

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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INTEL CORPORATION,  
Petitioner,

v.

ZOND, LLC,  
Patent Owner.

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Case IPR2014-00443  
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

Intel Corporation (“Intel”) filed a Petition requesting *inter partes* review of claims 1, 4, 10–12, 17, 18, and 44 of U.S. Patent No. 7,147,759 B2 (“the ’759 patent”). Paper 5 (“Pet.”). Zond, LLC (“Zond”) filed a Preliminary Response. Paper 12 (“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 Intel’s Petition and Zond’s Preliminary Response, we conclude that the information presented in the Petition demonstrates that there is a reasonable likelihood that Intel would prevail in challenging claims 1, 4, 10–12, 17, 18, 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 1, 4, 10–12, 17, 18, and 44 of the ’759 patent.

### A. Related Matters

Intel indicates that the ’759 patent was asserted in *Zond, LLC v. Intel Corp.*, No.1:13-cv-11570-RGS (D. Mass.). Pet. 1. Intel also identifies other matters where Zond asserted the claims of the ’759 patent against third

parties, as well as other Petitions for *inter partes* review that are related to this proceeding. *Id.*

*B. The '759 patent*

The '759 patent relates to a high-power pulsed magnetron sputtering apparatus. Ex. 1001, 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.

*C. Illustrative Claim*

Of the challenged claims, claim 1 is the only independent claim. Claims 4, 10, 11, 12, 17, 18, and 44 depend, directly or indirectly, from claim 1. Claim 1, reproduced below, is 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. 1001, 21:22–48 (emphases added).

*D. Prior Art Relied Upon*

Intel relies upon the following prior art references:

Wang	US 6,413,382	July 2, 2002	(Ex. 1005)
Müller-Horsche	US 5,247,531	Sept. 21, 1993	(Ex. 1021)
Kobayashi	US 5,968,327	Oct. 19, 1999	(Ex. 1022)

D.V. Mozgrin, et al., *High-Current Low-Pressure Quasi-Stationary Discharge in a Magnetic Field: Experimental Research*, 21 PLASMA PHYSICS REPORTS 400–409 (1995) (Ex. 1003) (“Mozgrin”).

A. A. Kudryavtsev and V.N. Skrebov, *Ionization Relaxation in a Plasma Produced by a Pulsed Inert-Gas Discharge*, 28(1) SOV. PHYS. TECH. PHYS. 30–35 (Jan. 1983) (Ex. 1004) (“Kudryavtsev”).

D.V. Mozgrin, *High-Current Low-Pressure Quasi-Stationary Discharge in a Magnetic Field: Experimental Research*, Thesis at Moscow Engineering Physics Institute (1994) (Ex. 1018) (“Mozgrin Thesis”).<sup>1</sup>

Li et al., *Low-Temperature Magnetron Sputter-Deposition, Hardness, and Electrical Resistivity of Amorphous and Crystalline Alumina Thin Films*, 18 J. VAC. SCI. TECH. A 2333–38 (2000) (Ex. 1020) (“Li”).

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<sup>1</sup> The Mozgrin Thesis is a Russian-language reference. The citations to the Mozgrin Thesis are to the certified English-language translation submitted by Intel (Ex. 1017).

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