

## PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1  
 Stylesheet Version v1.2

EPAS ID: PAT4381567

|                                                                                                                                                                                                 |                                                                                                                                                                                                                                                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SUBMISSION TYPE:</b>                                                                                                                                                                         | CORRECTIVE ASSIGNMENT                                                                                                                                                                                                                          |
| <b>NATURE OF CONVEYANCE:</b>                                                                                                                                                                    | Corrective Assignment to correct the MIDDLE INITIAL OF INVENTOR HOSSAM M. ABDALLAH FROM M. TO A. previously recorded on Reel 028830 Frame 0938. Assignor(s) hereby confirms the MIDDLE OF INITIAL OF HOSSAM M. ABDALLAH IS HOSSAM A. ABDALLAH. |
| <b>CONVEYING PARTY DATA</b>                                                                                                                                                                     |                                                                                                                                                                                                                                                |
| <b>Name</b>                                                                                                                                                                                     | <b>Execution Date</b>                                                                                                                                                                                                                          |
| CHARLES H. WALLACE                                                                                                                                                                              | 06/13/2012                                                                                                                                                                                                                                     |
| HOSSAM A. ABDALLAH                                                                                                                                                                              | 04/21/2017                                                                                                                                                                                                                                     |
| ELLIOT N. TAN                                                                                                                                                                                   | 06/13/2012                                                                                                                                                                                                                                     |
| SWAMINATHAN SIVAKUMAR                                                                                                                                                                           | 06/21/2012                                                                                                                                                                                                                                     |
| OLEG GOLONZKA                                                                                                                                                                                   | 06/14/2012                                                                                                                                                                                                                                     |
| ROBERT M. BIGWOOD                                                                                                                                                                               | 06/14/2012                                                                                                                                                                                                                                     |
| <b>RECEIVING PARTY DATA</b>                                                                                                                                                                     |                                                                                                                                                                                                                                                |
| <b>Name:</b>                                                                                                                                                                                    | INTEL CORPORATION                                                                                                                                                                                                                              |
| <b>Street Address:</b>                                                                                                                                                                          | 2200 MISSION COLLEGE BOULEVARD                                                                                                                                                                                                                 |
| <b>City:</b>                                                                                                                                                                                    | SANTA CLARA                                                                                                                                                                                                                                    |
| <b>State/Country:</b>                                                                                                                                                                           | CALIFORNIA                                                                                                                                                                                                                                     |
| <b>Postal Code:</b>                                                                                                                                                                             | 95054                                                                                                                                                                                                                                          |
| <b>PROPERTY NUMBERS Total: 1</b>                                                                                                                                                                |                                                                                                                                                                                                                                                |
| <b>Property Type</b>                                                                                                                                                                            | <b>Number</b>                                                                                                                                                                                                                                  |
| <b>PCT Number:</b>                                                                                                                                                                              | US1167930                                                                                                                                                                                                                                      |
| <b>CORRESPONDENCE DATA</b>                                                                                                                                                                      |                                                                                                                                                                                                                                                |
| <b>Fax Number:</b>                                                                                                                                                                              | (603)782-4378                                                                                                                                                                                                                                  |
| <i>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.</i> |                                                                                                                                                                                                                                                |
| <b>Phone:</b>                                                                                                                                                                                   | 603-622-8456                                                                                                                                                                                                                                   |
| <b>Email:</b>                                                                                                                                                                                   | lunderhill@finchmaloney.com                                                                                                                                                                                                                    |
| <b>Correspondent Name:</b>                                                                                                                                                                      | FINCH & MALONEY PLLC                                                                                                                                                                                                                           |
| <b>Address Line 1:</b>                                                                                                                                                                          | GATEWAY ONE                                                                                                                                                                                                                                    |
| <b>Address Line 2:</b>                                                                                                                                                                          | 50 COMMERCIAL - SUITE 300                                                                                                                                                                                                                      |
| <b>Address Line 4:</b>                                                                                                                                                                          | MANCHESTER, NEW HAMPSHIRE 03101                                                                                                                                                                                                                |
| <b>ATTORNEY DOCKET NUMBER:</b>                                                                                                                                                                  | P41436PCT                                                                                                                                                                                                                                      |
| <b>NAME OF SUBMITTER:</b>                                                                                                                                                                       | NEIL F. MALONEY, REG. NO. 42, 833                                                                                                                                                                                                              |
| <b>SIGNATURE:</b>                                                                                                                                                                               | /Neil F. Maloney/                                                                                                                                                                                                                              |

PATENT

|                                                                                                                                                                                         |            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>DATE SIGNED:</b>                                                                                                                                                                     | 04/24/2017 |
| <b>Total Attachments: 3</b><br>source=P41436PCT-Corrective-Assignment#page1.tif<br>source=P41436PCT-Corrective-Assignment#page2.tif<br>source=P41436PCT-Corrective-Assignment#page3.tif |            |

## PATENT ASSIGNMENT

Electronic Version v1.1

Stylesheet Version v1.1

| SUBMISSION TYPE:                                                                                                                                                                                                                                                                                                                                                                                                                        | NEW ASSIGNMENT             |               |                   |                    |                            |                    |             |                |            |                       |            |               |            |                   |            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------|-------------------|--------------------|----------------------------|--------------------|-------------|----------------|------------|-----------------------|------------|---------------|------------|-------------------|------------|
| NATURE OF CONVEYANCE:                                                                                                                                                                                                                                                                                                                                                                                                                   | ASSIGNMENT                 |               |                   |                    |                            |                    |             |                |            |                       |            |               |            |                   |            |
| CONVEYING PARTY DATA                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |               |                   |                    |                            |                    |             |                |            |                       |            |               |            |                   |            |
| <table border="1"><thead><tr><th>Name</th><th>Execution Date</th></tr></thead><tbody><tr><td>Charles H. Wallace</td><td>06/13/2012</td></tr><tr><td>Hossam M. Abdallah</td><td>06/14/2012</td></tr><tr><td>Elliot N. Tan</td><td>06/13/2012</td></tr><tr><td>Swaminathan Sivakumar</td><td>06/21/2012</td></tr><tr><td>Oleg Golonzka</td><td>06/14/2012</td></tr><tr><td>Robert M. Bigwood</td><td>06/14/2012</td></tr></tbody></table> |                            | Name          | Execution Date    | Charles H. Wallace | 06/13/2012                 | Hossam M. Abdallah | 06/14/2012  | Elliot N. Tan  | 06/13/2012 | Swaminathan Sivakumar | 06/21/2012 | Oleg Golonzka | 06/14/2012 | Robert M. Bigwood | 06/14/2012 |
| Name                                                                                                                                                                                                                                                                                                                                                                                                                                    | Execution Date             |               |                   |                    |                            |                    |             |                |            |                       |            |               |            |                   |            |
| Charles H. Wallace                                                                                                                                                                                                                                                                                                                                                                                                                      | 06/13/2012                 |               |                   |                    |                            |                    |             |                |            |                       |            |               |            |                   |            |
| Hossam M. Abdallah                                                                                                                                                                                                                                                                                                                                                                                                                      | 06/14/2012                 |               |                   |                    |                            |                    |             |                |            |                       |            |               |            |                   |            |
| Elliot N. Tan                                                                                                                                                                                                                                                                                                                                                                                                                           | 06/13/2012                 |               |                   |                    |                            |                    |             |                |            |                       |            |               |            |                   |            |
| Swaminathan Sivakumar                                                                                                                                                                                                                                                                                                                                                                                                                   | 06/21/2012                 |               |                   |                    |                            |                    |             |                |            |                       |            |               |            |                   |            |
| Oleg Golonzka                                                                                                                                                                                                                                                                                                                                                                                                                           | 06/14/2012                 |               |                   |                    |                            |                    |             |                |            |                       |            |               |            |                   |            |
| Robert M. Bigwood                                                                                                                                                                                                                                                                                                                                                                                                                       | 06/14/2012                 |               |                   |                    |                            |                    |             |                |            |                       |            |               |            |                   |            |
| RECEIVING PARTY DATA                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |               |                   |                    |                            |                    |             |                |            |                       |            |               |            |                   |            |
| <table border="1"><tr><td>Name:</td><td>Intel Corporation</td></tr><tr><td>Street Address:</td><td>2200 Mission College Blvd.</td></tr><tr><td>City:</td><td>Santa Clara</td></tr><tr><td>State/Country:</td><td>CALIFORNIA</td></tr><tr><td>Postal Code:</td><td>95052</td></tr></table>                                                                                                                                               |                            | Name:         | Intel Corporation | Street Address:    | 2200 Mission College Blvd. | City:              | Santa Clara | State/Country: | CALIFORNIA | Postal Code:          | 95052      |               |            |                   |            |
| Name:                                                                                                                                                                                                                                                                                                                                                                                                                                   | Intel Corporation          |               |                   |                    |                            |                    |             |                |            |                       |            |               |            |                   |            |
| Street Address:                                                                                                                                                                                                                                                                                                                                                                                                                         | 2200 Mission College Blvd. |               |                   |                    |                            |                    |             |                |            |                       |            |               |            |                   |            |
| City:                                                                                                                                                                                                                                                                                                                                                                                                                                   | Santa Clara                |               |                   |                    |                            |                    |             |                |            |                       |            |               |            |                   |            |
| State/Country:                                                                                                                                                                                                                                                                                                                                                                                                                          | CALIFORNIA                 |               |                   |                    |                            |                    |             |                |            |                       |            |               |            |                   |            |
| Postal Code:                                                                                                                                                                                                                                                                                                                                                                                                                            | 95052                      |               |                   |                    |                            |                    |             |                |            |                       |            |               |            |                   |            |
| PROPERTY NUMBERS Total: 1                                                                                                                                                                                                                                                                                                                                                                                                               |                            |               |                   |                    |                            |                    |             |                |            |                       |            |               |            |                   |            |
| <table border="1"><thead><tr><th>Property Type</th><th>Number</th></tr></thead><tbody><tr><td>PCT Number:</td><td>US2011067930</td></tr></tbody></table>                                                                                                                                                                                                                                                                                |                            | Property Type | Number            | PCT Number:        | US2011067930               |                    |             |                |            |                       |            |               |            |                   |            |
| Property Type                                                                                                                                                                                                                                                                                                                                                                                                                           | Number                     |               |                   |                    |                            |                    |             |                |            |                       |            |               |            |                   |            |
| PCT Number:                                                                                                                                                                                                                                                                                                                                                                                                                             | US2011067930               |               |                   |                    |                            |                    |             |                |            |                       |            |               |            |                   |            |
| CORRESPONDENCE DATA                                                                                                                                                                                                                                                                                                                                                                                                                     |                            |               |                   |                    |                            |                    |             |                |            |                       |            |               |            |                   |            |
| Fax Number: 6123328352                                                                                                                                                                                                                                                                                                                                                                                                                  |                            |               |                   |                    |                            |                    |             |                |            |                       |            |               |            |                   |            |
| Phone: 603-769-7493                                                                                                                                                                                                                                                                                                                                                                                                                     |                            |               |                   |                    |                            |                    |             |                |            |                       |            |               |            |                   |            |
| Email: klodermeier@cpaglobal.com                                                                                                                                                                                                                                                                                                                                                                                                        |                            |               |                   |                    |                            |                    |             |                |            |                       |            |               |            |                   |            |
| <i>Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent via US Mail.</i>                                                                                                                                                                                                                                                                                                                   |                            |               |                   |                    |                            |                    |             |                |            |                       |            |               |            |                   |            |
| Correspondent Name: Finch & Maloney PLLC                                                                                                                                                                                                                                                                                                                                                                                                |                            |               |                   |                    |                            |                    |             |                |            |                       |            |               |            |                   |            |
| Address Line 1: c/o CPA Global                                                                                                                                                                                                                                                                                                                                                                                                          |                            |               |                   |                    |                            |                    |             |                |            |                       |            |               |            |                   |            |
| Address Line 2: P.O. Box 52050                                                                                                                                                                                                                                                                                                                                                                                                          |                            |               |                   |                    |                            |                    |             |                |            |                       |            |               |            |                   |            |
| Address Line 4: Minneapolis, MINNESOTA 55402                                                                                                                                                                                                                                                                                                                                                                                            |                            |               |                   |                    |                            |                    |             |                |            |                       |            |               |            |                   |            |
| ATTORNEY DOCKET NUMBER:                                                                                                                                                                                                                                                                                                                                                                                                                 | P41436PCT                  |               |                   |                    |                            |                    |             |                |            |                       |            |               |            |                   |            |
| PATENT                                                                                                                                                                                                                                                                                                                                                                                                                                  |                            |               |                   |                    |                            |                    |             |                |            |                       |            |               |            |                   |            |
| REEL: 042319 FRAME: 0047                                                                                                                                                                                                                                                                                                                                                                                                                |                            |               |                   |                    |                            |                    |             |                |            |                       |            |               |            |                   |            |

## ASSIGNMENT

In consideration of good and valuable consideration, the receipt of which is hereby acknowledged, we, the undersigned inventor(s):

*A. H. 4/20/17*  
Charles H. Wallace; Hossam M. Abdallah; Elliot N. Tan; Swaminathan Sivakumar; Oleg Golonzka; Robert M. Higwood

herby sell, assign, and transfer to:

**Intel Corporation**

a corporation of Delaware, having a principal place of business at 2200 Mission College Boulevard, Santa Clara, California, 95052 USA ("Assignee"), and its successors, assigns, and legal representatives, the entire right, title, and interest for the United States and all foreign countries, in and to any and all inventions and improvements that are disclosed in the international application entitled:

### **PATTERN DECOMPOSITION LITHOGRAPHY TECHNIQUES**

(I hereby authorize and request my attorney, associated with Customer Number 99256, to insert on the designated lines below, the filing date and application number of said application when known.)

which was filed on December 29, 2011 as

International Application Number PCT/US2011/067930 and

which has been executed by the undersigned prior hereto or concurrently herewith on the date(s) indicated below.

and in and to said international application and all related applications (e.g. national phase applications), divisional applications, continuation applications, reexaminations, reissues, and the like) that have been or shall be filed in the United States and/or all foreign countries on said inventions and improvements, as well as in and to all rights of priority resulting from the filing of said international application;

agree that said Assignee may apply for and receive a patent or patents for said inventions and improvements in its own name; and that, when requested, without charge to, but at the expense of, said Assignee, its successors, assigns, and legal representatives, to carry out in good faith the intent and purpose of this Assignment, the undersigned will execute all design, utility, divisional, continuing, continuation-in-part, substitute, renewal, reissue, and all other patent applications on any and all said inventions and improvements; execute all rightful oaths, assignments, powers of attorney, and other papers; communicate to said Assignee, its successors, assigns, and legal representatives all facts known to the undersigned relating to said inventions and improvements and the history thereof; and generally assist said Assignee, its successors, assigns, or legal representatives in securing and maintaining proper patent protection for said

Attorney Docket No.: P41436PCT

inventions and improvements and for vesting title to said inventions and improvements, and all applications for patents and all patents on said improvements, in said Assignee, its successors, assigns, and legal representatives; and

covenant with said Assignee, its successors, assigns, and legal representatives that no assignment, grant, mortgage, license, or other agreement affecting the rights and property herein conveyed has been made to others by the undersigned, and that full right to convey the same as herein expressed is possessed by the undersigned.

  
WALLACE, Charles H.

6/13/12  
(Today's Date)

  
ABDALLAH, Hossain M. 4/21/17

6/14/12  
(Today's Date)

TAN, Elliot N.

6/13/12  
(Today's Date)

  
SIVAKUMAR, Swaminathan

6/21/12  
(Today's Date)

  
GOLONZKA, Oleg

6/14/12  
(Today's Date)

  
BIGWOOD, Robert M.

6/14/12  
(Today's Date)