## 505025821 07/30/2018 PATENT ASSIGNMENT COVER SHEET

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SUBMISSION TYPE:		NEW ASSIGNMENT	
NATURE OF CONVEYAN	CE:	ASSIGNMENT	
CONVEYING PARTY DA	TA		
		Name	Execution Date
JAE-JUNG KIM			05/29/2018
DONG-SOO LEE			05/29/2018
SANG-YONG KIM			05/29/2018
JIN-KYU JANG			05/29/2018
WON-KEUN CHUNG			05/29/2018
SANG-JIN HYUN			05/29/2018
	ГЛ		
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Street Address:		AMSUNG-RO, YEONGTONG-GU	
City:		SUWON-SI, GYEONGGI-DO	
State/Country:	KORE	KOREA, REPUBLIC OF	
Postal Code:	16677		
PROPERTY NUMBERS	Total: 1		
Property Type		Number	
Application Number:		16040807	
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**Total Attachments: 5** 

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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: SEMICONDUCTOR DEVICES

for which As for patent.	signor is about to make or has made United States or International application
WHEREAS, a	is a below named inventor(s), I/(we) hereby declare that:
Section I. D	eclaration
$\boxtimes$	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-ic	dentified application was made or authorized to be made by me (us).
	e that I am (we are) the original inventor (original joint inventors) of a claimed the above-identified application.
	y acknowledge that any willful false statement made in this declaration is inder 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or

SEC Ref No.	IE-201706-048-1-US0	Attorney Ref No.	SAM-55206 (AY5027US)
			(11.202.103)

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

COMBINED DECLARATION (37 CFR 1.63) FOR UTILITY PATENT APPLICATION AND 주지 한자 FORM 공정개발2팀(반도체연)/김재중/03127886/2018-05-29 12:35 Page 1 of 5 REEL: 046497 FRAME: 0450 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, 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;

SEC Ref No.	IE-201706-048-1-US0	Attorney Ref No.	SAM-55206
			(AY5027US)
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COMBINED DECLARATION (37 CFR 1.63) FOR UTILITY PATENT APPLICATION AND 주지구변지구 FORM 공정개발2팀(반도체연)/김재중/03127886/2018-05-29 12:35 Page 2 of 5 REEL: 046497 FRAME: 0451 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 Muir Patent Law, 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.

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



<u> 공경 : 알고빌(만도 이 연기 감지 분7031.27850</u>

LEGAL NAME OF SECOND	Family Name	First Given Name	Second Given Name
INVENTOR/ASSIGNOR	LEE	Dong-Soo	
SIGNATURE	Dungsus Law	DATE	ot. 29, 2018

LEGAL NAME (	Family Name	First Given Name	Second Given Name
THIRD	KIM	Sang-Yong	
	I		
676 Roš No	NE MANMAG A 40 1 1100	()	61 X X X 2 2 2 3 3 4

SEC Ref No. IE-201706-048-1-US0 Attorney Ref No. SAM-55206 \_\_\_\_\_\_(AY5027U5)

COMBINED DECLARATION (37 CFR 1.63) FOR UTILITY PATENT APPLICATION AND ASSIC PATENT FORM 공정개발2팀(반도체연)/김재중/03127886/2018-05-29 12:35 Page 3 of 5 PEEL - 040407 FD AME - 0466

#### REEL: 046497 FRAME: 0452

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INVENTOR/ASSIGNOR			
SIGNATURE	Kan By Yng	DATE	<u>t/29/201</u> 8

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LEGAL NAME OF FOURTH	Family Name	First Given Name	Second Given Name
INVENTOR/ASSIGNOR	JANG	Jin-Kyu	
SIGNATURE	- CG)	DATE	5/29/2018
L			J
LEGAL NAME OF FIFTH	Family Name	First Given Name	Second Given Name
INVENTOR/ASSIGNOR	순경기 ICHUNG 드시	℃ Mon-Keun <sup>®</sup>	
	· .		
SIGNATURE	Mury hant	itan DATE	<u>5/29 pus</u>

LEGAL NAME OF	Family Name	First Given Name	Second Given Name
SIXTH			
INVENTOR/ASSIGNOR	HYUN	Sang-Jin	
		- 6 8 8	

SEC Ref No.	IE-201706-048-1-US0	Attorney Ref No.	SAM-55206
			(AYS027US)

COMBINED DECLARATION (37 CFR 1.63) FOR UTILITY PATENT APPLICATION AND 유유도 TENT FORM 공정개발2팀(반도체면)/김재중/03127886/2018-05-29 12:35 Page 4 of 5 REEL: 046497 FRAME: 0453

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signature anyth fo	144 DATE 5/29 / 2018
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공경개발2형(반도체견)/김제종/03127886

SEC Ref No.	IE-201706-048-1-US0	Attorney Ref No.	SAM-55206
			(AY5027US)

COMBINED DECLARATION (37 CFR 1.63) FOR UTILITY PATENT APPLICATION AND ASSIGNMENT FORM 공전개발2팀(반도체연)/김재종/03127886/2018-05-29 12:35 RECORDED: 07/30/2018 REEL: 046497 FRAME: 0454