05/15/2015 503309948

PATENT ASSIGNMENT COVER SHEET

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| SUBMISSION TYPE: | NEW ASSIGNMENT |
|-----------------------|----------------|
| NATURE OF CONVEYANCE: | ASSIGNMENT |

CONVEYING PARTY DATA

| Name | Execution Date |
|---------------|----------------|
| TAEJOONG SONG | 04/10/2015 |
| JAE-HO PARK | 04/15/2015 |
| SANGHOON BAEK | 04/13/2015 |
| GIYOUNG YANG | 04/11/2015 |
| SANG-KYU OH | 04/16/2015 |
| HYOSIG WON | 04/16/2015 |

RECEIVING PARTY DATA

| Name: | SAMSUNG ELECTRONICS CO., LTD. |
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| City: | SUWON-SI, GYEONGGI-DO |
| State/Country: | KOREA, REPUBLIC OF |
| Postal Code: | 443-742 |

PROPERTY NUMBERS Total: 1

| Property Type | Number |
|---------------------|----------|
| Application Number: | 14709885 |

CORRESPONDENCE DATA

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| ATTORNEY DOCKET NUMBER: | SEC.3675 |
|-------------------------|--|
| NAME OF SUBMITTER: | ADAM C. VOLENTINE |
| SIGNATURE: | /ADAM C. VOLENTINE/ |
| DATE SIGNED: | 05/15/2015 |
| | This document serves as an Oath/Declaration (37 CFR 1.63). |

PATENT REEL: 035653 FRAME: 0562

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Total Attachments: 5 source=Declaration_Assignment_Form#page1.tif source=Declaration_Assignment_Form#page2.tif source=Declaration_Assignment_Form#page3.tif source=Declaration_Assignment_Form#page4.tif source=Declaration_Assignment_Form#page5.tif

PATENT REEL: 035653 FRAME: 0563

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: II | VTE | GRATED CIRCUIT LAYOUT DESIG | GN SYSTEM AND METHO | OD |
|------------------------------------|-------------|--|---|---|
| for which | Ass | gnor is about to make or has m | ade United States or Int | ernational application |
| for patent | t. | | | |
| WHEREAS | s, as | a below named inventor(s), I/(v | ve) hereby declare that: | |
| Section I. | | | | |
| This decla | rati | on is directed to: | | |
| \boxtimes | | The attached U.S. non-provision | onal patent application, | or |
| |] | U.S. non-provisional patent ap | | , filed |
| |] | PCT international patent applic | cation number | , filed on |
| | | | | |
| The above | e-ide | ntified application was made or | * 1. **** # #** | by me (us). |
| | | that I am (we are) the original in ne above-identified application. | nventor (original joint in | ventors) of a claimed |
| I (we) here punishable both. | eby e ur | acknowledge that any willful fal der 18 U.S.C. 1001 by fine or im | se statement made in the prisonment of not more | nis declaration is e than five (5) years, or |
| ¹ This form | requ | ires the use of an Application Data Sh | eet. | |
| SEC Ref No |). | IB-201407-042-1-US0 | Attorney Ref No. | IB-241288-US SEC.3675 |

PATENT REEL: 035653 FRAME: 0564 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,

| SEC Ref No. | IB-201407-042-1-US0 | Attorney Ref No. | IB-241288-US |
|-------------|---------------------|------------------|--------------|
| | | | SEC.3675 |

PATENT REEL: 035653 FRAME: 0565 divisional, renewal or substitute thereof, and as to letters patent any reissue, reexamination, 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 **VOLENTINE & WHITT, 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)

| LEGAL NAME OF | Family Name | First Given Name | Second Given Name |
|----------------------------|---------------|------------------|-------------------|
| FIRST INVENTOR/ASSIGNOR | SONG ** | TAEJOONG | i |
| | | | |
| SIGNATURE | SOUG TAE JOOH | DATE | 04/10/2015 |

| SEC Ref No. | IB-201407-042-1-US0 | Attorney Ref No. | IB-241288-US |
|-------------|---------------------|------------------|--------------|
| | | | SEC.3675 |

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| LEGAL NAME OF SECOND | Family Name | First Given Name | Second Given Name |
|-------------------------|-------------|------------------|-------------------|
| INVENTOR/ASSIGNOR | PARK | JAE-HO | |
| | | | |
| SIGNATURE | park jae-ho | DATE | 04/15/2015 |
| | | | |

| LEGAL NAME OF THIRD | Family Name | First Given Name | Second Given Name |
|---------------------|-----------------|------------------|-------------------|
| INVENTOR/ASSIGNOR | SANGHOON | | |
| | | | |
| SIGNATURE | ton | DATE | 04/13/2015 |
| | Back Sang hour. | | |

| LEGAL NAME OF FOURTH | | | First Given Name | Second Given Name |
|-------------------------|-----------------------------|---|------------------|-------------------|
| INVENTOR/ASS | | YANG | GIYOUNG | |
| SIGN | ATURE | rang, GI Youn | DATE DATE | 04/11/2015 |
| SEC Ref No. | MANNANNANNANNA KIBOOOOOOOOO | *************************************** | | |

PATENT¹⁵
REEL: 035653 FRAME: 0567***

| LEGAL NAME OF FIFTH | Family Name | First Given Name | Second Given Name |
|------------------------|-------------|------------------|-------------------|
| INVENTOR/ASSIGNOR | ОН | SANG-KYU | |
| SIGNATURE _ | OH SANG KY | DATE | 04/16/2015 |

| LEGAL NAME OF | Family Name | First Given Name | Second Given Name |
|----------------------------|---------------|------------------|-------------------|
| SIXTH INVENTOR/ASSIGNOR | WON | HYOSIG | |
| | | | |
| | 21 mil 1 - 78 | DATE | 04/16/2010 |
| SIGNATURE _ | Myay Win | | |
| | | | |

| SEC Ref No. | IB-201407-042-1-US0 | Attorney Ref No. | IB-241288-US |
|-------------|---------------------|------------------|--------------|
| *** | | | SEC.3675 |

RECORDED: 05/15/2015