

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

EPAS ID: PAT4906664

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	ASSIGNMENT
<b>CONVEYING PARTY DATA</b>	
<b>Name</b>	<b>Execution Date</b>
WEI ZHUO	03/28/2018
TIMOTHY DONALD GATHMAN	03/21/2018
WENBANG XU	03/28/2018
LI-CHUNG CHANG	04/04/2018
RUI LI	03/30/2018
RAHUL KARMAKER	03/23/2018
<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: 1</b>	
<b>Property Type</b>	<b>Number</b>
<b>Application Number:</b>	15867206
<b>CORRESPONDENCE DATA</b>	
<b>Fax Number:</b>	(310)201-5219
<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>	310.277.7200
<b>Email:</b>	Qualcomm-USPTO@seyfarth.com
<b>Correspondent Name:</b>	SEYFARTH SHAW LLP
<b>Address Line 1:</b>	2029 CENTURY PARK EAST, SUITE 3500
<b>Address Line 4:</b>	LOS ANGELES, CALIFORNIA 90067
<b>ATTORNEY DOCKET NUMBER:</b>	173143
<b>NAME OF SUBMITTER:</b>	JOSEPH LUTZ
<b>SIGNATURE:</b>	/Joseph Lutz/
<b>DATE SIGNED:</b>	04/09/2018
<b>Total Attachments: 18</b>	

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source=173143\_Signed\_Assignment\_AsFiled\_09April2018#page18.tif

ASSIGNMENT

WHEREAS, WE,

1. **Wei ZHUO**, 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**
2. **Timothy Donald GATHMAN**, 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. **Wenbang XU**, a citizen of the **People's Republic of China**, having a mailing address located at **5775 Morehouse Drive; San Diego, California 92121-1714** and a resident of **San Diego, California**
4. **Li-chung CHANG**, 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 **Irvine, California**
5. **Rui LI**, 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. **Rahul KARMAKER**, a citizen of **India**, 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 **FILTER CIRCUIT** (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). **15/867,206**, filed **January 10, 2018**, Qualcomm Reference No. **173143**, and all provisional applications relating thereto, together with U.S. Provisional Application No(s). **62/535,518**, filed **July 21, 2017**, Qualcomm Reference No. **173143P1**, (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 San Diego, on 03/28/18  
LOCATION DATE

  
Wei ZHUO

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

\_\_\_\_\_  
Timothy Donald GATHMAN

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

\_\_\_\_\_  
Wenbang XU

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

\_\_\_\_\_  
Li-chung CHANG

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

\_\_\_\_\_  
Rui LI

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

\_\_\_\_\_  
Rahul KARMAKER

**ASSIGNMENT**

WHEREAS, WE,

1. **Wei ZHUO**, 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**
2. **Timothy Donald GATHMAN**, 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. **Wenbang XU**, a citizen of the **People's Republic of China**, having a mailing address located at **5775 Morehouse Drive; San Diego, California 92121-1714** and a resident of **San Diego, California**
4. **Li-chung CHANG**, 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 **Irvine, California**
5. **Rui LI**, 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. **Rahul KARMAKER**, a citizen of **India**, 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 **FILTER CIRCUIT** (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). **15/867,206**, filed **January 10, 2018**, Qualcomm Reference No. **173143**, and all provisional applications relating thereto, together with U.S. Provisional Application No(s). **62/535,518**, filed **July 21, 2017**, Qualcomm Reference No. **173143P1**, (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;

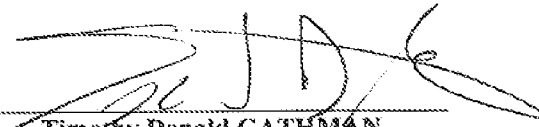
AND WE HEREBY covenant and agree that WE will communicate promptly to said ASSIGNEE, its successors, its legal representatives, and its assigns, any facts known to us respecting said INVENTIONS, and will testify in any legal proceeding, sign all lawful papers, execute all applications and certificates, 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

Wei ZHUO

Done at San Diego, CA USA, on 3/21/2018  
LOCATION DATE



Timothy Donald GATHMAN

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

Wenbang XU

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

Li-chung CHANG

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

Rui LI

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

Rahul KARMAKER



**ASSIGNMENT**

WHEREAS, WE,

1. **Wei ZHUO**, 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**
2. **Timothy Donald GATHMAN**, 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**
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5. **Rui LI**, 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. **Rahul KARMAKER**, a citizen of **India**, 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 **FILTER CIRCUIT** (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). **15/867,206**, filed **January 10, 2018**, Qualcomm Reference No. **173143**, and all provisional applications relating thereto, together with U.S. Provisional Application No(s). **62/535,518**, filed **July 21, 2017**, Qualcomm Reference No. **173143P1**, (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

\_\_\_\_\_  
Wei ZHUO

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

\_\_\_\_\_  
Timothy Donald GATHMAN

Done at San Diego, on 2/28/2018  
LOCATION DATE

  
\_\_\_\_\_  
Wenbang XU

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

\_\_\_\_\_  
Li-chung CHANG

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

\_\_\_\_\_  
Rui LI

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

\_\_\_\_\_  
Rahul KARMAKER

**ASSIGNMENT**

WHEREAS, WE,

1. **Wei ZHUO**, 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**
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6. **Rahul KARMAKER**, a citizen of **India**, 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 **FILTER CIRCUIT** (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.

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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;

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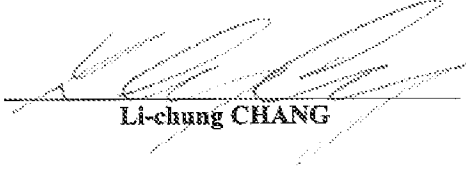
AND WE HEREBY covenant and agree that WE will communicate promptly to said ASSIGNEE, its successors, its legal representatives, and its assigns, any facts known to us respecting said INVENTIONS, and will testify in any legal proceeding, sign all lawful papers, execute all applications and certificates, 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 Wei ZHUO

Done at \_\_\_\_\_, on \_\_\_\_\_  
LOCATION DATE Timothy Donald GATHMAN

Done at \_\_\_\_\_, on \_\_\_\_\_  
LOCATION DATE Wenbang XU

Done at San Diego, on 4/4/2018  
LOCATION DATE   
Li-chung CHANG

Done at \_\_\_\_\_, on \_\_\_\_\_  
LOCATION DATE Rui LI

Done at \_\_\_\_\_, on \_\_\_\_\_  
LOCATION DATE Rahul KARMAKER

**ASSIGNMENT**

WHEREAS, WE,

1. **Wei ZHUO**, 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**
2. **Timothy Donald GATHMAN**, 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. **Wenbang XU**, a citizen of the **People's Republic of China**, having a mailing address located at **5775 Morehouse Drive; San Diego, California 92121-1714** and a resident of **San Diego, California**
4. **Li-chung CHANG**, 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 **Irvine, California**
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6. **Rahul KARMAKER**, a citizen of **India**, 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 **FILTER CIRCUIT** (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). **15/867,206**, filed **January 10, 2018**, Qualcomm Reference No. **173143**, and all provisional applications relating thereto, together with U.S. Provisional Application No(s). **62/535,518**, filed **July 21, 2017**, Qualcomm Reference No. **173143P1**, (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;



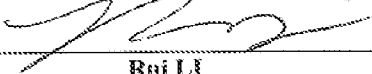
AND WE HEREBY covenant that WE will not execute any writing or do any act whatsoever conflicting with these presents.

Done at \_\_\_\_\_, on \_\_\_\_\_  
LOCATION DATE Wei ZHUO

Done at \_\_\_\_\_, on \_\_\_\_\_  
LOCATION DATE Timothy Donald GATHMAN

Done at \_\_\_\_\_, on \_\_\_\_\_  
LOCATION DATE Wenbang XU

Done at \_\_\_\_\_, on \_\_\_\_\_  
LOCATION DATE Li-chung CHANG

Done at SAN DIEGO, on 3/30/2018  
LOCATION DATE   
Rui Li

Done at \_\_\_\_\_, on \_\_\_\_\_  
LOCATION DATE Rahul KARMAKER

**ASSIGNMENT**

WHEREAS, WE,

1. **Wei ZHUO**, 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**
2. **Timothy Donald GATHMAN**, 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. **Wenbang XU**, a citizen of the **People's Republic of China**, having a mailing address located at **5775 Morehouse Drive; San Diego, California 92121-1714** and a resident of **San Diego, California**
4. **Li-chung CHANG**, 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 **Irvine, California**
5. **Rui LI**, 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. **Rahul KARMAKER**, a citizen of **India**, 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 **FILTER CIRCUIT** (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). **15/867,206**, filed **January 10, 2018**, Qualcomm Reference No. **173143**, and all provisional applications relating thereto, together with U.S. Provisional Application No(s). **62/535,518**, filed **July 21, 2017**, Qualcomm Reference No. **173143P1**, (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;

