504548809 09/14/2017

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1 Stylesheet Version v1.2

EPAS ID: PAT4595517

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

CONVEYING PARTY DATA

| Name | Execution Date |
|---------------|----------------|
| XUAN ANH TRAN | 01/21/2016 |
| ENG HUAT TOH | 01/21/2016 |

RECEIVING PARTY DATA

| Name: | GLOBALFOUNDRIES SINGAPORE PTE. LTD. | |
|-----------------|---|--|
| Street Address: | 60 WOODLANDS INDUSTRIAL PARK D STREET 2 | |
| City: | SINGAPORE | |
| State/Country: | SINGAPORE | |
| Postal Code: | 738406 | |

PROPERTY NUMBERS Total: 1

| Property Type | Number |
|---------------------|----------|
| Application Number: | 15705251 |

CORRESPONDENCE DATA

Fax Number: (656)846-2005

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: 6568549880

Email: oa.notification@horizonip.com.sg

Correspondent Name: HORIZON IP PTE. LTD.

Address Line 1: 7500A BEACH ROAD, #04-306/308

Address Line 2: THE PLAZA

Address Line 4: SINGAPORE, SINGAPORE 199591

| ATTORNEY DOCKET NUMBER: | GFSP2014NAT125US1 |
|-------------------------|--|
| NAME OF SUBMITTER: | DEXTER KAM CHIN |
| SIGNATURE: | /dexter chin/ |
| DATE SIGNED: | 09/14/2017 |
| | This document serves as an Oath/Declaration (37 CFR 1.63). |

Total Attachments: 2

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PATENT REEL: 043598 FRAME: 0220 504548809

Attorney's Docket No.: GFSP2014NAT125US0 GF Ref. No.: GSG011

COMBINED DECLARATION and ASSIGNMENT (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

| Title of Invention | HIGH DENSITY MULTI-TIME PROGRAMMABLE RESISTIVE MEMORY DEVICES AND METHOD OF FORMING THEREOF |
|--|---|
| | DECLARATION |
| As the below | named inventor, I hereby declare that: |
| This declarati | on The attached application, or |
| | United States application or PCT international application numberfiled on |
| The above-ide | ntified application was made or authorized to be made by me. |
| I believe that I am the original inventor or an original joint inventor of a claimed invention in the application. | |
| I 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. | |
| I have reviewed and understand the contents of the application and am aware of the duty to disclose to the US Patent and Trademark Office all information known to me to be material to patentability as defined in 37 CFR § 1.56. | |
| | ASSIGNMENT |
| For good and valuable consideration, the receipt, sufficiency and adequacy of which are hereby acknowledged, I hereby sell, assign, transfer, to GLOBALFOUNDRIES Singapore Ptc. Ltd. having a business address of 60 Woodlands Industrial Park D Street 2, Singapore 738406 its successors and assigns, absolutely and forever, my entire right, title and interest in and to the invention listed above, together with the Application, any and all Patents that may issue in the United States and/or any foreign countries, and any reissues, re-examinations, renewals, continuations, continuation-in-parts, divisionals or extensions thereof that may be issued or granted, and all right, title and interest to the inventions contained in said Patents and Applications, for the United States and all foreign countries, and all the rights and privileges relating thereto including but not limited to the priority rights arising from said Applications, the right to recover and take all such proceedings as may be necessary for the recovery of damages or otherwise in respect of past, present and future infringement, and the right to apply for, take and maintain patents on said inventions. | |
| If any portion of this Combined Declaration or Assignment is held unenforceable, then remaining portions hereof shall nevertheless remain in full force and effect. | |
| LEGAL NAME OF INVENTOR | |
| Inventor: | Xuan Anh TRAN Date: 2//01/2015 |
| Signature: | JM- |
| Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional form for each additional inventor. | |

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REEL: 043598 FRAME: 0221

COMBINED DECLARATION and ASSIGNMENT (374 CFR 1.63) FOR TUTILITY OR SDESIGNED APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76) NO AN APPLICATION OF A SHEET (37 CFR 1.76) NO AN APPLICATION DATA SHEET (37 CFR 1.76) NO AND APPLICATION DATA SHEET (37 CFR 1.76) NO APPLICATION DATA SHEET (37 CFR 1.76) NO APPLICATION DATA SHEET (37 CFR 1.76) NO APPLI

| Title of Invention | HIGH DENSITY MULTI-TIME PROGRAMMABLE RESISTIVE MEMORY DEVICES AND METHOD OF FORMING THEREOF | |
|---|---|--|
| | DECLARATION | |
| As the below | named inventor, I hereby declare that: | |
| This declarati | on | |
| | United States application or PCT international application numberfiled on | |
| The above-ide | ntified application was made or authorized to be made by me. | |
| I believe that I am the original inventor or an original joint inventor of a claimed invention in the application. | | |
| I 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. | | |
| I have reviewed and understand the contents of the application and am aware of the duty to disclose to the US Patent and Trademark Office all information known to me to be material to patentability as defined in 37 CFR § 1.56. | | |
| | ASSIGNMENT | |
| For good and valuable consideration, the receipt, sufficiency and adequacy of which are hereby acknowledged, I hereby sell, assign, transfer, to GLOBALFOUNDRIES Singapore Pte. Ltd. having a business address of 60 Woodlands Industrial Park D Street 2, Singapore 738406 its successors and assigns, absolutely and forever, my entire right, title and interest in and to the invention listed above, together with the Application, any and all Patents that may issue in the United States and/or any foreign countries, and any reissues, re-examinations, renewals, continuations, continuation-inparts, divisionals or extensions thereof that may be issued or granted, and all right, title and interest to the inventions contained in said Patents and Applications, for the United States and all foreign countries, and all the rights and privileges relating thereto including but not limited to the priority rights arising from said Applications, the right to recover and take all such proceedings as may be necessary for the recovery of damages or otherwise in respect of past, present and future infringement, and the right to apply for, take and maintain patents on said inventions. | | |
| | of this Combined Declaration or Assignment is held unenforceable, then remaining portions hereof less remain in full force and effect. | |
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| LEGAL NAM | E OF INVENTOR | |
| Inventor: | Eng Huat TOH Date: 2//0///6 | |
| Signature: | | |
| | ation data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form. | |

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PATENT REEL: 043598 FRAME: 0222

RECORDED: 09/14/2017