

Filed on behalf of Godo Kaisha IP Bridge 1

By: Neil F. Greenblum (ngreenblum@gbpatent.com)
Greenblum & Bernstein, P.L.C.
1950 Roland Clarke Place
Reston, VA 20191
Tel: 703-716-1191
Fax: 703-716-1180

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY LIMITED,
Petitioner,

v.

GODO KAISHA IP BRIDGE 1,
Patent Owner.

Case IPR2016-01246
U.S. Patent No. 7,126,174

**DECLARATION OF DR. E. FRED SCHUBERT, PH.D. IN SUPPORT OF
PATENT OWNER'S PRELIMINARY RESPONSE**

TABLE OF CONTENTS

Introduction	4
Summary of Opinions	4
Background and Qualifications	6
Previous Expert Witness Experience.....	6
Compensation.....	6
Background.....	7
Materials Reviewed	11
Legal Standards	11
Technological Background	13
Acronyms.....	13
Silicon integrated circuit (IC) processing.....	13
Electrical isolation in silicon integrated circuit wafers.....	23
Differences between LOCOS isolation and Trench isolation.....	30
LOCOS isolation and Trench isolation are not functionally equivalent.....	32
Difficulty of employing STI on wafers having a non-planar topology.....	35
Benefits of the claimed features of the '174 patent and their synergies.....	38
Synergies arising from use of L-shaped sidewalls and trench isolation.....	43
Prior Art	45
U.S. Patent No. 5,153,145 (“ <i>Lee</i> ”).....	45
U.S. Patent No. 5,539,229 (“ <i>Noble</i> ”).....	47
U.S. Patent No. 4,506,434 (“ <i>Ogawa</i> ”).....	49
Combination: <i>Lee & Noble</i>	51
The initial processing sequence of <i>Noble</i> is opposite from <i>Lee</i>	51
<i>Lee</i> and <i>Noble</i> processes are not compatible.....	57
<i>Lee-Noble</i> rejection fails on further grounds.....	61
There is No Disclosure Of How L-Shaped Sidewalls Can Be Formed.....	61
Salicidation of <i>Lee</i>	62
Conclusions regarding the <i>Lee-Noble</i> combination.....	63

Combination: *Lee & Ogawa*64
Initial Processing Sequence of *Ogawa* Is Opposite From *Lee*64
Lee and *Ogawa* processes are not compatible.....67
Conclusions regarding the *Lee-Ogawa* combination72

I, E. Fred Schubert, declare as follows:

Introduction

1. My name is Dr. E. Fred Schubert. I have been asked to submit this declaration on behalf of Godo Kaisha IP Bridge 1 (“IP Bridge” or “Patent Owner”) in connection with a Petition for *Inter Partes Review* of U.S. Patent No. 7,126,174 (“the ’174 patent”), which I understand was submitted to the Patent Trial and Appeal Board of the United States Patent and Trademark Office by petitioner Taiwan Semiconductor Manufacturing Company Ltd. (“TSMC”).

2. I have been retained as a technical expert by IP Bridge to study and provide my opinions on the technology claimed in, and the patentability or non-patentability of, claims 1-3, 5-7, 9-12, and 14-18 in the ’174 patent (“the Challenged Claims”).

3. I understand the ’174 patent is related to U.S. Patent Nos. 6,967,409 (the ’409 patent), 6,709,950 (the ’950 patent), and 6,281,562 (the ’562 patent) and also claims the benefit of priority to two Japanese applications, JP 7-192181, which was filed on July 27, 1995, and JP 7-330112, which was filed on December 19, 1995.

Summary of Opinions

4. I have reviewed the ’174 patent, associated prior art, the TSMC Petition, the Declaration of Dr. Banerjee, as well as references cited therein. I

understand that the Petitioner and its expert, Dr. Banerjee, express the following contentions:

5. *First*, Petitioner and its expert contend that LOCOS isolation and trench isolation are interchangeable and one could easily substitute LOCOS isolation with trench isolation.

6. *Second*, Petitioner and its expert offer two combinations, (1) *Lee* and *Noble* as well as (2) *Lee* and *Ogawa*, and contend that the substitution of *Lee*'s LOCOS isolation with either *Noble*'s or *Ogawa*'s trench isolation would result in the claimed invention of the '174 patent.

7. Based on my experience and knowledge in the field and based on my review of the documents, I express my opinions as follows:

8. *First*, it is my opinion that LOCOS isolation and trench isolation are substantially different structures thereby requiring that their fabrication processes as well as the processes that they are integrated into must be modified substantially when transitioning from LOCOS isolation to trench isolation.

9. *Second*, it is my opinion that a simple substitution of LOCOS isolation with trench isolation, without a detailed re-engineering of a fabrication process, is not obvious, not possible, and if done nonetheless, would result in a non-working Si IC device.

10. Accordingly, it is my opinion that the '174 patent is not obvious based

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.