

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Taiwan Semiconductor Manufacturing Company, Ltd.

Petitioner

v.

Godo Kaisha IP Bridge 1

Patent Owner

Patent No. 7,126,174

Filing Date: November 24, 2004

Issue Date: October 24, 2006

Title: SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING
THE SAME

Inter Partes Review No. IPR2016-01246

**DECLARATION OF DR. SANJAY KUMAR BANERJEE, PH.D. IN
SUPPORT OF PETITION FOR *INTER PARTES* REVIEW OF UNITED
STATES PATENT NO. 7,126,174**

TABLE OF CONTENTS

I. INTRODUCTION1

II. SUMMARY OF OPINIONS.....2

III. BACKGROUND AND QUALIFICATIONS.....2

 A. Background2

 B. Previous Expert Witness Experience6

 C. Compensation.....6

IV. MATERIALS REVIEWED.....7

V. LEGAL STANDARDS.....9

 A. Anticipation10

 B. Obviousness.....11

VI. TECHNOLOGICAL BACKGROUND.....15

 A. Integrated Circuits15

 B. Isolation Structures.....18

 1. LOCOS19

 2. Shallow Trench Isolation20

 C. Insulating Sidewalls22

VII. THE '174 PATENT25

 A. Disclosed “Conventional” Devices25

 B. Representative Embodiment27

 C. Japanese Application No. 7-192181 Does not Disclose All the
 Features of the Challenged Claims.....27

VIII. LEVEL OF ORDINARY SKILL.....30

IX. ANALYSIS	31
A. <i>Lee</i> (U.S. Patent No. 5,153,145)	31
B. <i>Noble</i> (U.S. Patent No. 5,539,229).....	32
C. <i>Ogawa</i> (U.S. Patent No. 4,506,434).....	33
D. The combined teachings of <i>Lee</i> and <i>Noble</i>	35
1. Claim 1 is obvious over <i>Lee</i> and <i>Noble</i>	43
2. Claim 2 is obvious over <i>Lee</i> and <i>Noble</i>	57
3. Claim 3 is obvious over <i>Lee</i> and <i>Noble</i>	58
4. Claim 5 is obvious over <i>Lee</i> and <i>Noble</i>	59
5. Claim 6 is obvious over <i>Lee</i> and <i>Noble</i>	62
6. Claim 7 is obvious over <i>Lee</i> and <i>Noble</i>	63
7. Claim 9 is obvious over <i>Lee</i> and <i>Noble</i>	65
8. Claim 10 is obvious over <i>Lee</i> and <i>Noble</i>	67
9. Claim 11 is obvious over <i>Lee</i> and <i>Noble</i>	70
10. Claim 12 is obvious over <i>Lee</i> and <i>Noble</i>	72
11. Claim 14 is obvious over <i>Lee</i> and <i>Noble</i>	74
12. Claim 15 is obvious over <i>Lee</i> and <i>Noble</i>	76
13. Claim 16 is obvious over <i>Lee</i> and <i>Noble</i>	78
14. Claim 17 is obvious over <i>Lee</i> and <i>Noble</i>	82
15. Claim 18 is obvious over <i>Lee</i> and <i>Noble</i>	84
E. The combined teachings of <i>Lee</i> and <i>Ogawa</i>	85
1. Claim 1 is obvious over <i>Lee</i> and <i>Ogawa</i>	91
2. Claim 2 is obvious over <i>Lee</i> and <i>Ogawa</i>	94

3.	Claim 3 is obvious over <i>Lee</i> and <i>Ogawa</i>	94
4.	Claim 5 is obvious over <i>Lee</i> and <i>Ogawa</i>	95
5.	Claim 6 is obvious over <i>Lee</i> and <i>Ogawa</i>	95
6.	Claim 7 is obvious over <i>Lee</i> and <i>Ogawa</i>	96
7.	Claim 9 is obvious over <i>Lee</i> and <i>Ogawa</i>	96
8.	Claim 10 is obvious over <i>Lee</i> and <i>Ogawa</i>	97
9.	Claim 11 is obvious over <i>Lee</i> and <i>Ogawa</i>	98
10.	Claim 12 is obvious over <i>Lee</i> and <i>Ogawa</i>	99
11.	Claim 14 is obvious over <i>Lee</i> and <i>Ogawa</i>	99
12.	Claim 15 is obvious over <i>Lee</i> and <i>Ogawa</i>	99
13.	Claim 16 is obvious over <i>Lee</i> and <i>Ogawa</i>	100
14.	Claim 17 is obvious over <i>Lee</i> and <i>Ogawa</i>	100
15.	Claim 18 is obvious over <i>Lee</i> and <i>Ogawa</i>	101
X.	CONCLUSION	101
I.	INTRODUCTION	1
II.	SUMMARY OF OPINIONS.....	2
III.	BACKGROUND AND QUALIFICATIONS.....	2
	A. Background	2
	B. Previous Expert Witness Experience	6
	C. Compensation.....	6
IV.	MATERIALS REVIEWED.....	7
V.	LEGAL STANDARDS.....	9

A.	Anticipation	10
B.	Obviousness.....	11
VI.	TECHNOLOGICAL BACKGROUND.....	15
A.	Integrated Circuits	15
B.	Isolation Structures.....	18
1.	LOCOS	19
2.	Shallow Trench Isolation	20
C.	Insulating Sidewalls	22
VII.	THE '174 PATENT	25
A.	Disclosed “Conventional” Devices	25
B.	Representative Embodiment	27
C.	Japanese Application No. 7-192181 Does not Disclose All the Features of the Challenged Claims.....	27
VIII.	LEVEL OF ORDINARY SKILL.....	30
IX.	ANALYSIS	31
A.	<i>Lee</i> (U.S. Patent No. 5,153,145)	31
B.	<i>Noble</i> (U.S. Patent No. 5,539,229).....	32
C.	<i>Ogawa</i> (U.S. Patent No. 4,506,434).....	33
D.	The combined teachings of <i>Lee</i> and <i>Noble</i>	35
1.	Claim 1 is obvious over <i>Lee</i> and <i>Noble</i>	43
2.	Claim 2 is obvious over <i>Lee</i> and <i>Noble</i>	57
3.	Claim 3 is obvious over <i>Lee</i> and <i>Noble</i>	58
4.	Claim 5 is obvious over <i>Lee</i> and <i>Noble</i>	59

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.