

UNITED STATES PATENT AND TRADEMARK OFFICE

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**BEFORE THE PATENT TRIAL AND APPEAL BOARD**

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Taiwan Semiconductor Manufacturing Company Limited

Petitioner

v.

Godo Kaisha IP Bridge 1

Patent Owner

**PETITION FOR *INTER PARTES* REVIEW  
OF UNITED STATES PATENT NO. 6,538,324**

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**DECLARATION OF DR. LI JIANG**

I, Li Jiang, declare:

1. I am a patent agent at the law firm of Finnegan, Henderson, Farabow, Garrett and Dunner LLP.

2. I provide this Declaration in connection with the above-identified *Inter Partes* Review proceeding. Unless otherwise stated, the facts stated in this Declaration are based on my personal knowledge.

3. Ex. 1006 is a copy of the paper, Holloway et al., “Tantalum as a diffusion barrier between copper and silicon: Failure mechanism and effect of nitrogen additions,” *Journal of Applied Physics*, 71(11), 5433-5444 (1992), along with the cover, title pages, and table of contents of the journal. Page 3 of Ex. 1006 (page 4 of Ex. 1006 is a color copy of the same page in the journal) includes a June 17, 1992, Library of Congress Copyright Office stamp. On June 15, 2016, I visited <https://catalog.loc.gov/>, and printed a copy of the Library of Congress Online Catalog Record of this journal under LC Control No. 33023425 from <https://lccn.loc.gov/33023425>. The copy of this record is now Exhibit 1012.

4. Ex. 1007 is a copy of the paper, Sun et al., “Properties of reactively sputter-deposited Ta-N thin films,” *Thin Solid Films*, 236 (1993) 347-351, along with the cover, title pages, and table of contents of the journal. Page 2 of Ex. 1007 (page 3 of Ex. 1007 is a color copy of the same page in the journal) includes a December 28, 1993, Library of Congress Copyright Office stamp. On June 15,

2016, I visited <https://catalog.loc.gov/>, and printed a copy of the Library of Congress Online Catalog Record of this journal under LC Control No. sf 81005059 from <https://lcn.loc.gov/sf81005059>. The copy of this record is now Exhibit 1013.

5. Ex. 1010 is a copy of excerpts from a book, El-Kareh, “Fundamentals of Semiconductor Processing Technology,” Kluwer Academic Publishers (1995), obtained from the Library of Congress. Page 2 of Ex. 1010 includes a December 21, 1994 Library of Congress Copyright Office stamp, and the text “LCCN 94-37113.” On June 16, 2016, I visited <https://catalog.loc.gov/>, and printed a copy of the Library of Congress Online Catalog Record of this book under LC Control No. 94037113 from <https://lcn.loc.gov/94037113>. The copy of this record is now Exhibit 1014.

6. Ex. 1015 is a copy of the paper, Stavrev et al., “Crystallographic and morphological characterization of reactively sputtered Ta, Ta-N and Ta-N-O thin films,” *Thin Solid Films*, 307 (1997) 79-88, along with the cover, title pages, and table of contents of the journal. Page 3 of Ex. 1015 (page 4 of Ex. 1015 is a color copy of the same page in the journal) includes a January 20, 1998, Library of Congress Copyright Office stamp. On June 20, 2016, I visited <https://catalog.loc.gov/>, and printed a copy of the Library of Congress Online Catalog Record of this journal under LC Control No. sf 81005059 from <https://lcn.loc.gov/sf81005059>. The copy of this record is now Exhibit 1016.

7. Ex. 1017 is a copy of the paper, Duan et al., “Magnetic Property and Microstructure Dependence of CoCrTa/Cr Media on Substrate Temperature and Bias,” IEEE Transactions on Magnetics, Vol. 28, No. 5, September 1992, along with the cover, title pages, and table of contents of the journal. Page 3 of Ex. 1017 includes a January 13, 1993, Library of Congress Copyright Office stamp. On June 23, 2016, I visited <https://catalog.loc.gov/>, and printed a copy of the Library of Congress Online Catalog Record of this journal under LC Control No. 74004562 from <https://lcn.loc.gov/74004562>. The copy of this record is now Exhibit 1018.

8. Ex. 1019 is a copy of the paper, Moussavi et al., “Comparison of Barrier Materials and Deposition Processes for Copper Integration,” Proceedings of the IEEE 1998 International Interconnect Technology Conference, pp. 295-97 (1998), along with the cover, title pages, and table of contents of the journal. Page 2 of Ex. 1019 includes an August 4, 1998, Library of Congress Copyright Office stamp. Page 3 of Ex. 1019 includes the text “97-80205.” On June 23, 2016, I visited <https://catalog.loc.gov/>, and printed a copy of the Library of Congress Online Catalog Record of this book under LC Control No. 97080205 from <https://lcn.loc.gov/97080205>. The copy of this record is now Exhibit 1020.

9. Ex. 1021 is a copy of the paper, Wijekoon et al., “Development of a Production Worthy Copper CMP Process,” 1998 IEEE/SEMI Advanced Semiconductor Manufacturing Conference, pp. 354-63 (1998), along with the

cover, title pages, and table of contents of the journal. Page 2 of Ex. 1021 includes an October 30, 1998, Library of Congress Copyright Office stamp. On June 23, 2016, I visited <https://catalog.loc.gov/>, and printed a copy of the Library of Congress Online Catalog Record of this journal under LC Control No. 96643156 from <https://lcn.loc.gov/96643156>. The copy of this record is now Exhibit 1022.

10. Ex. 1023 is a copy of the paper, Wang et al., “Barrier Properties of Very Thin Ta and TaN layers Against Copper Diffusion,” J. Electrochem. Soc., Vol. 145, No. 7, pp. 2538-45, along with the cover, title pages, and table of contents of the journal. Page 2 of Ex. 1021 includes a July 1998, Library of Congress Copyright Office stamp. On June 23, 2016, I visited <https://catalog.loc.gov/>, and printed a copy of the Library of Congress Online Catalog Record of this journal under LC Control No. 48010635 from <https://lcn.loc.gov/48010635>. The copy of this record is now Exhibit 1024.

11. I declare that all statements made herein of my knowledge are true, and that all statements made on information and belief are believed to be true, and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: June 24, 2016

By: /Li Jiang/  
Li Jiang