

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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.

Case IPR2014-00828¹
Patent 6,805,779 B2

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

¹ Cases IPR2014-00856, IPR2014-01070, and IPR2014-01022 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 30–37, 39, and 40 of U.S. Patent No. 6,805,779 B2 (Ex. 1201, “the ’779 patent”), pursuant to 35 U.S.C. § 314(a). Paper 9 (“Dec.”).

Subsequent to institution, we granted the revised Motions for Joinder filed by other Petitioners (collectively, “GlobalFoundries”) listed in the Caption above, joining Cases IPR2014-00856, IPR2014-01070, and IPR2014-01022 with the instant trial (Papers 12–14), and also granted a Joint Motion to Terminate with respect to TSMC (Paper 32). Zond filed a Response (Paper 26, “PO Resp.”), and GlobalFoundries filed a Reply (Paper 40, “Reply”). An oral hearing² was held on June 15, 2015, and a transcript of the hearing was entered into the record. Paper 50 (“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 30–37, 39, and 40 are unpatentable under 35 U.S.C. § 103(a).

² The oral arguments for this review and the following *inter partes* reviews were consolidated: IPR2014-00829, IPR2014-00917, 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 5.

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. 1201, Abs. For instance, Figure 2 of the '779 patent, reproduced below, illustrates a cross-sectional view of a plasma generating apparatus:

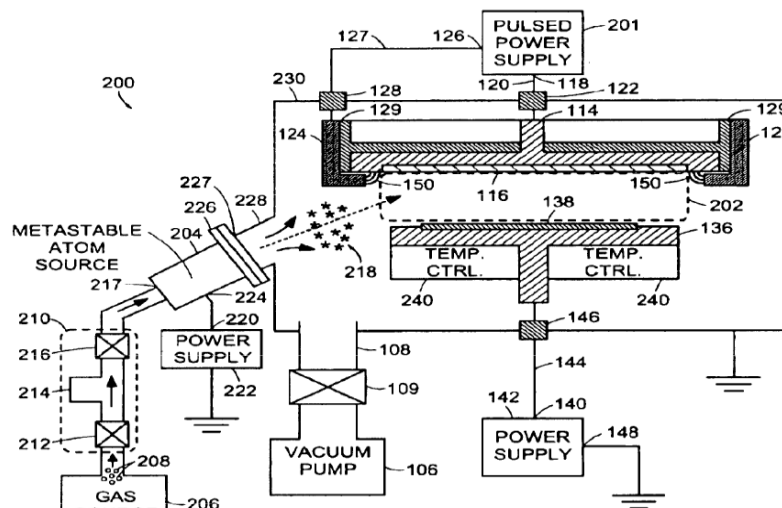


FIG. 2

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:

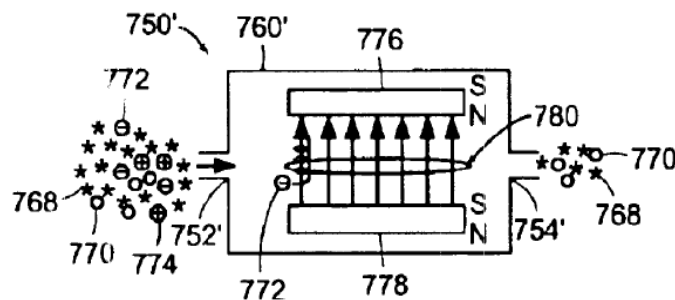


FIG. 12B

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 Claims

Of the challenged claims, claims 30 and 40 are the only independent claims. Claims 31–37 and 39 depend directly from claim 30.

Claims 30 and 40 are illustrative and reproduced below:

30. A method for generating a plasma with a multi-step ionization process, the method comprising:

generating *a magnetic field proximate to a volume of ground state atoms to substantially trap electrons proximate to the volume of ground state atoms;*

generating a volume of metastable atoms from the volume of ground state atoms; and

raising an energy of the metastable atoms so that at least a portion of the volume of metastable atoms is ionized, thereby *generating a plasma with a multi-step ionization process.*

Ex. 1201, 23:24–34 (emphases added).

40. A method for generating a plasma with a multi-step ionization process, the method comprising:

generating *a magnetic field proximate to a volume of ground state molecules to substantially trap electrons proximate to the volume of ground state molecules;*

generating a volume of *metastable molecules* from the volume of ground state molecules; and

raising an energy of the metastable molecules so that at least a portion of the volume of metastable molecules is ionized, thereby *generating a plasma with a multistep ionization process.*

Id. at 23:66–24:9 (emphases added).

D. Prior Art Relied Upon

GlobalFoundries relies upon the following prior art references:

Pinsley	US 3,761,836	Sept. 25, 1973	(Ex. 1205)
Angelbeck	US 3,514,714	May 26, 1970	(Ex. 1206)
Iwamura	US 5,753,886	May 19, 1998	(Ex. 1207)
Wells	PCT WO 83/01349	Apr. 14, 1983	(Ex. 1214)
Lovelock	EP 0 242 028 A2	Oct. 21, 1987	(Ex. 1215)

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