

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
and TSMC NORTH AMERICA CORPORATION,
Petitioners,

v.

ZOND, LLC,
Patent Owner.

Case IPR2014-00917
Patent 6,805,779 B2

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

CHANG, *Administrative Patent Judge.*

DECISION
Institution of *Inter Partes* Review
37 C.F.R. § 42.108

I. INTRODUCTION

Taiwan Semiconductor Manufacturing Company, Ltd. and TSMC North America Corporation (collectively, “TSMC”) filed a Petition requesting *inter partes* review of claims 7, 9, 20, 21, 38, and 44 of U.S. Patent No. 6,805,779 B2 (“the ’779 patent”). Paper 2 (“Pet.”). Zond, LLC (“Zond”) filed a Preliminary Response. Paper 8 (“Prelim. Resp.”). We have jurisdiction under 35 U.S.C. § 314.

The standard for instituting an *inter partes* review is set forth in 35 U.S.C. § 314(a), which provides:

THRESHOLD.—The Director may not authorize an *inter partes* review to be instituted unless the Director determines that the information presented in the petition filed under section 311 and any response filed under section 313 shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.

Upon consideration of TSMC’s Petition and Zond’s Preliminary Response, we conclude that the information presented in the Petition demonstrates that there is a reasonable likelihood that TSMC would prevail in challenging claims 7, 9, 20, 21, 38, and 44 as unpatentable under 35 U.S.C. § 103(a). Pursuant to 35 U.S.C. § 314, we hereby authorize an *inter partes* review to be instituted as to claims 7, 9, 20, 21, 38, and 44 of the ’779 patent.

A. Related Matters

TSMC indicates that the ’779 patent was asserted in several related district court proceedings, including *Zond, LLC v. Fujitsu Corp.*, No. 1:13-

cv-11634-WGY (D. Mass.). Pet. 1. TSMC also identifies other Petitions for *inter partes* review that are related to the instant proceeding. *Id.*

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:

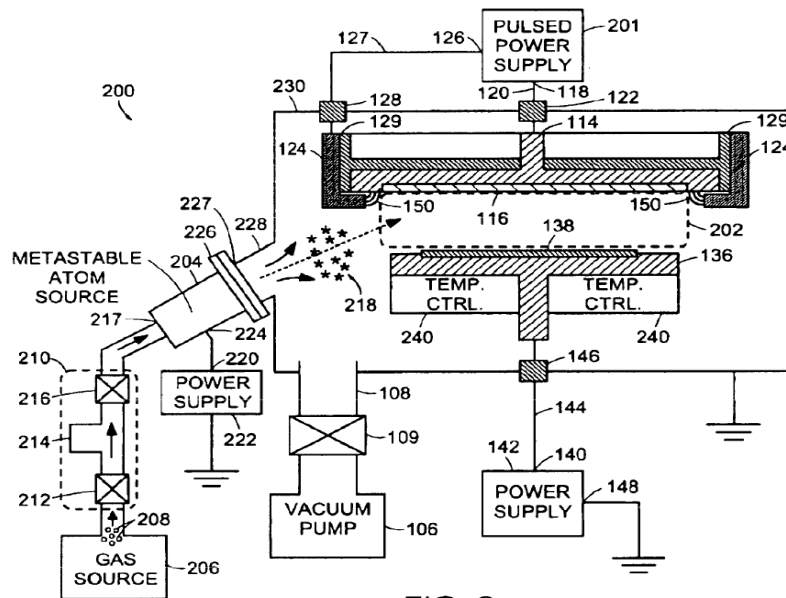


FIG. 2

In the embodiment shown in Figure 2, feed gas source 206 supplies ground state atoms 208 (e.g., ground state argon atoms) 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 the metastable atoms 218 in process chamber 230. *Id.* at 5:25–34.

The metastable atom source may include a parallel plate discharge chamber, an electron gun, or an inductively coupled discharge chamber that

excites a portion of the volume of ground state atoms 208 to a metastable state. *Id.* at 10:1–13. More specifically, ground state atoms 208 are excited to a metastable state by using an energy source, such as a DC plasma source, a radio frequency (RF) plasma source, an ultraviolet (UV) radiation source, an X-ray radiation source, an electron beam radiation source, a microwave plasma source, or a magnetron plasma discharge source. *Id.* at 19:1–10.

Electrons and ions are formed in metastable atom source 204 along with metastable atoms 218. *Id.* at 8:20–23. In another embodiment, the ions and electrons are separated from metastable atoms 218 and trapped in an electron/ion absorber before 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:

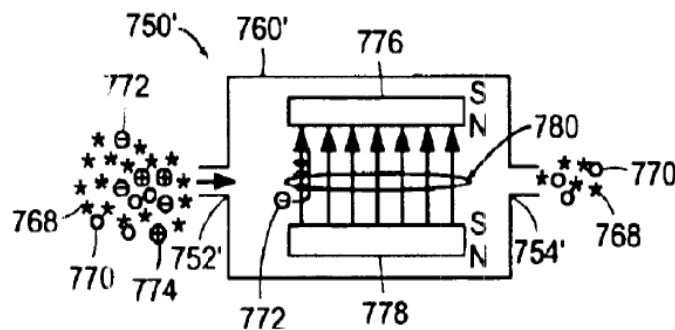


FIG. 12B

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. 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, 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. TSMC is not challenging independent claims 1, 28, and 30 in the instant proceeding.¹

Claims 1 and 7 are illustrative:

1. 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 excited atom source that receives ground state atoms from the feed gas source, the excited atom source comprising a magnet that generates *a magnetic field for substantially trapping electrons proximate to the ground state atoms*, the excited atom source generating excited atoms from the ground state atoms;

a plasma chamber that is coupled to the excited atom source, the plasma chamber confining a volume of excited atoms generated by the excited atom 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*.

¹ Independent claims 1 and 18 are being challenged in *GLOBALFOUNDRIES U.S., Inc. v. Zond, LLC*, Case IPR2014-01073 (Paper 2), and independent claim 30 is being challenged in *Taiwan Semiconductor Mfg. v. Zond, LLC*, Case IPR2014-00828 (Paper 2).

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