

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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GLOBAL FOUNDRIES U.S., INC., GLOBALFOUNDRIES DRESDEN  
MODULE ONE LLC & CO. KG, and GLOBALFOUNDRIES DRESDEN  
MODULE TWO LLC & CO. KG,  
Petitioners,

v.

ZOND, LLC,  
Patent Owner.

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Case IPR2014-01087  
Patent 7,147,759 B2

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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

GLOBALFOUNDRIES U.S., Inc., GLOBALFOUNDRIES Dresden Module One LLC & Co. KG, and GLOBALFOUNDRIES Dresden Module Two LLC & Co. KG (collectively, “GlobalFoundries”) filed a Petition requesting an *inter partes* review of claims 2, 3, 5–9, 13–16, 19, 41–43, and 45 of U.S. Patent No. 7,147,759 B2 (Ex. 1101, “the ’759 patent”). Paper 2 (“Pet.”). Zond, LLC (“Zond”), filed a Preliminary Response. Paper 7 (“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 the Petition and Preliminary Response, we conclude that the information presented in the Petition demonstrates that there is a reasonable likelihood that GlobalFoundries would prevail in challenging claims 2, 3, 5–9, 13–16, 19, 41–43, and 45 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 2, 3, 5–9, 13–16, 19, 41–43, and 45 of the ’759 patent.

*A. Related District Court Proceedings*

The parties indicate that the '759 patent was asserted in *Zond, LLC v. Advanced Micro Devices, Inc.*, No.1:13-cv-11577-DPW (D. Mass.). Paper 5; Ex. 1120. They also identify other proceedings in which Zond asserted the '759 patent. *Id.*

*B. Related Inter Partes Reviews*

Intel Corporation (“Intel”) filed a Petition to institute an *inter partes* review in *Intel Corp. v. Zond, LLC.*, Case IPR2014-00444, challenging the same claims based on the same grounds of unpatentability as those in the instant proceeding. *Compare* IPR2014-00444, Paper 4 (“’444 Pet.”), 2–60, with Pet. 2–60. On August 27, 2014, we instituted an *inter partes* review of claims 2, 3, 5–9, 13–16, 19, 41–43, and 45 of the '759 patent in IPR2014-00444. The trial, however, was terminated in light of the Written Settlement Agreement, made in connection with the termination of the proceeding in accordance with 35 U.S.C. § 317(b) and 37 C.F.R. § 42.74(b), between Intel and Zond. IPR2014-00444, Papers 14, 15; IPR2014-00443, Ex. 1035. In view of the termination of the Intel Proceeding, the Motion for Joinder filed by GlobalFoundries, seeking to join the instant proceeding with IPR2014-00444, is dismissed as moot in a separate decision.

The Gillette Company (“Gillette”) also filed a Petition for an *inter partes* review in *The Gillette Co. v. Zond, LLC*, Case IPR2014-00984, challenging the same claims based on the same grounds of unpatentability as those in IPR2014-00444 and in the instant proceeding.

*C. The '759 patent*

The '759 patent relates to a high-power pulsed magnetron sputtering apparatus. Ex. 1101, Abs. At the time of the invention, sputtering was a well-known technique for depositing films on semiconductor substrates. *Id.* at 1:6–13. The '759 patent indicates that prior art magnetron sputtering systems deposit films having low uniformity and poor target utilization (the target material erodes in a non-uniform manner). *Id.* at 1:55–62. To address these problems, the '759 patent discloses that increasing the power applied between the target and anode can increase the amount of ionized gas and, therefore, increase the target utilization. *Id.* at 2:60–62. However, increasing the power also “increases the probability of establishing an undesirable electrical discharge (an electrical arc) in the process chamber.” *Id.* at 2:63–67.

According to the '759 patent, forming a weakly-ionized plasma substantially eliminates the probability of establishing a breakdown condition in the chamber when high-power pulses are applied between the cathode and anode. *Id.* at 7:17–21. Once the weakly-ionized plasma is formed, high-power pulses are applied between the cathode and anode to generate a strongly-ionized plasma from the weakly-ionized plasma. *Id.* at 7:27–30, 7:65–66.

*D. Illustrative Claims*

Claims 2, 3, 5–9, 13–16, 19, 41–43, and 45 depend, directly or indirectly, from claim 1. Claims 1 and 6, reproduced below, are illustrative:

1. A magnetically enhanced sputtering source comprising:

- a) an anode;
- b) a cathode assembly that is positioned adjacent to the anode, the cathode assembly including a sputtering target;
- c) an ionization source that generates a weakly-ionized plasma proximate to the anode and the cathode assembly;
- d) a magnet that is positioned to generate a magnetic field proximate to the weakly-ionized plasma, the magnetic field substantially trapping electrons in the weakly-ionized plasma proximate to the sputtering target; and
- e) a *power supply generating a voltage pulse* that produces an electric field between the cathode assembly and the anode, the power supply being configured to generate the voltage pulse with an amplitude and a rise time that *increases an excitation rate of ground state atoms* that are present in the weakly-ionized plasma to create a multi-step ionization process that generates a strongly-ionized plasma, which comprises ions that sputter target material, from the weakly-ionized plasma, *the multi-step ionization process comprising exciting the ground state atoms to generate excited atoms, and then ionizing the excited atoms within the weakly-ionized plasma without forming an arc discharge.*

Ex. 1101, 21:22–48 (emphases added).

6. The sputtering source of claim 1 wherein the rise time of the voltage pulse is chosen to increase the ionization rate of the excited atoms in the weakly-ionized plasma.

*Id.* at 21:57–59.

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