

PATENT ASSIGNMENT

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| 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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| Chun-Yang Tsai | 08/24/2012 | | | | | | | | |
| Yu-Wei Ting | 08/24/2012 | | | | | | | | |
| Kuo-Ching Huang | 08/24/2012 | | | | | | | | |
| RECEIVING PARTY DATA | | | | | | | | | |
| Name: | Taiwan Semiconductor Manufacturing Company, Ltd. | | | | | | | | |
| Street Address: | No. 8, Li-Hsin Road 6 | | | | | | | | |
| City: | Hsin-Chu | | | | | | | | |
| State/Country: | TAIWAN | | | | | | | | |
| Postal Code: | 300-77 | | | | | | | | |
| PROPERTY NUMBERS Total: 1 | | | | | | | | | |
| <table border="1"> <thead> <tr> <th>Property Type</th> <th>Number</th> </tr> </thead> <tbody> <tr> <td>Application Number:</td> <td>13598378</td> </tr> </tbody> </table> | | Property Type | Number | Application Number: | 13598378 | | | | |
| Property Type | Number | | | | | | | | |
| Application Number: | 13598378 | | | | | | | | |
| CORRESPONDENCE DATA | | | | | | | | | |
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| 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

A S S I G N M E N T

WHEREAS, we,

- (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 5th 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

✓ 丁詔偉
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