

<b>PATENT ASSIGNMENT COVER SHEET</b>
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Electronic Version v1.1  
 Stylesheet Version v1.2

EPAS ID: PAT5436282

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	ASSIGNMENT
<b>CONVEYING PARTY DATA</b>	
<b>Name</b>	<b>Execution Date</b>
HEECHOOON LEE	02/15/2019
TINGFANG JI	02/21/2019
JOSEPH BINAMIRA SORIAGA	02/13/2019
ALEXEI YURIEVITCH GOROKHOV	02/12/2019
PETER GAAL	02/12/2019
JOHN EDWARD SMEE	03/08/2019
NAGA BHUSHAN	03/12/2019
<b>RECEIVING PARTY DATA</b>	
<b>Name:</b>	QUALCOMM INCORPORATED
<b>Street Address:</b>	5775 MOREHOUSE DRIVE
<b>City:</b>	SAN DIEGO
<b>State/Country:</b>	CALIFORNIA
<b>Postal Code:</b>	92121-1714
<b>PROPERTY NUMBERS Total: 2</b>	
<b>Property Type</b>	<b>Number</b>
<b>Application Number:</b>	16002236
<b>Application Number:</b>	62517845
<b>CORRESPONDENCE DATA</b>	
<b>Fax Number:</b>	(303)473-2720
<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>	303-473-2700
<b>Email:</b>	PLNORMAN@HOLLANDHART.COM
<b>Correspondent Name:</b>	MICHAEL DRAPKIN
<b>Address Line 1:</b>	P.O. BOX 11583
<b>Address Line 4:</b>	SALT LAKE CITY, UTAH 84147
<b>ATTORNEY DOCKET NUMBER:</b>	PN354.01 (93519.1619)
<b>NAME OF SUBMITTER:</b>	MICHAEL L. DRAPKIN
<b>SIGNATURE:</b>	/Michael L. Drapkin/

<b>DATE SIGNED:</b>	03/22/2019
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**Total Attachments: 8**

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ASSIGNMENT

WHEREAS, I/WE,

1. **Heechoon LEE**, a citizen of the **Republic of Korea**, having a mailing address located at **5775 Morehouse Drive, San Diego, California 92121-1714**, and a resident of **San Diego, California**,
2. **Tingfang JI**, a citizen of the **United States of America**, having a mailing address located at **5775 Morehouse Drive, San Diego, California 92121-1714**, and a resident of **San Diego, California**,
3. **Joseph Binamira SORIAGA**, a citizen of the **United States of America**, having a mailing address located at **5775 Morehouse Drive, San Diego, California 92121-1714**, and a resident of **San Diego, California**,
4. **Alexei Yurievitch GOROKHOV**, a citizen of the **United States of America**, having a mailing address located at **5775 Morehouse Drive, San Diego, California 92121-1714**, and a resident of **San Diego, California**,
5. **Peter GAAL**, a citizen of the **United States of America**, having a mailing address located at **5775 Morehouse Drive, San Diego, California 92121-1714**, and a resident of **San Diego, California**,
6. **John Edward SMEE**, a citizen of **Canada**, having a mailing address located at **5775 Morehouse Drive, San Diego, California 92121-1714**, and a resident of **San Diego, California**, and
7. **Naga BHUSHAN**, a citizen of the **United States of America**, having a mailing address located at **5775 Morehouse Drive, San Diego, California 92121-1714**, 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 **FREQUENCY DIVISION DUPLEXING HYBRID AUTOMATIC REPEAT REQUEST WITH MINI-SLOTS** (collectively the "INVENTIONS") for which I/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, I/WE do hereby acknowledge that I/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. 16/002,236, filed June 7, 2018, Qualcomm Reference No. 174783, and all provisional applications relating thereto, together with U.S. Provisional Application No. 62/517,845, filed June 9, 2017, Qualcomm Reference No. 174783P1, (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 I/WE further do acknowledge and agree that I/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;

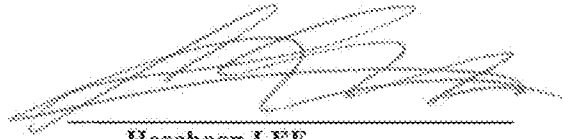
AND I/WE DO HEREBY authorize and request the Commissioner of Patents of the United States, and any Official of any country or countries foreign to the United States, whose duty it is to issue patents on applications or registrations, to issue all patents for said INVENTIONS to said ASSIGNEE, its successors,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

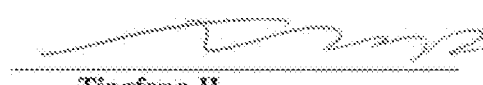
AND I/WE DO HEREBY sell, assign, transfer, and convey to said ASSIGNEE, its successors, its legal representatives, and its assigns all claims for damages and all remedies arising out of or relating to any violation(s) of any of the rights assigned hereby that have or may have accrued prior to the date 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 I/WE may be entitled, or that I/WE may

collect for any infringement or from any settlement or agreement related to any of said patents before or after issuance;

AND I/WE HEREBY covenant and agree that I/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;

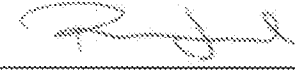
AND I/WE HEREBY covenant that I/WE will not execute any writing or do any act whatsoever conflicting with these presents.

Done at San Diego, on 02/15/19   
LOCATION DATE Heechoon LEE

Done at San Diego, CA, on 2/21/2019   
LOCATION DATE Tingfang Ji

Done at San Diego, CA, on 2/13/19   
LOCATION DATE Joseph Binamira SORIAGA

Done at \_\_\_\_\_, on \_\_\_\_\_  
LOCATION DATE Alexei Yurievitch GOROKHOV

Done at San Diego, on 02/12/2019   
LOCATION DATE Peter GAAL

Done at SANDIEGO, on 3/8/19   
LOCATION DATE John Edward SMEE

Done at SAN DIEGO, on 3/12/19   
LOCATION DATE Naga BHUSHAN

ASSIGNMENT

WHEREAS, I/WE,

1. **Heechoon LEE**, a citizen of the **Republic of Korea**, having a mailing address located at **5775 Morehouse Drive, San Diego, California 92121-1714**, and a resident of **San Diego, California**,
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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 **FREQUENCY DIVISION DUPLEXING HYBRID AUTOMATIC REPEAT REQUEST WITH MINI-SLOTS** (collectively the "INVENTIONS") for which I/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, I/WE do hereby acknowledge that I/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. 16/002,236, filed June 7, 2018, Qualcomm Reference No. 174783, and all provisional applications relating thereto, together with U.S. Provisional Application No. 62/517,845, filed June 9, 2017, Qualcomm Reference No. 174783P1, (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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AND I/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 I/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 I/WE may be entitled, or that I/WE may



collect for any infringement or from any settlement or agreement related to any of said patents before or after issuance;

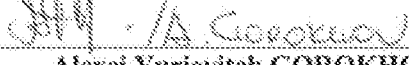
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AND I/WE HEREBY covenant that I/WE will not execute any writing or do any act whatsoever conflicting with these presents.

Done at \_\_\_\_\_, on \_\_\_\_\_  
LOCATION DATE Heechoon LEE

Done at \_\_\_\_\_, on \_\_\_\_\_  
LOCATION DATE Tingfang Ji

Done at \_\_\_\_\_, on \_\_\_\_\_  
LOCATION DATE Joseph Binamira SORIAGA

Done at SAN DIEGO, on 02/12/2019  
LOCATION DATE  Alexei Yurievitch GOROKHOV

Done at \_\_\_\_\_, on \_\_\_\_\_  
LOCATION DATE Peter GAAL

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