

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
 Stylesheet Version v1.2

EPAS ID: PAT3986262

SUBMISSION TYPE:	CORRECTIVE ASSIGNMENT
NATURE OF CONVEYANCE:	Corrective Assignment to correct the NAME OF THE THIRD CONVEYING PARTY FROM "THOMAS M. ZENG" TO "THOMAS ZENG" previously recorded on Reel 039134 Frame 0196. Assignor(s) hereby confirms the NAME OF THE THIRD CONVEYING PARTY IS "THOMAS ZENG".

CONVEYING PARTY DATA

Name	Execution Date
ASSAF SHACHAM	06/19/2016
SHAUL YOHAI YIFRACH	07/06/2016
THOMAS ZENG	07/02/2016

RECEIVING PARTY DATA

Name:	QUALCOMM INCORPORATED
Street Address:	5775 MOREHOUSE DRIVE
City:	SAN DIEGO
State/Country:	CALIFORNIA
Postal Code:	92121

PROPERTY NUMBERS Total: 1

Property Type	Number
Application Number:	15084886

CORRESPONDENCE DATA**Fax Number:**

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: 919-238-2300
Email: dsmith@wt-ip.com
Correspondent Name: W&T/QUALCOMM
Address Line 1: 106 PINEDALE SPRINGS WAY
Address Line 4: CARY, NORTH CAROLINA 27511

ATTORNEY DOCKET NUMBER:	161140/1173-356
NAME OF SUBMITTER:	DAVID M. SMITH
SIGNATURE:	/David M. Smith/
DATE SIGNED:	08/01/2016

Total Attachments: 8

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**United States Patent and Trademark Office**

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The coversheet of the assignment is displayed below:

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
ASSAF SHACHAM	06/19/2016
SHAUL YOHAI YIFRACH	07/06/2016
THOMAS M. ZENG	07/02/2016
RECEIVING PARTY DATA	
Name:	QUALCOMM INCORPORATED
Street Address:	5775 MOREHOUSE DRIVE
City:	SAN DIEGO
State/Country:	CALIFORNIA
Postal Code:	92121
PROPERTY NUMBERS Total: 1	
Property Type	Number
Application Number:	15084886
CORRESPONDENCE DATA	

PATENT**REEL: 039515 FRAME: 0875**

Fax Number:**Phone:** 919-238-2300**Email:** dsmith@wt-ip.com*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.***Correspondent Name:** W&T/QUALCOMM**Address Line 1:** 106 PINEDALE SPRINGS WAY**Address Line 4:** CARY, NORTH CAROLINA 27511

ATTORNEY DOCKET NUMBER:	161140/1173-356
NAME OF SUBMITTER:	DAVID M. SMITH
Signature:	/David M. Smith/
Date:	07/12/2016
Total Attachments: 6 source=161140_Assignment_07-12-16_AsRecorded#page1.tif source=161140_Assignment_07-12-16_AsRecorded#page2.tif source=161140_Assignment_07-12-16_AsRecorded#page3.tif source=161140_Assignment_07-12-16_AsRecorded#page4.tif source=161140_Assignment_07-12-16_AsRecorded#page5.tif source=161140_Assignment_07-12-16_AsRecorded#page6.tif	
RECEIPT INFORMATION EPAS ID: PAT3957792 Receipt Date: 07/12/2016	

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ASSIGNMENT

WHEREAS, WE,

1. **Assaf Shacham**, a citizen of Israel, having a mailing address located at 28A Atzmaut St., Zichron Yaakov, Israel 30900 and a resident of Zichron Yaakov, Israel,
2. **Shaul Yohai Yifrach**, a citizen of Israel, having a mailing address located at 5775 Morehouse Drive, San Diego, California 92121 and a resident of Haifa, Israel,
3. **Thomas Zeng**, a citizen of the United States, having a mailing address located at 5775 Morehouse Drive, San Diego, California 92121 and a resident of San Diego, California,

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 **HARDWARE-BASED TRANSLATION LOOKASIDE BUFFER (TLB) INVALIDATION** (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). 15/084,886 filed March 30, 2016, Qualcomm Reference No. 161140, 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;

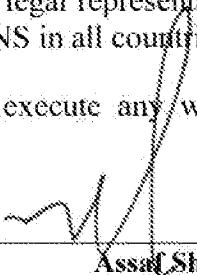
AND WE DO HEREBY authorize and request the Commissioner of Patents of the United States, and any Official of any country or countries foreign to the United States, whose duty it is to issue patents on applications or registrations, to issue all patents for said INVENTIONS to said ASSIGNEE, its successors,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

AND WE HEREBY covenant that WE will not execute any writing or do any act whatsoever conflicting with these presents.

Done at ISRAEL, on 19-Jan-16
LOCATION DATE


Assaf Shacham

Done at _____, on _____
LOCATION DATE

Shaul Yohai Yifrach

Done at _____, on _____
LOCATION DATE

Thomas Zeng

ASSIGNMENT

WHEREAS, WE,

1. **Assaf Shacham**, a citizen of Israel, having a mailing address located at 28A Atzmaut St., Zichron Yaakov, Israel 30900 and a resident of Zichron Yaakov, Israel,
2. **Shaul Yohai Yifrach**, a citizen of Israel, having a mailing address located at 5775 Morehouse Drive, San Diego, California 92121 and a resident of Haifa, Israel,
3. **Thomas Zeng**, a citizen of the United States, having a mailing address located at 5775 Morehouse Drive, San Diego, California 92121 and a resident of San Diego, California,

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 **HARDWARE-BASED TRANSLATION LOOKASIDE BUFFER (TLB) INVALIDATION** (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). 15/084,886 filed March 30, 2016, Qualcomm Reference No. 161140, 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;

AND WE HEREBY covenant that WE will not execute any writing or do any act whatsoever conflicting with these presents.

Done at _____, on _____
LOCATION DATE

Assaf Shacham

Done at HAIFA IL, on 8/7/16
LOCATION DATE

Shaul Yohai Yifrach

Done at _____, on _____
LOCATION DATE

Thomas Zeng

ASSIGNMENT

WHEREAS, WE,

1. **Assaf Shacham**, a citizen of Israel, having a mailing address located at 28A Atzmaut St., Zichron Yaakov, Israel 30900 and a resident of Zichron Yaakov, Israel,
2. **Shaul Yohai Yifrach**, a citizen of Israel, having a mailing address located at 5775 Morehouse Drive, San Diego, California 92121 and a resident of Haifa, Israel,
3. **Thomas Zeng**, a citizen of the United States, having a mailing address located at 5775 Morehouse Drive, San Diego, California 92121 and a resident of San Diego, California,

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 **HARDWARE-BASED TRANSLATION LOOKASIDE BUFFER (TLB) INVALIDATION** (collectively the "**INVENTIONS**") for which WE have executed and/or may execute one or more patent applications therefor; and

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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). 15/084,886 filed March 30, 2016, Qualcomm Reference No. 161140, 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;

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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;

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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 covenant that WE will not execute any writing or do any act whatsoever conflicting with these presents.

Done at _____, on _____
 LOCATION DATE Assaf Shacham

Done at _____, on _____
 LOCATION DATE Shaul Yohai Yifrach

Done at San Diego, on 7/2/2016
 LOCATION DATE Thomas Zeng