 remedy at law alone would be inadequate.

2 99. FEIT's infringement has occurred with knowledge of the '157 patent  
3 and knowledge that its acts constitute infringement. FEIT's continuing conduct,  
4 therefore, is willful.

5 100. Plaintiffs are entitled to injunctive relief and damages in accordance  
6 with 35 U.S.C. §§ 271, 281, 283, and 284.

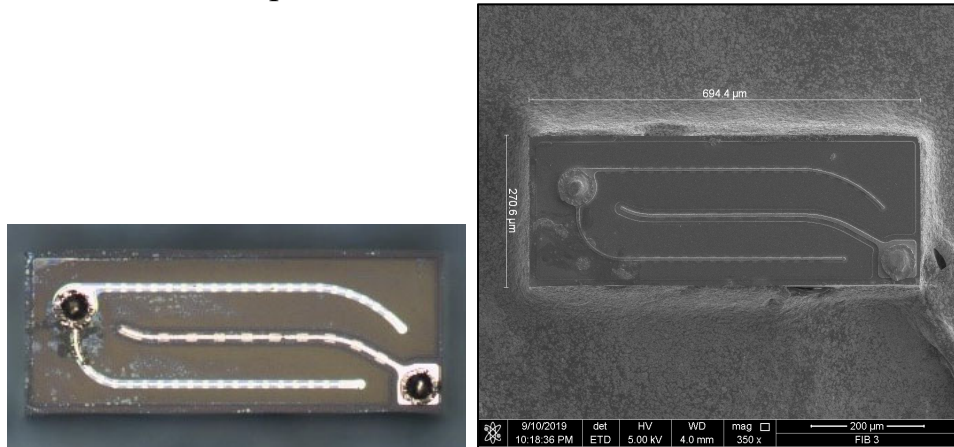
7 **COUNT 6**

8 **INFRINGEMENT OF U.S. PATENT NO. 10,217,912**

9 **EXEMPLARY CLAIM 1**

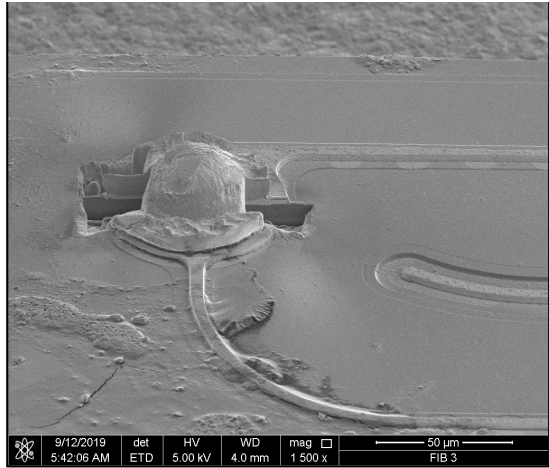
10 101. FEIT has infringed and continues to infringe one or more claims of the  
11 '912 patent, including but not limited to exemplary claim 1, in violation of 35  
12 U.S.C. § 271(a), at least by without authority making, using, offering to sell and/or  
13 selling the FEIT T48/840/LED/2 LED lighting device within the United States.

14 102. The FEIT T48/840/LED/2 LED lighting device includes a plurality of  
15 light emitting diodes (LED). Optical and SEM images of an LED from the FEIT  
16 T48/840/LED/2 LED are reproduced below.

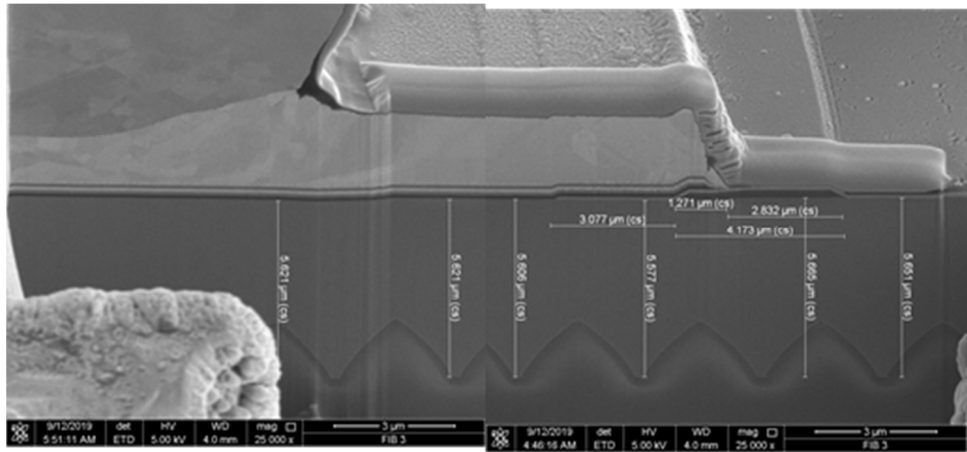


24 103. Below is an SEM image of the device after a hole was milled using a  
25 FIB. The hole was milled adjacent to a p-type contact on the upper surface of the  
26 device.

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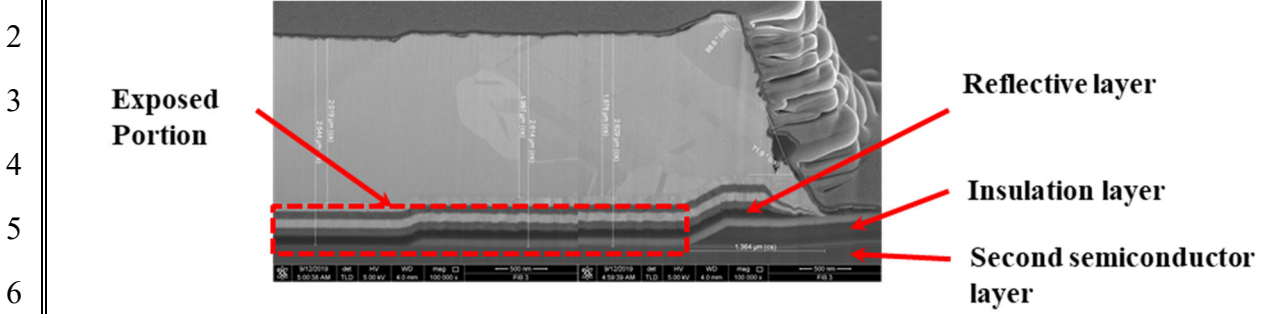


104. Below is a composite image of the inner surface of the milled hole showing the layer structure of the device, which includes from bottom to top: a patterned substrate and a stacked structure. The stacked structure includes from bottom to top, a first (n-type) semiconductor layer, an active layer, and a second (p-type) semiconductor layer.

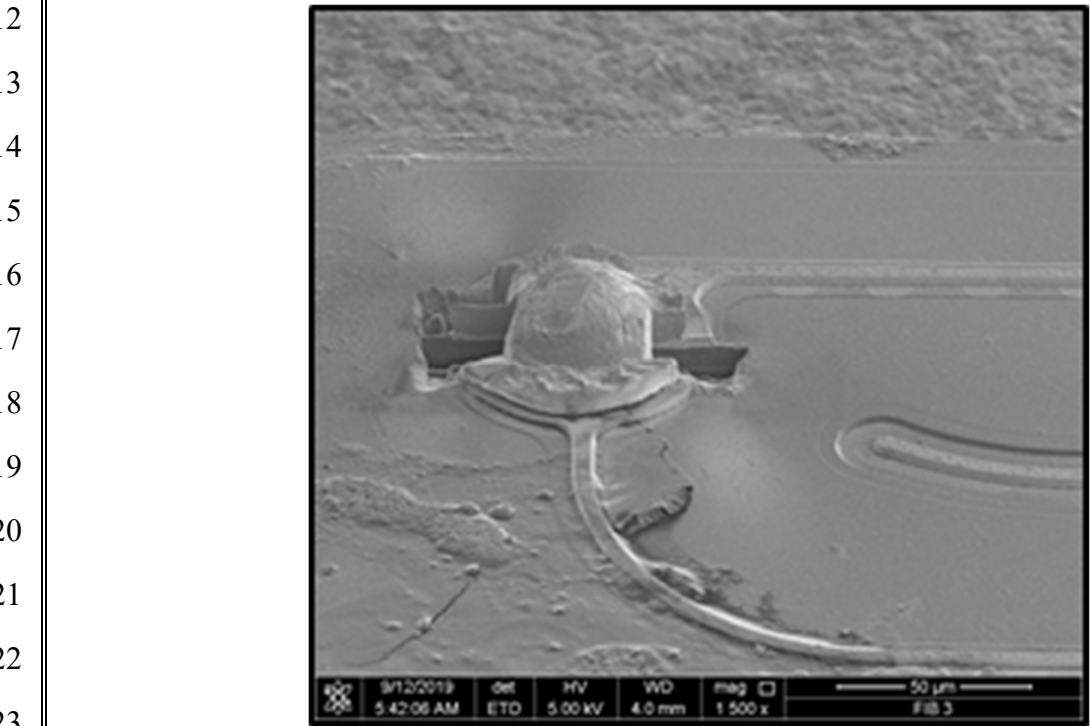


105. Below is an enlarged image of the inner surface of the milled hole showing additional details. The image identifies an insulation layer formed over the stacked structure and contacting the second (p-type) semiconductor layer. The insulation layer leaves open exposed portions that provide openings where contact occurs between a reflective layer comprised of aluminum formed over the stacked structure and the second (p-type) semiconductor layer. One of those exposed

1 portions is shown in the image below beneath the p-type contact.



7 106. Additional exposed portions are shown as faint circular regions along  
8 the length of the p-type extensions, where aluminum comprises a reflective layer.  
9 The openings can also be seen in the scanning electron microscope and optical  
10 microscope images below. In the optical microscope image the openings are  
11 relatively brighter spots along the length of the p-type extensions.



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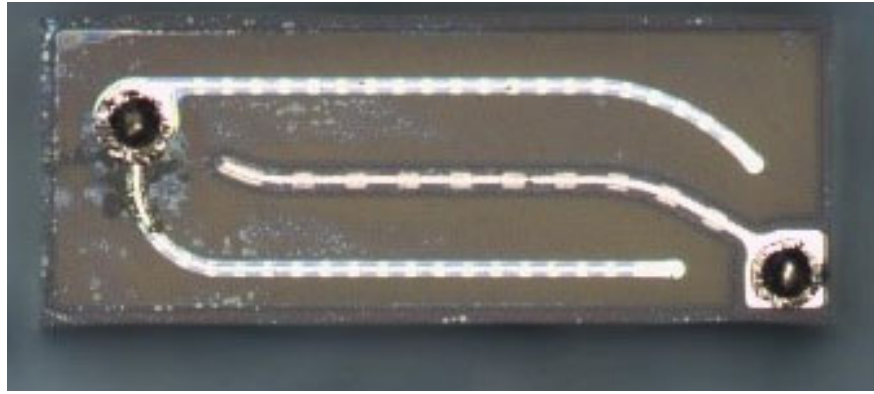
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107. FEIT’s infringement has caused and is continuing to cause damage and irreparable injury to Plaintiffs. Plaintiffs will continue to suffer damage and irreparable injury unless and until that infringement is enjoined by this Court, as a remedy at law alone would be inadequate.

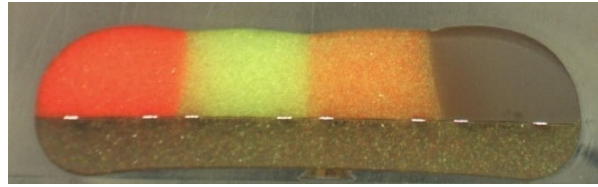
108. FEIT’s infringement has occurred with knowledge of the ’912 patent and knowledge that its acts constitute infringement. FEIT’s continuing conduct, therefore, is willful.

109. Plaintiffs are entitled to injunctive relief and damages in accordance with 35 U.S.C. §§ 271, 281, 283, and 284.

**COUNT 7**  
**INFRINGEMENT OF U.S. PATENT NO. 10,916,684**  
**EXEMPLARY CLAIM 1**

110. FEIT has infringed and continues to infringe one or more claims of the ’684 patent, including but not limited to exemplary claim 1, in violation of 35 U.S.C. § 271(a), at least by without authority making, using, offering to sell and/or selling the FEIT G3060/RGBW/FIL/AG LED bulb within the United States.

111. The FEIT G3060/RGBW/FIL/AG LED is an LED-based bulb. The images below provide two views of a flexible filament after removal from a FEIT G3060/RGBW/FIL/AG LED bulb. The first view shows a portion of the filament viewed from above (*i.e.*, plan view) and the second image shows a cross section through the filament.



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6 112. The flexible filament includes a plurality of light emitting diodes. The  
7 light emitting diodes appear as bright dots in the plan view and as short bright lines  
8 in the cross-sectional view. A measurement of the light output from the light  
9 emitting diodes indicates that they produce at least two different peak emission  
10 wavelengths, with one peak occurring at 445 nm and another peak occurring at 447  
11 nm.

12 113. The above images show the light emitting diodes encapsulated by a  
13 molded part that includes at least one wavelength converter that converts the  
14 primary light output by the light emitting diodes into secondary light. The  
15 wavelength converter comprises a mixture of at least three different phosphors each  
16 having a peak emission wavelength. At least two of the phosphors have different  
17 peak emission wavelengths in at least one color range.

18 114. FEIT's infringement has caused and is continuing to cause damage and  
19 irreparable injury to Plaintiffs. Plaintiffs will continue to suffer damage and  
20 irreparable injury unless and until that infringement is enjoined by this Court, as a  
21 remedy at law alone would be inadequate.

22 115. Plaintiffs are entitled to injunctive relief and damages in accordance  
23 with 35 U.S.C. §§ 271, 281, 283, and 284.

24 **COUNT 8**  
25 **INFRINGEMENT OF U.S. PATENT NO. 7,906,789**  
26 **EXEMPLARY CLAIM 1**

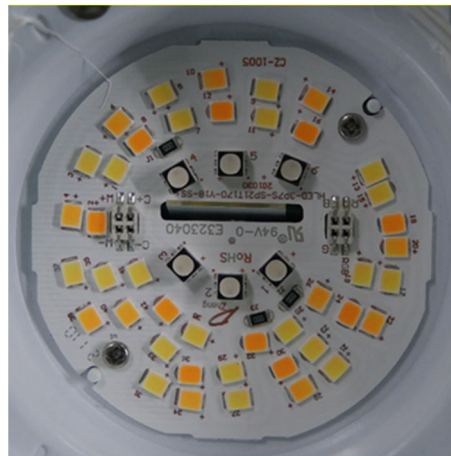
27 116. FEIT has infringed and continues to infringe one or more claims of the  
28 '789 patent, including but not limited to exemplary claim 1, in violation of 35

1 U.S.C. § 271(a), at least by without authority making, using, offering to sell and/or  
2 selling the FEIT LEDR4/RGBW/AG LED lighting device within the United States.

3 117. The FEIT LEDR4/RGBW/AG LED lighting device is a light-emitting  
4 apparatus with an emission rated at a color temperature from 2700K to 6500K. Two  
5 photo images are provided below, the first being the device and the second a  
6 portion of the packaging indicating the color temperature.



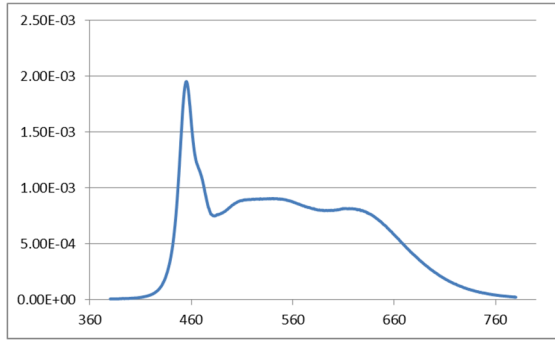
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14 118. Below is an image of the packaged light-emitting diodes of the FEIT  
15 LEDR4/RGBW/AG LED. As shown in the image, the encapsulant of the packaged  
16 light-emitting diodes appears either yellow or orange.



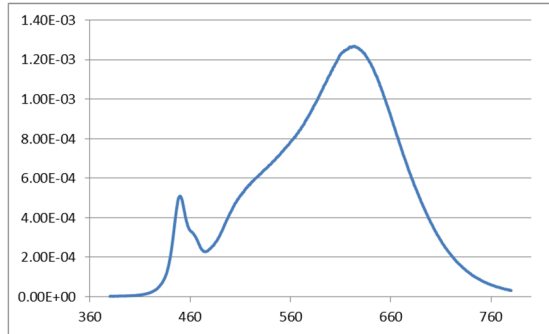
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24 119. The packages having yellow colored encapsulant include a first  
25 phosphor that modifies the light emitted by those packaged light-emitting diodes to  
26 provide a base light. The base light is relatively broad spectrum, but weighted  
27 toward the short-wavelength blue end of the spectrum. The resulting output  
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1 spectrum is represented in the image below and has the appearance of white light.



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8 120. The packages having orange colored encapsulant include a second  
9 phosphor that modifies the light-emitting by those packaged light-emitting diodes  
10 with additional long-wavelength light weighted toward the red end of the spectrum.  
11 The resulting output spectrum is represented in the image below.



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17 121. As discussed above, the color temperature of the combined output is  
18 approximately from 2700K to 6500K, which includes a warm white light.

19 122. FEIT's infringement has caused and is continuing to cause damage and  
20 irreparable injury to Plaintiffs. Plaintiffs will continue to suffer damage and  
21 irreparable injury unless and until that infringement is enjoined by this Court, as a  
22 remedy at law alone would be inadequate.

23 123. Plaintiffs are entitled to injunctive relief and damages in accordance  
24 with 35 U.S.C. §§ 271, 281, 283, and 284.

25 **COUNT 9**

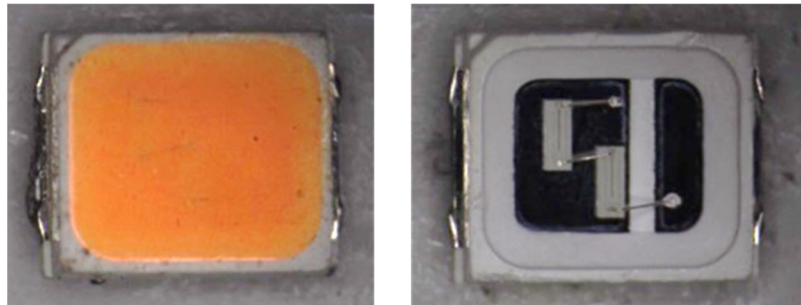
26 **INFRINGEMENT OF U.S. PATENT NO. 10,134,967**

27 **EXEMPLARY CLAIM 17**

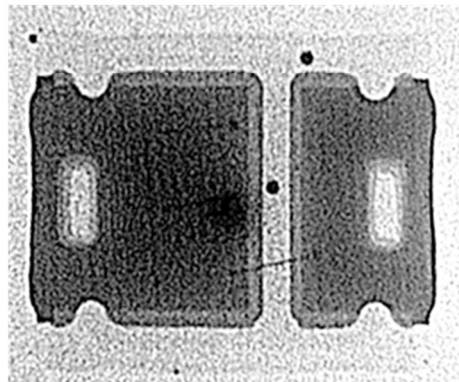
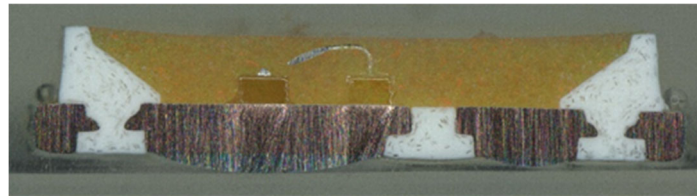
28 124. FEIT has infringed and continues to infringe one or more claims of the

1 '967 patent, including but not limited to exemplary claim 17, in violation of 35  
2 U.S.C. § 271(a), at least by without authority making, using, offering to sell and/or  
3 selling the FEIT A800830/10KLED/2/CAN LED bulb within the United States.

4 125. The FEIT A800830/10KLED/2/CAN LED bulb includes a plurality of  
5 LED packages. Optical microscope images of an LED package from the FEIT  
6 A800830/10KLED/2/CAN LED bulb are reproduced below before and after  
7 removal of an encapsulant. LED chips are disposed on the top surface of the lead  
8 frame in the optical image.



14 126. The top image below is an optical microscope image of a cross-section  
15 through the LED package. The bottom image below is an x-ray through the  
16 package.



27 127. As the above images show, the LED package contains two metal lead  
28 frames spaced apart from each other. The optical image shows that each lead frame

1 has a substantially flat top surface, a bottom surface, a fixing hole, and sidewalls  
2 between the top and bottom surfaces.

3 128. The cross-section image above depicts the cross-sectional shape of the  
4 sidewalls of both lead frames at the sides that face each other in the horizontal  
5 direction. In addition, the upper surface of the left and right lead frames extends  
6 further into the space between the lead frames than the bottom surface of the left  
7 and right lead frames. That the top surfaces extend further into the space indicates  
8 an undercut in the sidewall that partially defines a fixing space between the two  
9 lead frames. This same feature is also depicted in the x-ray image above. In  
10 particular, both leads are shown with relatively dark interior regions and three sides  
11 have relatively light outer regions. The differences in brightness correlate to the  
12 thickness of the metal at those locations. The relatively light outer regions  
13 correspond to undercut sidewalls on three sides of both lead frames. The undercuts  
14 form the fixing space.

15 129. As discussed above and as shown in the images above, the first and  
16 second lead frames include a fixing hole located in the interior portions and each  
17 fixing hole includes an undercut sidewall that envelopes inner bounds of the fixing  
18 hole.

19 130. As discussed above, the lead frames face each other in the horizontal  
20 direction and both lead frames have three undercut sidewalls as indicated by the  
21 cross-sectional and x-ray images above. Of those three undercut sidewalls, each  
22 lead frame has a sidewall shown as extending vertically in the x-ray image and two  
23 sidewalls shown as extending horizontally. The sidewalls extending horizontally in  
24 the x-ray image are all parallel to each other and also perpendicular to those shown  
25 extending vertically.

26 131. FEIT's infringement has caused and is continuing to cause damage and  
27 irreparable injury to Plaintiffs. Plaintiffs will continue to suffer damage and  
28 irreparable injury unless and until that infringement is enjoined by this Court, as a

1 remedy at law alone would be inadequate.

2 132. Plaintiffs are entitled to injunctive relief and damages in accordance  
3 with 35 U.S.C. §§ 271, 281, 283, and 284.

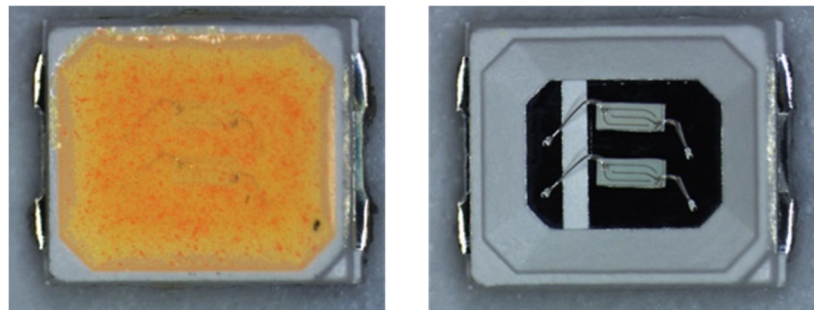
4 **COUNT 10**

5 **INFRINGEMENT OF U.S. PATENT NO. 10,510,933**

6 **EXEMPLARY CLAIM 15**

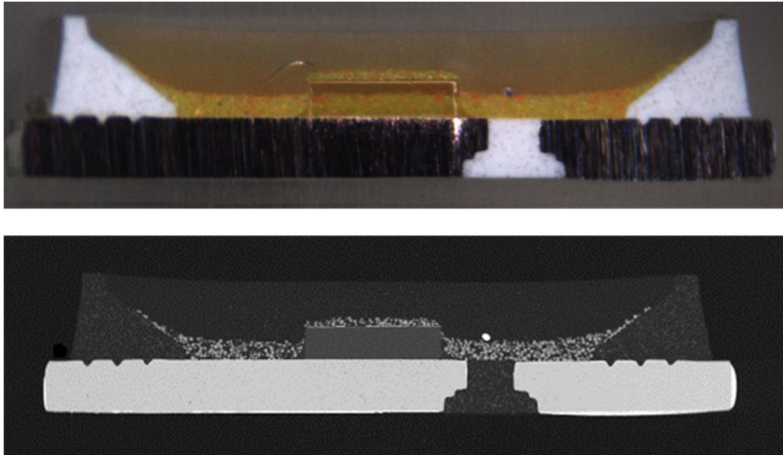
7 133. FEIT has infringed and continues to infringe one or more claims of the  
8 '933 patent, including but not limited to exemplary claim 15, in violation of 35  
9 U.S.C. § 271(a), at least by without authority making, using, offering to sell and/or  
10 selling the FEIT T48/840/LED/2 LED lighting device within the United States.

11 134. The FEIT T48/840/LED/2 LED includes a plurality of LED packages,  
12 each of which includes light emitting diodes. The image of an LED package from  
13 the FEIT T48/840/LED/2 LED lighting device is reproduced below left. The image  
14 below right shows an LED chip within package. The chip emits blue light with a  
15 Full Width at Half Maximum of less than 40 nm.



21 135. The images above left and right is are optical microscope images of  
22 the top surface of the package before and after encapsulant removal. The white  
23 material comprises a housing. The images below are an optical microscope image  
24 (top) and a SEM image (bottom) created after cross-sectioning the package. The  
25 housing material appears white in the optical image. The image shows that the  
26 package includes a housing having both a top surface, an opposite bottom surface,  
27 wherein the top surface includes, from top to bottom, upper, intermediate, and  
28 lower portions.

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136. Also shown in the image above is an encapsulating molding part formed over and around the light-emitting diode chip. The molding part is a silicon based encapsulant. The relatively bright inclusions within the encapsulant include two different phosphors, one a Lutetium-based phosphor that has an output wavelength in the green with a peak at around 545 nm, and the other a nitride-based phosphor that has an output wavelength in the red with a peak at around 635 nm. The Full Width at Half Maximum of the nitride-based phosphor is narrower than that of the Lutetium-based phosphor, which is wider than 40 nm.

137. The output from the blue chip combined with light down converted by the first and second phosphors is white light.

138. FEIT's infringement has caused and is continuing to cause damage and irreparable injury to Plaintiffs. Plaintiffs will continue to suffer damage and irreparable injury unless and until that infringement is enjoined by this Court, as a remedy at law alone would be inadequate.

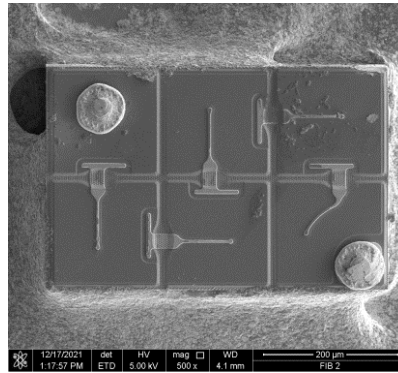
139. Plaintiffs are entitled to injunctive relief and damages in accordance with 35 U.S.C. §§ 271, 281, 283, and 284.

**COUNT 11**  
**INFRINGEMENT OF U.S. PATENT NO. 9,627,435**  
**EXEMPLARY CLAIM 1**

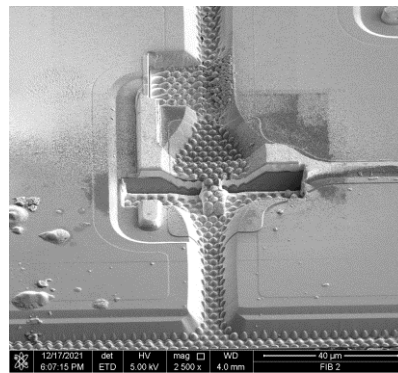
140. FEIT has infringed and continues to infringe one or more claims of the

1 '435 patent, including but not limited to exemplary claim 1, in violation of 35  
2 U.S.C. § 271(a), at least by without authority making, using, offering to sell and/or  
3 selling the FEIT BP7C7/850/LED/4 LED bulb within the United States.

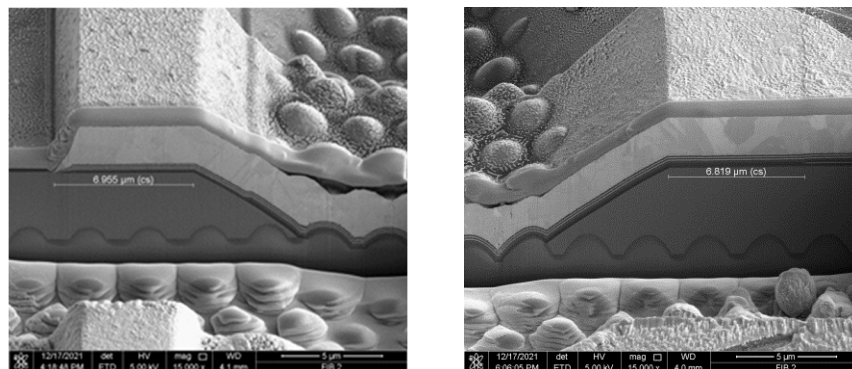
4 141. The FEIT BP7C7/850/LED/4 LED bulb includes an LED package  
5 comprising a light emitting diode (“LED”) chip that comprises light emitting cells.  
6 An SEM image of the LED chip from the FEIT BP7C7/850/LED/4 LED bulb is  
7 reproduced below.



14 142. Below is an SEM image of a pair of holes milled into the LED chip  
15 using a FIB.



23 143. Below are images created from SEM images of the milled holes.



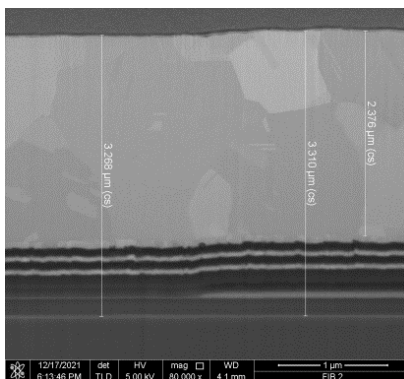
1 144. The bottom of the images reproduced above show a patterned  
2 substrate. Above the substrate are cross sectional views of portions of two of the  
3 light emitting cells.

4 145. Both of the light emitting cells include first and second semiconductor  
5 layers with an active layer disposed between them. The upper semiconductor layer  
6 comprises a p-type layer and the lower semiconductor layer comprises an n-type  
7 layer.

8 146. In addition, the light emitting cell on the left side of the image includes  
9 a continuous inclined surface having a slope between 20° and 80° from a horizontal  
10 plane of the substrate.

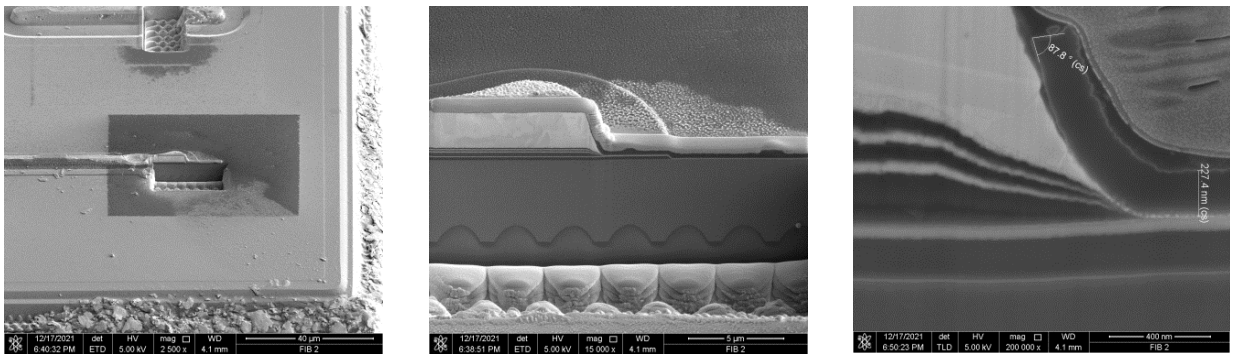
11 147. The light emitting cell includes at least two conductive materials,  
12 including a metallic conductor and a transparent layer of indium tin oxide (ITO). At  
13 least one of those conductive materials is disposed on the upper p-type  
14 semiconductor layer of the light emitting cell. And at least the other of those  
15 conductive materials electrically connects the light emitting cells.

16 148. Below is an enlarged SEM image of a part of the light emitting cell on  
17 the image above right. In this image, the ITO layer is shown as a relatively thin and  
18 bright line above the upper p-type semiconductor layer. The ITO layer extends  
19 horizontally from the right edge of the image. In this image, the metallic conductor  
20 is shown as including a relatively thick and bright layer above the upper p-type  
21 semiconductor that extends from the left side of the image to the right side of the  
22 image.



1 149. Below are SEM images of another hole milled into the LED chip and  
2 created from the milled hole.

3 150. As shown in right image below right, the light emitting cell includes at  
4 least two insulation layers. For example, portions of a pair of light-transmitting  
5 silicon dioxide (SiO<sub>2</sub>) layers are shown as relatively dark layers in the cross-  
6 sectional image. At least one of the SiO<sub>2</sub> layers overlaps one of the conductive  
7 materials and the light emitting cell. And at least the other of the SiO<sub>2</sub> layers  
8 overlaps the other of the conductive materials.



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14 151. FEIT’s infringement has caused and is continuing to cause damage and  
15 irreparable injury to Plaintiffs. Plaintiffs will continue to suffer damage and  
16 irreparable injury unless and until that infringement is enjoined by this Court, as a  
17 remedy at law alone would be inadequate.

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19 152. Plaintiffs are entitled to injunctive relief and damages in accordance  
20 with 35 U.S.C. §§ 271, 281, 283, and 284.

21 **COUNT 12**  
22 **INFRINGEMENT OF U.S. PATENT NO. 8,716,946**  
23 **EXEMPLARY CLAIM 1**

24 153. FEIT has infringed and continues to infringe one or more claims of the  
25 ’946 patent, including but not limited to exemplary claim 1, in violation of 35  
26 U.S.C. § 271(a), at least by without authority making, using, offering to sell and/or  
27 selling the FEIT BPG1640/927CA/FIL/2 (C) LED bulb within the United States.

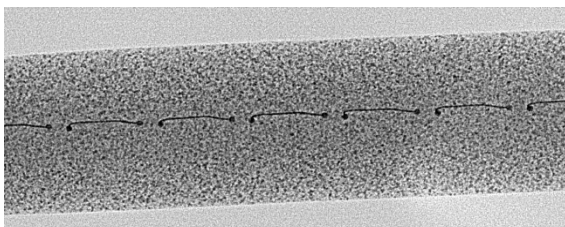
28 154. The FEIT BPG1640/927CA/FIL/2 (C) LED bulb includes a plurality



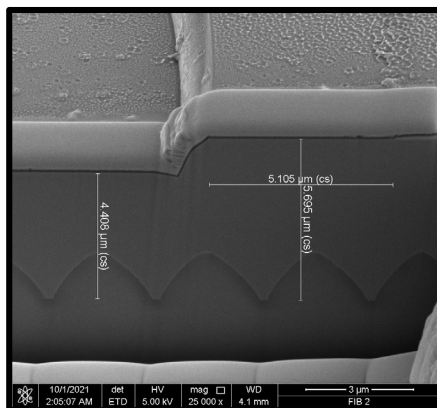
1 of LED filaments that comprises a series connected array of light emitting cells.  
2 Two filaments are visible in the image of a sample bulb reproduced below.



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11 155. The array is configured to receive an input voltage to cause the cells to  
12 emit light. An x-ray image of the array from a FEIT BPG1640/927CA/FIL/2 (C)  
13 LED bulb is provided below.



18 156. Below is a SEM image created from a hole milled into one of the LED  
19 cells. The cell includes an inclined side surface.



26 157. Two different voltages are relevant to the operation of the FEIT  
27 BPG1640/927CA/FIL/2 (C) LED bulb.

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1 158. As indicated by the base of the bulb as shown above, the FEIT  
2 BPG1640/927CA/FIL/2 (C) LED bulb is a screw-in type receives as input a wall  
3 voltage of 120V and 60Hz alternating current electricity. The reference to 60Hz  
4 indicates the periodic cycles over which the input voltage changes. During each  
5 cycle, the wall voltage includes a peak of approximately 120 volts after which the  
6 voltage falls toward zero volts.

7 159. Although wall voltage is received as the input to the FEIT  
8 BPG1640/927CA/FIL/2 (C) LED bulb, the light emitting cells cannot be properly  
9 driven by the 120V/60Hz alternating current. The 120V/60Hz alternating current  
10 has a cyclical peak of approximately 120 volts in the forward direction, passes  
11 through zero, and then reaches a peak of approximately 120 volts in the reverse  
12 direction. The alternating current, therefore, drops below the level necessary to  
13 drive the light emitting cells after the peak of 120 volts.

14 160. Instead of applying the input voltage to the light emitting cells,  
15 elements on a circuit boards within the base of the bulb convert the input to DC-like  
16 power to drive the light emitting cells. The DC-like power has a cyclical voltage  
17 that varies between approximately 128 volts and 129 volts. The cyclical DC-like  
18 power causes the light emitting cells to emit light having a periodically changing  
19 luminous intensity that remains non-zero throughout the cycle of the input  
20 120V/60Hz alternating current.

21 161. FEIT's infringement has caused and is continuing to cause damage and  
22 irreparable injury to Plaintiffs. Plaintiffs will continue to suffer damage and  
23 irreparable injury unless and until that infringement is enjoined by this Court, as a  
24 remedy at law alone would be inadequate.

25 162. FEIT's infringement has occurred with knowledge of the '946 patent  
26 and knowledge that its acts constitute infringement. FEIT's continuing conduct,  
27 therefore, is willful.

28 163. Plaintiffs are entitled to injunctive relief and damages in accordance

1 with 35 U.S.C. §§ 271, 281, 283, and 284.

2 **PRAYER FOR RELIEF**

3 WHEREFORE, the Plaintiffs requests that the Court enter judgment in their  
4 favor and against Defendant FEIT ELECTRIC CO., INC., as follows:

5 A. A judgment that Defendant infringe the '210, '225, '800, '314, '157,  
6 '912, '684, '789, '967, '933, '435 and '946 patents;

7 B. A preliminary and permanent injunction restraining and enjoining  
8 Defendant, its officers, partners, agents, servants, employees, parents, subsidiaries,  
9 divisions, affiliate corporations, joint ventures, other related business entities and  
10 all other persons acting in concert, participation, or in privity with them, and their  
11 successors and assigns, from infringing the '210, '225, '800, '314, '157, '912, '684,  
12 '789, '967, '933, '435 and '946 patents;

13 C. An award of damages to Plaintiffs Seoul Semiconductor and Seoul  
14 Viosys arising from Defendant's past and continuing infringement up until the date  
15 Defendant is finally and permanently enjoined from further infringement, including  
16 compensatory damages;

17 D. A determination that Defendant's infringement of one or more of  
18 the '210, '912, '157, '435 and '946 patents was willful, and a trebling of damages  
19 pursuant to 35 U.S.C. § 284;

20 E. A determination that this is an exceptional case and awarding the  
21 Seoul Plaintiffs' attorneys' fees pursuant to 35 U.S.C. § 285; An order awarding the  
22 Seoul Plaintiffs the costs and expenses that they have incurred in prosecuting this  
23 action;

24 F. An order awarding the Seoul Plaintiffs pre- and post-judgment interest  
25 on their damages; and

26 G. Such other and further relief in law or in equity as this Court deems  
27 just and proper.

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**JURY DEMAND**

Plaintiffs Seoul Semiconductor and Seoul Viosys respectfully request a jury trial on all issues so triable.

DATED: July 22, 2020

STEPTOE & JOHNSON LLP

By: /s/ Ashwin J. Ram  
Ashwin J. Ram

*Attorney for Plaintiff Seoul Semiconductor Co., Ltd., and Seoul Viosys Co., Ltd.*