

## PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1  
 Stylesheet Version v1.2

EPAS ID: PAT4575248

<b>SUBMISSION TYPE:</b>	CORRECTIVE ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	Corrective Assignment to correct the THE SPELLING OF THE NAME OF THE 5TH INVENTOR previously recorded on Reel 037453 Frame 0795. Assignor(s) hereby confirms the OF ITS ENTIRE INTEREST.
<b>CONVEYING PARTY DATA</b>	
<b>Name</b>	<b>Execution Date</b>
HAO CHEN	11/17/2015
CHEN-HSIANG HSU	11/17/2015
HUNG-CHIH LIN	11/17/2015
CHING-NEN PENG	11/17/2015
MILL-JER WANG	08/21/2017
<b>RECEIVING PARTY DATA</b>	
<b>Name:</b>	TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY LTD.
<b>Street Address:</b>	NO.8, LI-HSIN RD. 6, HSINCHU SCIENCE PARK
<b>City:</b>	HSINCHU
<b>State/Country:</b>	TAIWAN
<b>PROPERTY NUMBERS Total: 1</b>	
<b>Property Type</b>	<b>Number</b>
<b>Application Number:</b>	14954207
<b>CORRESPONDENCE DATA</b>	
<b>Fax Number:</b>	
<i>Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.</i>	
<b>Phone:</b>	949 387 2885
<b>Email:</b>	inbox@wpatca.com
<b>Correspondent Name:</b>	WPAT, PC INTELLECTUAL PROPERTY ATTORNEYS
<b>Address Line 1:</b>	2301 DUPONT DR. SUITE 510
<b>Address Line 4:</b>	IRVINE, CALIFORNIA 92612
<b>ATTORNEY DOCKET NUMBER:</b>	18506-901
<b>NAME OF SUBMITTER:</b>	ANTHONY KING
<b>SIGNATURE:</b>	/Anthony King/
<b>DATE SIGNED:</b>	08/31/2017
<b>Total Attachments: 6</b>	
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## PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1  
 Stylesheet Version v1.2

EPAS ID: PAT3689780

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	ASSIGNMENT
<b>CONVEYING PARTY DATA</b>	
<b>Name</b>	<b>Execution Date</b>
HAO CHEN	11/17/2015
CHEN-HSIANG HSU	11/17/2015
HUNG-CHIH LIN	11/17/2015
CHING-NEN PENG	11/17/2015
MIN-JER WANG	11/17/2015
<b>RECEIVING PARTY DATA</b>	
<b>Name:</b>	TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY LTD.
<b>Street Address:</b>	NO.8, LI-HSIN RD. 6, HSINCHU SCIENCE PARK
<b>City:</b>	HSINCHU
<b>State/Country:</b>	TAIWAN
<b>PROPERTY NUMBERS Total: 1</b>	
<b>Property Type</b>	<b>Number</b>
<b>Application Number:</b>	14954207
<b>CORRESPONDENCE DATA</b>	
<b>Fax Number:</b>	
<i>Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.</i>	
<b>Phone:</b>	949 387 2885
<b>Email:</b>	inbox@wpatca.com
<b>Correspondent Name:</b>	WPAT, PC INTELLECTUAL PROPERTY ATTORNEYS
<b>Address Line 1:</b>	1100 QUAIL STREET, SUITE 202
<b>Address Line 4:</b>	NEWPORT BEACH, CALIFORNIA 92660
<b>ATTORNEY DOCKET NUMBER:</b>	18506-901
<b>NAME OF SUBMITTER:</b>	ANTHONY KING
<b>SIGNATURE:</b>	/Anthony King/
<b>DATE SIGNED:</b>	01/11/2016
<b>Total Attachments: 2</b>	
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source=US5518-Assignment#page2.tif	

**ASSIGNMENT**

WHEREAS, I(we), WANG, Mill-Jer, whose post office address(es) appear(s) below, hereinafter referred to as ASSIGNOR, have invented certain new and useful invention entitled

**SEMICONDUCTOR DEVICE AND MANUFACTURING METHOD THEREOF**

(hereinafter referred to as the INVENTION) for which an application for United States Letters Patent /Utility Patent is executed on even date herewith unless at least one of the following is checked:

☐ United States Design Patent

was

☐ executed on:

☐ filed on: 11/30/2015 Serial No.: 14/954,307

☐ established by PCT International Patent Application No.: \_\_\_\_\_ filed: \_\_\_\_\_ designating the United States of America

☐ issued on \_\_\_\_\_ as U.S. Patent No.: \_\_\_\_\_

WHEREAS, **TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY LTD.**, whose post office address is **NO.8, LI-HSIN RD. 6, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN, R.O.C.** hereinafter referred to as ASSIGNEE, is desirous of acquiring the entire right, title and interest in and to the same in the United States and its territorial possessions;

NOW, THEREFORE, for good and valuable consideration, receipt of which is hereby acknowledged, I (we), ASSIGNOR, by these presents do sell, assign and transfer unto said ASSIGNEE, the entire right, title, and interest in and to said INVENTION and application throughout the United States of America, including any and all Letters Patent granted on any division, continuation, continuation-in-part and reissue of said application for the full term or terms for which the same may be granted, including all priority rights under any International Convention.

ASSIGNOR further covenants that no assignments, sale, agreement or encumbrance has been or will be made or entered into which would conflict with this Assignment;

ALSO, ASSIGNOR hereby agrees to execute any documents that legally may be required in connection with the filing, prosecution and maintenance of said application or any other patent application(s) in the United States for said INVENTION, including additional documents that may be required to affirm the rights of ASSIGNEE in and to said INVENTION, all without further consideration. ASSIGNOR also agrees, without further consideration and at ASSIGNEE'S expense, to identify and communicate to ASSIGNEE at ASSIGNEE'S request documents and information concerning the INVENTION that are within ASSIGNOR'S possession or control, and to provide further assurances and testimony on behalf of ASSIGNEE that lawfully may be required of ASSIGNOR in respect of the prosecution, maintenance, litigation and defense of any patent application or patent encompassed within the terms of this instrument. ASSIGNOR'S obligations under this instrument shall extend to ASSIGNOR'S heirs, executors, administrators and other legal representatives.

ALSO, ASSIGNOR hereby authorizes and requests the Commissioner of Patents and Trademarks to issue any and all Letters Patent referred to above to ASSIGNEE, as the ASSIGNEE of the entire right, title and interest in and to the same, for ASSIGNEE'S sole use and behoof; and for the use and behoof of ASSIGNEE'S legal representatives and successors, to the full end of the term for which such Letters Patent may be granted, as fully and entirely as the same would have been held by ASSIGNOR had this assignment and sale not been made.

Assignor Name <b>WANG, Mill-Jer</b>	Address <b>17F-1, NO. 37, CHIEN CHUNG 1 RD., HSINCHU CITY 300, TAIWAN (R.O.C.)</b>
Signature of Assignor (x) <i>Mill-Jer Wang</i>	Date of Signature (x) <i>8/21/2017</i>
Name of Witness (optional)	Name of Witness (optional)
Signature of Witness (optional)	Signature of Witness (Optional)

**ASSIGNMENT**

WHEREAS, I(we), CHEN, HAO, HSU, CHEN-HSIANG, LIN, HUNG-CHIH, PENG, CHING-NEN and WANG, MIN-JER whose post office address(es) appear(s) below, hereinafter referred to as ASSIGNOR, have invented certain new and useful invention entitled

**SEMICONDUCTOR DEVICE AND MANUFACTURING METHOD THEREOF**

(hereinafter referred to as the INVENTION) for which an application for United States Letters Patent /Utility Patent is executed on even date herewith unless at least one of the following is checked:

- ☐ United States Design Patent was  
☐ executed on:  
☒ filed on: 30 / November 2015      Serial No.: 14 / 954, 207  
☐ established by PCT International Patent Application No.:      filed:      designating the  
 United States of America  
☐ issued on \_\_\_\_\_ as U.S. Patent No.: \_\_\_\_\_

WHEREAS, TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY LTD. whose post office address is NO.8, LI-HSIN RD. 6, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN, R.O.C. hereinafter referred to as ASSIGNEE, is desirous of acquiring the entire right, title and interest in and to the same in the United States and its territorial possessions;

NOW, THEREFORE, for good and valuable consideration, receipt of which is hereby acknowledged, I (we), ASSIGNOR, by these presents do sell, assign and transfer unto said ASSIGNEE, the entire right, title, and interest in and to said INVENTION and application throughout the United States of America, including any and all Letters Patent granted on any division, continuation, continuation-in-part and reissue of said application for the full term or terms for which the same may be granted, including all priority rights under any International Convention.

ASSIGNOR further covenants that no assignments, sale, agreement or encumbrance has been or will be made or entered into which would conflict with this Assignment;

ALSO, ASSIGNOR hereby agrees to execute any documents that legally may be required in connection with the filing, prosecution and maintenance of said application or any other patent application(s) in the United States for said INVENTION, including additional documents that may be required to affirm the rights of ASSIGNEE in and to said INVENTION, all without further consideration. ASSIGNOR also agrees, without further consideration and at ASSIGNEE'S expense, to identify and communicate to ASSIGNEE at ASSIGNEE'S request documents and information concerning the INVENTION that are within ASSIGNOR'S possession or control, and to provide further assurances and testimony on behalf of ASSIGNEE that lawfully may be required of ASSIGNOR in respect of the prosecution, maintenance, litigation and defense of any patent application or patent encompassed within the terms of this instrument. ASSIGNOR'S obligations under this instrument shall extend to ASSIGNOR'S heirs, executors, administrators and other legal representatives.

ALSO, ASSIGNOR hereby authorizes and requests the Commissioner of Patents and Trademarks to issue any and all Letters Patent referred to above to ASSIGNEE, as the ASSIGNEE of the entire right, title and interest in and to the same, for ASSIGNEE'S sole use and behoof; and for the use and behoof of ASSIGNEE'S legal representatives and successors, to the full end of the term for which such Letters Patent may be granted, as fully and entirely as the same would have been held by ASSIGNOR had this assignment and sale not been made.

Assignor Name CHEN, HAO	Address 4F., NO.31, LN. 193, CHANG??AN ST., LUZHOU DIST., NEW TAIPEI CITY 247, TAIWAN (R.O.C.)
Signature of Assignor (X) <i>Chen, Hao</i>	Date of Signature (X) <i>11/17/2015</i>
Name of Witness (optional)	Name of Witness (optional)
Signature of Witness (optional)	Signature of Witness (Optional)

Assignor Name HSU, CHEN-HSIANG	Address NO.41-1, WENXIN S. 3RD RD., NANTUN DIST., TAICHUNG CITY 40855, TAIWAN (R.O.C.)
Signature of Assignor (X) <i>Hsu, Chen-Hsiang</i>	Date of Signature (X) 2015.11/17
Name of Witness (optional)	Name of Witness (optional)
Signature of Witness (optional)	Signature of Witness (Optional)

Assignor Name LIN, HUNG-CHIH	Address 9F-1, NO.411, SEC. 2, GUANGFU RD., EAST DIST., HSINCHU CITY 300, TAIWAN (R.O.C.)
Signature of Assignor (X) <i>Lin, Hung-chih</i>	Date of Signature (X) 2015.11/17
Name of Witness (optional)	Name of Witness (optional)
Signature of Witness (optional)	Signature of Witness (Optional)

Assignor Name PENG, CHING-NEN	Address NO.222, XIDA RD., EAST DIST., HSINCHU CITY 300, TAIWAN (R.O.C.)
<i>Peng Ching-Nen</i>	
Signature of Assignor (X) <i>Peng Ching-Nen</i>	Date of Signature (X) 2015.11/17
Name of Witness (optional)	Name of Witness (optional)
Signature of Witness (optional)	Signature of Witness (Optional)

Assignor Name WANG, MIN-JER	Address 17F-1, NO. 37, CHIEN CHUNG 1 RD., HSINCHU CITY 300, TAIWAN (R.O.C.)
Signature of Assignor (X) <i>Min-Jer Wang</i>	Date of Signature (X) 2015.11/17
Name of Witness (optional)	Name of Witness (optional)
Signature of Witness (optional)	Signature of Witness (Optional)