

PATENT ASSIGNMENT

Electronic Version v1.1
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| SUBMISSION TYPE: | NEW ASSIGNMENT | | | | | | | | | | | | | | |
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| NATURE OF CONVEYANCE: | ASSIGNMENT | | | | | | | | | | | | | | |
| CONVEYING PARTY DATA | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th>Name</th> <th>Execution Date</th> </tr> </thead> <tbody> <tr> <td>Chih-Yang CHANG</td> <td>12/14/2012</td> </tr> <tr> <td>Wen-Ting CHU</td> <td>12/14/2012</td> </tr> <tr> <td>Kuo-Chi TU</td> <td>12/14/2012</td> </tr> <tr> <td>Yu-Wen LIAO</td> <td>12/17/2012</td> </tr> <tr> <td>Hsia-Wei CHEN</td> <td>12/14/2012</td> </tr> <tr> <td>Chin-Chieh YANG</td> <td>12/14/2012</td> </tr> </tbody> </table> | | Name | Execution Date | Chih-Yang CHANG | 12/14/2012 | Wen-Ting CHU | 12/14/2012 | Kuo-Chi TU | 12/14/2012 | Yu-Wen LIAO | 12/17/2012 | Hsia-Wei CHEN | 12/14/2012 | Chin-Chieh YANG | 12/14/2012 |
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| Chih-Yang CHANG | 12/14/2012 | | | | | | | | | | | | | | |
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| Hsia-Wei CHEN | 12/14/2012 | | | | | | | | | | | | | | |
| Chin-Chieh YANG | 12/14/2012 | | | | | | | | | | | | | | |
| RECEIVING PARTY DATA | | | | | | | | | | | | | | | |
| Name: | TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD. | | | | | | | | | | | | | | |
| Street Address: | No. 8, Li-Hsin Rd. VI, Hsinchu Science Park | | | | | | | | | | | | | | |
| City: | Hsinchu | | | | | | | | | | | | | | |
| State/Country: | TAIWAN | | | | | | | | | | | | | | |
| Postal Code: | 300 | | | | | | | | | | | | | | |
| 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>13722345</td> </tr> </tbody> </table> | | Property Type | Number | Application Number: | 13722345 | | | | | | | | | | |
| Property Type | Number | | | | | | | | | | | | | | |
| Application Number: | 13722345 | | | | | | | | | | | | | | |
| CORRESPONDENCE DATA | | | | | | | | | | | | | | | |
| Fax Number: | 7035185499 | | | | | | | | | | | | | | |
| <i>Correspondence will be sent via US Mail when the fax attempt is unsuccessful.</i> | | | | | | | | | | | | | | | |
| Phone: | 7036841111 | | | | | | | | | | | | | | |
| Email: | tsmc@ipfirm.com | | | | | | | | | | | | | | |
| Correspondent Name: | Lowe Hauptman Ham & Berner, LLP (TSMC) | | | | | | | | | | | | | | |
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| ATTORNEY DOCKET NUMBER: | T5057-842 | | | | | | | | | | | | | | |
| NAME OF SUBMITTER: | Randy A. Noranbrock | | | | | | | | | | | | | | |
| Total Attachments: 1 source=EfiledAssgn#page1.tif | | | | | | | | | | | | | | | |

OP \$40.00 13722345

ASSIGNMENT

In consideration of the premises and other good and valuable consideration in hand paid, the receipt and sufficiency of which is hereby acknowledged, the undersigned,

- | | |
|--------------------|--------------------|
| 1) Chih-Yang CHANG | 4) Yu-Wen LIAO |
| 2) Wen-Ting CHU | 5) Hsia-Wei CHEN |
| 3) Kuo-Chi TU | 6) Chin-Chieh YANG |

who has made a certain new and useful invention, hereby sells, assigns and transfers unto TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD., having a place of business at No. 8, Li-Hsin Rd. VI, Hsinchu Science Park, Hsinchu 300, Taiwan R.O.C.

its successors and assigns (hereinafter designated "ASSIGNEE") the entire right, title and interest for the United States of America as defined in 35 U.S.C. 100 in the invention entitled

RESISTIVE RANDOM ACCESS MEMORY (RRAM) STRUCTURE AND METHOD OF MAKING THE RRAM STRUCTURE

(a) for which an application for United States Letters Patent was filed on 2012-12-20, and identified by United States Patent Application No. 13/722,345; or

(b) for which an application for United States Letters Patent was executed on _____,

and the undersigned hereby authorizes and requests the United States Commissioner of Patents and Trademarks to issue any and all United States Letters Patent which may be granted therefore and any and all extensions, divisions, reissues, continuations, or continuations-in-part thereof, and the right to all benefits under the International Convention for the Protection of Industrial Property to the said ASSIGNEE, for its interest as ASSIGNEE, its successors, assigns and legal representatives; the undersigned agrees that the attorneys of record in said application shall hereafter act on behalf of said ASSIGNEE;

AND the undersigned hereby agrees to transfer a like interest, and to render all necessary assistance in making application for and obtaining original, divisional, reissued or extended Letters Patent of the United States, upon request of the said ASSIGNEE, its successors, assigns and legal representatives, and without further remuneration, in and to any improvements, and applications for patent based thereon, growing out of or related to the said invention; and to execute any papers by the said ASSIGNEE, its successors, assigns and legal representatives, deemed essential to ASSIGNEE's full protection and title in and to the invention hereby transferred.

SIGNED on the date indicated aside my signature:

1) ✓ Chih-Yang Chang
Name: Chih-Yang CHANG

✓ Dec. 14 / 2012
Date:

2) ✓ Wen-Ting Chu
Name: Wen-Ting CHU

✓ Dec. 14 / 2012
Date:

3) ✓ Kuo-Chi Tu
Name: Kuo-Chi TU

✓ Dec. 14 / 2012
Date:

4) ✓ Yu-Wen Liao
Name: Yu-Wen LIAO

✓ Dec. 17 / 2012
Date:

5) ✓ Hsia-Wei Chen
Name: Hsia-Wei CHEN

✓ Dec. 14 / 2012
Date:

6) ✓ Chin-Chieh Yang
Name: Chin-Chieh YANG

✓ Dec. 14 / 2012
Date: