UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF NEW HAMPSHIRE

SENSOR ELECTRONIC TECHNOLOGY, INC., Plaintiff, v. LASER COMPONENTS USA, INC. Defendant.	Civil Action No. **JURY TRIAL DEMANDED**

COMPLAINT FOR PATENT INFRINGEMENT
AND DEMAND FOR JURY TRIAL

Plaintiff Sensor Electronic Technology, Inc. ("SETi" or "Plaintiff"), for its Complaint against defendant Laser Components USA, Inc. ("defendant" or "Laser Components"), alleges as follows:

INTRODUCTION

1. SETi brings this patent infringement action to protect its valuable patented technology related to ultraviolet light-emitting diodes ("UV LEDs").

2. A UV LED is a semiconductor device that converts electrical energy into ultraviolet light. Ultraviolet light has many applications including optical sensors, disinfection, forensics, medical imaging, protein analysis, and polymer curing.

3. UV LEDs have many advantages over conventional UV lamps, including lower energy consumption, longer lifetime, and smaller size.

THE PARTIES

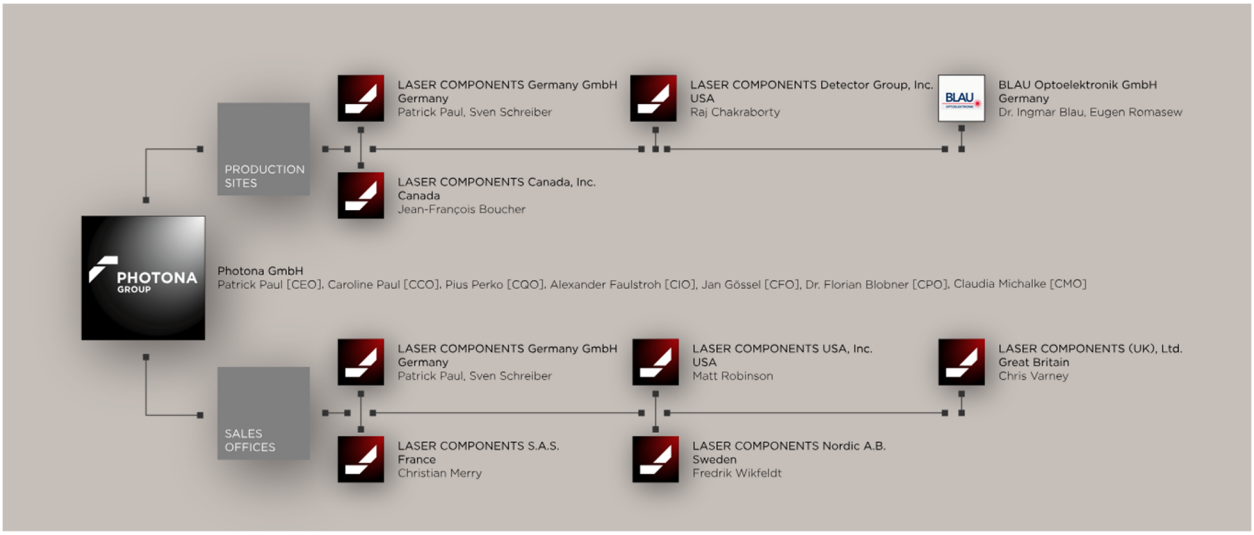
4. SETi was founded in 1999 at the Rensselaer Polytechnic Institute in New York State and relocated to Columbia, South Carolina in 2002.

5. In 2004, SETi launched the world's first commercially available deep UV LED with emission wavelengths shorter than 365 nm.

6. Today, SETi has more than 300 issued U.S. patents related to this technology.

7. Defendant Laser Components is one of the seven companies that form the Laser Components Group which, along with Blau Optoelektronik GmbH, form the Photona Group. *See* https://www.lasercomponents.com/us/company/about-us/ (August 22, 2024).

8. As of August 22, 2024, the diagram below, which is from https://www.lasercomponents.com/us/company/about-us/ (August 22, 2024), represents the organization of the Photona Group, including therein Laser Components, USA Inc.



9. The Photona Group provides shared service to the daughter companies, including overall strategy, finance, controlling, IT, quality management, marketing, design and product management.

10. The Laser Components Group was founded in 1982 and now comprises seven companies in Europe, Canada, and the United States.

11. The Laser Components Group employs more than 260 people.

12. The Laser Components Group generated revenue of more than 70 million euros in 2022.

13. Defendant Laser Components offers a wide range of detectors, laser diodes, laser modules, and optics, which includes more than 20,000 articles. https://www.lasercomponents.com/us/ (August 22, 2024).

14. Defendant Laser Components offers customized solutions to "cover all conceivable areas of application: from sensor technology to medical technology." https://www.lasercomponents.com/us/ (August 22, 2024).

15. Laser Components' core business is the production and sale of optical and optoelectronic components.

16. On its website, Laser Components states: "You can reach us here:" and lists the address 116 South River Road, Building C, Bedford, NH 03110.

17. Laser Components may be served through its registered agent for service of process, Corporation Service Company, 10 Ferry Street S313, Concord, NH 03301.

JURISDICTION AND VENUE

18. This is an action for patent infringement, under the patent laws of the United States, 35 U.S.C. § 271 et seq. This Court has subject matter jurisdiction under 28 U.S.C. §§ 1331 and 1338(a).

19. Venue is proper within this judicial District under 28 U.S.C. §§ 1391(b)-(d) and 1400(b). Laser Components is incorporated in New Hampshire and maintains a regular and established place of business in the State of New Hampshire and in this District, and upon information and belief, has regularly transacted business in this district, and has committed acts of infringement in this district.

20. This Court has general and specific personal jurisdiction over Laser Components because it is engaged in substantial and continuous business in this District through its conduct of business, including at least sales, offers for sale, and/or importing infringing products. At least a portion of the patent infringement claims alleged herein arise out of or are related to one or more of the foregoing activities.

PATENTS-IN-SUIT

21. On May 8, 2018, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 9,966,496 ("the '496 Patent"), entitled "Light Emitting Heterostructure with Partially Relaxed Semiconductor Layer," to Shatalov *et al*. SETi is the owner by assignment of the '496 Patent.

22. Exhibit 1 is a true and correct copy of the '496 Patent.

23. On December 1, 2020, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 10,854,785 ("the '785 Patent"), entitled "Contact Configuration for Optoelectronic Device," to Dobrinsky *et al*. SETi is the owner by assignment of the '785 Patent.

24. Exhibit 2 is a true and correct copy of the '785 Patent

25. On November 22, 2022, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 11,508,871 ("the '871 Patent"), entitled "Heterostructure Including a Semiconductor Layer With a Varying Composition," to Jain *et al*. SETi is the owner by assignment of the '871 Patent.

26. Exhibit 3 is a true and correct copy of the '871 Patent.

27. On March 21, 2023, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 11,611,011 ("the '011 Patent"), entitled "Heterostructure

Including a Semiconductor Layer With a Graded Composition," to Jain *et al*. SETi is the owner by assignment of the '011 Patent.

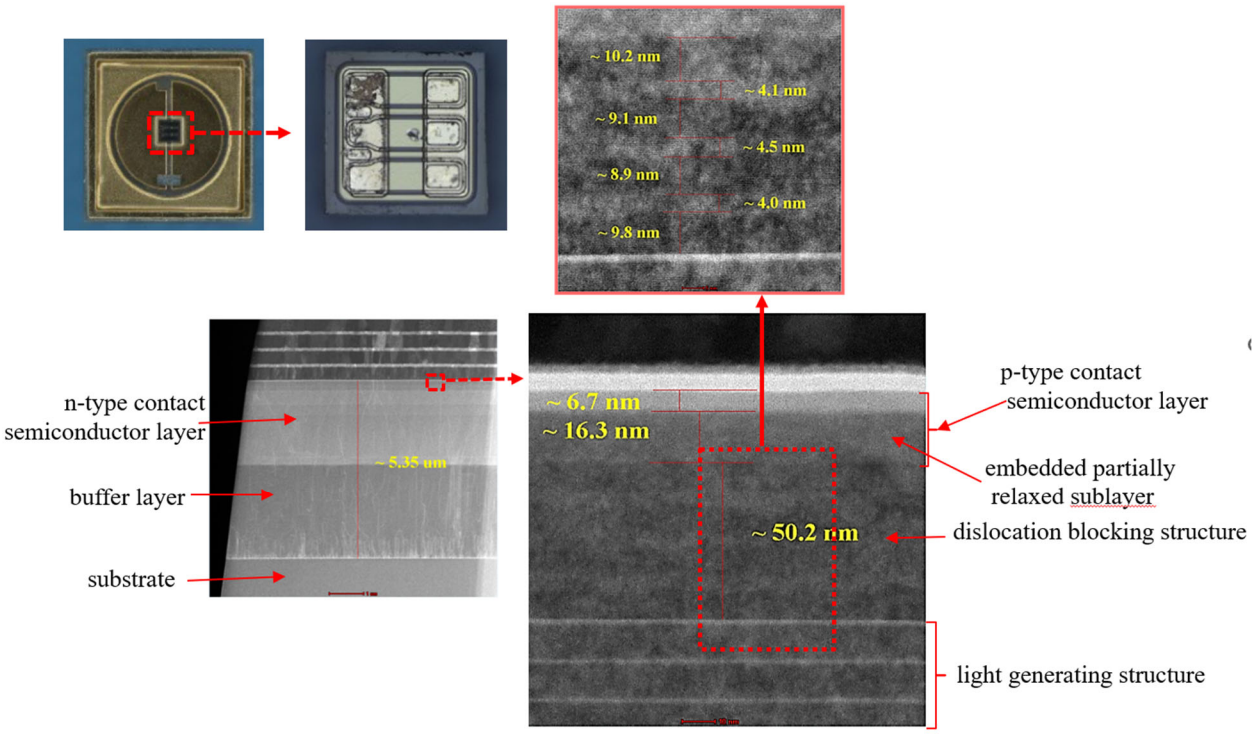
28. Exhibit 4 is a true and correct copy of the '011 Patent.

COUNT I

INFRINGEMENT OF THE '496 PATENT

29. Laser Components has infringed and continues to infringe one or more claims of the '496 Patent, including but not limited to exemplary claim 1, pursuant to 35U.S.C. § 271(a) at least by, without authority, making, using, offering to sell, and/or selling the PHOTON WAVE PKD-H10-F35 UV LED within the United States or importing the PHOTON WAVE PKD-H10-F35 UV LED into the United States.

30. Below is a series of x-ray and Transmission Electron Microscope ("TEM") images showing, among other things, a cross section of a heterostructure of the LED chip from the PHOTON WAVE PKD-H10-F35 UV LED.



31. The images of the heterostructure show that it includes (1) a substrate, (2) a buffer layer adjacent to the substrate, (3) a light generating structure having a first side and a second side wherein the substrate is transparent to light generated by the light generating structure, (4) an n-type contact semiconductor layer located on the first side of the light generating structure, (5) a p-type contact semiconductor layer located on the second side of the light generating structure, wherein at least one of the contact semiconductor layers includes an embedded partially relaxed sublayer, and wherein at least one of the contact semiconductor layers is located between the light generating structure and the buffer layer, and (6) a dislocation blocking structure located between the partially relaxed sublayer and the light generating structure, wherein the dislocation blocking structure includes a graded composition that changes from a first side of the dislocation blocking structure to the second side thereof.

32. Laser Components' infringement has caused and is continuing to cause damage and irreparable injury to Plaintiff. Plaintiff 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.

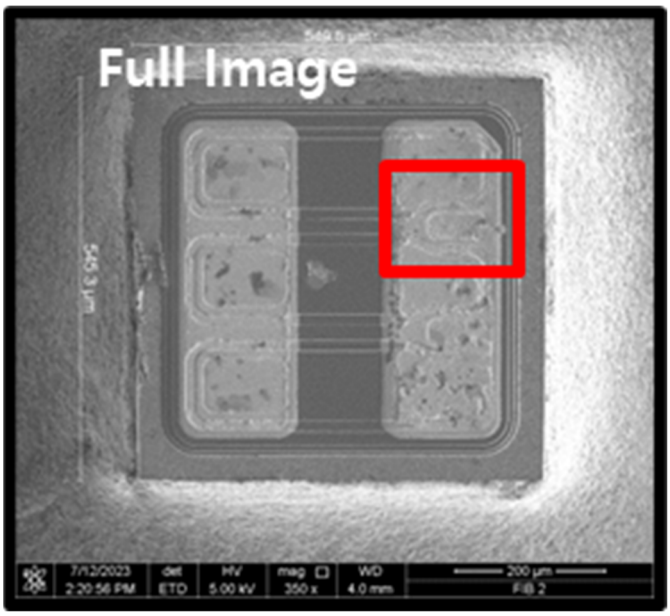
33. Plaintiff is entitled to injunctive relief and damages in accordance with 35 U.S.C. §§ 271, 281, 283, and 284.

COUNT II

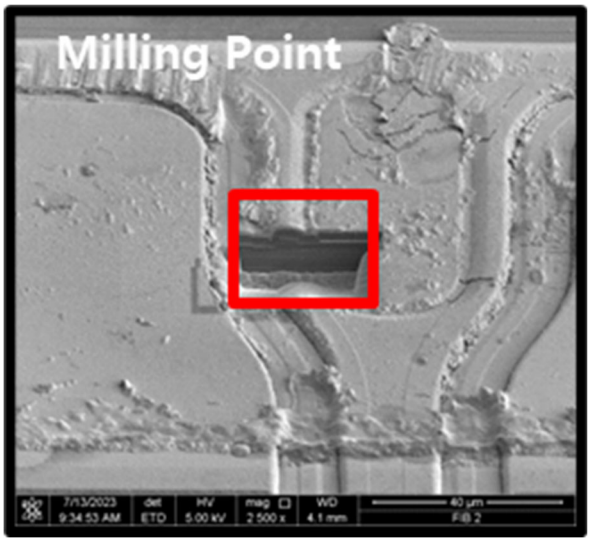
INFRINGEMENT OF THE '785 PATENT

34. Laser Components has infringed and continues to infringe one or more claims of the '785 Patent, including but not limited to exemplary claim 1, pursuant to 35 U.S.C. § 271(a) at least by, without authority, making, using, offering to sell, and/or selling the PHOTON WAVE PKD-H10-F35 UV LED within the United States or importing the PHOTON WAVE PKD-H10-F35 UV LED into the United States.

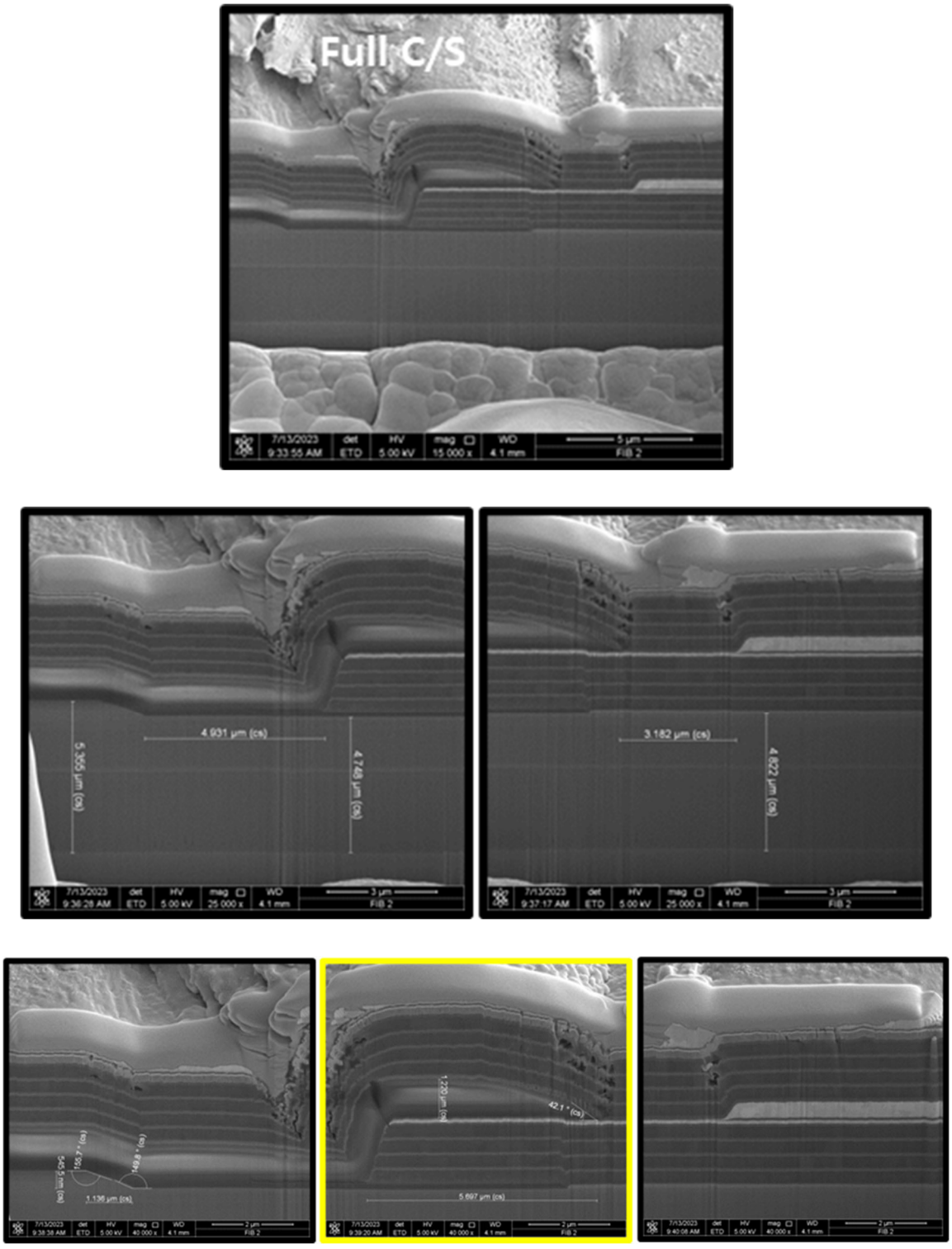
35. The PHOTON WAVE PKD-H10-F35 UV LED includes an optoelectronic device. A SEM image of an LED chip from a PHOTON WAVE PKD-H10-F35 UV LED is reproduced below (with annotations added for clarity).



36. Below is a SEM image (with annotations for clarity) taken after a hole was milled into the LED chip using a FIB at the location indicated with a red box in the image above.



37. Below are cross-section images taken at the location of the red box in the image above, after the hole was milled (with annotations added for clarity).



38. The composite images above show an n-type semiconductor layer having a surface, and a mesa located over a first portion of the surface of the n-type semiconductor layer,

a first n-type metallic contact layer located over at least a portion of the n-type contact region in proximity of the mesa boundary and a second n-type metallic contact layer located over a second portion of the n-type contact region. The n-type contact region is at least partially defined by the mesa boundary. The first n-type metallic contact layer forms an ohmic contact with the n-type semiconductor layer.

39. The above FIB-SEM images show a second n-type metallic contact layer located over a second portion of the n-type contact region, and it is formed of a reflective metallic material distinct from a metallic material used to form the first n-type metallic contact layer, and at least one-scattering element is arranged in the n-type semiconductor layer.

40. Laser Components' infringement has caused and is continuing to cause damage and irreparable injury to Plaintiff. Plaintiff 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.

41. Plaintiff is entitled to injunctive relief and damages in accordance with 35 U.S.C. §§ 271, 281, 283, and 284.

COUNT III

INFRINGEMENT OF THE '871 PATENT

42. Laser Components has infringed and continues to infringe one or more claims of the '871 Patent, including but not limited to exemplary claim 6, pursuant to 35 U.S.C. § 271(a) at least by, without authority, making, using, offering to sell, and/or selling the PHOTON WAVE PKD-H10-F35 UV LED within the United States or importing the PHOTON WAVE PKD-H10-F35 UV LED into the United States.

43. The PHOTON WAVE PKD-H10-F35 infringes each element of exemplary

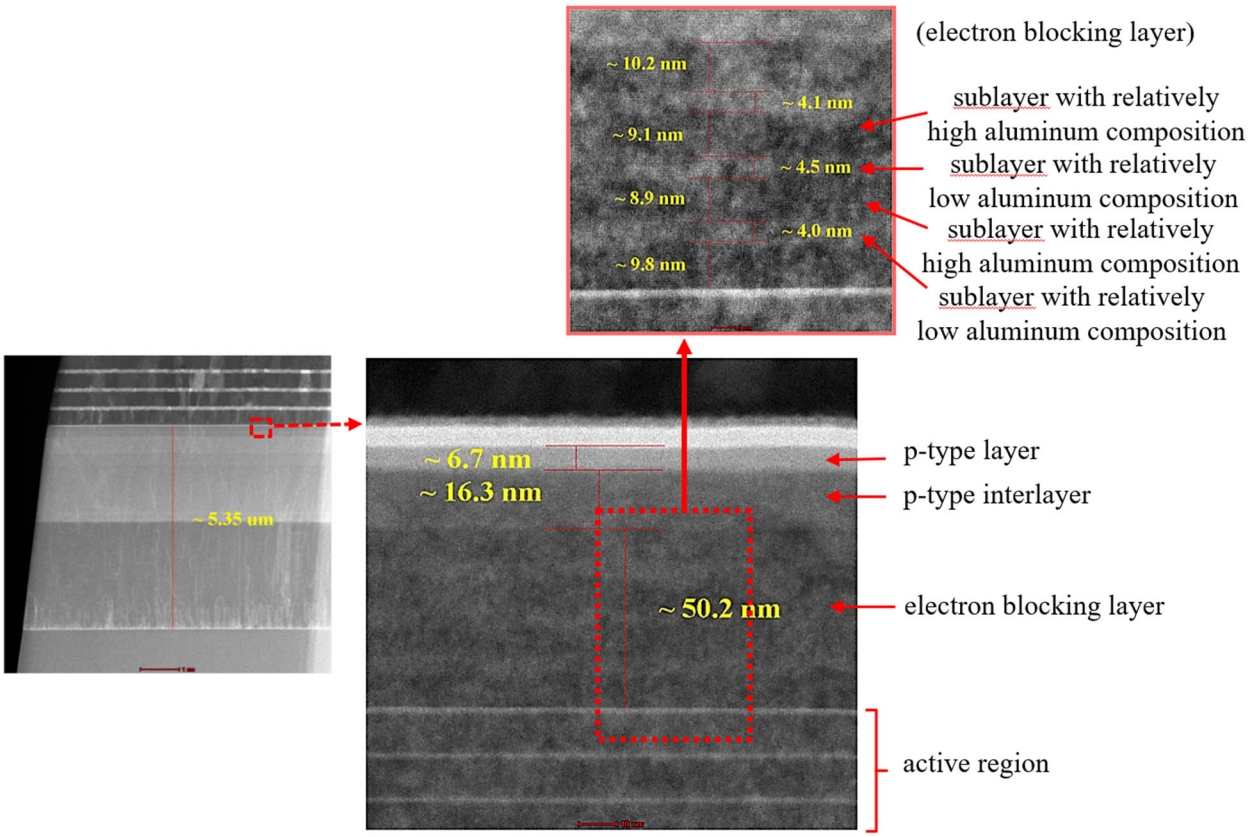
claim 6 of the ’871 patent.

44. The PHOTON WAVE PKD-H10-F35 includes a UV LED chip, which contains a semiconductor heterostructure comprised of different layers.

45. The TEM and SEM images below show a cross section of a UV LED chip from the PHOTON WAVE PKD-H10-F35. The stacked layers of the semiconductor heterostructure have different shades depending on their material composition.

46. The TEM and SEM images of the heterostructure show (1) a group III nitride active region including at least one quantum well and at least one barrier (labeled “active region”), (2) a group III nitride p-type layer having a p-type doping, the p-type layer located on a first side of the active region (labeled “p-type layer”), (3) a group III nitride electron blocking layer located between the active region and the p-type layer, wherein the electron blocking layer includes a plurality of sublayers, and wherein the plurality of sublayers form a superlattice in which the plurality of sublayers alternate between a sublayer with relatively high aluminum composition and a sublayer with relatively low aluminum composition, (labeled “electron blocking layer”), and (4) a group III nitride p-type interlayer located between the electron blocking layer and the p-type layer, wherein the p-type interlayer includes a region of graded aluminum alloy composition located adjacent to the electron blocking layer and a region of constant aluminum alloy composition located adjacent to the region of graded aluminum alloy composition, wherein the region of constant aluminum alloy composition has an aluminum composition that is higher than an aluminum alloy composition of the p-type layer and lower than a peak aluminum alloy composition in the electron blocking layer (labeled “p-type interlayer”). The reference measurement in the image on the bottom left is 1 μm. The reference measurement in the image on the bottom right is 10 nm. The reference measurement in the image

on the top right is 5 nm.



47. Laser Components' infringement has caused and is continuing to cause damage and irreparable injury to Plaintiff. Plaintiff 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.

48. Plaintiff is entitled to injunctive relief and damages in accordance with 35 U.S.C. §§ 271, 281, 283, and 284.

COUNT IV

INFRINGEMENT OF THE '011 PATENT

49. Laser Components has infringed and continues to infringe one or more claims of

the ’011 Patent, including but not limited to claim 12, pursuant to 35 U.S.C. § 271(a) at least by, without authority, making, using, offering to sell, and/or selling the PHOTON WAVE PKD-H10-F35 UV LED within the United States or importing the PHOTON WAVE PKD-H10-F35 UV LED into the United States.

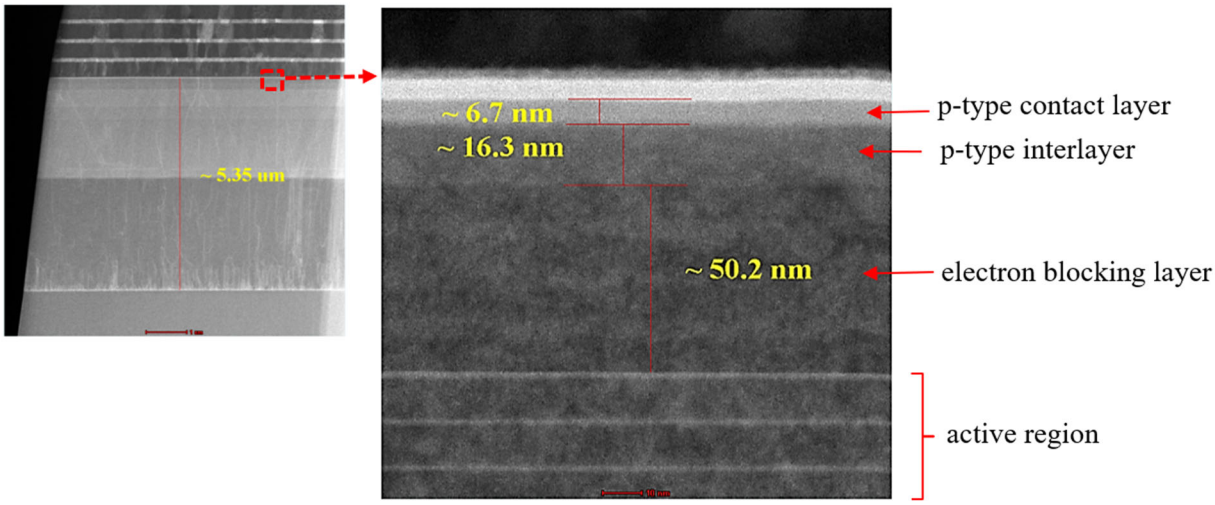
50. The PHOTON WAVE PKD-H10-F35 infringes each element of exemplary claim 12 of the ’011 patent.

51. The PHOTON WAVE PKD-H10-F35 includes a UV LED chip, which contains a semiconductor heterostructure comprised of different layers.

52. The TEM images below show a cross section of a UV LED chip from the PHOTON WAVE PKD-H10-F35. The stacked layers of the semiconductor heterostructure have different shades depending on their material composition.

53. The TEM images of the heterostructure show (1) a group III nitride active region including at least one quantum well and at least one barrier (labeled “active region”), (2) a group III nitride p-type contact layer having a p-type doping, the p-type contact layer located on a first side of the active region (labeled “p-type contact layer”), (3) a group III nitride electron blocking layer located between the active region and the p-type contact layer, wherein a region of the electron blocking layer immediately adjacent to the active region includes a graded transition that increases in a direction away from the active region to a peak alloy composition for the electron blocking layer (labeled “electron blocking layer”), and (4) a group III nitride p-type interlayer located between the electron blocking layer and the p-type contact layer, wherein the p-type interlayer includes a region of linearly graded transition and a region of constant composition located adjacent to the region of linearly graded transition, wherein the region of constant composition is located immediately adjacent to the p-type contact layer (labeled “p-type

interlayer"). The reference measurement in the TEM on the left is 1 µm. The reference measurement in the TEM on the right is 10 nm.



54. Laser Components' infringement has caused and is continuing to cause damage and irreparable injury to Plaintiff. Plaintiff 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.

55. Plaintiff is entitled to injunctive relief and damages in accordance with 35 U.S.C. §§ 271, 281, 283, and 284.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff respectfully requests that this Court enter judgment in its favor and against defendants as follows:

A. A declaration that defendant Laser Components has infringed the '496 Patent, '785 Patent, '871 Patent, and '011 Patent under 35 U.S.C. § 271, and a final judgment incorporating the same;

B. A permanent injunction, enjoining defendants and their officers, agents,

servants, employees, representatives, successors, and assigns, and all others acting in concert or participation with them from continued infringement under 35 U.S.C. § 271 of the '496 Patent,'785 Patent, '871 Patent, and '011 Patent;

C. An award of damages adequate to compensate Plaintiff for infringement of the '496 Patent,'785 Patent, '871 Patent, and '011 Patent, together with prejudgment and post-judgment interest and costs pursuant to 35 U.S.C. § 284;

D. Enhancement of damages for infringement up to treble the amount of actual damages pursuant to 35 U.S.C. § 284;

E. An accounting of all infringing sales and other infringing acts by Laser Components, and an order compelling an accounting for infringing acts not presented at trial and an award by the Court of additional damages for such acts; and

F. Any other relief to which Plaintiff is entitled or that the Court seems just and proper.

JURY DEMAND

Pursuant to Rule 38(b) of the Federal Rules of Civil Procedure, Plaintiff hereby demands trial by jury of all issues so triable.

Dated: August 30, 2024

/s/ Kathleen M. Mahan

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