

<b>PATENT ASSIGNMENT COVER SHEET</b>
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Electronic Version v1.1  
 Stylesheet Version v1.2

EPAS ID: PAT5402873

<b>SUBMISSION TYPE:</b>	CORRECTIVE ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	Corrective Assignment to correct the MISSING 3RD INVENTOR/ASSIGNOR: HAK-SOO YU previously recorded on Reel 048061 Frame 0690. Assignor(s) hereby confirms the NAME AND EXECUTION DATE OF 3RD INVENTOR/ASSIGNOR HAK-SOO YU.
<b>CONVEYING PARTY DATA</b>	
<b>Name</b>	<b>Execution Date</b>
PAVAN KUMAR KASIBHATLA	12/17/2018
SEONG-IL O	12/17/2018
HAK-SOO YU	12/17/2018
<b>RECEIVING PARTY DATA</b>	
<b>Name:</b>	SAMSUNG ELECTRONICS CO., LTD.
<b>Street Address:</b>	129, SAMSUNG-RO, YEONGTONG-GU, GYEONGGI-DO
<b>City:</b>	SUWON-SI
<b>State/Country:</b>	KOREA, REPUBLIC OF
<b>Postal Code:</b>	16677
<b>PROPERTY NUMBERS Total: 1</b>	
<b>Property Type</b>	<b>Number</b>
<b>Application Number:</b>	16251983
<b>CORRESPONDENCE DATA</b>	
<b>Fax Number:</b>	(202)293-7860
<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>	202-293-7060
<b>Email:</b>	tyarborough@sughrue.com, sughrue@sughrue.com
<b>Correspondent Name:</b>	SUGHRUE MION, PLLC
<b>Address Line 1:</b>	2100 PENNSYLVANIA AVENUE, N.W.
<b>Address Line 2:</b>	SUITE 800
<b>Address Line 4:</b>	WASHINGTON, D.C. 20037-3213
<b>ATTORNEY DOCKET NUMBER:</b>	Q243183
<b>NAME OF SUBMITTER:</b>	TODD YARBOROUGH, TEAMS DEPT
<b>SIGNATURE:</b>	/Todd Yarborough/
<b>DATE SIGNED:</b>	03/04/2019
This document serves as an Oath/Declaration (37 CFR 1.63).	

**Total Attachments: 6**

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**UNITED STATES PATENT AND TRADEMARK OFFICE**

UNDER SECRETARY OF COMMERCE FOR INTELLECTUAL PROPERTY AND  
DIRECTOR OF THE UNITED STATES PATENT AND TRADEMARK OFFICE

JANUARY 21, 2019

PTAS

SUGHRUE MION, PLLC  
2100 PENNSYLVANIA AVENUE, N.W.  
SUITE 800  
WASHINGTON, DC 20037

**505286796**

UNITED STATES PATENT AND TRADEMARK OFFICE  
NOTICE OF RECORDATION OF ASSIGNMENT DOCUMENT

THE ENCLOSED DOCUMENT HAS BEEN RECORDED BY THE ASSIGNMENT RECORDATION BRANCH OF THE U.S. PATENT AND TRADEMARK OFFICE. A COMPLETE COPY IS AVAILABLE AT THE ASSIGNMENT SEARCH ROOM ON THE REEL AND FRAME NUMBER REFERENCED BELOW.

PLEASE REVIEW ALL INFORMATION CONTAINED ON THIS NOTICE. THE INFORMATION CONTAINED ON THIS RECORDATION NOTICE REFLECTS THE DATA PRESENT IN THE PATENT AND TRADEMARK ASSIGNMENT SYSTEM. IF YOU SHOULD FIND ANY ERRORS OR HAVE QUESTIONS CONCERNING THIS NOTICE, YOU MAY CONTACT THE ASSIGNMENT RECORDATION BRANCH AT 571-272-3350. PLEASE SEND REQUEST FOR CORRECTION TO: U.S. PATENT AND TRADEMARK OFFICE, MAIL STOP: ASSIGNMENT RECORDATION BRANCH, P.O. BOX 1450, ALEXANDRIA, VA 22313.

RECORDATION DATE: 01/18/2019

REEL/FRAME: 048061/0690  
NUMBER OF PAGES: 7

BRIEF: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).

DOCKET NUMBER: Q243183

ASSIGNOR:

KASIBHATLA, PAVAN KUMAR

DOC DATE: 12/17/2018

ASSIGNOR:

O, SEONG-IL

DOC DATE: 12/17/2018

ASSIGNOR: YU, HAK-SOO

DOC DATE: 12/17/2018

ASSIGNEE:

SAMSUNG ELECTRONICS CO., LTD.  
129, SAMSUNG-RO, YEONGTONG-GU,  
GYEONGGI-DO  
SUWON-SI, KOREA, REPUBLIC OF 16677

APPLICATION NUMBER: 16251983

FILING DATE:

PATENT NUMBER:

ISSUE DATE:

TITLE: METHOD OF PERFORMING INTERNAL PROCESSING OPERATION OF MEMORY  
DEVICE

ASSIGNMENT RECORDATION BRANCH  
PUBLIC RECORDS DIVISION

## PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1  
Stylesheet Version v1.2

EPAS ID: PAT5233571

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	ASSIGNMENT
<b>CONVEYING PARTY DATA</b>	
<b>Name</b>	<b>Execution Date</b>
PAVAN KUMAR KASIBHATLA	12/17/2018
SEONG-IL O	12/17/2018
<del>HAK-SOO YU</del>	<del>12/17/2018</del>
<b>RECEIVING PARTY DATA</b>	
<b>Name:</b>	SAMSUNG ELECTRONICS CO., LTD.
<b>Street Address:</b>	129, SAMSUNG-RO, YEONGTONG-GU, GYEONGGI-DO
<b>City:</b>	SUWON-SI
<b>State/Country:</b>	KOREA, REPUBLIC OF
<b>Postal Code:</b>	16677
<b>PROPERTY NUMBERS Total: 1</b>	
<b>Property Type</b>	<b>Number</b>
Application Number:	16251983
<b>CORRESPONDENCE DATA</b>	
<b>Fax Number:</b>	(202)293-7980
<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>	202-293-7080
<b>Email:</b>	sughrue@sughrue.com, dbutler@sughrue.com
<b>Correspondent Name:</b>	SUGHRUE MON. PLLC
<b>Address Line 1:</b>	2100 PENNSYLVANIA AVENUE, N.W.
<b>Address Line 2:</b>	SUITE 800
<b>Address Line 4:</b>	WASHINGTON, D.C. 20037
<b>ATTORNEY DOCKET NUMBER:</b>	Q243183
<b>NAME OF SUBMITTER:</b>	DENNIS E BUTLER - TEAMS
<b>SIGNATURE:</b>	/Dennis Butler/
<b>DATE SIGNED:</b>	01/18/2019
This document serves as an Oath/Declaration (37 CFR 1.63).	
<b>Total Attachments: 5</b>	
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COMBINED DECLARATION (37 CFR §1.63) FOR UTILITY PATENT APPLICATION AND ASSIGNMENT FORM<sup>1</sup>

The undersigned acknowledges that this document is being used both as an assignment of the invention and as the declaration (37 CFR 1.63) for a Utility or Design Application.

WHEREAS, the undersigned, hereinafter referred to collectively as Assignor, has invented:

Title: METHOD OF PERFORMING INTERNAL PROCESSING OPERATION OF MEMORY DEVICE

for which Assignor is about to make or has made United States or International application for patent.

WHEREAS, as a below named inventor(s), I/(we) hereby declare that:

Section I. Declaration

This declaration is directed to:

- The attached U.S. non-provisional patent application, or
- U.S. non-provisional patent application number \_\_\_\_\_, filed on \_\_\_\_\_, or
- PCT international patent application number \_\_\_\_\_, filed on \_\_\_\_\_

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

I (we) believe that I am (we are) the original inventor (original joint inventors) of a claimed invention in the above-identified application.

I (we) 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.

<sup>1</sup> This form requires the use of an Application Data Sheet.

SEC Ref No. ID2016050051090 Attorney Ref No. Q243183

SAMSUNG ELECTRONICS CO., LTD.

I hereby state that I have reviewed and understand the contents of the above identified application, including the claims.

I acknowledge that I am aware of the duty to disclose information which is material to patentability as defined in 37 CFR § 1.56.

## Section II. Assignment

In consideration of the sum of One Dollar (\$1.00) and other good and valuable consideration paid to each of the undersigned, the undersigned hereby sell(s) and assign(s) to

**SAMSUNG ELECTRONICS CO., LTD.**

having an address at 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Republic of Korea (hereinafter designated as the Assignee), the entire (100%) right, title and interest for the United States as defined in 35 USC §100, in the invention described in the application identified in Section I of this document.

Assignor hereby confirms any prior assignment to Assignee, and to the extent that Assignor has not already done so, agrees to assign, and hereby does, sell, assign and transfer unto Assignee and its successors in interest, the full and exclusive right, title and interest in the United States of America and throughout the world, including the right to claim priority under the laws of the United States, the Paris Convention, and any foreign countries, to the inventions as described in the aforesaid application, to the aforesaid application itself, and all divisions, continuations, continuations-in-part, or other applications claiming priority directly or indirectly from the aforesaid application, and any United States or foreign Letters Patent, utility model, or other similar rights which may be granted thereon, including reissues, reexaminations and extensions thereof, and all copyright rights throughout the world in the aforesaid application and the subject matter disclosed therein, these rights, title and interest to be held and enjoyed by Assignee to the full end of the term for which the Letters Patent, utility model, or other similar rights, are granted and any extensions thereof as fully and entirely as the same would have been held by Assignor had this assignment and sale not been made, and the right to sue for, and recover for past infringements of, or liabilities for, any of the rights relating to any of the applications, patents, utility models, or other similar rights, resulting therefrom, and the copyright rights;

Assignor hereby covenants and agrees to execute all instruments or documents required or requested for the making and prosecution of any applications of any type for patent, utility model, or other similar rights, and for copyright, in the United States and in all foreign countries including, but not limited to, any provisional, continuation, continuation-in-part,

SEC Ref No. ID2018050051US0

Attorney Ref No. Q243183

COMBINED DECLARATION (37 CFR 1.63) FOR UTILITY PATENT APPLICATION AND ASSIGNMENT FORM

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**PATENT**

divisional, renewal or substitute thereof, and as to letters patent any reissue, re-examination, or extension thereof, and for litigation regarding, or for the purpose of protecting title and to the said invention, the United States application for patent, or Letters Patent therefor, and to testify in support thereof, for the benefit of Assignee without further or other compensation than that above set forth;

Assignor hereby covenants that no assignment, sale, license, agreement or encumbrance has been or will be entered into which would conflict with this Assignment; and

Assignor hereby requests the United States Patent and Trademark Office to issue the Letters Patent of the United States of America to Assignee, and requests that any official of any country or countries foreign to the United States, whose duty it is to issue or grant patents and applications as aforesaid, to issue the Letters Patent, Utility Model Registration or other similar right to Assignee.

The undersigned hereby grant(s) the law firm of SUGHRUE MION, PLLC the power to insert on this Declaration and Assignment any further identification which may be necessary or desirable in order to comply with the rules of the U.S. Patent and Trademark Office for recordation of this document.

SAMSUNG

DRAM 설계팀 (메모리) / 파반 / 14071580

SEC Ref No. ID20180500510S0 Attorney Ref No. Q243183

COMBINED DECLARATION (37 CFR 1.63) FOR UTILITY PATENT APPLICATION AND ASSIGNMENT FORM  
PATENT

Section IV. Inventor(s)/Assignor(s) Signature(s)

LEGAL NAME OF FIRST INVENTOR/ASSIGNOR	Family Name	First Given Name	Second Given Name
	KASIBHATLA	Pavan	Kumar

SIGNATURE *K. Pavan Kumar* DATE 2018/12/17

LEGAL NAME OF FIRST INVENTOR/ASSIGNOR	Family Name	First Given Name	Second Given Name
	O	Seong-il	

SIGNATURE *Seong-il O* DATE DEC-17-2018

DRAM (메모리 반도체) / 메모리 반도체

LEGAL NAME OF SECOND INVENTOR/ASSIGNOR	Family Name	First Given Name	Second Given Name
	YU	Hak-soo	

SIGNATURE *Hak-soo Yu* DATE DEC-17-2018

SEC Ref No. ID2018050051US0

Attorney Ref No. Q243183

COMBINED DECLARATION (37 CFR 1.63) FOR UTILITY PATENT APPLICATION AND ASSIGNMENT **PATENT**