

UNITED STATES PATENT AND TRADEMARK OFFICE

---

BEFORE THE PATENT TRIAL AND APPEAL BOARD

---

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD., TSMC  
NORTH AMERICA CORPORATION, FUJITSU SEMICONDUCTOR  
LIMITED, FUJITSU SEMICONDUCTOR AMERICA, INC., ADVANCED  
MICRO DEVICES, INC., RENESAS ELECTRONICS CORPORATION,  
RENEASAS 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., TOSHIBA  
CORPORATION, and THE GILLETTE COMPANY,  
Petitioners,

v.

ZOND, LLC,  
Patent Owner

Patent 7,811,421 B2

---

IPR Case Nos. IPR2014-00800, 00802, 00805

---

**DECLARATION OF LAWRENCE J. OVERZET PH.D.  
ON BEHALF OF PETITIONER**

## TABLE OF CONTENTS

I.	RELEVANT LAW .....	6
A.	Person of Ordinary Skill in the Art .....	6
B.	Anticipation .....	6
C.	Obviousness.....	7
II.	SUMMARY OF OPINIONS: CLAIMS 1-48 .....	9
III.	CLAIM CONSTRUCTION .....	10
A.	“weakly-ionized plasma” and “strongly-ionized plasma” .....	10
B.	“creates a weakly-ionized plasma” .....	12
C.	“pulse” .....	14
IV.	RESPONSE TO PATENT OWNER’S ARGUMENTS REGARDING THE ANTICIPATION AND OBVIOUSNESS OF CLAIMS 1-48 .....	16
D.	General Discussion.....	16
1.	Power, Voltage, and Current.....	16
2.	The Two Embodiments of Wang.....	18
E.	Independent Claims 1, 17, 34, 46, 47, and 48.....	22
1.	Weakly-Ionized and Strongly-Ionized Plasma in Wang.....	22
2.	Wang teaches a pulse for creating a weakly-ionized plasma and then a strongly-ionized plasma from the weakly-ionized plasma without arcing. 23	
3.	Wang teaches the generation of a voltage pulse whose amplitude, duration, and rise time are chosen to increase ion density.....	30
F.	Dependent Claims 11 and 23: “the power supply generates a constant voltage” .....	31
G.	Dependent Claims 12 and 24: “a rise time of the voltage pulse is chosen to increase an ionization rate of the strongly-ionized plasma” .....	35
H.	Dependent Claim 29: “a distance from the sputtering target to the substrate support in the range of approximately 1 cm to 100 cm” .....	37
I.	Dependent Claims 14, 26, and 37: “the rise time of the voltage pulse is in the range of approximately 0.01V/μsec to 1000V/μsec” .....	37

J. Dependent Claims 6, 31, and 45: “a gas flow controller that controls a flow of the feed gas so that the feed gas diffuses the strongly-ionized plasma” .....37

K. Dependent Claim 44: “diffusing the weakly-ionized plasma with a volume of the feed gas while ionizing the volume of the feed gas to create additional weakly-ionized plasma” .....41

L. Dependent Claims 7 and 32: “the gas flow controller controls the flow of the feed gas to allow additional power to be absorbed by the strongly ionized plasma, thereby generating additional thermal energy in the sputtering target” .....41

I, Lawrence J. Overzet, declare as follows:

1. My name is Lawrence J. Overzet.
2. I received my bachelors, masters, and Ph.D. in electrical engineering, all from the University of Illinois, College of Engineering, Urbana, IL. My doctoral thesis was titled “Enhancement of the Negative Ion Flux to Surfaces from Radio Frequency Processing Discharges.”
3. Since graduating in 1988, I have worked as a professor in the Department of Electrical Engineering at the University of Texas at Dallas. I have taught many courses including Introduction to Electromagnetic Fields I and II; Plasma Processing Technology; Plasma Science for Materials Processing; and Current Topics in Plasma Processing.
4. I have written over 75 articles, presented over 240 presentations at international symposia, and have 8 patents in various areas of electrical engineering, most of which being related to plasma science.
5. I am a senior member of the Institute of Electrical and Electronic Engineers (IEEE), and am a fellow of the American Vacuum Society (AVS) for my contributions toward understanding pulsed plasmas and the role of negative ions in plasma processing.
6. A copy of my resume is provided as Appendix A to this declaration.

7. I have reviewed the following publications in preparing this declaration:

- U.S. Patent No. 7,811,421 (the “421 Patent”) (Ex. 1001)).
- D.V. Mozgrin, *et al*, High-Current Low-Pressure Quasi-Stationary Discharge in a Magnetic Field: Experimental Research, Plasma Physics Reports, Vol. 21, No. 5, pp. 400-409, 1995 (“Mozgrin” (Ex. 1003)).
- U.S. Pat. No. 6,413,382 (“Wang” (Ex. 1004)), including U.S. Pat. No. 6,398,929 (“Chiang” (Ex. 1009)) which is incorporated by reference by Wang.
- U.S. Pat. No. 6,190,512 (“Lantsman” (Ex. 1005)).
- D.V. Mozgrin, High-Current Low-Pressure Quasi-Stationary Discharge in a Magnetic Field: Experimental Research, Thesis at Moscow Engineering Physics Institute, 1994 and Certified Translation (“Mozgrin Thesis” (Ex. 1207 and 1208)).
- U.S. Patent No. 7,808,184 (Ex. 1032)

8. I have read and understood each of the above publications and any other publication cited in this declaration. The disclosure of each of these publications provides sufficient information for someone to make and use the plasma generation and sputtering processes that are described in the above publications.

# Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

## Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

## Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

## Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

## API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

## LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

## FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

## E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.