

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2020/004228

## A. CLASSIFICATION OF SUBJECT MATTER

*H04J 13/00(2011.01)i, H04L 27/26(2006.01)i, H04W 74/00(2009.01)i, H04W 74/08(2009.01)i*

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H04J 13/00; H04J 11/00; H04W 72/04; H04W 74/00; H04W 74/08; H04L 27/26

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
 Korean utility models and applications for utility models: IPC as above  
 Japanese utility models and applications for utility models: IPC as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
 eKOMPASS (KIPO internal) & Keywords: PRACH(physical random access channel), RAR(random access response), N\_MAX  
 sequence, base sequence, CS(cyclic shift), group

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2016-122120 A1 (LG ELECTRONICS INC.) 04 August 2016 See paragraphs [0106]-[0107], [0151]; claim 3; and figures 19, 24.	1-3,6-8,11-13
A		4-5,9-10,14-15
Y	KR 10-2018-0084669 A (SAMSUNG ELECTRONICS CO., LTD.) 25 July 2018 See claims 1-4.	1-3,6-8,11-13
Y	US 2011-0249549 A1 (HAO, Peng et al.) 13 October 2011 See paragraph [0037]; and figure 2.	2-3,7-8,12-13
A	HUAWEI et al. PRACH preamble sequences and formats for capacity enhancement and beam management. R1-1709917. 3GPP TSG RAN WGI NR Ad Hoc Meeting. Qingdao, China. 17 June 2017 See section 3.	1-15
A	HUAWEI et al. PRACH preamble sequences and formats for capacity enhancement and beam management. R1-1711600. 3GPP TSG RAN WGI NR AdHoc Meeting. Qingdao, China. 22 June 2017 See section 3.	1-15



Further documents are listed in the continuation of Box C.



See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&amp;" document member of the same patent family

Date of the actual completion of the international search

13 JULY 2020 (13.07.2020)

Date of mailing of the international search report

13 JULY 2020 (13.07.2020)

Name and mailing address of the ISA/KR



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**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International application No.

**PCT/KR2020/004228**

Patent document cited in search report	Publication date	Patent family member	Publication date
WO 2016-122120 A1	04/08/2016	None	
KR 10-2018-0084669 A	25/07/2018	CN 108322282 A	24/07/2018
		US 2019-0364603 A1	28/11/2019
		WO 2018-131985 A1	19/07/2018
US 2011-0249549 A1	13/10/2011	CN 101179860 A	14/05/2008
		CN 101179860 B	16/03/2011
		CN 101803448 A	11/08/2010
		CN 101803448 B	22/05/2013
		EP 2221993 A1	25/08/2010
		EP 2221993 A4	26/10/2011
		EP 2509241 A1	10/10/2012
		US 2014-00140301 A1	22/05/2014
		US 8654624 B2	18/02/2014
		US 9398616 B2	19/07/2016
		WO 2009-070995 A1	11/06/2009