

## ASSIGNMENT

WHEREAS, WE,

1. **Jing LEI**, a citizen of **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**,
2. **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**,
3. **Hao XU**, 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. **Wanshi CHEN**, a citizen of **People's Republic of China**, having a mailing address located at 5775 Morehouse Drive; San Diego, California 92121-17140 and a resident of **San Diego, California**,
5. **Yongbin WEI**, 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 **La Jolla, California**,
6. **Xiaofeng WANG**, 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**,
7. **Renqiu WANG**, a citizen of <sup>+the People's Republic of China</sup> ~~Canada~~, having a mailing address located at 5775 Morehouse Drive; San Diego, California 92121-1714 and a resident of **San Diego, California**, X RW 09/26/2019
8. **Seyed Ali Akbar FAKOORIAN**, a citizen of **the Islamic Republic of Iran**, having a mailing address located at 5775 Morehouse Drive; San Diego, California 92121-1714 and a resident of **San Diego, California**,
9. **Madhavan Srinivasan VAJAPEYAM**, 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**,
10. **Alberto RICO ALVARINO**, a citizen of **Spain**, having a mailing address located at 5775 Morehouse Drive; San Diego, California 92121-1714 and a resident of **San Diego, California**, and
11. **Juan MONTOJO**, 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

**DESIGN OF SYNCHRONIZATION SIGNALS FOR NARROWBAND OPERATION**  
(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, or under International Conventions, Treaties, or Agreements, U.S. Application No. **15/247,355**, filed **August 25, 2016**, Qualcomm Reference No. **157331**, and all provisional applications relating thereto, together with U.S. Provisional Application No. **62/234,554**, filed **September 29, 2015**, Qualcomm Reference No. **157331P1**, and 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;

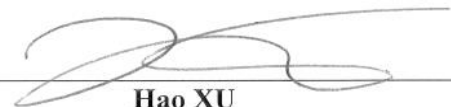
AND WE DO HEREBY sell, assign, transfer, and convey to said ASSIGNEE, its successors, its legal representatives, and its assigns all claims for damages and all remedies arising out of or relating to any violation(s) of any of the rights assigned hereby that have or may have accrued prior to the date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

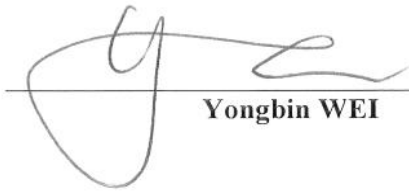
AND WE HEREBY covenant that WE will not execute any writing or do any act whatsoever conflicting with these presents.

Done at Qualcomm, on 10/19/2016  
LOCATION DATE  
  
Jing LEI

Done at San Diego, on 10/25/2016  
LOCATION DATE  
  
Peter GAAL

Done at San Diego, on 10/20/2016  
LOCATION DATE  
  
Hao XU

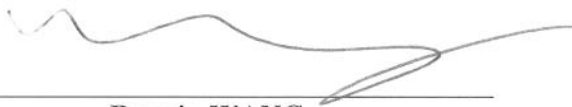
Done at San Diego, on 10/19/2016  
LOCATION DATE  
  
Wanshi CHEN

Done at San Diego, on 10/19/16  
LOCATION DATE  
  
Yongbin WEI

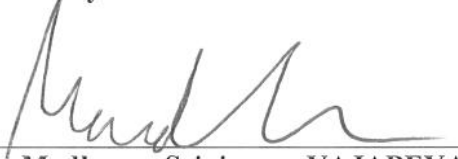
AND WE HEREBY covenant and agree that WE will communicate promptly to said ASSIGNEE, its successors, its legal representatives, and its assigns, any facts known to us respecting said INVENTIONS, and will testify in any legal proceeding, sign all lawful papers, execute all applications and certificates, 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 10/19/16  
LOCATION DATE  
  
Xiaofeng WANG

Done at San Diego, on 10/24/16  
LOCATION DATE  
  
Renqiu WANG

Done at San Diego, on 10/19/16  
LOCATION DATE  
ali fakoorian  
Seyed Ali Akbar FAKOORIAN

Done at San Diego, on 10/20/16  
LOCATION DATE  
  
Madhavan Srinivasan VAJAPAYAM

Done at San Diego, on 10/20/2016  
LOCATION DATE  
  
Alberto RICO ALVARINO

Done at San Diego, on 10/21/16  
LOCATION DATE  
  
Juan MONTOJO