504131350 12/09/2016

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1 Stylesheet Version v1.2

SUBMISSION TYPE: CORRECTIVE ASSIGNMENT

EPAS ID: PAT4178021

| SUBMISSION TYPE: | CORRECTIVE ASSIGNMENT |
|------------------|--|
| | Corrective Assignment to correct the ADD ACCIDENTALLY OMITTED SIXTH INVENTOR previously recorded on Reel 031931 Frame 0584. Assignor(s) hereby confirms the ASSIGNMENT OF ASSIGNOR'S INTEREST. |

CONVEYING PARTY DATA

| Name | Execution Date |
|----------------|----------------|
| CHEN-HUA YU | 12/26/2013 |
| TZU-SHIUN SHEU | 12/26/2013 |
| SHIN-PUU JENG | 12/27/2013 |
| SHIH-PENG TAI | 12/26/2013 |
| AN-JHIH SU | 12/26/2013 |
| CHI-HSI WU | 12/27/2013 |

RECEIVING PARTY DATA

| Name: | Taiwan Semiconductor Manufacturing Company, Ltd. | |
|-----------------|---|--|
| Street Address: | No. 8, Li-Hsin Rd. 6, Science-Based Industrial Park | |
| City: | Hsin-Chu | |
| State/Country: | TAIWAN | |
| Postal Code: | 300-77 | |

PROPERTY NUMBERS Total: 1

| Property Type | Number | |
|---------------------|----------|--|
| Application Number: | 14132709 | |

CORRESPONDENCE DATA

Fax Number: (972)732-9218

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: 972-732-1001

Email: docketing@slatermatsil.com

Correspondent Name: SLATER MATSIL, LLP

Address Line 1: 17950 PRESTON RD., SUITE 1000

Address Line 4: DALLAS, TEXAS 75252

| ATTORNEY DOCKET NUMBER: | TSM13-1309 |
|-------------------------|-------------------|
| NAME OF SUBMITTER: | MARANDA BRALLEY |
| SIGNATURE: | /Maranda Bralley/ |

PATENT 504131350 REEL: 040961 FRAME: 0468

| DATE SIGNED: | 12/09/2016 | | |
|---|--|--|--|
| | This document serves as an Oath/Declaration (37 CFR 1.63). | | |
| Total Attachments: 8 | | | |
| source=TSM13-1309 Assignment as filed#page1.tif | | | |
| source=TSM13-1309 Assignment as file | ed#page2.tif | | |
| source=TSM13-1309 Assignment as filed#page3.tif | | | |
| source=TSM13-1309 Assignment as filed#page4.tif | | | |
| source=TSM13-1309 Assignment as filed#page5.tif | | | |
| source=TSM13-1309 Assignment as filed#page6.tif | | | |
| source=TSMP13-1309 Assignment NEW#page1.tif | | | |
| source=TSMP13-1309 Assignment NEW#page2.tif | | | |

PATENT REEL: 040961 FRAME: 0469 Assignment Page 1 of 2

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1

Stylesheet Version v1.2

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

CONVEYING PARTY DATA

| Name | Execution Date |
|----------------|----------------|
| CHEN-HUA YU | 12/26/2013 |
| TZU-SHIUN SHEU | 12/26/2013 |
| SHIN-PUU JENG | 12/27/2013 |
| SHIH-PENG TAI | 12/26/2013 |
| AN-JHIH SU | 12/26/2013 |

RECEIVING PARTY DATA

| Name: | TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD. | | |
|-------------------|--|--|--|
| Street Address: | NO. 8, LI-HSIN RD. 6 | | |
| Internal Address: | SCIENCE-BASED INDUSTRIAL PARK | | |
| City: | HSIN-CHU | | |
| State/Country: | TAIWAN | | |
| Postal Code: | 300-77 | | |

PROPERTY NUMBERS Total: 1

| Property Type | Number |
|---------------------|----------|
| Application Number: | 14132709 |

CORRESPONDENCE DATA

 Fax Number:
 (972)732-9218

 Phone:
 972-732-1001

Email: docketing@slater-matsil.com

Correspondence will be sent via US Mail when the email attempt is unsuccessful.

Correspondent Name: SLATER & MATSIL, L.L.P.

Address Line 1: 17950 PRESTON ROAD, SUITE 1000

Address Line 4: DALLAS, TEXAS 75252

| ATTORNEY DOCKET NUMBER: | TSM13-1309 |
|---|---------------|
| NAME OF SUBMITTER: | WENDY SAXBY |
| Signature: | /Wendy Saxby/ |
| Date: | 01/09/2014 |
| Total Attachments: 2 source=43Y1837#page1.tif | |

source=43Y1837#page2.tif

RECEIPT INFORMATION

EPAS ID: PAT2674903 Receipt Date: 01/09/2014

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; and

WHEREAS, Taiwan Semiconductor Manufacturing Company, Ltd. ("Assignee"), a corporation organized and existing under the laws of Taiwan, the Republic of China, with its principal office at No. 8, Li-Hsin Rd. 6 Science-Based Industrial Park, Hsin-Chu 300-77, Taiwan, R.O.C., is desirous of acquiring my entire right, title and interest in and to said invention, and to said application and any Letters Patent that may issue thereon in the United States and all other countries throughout the world;

NOW, THEREFORE, for good and valuable consideration, the receipt of which is hereby acknowledged, I hereby sell and assign to said Assignee, its successors and assigns, my entire right, title and interest in and to said invention and in and to said application and all patents which may be granted therefor, and all future non-provisional applications including divisions, reissues, substitutions, continuations, and extensions thereof; and I hereby authorize and request the Commissioner for Patents to issue all patents for said invention, or patent resulting therefrom, insofar as my interest is concerned, to said Assignee, as assignee of my entire right, title and interest. I declare that I have not executed and will not execute any agreement in conflict herewith.

I also hereby sell and assign to Assignee, its successors and assigns, my foreign rights to the invention disclosed in said application, in all countries of the world, including, but not limited to, the right to file applications and obtain patents under the terms of the International Convention for the Protection of Industrial Property, and of the European Patent Convention, and further agree to execute any and all patent applications, assignments, affidavits, and any other papers in connection therewith necessary to perfect such patent rights.

I hereby further agree that I will communicate to said Assignee, or to its successors, assigns, and legal representatives, any facts known to me respecting said invention or the file history thereof, and at the expense of said Assignee, its legal representatives, successors, or assigns, will 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 Assignee, its legal representatives, successors, and assigns, to obtain and enforce proper patent protection for said invention in all countries.

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

| TITLE OF INVENTION | Chip-on-Substrate Packaging on Carrier | | | |
|---|--|-------------------------------------|---------------------|----------------------------|
| SIGNATURE OF INVENTOR AND NAME | Chen-Hua Yu | Teu-Shrun Shen Tzu-Shiun Sheu | Shin-Puu Jeng | Shih-Peng Shih-Peng Tai |
| DATE | 12/26/13 | 1/2013 | 12/27/2013 | 2013/12/26 |
| RESIDENCE | Hsin-Chu, Talwan | Hsin-Chu, Taiwan | Hsin-Chu, Taiwan | Xinpu Township, Taiwan |

ATTORNEY DOCKET NO. TSM13-1309

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; and

WHEREAS, Taiwan Semiconductor Manufacturing Company, Ltd. ("Assignee"), a corporation organized and existing under the laws of , with its principal office at No. 8, Li-Hsin Rd. 6 Science-Based Industrial Park, is desirous of acquiring my entire right, title and interest in and to said invention, and to said application and any Letters Patent that may issue thereon in the United States and all other countries throughout the world;

NOW, THEREFORE, for good and valuable consideration, the receipt of which is hereby acknowledged, I hereby sell and assign to said Assignee, its successors and assigns, my entire right, title and interest in and to said invention and in and to said application and all patents which may be granted therefor, and all future non-provisional applications including divisions, reissues, substitutions, continuations, and extensions thereof; and I hereby authorize and request the Commissioner for Patents to issue all patents for said invention, or patent resulting therefrom, insofar as my interest is concerned, to said Assignee, as assignee of my entire right, title and interest. I declare that I have not executed and will not execute any agreement in conflict herewith.

I also hereby sell and assign to Assignee, its successors and assigns, my foreign rights to the invention disclosed in said application, in all countries of the world, including, but not limited to, the right to file applications and obtain patents under the terms of the International Convention for the Protection of Industrial Property, and of the European Patent Convention, and further agree to execute any and all patent applications, assignments, affidavits, and any other papers in connection therewith necessary to perfect such patent rights.

I hereby further agree that I will communicate to said Assignee, or to its successors, assigns, and legal representatives, any facts known to me respecting said invention or the file history thereof, and at the expense of said Assignee, its legal representatives, successors, or assigns, will 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 Assignee, its legal representatives, successors, and assigns, to obtain and enforce proper patent protection for said invention in all countries.

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

| TITLE OF INVENTION | Chip-on-Substrate Packaging on Carrier | | | | |
|---|--|----------------------|--|--|--|
| SIGNATURE OF INVENTOR AND NAME | An-Jhih Su | Chilaw Chi-Hsi Wu | | | |
| DATE | 12/26/2013 | 12/47/2013 | | | |
| RESIDENCE | Bade City, Taiwan | Hsin-Chu, Taiwan | | | |

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; and

WHEREAS, Taiwan Semiconductor Manufacturing Company, Ltd. ("Assignee"), a corporation organized and existing under the laws of Taiwan, the Republic of China, with its principal office at No. 8, Li-Hsin Rd. 6 Science-Based Industrial Park, Hsin-Chu 300-77, Taiwan, R.O.C., is desirous of acquiring my entire right, title and interest in and to said invention, and to said application and any Letters Patent that may issue thereon in the United States and all other countries throughout the world;

NOW, THEREFORE, for good and valuable consideration, the receipt of which is hereby acknowledged, I hereby sell and assign to said Assignee, its successors and assigns, my entire right, title and interest in and to said invention and in and to said application and all patents which may be granted therefor, and all future non-provisional applications including divisions, reissues, substitutions, continuations, and extensions thereof; and I hereby authorize and request the Commissioner for Patents to issue all patents for said invention, or patent resulting therefrom, insofar as my interest is concerned, to said Assignee, as assignee of my entire right, title and interest, I declare that I have not executed and will not execute any agreement in conflict herewith.

I also hereby sell and assign to Assignee, its successors and assigns, my foreign rights to the invention disclosed in said application, in all countries of the world, including, but not limited to, the right to file applications and obtain patents under the terms of the International Convention for the Protection of Industrial Property, and of the European Patent Convention, and further agree to execute any and all patent applications, assignments, affidavits, and any other papers in connection therewith necessary to perfect such patent rights.

I hereby further agree that I will communicate to said Assignee, or to its successors, assigns, and legal representatives, any facts known to me respecting said invention or the file history thereof, and at the expense of said Assignee, its legal representatives, successors, or assigns, will 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 Assignee, its legal representatives, successors, and assigns, to obtain and enforce proper patent protection for said invention in all countries.

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

| TITLE OF INVENTION | Chip-on-Substrate Packaging on Carrier | | | | |
|---|--|-------------------------------------|---------------------|---------------------------|--|
| SIGNATURE OF INVENTOR AND NAME | Chen-Hua Yu | Ttu-shrun shen Tzu-Shiun Sheu | Shin-Puu Jeng | Shih-Peng Tai | |
| DATE | 12/26/13 | 12/2013 | 12/27/2013 | 2013/12/26 | |
| RESIDENCE | Hsin-Chu, Taiwan | Hsin-Chu, Taiwan | Hsin-Chu, Taiwan | Xinpu Township, Taiwan | |

RECORDED: 12/09/2016

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; and

WHEREAS, Taiwan Semiconductor Manufacturing Company, Ltd. ("Assignee"), a corporation organized and existing under the laws of , with its principal office at No. 8, Li-Hsin Rd. 6 Science-Based Industrial Park, is desirous of acquiring my entire right, title and interest in and to said invention, and to said application and any Letters Patent that may issue thereon in the United States and all other countries throughout the world;

NOW, THEREFORE, for good and valuable consideration, the receipt of which is hereby acknowledged, I hereby sell and assign to said Assignee, its successors and assigns, my entire right, title and interest in and to said invention and in and to said application and all patents which may be granted therefor, and all future non-provisional applications including divisions, reissues, substitutions, continuations, and extensions thereof; and I hereby authorize and request the Commissioner for Patents to issue all patents for said invention, or patent resulting therefrom, insofar as my interest is concerned, to said Assignee, as assignee of my entire right, title and interest. I declare that I have not executed and will not execute any agreement in conflict herewith.

I also hereby sell and assign to Assignee, its successors and assigns, my foreign rights to the invention disclosed in said application, in all countries of the world, including, but not limited to, the right to file applications and obtain patents under the terms of the International Convention for the Protection of Industrial Property, and of the European Patent Convention, and further agree to execute any and all patent applications, assignments, affidavits, and any other papers in connection therewith necessary to perfect such patent rights.

I hereby further agree that I will communicate to said Assignee, or to its successors, assigns, and legal representatives, any facts known to me respecting said invention or the file history thereof, and at the expense of said Assignee, its legal representatives, successors, or assigns, will 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 Assignee, its legal representatives, successors, and assigns, to obtain and enforce proper patent protection for said invention in all countries.

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

| TITLE OF INVENTION | Chip-on-Substrate Packaging on Carrier | | | | |
|---|--|----------------------|--|--|--|
| SIGNATURE OF INVENTOR AND NAME | An-Thich Su | Chilaw Chi-Hsi Wu | | | |
| DATE | 17/26/2013 | 12/37/2013 | | | |
| RESIDENCE | Bade City, Taiwan | Hsin-Chu, Taiwan | | | |

Page 2 of 2

Assignment

PATENT REEL: 040961 FRAME: 0475