

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FUJITSU SEMICONDUCTOR LIMITED,
FUJITSU SEMICONDUCTOR AMERICA, INC.,
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.,
TOSHIBA CORPORATION, and
THE GILLETTE COMPANY,
Petitioners,

v.

ZOND, LLC,
Patent Owner

Patent 7,147,759 B2

IPR Case Nos. IPR2014-00781, 00782, 01083, 01086, 01087¹

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

¹ Petitioners for IPR2014-01086 and IPR2014-01087 only include GLOBALFOUNDRIES U.S., Inc., GLOBALFOUNDRIES Dresden Module One LLC & Co. KG, GLOBALFOUNDRIES Dresden Module Two LLC & CO. KG, and the Gillette Company

TABLE OF CONTENTS

I.	RELEVANT LAW	5
A.	Claim Construction.....	5
B.	Obviousness.....	6
II.	SUMMARY OF OPINIONS: CLAIMS 1-50	8
III.	CLAIM CONSTRUCTION	9
A.	“weakly-ionized plasma” and “strongly-ionized plasma”	10
B.	“multi-step ionization process”	12
C.	“without forming an arc”.....	13
IV.	RESPONSE TO PATENT OWNER’S ARGUMENTS REGARDING THE OBVIOUSNESS OF CLAIMS 1-50	14
A.	General Discussion.....	14
1.	Kudryavtsev <i>et al.</i>	14
2.	Power, Voltage, and Current	20
3.	The Two Embodiments of Wang	24
4.	Combining the Teachings of Wang and Kudryavtsev	27
B.	Independent Claims 1, 20, and 40.....	31
1.	Weakly-Ionized and Strongly-Ionized Plasma in Wang.....	31
2.	Wang Teaches An Amplitude And A Rise-Time To Increase The Excitation Rate Of Atoms In The Weakly-Ionized Plasma	33
3.	Wang Teaches Without Forming An Arc	37
C.	Dependent Claims 2 and 3: Constant Power and Voltage	41
D.	Dependent Claim 6: Choosing a Rise Time of the Voltage Pulse to Increase Ionization Rate of the Excited Atoms in Weakly-Ionized Plasma.....	45
E.	Dependent Claim 11: Substrate Support Temperature Controller.....	48
F.	Dependent Claim 13: Choosing the Volume Between the Anode and the Cathode Assembly to Increase the Ionization Rate of the Excited Atoms in the Weakly-Ionized Plasma.....	49
G.	Dependent Claims 22, 26, 30, 31: Uniform Field/Plasma/Impact.....	50
1.	Dependent claim 22: uniform electric field	51

2. Dependent claims 9, 26, and 31: uniform plasma.....	52
3. Dependent claim 30: uniform target impact.....	55
H. Dependent Claims 17, 38, and 39: Exposing the feed gas.....	56
1. Dependent claim 38: electrode emitting electrons.....	57
2. Dependent claims 17 and 39: UV source.....	58
I. Dependent Claims 44 and 49: Specific pulse rise time.....	60

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. My courses include Introduction to Electromagnetic Fields I and II, and Plasma Processing Technology; Plasma Science for Materials Processing; and Current Topics in Plasma Processing.
4. I have over 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. 7,147,759 (the “759 Patent”) (Ex. 1001; 1101; 1201; 1301; 1401)).
- 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; 1103; 1203; 1303; 1403)).
- A. A. Kudryavtsev *et al*, Ionization relaxation in a plasma produced by a pulsed inert-gas discharge, Sov. Phys. Tech. Phys. 28(1), pp. 30-35, January 1983 (“Kudryavtsev” (Ex. 1004; 1104; 1204; 1304; 1404)).
- U.S. Pat. No. 6,413,382 (“Wang” (Ex. 1005; 1105; 1205; 1305; 1405)), including U.S. Pat. No. 6,306,265 (“Fu” (Ex. 1023; 1223)) and U.S. Pat. No. 6,398,929 (“Chiang” (Ex. 2004)) which are both incorporated by reference by Wang.

- Li et al, J. Vac. Sci. Technol. A 18(5), pp. 2333-38, 2000 (“Li” (Ex. 1020; 1220)).
- European Pat. Publication EP 1113088 (“Yamaguchi” (Ex. 1222)).
- U.S. Pat. 5,257,531 (“Müller-Horsche” (Ex. 1021; 1123; 1221; 1329; 1422)).
- D.V. Mozgrin, High-Current Low-Pressure Quasi-Stationary Discharge in a Magnetic Field: Experimental Research, Thesis at Moscow Engineering Physics Institute, 1994 (“Mozgrin Thesis” (Ex. 1217)).
- 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.

8. Also, I have reviewed papers in the *Inter Partes* Review Case Nos. IPR2014-00781, 00782, 01083, 01086, 01087, including the Petitions and the accompanying Declarations of Dr. Uwe Kortshagen. As discussed below, I agree with Dr. Kortshagen’s conclusions as stated in those Declarations. Further, I have reviewed the Board’s Institution Decisions, Patent Owner’s Responses, and the accompanying Declaration of Larry D. Hartsough, Ph.D.

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.