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11 Attorneys for Plaintiff North Star Innovations, Inc.
12

13 **IN THE UNITED STATES DISTRICT COURT**
14 **FOR THE CENTRAL DISTRICT OF CALIFORNIA**

15
16 NORTH STAR INNOVATIONS INC.,

17 Plaintiff,

18 v.

19 UMC GROUP USA AND
20 CYPRESS SEMICONDUCTOR
CORPORATION,

21 Defendants.
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Case No. 8:16-cv-01721

**FIRST AMENDED COMPLAINT
FOR PATENT INFRINGEMENT**

JURY TRIAL DEMANDED

1 Plaintiff North Star Innovations Inc. (“Plaintiff” or “North Star”), by and
2 through its attorneys, files this First Amended Complaint for Patent Infringement
3 against Defendant UMC Group USA and Defendant Cypress Semiconductor
4 Corporation. Plaintiff alleges as follows:

5 **PARTIES**

6 1. Plaintiff North Star is a corporation organized and existing under the
7 laws of the State of Delaware, with a principal place of business at 600 Anton Blvd.,
8 Costa Mesa, California 92626. Plaintiff is the owner of seminal patents in various
9 fields, including integrated circuits, semiconductor memory architecture, and
10 semiconductor memory devices. Plaintiff’s portfolio includes, for example, patents
11 that teach valuable innovations and improvements related to semiconductor
12 manufacturing processes and packaging, as well as patents that teach novel circuit
13 designs to improve speed, power consumption, density, reliability, cost, efficiency,
14 and organization. Plaintiff is actively engaged in licensing efforts with respect to
15 such technologies.

16 2. Defendant UMC Group USA (“UMC USA”) is a California
17 corporation organized and existing under the laws of the State of California, with a
18 principal place of business at 488 De Guigne Drive, Sunnyvale, CA 95124. UMC
19 USA may be served by serving its registered agent for service of process, Mr. Peter
20 Courture, 993 Highland Circle, Los Altos, CA 94024.

21 3. On information and belief, UMC USA is the U.S. and North American
22 sales arm for, and a wholly-owned subsidiary of, United Microelectronics
23 Corporation (“UMC”), a Taiwanese company that manufactures and sells
24 semiconductor products throughout the world. *See, e.g.,*
25 <http://www.umc.com/English/contact/index.asp>. UMC’s website states: “UMC is a
26 leading global semiconductor foundry that provides advanced technology and
27 manufacturing for applications spanning every major sector of the IC [i.e.,

1 integrated circuit] industry. UMC's robust foundry solutions allow chip designers
2 to leverage the company's leading-edge processes ... and a wide range of specialty
3 technologies. Production is supported through 10 wafer manufacturing facilities
4 The company employs over 17,000 people worldwide and has offices in Taiwan,
5 Japan, Korea, China, Singapore, Europe, and the United States.” UMC is a publicly
6 traded entity in the United States, listed on the New York Stock Exchange under
7 the ticker symbol of “UMC”.

8 4. Defendant Cypress Semiconductor Corporation (“Cypress”) is a
9 corporation organized and existing under the laws of the State of Delaware, with a
10 place of business at 198 Champion Ct., San Jose, CA 95134-1709. Defendant may
11 be served with process by serving its registered agent for service of process:
12 Corporation Service Company, 2710 Gateway Oaks Dr., Suite 150N, Sacramento,
13 California, 95833.

14 5. Cypress manufactures and sells various memory products, such as
15 SRAM, NOR Flash memories, and dual-port memories. On its website, Cypress
16 claims to be “the global leader in high-performance and low power memories [and]
17 No. 1 in SRAM market share,” while Spansion, Inc. (which was recently merged
18 into Cypress) has long touted itself as “the world’s leading manufacturer of NOR
19 Flash memory.”

20 6. Joinder of both defendants in this action is proper under 35 U.S.C. §
21 299 because (a) Plaintiff asserts a right to relief against the defendants jointly,
22 severally, or in the alternative with respect to or arising out of the same transaction,
23 occurrence, or series of transactions or occurrences relating to the making, using,
24 importing into the U.S., offering for sale, or selling of the same accused product or
25 process, and (b) questions of fact common to all defendants will arise in this action.

1 **JURISDICTION AND VENUE**

2 7. This action arises under the patent laws of the United States, 35 U.S.C.
3 § 1 *et seq.*, including §§ 271, 281, 282(a), 283, 284, and 285. This Court has subject
4 matter jurisdiction over this patent infringement action pursuant to 28 U.S.C. §§
5 1331 and 1338(a).

6 8. This Court has personal jurisdiction over Defendants. Defendants have
7 regularly conducted and continue to conduct business in the State of California. On
8 information and belief, Defendants, directly or indirectly through their agents, have
9 committed infringing activities in California and in the United States by, at a
10 minimum, offering for sale and selling products that infringe the Patents-In-Suit (as
11 defined below); by placing such infringing products into the stream of commerce
12 with the awareness, knowledge, and intent that they would be used, offered for sale,
13 and/or sold by others in this judicial district and/or purchased by consumers in this
14 judicial district; and/or by offering for sale and/or selling in this judicial district one
15 or more products made by a process patented in the U.S.

16 9. For example, according to the sworn declaration of UMC USA's
17 General Manager, T.J. Lin, UMC USA: facilitates domestic (i.e., U.S.) contracts
18 between UMC and UMC's customers in the U.S. for the sale of wafers to such U.S.
19 customers (such as, for example, Cypress Semiconductor Corporation); provides
20 price quotations and other terms and conditions to U.S. customers; receives and
21 accepts purchase orders from U.S. customers; executes wafer supply agreements
22 with U.S. customers; invoices U.S. customers; collects payment from U.S.
23 customers; and retains at least some of the amounts collected from those U.S.
24 customers.

25 10. Further, this Court has personal jurisdiction over UMC USA because
26 it is organized under the laws of the State of California and over Cypress because its
27 principal place of business is here in California. Defendants have thereby availed

1 themselves of the privileges of conducting business in the State of California and
2 have sought protection and benefit from the laws of the State of California. This
3 Court’s exercise of personal jurisdiction over Defendants would therefore comport
4 with due process.

5 11. Venue is proper pursuant to 28 U.S.C. §§ 1391(b) and 1400(b).

6 **THE PATENTS-IN-SUIT**

7 12. On October 5, 1999, U.S. Patent No. 5,961,373 (“the ’373 Patent”) –
8 entitled “Process for Forming a Semiconductor Device” – was lawfully and properly
9 issued by the United States Patent and Trademark Office (“USPTO”), after a full
10 and fair examination. The named inventors on the ’373 Patent are Lei Ping Lai and
11 Sung C. Kim. A true and correct copy of the ’373 Patent is attached hereto as Exhibit
12 A and incorporated by reference.

13 13. Generally speaking, the ’373 Patent teaches, among other things, a
14 Chemical Mechanical Polishing (“CMP”) process in which conditioning of a
15 polishing pad is optimized to provide, among other benefits, a reproducible
16 polishing process that reduces the likelihood of dishing and contributes to improved
17 planarity and greater efficiency.

18 14. On November 7, 2000, U.S. Patent No. 6,143,648 (“the ’648 Patent”) –
19 – entitled “Method for Forming an Integrated Circuit” – was lawfully and properly
20 issued by the United States Patent and Trademark Office (“USPTO”), after a full
21 and fair examination. The named inventors on the ’648 Patent are Robert Arthur
22 Rodriguez and Heather Marie Klesat. A true and correct copy of the ’648 Patent is
23 attached hereto as Exhibit B and incorporated by reference.

24 15. Generally speaking, the ’648 Patent teaches, among other things, a
25 novel method for forming void-free plug contacts in which portions of the openings
26 are tapered.

1 16. On April 13, 1999, U.S. Patent No. 5,893,752 (“the ’752 Patent”) –
2 entitled “Process for Forming a Semiconductor Device” – was lawfully and properly
3 issued by the United States Patent and Trademark Office (“USPTO”), after a full
4 and fair examination. The named inventors on the ’752 Patent are Jiming Zhang and
5 Dean J. Denning. A true and correct copy of the ’648 Patent is attached hereto as
6 Exhibit C and incorporated by reference.

7 17. Generally speaking, the ’752 Patent teaches, among other things, a
8 novel method for forming a semiconductor device having metal interconnects,
9 which method, at least in certain embodiments, uses a first conductive film that
10 includes tantalum and nitrogen and a second conductive film that includes mostly
11 copper, to form a good barrier, to allow for better adhesion, to achieve better contact
12 resistance, and to reduce the effects of electromigration.

13 18. The ’373 Patent, the ’648 Patent, and the ’752 Patent may be referred
14 to individually as a “Patent-in-Suit” or collectively as the “Patents-in-Suit.”

15 19. By way of assignment, Plaintiff is the owner of all right, title, and
16 interest in and to the Patents-in-Suit, including the rights to prosecute this action
17 and to collect and receive damages for all past, present, and future infringements.

18 **COUNT ONE: INFRINGEMENT OF THE ’373 PATENT**

19 20. Plaintiff incorporates the above allegations as if set forth here in full.

20 21. The ’373 Patent is valid and enforceable. UMC USA does not have a
21 license to practice the patented inventions of the ’373 Patent.

22 22. On information and belief, at least Claims 1, 2, 3, and 10 of the ’373
23 Patent are infringed when the CMP process is performed (a) on any patterned
24 semiconductor device substrate that includes an insulating layer and (b) by, and in
25 accordance with the recommended use of, certain (i) CMP polishing machines
26 manufactured and/or provided by Applied Materials, such as the AMAT Mirra
27 Polisher or the AMAT Reflexion Polisher, and (ii) pad conditioners, such as the 3M

1 Diamond Pad Conditioner A165 or the K00003 Kinik pad conditioner. As described
2 herein, various products identified below include integrated circuits cut from UMC
3 wafers that (a) are, or include, patterned semiconductor device substrates that
4 include an insulating layer, and (b) have been subject to the CMP process as
5 described above, namely, by, and in accordance with the recommended use of,
6 certain (i) CMP polishing machines manufactured and/or provided by Applied
7 Materials, such as the AMAT Mirra Polisher or the AMAT Reflexion Polisher, and
8 (ii) pad conditioners, such as the 3M Diamond Pad Conditioner A165 or the K00003
9 Kinik pad conditioner.

10 23. On information and belief, and in violation of 35 U.S.C. §271(g),
11 UMC USA infringes at least Claims 1, 2, 3, and 10 of the '373 Patent. For example,
12 on information and belief, UMC USA offers for sale or sells products made
13 according to a process that meets every limitation in Claim 1 of the '373 Patent,
14 which recites: "A process for forming a semiconductor device comprising the steps
15 of: placing a substrate onto a polishing pad within an apparatus, wherein a layer
16 overlies the substrate; polishing the layer and conditioning the polishing pad using
17 a first conditioner during a first time period; polishing the layer without
18 conditioning the polishing pad using the first conditioner for a second time period
19 after the first time period and before depositing an additional layer; and removing
20 the substrate from the apparatus after the steps of polishing."

21 24. On information and belief, many of the wafers manufactured by UMC
22 pursuant to wafer supply agreements executed between UMC USA and U.S.
23 customers, including wafers that are offered for sale and/or sold by UMC USA in
24 the U.S. (in violation of 35 U.S.C. §271(g)), are manufactured at overseas foundries
25 that own and utilize one or more Applied Materials Mirra and/or Reflexion
26 Polishers, such as UMC Fab 12A in Tainan, Taiwan, UMC Fab 8D in Hsinchu,
27 Taiwan, and UMC Fab 12i in Singapore.

1 25. For example, UMC USA offers for sale and/or sells numerous
2 products manufactured at UMC Fab 12A, in violation of 35 U.S.C. §271(g). By way
3 of example, and on information and belief, the Cypress HX3 USB 3.0 HUB
4 Controller and Cypress' entire 16-MBIT Asynchronous SRAM Family (65nm)
5 include integrated circuits cut from wafers manufactured at UMC Fab 12A in
6 Tainan, Taiwan, using at least the process patented by Claim 1 of the '373 Patent.
7 On information and belief, UMC USA offers for sale and sells such wafers in the
8 U.S., in violation of 35 U.S.C. § 271(g).

9 26. UMC USA is and has been aware, since at least May 2016 if not
10 earlier, that integrated circuits cut from its infringing wafers are included in the
11 above-named products and that such products are offered for sale, sold, and/or used
12 within the United States.

13 27. On information and belief, there are additional products sold within
14 the U.S. that include integrated circuits cut from wafers offered for sale or sold by
15 UMC USA, and those wafers infringe because they are manufactured, in whole or
16 in part, using the patented processes recited in one or more claims of the '373 Patent,
17 in violation of 35 U.S.C. § 271(g). Plaintiff expressly reserves the right to assert
18 additional patents and additional claims and to identify additional infringing
19 products and additional entities who operate in concert with UMC USA, in
20 accordance with the Federal Rules of Civil Procedure, the Court's scheduling order
21 and the Court's local rules.

22 28. Plaintiff has been damaged by UMC USA's infringing conduct and
23 will continue to be damaged unless UMC USA is enjoined from further
24 infringement. Accordingly, upon finding for Plaintiff, the Court should award to
25 Plaintiff damages adequate to compensate for the infringement, in an amount to be
26 determined at trial, but in no event less than a reasonable royalty for the use made
27 of the invention by the infringer, together with interest and costs as fixed by the

1 Court. Further, upon judgment in favor of Plaintiff, the Court should permanently
2 enjoin UMC USA from committing the infringing acts.

3 **COUNT TWO: INFRINGEMENT OF THE '648 PATENT**

4 29. Plaintiff incorporates the above allegations as if set forth here in full.

5 30. The '648 Patent is valid and enforceable. Defendants do not have a
6 license to practice the patented inventions of the '648 Patent.

7 31. On information and belief, and in violation of 35 U.S.C. §271(a)
8 and/or (g), Defendants infringe at least Claim 9 of the '648 Patent.

9 32. For example, on information and belief, Cypress imports, offers to
10 sell, sells, and/or uses products, such as its 4Mb FAST Asynchronous SRAM, Part
11 No. CY7C1041G-10ZSXI ("FAST SRAM"), made by the novel process patented
12 by Claim 9 of the '648 Patent, which recites: "A method for forming an integrated
13 circuit, the method comprising: forming an opening in a surface of a semiconductor
14 substrate, the opening having a bottom portion, sidewall portions, and a top portion,
15 wherein the top portion includes a taper having dimensions that are wider towards
16 the surface of the semiconductor substrate and, narrower towards the sidewall
17 portions; depositing a material over the surface of the semiconductor substrate and
18 within the opening; polishing away portions of the material over the surface of the
19 semiconductor substrate; and polishing away portions of the semiconductor
20 substrate to remove the top portion of the opening including the taper and portions
21 of the material contained within the top portion." In other words, the FAST SRAM
22 is made according to a process that performs each and every one of the above-
23 referenced method steps. Cypress' actions in this regard violate 35 U.S.C. §271(a)
24 and (g).

25 33. Further, the above-referenced FAST SRAM is manufactured by UMC
26 in Tainan, Taiwan. On information and belief, UMC USA offers for sale and sells
27

1 such products in the U.S. to customers such as Cypress, in violation of 35 U.S.C.
2 §271(g).

3 34. On information and belief, the patented method of Claim 9 of the '648
4 Patent is practiced in connection with the dual damascene integration schemes
5 present in various products and components made, imported, used, sold, or offered
6 for sale by Defendants. The importation, offer for sale, sale, or use of such products
7 by Defendants violates 35 U.S.C. § 271(a) and/or (g).

8 35. On information and belief, additional products of Defendants are, or
9 include components that are, manufactured using the patented methods recited in
10 one or more claims of the '648 Patent, and Defendants' conduct with respect to such
11 products violates at least 35 U.S.C. § 271(g). Plaintiff expressly reserves the right
12 to assert additional patents and additional claims and to identify additional
13 infringing products, in accordance with the Federal Rules of Civil Procedure, the
14 Court's scheduling order and the Court's local rules.

15 36. Plaintiff has been damaged by Defendants' infringing conduct and
16 will continue to be damaged unless Defendants are enjoined from further
17 infringement. Accordingly, upon finding for Plaintiff, the Court should award to
18 Plaintiff damages adequate to compensate for the infringement, in an amount to be
19 determined at trial, but in no event less than a reasonable royalty for the use made
20 of the invention by the infringer, together with interest and costs as fixed by the
21 Court. Further, upon judgment in favor of Plaintiff, the Court should permanently
22 enjoin Defendants from committing the infringing acts.

23 **COUNT THREE: INFRINGEMENT OF THE '752 PATENT**

24 37. Plaintiff incorporates the above allegations as if set forth here in full.

25 38. The '752 Patent is valid and enforceable. Defendants do not have a
26 license to practice the patented inventions of the '752 Patent.

1 products violates at least 35 U.S.C. § 271(g). Plaintiff expressly reserves the right
2 to assert additional patents and additional claims and to identify additional
3 infringing products, in accordance with the Federal Rules of Civil Procedure, the
4 Court's scheduling order and the Court's local rules.

5 43. Plaintiff has been damaged by Defendants' infringing conduct and
6 will continue to be damaged unless Defendants are enjoined from further
7 infringement. Accordingly, upon finding for Plaintiff, the Court should award to
8 Plaintiff damages adequate to compensate for the infringement, in an amount to be
9 determined at trial, but in no event less than a reasonable royalty for the use made
10 of the invention by the infringer, together with interest and costs as fixed by the
11 Court. Further, upon judgment in favor of Plaintiff, the Court should permanently
12 enjoin Defendants from committing the infringing acts.

13 **DEMAND FOR JURY TRIAL**

14 44. Plaintiff hereby demands a trial by jury on all issues.

15 **PRAYER FOR RELIEF**

16 WHEREFORE, Plaintiff respectfully prays for entry of judgment as follows:

17 1. That Defendants have directly infringed one or more claims of the
18 Patents-in-Suit.

19 2. That Plaintiff is entitled to, and should recover, all damages to which
20 Plaintiff is entitled under 35 U.S.C. § 284, but in no event less than a reasonable
21 royalty;

22 3. That Defendants shall be permanently enjoined from further
23 infringement;

24 4. That Defendants be ordered to provide an accounting;

25 5. That Plaintiff, as the prevailing party, shall recover from Defendants all
26 taxable costs of court;

1 6. That Plaintiff shall recover from Defendants all pre- and post-judgment
2 interest on the damages award, calculated at the highest interest rates allowed by law;

3 7. That this case is exceptional and that Plaintiff therefore shall recover its
4 attorney's fees and other recoverable expenses, under 35 U.S.C. § 285; and

5 8. That Plaintiff shall recover from Defendants such other and further relief
6 as the Court may deem appropriate.

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9 DATED: September 26, 2016

BRANDON C. FERNALD
FERNALD LAW GROUP, LLP

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By: /s/ Brandon C. Fernald
Brandon C. Fernald

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