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Core Optical Technologies, LLC

UNITED STATES DISTRICT COURT

CENTRAL DISTRICT OF CALIFORNIA

CORE OPTICAL TECHNOLOGIES,
LLC,

Plaintiff,

v.

ADVA OPTICAL NETWORKING SE,
ADVA OPTICAL NETWORKING
NORTH AMERICA, INC., and DOES 1
through 10, inclusive,

Defendants.

CASE NO:

**COMPLAINT FOR PATENT
INFRINGEMENT**

JURY TRIAL DEMANDED

Plaintiff Core Optical Technologies, LLC (“Plaintiff” or “Core”), by and through its undersigned counsel, hereby files this Complaint against Defendants ADVA Optical Networking SE (“ADVA EU”), ADVA Optical Networking North America, Inc. (“ADVA US”) (collectively, “ADVA”), and Does 1 through 10, inclusive (“Does”) (collectively, “Defendants”). Core alleges as follows:

THE PARTIES

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

5 2. Defendant ADVA EU is a *societas Europaea* organized under the laws
6 of the European Union, with a principal place of business located at Fraunhoferstraße
7 9a, 82152 Martinsried/Munich, Germany.

8 3. Defendant ADVA US is a corporation organized under the laws of the
9 state of Delaware, with a principal place of business located at 5755 Peachtree
10 Industrial Blvd, Norcross, Georgia 30092.

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

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

23 6. On information and belief, each Doe Defendant has directly and/or
24 indirectly infringed the Asserted Claims, either by themselves or in concert with other
25 Defendants, by using ADVA's fiber optic cross polarization interference cancelling
26 devices in the United States. Core reserves the right to amend this Complaint to
27 identify the specific infringing acts of each Doe Defendant once it learns such facts.
28 Core expect that most, or all, of such facts are non-public. Core expects to uncover

1 such facts in discovery.

2 **JURISDICTION AND VENUE**

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

8 8. This Court has subject matter jurisdiction over this case under 28 U.S.C.
9 §§ 1331 and 1338(a), because the claims arise under the patent laws of the United
10 States, 35 U.S.C. §§ 1, *et seq.*

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

17 10. This Court has general personal jurisdiction over Defendant ADVA US
18 because ADVA US maintains a regular and established place of business in this
19 judicial district, including its office located at 20520 Nordhoff Street, Chatsworth, CA
20 91311.

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

24 12. This Court has specific personal jurisdiction over Defendant ADVA EU
25 because, on information and belief, it has committed acts that infringe the Asserted
26 Claims in California, and in this judicial district. More specifically, on information
27 and belief, ADVA EU has performed all of the steps of the Asserted Claims in
28 California, and in this judicial district, either personally, through intermediaries, or in

1 conjunction with one or more joint venturers or customers. Furthermore, on
 2 information and belief, ADVA EU has induced and/or contributed to customers'
 3 infringement of the Asserted Claims in California, and in this judicial district.

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

12 14. Venue is proper in this judicial district against each Defendant.

13 15. Venue is proper against Defendant ADVA EU because it is a foreign
 14 corporation, and venue is proper against foreign corporations in any judicial district of
 15 the United States. *See* 28 U.S.C. § 1391(c)(3).

16 16. Venue is proper against Defendant ADVA US because, on information
 17 and belief: (i) ADVA US has a regular and established place of business in this
 18 judicial district, including its office located at 20520 Nordhoff Street, Chatsworth, CA
 19 91311; and (ii) ADVA US has committed acts of infringement in this judicial district,
 20 including performing all of the steps of the method(s) claimed in the '211 Patent in
 21 this judicial district; and/or performing acts of contributory or induced infringement
 22 in this judicial district. *See* 28 U.S.C. § 1400(b).

23 17. In addition, venue is proper because Core resides in this judicial district,
 24 and Core has and continues to suffer harm in this judicial district. Moreover, a
 25 substantial part of the events giving rise to this action occurred in this judicial district,
 26 including the inventive activities giving rise to the '211 patent.

27 **THE ASSERTED PATENT**

28 18. Mark Core, the sole named inventor of the '211 patent, earned his Ph.D.

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

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

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

27 33. A method comprising:
28

(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

21. 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: (i) the FSP 3000 Series Platforms, including the FSP 3000 AgileConnect, FSP 3000 CloudConnect, and FSP 3000 AccessConnect Platforms (the "FSP 3000"); (ii) the ADVA modules, line cards, transponders, muxponders, and other equipment which are used with the FSP 3000 to perform optical communication with polarization-division multiplexing ("PDM") and cross-polarization interference cancelling ("XPIC") (the "Modules"); and (iii) the software and firmware used to control and operate the FSP 3000 and the Modules to perform optical communication with PDM and XPIC (the "Software") (collectively, "the Fiber Optic XPIC Devices").

22. Each Fiber Optic XPIC Device is, or can be, configured to perform all of

1 the steps recited in the Asserted Claims of the '211 Patent, during normal use. On
 2 information and belief, each Defendant has actually used the Fiber Optic XPIC
 3 Devices to perform each step of the methods recited in the Asserted Claims of the
 4 '211 Patent, within the United States, either itself, through intermediaries, or in
 5 conjunction with one or more joint venturers or customers.

6 23. ADVA's product literature, its website, and other publicly-available
 7 information shows that the Fiber Optic XPIC Devices, when used with appropriate
 8 components, are configured to perform all of the steps of claim 33, during normal use.

9 24. Element 33(a) recites "receiving an optical signal over a single fiber
 10 optic transmission medium." The Fiber Optic XPIC Devices are configured to do this,
 11 during normal operation.

12 25. For instance, a datasheet for the FSP 3000 (Ex. 2) states that the FSP
 13 3000 provides "terascale *optical* transport for profitable growth," with "38.4Tbit/s
 14 duplex capacity *per fiber*." Ex. 2 at 1. Similarly, a datasheet for the FSP 3000
 15 AgileConnect (Ex. 3) states that the AgileConnect provides "scalable *optical* transport
 16 for profitable growth," suitable for "point-to-point [and] ring and mesh" fiber-optic
 17 network topologies. Ex. 3 at 1-2. A datasheet for the FSP 3000 CloudConnect (Ex. 4)
 18 states that the CloudConnect provides a "single platform supporting both *optical*
 19 layers" -i.e., "coherent" and "direct detect" – with a "system capacity per *fiber* pair"
 20 of "48/96/128 channels" for "coherent" communication. Ex. 4 at 1, 5. Finally, a
 21 datasheet for the FSP 3000 AccessConnect (Ex. 5) states that the AccessConnect
 22 provides "[s]calable *optical* transport for carrier access networks," to "[m]eet *fiber*
 23 services demands." Ex. 5 at 1.

24 26. Thus, ADVA's datasheets show that the Fiber Optic XPIC Devices are
 25 configured to "receiv[e] an optical signal over a single fiber optic transmission
 26 medium," during normal operation.

27 27. Element 33(a1) recites "the optical signal being at least two polarized
 28 field components independently modulated with independent information bearing

1 waveforms.” Publicly-available evidence shows that, when properly configured and
 2 used with appropriate components, the Fiber Optic XPIC Devices perform this step
 3 during normal operation.

4 28. Optical communication using “at least two polarized field components
 5 independently modulated with independent information bearing waveforms” is called
 6 “polarization-division multiplexed” (“PDM”) or “dual-polarization” (“DP”) optical
 7 communication. Publicly-available evidence shows that the Fiber Optic XPIC
 8 Devices, when properly configured and used with appropriate components, perform
 9 PDM optical communication during normal use.

10 29. Numerous ADVA documents admit that, by 2012 or earlier, coherent
 11 PDM communication had become the “de facto” standard for 100 gigabits per second
 12 (“Gbps” or “Gb/s”) or faster optical transport. For instance, the April 2012 article
 13 “From Static to Software-Defined Optical Networks,” by ADVA engineers J.P.
 14 Elbers and A. Autenrieth (Ex. 6), admits that “[a]dvances in digital signal processing
 15 made 100 Gb/s dual-polarization quadrature phase shift keying (DP-QPSK) the *de-*
 16 *facto modulation format standard* for long-haul networks.” Ex. 6 at 1. Similarly, the
 17 2011 article “Next-Generation Ultra-High-Speed DWDM Transport,” by ADVA
 18 engineers Klaus Grobe, Michael Eiselt, and Jorg-Peter Elbers (Ex. 7), admits that
 19 “[i]n long-haul networks, Coherent Dual-Polarization Quaternary Phase-Shift Keying
 20 (Co-DP-QPSK) is the *modulation format of choice* ... [to] support[] 100 Gb/s
 21 transmission.” Ex. 7 at 1. And, the 2015 article “Juniper ADVA Packet Optical
 22 Convergence” (Ex. 8), which was apparently co-written by Juniper and ADVA, states
 23 that “[t]his DP-QPSK modulation scheme is aligned to the Optical Internetworking
 24 Forum (OIF) implementation agreements for 100Gbps transceivers, which have
 25 established this modulation scheme as the *de facto single technology* of choice for
 26 long-haul 100Gbps transport across the industry.” Ex. 8 at 6.

27 30. Accordingly, by ADVA’s own admissions, any ADVA products that
 28 perform 100Gbps or faster long-haul optical communication necessarily use PDM

1 modulation, which is the “*de facto* single technology” for such communication. This
 2 is confirmed by a 2011 article in Lightwave magazine, which states that ADVA “has
 3 embraced DP-QPSK with coherent detection for long-reach applications.” *See*
 4 [https://www.lightwaveonline.com/network-design/article/16660942/adva-optical-](https://www.lightwaveonline.com/network-design/article/16660942/adva-optical-networking-offers-costreduced-100gbps-for-metro-networks)
 5 [networking-offers-costreduced-100gbps-for-metro-networks](https://www.lightwaveonline.com/network-design/article/16660942/adva-optical-networking-offers-costreduced-100gbps-for-metro-networks).

6 31. The FSP 3000 datasheet indicates that the FSP 3000 can provide “[t]otal
 7 optical transparent distance (without regeneration)” of greater than “3500 km,” at
 8 speeds of “100G to 400G,” using “coherent” optics. Ex. 2 at 2-3. As ADVA’s own
 9 documents admit, the “*de facto* single technology” for such long-haul optical
 10 communication, at “100G to 400G” speeds, is PDM optical communication. Thus, the
 11 FSP 3000 datasheet indicates that—when it is properly configured, and used with
 12 appropriate components—the FSP 3000 performs PDM optical communication, as
 13 recited in element 33(a1).

14 32. Moreover, the FSP 3000 Platform can be used with the “QuadFlex”
 15 module. *See* Ex. 9 (QuadFlex datasheet) at 1. The QuadFlex datasheet indicates that
 16 the QuadFlex card performs “coherent transmission” in QPSK, 16QAM and 8QAM
 17 formats. *Id.* at 2. The QuadFlex can reach “[u]p to 4000km at 100G QPSK,” “[u]p to
 18 1500km at 150G 8QAM,” and “[u]p to 800km at 200G 16QAM,” with “30ps PMD
 19 tolerance” and “280ns/nm CD tolerance.” *Id.* On information and belief, the only way
 20 to achieve such reach, PMD tolerance and CD tolerance in a coherent optical system
 21 operating at the stated data rates is to use **PDM** signals. Indeed, the ADVA article
 22 “DLR and ADVA set new world record for optical free-space data transmission” (Ex.
 23 10) admits that the “QuadFlex™ line cards . . . carry 200Gbit/s payload data **using**
 24 **dual-polarization 16QAM** (quadrature amplitude modulation).” Ex. 10 at 3. Thus,
 25 when the FSP 3000 is used with the QuadFlex line card, and properly configured, it
 26 performs step 33(a1), during normal use.

27 33. Additionally, the datasheet for the FSP 3000 CloudConnect states that
 28 the CloudConnect achieves the following link reaches, in the following formats:

- DP-QPSK – 100Gbit/s over up to 3,500km
- DP-8QAM – 150Gbit/s over up to 1,500km
- DP-16QAM – 200Gbit/s over up to 800km
- PAM4: 100Gbit/s over up to 100Km

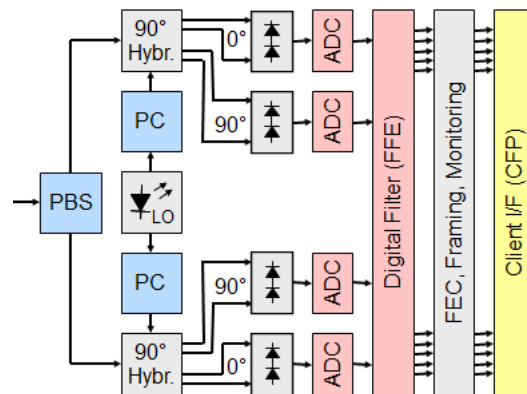
Ex. 4 at 5. The prefix “DP” before each format confirms that each format uses *dual polarization* modulation. Moreover, the listed “reach” for the “DP-QPSK” format is “over up to 3,500 km,” which corresponds to the “maximum distance” of “> 3500 km” listed in Exhibit 2, the FSP 3000 datasheet. Thus, Exhibit 4 confirms that the communication formats of the overall FSP 3000 system are PDM formats.

34. Accordingly, the publicly-available evidence shows that the Fiber Optic XPIC Devices, when properly configured and used with appropriate components, receive optical signals being “at least two polarized field components independently modulated with independent information bearing waveforms,” as recited in element 33(a1), during normal use.

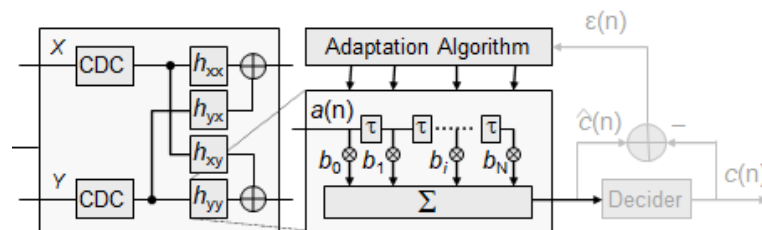
35. Element 33(b) recites “mitigating cross polarization interference associated with the at least two modulated polarized field components to reconstruct the information bearing waveforms.” Publicly-available evidence shows that the Fiber Optic XPIC Devices, when properly configured and used with appropriate components, perform this step during normal operation.

36. For instance, the article “Next Generation Ultra-High-Speed DWDM Transport,” by three ADVA engineers, states that a “key enabler” of the coherent dual-polarization QPSK (“Co-DP-QPSK”) modulation in ADVA’s 100G optical networks is “an Intradyne receiver employing digital frequency and phase tracking, CD and PMD compensation (equalization), *and polarization de-multiplexing.*” Ex. 7 at 1. The structure of this “Intradyne receiver” is described and depicted in a May 2011 PowerPoint presentation titled “Next-Generation Ultra-High-Speed DWDM Transport,” by ADVA engineers Klaus Grobe, Jorg-Peter Elbers, and Michael Eiselt (Ex. 11). The presentation shows that all “high-speed transmission (long-haul)” at speeds of 100G or greater must use “dual polarization” modulation. Ex. 11 at 3. The

presentation then depicts ADVA's coherent intradyne receiver as follows (*id.* at 4):



37. As seen above, ADVA's coherent intradyne receiver includes a "Digital Filter" with "FFE" (i.e., feed-forward equalization) capabilities. The presentation indicates that this "Digital Filter" includes a "Butterfly FFE w/CMA [constant-modulus algorithm] for PMD [polarization-mode dispersion] compensation." *Id.* at 4. The structure of this "butterfly equalizer" is shown below (*id.*):



38. As seen above, the "butterfly FFE" in ADVA's receiver is a 2x2 MIMO filter, which applies weighting factors h_{xx} , h_{yx} , h_{xy} , h_{yy} to the received x-polarized and y-polarized optical signals, to reconstruct the originally-transmitted waveforms. In operation, such a filter "mitigate[es] 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). Thus, the publicly-available evidence shows that the Fiber Optic XPIC Devices, when properly configured and used with appropriate components, perform step 33(b) during normal use.

39. Element 33(b1) recites "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." When properly configured and used with

1 appropriate components, the Fiber Optic XPIC Devices perform this step during
2 normal use.

3 40. As discussed above, the Fiber Optic XPIC Devices include a “butterfly
4 FFE” which mitigates cross-polarization interference by applying a 2x2 matrix of
5 weighting factors, h_{xx} , h_{yx} , h_{xy} , h_{yy} to the received x-polarized and y-polarized optical
6 signals. On information and belief, the matrix coefficients h_{xx} , h_{yx} , h_{xy} , h_{yy} in the Fiber
7 Optic XPIC Devices are complex values. The matrix coefficients ***must be*** complex
8 values because, in general, the waveform of an optical signal propagating down a
9 fiber optic medium is complex. In order to fully recover the transmitted signals from
10 the received signals, the matrix coefficients must be complex, such that the “real” part
11 of the coefficient corrects deviations in the amplitude of the signal, and the
12 “imaginary” part of the coefficient corrects deviations in the phase of the signal.
13 Thus, on information and belief, the matrix coefficients h_{xx} , h_{yx} , h_{xy} , h_{yy} in the Fiber
14 Optic XPIC Devices are “complex” values, which “apply both amplitude scaling and
15 phase shifting to the at least two modulated polarized field components.”

16 41. Accordingly, when properly configured and used with appropriate
17 components, the Fiber Optic XPIC Devices perform step 33(b1) during normal use.

18 42. Therefore, the publicly-available evidence shows that the Fiber Optic
19 XPIC Devices, when configured properly and used with the appropriate components,
20 are configured to perform all of the elements of claim 33, during normal use.

21 Marking – 35 U.S.C. § 287(a)

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

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

28 45. Moreover, Core alleges that Defendants infringe ***only*** method claims of

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

6 46. Because Core has never directly marketed any product or service that
 7 practices any of the claimed inventions of the '211 Patent, and no third party was
 8 authorized to practice any claimed inventions of the '211 patent prior to October 21,
 9 2014, 35 U.S.C. § 287(a) cannot prevent or otherwise limit Core's entitlement to
 10 damages for acts of infringement that occurred prior to October 21, 2014.

11 47. Because Core alleges that Defendants infringe only method claims of the
 12 '211 patent, 35 U.S.C. § 287(a) does not apply, even for acts of infringement that
 13 occurred after October 21, 2014. Thus, 35 U.S.C. § 287(a) does not limit Core's
 14 entitlement to damages against Defendants, in any way, for any period of time.

15 48. Moreover, on December 18, 2017, Core sent a letter to ADVA, **expressly**
 16 **notifying** ADVA that it was infringing the '211 patent. A copy of this letter is
 17 attached as Exhibit 12. In the letter, Core noted that it was the owner of the '211
 18 patent, and attached a copy of the patent. Ex. 12 at 1. The letter then stated (*id.*):

19 Core Optical provides this letter to ADVA Optical Networking
 20 ("ADVA") as actual notice under 35 U.S.C. §287 of infringement
 21 of the '211 Patent arising from ADVA's manufacture, use,
 22 importation, offer for sale, and/or sale in the United States of
 23 ADVA's coherent 100G and higher transport solutions including
 24 at least the ADVA FSP 3000 AgileConnect™, FSP 3000
 25 CloudConnect™ and FSP 3000 AccessConnect™ optical
 26 transport solutions.

27 49. This letter expressly notified ADVA that, *inter alia*, the "use" of the
 28 Fiber Optic XPIC Devices infringes claims of the '211 patent. Accordingly, Core

1 provided express notice of infringement to ADVA on December 18, 2017. As a result,
 2 even if § 287 did apply to Core's assertion of method claims in this case (which it
 3 does not), Core complied with § 287 on December 18, 2017, and Core is entitled to
 4 damages for all acts of infringement after that date.

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

6 50. Plaintiff repeats and realleges each and every allegation contained in
 7 Paragraphs 1-49 above, as if fully set forth herein.

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

12 52. Defendants' acts complained of herein, including their use of the Fiber
 13 Optic XPIC Devices, directly infringes the Asserted Claims, because—as shown in
 14 Paragraphs 21-42 *supra* (for claim 33)—the Fiber Optic XPIC Devices are configured
 15 to perform all of the steps recited in those claims, during normal use.

16 53. Defendants have directly infringed the Asserted Claims of the '211
 17 Patent by performing all of the steps of those claims within the U.S., either
 18 themselves, through intermediaries, or in conjunction with joint venturers and/or
 19 customers. Specifically, on information and belief, Defendants have performed all of
 20 the steps recited in each Asserted Claim, either personally, through intermediaries, or
 21 in conjunction with joint venturers and/or customers, by operating the Fiber Optic
 22 XPIC Devices within the U.S.. Such operation necessarily performs all of the steps
 23 recited in those claims, as shown in Paragraphs 21-42 *supra* (for claim 33).

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

25 54. Plaintiff repeats and realleges each and every allegation contained in
 26 Paragraphs 1-53 *supra*, as if fully set forth herein.

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

1 56. Defendants have actively induced infringement of these claims by selling
2 the Fiber Optic XPIC Devices to one or more customers in the U.S., along with
3 documentation and instructions demonstrating how to use the devices to infringe the
4 claims, and/or by providing service, maintenance, support, or other active assistance
5 to their customers in using the Fiber Optic XPIC Devices in the U.S. The
6 documentation which Defendants have provided includes, at least: (i) the product
7 information for the Fiber Optic XPIC Devices set forth on Defendants' websites,
8 including <https://www.adva.com/en>, which includes the various white papers,
9 manuals, datasheets, and other technical documentation for the Fiber Optic XPIC
10 Devices provided on Defendants' websites; (ii) the specific instances of Defendants'
11 product documentation which are attached as Exhibits to this Complaint, or which are
12 otherwise referenced in this Complaint; and (iii) the other product documentation
13 which, on information and belief, Defendants provide in electronic and/or paper form
14 to their customers for the Fiber Optic XPIC Devices.

15 57. For instance, the datasheet for the FSP 3000 AgileConnect indicates that
16 ADVA provides customers with "the FSP 3000R7 Documentation Suite," which
17 "contains important safety and permissible configuration information, as well as
18 installation and maintenance procedures." Ex. 3 at 4. On information and belief, this
19 "Documentation Suite"—and other documentation provided with the Fiber Optic
20 XPIC Devices—contains detailed instructions on how to install, configure and
21 operate the Fiber Optic XPIC Devices to practice the Asserted Claims.

22 58. On information and belief, ADVA has also provided other product
23 documentation, training, support, advertisement and/or other communications or
24 materials to end-users, apart from the materials specifically referenced in this
25 Complaint, which were intended to induce, and which did induce, end-users to
26 infringe the Asserted Claims. Core expects that many such materials are non-public.
27 Core expects that it will uncover such materials through discovery in this case. Core
28 reserves the right to amend this Complaint to identify such additional materials as

1 they are uncovered through discovery, to the maximum extent permitted by law.

2 59. As shown in Paragraphs 21-42 *supra*, when Defendants' customers use
3 the Fiber Optic XPIC Devices in the U.S., such use meets all of the elements recited
4 in the Asserted Claims. Thus, Defendants have committed affirmative acts (i.e.,
5 selling the Fiber Optic XPIC Devices, providing documentation on how to use the
6 Fiber Optic XPIC Devices, and/or providing service, maintenance, technical support,
7 or other active assistance to their customers) which have resulted in direct
8 infringement of the '211 Patent by their customers in the United States.

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

12 61. For example, on information and belief, Defendants knew of the '211
13 Patent's existence and relevance due to Core's filing of complaints for infringement
14 of that patent in: (1) Central District of California Case No. SACV 12-1872 AG,
15 styled *Core Optical Technologies, LLC v. Ciena Corporation, et al.* (filed October 29,
16 2012); (2) Central District of California Case No. SACV 16-0437 AG, styled *Core*
17 *Optical Technologies, LLC v. Fujitsu Network Communications, Inc.* (filed March 7,
18 2016); and (3) Central District of California Case No. SACV 8:17-cv-00548AG,
19 styled *Core Optical Technologies, LLC v. Infinera Corp.* (filed March 24, 2017).

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

26 63. Moreover, ADVA knew of the existence and relevance of the '211
27 Patent through the infringement notice letter (Ex. 12) which Core sent to ADVA on
28 December 18, 2017. The notice letter provided a copy of the '211 Patent to ADVA,

1 and expressly advised ADVA that, *inter alia*, the “use” of the Fiber Optic XPIC
2 Devices infringes claims of the ’211 patent. Ex. 12 at 1. Thus, by December 18, 2017
3 at the latest, ADVA had actual knowledge of the ’211 patent, and had actual
4 knowledge that use of the Fiber Optic XPIC Devices infringes claims of that patent.

5 64. In view of the foregoing, at all relevant times, Defendants have known
6 about the existence and relevance of the ’211 patent, and have known that the
7 operation of the Fiber Optic XPIC Devices, when properly configured and used with
8 appropriate components, infringes the Asserted Claims during normal use.

9 65. On information and belief, when Defendants sold the Fiber Optic XPIC
10 Devices to U.S. customers, and/or provided service, maintenance, technical support,
11 or other active assistance to such customers, they did so with the specific intent to
12 encourage the customers to perform acts constituting direct infringement of the ’211
13 Patent. This is evidenced by Paragraphs 60-64 *supra*, which show that Defendants
14 were aware of the existence and relevance of the ’211 patent at all relevant times.
15 Because Defendants were aware of the ’211 patent’s relevance and existence, they
16 always knew – based on information and belief – that their customers’ use of the
17 Fiber Optic XPIC Devices would constitute infringement of that patent. Defendants’
18 decision to continue marketing the Fiber Optic XPIC Devices to U.S. customers,
19 despite knowing that such customers’ use would constitute direct infringement,
20 evidences that Defendants had a specific intent to encourage direct infringement of
21 the ’211 patent by their customers.

22 66. Therefore, Defendants have unlawfully induced infringement of the ’211
23 Patent, in violation of 35 U.S.C. § 271(b).

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

25 67. Plaintiff repeats and realleges each and every allegation contained in
26 Paragraphs 1-66 *supra*, as if fully set forth herein.

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

69. 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 21-42 *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.

70. The components of the Fiber Optic XPIC Devices that can be used to mitigate cross-polarization interference 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.

71. 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 60-64 *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 Core's prior litigations against others in the optical networking industry, and because of the December 18, 2017 notice letter to ADVA (Ex. 12). For the reasons set forth in Paragraphs 60-64, 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 constitutes direct infringement of the Asserted Claims.

72. The components of the Fiber Optic XPIC Devices that are configured to

1 perform cross-polarization interference mitigation, including the portions of the
 2 “Digital Filter” that perform “butterfly” equalization (Ex. 11 at 5), are not staple
 3 articles of commerce, and—as configured to perform cross-polarization interference
 4 mitigation during normal operation—are not capable of substantial noninfringing use.
 5 To the contrary, these components, as configured, are *especially adapted* to perform
 6 the claimed cross-polarization interference mitigation methods, during normal use. *Id.*

7 73. For example, the Fiber Optic XPIC Devices include the QuadFlex line
 8 card. The Datasheet for the QuadFlex line card indicates that that line card operates in
 9 only three different “coherent transmission” modes: “100Gbit/s QPSK,” “150Gbit/s
 10 8QAM,” and “200Gbit/s 16QAM.” Ex. 9 at 2. As discussed above, all three of those
 11 modes use polarization-divisional multiplex optical communication.

12 74. As shown in Paragraphs 21-42 *supra*, when one of the Fiber Optic XPIC
 13 Devices is configured to operate in polarization-division multiplexed mode, it
 14 *necessarily* infringes the Asserted Claims. Thus, because the QuadFlex *always*
 15 operates in polarization-division multiplexed mode, when it is properly configured, it
 16 has no non-infringing uses. Accordingly, at the very least, when the Fiber Optic XPIC
 17 Devices are used with the QuadFlex line card, they are not capable of substantial non-
 18 infringing use.

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

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

REMEDIES, ENHANCED DAMAGES, EXCEPTIONAL CASE

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

78. 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.

79. For at least the reasons set forth in Paragraphs 60-64 *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.

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

81. As set forth in Paragraphs 60-64 *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. ADVA is a large company, with annual revenue of over 500 million Euros.¹ 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.

¹ See <https://www.adva.com/en/newsroom/press-releases/20200220-adva-posts-annual-revenues-of-eur-556-8-million-for-2019>.

82. 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. 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. 13 (decision denying review in IPR2016-01618); Ex. 14 (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.

83. 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.

84. 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;

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

Core demands a jury trial on all issues so triable.

By: /s/Lawrence M. Hadley
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