

PATENT ASSIGNMENT COVER SHEET

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 Stylesheet Version v1.2

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SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT
CONVEYING PARTY DATA	
Name	Execution Date
SHIH-YEN LIN	10/18/2016
CHI-WEN LIU	11/02/2016
CHONG-RONG WU	10/18/2016
XIANG-RUI CHANG	10/18/2016
RECEIVING PARTY DATA	
Name:	TAIWAN SEMICONDUCTOR MANUFACTURING CO., LTD.
Street Address:	NO. 8, LI-HSIN RD. 6
Internal Address:	SCIENCE-BASED INDUSTRIAL PARK
City:	HSIN-CHU
State/Country:	TAIWAN
Postal Code:	300-77
Name:	NATIONAL TAIWAN UNIVERSITY
Street Address:	NO. 1, SEC. 4, ROOSEVELT ROAD
City:	TAIPEI
State/Country:	TAIWAN
Postal Code:	10617
PROPERTY NUMBERS Total: 1	
Property Type	Number
Application Number:	15884729
CORRESPONDENCE DATA	
Fax Number:	(214)200-0853
<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>	
Phone:	2146515000
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Address Line 1:	2323 VICTORY AVENUE
Address Line 2:	SUITE 700
Address Line 4:	DALLAS, TEXAS 75219

ATTORNEY DOCKET NUMBER:	2016-0051/24061.3357US02
NAME OF SUBMITTER:	YILUN WANG
SIGNATURE:	/Yilun Wang/
DATE SIGNED:	01/31/2018
Total Attachments: 4 source=3357US02 - Assignment#page1.tif source=3357US02 - Assignment#page2.tif source=3357US02 - Assignment#page3.tif source=3357US02 - Assignment#page4.tif	

ASSIGNMENT

WHEREAS, we,

- | | | | |
|-----|----------------|----|--|
| (1) | Shih-Yen Lin | of | Hsinchu City, Taiwan, Republic of China |
| (2) | Chi-Wen Liu | of | Hsinchu, Taiwan, Republic of China |
| (3) | Chong-Rong Wu | of | New Taipei City, Taiwan, Republic of China |
| (4) | Xian-Rui Chang | of | Hsin-Chu, Taiwan, Republic of China |

have invented certain improvements in

**SEMICONDUCTOR DEVICE WITH TRANSITION METAL
DICHALOCOGENIDE HETERO-STRUCTURE**

for which we have executed an application for Letters Patent of the United States of America,

_____ of even date filed herewith; and

 X filed on May 31, 2016, and assigned application number 15/169,451; and

WHEREAS, we authorize the attorney of record to update this document to include Patent Office information as deemed necessary (i.e., filing date, serial number, etc.);

WHEREAS, **TAIWAN SEMICONDUCTOR MANUFACTURING CO., LTD.**, ("TSMC"), No. 8, Li-Hsin Rd. 6, Science-Based Industrial Park Hsin-Chu, Taiwan 300-77, Republic of China and **NATIONAL TAIWAN UNIVERSITY** ("NTU"), No. 1, Sec. 4, Roosevelt Road, Taipei, 10617 Taiwan, Republic of China are 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, for 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 **TSMC and NTU**, its successors, legal representatives, and assigns, our right, title, and interest in, to and under the said invention, and the said application, and all divisional, renewal, substitutional, continuing and continuation-in-part 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 **TSMC and NTU**, its successors, legal representatives and assigns, in accordance with the terms of this instrument.

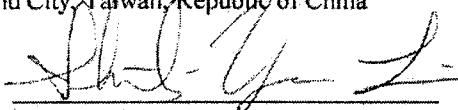
AND WE HEREBY covenant that we have full right to convey the entire interest herein assigned, and that we have not executed, and will not execute, any agreement in conflict herewith.

AND WE HEREBY further covenant and agree that we will communicate to **TSMC and NTU**, 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 **TSMC and NTU**, its successors, legal representatives and assigns, to obtain and enforce proper patent protection for said invention in all countries.

Inventor Name: Shih-Yen Lin

Residence Address: No. 149 Sheng-Li Road, Hsinchu City, Taiwan, Republic of China

Dated: 2016-10-18


Inventor Signature

Inventor Name: Chi-Wen Liu

Residence Address: 3F, No. 561, Nan-Da Road, Hsinchu, Taiwan, Republic of China

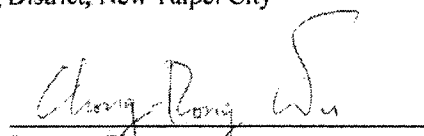
Dated: _____

Inventor Signature

Inventor Name: Chong-Rong Wu

Residence Address: Zhengyi North Road, Sanchong District, New Taipei City
Taiwan, Republic of China

Dated: 2016/10/18


Inventor Signature

Inventor Name: Xiang-Rui Chang

Residence Address: No. 1, Section 4, Roosevelt Road, Taipei
10617 Taiwan, Republic of China

Dated: 2016/10/18


Inventor Signature

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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 TSMC and NTU, 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 TSMC and NTU, its successors, legal representatives and assigns, to obtain and enforce proper patent protection for said invention in all countries.

Inventor Name: Shih-Yen Lin

Residence Address: No. 149 Sheng-Li Road, Hsinchu City, Taiwan, Republic of China

Dated: _____

Inventor Signature

Inventor Name: Chi-Wen Liu

Residence Address: 3F, No. 561, Nan-Da Road, Hsinchu, Taiwan, Republic of China

Dated: Nov. 2. 2016

Chi-Wen Liu
Inventor Signature

Inventor Name: Chong-Rong Wu

Residence Address: Zhengyi North Road, Sanchong District, New Taipei City
Taiwan, Republic of China

Dated: _____

Inventor Signature

Inventor Name: Xian-Rui Chang

Residence Address: No. 1, Section 4, Roosevelt Road, Taipei
10617 Taiwan, Republic of China

Dated: _____

Inventor Signature