UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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PDF SOLUTIONS, INC.,

Petitioner,

v.

OCEAN SEMICONDUCTOR LLC,

Patent Owner.

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Case No. 2022-01196

Patent No. 6,836,691

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DECLARATION OF P.K. MOZUMDER, Ph.D.

PDF Solutions v Ocean Semiconductor, IPR2022-01196

I, P.K. Mozumder, declare:

1.   I am over 18 years of age and reside in Dallas, TX.

2.   I am a Vice President at PDF Solutions, Inc. ("PDF"), where I have been employed since 1998. I have been asked by PDF's counsel to provide my independent analysis of claims 1-19 of U.S. Patent No. 6,836,691 ("the '691 patent") (Ex. 1001) in light of certain prior art publications discussed below.

3.   Other than my regular PDF salary, I will not receive any compensation for work done in connection with this matter and neither my salary nor any bonus depends in any way on the outcome in this matter.

4.   It is my understanding that PDF's counsel, in addition to representing PDF as the petitioner, will also be representing me personally in this matter.

I.   PERSONAL AND PROFESSIONAL BACKGROUND

5.   I discuss here portions of my education and professional experience relevant to this matter.

A.   Education

6.   I received a Bachelor's Degree, Electrical Engineering, Computer Engineering from Indian Institute of Technology, Bombay, in 1984.

7.   I also received a Ph.D. from Carnegie Mellon University in 1989. My Ph.D. Thesis was entitled, "Statistical quality control for VLSIC fabrication process."

B.   Experience

8.   From 1989 until 1998, I worked at Texas Instruments ("TI") as a

Manager and Technical lead for advanced process synthesis and control.

9.   While at TI, I developed top-down design methodologies for reducing

the cost and cycle-time for developing application-specific integrated circuit ("IC")

manufacturing technologies. I also developed algorithms and techniques for

utilizing device and process simulation and short and full-flow silicon experiments

for application-specific technology development.

10.   While at TI, I was actively involved with the Microelectronics

Manufacturing Science and Technology ("MMST") program that began at TI in

1988. The MMST program aimed to demonstrate the technical feasibility of

several synergistic concepts in wafer fabrication that TI had pursued internally

since the early 1980s.

11.   MMST was intended for use in factories with similar single-wafer

process modules that each have in-situ sensors and actuators for real-time process

control and diagnostics. Local machine and process control was seamlessly

integrated with factory-wide controls into an overall Computer Integrated

Manufacturing ("CIM") environment.

12.   In 1992, we constructed a manufacturing laboratory that embodied

first-pass implementations of TI's MMST concepts. We then successfully

conducted a final "1000-Wafer Demonstration" in early 1993 that demonstrated the technical feasibility of advanced manufacturing concepts. TI then proceeded to offer a commercial CIM system based on our MMST research through its Enterprise Systems business.

13.   Multiple publications demonstrate my involvement in the development of TI's MMST program: Barna, G. G., Loewenstein, L. M., Brankner, K. J., Butler, S. W., **Mozumder, P. K.**, Stefani, J. A., Henck, S. A., Chapados, P., Buck, D., Maung, S., Saxena, S., "Sensor integration into plasma etch reactors of a developmental pilot line." Journal of Vacuum Science & Technology B: Microelectronics and Nanometer Structures Processing, Measurement, and Phenomena, 12(4):2860-7 (1994); and, Stefani, J. A., Poarch, S., Saxena, S., **Mozumder, P. K.**, "Advanced process control of a CVD tungsten reactor. IEEE Transactions on Semiconductor Manufacturing," 9(3):366-83 (1996).

14.   I have also authored or co-authored other articles on the topic of semiconductor manufacturing, process control, modeling, and optimization, including the following: M. Chew, S. Saxena, T. F. Cobourn, **P. K. Mozumder** and A. J. Strojwas, "A new methodology for concurrent technology development and cell library optimization," Proceedings Twelfth International Conference on VLSI Design. (Cat. No.PR00013), 1999, pp. 18-24; S. Rao, S. Saxena, **P. K.**

Mozumder, K. Vasanth, J. Davis and R. Burch, "Reducing silicon usage during technology development-a variance analysis approach," IWSM. 1998 3rd International Workshop on Statistical Metrology (Cat. No.98EX113), 1998, pp. 54-57; Davis, J.C. and **Mozumder, P.K.** and Burch, R. and Fernando, C. and Apte, P.P. and Saxena, S. and Rao, S. and Vasanth, K, "Automatic synthesis of equipment recipes from specified wafer-state transitions," IEEE Transactions on Semiconductor Manufacturing, vol. 11, no. 4, pp. 527-536, Nov. 1998; Saxena, S. and Burch, R. and Vasanth, K. and Rao, S. and Fernando, C. and Davis, J. and **Mozumder, P.K.**, "An application of process synthesis methodology for first-pass fabrication success of high-performance deep-submicron CMOS," International Electron Devices Meeting. IEDM Technical Digest, 1997, pp. 149-152; Gardner, M.M., Lu, J.C., Gyurcsik, R.S., Wortman, J.J., Hornung, B.E., Heinisch, H.H., Rying, E.A., Rao, S., Davis, J.C. and **Mozumder, P.K.**, 1997. "Equipment fault detection using spatial signatures." IEEE Transactions on Components, Packaging, and Manufacturing Technology: Part C, 20(4), pp.295-304; Boning, D.S. and **Mozumder, P.K.**, 1994. "DOE/Opt: A system for design of experiments, response surface modeling, and optimization using process and device simulation." IEEE Transactions on Semiconductor Manufacturing, 7(2), pp.233-244; **Mozumder, P.K.** and Barna, G.G., 1994. "Statistical feedback control of a plasma etch process." IEEE Transactions on Semiconductor Manufacturing, 7(1), pp.1-11;

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