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| <b>PATENT ASSIGNMENT COVER SHEET</b> |
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EPAS ID: PAT4791639

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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>                              |
| SANGSIG KIM   | 12/11/2017   |
| KYOUNGAH CHO  | 12/11/2017   |
| MINSUK KIM  | 12/11/2017   |
| YOONJOONG KIM   | 12/11/2017   |
| SOLA WOO  | 12/11/2017   |
| DOOHYEOK LIM  | 12/11/2017   |
| <b>RECEIVING PARTY DATA</b>   |  |
| <b>Name:</b>  | KOREA UNIVERSITY RESEARCH AND BUSINESS FOUNDATION  |
| <b>Street Address:</b>  | 145, ANAM-RO                                       |
| <b>Internal Address:</b>  | SEONGBUK-GU  |
| <b>City:</b>  | SEOUL  |
| <b>State/Country:</b>   | KOREA, REPUBLIC OF                                 |
| <b>Postal Code:</b>   | 02841  |
| <b>PROPERTY NUMBERS Total: 1</b>  |  |
| <b>Property Type</b>  | <b>Number</b>                                      |
| <b>Application Number:</b>  | 15870092   |
| <b>CORRESPONDENCE DATA</b>  |  |
| <b>Fax Number:</b>  | (919)419-0383                                      |
| <i>Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.</i> |  |
| <b>Phone:</b>   | 919-493-8000                                       |
| <b>Email:</b>   | djones@jwth.com                                    |
| <b>Correspondent Name:</b>  | JEFFREY L. WILSON, JENKINS WILSON TAYLOR & HUNT PA |
| <b>Address Line 1:</b>  | 3015 CARRINGTON MILL BLVD.                         |
| <b>Address Line 2:</b>  | SUITE 550  |
| <b>Address Line 4:</b>  | MORRISVILLE, NORTH CAROLINA 27560                  |
| <b>ATTORNEY DOCKET NUMBER:</b>  | 1778/76 PCT/US                                     |
| <b>NAME OF SUBMITTER:</b>   | DEBRA C. JONES                                     |
| <b>SIGNATURE:</b>   | /Debra C. Jones/                                   |
| <b>DATE SIGNED:</b>   | 01/24/2018   |

PATENT

**Total Attachments: 4**

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PATENT

Atty Docket:

ASSIGNMENT

WHEREAS, we, **Sangsig KIM** of **Seoul**, Republic of Korea, **Kyongah CHO** of **Seoul**, Republic of Korea, **Minsuk KIM** of **Seoul**, Republic of Korea, **Yoonjoong KIM** of **Seoul**, Republic of Korea, **Sola WOO** of **Gyeonggi-do**, Republic of Korea, **Doohyeok LIM** of **Daejeon**, Republic of Korea, hereinafter ("Assignors"), have invented certain new and useful improvements in **SEMICONDUCTOR DEVICE** for which application for which a U.S. Letters Patent was made based on Korean Application No. 10-2016-0123389 filed September 26, 2016. We hereby authorize and request our attorneys, Jenkins, Wilson, Taylor & Hunt, P.A., to insert here in parentheses (application number 15/870,092, filed January 12, 2018) the filing date and application number of said application when known.

AND, WHEREAS, **KOREA UNIVERSITY RESEARCH AND BUSINESS FOUNDATION**, a corporation located at 145, Anam-ro, Seongbuk-gu, Seoul 02841, Republic of Korea (hereinafter "Assignee"), is desirous of acquiring an interest therein.

NOW, THEREFORE, To Whom It May Concern, be it known that for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Assignors have sold and by these presents do hereby sell, assign, transfer and convey unto the said Assignee, its successors and assigns, their entire right, title and interest in and to the said invention and application, and in and to any and all continuations, continuations-in-part, or divisions thereof, and in and to any and all Letters Patent of the United States of America and all foreign countries or reissues thereof which may be granted therefor or thereon, for the full end of the term for which said Letters Patent may be granted, together with their right to claim the priority of said application in all foreign countries in accordance with the International Convention, the same to be held and enjoyed by said Assignee, its successors and assigns, as fully and entirely as the same would have been held and enjoyed by Assignors if this assignment and sale had not been made.

Assignors hereby request that said Letters Patent be issued in accordance with this assignment.

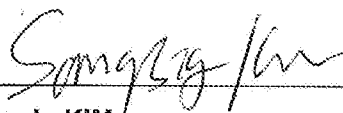
Assignors further covenant and agree that, at the time of the execution and delivery of these presents, Assignors possess full title to the invention and application above-mentioned, and that they have the unencumbered right and authority to make this assignment.

Assignors further covenant and agree, and likewise bind their heirs, legal representatives and assigns, to promptly communicate to said Assignee or its

Attorney Docket No.

representatives any facts known to them relating to said invention, to testify in any interference or legal proceedings involving said invention, to execute any additional papers which may be requested to confirm the right of the Assignee, its representatives, successors and assigns to secure patent or similar protection for the said invention in all countries and to vest in the Assignee complete title to the said invention and Letters Patent, without further compensation, but at the expense of said Assignee, its successors, assigns and other legal representatives.

Executed this 11 day of December 2017.

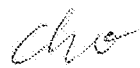
  
\_\_\_\_\_  
Sangsig KIM

Witnessed by:

\_\_\_\_\_  
Name Date

\_\_\_\_\_  
Name Date

Executed this 11 day of December 2017.

  
\_\_\_\_\_  
Kyoungah CHO


Witnessed by:

\_\_\_\_\_  
Name Date

\_\_\_\_\_  
Name Date

Attorney Docket No.

Executed this 11 day of December 2017.

  
\_\_\_\_\_  
Minsuk KIM

Witnessed by:

\_\_\_\_\_  
Name Date

\_\_\_\_\_  
Name Date

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Executed this 11 day of December 2017.

  
\_\_\_\_\_  
Yoonjoong KIM

Witnessed by:

\_\_\_\_\_  
Name Date

\_\_\_\_\_  
Name Date

Attorney Docket No.

Executed this 11 day of December 2017.



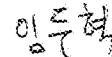
\_\_\_\_\_  
Sola WOO

Witnessed by:

\_\_\_\_\_  
Name Date

\_\_\_\_\_  
Name Date

Executed this 11 day of December 2017.



\_\_\_\_\_  
Doohyeok LIM

Witnessed by:

\_\_\_\_\_  
Name Date

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Name Date