IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD. AND TSMC NORTH AMERICA CORP.,

Petitioners,

-vs-

ZOND, LLC,

Patent Owner.

Case Nos.
IPR2014-00781
IPR2014-00782
IPR2014-01083
IPR2014-01086
IPR2014-01087

VIDEOTAPED DEPOSITION of DR. UWE KORTSHAGEN
VOLUME I
Minneapolis, Minnesota
December 3rd, 2014

Reported by:
Amy L. Larson, RPR
Job No. 87857

APPEARANCES:

RADULESCU
350 Fifth Avenue
New York, New York 10118
By: Etai Lahav, Esq.
Maria Granovsky, Esq.
For: Zond, LLC

GONSALVES LAW FIRM
2216 Beacon Lane
Falls Church, Virginia 22043
By: Gregory Gonsalves, Esq.
For: Zond, LLC

DUANE MORRIS
100 High Street
Boston, Massachusetts 02110
By: Anthony Fitzpatrick, Esq.
For: Taiwan Semiconductor Manufacturing Company Limited and TSMC North America

HAYNES AND BOONE
2323 Victory Avenue
Dallas, Texas 75219
By: David McCombs, Esq.
By: Gregory Huh, Esq.
For: Taiwan Semiconductor Manufacturing Company Limited and TSMC North America

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APPEARANCES: (CONT'D.)

WHITE & CASE
701 Thirteenth Street, N.W.
Washington, D.C. 20005
By: David Tennant, Esq.
By: Brett Rismiller, Esq.
For: Global Foundries

O'MELVENY & MYERS
400 South Hope Street
Los Angeles, California 90071
By: Vincent Zhou, Esq. (By telephone)
For: Advanced Micro Devices

FOLEY & LARDNER
321 North Clark Street
Chicago, Illinois 60654
By: Michael Houston, Esq. (By telephone)
For: Renesas Electronics Corporation and Renesas Electronics America, Inc.

BAKER BOTTS
One Shell Plaza
910 Louisiana Street
Houston, Texas 77002
By: Michael Silliman, Esq.
For: Toshiba

ALSO PRESENT: Dean Hibben, Videographer

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THE VIDEOTAPED DEPOSITION OF DR. UWE KORTSHAGEN, VOLUME I, taken on this 3rd day of December, 2014, at The Commons Hotel, 615 Washington Avenue, S.E., Minneapolis, Minnesota, commencing at approximately 7:37 a.m.

P R O C E E D I N G S

THE VIDEOGRAPHER: This is the start of tape number 1 in the videotaped deposition of Dr. Uwe Kortshagen in the matter of Taiwan Semiconductor Manufacturing Company, LL -- LTD, et al. Versus Zond, LLC, in the United States Patent and Trademark Office before the Patent Trial and Appeal Board, case numbers IPR 2014-00781, IPR 2014-00782, IPR 2014-01083, IPR 2014-01086, and IPR 2014-01087.

This deposition is being held at the Commons Hotel in Minneapolis, Minnesota, on December 3rd, 2014, at approximately 7:41 a.m.

My name is Dean Hibben, I'm the legal video specialist from TSG Reporting, Incorporated, headquartered at 747 Third

Avenue, New York, New York. The court reporter is Amy Larson in association with TSG Reporting.

Will counsel please introduce yourselves.

MR. LAHAV: Etai Lahav of Radulescu, LLP, representing the patent owner Zond.

MS. GRANOVSKY: Maria Granovsky, Radulescu, LLP, representing Zond.

MR. GONSALVES: Greg Gonsalves representing Zond.

MR. FITZPATRICK: Anthony Fitzpatrick from Duane Morris, LLP, representing Taiwan Semiconductor Manufacturing Company Limited and TSMC North America.

MR. TENNANT: David Tennant with White & Case representing Global Foundries.

MR. MCCOMBS: David McCombs with Haynes & Boone representing TSMC North America and Taiwan Semiconductor Limited and Fujitsu.

MR. HUH: Gregory Huh with Haynes & Boone representing TSMC and Fujitsu.

MR. RISMILLER: Brett Rismiller with White & Case representing Global Foundries.

THE VIDEOGRAPHER: And those on the phone, please.

MR. ZHOU: Yes, this is Xin-Yi Zhou. It's spelled X-I-N dash Y-I, and the last name is Z-H-O-U, and I represent Advanced Micro Devices, Inc.

MR. HOUSTON: This is Michael Houston of Foley & Lardner representing Renesas Electronics Corporation and Renesas Electronics America, Inc., Renesas being spelled R-E-N-E-S-A-S, for the court reporter.

MR. SILLIMAN: Michael Silliman here, last name is S-I-L-L-I-M-A-N, from Baker, Botts, LLP, representing Toshiba.

THE VIDEOGRAPHER: And would the court reporter please swear in the witness.

DR. UWE KORTSHAGEN,

a witness in the above-entitled action, after having been first duly sworn, was deposed and says as follows:

MR. FITZPATRICK: Before we begin the questioning this morning, I did want to state on the record that objections that I make or that Mr. Tennant makes will apply to all petitioners, to avoid having -- us having to make duplicate objections.

MR. LAHAV: And we agree with that. And if we could actually limit it to statements from Mr. Fitzpatrick that would be best, but --

MR. FITZPATRICK: Our intention is to try to do that to the extent possible.

MR. LAHAV: Okay. Thank you.

EXAMINATION

BY MR. LAHAV:

Q. Good morning.

A. Good morning.

Q. Can you please state your full name for the record.

A. My full name is Uwe Richard Kortshagen.

Q. And can you spell all of that.

A. The first name is spelled U-W-E. The middle name R-I-C-H-R -- A-R-D, and the last name

is K-O-R-T-S-H-A-G-E-N.
Q. Have you ever given a deposition before?
A. No.
Q. Okay. So I'm going to go over some of the rules of depositions, okay?
A. Thank you.
Q. Do you understand that you've just taken an oath to testify truthfully?
A. Yes.
Q. And you will testify truthfully today?
A. Yes.
Q. You understand that I'm going to be asking you questions?
A. Yes.
Q. And that you have an obligation to answer my questions?
A. Yes.
Q. And that even if your counsel objects to my questions, you still have to answer them; do you understand that?
A. Yes.
Q. The one exception to that is if you get instructed on attorney work product or attorney/client privilege; do you understand?

A. Yes.
Q. Please allow me to finish my question before you answer, okay?
A. Yes.
Q. Thank you. If you don't understand a question or you would like me to rephrase, please ask me to do so, okay?
A. Yes.
Q. If I ask a question and you answer it, I'm going to assume you understood it. Is that fair?
A. Yes.
Q. Okay. Please also be careful to give audible, verbal answers to my questions, all right?
A. Yes.
Q. So uh-huhs or nuh-uhs, the court reporter has trouble taking those, so it's important to give the verbal answers, all right?
A. Yes.
Q. Are you taking any medications that might impair your ability to testify truthfully today?
A. No.

Q. Is there any other reason why you can't testify truthfully today?
A. No.
Q. Okay. Where are you currently employed?
A. At the University of Minnesota.
Q. And what is your title?
A. I'm a professor of mechanical engineering.
Q. In your CV you reference a diploma degree in physics in June of 1988, and it's -- how do you pronounce the name of the university?
A. The University of Bochum.
Q. Bochum?
A. Bochum.
Q. Bochum. And is a diploma degree like a bachelor's degree in the United States?
A. It is probably between a bachelor's and a master's degree. It is a five-year degree.
Q. Okay. Did you -- okay. And then you obtained a Ph.D. in January of 1991 from the same university?
A. That is correct, yes.
Q. Did you prepare a dissertation in connection with your Ph.D.?
A. Yes, I did.

Q. What was the topic of that dissertation?
A. The topic was on electron energy distribution functions in radio frequency produced plasmas.
Q. Did you study any particular applications?
A. I studied a particular method of generating plasmas based on so-called propagating surface waves.
Q. And did you -- did you study any particular commercial application or application of any particular endeavor other than the generalized -- generation of plasmas?
A. No.
Q. Okay. Did that dissertation entail research relating to generation of plasmas inside a magnetron?
A. No.
Q. Did you study in your dissertation generating plasmas for purposes of sputtering?
A. No.
Q. After your Ph.D., under education your CV lists a, quote, habilitation in experimental physics?
A. That is correct.

Q. What is a habilitation in experimental physics?
A. Habilitation is a specific degree in the German academic system which at that time in the 1990s was required to become a. university professor.
Q. Does it correlate with post-doc research?
A. Yeah, you may correlate it with -- with an advanced post doc. It also includes writing yet another thesis, habilitation, but one is already in the position to advise Ph.D. students at that point.
Q. Was there any coursework required --
A. No, there is no --
Q. Go ahead.
A. No, there is no coursework required.
Q. What was the topic of your thesis for your habilitation?
A. The topic of the thesis was on kinetic theory and experiments studying electron distribution functions in a wide range of plasmas.
Q. In that, quote, "wide range of plasmas," end quote, did that include plasmas used for

sputtering?
A. Yes.
Q. Did it include plasmas used for magnetron sputtering?
A. No.
Q. Can you explain the work you did in connection with your habilitation related to plasmas used for sputtering?
A. Among other -- among the different systems that I studied at that time was a particular plasma system called capacitively coupled plasma, and such kinds of plasmas can be used for the chemical vapor deposition of films, but they can also be used for sputtering.
Q. And sputtering is not chemical vapor deposition, correct?
A. I would call it more physical vapor deposition.
Q. So sputtering is physical vapor deposition and chemical vapor deposition is some other process, right?
A. Could you repeat that question, please?
Q. Sure. I'm not going to repeat it, I'm going to change it.

When -- when people in the art talk about chemical vapor deposition, that's something different than sputtering, correct?
A. Generally, I would say this is correct, yes.
Q. So you said you studied this capacitively? coupled plasmas that could be used for sputtering. Did you study them in connection with their use for sputtering?
A. I studied them with respect to their -- how should I express it -- with respect to the properties of electrons within these plasmas, in particular, the energy distribution function of electrons.
Q. But you didn't study how to make use of that energy distribution function with respect to sputtering, correct?
MR. FITZPATRICK: Objection to the form of the question.
THE WITNESS: I think the correct way to answer this is to say that the fundamental studies of electron distribution functions that I performed also applied to situations of sputtering.
BY MR. LAHAV:

Q. Did you apply them?
MR. FITZPATRICK: Objection to the form of the question.
THE WITNESS: If you're asking me whether I applied what I learned at the time. to sputtering, the answer is no.
BY MR. LAHAV:
Q. Did you study how those plasmas might be used for sputtering?
A. No.
Q. Do you have any industry experience? Have you ever worked in industry?
A. No.
Q. Have you ever operated a PVD apparatus?
A. No.
Q. So you've never operated a magnetron sputtering chamber, for example, right?
A. No.
Q. Have you ever designed a magnetron sputtering chamber?
A. No.
Q. The focus of your research with respect to plasmas relates to nanoparticles and nanocrystals, correct?

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