

700498176 12/20/2012

Form PTO-1595 (Rev. 6-12)
OMB No. 0651-0027 (exp. 04/30/2015)

U.S. DEPARTMENT OF COMMERCE
United States Patent and Trademark Office

RECORDATION FORM COVER SHEET PATENTS ONLY

To the Director of the U.S. Patent and Trademark Office: Please record the attached documents or the new address(es) below.

1. Name of conveying party(ies): Sunil SHIM (10/11/2012), Jaehoon JANG (10/11/2012), Donghyuk CHAE (11/22/2012), Youngho LIM (10/15/2012), Hansoo KIM (10/11/2012), and Jaehun JEONG (12/13/2012) Additional name(s) of conveying party(ies) attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	2. Name and address of receiving party(ies) Name: <u>Samsung Electronics Co., Ltd.</u> Internal Address: _____ Street Address: _____ 129, Samsung-ro, Yeongtong-gu City: <u>Suwon-Si, Gyeonggi-Do</u> State: _____ Country: <u>Republic of Korea</u> Zip: <u>443-742</u> Additional name(s) & address(es) attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
3. Nature of conveyance/Execution Date(s): Execution Date(s): in parentheses after inventor name <input checked="" type="checkbox"/> Assignment <input type="checkbox"/> Merger <input type="checkbox"/> Change of Name <input type="checkbox"/> Security Agreement <input type="checkbox"/> Joint Research Agreement <input type="checkbox"/> Government Interest Assignment <input type="checkbox"/> Executive Order 9424, Confirmatory License <input type="checkbox"/> Other _____	4. Application or patent number(s): <input type="checkbox"/> This document serves as an Oath/Declaration (37 CFR 1.63). A. Patent Application No.(s) 13/721,963 B. Patent No.(s) Additional numbers attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
5. Name and address to whom correspondence concerning document should be mailed: Name: <u>John A. Castellano</u> <u>HARNES, DICKEY & PIERCE, P.L.C.</u> Internal Address: Atty. Dkt.: 8947-000488/US/CPA Street Address: P.O. Box 8910 City: <u>Reston</u> State: <u>VA</u> Zip: <u>20195</u> Phone Number: <u>(703) 668-8000</u> Fax Number: <u>(703) 668-8200</u> Email Address: <u>dcmailroom@hdp.com</u>	6. Total number of applications and patents involved: 1 7. Total fee (37 CFR 1.21(h) & 3.41) \$ <u>40.00</u> <input checked="" type="checkbox"/> Authorized to be charged to deposit account <input type="checkbox"/> Enclosed <input type="checkbox"/> None required (government interest not affecting title)
9. Signature: <div style="text-align: center;"> _____ Signature <u>John A. Castellano - 35,094</u> Name of Person Signing </div>	8. Payment Information Deposit Account Number <u>08-0750</u> Authorized User Name <u>John A. Castellano</u> <div style="text-align: right;"> December 20, 2012 Date Total number of pages including cover sheet, attachments, and documents: 22 </div>

Documents to be recorded (including cover sheet) should be faxed to (571) 273-0140, or mailed to:
Mail Stop Assignment Recordation Services, Director of the USPTO, P.O.Box 1450, Alexandria, V.A. 22313-1450

CH \$40.00 080750 13721963

700498176

PATENT
REEL: 029585 FRAME: 0457

SAMSUNG ELECTRONICS CO., LTD.

**COMBINED DECLARATION (37 CFR §1.63) FOR UTILITY PATENT APPLICATION AND
ASSIGNMENT FORM¹**

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: **NONVOLATILE MEMORY DEVICES AND OPERATING METHODS THEREOF**

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.

¹ This form requires the use of an Application Data Sheet.

SEC Ref No. **IE-200908-050-1-US1** Attorney Ref No. **8947-000488/US/CPA**

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 443-742, 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, divisional, renewal or substitute thereof, and as to letters patent any reissue, re-

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Attorney Ref No. 8947-000488/US/CPA

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Page 2 of 5

PATENT

REEL: 029585 FRAME: 0459

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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 Harness, Dickey & Pierce, P.L.C. 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.

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

LEGAL NAME OF FIRST INVENTOR/ASSIGNOR	Family Name	First Given Name	Second Given Name
	SHIM	Sunil	

SIGNATURE *Sunil Shin* DATE 10/11/2012

SEC Ref No. IE-200908-050-1-US1 Attorney Ref No. 8947-000488/US/CPA

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

PATENT

REEL: 029585 FRAME: 0460

SAMSUNG ELECTRONICS CO., LTD.

LEGAL NAME OF SECOND INVENTOR/ASSIGNOR	Family Name	First Given Name	Second Given Name
	JANG	Jaehoon	
SIGNATURE <u>Jaehoon Jang</u> DATE <u>2012/10/11</u>			

LEGAL NAME OF THIRD INVENTOR/ASSIGNOR	Family Name	First Given Name	Second Given Name
	CHAE	Donghyuk	
SIGNATURE _____ DATE _____			

LEGAL NAME OF FOURTH INVENTOR/ASSIGNOR	Family Name	First Given Name	Second Given Name
	LIM	Youngho	
SIGNATURE _____ DATE _____			

SEC Ref No. IE-200908-050-1-US1Attorney Ref No. 8947-000488/US/CPA

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

PATENT**REEL: 029585 FRAME: 0461**

SAMSUNG ELECTRONICS CO., LTD.

LEGAL NAME OF FIFTH INVENTOR/ASSIGNOR	Family Name	First Given Name	Second Given Name
	KIM	Hansoo	
<p>SIGNATURE <u>H.S. Kim</u> DATE <u>10/11/2012</u></p>			

LEGAL NAME OF SIXTH INVENTOR/ASSIGNOR	Family Name	First Given Name	Second Given Name
	JEONG	Jaehun	
<p>SIGNATURE _____ DATE _____</p>			

SEC Ref No. 1E-200908-050-1-US1 Attorney Ref No. 8947-000488/US/CPA

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

PATENT
REEL: 029585 FRAME: 0462

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Attorney Ref No. **8947-000488/US/CPA**

SAMSUNG ELECTRONICS CO., LTD.

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Samsung Electronics Co., Ltd.

having an address at 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do 443-742, 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;

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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;

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

LEGAL NAME OF FIRST INVENTOR/ASSIGNOR	Family Name	First Given Name	Second Given Name
	SHIM	Sunil	
<div style="display: flex; justify-content: space-between; align-items: flex-end; padding-top: 50px;"> <div style="width: 45%;">SIGNATURE _____</div> <div style="width: 45%;">DATE _____</div> </div>			

SEC Ref No. IE-200908-050-1-US1 Attorney Ref No. 8947-000488/US/CPA

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

SAMSUNG ELECTRONICS CO., LTD.

LEGAL NAME OF SECOND INVENTOR/ASSIGNOR	Family Name	First Given Name	Second Given Name
	JANG	Jaehoon	
SIGNATURE _____ DATE _____			

LEGAL NAME OF THIRD INVENTOR/ASSIGNOR	Family Name	First Given Name	Second Given Name
	CHAE	Donghyuk	
SIGNATURE <u>Donghyuk Chae</u> DATE <u>21 Nov 2012</u>			

LEGAL NAME OF FOURTH INVENTOR/ASSIGNOR	Family Name	First Given Name	Second Given Name
	LIM	Youngho	
SIGNATURE _____ DATE _____			

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

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PATENT**REEL: 029585 FRAME: 0466**

SAMSUNG ELECTRONICS CO., LTD.

LEGAL NAME OF FIFTH INVENTOR/ASSIGNOR	Family Name	First Given Name	Second Given Name
	KIM	Hansoo	
SIGNATURE _____ DATE _____			

LEGAL NAME OF SIXTH INVENTOR/ASSIGNOR	Family Name	First Given Name	Second Given Name
	JEONG	Jaehun	
SIGNATURE _____ DATE _____			

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

Page 5 of 5

PATENT
REEL: 029585 FRAME: 0467

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Samsung Electronics Co., Ltd.

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Page 2 of 5

PATENT
REEL: 029585 FRAME: 0469

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<div style="display: flex; justify-content: space-between; align-items: flex-end; padding: 20px;"> <div style="width: 45%;">SIGNATURE _____</div> <div style="width: 45%;">DATE _____</div> </div>			

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	JANG	Jaehoon	
<p>SIGNATURE _____ DATE _____</p>			

LEGAL NAME OF THIRD INVENTOR/ASSIGNOR	Family Name	First Given Name	Second Given Name
	CHAE	Donghyuk	
<p>SIGNATURE _____ DATE _____</p>			

LEGAL NAME OF FOURTH INVENTOR/ASSIGNOR	Family Name	First Given Name	Second Given Name
	LIM	Youngho	
<p>SIGNATURE  DATE 15 / OCT / 2012</p>			

SEC Ref No. IE-200908-050-1-US1 Attorney Ref No. 8947-000488/US/CPA

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SAMSUNG ELECTRONICS CO., LTD.

LEGAL NAME OF FIFTH INVENTOR/ASSIGNOR	Family Name	First Given Name	Second Given Name
	KIM	Hansoo	
<p>SIGNATURE _____ DATE _____</p>			

LEGAL NAME OF SIXTH INVENTOR/ASSIGNOR	Family Name	First Given Name	Second Given Name
	JEONG	Jaehun	
<p>SIGNATURE _____ DATE _____</p>			

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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 Harness, Dickey & Pierce, P.L.C. 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.

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

LEGAL NAME OF FIRST INVENTOR/ASSIGNOR	Family Name	First Given Name	Second Given Name
	SHIM	Sunil	
<div style="display: flex; justify-content: space-between; align-items: flex-end; height: 100px;"> <div style="width: 45%;">SIGNATURE _____</div> <div style="width: 45%;">DATE _____</div> </div>			

SEC Ref No. IE-200908-050-1-US1 Attorney Ref No. 8947-000488/US/CPA

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

SAMSUNG ELECTRONICS CO., LTD.

LEGAL NAME OF SECOND INVENTOR/ASSIGNOR	Family Name	First Given Name	Second Given Name
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LEGAL NAME OF THIRD INVENTOR/ASSIGNOR	Family Name	First Given Name	Second Given Name
	CHAE	Donghyuk	
SIGNATURE _____ DATE _____			

LEGAL NAME OF FOURTH INVENTOR/ASSIGNOR	Family Name	First Given Name	Second Given Name
	LIM	Youngho	
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SEC Ref No. **IE-200908-050-1-US1**Attorney Ref No. **8947-000488/US/CPA**


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SAMSUNG ELECTRONICS CO., LTD.

LEGAL NAME OF FIFTH INVENTOR/ASSIGNOR	Family Name	First Given Name	Second Given Name
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LEGAL NAME OF SIXTH INVENTOR/ASSIGNOR	Family Name	First Given Name	Second Given Name
	JEONG	Jaehun	
SIGNATURE  DATE <u>12/13/2012</u>			

SEC Ref No. IE-200908-050-1-US1Attorney Ref No. 8947-000488/US/CPA