

## 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>
JUI-CHE TSAI	08/16/2018
CHENG HUNG LEE	08/16/2018
SHIH-LIEN LINUS LU	08/16/2018
<b>RECEIVING PARTY DATA</b>	
<b>Name:</b>	TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
<b>Street Address:</b>	NO. 8, LI-HSIN RD. VI, HSINCHU SCIENCE PARK
<b>City:</b>	HSINCHU
<b>State/Country:</b>	TAIWAN
<b>Postal Code:</b>	300
<b>PROPERTY NUMBERS Total: 1</b>	
<b>Property Type</b>	<b>Number</b>
Application Number:	16204396
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<b>NAME OF SUBMITTER:</b>	RANDY A. NORANBROCK
<b>SIGNATURE:</b>	/Randy A. Noranbrock/
<b>DATE SIGNED:</b>	11/29/2018
<b>Total Attachments: 1</b> source=EfiledAssgn#page1.tif	

TC ②

Docket No. T5057-1312U  
P20171556US00

### 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) Jui-Che TSAI
- 2) Cheng Hung LEE
- 3) Shih-Lien Linus LU

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

#### MEMORY CIRCUIT AND METHOD OF OPERATING SAME

(a) for which an application for United States Letters Patent was filed on 2018-11-29, and identified by United States Patent Application No. 16/204,396; 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) Jui - Che Tsai  
Name: Jui-Che TSAI

2018 / 8 / 16  
Date:

2) Cheng Hung Lee  
Name: Cheng Hung LEE

2018 / 8 / 16  
Date:

3) Shih-Lien Linus LU  
Name: Shih-Lien Linus LU

August 16, 2018  
Date: