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UNITED STATES DISTRICT COURT

CENTRAL DISTRICT OF CALIFORNIA

SOUTHERN DIVISION

CORE OPTICAL TECHNOLOGIES, LLC,

Plaintiff,

v.

NOKIA CORPORATION, a Finnish Corporation, NOKIA OF AMERICA CORPORATION, a Delaware Corporation, and DOES 1 through 10, inclusive,

Defendants.

CASE NO: 8:19-cv-2190

SECOND AMENDED COMPLAINT FOR PATENT INFRINGEMENT

JURY TRIAL DEMANDED

Plaintiff Core Optical Technologies, LLC ("Plaintiff" or "Core"), by and through its undersigned counsel, hereby files this Second Amended Complaint against Defendants Nokia Corporation ("Nokia Corp."), Nokia of America Corporation ("Nokia US") (collectively, "Nokia"), and Does 1 through 10, inclusive ("Does") (collectively, "Defendants"). For its complaint, Core alleges as follows:

THE PARTIES

1. Core is a limited liability company organized and existing under the laws of the State of California. Core has a principal place of business located at 18792 Via Palatino, Irvine, California 92603.

2. Defendant Nokia Corp. is a limited liability corporation organized and existing under the laws of Finland. Nokia Corp. maintains its principal place of business at Karaportti 3, 02610 Espoo, Finland.

3. Defendant Nokia of America Corporation, fka "Alcatel-Lucent USA Inc.," is a corporation organized and existing under the laws of Delaware, with a principal place of business located at 3201 Olympus Boulevard, Dallas, Texas, USA. Nokia of America Corporation is a subsidiary of Nokia Corporation. Upon information and belief, Nokia of America Corporation conducts operational activity on behalf of Nokia Corporation within the United States.

4. Defendants Does are: (i) customers and/or end-users of Nokia's fiber optic cross polarization interference cancelling devices; (ii) other end-users of Nokia's fiber optic cross polarization interference cancelling devices; (iii) persons, such as third-party vendors or contractors, who have assisted Nokia or the other Doe Defendants in using Nokia's fiber optic cross polarization interference cancelling devices in a manner that infringes the Asserted Claims (as defined below); and/or (iv) other persons, all of whom have infringed the Asserted Claims, or who have assisted other Defendants in infringing the Asserted Claims, by or through their use of Nokia's fiber optic cross polarization interference cancelling devices.

5. The true names and identities of the Doe Defendants are unknown at this time. Therefore, they are being sued under their fictitious names. At such time as their true names are ascertained, this Complaint will be amended to so reflect.

6. On information and belief, each Doe Defendant has directly and/or indirectly infringed the Asserted Claims, either by themselves or in concert with other Defendants, by using Nokia's fiber optic cross polarization interference cancelling

devices in the United States. Core reserves the right to amend this Complaint to identify the specific infringing acts of each Doe Defendant once it learns such facts. Core expect that most, or all, of such facts are non-public. Core expects to uncover such facts in discovery.

JURISDICTION AND VENUE

7. This is an action for infringement of method claims, and *only* method claims, of U.S. Patent No. 6,782,211, entitled "Cross Polarization Interface [sic] Canceler," which was duly issued by the United States Patent and Trademark Office on August 24, 2004 ("the '211 patent"). The asserted claims in this case are *only* method claims 30, 32, 33, 35 and 37 of the '211 patent ("the Asserted Claims").

8. This Court has subject matter jurisdiction over this case under 28 U.S.C. §§ 1331 and 1338(a), because the claims arise under the patent laws of the United States, 35 U.S.C. §§ 1, *et seq*.

9. This Court has general personal jurisdiction over each Defendant, because each Defendant conducts continuous and systematic business in California, including, upon information and belief, in this judicial district. This Court also has general personal jurisdiction over each Defendant because each maintains a regular and established place of business in this district.

10. In addition, this Court has specific personal jurisdiction over each Defendant because, on information and belief, each Defendant has committed acts of infringement in California, and within this judicial district.

11. This Court has specific personal jurisdiction over Defendant Nokia US because, on information and belief, it has committed acts that infringe the Asserted Claims in California, and in this judicial district. More specifically, on information and belief, Nokia US has performed all of the steps of the Asserted Claims in California, and in this judicial district, either personally, through intermediaries, or in conjunction with one or more joint venturers or customers. Furthermore, on information and belief, Nokia US has induced and/or contributed to customers'

infringement of the Asserted Claims in California, and in this judicial district.

12. This Court has specific personal jurisdiction over Defendant Nokia Corp. because, on information and belief, it has marketed, manufactured, used, offered for sale, sold, imported, and/or distributed within California, and in this judicial district, devices that can be configured to cancel cross polarization interference in received fiber optic signals—which, as so configured, perform all the steps of the Asserted Claims. On information and belief, Nokia Corp. has performed all the steps of the Asserted Claims in California, and in this judicial district, either itself, through intermediaries, or in conjunction with joint venturers or customers. Furthermore, on information and belief, Nokia Corp. has induced and/or contributed to customers' infringing uses of the Asserted Claims in California, and in this judicial district.

13. This Court also has specific personal jurisdiction over Defendant Nokia Corp. because, on information and belief, Nokia Corp. has supplied to Nokia US devices that can be configured to mitigate and/or cancel cross polarization interference in received fiber optic signals, which, as so configured and used, perform all the steps of the Asserted Claims. On information and belief, Nokia US has then sold, offered for sale, used, or distributed such devices, as so configured, to customers located within California, and within this judicial district, who have used the devices in a manner that infringes the Asserted Claims.

14. Nokia Corp. has admitted that, by supplying devices that can be configured to cancel cross polarization interference in received fiber optic signals to a U.S. subsidiary, which subsequently markets the devices to customers in California, Nokia Corp. subjects itself to personal jurisdiction in California. Nokia Corp. made this admission in *Nazomi Commc'ns, Inc. v. Nokia Corp.*, No. SACV10151DOCRNBX, 2010 WL 11509140, at *2 (C.D. Cal. Oct. 12, 2010).

15. In *Nazomi*, Nokia Corp., and several other defendants, were accused of infringing two patents relating to Java hardware acceleration. *Id.* at * 1. The patentee filed suit against Nokia Corp. and the other Defendants in the Central District of

California. *Id.* Multiple Defendants then moved to transfer the case to the Northern District of California, under 28 U.S.C. § 1404. *Id.* Nokia did not oppose the motion to transfer. To the contrary – Nokia submitted two Declarations, ***supporting*** the motion to transfer. *See* Ex. 31 (Declaration of Nokia employee Jill Piasecki, supporting the motion to transfer); Ex. 32 (Declaration of Nokia employee Stephen M. Smith, supporting the motion to transfer). Because Nokia affirmatively supported the motion to transfer, Nokia can be deemed to have adopted the positions taken therein.

16. As part of the motion to transfer, the Defendants, including Nokia Corp., were required to establish that "[t]he exercise of personal jurisdiction over [them] would be proper in the Northern District of California." *Id.* To meet this requirement, Defendants' lawyers submitted a motion ***expressly conceding*** that Nokia Corp. was subject to personal jurisdiction in California. *See* Ex. 30 (Defendants' Motion to Transfer in *Nazomi*) at 5. Nokia Corp. ***affirmatively adopted*** this position in two separate Declarations, thus conceding that it is subject to personal jurisdiction in this judicial district, as follows:

> Personal jurisdiction is ***appropriate*** in the Northern District for this case for Nokia Inc. ***and Nokia Corporation***. Nokia Inc. offered the accused Nokia 770 for sale through physical retail outlets in the Northern District. Bahr Decl. at ii 2. Nokia Inc. also offered the Nokia 770 for sale through at least the e-commerce site nokiausa.com, purposefully directed at consumers in the U.S., which include those consumers in the Northern District. Id. at ii 3. When the Nokia 770 was offered for sale on nokiausa.com, the site was operated by LetsTalk, which was headquartered in the Northern District. Id. at ii 4. The Nokia 770 was actually sold to customers in the Northern District through at least the nokiausa.com site. Id. at ii 5. Nokia Inc. is a wholly-owned subsidiary of Nokia Holding Inc., which is a wholly-owned subsidiary of Nokia Corporation. Piasecki Decl. at ii 2. ***Nokia Corporation provided the Nokia 770 to Nokia Inc. to sell to U.S. customers.*** Smith Decl. at ii 2. (Ex. 30 at 5) (emphases added)

17. Thus, in *Nazomi*, Nokia Corp. ***admitted*** – through the Declarations of

Smith and Piasecki, and through its adoption of the arguments made by the moving Defendants – that, when it provides relevant devices to a U.S. subsidiary, who then offers the devices for sale in California through "physical outlets" or "e-commerce," Nokia Corp. subjects itself to personal jurisdiction in California.

18. In *Nazomi*, Nokia's argument was successful. *Nazomi*, 2010 WL 11509140 at *2. This Court transferred the case to the Northern District, ***explicitly finding*** that Nokia Corp. was subject to personal jurisdiction in California, because "Nokia Corporation provided the allegedly infringing product to its subsidiary Nokia, Inc., which thereafter offered the product for sale throughout Northern California, thus establishing that both entities directed their activities towards California." *Nazomi*, 2010 WL 11509140 at * 2.

19. Here, as in *Nazomi*—on information and belief—Nokia Corp. provides the devices that can be configured to mitigate and/or cancel cross polarization interference in received fiber optic signals to its U.S. subsidiary, Nokia U.S.. Nokia U.S. then sells and offers such devices for sale to customers in California, both: (i) through "physical outlets;" and (ii) through Internet sites. Because the same facts are present here as in *Nazomi*—and because Nokia Corp. ***admitted*** it was subject to personal jurisdiction in California in *Nazomi*—Nokia Corp. is subject to personal jurisdiction in California, and in this judicial district, in this case.

20. Nokia Corp. is also subject to personal jurisdiction because it offers devices that can be configured to mitigate and/or cancel cross polarization interference in received fiber optic signals for sale to customers in California, including in this judicial district, through its website. On information and belief, Nokia Corp. operates the website located at https://www.nokia.com/. That website is available to customers in California, including customers in this judicial district.

21. The Nokia website offers devices that can be configured to mitigate and/or cancel cross polarization interference in received fiber optic signals. For instance, the page https://www.nokia.com/networks/products/1830-photonic-service-

switch/ is a marketing page for the 1830 PSS Family devices. Those devices can be configured to mitigate and/or cancel cross polarization interference in received fiber optic signals in a manner that, upon use, infringes the Asserted Claims. At the very top of this page is a large button labeled "How to Buy." *Id.* When this button is clicked, the user is taken to a page titled "Connect with sales", https://www.nokia.com/networks/connect-with-sales/, which allows a potential customer to "specify the solution you'd like to discuss and provide any additional details." *See* Ex. 33. This page allows the user to submit such a request, along with their name, phone number, email address, company name, and job function. *Id.* On information and belief, when a customer in this judicial district submits a request, on this page, to purchase the relevant devices, a Nokia sales representative will contact them, and try to make a sale. Accordingly, Nokia Corp.'s website specifically directs sales activities relating to the devices to customers in this judicial district.

22. Additionally, Nokia Corp. publishes the website infocenter.nokia.com to residents of this judicial district. As explained in Paragraphs 79-84 *infra*, that website specifically instructs end-users of Nokia's devices on how to use those devices to perform all the steps of the Asserted Claims. Thus, Nokia Corp. has specifically directed acts to residents of the district (i.e., publishing the infocenter.nokia.com website), which are intended to induce direct infringement by residents of this judicial district, and which, on information and belief, have actually induced direct infringement by residents of this judicial district.

23. In addition, on information and belief, Nokia Corp. employees have traveled to this district to perform marketing activities relating to fiber optic cross polarization interference cancelling devices, such as at trade shows held in this judicial district.

24. Nokia Corp. has purposefully directed activities towards this judicial district, at least by: (i) providing fiber optic cross polarization interference cancelling devices to Nokia U.S. for distribution, use, or sale in this judicial district; (ii)

providing an interactive website, which residents of this judicial district may use to purchase fiber optic cross polarization interference cancelling devices; (iii) publishing the infocenter.nokia.com website, which specifically instructs residents of this district how to use the fiber optic cross polarization interference cancelling devices to practice the Asserted Claims; and (iv) traveling to this judicial district for marketing activities relating to fiber optic cross polarization interference cancelling devices.

25. Core's claims against Nokia Corp. arise out of Nokia Corp's. activities directed to and occurring in this judicial district, because Nokia Corp. sells and markets fiber optic cross polarization interference cancelling devices to customers in this judicial district, the use of which such devices (when appropriately configured) constitutes infringement of the Asserted Claims of the '211 Patent.

26. Finally, the exercise of jurisdiction over Nokia Corp. comports with fair play and substantial justice, because Nokia Corp. is a large, sophisticated corporation, which obtains substantial benefit from its sales and marketing of fiber optic cross polarization interference cancelling devices to customers in this judicial district.

27. Accordingly, for the foregoing reasons, the exercise of specific personal jurisdiction over Nokia Corp. is proper in this judicial district.

28. Venue is proper in this judicial district against each Defendant.

29. Venue is proper against Defendant Nokia Corp. because Nokia Corp. is a foreign corporation. Venue is proper against foreign corporations in any judicial district where they are subject to personal jurisdiction. *See* 28 U.S.C. § 1391(c)(3).

30. Venue is proper against Defendant Nokia U.S. because, on information and belief: (i) Nokia U.S. has a regular and established place of business in this judicial district; and (ii) Nokia U.S. has committed acts of infringement in this judicial district, including performing all the steps of the method(s) claimed in the '211 Patent in this judicial district; and/or performing acts of contributory or induced infringement in this judicial district. *See* 28 U.S.C. § 1400(b).

31. In addition, venue is proper because Core resides in this judicial district,

and Core has and continues to suffer harm in this judicial district. Moreover, a substantial part of the events giving rise to this action occurred in this judicial district, including the inventive activities giving rise to the '211 patent.

THE ASSERTED PATENT

32. Mark Core, the sole named inventor of the '211 patent, earned his Ph.D. in electrical and computer engineering from the University of California, Irvine, and is the Manager of Core Optical Technologies, LLC. The pioneering technology set forth in the ’211 patent greatly increases data transmission rates in fiber optic networks, by enabling two optical signals transmitted in the same frequency band, but at generally orthogonal polarizations, to be recovered at a receiver. The patented technology that enables the recovery of these signals includes coherent optical receivers and related methods that mitigate cross-polarization interference associated with the transmission of the signals through the fiber optic network. The coherent receivers and their patented methods mitigate the effects of polarization dependent loss and dispersion effects that limit the performance of optical networks, greatly increasing the transmission distance and eliminating or reducing the need for a variety of conventional network equipment such as amplifiers, regenerators, and compensators. The patented technology set forth in the ’211 patent has been adopted by Defendants in, at least, their packet-optical transport solutions described below.

33. On November 5, 1998, Mark Core filed with the United States Patent and Trademark Office ("USPTO") Provisional Patent Application No. 60/107,123 ("the '123 application") directed to his pioneering inventions. On November 4, 1999, Mark Core filed with the USPTO a non-provisional patent application, U.S. Patent Application No. 09/434,213 ("the '213 application"), claiming priority to the '123 application. On August 24, 2004, the USPTO issued the '211 patent from the '213 application. The entire right, title, and interest in and to the '211 patent, including all rights to past damages, has been assigned to Core in an assignment recorded with the USPTO. The '211 patent is attached as Exhibit 1 to this Complaint.

34. The Asserted Claims of the '211 patent are all method claims. One of these is claim 33, an independent method claim. Claim 33 is reproduced below, with parenthetical annotations to identify the different elements of the claim:

> 33. A method comprising:
>
> > (33a) receiving an optical signal over a single fiber optic transmission medium,
> >
> > > (33a1) the optical signal being at least two polarized field components independently modulated with independent information bearing waveforms; and
> >
> > (33b) mitigating cross polarization interference associated with the at least two modulated polarized field components to reconstruct the information bearing waveforms
> >
> > > (33b1) using a plurality of matrix coefficients being complex values to apply both amplitude scaling and phase shifting to the at least two modulated polarized field components.

DEFENDANTS' CROSS POLARIZATION CANCELLING DEVICES

35. Defendants and/or their divisions, subsidiaries, and/or agents are engaged in the business of making, using, distributing, importing, offering for sale and/or selling devices that can be configured to mitigate and/or cancel cross polarization interference in received fiber optic signals. As so configured, the devices, when used, perform all the steps of the methods claimed in the Asserted Claims, during normal use. These devices include, but are not limited to, the 1830 Photonic Service Switch product family (the "1830 PSS Family"), the 1830 Photonic Service Interconnect product family (the "1830 PSI Family"), the 1620 SOFTNODE product family (the "1620 SOFTNODE Family"), and the WaveLite Metro 200 (the "Metro 200") (collectively, "the Fiber Optic XPIC Devices").

36. Each Fiber Optic XPIC Device is, or can be, configured to perform all of the steps recited in the Asserted Claims of the '211 Patent, during normal use. On information and belief, each Defendant has actually used the Fiber Optic XPIC Devices to perform each step of the methods recited in the Asserted Claims of the '211 Patent, within the United States, either itself, through intermediaries, or in conjunction with one or more joint venturers or customers.

The 1830 PSS Family

37. According to Nokia's website, the 1830 PSS Family is a "flexible transport layer with capabilities such as 100G-600G transport wavelengths, agile wavelength routing, and scalable multilayer switching and services." *See* Exhibit 2 (https://www.nokia.com/networks/products/1830-photonic-service-switch/) at 1. Information from Nokia's website, and from other publicly-available sources, demonstrates that the 1830 PSS Family, when used with appropriate components, is configured to perform all of the steps recited in claim 33, during normal use.

38. Nokia's website states that the "1830 PSS portfolio helps you optimize ***optical networks***," by "supporting efficient, high-performance 100G–600G wavelength transport." Exh. 2 at 1-2 (emphasis added). Thus, the 1830 PSS Family includes components that "receiv[e] an optical signal over a single fiber optic transmission medium," as recited in element 33(a).

39. Specifically, the 1830 PSS Family includes pluggable "interface cards," which can be plugged into the various 1830 PSS chassis models (e.g., PSS-4, PSS-8, PSS-16, PSS-32, etc.). *See* Exhibit 3 (Datasheet, Nokia 1830 PSS-4, PSS-8, PSS-16 and PSS-32 platforms, downloaded from https://onestore.nokia.com/asset/194066) at 5-6. The interface cards send and "receiv[e] an optical signal over a single fiber optic transmission medium," as recited in element 33(a). *Id.* Thus, the 1830 PSS Family is configured to perform element 33(a) during normal use.

40. A datasheet available on Nokia's website states that the 1830 PSS Family can be used with a variety of interface cards, including the D5X500,

D5X500Q, D5X500L, and D5X500 Subsea cards ("D5X500 Series"). *See* Exh. 3 at 6. A datasheet for the D5X500 Series states that these cards use a variety of modulation formats, including "250G DP-16QAM," "200G DP-16QAM," "200G DP-8QAM," "100G DP-QPSK," "100G SP-DP-QPSK," and "50G DP-BPSK." *See* Exhibit 4 (Datasheet, Nokia 1830 PSS 500G Muxponder) at 3.

41. Each of these modulation formats is coded "DP," which means "dual polarization." "Dual polarization" means modulation in which two signals are sent at the same frequency, at the same time, but at orthogonal polarizations to one another. This technique is also known as "polarization division multiplexing" (PDM). PDM receivers, such as the receivers in the D5X500 Series of 1830 PSS Family interface cards, receive an "optical signal being at least two polarized field components independently modulated with independent information bearing waveforms," as recited in element 33(a1). Thus, the 1830 PSS Family, when used with the appropriate interface cards, is configured to perform element 33(a1) during normal use.

42. Element 33(b) recites "mitigating cross polarization interference associated with the at least two modulated polarized field components to reconstruct the information bearing waveforms." Publicly-available evidence demonstrates that the 1830 PSS Family, when used with appropriate components, is configured to perform this step during normal use.

43. For instance, the document "Discus D 2.3, Updates to the reference architecture" (Exhibit 5)[1] was published in 2015 by "the Discus Consortium," which included "Alcatel-Lucent Deutschland AG." Exh. 5 at 3. Alcatel-Lucent was purchased by Nokia in 2015-2016[2]; thus, Defendants are the successors-in-interest to the "Alcatel-Lucent" who participated in the "Discus Consortium."

[1] From https://cordis.europa.eu/docs/projects/cnect/7/318137/080/deliverables/001-318137DISCUSD23FINALrenditionDownload.pdf.

[2] *See* https://www.nokia.com/about-us/news/releases/2016/11/02/nokia-finalizes-its-acquisition-of-alcatel-lucent-ready-to-seize-global-connectivity-opportunities/.

44. Section 6 of the Discus document describes "100G-DP-QPSK transmission" – i.e., 100 Gb per second, dual-polarization, quadrature-phase shift keying transmission. *Id.* at 40. The document identifies the "Alcatel-Lucent, **1830 PSS**" as a product that performs such 100G-DP-QPSK transmission. *Id.* at 58. Thus, the Discus document specifically describes the functionality of the 1830 PSS Family.

45. The Discus document states that 100G-DP-QPSK transceivers, including those in the 1830 PSS Family, include "coherent" receivers which "use[] DSP" to "***mitigate*** the impact of . . . ***polarization cross-talk*** . . . between orthogonally polarized channels resulting from the ***misalignment between the states of polarization (SOP***) of the LO and the detected signal." *Id.* at 40 (emphases added). This confirms that the 1830 PSS Family, when used with a 100G-DP-QPSK transceiver, is configured to perform cross-polarization interference mitigation – i.e., to "mitigat[e] cross polarization interference associated with the at least two modulated polarized field components to reconstruct the information bearing waveforms" - as recited in element 33(b), during normal use.

46. Similarly, a 2011 article titled "Impact of nonlinear and polarization effects in coherent systems," by Alcatel-Lucent employee Chongjin Xie (Exhibit 6), describes a typical "digital coherent optical communication system." Exh. 6 at 3-4. On information and belief, because the author of this article was an Alcatel-Lucent employee, the "digital coherent optical communication system" described and depicted in this article is the (then-Alcatel-Lucent, now-Nokia) 1830 PSS.

47. As the article explains, the 1830 PSS Family includes an "ASIC" (Application-Specific Integrated Circuit) which performs "polarization demultiplexing." *Id.* at 4-5. The "[p]olarization demultiplexing . . . [is] performed with a butterfly equalizer, which consists of four subequalizers" *Id.* The "butterfly equalizer" performs computations to "compensate transmission impairments" – i.e., to correct for the loss of orthogonality and dispersion which occurs as the signal propagates down the line. *Id.* Thus, this article confirms that the PSS 1830 Family,

when used with the butterfly equalizer ASIC, is configured to perform cross-polarization interference mitigation – i.e., to "mitigat[e] cross polarization interference associated with the at least two modulated polarized field components to reconstruct the information bearing waveforms," as recited in element 33(b).

48. Element 33(b1) recites that the "mitigating" is performed by "using a plurality of matrix coefficients being complex values to apply both amplitude scaling and phase shifting to the at least two modulated polarized field components." Publicly-available information shows that the 1830 PSS Family, when used with appropriate components, is configured to perform this step during normal use.

49. For instance, the 2016 article "From first fibers to mode-division multiplexing," by Nokia employee Peter J. Winzer (Exh. 7), describes "today's digital coherent ASICs" – i.e., the integrated circuits used to perform DSP in modern coherent optical receivers. Exh. 7 at 6. Because the article is written by a Nokia employee, on information and belief, the reference to "today's digital coherent ASICs" refers to Nokia's ASICs, and specifically, the ASICs in the 1830 PSS Family.

50. The article states that, in the 1830 PSS Family ASIC, there is a "2x2 MIMO" which performs "polarization demultiplexing." *Id.* A 2x2 MIMO is configured to perform ***matrix operations***, which apply "amplitude scaling" and "phase shifting" to convert two complex input signals into two modified output signals. Because the article describes using a 2x2 MIMO to perform "polarization demultiplexing," it is clear that the 2x2 MIMO in the 1830 PSS Family ASIC is configured to perform matrix operations to "mitigate cross-polarization interference," as recited in the Asserted Claims. Thus, when the 1830 PSS Family is used with the appropriate ASIC, it is configured to perform element 33(b1) during normal use.

51. Similarly, a 2018 PhD thesis by Nokia employee Alexis Carbo Meseguer (Exhibit 8) describes and depicts an "optical coherent receiver and digital processing scheme." Exh. 8 at 37. Because this thesis was written by a Nokia employee, and because the "optical coherent receiver" described therein appears to be the same

"optical coherent receiver" described in the Chongjin Xie article (Exh. 6 at 4), on information and belief, the "optical coherent receiver" depicted in the thesis is a Nokia receiver; specifically, a receiver from the 1830 PSS Family.

52. The Meseguer thesis states that the 1830 PSS receiver includes a DSP with an "adaptive equalizer," which "is implemented with a butterfly structure." Exh. 8 at 38. The thesis specifically shows that the adaptive equalizer performs a ***matrix computation***, which applies amplitude scaling and phase shifting on complex values, to "recover the original in-phase and quadrature components" from two components received "***at an arbitrary polarization state***." *Id.* (emphasis added). Thus, the article confirms that the 1830 PSS Family, when used with appropriate components, is configured to perform element 33(b1) during normal use.

53. Numerous Nokia patents confirm that Nokia's optical equipment, including the equipment used in the 1830 PSS Family, mitigates cross-polarization inference by performing a matrix computation on complex values. *See* Exh. 9 (Nokia's U.S. Pat. No. 8,571,423) at col. 11 (describing matrix operations used to mitigate cross-polarization interference); Exh. 10 (Nokia's U.S. Pat. No. 7,509,054) at col. 5-6 (same); Exh. 11 (Nokia's U.S. Pat. No. 7,747,169) at col. 9-10 (same).

54. Accordingly, as shown above, the 1830 PSS Family, when used with appropriate components, is configured to perform all of the steps recited in claim 33, during normal use.

The 1830 PSI Family

55. The 1830 PSI Family is described on Nokia's website at https://www.nokia.com/networks/products/1830-photonic-service-interconnect/#overview. According to the website, "[t]he Nokia 1830 Photonic Service Interconnect (PSI) product family provides industry leading performance, scale, and simplicity for Data Center Interconnection (DCI) applications." *Id.*

56. The Nokia website indicates that the 1830 PSI Family uses "coherent optical line ports based on industry leading Nokia PSE-3 and PSE-2 digital signal

processors." *See* https://www.nokia.com/networks/products/1830-photonic-service-interconnect/#features-and-benefits. On information and belief, these "coherent optical line ports," and associated equipment, are configured to perform polarization-division multiplexing and matrix-based cross-polarization interference mitigation, in the same way as the 1830 PSS Family, as described in Paragraphs 37-54 *supra*.

57. For instance, a datasheet for the 1830 PSI-M (Exh. 12, downloaded from https://onestore.nokia.com/asset/201662) states that this member of the 1830 PSI Family is a "high capacity, modular, optical networking platform," for "long haul" operation. Exh. 12 at 1. The datasheet states that the 1830 PSI-M's "line ports" can perform "100G QPSK" and "200G 16QAM" modulation. *Id.* at 3. On information and belief, the only way to achieve 100G "long haul" data rates with QPSK modulation, and 200G "long haul" data rates with 16QAM modulation, is to perform polarization-division multiplexing, with cross-polarization interference mitigation.

58. The datasheet further states that the 1830 PSI-M uses "CFP2-ACO WDM line ports." *Id.* On information and belief, transceivers using CFP2-ACO line ports necessarily perform polarization-division multiplexing with cross-polarization interference mitigation, in the same way described in Paragraphs 37-54 above.

59. Therefore, for the same reasons set forth in Paragraphs 37-54, and on information and belief, the 1830 PSI Family is configured to perform all steps of claim 33, during normal use.

The 1620 SOFTNODE Family

60. The 1620 SOFTNODE Family is a family of undersea optical networking equipment originally manufactured by Alcatel-Lucent Submarine Networks. *See* Exh. 13 (Submarine Telecoms Forum, Issue 82, downloaded from https://subtelforum.com/STF-82/E35F83BD4413E4FDF24471F7A5C34783/STF-82.pdf) at 43-44. On information and belief, Nokia acquired Alcatel-Lucent Submarine Networks when it acquired Alcatel-Lucent; thus, Nokia is the successor-in-interest to all business (and all liability) for the 1620 SOFTNODE Family.

61. A 2015 article from Converge Network Digest (Exh. 14) states that the 1620 SOFTNODE family achieved a "300G" (i.e., 300 Gb/s) data rate, over a "10,000 kilometer" distance, using "8QAM" modulation. Exh. 14 at 1. On information and belief, a 300 Gb/s data rate can only be achieved with 8QAM modulation, over a 10,000 km distance, if the device uses polarization-division multiplexing with cross-polarization interference mitigation, as described in Paragraphs 37-54 *supra*.

62. Therefore, for the same reasons set forth in Paragraphs 37-54 *supra*, and on information and belief, the 1620 SOFTNODE products are configured to perform all steps of claim 33, during normal use.

The WaveLite Metro 200

63. The WaveLite Metro 200 is described in a datasheet available on the Nokia website. *See* Exh. 15 (WaveLite Metro 200 datasheet, downloaded from https://onestore.nokia.com/asset/201250).

64. According to the Datasheet, the Metro 200 is a "200-Gb, single wavelength, 600 km-reach multiservice aggregation muxponder." Exh. 15 at 1. The datasheet states that the "line-side interface" of the Metro 200 achieves either a "200 Gbps" data rate with "16QAM" modulation, or a "100G" data rate with "QPSK" modulation. *Id.* at 1. On information and belief, the only way to achieve these data rates with these types of modulation, in a "600 km-reach" product (Exh. 15 at 1), is to perform polarization-division multiplexing with cross-polarization interference mitigation, as described in Paragraphs 37-54 *supra*.

65. Furthermore, the datasheet states that the Metro 200 uses a "CFP2-ACO" optical interface. *Id.* at 2. On information and belief, transceivers using CFP2-ACO optical interfaces necessarily perform polarization-division multiplexing with cross-polarization interference mitigation, as described in Paragraphs 37-54 *supra*.

66. Therefore, for the same reasons set forth in Paragraphs 37-54 *supra*, and on information and belief, the Metro 200 is configured to perform all steps of claim 33, during normal use.

Marking – 35 U.S.C. § 287(a)

67. Core has never made, sold, used, offered to sell, or imported into the United States any article that practices any claim of the '211 Patent. Core has never sold, commercially performed, or offered to commercially perform any service that practices any claim of the '211 Patent.

68. Prior to October 21, 2014, Core had never authorized, licensed, or in any way permitted any third party to practice any claim of the '211 Patent.

69. Moreover, Core alleges that Defendants infringe ***only*** method claims of the '211 patent. Core does not allege that Defendants infringe any apparatus claims of the '211 patent. The marking requirement of 35 U.S.C. § 287(a) does not apply when a patentee only asserts infringement of method claims. *See Crown Packaging Tech., Inc. v. Rexam Beverage Can Co*., 559 F.3d 1308, 1316 (Fed. Cir. 2009); *Hanson v. Alpine Valley Ski Area, Inc*., 718 F.2d 1075, 1082-83 (Fed.Cir.1983).

70. Because Core has never directly marketed any product or service that practices any of the claimed inventions of the '211 Patent, and no third party was authorized to practice any claimed inventions of the '211 patent prior to October 21, 2014, 35 U.S.C. § 287(a) cannot prevent or otherwise limit Core's entitlement to damages for acts of infringement that occurred prior to October 21, 2014.

71. Because Core alleges that Defendants infringe only method claims of the '211 patent, 35 U.S.C. § 287(a) does not apply, even for acts of infringement that occurred after October 21, 2014. Thus, 35 U.S.C. § 287(a) does not limit Core's entitlement to damages against Defendants, in any way, for any period of time.

COUNT I – DIRECT PATENT INFRINGEMENT (35 U.S.C § 271(a))

72. Plaintiff repeats and realleges each and every allegation contained in Paragraphs 1-71 above, as if fully set forth herein.

73. Defendants have made, used, offered for sale, and/or sold, directly and/or through intermediaries, in this judicial district and/or elsewhere in the United States, one or more of the Fiber Optic XPIC Devices, and/or imported into the United States

one or more of the Fiber Optic XPIC Devices.

74. Defendants' acts complained of herein, including their use of the Fiber Optic XPIC Devices, directly infringes the Asserted Claims, because—as shown in Paragraphs 35-66 *supra* (for claim 33)—the Fiber Optic XPIC Devices are configured to perform all of the steps recited in those claims, during normal use.

75. Defendants have directly infringed the Asserted Claims of the '211 Patent by performing all of the steps of those claims within the U.S., either themselves, through intermediaries, or in conjunction with joint venturers and/or customers. Specifically, on information and belief, Defendants have performed all of the steps recited in each Asserted Claim, either personally, through intermediaries, or in conjunction with joint venturers and/or customers, by operating the Fiber Optic XPIC Devices within the U.S.. Such operation necessarily performs all of the steps recited in those claims, as shown in Paragraphs 35-66 *supra* (for claim 33).

COUNT II – INDUCEMENT OF INFRINGEMENT (35 U.S.C § 271(b))

76. Plaintiff repeats and realleges each and every allegation contained in Paragraphs 1-75 *supra*, as if fully set forth herein.

77. Defendants have actively induced infringement of the Asserted Claims of the '211 Patent, in violation of 35 U.S.C. § 271(b).

78. Defendants have actively induced infringement of these claims by selling the Fiber Optic XPIC Devices to one or more customers in the U.S., along with documentation and instructions demonstrating how to use the devices to infringe the claims, and/or by providing service, maintenance, support, or other active assistance to their customers in using the Fiber Optic XPIC Devices in the U.S.. The documentation which Defendants have provided includes, at least: (i) the product information for the Fiber Optic XPIC Devices set forth on Defendants' websites, including http://nokia.com, which includes the various white papers, manuals, datasheets, and other technical documentation for the Fiber Optic XPIC Devices provided on Defendants' websites; (ii) the specific instances of Defendants' product

documentation which are attached as Exhibits to this Complaint, or which are otherwise referenced in this Complaint; and (iii) the other product documentation which, on information and belief, Defendants provide in electronic and/or paper form to their customers for the Fiber Optic XPIC Devices.

79. For instance, Nokia publishes the website "infocenter.nokia.com," which contains product documentation for a variety of Nokia products, including the Fiber Optic XPIC Devices. One section of that website, available at https://infocenter.nokia.com/public/NFMP18R9A/index.jsp?, provides extensive product documentation for Nokia's "Network Functions Manager – Packet" (NFM-P) software (the "NFM-P Website"). On information and belief, NFM-P is Nokia's software which Nokia's end-users use to install, configure and operate their optical networks incorporating the Fiber Optic XPIC Devices.

80. The NFM-P Website contains extensive instructions on how to install, configure, and operate optical networks incorporating the Fiber Optic XPIC Devices. For instance, the section titled "Optical User Guide," which is "intended for optical network planners, administrators, and operators," provides "information about how to access NFM-P to configure and manage the 1830 PSS network." *See* NFM-P Website/Optical User Guide/About this document. Other sections of the NFM-P website provide detailed instructions for "Installation and Upgrade," "Planning," "System Architecture," and "User" operations. *See* NFM-P Website.

81. One section of the NFM-P Website is located at the sub-directory Optical User Guide/18300 PSS device management/9. 1830 PSS equipment management/Managing cards. A printout of this section of the website is attached as Exhibit 34. This section provides instructions on how to configure different line cards for use with the 1830 PSS system. One series of line cards whose configuration is expressly discussed is the "D5X500 card" series. Ex. 34 at 1. As discussed in Paragraph 40 *supra*, the D5X500 series uses ***dual polarization*** optical modulation.

82. Exhibit 34 expressly teaches an end-user how to set the type of

modulation used by the D5X500 card, including how to set it to use dual-polarization modulation. Specifically, Exhibit 34 states: "The D5X500 card supports QPSK and SP-QPSK encoding types on the OTU4 line port. You can configure the encoding type only on the L1 port. The L2 port is configured automatically with the same value. ***To change the Encoding type, provision the L1 line port as OTU4 and change the encoding type to QPSK/SP-QPSK in the Port Specifics→General sub-tab of the Physical Port (Edit) form***." Ex. 34 at 1 (emphasis added). The emphasized portion of Exhibit 34 is an explicit instruction on the specific steps an end-user must take to set the "encoding type" – i.e., modulation type – in the D5X500 card.

83. Exhibit 34 goes on to state that, when an end-user selects the "encoding type" by following the above procedure, "[t]he modulation formats supported are:"

Table 9-2: Modulation formats supported

Modulation format	L1 port	L2 port
8QAM	OTU4x2	OTU4x2
16QAM (16QAM_ 200G)	OTU4x2	OTU4x2
QPSK (DP-QPSK)	OTU4	OTU4
SP-QPSK	OTU4	OTU4
16QAM (16QAM_ 250G)	OTU4Halfx5	OTU4Halfx5
BPSK	OTU4Half	OTU4Half

Ex. 34 at 2 (highlighting added). As seen above, at least one of the "modulation formats" which a user can select, by following the procedure outlined in Exhibit 34, is "QPSK (***DP-QPSK)***" – i.e., ***dual polarization*** quadrature phase shift keying. As discussed above, when the Fiber Optic XPIC Devices are operated with DP-QPSK modulation, they necessarily infringe the Asserted Claims.

84. Accordingly, the NFM-P Website expressly teaches Nokia's end-users how to use the Fiber Optic XPIC Devices to infringe the Asserted Claims. Nokia's publication of this Website shows both that Nokia specifically intended to induce infringement by its end-users, and that Nokia engaged in acts – including the

publication of the NFM-P Website – which actually did induce infringement by its end-users. An end-user, following the instructions on the NFM-P Website, would necessarily infringe each of the Asserted Claims of the '211 patent.

85. On information and belief, Nokia has also provided other product documentation, training, support, advertisement and/or other communications or materials to end-users, apart from the materials specifically referenced in this Complaint, which were intended to induce, and which did induce, end-users to infringe the asserted claims. Core expects that many such materials are non-public. Core expects that it will uncover such materials through discovery in this case. Core reserves the right to amend this Complaint to identify such additional materials as they are uncovered through discovery, to the maximum extent permitted by law.

86. As shown in Paragraphs 35-66 *supra*, when Defendants' customers use the Fiber Optic XPIC Devices in the U.S., such use meets all of the elements recited in the Asserted Claims. Thus, Defendants have committed affirmative acts (i.e., selling the Fiber Optic XPIC Devices, providing documentation on how to use the Fiber Optic XPIC Devices, and/or providing service, maintenance, technical support, or other active assistance to their customers) which have resulted in direct infringement of the '211 Patent by their customers in the United States.

87. On information and belief, and for the following reasons, Defendants had actual knowledge of the existence and relevance of the '211 Patent, or were willfully blind to its existence and relevance, prior to the filing of the Complaint.

88. For example, on information and belief, Defendants knew of the '211 Patent's existence and relevance due to Core's filing of complaints for infringement of that patent in: (1) Central District of California Case No. SACV 12-1872 AG, styled *Core Optical Technologies, LLC v. Ciena Corporation, et al*. (filed October 29, 2012); (2) Central District of California Case No. SACV 16-0437 AG, styled *Core Optical Technologies, LLC v. Fujitsu Network Communications, Inc*. (filed March 7, 2016); and (3) Central District of California Case No. SACV 8:17-cv-00548AG,

styled *Core Optical Technologies, LLC v. Infinera Corp*. (filed March 24, 2017).

89. On information and belief, as a major player in the optical networking industry, Nokia monitors patent lawsuits against other players in the industry. On information and belief, through such monitoring, Nokia knew of—or was willfully blind to—the existence of the '211 Patent, due to Core's three prior lawsuits against other industry players. Through such monitoring, Nokia knew—or was willfully blind—that its Fiber Optic XPIC Devices infringe the '211 Patent during normal use.

90. Moreover, Nokia knew of the existence and relevance of the '211 Patent—or was willfully blind to its existence and relevance—through its own patent prosecution activities.

91. Nokia owns or has owned, directly or indirectly, ***six separate U.S. patents*** against which the '211 Patent was cited as prior art during prosecution. These are: (i) U.S. Pat. No. 7,509,054, issued March 24, 2009 (Exh. 10); (ii) U.S. Pat. No. 7,747,169, issued June 29, 2010 (Exh. 11); (iii) U.S. Pat. No. 7,809,284, issued October 5, 2010 (Exh. 16); (iv) U.S. Pat. No. 7,822,350, issued October 26, 2010 (Exh. 17); (v) U.S. Pat. No. 8,023,834, issued September 20, 2011 (Exh. 18); and (vi) U.S. Pat. No. 8,655,191, issued February 18, 2014 (Exh. 19).

92. These patents all relate to the same general technology as the Fiber Optic XPIC Devices – i.e., coherent optical receivers for PDM optical communication. Because the '211 Patent was cited against Nokia as prior art in ***six separate*** patent applications, for technology ***directly related*** to the Fiber Optic XPIC Devices, Nokia either knew, or was willfully blind, that: (i) the '211 Patent existed; and (ii) normal use of the Fiber Optic XPIC Devices, as configured, infringes the '211 Patent.

93. Moreover, Nokia knew of the existence and relevance of the '211 patent through a letter that counsel for Core sent to Nokia's predecessor-in-interest, Siemens Corporation ("Siemens"), on October 15, 2007 (Ex. 20).

94. In the letter, Core's patent attorney, William Schaal, notified John Musone, an attorney in Siemens's intellectual property department, that Core had

recently learned of the publication of Siemens's U.S. Pat. App. Pub. No. 2005/0286904 (Ex. 21) ("the '904 publication"). *See* Ex. 20 at 1. Mr. Schaal notified Siemens that the '904 publication was "for identical technology as covered by U.S. Patent No. 6,782,211" – i.e., the Patent-in-Suit. *Id.* Mr. Schaal directed Siemens to, "at a minimum," submit the '211 patent to the USPTO as a prior art reference during prosecution of the '904 publication. *Id.* Mr. Schaal also stated that "[i]f Siemens is interested in obtaining a license of the technology" of the '211 patent, "we can discuss any proposed arrangement with our client [Core]." *Id.* Thus, the letter clearly notified Siemens that the '211 patent was directly relevant to the "Optical Polarization Multiplex" technology which Siemens was apparently pursuing, and attempting to patent, in the '904 publication.

95. Shortly after Mr. Schaal sent his letter to Siemens, on January 7, 2008, Siemens assigned the relevant patent application, U.S. Pat. App. No. 10/528,313 ("the '313 application"), to "Nokia Siemens Networks GmbH & Co KG." *See* Ex. 22 (assignment history for the ''313 application) at 2. Nokia Siemens Networks GmbH ("Nokia Siemens") was a joint venture of Nokia Corp. and Siemens, formed in 2006-2007. *See* Ex. 23 (6/19/2006 article in The Guardian, covering the announcement of the joint venture). In August 2013, Nokia Corp. acquired all of Siemens's stock in Nokia Siemens, and converted the joint venture to a wholly-owned subsidiary of Nokia Corp. Ex. 24 (8/7/2013 ComputerWorld article on acquisition) at 1-2. After it completed the acquisition, Nokia rebranded Nokia Siemens as "Nokia Solutions and Networks, or NSN" (herein, "NSN"). *Id.* at 1.

96. At the time of Nokia's acquisition of Siemens's stake, the CEO of Nokia Siemens was Rajeev Suri. *Id.* Mr. Suri remained the CEO of this entity after its acquisition and rebranding as NSN. *Id.* Mr. Suri is now the CEO of Nokia Corp. *See* https://www.nokia.com/about-us/what-we-do/group-leadership-team/rajeev-suri-president-and-chief-executive-officer-ceo/.

97. In 2014, Nokia "phased out" the name "Nokia Solutions and Networks,"

and rebranded this business as "Nokia Networks." *See* Ex. 25 at 1. Subsequently, on information and belief, Nokia dissolved any separate corporate existence for "Nokia Networks," and converted this business into a mere ***division*** of Nokia Corp. *See, e.g.,* Ex. 26 (excerpt from 2015 Nokia Annual Report, indicating that "in 2015," Nokia had "two main businesses (Nokia Networks and Nokia Technologies)," but that "[i]n 2016," there was no longer a specific "Nokia Networks" business); Ex. 27 (excerpt from 2016 Nokia Annual Report, identifying Nokia Networks as "[o]ur former business focused on mobile network infrastructure software, hardware and services.")

98. In view of the foregoing, at all relevant times, Defendants have known about the existence and relevance of the '211 patent, through the October 15, 2007 notice letter. On information and belief, Defendants learned about that letter on or after January 7, 2008, when the '313 application was assigned to Nokia Siemens - a joint venture of which Nokia was one of only two equal owners. Defendants' knowledge of the October 15, 2007 letter flowed from Nokia Siemens, to NSN, to Nokia Networks, and then ultimately to Nokia Corp. itself. Moreover, on information and belief – as the U.S. operating entity for Nokia – Nokia U.S. would have been, and was, aware of the October 15, 2007 letter, which pertained to U.S. patents, at all relevant times. Thus, the October 15, 2007 letter is strong evidence that Defendants were aware of the relevance and existence of the '211 patent prior to the filing of the Complaint, and during the entire period of their infringement.

99. On information and belief, when Defendants sold the Fiber Optic XPIC Devices to U.S. customers, and/or provided service, maintenance, technical support, or other active assistance to such customers, they did so with the specific intent to encourage the customers to perform acts constituting direct infringement of the '211 Patent. This is evidenced by Paragraphs 87-98 *supra*, which show that Defendants were aware of the existence and relevance of the '211 patent at all relevant times. Because Defendants were aware of the '211 patent's relevance and existence, they always knew – based on information and belief – that their customers' use of the

Fiber Optic XPIC Devices would constitute infringement of that patent. Defendants' decision to continue marketing the Fiber Optic XPIC Devices to U.S. customers, despite knowing that such customers' use would constitute direct infringement, evidences that Defendants had a specific intent to encourage direct infringement of the '211 patent by its customers.

100. Therefore, Defendants have unlawfully induced infringement of the '211 Patent, in violation of 35 U.S.C. § 271(b).

COUNT III – CONTRIBUTORY INFRINGEMENT (35 U.S.C. § 271(c))

101. Plaintiff repeats and realleges each and every allegation contained in Paragraphs 1-100 *supra*, as if fully set forth herein.

102. Defendants have committed contributory infringement of the Asserted Claims of the '211 Patent, in violation of 35 U.S.C. § 271(c).

103. Defendants have committed contributory infringement by selling, offering to sell and/or importing into the United States the Fiber Optic XPIC Devices. As shown in Paragraphs 35-66 *supra,* the Fiber Optic XPIC Devices contain components—including the coherent optical receivers, and accompanying electronics, in the "interface cards" or "line cards"—which, as configured, perform cross-polarization interference mitigation on polarization-multiplexed optical signals. These components, when used as configured during normal operation, practice the inventions claimed in the Asserted Claims.

104. The components of the Fiber Optic XPIC Devices that can be used to perform cross-polarization interference mitigation practice a material part of the Asserted Claims, because they perform one of the key inventive functions of the '211 Patent – i.e. they mitigate the effects of cross-polarization interference, using matrix operations, to reconstruct the original polarization-division-multiplexed signals.

105. On information and belief, prior to the filing of the Complaint, Defendants had actual knowledge, or were willfully blind, that these components of the Fiber Optic XPIC Devices were especially made or adapted for use in a manner

that infringes the Asserted Claims of the '211 Patent. As shown in Paragraphs 87-98 *supra*, Defendants knew, or were willfully blind, that the Fiber Optic XPIC Devices are configured to infringe the '211 Patent upon use, at least because of: (i) Core's prior litigations against others in the optical networking industry; (ii) Nokia's six separate patents, in which the '211 Patent was cited as prior art; and (iii) the October 2007 notice letter. For the reasons set forth in Paragraphs 87-98, and on information and belief, Defendants knew, or were willfully blind, that normal use of the Fiber Optic XPIC Devices infringes the Asserted Claims of the '211 Patent. Despite that knowledge (or willful blindness), Defendants actively sold the Fiber Optic XPIC Devices in the United States, knowing that their customers would use the Fiber Optic XPIC Devices in the United States, and knowing (or being willfully blind) that such use would constitute direct infringement of the Asserted Claims.

106. The components of the Fiber Optic XPIC Devices that are configured to perform cross-polarization interference mitigation – including the "adaptive equalizer," which is configured to correct for cross-polarization interference via "digital signal processing" (Ex. 8 at 37-38) - are not staple articles of commerce, and—as configured to perform cross-polarization interference mitigation during normal operation—are not capable of substantial noninfringing use. To the contrary, these components, as configured, are ***especially adapted*** to perform the claimed cross-polarization interference mitigation methods, during normal use. *Id.*

107. For example, the Fiber Optic XPIC Devices include the D5X500 Series of line cards. The D5X500 Series can be used with the 1830 PSS Chassis to create an optical transport network. *See* Ex. 4 at 2. According to the D5X500 Datasheet, the D5X500 Series can "us[e] six different multi-modulation formats." *Id.* These formats are summarized in the following table (Ex. 4 at 3):

Line capacity (per port)	250G	DP-16QAM
	200G	DP-16QAM
	200G	DP-8QAM
	100G	DP-QPSK
	100G	SP-DP-QPSK (set partition)
	50G	DP-BPSK

108. As seen above, ***all six*** of the available modulation formats for the D5X500 Series use "DP" – i.e., ***dual polarization*** modulation. Thus, the D5X500 Series cards, as configured, ***always*** use dual polarization modulation. As discussed above, when a card uses dual polarization modulation, it necessarily infringes the Asserted Claims. Thus, the D5X500 Series cards have no non-infringing uses: in ***every*** mode of operation, they practice the asserted claims. Accordingly, at least when they are used with the D5X500 Series cards (as configured), the Fiber Optic XPIC Devices are not capable of substantial non-infringing use.

109. On information and belief, there are additional line cards, interface cards, transceivers, or other components in the Fiber Optic XPIC Devices that lack substantial non-infringing uses. Core expects that much of the information about these components is non-public. Core expects that, through discovery, it may uncover additional evidence regarding components of the Fiber Optic XPIC Devices that, as configured, are incapable of substantial non-infringing use. Core reserves the right to amend this Complaint to identify such additional components as they are uncovered in discovery, to the maximum extent permitted by law.

110. Accordingly, Defendants have unlawfully contributed to infringement of the '211 Patent, in violation of 35 U.S.C. § 271(c).

REMEDIES, ENHANCED DAMAGES, EXCEPTIONAL CASE

111. Plaintiff repeats and realleges each and every allegation contained in Paragraphs 1-110 *supra*, as if fully set forth herein.

112. Defendants' direct infringement (Count I), induced infringement (Count II), and contributory infringement (Count III) of the '211 patent has caused, and will continue to cause, significant damage to Core. As a result, Core is entitled to an award

of damages adequate to compensate it for Defendants' infringement, but in no event less than a reasonable royalty pursuant to 35 U.S.C. § 284. Core is also entitled to recover prejudgment interest, post-judgment interest, and costs.

113. For at least the reasons set forth in Paragraphs 87-98 *supra*, prior to the filing of this Complaint, Defendants knew (or were willfully blind) that the Fiber Optic XPIC Devices are configured to infringe the Asserted Claims of the '211 Patent, during normal use. Despite this known, objectively-high risk that its actions constituted direct and indirect infringement, Defendants continued to directly and indirectly infringe the '211 patent, up to the filing of this Complaint. Accordingly, Defendants' infringement has been (and is) willful.

114. In addition to being willful, Defendants' conduct has been egregious.

115. As set forth in Paragraphs 87-98 *supra*, despite knowing of (or being willfully blind to) their infringement, Defendants continued to infringe, on a large scale, up to the very date when the '211 patent expired. Nokia is a massive company, with over $26 billion in annual revenue.[3] Meanwhile, Plaintiff is a small company, owned by an individual inventor. On information and belief, Defendants persisted in their willful infringement, at least in part, because they believed they could use their superior resources to overwhelm Plaintiff in litigation. If proven, this would constitute "egregious" conduct, warranting enhanced damages.

116. Moreover, the validity of the '211 patent has been twice confirmed by the Patent Trial and Appeal Board ("PTAB"), in: (i) IPR2016-01618, filed by Fujitsu Network Communications, Inc.; and (ii) IPR2018-01259, filed by Infinera Corporation. In both *Inter Partes* Review proceedings, the Petitioners—who were defendants in the prior litigations—cited numerous prior art references, to attempt to establish that claims of the '211 patent, including the Asserted Claims, were invalid.

[3] *See* https://www.nasdaq.com/articles/nokia-is-preparing-to-come-roaring-back-in-the-new-decade-2019-12-31

Yet, in both cases, the PTAB ***denied*** institution, finding that the Petitioners had failed to establish a "reasonable likelihood" that ***any*** claim of the '211 patent was invalid. *See* Ex. 28 (decision denying review in IPR2016-01618); Ex. 29 (decision denying review in IPR2018-01259). Because the PTAB has already rejected two extensive invalidity challenges to the '211 patent, Defendants cannot reasonably believe that they have a viable invalidity defense. Defendants' decision to persist in known, clearly-infringing conduct, despite the lack of any viable invalidity defense, is further evidence of "egregiousness," warranting an award of enhanced damages.

117. For at least the foregoing reasons, Defendants' conduct has been willful and egregious. Accordingly, under 35 U.S.C. § 284, the Court should enhance Core's damages in this case by up to three times the amount found or assessed.

118. For at least the foregoing reasons, this case is an "exceptional" case within the meaning of 35 U.S.C. § 285. Accordingly, Core is entitled to an award of attorneys' fees and costs, and the Court should award such fees and costs.

PRAYER FOR RELIEF

WHEREFORE, Core prays for relief as follows:

1. That judgment be entered in favor of Core, and against Defendants;

2. That Core be awarded damages adequate to compensate it for Defendants' infringement of the Asserted Claims of the '211 Patent, in an amount to be determined at trial, as well as interest thereon;

3. That Core be awarded the costs of suit;

4. That Defendants' infringement be declared willful and egregious;

5. That the Court increase Core's damages up to three times the amount assessed under 35 U.S.C. § 284;

5. That the Court declare this an exceptional case under 35 U.S.C. § 285, and award Core its attorneys' fees and costs incurred in this action; and

6. That the Court grant such further relief as it deems just and proper.

JURY TRIAL DEMAND

Core demands a jury trial on all issues so triable.

DATED: March 27, 2020

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