

# Appendix G: LTE Down-Link Carrier Aggregation

The tables below show the supported frequency bands of the device for DL Inter-band and DL Intra-band combinations.

Power measurements were performed on the channel with the highest maximum output power from Tune-up Procedure on ANT1 antenna.

When carrier aggregation is limited to downlink only, uplink maximum output power (single carrier) is measured for the supported combinations of downlink carrier aggregation listed in the table below. In applying the power measurement procedures of KDB 941225 D05A and April 2018 TCB workshop for DL CA to qualify for UL SAR test exclusion, power measurement is required only for the subset in each row with the largest combination of frequency bands and CCs (far right most configuration highlighted in the table below).

Index	2CC	Restriction	Completely Covered by Measurement Superset	Index	3CC	Restriction	Completely Covered by Measurement Superset	Index	4CC	Restriction	Completely Covered by Measurement Superset	Index	5CC	Restriction	Completely Covered by Measurement Superset
2CC# 1	CA_2C		3CC#24	3CC# 1	CA_48D		4CC#11	4CC# 1	CA_41D		5CC#3	5CC# 1	CA_2A-48E		No
2CC# 2	CA_5B		3CC#43	3CC# 2	CA_41A-41C		No	4CC# 2	CA_41E		No	5CC# 2	CA_41C-41D		No
2CC# 3	CA_7B		No	3CC# 3	CA_48A-48C		4CC#26	4CC# 3	CA_48E		5CC#4	5CC# 3	CA_25A-25A-41D		No
2CC# 4	CA_7C		3CC#17	3CC# 4	CA_66A-66B		4CC#12	4CC# 4	CA_41A-41D		No	5CC# 4	CA_48E-66A		No
2CC# 5	CA_12B		3CC#18	3CC# 5	CA_66A-66C		4CC#13	4CC# 5	CA_41C-41C		No	5CC# 5	CA_2A-2A-5A-66A-66A		No
				3CC# 6	CA_2A-2A-4A		4CC#6	4CC# 6	CA_2A-2A-4A-4A		No	5CC# 6	CA_2A-2A-5A-66B		No
2CC# 7	CA_41C		3CC#2	3CC# 7	CA_2A-2A-5A		4CC#33	4CC# 7	CA_2A-2A-12B		No	5CC# 7	CA_2A-2A-5A-66C		No
2CC# 8	CA_48C		3CC#3	3CC# 8	CA_2A-2A-12A		4CC#34	4CC# 8	CA_2A-2A-66A-66A		5CC#8	5CC# 8	CA_2A-2A-12A-66A-66A		No
2CC# 9	CA_66B		3CC#4	3CC# 9	CA_2A-2A-13A		4CC#36	4CC# 9	CA_2A-2A-66B		5CC#6	5CC# 9	CA_2A-2A-14A-66A-66A		No
2CC# 10	CA_66C		3CC#5	3CC# 10	CA_2A-2A-14A		4CC#37	4CC# 10	CA_2A-2A-66C		5CC#7	5CC# 10	CA_2A-5B-66B		No
2CC# 11	CA_2A-2A		3CC#6	3CC# 11	CA_2A-2A-30A		4CC#39	4CC# 11	CA_2A-48D		5CC#12	5CC# 11	CA_2A-5B-66C		No
2CC# 12	CA_4A-4A		3CC#28	3CC# 12	CA_2A-2A-66A		4CC#40	4CC# 12	CA_2A-66A-66B		No	5CC# 12	CA_2A-48D-66A		No
2CC# 13	CA_7A-7A		3CC#35	3CC# 13	CA_2A-2A-71A		4CC#40	4CC# 13	CA_2A-66A-66C		No	5CC# 13	CA_2A-5B-66A-66A		No
2CC# 14	CA_25A-25A		3CC#54	3CC# 14	CA_2A-4A-4A		4CC#41	4CC# 14	CA_2C-66A-66A		No	5CC# 14	CA_5B-30A-66A-66A		No
2CC# 15	CA_41A-41A		No	3CC# 15	CA_2A-5B		4CC#50	4CC# 15	CA_4A-4A-5B		No	5CC# 15	CA_2A-2A-5A-30A-66A		No
2CC# 16	CA_48A-48A		3CC#59	3CC# 16	CA_2A-7A-7A		4CC#44	4CC# 16	CA_4A-4A-12B		No	5CC# 16	CA_2A-2A-12A-30A-66A		No
2CC# 17	CA_66A-66A		3CC#62	3CC# 17	CA_2A-7C		4CC#45	4CC# 17	CA_5A-66A-66B		No	5CC# 17	CA_2A-2A-14A-30A-66A		No
2CC# 18	CA_2A-4A		3CC#14	3CC# 18	CA_2A-12B		4CC#46	4CC# 18	CA_5A-66A-66C		No	5CC# 18	CA_2A-5A-30A-66A-66A		No
2CC# 19	CA_2A-5A		3CC#70	3CC# 19	CA_2A-48A-48A		No	4CC# 19	CA_5B-66A-66A		5CC#13	5CC# 19	CA_2A-5B-30A-66A		No
2CC# 20	CA_2A-7A		3CC#16	3CC# 20	CA_2A-48C		4CC#59	4CC# 20	CA_5B-66B		5CC#10	5CC# 20	CA_2A-12A-30A-66A-66A		No
2CC# 21	CA_2A-12A		3CC#75	3CC# 21	CA_2A-66A-66A		4CC#60	4CC# 21	CA_5B-66C		5CC#11	5CC# 21	CA_2A-14A-30A-66A-66A		No
2CC# 22	CA_2A-13A		3CC#76	3CC# 22	CA_2A-66B		4CC#48	4CC# 22	CA_13A-66A-66B		No				
2CC# 23	CA_2A-14A		3CC#77	3CC# 23	CA_2A-66C		4CC#49	4CC# 23	CA_13A-66A-66C		No				
2CC# 24	CA_2A-17A		No	3CC# 24	CA_2C-5A		No	3CC# 24	CA_25A-25A-41C		No				
2CC# 25	CA_2A-30A		3CC#79	3CC# 25	CA_2C-12A		No	4CC# 25	CA_25A-41D		5CC#3				
2CC# 26	CA_2A-48A		3CC#80	3CC# 26	CA_2C-30A		No	4CC# 26	CA_48A-48A-66A-66A		No				
2CC# 27	CA_2A-66A		3CC#81	3CC# 27	CA_2C-66A		No	4CC# 27	CA_48A-48C-66A		No				
2CC# 28	CA_2A-71A		3CC#81	3CC# 28	CA_4A-4A-5A		4CC#62	4CC# 28	CA_48C-66A-66A		No				
2CC# 29	CA_4A-5A		3CC#82	3CC# 29	CA_4A-4A-7A		No	4CC# 29	CA_48D-66A		No				
2CC# 30	CA_4A-7A		3CC#83	3CC# 30	CA_4A-4A-12A		4CC#63	4CC# 30	CA_2A-2A-4A-5A		No				
2CC# 31	CA_4A-12A		3CC#84	3CC# 31	CA_4A-4A-13A		No	4CC# 31	CA_2A-2A-4A-12A		No				
2CC# 32	CA_4A-13A		3CC#31	3CC# 32	CA_4A-4A-30A		4CC#63	4CC# 32	CA_2A-2A-5A-30A		5CC#15				
2CC# 33	CA_4A-17A		No	3CC# 33	CA_4A-4A-71A		No	4CC# 33	CA_2A-2A-5A-66A		5CC#15				
2CC# 34	CA_4A-30A		3CC#32	3CC# 34	CA_4A-5B		4CC#15	4CC# 34	CA_2A-2A-12A-30A		5CC#16				
2CC# 35	CA_4A-71A		3CC#33	3CC# 35	CA_4A-7A-7A		4CC#44	4CC# 35	CA_2A-2A-12A-66A		5CC#16				
2CC# 36	CA_5A-7A		3CC#38	3CC# 36	CA_4A-7C		4CC#45	4CC# 36	CA_2A-2A-13A-66A		No				
2CC# 37	CA_5A-25A		No	3CC# 37	CA_4A-12B		4CC#46	4CC# 37	CA_2A-2A-14A-30A		5CC#17				
2CC# 38	CA_5A-30A		3CC#85	3CC# 38	CA_5A-7A-7A		No	4CC# 38	CA_2A-2A-14A-66A		5CC#17				
				3CC# 39	CA_5A-7C		No	4CC# 39	CA_2A-2A-30A-66A		5CC#17				
2CC# 40	CA_5A-41A		No	3CC# 40	CA_5A-66A-66A		4CC#47	4CC# 40	CA_2A-2A-66A-71A		No				
2CC# 41	CA_5A-48A		No	3CC# 41	CA_5A-66B		4CC#48	4CC# 41	CA_2A-4A-4A-5A		No				
2CC# 42	CA_5A-66A		3CC#40	3CC# 42	CA_5A-66C		4CC#49	4CC# 42	CA_2A-4A-4A-12A		No				
2CC# 43	CA_7A-12A		3CC#72	3CC# 43	CA_5B-30A		4CC#50	4CC# 43	CA_2A-4A-5B		No				
2CC# 44	CA_7A-26A		3CC#45	3CC# 44	CA_5B-66A		4CC#51	4CC# 44	CA_2A-4A-7A-7A		No				
2CC# 45	CA_7A-66A		3CC#46	3CC# 45	CA_7A-7A-26A		No	4CC# 45	CA_2A-4A-7C		No				
2CC# 46	CA_12A-25A		No	3CC# 46	CA_7A-7A-66A		No	4CC# 46	CA_2A-4A-12B		No				
2CC# 47	CA_12A-30A		3CC#87	3CC# 47	CA_12A-66A-66A		4CC#52	4CC# 47	CA_2A-5A-66A-66A		5CC#5				
2CC# 48	CA_12A-66A		3CC#47	3CC# 48	CA_12A-66C		4CC#53	4CC# 48	CA_2A-5A-66B		5CC#6				
2CC# 49	CA_13A-48A		3CC#88	3CC# 49	CA_13A-48C		4CC#67	4CC# 49	CA_2A-5A-66C		5CC#7				
2CC# 50	CA_13A-66A		3CC#50	3CC# 50	CA_13A-66A-66A		4CC#14	4CC# 50	CA_2A-5B-30A		5CC#19				
2CC# 51	CA_14A-30A		3CC#89	3CC# 51	CA_13A-66B		4CC#55	4CC# 51	CA_2A-5B-66A		5CC#19				
2CC# 52	CA_14A-66A		3CC#89	3CC# 52	CA_13A-66C		4CC#56	4CC# 52	CA_2A-12A-66A-66A		5CC#20				
2CC# 53	CA_25A-26A		3CC#54	3CC# 53	CA_14A-66A-66A		4CC#57	4CC# 53	CA_2A-12A-66C		No				
2CC# 54	CA_25A-41A		3CC#55	3CC# 54	CA_25A-25A-26A		No	4CC# 54	CA_2A-13A-66A-66A		No				
2CC# 55	CA_26A-41A		No	3CC# 55	CA_25A-25A-41A		No	4CC# 55	CA_2A-13A-66B		No				

Index	2CC	Restriction	Completely Covered by Measurement Superset	Index	3CC	Restriction	Completely Covered by Measurement Superset	Index	4CC	Restriction	Completely Covered by Measurement Superset	Index	5CC	Restriction	Completely Covered by Measurement Superset
2CC# 55	CA_26A-41A		No	3CC# 55	CA_25A-25A-41A		No	4CC# 55	CA_2A-13A-66B		No				
2CC# 56	CA_30A-66A		3CC#58	3CC# 56	CA_25A-41C		No	4CC# 56	CA_2A-13A-66C		No				
2CC# 57	CA_48A-66A		3CC#60	3CC# 57	CA_26A-41C		No	4CC# 57	CA_2A-14A-66A-66A		5CC#21				
2CC# 58	CA_66A-71A		3CC#62	3CC# 58	CA_30A-66A-66A		4CC#58	4CC# 58	CA_2A-30A-66A-66A		5CC#21				
				3CC# 59	CA_48A-48A-66A		4CC#26	4CC# 59	CA_2A-48C-66A		No				
				3CC# 60	CA_48A-66A-66A		4CC#26	4CC# 60	CA_2A-66A-66A-71A		No				
				3CC# 61	CA_48C-66A		4CC#59	4CC# 61	CA_2A-66C-71A		No				
				3CC# 62	CA_66A-66A-71A		4CC#60	4CC# 62	CA_4A-4A-5A-30A		No				
				3CC# 63	CA_66C-71A		4CC#61	4CC# 63	CA_4A-4A-12A-30A		No				
				3CC# 64	CA_2A-4A-5A		4CC#69	4CC# 64	CA_5A-30A-66A-66A		5CC#18				
				3CC# 65	CA_2A-4A-7A		4CC#70	4CC# 65	CA_5B-30A-66A		5CC#19				
				3CC# 66	CA_2A-4A-12A		4CC#71	4CC# 66	CA_12A-30A-66A-66A		5CC#20				
				3CC# 67	CA_2A-4A-13A		No	4CC# 67	CA_13A-48C-66A		No				
				3CC# 68	CA_2A-4A-30A		4CC#71	4CC# 68	CA_14A-30A-66A-66A		5CC#21				
				3CC# 69	CA_2A-4A-71A		No	4CC# 69	CA_2A-4A-5A-30A		No				
				3CC# 70	CA_2A-5A-30A		4CC#72	4CC# 70	CA_2A-4A-7A-12A		No				
				3CC# 71	CA_2A-5A-66A		4CC#72	4CC# 71	CA_2A-4A-12A-30A		No				
				3CC# 72	CA_2A-7A-12A		4CC#74	4CC# 72	CA_2A-5A-30A-66A		5CC#18				
				3CC# 73	CA_2A-7A-66A		4CC#74	4CC# 73	CA_2A-7A-7A-66A		No				
				3CC# 74	CA_2A-12A-30A		4CC#75	4CC# 74	CA_2A-7A-12A-66A		No				
				3CC# 75	CA_2A-12A-66A		4CC#75	4CC# 75	CA_2A-12A-30A-66A		5CC#20				
				3CC# 76	CA_2A-13A-66A		No	4CC# 76	CA_2A-14A-30A-66A		5CC#21				
				3CC# 77	CA_2A-14A-30A		4CC#76								
				3CC# 78	CA_2A-14A-66A		4CC#76								
				3CC# 79	CA_2A-30A-66A		4CC#76								
				3CC# 80	CA_2A-48A-66A		No								
				3CC# 81	CA_2A-66A-71A		4CC#60								
				3CC# 82	CA_4A-5A-30A		4CC#62								
				3CC# 83	CA_4A-7A-12A		4CC#70								
				3CC# 84	CA_4A-12A-30A		4CC#71								
				3CC# 85	CA_5A-30A-66A		4CC#64								
				3CC# 86	CA_7A-12A-66A		4CC#74								
				3CC# 87	CA_12A-30A-66A		4CC#75								
				3CC# 88	CA_13A-48A-66A		No								
				3CC# 89	CA_14A-30A-66A		4CC#76								

In applying the power measurement procedures of KDB 941225 D05A for DL CA to qualify for UL SAR test exclusion, power measurement is required only for the CA configuration with the largest aggregated DL CA BW in each frequency band, independently for contiguous and non-contiguous CA; however, if the same frequency band is used for both contiguous and non-contiguous CA, power measurement was performed using the configuration with the largest aggregated BW and maximum output power among contiguous and non-contiguous CA.

### 2CC DL CA Measured Results

E-UTRA CA configuration	CC1 (UL)					CC2 (DL)			Aggregated BW	CA Inactive (dBm)	CA Active (dBm)	Delta
	Mode	BW (MHz)	Channel	Freq (MHz)	RB,Offset	BW (MHz)	Channel	Freq (MHz)				
CA_7B	QPSK	15	21076	2532.6	1,0	5	3169	2661.9	20	24.90	24.90	0.00
CA_38C	QPSK	20	37901	2585.1	1,0	20	38099	2604.9	40	24.90	24.90	0.00
CA_41A-41A	QPSK	20	39750	2506	1,0	20	41292	2660.2	40	24.48	24.33	-0.15
CA_2A-17A	QPSK	20	18900	1880	1,49	10	5790	740	30	25.2	25.17	-0.03
CA_4A-17A	QPSK	20	20175	1732.5	1,49	10	5790	740	30	25.65	25.63	-0.02
CA_5A-25A	QPSK	10	20525	836.5	1,24	20	8365	1962.5	30	25.70	25.68	-0.02
CA_5A-38A	QPSK	10	20525	836.5	1,24	20	38000	2595	30	25.68	25.65	-0.03
CA_5A-41A	QPSK	10	20525	836.5	1,24	20	40620	2593	30	25.66	25.64	-0.02
CA_5A-48A	QPSK	10	20525	836.5	1,24	20	55773	3603.3	30	25.69	25.66	-0.03
CA_12A-25A	QPSK	5	23110	709	1,24	5	8665	1992.5	10	25.70	25.65	-0.05
CA_26A-41A	QPSK	10	26865	831.5	1,37	20	40842	2615.2	30	25.66	24.63	-1.03

### 3CC DL CA Measured Results

E-UTRA CA configuration	CC1 (UL)					CC2 (DL)			CC3 (DL)			Aggregated BW	CA Inactive (dBm)	CA Active (dBm)	Delta
	Mode	BW (MHz)	Channel	Freq (MHz)	RB,Offset	BW (MHz)	Channel	Freq (MHz)	BW (MHz)	Channel	Freq (MHz)				
CA_41A-41C	QPSK	20	39750	2506	1,0	20	41292	2660.2	20	41490	2680	60	24.86	24.86	0.00
CA_2A-48A-48A	QPSK	20	18900	1880	1,49	20	55934	3619.4	20	55340	3560	60	25.2	25.21	0.01
CA_2C-5A	QPSK	20	18801	1870.1	1,49	20	999	1969.9	10	2525	881.5	50	25.26	25.29	0.03
CA_2C-12A	QPSK	20	18801	1870.1	1,49	20	999	1969.9	10	5095	737.5	50	25.29	25.27	-0.02
CA_2C-30A	QPSK	20	18801	1870.1	1,49	20	999	1969.9	10	9820	2355	50	25.32	25.30	-0.02
CA_2C-66A	QPSK	20	18801	1870.1	1,49	20	999	1969.9	20	66786	2145	60	25.32	25.30	-0.02
CA_4A-4A-7A	QPSK	20	20050	1720	1,49	20	2300	2145	20	3100	2655	60	25.70	25.68	-0.02
CA_4A-4A-13A	QPSK	20	20050	1720	1,49	20	2300	2145	10	5230	751	50	25.70	25.68	-0.02
CA_4A-4A-71A	QPSK	20	20050	1720	1,49	20	2300	2145	10	68761	634.5	50	25.61	25.25	-0.36
CA_5A-7A-7A	QPSK	10	20525	836.5	1,24	20	3100	2655	20	3100	2655	50	25.70	25.69	-0.01
CA_5A-7C	QPSK	10	20525	836.5	1,24	20	2950	2640	20	3148	2659.8	50	25.46	25.43	-0.03
CA_7A-7A-26A	QPSK	20	20800	2505	1,49	20	3200	2665	10	8750	876.5	50	25.49	25.47	-0.02
CA_7A-7A-66A	QPSK	20	20800	2505	1,49	20	3200	2665	20	66536	1980	60	25.44	25.41	-0.03
CA_25A-25A-26A	QPSK	20	26140	1860	1,49	20	8590	1985	10	8865	876.5	50	24.85	24.83	-0.02
CA_25A-25A-41A	QPSK	20	26140	1860	1,49	20	8590	1985	20	40340	2565	60	24.86	24.85	-0.01
CA_25A-41C	QPSK	20	26140	1860	1,37	20	40842	2615.2	20	41040	2645	60	25.70	25.67	-0.03
CA_26A-41C	QPSK	15	26865	831.5	1,37	20	40842	2615.2	20	41040	2645	55	25.70	25.67	-0.03
CA_2A-4A-13A	QPSK	20	18900	1880	1,49	20	2175	2132.5	10	5230	751	50	25.57	25.43	-0.15
CA_2A-4A-71A	QPSK	20	18900	1880	1,49	20	2175	2132.5	20	68761	634.5	60	25.50	25.49	-0.01
CA_2A-13A-66A	QPSK	20	18900	1880	1,49	10	5230	751	20	66786	2145	50	25.60	25.46	-0.14
CA_2A-48A-66A	QPSK	20	18900	1880	1,49	20	55990	3625	20	66786	2145	60	25.53	25.47	-0.06
CA_13A-48A-66A	QPSK	10	23230	782	1,24	20	55990	3625	20	66786	2145	50	25.58	25.47	-0.11

