

## PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1  
Stylesheet Version v1.2

EPAS ID: PAT5818680

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	ASSIGNMENT
<b>CONVEYING PARTY DATA</b>	
<b>Name</b>	<b>Execution Date</b>
TAE-SIK YUN	11/01/2019
DAE-SUK KIM	11/01/2019
SEOK-CHEOL YOON	11/01/2019
NO-GUEN JOO	11/01/2019
<b>RECEIVING PARTY DATA</b>	
<b>Name:</b>	SK HYNIX INC.
<b>Street Address:</b>	2091, GYEONGCHUNG-DAERO, BUBAL-EUB, ICHEON-SI
<b>City:</b>	GYEONGGI-DO
<b>State/Country:</b>	KOREA, REPUBLIC OF
<b>PROPERTY NUMBERS Total: 1</b>	
<b>Property Type</b>	<b>Number</b>
<b>Application Number:</b>	16682696
<b>CORRESPONDENCE DATA</b>	
<b>Fax Number:</b>	(571)327-5452
<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>	5713275450
<b>Email:</b>	ipntlaw@ipntlaw.com
<b>Correspondent Name:</b>	IP & T GROUP LLP
<b>Address Line 1:</b>	8230 LEESBURG PIKE
<b>Address Line 2:</b>	SUITE 650
<b>Address Line 4:</b>	VIENNA, VIRGINIA 22182
<b>ATTORNEY DOCKET NUMBER:</b>	P18H0283/US
<b>NAME OF SUBMITTER:</b>	KEON WOO PARK
<b>SIGNATURE:</b>	/Keon Woo PARK/
<b>DATE SIGNED:</b>	11/13/2019
	This document serves as an Oath/Declaration (37 CFR 1.63).
<b>Total Attachments: 4</b>	
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Attorney Docket No.: \_\_\_\_\_

ASSIGNMENT OF AND DECLARATION FOR APPLICATION FOR UNITED STATES LETTERS PATENT

WHEREAS YUN, Tae-Sik, hereinafter referred to collectively as the assignor and inventor, has invented a certain improvement relating to SEMICONDUCTOR MEMORY DEVICE AND OPERATING METHOD THEREOF

[X] said application being attached hereto; [ ] said application having been filed in the United States Patent and Trademark Office on \_\_\_\_\_, us Application Serial No. \_\_\_\_\_, and was amended on \_\_\_\_\_ (if applicable); [ ] the specification of which was filed under the Patent Cooperation Treaty on \_\_\_\_\_, Serial No. \_\_\_\_\_, the United States of America being designated.

AND WHEREAS SK hynix Inc. of 2091, Gyeongchung-daero, Bubal-eub, Icheon-si, Gyeonggi-do, Republic of Korea, hereinafter referred to as the assignee or applicant, is desirous of acquiring the entire right, title and interest in and to said application, including any and all divisions and continuations thereof, and in and to said invention and any and all patents which may be granted therefor, including any and all renewals, reissues and prolongations thereof;

NOW THIS WITNESSETH, that for and in consideration of One Dollar (\$1.00), and other good and valuable consideration paid by said assignee to said assignor, the receipt of which is hereby acknowledged, said assignor hereby assigns, sells and transfers to said assignee, and said assignee's successors and assigns, the full and exclusive right, title and interest in and to said application, including any and all divisions and continuations thereof, and in and to said invention and any and all patents which may be granted therefor, including any and all renewals, reissues and prolongations thereof, with all the rights, powers, privileges and advantages in anywise arising from or appertaining thereto, for and during the term or terms of any and all such patents when granted, including any and all renewals, reissues and prolongations thereof, for the use and benefit of said assignee, and said assignee's successors and assigns, in as ample and beneficial a manner as the said assignor might or could have held and enjoyed the same, if this assignment had not been made.

AND said assignor hereby agrees to perform, upon the request of said assignee, or said assignee's successors or assigns, any and all acts relating to the obtaining or to the asserting of said patents, including any and all renewals, reissues and prolongations thereof.

AND said assignor authorizes and requests the Commissioner of Patents and Trademarks to issue Letters Patent on said application, and on any and all divisions and continuations thereof, to said assignee, and said assignee's successors and assigns, in accordance herewith.

As an above-named inventor, I hereby declare that the above-identified application was made or authorized to be made by me, and that I am the original inventor or an original joint inventor of a claimed invention in 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.

ASSIGNOR (INVENTOR):

Signature: YUN Tae Sik Date: November 01, 2019

Printed or Typed Name: YUN, Tae-Sik



Attorney Docket No.: \_\_\_\_\_

ASSIGNMENT OF AND DECLARATION FOR APPLICATION FOR UNITED STATES LETTERS PATENT

WHEREAS KIM, Dae-Suk, hereinafter referred to collectively as the assignor and inventor, has invented a certain improvement relating to SEMICONDUCTOR MEMORY DEVICE AND OPERATING METHOD THEREOF

[X] said application being attached hereto; [ ] said application having been filed in the United States Patent and Trademark Office on \_\_\_\_\_ as Application Serial No. \_\_\_\_\_ and was amended on \_\_\_\_\_ (if applicable); [ ] the specification of which was filed under the Patent Cooperation Treaty on \_\_\_\_\_ Serial No. \_\_\_\_\_, the United States of America being designated.

AND WHEREAS SK hynix Inc. of 2091, Gyeongchung-daero, Buhak-eub, Icheon-si, Gyeonggi-do, Republic of Korea, hereinafter referred to as the assignee or applicant, is desirous of acquiring the entire right, title and interest in and to said application, including any and all divisions and continuations thereof, and in and to said invention and any and all patents which may be granted therefor, including any and all renewals, reissues and prolongations thereof;

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AND said assignor authorizes and requests the Commissioner of Patents and Trademarks to issue Letters Patent on said application, and on any and all divisions and continuations thereof, to said assignee, and said assignee's successors and assigns, in accordance herewith.

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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.

ASSIGNOR (INVENTOR):

Signature: KIM DAE SUK Date: November 01, 2019

Printed or Typed Name: KIM, Dae-Suk

ASSIGNMENT OF AND DECLARATION FOR APPLICATION  
FOR UNITED STATES LETTERS PATENT

WHEREAS YOON, Seuk-Cheol, hereinafter referred to collectively as the assignor and inventor, has invented a certain improvement relating to SEMICONDUCTOR MEMORY DEVICE AND OPERATING METHOD THEREOF

said application being attached hereto;  
 said application having been filed in the United States Patent and Trademark Office on \_\_\_\_\_, as Application Serial No. \_\_\_\_\_, and was amended on \_\_\_\_\_ (if applicable);  
 the specification of which was filed under the Patent Cooperation Treaty on \_\_\_\_\_, Serial No. \_\_\_\_\_, the United States of America being designated.

AND WHEREAS SK hynix Inc. of 2091, Gyeongchung-daero, Buhaf-eub, Ichon-si, Gyeonggi-do, Republic of Korea, hereinafter referred to as the assignee or applicant, is desirous of acquiring the entire right, title and interest in and to said application, including any and all divisions and continuations thereof, and in and to said invention and any and all patents which may be granted therefor, including any and all renewals, reissues and prolongations thereof;

NOW THIS WITNESSETH, that for and in consideration of One Dollar (\$1.00), and other good and valuable consideration paid by said assignee to said assignor, the receipt of which is hereby acknowledged, said assignor hereby assigns, sells and transfers to said assignee, and said assignee's successors and assigns, the full and exclusive right, title and interest in and to said application, including any and all divisions and continuations thereof, and in and to said invention and any and all patents which may be granted therefor, including any and all renewals, reissues and prolongations thereof; said assignee, and said assignee's successors and assigns, to have, hold, exercise and enjoy the said application, including any and all divisions and continuations thereof, and the said invention and any and all patents which may be granted therefor, including any and all renewals, reissues and prolongations thereof, with all the rights, powers, privileges and advantages in anywise arising from or appertaining thereto, for and during the term or terms of any and all such patents when granted, including any and all renewals, reissues and prolongations thereof, for the use and benefit of said assignor, and said assignee's successors and assigns, in as ample and beneficial a manner as the said assignor might or could have held and enjoyed the same, if this assignment had not been made.

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AND said assignor authorizes and requests the Commissioner of Patents and Trademarks to issue Letters Patent on said application, and on any and all divisions and continuations thereof, to said assignee, and said assignee's successors and assigns, in accordance herewith.

As an above-named inventor, I hereby declare that the above-identified application was made or authorized to be made by me, and that I am the original inventor or an original joint inventor of a claimed invention in 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.

ASSIGNOR (INVENTOR):

Signature: Yoon Seuk Cheol Date: November 01, 2019

Printed or Typed Name: YOON, Seuk-Cheol

Attorney Docket No.: \_\_\_\_\_

ASSIGNMENT OF AND DECLARATION FOR APPLICATION  
FOR UNITED STATES LETTERS PATENT

WHEREAS JOO, No-Guen, hereinafter referred to collectively as the assignor and inventor, has invented a certain improvement relating to SEMICONDUCTOR MEMORY DEVICE AND OPERATING METHOD THEREOF

said application being attached hereto;  
 said application having been filed in the United States Patent and Trademark Office on \_\_\_\_\_, as Application Serial No. \_\_\_\_\_, and was amended on \_\_\_\_\_ (if applicable);  
 the specification of which was filed under the Patent Cooperation Treaty on \_\_\_\_\_, Serial No. \_\_\_\_\_, the United States of America being designated.

AND WHEREAS SK hynix Inc. of 2091, Gyeongchung-daero, Bubal-eub, Icheon-si, Gyeonggi-do, Republic of Korea, hereinafter referred to as the assignee or applicant, is desirous of acquiring the entire right, title and interest in and to said application, including any and all divisions and continuations thereof, and in and to said invention and any and all patents which may be granted therefor, including any and all renewals, reissues and prolongations thereof;

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AND said assignor hereby agrees to perform, upon the request of said assignee, or said assignee's successors or assigns, any and all acts relating to the obtaining or to the asserting of said patents, including any and all renewals, reissues and prolongations thereof.

AND said assignor authorizes and requests the Commissioner of Patents and Trademarks to issue Letters Patent on said application, and on any and all divisions and continuations thereof, to said assignee, and said assignee's successors and assigns, in accordance herewith.

As an above-named inventor, I hereby declare that the above-identified application was made or authorized to be made by me, and that I am the original inventor or an original joint inventor of a claimed invention in 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.

ASSIGNOR (INVENTOR):

Signature: Joo No Guen Date: November 01, 2019

Printed or Typed Name: JOO, No-Guen