

**IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF DELAWARE**

**GREENTHREAD, LLC**

**Plaintiff,**

**vs.**

**ON SEMICONDUCTOR CORPORATION;  
SEMICONDUCTOR COMPONENTS  
INDUSTRIES, LLC D/B/A ON  
SEMICONDUCTOR LLC**

**Defendants.**

**Civil Action No. 23-443-RGA-LDH**

**JURY TRIAL DEMANDED**

**SECOND AMENDED COMPLAINT FOR PATENT INFRINGEMENT**

Plaintiff Greenthread, LLC (“Greenthread” or “Plaintiff”) files this Second Amended Complaint against Defendants ON Semiconductor Corporation, Semiconductor Components Industries, LLC d/b/a ON Semiconductor LLC (collectively “ON Semiconductor” or “Defendants”) and hereby alleges as follows:

**THE NATURE OF THE ACTION**

1. Greenthread owns a family of patents related to transistors and other components of integrated semiconductor devices. Greenthread’s patented inventions describe semiconductor devices that employ graded dopants and well regions for creating electric fields for aiding and/or limiting the movement of carriers to (or from) the semiconductor surface to (or from) the semiconductor substrate. These inventions improve semiconductor devices by (1) creating faster, more efficient, and more reliable processors, logic devices, and image sensors and (2) allowing manufacturers to scale down the feature size of their semiconductor products.

2. Defendants have infringed and continue to infringe two Greenthread patents:

10,510,842 (the “’842 Patent”), and 11,121,222 (the “’222 Patent) (collectively “the Greenthread Patents”), copies of which are attached hereto as Exhibits 1-2, respectively. Defendants have infringed and continue to infringe the Greenthread Patents by making, using, selling, offering for sale, and/or importing into the United States, semiconductor devices with infringing graded dopant regions and/or electronic products containing the same.

### **THE PARTIES**

3. Plaintiff Greenthread, LLC (“Greenthread”) is a limited liability company organized and existing under the laws of Texas, having its principal place of business at 7424 Mason Dells Drive, Dallas, Texas 75230-3244.

4. Defendant ON Semiconductor Corporation is a corporation organized and existing under the laws of Delaware, having its principal place of business at 5005 East McDowell Road, Phoenix, Arizona, 85008. ON Semiconductor Corporation may be served through its registered agent the Corporation Trust Company at Corporation Trust Center 1209 Orange Street, Wilmington, Delaware 19801.

5. Defendant Semiconductor Components Industries, LLC, is a limited liability company with its principal place of business at 5005 East McDowell Road, Phoenix, Arizona, 85008. Upon information and belief, Semiconductor Components Industries, LLC, is the principal domestic operating subsidiary of ON Semiconductor Corporation and does business under the name of ON Semiconductor. Upon information and belief, Semiconductor Components Industries, LLC is a wholly-owned subsidiary of ON Semiconductor Corporation.

6. ON Semiconductor designs, manufactures, and markets a comprehensive portfolio of semiconductor products. More specifically, ON Semiconductor describes itself as a supplier of

“intelligent power and sensing technologies that solve the most challenging customer problems.”<sup>1</sup>

ON Semiconductor further describes itself as a “leader in intelligent power and sensing” that has “pivoted our investments to align with the high-growth megatrends in automotive and industrial.”<sup>2</sup>

7. Upon information and belief, Defendants are part of the same corporate structure and distribution chain for the making, importing, designing, manufacturing, offering to sell, selling, and/or using of the ON Semiconductor Accused Products in the United States, including in the state of Delaware generally and in this judicial district in particular. Upon information and belief, Defendants and their affiliates share the same management, common ownership, advertising platforms, facilities, distribution chains and platforms, and product lines involving the ON Semiconductor Accused Products. On information and belief, Defendants and their affiliates act in concert with respect to their infringement of the Greenthread Patents.

8. Upon information and belief, at least some of Defendants’ contracts for sale of ON Semiconductor Accused Products occur through subsidiaries, affiliates, or third-party distributors who provide ON Semiconductor Accused Products to Defendants direct or indirect customers, many of whom incorporate ON Semiconductor Accused Products into finished goods for importation into and sale in the United States. Profits from these sales flow into the United States to Defendants, even if portions of the supply chain for ON Semiconductor Accused Products exist outside the United States.

9. Defendants’ customers include major electronics companies such as Asus, Dell, Hewlett Packard, Lenovo, Western Digital, Samsung, Intel Corporation (“Intel”), and Sony Group Corporation (“Sony”) (collectively “Electronics OEMs”). Upon information and belief, when

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<sup>1</sup> <https://investor.onsemi.com/static-files/e6394327-d8e6-48f9-81ab-2ff550c298e6>

<sup>2</sup> *Id.*

Defendants sell ON Semiconductor Accused Products to Electronics OEMs or auto manufacturers. Defendants understand and intend that a significant portion of these goods will be imported into the United States for use and sale here, even when portions of the supply chain exist outside the United States.

10. Upon information and belief, Defendants' Electronics customers OEMs and auto manufacturer customers procure ON Semiconductor Accused Products through subsidiaries, affiliates, or third-party distributors. Nevertheless, Defendants design their products with these Electronics customers OEMs and auto manufacturer customers in mind. Defendants and these customers understand that the transaction or series of transactions by which ON Semiconductor Accused Products move from Defendants to these customers is in substance Defendants supplying ON Semiconductor Accused Products to these customers.

#### **SUBJECT MATTER JURISDICTION**

11. This action arises under the patent laws of the United States, namely 35 U.S.C. §§ 271, 281, and 284-285, among others.

12. This court has subject matter jurisdiction over the patent infringement claims asserted in this case under 28 U.S.C. §§ 1331 and 1338(a).

#### **PERSONAL JURISDICTION AND VENUE**

13. This Court has specific personal jurisdiction over Defendants because they have committed acts within this District giving rise to this action (including acts of infringement) and have established minimum contacts with this forum such that the exercise of jurisdiction over Defendants would not offend traditional notions of fair play and substantial justice. Such acts include selling ON Semiconductor Accused Products.

14. The Court has general personal jurisdiction over ON Semiconductor Corporation

because it is incorporated in Delaware.

15. The Court has general personal jurisdiction over Semiconductor Components Industries, LLC, because its sole member is a Delaware corporation, ON Semiconductor Corporation.

16. Venue is proper under 28 U.S.C. §§ 1391(b) and 1400(b), because Defendants reside in this District.

17. “ON Semiconductor Accused Products” are products accused of meeting the claim limitations of a Greenthread Patent in this suit. Defendants designs and manufactures semiconductor devices containing transistors and other structures that infringe the Greenthread Patents in the United States. The infringing structures within semiconductor devices have application in many types of devices designed and manufactured by ON Semiconductor, including discrete & power modules, power management, signal conditioning & control, sensors, motor control, custom & audio/video application-specific standard products (ASSP), interfaces, wireless connectivity, and timing, logic, and memory devices.<sup>3</sup>

18. Exhibit 4 demonstrates how exemplary ON Semiconductor Accused Products meet the claim limitations of Greenthread Patents and is herein incorporated by reference.

### **THE GREENTHREAD PATENTS**

19. On December 17, 2019, the U.S. Patent and Trademark Office duly and legally issued U.S. Patent No. 10,510,842 (“the ’842 Patent”), entitled “Semiconductor Devices with Graded Dopant Regions,” listing Dr. Mohan Rao as the inventor, from a patent application filed on May 9, 2017. The ’842 Patent claims priority from U.S. Patent Application No. 10/934,915,<sup>4</sup>

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<sup>3</sup> <https://www.onsemi.com/products>

<sup>4</sup> Pub. No. US 2006/0049464.

filed on September 3, 2004. A true and correct copy of the '842 Patent is attached hereto as Exhibit 1 and incorporated herein by reference.

20. On September 14, 2021, the U.S. Patent and Trademark Office duly and legally issued U.S. Patent No. 11,121,222 (“the '222 Patent”), entitled “Semiconductor Devices with Graded Dopant Regions,” listing Dr. Mohan Rao as the inventor, from a patent application filed on July 27, 2020. The '222 Patent claims priority from U.S. Patent Application No. 10/934,915,<sup>5</sup> filed on September 3, 2004. A true and correct copy of the '222 Patent is attached hereto as Exhibit 2 and incorporated herein by reference.

21. The '842 and the '222 Patents are collectively referred to as the “Greenthread Patents.”

22. Greenthread exclusively owns all rights, title, and interest in the Greenthread Patents necessary to bring this action, including the right to recover past and future damages. Certain of the Greenthread Patents were previously owned by Dr. G.R. Mohan Rao (“Dr. Rao”). On April 27, 2015, Dr. Rao assigned to Greenthread the then-issued Greenthread Patents and all related “continuations, continuations-in-part and extensions of said Applications and Patents and any pending applications or issued patents that directly claim or are amended to claim priority to any of the Applications or Patents.” Dr. Rao’s assignment was recorded with the U.S. Patent and Trademark Office on May 13, 2015, and again on July 22, 2021, and is attached hereto as Exhibit 3. Greenthread has therefore owned all rights to the Greenthread Patents necessary to bring this action throughout the period of ON Semiconductor’s infringement and still owns those rights to the Greenthread Patents.

23. Defendants are not currently licensed to practice the Greenthread Patents.

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<sup>5</sup> Pub. No. US 2006/0049464.

24. The Greenthread Patents are valid and enforceable.

### **FACTUAL BACKGROUND**

25. Dr. G.R. Mohan Rao (“Dr. Rao”), the sole inventor of the Greenthread Patents, has been an innovator in the semiconductor industry since the 1960s. He is a named inventor on more than 100 Patents worldwide and authored numerous technical publications over the last 50 years.

26. In September 1968, Dr. Rao received a Ph.D. in physics with a specialization in electronics from Andhra University in Waltair, India. He then traveled to the United States to attend a graduate program in physics at the University of Cincinnati.

27. After learning of an opportunity to work with Professor William Carr of Southern Methodist University (“SMU”), Dr. Rao transferred to SMU where he earned a Ph.D. in Electrical Engineering. While there, he worked in the SMU laboratory with Jack Kilby of Texas Instruments (a pioneering electrical engineer who would later receive a Nobel Prize for his work), on metal-oxide-silicon transistors (“MOS devices”), which are used for switching and amplifying electronic signals in electronic devices. MOS devices form the basis of modern electronics and are the most widely used semiconductor devices in the world. The U.S. Patent and Trademark Office has called this device a “groundbreaking invention that transformed life and culture around the world.”<sup>6</sup> Dr. Rao built these devices from scratch while a graduate student at SMU.

28. Through his mentor, Jack Kilby, Dr. Rao interviewed with—and was ultimately hired by—Texas Instruments to continue his work on MOS devices in 1972. Dr. Rao worked at Texas Instruments for the next twenty-two years, rising from an engineer to a Senior Fellow. At that time, Texas Instruments had only 12 Senior Fellows out of approximately 20,000 engineers. Eventually, Dr. Rao moved into a management position at Texas Instruments, ultimately becoming

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<sup>6</sup> <https://www.uspto.gov/about-us/news-updates/remarks-director-iancu-2019-international-lectual-property-conference>

a Senior Vice President in 1985.

29. At Texas Instruments, Dr. Rao received his first patent while working in a process and product engineering capacity to solve a production problem with Texas Instruments' 4-kilobit RAM product. That patent was merely the beginning of Dr. Rao's long inventive career. Indeed, from the late 1970s through the mid-1980s, Dr. Rao worked on or managed projects relating to Texas Instruments' 64kb RAM, 256Kb RAM, 1Mb RAM, 4 Mb RAM, EEPROM, SRAM, and microcontrollers. For that work, Dr. Rao received numerous additional U.S. Patents.

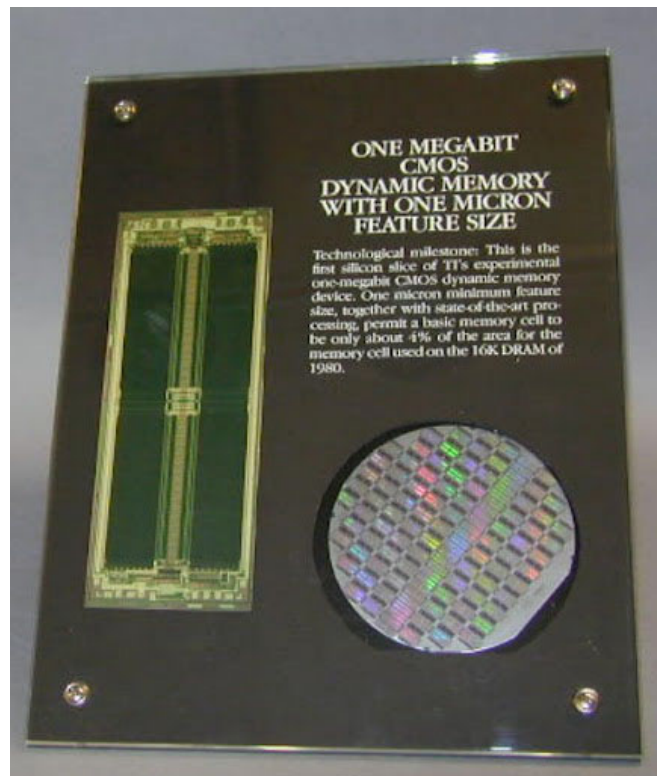
30. The USPTO was not the only organization to recognize Dr. Rao's achievements. Some of Dr. Rao's work at Texas Instruments was so remarkable that it has been credited in multiple exhibits in the National Museum of American History at the Smithsonian Institution.<sup>7</sup> For example, the Smithsonian has displayed Texas Instruments' experimental 1-megabit CMOS DRAM, produced in April 1985 under Dr. Rao's leadership, and credited Dr. Rao for the achievement.<sup>8</sup>

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<sup>7</sup> <http://smithsonianchips.si.edu/texas/wafer.htm>

<sup>8</sup> [http://smithsonianchips.si.edu/texas/t\\_360.htm](http://smithsonianchips.si.edu/texas/t_360.htm)





31. In 1994, Dr. Rao left Texas Instruments for Cirrus Logic. During his two-year tenure at Cirrus Logic, he received more U.S. Patents relating to his work on integrated graphics controllers and memory.

32. In 1996, Dr. Rao started a company called Silicon Aquarius. Through a relationship between Silicon Aquarius and Matsushita, Dr. Rao led a design team in working on a 256Mb DRAM chip. After Silicon Aquarius ceased operations, Dr. Rao did consulting work for a number of different consulting companies and devoted much of his free time to thinking about various challenges and problems with which the semiconductor industry had struggled for years.

33. In 2003, Dr. Rao and Philip John founded Greenthread to continue Dr. Rao's pioneering work. A focal point of Dr. Rao's research was poor refresh time and the related problem of how to deal with and control the movement of both wanted and unwanted carriers in semiconductor devices, including memory and logic devices. Dr. Rao realized that graded dopants

could be used to create a “drift layer” and other structures to facilitate the movement—in an upward or downward direction, as appropriate—of carriers from the semiconductor surfaces down into the substrate and vice versa. It was Dr. Rao’s work on this problem that culminated in the Greenthread Patents.

### **ON SEMICONDUCTOR’S INFRINGEMENT**

34. ON Semiconductor has directly infringed, and continues to infringe, one or more claims of each of the Greenthread Patents through making, using, offering to sell, selling within the United States, and/or importing into the United States semiconductor products, including AR0820AT, that practice the claimed inventions (*i.e.*, the ON Semiconductor Accused Products). A non-exhaustive, exemplary list of the types or categories of products or devices that infringe are further identified in Exhibit 4.

35. The exemplary transistors are representative of how all the transistors in the ON Semiconductor Accused Products function. Using any one of these transistors therefore infringes. Additionally, even if some transistors in ON Semiconductor’s devices were not accused, with millions of transistors in the accused products, it is not possible for ordinary users to distinguish among transistors in the device or configure the device to only use some transistors. When using an accused product, infringement is inevitable.

36. Further, in concert with others, including ON Semiconductor authorized distributors and customers, ON Semiconductor caused infringing products to be made, used, offered to be sold, sold within the United States, and/or imported into the United States. ON Semiconductor has knowledge of the Greenthread patents at least through the service of the Complaint.

37. ON Semiconductor manufactures and tests ON Semiconductor Accused Products

in the United States at manufacturing facilities around the country.<sup>9</sup>

38. As shown in Exhibit 4, the exemplary ON Semiconductor Accused Product, AR0820AT, meets each and every element of at least one claim of the Greenthread Patents.

39. Upon information and belief, ON Semiconductor fabricates and designs the ON Semiconductor Accused Products using similar designs according to a limited number of processes, many or all of which utilize substantially similar process steps, including process steps for creating regions with graded dopant concentrations, because the invention would have application in those categories of products, for example by improving switching time in transistors in the ON Semiconductor Accused Products. Upon information and belief, the ON Semiconductor Accused Products are in relevant part substantially similar to the exemplary AR0820AT shown in Exhibit 4, particularly with regard to the manner in which the exemplary AR0820AT includes and utilizes regions with graded dopant concentrations. Exhibit 4 is thus illustrative of the manner in which the ON Semiconductor Accused Products meet the claim limitations of the Greenthread Patents.<sup>10</sup>

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<sup>9</sup> <https://www.onsemi.com/company/about-onsemi/locations>

<sup>10</sup> Multiple courts have upheld Greenthread's construction of the Greenthread Patents in related matters. In *Greenthread, LLC v. Samsung Electronics Co., Ltd. et al.*, Case No. 2:19-cv-00147-JRG (E.D. Tex.), the Eastern District of Texas Court adopted Greenthread's claim construction. See Dkt. 67. In *Greenthread, LLC v. Intel Corp., et al.*, Case No. 6:22-cv-00105-ADA (W.D. Tex.), the Western District of Texas similarly issued a preliminary claim construction order adopting Greenthread's construction. See Dkt. 36-21 in *Greenthread, LLC v. Intel Corp.*, Case No. 3:22-cv-02001-JR (attaching as an exhibit the Western District of Texas's preliminary claim construction order in a status update before the District of Oregon). The claims in this matter against Intel were ultimately severed and transferred to Oregon, and the District of Oregon adopted the Western District of Texas' preliminary claim construction. See Dkt. 44 ("The Court also finds that the WDTX's preliminary constructions and summary judgment rulings are neither legally incorrect nor factually distinguishable. As a result, the Court adopts the WDTX's preliminary constructions and summary judgment rulings as its own. . ."). The Western District of Texas also denied Defendants' motions to dismiss and for summary judgment on similar grounds. See Dkt. 36-22 in *Greenthread, LLC v. Intel Corp.*, Case no. 3:22-cv-02001-JR (attaching as an exhibit the Western District of Texas' denial of Defendants' motion for summary judgment); Dkt. 110 in *Greenthread*

**ON SEMICONDUCTOR'S KNOWLEDGE AND INTENTION OF DIRECT  
INFRINGEMENT BY OTHERS**

40. ON Semiconductor designs the ON Semiconductor Accused Products and accordingly understands how its products work, including how current flows in the individual transistors in each of the ON Semiconductor Accused Products. The infringing doping configurations of individual transistors in the ON Semiconductor Accused Products do not depend on how said products are used or configured. The ON Semiconductor Accused Products necessarily infringe on the Greenthread Patents, because the claims apply to the dopant profile (*i.e.*, chemical composition and electrical properties) of any one of the millions of transistors within the ON Semiconductor Accused Products. Ex 4, Tech Insights Report at Cover, 11. Put differently, users and re-sellers of ON Semiconductor's chips do not change the chemical composition of the millions of the chips' transistors or otherwise affect infringement. Any use, offer to sell, sale, or importation into the United States of an ON Semiconductor Accused Product directly infringes on the Greenthread Patents under 35 U.S.C. § 271(a) ("[W]hoever ... uses, offers to sell, or sells any patented invention ... infringes the patent."). Therefore, ON Semiconductor knows that its distributors (who sell and offer to sell the accused products) and end users (who use the accused products) infringe directly. Further, since becoming aware of Greenthread's infringement allegations since the filing of the original Complaint on April 24, 2023, ON Semiconductor has knowledge specifically that the ON Semiconductor Accused Products infringe but have not ceased sales.

41. For example, ON Semiconductor is a supplier to the California-based Leopard

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*LLC v. Intel Corp.*, Case No. 6:22-cv-00105-ADA (W.D. Tex). The District of Oregon similarly adopted these rulings. *See* Dkt. 44 in *Greenthread, LLC v. Intel Corp.*, Case no. 3:22-cv-02001-JR.

Imaging. Leopard Imaging infringes Greenthread's Patents by incorporating ON Semiconductor Accused Product AR0820 into its LI-AR0820-GMSL2-060H camera and selling, offering for sale, testing, and importing the LI-AR0820-GMSL2-060H in the United States.<sup>11</sup> By providing Leopard Imaging with ON Semiconductor Accused Products for incorporation into Leopard Imaging products, ON Semiconductor induces and intends for Leopard Imaging to use, sell, offer for sale, or import ON Semiconductor Accused Products in Leopard Imaging products. Therefore, ON Semiconductor induces infringement by Leopard Imaging.

42. ON Semiconductor publicly states that it "serve[s] a broad base of end-user markets, with a primary focus towards automotive" applications. The exemplary AR0820AT accused product is intended for automotive applications. Defendants sell ON Semiconductor Accused Products to auto manufacturers and/or their suppliers with the knowledge and intent that these products will be used, sold, or imported into the United States as part of automobiles. End-users of ON Semiconductor Accused Products include drivers of automobiles incorporating ON Semiconductor Accused Products.<sup>12</sup> By virtue of ON Semiconductor's knowledge of how its products function and the Greenthread Patents, ON Semiconductor knows and intends for these automobile users to infringe by using their automobiles in the United States.

43. Defendants sell ON Semiconductor Accused Products to Electronics OEMs. By virtue of ON Semiconductor's knowledge of how its products function and the Greenthread Patents, ON Semiconductor knows and intends for Electronics OEMs to infringe by selling, offering to sell, using and/or importing into the United States Electronics OEM products

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<sup>11</sup> <https://leopardimaging.com/product/automotive-cameras/cameras-by-interface/maxim-gmsl-2-cameras/li-ar0820-gmsl2/li-ar0820-gmsl2-060h/>

<sup>12</sup> <https://investor.onsemi.com/static-files/30dc7e07-6ded-43bb-92e5-69fa4f773500> at 8

containing ON Semiconductor Accused Products. ON Semiconductor further knows and intends that end-users of Electronics OEM products will infringe by using Electronics OEM products containing ON Semiconductor Accused Products.

**ON SEMICONDUCTOR SALES TO INTEL**

44. ON Semiconductor sells or has within the last six years sold ON Semiconductor Accused Products to Intel.

45. ON Semiconductor affiliates sell or within the last six years have sold ON Semiconductor Accused Products to Intel.

46. ON Semiconductor sells or within the last six years has sold ON Semiconductor Accused Products to Intel affiliates.

47. ON Semiconductor affiliates sell or within the last six years have sold ON Semiconductor Accused Products to Intel affiliates.

48. ON Semiconductor has caused Intel to receive, obtain, or otherwise acquire ON Semiconductor Accused Products in the last six years.

49. ON Semiconductor has caused Intel affiliates to receive, obtain, or otherwise acquire ON Semiconductor Accused Products in the last six years.

50. ON Semiconductor affiliates have caused Intel to receive, obtain, or otherwise acquire ON Semiconductor Accused Products in the last six years.

51. ON Semiconductor affiliates have caused Intel affiliates to receive, obtain, or otherwise acquire ON Semiconductor Accused Products in the last six years.

52. Intel incorporates or has incorporated in the last six years ON Semiconductor Accused Products into Intel-branded products sold in the United States.

53. Intel affiliates incorporate or have incorporated in the last six years ON

Semiconductor Accused Products into Intel-branded products sold in the United States.

54. At least one contract governing a transaction described in Paragraphs 44–47 obligate ON Semiconductor to indemnify Intel for claims of patent infringement relating to ON Semiconductor Accused Products.

55. At least one contract governing a transaction described in Paragraphs 44–47 provides for ON Semiconductor to assume control of litigation against Intel for claims of patent infringement relating to ON Semiconductor Accused Products.

56. At least one transaction described in Paragraphs 44–47 was covered by a license to Greenthread’s Patents.

57. At least one contract governing a transaction described in Paragraphs 48–51 obligates ON Semiconductor to indemnify Intel for claims of patent infringement relating to ON Semiconductor Accused Products.

58. At least one contract governing a transaction described in Paragraphs 48–51 provides for ON Semiconductor to assume control of litigation against Intel for claims of patent infringement relating to ON Semiconductor Accused Products.

59. At least one transaction described in Paragraphs 48–51 was covered by a license to Greenthread’s Patents.

**A. Intel and NCP81255**

60. ON Semiconductor sells or has within the last six years sold ON Semiconductor Accused Product NCP81255 to Intel.

61. ON Semiconductor affiliates sell or within the last six years have sold ON Semiconductor Accused Product NCP81255 to Intel.

62. ON Semiconductor sells or within the last six years has sold ON Semiconductor Accused Product NCP81255 to Intel affiliates.

63. ON Semiconductor affiliates sell or within the last six years have sold ON Semiconductor Accused Product NCP81255 to Intel affiliates.

64. ON Semiconductor has caused Intel to receive, obtain, or otherwise acquire ON Semiconductor Accused Product NCP81255 in the last six years.

65. ON Semiconductor has caused Intel affiliates to receive, obtain, or otherwise acquire ON Semiconductor Accused Product NCP81255 in the last six years.

66. ON Semiconductor affiliates have caused Intel to receive, obtain, or otherwise acquire ON Semiconductor Accused Product NCP81255 in the last six years.

67. ON Semiconductor affiliates have caused Intel affiliates to receive, obtain, or otherwise acquire ON Semiconductor Accused Product NCP81255 in the last six years.

68. Intel incorporates or has incorporated in the last six years ON Semiconductor Accused Product NCP81255 into Intel-branded products.

69. Intel affiliates incorporate or have incorporated in the last six years ON Semiconductor Accused Product NCP81255 into Intel-branded products.

70. At least one contract governing a transaction described in Paragraphs 60–63 obligate ON Semiconductor to indemnify Intel for claims of patent infringement relating to ON Semiconductor Accused Product NCP81255.

71. At least one contract governing a transaction described in Paragraphs 60–63 provide for ON Semiconductor to assume control of litigation against Intel for claims of patent infringement relating to ON Semiconductor Accused Product NCP81255.

72. At least one transaction described in Paragraphs 60–63 involving ON Semiconductor Accused Product NCP81255 was covered by a license to Greenthread's Patents.

73. At least one contract governing the transactions described in Paragraphs 64–67



obligate ON Semiconductor to indemnify Intel for claims of patent infringement relating to ON Semiconductor Accused Product NCP81255.

74. At least one contract governing a transaction described in Paragraphs 64–67 provide for ON Semiconductor to assume control of litigation against Intel for claims of patent infringement relating to ON Semiconductor Accused Product NCP81255.

75. At least one transaction described in Paragraphs 64–67 involving ON Semiconductor Accused Product NCP81255 was covered by a license to Greenthread’s Patents.

**B. Intel and NB3L202KMNTXG**

76. ON Semiconductor sells or has within the last six years sold ON Semiconductor Accused Product NB3L202KMNTXG to Intel.

77. ON Semiconductor affiliates sell or within the last six years have sold ON Semiconductor Accused Product NB3L202KMNTXG to Intel.

78. ON Semiconductor sells or within the last six years has sold ON Semiconductor Accused Product NB3L202KMNTXG to Intel affiliates.

79. ON Semiconductor affiliates sell or within the last six years have sold ON Semiconductor Accused Product NB3L202KMNTXG to Intel affiliates.

80. ON Semiconductor has caused Intel to receive, obtain, or otherwise acquire ON Semiconductor Accused Product NB3L202KMNTXG in the last six years.

81. ON Semiconductor has caused Intel affiliates to receive, obtain, or otherwise acquire ON Semiconductor Accused Product NB3L202KMNTXG in the last six years.

82. ON Semiconductor affiliates have caused Intel to receive, obtain, or otherwise acquire ON Semiconductor Accused Product NB3L202KMNTXG in the last six years.

83. ON Semiconductor affiliates have caused Intel affiliates to receive, obtain, or otherwise acquire ON Semiconductor Accused Product NB3L202KMNTXG in the last six years.

84. Intel incorporates or has incorporated in the last six years ON Semiconductor Accused Product NB3L202KMNTXG into Intel-branded products.

85. Intel affiliates incorporate or have incorporated in the last six years ON Semiconductor Accused Product NB3L202KMNTXG into Intel-branded products.

86. At least one contract governing the transactions described in Paragraphs 76–79 obligate ON Semiconductor to indemnify Intel for claims of patent infringement relating to ON Semiconductor Accused Product NB3L202KMNTXG.

87. At least one contract governing a transaction described in Paragraphs 76–79 provides for ON Semiconductor to assume control of litigation against Intel for claims of patent infringement relating to ON Semiconductor Accused Product NB3L202KMNTXG.

88. At least one transaction described in Paragraphs 76–79 involving ON Semiconductor Accused Product NB3L202KMNTXG was covered by a license to Greenthread's Patents.

89. At least one contract governing the transactions described in Paragraphs 80–83 obligate ON Semiconductor to indemnify Intel for claims of patent infringement relating to ON Semiconductor Accused Product NB3L202KMNTXG.

90. At least one contract governing a transaction described in Paragraphs 80–83 provide for ON Semiconductor to assume control of litigation against Intel for claims of patent infringement relating to ON Semiconductor Accused Product NB3L202KMNTXG.

91. At least one transaction described in Paragraphs 80–83 involving ON Semiconductor Accused Product NB3L202KMNTXG was covered by a license to Greenthread's Patents.

**C. Intel and NB3L204KMNTXG**

92. ON Semiconductor sells or has within the last six years sold ON Semiconductor

Accused Product NB3L204KMNTXG to Intel.

93. ON Semiconductor affiliates sell or within the last six years have sold ON Semiconductor Accused Product NB3L204KMNTXG to Intel.

94. ON Semiconductor sells or within the last six years has sold ON Semiconductor Accused Product NB3L204KMNTXG to Intel affiliates.

95. ON Semiconductor affiliates sell or within the last six years have sold ON Semiconductor Accused Product NB3L204KMNTXG to Intel affiliates.

96. ON Semiconductor has caused Intel to receive, obtain, or otherwise acquire ON Semiconductor Accused Product NB3L204KMNTXG in the last six years.

97. ON Semiconductor has caused Intel affiliates to receive, obtain, or otherwise acquire ON Semiconductor Accused Product NB3L204KMNTXG in the last six years.

98. ON Semiconductor affiliates have caused Intel to receive, obtain, or otherwise acquire ON Semiconductor Accused Product NB3L204KMNTXG in the last six years.

99. ON Semiconductor affiliates have caused Intel affiliates to receive, obtain, or otherwise acquire ON Semiconductor Accused Product NB3L204KMNTXG in the last six years.

100. Intel incorporates or has incorporated in the last six years ON Semiconductor Accused Product NB3L204KMNTXG into Intel-branded products.

101. Intel affiliates incorporate or have incorporated in the last six years ON Semiconductor Accused Product NB3L204KMNTXG into Intel-branded products.

102. At least one contract governing the transactions described in Paragraphs 92–95 obligate ON Semiconductor to indemnify Intel for claims of patent infringement relating to ON Semiconductor Accused Product NB3L204KMNTXG.

103. At least one contract governing a transaction described in Paragraphs 92–95

provides for ON Semiconductor to assume control of litigation against Intel for claims of patent infringement relating to ON Semiconductor Accused Product NB3L204KMNTXG.

104. At least one transaction described in Paragraphs 92–95 involving ON Semiconductor Accused Product NB3L204KMNTXG was covered by a license to Greenthread’s Patents.

105. At least one contract governing the transactions described in Paragraphs 96–99 obligate ON Semiconductor to indemnify Intel for claims of patent infringement relating to ON Semiconductor Accused Product NB3L204KMNTXG.

106. At least one contract governing a transaction described in Paragraphs 96–99 provide for ON Semiconductor to assume control of litigation against Intel for claims of patent infringement relating to ON Semiconductor Accused Product NB3L204KMNTXG.

107. At least one transaction described in Paragraphs 96–99 involving ON Semiconductor Accused Product NB3L204KMNTXG was covered by a license to Greenthread’s Patents.

**D. Intel and NB3L208KMNTXG**

108. ON Semiconductor sells or has within the last six years sold ON Semiconductor Accused Product NB3L208KMNTXG to Intel.

109. ON Semiconductor affiliates sell or within the last six years have sold ON Semiconductor Accused Product NB3L208KMNTXG to Intel.

110. ON Semiconductor sells or within the last six years has sold ON Semiconductor Accused Product NB3L208KMNTXG to Intel affiliates.

111. ON Semiconductor affiliates sell or within the last six years have sold ON Semiconductor Accused Product NB3L208KMNTXG to Intel affiliates.

112. ON Semiconductor has caused Intel to receive, obtain, or otherwise acquire ON

Semiconductor Accused Product NB3L208KMNTXG in the last six years.

113. ON Semiconductor has caused Intel affiliates to receive, obtain, or otherwise acquire ON Semiconductor Accused Product NB3L208KMNTXG in the last six years.

114. ON Semiconductor affiliates have caused Intel to receive, obtain, or otherwise acquire ON Semiconductor Accused Product NB3L208KMNTXG in the last six years.

115. ON Semiconductor affiliates have caused Intel affiliates to receive, obtain, or otherwise acquire ON Semiconductor Accused Product NB3L208KMNTXG in the last six years.

116. Intel incorporates or has incorporated in the last six years ON Semiconductor Accused Product NB3L208KMNTXG into Intel-branded products.

117. Intel affiliates incorporate or have incorporated in the last six years ON Semiconductor Accused Product NB3L208KMNTXG into Intel-branded products.

118. At least one contract governing the transactions described in Paragraphs 108–111 obligate ON Semiconductor to indemnify Intel for claims of patent infringement relating to ON Semiconductor Accused Product NB3L208KMNTXG.

119. At least one contract governing a transaction described in Paragraphs 108–111 provides for ON Semiconductor to assume control of litigation against Intel for claims of patent infringement relating to ON Semiconductor Accused Product NB3L208KMNTXG.

120. At least one transaction described in Paragraphs 108–111 involving ON Semiconductor Accused Product NB3L208KMNTXG was covered by a license to Greenthread's Patents.

121. At least one contract governing the transactions described in Paragraphs 112–115 obligate ON Semiconductor to indemnify Intel for claims of patent infringement relating to ON Semiconductor Accused Product NB3L208KMNTXG.

122. At least one contract governing a transaction described in Paragraphs 112–115 provide for ON Semiconductor to assume control of litigation against Intel for claims of patent infringement relating to ON Semiconductor Accused Product NB3L208KMNTXG.

123. At least one transaction described in Paragraphs 112–115 involving ON Semiconductor Accused Product NB3L208KMNTXG was covered by a license to Greenthread's Patents.

**E. Intel and NB3N1900KMNTXG**

124. ON Semiconductor sells or has within the last six years sold ON Semiconductor Accused Product NB3N1900KMNTXG to Intel.

125. ON Semiconductor affiliates sell or within the last six years have sold ON Semiconductor Accused Product NB3N1900KMNTXG to Intel.

126. ON Semiconductor sells or within the last six years has sold ON Semiconductor Accused Product NB3N1900KMNTXG to Intel affiliates.

127. ON Semiconductor affiliates sell or within the last six years have sold ON Semiconductor Accused Product NB3N1900KMNTXG to Intel affiliates.

128. ON Semiconductor has caused Intel to receive, obtain, or otherwise acquire ON Semiconductor Accused Product NB3N1900KMNTXG in the last six years.

129. ON Semiconductor has caused Intel affiliates to receive, obtain, or otherwise acquire ON Semiconductor Accused Product NB3N1900KMNTXG in the last six years.

130. ON Semiconductor affiliates have caused Intel to receive, obtain, or otherwise acquire ON Semiconductor Accused Product NB3N1900KMNTXG in the last six years.

131. ON Semiconductor affiliates have caused Intel affiliates to receive, obtain, or otherwise acquire ON Semiconductor Accused Product NB3N1900KMNTXG in the last six years.

132. Intel incorporates or has incorporated in the last six years ON Semiconductor

Accused Product NB3N1900KMNTXG into Intel-branded products.

133. Intel affiliates incorporate or have incorporated in the last six years ON Semiconductor Accused Product NB3N1900KMNTXG into Intel-branded products.

134. At least one contract governing the transactions described in Paragraphs 124–127 obligate ON Semiconductor to indemnify Intel for claims of patent infringement relating to ON Semiconductor Accused Product NB3N1900KMNTXG.

135. At least one contract governing a transaction described in Paragraphs 124–127 provides for ON Semiconductor to assume control of litigation against Intel for claims of patent infringement relating to ON Semiconductor Accused Product NB3N1900KMNTXG.

136. At least one transaction described in Paragraphs 124–127 involving ON Semiconductor Accused Product NB3N1900KMNTXG was covered by a license to Greenthread's Patents.

137. At least one contract governing the transactions described in Paragraphs 128–131 obligate ON Semiconductor to indemnify Intel for claims of patent infringement relating to ON Semiconductor Accused Product NB3N1900KMNTXG.

138. At least one contract governing a transaction described in Paragraphs 128–131 provide for ON Semiconductor to assume control of litigation against Intel for claims of patent infringement relating to ON Semiconductor Accused Product NB3N1900KMNTXG.

139. At least one transaction described in Paragraphs 128–131 involving ON Semiconductor Accused Product NB3N1900KMNTXG was covered by a license to Greenthread's Patents.

**ON SEMICONDUCTOR SALES TO SONY**

140. ON Semiconductor sells or has within the last six years sold ON Semiconductor

Accused Products to Sony.

141. ON Semiconductor affiliates sell or within the last six years have sold ON Semiconductor Accused Products to Sony.

142. ON Semiconductor sells or within the last six years has sold ON Semiconductor Accused Products to Sony affiliates.

143. ON Semiconductor affiliates sell or within the last six years have sold ON Semiconductor Accused Products to Sony affiliates.

144. ON Semiconductor has caused Sony to receive, obtain, or otherwise acquire ON Semiconductor Accused Products in the last six years.

145. ON Semiconductor has caused Sony affiliates to receive, obtain, or otherwise acquire ON Semiconductor Accused Products in the last six years.

146. ON Semiconductor affiliates have caused Sony to receive, obtain, or otherwise acquire ON Semiconductor Accused Products in the last six years.

147. ON Semiconductor affiliates have caused Sony affiliates to receive, obtain, or otherwise acquire ON Semiconductor Accused Products in the last six years.

148. Sony incorporates or has incorporated in the last six years ON Semiconductor Accused Products into Sony-branded products sold in the United States.

149. Sony affiliates incorporate or have incorporated in the last six years ON Semiconductor Accused Products into Sony-branded products sold in the United States.

150. At least one contract governing a transaction described in Paragraphs 140–143 obligate ON Semiconductor to indemnify Sony for claims of patent infringement relating to ON Semiconductor Accused Products.

151. At least one contract governing a transaction described in Paragraphs 140–143



provide for ON Semiconductor to assume control of litigation against Sony for claims of patent infringement relating to ON Semiconductor Accused Products.

152. At least one transaction described in Paragraphs 140–143 was covered by a license to Greenthread’s Patents.

153. At least one contract governing a transaction described in Paragraphs 144–147 obligate ON Semiconductor to indemnify Sony for claims of patent infringement relating to ON Semiconductor Accused Products.

154. At least one contract governing a transaction described in Paragraphs 144–147 provide for ON Semiconductor to assume control of litigation against Sony for claims of patent infringement relating to ON Semiconductor Accused Products.

155. At least one transaction described in Paragraphs 144–147 was covered by a license to Greenthread’s Patents.

**A. Sony and NCP252160**

156. ON Semiconductor sells or has within the last six years sold ON Semiconductor Accused Product NCP252160 to Sony.

157. ON Semiconductor affiliates sell or within the last six years have sold ON Semiconductor Accused Product NCP252160 to Sony.

158. ON Semiconductor sells or within the last six years has sold ON Semiconductor Accused Product NCP252160 to Sony affiliates.

159. ON Semiconductor affiliates sell or within the last six years have sold ON Semiconductor Accused Product NCP252160 to Sony affiliates.

160. ON Semiconductor has caused Sony to receive, obtain, or otherwise acquire ON Semiconductor Accused Product NCP252160 in the last six years.

161. ON Semiconductor has caused Sony affiliates to receive, obtain, or otherwise

acquire ON Semiconductor Accused Product NCP252160 in the last six years.

162. ON Semiconductor affiliates have caused Sony to receive, obtain, or otherwise acquire ON Semiconductor Accused Product NCP252160 in the last six years.

163. ON Semiconductor affiliates have caused Sony affiliates to receive, obtain, or otherwise acquire ON Semiconductor Accused Product NCP252160 in the last six years.

164. Sony incorporates or has incorporated in the last six years ON Semiconductor Accused Product NCP252160 into Sony-branded products sold in the United States,

165. Sony affiliates incorporate or have incorporated in the last six years ON Semiconductor Accused Product NCP252160 into Sony-branded products sold in the United States.

166. Sony incorporates or has incorporated in the last six years ON Semiconductor Accused Product NCP252160 into the Sony PlayStation.

167. Sony affiliates incorporate or have incorporated in the last six years ON Semiconductor Accused Product NCP252160 into the Sony PlayStation.

168. At least one contract governing the transactions described in Paragraphs 156–159 obligate ON Semiconductor to indemnify Sony for claims of patent infringement relating to ON Semiconductor Accused Product NCP252160.

169. At least one contract governing a transaction described in Paragraphs 156–159 provide for ON Semiconductor to assume control of litigation against Sony for claims of patent infringement relating to ON Semiconductor Accused Product NCP252160.

170. At least one transaction described in Paragraphs 156–159 was covered by a license to Greenthread's Patents.

171. At least one contract governing the transactions described in Paragraphs 160–163

obligate ON Semiconductor to indemnify Sony for claims of patent infringement relating to ON Semiconductor Accused Product NCP252160.

172. At least one contract governing a transaction described in Paragraphs 160–163 provide for ON Semiconductor to assume control of litigation against Sony for claims of patent infringement relating to ON Semiconductor Accused Product NCP252160.

173. At least one transaction described in Paragraphs 160–163 was covered by a license to Greenthread’s Patents.

#### **ON SEMICONDUCTOR SALES TO ELECTRONICS DISTRIBUTORS**

174. ON Semiconductor’s U.S. distributors also include Mouser Electronics,<sup>13</sup> Digikey,<sup>14</sup> and Arrow Electronics.<sup>15</sup> All three are authorized ON Semiconductor distributors in the U.S.<sup>16</sup> and sell ON Semiconductor Accused Products through dedicated “OnSemi” product pages in the U.S. Thus, all three are direct infringers, as are their customers who purchase and use accused products.

175. Mouser currently offers for sale an infringing Leopard Imaging product.

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<sup>13</sup> <https://www.mouser.com/manufacturer/onsemi/>

<sup>14</sup> <https://www.digikey.com/en/supplier-centers/onsemi>

<sup>15</sup> <https://www.arrow.com/en/manufacturers/on-semiconductor>

<sup>16</sup> <https://www.onsemi.com/support/sales> (listing Arrow, Digi-Key, Mouser, and other distributors).

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**Mouser #:** 931-LIAR082GMSL2060H

**Mfr. #:** LI-AR0820-GMSL2-060H

**Mfr.:** Leopard Imaging

**Customer #:**

**Description:** Cameras & Camera Modules ONSem AR0820 8.3M CMOS SensorActive Pixels: 3840H x 2160V

**Datasheet:** [LI-AR0820-GMSL2-060H Datasheet \(PDF\)](#)

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**Stock:** 1 Can Ship Immediately

**Enter Quantity:** Minimum: 1 Multiples: 1

**Pricing (USD)**

Qty.	Unit Price	Ext. Price
1	\$523.82	\$523.82
10	\$503.72	\$5,037.20

**FEATURED PRODUCTS**  
**LEOPARD IMAGING**



**LI-IMX424-GW5400-  
FPDLINKIII-120H Camera**

Features a Sony diagonal 9.69mm (Type 1/1.7) CMOS imager sensor

### **COUNT I: INFRINGEMENT OF U.S. PATENT NO. 10,510,842**

176. Greenthread incorporates by reference and re-alleges all of the foregoing paragraphs of this Complaint and exhibits attached hereto as if fully set forth herein.

177. The following allegations are based on publicly available information and a reasonable investigation of the structure and operation of the ON Semiconductor Accused Products. Greenthread reserves the right to modify this description, including, for example, on the basis of information about the ON Semiconductor Accused Products that it obtains during discovery.

178. As alleged above and in Exhibit 4, the products analyzed in Exhibit 4 meet each and every one of the claim limitations of at least one claim of the '842 Patent.

179. As alleged above, the products analyzed in Exhibit 4 are exemplary of the ON Semiconductor Accused Products.

180. As alleged above, Defendants have infringed and continue to infringe at least one

claim of the '842 Patent by making, using, offering to sell, selling within the United States, and/or importing into the United States ON Semiconductor Accused Products.

181. As alleged above, ON Semiconductor induced infringement of at least one claim of the '842 Patent by designing and marketing infringing products for sale, use, and importation into the United States.

182. Defendants' infringement has damaged and continues to damage Greenthread in an amount yet to be determined, of at least a reasonable royalty.

**COUNT II: INFRINGEMENT OF U.S. PATENT NO. 11,121,222**

183. Greenthread incorporates by reference and re-alleges all of the foregoing paragraphs of this Complaint and exhibits attached hereto as if fully set forth herein.

184. The following allegations are based on publicly available information and a reasonable investigation of the structure and operation of the ON Semiconductor Accused Products. Greenthread reserves the right to modify this description, including, for example, on the basis of information about the ON Semiconductor Accused Products that it obtains during discovery.

185. As alleged above and in Exhibit 4, the products analyzed in Exhibit 4 meet each and every one of the claim limitations of at least one claim of the '222 Patent.

186. As alleged above, the products analyzed in Exhibit 4 are exemplary of the ON Semiconductor Accused Products.

187. As alleged above, Defendants have infringed and continue to infringe at least one claim of the '222 Patent by making, using, offering to sell, selling within the United States, and/or importing into the United States ON Semiconductor Accused Products.

188. As alleged above, ON Semiconductor induced infringement of at least one claim of

the '222 Patent by designing and marketing infringing products for sale, use, and importation into the United States.

189. Defendants' infringement has damaged and continues to damage Greenthread in an amount yet to be determined, of at least a reasonable royalty.

### **DAMAGES**

190. As a result of Defendants' acts of infringement, Greenthread has suffered and continues to suffer actual and consequential damages. However, Greenthread does not yet know the full extent of the infringement and the amount of damages cannot be ascertained except through discovery and special accounting. To the fullest extent permitted by law, Greenthread seeks recovery of damages at least for reasonable royalties, unjust enrichment, and benefits received by Defendant as a result of using the patented technology. Greenthread further seeks any other damages to which Greenthread is entitled under law or in equity.

### **DEMAND FOR JURY TRIAL**

191. Greenthread hereby demands a jury trial for all issues so triable.

### **PRAYER FOR RELIEF**

WHEREFORE, Greenthread respectfully requests that this Court enter judgment in its favor as follows:

- A. That Judgment be entered that Defendants have infringed one or more claims of the Greenthread Patents, literally and under the doctrine of equivalents;
- B. That, in accordance with 35 U.S.C. § 283, Defendants and all their affiliates, employees, agents, officers, directors, attorneys, successors, and assigns and all those acting on behalf of or in active concert or participation with any of them, be preliminarily and permanently

enjoined from (1) infringing the Greenthread Patents and (2) making, using, selling, and offering for sale, or importing into the United States, the ON Semiconductor Accused Products;

- C. An award of damages sufficient to compensate Greenthread for Defendants' infringement under 35 U.S.C. § 284;
- D. That the case be found exceptional under 35 U.S.C. § 285 and that Greenthread be awarded its reasonable attorneys' fees;
- E. Costs and expenses in this action;
- F. An award of prejudgment and post-judgment interest; and
- G. Such other and further relief as the Court may deem just and proper.

Dated: November 22, 2023

Respectfully submitted,

FARNAN LLP

/s/ Brian E. Farnan

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