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PATENT ASSIGNMENT COVER SHEET

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SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT

CONVEYING PARTY DATA

Name	Execution Date
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CHUNG-EN TSAI	03/21/2018
FANG-LIANG LU	03/21/2018
HUANG-SIANG LAN	03/27/2018
CHEE-WEE LIU	03/21/2018
SAMUEL C. PAN	03/21/2018

RECEIVING PARTY DATA

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PROPERTY NUMBERS Total: 1

Property Type	Number
Application Number:	15940423

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PATENT 504863931 REEL: 045508 FRAME: 0871

NAME OF SUBMITTER:	RENELL G. FEIMSTER FOR BERNARD P. CODD	
SIGNATURE:	/Renell G. Feimster for Bernard P. Codd/	
DATE SIGNED: 04/11/2018		
Total Attachments: 3		

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> PATENT REEL: 045508 FRAME: 0872

COMBINED DECLARATION AND ASSIGNMENT FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

I believe I am the original or an original joint inventor of a claimed invention in the

applica	ation for which a patent is sought on the invention entitled:	
which	SEMICONDUCTOR DEVICE AND MANUFACTURING METHOD THEREOF application is:	
\boxtimes	attached, or	
	United States application number or PCT international application numberfiled on,	
The ab	ove-identified application was made or authorized to be made by me.	
time I author associa	event that the filing date and/or application number are not entered above at the execute this document, and if such information is deemed necessary, I hereby ize and request the registered practitioners of McDermott Will & Emery LLP, ated with the Customer Number 20277, to insert above the filing date and/or ation number of the application.	
I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.		

CL . .

ASSIGNMENT

For good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, I hereby assign to

TAIWAN SEMICONDUCTOR MANUFACTURING CO., LTD.
No. 8, Li-Hsin Rd. 6, Science Based Industrial Park, Hsinchu, Taiwan 300
And

NATIONAL TAIWAN UNIVERSITY
No. 1, Sec. 4, Roosevelt Road Taipei, Taiwan

(hereinafter designated as the Assignee), the entire (100%) right, title and interest for the United States as defined in 35 USC §100, in the invention described in the application identified in this document.

I hereby confirm any prior assignment to Assignee, and to the extent that I have not already done so, agree to assign, and hereby do, sell, assign and transfer unto Assignee and its successors in interest, the full and exclusive right, title and interest in the United States of America and throughout the world, including the right to claim priority under the laws of the United States, the Paris Convention, and any foreign countries, to the inventions as described in the aforesaid application, to the aforesaid application itself, and all divisions, continuations, continuations-in-part, or other applications claiming priority directly or indirectly from the aforesaid application, and any United States or foreign Letters Patent, utility model, or other similar rights which may be granted thereon, including reissues, reexaminations and extensions thereof, and all copyright rights throughout the world in the aforesaid application and the subject matter disclosed therein, these rights, title and interest to be held and enjoyed by Assignee to the full end of the term for which the Letters Patent, utility model, or other similar rights, are granted and any extensions thereof as fully and entirely as the same would have been held by the undersigned had this assignment and sale not been made, and the right to sue for, and recover for past infringements of, or liabilities for, any of the rights relating to any of the applications, patents, utility models, or other similar rights, resulting therefrom, and the copyright rights;

I hereby covenant and agree to execute all instruments or documents required or requested for the making and prosecution of any applications of any type for patent, utility model, or other similar rights, and for copyright, in the United States and in all foreign countries including, but not limited to, any provisional, continuation, continuation-in-part, divisional, renewal or substitute thereof, and as to letters patent any reissue, re-examination, or extension thereof, and for litigation regarding, or for the purpose of protecting title and to the said invention, the United States application for patent, or Letters Patent therefor, and to testify in support thereof, for the benefit of Assignee without further or other compensation than that above set forth;

Page 2 of 3

I hereby covenant that no assignment, sale, license, agreement or encumbrance has been or will be entered into which would conflict with this Assignment.

Legal name of inventor I-Hsieh Wong	MARINE TO THE	
First inventor's signature	Date	
I-HoTeh Wong	2018.03.27	
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Legal name of inventor Chung-En Tsai		
Second inventor's signature	Date	
Chung-En Tsaj	2018,03,2	
Legal name of inventor		
Fang-Liang Lu		
Third inventor's signature	Date	
Fang-Liang Lu	>0(8 3, 2)	
N		
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Huang-Siang Lan		
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Legal name of inventor		
Samuel C. Pan	Data	
Sixth inventor's signature	Date	
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· /	2018	

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