

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 IPR2014-00805
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 23, 2014, Taiwan Semiconductor Manufacturing Company, LTD. and TSMC North America Corporation (collectively, “TSMC”) filed a Petition requesting *inter partes* review of claims 3–7, 18–20, 31, 32, 36, 40, 41, 44, and 45 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 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.

Taking into account Zond’s Patent Owner Preliminary Response, we conclude that the information presented in the Petition demonstrates there is a reasonable likelihood that TSMC would prevail in challenging claims 3–7, 18–20, 31, 32, 36, 40, 41, 44, 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 3–7, 18–20, 31, 32, 36, 40, 41, 44, and 45 of the ’421 patent.

A. *Related District Court Proceedings*

TSMC indicates 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 and Paper 4. TSMC also identifies other matters where Zond asserted the claims of the '421 patent against third parties. *Id.*

B. Related Inter Partes Reviews

Intel Corporation (“Intel”) filed a Petition to institute an *inter partes* review in IPR2014-00473, challenging the same claims based on the same grounds of unpatentability as those in the instant proceeding. *Compare* IPR2014-00473, Paper 2 (“’468 Pet.”), 3–60, *with* Pet. 3–60. On September 2, 2014, we instituted an *inter partes* review of claims 3–7, 18–20, 31, 32, 36, 40, 41, 44, and 45 of the ’421 patent in IPR2014-00473 (Paper 11, “’473 Dec.”), based on the following grounds of unpatentability:

Claims	Basis	References
3–5, 36, 40, and 41	§ 103	Mozgrin and Kawamata
6, 31, 44, and 45	§ 103	Mozgrin and Lantsman
7, 18–20, and 32	§ 103	Mozgrin, Lantsman, and Kawamata

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. IPR2014-00473, Papers 13, 14.

TSMC has filed a Motion for Joinder, seeking to join the instant proceeding with *Intel Corp. v. Zond, LLC.*, Case IPR2014-00473 (PTAB) (“IPR2014-00473”). Paper 6 (“Mot.”). In view of the termination of the Intel Proceeding, however, TSMC’s Motion for Joinder is dismissed as moot

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in a separate decision.

Several companies also filed a Petition for *inter partes* review, challenging the same claims based on the same grounds of unpatentability as those in IPR2014-00473 and in the instant proceeding.

These include: Fujitsu Semiconductor Limited and Fujitsu Semiconductor America, Inc. (*Fujitsu Semiconductor Ltd. v. Zond, LLC*, Case IPR 2014-00851 (PTAB), Paper 1); The Gillette Company (*The Gillette Co. v. Zond, LLC*, Case IPR2014-00990 (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 IPR2014-01069 (PTAB), Paper 1).

C. The '421 Patent

The '421 patent relates to a high-deposition 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 1:15–16. The '421 patent indicates prior art magnetron sputtering systems deposit films having 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 that increasing the power applied between the target and anode can increase the amount of ionized gas, therefore, increasing 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 Claims

Of the challenged claims, none are independent. Claims 3–7, 18–20, 31, 32, 36, 40, 41, 44, and 45 depend, directly or indirectly, from claims 1, 17, and 34. Claims 1 and 3, reproduced below, are illustrative:

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