



Declaratory Judgment Action”). This prior declaratory judgment action remains pending and active in this District.

2. The '998 patent is titled “Linearized Optical Digital-to-Analog Modulator” and issued on May 24, 2022. The patent is directed to methods and systems for converting digital data into modulated optical signals. Because a copy of the '998 patent is not yet available from the United States Patent and Trademark Office (“USPTO”) in downloadable form, attached as Exhibit A is a compilation of the relevant excerpts from the prosecution file history of the application from which the '998 patent matured (U.S. Patent Application 17/481,904), *i.e.*, the Issue Notification (identifying the '998 patent number); the Issue Classification (identifying the final, as-issued claim numbering for the allowed application claims); a listing of the allowed claims; and a copy of the specification as originally filed with the USPTO in connection with U.S. Patent Application 17/481,904.

3. The '998 patent is the latest patent to issue in a family of patents that have been the subject of an ongoing dispute between Ramot, Cisco, and Acacia dating back to 2014, when Ramot first sued Cisco on two ancestor patents of the '998 patent in the Eastern District of Texas. These two patents—U.S. Patent No. 8,044,835 and U.S. Patent No. 8,797,198—were the first to issue in the “Linearized Optical Digital-to-Analog Modulator” family. Ramot voluntarily dismissed that suit in February 2015, approximately three months after filing it, but continued to pursue prosecution of child patents in the family. Since the filing of its original lawsuit, Ramot has been obtaining patents tracing back to the two originally-asserted patents and then suing Cisco, and more recently also Acacia, on each newly-issued patent in the “Linearized Optical Digital-to-Analog Modulator” family.

4. In June 2019, Ramot sued Cisco in the Eastern District of Texas on three patents from the “Linearized Optical Digital-to-Analog Modulator” family it had obtained since dismissing its 2014 action against Cisco—U.S. Patent No. 10,270,535 (the “’535 patent”); U.S. Patent No. 10,033,465 (the “’465 patent”); and U.S. Patent No. 10,461,866 (the “’866 patent”). *See Ramot at Tel Aviv University Ltd. v. Cisco Systems, Inc.*, C.A. No. 2:19-cv-255-JRG (E.D. Tex.) (hereinafter, the “2019 Texas Action”). That lawsuit targeted optical transceiver modules and components thereof. Importantly, Acacia was one of Cisco’s suppliers of optical transceiver modules accused by Ramot under both direct and contributory infringement theories. Shortly after that lawsuit was filed, Cisco announced it was acquiring Acacia. The Eastern District of Texas stayed that case in January 2021 because of the pendency of *ex parte* reexaminations against the asserted patents.

5. Then, in February 2021, Ramot brought its dispute against Acacia and Cisco to this District. After the Eastern District of Texas stayed the 2019 case, Ramot asserted two of the patents from the 2019 Texas Action—including the ’535 patent, an ancestor of the ’998 patent—against Acacia in this District. *See Ramot at Tel Aviv University Ltd. v. Acacia Comm’ns, Inc.*, C.A. No. 21-295 (D. Del.) (hereinafter, the “February 2021 Delaware Action”). Notably, Ramot filed its lawsuit in Delaware only three days before Cisco completed its acquisition of Acacia. Since March 1, 2021, Acacia has been a wholly-owned subsidiary of Cisco.

6. Also notably, as set forth below, Ramot has represented to this Court that the 2019 suit in Texas concerns only activities of Cisco and Acacia with respect to accused products **before** the March 1, 2021 acquisition. *See* February 2021 Delaware Action, C.A. No. 21-295, D.I. 14 at 2 (Plaintiff Ramot at Tel Aviv University Ltd.’s Opposition to Defendant’s Motion to Stay Pending *Ex Parte* Reexamination). On the other hand, Ramot told this Court that the suit Ramot filed in

February 2021 in this District concerns “infringement across Acacia’s entire product line . . . all of its infringing sales.” *Id.* Thus, the February 2021 Delaware Action is broader in scope with respect to Acacia’s accused products than the 2019 Texas Action.

7. Subsequently, U.S. Patent 11,133,872 (the “’872 patent”) issued to Ramot on September 28, 2021. The ’872 patent is a member of Ramot’s “Linearized Optical Digital-to-Analog Modulator” patent family and is, specifically, a continuation of Ramot’s ’866 patent previously asserted against Cisco in 2019 Texas Action and against Acacia in the February 2021 Delaware Action.

8. At the time the ’872 patent issued, both Cisco and Acacia reasonably believed that Ramot would accuse numerous of Cisco’s and Acacia’s optical transceiver modules, components thereof, and networking equipment in which such modules are incorporated, of infringing one or more claims of the ’872 patent. Consequently, on September 28, 2021, Cisco and Acacia filed in this District a Complaint for Declaratory Judgment against Ramot. *See Cisco Systems Inc. & Acacia Comm’ns, Inc. v. Ramot at Tel Aviv University Ltd.*, C.A. No. 21-1365 (D. Del.), D.I. 1. As set forth in that previous declaratory judgment complaint, Ramot’s history of asserting patents in the “Linearized Optical Digital-to-Analog Modulator” family against Cisco and Acacia supported the reasonableness of their belief that numerous of Cisco’s and Acacia’s products would be accused by Ramot of infringing the ’872 patent. *See, e.g., id.* at ¶ 7.

9. Cisco’s and Acacia’s belief proved correct. On February 7, 2022, Ramot answered Cisco’s and Acacia’s declaratory judgment complaint, and counterclaimed for purported infringement of the ’872 patent. *See* September 2021 Delaware Declaratory Judgment Action, C.A. No. 21-1365, D.I. 8 (Answer and Counterclaims for Patent Infringement) at ¶¶ 77-163. In its counterclaim, “Ramot alleges that Cisco and Acacia directly and indirectly infringe” the ’872

patent “by making, using, offering for sale, selling and importing optical networking transceiver modules and line cards, and components thereof, providing advanced electro-optical modulation techniques—including, without limitation, certain of Cisco’s and Acacia’s various optical networking modules, line cards, and associated circuitry and software.” *Id.* at ¶ 79.

10. In its counterclaim in the September 2021 Delaware Declaratory Judgment Action, Ramot references general categories of “Acacia Accused Products” (*id.* at ¶ 114), “Cisco Accused Products” (*id.* at ¶ 129), and the “’872 Accused Products” (*id.* at ¶ 135). As further detailed below, according to Ramot, the “Acacia Accused Products” include “optical transceiver modules” and components thereof that “support advanced mapping and modulation techniques according to the [’872 Patent]—including without limitation digital mapping to provide pre-equalization, pre-distortion, shaping, and non-linearity compensation.” *Id.* at ¶ 114. The “Cisco Accused Products” include “transceiver modules and associated DSP [digital signal processing] functionality” that “support advanced mapping and modulation techniques”; “numerous line cards and systems with embedded coherent transceivers”; and “numerous line cards and systems with embedded DSP circuitry and slots for pluggable optics.” *Id.* at ¶¶ 129, 130-131. The “’872 Accused Products” include the “identified Cisco Accused Products and Acacia Accused Products that use digital mapping of data for, *inter alia*, equalization, pre-distortion, shaping, or compensation of the transmitted signal.” *Id.* at ¶ 135.

11. Today, Ramot obtained from the USPTO the ’998 patent at issue in this current Complaint for Declaratory Judgment. As noted, the ’998 patent is yet another member of the “Linearized Optical Digital-to-Analog Modulator” patent family and, specifically, is a continuation of the ’872 patent that is the subject of Cisco’s and Acacia’s previous declaratory judgment claim,

as well as Ramot's counterclaim, in the September 2021 Delaware Declaratory Judgment Action. That claim and counterclaim currently remain pending and active in this District.

12. Now that the '998 patent has issued, Cisco and Acacia reasonably believe that Ramot will further accuse of infringing the newly-issued '998 patent the same and/or similar sets of products that it has previously accused of infringing related patents in the same family in Ramot's prior litigations against Cisco and Acacia. The products at issue include Cisco's and Acacia's optical transceiver modules, components thereof, and networking equipment in which such modules are incorporated (*e.g.*, line cards). As set forth below, Ramot's history of asserting patents in the "Linearized Optical Digital-to-Analog Modulator" family against Cisco and Acacia—including Ramot's recent counterclaim of infringement of the parent '872 patent, a counterclaim that Ramot filed less than three months ago in this District—supports the reasonableness of this belief. Accordingly, Cisco and Acacia bring this lawsuit seeking to remove the cloud of infringement allegations placed over their optical-transceiver-module-related products by the '998 patent.

### **THE PARTIES**

13. Plaintiff Cisco Systems, Inc. is a Delaware corporation with its principal place of business at 170 West Tasman Drive, San Jose, California 95134.

14. Plaintiff Acacia Communications, Inc. is a wholly-owned subsidiary of Cisco. Acacia is incorporated in Delaware with its principal place of business at Three Mill and Main Place, Suite 400, Maynard, Massachusetts 01754. Cisco completed its acquisition of Acacia on March 1, 2021.

15. On information and belief, defendant Ramot at Tel Aviv University, Ltd. is a limited liability company organized under the laws of Israel with its principal place of business at Tel Aviv University, Senate Building at Gate no. 4, George Wise Street, Tel Aviv, Israel.

16. On information and belief, Ramot is the owner by assignment of the '998 patent, as well as at least four related United States patents—U.S. Patent No. 10,033,465 (the “'465 patent”), U.S. Patent No. 10,270,535 (the “'535 patent”), U.S. Patent No. 10,461,866 (the “'866 patent”), and U.S. Patent No. 11,133,872 (the “'872 patent”). The '465 patent is attached as Exhibit B hereto; the '535 patent as Exhibit C; the '866 patent as Exhibit D; and the '872 patent as Exhibit E.

### **RAMOT PATENTS**

17. The five patents referenced above—the '998 patent, the '465 patent, the '535 patent, the '866 patent, and the '872 patent—all share a common specification and title (“Linearized Optical Digital-to-Analog Modulator”); all name the same three inventors (Yossef Ehrlichman, Ofer Amrani, and Shlomo Ruschin); and all purport to claim priority to the same U.S. provisional application (No. 60/943,559, filed June 13, 2007).

18. As set forth further in the Claim for Relief below, each of the five independent claims of the '998 patent recites limitations requiring “digital-to-digital mapping.” These digital-to-digital-mapping limitations are key elements both in the claims of the '998 patent and in the claims of the '465 patent, the '535 patent, and the '866 patent that Ramot previously asserted against Cisco and/or Acacia, and in the claims of the '872 patent that Ramot is currently asserting against Cisco and Acacia in the pending September 2021 Delaware Declaratory Judgment Action.

19. As one example, one limitation of previously-asserted claim 1 of the '535 patent requires “converting the N bits of digital data to M drive voltage values, where  $M > N$  and  $N > 1$ .” Previously-asserted claim 1 of the '465 patent includes a similar limitation: “inputting into an optical modulator N bits of digital data in parallel, N being larger than one; [and] mapping a set of N input values corresponding to said N bits of digital data to a vector of M voltage values where M is equal to or larger than N.” Previously-asserted claim 7 of the '866 Patent likewise includes

a digital-to-digital-mapping limitation: “using the digital to digital converter for mapping a set of N input values corresponding to the N bits of digital data word to a digital drive vector corresponding to M drive voltage values where M is larger than N.”

20. Similar to the claims of the three previously-asserted patents discussed in the paragraph above, claims 1 and 15 of the '872 patent at issue in the pending September 2021 Delaware Declaratory Judgment Action includes a similar “digital-to-digital mapping” limitation. For instance, claims 1 and 15 of the '872 patent recite “converting, based on digital-to-digital mapping, the plurality N digital input data bits to M digital output data bits associated with M drive voltage values,” *inter alia*, “wherein  $M > N$  and  $N > 1$ ” and “wherein the digital-to-digital mapping comprises, for each unique plurality of N digital input data bits, a mapping to a corresponding M digital output data bits.”

21. Ramot asserted claims 1 and 15 of the '872 patent in its counterclaim against “Acacia Accused Products” and “Cisco Accused Products” in the September 2021 Delaware Declaratory Judgment Action. *See*, C.A. No. 21-1365 (D. Del.), D.I. 8 (Answer and Counterclaims for Patent Infringement) at ¶ 135. Notably, Ramot’s counterclaim focused on the “digital-to-digital mapping” as a central feature of the '872 patent: “In one aspect of the invention, the disclosed and claimed features enable using a digital-to-digital mapping to provide digital pre-correction for irregularities in linearity and other signal characteristics of the optical signal output response from the modulator.” *Id.* at ¶ 96.

22. Ramot’s counterclaim also explicitly referenced the “mapping” functionality in discussing the operation of the accused Acacia and Cisco products. *See, e.g., id.* at ¶ 104 (“The digital mapping technologies of the [’872 patent], as practiced by Acacia’s DSP ASICs, are an enabling technology for these 400Gbps coherent transmission applications.”); ¶ 110 (“Acacia’s



coherent optical transceiver modules (and DSP ASIC components thereof) achieve optical networking transport speeds of 100 Gbps and above by employing the digital signal mapping techniques of the [’872 patent].”); ¶ 111 (“These digital shaping adjustments utilize the claimed digital mapping of the [’872 patent].”); ¶ 114 (“As described above, and detailed with respect to the patent claims below, Acacia’s infringing coherent optical transceiver modules (and DSP ASIC and Silicon Photonic IC components thereof)...support advanced mapping and modulation techniques according to the Asserted [’872] Patent—including without limitation digital mapping to provide digital pre-equalization, pre-distortion, shaping, and non-linearity compensation.”); ¶ 123 (“Cisco’s infringing products achieve optical networking transport speeds of 100 Gbps and above by employing the advanced modulation techniques and digital mapping of the Asserted [’872] Patent . . . .”); ¶ 125 (“The advanced digital mapping techniques of the Asserted [’872] Patent are key features of products crucial to Cisco’s optical networking platforms.”); ¶ 127 (“As described above, the coherent pluggable optics that Cisco paid \$4.5 billion to acquire from Acacia use the digital mapping techniques of the Asserted [’872] Patent to provide digital pre-equalization, pre-distortion, shaping, and non-linearity compression.”); ¶ 135 (“the above identified Cisco Accused Products and Acacia Accused Products...use digital mapping of data for, *inter alia*, equalization, pre-distortion, shaping, or compensation of the transmitted signal . . . .”); ¶ 147 (“As described above, Acacia’s Accused Products include a converter for converting, based on a digital-to-digital mapping, the N digital input data bits to M digital output data bits, that are associated with M drive voltage values, where  $M > N$  and  $N > 1$ .”); ¶ 151 (“The ’872 Accused Products include a digital-to-digital mapping that outputs a pattern that alters the linearity of an optical response of the modulator.”).

23. Like the claims of the related patents previously asserted by Ramot against Cisco and Acacia as summarized above, all of the independent claims of the '998 patent at issue in this Complaint for Declaratory Judgment include similar “digital-to-digital mapping” limitations. For example:

a. Independent claim 1 recites an “optical modulation system,” *inter alia*, “wherein a digital-to-digital mapping maps the plurality of N digital input data bits to a set of M digital output data bits associated with a plurality of voltage values” and “wherein the digital-to-digital mapping comprises, for each digital input value included in a set of possible digital input values for the plurality of N digital input data bits, a set of corresponding digital output values from a set of possible digital output values”;

b. Independent claim 16 recites an “optical modulation system,” *inter alia*, “wherein a digital-to-digital mapping maps the plurality of N digital input data bits to M digital output data bits associated with a plurality of voltage values” and “wherein the digital-to-digital mapping comprises, for each digital input value included in a set of possible digital input values for the plurality of N digital input data bits, a set of corresponding digital output values from a set of possible digital output values”;

c. Independent claim 32 recites an “optical modulation system,” *inter alia*, “wherein the N bits of the N bit digital input data word are mapped to a set of M output bits corresponding to a set of voltage values” and “wherein the input digital data word is one from a set of  $2^N$  input data words, the M output bits are from a set of  $2^M$  M output bits, wherein each M output bits in the set of  $2^M$  M output bits corresponds to a different set of voltage values”;

d. Independent claim 45 recites an “optical modulation system,” *inter alia*, “wherein the N bits of the N bit digital input data word are mapped to a set of M output bits

corresponding to a set of voltage values” and “wherein the input digital data word is one from a set of  $2^N$  input data words, the set of  $M$  output bits are each from a set of  $2^M$   $M$  output bits, wherein each  $M$  output bits in the set of  $2^M$   $M$  output bits corresponds to a different set of voltage values”; and

e. Independent claim 58 recites an “optical modulation system,” *inter alia*, “wherein a digital-to-digital mapping maps the plurality of  $N$  digital input data bits to  $M$  digital output data bits” and “wherein the digital-to-digital mapping comprises, for each digital input value included in a set of possible digital input values for the plurality of  $N$  digital input data bits, a set of  $M$  corresponding digital output values from a set of possible digital output values.”

#### **RAMOT’S RECENT LITIGATION HISTORY AGAINST CISCO AND ACACIA**

24. On July 9, 2019, Cisco publicly announced its intent to acquire one of its then-existing suppliers, Acacia. Acacia designs and manufactures high-speed, optical interconnect technologies. *See* Cisco News Release, July 9, 2019, “Cisco Intends to Acquire Acacia Communications,” available at <https://newsroom.cisco.com/press-release-content?articleId=2000889> (last visited May 22, 2022).

25. Less than one month before that announcement, on June 12, 2019, Ramot sued Cisco in the Eastern District of Texas. *See Ramot at Tel Aviv University Ltd. v. Cisco Systems, Inc.*, C.A. No. 2:19-cv-225-JRG (E.D. Tex.) (the “2019 Texas Action”).

26. In the 2019 Texas Action, Ramot originally asserted two related ancestor patents to the ’998 patent at issue here, the ’535 patent and the ’465 patent, both belonging to the same “Linearized Optical Digital-to-Analog Modulator” patent family.

27. While the 2019 Texas Action was pending, the ’866 patent issued, on October 29, 2019. The ’866 patent is a child of the ’535 patent, the immediate parent of the ’872 patent, and the grandparent of the ’998 patent at issue in the current Complaint for Declaratory Judgment.

Less than two months later, on December 12, 2019, Ramot filed an amended complaint in the 2019 Texas Action adding a count charging Cisco with infringement of the '866 patent. *See* C.A. No. 2:19-cv-225-JRG (E.D. Tex.), D.I. 48 (First Amended Complaint) at ¶¶ 60-72.

28. On January 13, 2021, the Eastern District of Texas stayed Ramot's 2019 Texas Action, pending *ex parte* reexamination of the '535 patent, the '465 patent, and the '866 patent. *See* C.A. No. 2:19-cv-225 (E.D. Tex.), D.I. 235 (Order on Motion to Stay). The court was "persuaded that the benefits of a stay outweigh the costs of postponing resolution of the litigation in this particular case." *Id.* at 4. In particular, the court explained that the claims of the patents would "almost surely . . . be modified" during *ex parte* reexamination—and even "may be dropped completely":

All asserted claims of all Asserted Patents have been rejected in preliminary Office Actions in the *ex parte* reexams. (Dkt. Nos. 171, 180, 209.) When claims are rejected in an *ex parte* reexamination proceeding, the patent owner can narrow, cancel, or submit new claims. *See* M.P.E.P. § 2258. Thus, the asserted claims that have been rejected in the reexamination proceedings **are almost surely to be modified in some material way** in response to their rejection, and **they may be dropped completely**. They will not likely stay as they were when this suit was filed. If the case were to proceed to trial on the current claims, there is a serious risk of wasted resources as to the parties and the Court.

*Id.* at 4 (emphasis added).

29. The following month, on February 26, 2021, Ramot filed another patent-infringement action—this time in Delaware—asserting two of the patents previously asserted in the Eastern District of Texas, the '535 patent and the '465 patent. *See Ramot at Tel Aviv University, Ltd. v. Acacia Comm'ns, Inc.*, C.A. No. 21-295 (D. Del.) (the "February 2021 Delaware Action").

30. In the February 2021 Delaware Action, Ramot named Acacia as the sole defendant. Three days after the lawsuit was filed, Cisco completed its acquisition of Acacia. *See, e.g.*, Cisco

Press Release, March 1, 2021, “Cisco Completes Acquisition of Acacia Communications, Inc.,” available at <https://newsroom.cisco.com/press-release-content?type=webcontent&articleId=2144825> (last accessed May 22, 2022). Through this corporate transaction, Acacia became a wholly-owned subsidiary of Cisco.

31. In a subsequent pleading in the February 2021 Delaware Action, Ramot justified its selection of Delaware for its infringement dispute by characterizing its 2019 Texas Action as being limited in scope and concerning only “pre-acquisition sales of certain products to Cisco.” C.A. No. 21-295 (D. Del.), D.I. 14 at 2 (Plaintiff Ramot at Tel Aviv University Ltd.’s Opposition to Defendant’s Motion to Stay Pending *Ex Parte* Reexamination). The lawsuit in Delaware, on the other hand, concerned “infringement across Acacia’s entire product line.” *Id.*:

Ramot brought this present case to address identified infringement across Acacia’s entire product line—and accused all of its infringing sales, not just the pre-acquisition sales of certain products to Cisco that were at issue in the Texas case. *See* Complaint, D.I. 1 at ¶¶ 21-39. Accordingly, a substantial amount of new and unique discovery into newly accused products and sales is needed in this case.

32. The Court stayed the February 2021 Delaware Action on September 3, 2021, pending the *ex parte* reexaminations pending for the ’535 patent and the ’465 patent. *See* C.A. No. 21-295 (D. Del.), D.I. 23.

33. As explained above, on September 28, 2021, upon issuance of the ’872 patent to Ramot, Cisco and Acacia filed a declaratory judgment complaint against Ramot in this District, seeking a declaration that certain of Cisco’s and Acacia’s optical transceiver modules, components thereof, and networking equipment incorporating such modules did not infringe the ’872 patent. *See* C.A. No. 21-1365 (D. Del.), D.I. 1 (the “September 2021 Delaware Declaratory Judgment Action”).

34. On February 7, 2022, in the September 2021 Delaware Declaratory Judgment Action, Ramot filed its Answer and Counterclaim for Patent Infringement. *See* C.A. No. 21-1365 (D. Del.), D.I. 8. As summarized above and detailed further below, in its counterclaim, Ramot alleged that numerous of Cisco’s and Acacia’s optical transceiver modules, components therefor, and networking equipment incorporating such modules (*e.g.*, line cards) infringed the ’872 patent—including all of the accused products identified in Cisco’s and Acacia’s earlier Complaint for Declaratory Judgment in that action. *See, e.g., id.* at ¶ 114 (discussing “Acacia Accused Products”); ¶¶ 129, 130-131 (discussing “Cisco Accused Products”); *id.* at ¶ 135 (discussing the “’872 Accused Products”). The September 2021 Delaware Declaratory Judgment Action remains pending and active in this District.

## **JURISDICTION AND VENUE**

### **Subject-Matter Jurisdiction**

35. This action arises under the patent laws of the United States, 35 U.S.C. § 1 *et seq.* This Court has subject-matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a). Additionally, this Court has subject-matter jurisdiction over Cisco’s and Acacia’s request for declaratory relief under 28 U.S.C. §§ 2201 and 2202.

36. An actual controversy exists between Ramot, on the one hand, and Cisco and Acacia, on the other, as to whether Cisco and Acacia directly infringe the ’998 patent under 35 U.S.C. § 271(a). This controversy includes the question of whether Cisco and Acacia directly infringe the ’998 patent by making, using, offering for sale, selling, and/or importing products that Ramot previously alleged infringe related patents in the “Linearized Optical Digital-to-Analog Modulator” family, *i.e.*, the ’535 patent, the ’465 patent, the ’866 patent, and the ’872 patent.

37. The products at issue include (a) networking equipment including line cards and optical transceiver modules; (b) the optical network transceiver modules themselves, including

coherent optical transceiver modules; and (c) components of optical transceiver modules and associated circuitry and software, such as digital signal processing application specific integrated circuits and silicon photonic integrated circuits (the “Accused Products”).

38. The Accused Products include (a) Acacia’s and/or Acacia’s AC1200 products, AC400 products, CIM8 pluggable modules, and 100G, 200G, and 400G pluggable modules in a variety of standard form factors such as CFP-DCO, CFP2-DCO, CFP2-ACO, OSFP, and QSFP-DD, as well as “BiDi” modules that communicate at or above 100 Gbps and “single lambda” modules that communicate according to the 100G-FR, 100G-LR, and/or 400G-FR technical specifications; (b) components of these modules, *i.e.*, Acacia’s digital signal processing (“DSP”) application specific integrated circuits (“ASICs”) and “Silicon Photonic integrated circuits”; and (c) Cisco’s networking equipment, including *e.g.* line cards and routers, incorporating optical transceiver modules, embedded coherent transceivers, and/or embedded DSP circuitry and slots for pluggable optics.

39. As shown below, there is a substantial controversy over Cisco’s and Acacia’s purported direct infringement, between parties having adverse legal interests, of sufficient immediacy and reality to warrant the issuance of a declaratory judgment. This controversy exists based on Ramot’s prior assertions of related patents in the “Linearized Optical Digital-to-Analog Modulator” family in previous litigation against the Accused Products of Cisco and Acacia.

40. For example, in the February 2021 Delaware Action that Ramot filed in this District six months ago, it accused Acacia of directly infringing at least claim 2 of the ’535 patent and at least claim 13 of the ’465 patent, both of which are related patents to the ’998 patent belonging to the same “Linearized Optical Digital-to-Analog Modulator” patent family. Ramot alleged that direct infringement occurred through Acacia’s “making, using, offering for sale, selling and importing

optical networking transceiver modules and components thereof...including, without limitation certain of Acacia’s various coherent optical modules and associated circuitry and software.” C.A. No. 21-295 (D. Del.), D.I. 1 (Complaint) at ¶¶ 3, 49, 63.

41. The categories of accused products in the February 2021 Delaware Action included (a) “Acacia’s coherent optical transceiver modules includ[ing] embedded modules such as the AC1200 and AC400 products, as well as 100G, 200G, and 400G pluggable modules in a variety of standard form factors such as CFP-DCO, CFP2-DCO, CFP2-ACO, OSFP, and QSFP-DD”; and (b) “multiple generations of [Acacia’s] DSP ASICs and Silicon Photonic ICs” that are components of the coherent optical transceiver modules. *Id.* at ¶¶ 21-23; *see generally* ¶¶ 21-39 (discussing the various accused “infringing coherent optical transceiver modules and DSP ASIC and Silicon Photonic IC components thereof”).

42. As another example, in the 2019 Texas Action, Ramot accused Cisco of directly infringing claims 1 and 2 of the related ’535 patent); claims 7, 8, 10-12, 19, 20, and 22-24 of the related ’866 patent); and claims 1, 2, 4 and 5 of the related ’465 patent. Ramot alleged that such direct infringement occurred through Cisco’s “making, using, offering for sale, selling, and importing networking equipment with corresponding line cards and optical transceiver modules providing advanced electro-optical modulation techniques—including, without limitation, certain of Cisco’s various 100G, 200G and 400G optical modules and associated circuitry and software.” C.A. No. 2:19-cv-225-JRG (E.D. Tex.), D.I. 48 (First Amended Complaint) at ¶¶ 2, 33, 40, 48, 61, 66.

43. The accused products in the 2019 Texas Action include “100, 200, and 400 Gbps pluggable CFP2 modules; 100, 200, and 400 Gbps QSFP56 and QSFP-DD modules, including modules that operate at speeds at or about 50 Gbps per optical or electrical lane; ‘BiDi’ modules



that communicate at or above 100 Gbps, including 100G BiDi and 400G BiDi products; modules that communicate according to the 100G-FR, 100G-LR, and 400G-FR4 Technical Specifications; and other modules that include similar functionality.” *Id.* at ¶ 30.

44. As another example, in its counterclaim in the September 2021 Delaware Declaratory Judgment Action—a counterclaim filed less than three months ago—Ramot alleged that numerous of Cisco’s and Acacia’s optical transceiver modules, components thereof, and networking equipment incorporating such modules (*e.g.*, line cards) infringed claims 1 and 15 of the ’872 patent, the immediate parent of the ’998 patent at issue in this Complaint for Declaratory Judgment. *See* C.A. No. 21-1365 (D. Del.), D.I. 8 (Answer and Counterclaims for Patent Infringement) at ¶ 135.

45. In the counterclaim, Ramot identified the “Acacia Accused Products” as “Acacia’s infringing coherent optical transceiver modules (and DSP ASIC and Silicon Photonic IC components thereof”)...[that] support advanced mapping and modulation techniques according to the Asserted [’872] Patent—including without limitation digital mapping to provide digital pre-equalization, pre-distortion, shaping, and non-linearity compensation.” *Id.* at ¶ 114. These “Acacia Accused Products include, but are not limited to: 100, 200, and 400 Gbps pluggable CFP-DCO and CFP2-DCO modules; 1.2T (AC1200) and 400G (AC400) embedded modules; CIM8 pluggable modules; 400 Gbps OSFP and QSFP-DD pluggable modules that operate relative to 400ZR or OpenZR+ industry implementation agreements; and 100G QSFP-DD pluggable modules.” *Id.* at ¶ 115. The “Acacia Accused Products” also include (a) “Acacia’s CFP-ACO modules to the extent they are used with an Acacia DSP ASIC on a linecard” and (b) designs “that implement one of Acacia’s Denali, Meru, Pico, Greylock, or Jannu DSP ASICs coupled together with one of Acacia’s Silicon Photonic ICs.” *Id.*

46. In the counterclaim, Ramot also identified the following as the “Cisco Accused Products”:

a. “Cisco’s infringing transceiver modules and associated DSP functionality”...[that] support advanced mapping and modulation techniques, including without limitation Quadrature Modulation (*e.g.*, 16-QAM) and Pulse Amplitude Modulation (*e.g.*, PAM4).” This includes “100, 200, and 400 Gbps pluggable coherent modules, including CFP2-ACO and CFP2-DCO modules, and QSFP-DD or OSFP format 400G ZR modules; 100 Gbps and higher-speed embedded coherent modules; 100, 200, and 400 Gbps QSFP28, QSFP56 and QSFP-DD pluggable modules, including modules that operate at speeds at or above 50 Gbps per optical or electrical lane; ‘BiDi’ modules that communicate at or above 100 Gbps, including 100G BiDi or 400G BiDi products; [and] 100G ‘single lambda’ modules that communicate according to the 100G-FR, 100G-LR, 400G-FR..Technical Specifications.” *Id.* at ¶ 129.

b. “CFP2-ACO pluggable transceivers (*e.g.*, ONS-CFP2-WDM); CFP2-DCO pluggable transceivers (*e.g.*, CFP2-WDM-DETS-1HL, CFP2-WDM-DS-1HL, CFP2-LIC-UPG-200G); 400G ZR coherent pluggable transceivers (*e.g.*, QDD-400G-ZR-S, QDD-400G-ZRP-S); Single-lambda CPAK transceivers, *e.g.*, CPAK-100G-FR; 40/100G ‘BiDi’ transceivers, *e.g.*, QSFP-40/100G-SRBD; 100G single-lambda QSFP transceivers (*e.g.*, QSFP-100G-DR-S, QSFP-100G-FR-S, QSFP-100G-LR-S, QSFP-100G-ELR-S); and 400G pluggable QDFP56 or QSFP-DD transceiver modules (*e.g.*, QDD-400G-DR4-S, QDD-400G-FR4-S, QDD-400G-LR4-S, QDD-400G-LR8-S, QDD-4x100G-FR-S, QDD-4x100G-LR-S, QDD-400-AOCxM).” *Id.* at ¶ 130.

c. “Cisco’s numerous line cards and systems with embedded coherent transceivers, such as the Cisco NCS 2000 200-Gbps Multirate DWDM Line Card (*e.g.*, NCS2K-200G-CK-C=), the NCS1004 system, C-Band 1.2T Transponder Line Card, L-Band Transponder

Line Card, and 800G QSFP-DD Transponder Line Card (e.g., NCS1K4-1.2T-K9=, NCS1K4-1.2T-K9=, NCS1K4-2-QDD-C-K9=).” *Id.* at ¶ 131; and

d. “Cisco’s numerous line cards and systems with embedded DSP circuitry and slots for pluggable optics such as CFP2-ACO transceivers, such as the NCS 1002 system (e.g., NCS1002-K9=); Cisco NCS 2000 series, 400 Gbps XPonder Card (e.g., NCS2K-400G-XP=), the NCS 4000 series, 400 Gbps DWDM/OTN/Packet Universal Line Card (e.g., NCS4K-4H-OPW-QC2=), the Cisco NCS 5500 series, 1.2-Tbps IPoDWDM Modular Line Card (e.g., NC55-6x200-DWDM-S), or the Cisco 9000 Series Routers, 400G and 200G Modular Line Cards (e.g. A9K-MOD400-SE line card with A9K-MPA-2X100GE modular port adaptor).” *Id.* at ¶ 132.

47. All of the Cisco and Acacia products identified in paragraphs 37 through 46 above are encompassed within the definition of Accused Products for purposes of this declaratory judgment complaint.

48. Furthermore, an actual controversy exists between Ramot, on the one hand, and Cisco and Acacia, on the other, as to whether Cisco and Acacia indirectly infringe the ’998 patent under 35 U.S.C. §§ 271(b) and/or (c). This controversy includes a dispute as to whether Cisco’s and Acacia’s, *inter alia*, blog posts, presentations, whitepapers, videos, customer instructions, and/or design contributions with respect to the Accused Products constitute encouragement with a specific intent to induce infringement within the meaning of 35 U.S.C. § 271(b). This actual controversy also includes a dispute as to whether Cisco and Acacia make, use, sell, offer for sale, or import coherent optical transceiver modules or components thereof (such as DSP ASICs and Silicon Photonic ICs) knowing that these products constitute a material part of the claimed invention, are especially made or adapted for use in infringing the ’998 patent, and are not staple

articles or commodities of commerce capable of substantial noninfringing uses, such that contributory infringement occurs within the meaning of 35 U.S.C. § 271(c).

49. As shown below, there is a substantial controversy over Cisco's and Acacia's purported indirect infringement, between parties having adverse legal interests, of sufficient immediacy and reality to warrant the issuance of a declaratory judgment. This controversy exists based on Ramot's prior assertions of related patents in the "Linearized Optical Digital-to-Analog Modulator" family in previous litigation against Cisco and Acacia.

50. For example, in the February 2021 Delaware Action, Ramot accused Acacia of inducing infringement under 35 U.S.C. § 271(b) of the related '535 patent and '465 patent through *inter alia* "contributing to its customer's designs" and publishing "Blog posts, Presentations, Whitepapers, and Videos" concerning the Accused Products. C.A. No. 21-295 (D. Del.), D.I. 1 (Complaint) at ¶¶ 38, 51, 65; *see also id.* at ¶¶ 24-39 (identifying specific blog posts, presentations, whitepapers, and videos).

51. In the February 2021 Delaware Action, Ramot also accused Acacia of contributory infringement under 35 U.S.C. § 271(c) of the '535 patent and the '465 patent through the making, using, selling, offering for sale, and importing the "'535 Accused Products" and the "'465 Accused Products" based on the allegation that Acacia knew "that those products constitute a material part of the claimed invention, that they are especially made or adapted for use in infringing the . . . Patent, and that they are not staple articles or commodities of commerce capable of substantial non-infringing use." *Id.* at ¶¶ 52, 66.

52. As a second example, in the 2019 Texas Action, Ramot accused Cisco of inducing infringement under 35 U.S.C. § 271(b) of the related '535 patent, the '866 patent, and the '465 patent through *inter alia* "instruct[ing] its customers on how to use and implement the technology

claimed” in the asserted patents via product datasheets, brochures, and product briefs. C.A. No. 2:19-cv-225-JRG (E.D. Tex.), D.I. 48 (First Amended Complaint) at ¶¶ 42, 55, 68.

53. In the 2019 Texas Action, Ramot also accused Cisco of contributory infringement under 35 U.S.C. § 271(c) of the ’535 patent, the ’866 patent, and the ’465 patent through the making, using, selling, offering for sale, and importation of the “’535 Accused Products,” the “’866 Accused Products,” and the “’465 Accused Products” based on the allegation that Cisco knew “that those products constitute a material part of the claimed invention, that they are especially made or adapted for use in infringing the...Patent, and that they are not staple articles or commodities of commerce capable of substantial non-infringing use.” *Id.* at ¶¶ 43, 56, 69.

54. As a third (and final) example, in its counterclaim in the September 2021 Delaware Declaratory Judgment Action, Ramot accused Cisco and Acacia of inducing infringement under 35 U.S.C. § 271(b) of the related ’872 patent, through *inter alia* “encourag[ing] and instruct[ing] their customers on how to use and implement the technology claimed in the ’872 patent” through “the website postings, Blog posts, Presentations, Whitepapers, and Videos discussed” in Ramot’s counterclaim. C.A. No. 21-1365 (D. Del.), D.I. 8 (Answer and Counterclaims for Patent Infringement) at ¶ 156.

55. In the counterclaim in the September 2021 Delaware Declaratory Judgment Action, Ramot also accused Cisco and Acacia of contributory infringement under 35 U.S.C. § 271(c) of the ’872 patent through the making, using, selling, offering for sale, and importation of the “’872 Accused Products” based on the allegation that Cisco and Acacia knew “that those products constitute a material part of the claimed invention, that they are especially made or adapted for use in infringing the ’872 Patent, and that they are not staple articles or commodities of commerce capable of substantial non-infringing use.” *Id.* at ¶ 157.

56. Cisco's and Acacia's reasonable belief that Ramot will charge them with infringing one or more claims of the '872 patent, both directly and indirectly, is further supported by Ramot's history of asserting related patents in this same "Linearized Optical Digital-to-Analog Modulator" family against Cisco and Acacia.

57. For instance, as summarized above, when the '998 patent's immediate parent (the '872 patent) issued and became the basis of Cisco's and Acacia's September 2021 Delaware Declaratory Judgment Action, Ramot filed a counterclaim charging all of the products at issue in Cisco's and Acacia's declaratory judgment claim with direct and indirect infringement of the '872 patent. *See* C.A. No. 21-1365 (D. Del.), D.I. 8 (Answer and Counterclaims for Patent Infringement) at ¶¶ 78-157.

58. Likewise, when the '872 patent's own parent (the '866 patent) issued during the course of Ramot's 2019 Texas Action against Cisco, Ramot amended its complaint within two months, on October 29, 2019, to charge Cisco with direct and indirect infringement of the '866 patent. *See* C.A. No. 2:19-cv-225-JRG (E.D. Tex.), D.I. 48 (First Amended Complaint) at ¶¶ 60-72.

59. As another example of Ramot's repeated litigation of patents in the same family against Cisco and/or Acacia, on November 5, 2014, Ramot sued Cisco in the Eastern District of Texas, alleging that Cisco's "100G" networking-equipment products infringed U.S. Patent No. 8,044,835 (the "'835 patent") and U.S. Patent No. 8,797,198 (the "'198 patent"). *See Ramot at Tel Aviv University Ltd. v. Cisco Systems, Inc.*, C.A. No. 2:14-cv-1018-JRG (E.D. Tex.), D.I. 1 (Complaint) (hereinafter, the "2014 Action"). Ramot voluntarily dismissed the 2014 Action without prejudice approximately three months later, on February 24, 2015. *See* C.A. No. 2:14-cv-1018-JRG (E.D. Tex.), D.I. 16 (Notice of Voluntary Dismissal Without Prejudice).

60. The '835 patent and '198 patent asserted in the 2014 Action belong to the same patent family as the '998 patent at issue in this Complaint for Declaratory Judgment; the three related patents asserted in the 2019 Texas Action and the February 2021 Delaware Action; and the '872 patent at issue in the September 2021 Delaware Declaratory Judgment Action.

61. Moreover, to support its claim for willful infringement in the 2019 Texas Action, Ramot alleged that because Cisco had been charged with infringement of related patents in the 2014 Action—*i.e.*, the '835 patent and the '198 patent—Cisco was “aware” its activities also allegedly infringed the child patents in the same family. *See, e.g.*, C.A. No. 2:19-cv-225-JRG (E.D. Tex.), D.I. 48 (First Amended Complaint) at ¶ 70 (“On information and belief, Cisco was aware of the '866 Patent and related Ramot patents, had knowledge of the infringing nature of its activities, and nevertheless continues its infringing activities. For example, on November 5, 2014, Ramot sued Cisco for infringement of two parent patents of the '866 patent.”).

62. Similarly, in its counterclaim in the September 2021 Delaware Declaratory Judgment Action, Ramot alleged that Cisco and Acacia allegedly willfully infringed the '872 patent because of the Ramot’s prior lawsuits against the two companies over “related Ramot patents.” Ramot specifically pointed to:

a. the 2014 Action against Cisco. *See* C.A. No. 21-1365 (D. Del.), D.I. 8 (Answer and Counterclaims for Patent Infringement) at ¶ 161 (“In addition, on November 5, 2014, Ramot sued Cisco for infringement of two related predecessor patents of the '872 patent.”);

b. the 2019 Texas Action against Cisco. *See id.* at ¶ 158 (“For example, on June 12, 2019, Ramot sued Acacia customer Cisco for infringement of related Ramot patents. *See Ramot at Tel Aviv University Ltd. v. Cisco Systems, Inc.*, Case No. 2:19-cv-00225-JRG (E.D. Tex.), D.I. 1. Acacia participated in that lawsuit as a third party under subpoena.”); and

c. the February 2021 Delaware Action against Acacia. *See id.* (“In addition, on February 26, 2021, Ramot sued Acacia for infringement of related Ramot patents”);

63. The fact that Ramot sued Cisco on related patents in the 2014 Texas Action and the 2019 Texas Action, sued Acacia on “related Ramot patents” in the February 2021 Delaware Action, and alleged infringement by *both* Cisco and Acacia of the ’998 patent’s immediate parent (the ’872 patent) in the September 2021 Delaware Declaratory Judgment Action gives Cisco and Acacia reason to believe that Ramot also will claim that Cisco’s and Acacia’s activities with respect to the Accused Products infringe one or more claims of the ’998 patent at issue here.

### **Personal Jurisdiction**

64. Ramot is subject to specific personal jurisdiction in this District because of (a) its filing of the related February 2021 Delaware Action in this District, *see Ramot at Tel Aviv Univ., Ltd. v. Acacia Comm’ns Inc.*, C.A. No. 21-295 (D. Del.), D.I. 1 (Complaint), and/or (b) its filing of a patent-infringement counterclaim in the related September 2021 Delaware Declaratory Judgment Action, *see Cisco Systems, Inc. & Acacia Comm’ns, Inc. v. Ramot at Tel Aviv Univ. Ltd.*, C.A. No. 21-1365 (D. Del.), D.I. 8 (Answer and Counterclaims for Patent Infringement). By bringing these claims in Delaware, Ramot consented to personal jurisdiction in the State of Delaware.

65. By filing the February 2021 Delaware Action and its counterclaim in the September 2021 Delaware Declaratory Judgment Action, Ramot also subjected itself to specific personal jurisdiction in this District by transacting business in Delaware within the meaning of Delaware’s Long-Arm Statute, 10 Del. C. § 3104(c)(1).

66. In the alternative, and as additional support for personal jurisdiction over Ramot in Delaware, personal jurisdiction can be established through service of summons or waiver of service of summons under Fed. R. Civ. P. 4(k)(2). Ramot alleges that it is an Israeli company



headquartered in Israel. Ramot has never alleged any presence or activity in any state in the United States, nor do public records and public searches indicate any such presence or activity in any state in the United States, with the exception of Ramot’s assertion, licensing, and litigation campaigns over the “Linearized Optical Digital-to-Analog Modulator” patent family, including Ramot’s prior 2014 Texas Action against Cisco, its 2019 Texas Action against Cisco, its February 2021 Delaware Action against Acacia, and its counterclaim against Cisco and Acacia in the September 2021 Delaware Declaratory Judgment Action. On information and belief, based on the foregoing facts, Ramot is not amenable to personal jurisdiction in any state’s court of general jurisdiction, but does have sufficient minimal contacts with the United States as a whole. Accordingly, Fed. R. Civ. P. 4(k)(2) provides an additional basis for the exercise of personal jurisdiction over Ramot with respect to Cisco’s and Acacia’s claim for declaratory relief.

#### **Venue**

67. Venue is proper in this District pursuant to 28 U.S.C. § 1391.

#### **CLAIM FOR RELIEF Declaration of Noninfringement of the ’998 Patent**

68. Plaintiffs Cisco and Acacia restate and incorporate each of the allegations of paragraphs 1-67 above as if fully set forth herein.

69. Defendant Ramot purports to be the owner all rights, title, and interests in the ’998 patent, including the right to enforce the ’998 patent.

70. Cisco does not infringe and has not infringed—directly, contributorily, or by inducement—any claim of the ’998 patent by manufacturing, using, selling, offering for sale, or importing any of the Accused Products at issue in this action.

71. Acacia does not infringe and has not infringed—directly, contributorily, or by inducement—any claim of the '998 patent by manufacturing, using, selling, offering for sale, or importing any of the Accused Products at issue in this action.

72. The Accused Products include products that are analog-driven, *i.e.*, which use a digital signal processor having a digital-to-analog converter at its output. These analog-driven products include Acacia's and Cisco's AC1200 products, AC400 products, CIM8 pluggable modules, and 100G, 200G, and 400G pluggable modules in a variety of standard form factors such as CFP-DCO, CFP2-DCO, CFP2-ACO, OSFP, and QSFP-DD; "BiDi" modules that communicate at or above 100 Gbps; "single lambda" modules that communicate according to the 100G-FR, 100G-LR and/or 400G-FR technical specifications; components of these modules, *i.e.*, Acacia's and Cisco's DSP ASICs and Silicon Photonic ICs; and Cisco's networking equipment (including *e.g.* line cards and routers), incorporating such modules or components, including networking equipment incorporating optical transceiver modules, embedded coherent transceivers, and/or embedded DSP circuitry and slots for pluggable optics.

73. The analog-driven Accused Products do not infringe any issued claims of the '998 patent because none of the issued claims of the '998 patent—including all five independent claims, *i.e.* issued claims 1, 16, 32, 45, and 58—cover systems or methods that use analog-driven modulators, *i.e.*, a modulator that is driven with analog drive voltage signals.

74. Moreover, the analog-driven Accused Products do not infringe issued claim 1 of the '998 patent, a system claim, and all claims depending therefrom, because, as analog-driven devices, they do not include at least the following limitations as required by the claims: (a) "a modulator for modulating the input optical signal responsively to the plurality of N digital input data bits to output a modulation of the input optical signal, thereby generating one or more

modulated optical signal outputs for transmission over one or more optical fibers”; (b) “wherein a digital-to-digital mapping maps the plurality of N digital input bits to a set of M digital output data bits associated with a plurality of voltage values;” and (c) “wherein the input optical signal is modulated based on the plurality of voltage values.”

75. The analog-driven Accused Products do not infringe issued claim 16 of the ’998 patent, a system claim, and all claims depending therefrom, because, as analog-driven devices, they do not include at least the following limitations as required by the claims: (a) “a modulator for modulating the input optical signal responsively to the plurality of N digital input data bits to output a modulation of the input optical signal, thereby generating one or more modulated optical signal outputs for transmission over one or more optical fibers”; (b) “wherein a digital-to-digital mapping maps the plurality of N digital input bits to M digital output data bits associated with a plurality of voltage values;” and (c) “wherein the input optical signal is modulated based on the plurality of voltage values.”

76. The analog-driven Accused Products do not infringe issued claim 32 of the ’998 patent, a system claim, and all claims depending therefrom, because, as analog-driven devices, they do not include at least the following limitations as required by the claims: (a) “wherein the N bits of the N bit digital input data word are mapped to a series of M output bits corresponding to a set of voltage values”; (b) “wherein the input digital data word is one from a set of  $2^N$  input data words, the M output bits are from a set of  $2^M$  M output bits, wherein each M output bits in the set of  $2^M$  M output bits corresponds to a different set of voltage values”; and (c) “wherein the input optical signal received by each of the waveguide branches of the modulator is modulated based on at least a subset of the set of voltage values to generate a corresponding modulated optical signal.”

77. The analog-driven Accused Products do not infringe issued claim 45 of the '998 patent, a system claim, and all claims depending therefrom, because, as analog-driven devices, they do not include at least the following limitations as required by the claims: (a) “wherein the N bits of the N bit digital input data word are mapped to a series of M output bits corresponding to a set of voltage values”; (b) “wherein the input digital data word is one from a set of  $2^N$  input data words, the set of M output bits are each from a set of  $2^M$  M output bits, wherein each M output bits in the set of  $2^M$  M output bits corresponds to a different set of voltage values”; and (c) “wherein each of the optical signal output generated by the electro-absorption signal generation device is modulated based on at least a subset of the set of voltage values to generate a corresponding modulated optical signal.”

78. The analog-driven Accused Products do not infringe issued claim 58 of the '998 patent, a system claim, and all claims depending therefrom, because, as analog-driven devices, they do not include at least the following limitations as required by the claims: (a) “wherein a digital-to-digital mapping maps the plurality of N digital input data bits to M digital output data bits”; (b) “wherein the digital-to-digital mapping comprises, for each digital input value included in a set of possible digital input values for the plurality of N digital input data bits, a set of M corresponding digital output values from a set of possible digital output values”; and (c) “wherein the optical modulation system further comprises a modulator for modulating the input optical signal responsively to the M digital output data bits, to output a modification of the input optical signal, thereby generating one or more modulated optical signal outputs for transmission over one or more optical fibers.”

79. The Accused Products also include products that are digitally-driven. These digitally-driven products include digitally-driven versions of Cisco's 100G, 200G, and 400G

optical modules, including versions of the QSFP-100G-DR-S, QSFP-100G-FR-S, QSFP-100G-LR-S, and QSFP-100G-ERL-S products.

80. The digitally-driven Accused Products do not infringe any issued claims of the '998 patent because they lack each of the limitations of the five independent claims identified as missing above in the analog-driven Accused Products.

81. The digitally-driven Accused Products also do not infringe any issued claims of the '998 patent because they do not meet the “digital-to-digital mapping” and “mapp[ing]” limitations recited in each of the five independent claims. For instance, each of Cisco’s digitally-driven Accused Products use coding changes (*e.g.*, gray coding with thermometer coding) that do not perform the necessary “digital-to-digital mapping” and “mapp[ing]” recited in the independent claims.

82. In addition, the digitally-driven Accused Products also do not infringe issued claim 1 of the '998 patent, a system claim, and all claims depending therefrom, because the products' use of gray coding and thermometer coding does not meet the limitations relating to successively increasing and/or decreasing “deltas,” *i.e.*, (a) “wherein, within the digital-to-digital mapping, for a first subset of successively increasing digital input values specified in the digital-to-digital mapping, deltas between numerical values of successive digital outputs in the set of digital output values corresponding respectively to successively increasing digital input values in the first subset, decrease” and (b) “wherein, within the digital-to-digital mapping, for a second subset of successively increasing digital input values specified in the digital-to-digital mapping, deltas between numerical values of successive digital outputs in the set of digital output values corresponding respectively to the successively increasing digital input values in the second subset, increase.”

83. The digitally-driven Accused Products also do not infringe issued claim 16 of the '998 patent, a system claim, and all claims depending therefrom, because the products' use of gray coding and thermometer coding does not meet the limitations relating to successively increasing and/or decreasing "deltas," *i.e.*, (a) "wherein, within the digital-to-digital mapping, for a first subset of successively decreasing digital input values specified in the digital-to-digital mapping, deltas between numerical values of successive digital outputs in the set of digital output values corresponding respectively to successively decreasing digital input values in the first subset, decrease" and (b) "wherein, within the digital-to-digital mapping, for a second subset of successively decreasing digital input values specified in the digital-to-digital mapping, deltas between numerical values of successive digital outputs in the set of digital output values corresponding respectively to the successively decreasing digital input values in the second subset, increase."

84. The digitally-driven Accused Products also do not infringe issued claim 58 of the '998 patent, a system claim, and all claims depending therefrom, because the products' use of gray coding and thermometer coding does not meet the limitations relating to successively increasing and/or decreasing "deltas," *i.e.*, (a) "wherein, within the digital-to-digital mapping, for a first subset of successively increasing digital input values specified in the digital-to-digital mapping, deltas between numerical values of successive digital outputs in the set of digital output values corresponding respectively to successively increasing digital input values in the first subset, decrease" and (b) "wherein, within the digital-to-digital mapping, for a second subset of successively increasing digital input values specified in the digital-to-digital mapping, deltas between numerical values of successive digital outputs in the set of digital output values

corresponding respectively to the successively increasing digital input values in the second subset, increase.”

85. Cisco and Acacia do not induce infringement within the meaning of 35 U.S.C. § 271(b). None of their blog posts, presentations, whitepapers, videos, customer instructions, and/or design contributions with respect to the analog-driven or digitally-driven Accused Products—including those identified by Ramot in the 2019 Texas Action, the February 2021 Delaware Action, or the September 2021 Delaware Declaratory Judgment Action, as referenced above—encourage any individual or entity to directly infringe any claim of the ’998 patent. Nor do Cisco or Acacia have the requisite specific intent to induce infringement.

86. Cisco and Acacia do not contributorily infringe within the meaning of 35 U.S.C. § 271(c). Cisco and Acacia do not make, use, sell, offer for sale, or import the analog-driven or digitally-driven Accused Products or components thereof (such as DSP ASICs and Silicon Photonic ICs) knowing that these products constitute a material part of the claimed invention, are especially made or adapted for use in infringing the ’998 patent, and are not staple articles or commodities of commerce capable of substantial noninfringing uses.

87. Cisco and Acacia seek and are entitled to a declaration that they do not infringe, directly or indirectly, any claim of the ’998 patent under the patent laws of the United States, 35 U.S.C. § 1 *et seq.*

#### **PRAYER FOR RELIEF**

WHEREFORE, Plaintiffs Cisco and Acacia respectfully request and pray that this Court:

- a. Find and declare that Cisco and Acacia do not infringe and have not infringed, in any manner, directly or indirectly, any claim of the ’998 patent under the patent laws of the United States, 35 U.S.C. § 1 *et seq.*;
- b. Award Cisco and Acacia all of its costs of this action;

- c. To the extent that Cisco and/or Acacia is the prevailing party, find that this is an exceptional case and award Cisco and Acacia its attorneys' fees pursuant to 35 U.S.C. § 285 and all other applicable statutes, rules, and common law; and
- d. Grant Cisco and Acacia such other and further relief as the Court deems just and proper under the circumstances.

### **JURY DEMAND**

Plaintiffs Cisco and Acacia demand a trial by jury on all issues so triable.

MORRIS, NICHOLS, ARSHT & TUNNELL LLP

*/s/ Jennifer Ying*

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