

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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FUJITSU SEMICONDUCTOR LIMITED, FUJITSU SEMICONDUCTOR AMERICA, INC., ADVANCED MICRO DEVICES, INC., RENESAS ELECTRONICS CORPORATION, RENESAS ELECTRONICS AMERICA, INC., GLOBALFOUNDRIES U.S., INC., GLOBALFOUNDRIES DRESDEN MODULE ONE LLC & CO. KG, GLOBALFOUNDRIES DRESDEN MODULE TWO LLC & CO. KG, TOSHIBA AMERICA ELECTRONIC COMPONENTS, INC., TOSHIBA AMERICA INC., TOSHIBA AMERICA INFORMATION SYSTEMS, INC., TOSHIBA CORPORATION, and THE GILLETTE COMPANY,  
Petitioners,

v.

ZOND, LLC,  
Patent Owner.

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Case IPR2014-00917<sup>1</sup>  
Patent 6,805,779 B2

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Before KEVIN F. TURNER, DEBRA K. STEPHENS, JONI Y. CHANG, SUSAN L.C. MITCHELL, and JENNIFER MEYER CHAGNON,  
*Administrative Patent Judges.*

CHANG, *Administrative Patent Judge.*

FINAL WRITTEN DECISION  
*Inter Partes* Review  
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

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<sup>1</sup> Cases IPR2014-00918, IPR2014-01074, and IPR2014-01025 have been joined with the instant *inter partes* review.

## I. INTRODUCTION

Taiwan Semiconductor Manufacturing Company, Ltd. and TSMC North America Corporation (collectively, “TSMC”) filed a Petition requesting an *inter partes* review. Paper 2 (“Pet.”). Patent Owner Zond, LLC (“Zond”) filed a Preliminary Response. Paper 8 (“Prelim. Resp.”). On November 17, 2014, we instituted the instant trial as to claims 7, 9, 20, 21, 38, and 44 of U.S. Patent No. 6,805,779 B2 (Ex. 1401, “the ’779 patent”), pursuant to 35 U.S.C. § 314(a). Paper 10 (“Dec.”).

Subsequent to institution, we granted the revised Motions for Joinder filed by other Petitioners (collectively, “GlobalFoundries”) listed in the Caption above, joining Cases IPR2014-00918, IPR2014-01074, and IPR2014-01025 with the instant trial (Papers 13–15), and also granted a Joint Motion to Terminate with respect to TSMC (Paper 31). Zond filed a Response (Paper 27, “PO Resp.”), and GlobalFoundries filed a Reply (Paper 38, “Reply”). An oral hearing<sup>2</sup> was held on June 15, 2015, and a transcript of the hearing was entered into the record. Paper 48 (“Tr.”).

We have jurisdiction under 35 U.S.C. § 6(c). This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a). For the reasons set forth below, we determine that GlobalFoundries has shown by a preponderance of the evidence that claims 7, 9, 20, 21, 38, and 44 are unpatentable under 35 U.S.C. § 103(a).

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<sup>2</sup> The oral arguments for this review and the following *inter partes* reviews were consolidated: IPR2014-00828, IPR2014-00829, IPR2014-01073, and IPR2014-01076.

### A. Related Matters

The parties indicate that the '779 patent was asserted in several related district court proceedings, including *Zond, LLC v. Advanced Micro Devices, Inc.*, No.1:13-cv-11577-DPW (D. Mass.), and identify other petitions for *inter partes* review that are related to this proceeding. Pet. 1; Paper 6.

### B. The '779 Patent

The '779 patent relates to a method and a system for generating a plasma with a multi-step ionization process. Ex. 1401, Abs. For instance, Figure 2 of the '779 patent, reproduced below, illustrates a cross-sectional view of a plasma generating apparatus:

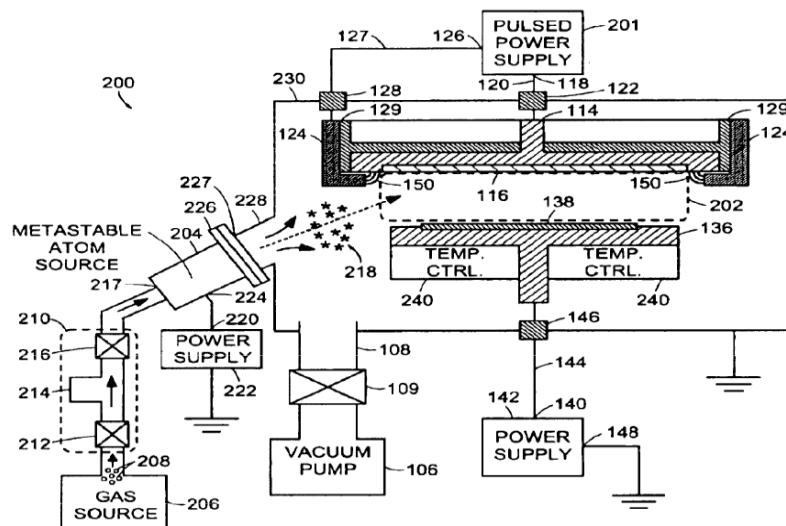


FIG. 2

In the embodiment shown in Figure 2, feed gas source 206 supplies ground state atoms 208 to metastable atom source 204 that generates metastable atoms 218 from ground state atoms 208. *Id.* at 4:26–42. Plasma 202 is generated from metastable atoms 218 in process chamber 230. *Id.* at 5:25–34.

Electrons and ions are formed in metastable atom source 204 along with excited or metastable atoms 218. *Id.* at 8:20–23. In another embodiment, the ions and electrons are separated from excited or metastable atoms 218 and trapped in an electron/ion absorber before excited or metastable atoms 218 are injected into plasma chamber 230. *Id.* at 8:23–26, 18:62–67, Fig. 10. Figure 12B of the '779 patent illustrates the electron/ion absorber and is reproduced below:

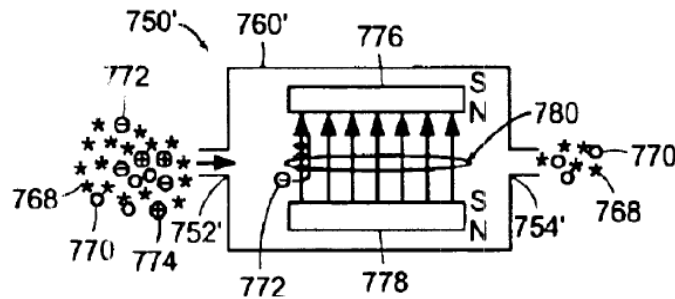


FIG. 12B

As shown in Figure 12B, electron/ion absorber 750' includes magnets 776 and 778 that generate magnetic field 780, trapping electrons 772 and ions 774 in chamber 760'. *Id.* at 20:9–13. Excited or metastable atoms 768 and ground state atoms 770 then flow through output 754'. *Id.* at 20:19–21.

### C. Illustrative Claim

Of the challenged claims, claim 44 is the sole independent claim. Claims 7 and 9 depend directly from independent claim 1; claims 20 and 21 depend directly from claim 18; and claim 38 depends directly from

independent claim 30. GlobalFoundries is not challenging independent claims 1, 28, and 30 in the instant proceeding.<sup>3</sup>

Claim 44 is illustrative:

44. A plasma generator that generates a plasma with a multi-step ionization process, the plasma generator comprising:

a feed gas source comprising ground state atoms;

an *inductively coupled discharge source* that is coupled to the feed gas source, the inductively coupled discharge source generating excited atoms from the ground state atoms;

a plasma chamber that is coupled to the inductively coupled discharge source, the plasma chamber confining

a volume of excited atoms generated by the inductively coupled discharge source; and

an energy source that is coupled to the volume of excited atoms confined by the plasma chamber, the energy source raising an energy of excited atoms in the volume of excited atoms so that at least a portion of the excited atoms in the volume of excited atoms is ionized, thereby *generating a plasma with a multi-step ionization process*.

*Id.* at 24:48–67 (emphases added).

#### *D. Prior Art Relied Upon*

GlobalFoundries relies upon the following prior art references:

Pinsley	US 3,761,836	Sept. 25, 1973	(Ex. 1405)
Angelbeck	US 3,514,714	May 26, 1970	(Ex. 1406)
Iwamura	US 5,753,886	May 19, 1998	(Ex. 1407)

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<sup>3</sup> Independent claims 1 and 18 are being challenged in Case IPR2014-01073, and independent claim 30 is being challenged in Case IPR2014-00828.

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