

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>Andrew E. Gruber</td> <td>12/10/2012</td> </tr> <tr> <td>Tao Wang</td> <td>12/14/2012</td> </tr> <tr> <td>Shambhoo Khandelwal</td> <td>12/14/2012</td> </tr> </tbody> </table>		Name	Execution Date	Andrew E. Gruber	12/10/2012	Tao Wang	12/14/2012	Shambhoo Khandelwal	12/14/2012
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Andrew E. Gruber	12/10/2012								
Tao Wang	12/14/2012								
Shambhoo Khandelwal	12/14/2012								
RECEIVING PARTY DATA									
Name:	QUALCOMM Incorporated								
Street Address:	5775 Morehouse Drive								
City:	San Diego								
State/Country:	CALIFORNIA								
Postal Code:	92121-1714								
PROPERTY NUMBERS Total: 1									
<table border="1"> <thead> <tr> <th>Property Type</th> <th>Number</th> </tr> </thead> <tbody> <tr> <td>Application Number:</td> <td>13725393</td> </tr> </tbody> </table>		Property Type	Number	Application Number:	13725393				
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Application Number:	13725393								
CORRESPONDENCE DATA									
Fax Number:	6517351102								
<i>Correspondence will be sent via US Mail when the fax attempt is unsuccessful.</i>									
Phone:	651 735 1100								
Email:	pairedocketing@ssiplaw.com								
Correspondent Name:	Shumaker & Sieffert, P. A.								
Address Line 1:	1625 Radio Drive, Suite 300								
Address Line 4:	Woodbury, MINNESOTA 55125								
ATTORNEY DOCKET NUMBER:	1212-346US01								
NAME OF SUBMITTER:	Susan J. Daly								
<p>Total Attachments: 9 source=Assignment#page1.tif source=Assignment#page2.tif</p>									

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ASSIGNMENT

WHEREAS, WE,

1. **Andrew E. Gruber**, a citizen of **United States of America**, having a mailing address located at **5775 Morehouse Drive, San Diego, CA 92121-1714** and a resident of **Arlington, MA**,
2. **Tao Wang**, a citizen of **China**, having a mailing address located at **5775 Morehouse Drive, San Diego, CA 92121-1714** and a resident of **Sunnyvale, CA**,
3. **Shambhoo Khandelwal**, a citizen of **India**, having a mailing address located at **5775 Morehouse Drive, San Diego, CA 92121-1714** and a resident of **Santa Clara, CA**,

have conceived of one or more processes, methods, machines, articles of manufacture, designs, compositions of matter, inventions, discoveries or new or useful improvements relating to **MULTI-MODE MEMORY ACCESS TECHNIQUES FOR PERFORMING GRAPHICS PROCESSING UNIT-BASED MEMORY TRANSFER OPERATIONS** (collectively the "INVENTIONS") for which WE have executed and/or may execute one or more patent applications therefor; and

WHEREAS, QUALCOMM Incorporated (hereinafter "ASSIGNEE"), a Delaware corporation, having a place of business at 5775 Morehouse Drive, San Diego, California 92121-1714, U.S.A., desires to acquire or otherwise obtain the entire right, title, and interest in and to said INVENTIONS, including all inventions related thereto or thereof, all patent applications therefor, and all patents that have granted or may be granted hereafter thereon, including but not limited to those identified below.

NOW, THEREFORE, for good and valuable consideration, the receipt of which is hereby acknowledged, WE do hereby acknowledge that WE have sold, assigned, conveyed, and transferred, and by these presents do hereby sell, assign, convey, and transfer, unto ASSIGNEE, its successors, its legal representatives, and its assigns, the entire right, title, and interest throughout the world in and to said INVENTIONS, including all patent applications therefor that may have been filed or may be filed hereafter for said INVENTIONS in the United States, including but not limited to U.S. Application No(s). 13/725,393 filed 12/21/2012, QUALCOMM Reference No. **123097**, and all provisional applications relating thereto, (and do hereby authorize ASSIGNEE and its representative to hereafter add herein such application number(s) and/or filing date(s) when known), and all divisional applications, renewal applications, continuation applications, continuation-in-part applications, and design applications thereof, and all issued patents of the United States which may have granted or may be granted hereafter thereon and all reissues, renewals, reexaminations, and extensions to any of the foregoing and all patents issuing thereon in the United States;

AND WE further do acknowledge and agree that WE have sold, assigned, conveyed, and transferred, and by these presents do hereby sell, assign, convey, and transfer, unto ASSIGNEE, its successors, its legal representatives, and its assigns, all rights of priority under International

Conventions, Treaties, or Agreements, and the entire right, title, and interest throughout the world in said INVENTIONS, including all inventions related thereto or thereof, and all patent applications therefor that may have been filed or may be filed hereafter for said INVENTIONS in any foreign country, countries, or treaty/union organizations, and all divisional applications, renewal applications, continuation applications, continuation-in-part applications, patent of addition applications, confirmation applications, validation applications, utility model applications, and design applications thereof, and all issued patents which may have granted or may be granted hereafter for said INVENTIONS in any country or countries foreign to the United States, and all reissues, renewals, reexaminations, and extensions thereof;

AND WE DO HEREBY authorize and request the Commissioner of Patents of the United States, and any Official of any country or countries foreign to the United States, whose duty it is to issue patents on applications or registrations, to issue all patents for said INVENTIONS to said ASSIGNEE, its successors, its legal representatives and its assigns, in accordance with the terms of this instrument;

AND WE DO HEREBY sell, assign, transfer, and convey to said ASSIGNEE, its successors, its legal representatives, and its assigns all claims for damages and all remedies arising out of or relating to any violation(s) of any of the rights assigned hereby that have or may have accrued prior to the date of assignment to said ASSIGNEE, or may accrue hereafter, including, but not limited to the right to sue for, seek, obtain, collect, recover, and retain damages and any ongoing or prospective royalties to which WE may be entitled, or that WE may collect for any infringement or from any settlement or agreement related to any of said patents before or after issuance;

AND WE HEREBY covenant and agree that WE will communicate promptly to said ASSIGNEE, its successors, its legal representatives, and its assigns, any facts known to us respecting said INVENTIONS, and will testify in any legal proceeding, sign all lawful papers, execute all applications and certificates, make all rightful declarations and/or oaths, and provide all lawful assistance to said ASSIGNEE, its successors, its legal representatives and its assigns, to obtain and enforce patent protection for said INVENTIONS in all countries;

PATENT
QUALCOMM Ref. No. **123097**
Page 3 of 3

AND WE HEREBY represent that WE have full and exclusive, unencumbered right to sell, assign, convey and transfer all subject matter herein, and hereby covenant that WE have not and will not execute any writing or do any act whatsoever conflicting with these presents.

Done at Arlington, MA, on 12/10/12 Andrew E. Gruber
LOCATION DATE

Done at _____, on _____
LOCATION DATE Tao Wang

Done at _____, on _____
LOCATION DATE Shambhoo Khundelwal

ASSIGNMENT

WHEREAS, WE,

1. **Andrew E. Gruber**, a citizen of **United States of America**, having a mailing address located at **5775 Morehouse Drive, San Diego, CA 92121-1714** and a resident of **Arlington, MA**,
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AND WE further do acknowledge and agree that WE have sold, assigned, conveyed, and transferred, and by these presents do hereby sell, assign, convey, and transfer, unto ASSIGNEE, its successors, its legal representatives, and its assigns, all rights of priority under International

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AND WE DO HEREBY authorize and request the Commissioner of Patents of the United States, and any Official of any country or countries foreign to the United States, whose duty it is to issue patents on applications or registrations, to issue all patents for said INVENTIONS to said ASSIGNEE, its successors, its legal representatives and its assigns, in accordance with the terms of this instrument;

AND WE DO HEREBY sell, assign, transfer, and convey to said ASSIGNEE, its successors, its legal representatives, and its assigns all claims for damages and all remedies arising out of or relating to any violation(s) of any of the rights assigned hereby that have or may have accrued prior to the date of assignment to said ASSIGNEE, or may accrue hereafter, including, but not limited to the right to sue for, seek, obtain, collect, recover, and retain damages and any ongoing or prospective royalties to which WE may be entitled, or that WE may collect for any infringement or from any settlement or agreement related to any of said patents before or after issuance;

AND WE HEREBY covenant and agree that WE will communicate promptly to said ASSIGNEE, its successors, its legal representatives, and its assigns, any facts known to us respecting said INVENTIONS, and will testify in any legal proceeding, sign all lawful papers, execute all applications and certificates, make all rightful declarations and/or oaths, and provide all lawful assistance to said ASSIGNEE, its successors, its legal representatives and its assigns, to obtain and enforce patent protection for said INVENTIONS in all countries;

AND WE HEREBY represent that WE have full and exclusive, unencumbered right to sell, assign, convey and transfer all subject matter herein, and hereby covenant that WE have not and will not execute any writing or do any act whatsoever conflicting with these presents.

Done at _____, on _____
LOCATION DATE **Andrew E. Gruber**

Done at Santa Clara, on 12/14/2012
LOCATION DATE **Tao Wang**

Done at _____, on _____
LOCATION DATE **Shambhoo Khandelwal**

ASSIGNMENT

WHEREAS, WE,

1. **Andrew E. Gruber**, a citizen of **United States of America**, having a mailing address located at **5775 Morehouse Drive, San Diego, CA 92121-1714** and a resident of **Arlington, MA**,
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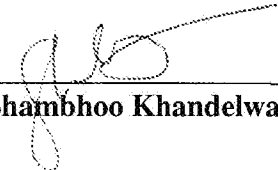
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Done at _____, on _____
LOCATION DATE **Andrew E. Gruber**

Done at _____, on _____
LOCATION DATE **Tao Wang**

Done at SANTA CLARA, on 12/19/2012
LOCATION DATE 
Shambhoo Khandelwal