

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

INVENSAS CORPORATION,)	
)	
Plaintiff,)	
)	Civil Action No. _____
v.)	
)	
AVAGO TECHNOLOGIES LIMITED)	DEMAND FOR JURY TRIAL
AVAGO TECHNOLOGIES U.S. INC.,)	
EMULEX CORPORATION, LSI)	
CORPORATION and PLX TECHNOLOGY,)	
INC.,)	
_____ Defendants. _____		

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Invensas Corporation (“Invensas” or “Plaintiff”) brings this action for patent infringement against Defendants Avago Technologies Limited and Avago Technologies U.S. Inc. (collectively “Avago”), Emulex Corporation (“Emulex”), LSI Corporation (“LSI”) and PLX Technology, Inc. (“PLX”) (collectively “Defendants”) and alleges as follows:

THE PARTIES

1. Plaintiff Invensas Corporation (“Invensas”) is a Delaware corporation with its principal place of business at 3025 Orchard Parkway, San Jose, California. Invensas is a wholly-owned subsidiary of Tessera Intellectual Property Corporation which is a wholly-owned subsidiary of Tessera Technologies, Inc.

2. Upon information and belief, Defendant Avago Technologies Limited is a limited liability company organized and existing under the laws of Singapore, with places of business at 1320 Ridder Park Drive, San Jose, California 95131 and 1 Yishun Avenue 7 Singapore 768923. On information and belief, Avago Technologies Limited is an indirect subsidiary of Broadcom Limited.

3. Upon information and belief, Defendant Avago Technologies U.S. Inc. is a Delaware corporation with a principal place of business at 1320 Ridder Park Drive, San Jose, California 95131. Avago Technologies U.S. Inc. has appointed Corporation Service Company, 2711 Centerville Rd., Suite 400, Wilmington, Delaware 19808 as its agent for service of process. On information and belief, Avago Technologies U.S. Inc. is a subsidiary of Avago Technologies Limited.

4. Upon information and belief, Defendant Emulex Corporation (“Emulex”) is a Delaware corporation with its principal place of business at 3333 Susan Street, Costa Mesa, California 92626. Emulex has appointed Corporation Service Company, 2711 Centerville Rd., Suite 400, Wilmington, Delaware 19808, as its agent for service of process. On information and belief, Emulex Corporation is a subsidiary of Avago Technologies Limited.

5. Upon information and belief, Defendant LSI Corporation (“LSI”) is a Delaware corporation with its principal place of business at 1320 Ridder Park Drive, San Jose, California 95131. LSI has appointed Corporation Service Company, 2711 Centerville Rd., Suite 400, Wilmington, Delaware 19808 as its agent for service of process. On information and belief, LSI Corporation is a subsidiary of Avago Technologies Limited.

6. Upon information and belief, Defendant PLX Technology, Inc. (“PLX”) is a Delaware corporation with its principal place of business at 870 W. Maude Avenue, Sunnyvale, California 94085. PLX has appointed Corporation Service Company, 2711 Centerville Rd., Suite 400, Wilmington, Delaware 19808 as its agent for service of process. On information and belief, PLX Technology, Inc. is a subsidiary of Avago Technologies Limited.

JURISDICTION AND VENUE

7. This is an action for patent infringement under the patent laws of the United States of America, 35 U.S.C. §§ 1 *et seq.*, including 35 U.S.C. § 271. The Court has subject matter jurisdiction over the matters pleaded herein under 28 U.S.C. §§ 1331 and 1338(a).

8. The Court has personal jurisdiction over Defendants because, on information and belief, each of the Defendants has regularly and systematically transacted business in this judicial district, directly or through intermediaries, and/or committed acts of infringement in this judicial district. Each of the Defendants has also placed infringing products into the stream of commerce by shipping those products into this district or knowing that the products would be shipped into this district.

9. Venue is proper in this judicial district pursuant to 28 U.S.C. §§ 1400 and 1391(b) and (c) because, among other reasons, each Defendant is subject to personal jurisdiction in this district and has committed acts of infringement in this district, including selling and distributing infringing products in this district.

CLAIMS FOR PATENT INFRINGEMENT

Count I: Infringement of U.S. Patent No. 6,849,946

(Against All Defendants)

10. Invensas hereby incorporates the allegations of Paragraphs 1 through 9 as if fully set forth herein.

11. United States Patent No. 6,849,946 (“’946 Patent”) is titled “Planarized Semiconductor Interconnect Topography and Method for Polishing a Metal Layer to Form Interconnect.” It issued on February 1, 2005, and names Anantha R. Sethuraman and Christopher A. Seams as the inventors. The ’946 Patent issued from United States Patent

Application No. 09/779,123, filed on February 7, 2001. It is a continuation of Application No. 09/143,723, filed on August 31, 1998, now United States Patent No. 6,232,231.

12. Invensas Corporation is the sole owner by assignment of all right, title, and interest in the '946 Patent. A true and correct copy of the '946 Patent is attached as **Exhibit A**.

13. In non-technical terms, the '946 Patent discloses and claims a semiconductor layout configuration and method that results in a more efficient planarization process for a semiconductor chip. During prior art chemical mechanical polishing (CMP) of a semiconductor chip layer, the surface layer may include relatively hard areas (dielectric) and relatively soft areas (metal interconnects) that polish at different rates. The CMP pad conforms to the surface being polished, and thus flexes in softer areas that polish more quickly, causing the surface of those soft areas to become recessed relative to the adjacent areas of the harder dielectric. This is known as the "dishing" problem. Similarly, relatively small oxide regions are removed by the CMP pad at a faster rate than large oxide regions, leading to a problem known as "oxide erosion." The '946 Patent solves the "dishing" and "oxide erosion" problems by disclosing the etching of laterally spaced dummy trenches in a dielectric layer between a wide metal interconnect and a series of narrow metal interconnects, and filling the dummy trenches with a conductive material (*e.g.*, metal). Advantageously, the polish rate of the conductive material above the dummy trenches and the wide and narrow trenches is substantially uniform, as is the polish rate of the oxide, resulting in a substantially planar surface.

14. Invensas is informed and believes, and thereon alleges, that each of the Defendants has infringed, is currently infringing, and/or will infringe the '946 Patent in violation of 35 U.S.C. § 271 by, among other things, making, using, selling, offering to sell, and/or importing within this district and elsewhere in the United States, without license or authority,

products falling within the scope of one or more claims of the '946 Patent, including at least Claim 16 and other claims that depend from Claim 16, literally and/or under the doctrine of equivalents.

15. Based on the information presently available to it, Invensas alleges that Avago's AVSP-4412-002 TCA625 1521 KR, Emulex's XE104-P1 P007402-02A EAS18B40 1518, LSI's B69002V0 20MM001FQHFC BJS4902X, LSI's SAS3108-2 1518 APS18005, LSI's TT60452V0, LSI's TTB71001V0, PLX's PEX8747-CA80BC G, and PLX's PEX9749-AA80BC G semiconductor devices are exemplary devices that infringe at least Claim 16 of the '946 Patent and other claims that depend from Claim 16. The exemplary devices fall into different product families and series that span across different product categories and include the following infringing products:

- Avago's AVSP-4412-002 Bidirectional Retimer IC is part of Avago's family of multi-channel retimer IC devices. On information and belief, the infringing products from this family include Avago's AVSP-4412-002 semiconductor devices, other Avago Multi-Channel Retimer IC semiconductor devices, all Avago semiconductor devices that are the same or substantially similar to the AVSP-4412-002 or other Avago Multi-Channel Retimer IC semiconductor devices, and all products containing the same.
- Emulex's XE104-P1 Ethernet Controller is part of Emulex's XE100 (Skyhawk) family of Ethernet Controllers. On information and belief, the infringing products from this family include Emulex's XE104-P1 semiconductor devices, other Emulex Ethernet Controller semiconductor devices, all Emulex semiconductor devices that

are the same or substantially similar to the XE104-P1 or other Emulex Ethernet Controller semiconductor devices, and all products containing the same.

- LSI's SAS3108 Serial Attached SCSI (SAS) RAID-On-a-Chip (ROC) semiconductor device is part of LSI's RAID-On-a-Chip (ROC) family of devices. On information and belief, the infringing products from this family include LSI's SAS3108 semiconductor devices, other LSI RAID-On-a-Chip (ROC) semiconductor devices, all LSI semiconductor devices that are the same or substantially similar to the LSI SAS3108 or other LSI RAID-On-a-Chip (ROC) semiconductor devices, and all products containing the same.
- LSI's B69002V0 20MM001FQHFC BJS4902X, TT60452V0 and TTB71001V0 Storage Controllers are part of LSI's family of storage controllers. On information and belief, the infringing products from this family include LSI's B69002V0 20MM001FQHFC BJS4902X, TT60452V0 and TTB71001V0 semiconductor devices, other LSI storage controller semiconductor devices, all LSI semiconductor devices that are the same or substantially similar to the B69002V0 20MM001FQHFC BJS4902X, TT60452V0, TTB71001V0 or other LSI storage controller semiconductor devices, and all products containing the same.
- PLX's PEX8747-CA80BC G PCI Express Switch is part of PLX's 8700 family of PCI ExpressLane (PCIe Gen3) Switch devices. On information and belief, the infringing products from this family include PLX's PEX8747-CA80BC G semiconductor devices, other PLX 8700 family PCI ExpressLane (PCIe Gen3) Switch semiconductor devices, all PLX semiconductor devices that are the same or substantially similar to the PEX8747-CA80BC G or other PLX 8700 family PCI

ExpressLane (PCIe Gen3) Switch semiconductor devices, and all products containing the same.

- PLX's PEX9749-AA80BC PCI Express Switch is part of PLX's 9700 family of PCI ExpressFabric (PCIe Gen3) Switch devices. On information and belief, the infringing products from this family include PLX's PEX9749-AA80BC semiconductor devices, other PLX 9700 family PCI ExpressFabric (PCIe Gen3) Switch semiconductor devices, all PLX semiconductor devices that are the same or substantially similar to the PEX9749-AA80BC or other PLX 9700 family PCI ExpressFabric (PCIe Gen3) Switch semiconductor devices, and all products containing the same.

The infringing products identified in this paragraph, all Avago, Emulex, LSI and PLX products that have substantially the same laterally spaced dummy trench structures filled with a conductive material and placed between a wide metal interconnect and a series of narrow metal interconnects, and products containing the same, are referred to collectively as the "Infringing '946 Products." Invensas makes this preliminary identification of infringing products and infringed claims without the benefit of discovery or claim construction in this action, and expressly reserves the right to augment, supplement, and revise its identifications based on additional information obtained through discovery or otherwise.

16. On information and belief, each of the Defendants directly infringes, and is inducing infringement of, the '946 Patent, in violation of 35 U.S.C. § 271(a) and (b), by making, using, offering to sell, selling, and/or importing the Infringing '946 Products in this judicial district and elsewhere in the United States and inducing others to make, use, offer to sell, sell, and/or import Infringing '946 Products or products containing Infringing '946 Products. The Infringing '946 Products comprise a semiconductor layout configuration and method that results

in a more efficient polishing process. Specifically, the Infringing '946 Products include etched laterally-spaced dummy trenches in a dielectric layer between a wide metal interconnect and a series of narrow metal interconnects, and fill the dummy trenches with a conductive material (metal) as indicated by the '946 Patent. The polish rate of the conductive material and oxide above the dummy trenches and the wide and narrow trenches is substantially uniform, as is the polish rate of the oxide, for the Infringing '946 Products, resulting in a substantially planar surface.

17. Avago has been aware of the '946 Patent since no later than May 23, 2016, the date of the filing of a Complaint by Tessera Technologies, Inc., Tessera, Inc. and Invensas Corporation under Section 337 of the Tariff Act of 1930, as Amended, in the United States International Trade Commission ("ITC") Investigation No. 337-TA-1010. Avago also has been aware that Avago customers, distributors, and other purchasers of the Infringing '946 Products are infringing the '946 Patent as set forth in the Complaint in Investigation No. 337-TA-1010. Emulex, LSI and PLX have been aware of the '946 Patent since no later than the date of this Complaint. Emulex, LSI and PLX also have been aware that their customers, distributors, and other purchasers of the Infringing '946 Products are infringing the '946 Patent as set forth in the Complaint.

18. Each of the Defendants is knowingly and intentionally inducing infringement of the '946 Patent, in violation of 35 U.S.C. § 271(b), by actively encouraging others to make, use, offer for sale, sell, and/or import within this judicial district and elsewhere in the United States, without license or authority, Infringing '946 Products or products containing Infringing '946 Products that directly infringe the '946 Patent. For example, each Defendant markets, promotes and advertises its infringing semiconductor devices and offers product briefs and descriptions,

press releases, data sheets, manuals, user guides, and other materials that actively encourage others to directly infringe the '946 Patent by making, using, selling, offering to sell and/or importing products that contain each Defendant's infringing semiconductor devices through its website (www.avagotech.com), at trade shows and conferences, and through its sales representatives, distributors and other channels that encourage and facilitate infringing use of each Defendant's semiconductor devices by others. *See, e.g., Exhibit B* (Avago, Emulex, LSI, and PLX product pages, press releases and other information about exemplary devices). Since at least the date of the Complaint in Investigation No. 337-TA-1010, Avago has had knowledge that the Infringing '946 Products infringe the '946 Patent and it has intended that Avago customers, distributors, and other purchasers infringe the '946 Patent by making, using, selling, offering to sell, and/or importing Infringing '946 Products or products containing the Infringing '946 Products. Since at least the date of this Complaint, Emulex, LSI, and PLX have had knowledge that the Infringing '946 Products infringe the '946 Patent and have intended that their customers, distributors, and other purchasers infringe the '946 Patent by making, using, selling, offering to sell, and/or importing Infringing '946 Products or products containing the Infringing '946 Products.

19. Defendants' acts of infringement have caused damage to Invensas in an amount yet to be determined and subject to proof at trial.

Count II: Infringement of U.S. Patent No. 6,133,136

(Against Defendant PLX)

20. Invensas hereby incorporates the allegations of Paragraphs 1 through 19 as if fully set forth herein.

21. United States Patent No. 6,133,136 ("136 Patent") is titled "Robust Interconnect Structure." It issued on October 17, 2000, and names Daniel Charles Edelstein, Vincent

McGahay, Henry A. Nye, III, Brian George Reid Ottey, and William H. Price as the inventors. The '136 Patent issued from United States Patent Application No. 09/314,003, filed on May 19, 1999. On August 2, 2016, the United States Patent and Trademark Office issued a Certificate of Correction for the '136 Patent.

22. Invensas Corporation is the sole owner by assignment of all right, title, and interest in the '136 Patent. A true and correct copy of the '136 Patent including the Certificate of Correction is attached as **Exhibit C**.

23. In non-technical terms, the '136 Patent discloses and claims a structure for metal interconnects used in semiconductor packaging. Copper is increasingly used as an interconnect in semiconductor devices because it has lower resistivity and a reduced susceptibility to electromigration as compared to traditional aluminum or aluminum alloy interconnects. However, copper has a tendency to diffuse into surrounding dielectric materials, which reduces the structural integrity of the devices. The '136 Patent discloses and claims a structure that improves the structural integrity of copper interconnects. The claimed structure comprises a layer of copper, a barrier layer, a layer of aluminum copper (AlCu), and a pad-limiting layer. The layer of AlCu and the barrier layer are interposed between the layer of copper and the pad-limiting layer. The barrier layer is located between the layer of copper and the layer of AlCu. The '136 Patent discloses that the barrier layer is typically titanium, titanium nitride, tantalum or tantalum nitride, or alloys thereof. The pad-limiting layer is typically titanium nitride, copper, gold, titanium tungsten, chromium or a combination of such materials.

24. Invensas is informed and believes, and thereon alleges, that PLX has infringed, is currently infringing, and/or will infringe the '136 Patent in violation of 35 U.S.C. § 271 by, among other things, making, using, selling, offering to sell, and/or importing within this district

and elsewhere in the United States, without license or authority, products falling within the scope of one or more claims of the '136 Patent, including at least Claims 1 and 11, claims that depend from Claims 1 and 11, including corrected claims 33 and 34, literally and/or under the doctrine of equivalents.

25. Based on the information presently available to it, Invensas alleges that PLX's PEX8680-AA50RBC F, PEX8712-CA80BC G, PEX8713-CA80BC G, PEX8717-CA80BC G, PEX8724-CA80BC G, PEX8725-CA80BC G, PEX8732-CA80BC G, PEX8733-CA80BC G, PEX8747-CA80BC G, PEX8749-CA80BC G semiconductor devices are exemplary devices that infringe at least Claims 1 and 11 of the '136 Patent and other claims that depend from Claims 1 and 11, including corrected claims 33 and 34. The exemplary devices fall into different product families and series that span across different product categories and include the following infringing products:

- PLX's PEX8680-AA50RBC F PCI Express Switch is part of PLX's 8600 family of PCI ExpressLane (PCIe Gen2) Switch devices. On information and belief, the infringing products from this family include PLX's PEX8680-AA50RBC F semiconductor devices, other PLX 8600 family PCI ExpressLane (PCIe Gen2) Switch semiconductor devices, all PLX semiconductor devices that are the same or substantially similar to the PEX8680-AA50RBC F or other PLX 8600 family PCI ExpressLane (PCIe Gen2) Switch semiconductor devices, and all products containing the same.
- PLX's PEX8712-CA80BC G, PEX8713-CA80BC G, PEX8717-CA80BC G, PEX8724-CA80BC G, PEX8725-CA80BC G, PEX8732-CA80BC G, PEX8733-CA80BC G, PEX8747-CA80BC G, and PEX8749-CA80BC G PCI Express Switches

are part of PLX's 8700 family of PCI ExpressLane (PCIe Gen3) Switch devices. On information and belief, the infringing products from this family include PLX's PEX8712-CA80BC G, PEX8713-CA80BC G, PEX8717-CA80BC G, PEX8724-CA80BC G, PEX8725-CA80BC G, PEX8732-CA80BC G, PEX8733-CA80BC G, PEX8747-CA80BC G, and PEX8749-CA80BC G semiconductor devices, other PLX 8700 family PCI ExpressLane (PCIe Gen3) Switch semiconductor devices, all PLX semiconductor devices that are the same or substantially similar to the PEX8712-CA80BC G, PEX8713-CA80BC G, PEX8717-CA80BC G, PEX8724-CA80BC G, PEX8725-CA80BC G, PEX8732-CA80BC G, PEX8733-CA80BC G, PEX8747-CA80BC G, PEX8749-CA80BC G PCI Express Switches, or other PLX 8700 family PCI ExpressLane (PCIe Gen3) Switch semiconductor devices, and all products containing the same.

The infringing products identified in this paragraph, all PLX products that that have the same or substantially the same interconnect structure including a layer of copper, a barrier layer, a layer of aluminum copper (AlCu), and a pad-limiting layer, and products containing the same are referred to collectively as the "Infringing '136 Products." Invensas makes this preliminary identification of infringing products and infringed claims without the benefit of discovery or claim construction in this action, and expressly reserves the right to augment, supplement, and revise its identifications based on additional information obtained through discovery or otherwise.

26. On information and belief, PLX directly infringes and/or is inducing infringement of the '136 Patent, in violation of 35 U.S.C. § 271(a) and (b), by making, using, offering to sell, selling, and/or importing the Infringing '136 Products in this judicial district and elsewhere in the

United States, and inducing others to make, use, offer to sell, sell, and/or import Infringing '136 Products or products containing Infringing '136 Products. The Infringing '136 Products comprise a structure that results in improved structural integrity of copper interconnects. Specifically, the Infringing '136 Products use a structure comprised of a layer of copper, a barrier layer, a layer of aluminum copper (AlCu) and a pad-limiting layer where the layer of AlCu and the barrier layer are interposed between the layer of copper and the pad-limiting layer and the barrier layer is located between the layer of copper and the layer of AlCu, resulting in improved structural integrity of copper interconnects.

27. PLX has been aware of the '136 Patent since no later than the date of this Complaint. PLX also has been aware that PLX customers, distributors, and other purchasers of the Infringing '136 Products are infringing the '136 Patent as set forth in this Complaint.

28. PLX is knowingly and intentionally inducing infringement of the '136 Patent, in violation of 35 U.S.C. § 271(b), by actively encouraging others to make, use, offer for sale, sell, and/or import within this judicial district and elsewhere in the United States, without license or authority, Infringing '136 Products or products containing Infringing '136 Products that directly infringe the '136 Patent. For example, PLX markets, promotes and advertises its infringing semiconductor devices and offers product briefs and descriptions, press releases, data sheets, manuals, user guides, and other materials that actively encourage others to directly infringe the '136 Patent by making, using, selling, offering to sell and/or importing products that contain PLX's infringing semiconductor devices through its website (www.avagotech.com), at trade shows and conferences, and through its sales representatives, distributors, and other channels that encourage and facilitate infringing use of PLX's semiconductor devices by others. *See, e.g., Exhibit D* (PLX product pages, press releases and other information about exemplary devices).

Since at least the date of this Complaint, PLX has had knowledge that the Infringing '136 Products infringe the '136 Patent and it has intended that PLX customers, distributors, and other purchasers infringe the '136 Patent by making, using, selling, offering to sell, and/or importing Infringing '136 Products or products containing the Infringing '136 Products.

29. PLX's acts of infringement have caused damage to Invensas in an amount yet to be determined and subject to proof at trial.

PRAYER FOR RELIEF

WHEREFORE, Invensas prays for relief as follows:

- A. Judgment that Avago, Emulex, LSI, and PLX have directly infringed the '946 Patent, literally and/or under the doctrine of equivalents;
- B. Judgment that Avago, Emulex, LSI, and PLX have induced the infringement of the '946 Patent;
- C. Judgment that PLX has directly infringed the '136 Patent, literally and/or under the doctrine of equivalents;
- D. Judgment that PLX has induced the infringement of the '136 Patent;
- E. Compensatory damages in an amount according to proof, and in any event no less than a reasonable royalty;
- F. An award of reasonable attorneys' fees, costs, and expenses pursuant to 35 U.S.C. § 285 because this is an exceptional case;
- G. Prejudgment interest on all damages awarded to Invensas;
- H. Post-judgment interest on all sums awarded to Invensas from the date of the judgment;
- I. Costs of suit incurred herein; and
- J. Any and all other relief that the Court deems just and equitable.

DEMAND FOR JURY TRIAL

Invensas hereby demands a trial by jury on all issues so triable.

Dated: November 7, 2016

Respectfully submitted,

FARNAN LLP

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