

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

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 NTD PATENT & TRADEMARK AGENCY
 LIMITED

PCT

WRITTEN OPINION OF THE
 INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing <i>(day/month/year)</i> 27 June 2018		
Applicant's or agent's file reference P20172224	FOR FURTHER ACTION See paragraph 2 below	
International application No. PCT/CN2017/104081	International filing date <i>(day/month/year)</i> 28 September 2017	Priority date <i>(day/month/year)</i>
International Patent Classification (IPC) or both national classification and IPC H04L 1/00(2006.01)i		
Applicant QUALCOMM Incorporated et al		

1. This opinion contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the international application
- Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/ STATE INTELLECTUAL PROPERTY OFFICE OF THE P.R.CHINA China 6, Xitucheng Rd., Jimen Bridge, Haidian District, Beijing 100088	Date of completion of this opinion 12 June 2018	Authorized officer ZHANG,Zhen
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International application No.

PCT/CN2017/104081

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - the international application in the language in which it was filed.
 - a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).
2. This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a)).
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:
 - a. forming part of the international application as filed:
 - in the form of an Annex C/ST.25 text file.
 - on paper or in the form of an image file.
 - b. furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
 - c. furnished subsequent to the international filing date for the purposes of international search only:
 - in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).
 - on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).
4. In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

**WRITTEN OPINION OF THE
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Box No. V **Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	<u>1-12</u>	YES
	Claims	<u>None</u>	NO
Inventive step (IS)	Claims	<u>None</u>	YES
	Claims	<u>1-12</u>	NO
Industrial applicability (IA)	Claims	<u>1-12</u>	YES
	Claims	<u>None</u>	NO

2. Citations and explanations :

- [1] Reference is made to the following documents:
- [2] D1: 3GPP Draft, R1-154067, DRS design for LAA
- [3] D2: 3GPP Draft, R1-1700315, Design and Evaluation of CSI-RS for NR MIMO with Mixed Numerology Support
- [4] D1 is considered to be the prior art closest to the technical solution set forth by independent claims 1 and 6. D1 discloses a method of DRS design for LAA, and specifically discloses the following technical features (see pages 1-3): A UE may monitor candidates of DRS occasion (i.e. RMR configuration) within the configured DMTC. Therefore, RAN1 needs to study a rate-matching pattern for PDSCH to allow the PDSCH to be multiplexed with the DRS occasion candidates of DRS. A UE rate-matches the resource elements (i.e. first REs) corresponding to a rate-matching pattern indicated by the DCI scheduling the PDSCH for the UE. The rate-matching pattern can correspond exactly to the DRS occasion. The PDSCH is not mapped to the resource elements corresponding to a rate-matching pattern indicated by the DCI scheduling the PDSCH (i.e. mapping a PDSCH to one or more second REs not including the first REs). It can be determined directly and undoubtedly from D1 that the UE identifies the REs before rate matching.
- [5] Claim 1 differs from D1 in that: 1.the UE identifies REs based on a transmission numerology; 2.the UE receives a configuration from a serving cell; 3.the first REs are used in the serving cell or a neighboring cell; Claim 6 differs from D1 in 1, 2 and 4.the first REs are rate matched based on PUCCH and SRS. Therefore, claims 1-12 are novel in the sense of PCT Article 33(2).
- [6] However, D2 discloses that (see sections 1-3): Due to mix of numerology the rate matching may not be efficient and only partial RE may be used while rate matching the PDSCH around a CSI-RS of a different numerology. So the possibility of CSI-RS and PDSCH being transmitted with different numerology in the same block is a possibility with both cases. That is to say, D2 indicates that RE is related to transmission numerology, therefore, a person skilled in the art can be motivated to identify one or more REs based on a transmission numerology. However, receiving a configuration is an alternate method of monitoring a configuration, PUCCH and SRS can instead DRS, and it is common knowledge to receive a configuration from a serving cell and rate match REs based on PUCCH and SRS. It is a common practice for a person skilled in the art to use REs in the serving cell or a neighboring cell. Therefore, the distinguishing technical features 2-4 are commonly known to a person skilled in the art.
- [7] The transmission numerology of a serving cell and the transmission numerology of a neighboring cell may be different or the same, and subcarrier spacing is one common transmission numerology, therefore, the additional technical features of claims 2-5 are common knowledge in the art. Uplink long transmission, uplink short transmission and uplink short duration are common transmission modes, and the use of above transmission modes is a common practice. Identifying REs based on uplink MIMO precoder is also a common practice. Therefore, the additional technical features of claims 7-12 are common knowledge in the art. Claims 1-12 do not involve an inventive step in the sense of PCT Article 33(3).
- [8] Claims 1-12 are industrially applicable and satisfy the criteria of PCT Article 33(4).