

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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

v.

ZOND, LLC,
Patent Owner

Case IPR2014-00800
Patent 7,811,421 B2

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

STEPHENS, *Administrative Patent Judge.*

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

I. INTRODUCTION

On May 22, 2014, Taiwan Semiconductor Manufacturing Company, LTD. and TSMC North America Corporation (collectively, “TSMC”) filed a Petition requesting an *inter partes* review of claims 1, 2, 8, 10–13, 15–17, 22–25, 27–30, 33, 34, 38, 39, 42, 43, and 46–48 (“the challenged claims”) of U.S. Patent No. 7,811,421 B2 (“the ’421 patent”). Paper 1 (“Pet.”). Zond, LLC (“Zond”) filed a Patent Owner 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.

Taking into account Zond’s Preliminary Response, and based on the information presented in the Petition, we are persuaded a reasonable likelihood exists that TSMC would prevail in challenging claims 1, 2, 8, 10–13, 15–17, 22–25, 27–30, 33, 34, 38, 39, 42, 43, and 46–48 as unpatentable. Pursuant to 35 U.S.C. § 314, we hereby authorize an *inter partes* review as to claims 1, 2, 8, 10–13, 15–17, 22–25, 27–30, 33, 34, 38, 39, 42, 43, and 46–48 of the ’421 patent.

A. Related District Court Proceedings

TSMC indicates that the '421 patent was asserted in *Zond, LLC v. Fujitsu Semiconductor Ltd*, No.1:13-cv-11634-WGY (D. Mass.), in which TSMC is a co-defendant. Pet. 1; Paper 5, 1. TSMC also identifies other proceedings in which Zond asserted the '421 patent. *Id.*

B. Related Inter Partes Review

Intel Corporation (“Intel”) filed a Petition to institute an *inter partes* review in IPR2014-00468, challenging the same claims based on the same grounds of unpatentability as those in the instant proceeding. *Compare* IPR2014-00468, Paper 4 (“’468 Pet.”), 2–58, *with* Pet. 3–59. On September 2, 2014, we instituted an *inter partes* review of claims 1, 2, 8, 10–13, 15–17, 22–25, 27–30, 33, 34, 38, 39, 42, 43, and 46–48 of the '421 patent in IPR2014-00468 (Paper 12, “’468 Dec.”), based on the following grounds of unpatentability:

Claim	Basis	References
1, 2, 8, 10–13, 16, 17, 22–25, 28–30, 33, 34, 39, 42, 43, 46–48	§ 102	Wang
15, 27, 38	§ 103	Wang and Mozgrin

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. IPR2014-00468, Papers 14, 15. TSMC has filed a Motion for Joinder, seeking to join the instant proceeding with *Intel Corp. v. Zond*,

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LLC, Case IPR2014-00468 (PTAB) (“IPR2014-00468”). Paper 6 (“Mot.”). In view of the termination of the Intel Proceeding, however, TSMC’s Motion for Joinder is dismissed as moot in a separate decision.

The following parties also filed Petitions for *inter partes* review that challenge the same claims based on the same grounds of unpatentability as those in IPR2014-00468 and in the instant proceeding: Fujitsu Semiconductor Limited and Fujitsu Semiconductor America, Inc. (*Fujitsu Semiconductor Ltd. v. Zond, LLC*, Case IPR 2014-00844 (PTAB), Paper 1); The Gillette Company (*The Gillette Co. v. Zond, LLC*, Case IPR2014-00991 (PTAB), Paper 2); and 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., and Toshiba Corporation (collectively, “AMD”) (*Advanced Micro Devices, Inc. v. Zond, LLC*, Case IPR2014-01037 (PTAB), Paper 2).

C. The ’421 patent

The ’421 patent relates to a high-deposition 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 1:15–16. The ’421 patent indicates prior art magnetron sputtering systems deposit films that have low uniformity, poor target utilization (the target material erodes in a non-uniform manner), and relatively low deposition rate (low

amount of material deposited on the substrate per unit time). *Id.* at 1:63–2:14. To address these problems, the '421 patent discloses increasing the power applied between the target and anode can increase the amount of ionized gas and, therefore, increase the target utilization and sputtering yield. *Id.* at 3:20–22. However, increasing the power also “increases the probability of establishing an undesirable electrical discharge (an electrical arc) in the process chamber.” *Id.* at 3:23–29.

According to the '421 patent, magnetron sputtering apparatus 200 includes cathode assembly 216, which includes cathode 218 and sputtering target 220. *Id.* at 6:46–49. Pulsed power supply 234 is directly coupled to cathode assembly 216. *Id.* at 7:7–9. Pulsed power supply 234 generates peak voltage levels of between about 5 kV and about 30 kV, and operating voltages are generally between about 50 V and 1 kV. *Id.* at 7:17–20.

The '421 patent forms a weakly-ionized or pre-ionized plasma that 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 9:16–19. 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 9:29–31, 10:8–9.

D. Illustrative Claim

Of the challenged claims, claims 1, 17, 34, and 46–48 are independent. Claims 2, 8, 10–13, 15, 16, 22–25, 27–30, 33, 38, 39, 42, and

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