

## PATENT ASSIGNMENT COVER SHEET

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<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	ASSIGNMENT
<b>CONVEYING PARTY DATA</b>	
<b>Name</b>	<b>Execution Date</b>
SHIH-CHUN HUANG	05/27/2019
YA-WEN YEH	05/27/2019
CHIEN WEN LAI	05/27/2019
WEI-LIANG LIN	05/27/2019
YA HUI CHANG	05/27/2019
YUNG-SUNG YEN	05/27/2019
RU-GUN LIU	05/27/2019
CHIN-HSIANG LIN	05/27/2019
YU-TIEN SHEN	05/27/2019
<b>RECEIVING PARTY DATA</b>	
<b>Name:</b>	TAIWAN SEMICONDUCTOR MANUFACTURING CO., LTD.
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<b>Internal Address:</b>	HSINCHU SCIENCE PARK
<b>City:</b>	HSINCHU
<b>State/Country:</b>	TAIWAN
<b>Postal Code:</b>	300-78
<b>PROPERTY NUMBERS Total: 1</b>	
<b>Property Type</b>	<b>Number</b>
Application Number:	16107699
<b>CORRESPONDENCE DATA</b>	
<b>Fax Number:</b>	(214)200-0853
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<b>ATTORNEY DOCKET NUMBER:</b>	2017-2122/24061.3652US01

PATENT

<b>NAME OF SUBMITTER:</b>	MARCY OGADO
<b>SIGNATURE:</b>	/Marcy Ogado/
<b>DATE SIGNED:</b>	09/11/2019
<b>Total Attachments: 3</b> source=3652US01_Assignment#page1.tif source=3652US01_Assignment#page2.tif source=3652US01_Assignment#page3.tif	

77 (5)

Docket No.: P20172122US00 / 24061.3652US01  
Customer No.: 000042717

**ASSIGNMENT**

WHEREAS, we,

- (1) Shih-Chun Huang of Hsinchu City, Taiwan (R.O.C.)
- (2) Ya-Wen Yeh of Taipei City, Taiwan (R.O.C.)
- (3) Chien Wen Lai of Hsinchu City, Taiwan (R.O.C.)
- (4) Wei-Liang Lin of Hsin-Chu City, Taiwan (R.O.C.)
- (5) Ya Hui Chang of Hsinchu City, Taiwan (R.O.C.)
- (6) Yung-Sung Yen of New Taipei City, Taiwan (R.O.C.)
- (7) Ru-Gun Liu of Hsinchu County, Taiwan (R.O.C.)
- (8) Chin-Hsiang Lin of Hsin-Chu, Taiwan (R.O.C.)
- (9) Yu-Tien Shen of Tainan City, Taiwan (R.O.C.)

have invented certain improvements in

**DIRECTIONAL DEPOSITION FOR SEMICONDUCTOR FABRICATION**

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

  X   of even date filed herewith; and  
           filed on 08-21-2018 and assigned application number 16/107,699; 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"), 8, Li-Hsin Rd. 6, Hsinchu Science Park, Hsinchu, Taiwan 300-78, 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, 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 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

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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: Shih-Chun Huang

Residence Address: Hsinchu City, Taiwan (R.O.C.)

Dated: 2019.05.27

Shih-Chun Huang  
Inventor Signature

Inventor Name: Ya-Wen Yeh

Residence Address: Taipei City, Taiwan (R.O.C.)

Dated: 2019.05.27

Ya-Wen Yeh  
Inventor Signature

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Residence Address: Hsinchu City, Taiwan (R.O.C.)

Dated: 2019/5/27

Chien Wen Lai  
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Dated: 2019.05.27

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Dated: 2019.05.27

Ya Hui Chang  
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Dated: 2019.05.27

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Yu-Tien Shen  
Inventor Signature