01/05/2017 504164820

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1 Stylesheet Version v1.2 EPAS ID: PAT4211497

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

CONVEYING PARTY DATA

| Name | Execution Date |
|-----------------|----------------|
| DIMIN NIU | 10/07/2016 |
| MU-TIEN CHANG | 10/07/2016 |
| HONGZHONG ZHENG | 10/07/2016 |
| HYUN-JOONG KIM | 12/23/2016 |
| WON-HYUNG SONG | 12/23/2016 |
| JANGSEOK CHOI | 12/23/2016 |

RECEIVING PARTY DATA

| Name: | SAMSUNG ELECTRONICS CO., LTD |
|-----------------|-------------------------------|
| Street Address: | 129, SAMSUNG-RO, YEONGTONG-GU |
| City: | SUWON-SI, GYEONGGI-DO |
| State/Country: | KOREA, REPUBLIC OF |
| Postal Code: | 16677 |

PROPERTY NUMBERS Total: 1

| Property Type | Number | |
|---------------------|----------|--|
| Application Number: | 15286460 | |

CORRESPONDENCE DATA

Fax Number: (626)577-8800

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.

Phone: 626 795-9900 Email: pto@lrrc.com

LEWIS ROCA ROTHGERBER CHRISTIE LLP **Correspondent Name:**

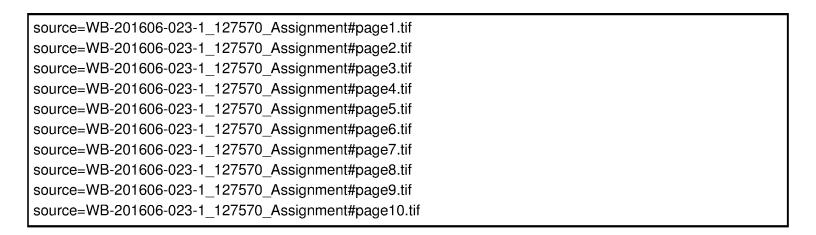
Address Line 1: P.O. BOX 29001

Address Line 4: GLENDALE, CALIFORNIA 91209

| NAME OF SUBMITTER: | VICKIE D. WALL |
|--------------------|------------------|
| SIGNATURE: | /Vickie D. Wall/ |
| DATE SIGNED: | 01/05/2017 |

Total Attachments: 10

PATENT REEL: 040859 FRAME: 0963



PATENT REEL: 040859 FRAME: 0964

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: A DR | AM ASSIST ERROR CORRECTION MECHANISM FOR DDR SDRAM INTERFACE | |
| for which Assi | gnor 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. Dec | claration | |
| This declaration | on is directed to: | |
| | The attached U.S. non-provisional patent application, or | |
| | U.S. non-provisional patent application number $\underline{15/286,460}$, filed on $\underline{\text{October}}$ $\underline{5,2016}$, or | |
| | PCT international patent application number, filed on | |
| The above-ide | entified application was made or authorized to be made by me (us). | |
| • • | that I am (we are) the original inventor (original joint inventors) of a claimed ne above-identified application. | |
| | acknowledge that any willful false statement made in this declaration is der 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or | |
| ¹ This form requ | uires the use of an Application Data Sheet. | |
| SEC Ref No | WB-201606-023-1 Attorney Ref No. <u>127570</u> | |

PATENT REEL: 040859 FRAME: 0965 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

| SEC Ref No. | WB-201606-023-1 | Attorney Ref No. | 127570 |
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COMBINED DECLARATION (37 CFR 1.63) FOR UTILITY PATENT APPLICATION AND ASSIGNMENT FORM
Page 2 of 5

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;

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 patent attorneys and agents associated with U.S. Patent and Trademark Office Customer No. 129498, 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 | NIU | Dimin | |
| * | | | L |
| | | | |
| SIGNATURE | | DATE | 10/712016 |
| SIGNATORE | . | | |

| SEC Ref No. | WB-201606-023-1 | Attorney Ref No. 127570 |
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| | | |

| LEGAL NAME OF SECOND | Family Name | First Given Name | Second Given Name |
|-------------------------|-------------|------------------|-------------------|
| INVENTOR/ASSIGNOR | CHANG | Mu-Tien | |
| <u> </u> | | | |
| SIGNATURE | isar | DATE | 10/7/16 |
| SIGNATURE | USA Comment | | |

| LEGAL NAME OF THIRD | Family Name | First Given Name | Second Given Name |
|---------------------------------------|-------------|------------------|-------------------|
| INVENTOR/ASSIGNOR | ZHENG | Hongzhong | |
| · · · · · · · · · · · · · · · · · · · | | <u></u> | L |
| \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ | 4 | DATE | 10/7/16 |
| SIGNATURE | | 5 | |

| LEGAL NAME OF FOURTH INVENTOR/ASSIGNOR | Family Name | First Given Name | Second Given Name |
|--|-------------|------------------|--|
| | KIM | Hyun-Joong | |
| | | | |
| | | DATE | |
| SIGNATURE | | | ······································ |

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| | *************************************** | | *************************************** |

SAMSUNG ELECTRONICS CO., LTD.

| LEGAL NAME OF | Family Name | First Given Name | Second Given Name |
|-------------------------|-------------|------------------|-------------------|
| FIFTH INVENTOR/ASSIGNOR | SONG | Won-hyung | |
| l | | | |
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| SIGNATURE | | DATE | |
| | | | |

| LEGAL NAME OF | Family Name | First Given Name | Second Given Name |
|-------------------------|-------------|------------------|-------------------|
| SIXTH INVENTOR/ASSIGNOR | CHOI | Jangseok | |
| | | | .1 |
| | | | |
| SIGNATURE | | DATE | |
| <u>.</u> | | noch; | |

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SEC Ref No. WB-201606-023-1 Attorney Ref No. 127570

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: A DRAM ASSIST ERROR CORRECTION MECHANISM FOR DDR SDRAM INTERFACE 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 \boxtimes U.S. non-provisional patent application number <u>15/286,460</u>, filed on <u>October</u> 5, 2016, 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. WB-201606-023-1 Attorney Ref No. 127570

> Page **1** of **5** PATENT

> > **REEL: 040859 FRAME: 0970**

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

| SEC Ref No | WB-201606-023-1 | Attorney Ref No | 127578 | |
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COMBINED DECLARATION (37 CFR 1.63) FOR UTILITY PATENT APPLICATION AND ASSIGNMENT FORM Page 2 of 5

REEL: 040859 FRAME: 0971

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;

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 patent attorneys and agents associated with U.S. Patent and Trademark Office Customer No. 129498, 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 | Family Name | First Given Name | Second Given Name |
|---------------------|-------------|------------------|-------------------|
| INVENTOR/ASSIGNOR | טוא | Dimin | |
| | | | |
| | | DATE | |
| SIGNATURE | | | |

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

Page 3 of 5

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| LEGAL NAME OF | Family Name | ê | First Give | in Name | Second G | iven Name |
|-----------------------------|-------------|---|--------------|---------|----------|-----------|
| SECOND INVENTOR/ASSIGNOR | CHANG | | Mu- | lien | | |
| | | | | | | |
| SIGNATURE | | | | DATE | | |
| | | | i Ligania | | | |
| LEGAL NAME OF | Family Name | 3 | First Give | n Name | Second G | iven Name |

| LEGA | AL NAME OF | Family Name | First Given Name | Second Given Name |
|----------|-----------------------|-------------|------------------|-------------------|
| INVENT | THIRD TOR/ASSIGNOR | ZHENG | Hongzhong | |
| <u>8</u> | | | | |
| | SIGNATURE _ | | DATE | |
| | | | | |

| LEGAL NAME OF | Family Name | First Given Name | Second Given Name |
|--------------------------|-------------|------------------|-------------------|
| FOURTH INVENTOR/ASSIGNOR | : KIM | Hyun-Joang | |
| | | | |
| | 224 | DATE | &c 23-1, 2-416 |
| SIGNATURE | | | |

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COMBINED DECLARATION (37 CFR 1.63) FOR UTILITY PATENT APPLICATION AND ASSIGNMENT FORM Page 4 of 5

| SONG | Won-hyung | |
|------|-----------|-------------|
| | | |
| | DATE | 2016; 12-23 |
| | | |

| LEGAL NAME OF | Family Name | First Given Name | Second Given Name |
|------------------------|-------------|------------------|-------------------|
| SIXTH NVENTOR/ASSIGNOR | СНОІ | Jangseok | |
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Attorney Raf No. 127570 SEC Ref No. WB-201606-023-1

COMBINED DECLARATION (37 CFR 1.63) FOR UTILITY PATENT APPLICATION AND ASSIGNMENT FORM Page 5 of 5

RECORDED: 01/05/2017

PATENT

REEL: 040859 FRAME: 0974