

## PATENT ASSIGNMENT COVER SHEET

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Assignment ID: PATI198861

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT	
<b>NATURE OF CONVEYANCE:</b>	ASSIGNMENT	
<b>CONVEYING PARTY DATA</b>		
<b>Name</b>		<b>Execution Date</b>
Samsung Electronics Co., Ltd.		02/21/2024
<b>RECEIVING PARTY DATA</b>		
<b>Company Name:</b>	Nokia Technologies Oy	
<b>Street Address:</b>	Karakaari 7	
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<b>State/Country:</b>	FINLAND	
<b>Postal Code:</b>	FI-02610	
<b>PROPERTY NUMBERS Total: 54</b>		
<b>Property Type</b>	<b>Number</b>	
Application Number:	14908039	
Application Number:	14280013	
Application Number:	17054503	
Application Number:	14709027	
Application Number:	15941780	
Application Number:	14325791	
Application Number:	15543965	
Application Number:	15575727	
Application Number:	15168800	
Application Number:	15324197	
Application Number:	15213312	
Application Number:	14002489	
Application Number:	15198860	
Application Number:	15749665	
Application Number:	15253850	
Application Number:	15842369	
Application Number:	16469949	
Application Number:	14374892	
Application Number:	16100869	
Application Number:	16955878	

PATENT



Property Type	Number
Application Number:	16645262
Application Number:	16610363
Application Number:	16957967
Application Number:	17057923
Application Number:	16707737
Application Number:	13890551
Application Number:	15617990
Application Number:	15796628
Application Number:	15703897
Application Number:	15862183
Application Number:	15721378
Application Number:	16632052
Application Number:	16481032
Application Number:	15934168
Application Number:	14375774
Application Number:	16632727
Application Number:	16622853
Application Number:	16328203
Application Number:	14035908
Application Number:	16476035
Application Number:	15448043
Application Number:	16483956
Application Number:	16497424
Application Number:	16483676
Application Number:	61885385
Application Number:	14500463
Application Number:	62332637
Application Number:	62334756
Application Number:	62374273
Application Number:	15582575
Application Number:	62356002
Application Number:	15400602
Application Number:	16497416
Application Number:	16790468

#### CORRESPONDENCE DATA

Fax Number:

*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.*



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<b>ATTORNEY DOCKET NUMBER:</b>	PA Samsung Elec Co Ltd
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<b>NAME OF SUBMITTER:</b>	Tammy Hobbs
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<b>SIGNATURE:</b>	Tammy Hobbs
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<b>DATE SIGNED:</b>	04/29/2024
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**Total Attachments: 8**

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## PATENT ASSIGNMENT

This assignment of patent rights ("Patent Assignment") shall be effective as of February 21, 2024 (the "Effective Date").

For good and valuable consideration in the sum of one Dollar (\$1.00), the receipt of which is hereby acknowledged, **Samsung Electronics Co., Ltd.**, a corporation validly organised and existing under the laws of the Republic of Korea, having its principal place of business at Maetan-dong 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, the Republic of Korea ("**Assignor**") does hereby sell, assign, transfer, and convey unto **Nokia Technologies Oy**, a corporation validly organized and existing under the laws of Finland having its principal place of business at Karakaari 7, FI-02610 Espoo, FINLAND (the "**Assignee**"), all right, title, and interest that exist today and may exist in the future in and to any and all of the following (collectively, the "**Patent Rights**"):

- (a) all patents and patent applications listed in the table below in Exhibit A (each a "**Listed Patent**", collectively the "**Listed Patents**");
- (b) all reissues, reexaminations, continuations, continuations-in-part, divisionals, renewals and extensions of such Listed Patents;
- (c) all patents and patent applications (i) to which any Listed Patent directly or indirectly claims priority to, or the benefit of, the filing date, or (ii) for which any Listed Patent directly or indirectly forms a basis for priority or otherwise provides the benefit of an earlier filing date;
- (d) all foreign counterparts to any or all of the foregoing;
- (e) all of (b), (c) and (d) above irrespective of whether pending, issued, abandoned or filed prior to, on or after the Effective Date;
- (f) inventions, invention disclosures, and discoveries claimed in any of the Listed Patents and/or any item in the foregoing categories (b) through (d); and
- (g) all rights to apply in any or all countries of the world for patents, certificates of invention, utility models, or other governmental grants or issuances of any type related to any item in any of the foregoing categories (a) through (f), including, without limitation, under the Paris Convention for the Protection of Industrial Property, the International Patent Cooperation Treaty, or any other convention, treaty, agreement, or understanding.

Assignor hereby authorizes the respective patent office or governmental agency in each jurisdiction to issue any and all patents, certificates of invention, utility models or other governmental grants or issuances that may be granted upon any of the Patent Rights in the name of Assignee, as the assignee to the entire interest therein.

At the request of Assignee, and without further consideration, Assignor will execute or have executed and deliver such other instruments of sale, transfer, assignment, and other confirmation and take such other action that are necessary in order to sell, transfer, and assign effectively to Assignee the Patent Rights and to allow Assignee to perfect and record those sales, transfers, and assignments.



The Patent Rights are assigned subject to existing encumbrances.

The terms and conditions of this Patent Assignment will inure to the benefit of Assignee, its successors, assigns, and other legal representatives and will be binding upon Assignor, its successors, assigns, and other legal representatives.

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IN WITNESS WHEREOF, each of the Parties has caused this Assignment to be executed by its duly authorized representatives as of the Effective Date.

**ASSIGNOR:**

**Samsung Electronics Co., Ltd.**

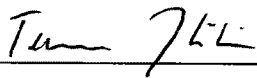
By: 

Name: HOJIN CHANG

Title: 2024.2.19.

**ASSIGNEE:**

**Nokia Technologies Oy**

By: 

Name: **Teemu Itälä**  
**Authorized Signatory**

Title: \_\_\_\_\_

By: 

Name: **Jeremie Vaquer**  
**Authorized signatory**

Title: \_\_\_\_\_



# Exhibit A to Patent Assignment

## Listed Patents

No	Title	Country	Application No.	Filing date	Patent No.	Issue date	Status
2	APPARATUS AND METHOD FOR PROVIDING SERVICE IN WIRELESS COMMUNICATION SYSTEM	KR	KR20180053872A	20180510			Pending
		US	US17/054503	20201110	US11284302	20220322	Granted
3	APPARATUS, TERMINAL AND SIGNAL TRANSMITTING AND RECEIVING METHOD THEREOF IN A WIRELESS COMMUNICATION SYSTEM	DE	EP18165392.4	20180403	EP3382926	20200108	Granted
		EP	EP18165392.4	20180403	EP3382926	20200108	Granted
		GB	EP18165392.4	20180403	EP3382926	20200108	Granted
		KR	KR1020180036849A	20180329			NOA
		US	US15/941780	20180330	US10581573	20200303	Granted
4	MOBILE COMMUNICATION SYSTEM AND DATA TRANSMISSION METHOD THEREOF	DE	EP12791953.8	20131106	EP2715963	20190703	Granted
		EP	EP12791953.8	20131106	EP2715963	20190703	Granted
		GB	EP12791953.8	20131106	EP2715963	20190703	Granted
		KR	KR1020110051309A	20110530	KR101820742	20180116	Granted
		US	US14/002489	20130830	US10313042	20190604	Granted
5	METHOD AND APPARATUS FOR TRANSMITTING A SIGNAL ON CONTROL CHANNEL IN A ORTHOGONAL FREQUENCY DIVISION MULTIPLEXING COMMUNICATION SYSTEM	US	US14/374892	20140725	US9538507	20170103	Granted
6	SCHEME FOR PERFORMING BEAMFORMING IN COMMUNICATION SYSTEM	CN	CN201380024569.5	20141110	CN104285385B	20180629	Granted
		DE	EP13787590.2	20141110	EP2847881	20180321	Granted
		EP	EP13787590.2	20141110	EP2847881	20180321	Granted
		GB	EP13787590.2	20141110	EP2847881	20180321	Granted
		US	US13/890551	20130509	US10375733	20190806	Granted
7	METHOD AND APPARATUS FOR TRANSMITTING UPLINK CONTROL CHANNELS AND UPLINK DATA CHANNELS IN COMP SYSTEM	DE	EP13744201.8	20140730	EP2811664	20190904	Granted
		EP	EP13744201.8	20140730	EP2811664	20190904	Granted
		GB	EP13744201.8	20140730	EP2811664	20190904	Granted
		KR	KR1020120008814A	20120130	KR101939153	20190110	Granted
		US	US14/375774	20140730	US9392589	20160712	Granted
8	METHOD AND APPARATUS FOR TRANSMITTING AND RECEIVING BROADCAST CHANNEL IN CELLULAR COMMUNICATION SYSTEM	DE	EP13839237.8	20150423	EP2898646	20191204	Granted
		EP	EP13839237.8	20150423	EP2898646	20191204	Granted
		KR	KR1020120105577A	20120924	KR102059379	20191219	Granted
		US	US14/035908	20130924	US9413451	20160809	Granted
13	METHOD AND APPARATUS FOR REQUESTING SCHEDULING IN CELLULAR MOBILE COMMUNICATION SYSTEM	CN	CN201480044083.2	20160203	CN105453684B	20200107	Granted
		DE	EP14834010.2	20160209	EP3032909	20200617	Granted
		EP	EP14834010.2	20160209	EP3032909	20200617	Granted
		FR	EP14834010.2	20160209	EP3032909	20200617	Granted
		IN	IN201637003784	20160203	IN377051	20210916	Granted
		JP	JP2016-533254	20160105	JP6486928	20190301	Granted
		KR	KR1020130094471A	20130809	KR102123434	20200610	Granted
		US	US14/908039	20160127	US10182451	20190115	Granted



14	METHOD AND APPARATUS FOR PERFORMING DISCOVERY FOR DEVICE-TO-DEVICE COMMUNICATION	CN	CN201480031578.1	20151202	CN105264816B	20190322	Granted
		KR	KR20130055873A	20130516	KR102142576	20200803	Granted
		US	US14/280013	20140516	US9654967	20170516	Granted
26	INTERFERENCE MEASUREMENT METHOD AND APPARATUS FOR USE IN MOBILE COMMUNICATION SYSTEM	CN	CN201580024360.8	20161109	CN106464406B	20191217	Granted
		DE	DE15788653.2	20161130	DE3140937	20200729	Granted
		EP	EP15788653.2	20161130	EP3140937	20200729	Granted
		FR	FR15788653.2	20161130	FR3140937	20200729	Granted
		IN	IN201637038071	20161108			Pending
		KR	KR20140055567A	20140509	KR102323003	20211102	Granted
30	LAWFUL INTERCEPTION METHOD AND APPARATUS OF D2D COMMUNICATION-CAPABLE TERMINAL	US	US14/709027	20150511	US10454554	20191022	Granted
		KR	KR20140058636A	20140515	KR102191362	20201209	Granted
33	BEAMFORMING METHOD AND APPARATUS THEREFOR	US	US14/325791	20140708	US9813550	20171107	Granted
		KR	KR20150008035A	20150116	KR102351268	20220111	Granted
34	METHOD AND DEVICE FOR PROVIDING FEEDBACK SIGNAL IN WIRELESS COMMUNICATION SYSTEM USING TWO-DIMENSIONAL ANTENNA	US	US15/543965	20170714	US10454552	20191022	Granted
		CN	CN201680035885.6	20171219	CN107710640B	20210611	Granted
		KR	KR20150069909A	20150519	KR102279499	20210714	Granted
36	METHOD AND APPARATUS FOR TRANSMITTING AND RECEIVING DATA IN MOBILE COMMUNICATION SYSTEM	US	US15/575727	20171120	US10644776	20200505	Granted
		CN	CN201680031293.7	20171129	CN107683570B	20210402	Granted
		DE	DE16803706.7	20171222	DE3304969	20200205	Granted
		EP	EP16803706.7	20171222	EP3304969	20200205	Granted
		GB	GB16803706.7	20171222	GB3304969	20200205	Granted
		KR	KR20150076091A	20150529	KR102319698	20211026	Granted
		NL	NL16803706.7	20171222	NL3304969	20200205	Granted
37	METHOD AND APPARATUS FOR RANDOM ACCESS FOR MULTIPLE DEVICES IN WIRELESS COMMUNICATION SYSTEM	US	US15/168800	20160531	US10530530	20200107	Granted
		KR	KR20150071248A	20150521	KR102357511	20220126	Granted
39	METHOD AND APPARATUS FOR COMMUNICATING CHANNEL STATE INFORMATION IN FULL-DIMENSIONAL MIMO SYSTEM	US	US15/324197	20170105	US10111254	20181023	Granted
		KR	KR20150101216A	20150716	KR102405408	20220531	Granted
40	APPARATUS AND METHOD FOR IDENTIFYING NEIGHBOR CELL IN WIRELESS COMMUNICATION SYSTEM	US	US15/213312	20160718	US10348383	20190709	Granted
		KR	KR20150094167A	20150701	KR102404862	20220530	Granted
41	METHOD AND APPARATUS FOR TRANSMITTING AND RECEIVING SIGNALS USING OPEN-LOOP MULTI-INPUT/OUTPUT TECHNOLOGY	US	US15/198860	20160630	US10142896	20181127	Granted
		CN	CN201680048018.6	20180213	CN107925453B	20210514	Granted
		KR	KR20150115865A	20150818	KR102357905	20220126	Granted
		US	US15/749665	20180201	US10623050	20200414	Granted



42	APPARATUS AND METHOD FOR OPERATING RADIO ACCESS TECHNOLOGY IN COMMUNICATION SYSTEM SUPPORTING TIME DIVISION DUPLEXING SCHEME	KR	KR20150122444A	20150831	KR102419407	20220706	Granted
		US	US15/253850	20160831	US10313995	20190604	Granted
48	METHOD AND APPARATUS FOR TRANSMITTING AND RECEIVING DOWNLINK CONTROL CHANNEL IN WIRELESS COMMUNICATION SYSTEM	KR	KR20160170605A	20161214			Pending
		US	US15/842369	20171214	US10542531	20200121	Granted
49	METHOD AND DEVICE FOR TRANSMITTING/RECEIVING UPLINK CONTROL INFORMATION IN WIRELESS COMMUNICATION SYSTEM	KR	KR20170002579A	20170106			Pending
		US	US16/469949	20190614	US11337188	20220517	Granted
52	METHOD AND APPARATUS FOR INDICATING APERIODIC CSI REPORTING TIME IN WIRELESS COMMUNICATION SYSTEM	KR	KR20170102659A	20170811	KR102436802	20220823	Granted
		US	US16/100869	20180810	US11323902	20220503	Granted
53	METHOD AND APPARATUS FOR ANTENNA BEAM TRACKING IN WIRELESS CELLULAR COMMUNICATION SYSTEM	KR	KR20170177108A	20171221	KR102439425	20220830	Granted
		US	US16/955878	20200619	US11405090	20220802	Granted
54	METHOD AND APPARATUS FOR TRANSMITTING AND RECEIVING DOWNLINK CONTROL SIGNAL IN WIRELESS COMMUNICATION SYSTEM	KR	KR20170126894A	20170929	KR102444828	20220914	Granted
		US	US16/645262	20200306	US11159300	20211026	Granted
55	METHOD AND APPARATUS FOR DATA TRANSMISSION IN WIRELESS CELLULAR COMMUNICATION SYSTEM	KR	KR20170111962A	20170901	KR102472160	20221124	Granted
		US	US16/610363	20191101	US11223450	20220111	Granted
56	METHOD AND APPARATUS FOR REFERENCE SIGNAL CONFIGURATION FOR NON-LINEAR PRECODING	KR	KR20170182046A	20171228			Pending
		US	US16/957967	20200625	US11184075	20211123	Granted
57	METHOD AND APPARATUS FOR TRANSMITTING AND RECEIVING MULTICAST UNICAST SUPERPOSITION SIGNALS IN WIRELESS COMMUNICATION SYSTEM	KR	KR20180057896A	20180521			Pending
		US	US17/057923	20201123	US11411676	20220809	Granted
58	METHOD AND APPARATUS FOR CONTROLLING TRANSMISSION POWER IN WIRELESS COMMUNICATION SYSTEM	KR	KR20180157483A	20181207			Pending
		US	US16/707737	20191209	US11317361	20220426	Granted
61		KR	KR20160071260A	20160608	KR102473313	20221129	Granted



	METHOD AND DEVICE FOR PROVIDING CONTROL INFORMATION FOR DIFFERENT SERVICES	US	US15/617990	20170608	US10798692	20201006	Granted
62	METHOD AND APPARATUS FOR ALLOCATING RESOURCE IN COMMUNICATION SYSTEM	KR	KR20160142294A	20161028			Pending
		US	US15/796628	20171027	US10531484	20200107	Granted
64	APPARATUS AND METHOD FOR SUPORTTING MIXED NUMEROLOGY IN WIRELESS COMMUNICATION SYSTEM	KR	KR20160125716A	20160929			Pending
		US	US15/703897	20170913	US10531469	20200107	Granted
65	METHOD AND APPARATUS FOR RETRANSMISSION IN COMMUNICATION SYSTEM	KR	KR20170001489A	20170104			Pending
		US	US15/862183	20180104	US10530537	20200107	Granted
66	METHOD AND APPARATUS FOR TRANSMITTING AND RECEIVING A SIGNAL IN A WIRELESS COMMUNICATION SYSTEM USING RESOURCE BLOCK STRUCTURE	US	US15/721378	20170929	US10506583	20191210	Granted
		KR	KR20170125580	20170927	KR102362461	20220209	Granted
67	TERMINAL AND BASE STATION IN WIRELESS COMMUNICATION SYSTEM, AND COMMUNICATION METHOD THEREOF	EP	EP18837943.2	20200116	EP3641389	20230222	Granted
		DE	18837943.2	20200116	DE3641389	20230222	Granted
		GB	18837943.2	20200116	GB3641389	20230222	Granted
		KR	KR20170094517A	20170726	KR102323799	20211103	Granted
		US	US16/632052	20200117	US11166193	20211102	Granted
68	METHOD FOR PROCESSING DATA IN COMMUNICATION SYSTEM	KR	KR20170015192A	20170202			Pending
		US	US16/481032	20190725	US11122463	20210914	Granted
69	METHOD AND APPARATUS FOR ADJUSTING TIMING IN WIRELESS COMMUNICATION SYSTEM	KR	KR20170037148A	20170323	KR102292994	20210818	Granted
		US	US15/934168	20180323	US10863530	20201208	Granted
70	METHOD FOR PERFORMING RACH PROCEDURE BETWEEN TERMINAL AND BASE STATION, AND BASE STATION AND TERMINAL THEREFOR	CN	CN201780093459.2	20200122			Pending
		EP	EP17918890.9	20200220			Pending
		KR	KR20170096171A	20170728	KR102406365	20220602	Granted
		US	US16/632727	20200121	US11184932	20211123	Granted
71	DEVICE AND METHOD FOR ALLOCATING AND INDICATING RESOURCES IN WIRELESS COMMUNICATION SYSTEM	KR	KR20170075883A	20170615	KR102342730	20211220	Granted
		US	US16/622853	20191213	US11184881	20211123	Granted
79	METHOD FOR RADIO LINK MONITORING AND CORRESPONDING USER EQUIPMENT	CN	CN201610742056.3	20160826			Pending
		US	US16/328203	20190225	US11178561	20211116	Granted
82		CN	CN201710014198.2	20170109			Pending



	METHOD AND APPARATUS FOR SELECTING RANDOM ACCESS CHANNEL IN WIRELESS COMMUNICATION SYSTEMS	US	US16/476035	20190703	US10966256	20210330	Granted
83	FILTERING-BASED SIGNAL TRANSMISSION AND RECEIVING METHODS AND CORRESPONDING TRANSMITTER AND RECEIVER	CN	CN202211700255.X	20160811			Pending
		US	US15/448043	20170302	US10484216	20191119	Granted
84	APPARATUS AND METHOD FOR PERFORMING A RANDOM ACCESS	CN	CN201710067369.8	20170206			Pending
		KR	KR20197025960A	20190904	KR102457372	20221018	Granted
		US	US16/483956	20190806	US11089631	20210810	Granted
85	METHOD AND APPARATUS FOR TRANSMITTING AND RECEIVING UPLINK DATA	CN	CN201711147497.X	20171117	CN108633102B	20210824	Granted
		CN	CN201710183439.6	20170324			Pending
		CN	CN202110892034.6	20171117			Pending
		US	US16/497424	20190924	US11096220	20210817	Granted
87	A USER EQUIPMENT AND DATA TRANSMISSION METHOD THEREOF	CN	CN201810203483.3	20180312	CN108809603B	20220930	Granted
		CN	CN201710316544.2	20170505			Pending
		DE	DE18794889.8	20191028	DE3603307	20211006	Granted
		EP	EP18794889.8	20191028	EP3603307	20211006	Granted
		KR	KR20197033255A	20191108	KR102425585	20220721	Granted
		US	US16/483676	20190805	US11122620	20210914	Granted
89	Device-to-Device Broadcast Communication Channel Design	US	US14/500463	20140929	US9717094	20170725	Granted
91	APPARATUS AND METHOD FOR INITIAL ACCESS IN WIRELESS COMMUNICATION SYSTEM	KR	KR20170056818A	20170504	KR102359272	20220128	Granted
		US	US15/582575	20170428	US10887143	20210105	Granted
94	APPARATUS AND METHOD FOR INITIAL ACCESS IN WIRELESS COMMUNICATION SYSTEM	GB	GBGB1600337.8	20160108	GBGB2546099	20190529	Granted
		US	US15/400602	20170106	US10694550	20200623	Granted
96	METHOD AND APPARATUS FOR PHASE TRACKING REFERENCE SIGNAL IN A WIRELESS COMMUNICATION SYSTEM	GB	GB1704731.7	20170324	GB2562462	20211117	Granted
		US	US16/497416	20190924	US11375462	20220628	Granted
97	IMPROVEMENTS IN AND RELATING TO RANDOM ACCESS IN A TELECOMMUNICATION SYSTEM	EP	EP20755361.1	20210706			Pending
		GB	GBGB2000653.2	20200116	GBGB2584746	20211109	Granted
		GB	GBGR20190100071	20190213			Pending
		US	US16/790468	20200213	US11357057	20220607	Granted