To the Director of the U.S. Patont and Trademark Office: Please record the attached original documents or copy thereof.	<u> </u>	<u> </u>			RECORDATION FORM CO PATENTS ONL			U.S. Department of Commerce Patent and Trademark Office Attorney Docket No.
1. Name of conveying party(ies): 1. Hor-Young KIM 2. Hor-Young KIM 3. Hor-Young KIM 3. Juny-Bale LEE Additional name(s) of conveying parties attached? □ Yes ☒ No Internal Address: 3. Nature of conveyance: Street Address: 416, Maetan-dong, Yeongtong-gu Assignment □ Merger City: Suwon-Bi □ Security Agreement □ Change of Name State: Gyonggi-do Country: Republic Zip Code: □ Joint Research □ Government Interest Assignment Additional name(s) & Address(es) attached? □ Executive Order 9494. □ Other: □ Other: □ Yes ☒ No Execution Order 9494. □ Other: □ Yes ☒ No Execution 1. 2010-04-23 Date(s): Application number(s) or patent number(s): If this document is being filed together with a new application, the execution date of the application: A. Patent Application Number: □ Patent Number(s): 12/788,029 Additional numbers attached? □ Yes ☒ No 5. Name and address of party to whom correspondence concerning document should be mailed: (finity): 703-757-7880 (finity): 703-757-7880 (finity): 703-757-7447 (enait): patrick@multipatentconsulting.com Name: Patrick D. Muir (fiel): 703-757-7880 (finity): 703-757-7447 (enait): patrick@multipatentconsulting.com Internal Address: Muir Patent Consulting, PLLC Sireet Address: 9913 Georgetown Pike, Suite 200 PO Box 1213 City: Great Falls State: VA Zip: 22066 8. Deposit Account No.: 50-4574 9. Statement and aignature. To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the ordiginal document. Execution and difference in the copy of the ordiginal document.	To the	⇒ Director e record t	of the U.S h <u>e attach</u>	3. Patent and ed original (d Trademark Office: documents or copy therec	of.	Mai	
Additional name(s) of conveyance: Street Address: A16, Maetan-dong, Yeongtong-gu	1.	Name o	ing party(ies /	5):				
Assignment		2. Ho-0			Name:	Name: Samsung Electronics Co., Ltd.		
Assignment	Additio	nal name(s) of conv	eying parties	attached? 🗌 Yes 🗵 No	Internal Ac	idress:	
Change of Name State: Gyonggi-do Country: Republic Zip Code: of Korea Joint Research Government Interest Assignment Additional name(s) & Address(es) attached? Execution 1. 2010-04-23 Additional name(s) & Address(es) attached? Yes No No No No No No No N	3.	Nature	of convey	/ance:		Street Add	Street Address: 416, Maetan-dong, Yeongtong-gu	
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Executive Order 9494, Confirmatory License Execution Date(s): 1. 2010-04-23 4. Application number(s) or patent number(s): If this document is being filed together with a new application, the execution date of the application: A. Patent Application Number: 9. Patent Number(s): 12/788,029 Additional numbers attached? Ves No 5. Name and address of party to whom correspondence concerning document should be mailed: Name: Patrick D. Muir (tel): 703-757-7880 (fax): 703-757-7447 (e-mail):						Additional		
Application number(s) or patent number(s): If this document is being filed together with a new application, the execution date of the application: A. Patent Application Number: B. Patent Number(s):		Executive Confirmate	Order 949 NV Licens	4, 🗆			_	
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Additional numbers attached? Yes No					ent number(s): If this docu	<u> </u>		
5. Name and address of party to whom correspondence concerning document should be mailed: Name: Patrick D. Muir (tel): 703-757-7880 (fax): 703-757-7447 (e-mail): patrick@muirpatentconsulting.com Internal Address: Muir Patent Consulting, PLLC Street Address: 9913 Georgetown Pike, Suite 200 PO Box 1213 City: Great Falls State: VA Zip: 22066 Statement and signature. To the best of my knowledge and belief, the foregoing Information is true and correct and any attached copy is a true copy of the original document. Bradley Edebare Republic Consulting and patents Involved: 1 Total number of applications and patents Involved: 1 Total fee (37 CFR 1.21(h) and 3.41): \$40 Enclosed (Please charge deficiency or credit overpayment to deposit account 50-4574) Authorized to be charged to deposit account None required (government interest not affecting title) None required (government interest not affecting title) State: VA Zip: 22066 Statement and signature. To the best of my knowledge and belief, the foregoing Information is true and correct and any attached copy is a true copy of the original document.	····	12/788,0	29					
Name: Patrick D. Muir (tel): 703-757-7880 (fax): 703-757-7447 (e-mail): patrick@muirpatentconsulting.com Internal Address: Muir Patent Consulting, PLLC Street Address: 9913 Georgetown Pike, Suite 200 PO Box 1213 City: Great Falls State: VA Zip: 22066 State: V	,			Add	litional numbers attached?	Yes		⊠ No
(fax): 703-757-7447 (e-mail): patrick@muirpatentconsulting.com Internal Address:	5.	Name ar concern	id addres ing docur	s of party to nent should	whom correspondence be mailed:	_	tal nur	mber of applications and patents
Internal Address: Muir Patent Consulting, PLLC Street Address: 9913 Georgetown Pike, Suite 200 PO Box 1213 City: Great Falls State: VA Zip: 22066 Statement and signature. To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document. Signed: Cally Colleges Pos No. 57 040 Signed: Cally Colleges Pos No. 57 040 Authorized to be charged to deposit account No. Mathematical None required (government interest not affecting title) None required (government interest not affecting title) None required (government interest not affecting title) State: VA Zip: 22066 Statement and signature. To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the program of the pr	Name:	Patrick [D. Muir	(fax): 703-7 (e-mail);	757-7447			
Street Address: 9913 Georgetown Pike, Suite 200 PO Box 1213 City: Great Falls State: VA Zip: 22066 8. Deposit Account No.: 50-4574 9. Statement and signature. To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document. Signed: Bralley Edelber Republic Statement and	Internal	Address:	Muir Pa			-	overp	payment to deposit account 50-4574)
City: Great Falls State: VA Zip: 22066 8. Deposit Account No.: 50-4574 9. Statement and signature. To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document. Signed: Bradley Edelman Box No. 57.840	Street A			ike, Suite 200	<u> </u>	— — — — — — — — — — — — — — — — — — —		
9. Statement and signature. To the best of my knowledge and belief, the foregoing Information is true and correct and any attached copy is a true copy of the original document. Signed: Bradley Edelman Box No 57 040	City:				_	— /agranmont interest hot directille		
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Signed: Bradly Edelman 2010-05-26 Bradley Edelman, Reg. No. 57,648 Date	Fo the boriginal o	est of my k document.	(nowledge	ı and belief, t	the foregoing Information is	true and corre	ct and	any attached copy is a true copy of the
Bradley Edelman, Reg. No. 57,648 Date		Sign	ied:	<u> </u>	Fradlin Edelin	an /		2010-05-26
			Bradley Edelman, Reg. No. 8			7,648		Date

PATENT REEL: 024447 FRAME: 0563

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ASSIGNMENT

We, Ho-Young Kim, Ho-Cheol Lee, and Jung-Bae Lee ("Assignors"), have an interest in the invention entitled:

SEMICONDUCTOR MEMORY DEVICE AND MEMORY SYSTEM HAVING THE SAME

which is the subject of a United States or International application for patent entitled above and naming the undersigned inventors

[] in a Provisional Patent Application No.	
in a Non-Provisional Application along with a Declaration signed t	oday with this assignment:
L J III a NO∩-P(OVISIONAL Application where the Declaration was slope.	d on
12(788,029 or PCT International Application filed on May 76, 2010, and	assigned Serial No.
21188,024 or PCT International Application No.	•
[] in U.S. Patent No, issued	

Samsung Electronics Co. LTD., 416, Maetan-dong, Yeongtong-gu, Suwon-si, Gyeonggi-do, Republic of Korea, ("Assignee"), is desirous of acquiring Assignor's interest in the invention.

Assignore acknowledge receipt and adequacy of good and valuable consideration in exchange for this Assignment, and assign to Assignee and its successors in interest, the full and exclusive right, title and interest to any and all inventions, developments and improvements disclosed or described in the patent application listed above ("the invention"), in the United States of America and all foreign countries, including the right to claim priority under the laws of the United States, the Paris Convention, and any foreign countries, for the full term of the patent, including extensions of time, the same as if held by Assignor had this Assignment not been made. This Assignment includes the assignment of the right to recover for past infringements of, or liabilities for, any of the rights related to the invention.

Assignors covenant and agree to cooperate with Assignee and execute all instruments or documents requested for the making and prosecution of any applications of any type for patent in the United States and in all foreign countries including, but not limited to the following: provisional, continuation, continuation-in-part, divisional, renewal or substitute, reissue, re-examination, or extension. Assignors covenant and agree to cooperate with Assignee in any litigation regarding the invention, patents or applications regarding the invention, and render all necessary assistance deemed essential to Assignee's full protection and title in and to the invention hereby transferred without further or other compensation than that provided in this Assignment; the undersigned agree that the attorneys of record in said application shall hereafter act on behalf of said

Assignors covenant that no assignment, sale or agreement or encumbrance has been or will be entered into which would conflict with this Assignment.

Assignors request the Commissioner of Patents and Trademarks to issue said Letters Patent of the United States of America to Assignee, and request that any official of any country or countries foreign to the United States, whose duty it is to issue or grant patents and applications, issue said Letters Patent, Utility Model Registration or Inventor's Certificate to Assignee.

Assignors hereby grant the firm of MUIR PATENT CONSULTING, PLLC the power to insert on this assignment any further identification that may be necessary or desirable in order to comply with the rules of any Issuing authority, including the United States Patent and Trademark Office, for recordation of this document.

Ho-Young Kim (signature)	Apr >>, >つ10 Date
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(Assignment) 1 of 2

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Ho-Cheol Lee (signal Assignor 2: Ho-Cheol Lee

_(signature)

APR 23, 2010

Date

-Jung-3ae Lee

Assignor 3: Jung-Bae Lee (signature)

Apr. 23, 2010

Date

(Assignment) 2 of 2

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PATENT

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RECORDED: 05/26/2010