PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1 Stylesheet Version v1.2

EPAS ID: PAT3041951

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

CONVEYING PARTY DATA

| Name | Execution Date |
|-------------------|----------------|
| ARCHANA VENUGOPAL | 08/20/2014 |
| MARIE DENISON | 08/18/2014 |
| LUIGI COLOMBO | 09/02/2014 |
| SAMEER PENDHARKAR | 09/03/2014 |

RECEIVING PARTY DATA

| Name: | TEXAS INSTRUMENTS INCORPORATED |
|-------------------|--------------------------------|
| Street Address: | 12500 TI BOULEVARD |
| Internal Address: | M/S 3999 |
| City: | DALLAS |
| State/Country: | TEXAS |
| Postal Code: | 75243 |

PROPERTY NUMBERS Total: 1

| Property Type | Number |
|---------------------|----------|
| Application Number: | 14499216 |

CORRESPONDENCE DATA

Fax Number: (214)567-2228

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: 214-479-1243 Email: uspto@ti.com

Correspondent Name: TEXAS INSTRUMENTS INCORPORATED

Address Line 1: 12500 TI BOULEVARD

Address Line 2: M/S 3999

Address Line 4: DALLAS, TEXAS 75243

| ATTORNEY DOCKET NUMBER: | TI-73378 |
|-------------------------|------------------|
| NAME OF SUBMITTER: | SHAWN T. WALSH |
| SIGNATURE: | /Shawn T. Walsh/ |
| DATE SIGNED: | 09/29/2014 |

Total Attachments: 8

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ASSIGNMENT

| W | HEREAS, I, the un | dersigned inventor | (or one of the | undersigned join | t inventors), | of residence as listed, | having invented certain |
|-------------|-------------------|--------------------|-----------------|-------------------|---------------|-------------------------|-------------------------|
| new and use | aful improvements | as below entitled. | for which appli | cation for United | States Letten | s Patent is made. | • |

NOW, THEREFORE, for good and valuable consideration, the receipt of which is hereby acknowledged, I hereby sell and assign unto the said TEXAS INSTRUMENTS INCORPORATED, its successors and assigns, my entire right, title and interest in and to the said invention and in and to the said application(s) and all patents which may be granted therefor, and all divisions, reissues, substitutions, continuations, and extensions thereof, and I hereby authorize and request the Patent and Trademark Office to issue all patents for said invention, or patents resulting therefrom, to the said TEXAS INSTRUMENTS INCORPORATED, as assignee of my entire right, title and interest.

I also hereby self and assign to TEXAS INSTRUMENTS INCORPORATED, its successors and assigns, my corresponding rights to the invention disclosed in said application in all other countries of the world, including the right to claim priority, file applications and obtain patents under the terms of the Paris Convention for the Protection of Industrial Property, and further agree to execute any and all patent applications, assignments, affidavits, and any other papers in connection therewith necessary to perfect such rights.

I hereby further agree that I will communicate to said TEXAS INSTRUMENTS INCORPORATED, or to its successors, assigns, and legal representatives, any facts known to me respecting said invention, and at the expense of said assignee company, testify in any legal proceedings, sign all lawful papers, execute all divisional, continuation, reissue and substitute applications, make all lawful oaths, and generally do everything possible to aid said TEXAS INSTRUMENTS INCORPORATED, its successors, assigns and nominees to obtain and enforce proper patent protection for said invention in all countries.

I authorize the later insertion of the nonprovisional application number and filing date hereinbelow.

IN WITNESS WHEREOF, I hereunto set hand and seal this day and year,

| TITLE | INTEGRATION OF HEAT SPREADER FOR BEOL THERMAL MANAGEMENT | | |
|-----------------------------------|--|-------------|--|
| NONPROVISIONAL APPLICATION NO. | | FILING DATE | |

| SIGNATURE OF INVENTOR | Vitahan |
|-------------------------------|-------------------|
| PRINTED NAME OF INVENTOR | Archana Venugopal |
| DATE | 08/20/14 |
| RESIDENCE (CITY AND STATE) | DAWAS , TX |

| SIGNATURE OF INVENTOR | |
|-------------------------------|-------------------|
| PRINTED NAME OF INVENTOR | Marie Denison |
| DATE | |
| RESIDENCE (CITY AND STATE) | |
| SIGNATURE OF INVENTOR | |
| PRINTED NAME OF INVENTOR | Luigi Colombo |
| DATE | |
| RESIDENCE (CITY AND STATE) | |
| SIGNATURE OF INVENTOR | |
| PRINTED NAME OF INVENTOR | Sameer Pendharkar |
| DATE | |
| RESIDENCE (CITY AND STATE) | |

After recording, return Assignment to:

Donna Williams Texas Instruments Incorporated 12500 TI Boulevard, M/S 3999 Dallas, TX 75243

ASSIGNMENT

| 00000000000000000000000000000000000000 | | | |
|---|---|--|---|
| WHEREAS, I, the unde new and useful improvements as | rsigned inventor (or one of the undersi below entitled, for which application fo | gned joint inventors), of reside or United States Letters Patent | nce as listed, having invented certain is made. |
| Delaware, with a place of busine interest in and to the said inve | STRUMENTS INCORPORATED, a cost at 12500 TI Boulevard, M/S 3999, Doublevard, mand to the said application and filed | allas, Texas 75243, is desirou d any Letters Patent that ma | s of acquiring my entire right, title and |
| unto the said TEXAS INSTRUM invention and in and to the said continuations, and extensions the | or good and valuable consideration, the ENTS INCORPORATED, its successor application(s) and all patents which receof; and I hereby authorize and requerefrom, to the said TEXAS INSTRUM | irs and assigns, my entire righ may be granted therefor, and uest the Patent and Tradema | it, title and interest in and to the said all divisions, reissues, substitutions, rk Office to issue all patents for said |
| to the invention disclosed in said obtain patents under the terms of | ssign to TEXAS INSTRUMENTS INCO f application in all other countries of t f the Paris Convention for the Protecti affidavits, and any other papers in con | he world, including the right to on of Industrial Property, and | o claim priority, file applications and further agree to execute any and all |
| and legal representatives, any fa legal proceedings, sign all lawful generally do everything possible | nat i will communicate to said TEXAS cts known to me respecting said inver papers, execute all divisional, continua to aid said TEXAS INSTRUMENTS In ion for said invention in all countries. | ition, and at the expense of sation, reissue and substitute an | aid assignee company, testify in any plications, make all lawful paths and |
| I authorize the later inser | tion of the nonprovisional application n | umber and filing date hereinbe | Now, |
| IN WITNESS WHEREO | F, I hereunto set hand and seal this da | y and year; | |
| TITLE | INTEGRATION OF HEAT SP | READER FOR BEOL TH | HERMAL MANAGEMENT |
| NONPROVISIONAL APPLICATION NO. | | FILING DATE | |
| | | | *************************************** |
| SIGNATURE OF INVENTOR | | | |
| PRINTED NAME OF INVENTOR | Archana Venugopal | | |
| DATE | | | |
| RESIDENCE (CITY AND STATE) | | | |

| *************************************** | |
|---|-------------------|
| SIGNATURE OF INVENTOR | |
| PRINTED NAME OF INVENTOR | Marie Denison |
| DATE | 02/12/14 |
| RESIDENCE (CITY AND STATE) | PLANO, TX |
| SIGNATURE OF INVENTOR | |
| PRINTED NAME OF INVENTOR | Luigi Colombo |
| DATE | |
| RESIDENCE (CITY AND STATE) | |
| SIGNATURE OF INVENTOR | |
| PRINTED NAME OF INVENTOR | Sameer Pendharkar |
| DATE | |
| RESIDENCE (CITY AND STATE) | |

After recording, return Assignment to:

Donna Williams Texas Instruments Incorporated 12500 TI Boulevard, M/S 3999 Dallas, TX 75243

PRINTED NAME

OF INVENTOR

DATE

RESIDENCE (CITY AND STATE) Archana Venugopal

ASSIGNMENT

| WHEREAS, I, the undersigned inventor (or one of the undersigned joint inventors), of residence as listed, having invented certain new and useful improvements as below entitled, for which application for United States Letters Patent is made. | | | | | | |
|---|--|--|--|--|--|--|
| WHEREAS, TEXAS INSTRUMENTS INCORPORATED, a corporation organized and existing under the laws of the State of Delaware, with a place of business at 12500 TI Boulevard, M/S 3999, Dallas, Texas 75243, is desirous of acquiring my entire right, title and interest in and to the said invention, and to the said application and any Letters Patent that may issue thereon, as well as to U.S. Provisional Application No(s), filed; | | | | | | |
| NOW, THEREFORE, for good and valuable consideration, the receipt of which is hereby acknowledged, I hereby sell and assign unto the said TEXAS INSTRUMENTS INCORPORATED, its successors and assigns, my entire right, title and interest in and to the said invention and in and to the said application(s) and all patents which may be granted therefor, and all divisions, reissues, substitutions, continuations, and extensions thereof; and I hereby authorize and request the Patent and Trademark Office to issue all patents for said invention, or patents resulting therefrom, to the said TEXAS INSTRUMENTS INCORPORATED, as assignee of my entire right, title and interest. | | | | | | |
| to the invention disclosed in said obtain patents under the terms of | sign to TEXAS INSTRUMENTS INCO application in all other countries of ti the Paris Convention for the Protecti affidavits, and any other papers in con | he world, including the right to on of Industrial Property, and t | claim priority, file applications and further agree to execute any and all | | | |
| I hereby further agree that I will communicate to said TEXAS INSTRUMENTS INCORPORATED, or to its successors, assigns, and legal representatives, any facts known to me respecting said invention, and at the expense of said assignee company, testify in any legal proceedings, sign all lawful papers, execute all divisional, continuation, reissue and substitute applications, make all lawful caths, and generally do everything possible to aid said TEXAS INSTRUMENTS INCORPORATED, its successors, assigns and nominees to obtain and enforce proper patent protection for said invention in all countries. | | | | | | |
| l authorize the later inserti | ion of the nonprovisional application n | umber and filing date hereinbe | low. | | | |
| IN WITNESS WHEREOF | , I hereunto set hand and seal this da | y and year; | | | | |
| TITLE | TITLE INTEGRATION OF HEAT SPREADER FOR BEOL THERMAL MANAGEMENT | | | | | |
| NONPROVISIONAL APPLICATION NO. | | FILING DATE | | | | |
| | | | | | | |
| SIGNATURE OF INVENTOR | | | | | | |

Attorney Docket No. TI-

| SIGNATURE OF INVENTOR | |
|-------------------------------|-------------------|
| PRINTED NAME OF INVENTOR | Marie Denison |
| DATE | |
| RESIDENCE (CITY AND STATE) | 4 |
| SIGNATURE OF INVENTOR | |
| PRINTED NAME OF INVENTOR | Luigi Colombo |
| DATE | Jept 2, 2014 |
| RESIDENCE (CITY AND STATE) | Dallas, 7x |
| SIGNATURE OF INVENTOR | |
| PRINTED NAME OF INVENTOR | Sameer Pendharkar |
| DATE | |
| RESIDENCE (CITY AND STATE) | |

After recording, return Assignment to:

Donna Williams Texas Instruments Incorporated 12500 Ti Boulevard, M/S 3999 Dallas, TX 75243

ASSIGNMENT

| WHEREAS, I, the undersigned inventor (or one of the undersigned joint inventors), of residence as listed, having invented certain new and useful improvements as below entitled, for which application for United States Letters Patent is made. |
|---|
| WHEREAS, TEXAS INSTRUMENTS INCORPORATED, a corporation organized and existing under the laws of the State of Delaware, with a place of business at 12500 TI Boulevard, M/S 3999, Dallas, Texas 75243, is desirous of acquiring my entire right, title and interest in and to the said invention, and to the said application and any Letters Patent that may issue thereon, as well as to U.S. Provisional Application No(s), filed; |
| NOW, THEREFORE, for good and valuable consideration, the receipt of which is hereby acknowledged, I hereby sell and assign unto the said TEXAS INSTRUMENTS INCORPORATED, its successors and assigns, my entire right, title and interest in and to the said invention and in and to the said application(s) and all patents which may be granted therefor, and all divisions, reissues, substitutions, continuations, and extensions thereof; and I hereby authorize and request the Patent and Trademark Office to issue all patents for said invention, or patents resulting therefrom, to the said TEXAS INSTRUMENTS INCORPORATED, as assignee of my entire right, title and interest. |
| I also hereby sell and assign to TEXAS INSTRUMENTS INCORPORATED, its successors and assigns, my corresponding rights to the invention disclosed in said application in all other countries of the world, including the right to claim priority, file applications and obtain patents under the terms of the Paris Convention for the Protection of Industrial Property, and further agree to execute any and all patent applications, assignments, affidavits, and any other papers in connection therewith necessary to perfect such rights. |
| I hereby further agree that I will communicate to said TEXAS INSTRUMENTS INCORPORATED, or to its successors, assigns, and legal representatives, any facts known to me respecting said invention, and at the expense of said assignee company, testify in any legal proceedings, sign all lawful papers, execute all divisional, continuation, reissue and substitute applications, make all lawful oaths, and generally do everything possible to aid said TEXAS INSTRUMENTS INCORPORATED, its successors, assigns and nominees to obtain and enforce proper patent protection for said invention in all countries. |

I authorize the leter insertion of the nonprovisional application number and filing date hereinbelow.

IN WITNESS WHEREOF, I hereunto set hand and seal this day and year;

| TITLE | INTEGRATION OF HEAT SPREADER FOR BEOL THERMAL MANAGEMENT |
|-----------------------------------|--|
| NONPROVISIONAL APPLICATION NO. | FILING DATE |
| | |
| SIGNATURE OF INVENTOR | |
| PRINTED NAME OF INVENTOR | Archana Venugopal |
| DATE | |
| RESIDENCE (CITY AND STATE) | |

| SIGNATURE OF INVENTOR | |
|-------------------------------|-------------------|
| PRINTED NAME OF INVENTOR | Marie Denison |
| DATE | |
| RESIDENCE (CITY AND STATE) | |
| SIGNATURE OF INVENTOR | |
| PRINTED NAME OF INVENTOR | Luigi Colombo |
| DATE | |
| RESIDENCE (CITY AND STATE) | |
| SIGNATURE OF INVENTOR | W6-22 |
| PRINTED NAME OF INVENTOR | Sameer Pendharkar |
| DATE | 9/3/14 |
| RESIDENCE (CITY AND STATE) | ALLEN, TX |

After recording, return Assignment to:

Donna Williams Texas Instruments Incorporated 12500 Ti Boulevard, M/S 3999 Dallas, TX 75243

> PATENT REEL: 033836 FRAME: 0486

RECORDED: 09/29/2014