

PATENT ASSIGNMENT

Electronic Version v1.1
 Stylesheet Version v1.1

SUBMISSION TYPE:	NEW ASSIGNMENT										
NATURE OF CONVEYANCE:	ASSIGNMENT										
CONVEYING PARTY DATA											
<table border="1"> <thead> <tr> <th>Name</th> <th>Execution Date</th> </tr> </thead> <tbody> <tr> <td>Chun-Yang Tsai</td> <td>08/24/2012</td> </tr> <tr> <td>Yu-Wei Ting</td> <td>08/24/2012</td> </tr> <tr> <td>Kuo-Ching Huang</td> <td>08/24/2012</td> </tr> </tbody> </table>		Name	Execution Date	Chun-Yang Tsai	08/24/2012	Yu-Wei Ting	08/24/2012	Kuo-Ching Huang	08/24/2012		
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<table border="1"> <tr> <td>Name:</td> <td>Taiwan Semiconductor Manufacturing Company, Ltd.</td> </tr> <tr> <td>Street Address:</td> <td>No. 8, Li-Hsin Road 6</td> </tr> <tr> <td>City:</td> <td>Hsin-Chu</td> </tr> <tr> <td>State/Country:</td> <td>TAIWAN</td> </tr> <tr> <td>Postal Code:</td> <td>300-77</td> </tr> </table>		Name:	Taiwan Semiconductor Manufacturing Company, Ltd.	Street Address:	No. 8, Li-Hsin Road 6	City:	Hsin-Chu	State/Country:	TAIWAN	Postal Code:	300-77
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CORRESPONDENCE DATA											
<p>Fax Number: 2142000853 Phone: 214-651-5000 Email: ipdocketing@haynesboone.com <i>Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent via US Mail.</i></p> <p>Correspondent Name: HAYNES AND BOONE, LLP Address Line 1: 2323 Victory Avenue Address Line 2: Suite 700 Address Line 4: Dallas, TEXAS 75219</p>											
ATTORNEY DOCKET NUMBER:	24061.2280										
NAME OF SUBMITTER:	Rachel L.I. Davis										
Total Attachments: 2 source=2280_Assignment#page1.tif source=2280_Assignment#page2.tif											

OP \$40.00 13598378

ASSIGNMENT

WHEREAS, we,

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|-----|-----------------|----|--|
| (1) | Chun-Yang Tsai | of | No. 19-6, Houhu Hubei Village, Linkou District
New Taipei City 244, Taiwan, R.O.C. |
| (2) | Yu-Wei Ting | of | 2F, No. 14, Alley 69, Lane 66, Wende Road, Neihu District
Taipei City 114, Taiwan, R.O.C. |
| (3) | Kuo-Ching Huang | of | 6F-1, No. 419-3, Sec. 2, Gongdao 5 th Road, East District
Hsinchu City 300, Taiwan, R.O.C. |

have invented certain improvements in

**STRUCTURE AND METHOD FOR A COMPLIMENTARY RESISTIVE SWITCHING
RANDOM ACCESS MEMORY FOR HIGH DENSITY APPLICATION**

for which we have filed an application for Letters Patent of the United States of America on 8-29-2012, as U.S. Serial No. 13/598,378; and

WHEREAS, Taiwan Semiconductor Manufacturing Company, Ltd., ("TSMC"), No. 8, Li-Hsin Rd. 6, Science-Based Industrial Park Hsin-Chu, Taiwan 300-77, Republic of China. is desirous of obtaining the entire right, title, and interest in, to and under the said invention and the said application in the United States of America and in any and all countries foreign thereto;

NOW, THEREFORE, good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, and other good and valuable consideration, we have sold, assigned, transferred and set over, and by these presents do hereby sell, assign, transfer and set over, unto the said TSMC, its successors, legal representatives, and assigns, the entire right, title, and interest in, to and under the said invention, and the said application, and all divisional, renewal, substitutional, and continuing applications thereof, and all Letters Patent of the United States of America which may be granted thereon and all reissues and extensions thereof, and all applications for Letters Patent which may be filed for said invention in any country or countries foreign to the United States of America, and all extensions, renewals, and reissues thereof, and all prior patents and patent applications from which a filing priority of the above-described patent application may be obtained, including the right to collect past damages; and we hereby authorize and request the Commissioner of Patents of the United States of America, and any official of any country or countries foreign to the United States of America, whose duty it is to issue patents on applications as aforesaid, to issue all Letters Patent for said invention to the said TSMC, its successors, legal representatives and assigns, in accordance with the terms of this instrument.

AND WE HEREBY covenant that we have full right to convey the entire interest herein assigned, and that we have not executed, and will not execute, any agreement in conflict herewith.

AND WE HEREBY further covenant and agree that we will communicate to said TSMC, its successors, legal representatives and assigns, any facts known to us respecting said invention, and testify in any legal proceedings, sign all lawful papers, execute all divisional, renewal, substitutional, continuing, and reissue applications, make all rightful declarations and/or oaths and generally do everything possible to aid the said TSMC, its successors, legal representatives and assigns, to obtain and enforce proper patent protection for said invention in all countries.

Inventor Name: Chun-Yang Tsai

Residence Address: No. 19-6, Houhu Hubei Village, Linkou District
New Taipei City 244, Taiwan, R.O.C.

Dated: ✓ 2012/08/24

✓ 蔡陽揚
Inventor Signature

Inventor Name: Yu-Wei Ting

Residence Address: 2F, No. 14, Alley 69, Lane 66, Wende Road, Neihu District
Taipei City 114, Taiwan, R.O.C.

Dated: ✓ 2012/08/24

✓ 丁裕偉
Inventor Signature

Inventor Name: Kuo-Ching Huang

Residence Address: 6F-1, No. 419-3, Sec. 2, Gongdao 5th Road, East District
Hsinchu City 300, Taiwan, R.O.C.

Dated: ✓ 2012/08/24

✓ 黃國欽
Inventor Signature