

Appendix B

Invalidity of U.S. Patent No. 10,448,430

'430 Patent	Reference
1[pre] A random access method, comprising:	<i>Kim '068</i> at [0001-5], [0034-37], [0046], [0056-58], [0061], [0064],[0065-72], [0083], [0104], [0106], [0111], [0113], [0116], FIGs. 1, 3-8, Table 1.
	<i>Gao</i> at Abstract, 1-4, 6-7, 10-11, 15-16 claim 1, claims 4-5, Figs. 1, 2, 4.
	<i>Jiang</i> at Abstract, claim 1, claim 2, [0001], [0002], [0003], [0004], [0005], [0006], [0007], [0008], [0009], [0010], [0022], [0023], FIG. 1, [00024], FIG. 2, [0029], FIG. 7, [0140].
	<i>Vujcic</i> at [Abstract], [0001], [0002], [0003], [0026], [0027], [0028], [0029], [0036], [0050], [0051], [0052], [0053], [0054], FIG. 4, FIG. 6, FIG. 7, FIG. 9, FIG. 10, [0073], [0074], Claim 16.
	<i>Kim '055</i> at [3], [4-9], [12], [51], [52], [94], [34], [36], FIG. 6, FIG. 13, FIG. 19, FIG. 21, [Claim 1].
	3GPP TS 36.300 V12.5.0 at Sections 1, 10.1.5.
	3GPP TS 36.321V12.5.0 at Sections 1, 5, 5.1, 5.1.1.
	3GPP TS 36.213 V12.5.0 at Sections 1, 6, 6.1, 6.1.1.
	3GPP TS 36.300 V11.0.0 at Sections 1, 10.1.5.
	3GPP TS 36.321 V11.0.0 at Sections 1, 5, 5.1, 5.1.1.
	3GPP TS 36.213 V11.0.0 at Sections 1, 6, 6.1, 6.1.1.
	R1-152707 at 3.
	TR 36.888 at 20-21.
	<i>Ahn</i> at Abstract, [0001], [0007], [0010], [0011], [0016], [0019], FIGs. 2, 5-8.
	<i>Cox</i> at 116, 133, 138, 142, 152-53, 163-168, 173, 185, 190, 192, 199, 246, 250, 294, 330.
	<i>Jeong</i> at Abstract, 1:24-39, 1:42-50, 1:51-57, 1:58-2:10, 2:11-14, 2:15-30, 2:58-62, 2:63-3:5, 3:14-15, 3:16-17, 3:18-20, 3:45-49, 3:50-4:2, 4:32-35, FIGS. 1-7, claims 1-2.
	<i>Lee</i> at Abstract, 1:19-23, 1:35-44, 1:50-58, 2:8-23, 2:24-39, 3:52-54, 3:55-58, 3:59-61, 3:62-64, 4:9-11, 4:25-27, 4:28-30, 5:19-37, 5:38-43, 5:48-57, 5:58-6:10, 6:11-13, 6:16-18, 6:19-22, 6:49-52, 6:53-55, 6:56-65, 7:13-20, 8:5-19, 10:26-36, 10:37-41, 18:32-34, 24:6-7, 24:9-25, 24:27-44, 24:45-50, 24:51-57, 30:13-21, 30:37-39, 30:40-44, FIGS. 9, 15, claim 1.
	<i>Tseng</i> at 6:9-13, 6:56-60, FIG. 5.
	Samsung Galaxy S6 https://www.samsung.com/us/business/support/owners/product/galaxy-s6-t-mobile/#fullspecs . https://image.semiconductor.samsung.com/content/samsung/p6/etc/exynos/file/solution/Modem-Modem-333.pdf .

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	https://www.cablefree.net/wirelesstechnology/4glte/lte-ue-category-class-definitions/ . Samsung Galaxy S6 Edge https://www.samsung.com/us/mobile/phones/galaxy-s/samsung-galaxy-s6-edge-32gb-t-mobile-gold-platinum-sm-g925tztatmb/ . https://image.semiconductor.samsung.com/content/samsung/p6/etc/exynos/file/solution/Modem-Modem-333.pdf . https://www.cablefree.net/wirelesstechnology/4glte/lte-ue-category-class-definitions/ .
	Samsung Galaxy S7 https://www.samsung.com/us/support/mobile/phones/galaxy-s/galaxy-s7 . https://semiconductor.samsung.com/processor/mobile-processor/exynos-8-octa-8890/ . https://www.cablefree.net/wirelesstechnology/4glte/lte-ue-category-class-definitions/ . https://www.gsmarena.com/samsung_galaxy_s7-7821.php
	Samsung Galaxy S7 Edge https://www.samsung.com/us/support/mobile/phones/galaxy-s/galaxy-s7-edge . https://semiconductor.samsung.com/processor/mobile-processor/exynos-8-octa-8890/ . https://www.cablefree.net/wirelesstechnology/4glte/lte-ue-category-class-definitions/ . https://www.gsmarena.com/samsung_galaxy_s7_edge-7945.php
1[a] sending, by a first User Equipment (UE) in a UE group, a preamble to an evolved Node B (eNB) over a time-frequency resource, the time-frequency resource comprising a time domain resource and a frequency domain resource;	<i>Kim '068</i> at [0006-10], [0019-20], [0026], [00038-39], [0047-55], [0061], [0063], [0071-87], [0093-97], [0107-08], [0115], [0157], [0184-88], [0194-95], [0195], [0223], [0231], [0246], [claims 1-3], FIGs. 2, 9-10. <i>Gao</i> at Abstract, 1-4, 6-7, 9, 11-13, 15-16, 19-20, 24-26, claims 1-5, claims 7-9, claims 11-13, claim 15, claims 19-21, Figs. 3, 5-7. <i>Jiang</i> at Abstract, claim 1, claim 8, [0007], [0022], [0037], [0038], [0039], [0040], [0041], [0042], [0043], [0063], [0142], [0143]. <i>Vujcic</i> at [0005], FIG. 1, FIG. 3, FIG. 5, FIG. 7, FIG. 8, FIG. 9, FIG. 11, FIG. 10, [0006], [0026], [0027], [0037], [0038], [0039], [0040], [0041], [0042], [0075], [0082], [0083], [0084], [0085], [0086], [0091], [0092], [0093], [0094], [0095], Claim 16, Claim 17.

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	<i>Kim '055</i> at [11], [12], [13], [14], [29], [38],[39], [43], [44], [53], [59], [60], [94], [95], [96], [97], [98], [99], [101], [102], [121], [123], FIG. 1, FIG. 2, FIG. 7, FIG. 14, FIG. 15, FIG. 18, [Claim 1], . [Claim 2], [Claim 3], [Claim 4], [Claim 5].
	3GPP TS 36.300 V12.5.0 at Sections 5.2.5, 10.1.5.
	3GPP TS 36.321V12.5.0 at Sections 5.1.2, 5.1.3.
	3GPP TS 36.213 V12.5.0 at Section 6.1.
	3GPP TS 36.300 V11.0.0 at Sections 5.2.5, 10.1.5.
	3GPP TS 36.321 V11.0.0 at Sections 5.1.2, 5.1.3.
	3GPP TS 36.213 V11.0.0 at Section 6.1.
	R1-152707 at 1, 2, 3.
	TR 36.888 at 20, 46.
	<i>Ahn</i> at Abstract, [0011-18], [0025], [0028-46], [0051-55], [0061], [0072-73], [0075-78], [0081], [0083-87], [0089], [0091], [0092-96], [0100-05], [0107-13], FIGs. 1-2, 5-8 claims 1-3, 7.
	<i>Cox</i> at 163-168.
	<i>Jeong</i> at 2:15-30, 2:31-39, 3:50-4:2, 4:36-45, 4:59-67, FIGS. 1-7, claims 1-2.
	<i>Lee</i> at Abstract, 2:8-23, 2:24-39, 4:4-6, 10:26-36, 10:57-59, 10:60-67, 11:1-19, 11:20-33, 12:63-65, 12:66-13:6, 18:35-65, FIGs. 7, 20, claim 1.
	<i>Tseng</i> at 6:61-7:17, FIG. 5.
[1b] monitoring, by at least one of the first UE or a second UE in the UE group, a Random Access Response (RAR) corresponding to the preamble and sent by the eNB, wherein the first UE is at least one UE in the UE group, and the second UE is all or some UEs in the UE group; and	<i>Kim '068</i> at [0026], [0061-3], [0072], [0079-82], [0086-89], [0092-94], [0098-101], [0108-09]. [0115], [0120-31], [0132-145], [0157-59], [0162], [0165-67], [0189-91], [0246], [claim 1].
	<i>Gao</i> at 3-11, 13-16, 19-26, claim 1, claim 4, claims 6-8, claim 11, claims 16-20, Fig. 5.
	<i>Jiang</i> at Abstract, claim 1, claim 2, claim 3, claim 4, claim 8. [0008], [0009], [0013], [0022], [0025], FIG. 3, [0026], FIG. 4, [0039], [0044], [0045], [0046], [0047]. [0048], [0048], [0049], [0059], [0060], [0064], [0065], [0066]. [0067], [0069], [0070], [0072], [0073], [0074]. [0075], [0076], [0078], [0079], [0080], [0081], [0082], [0083], [0084], [0085], [0086], [0091], [0092], [0093], [0094], [0100], [0101], [0109], [0145], [0144], [0145].
	<i>Vujcic</i> at [0043], [0044], [0046], [0047], [0075], [0076], [0082], Claim 16.
	<i>Kim '055</i> at [12], [13], [14], [15], [32], FIG. 17, [54], [94], [95], [103], [104], [105], [106], [121], [124], [125], FIG. 18, [Claim 1], [Claim 6], [Claim 7], [Claim 8], [Claim 11], [Claim 13], [Claim 15].
	3GPP TS 36.300 V12.5.0 at Sections 10.1.5, 7.2.

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	3GPP TS 36.321 V12.5.0 at Sections 5.1.4, 5.1.5
	3GPP TS 36.213 V12.5.0 at Section 6.2.
	3GPP TS 36.300 V11.0.0 at Sections 10.1.5, 7.2.
	3GPP TS 36.321 V11.0.0 at Sections 5.1.4, 5.1.5
	3GPP TS 36.213 V11.0.0 at Section 6.2.
	R1-152707 at 3.
	TR 36.888 at 20-21, 46.
	<i>Ahn</i> at Abstract, [0011], [0016], [0020], [0044], [0055-61], [0079], [0082], [0097], [0099], [0101-03], [0105], [0109], FIGs. 1-3, 5-8, claims 1, 5-6.
	<i>Cox</i> at 166-68.
	<i>Jeong</i> at Abstract, 2:31-39, 2:58-62, 2:63-3:5, 3:50-4:2, 4:3-14, 4:46-58, FIGS. 1-7, claims 1-2.
	<i>Lee</i> at Abstract, 2:8-23, 2:24-39, 2:40-44, 2:45-47, 2:48-52, 2:53-56, 2:57-61, 2:64-67, 3:1-3, 3:12-17, 3:18-30, 3:31-39, 10:26-36, 12:30-46, 19:1-17, 19:18-33, 19:33-52, 19:53-55, 19:57-67, 20:1-44, 20:60-21:4, 21:5-10, FIGs. 7, 20, claim 1.
	<i>Tseng</i> at 7:5-8:45, FIG. 5.
[1c] after monitoring, by at least one of the first UE or the second UE, the RAR corresponding to the preamble and sent by the eNB: sending, by at least one of the first UE or the second UE, a message 3 according to a Uplink (UL)	<i>Kim '068</i> at [0041], [0061], [0063], [0072], [0080], [0088-90], [0093-94], [0099-103], [0108-12], [0115], [0156-62], [0171], [0189-92], [claim 1], FIG. 13.
	<i>Gao</i> at 3-5, 7, 11, 14-16, 20-26, claim 4, claims 6-10, claims 16-20.
	<i>Jiang</i> at at Abstract, claim 1, claim 5, [0009], [0050], [0051], [0052], [0053], [0054], [0055], [0056], [0091], [0092], [0109], [0110], [0121], [0146], [0147].
	<i>Vujcic</i> at [0044], [0075], [0076], [0077], [0079], [0080], [0081], TABLE 1, [0082], [0083], [0084], [0085], [0095], Claim 16.
	<i>Kim '055</i> at [12], [13], [14], [55], [56], [Claim 1].
	3GPP TS 36.300 V12.5.0 at Sections 8.1, 10.1.5, 10.1.6.

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grant allocated thereto, wherein the message 3 comprises a number of UEs having random access requests in the UE group or a number of UEs contained in the UE group or a pre-set UE number.	3GPP TS 36.321 V12.5.0 at Sections 5.1.5, 5.4.1.
	3GPP TS 36.213 V12.5.0 at Sections 6.1.3, 6.1.1, 6.2.
	3GPP TS 36.300 V11.0.0 at Sections 8.1, 10.1.5, 10.1.6.
	3GPP TS 36.321 V11.0.0 at Sections 5.1.5, 5.4.1.
	3GPP TS 36.213 V11.0.0 at Sections 6.1.3, 6.1.1, 6.2.
	R1-152707 at 3.
	TR 36.888 at 20-21.
	<i>Ahn</i> at Abstract, [0011], [0026], [0061], [0080], [0088-91], [0098-99], [0101-03], [0105], [0109], [0115-25], FIGs. 1, 2, 4-9, claims 1, 6-8.
	<i>Cox</i> at 163, 166-68.
	<i>Jeong</i> at Abstract, 2:31-39, 2:40-45, 2:58-62, 2:63-3:5, 3:50-4:2, 4:3-14, 4:15-31, 4:46-58, FIGS. 1-7, claims 1-2.
	<i>Lee</i> at Abstract, 1:19-23, 1:62-67, 2:8-23, 2:24-39, 2:40-44, 2:45-47, 2:53-56, 2:57-61, 2:62-63, 2:64-67, 3:12-17, 3:18-30, 3:31-39, 10:8-15, 10:26-36, 12:47-62, 21:11-25, 21:31-46, claim 1.
	<i>Tseng</i> at 8:46-9:50, FIG. 5.

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[2] The method according to claim 1, wherein the first UE is at least one of the following: at least one fixed UE; or, at least one UE determined according to a pre-set rule; or, at least one UE notified by the eNB.	<i>Kim '068</i> at [0006], [0007], [0047], [0071], [0093], [0187].
	<i>Gao</i> at 2-3, 5-6, 12-13, 17-18, 20, 22, claims 1-4, claims 7-8, claims 13-14, claims 19-20.
	<i>Jiang</i> at Abstract, claim 3, claim 6, claim 11, claim 12, [0081], [0082], [0087], [0091], [0114], [0120], [0162], [0167].
	<i>Vujcic</i> at [0037].
	<i>Kim '055</i> at [39].
	3GPP TS 36.300 V12.5.0 at Section 10.1.5.
	3GPP TS 36.321 V12.5.0 at Sections 5, 5.1, 5.1.1.
	3GPP TS 36.213 V12.5.0 at Section 6.
	3GPP TS 36.300 V11.0.0 at Section 10.1.5.
	3GPP TS 36.321 V11.0.0 at Sections 5, 5.1, 5.1.1.
	3GPP TS 36.213 V11.0.0 at Section 6.
	R1-152707 at 1.
	<i>Ahn</i> at Abstract, [0011], [0028], [0051], [0072-73], [0101-03], [0105], [0107-16], claims 1-5, 7-8.
	<i>Cox</i> at 166-68.
	<i>Jeong</i> at 2:15-30, 4:36-45, 6:24-36, FIGS. 1-7, claims 1, 3, 5.
	<i>Lee</i> at 5:19-37, 10:60-67, 26:44-65, 28:58-64, 40:52-60, 40:66-17.
	<i>Tseng</i> at 3:22-29.
[3] The method according to claim 1, wherein at least one	<i>Kim '068</i> at [0007], [0014-18], [0028], [0047-54], [0049], [0059-60], [0068], [0075-8], [0080-81], [0093], [0115], [0159], [0187-89].

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of the preamble, the time domain resource or the frequency domain resource is pre-set, or determined by a group Identifier (ID) of the UE group, or notified by the eNB.	<i>Gao</i> at 2-3, 5-6, 12-13, 17-18, 20, claim 1, claim 4, claims 7-8, claims 13-14, claims 19-20.
	<i>Jiang</i> at Abstract, claim 1, claim 2, claim 3, claim 5, claim 6, claim 7, claim 9, claim 11, claim 12, claim 13, [0009], [0010], [0014], [0015], [0019], [0020], [0038], [0040], [0042], [0043], [0048], [0049], [0050], [0053], [0054], [0057], [0067], [0070], [0071], [0072], [0081], [0082], [0083], [0109], [0110], [0116], [0147], [0160].
	<i>Vujcic</i> at [0037], [0078], [0096].
	<i>Kim '055</i> at [43], [44], [45], [46], [47], [48], [49], FIG. 3, FIG. 4, FIG. 5.
	3GPP TS 36.321 V12.5.0 at Sections 5.1.3, 5.1.4.
	3GPP TS 36.213 V12.5.0 at Section 6.1.
	3GPP TS 36.321 V11.0.0 at Sections 5.1.3, 5.1.4.
	3GPP TS 36.213 V11.0.0 at Section 6.1.
	R1-152707 at 4.
	<i>Ahn</i> at Abstract, [0011-16], [0035-42], [0051-55], [0072-73], [0085-89], [0091], [0095], [0098], [0101-03], [0105], [0107-16], claims 1-5, 7-8.
	<i>Cox</i> at 166-68.
	<i>Jeong</i> at 2:15-30, 4:36-45, 6:24-36, FIGS. 1-7, claims 1,3, 5.
	<i>Lee</i> at 26:44-65, 28:55-64, 40:52-60, 40:66-41:8.
	<i>Tseng</i> at 6:38-57.
[4] The method according to claim 3, wherein at least one of the preamble, the time	<i>Kim '068</i> at [0014-18], [0028], [0047-49], [0187].

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domain resource or the frequency domain resource corresponds to the number of UEs having random access requests in the UE group or the number of UEs contained in the UE group or the pre-set UE number.	<i>Gao</i> at 2-3, 5-6, 12-13, 17-18, 22, claim 1, claims 3-4, claim 7, claims 13-14, claims 19-20.
	<i>Jiang</i> at [0009], [0010], [0014], [0015], [0019], [0020], [0038], [0039], [0040], [0041], [0067], [0068], [0069], [0070], [0072], [0081], [0083].
	<i>Vujcic</i> at [0037].
	<i>Kim '055</i> at [43], [44], [45], [46], [47], [48], [49].
	3GPP TS 36.300 V12.5.0 at Sections 5.1.3, 5.1.4, 8.1.
	3GPP TS 36.213 V12.5.0 at Section 6.1.
	3GPP TS 36.300 V11.0.0 at Sections 5.1.3, 5.1.4, 8.1.
	3GPP TS 36.213 V11.0.0 at Section 6.1.
	<i>Ahn</i> at Abstract, [0011], [0051-55], [0072-73], [0085-89], [0091], [0095], [0098], [0101-03], [0105], [0107-16], claims 1-5, 7-8.
	<i>Cox</i> at 166-68.
	<i>Jeong</i> at 2:15-30, 4:36-45, 6:24-36, FIGS. 1-7, claims 1,3, 5.
	<i>Lee</i> at 26:44-65, 28:55-64, 40:52-60, 40:66-41:8.
[5pre] The method according to claim 1, wherein monitoring, by at least one of the first UE or the second UE, the RAR corresponding to the preamble and sent by the eNB comprises: descrambling, by at least	<i>Tseng</i> at 6:38-57.
	<i>Kim '068</i> at [0007], [0026], [0062], [0080], [0087].
	<i>Gao</i> at 7-8, 11, 13-15, 20-21, 24-26, claim 6, claim 8, claims 16-18.
	<i>Jiang</i> at [0026], FIG. 4, [0047], [0048], [0049], [0059], [0060], [0064], [0065], [0066], [0067], [0068], [0069], [0070], [0071], [0072], [0073], [0074], TABLE 1, [0075], [0076], [0079], [0080], [0081], [0082], [0083], [0084], [0085], [0085].
	<i>Vujcic</i> at [0028], [0055], [0056], [0079], [0080], [0081], TABLE 1, [0082], [0083].

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one of the first UE or the second UE, a Cyclic Redundancy Check (CRC) of Downlink Control Information (DCI) for scheduling the RAR according to a pre-set Random Access Radio Network Temporary Identity (RA-RNTI) or an RA-RNTI corresponding to the preamble, and receiving the RAR, the RAR comprising at least one of at least one Temporary Cell Radio Network Temporary Identity (TC-RNTI) or at least one Uplink (UL) grant; and	<i>Kim '055</i> at [48], [108].
	3GPP TS 36.213 V12.5.0 at Section 7.1.
	3GPP TS 36.213 V11.0.0 at Section 7.1.
	R1-152707 at 3.
	<i>Ahn</i> at [0011], [0016], [0044], [055-61], [0079], [0082-3], [0102-03], [0109], FIG. 3.
	<i>Cox</i> at 167-68, 143-45.
	<i>Jeong</i> at 4:15-31, 5:1-40, 5:41-65, 6:1-21, 6:24-55, 6:58-7:17, FIGS. 1-7.
	<i>Lee</i> at 12:47-62.
	<i>Tseng</i> at 7:5-8:45.
[5a] determining, by at least one of the first UE or the second UE, at least one of a TC-RNTI or UL grant allocated thereto according to at least one of at least one TC-RNTI or at least one UL grant contained in the RAR; or monitoring, by at least one of the first UE or the second UE, the RAR	<i>Kim '068</i> at [0026], [0062], [0080-81], [0087], [0244].
	<i>Gao</i> at 7-8, 11, 13-15, 20-21, 24-26, claim 6, claim 8, claims 16-18.

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corresponding to the preamble and sent by the eNB comprises: determining, by at least one of the first UE or the second UE, corresponding RA-RNTIs according to at least one of respective IDs or preambles, descrambling a CRC of DCI for scheduling the RAR according to the corresponding RA-RNTIs, and receiving corresponding RARs, the RAR comprising at least one of a TC-RNTI or a UL grant allocated to the first UE or second UE.	<i>Jiang</i> at [0047], [0048], [0049], [0053], [0054], [0057]. [0058], [0094],[0116], [0118].
	<i>Vujcic</i> at [0028], [0055], [0056], [0079], [0080], [0081], TABLE 1, [0082], [0083].
	<i>Kim '055</i> at [108].
	3GPP TS 36.321V12.5.0 at Section 5.
	3GPP TS 36.213 V12.5.0 at Section 6.2
	3GPP TS 36.321 V11.0.0 at Section 5.
	3GPP TS 36.213 V11.0.0 at Section 6.2
	R1-152707 at 3.
	<i>Ahn</i> at [0011], [0016], [0044], [055], [055-61], [0079], [0082-3], [0102-03], [0109], FIG. 3.
	<i>Cox</i> at 167-68, 143-45.
	<i>Jeong</i> at 4:15-31, 5:1-40, 5:41-65, 6:1-21, 6:24-55, 6:58-7:17, FIGS. 1-7.
	<i>Tseng</i> at 7:5-8:45.

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[6] The method according to claim 5, wherein determining, by at least one of the first UE or the second UE, at least one of the TC-RNTI or the UL grant allocated thereto according to at least one of at least one TC-RNTI or at least one UL grant contained in the RAR comprises: determining, by at least one of the first UE or the second UE, at least one of a TC-RNTI or a UL grant allocated thereto according to at least one of an ID of the first UE or the second UE in accordance with a pre-set rule.	<i>Kim '068</i> at [0080], [0081], [0158].
	<i>Gao</i> at 7-8, 11, 13-15, 20-21, 24-26, claim 6, claim 8, claims 16-18.
	<i>Jiang</i> at [0047], [0048], [0049], [0053], [0054], [0058], [0094].
	<i>Vujcic</i> at [0028], [0055], [0056], [0079], [0080], [0081], TABLE 1, [0082], [0083].
	<i>Kim '055</i> at [48], [54], [55], [56].
	3GPP TS 36.300 V12.5.0 at Section 10.1.5.
	3GPP TS 36.321 V12.5.0 at Section 5.1.5, 6.1.3.
	3GPP TS 36.213 V12.5.0 at Section 6.2.
	3GPP TS 36.300 V11.0.0 at Section 10.1.5.
	3GPP TS 36.321 V11.0.0 at Section 5.1.5, 6.1.3.
	3GPP TS 36.213 V11.0.0 at Section 6.2.
	<i>Cox</i> at 167-68.
	<i>Jeong</i> at 4:15-31, 5:1-40, 5:41-65, 6:1-21, 6:24-55, 6:58-7:17, FIGS. 1-7.
[7] The method according to claim 1, further comprising: after sending, by at least one of the first UE or the second	<i>Tseng</i> at 7:5-8:45.
	<i>Kim '068</i> at [0061], [0072], [0091-94], [0102-03], [0109-112], [0156], [0160-63].
	<i>Gao</i> at 3-5, 7, 11, 14-16, 20-22, claim 6, claim 8, claims 16-18.
	<i>Jiang</i> at claim 1, claim 6, claim 7, claim 9, claim 12, [0010], [0027], FIG. 5, [0028], FIG. 6, [0055], [0056], [0057], [0058], [0111], [01112], [01114], [01116], [0118], [0121], [0148], [0149].

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UE, the message 3 according to the UL grant allocated thereto, receiving, by at least one of the first UE or the second UE, a message 4 sent by the eNB.	<i>Vujcic</i> at [0044], [0045].
	<i>Kim '055</i> at [56].
	3GPP TS 36.300 V12.5.0 at Sections 10.1.5, 10.1.6.
	3GPP TS 36.321 V12.5.0 at Sections 5.1.5.
	3GPP TS 36.213 V12.5.0 at Section 6.1, 6.1.1.
	3GPP TS 36.300 V11.0.0 at Sections 10.1.5, 10.1.6.
	3GPP TS 36.321 V11.0.0 at Sections 5.1.5.
	3GPP TS 36.213 V11.0.0 at Section 6.1, 6.1.1.
	R1-152707 at 3.
	Cox at 167-68.
	<i>Jeong</i> at Abstract, 2:31-39, 2:40-45, 2:46-51, 2:58-62, 2:63-3:5.
	<i>Lee</i> at 21:47-56, 21:57-22:15, 22:16-17, 22:18-46, 22:47-23:12.
	<i>Tseng</i> at 8:46-9:50, FIG. 5.
[8] The method according to claim 7, wherein receiving, by at least one of the first UE or the second UE, the message 4 sent by the eNB comprises: scrambling a CRC of DCI for scheduling the message 4 by using a TC-RNTI allocated to at least one of the first UE or the second UE.	<i>Kim '068</i> at [0007], [0061], [0092].
	<i>Gao</i> at 3-5, 7, 11, 14-15, 20-22, claim 6, claim 8, claim 16, claim 18.
	<i>Jiang</i> at claim 7, claim 13, [0020], [0054], [0056], [0057], [0058], [0059], [0112], FIG. 5, [0113], [0114], [0116], [0117], [0118], [0119], [0120], [0122], 0123], [0124], 0125], [0126], [0127], [0128], [0168], [0169], [0170], [0182],
	<i>Vujcic</i> at [0083], [0084].
	<i>Kim '055</i> at [48], [108].
	3GPP TS 36.321 V12.5.0 at Sections 5.1.5, 6.1.3.
	3GPP TS 36.213 V12.5.0 at Section 7.1.
	3GPP TS 36.321 V11.0.0 at Sections 5.1.5, 6.1.3.
	3GPP TS 36.213 V11.0.0 at Section 7.1.

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'430 Patent	Reference
	R1-152707 at 3.
	TR 36.888 at 20-21.
	Cox at 167-68.
	<i>Tseng</i> at 8:46-9:50.
[9] The method according to claim 8, wherein the message 4 comprises at least one set of radio resources, radio resources allocated to at least one of the first UE or the second UE are determined by at least one of the first UE or the second UE according to at least one set of radio resources in the message 4; or the message 4 comprises a set of radio resources allocated to the first UE or second UE.	<i>Kim '068</i> at [0054], [0061], [0092].
	<i>Gao</i> at 3-5, 7, 11, 14-15, 20-22, claim 6, claim 8, claim 16, claim 18.
	<i>Jiang</i> at claim 13, [0020], [0057], [0058], [0182].
	<i>Vujcic</i> at [0083], [0084], [0096].
	<i>Kim '055</i> at [13].
	3GPP TS 36.321 V12.5.0 at Sections 5.1.5, 6.1.3.
	3GPP TS 36.213 V12.5.0 at Section 7.1.
	3GPP TS 36.321 V11.0.0 at Sections 5.1.5, 6.1.3.
	3GPP TS 36.213 V11.0.0 at Section 7.1
	R1-152707 at 3.
	Cox at 167-68.
	<i>Tseng</i> at 8:46-9:50.
[10] The method according to claim 9, wherein the	<i>Kim '068</i> [0050], [0061], [0092], [0188].
	<i>Gao</i> at 3-5, 7, 11, 15, 21-22, claim 6, claim 8, claim 16, claim 18.

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radio resources allocated to at least one of the first UE or the second UE are further determined by at least one of the first UE or the second UE according to an ID of at least one of the first UE or the second UE in accordance with a pre-set rule.	<i>Jiang</i> at claim 3, [0020], [0057], [0058], [0182].
	<i>Vujcic</i> at [0083], [0084], [0096].
	<i>Kim '055</i> at [13].
	3GPP TS 36.321 V12.5.0 at Sections 5.1.5, 6.1.3.
	3GPP TS 36.213 V12.5.0 at Section 7.1.
	3GPP TS 36.321 V11.0.0 at Sections 5.1.5, 6.1.3.
	3GPP TS 36.213 V11.0.0 at Section 7.1.
	R1-152707 at 3.
	<i>Cox</i> at 167-68.
	<i>Tseng</i> at 8:46-9:50.
[11] The method according to claim 7, further comprising: after receiving, by at least one of the first UE or the second UE, the message 4 sent by the eNB, sending, by at least one of the first UE or the second UE, an indicating signal for notifying the eNB of a successful access of at least one of the first UE or the second UE to the eNB, wherein the indicating signal is a Scheduling Request (SR) or an	<i>Kim '068</i> at [0007], [0054], [0062-63], [0109], [0156], [0221], [0222], [0227].
	<i>Jiang</i> at [0031].
	<i>Vujcic</i> at [0046], [0047].
	<i>Kim '055</i> at [50], [107].
	3GPP TS 36.321 V12.5.0 at Sections 5.1.5, 6.1.3.
	3GPP TS 36.213 V12.5.0 at Section 7.1.
	3GPP TS 36.321 V11.0.0 at Sections 5.1.5, 6.1.3.
	3GPP TS 36.213 V11.0.0 at Section 7.1.
	R1-152707 at 3.
	<i>Ahn</i> at [0040]

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Acknowledgement (ACK) signal.	Cox at 167-68.
	Jeong at 3:50-4:2, 4:15-31, 4:46-58, 4:59-66, FIGS. 1-7.
	Lee at 8:27-52, 10:42-50, 12:30-46.
	Tseng at 9:51-10:21.
[12] The method according to claim 7, further comprising: after receiving, by at least one of the first UE or the second UE, the message 4 sent by the eNB, receiving, by at least one of the first UE or the second UE, indicating information, sent by the eNB, for indicating re-initiation of a random access of at least one of the first UE or the second UE.	Kim '068 at [0103].
	Gao at 12.
	Vujcic at [0045].
	Kim '055 at [56].
	3GPP TS 36.321V12.5.0 at Section 5.3.2.
	3GPP TS 36.321 V11.0.0 at Section 5.3.2.
	Ahn at [0013], [0040], [0078], [0083], [0096], [0104], [0113].
	Cox at 167-68.
	Tseng at 8:46-9:50.
[13] The method according to claim 7, wherein the message 3 and the message 4 comprise a group ID of the UE group or a pre-set field.	Kim '068 at [0088-90], [0161].
	Gao at 4, 7-8, 14, 21, 25-26, claim 7, claim 17.
	Jiang at claim 7, [0053], [0054], [0057], [0058], [0116], [0118], [0170].
	Vujcic at [0077].
	Kim '055 at [55], [56].
	3GPP TS 36.321V12.5.0 at Section 5.1.5, 5.4.1, 6.1.3.

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'430 Patent	Reference
	3GPP TS 36.213 V12.5.0 at Section 7.1.
	3GPP TS 36.321 V11.0.0 at Section 5.1.5, 5.4.1, 6.1.3.
	3GPP TS 36.213 V11.0.0 at Section 7.1.
	<i>Ahn</i> at [0011], [0042], [0044], [0073], [0075].
	<i>Cox</i> at 167-68.
[14] The method according to claim 1, further comprising: before sending, by the first UE in the UE group, the preamble over the time-frequency resource, receiving, by at least one of the first UE or the second UE, Downlink Control Information (DCI) or a paging message or a Radio Resource Control (RRC) message sent by the eNB; or, receiving, by the first UE, random access request information sent by the second UE.	<i>Kim '068</i> at [0050-54], [0062], [0071-81].
	<i>Gao</i> at 10-11, 19, Claim 4.
	<i>Vujcic</i> at [0049], [0055].
	<i>Kim '055</i> at [12], [13], [14], [47], [48], [58], [125].
	3GPP TS 36.300 V12.5.0 at Sections 7.2, 10.1.4, 10.1.5, 19.2.1, 19.2.2.
	3GPP TS 36.321V12.5.0 at Sections 5.1, 5.1.1, 5.1.3, 5.1.4.
	3GPP TS 36.300 V11.0.0 at Sections 7.2, 10.1.4, 10.1.5, 19.2.1, 19.2.2.
	3GPP TS 36.321 V11.0.0 at Sections 5.1, 5.1.1, 5.1.3, 5.1.4.
	R1-152707 at 1.
	<i>Ahn</i> at [0011], [0042], [0044], [0073], [0075].
	<i>Cox</i> at 163-68.
	<i>Jeong</i> at 4:15-31, FIGS. 1-7.
	<i>Lee</i> at 7:48-64, 9:8-22, 9:27-30, 30:13-21, 30:22-36, 30:45-51, 30:52-53, 30:54-62, 30:63-31:4, 31:5-6, 31:7-13, claims 2-9.
	<i>Tseng</i> at 9:51- 10:21.
[15] The method according to claim 14, wherein receiving, by at least one of the first UE or the second UE, the DCI or the paging message or the RRC message sent by the eNB	<i>Kim '068</i> at [0007], [0062], [0071], [0073-78], [0080-81].
	<i>Vujcic</i> at [0015], [0016], [0017], FIG. 2A, FIG. 2B, FIG. 2C, [0018], [0019], [0020], [0021], [0022].
	<i>Kim '055</i> at [12], [13], [14], [58], [125].
	3GPP TS 36.213 V12.5.0 at Sections 6, 6.1.
	3GPP TS 36.213 V11.0.0 at Sections 6, 6.1.
	R1-152707 at 1.
	<i>Ahn</i> at [0011], [0042], [0044], [0073], [0075].

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comprises at least one of the following: the DCI or a CRC of DCI for scheduling the paging message or the RRC message is scrambled by using a group ID of the UE group; the DCI or the paging message or the RRC message comprises a group ID of the UE group; the DCI or the paging message or the RRC message comprises an ID of at least one of the first UE or the second UE; or the DCI or the paging message or the RRC message comprises at least one of an ID of the preamble, the time domain resource of the preamble or the frequency domain resource of the preamble.	Cox at 163-68.
	Lee at Abstract, 2:8-23, 2:24-39, 2:40-44, 2:53-56, 2:62-63, 2:64-67, 3:1-3, 3:12-17, 3:18-30, 3:31-39.
	TR 36.888 at 46.
[17] The method according to claim 1, wherein sending, by the first UE in the UE group, the preamble over the time-frequency resource comprises: periodically	Gao at 1.
	Jiang at [0078], [0044], [0109].
	Kim '055 at [57], [106].
	Vujcic at [0027].
	3GPP TS 36.321 V12.5..0 at Section 5.1.1.

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sending, by the first UE, the preamble over the frequency domain resource.	3GPP TS 36.321 V11.0.0 at Section 5.1.1.
	R1-152707 at 1.
	TR 36.888 at 46.
	Cox at 163-68.
	Tseng at 8:20-45.
[18pre] A User Equipment (UE), comprising: a sending unit and a monitoring unit,	Kim '068 at [Abstract], [0057], [0064-65], [0071-72], [0234-0238].
	Gao at Abstract, 1-2, 6-7, 10-11, 13, 15-16, claim 1, claims 4-5, Figs. 1, 2, 4.
	Jiang at claim 9, [0011], [0022], [0029], FIG. 7, [0030], FIG. 8, [0152].
	Vujcic at Claim 22.
	Kim '055 at [14], [135], [137], [138], FIG. 22, [Claim 1], [Claim 16].
	3GPP TS 36.300 V12.5.0 at Sections 1, 10.1.5.
	3GPP TS 36.321V12.5.0 at Sections 1, 5, 5.1, 5.1.1.
	3GPP TS 36.213 V12.5.0 at Sections 1, 6, 6.1, 6.1.1.
	3GPP TS 36.300 V11.0.0 at Sections 1, 10.1.5.
	3GPP TS 36.321 V11.0.0 at Sections 1, 5, 5.1, 5.1.1.
	3GPP TS 36.213 V11.0.0 at Sections 1, 6, 6.1, 6.1.1.
	R1-152707 at 3.
	Ahn at [0021], [0128-29], FIG. 4, claims 9-13.
	Cox at 163-68.
	Jeong at FIGS. 1-7, claims 1-4.
	Lee at claim 10.
	Tseng at 3:30-4:61, FIGs. 2-3.
	Samsung Galaxy S6
	https://www.samsung.com/us/business/support/owners/product/galaxy-s6-t-mobile/#fullspecs .
	https://image.semiconductor.samsung.com/content/samsung/p6/etc/exynos/file/solution/Modem-Modem-333.pdf .
	https://www.cablefree.net/wirelesstechnology/4glte/lte-ue-category-class-definitions/ .
	Samsung Galaxy S6 Edge

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	https://www.samsung.com/us/mobile/phones/galaxy-s/samsung-galaxy-s6-edge-32gb-t-mobile-gold-platinum-sm-g925tztatmb/ . https://image.semiconductor.samsung.com/content/samsung/p6/etc/exynos/file/solution/Modem-Modem-333.pdf . https://www.cablefree.net/wirelesstechnology/4glte/lte-ue-category-class-definitions/ .
	Samsung Galaxy S7 https://www.samsung.com/us/support/mobile/phones/galaxy-s/galaxy-s7 . https://semiconductor.samsung.com/processor/mobile-processor/exynos-8-octa-8890/ . https://www.cablefree.net/wirelesstechnology/4glte/lte-ue-category-class-definitions/ . https://www.gsmarena.com/samsung_galaxy_s7-7821.php
	Samsung Galaxy S7 Edge https://www.samsung.com/us/support/mobile/phones/galaxy-s/galaxy-s7-edge . https://semiconductor.samsung.com/processor/mobile-processor/exynos-8-octa-8890/ . https://www.cablefree.net/wirelesstechnology/4glte/lte-ue-category-class-definitions/ . https://www.gsmarena.com/samsung_galaxy_s7_edge-7945.php
[18a] wherein the sending unit is configured to: send a preamble to an evolved Node B (eNB) over a time-frequency resource, the time-frequency resource comprising a time domain resource and a frequency domain resource;	<i>Kim '068</i> at [0006-7], [0055], [0083-85], [0093], [0107], [0115], [241-3].
	<i>Gao</i> at 1, 11-13, 15-16, 24-26, claims 1-5, claim 7, Fig. 5.
	<i>Jiang</i> at claim 9, [0012], [0022], [0153].
	<i>Vujcic</i> at Claim 22.
	<i>Kim '055</i> at [14], [Claim 1], [Claim 16], [Claim 21], [Claim 23].
	3GPP TS 36.300 V12.5.0 at Sections 5.2.5, 10.1.5.
	3GPP TS 36.321 V12.5.0 at Sections 5.1.2, 5.1.3.
	3GPP TS 36.213 V12.5.0 at Section 6.1.
	3GPP TS 36.300 V11.0.0 at Sections 5.2.5, 10.1.5.
	3GPP TS 36.321 V11.0.0 at Sections 5.1.2, 5.1.3.
	3GPP TS 36.213 V11.0.0 at Section 6.1.
	<i>Cox</i> at 163-68.
	<i>Jeong</i> at claims 1-4.
	<i>Lee</i> at claim 10.
	R1-152707 at 1-3.

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	<i>Ahn</i> at [0021], [0128-29], FIG. 4, claims 9-13.
	<i>Tseng</i> at 3:30-4:61, FIGs. 2-3.
[18b] the monitoring unit is configured to: monitor a Random Access Response (RAR) corresponding to the preamble and sent by the eNB; and	<i>Kim '068</i> at [0072-73], [0077-80], [0083-87], [0241-44].
	<i>Gao</i> at 3-9, 11,13-16, 19-26, claim 1, claim 4, claims 6-8.
	<i>Jiang</i> at claim 9, claim 10, claim 11, [0013], [0022], [0031], FIG. 9, [0154], [0155], [0156], [0157], [0158], [0161], [0162], [0163], [0164], [0166], [0167], [0168], [0169], [0170], [0171].
	<i>Vujcic</i> at Claim 22.
	<i>Kim '055</i> at [14], [Claim 1], [Claim 16], [Claim 21], [Claim 23].
	3GPP TS 36.300 V12.5.0 at Sections 10.1.5, 7.2.
	3GPP TS 36.321V12.5.0 at Sections 5.1.4, 5.1.5
	3GPP TS 36.213 V12.5.0 at Section 6.2.
	3GPP TS 36.300 V11.0.0 at Sections 10.1.5, 7.2.
	3GPP TS 36.321 V11.0.0 at Sections 5.1.4, 5.1.5
	3GPP TS 36.213 V11.0.0 at Section 6.2.
	<i>Cox</i> at 163-68.
	<i>Jeong</i> at claims 1-4.
	<i>Lee</i> at claim 10.
	R1-152707 at 3.
	<i>Ahn</i> at [0021], [0128-29], FIG. 4, claims 9-13.
	<i>Tseng</i> at 3:30-4:61, FIGs. 2-3.
[18c] the sending unit is further configured to: send a message 3 according to a Uplink (UL) grant allocated to the UE, wherein the message 3 comprises a number of UEs having random access requests in a UE group or a number of UEs contained in the UE	<i>Kim '068</i> at [0241-244].
	<i>Gao</i> at 3-5, 7, 11, 14-16, 20-26, claim 4, claims 6-8, claim 10.
	<i>Jiang</i> at claim 9, [0014], [0015], [0032], FIG. 10, [0110], [0147], [0160], [0161], [0181].
	<i>Vujcic</i> at Claim 22.
	<i>Kim '055</i> at [14], [Claim 1], [Claim 16].
	3GPP TS 36.300 V12.5.0 at Sections 8.1, 10.1.5, 10.1.6.
	3GPP TS 36.321V12.5.0 at Sections 5.1.5, 5.4.1.
	3GPP TS 36.213 V12.5.0 at Sections 6.1.3, 6.1.1, 6.2.
	3GPP TS 36.300 V11.0.0 at Sections 8.1, 10.1.5, 10.1.6.
	3GPP TS 36.321 V11.0.0 at Sections 5.1.5, 5.4.1.

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group or a pre-set UE number.	3GPP TS 36.213 V11.0.0 at Sections 6.1.3, 6.1.1, 6.2.
	<i>Cox</i> at 163-68.
	<i>Jeong</i> at claims 1-4.
	<i>Lee</i> at claim 10.
	R1-152707 at 3.
	<i>Ahn</i> at [0021], [0128-29], FIG. 4, claims 9-13.
	<i>Tseng</i> at 3:30-4:61, FIGs. 2-3.