

## 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>
RAINER YEN-CHIEH HUANG	05/13/2021
HAI-CHING CHEN	05/16/2021
YU-MING LIN	05/13/2021
CHUNG-TE LIN	05/13/2021
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<b>PROPERTY NUMBERS Total: 1</b>	
<b>Property Type</b>	<b>Number</b>
<b>Application Number:</b>	17319461
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<b>NAME OF SUBMITTER:</b>	DAVID W. POTASHNIK
<b>SIGNATURE:</b>	/David W. Potashnik/
<b>DATE SIGNED:</b>	05/27/2021
This document serves as an Oath/Declaration (37 CFR 1.63).	

**Total Attachments: 2**

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## DECLARATION AND ASSIGNMENT

Title of Invention: **CARRIER BARRIER LAYER FOR TUNING A THRESHOLD VOLTAGE  
OF A FERROELECTRIC MEMORY DEVICE**

As a below named inventor, or one of the below named joint inventors, I hereby declare that:

This declaration and assignment is directed to the application attached hereto. If the application is not attached hereto, the application is as identified by the attorney docket number as set forth above and/or the following:

United States Application No. or PCT International Application No.: , filed on .

The above-identified application was made or authorized to be made by me.

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

I have reviewed and understand the contents of the above-identified application, including the claims.

I am aware of the duty to disclose to the U.S. Patent and Trademark Office all information known to me to be material to patentability as defined in 37 C.F.R. §1.56.

All statements made of my own knowledge are true and all statements made on information and belief are believed to be true.

I hereby acknowledge that any willful false statement made in this declaration may jeopardize the validity of the application or any patent issuing thereon and is punishable under 18 U.S.C. §1001 by fine or imprisonment of not more than five (5) years, or both.

The above-identified invention shall henceforth be referred to herein as the "INVENTION" and the above-identified application shall henceforth be referred to herein as the "APPLICATION."

**Taiwan Semiconductor Manufacturing Company, Ltd.**, a corporation organized and existing under the laws of Taiwan, with its principal office at 8, Li-Hsin Rd. 6, Hsinchu Science Park, Hsinchu, 300-78, Taiwan and its heirs, successors, legal representatives and assigns shall henceforth be referred to collectively herein as ASSIGNEE.

For good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, I have assigned and do hereby assign to ASSIGNEE, its successors and assigns, my entire right, title and interest in and to said INVENTION and in and to said APPLICATION and all patents which may be granted therefor, and all future non-provisional applications including, but not limited to, divisions, reissues, substitutions, continuations, and extensions thereof; and I hereby authorize and request the Commissioner for Patents to issue all patents for said INVENTION, or patents resulting therefrom, insofar as my interest is concerned, to ASSIGNEE, as assignee of my entire right, title and interest. I declare that I have not executed and will not execute any agreement in conflict herewith.

Additionally, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, I have also assigned and hereby assign to ASSIGNEE, its successors and assigns, all of my rights to the INVENTION disclosed in said APPLICATION, in all countries of the world, including, but not limited to, the right to file applications and obtain patents under the terms of the International Convention for the Protection of Industrial Property, and of the European Patent Convention, and I further agree to execute any and all patent applications, assignments, affidavits, and any other papers in connection therewith necessary to perfect such rights.

I hereby further agree that I will communicate to ASSIGNEE, or to its successors, assigns, and legal representatives, any facts known to me respecting said INVENTION or the file history thereof, and at the expense of ASSIGNEE, its legal representatives, successors, or assigns, will testify in any legal proceedings, sign all lawful papers, execute all divisional, continuation, reissue and substitute applications, make all lawful oaths, and generally do everything possible to aid ASSIGNEE, its legal representatives, successors, and assigns, to obtain and enforce proper patent protection for said invention in all countries.

I hereby grant the attorney of record the power to insert on this document any further identification that may be necessary or desirable in order to comply with the rules of the United States Patent and Trademark Office or other authority for recordation of this document.

IN WITNESS WHEREOF, I hereunto set my hand and seal this day and year.

1.	NAME OF INVENTOR (Full Legal Name) : <u>Rainer Yen-Chieh Huang</u>	
Signature:	<div><small>DocuSigned by:</small>  <small>40B1B4F60F3A472...</small></div>	Date: <u>5/13/2021</u>
2.	NAME OF INVENTOR (Full Legal Name) : <u>Hai-Ching Chen</u>	
Signature:	<div><small>DocuSigned by:</small>  <small>40DBF198A7A8422...</small></div>	Date: <u>5/16/2021</u>
3.	NAME OF INVENTOR (Full Legal Name) : <u>Yu-Ming Lin</u>	
Signature:	<div><small>DocuSigned by:</small>  <small>8E1D2EE3C887432...</small></div>	Date: <u>5/13/2021</u>
4.	NAME OF INVENTOR (Full Legal Name) : <u>Chung-Te Lin</u>	
Signature:	<div><small>DocuSigned by:</small>  <small>BB2957A8DBDD4D5...</small></div>	Date: <u>5/13/2021</u>