

PATENT ASSIGNMENT COVER SHEET

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| SUBMISSION TYPE: | NEW ASSIGNMENT |
| NATURE OF CONVEYANCE: | ASSIGNMENT |
| CONVEYING PARTY DATA | |
| Name | Execution Date |
| SHENG-TSUNG WANG | 09/03/2019 |
| LIN-YU HUANG | 09/03/2019 |
| CHIA-LIN CHUANG | 09/03/2019 |
| CHIA-HAO CHANG | 09/03/2019 |
| CHENG-CHI CHUANG | 09/03/2019 |
| YU-MING LIN | 09/03/2019 |
| CHIH-HAO WANG | 09/03/2019 |
| RECEIVING PARTY DATA | |
| Name: | TAIWAN SEMICONDUCTOR MANUFACTURING CO., LTD. |
| Street Address: | NO. 8, LI-HSIN RD. 6, HSINCHU SCIENCE PARK |
| City: | HSINCHU |
| State/Country: | TAIWAN |
| Postal Code: | 300-78 |
| PROPERTY NUMBERS Total: 1 | |
| Property Type | Number |
| Application Number: | 16571715 |
| CORRESPONDENCE DATA | |
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| ATTORNEY DOCKET NUMBER: | 252056-1010 |
| NAME OF SUBMITTER: | DANIEL R. MCCLURE |
| SIGNATURE: | /Daniel R. McClure/ |
| DATE SIGNED: | 09/16/2019 |

PATENT

Total Attachments: 2

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ASSIGNMENT

WHEREAS, Sheng-Tsung WANG, Lin-Yu HUANG, Chia-Lin CHUANG, Chia-Hao CHANG,
Cheng-Chi CHUANG, Yu-Ming LIN and Chih-Hao WANG

hereafter referred to as ASSIGNOR, has/have invented certain new and useful improvements as described and set forth in the below identified application for United States Letters Patent:

Title: **GATE SPACER WITH AIR GAP FOR SEMICONDUCTOR DEVICE STRUCTURE**
AND METHOD FOR FORMING THE SAME

Filed: _____ Serial No. _____
 Executed on: _____

WHEREAS, Taiwan Semiconductor Manufacturing Co., Ltd., of No. 8, Li-Hsin Rd. 6, Hsinchu
Science Park, Hsinchu 300-78, Taiwan R.O.C., hereinafter referred to as ASSIGNEE, is desirous of acquiring ASSIGNOR'S interest in the said invention and application and in any U.S. Letters Patent which may be granted on the same;

NOW, THEREFORE, TO ALL WHOM IT MAY CONCERN: Be it known that, for good and valuable consideration, receipt of which is hereby acknowledged by Assignor, Assignor has/have sold, assigned and transferred, and by these presents does/do sell, assign and transfer unto the said Assignee, and Assignee's successors and assigns, all his/her/their rights, title and interest in and to the said invention and application and all future improvements thereon, and in and to any Letters Patent which may hereafter be granted on the same in the United States, the said interest to be held and enjoyed by said Assignee as fully and exclusively as it would have been held and enjoyed by said Assignor had this Assignment and transfer not been made, to the full end and term of any Letters Patent which may be granted thereon, or of any division, renewal, continuation in whole or in part, substitution, conversion, reissue, prolongation or extension thereof.

Assignor further agrees/agree that he/she/they will, without charge to said Assignee, but at Assignee's expense, cooperate with Assignee in the prosecution of said application and/or applications, execute, verify, acknowledge and deliver all such further papers, including applications for Letters Patent and for the reissue thereof, and instruments of assignment and transfer thereof, and will perform such other acts as Assignee lawfully may request, to obtain or maintain Letters Patent for said invention and improvement, and to vest title thereto in said Assignee, or Assignee's successors and assigns.

IN TESTIMONY WHEREOF, Assignor has/have signed his/her/their name(s) on the date(s) indicated.

ASSIGNMENT

9/3/2019 Sheng-Tsung Wang
Date Name: Sheng-Tsung WANG

9/3/2019 Lin-Yu HUANG
Date Name: Lin-Yu HUANG

9/3/2019 Chia-Lin Chuang
Date Name: Chia-Lin CHUANG

9/3/2019 Chia-Hao Chang
Date Name: Chia-Hao CHANG

9/3/2019 Cheng-Chi Chuang
Date Name: Cheng-Chi CHUANG

9/3/2019 Yu-Ming LIN
Date Name: Yu-Ming LIN

9/3/2019 Chih-Hao Wang
Date Name: Chih-Hao WANG