Appendix H. – Power reduction verification

Per the May 2017 TCBC Workshop notes, demonstration of proper functioning of the power reduction mechanism is required to support the corresponding SAR Configurations.

Procedures for determining proximity sensor triggering distances

(KDB 616217 D04v01r02 §6.2)

The distance verification procedure was performed according to the following procedure:

1. A base station simulator was used to establish an RF connection and to monitor the power levels. The device being tested was placed below the relevant section of the phantom with the relevant side or edge of the device facing toward the phantom. For Licensed modes, the device state index(DSI) on the device UI was monitored to determine the triggering state.
2. The device was moved toward and away from the phantom to determine the distance at which the mechanism triggers and the output power is reduced, per KDB Publication 616217 D04v01r02 .Each applicable test position was evaluated. The distance were conformed to be the same or larger (more conservative) than the minimum distances provided by the manufacturer.
3. Step 1 and 2 were repeated for the relevant modes, as appropriate
4. Steps1 through 3 were repeated for all distance-based power reduction mechanisms.

For detailed measurement conducted power results, please refer to the Section .11

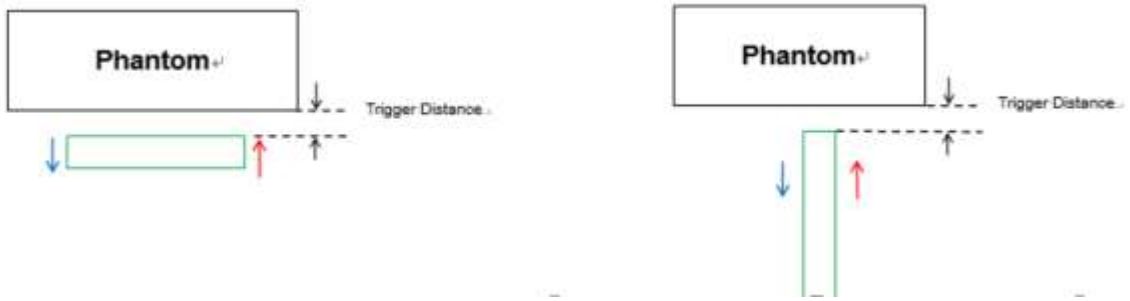
1. Power Reduction Verification for Main Ant 1

This device utilizes a power reduction mechanism for some wireless modes under some conditions when the device is being used in close proximity to the user's hand for Main Ant1
FCC KDB Publication 616217D04v01r02 section 6 was used as a guideline for selection SAR test distances for this device when being used in Proximity use conditions.

Mechanism(s)	Mode/Band	Device State Index	
		Un-triggered (Max Power)	Triggered (Reduced Power)
Grip	GSM 850 GPRS 1Tx	DSI 0	DSI 1
Grip	GSM 850 GPRS 2Tx	DSI 0	DSI 1
Grip	GSM 850 GPRS 3Tx	DSI 0	DSI 1
Grip	GSM 850 GPRS 4Tx	DSI 0	DSI 1
Grip	GSM 1900 GPRS 1Tx	DSI 0	DSI 1
Grip	GSM 1900 GPRS 2Tx	DSI 0	DSI 1
Grip	GSM 1900 GPRS 3Tx	DSI 0	DSI 1
Grip	GSM 1900 GPRS 4Tx	DSI 0	DSI 1
Grip	UMTS Band 5	DSI 0	DSI 1
Grip	UMTS Band 4	DSI 0	DSI 1
Grip	UMTS Band 2	DSI 0	DSI 1
Grip	LTE Band 2	DSI 0	DSI 1
Grip	LTE Band 4	DSI 0	DSI 1
Grip	LTE Band 5	DSI 0	DSI 1
Grip	LTE Band 12	DSI 0	DSI 1
Grip	LTE Band 13	DSI 0	DSI 1
Grip	LTE Band 25	DSI 0	DSI 1
Grip	LTE Band 26	DSI 0	DSI 1
Grip	LTE Band 41	DSI 0	DSI 1
Grip	LTE Band 41(HPUE)	DSI 0	DSI 1
Grip	LTE Band 66	DSI 0	DSI 1
Grip	N5	DSI 0	DSI 1
Grip	N66	DSI 0	DSI 1

Note: This device uses different Device State Indices(DSI) to configure different time averaged power level based on certain exposure scenarios. For this model, DSI=1 represents the case when the grip sensor is active, and DSI=0 represents the case where the device cannot detect the use condition.

1.2 Proximity sensor triggering Distance Verification.



Proximity Sensor Trigger Distance Assessment KDB 616217 D04 §6.2 (Rear / Right / Top side)

LEGEND

→ Direction of DUT travel for determination of power reduction triggering point

→ Direction of DUT travel for determination of full power resumption triggering point

Tissue simulating liquid	Trigger distance - Rear		Trigger distance – Right Side		Trigger distance – Right Corner Side		Trigger distance - Top	
	Moving toward phantom [mm]	Moving away from phantom [mm]	Moving toward phantom [mm]	Moving away from phantom [mm]	Moving toward phantom [mm]	Moving away from phantom [mm]	Moving toward phantom [mm]	Moving away from phantom [mm]
700MHz	16	17	10	11	15	16	23	24
800MHz	16	17	10	11	15	16	23	24
1750 MHz	16	17	10	11	15	16	23	24
1900 MHz	16	17	10	11	15	16	23	24
2600 MHz	16	17	10	11	15	16	23	24

Distance Measurement verification for Proximity sensor

Rear side – EUT Moving toward (trigger) to the Phantom

Distance	Distance to DUT Output power (dBm)									
	21	20	19	18	17	16	15	14	13	12
GSM 850 GPRS 1Tx	32.17	32.20	32.15	32.20	32.20	24.47	24.44	24.51	24.36	24.39
GSM 850 GPRS 2Tx	31.23	31.31	31.16	31.14	31.25	21.29	21.38	21.39	21.25	21.45
GSM 850 GPRS 3Tx	29.92	29.89	29.86	29.88	29.89	19.59	19.67	19.59	19.57	19.52
GSM 850 GPRS 4Tx	27.24	27.25	27.34	27.29	27.37	18.27	18.21	18.21	18.23	18.25
GSM 1900 GPRS 1Tx	29.90	29.81	29.78	29.92	29.78	19.42	19.52	19.52	19.42	19.50
GSM 1900 GPRS 2Tx	28.85	28.83	28.75	28.91	28.85	18.50	18.34	18.47	18.43	18.43
GSM 1900 GPRS 3Tx	26.49	26.61	26.45	26.65	26.55	16.62	16.48	16.50	16.64	16.66
GSM 1900 GPRS 4Tx	24.58	24.54	24.46	24.52	24.58	14.87	14.72	14.70	14.80	14.81
UMTS Band 5	24.10	24.15	24.21	24.14	24.15	15.48	15.57	15.47	15.58	15.59
UMTS Band 4	21.95	21.97	21.99	21.92	22.04	11.93	12.06	11.96	12.06	11.96
UMTS Band 2	22.00	22.10	21.93	22.09	22.09	11.99	11.95	12.08	11.98	11.97
LTE Band 2	22.02	22.13	22.09	22.01	22.19	12.17	12.13	12.12	12.03	12.00
LTE Band 4	22.61	22.68	22.68	22.62	22.72	12.73	12.78	12.76	12.78	12.66
LTE Band 5	23.93	24.08	24.08	23.99	23.94	15.04	15.00	14.91	14.92	15.02
LTE Band 12	23.90	23.93	24.00	24.00	24.02	16.02	16.03	16.08	16.03	15.90
LTE Band 13	23.90	24.04	24.02	24.03	24.00	15.94	15.90	16.00	15.95	16.02
LTE Band 17	23.96	24.08	24.02	24.02	23.97	15.91	16.03	15.91	16.07	16.08
LTE Band 25	22.14	22.18	22.14	22.15	22.06	12.12	12.06	12.16	12.04	12.05
LTE Band 26	23.92	23.93	23.94	23.92	24.04	12.15	12.01	12.06	12.20	12.12
LTE Band 41	23.94	23.98	23.90	23.90	23.91	13.92	13.98	14.08	14.04	14.01
LTE Band 41(HPUE)	26.08	25.93	26.03	26.06	25.93	14.00	13.91	14.10	13.98	14.09
LTE Band 66	22.72	22.79	22.80	22.76	22.67	12.74	12.61	12.63	12.75	12.78
N5	24.04	23.90	24.06	24.06	23.99	16.08	15.99	15.99	15.92	16.00
N66	21.99	22.09	22.01	22.04	22.00	12.10	11.97	12.05	12.08	11.94

Rear side – EUT Moving away (Release) from the Phantom

Distance	Distance to DUT Output power (dBm)									
	13	14	15	16	17	18	19	20	21	22
GSM 850 GPRS 1Tx	24.37	24.32	24.45	24.52	24.48	32.22	32.13	32.07	32.09	32.20
GSM 850 GPRS 2Tx	21.45	21.40	21.35	21.33	21.41	31.30	31.24	31.19	31.24	31.28
GSM 850 GPRS 3Tx	19.54	19.55	19.53	19.53	19.67	29.75	29.90	29.89	29.85	29.93
GSM 850 GPRS 4Tx	18.25	18.17	18.19	18.15	18.23	27.31	27.35	27.36	27.35	27.26
GSM 1900 GPRS 1Tx	19.40	19.54	19.43	19.54	19.53	29.82	29.79	29.91	29.73	29.85
GSM 1900 GPRS 2Tx	18.31	18.43	18.38	18.50	18.42	28.87	28.92	28.93	28.87	28.89
GSM 1900 GPRS 3Tx	16.55	16.67	16.53	16.57	16.53	26.60	26.58	26.54	26.58	26.48
GSM 1900 GPRS 4Tx	14.82	14.84	14.72	14.81	14.86	24.44	24.62	24.44	24.51	24.56
UMTS Band 5	15.42	15.56	15.20	15.51	15.51	24.12	24.13	24.22	24.54	24.05
UMTS Band 4	11.95	12.05	11.92	12.02	11.92	21.93	21.96	21.95	21.62	22.54
UMTS Band 2	11.96	11.94	12.11	11.93	11.96	22.04	22.14	21.96	22.79	22.39
LTE Band 2	12.17	12.51	12.11	12.05	12.55	22.05	22.11	22.07	22.08	22.59
LTE Band 4	12.77	12.75	12.55	12.75	12.55	22.66	22.60	22.88	22.69	22.12
LTE Band 5	15.07	15.13	14.88	14.91	15.12	23.97	24.00	24.98	23.19	23.24
LTE Band 12	16.08	16.03	16.45	16.02	15.59	23.89	23.96	24.11	24.50	24.62
LTE Band 13	15.99	15.20	16.45	15.93	16.32	23.98	24.04	24.00	24.02	24.60
LTE Band 17	15.92	16.05	15.95	16.05	16.58	23.99	24.44	24.03	24.01	23.57
LTE Band 25	12.11	12.04	12.12	12.04	12.55	22.12	22.55	22.12	22.45	22.03
LTE Band 26	12.12	12.00	12.03	12.44	12.22	23.91	23.99	23.90	23.62	24.14
LTE Band 41	13.95	13.91	14.05	14.04	14.01	23.91	23.49	23.94	23.98	23.92
LTE Band 41(HPUE)	14.50	13.95	14.80	13.93	14.89	26.05	25.98	26.44	26.09	25.94
LTE Band 66	12.75	12.68	12.62	12.72	12.78	22.75	22.59	22.66	22.56	22.57
N7	11.55	11.55	11.42	11.52	11.54	23.53	23.11	23.12	23.61	23.18
N66	12.11	11.94	12.02	12.02	11.92	21.11	22.19	22.02	22.01	22.10

Based on the most conservative measured triggering distance of 16mm, additional Body SAR measurements were required at 15mm from rear side for the above modes.

Right side – EUT Moving toward (trigger) to the Phantom

Distance	Distance to DUT Output power (dBm)									
	15	14	13	12	11	10	9	8	7	6
GSM 850 GPRS 1Tx	32.11	32.09	32.24	32.20	32.26	24.35	24.36	24.37	24.47	24.38
GSM 850 GPRS 2Tx	31.13	31.29	31.31	31.17	31.16	21.44	21.37	21.27	21.35	21.34
GSM 850 GPRS 3Tx	29.92	29.94	29.80	29.91	29.85	19.53	19.64	19.61	19.61	19.59
GSM 850 GPRS 4Tx	27.37	27.40	27.25	27.21	27.37	18.17	18.10	18.18	18.26	18.29
GSM 1900 GPRS 1Tx	29.78	29.88	29.84	29.81	29.86	19.40	19.42	19.42	19.59	19.58
GSM 1900 GPRS 2Tx	28.84	28.89	28.74	28.81	28.74	18.33	18.48	18.30	18.45	18.40
GSM 1900 GPRS 3Tx	26.58	26.62	26.59	26.45	26.58	16.52	16.63	16.59	16.68	16.60
GSM 1900 GPRS 4Tx	24.49	24.60	24.45	24.54	24.55	14.72	14.84	14.74	14.89	14.78
UMTS Band 5	24.02	24.02	24.07	24.02	24.00	16.26	16.42	16.23	16.28	16.38
UMTS Band 4	23.44	23.55	23.51	23.42	23.58	13.84	13.67	13.73	13.86	13.80
UMTS Band 2	24.00	23.94	24.06	23.98	24.08	13.99	13.92	14.04	13.96	13.97
LTE Band 2	24.44	24.59	24.55	24.43	24.45	12.83	12.96	12.92	12.95	12.96
LTE Band 4	23.87	23.98	23.84	23.96	23.84	12.60	12.43	12.47	12.47	12.46
LTE Band 5	23.74	23.88	23.75	23.90	23.92	15.74	15.85	15.93	15.83	15.92
LTE Band 12	24.73	24.73	24.71	24.73	24.64	14.33	14.19	14.25	14.17	14.30
LTE Band 13	24.46	24.49	24.39	24.40	24.52	13.71	13.75	13.66	13.77	13.78
LTE Band 17	24.43	24.49	24.46	24.42	24.36	13.81	13.75	13.90	13.72	13.75
LTE Band 25	24.59	24.60	24.55	24.52	24.52	13.26	13.30	13.31	13.23	13.27
LTE Band 26	23.90	23.91	23.92	23.91	24.00	13.65	13.65	13.74	13.71	13.68
LTE Band 41	24.30	24.35	24.36	24.40	24.34	13.19	13.30	13.33	13.35	13.26
LTE Band 41(HPUE)	26.32	26.35	26.45	26.38	26.28	13.09	13.07	12.97	13.15	13.16
LTE Band 66	24.07	23.97	24.04	24.13	24.15	12.84	12.72	12.80	12.74	12.81
N5	24.16	24.23	24.12	24.20	24.20	16.20	16.28	16.18	16.22	16.19
N66	24.41	24.58	24.48	24.53	24.53	12.07	12.20	12.09	12.06	12.04

Right side – EUT Moving away (Release) from the Phantom

Distance	Distance to DUT Output power (dBm)									
	7	8	9	10	11	12	13	14	15	16
GSM 850 GPRS 1Tx	24.49	24.41	24.37	24.50	24.44	32.18	32.20	32.17	32.16	32.16
GSM 850 GPRS 2Tx	21.37	21.32	21.28	21.35	21.29	31.18	31.15	31.20	31.24	31.25
GSM 850 GPRS 3Tx	19.63	19.55	19.72	19.59	19.62	29.91	29.88	29.78	29.87	29.79
GSM 850 GPRS 4Tx	18.18	18.15	18.17	18.17	18.20	27.34	27.23	27.32	27.32	27.33
GSM 1900 GPRS 1Tx	19.56	19.46	19.43	19.50	19.48	29.92	29.87	29.73	29.76	29.77
GSM 1900 GPRS 2Tx	18.36	18.39	18.49	18.35	18.35	28.83	28.88	28.91	28.89	28.86
GSM 1900 GPRS 3Tx	16.68	16.64	16.64	16.48	16.57	26.55	26.46	26.63	26.63	26.61
GSM 1900 GPRS 4Tx	14.86	14.87	14.80	14.74	14.85	24.43	24.58	24.50	24.43	24.58
UMTS Band 5	16.20	16.23	16.18	16.27	16.31	23.95	24.01	23.94	24.12	23.98
UMTS Band 4	13.75	13.81	13.91	13.86	13.90	23.34	23.43	23.37	23.50	23.50
UMTS Band 2	14.00	14.08	14.05	13.93	13.90	23.98	24.10	24.06	24.06	24.05
LTE Band 2	12.86	12.84	12.87	12.85	12.92	24.36	24.53	24.45	24.35	24.38
LTE Band 4	12.68	12.66	12.67	12.51	12.63	23.77	23.84	23.92	23.93	23.84
LTE Band 5	15.80	15.73	15.65	15.75	15.68	23.77	23.81	23.69	23.69	23.78
LTE Band 12	14.29	14.28	14.36	14.42	14.37	24.65	24.71	24.75	24.74	24.74
LTE Band 13	13.71	13.74	13.79	13.62	13.67	24.38	24.41	24.52	24.52	24.38
LTE Band 17	13.82	13.83	13.81	13.90	13.82	24.34	24.49	24.39	24.46	24.48
LTE Band 25	13.33	13.22	13.32	13.27	13.25	24.50	24.53	24.54	24.66	24.56
LTE Band 26	13.69	13.75	13.66	13.65	13.59	23.88	23.98	23.97	23.85	23.99
LTE Band 41	13.14	13.25	13.24	13.10	13.11	24.36	24.24	24.31	24.35	24.26
LTE Band 41(HPUE)	13.14	13.01	13.17	13.02	13.19	26.24	26.33	26.42	26.23	26.36
LTE Band 66	12.80	12.84	12.88	12.83	12.81	24.14	23.99	24.15	23.99	24.06
N5	16.19	16.17	16.12	16.12	16.11	24.19	24.17	24.10	24.07	24.23
N66	12.03	12.14	12.13	12.01	12.12	24.31	24.38	24.34	24.45	24.35

Based on the most conservative measured triggering distance of 10mm, additional Body SAR measurements were required at 9mm from right side for the above modes

Right Corner side – EUT Moving toward (trigger) to the Phantom

Distance	Distance to DUT Output power (dBm)									
	20	19	18	17	16	15	14	13	12	11
GSM 850 GPRS 1Tx	32.22	32.17	32.15	32.09	32.26	24.40	24.48	24.37	24.34	24.50
GSM 850 GPRS 2Tx	31.17	31.22	31.29	31.12	31.25	21.29	21.28	21.36	21.34	21.33
GSM 850 GPRS 3Tx	29.75	29.93	29.80	29.89	29.75	19.68	19.63	19.61	19.64	19.63
GSM 850 GPRS 4Tx	27.30	27.29	27.21	27.26	27.21	18.26	18.18	18.29	18.20	18.17
GSM 1900 GPRS 1Tx	29.81	29.74	29.81	29.73	29.74	19.51	19.56	19.54	19.56	19.52
GSM 1900 GPRS 2Tx	28.86	28.79	28.77	28.87	28.91	18.33	18.39	18.44	18.49	18.30
GSM 1900 GPRS 3Tx	26.61	26.65	26.52	26.45	26.52	16.48	16.48	16.59	16.56	16.62
GSM 1900 GPRS 4Tx	24.43	24.59	24.57	24.62	24.60	14.86	14.81	14.82	14.75	14.72
UMTS Band 5	23.90	23.89	23.99	23.98	23.97	16.19	16.15	16.19	16.14	16.18
UMTS Band 4	23.38	23.40	23.24	23.26	23.25	13.83	13.84	13.75	13.73	13.76
UMTS Band 2	23.93	24.00	24.08	23.96	23.91	14.02	13.90	14.09	13.94	14.09
LTE Band 2	24.40	24.29	24.41	24.42	24.38	12.93	12.94	12.88	12.86	12.93
LTE Band 4	23.73	23.75	23.86	23.78	23.80	12.59	12.78	12.60	12.71	12.63
LTE Band 5	23.68	23.79	23.84	23.72	23.67	15.72	15.81	15.81	15.73	15.86
LTE Band 12	24.65	24.64	24.59	24.63	24.69	14.25	14.25	14.32	14.28	14.23
LTE Band 13	24.47	24.38	24.45	24.43	24.44	13.68	13.64	13.74	13.76	13.70
LTE Band 17	24.32	24.29	24.28	24.42	24.29	13.74	13.82	13.91	13.90	13.80
LTE Band 25	24.44	24.56	24.43	24.56	24.58	13.41	13.35	13.23	13.37	13.35
LTE Band 26	23.80	23.83	23.87	23.85	23.78	13.67	13.78	13.69	13.77	13.72
LTE Band 41	24.35	24.35	24.34	24.33	24.43	13.12	13.21	13.19	13.10	13.23
LTE Band 41(HPUE)	26.19	26.23	26.21	26.18	26.17	13.23	13.20	13.24	13.11	13.16
LTE Band 66	24.22	24.18	24.20	24.18	24.08	12.71	12.81	12.90	12.89	12.84
N5	24.13	24.17	24.20	24.22	24.26	16.10	16.22	16.25	16.26	16.27
N66	24.22	24.30	24.23	24.24	24.33	12.10	11.96	12.00	11.93	12.04

Right Corner side – EUT Moving away (Release) from the Phantom

Distance	Distance to DUT Output power (dBm)									
	12	13	14	15	16	17	18	19	20	21
GSM 850 GPRS 1Tx	24.32	24.48	24.47	24.37	24.33	32.11	32.10	32.15	32.16	32.08
GSM 850 GPRS 2Tx	21.28	21.43	21.31	21.38	21.39	31.13	31.20	31.26	31.13	31.17
GSM 850 GPRS 3Tx	19.63	19.55	19.58	19.59	19.62	29.76	29.74	29.81	29.80	29.80
GSM 850 GPRS 4Tx	18.28	18.23	18.20	18.09	18.17	27.24	27.36	27.30	27.30	27.25
GSM 1900 GPRS 1Tx	19.41	19.59	19.55	19.42	19.51	29.90	29.76	29.80	29.83	29.83
GSM 1900 GPRS 2Tx	18.34	18.46	18.34	18.41	18.43	28.87	28.89	28.74	28.75	28.94
GSM 1900 GPRS 3Tx	16.53	16.51	16.67	16.51	16.62	26.64	26.49	26.45	26.64	26.49
GSM 1900 GPRS 4Tx	14.79	14.73	14.76	14.84	14.79	24.60	24.54	24.44	24.56	24.47
UMTS Band 5	16.18	16.27	16.29	16.28	16.14	23.81	23.85	23.81	23.82	23.85
UMTS Band 4	13.80	13.82	13.87	13.81	13.75	23.36	23.47	23.45	23.36	23.31
UMTS Band 2	14.04	14.09	14.04	13.92	13.98	23.91	23.98	23.85	23.97	23.89
LTE Band 2	13.01	12.91	12.97	12.86	12.84	24.31	24.37	24.43	24.48	24.35
LTE Band 4	12.66	12.56	12.60	12.55	12.64	23.70	23.71	23.76	23.82	23.67
LTE Band 5	15.72	15.82	15.67	15.74	15.69	23.75	23.68	23.70	23.63	23.67
LTE Band 12	14.33	14.32	14.21	14.30	14.23	24.72	24.66	24.68	24.67	24.70
LTE Band 13	13.60	13.77	13.67	13.70	13.63	24.52	24.52	24.52	24.54	24.54
LTE Band 17	13.71	13.83	13.77	13.72	13.64	24.42	24.26	24.31	24.36	24.26
LTE Band 25	13.36	13.35	13.34	13.32	13.33	24.38	24.54	24.40	24.36	24.51
LTE Band 26	13.64	13.70	13.67	13.67	13.65	23.87	23.82	23.86	23.90	23.80
LTE Band 41	13.07	13.02	13.17	13.19	13.08	24.27	24.35	24.41	24.38	24.45
LTE Band 41(HPUE)	13.23	13.24	13.14	13.24	13.27	26.12	26.11	26.20	26.16	26.21
LTE Band 66	12.67	12.77	12.75	12.61	12.64	24.16	24.19	24.21	24.18	24.25
N5	16.11	16.12	16.20	16.20	16.00	24.07	24.14	24.11	24.05	24.10
N66	12.08	12.14	12.12	12.06	12.18	24.27	24.14	24.23	24.16	24.26

Based on the most conservative measured triggering distance of 15mm, additional Body SAR measurements were required at 14mm from Right corner side for the above modes.

Top side – EUT Moving toward (trigger) to the Phantom

Distance	Distance to DUT Output power (dBm)									
	28	27	26	25	24	23	22	21	20	19
GSM 850 GPRS 1Tx	32.08	32.16	32.19	32.19	32.27	24.34	24.45	24.36	24.38	24.34
GSM 850 GPRS 2Tx	31.30	31.26	31.24	31.27	31.16	21.31	21.42	21.33	21.38	21.29
GSM 850 GPRS 3Tx	29.92	29.91	29.80	29.92	29.89	19.69	19.62	19.65	19.69	19.71
GSM 850 GPRS 4Tx	27.20	27.34	27.28	27.21	27.37	18.11	18.25	18.25	18.13	18.24
GSM 1900 GPRS 1Tx	29.73	29.84	29.85	29.84	29.92	19.51	19.59	19.54	19.42	19.53
GSM 1900 GPRS 2Tx	28.75	28.83	28.83	28.94	28.94	18.40	18.47	18.41	18.50	18.32
GSM 1900 GPRS 3Tx	26.51	26.65	26.65	26.54	26.45	16.50	16.64	16.59	16.52	16.50
GSM 1900 GPRS 4Tx	24.61	24.54	24.56	24.51	24.47	14.72	14.82	14.71	14.87	14.76
UMTS Band 5	23.84	23.79	23.77	23.88	23.76	16.19	16.14	16.09	16.21	16.17
UMTS Band 4	23.43	23.38	23.38	23.28	23.31	13.70	13.81	13.89	13.79	13.80
UMTS Band 2	23.81	24.00	23.92	23.94	24.01	14.02	14.06	13.97	13.96	13.95
LTE Band 2	24.21	24.29	24.22	24.41	24.31	12.96	12.92	13.04	13.01	12.95
LTE Band 4	23.63	23.67	23.60	23.73	23.80	12.67	12.70	12.72	12.69	12.74
LTE Band 5	23.72	23.85	23.73	23.77	23.75	15.62	15.81	15.77	15.67	15.63
LTE Band 12	24.74	24.62	24.71	24.69	24.63	14.36	14.23	14.29	14.39	14.26
LTE Band 13	24.52	24.54	24.42	24.42	24.42	13.62	13.62	13.69	13.54	13.60
LTE Band 17	24.34	24.51	24.35	24.52	24.45	13.71	13.71	13.65	13.75	13.67
LTE Band 25	24.39	24.36	24.32	24.45	24.47	13.31	13.43	13.40	13.28	13.46
LTE Band 26	23.77	23.79	23.80	23.95	23.93	13.73	13.69	13.63	13.56	13.66
LTE Band 41	24.18	24.27	24.30	24.30	24.32	13.01	13.05	13.00	13.05	13.03
LTE Band 41(HPUE)	26.03	26.06	26.12	26.07	26.06	13.30	13.30	13.31	13.27	13.30
LTE Band 66	24.06	24.19	24.24	24.20	24.12	12.66	12.61	12.73	12.65	12.60
N5	24.10	24.16	24.09	24.04	24.06	16.04	16.03	16.09	16.02	16.03
N66	24.30	24.19	24.34	24.31	24.21	12.01	12.18	12.14	12.12	12.03

Top side – EUT Moving away (Release) from the Phantom

Distance	Distance to DUT Output power (dBm)									
	20	21	22	23	24	25	26	27	28	29
GSM 850 GPRS 1Tx	24.32	24.34	24.45	24.44	24.46	32.23	32.17	32.22	32.10	32.20
GSM 850 GPRS 2Tx	21.40	21.45	21.39	21.37	21.36	31.22	31.16	31.23	31.31	31.31
GSM 850 GPRS 3Tx	19.59	19.58	19.61	19.66	19.67	29.74	29.75	29.84	29.91	29.80
GSM 850 GPRS 4Tx	18.16	18.25	18.25	18.24	18.17	27.23	27.20	27.31	27.36	27.25
GSM 1900 GPRS 1Tx	19.40	19.39	19.54	19.54	19.54	29.92	29.89	29.81	29.83	29.77
GSM 1900 GPRS 2Tx	18.40	18.38	18.46	18.41	18.37	28.89	28.79	28.91	28.76	28.75
GSM 1900 GPRS 3Tx	16.58	16.52	16.58	16.50	16.63	26.47	26.57	26.51	26.52	26.45
GSM 1900 GPRS 4Tx	14.71	14.73	14.81	14.78	14.82	24.48	24.57	24.61	24.45	24.47
UMTS Band 5	16.16	16.27	16.16	16.14	16.28	23.87	23.93	23.83	23.91	23.94
UMTS Band 4	13.71	13.65	13.80	13.65	13.70	23.48	23.52	23.39	23.39	23.48
UMTS Band 2	14.03	13.96	13.94	14.05	13.96	23.71	23.89	23.82	23.87	23.86
LTE Band 2	12.88	12.97	12.98	12.94	13.04	24.28	24.24	24.27	24.17	24.21
LTE Band 4	12.66	12.70	12.71	12.74	12.76	23.59	23.58	23.72	23.69	23.63
LTE Band 5	15.52	15.61	15.67	15.62	15.67	23.62	23.65	23.62	23.62	23.79
LTE Band 12	14.39	14.33	14.44	14.40	14.44	24.84	24.64	24.72	24.74	24.84
LTE Band 13	13.58	13.67	13.71	13.71	13.52	24.50	24.61	24.53	24.45	24.51
LTE Band 17	13.61	13.79	13.73	13.62	13.64	24.32	24.25	24.24	24.34	24.39
LTE Band 25	13.25	13.31	13.33	13.30	13.29	24.46	24.36	24.38	24.36	24.46
LTE Band 26	13.80	13.78	13.75	13.70	13.82	23.83	23.75	23.79	23.68	23.80
LTE Band 41	13.00	13.02	12.97	12.94	12.99	24.19	24.27	24.28	24.17	24.24
LTE Band 41(HPUE)	13.32	13.34	13.22	13.33	13.25	25.94	25.95	26.06	25.98	26.09
LTE Band 66	12.56	12.64	12.71	12.64	12.60	24.07	24.09	24.14	24.00	24.16
N5	16.13	16.13	15.94	16.04	15.99	24.16	24.14	24.05	24.07	24.16
N66	11.91	12.05	12.10	11.99	12.06	24.37	24.40	24.29	24.30	24.29

Based on the most conservative measured triggering distance of 23mm, additional Body SAR measurements were required at 22mm from top side for the above modes.

1.3 Proximity Sensor Coverage for SAR measurements

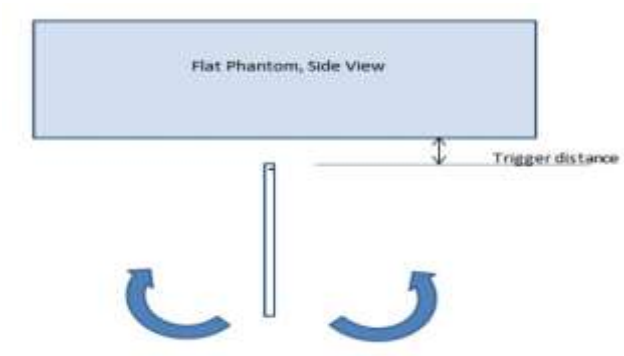
(KDB 616217 D04v01r02 §6.3)

As there is no spatial offset between the antenna and the proximity sensor element, proximity sensor coverage did not need to be assessed.

1.4 Proximity Sensor Tilt Angle Assessment

(KDB 616217 D04v01r02 §6.4)

The DUT was positioned directly below the flat phantom at the minimum measured trigger distance with Bottom side parallel to the base of the flat phantom for each band. The EUT was rotated about Bottom side for angles up to ±45°. If the output power increased during the rotation the DUT was moved 1mm toward the phantom and the rotation repeated. This procedure was repeated until the power remained reduced for all angles up ±45°.



Proximity sensor tilt angle assessment (Bottom side) KDB 616217 §6.4

Summary of Tablet Tilt Angle influence to Proximity Sensor Triggering (Top side)

Band (MHz)	Minimum distance at which power reduction was maintained over-45°	Power reduction status										
		-45°	-40°	-30°	-20°	-10°	0°	10°	20°	30°	40°	45°
700MHz	23 mm	On	On	On	On	On	On	On	On	On	On	On
800MHz	23 mm	On	On	On	On	On	On	On	On	On	On	On
1750 MHz	23 mm	On	On	On	On	On	On	On	On	On	On	On
1900 MHz	23 mm	On	On	On	On	On	On	On	On	On	On	On
2600 MHz	23 mm	On	On	On	On	On	On	On	On	On	On	On

1.5 Resulting test positions for Body SAR measurements

Wireless technologies	Position	§6.2 Triggering Distance [mm]	§6.3 Coverage	§6.4 Tilt Angle	Worst case distance for Body SAR [mm]
Main Ant 1	Rear	16	N/A	N/A	15
	Right Side	10	N/A	N/A	9
	Right Corner	15	N/A	N/A	14
	Top	23	N/A	N/A	22

Note: FCC KDB Publication 616217 D04v01r02 Section 6 was used as a guideline for selecting SAR test distances for this device when being used in proximity use conditions.

2. Power reduction Verification for WLAN 1 Ant

This device uses a power reduction mechanism for SAR compliance for WLAN operations during Grip sensor is activated.

Mechanism(s)	Mode/Band	Un-triggered (Max Power) Except 1ch,2ch,10ch 38ch, 58ch, 62ch, 102ch, 106ch	Mechanism 1: (Grip is active, Reduced Power)
Grip	2.4GHz 802.11b	18.06	10.60
Grip	2.4GHz 802.11g	16.88	10.68
Grip	2.4GHz 802.11n	17.81	10.61
Grip	2.4GHz 802.11ax SU	17.50	10.54
Grip	2.4GHz Bluetooth	15.31	8.91
Grip	5GHz 802.11a	17.84	9.23
Grip	5GHz 802.11n 20MHz	17.43	9.51
Grip	5GHz 802.11ac 20MHz	17.69	9.18
Grip	5GHz 802.11ax 20MHz SU	17.72	9.15
Grip	5GHz 802.11n 40MHz	16.78	8.19
Grip	5GHz 802.11ac 40MHz	16.81	8.16
Grip	5GHz 802.11ax 40MHz SU	16.46	8.55
Grip	5GHz 802.11ac 80MHz	15.59	8.83
Grip	5GH 802.11ax 80MHz SU	14.71	9.12
Grip	5GHz 802.11ax 160MHz SU	13.91	9.43

Simultaneous condition with 2GHz WLAN and 5GHz WLAN or Simultaneous condition with 5G NR

Mode/Band	(Max Power) Except 1ch,2ch,10ch 38ch, 58ch, 62ch, 102ch, 106ch	Simultaneous condition wit h 2GHz WLAN and 5GHz WLAN or Simultaneous condition with 5G NR
2.4GHz 802.11b	18.06	8.52
2.4GHz 802.11g	16.88	8.43
2.4GHz 802.11n	17.81	8.55
2.4GHz 802.11ax SU	17.50	8.44
2.4GHz Bluetooth	15.31	7.42
5GHz 802.11a	17.84	7.42
5GHz 802.11n 20MHz	17.43	7.44
5GHz 802.11ac 20MHz	17.69	7.55
5GHz 802.11ax 20MHz SU	17.72	7.35
5GHz 802.11n 40MHz	16.78	7.52
5GHz 802.11ac 40MHz	16.81	7.43
5GHz 802.11ax 40MHz SU	16.46	7.12
5GHz 802.11ac 80MHz	15.59	7.44
5GH 802.11ax 80MHz SU	14.71	7.52
5GHz 802.11ax 160MHz SU	13.91	7.48
6GHz 802.11a	10.52	9.62
6GHz 802.11ax 20MHz	12.51	9.46
6GHZ 802.11ax 40MHz	11.56	8.55
6GHz 802.11ax 80MHz	11.44	8.42
6GHz 802.11ax 160MHz	11.48	8.44

Tissue simulating liquid	Trigger distance – Rear		Trigger distance – Right Side		Trigger distance – Right Corner Side		Trigger distance – Top	
	Moving toward phantom [mm]	Moving away from phantom [mm]	Moving toward phantom [mm]	Moving away from phantom [mm]	Moving toward phantom [mm]	Moving away from phantom [mm]	Moving toward phantom [mm]	Moving away from phantom [mm]
2450MHz	17	18	10	11	15	16	22	23
5000MHz	17	18	10	11	15	16	22	23

Rear side – EUT Moving toward (trigger) to the Phantom

Mode	Distance to DUT Output power (dBm)									
	22	21	20	19	18	17	16	15	14	13
2.4GHz 802.11b	18.13	18.16	18.02	18.05	18.16	10.50	10.58	10.69	10.64	10.69
2.4GHz 802.11g	16.80	16.92	16.78	16.80	16.85	10.61	10.74	10.65	10.59	10.76
2.4GHz 802.11n	17.85	17.77	17.73	17.71	17.75	10.67	10.70	10.66	10.56	10.67
2.4GHz 802.11ax SU	17.58	17.60	17.49	17.42	17.40	10.44	10.61	10.61	10.61	10.48
2.4GHz Bluetooth	15.32	15.31	15.27	15.38	15.38	8.94	8.92	8.86	8.82	8.89
5GHz 802.11a	17.88	17.89	17.75	17.84	17.76	9.32	9.19	9.33	9.16	9.23
5GHz 802.11n 20MHz	17.39	17.38	17.52	17.38	17.52	9.43	9.59	9.57	9.45	9.50
5GHz 802.11ac 20MHz	17.61	17.76	17.69	17.70	17.77	9.12	9.12	9.19	9.23	9.27
5GHz 802.11ax 20MHz SU	17.63	17.80	17.71	17.78	17.76	9.06	9.09	9.17	9.12	9.20
5GHz 802.11n 40MHz	16.68	16.74	16.87	16.71	16.74	8.20	8.20	8.23	8.20	8.25
5GHz 802.11ac 40MHz	16.87	16.74	16.83	16.90	16.86	8.17	8.16	8.24	8.18	8.09
5GHz 802.11ax 40MHz SU	16.41	16.49	16.47	16.49	16.54	8.55	8.63	8.48	8.60	8.50
5GHz 802.11ac 80MHz	15.49	15.66	15.67	15.60	15.56	8.73	8.77	8.75	8.85	8.78
5GH 802.11ax 80MHz SU	14.73	14.78	14.70	14.77	14.65	9.15	9.15	9.04	9.11	9.14
5GHz 802.11ax 160MHz SU	13.93	13.87	13.83	13.87	13.90	9.49	9.37	9.44	9.37	9.44

Rear side – EUT Moving away (Release) from the Phantom

Mode	Distance to DUT Output power (dBm)									
	14	15	16	17	18	19	20	21	22	23
2.4GHz 802.11b	10.56	10.68	10.50	10.53	10.50	17.99	18.12	18.02	18.05	18.10
2.4GHz 802.11g	10.64	10.74	10.68	10.71	10.67	16.87	16.90	16.95	16.86	16.95
2.4GHz 802.11n	10.65	10.56	10.70	10.69	10.55	17.74	17.86	17.86	17.73	17.84
2.4GHz 802.11ax SU	10.58	10.49	10.52	10.55	10.64	17.48	17.53	17.56	17.55	17.48
2.4GHz Bluetooth	8.95	8.81	8.94	8.91	8.82	15.40	15.26	15.34	15.22	15.39
5GHz 802.11a	9.27	9.18	9.33	9.16	9.15	17.88	17.85	17.84	17.92	17.86
5GHz 802.11n 20MHz	9.58	9.45	9.50	9.55	9.60	17.39	17.45	17.38	17.50	17.45
5GHz 802.11ac 20MHz	9.18	9.12	9.10	9.21	9.14	17.71	17.76	17.66	17.72	17.70
5GHz 802.11ax 20MHz SU	9.09	9.17	9.09	9.16	9.19	17.67	17.62	17.64	17.65	17.66
5GHz 802.11n 40MHz	8.12	8.22	8.17	8.14	8.28	16.73	16.88	16.72	16.80	16.87
5GHz 802.11ac 40MHz	8.07	8.06	8.24	8.14	8.07	16.71	16.74	16.85	16.83	16.74
5GHz 802.11ax 40MHz SU	8.52	8.61	8.64	8.65	8.49	16.49	16.53	16.54	16.49	16.48
5GHz 802.11ac 80MHz	8.87	8.83	8.89	8.80	8.75	15.53	15.50	15.52	15.67	15.59
5GH 802.11ax 80MHz SU	9.18	9.15	9.03	9.22	9.06	14.69	14.72	14.71	14.67	14.64
5GHz 802.11ax 160MHz SU	9.53	9.46	9.43	9.34	9.52	13.98	13.91	13.85	13.84	13.83

Based on the most conservative measured triggering distance of 17mm, additional Body SAR measurements were required at 16mm from rear side for the above modes.

Right side – EUT Moving toward (trigger) to the Phantom

Mode	Distance to DUT Output power (dBm)									
	15	14	13	12	11	10	9	8	7	6
2.4GHz 802.11b	18.10	17.99	18.11	18.10	18.13	10.57	10.58	10.59	10.67	10.54
2.4GHz 802.11g	16.92	16.87	16.89	16.79	16.93	10.62	10.72	10.59	10.76	10.77
2.4GHz 802.11n	17.72	17.86	17.91	17.87	17.85	10.70	10.61	10.59	10.70	10.56
2.4GHz 802.11ax SU	17.54	17.45	17.47	17.59	17.45	10.58	10.45	10.56	10.63	10.62
2.4GHz Bluetooth	15.27	15.33	15.21	15.22	15.36	8.94	8.96	8.93	9.00	8.92
5GHz 802.11a	17.75	17.83	17.76	17.79	17.79	9.29	9.33	9.19	9.33	9.25
5GHz 802.11n 20MHz	17.49	17.39	17.35	17.47	17.38	9.56	9.55	9.48	9.55	9.56
5GHz 802.11ac 20MHz	17.63	17.79	17.64	17.59	17.62	9.17	9.23	9.21	9.19	9.20
5GHz 802.11ax 20MHz SU	17.77	17.77	17.78	17.63	17.82	9.08	9.10	9.06	9.23	9.18
5GHz 802.11n 40MHz	16.70	16.79	16.86	16.79	16.68	8.23	8.29	8.27	8.22	8.22
5GHz 802.11ac 40MHz	16.81	16.90	16.89	16.72	16.91	8.23	8.17	8.08	8.11	8.16
5GHz 802.11ax 40MHz SU	16.50	16.47	16.46	16.38	16.41	8.50	8.61	8.55	8.59	8.61
5GHz 802.11ac 80MHz	15.63	15.61	15.50	15.52	15.52	8.84	8.78	8.89	8.77	8.74
5GH 802.11ax 80MHz SU	14.61	14.67	14.63	14.79	14.80	9.21	9.07	9.18	9.13	9.16
5GHz 802.11ax 160MHz SU	13.98	13.86	13.89	14.00	13.86	9.43	9.47	9.49	9.52	9.43

Right side – EUT Moving away (Release) from the Phantom

Mode	Distance to DUT Output power (dBm)									
	7	8	9	10	11	12	13	14	15	16
2.4GHz 802.11b	10.55	10.64	10.69	10.66	10.69	17.99	18.08	18.04	18.03	18.01
2.4GHz 802.11g	10.69	10.63	10.77	10.78	10.70	16.79	16.98	16.89	16.87	16.85
2.4GHz 802.11n	10.52	10.65	10.71	10.56	10.67	17.88	17.82	17.81	17.84	17.73
2.4GHz 802.11ax SU	10.63	10.47	10.50	10.53	10.46	17.51	17.46	17.43	17.57	17.50
2.4GHz Bluetooth	8.98	8.83	9.00	8.94	8.94	15.36	15.40	15.24	15.34	15.35
5GHz 802.11a	9.31	9.18	9.32	9.18	9.13	17.88	17.77	17.80	17.78	17.74
5GHz 802.11n 20MHz	9.43	9.45	9.46	9.47	9.45	17.46	17.34	17.48	17.37	17.47
5GHz 802.11ac 20MHz	9.27	9.25	9.26	9.22	9.21	17.66	17.59	17.72	17.61	17.59
5GHz 802.11ax 20MHz SU	9.18	9.13	9.25	9.20	9.15	17.71	17.80	17.64	17.63	17.68
5GHz 802.11n 40MHz	8.28	8.11	8.29	8.29	8.27	16.82	16.77	16.78	16.77	16.88
5GHz 802.11ac 40MHz	8.19	8.06	8.17	8.14	8.23	16.79	16.73	16.75	16.79	16.85
5GHz 802.11ax 40MHz SU	8.52	8.46	8.52	8.52	8.63	16.41	16.44	16.38	16.44	16.39
5GHz 802.11ac 80MHz	8.76	8.87	8.90	8.73	8.88	15.52	15.56	15.58	15.64	15.49
5GH 802.11ax 80MHz SU	9.03	9.21	9.14	9.19	9.12	14.61	14.77	14.63	14.69	14.74
5GHz 802.11ax 160MHz SU	9.42	9.51	9.42	9.34	9.33	13.87	13.99	13.93	13.91	13.90

Based on the most conservative measured triggering distance of 10mm, additional Body SAR measurements were required at 9mm from right side for the above modes.

Right Corner side – EUT Moving toward (trigger) to the Phantom

Mode	Distance to DUT Output power (dBm)									
	20	19	18	17	16	15	14	13	12	11
2.4GHz 802.11b	18.00	18.15	18.16	18.13	18.09	10.61	10.51	10.70	10.59	10.63
2.4GHz 802.11g	16.98	16.96	16.81	16.91	16.84	10.63	10.78	10.74	10.78	10.77
2.4GHz 802.11n	17.87	17.74	17.85	17.81	17.71	10.60	10.67	10.71	10.66	10.54
2.4GHz 802.11ax SU	17.41	17.44	17.55	17.50	17.49	10.58	10.48	10.45	10.60	10.53
2.4GHz Bluetooth	15.23	15.39	15.37	15.32	15.31	8.85	8.98	8.89	8.97	8.94
5GHz 802.11a	17.78	17.87	17.74	17.80	17.93	9.31	9.26	9.20	9.22	9.14
5GHz 802.11n 20MHz	17.40	17.39	17.35	17.34	17.46	9.49	9.42	9.60	9.43	9.60
5GHz 802.11ac 20MHz	17.59	17.66	17.59	17.68	17.59	9.23	9.19	9.20	9.20	9.26
5GHz 802.11ax 20MHz SU	17.74	17.75	17.80	17.66	17.67	9.05	9.15	9.13	9.21	9.18
5GHz 802.11n 40MHz	16.68	16.86	16.82	16.85	16.73	8.15	8.26	8.18	8.11	8.09
5GHz 802.11ac 40MHz	16.91	16.88	16.72	16.77	16.76	8.09	8.15	8.11	8.16	8.09
5GHz 802.11ax 40MHz SU	16.38	16.36	16.43	16.39	16.46	8.50	8.65	8.52	8.46	8.63
5GHz 802.11ac 80MHz	15.57	15.54	15.67	15.50	15.55	8.89	8.77	8.78	8.86	8.80
5GH 802.11ax 80MHz SU	14.77	14.66	14.80	14.79	14.79	9.16	9.22	9.04	9.10	9.17
5GHz 802.11ax 160MHz SU	14.01	13.81	13.99	13.89	13.85	9.52	9.33	9.51	9.39	9.42

Right Corner side – EUT Moving away (Release) from the Phantom

Mode	Distance to DUT Output power (dBm)									
	12	13	14	15	16	17	18	19	20	21
2.4GHz 802.11b	10.57	10.68	10.66	10.66	10.60	18.15	18.09	18.11	17.98	18.07
2.4GHz 802.11g	10.63	10.70	10.62	10.75	10.65	16.82	16.95	16.84	16.85	16.97
2.4GHz 802.11n	10.51	10.64	10.51	10.70	10.64	17.75	17.85	17.74	17.86	17.73
2.4GHz 802.11ax SU	10.56	10.57	10.47	10.51	10.44	17.41	17.44	17.56	17.45	17.59
2.4GHz Bluetooth	8.93	8.91	8.83	8.81	8.83	15.38	15.23	15.36	15.23	15.29
5GHz 802.11a	9.20	9.28	9.33	9.14	9.18	17.93	17.86	17.90	17.75	17.74
5GHz 802.11n 20MHz	9.56	9.52	9.52	9.57	9.42	17.42	17.41	17.34	17.47	17.40
5GHz 802.11ac 20MHz	9.26	9.14	9.08	9.28	9.12	17.61	17.59	17.62	17.64	17.79
5GHz 802.11ax 20MHz SU	9.11	9.17	9.05	9.23	9.22	17.65	17.76	17.62	17.62	17.66
5GHz 802.11n 40MHz	8.23	8.29	8.29	8.11	8.24	16.88	16.75	16.68	16.69	16.69
5GHz 802.11ac 40MHz	8.20	8.22	8.08	8.16	8.21	16.75	16.90	16.78	16.79	16.88
5GHz 802.11ax 40MHz SU	8.60	8.57	8.60	8.53	8.56	16.47	16.49	16.43	16.41	16.42
5GHz 802.11ac 80MHz	8.93	8.88	8.80	8.83	8.84	15.54	15.61	15.67	15.62	15.58
5GH 802.11ax 80MHz SU	9.05	9.09	9.14	9.15	9.10	14.76	14.66	14.69	14.75	14.64
5GHz 802.11ax 160MHz SU	9.36	9.36	9.37	9.38	9.43	13.99	13.87	13.98	13.89	13.85

Based on the most conservative measured triggering distance of 15mm, additional Body SAR measurements were required at 14mm from right corner side for the above modes.

Top side – EUT Moving toward (trigger) to the Phantom

Mode	Distance to DUT Output power (dBm)									
	27	26	25	24	23	22	21	20	19	18
2.4GHz 802.11b	18.15	18.09	18.00	17.98	18.11	10.69	10.60	10.69	10.66	10.69
2.4GHz 802.11g	16.86	16.84	16.90	16.91	16.84	10.59	10.77	10.64	10.71	10.68
2.4GHz 802.11n	17.82	17.73	17.90	17.84	17.85	10.53	10.67	10.69	10.56	10.65
2.4GHz 802.11ax SU	17.48	17.55	17.40	17.50	17.46	10.51	10.49	10.56	10.54	10.59
2.4GHz Bluetooth	15.22	15.36	15.37	15.30	15.31	8.98	8.89	8.84	9.01	8.91
5GHz 802.11a	17.78	17.81	17.85	17.85	17.91	9.26	9.23	9.14	9.17	9.23
5GHz 802.11n 20MHz	17.33	17.41	17.33	17.40	17.49	9.57	9.47	9.51	9.55	9.44
5GHz 802.11ac 20MHz	17.76	17.79	17.78	17.62	17.71	9.13	9.24	9.28	9.09	9.19
5GHz 802.11ax 20MHz SU	17.72	17.71	17.63	17.70	17.72	9.12	9.22	9.21	9.20	9.25
5GHz 802.11n 40MHz	16.80	16.75	16.83	16.77	16.81	8.25	8.17	8.21	8.26	8.10
5GHz 802.11ac 40MHz	16.81	16.83	16.72	16.77	16.85	8.17	8.23	8.09	8.20	8.06
5GHz 802.11ax 40MHz SU	16.46	16.56	16.54	16.39	16.38	8.53	8.46	8.48	8.62	8.52
5GHz 802.11ac 80MHz	15.54	15.66	15.54	15.55	15.50	8.74	8.75	8.86	8.90	8.84
5GH 802.11ax 80MHz SU	14.67	14.71	14.75	14.65	14.80	9.12	9.10	9.06	9.13	9.13
5GHz 802.11ax 160MHz SU	13.92	13.86	13.96	13.82	13.90	9.50	9.40	9.33	9.50	9.50

Top side – EUT Moving away (Release) from the Phantom

Mode	Distance to DUT Output power (dBm)									
	19	20	21	22	23	24	25	26	27	28
2.4GHz 802.11b	10.56	10.54	10.65	10.67	10.67	18.05	17.98	18.00	18.09	17.99
2.4GHz 802.11g	10.67	10.71	10.69	10.73	10.65	16.87	16.98	16.83	16.78	16.95
2.4GHz 802.11n	10.58	10.69	10.54	10.53	10.70	17.79	17.82	17.71	17.86	17.77
2.4GHz 802.11ax SU	10.57	10.58	10.64	10.57	10.59	17.58	17.58	17.56	17.50	17.43
2.4GHz Bluetooth	8.82	8.88	8.84	8.81	8.90	15.41	15.36	15.28	15.37	15.40
5GHz 802.11a	9.25	9.22	9.14	9.22	9.26	17.81	17.80	17.78	17.74	17.92
5GHz 802.11n 20MHz	9.61	9.51	9.49	9.42	9.57	17.34	17.53	17.45	17.37	17.46
5GHz 802.11ac 20MHz	9.13	9.26	9.28	9.10	9.22	17.64	17.67	17.78	17.62	17.75
5GHz 802.11ax 20MHz SU	9.21	9.18	9.10	9.09	9.10	17.76	17.80	17.65	17.64	17.66
5GHz 802.11n 40MHz	8.18	8.18	8.29	8.14	8.13	16.74	16.72	16.73	16.76	16.78
5GHz 802.11ac 40MHz	8.12	8.17	8.19	8.08	8.19	16.72	16.87	16.85	16.76	16.90
5GHz 802.11ax 40MHz SU	8.61	8.56	8.50	8.62	8.51	16.48	16.37	16.45	16.39	16.46
5GHz 802.11ac 80MHz	8.76	8.77	8.80	8.79	8.79	15.49	15.69	15.56	15.60	15.51
5GH 802.11ax 80MHz SU	9.16	9.21	9.11	9.06	9.15	14.79	14.74	14.66	14.71	14.77
5GHz 802.11ax 160MHz SU	9.39	9.38	9.42	9.43	9.53	14.00	13.87	13.85	13.94	13.85

Based on the most conservative measured triggering distance of 22mm, additional Body SAR measurements were required at 21mm from top side for the above modes.

2.1 Proximity Sensor Coverage for SAR measurements

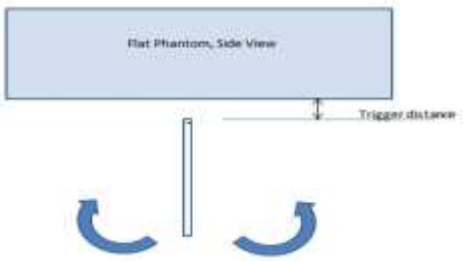
(KDB 616217 D04v01r02 §6.3)

As there is no spatial offset between the antenna and the proximity sensor element, proximity sensor coverage did not need to be assessed.

2.2 Proximity Sensor Tilt Angle Assessment

(KDB 616217 D04v01r02 §6.4)

The DUT was positioned directly below the flat phantom at the minimum measured trigger distance with Bottom side parallel to the base of the flat phantom for each band. The EUT was rotated about Bottom side for angles up to ±45°. If the output power increased during the rotation the DUT was moved 1mm toward the phantom and the rotation repeated. This procedure was repeated until the power remained reduced for all angles up ±45°.



Proximity sensor tilt angle assessment (Bottom side) KDB 616217 §6.4

Summary of Tablet Tilt Angle influence to Proximity Sensor Triggering (Top side)

Band (MHz)	Minimum distance at which power reduction was maintained over-45°	Power reduction status										
		-45°	-40°	-30°	-20°	-10°	0°	10°	20°	30°	40°	45°
2450 MHz	22 mm	On	On	On	On	On	On	On	On	On	On	On
5000 MHz	22 mm	On	On	On	On	On	On	On	On	On	On	On

2.3 Resulting test positions for Body SAR measurements

Wireless technologies	Position	§6.2 Triggering Distance [mm]	§6.3 Coverage	§6.4 Tilt Angle	Worst case distance for Body SAR [mm]
WLAN 1 Ant	Rear	17	N/A	N/A	16
	Right	10	N/A	N/A	9
	Right Corner	15	N/A	N/A	14
	Top	22	N/A	N/A	21

Note: FCC KDB Publication 616217 D04v01r02 Section 6 was used as a guideline for selecting SAR test distances for this device when being used in phablet use conditions.

3. Power reduction Verification for WLAN 2 Ant

This device uses a power reduction mechanism for SAR compliance for WLAN operations during Grip sensor is activated.

Mechanism(s)	Mode/Band	Un-triggered (Max Power) Except 1ch,2ch,10ch 38ch, 58ch, 62ch, 102ch, 106ch	Mechanism 1: (Reduced Power)
Grip	2.4GHz 802.11b	18.01	10.50
Grip	2.4GHz 802.11g	16.82	10.38
Grip	2.4GHz 802.11n	17.85	10.21
Grip	2.4GHz 802.11ax SU	17.56	10.54
Grip	2.4GHz Bluetooth	15.38	8.41
Grip	5GHz 802.11a	17.87	9.35
Grip	5GHz 802.11n 20MHz	17.41	9.52
Grip	5GHz 802.11ac 20MHz	17.62	9.15
Grip	5GHz 802.11ax 20MHz SU	17.72	9.15
Grip	5GHz 802.11n 40MHz	16.72	8.12
Grip	5GHz 802.11ac 40MHz	16.82	8.16
Grip	5GHz 802.11ax 40MHz SU	16.44	8.57
Grip	5GHz 802.11ac 80MHz	15.59	8.89
Grip	5GH 802.11ax 80MHz SU	14.74	9.12
Grip	5GHz 802.11ax 160MHz SU	13.94	9.44

Simultaneous condition with 2GHz WLAN and 5GHz WLAN or Simultaneous condition with 5G NR

Mode/Band	(Max Power) Except 1ch,2ch,10ch 38ch, 58ch, 62ch, 102ch, 106ch	Simultaneous condition wit h 2GHz WLAN and 5GHz WLAN or Simultaneous condition with 5G NR
2.4GHz 802.11b	18.01	8.51
2.4GHz 802.11g	16.82	8.42
2.4GHz 802.11n	17.85	8.53
2.4GHz 802.11ax SU	17.56	8.45
2.4GHz Bluetooth	15.38	7.44
5GHz 802.11a	17.87	7.44
5GHz 802.11n 20MHz	17.41	7.41
5GHz 802.11ac 20MHz	17.62	7.51
5GHz 802.11ax 20MHz SU	17.72	7.35
5GHz 802.11n 40MHz	16.72	7.52
5GHz 802.11ac 40MHz	16.82	7.42
5GHz 802.11ax 40MHz SU	16.44	7.13
5GHz 802.11ac 80MHz	15.59	7.46
5GH 802.11ax 80MHz SU	14.74	7.58
5GHz 802.11ax 160MHz SU	13.94	7.45
6GHz 802.11a	10.54	9.65
6GHz 802.11ax 20MHz	12.04	9.41
6GHZ 802.11ax 40MHz	11.56	8.51
6GHz 802.11ax 80MHz	11.06	8.45
6GHz 802.11ax 160MHz	11.08	8.44

Tissue simulating liquid	Trigger distance – Rear		Trigger distance – Left Side		Trigger distance – Left Corner Side		Trigger distance – Top	
	Moving toward phantom [mm]	Moving away from phantom [mm]	Moving toward phantom [mm]	Moving away from phantom [mm]	Moving toward phantom [mm]	Moving away from phantom [mm]	Moving toward phantom [mm]	Moving away from phantom [mm]
2450MHz	15	16	8	9	12	13	18	19
5000MHz	15	16	8	9	12	13	18	19

Rear side – EUT Moving toward (trigger) to the Phantom

Mode	Distance to DUT Output power (dBm)									
	20	19	18	17	16	15	14	13	12	11
2.4GHz 802.11b	17.94	17.94	17.92	18.02	18.08	10.41	10.58	10.47	10.51	10.52
2.4GHz 802.11g	16.86	16.76	16.75	16.89	16.76	10.30	10.42	10.39	10.38	10.40
2.4GHz 802.11n	17.93	17.83	17.90	17.77	17.80	10.12	10.11	10.13	10.21	10.25
2.4GHz 802.11ax SU	17.49	17.57	17.46	17.47	17.57	10.56	10.46	10.46	10.47	10.53
2.4GHz Bluetooth	15.44	15.41	15.28	15.44	15.43	8.40	8.44	8.34	8.39	8.36
5GHz 802.11a	17.86	17.77	17.82	17.78	17.77	9.26	9.42	9.39	9.27	9.26
5GHz 802.11n 20MHz	17.48	17.39	17.37	17.49	17.51	9.57	9.53	9.51	9.45	9.45
5GHz 802.11ac 20MHz	17.69	17.63	17.70	17.69	17.54	9.24	9.23	9.13	9.16	9.14
5GHz 802.11ax 20MHz SU	17.66	17.73	17.63	17.78	17.80	9.11	9.16	9.25	9.18	9.13
5GHz 802.11n 40MHz	16.67	16.74	16.65	16.65	16.65	8.16	8.05	8.20	8.02	8.19
5GHz 802.11ac 40MHz	16.86	16.83	16.85	16.73	16.85	8.24	8.26	8.15	8.16	8.20
5GHz 802.11ax 40MHz SU	16.44	16.47	16.49	16.43	16.46	8.57	8.51	8.51	8.57	8.53
5GHz 802.11ac 80MHz	15.50	15.64	15.57	15.60	15.63	8.98	8.87	8.99	8.98	8.99
5GH 802.11ax 80MHz SU	14.77	14.75	14.68	14.65	14.78	9.13	9.02	9.10	9.07	9.13
5GHz 802.11ax 160MHz SU	13.96	14.02	13.84	13.98	14.00	9.44	9.49	9.41	9.47	9.40

Rear side – EUT Moving away (Release) from the Phantom

Mode	Distance to DUT Output power (dBm)									
	12	13	14	15	16	17	18	19	20	21
2.4GHz 802.11b	10.44	10.47	10.58	10.55	10.46	18.02	17.95	18.00	18.01	18.05
2.4GHz 802.11g	10.29	10.46	10.37	10.44	10.38	16.75	16.78	16.87	16.84	16.88
2.4GHz 802.11n	10.16	10.15	10.17	10.11	10.14	17.87	17.86	17.85	17.89	17.94
2.4GHz 802.11ax SU	10.49	10.63	10.45	10.44	10.49	17.63	17.54	17.66	17.58	17.53
2.4GHz Bluetooth	8.50	8.34	8.41	8.46	8.33	15.33	15.46	15.39	15.43	15.30
5GHz 802.11a	9.39	9.43	9.31	9.41	9.40	17.92	17.83	17.96	17.77	17.96
5GHz 802.11n 20MHz	9.62	9.56	9.59	9.62	9.47	17.32	17.41	17.41	17.37	17.42
5GHz 802.11ac 20MHz	9.06	9.14	9.05	9.25	9.18	17.71	17.66	17.71	17.57	17.57
5GHz 802.11ax 20MHz SU	9.11	9.11	9.15	9.12	9.08	17.66	17.74	17.67	17.75	17.65
5GHz 802.11n 40MHz	8.05	8.14	8.17	8.02	8.21	16.62	16.75	16.78	16.81	16.82
5GHz 802.11ac 40MHz	8.08	8.17	8.14	8.11	8.14	16.81	16.80	16.79	16.78	16.85
5GHz 802.11ax 40MHz SU	8.58	8.64	8.49	8.63	8.53	16.37	16.50	16.40	16.53	16.52
5GHz 802.11ac 80MHz	8.92	8.90	8.85	8.97	8.82	15.65	15.68	15.64	15.63	15.69
5GH 802.11ax 80MHz SU	9.20	9.06	9.20	9.04	9.22	14.70	14.65	14.82	14.74	14.83
5GHz 802.11ax 160MHz SU	9.50	9.53	9.47	9.53	9.36	13.98	13.98	13.92	14.02	13.84

Based on the most conservative measured triggering distance of 15mm, additional Body SAR measurements were required at 14mm from rear side for the above modes.

Left side – EUT Moving toward (trigger) to the Phantom

Mode	Distance to DUT Output power (dBm)									
	13	12	11	10	9	8	7	6	5	4
2.4GHz 802.11b	18.11	18.02	17.92	17.98	18.02	10.47	10.60	10.40	10.57	10.52
2.4GHz 802.11g	16.84	16.91	16.84	16.86	16.82	10.47	10.28	10.43	10.29	10.42
2.4GHz 802.11n	17.79	17.87	17.82	17.85	17.75	10.15	10.17	10.24	10.26	10.13
2.4GHz 802.11ax SU	17.54	17.51	17.50	17.60	17.47	10.48	10.46	10.59	10.45	10.59
2.4GHz Bluetooth	15.41	15.42	15.32	15.45	15.32	8.38	8.36	8.44	8.45	8.36
5GHz 802.11a	17.80	17.87	17.83	17.80	17.83	9.29	9.44	9.45	9.38	9.32
5GHz 802.11n 20MHz	17.49	17.39	17.42	17.31	17.44	9.49	9.50	9.50	9.57	9.42
5GHz 802.11ac 20MHz	17.55	17.54	17.56	17.60	17.67	9.11	9.21	9.21	9.10	9.07
5GHz 802.11ax 20MHz SU	17.63	17.75	17.66	17.81	17.74	9.07	9.10	9.10	9.15	9.17
5GHz 802.11n 40MHz	16.69	16.64	16.69	16.72	16.62	8.18	8.20	8.05	8.13	8.02
5GHz 802.11ac 40MHz	16.78	16.92	16.84	16.87	16.72	8.20	8.17	8.13	8.12	8.23
5GHz 802.11ax 40MHz SU	16.40	16.34	16.46	16.53	16.53	8.60	8.48	8.50	8.57	8.50
5GHz 802.11ac 80MHz	15.56	15.65	15.64	15.49	15.55	8.93	8.79	8.88	8.92	8.97
5GH 802.11ax 80MHz SU	14.75	14.75	14.73	14.79	14.73	9.21	9.11	9.22	9.20	9.07
5GHz 802.11ax 160MHz SU	13.87	13.84	13.99	13.99	14.00	9.35	9.36	9.41	9.40	9.43

Left side – EUT Moving away (Release) from the Phantom

Mode	Distance to DUT Output power (dBm)									
	5	6	7	8	9	10	11	12	13	14
2.4GHz 802.11b	10.44	10.48	10.42	10.50	10.42	17.93	17.96	17.92	17.92	18.00
2.4GHz 802.11g	10.34	10.34	10.37	10.40	10.47	16.72	16.75	16.83	16.78	16.92
2.4GHz 802.11n	10.15	10.17	10.13	10.28	10.25	17.76	17.85	17.82	17.75	17.93
2.4GHz 802.11ax SU	10.52	10.44	10.57	10.56	10.49	17.49	17.55	17.63	17.53	17.54
2.4GHz Bluetooth	8.41	8.35	8.31	8.43	8.36	15.41	15.43	15.33	15.33	15.30
5GHz 802.11a	9.39	9.32	9.29	9.25	9.33	17.88	17.89	17.86	17.91	17.83
5GHz 802.11n 20MHz	9.62	9.52	9.45	9.55	9.53	17.48	17.39	17.48	17.42	17.34
5GHz 802.11ac 20MHz	9.05	9.12	9.18	9.11	9.19	17.59	17.65	17.63	17.57	17.67
5GHz 802.11ax 20MHz SU	9.07	9.15	9.06	9.09	9.11	17.82	17.74	17.66	17.74	17.73
5GHz 802.11n 40MHz	8.22	8.04	8.16	8.17	8.22	16.70	16.78	16.66	16.71	16.67
5GHz 802.11ac 40MHz	8.18	8.19	8.14	8.18	8.16	16.90	16.90	16.77	16.80	16.85
5GHz 802.11ax 40MHz SU	8.61	8.52	8.48	8.59	8.47	16.46	16.46	16.44	16.39	16.52
5GHz 802.11ac 80MHz	8.96	8.98	8.87	8.99	8.82	15.60	15.50	15.67	15.52	15.65
5GH 802.11ax 80MHz SU	9.11	9.05	9.10	9.10	9.15	14.82	14.84	14.80	14.78	14.76
5GHz 802.11ax 160MHz SU	9.36	9.45	9.53	9.37	9.40	13.98	13.89	14.00	13.95	13.98

Based on the most conservative measured triggering distance of 8mm, additional Body SAR measurements were required at 7mm from left side for the above modes.

Left Corner side – EUT Moving toward (trigger) to the Phantom

Mode	Distance to DUT Output power (dBm)									
	17	16	15	14	13	12	11	10	9	8
2.4GHz 802.11b	17.92	17.93	18.04	18.00	18.03	10.46	10.51	10.58	10.52	10.57
2.4GHz 802.11g	16.85	16.82	16.78	16.76	16.90	10.46	10.41	10.30	10.40	10.41
2.4GHz 802.11n	17.88	17.83	17.77	17.88	17.94	10.24	10.19	10.24	10.22	10.12
2.4GHz 802.11ax SU	17.53	17.63	17.57	17.54	17.49	10.44	10.45	10.62	10.52	10.48
2.4GHz Bluetooth	15.39	15.45	15.28	15.37	15.33	8.33	8.39	8.48	8.50	8.34
5GHz 802.11a	17.79	17.80	17.94	17.85	17.89	9.35	9.40	9.26	9.29	9.42
5GHz 802.11n 20MHz	17.36	17.48	17.48	17.39	17.45	9.46	9.58	9.52	9.57	9.61
5GHz 802.11ac 20MHz	17.57	17.65	17.53	17.65	17.67	9.23	9.24	9.21	9.25	9.25
5GHz 802.11ax 20MHz SU	17.65	17.75	17.72	17.78	17.69	9.18	9.21	9.25	9.08	9.16
5GHz 802.11n 40MHz	16.68	16.82	16.75	16.79	16.81	8.14	8.19	8.07	8.10	8.05
5GHz 802.11ac 40MHz	16.77	16.90	16.74	16.84	16.87	8.23	8.07	8.09	8.13	8.17
5GHz 802.11ax 40MHz SU	16.34	16.52	16.49	16.40	16.41	8.66	8.56	8.57	8.60	8.61
5GHz 802.11ac 80MHz	15.61	15.65	15.64	15.55	15.59	8.83	8.87	8.90	8.98	8.80
5GH 802.11ax 80MHz SU	14.84	14.66	14.66	14.80	14.77	9.07	9.16	9.12	9.08	9.12
5GHz 802.11ax 160MHz SU	13.96	13.97	14.03	13.91	14.04	9.51	9.46	9.54	9.49	9.51

Left Corner side – EUT Moving away (Release) from the Phantom

Mode	Distance to DUT Output power (dBm)									
	9	10	11	12	13	14	15	16	17	18
2.4GHz 802.11b	10.58	10.46	10.52	10.58	10.56	17.96	17.96	17.92	17.98	17.96
2.4GHz 802.11g	10.45	10.35	10.46	10.33	10.44	16.83	16.87	16.73	16.82	16.81
2.4GHz 802.11n	10.19	10.29	10.25	10.30	10.12	17.94	17.79	17.77	17.91	17.81
2.4GHz 802.11ax SU	10.47	10.57	10.61	10.47	10.61	17.54	17.59	17.51	17.49	17.57
2.4GHz Bluetooth	8.31	8.51	8.48	8.44	8.33	15.46	15.28	15.38	15.42	15.47
5GHz 802.11a	9.27	9.39	9.41	9.30	9.32	17.93	17.80	17.84	17.95	17.83
5GHz 802.11n 20MHz	9.53	9.47	9.46	9.46	9.52	17.41	17.43	17.46	17.33	17.51
5GHz 802.11ac 20MHz	9.18	9.13	9.10	9.09	9.14	17.71	17.65	17.71	17.58	17.56
5GHz 802.11ax 20MHz SU	9.08	9.13	9.24	9.22	9.05	17.67	17.70	17.70	17.77	17.71
5GHz 802.11n 40MHz	8.05	8.06	8.18	8.21	8.18	16.72	16.67	16.80	16.76	16.70
5GHz 802.11ac 40MHz	8.14	8.26	8.13	8.26	8.19	16.79	16.74	16.92	16.91	16.72
5GHz 802.11ax 40MHz SU	8.52	8.64	8.51	8.58	8.48	16.53	16.34	16.49	16.50	16.40
5GHz 802.11ac 80MHz	8.81	8.94	8.95	8.83	8.86	15.59	15.55	15.67	15.53	15.63
5GH 802.11ax 80MHz SU	9.22	9.02	9.10	9.06	9.16	14.71	14.70	14.70	14.84	14.78
5GHz 802.11ax 160MHz SU	9.51	9.43	9.35	9.42	9.34	13.88	13.99	13.93	13.98	13.84

Based on the most conservative measured triggering distance of 12mm, additional Body SAR measurements were required at 11mm from left corner side for the above modes.

Top side – EUT Moving toward (trigger) to the Phantom

Mode	Distance to DUT Output power (dBm)									
	23	22	21	20	19	18	17	16	15	14
2.4GHz 802.11b	18.00	17.99	18.08	17.92	17.95	10.59	10.51	10.52	10.49	10.46
2.4GHz 802.11g	16.88	16.89	16.79	16.85	16.75	10.37	10.31	10.40	10.39	10.32
2.4GHz 802.11n	17.87	17.76	17.76	17.78	17.95	10.25	10.22	10.11	10.17	10.16
2.4GHz 802.11ax SU	17.46	17.65	17.64	17.51	17.62	10.58	10.57	10.59	10.53	10.46
2.4GHz Bluetooth	15.47	15.40	15.42	15.28	15.32	8.46	8.37	8.48	8.34	8.45
5GHz 802.11a	17.83	17.96	17.91	17.90	17.96	9.30	9.27	9.37	9.35	9.32
5GHz 802.11n 20MHz	17.39	17.32	17.33	17.31	17.44	9.50	9.62	9.46	9.49	9.53
5GHz 802.11ac 20MHz	17.62	17.58	17.62	17.70	17.59	9.25	9.07	9.08	9.05	9.06
5GHz 802.11ax 20MHz SU	17.72	17.68	17.80	17.62	17.69	9.12	9.05	9.19	9.22	9.09
5GHz 802.11n 40MHz	16.69	16.65	16.79	16.69	16.65	8.18	8.11	8.05	8.02	8.17
5GHz 802.11ac 40MHz	16.85	16.87	16.78	16.91	16.82	8.22	8.08	8.13	8.24	8.13
5GHz 802.11ax 40MHz SU	16.41	16.36	16.48	16.47	16.43	8.61	8.61	8.58	8.61	8.47
5GHz 802.11ac 80MHz	15.51	15.64	15.51	15.55	15.63	8.83	8.80	8.83	8.89	8.93
5GH 802.11ax 80MHz SU	14.83	14.72	14.81	14.73	14.76	9.13	9.21	9.20	9.13	9.19
5GHz 802.11ax 160MHz SU	13.93	13.89	13.89	13.96	13.84	9.35	9.42	9.36	9.50	9.48

Top side – EUT Moving away (Release) from the Phantom

Mode	Distance to DUT Output power (dBm)									
	15	16	17	18	19	20	21	22	23	24
2.4GHz 802.11b	10.53	10.46	10.56	10.47	10.56	18.01	18.04	17.98	17.92	18.02
2.4GHz 802.11g	10.43	10.46	10.46	10.34	10.41	16.78	16.72	16.81	16.77	16.75
2.4GHz 802.11n	10.23	10.27	10.14	10.27	10.11	17.77	17.94	17.75	17.91	17.91
2.4GHz 802.11ax SU	10.47	10.55	10.58	10.50	10.64	17.46	17.48	17.58	17.59	17.66
2.4GHz Bluetooth	8.37	8.39	8.46	8.33	8.37	15.45	15.44	15.37	15.29	15.32
5GHz 802.11a	9.34	9.45	9.30	9.33	9.25	17.83	17.82	17.89	17.96	17.97
5GHz 802.11n 20MHz	9.60	9.57	9.56	9.47	9.49	17.32	17.41	17.44	17.47	17.46
5GHz 802.11ac 20MHz	9.23	9.10	9.11	9.09	9.05	17.53	17.70	17.68	17.61	17.72
5GHz 802.11ax 20MHz SU	9.17	9.19	9.06	9.12	9.07	17.66	17.80	17.68	17.63	17.80
5GHz 802.11n 40MHz	8.10	8.16	8.12	8.12	8.19	16.80	16.77	16.78	16.63	16.65
5GHz 802.11ac 40MHz	8.13	8.21	8.21	8.18	8.19	16.92	16.89	16.86	16.77	16.92
5GHz 802.11ax 40MHz SU	8.57	8.61	8.55	8.60	8.51	16.40	16.41	16.48	16.54	16.42
5GHz 802.11ac 80MHz	8.82	8.96	8.82	8.94	8.82	15.66	15.52	15.59	15.50	15.67
5GH 802.11ax 80MHz SU	9.15	9.11	9.22	9.04	9.16	14.73	14.70	14.64	14.65	14.80
5GHz 802.11ax 160MHz SU	9.50	9.44	9.54	9.43	9.47	14.04	13.98	13.96	13.99	13.96

Based on the most conservative measured triggering distance of 18mm, additional Body SAR measurements were required at 17mm from top side for the above modes.

3.1 Proximity Sensor Coverage for SAR measurements

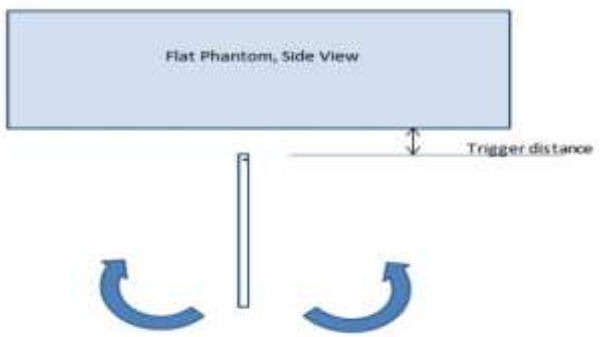
(KDB 616217 D04v01r02 §6.3)

As there is no spatial offset between the antenna and the proximity sensor element, proximity sensor coverage did not need to be assessed.

3.2 Proximity Sensor Tilt Angle Assessment

(KDB 616217 D04v01r02 §6.4)

The DUT was positioned directly below the flat phantom at the minimum measured trigger distance with Bottom side parallel to the base of the flat phantom for each band. The EUT was rotated about Bottom side for angles up to ±45°. If the output power increased during the rotation the DUT was moved 1mm toward the phantom and the rotation repeated. This procedure was repeated until the power remained reduced for all angles up ±45°.



Proximity sensor tilt angle assessment (Bottom side) KDB 616217 §6.4

Summary of Tablet Tilt Angle influence to Proximity Sensor Triggering (Top side)

Band (MHz)	Minimum distance at which power reduction was maintained over-45°	Power reduction status										
		-45°	-40°	-30°	-20°	-10°	0°	10°	20°	30°	40°	45°
2450 MHz	18 mm	On	On	On	On	On	On	On	On	On	On	On
5000 MHz	18 mm	On	On	On	On	On	On	On	On	On	On	On

3.3 Resulting test positions for Body SAR measurements

Wireless technologies	Position	§6.2 Triggering Distance [mm]	§6.3 Coverage	§6.4 Tilt Angle	Worst case distance for Body SAR [mm]
WLAN 2 Ant	Rear	15	N/A	N/A	14
	Left	8	N/A	N/A	7
	Left Corner	12	N/A	N/A	11
	Top	18	N/A	N/A	17

Note: FCC KDB Publication 616217 D04v01r02 Section 6 was used as a guideline for selecting SAR test distances for this device when being used in use conditions.

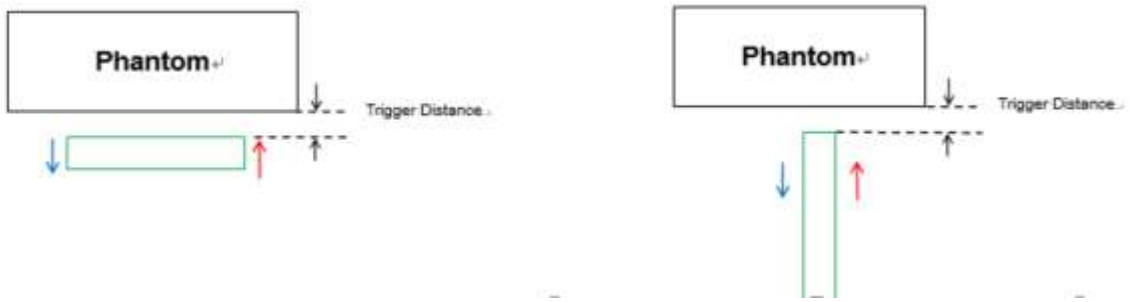
4. Power reduction Verification for Sub 1 Ant

This device utilizes a power reduction mechanism for some wireless modes under some conditions when the device is being used in close proximity to the user's hand for Sub Ant1
FCC KDB Publication 616217D04v01r02 section 6 was used as a guideline for selection SAR test distances for this device when being used in Proximity use conditions.

Mechanism(s)	Mode/Band	Device State Index	
		Un-triggered (Max Power)	Triggered (Reduced Power)
Grip	LTE Band 2	DSI 0	DSI 1
Grip	LTE Band 66	DSI 0	DSI 1

Note: This device uses different Device State Indices(DSI) to configure different time averaged power level based on certain exposure scenarios. For this model, DSI=1 represents the case when the grip sensor is active, and DSI=0 represents the case when grip sensor is not activated, Max power condition.

4.2 Proximity sensor triggering Distance Verification.



Proximity Sensor Trigger Distance Assessment KDB 616217 D04 §6.2 (Rear / Bottom side)

LEGEND

→ Direction of DUT travel for determination of power reduction triggering point

→ Direction of DUT travel for determination of full power resumption triggering point

Tissue simulating liquid	Trigger distance - Rear		Trigger distance - Bottom	
	Moving toward phantom [mm]	Moving away from phantom [mm]	Moving toward phantom [mm]	Moving away from phantom [mm]
1750 MHz	10	11	18	19
1900 MHz	10	11	18	19

Distance Measurement verification for Proximity sensor

Rear side – EUT Moving toward (trigger) to the Phantom

Distance	Distance to DUT Output power (dBm)									
	15	14	13	12	11	10	9	8	7	6
LTE Band 2	23.02	23.16	23.06	23.08	23.12	13.42	13.45	13.36	13.41	13.35
LTE Band 66	23.19	23.15	23.13	23.30	23.14	13.37	13.44	13.26	13.29	13.39

Rear side – EUT Moving away (Release) from the Phantom

Distance	Distance to DUT Output power (dBm)									
	7	8	9	10	11	12	13	14	15	16
LTE Band 2	13.35	13.27	13.34	13.35	13.33	23.08	23.05	23.03	23.05	23.19
LTE Band 66	13.27	13.41	13.31	13.29	13.31	23.31	23.12	23.27	23.12	23.19

Based on the most conservative measured triggering distance of 10mm, additional Body SAR measurements were required at 9mm from Rear side for the above modes.

Bottom side – EUT Moving toward (trigger) to the Phantom

Distance	Distance to DUT Output power (dBm)									
	23	22	21	20	19	18	17	16	15	14
LTE Band 2	23.19	23.17	23.04	23.04	23.09	13.42	13.43	13.29	13.40	13.27
LTE Band 66	23.21	23.26	23.28	23.25	23.21	13.34	13.43	13.37	13.39	13.26

Bottom side – EUT Moving away (Release) from the Phantom

Distance	Distance to DUT Output power (dBm)									
	15	16	17	18	19	20	21	22	23	24
LTE Band 2	13.37	13.28	13.30	13.28	13.43	23.20	23.05	23.02	23.20	23.20
LTE Band 66	13.29	13.26	13.43	13.41	13.38	23.17	23.25	23.13	23.27	23.12

Based on the most conservative measured triggering distance of 18mm, additional Body SAR measurements were required at 17mm from Bottom side for the above modes.

4.3 Proximity Sensor Coverage for SAR measurements

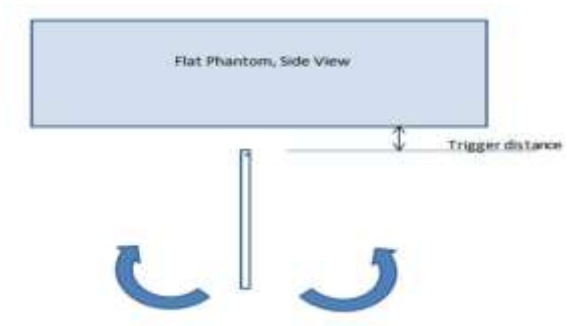
(KDB 616217 D04v01r02 §6.3)

As there is no spatial offset between the antenna and the proximity sensor element, proximity sensor coverage did not need to be assessed.

4.4 Proximity Sensor Tilt Angle Assessment

(KDB 616217 D04v01r02 §6.4)

The DUT was positioned directly below the flat phantom at the minimum measured trigger distance with Bottom side parallel to the base of the flat phantom for each band. The EUT was rotated about Bottom side for angles up to ±45°. If the output power increased during the rotation the DUT was moved 1mm toward the phantom and the rotation repeated. This procedure was repeated until the power remained reduced for all angles up ±45°.



Proximity sensor tilt angle assessment (Bottom side) KDB 616217 §6.4

Summary of Tablet Tilt Angle influence to Proximity Sensor Triggering (Bottom side)

Band (MHz)	Minimum distance at which power reduction was maintained over-45°	Power reduction status										
		-45°	-40°	-30°	-20°	-10°	0°	10°	20°	30°	40°	45°
1750 MHz	18 mm	On	On	On	On	On	On	On	On	On	On	On
1900 MHz	18 mm	On	On	On	On	On	On	On	On	On	On	On
2600 MHz	18 mm	On	On	On	On	On	On	On	On	On	On	On

4.5 Resulting test positions for Body SAR measurements

Wireless technologies	Position	§6.2 Triggering Distance [mm]	§6.3 Coverage	§6.4 Tilt Angle	Worst case distance for Body SAR [mm]
Sub Ant 1	Rear	10	N/A	N/A	9
	Bottom	18	N/A	N/A	17

Note: FCC KDB Publication 616217 D04v01r02 Section 6 was used as a guideline for selecting SAR test distances for this device when being used in proximity use conditions.

Appendix I. – DL CA Power Measurement

1. LTE Uplink and Down-link Carrier Aggregation Conducted Powers

SAR test exclusion for LTE downlink Carrier Aggregation is determined by power measurements according to the number component carriers(CCs) supported by test product implementation. For those configurations required by April 2018 TCBC Workshop notes, conducted power measurements with LTE Carrier Aggregation(CA) (downlink only) active are made in accordance to KDB Publication 941225 D05Av01r02. The RRC connection is only handled by one cell, the primary component carrier (PCC) for downlink and uplink communications. After making a data connection to the PCC, the UE device adds secondary component carrier(s)(SCC) on the downlink only.

Downlink Carrier aggregation:

1. This device only supports downlink carrier aggregation. For every supported combination of downlink carrier aggregation, power measurements were performed with the downlink carrier aggregation active for the configuration with highest measured maximum conducted power with downlink carrier aggregation inactive measured among the channel bandwidth, modulation, and RB combinations in each frequency band.
2. All control and acknowledge data is sent on uplink channels that operate identical to specifications when downlink carrier aggregation is inactive.
3. Per FCC KDB publication 941225 D05A v01r02, Section C)3)b)ii), PCC uplink channel was selected at downlink carrier aggregation combinations. The downlink PCC channel was paired with the selected PCC uplink channel according to normal configurations without carrier aggregation.
4. For continuous intra-band carrier aggregation, the downlink channel spacing between the component carriers was set to multiple of 300kHz less than the nominal channel spacing defined in section 5.4.1A of 3GPP TS 36.521.
5. For non-continuous intra-band carrier aggregation, the downlink channel spacing between the component carriers was set to be larger than the nominal channel spacing and provided maximum separation between the component carriers.
6. All selected downlink channels remained fully within the downlink transmission band of the respective component carrier.

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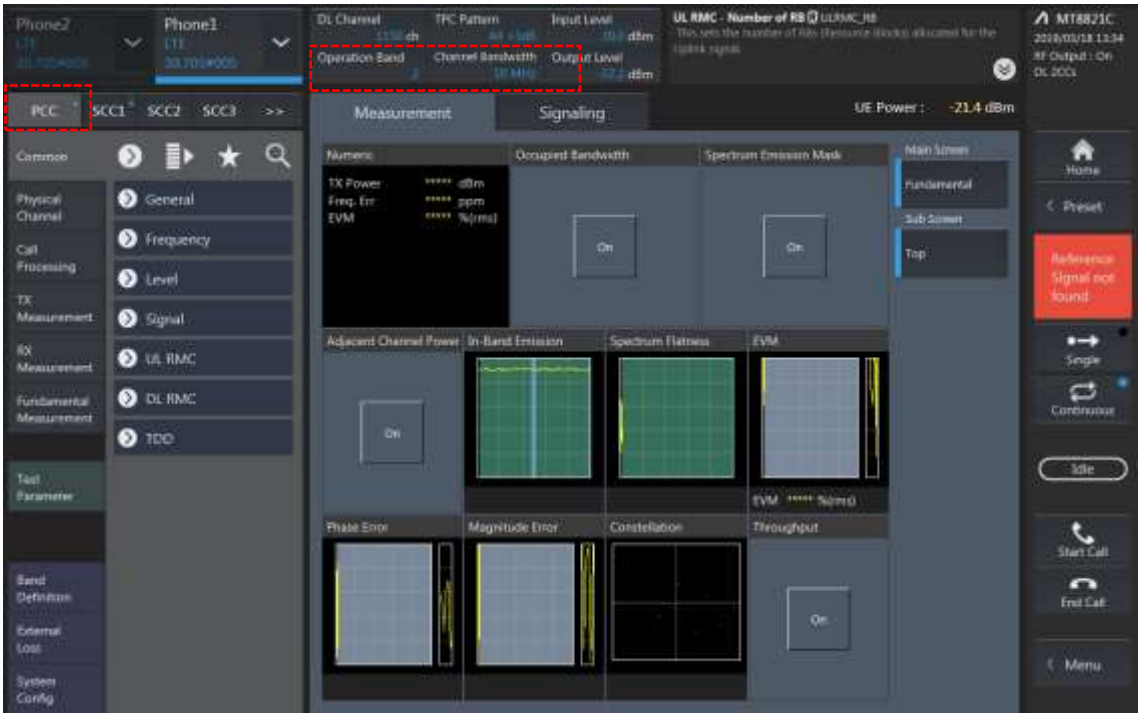
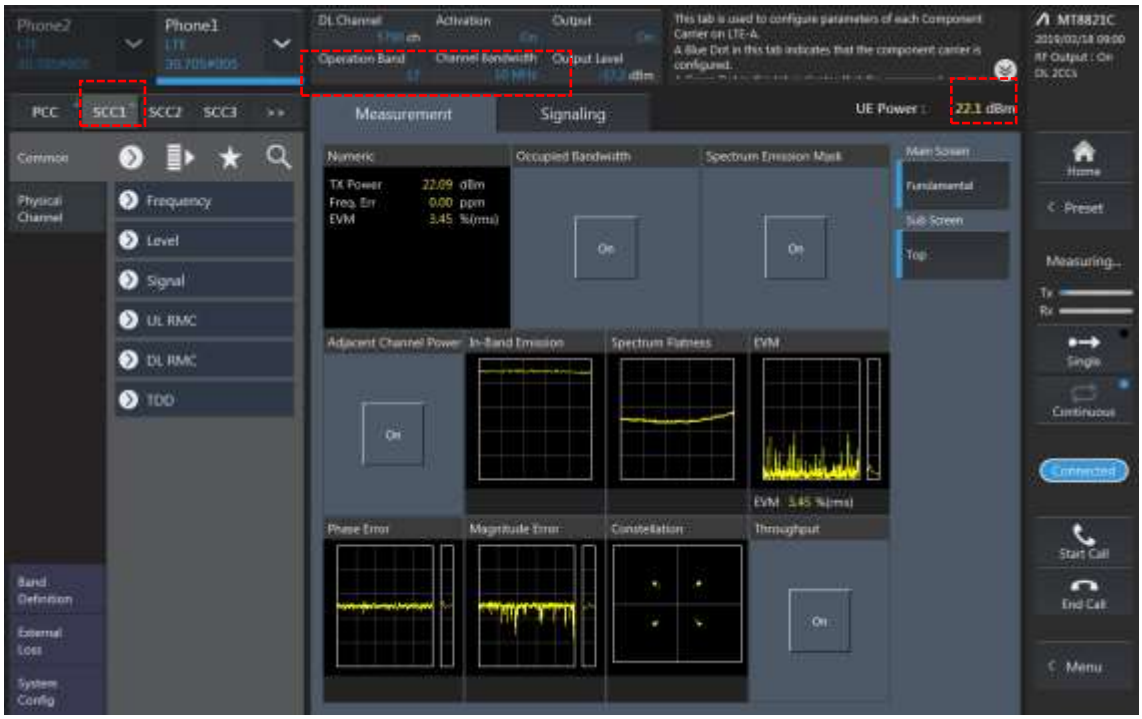
Power Measurement setup

LTE Down Link 2CA Call Setup

PCC Setting : Channel/ RB/ BW/ Modulation



SCC Setting : Channel/ RB/ BW/ Modulation and call Connection

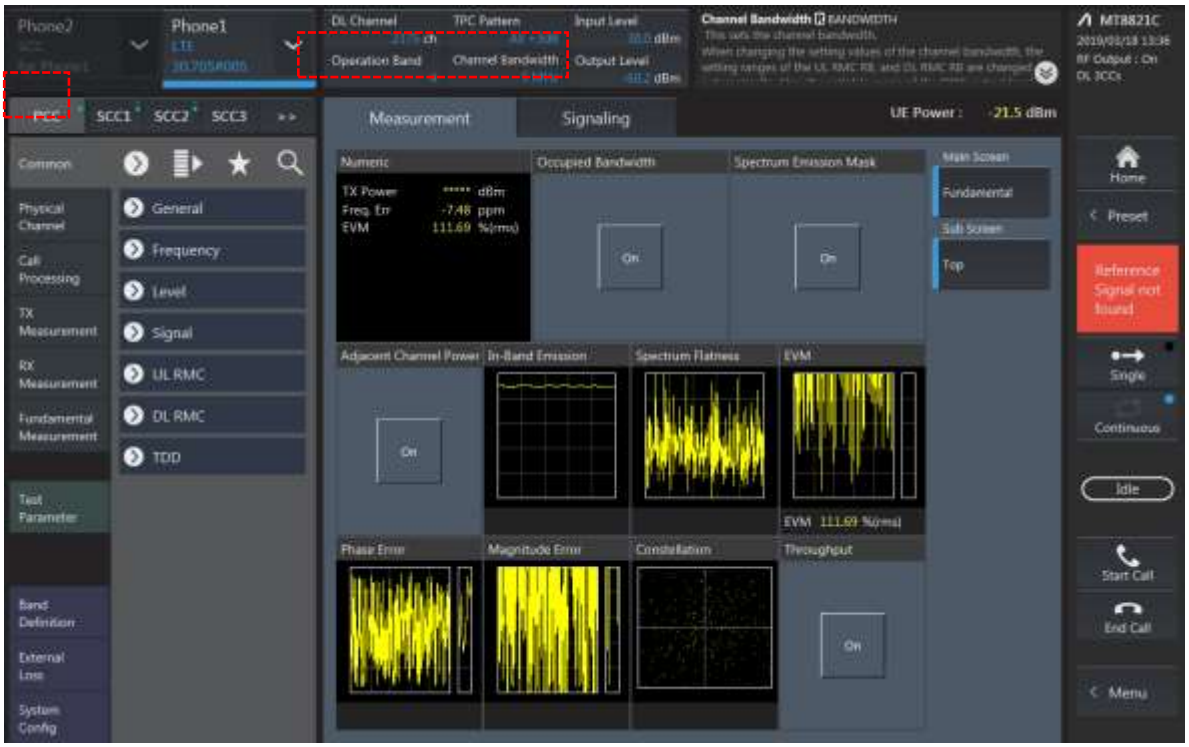


2CA Downlink Carrier aggregation Maximum conducted Powers

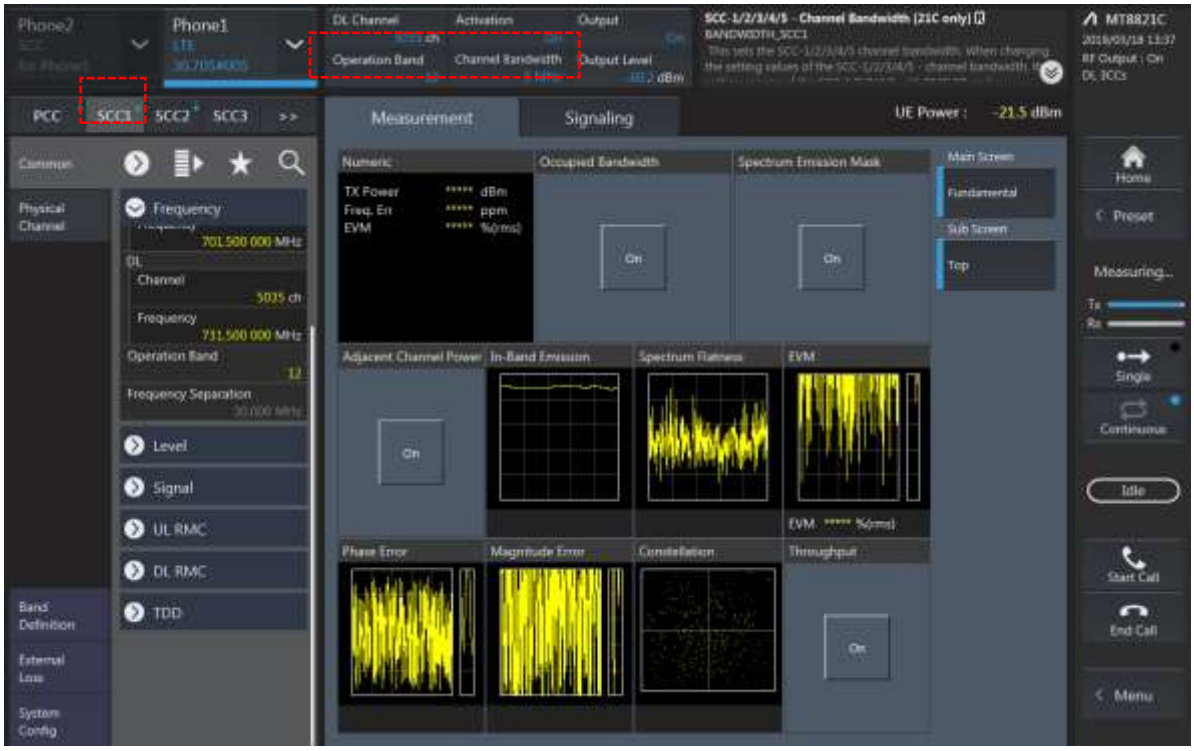
Combination	PCC									SCC				Tx Power		
	Band	BW	PCC UL Channel	PCC UL Frequency	PCC DL Channel	PCC DL Frequency	Modulation	RB	offset	Band	BW	SCC DL Channel	SCC DL Frequency	LTE Single Carrier Tx Power (dBm) (1)	LTE Tx Power with DL CA Enabled(dBm) (2)	Deviaion (2)-(1)
2A-2A	2	15	18675	1857.5	675	1937.5	QPSK	1	36	2	20	1100	1980	22.67	22.58	-0.09
2C	2	15	18675	1857.5	675	1937.5	QPSK	1	36	2	20	846	1954.6	22.67	22.57	-0.1
2A-12A(0,1)	2	15	18675	1857.5	675	1937.5	QPSK	1	36	12	10	5095	737.5	22.67	22.59	-0.08
2A-12A(2)	2	10	18650	1855	650	1935	QPSK	1	24	12	10	5095	737.5	22.51	22.5	-0.01
2A-66A(0,2)	2	15	18675	1857.5	675	1937.5	QPSK	1	36	66	20	66786	2145	22.67	22.52	-0.15
2A-66A(1)	2	10	18650	1855	650	1935	QPSK	1	24	66	10	66786	2145	22.51	22.49	-0.02
5A-41A	5	5	20625	846.5	2625	891.5	QPSK	1	0	41	20	40620	2593	24.08	24.06	-0.02
2A-12A(0,1)	12	10	23095	707.5	5095	737.5	QPSK	1	24	2	20	900	1960	24.57	24.54	-0.03
2A-12A(2)	12	10	23095	707.5	5095	737.5	QPSK	1	24	2	10	900	1960	24.57	24.53	-0.04
26A-41A	26	5	27015	846.5	9015	891.5	QPSK	1	24	41	20	40620	2593	24.11	24.09	-0.02
41A-41A	41	5	40620	2593	40620	2593	QPSK	1	12	41	20	41490	2680	24.65	24.51	-0.14
2A-66A(0,2)	66	5	132322	1745	66786	2145	QPSK	1	0	2	20	900	1960	22.92	22.87	-0.05
2A-66A(1)	66	5	132322	1745	66786	2145	QPSK	1	0	2	10	900	1960	22.92	22.89	-0.03
66B	66	5	132322	1745	66786	2145	QPSK	1	0	66	15	66693	2135.7	22.92	22.87	-0.05
66C	66	5	132322	1745	66786	2145	QPSK	1	0	66	20	66669	2133.3	22.92	22.89	-0.03
2A-17A	2	10	18650	1855	650	1935	QPSK	1	24	17	10	5790	740	22.51	22.49	-0.02
4A-17A	4	5	20375	1752.5	2375	2152.5	QPSK	1	12	17	10	5790	740	22.82	22.79	-0.03
2A-17A	17	10	23825	713.5	5825	743.5	QPSK	1	12	2	10	900	1960	24.53	24.49	-0.04
4A-17A	17	10	23825	713.5	5825	743.5	QPSK	1	12	4	10	2175	2132.5	24.53	24.5	-0.03

LTE Down Link 3CA Call Setup

1) PCC Setting: Channel /RB/BW/Modulation



2) SCC1 Setting : Channel /RB/BW/Modulation



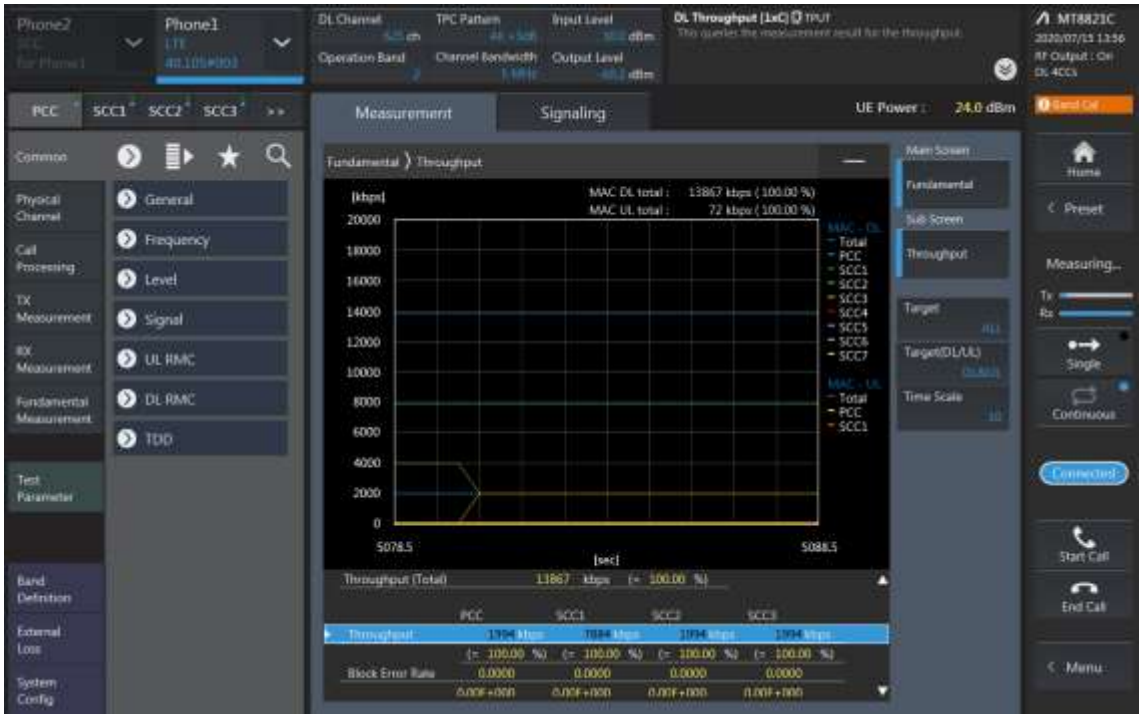
3) SCC2 Setting (Channel /RB/BW/Modulation)and call Connection

3CA Downlink Carrier aggregation Maximum conducted Powers

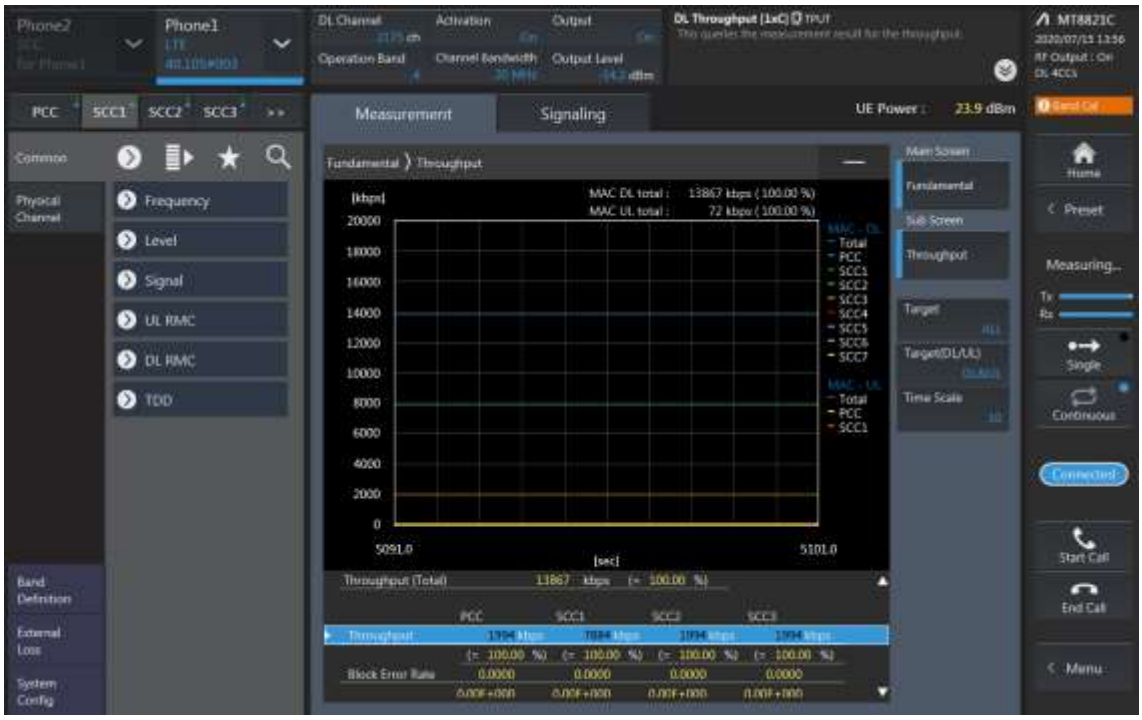
	PCC									SCC				SCC				Tx Power		
Combinatio	Band	BW	PCC UL Channel	PCC UL Frequency	PCC DL Channel	PCC DL Frequency	Modulation	RB	offset	Band	BW	SCC DL Channel	SCC DL Frequency	Band	BW	SCC DL Channel	SCC DL Frequency	LTE Single Carrier Tx Power (dBm) (1)	LTE Tx Power with DL CA Enabled(dBm) (2)	Deviaion (2)-(1)
2A-4A-5A	2	15	18675	1857.5	675	1937.5	QPSK	1	36	4	20	2175	2132.5	5	10	2525	881.5	22.67	22.57	-0.1
2A-4A-13A	2	15	18675	1857.5	675	1937.5	QPSK	1	36	4	20	2175	2132.5	13	10	5230	751	22.67	22.55	-0.12
4A-2A-5A	4	5	20375	1752.5	2375	2152.5	QPSK	1	12	2	20	900	1960	5	10	2525	881.5	22.82	22.8	-0.02
4A-2A-13A	4	5	20375	1752.5	2375	2152.5	QPSK	1	12	2	20	900	1960	13	10	5230	751	22.82	22.77	-0.05
A-4A-12A(	4	5	20375	1752.5	2375	2152.5	QPSK	1	12	4	20	2050	2120	12	10	5095	737.5	22.82	22.79	-0.03
A-4A-12A(	4	5	20375	1752.5	2375	2152.5	QPSK	1	12	4	10	2000	2115	12	10	5095	737.5	22.82	22.78	-0.04
5A-2A-4A	5	5	20625	846.5	2625	891.5	QPSK	1	0	2	20	900	1960	4	20	2175	2132.5	24.08	24.05	-0.03
A-66A-66	5	5	20625	846.5	2625	891.5	QPSK	1	0	66	20	66786	2145	66	20	67236	2190	24.08	24.04	-0.04
2A-4A-4A(	12	10	23095	707.5	5095	737.5	QPSK	1	24	4	20	2175	2132.5	4	20	2050	2120	24.57	24.56	-0.01
2A-4A-4A(	12	10	23095	707.5	5095	737.5	QPSK	1	24	4	10	2175	2132.5	4	10	2000	2115	24.57	24.55	-0.02
2A-66A-66	12	10	23095	707.5	5095	737.5	QPSK	1	24	66	20	66786	2145	66	20	67236	2190	24.57	24.56	-0.01
13A-2A-4A	13	10	23230	782	5230	751	QPSK	1	0	2	20	900	1960	4	20	2175	2132.5	24.37	24.32	-0.05
26A-41C	26	10	27015	846.5	9015	891.5	QPSK	1	24	41	20	40620	2593	4	20	40818	2612.8	24.11	24.06	-0.05
41A-41C	41	5	40620	2593	40620	2593	QPSK	1	12	41	20	39750	2506	41	20	39948	2525.8	24.65	24.59	-0.06
41C-41A	41	5	40620	2593	40620	2593	QPSK	1	12	41	20	40818	2612.8	41	20	39750	2506	24.65	24.58	-0.07
6A-66A-5	66	5	132322	1745	2145	66786	QPSK	1	0	66	20	67236	2190	5	10	2525	881.5	22.92	22.89	-0.03
6A-66A-12	66	5	132322	1745	2145	66786	QPSK	1	0	66	20	67236	2190	12	10	5095	737.5	22.92	22.9	-0.02

LTE Down Link 4CA Call Setup

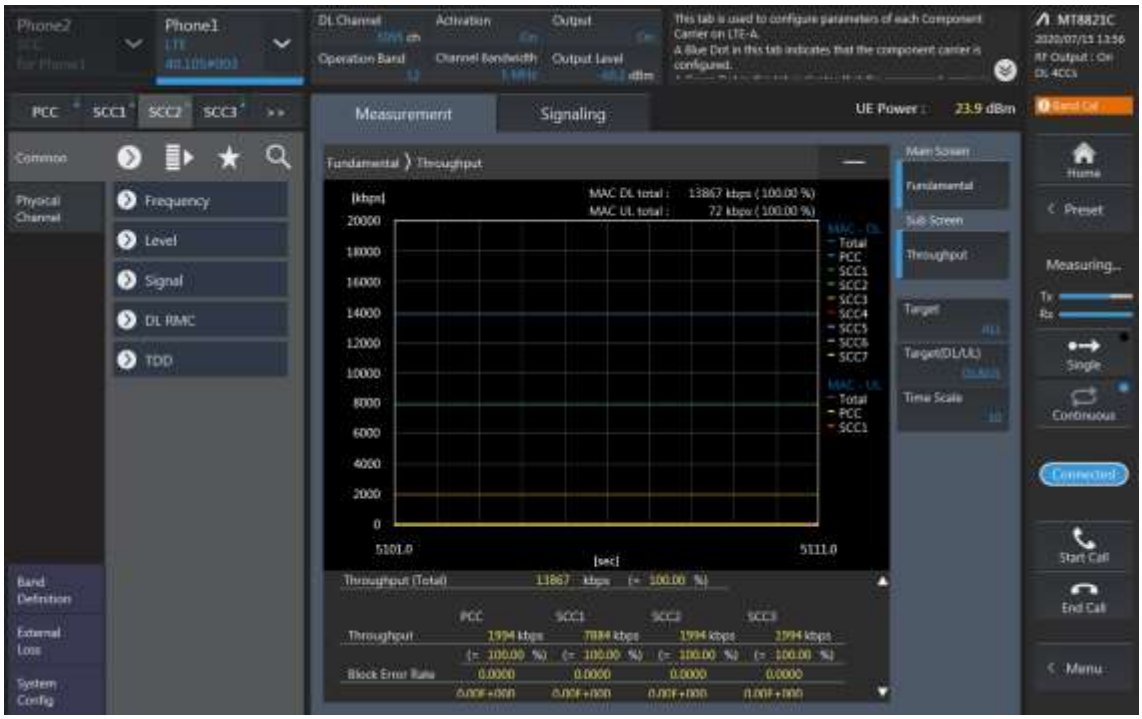
PCC Setting: Channel /RB/BW/Modulation



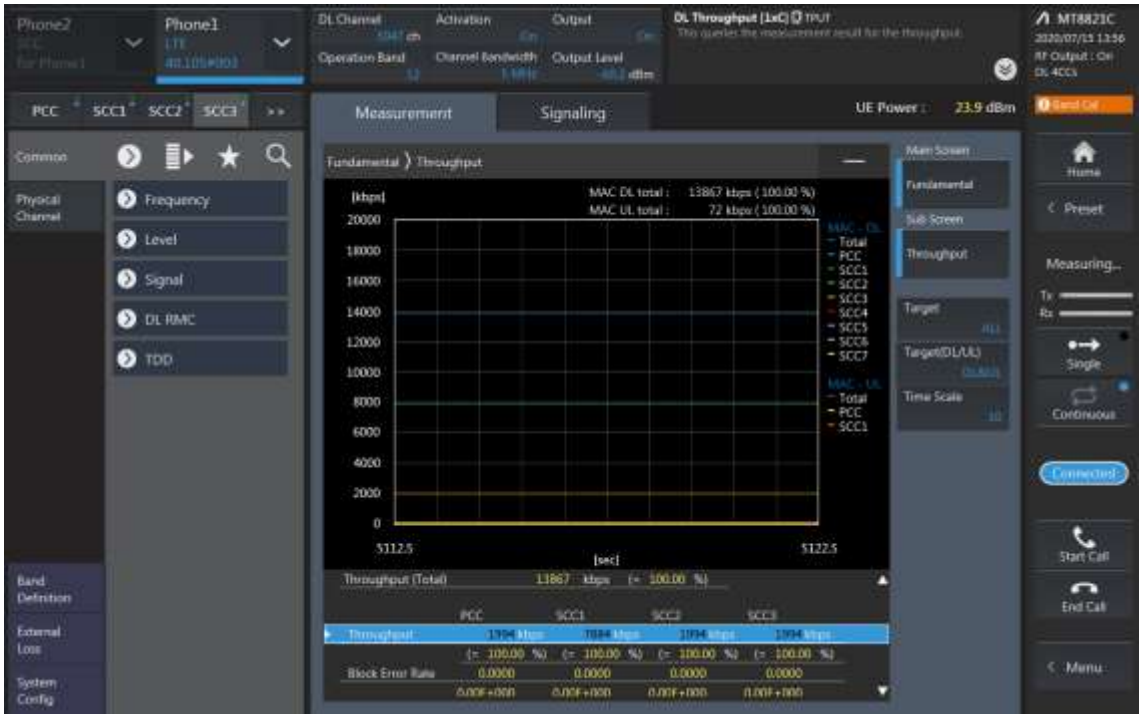
SCC1 Setting (Channel /RB/BW/Modulation)and call Connection



SCC2 Setting (Channel /RB/BW/Modulation)and call Connection



SCC3 Setting (Channel /RB/BW/Modulation)and call Connection

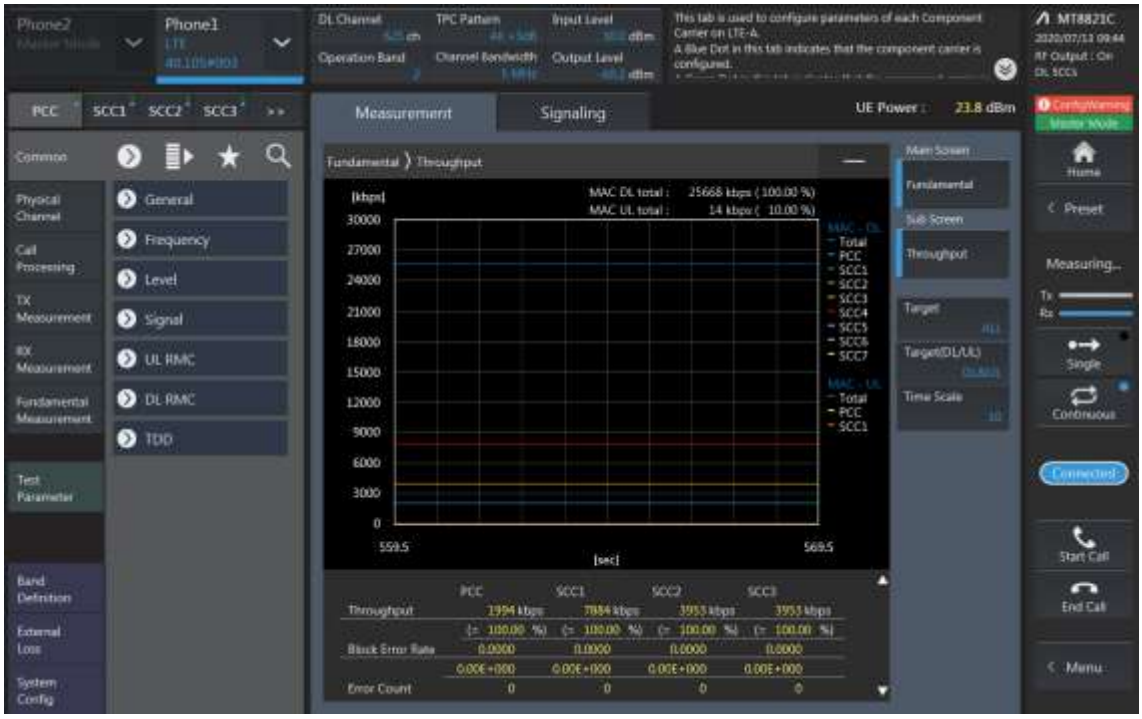


4CA Downlink Carrier aggregation Maximum conducted Powers

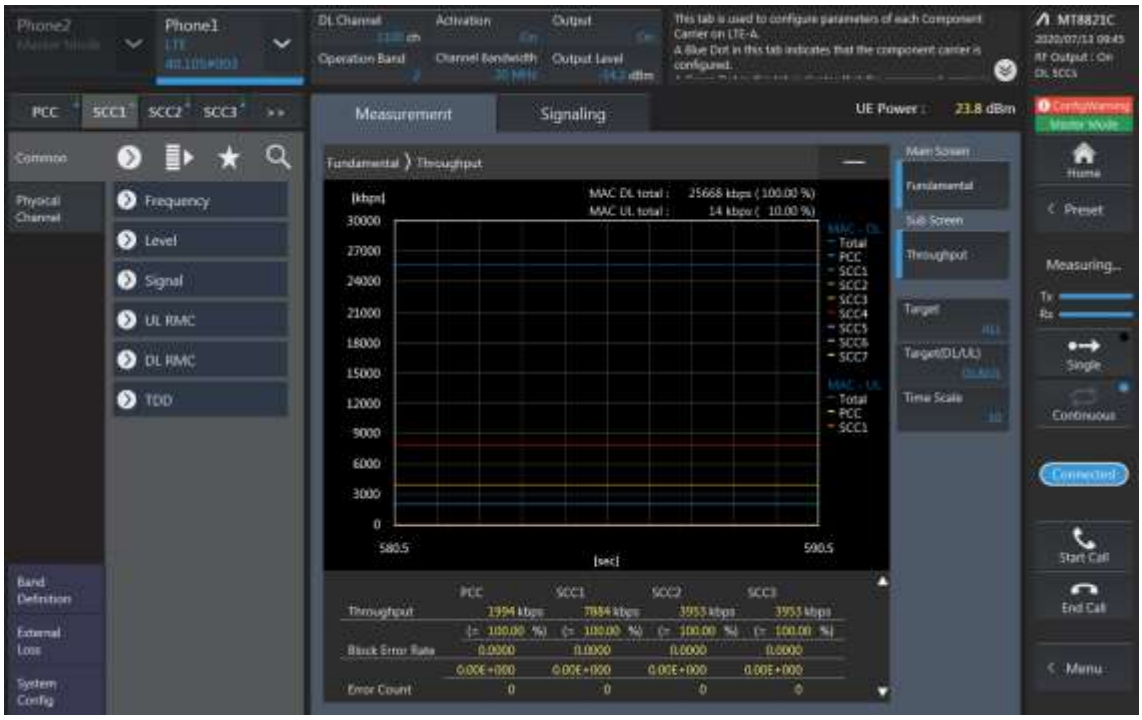
Combination	PCC									SCC				SCC				SCC				Tx Power		
	Band	BW	PCC UL Channel	PCC UL Frequency	PCC DL Channel	PCC DL Frequency	Modulation	RB	offset	Band	BW	SCC DL Channel	SCC DL Frequency	Band	BW	SCC DL Channel	SCC DL Frequency	Band	BW	SCC DL Channel	SCC DL Frequency	LTE Single Carrier Tx Power (dBm) (1)	LTE Tx Power with DL CA Enabled(dBm) (2)	Deviaion (2)-(1)
41A-41D	41	5	40620	2593	40620	2593	QPSK	1	12	41	20	39750	2506	41	20	39948	2525.8	41	20	40146	2545.6	24.65	24.58	-0.07
41C-41C	41	5	40620	2593	40620	2593	QPSK	1	12	41	20	40737	2604.7	41	20	39750	2506	41	20	39948	2525.8	24.65	24.61	-0.04
41D-41A	41	5	40620	2593	40620	2593	QPSK	1	12	41	20	40737	2604.7	41	20	40935	2624.5	41	20	39750	2506	24.65	24.62	-0.03

LTE Down Link 5CA Call Setup

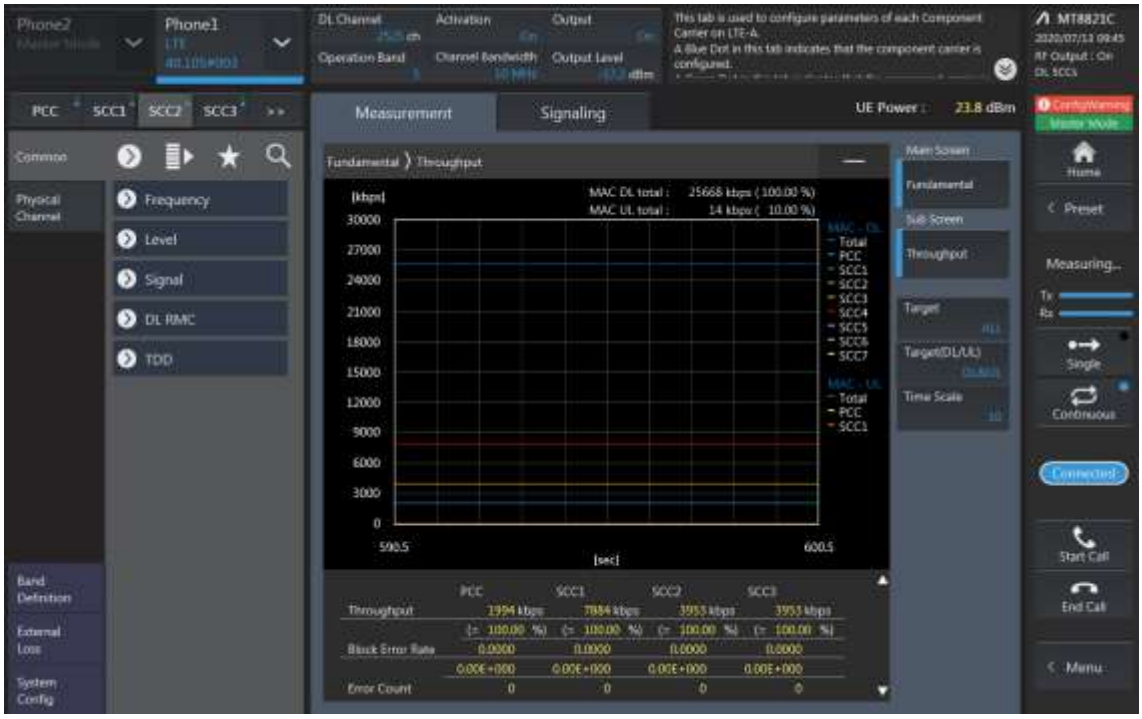
PCC Setting: Channel /RB/BW/Modulation



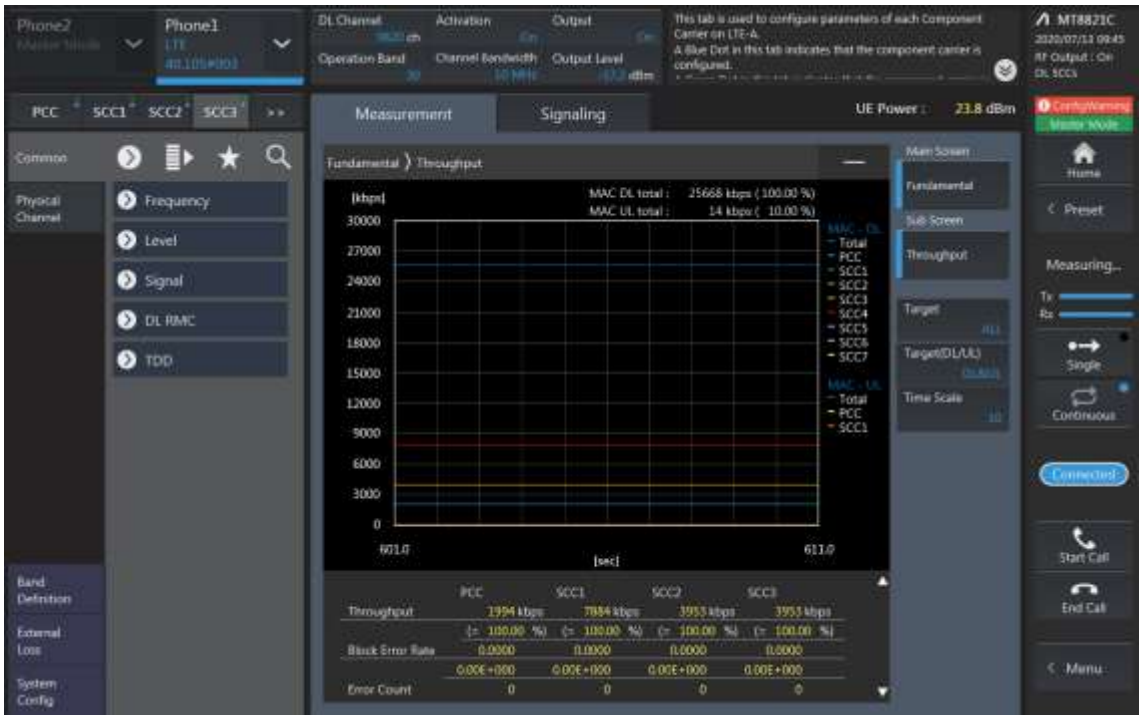
SCC1 Setting (Channel /RB/BW/Modulation)and call Connection



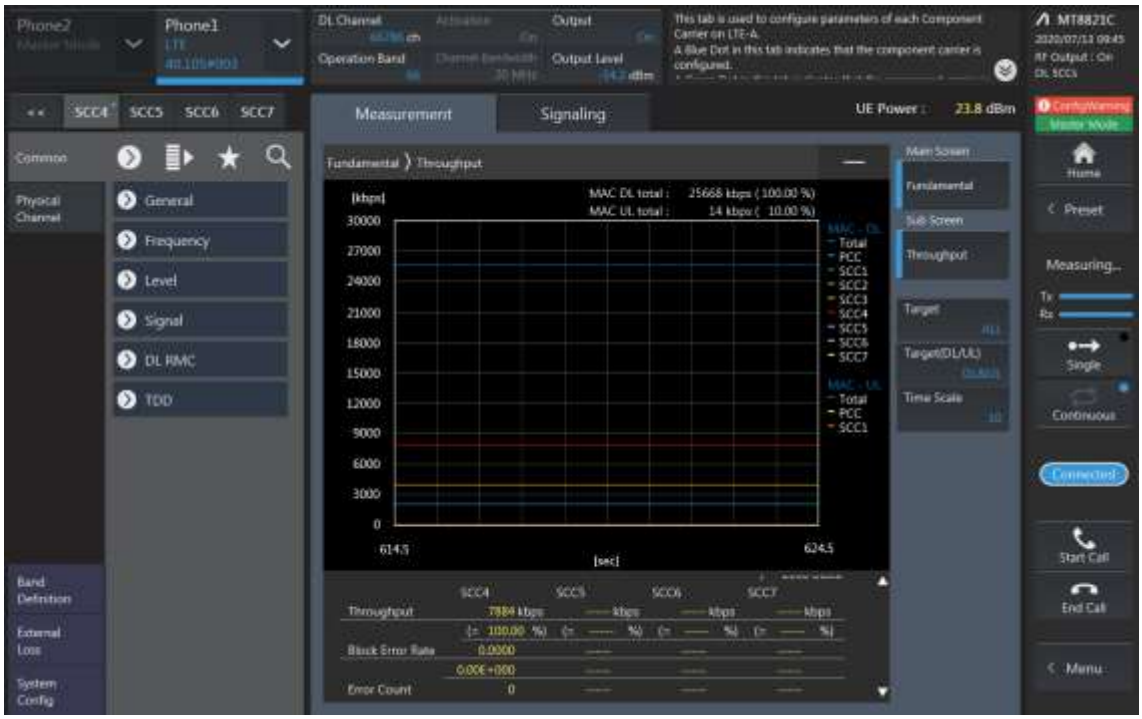
SCC2 Setting (Channel /RB/BW/Modulation)and call Connection



SCC3 Setting (Channel /RB/BW/Modulation)and call Connection



SCC4 Setting (Channel /RB/BW/Modulation)and call Connection

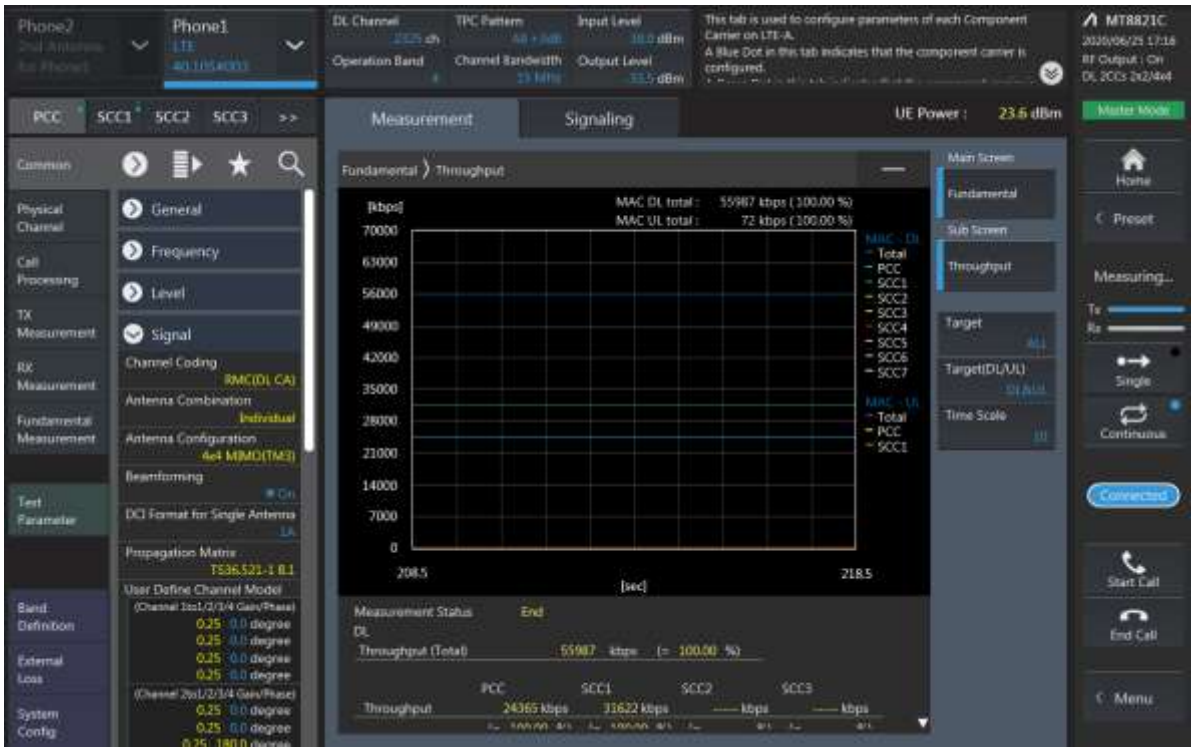


5CA Downlink Carrier aggregation conducted Powers

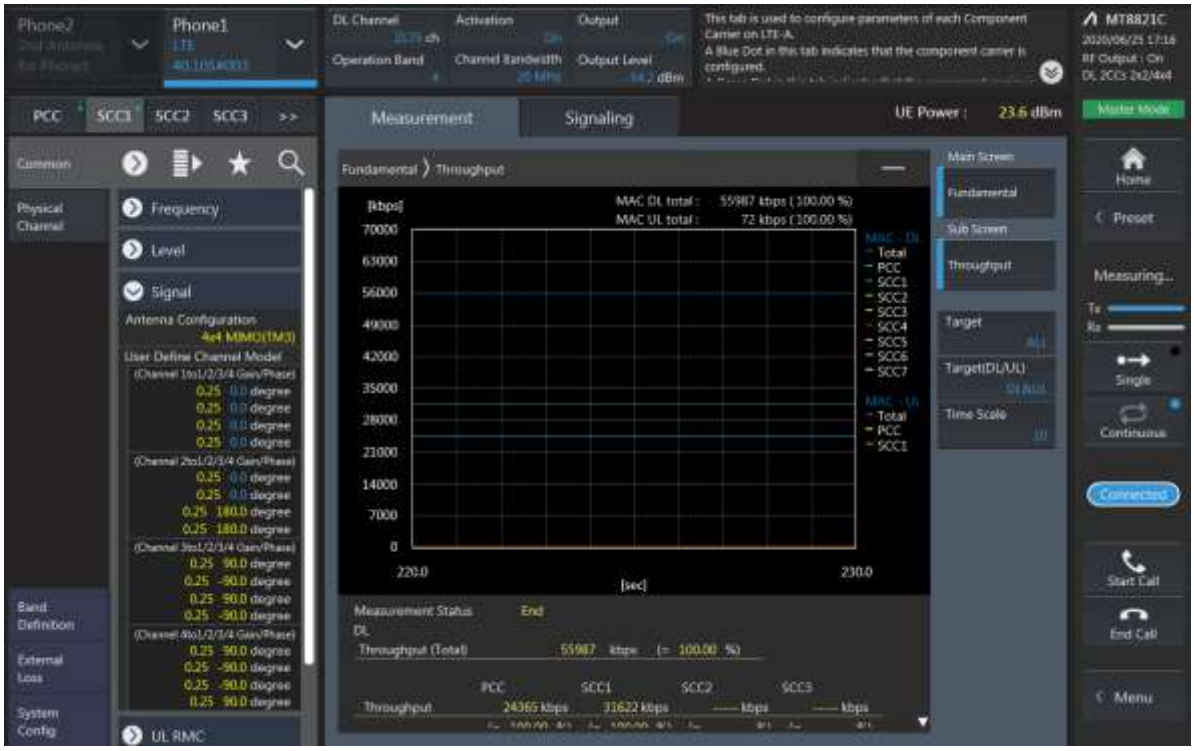
Combination	PCC									SCC				SCC				SCC				SCC				Tx Power		
	Band	BW	PCC UL Channel	PCC UL Frequency	PCC DL Channel	PCC DL Frequency	Modulation	RB	offset	Band	BW	SCC DL Channel	SCC DL Frequency	Band	BW	SCC DL Channel	SCC DL Frequency	Band	BW	SCC DL Channel	SCC DL Frequency	Band	BW	SCC DL Channel	SCC DL Frequency	LTE Single Carrier Tx Power (dBm) (1)	LTE Tx Power with DL CA Enabled(dBm) (2)	Deviaion (2)-(1)
41C-41D	41	5	40620	2593	40620	2593	QPSK	1	12	41	20	40737	2604.7	41	20	39750	2506	41	20	39948	2525.8	41	20	40146	2545.6	24.65	24.58	-0.07
41D-41C	41	5	40620	2593	40620	2593	QPSK	1	12	41	20	40737	2604.7	41	20	40935	2624.5	41	20	39750	2506	41	20	39948	2525.8	24.65	24.59	-0.06

LTE Down Link 2CA 4x4 MIMO Call Setup

PCC Setting : Channel/ RB/ BW/ Modulation



SCC Setting : Channel/ RB/ BW/ Modulation and call Connection

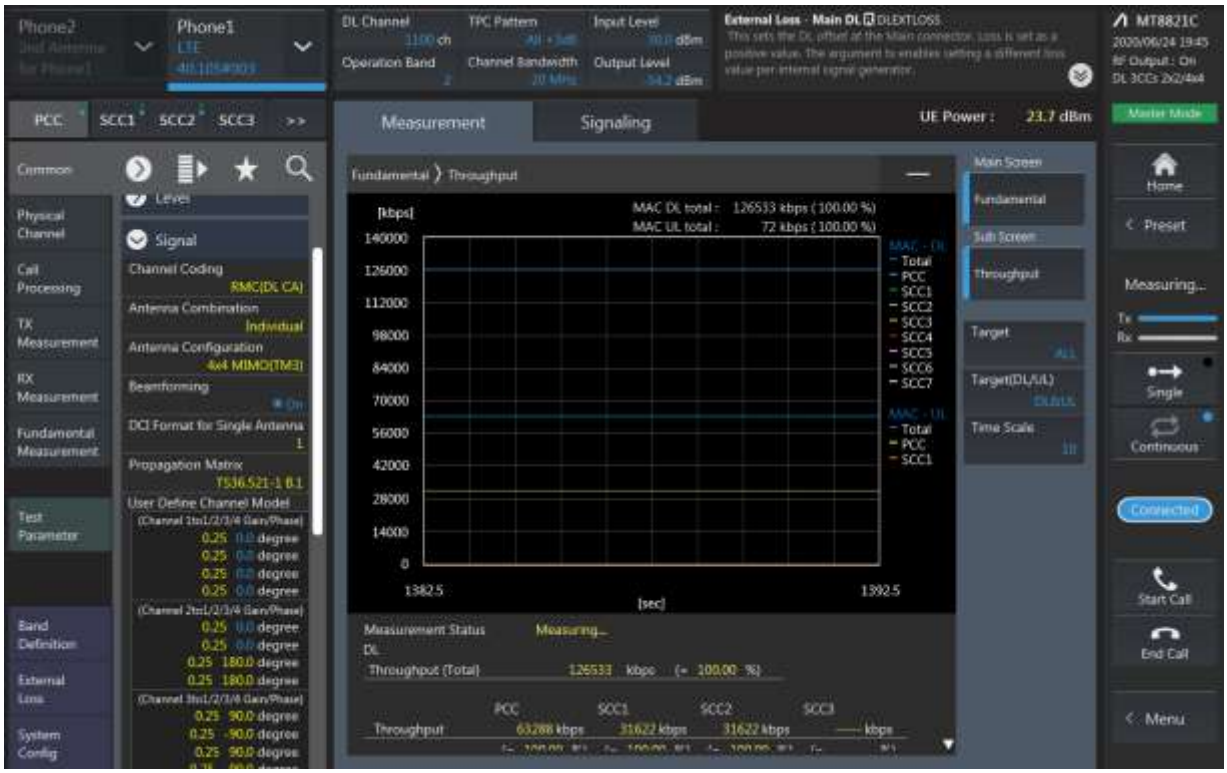


LTE Downlink 2CA 4X4 MIMO Maximum Conducted Power

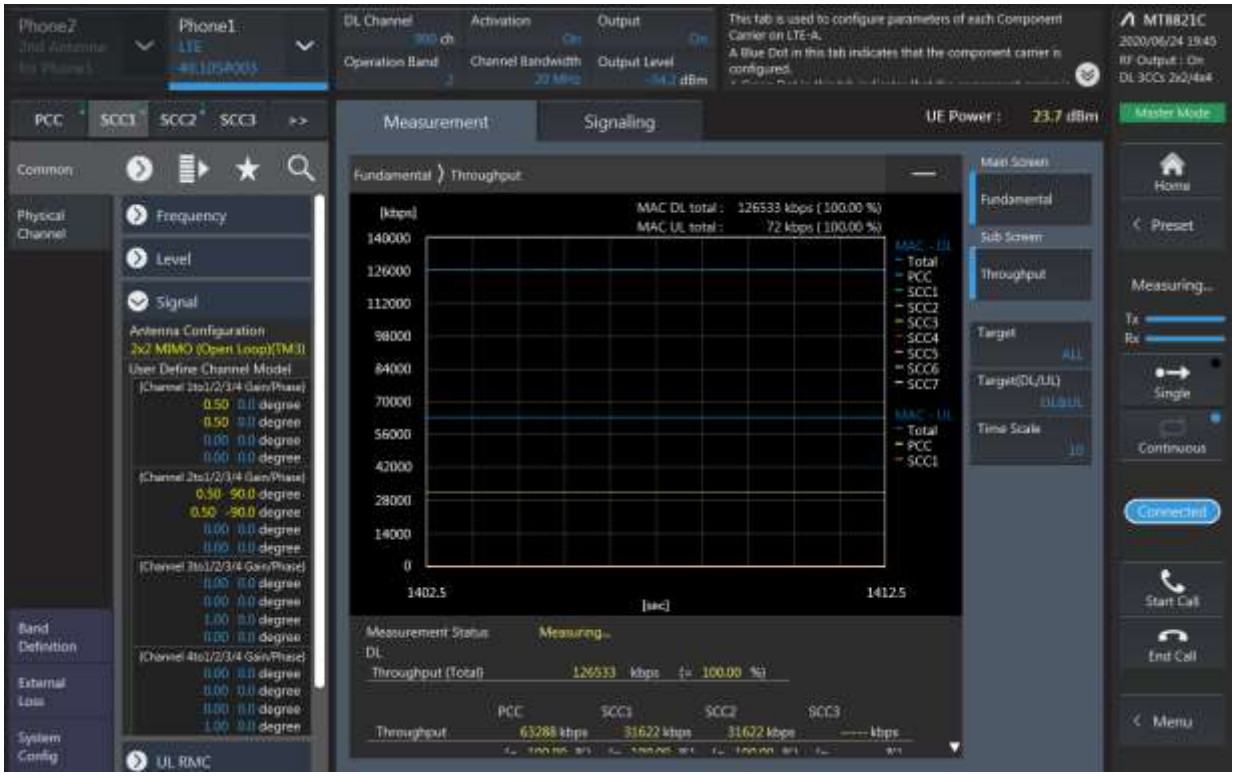
Combination	PCC									SCC				Tx Power		
	Band	BW	PCC UL Channel	PCC UL Frequency	PCC DL Channel	PCC DL Frequency	Modulation	RB	offset	Band	BW	SCC DL Channel	SCC DL Frequency	LTE Single Carrier Tx Power (dBm) (1)	LTE Tx Power with DL CA Enabled(dBm) (2)	Deviaion (2)-(1)
2A-[66A](0,2)	2	15	18675	1857.5	675	1937.5	QPSK	1	36	66	20	66786	2145	22.67	22.56	-0.11
2A-[66A](1)	2	10	18650	1855	650	1935	QPSK	1	24	66	10	66786	2145	22.51	22.49	-0.02
5A-[41A]	5	5	20625	846.5	2625	891.5	QPSK	1	0	41	20	40620	2593	24.08	24.06	-0.02
26A-[41A]	26	5	27015	846.5	9015	891.5	QPSK	1	24	41	20	40620	2593	24.11	22.08	-2.03
41A-[41A]	41	5	40620	2593	40620	2593	QPSK	1	12	41	20	41490	2680	24.65	24.55	-0.1
[41A]-41A	41	5	40620	2593	40620	2593	QPSK	1	12	41	20	41490	2680	24.65	24.57	-0.08
[41A]-[41A]	41	5	40620	2593	40620	2593	QPSK	1	12	41	20	41490	2680	24.65	24.52	-0.13
2A-[66A](0,2)	66	5	132322	1745	2145	66786	QPSK	1	0	2	20	900	1960	22.92	22.87	-0.05
2A-[66A](1)	66	5	132322	1745	2145	66786	QPSK	1	0	2	10	900	1960	22.92	22.86	-0.06
[66B]	66	5	132322	1745	2145	66786	QPSK	1	0	66	15	2135.7	66693	22.92	22.9	-0.02
[66C]	66	5	132322	1745	2145	66786	QPSK	1	0	66	20	2133.3	66669	22.92	22.75	-0.17
[4A]-17A	4	5	20375	1752.5	2375	2152.5	QPSK	1	12	17	10	5790	740	22.82	22.77	-0.05
17A-[4A]	17	10	23825	713.5	5825	743.5	QPSK	1	12	4	10	2175	2132.5	24.53	24.48	-0.05

LTE Down Link 3CA 4x4 MIMO Call Setup

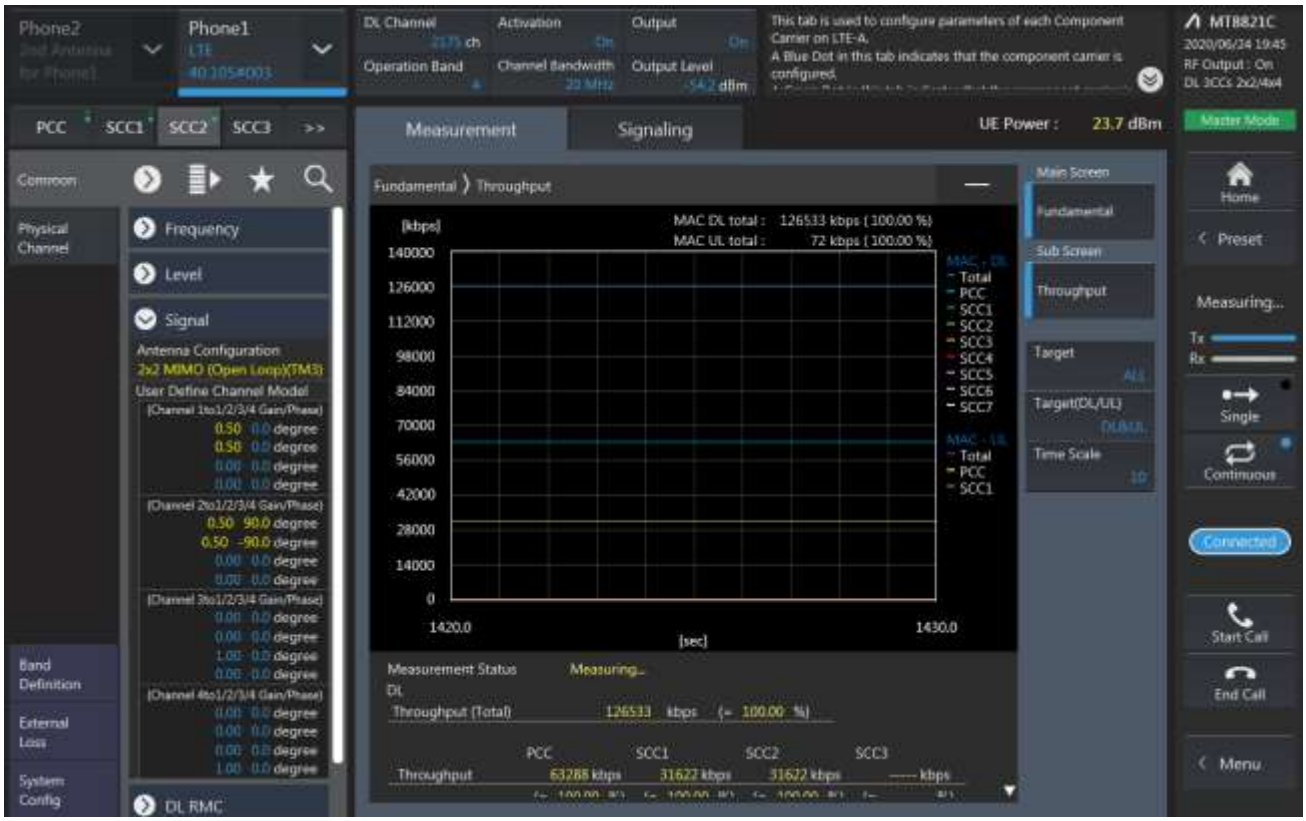
PCC Setting: Channel /RB/BW/Modulation



CC1 Setting : Channel /RB/BW/Modulation



SCC2 Setting (Channel /RB/BW/Modulation)and call Connection

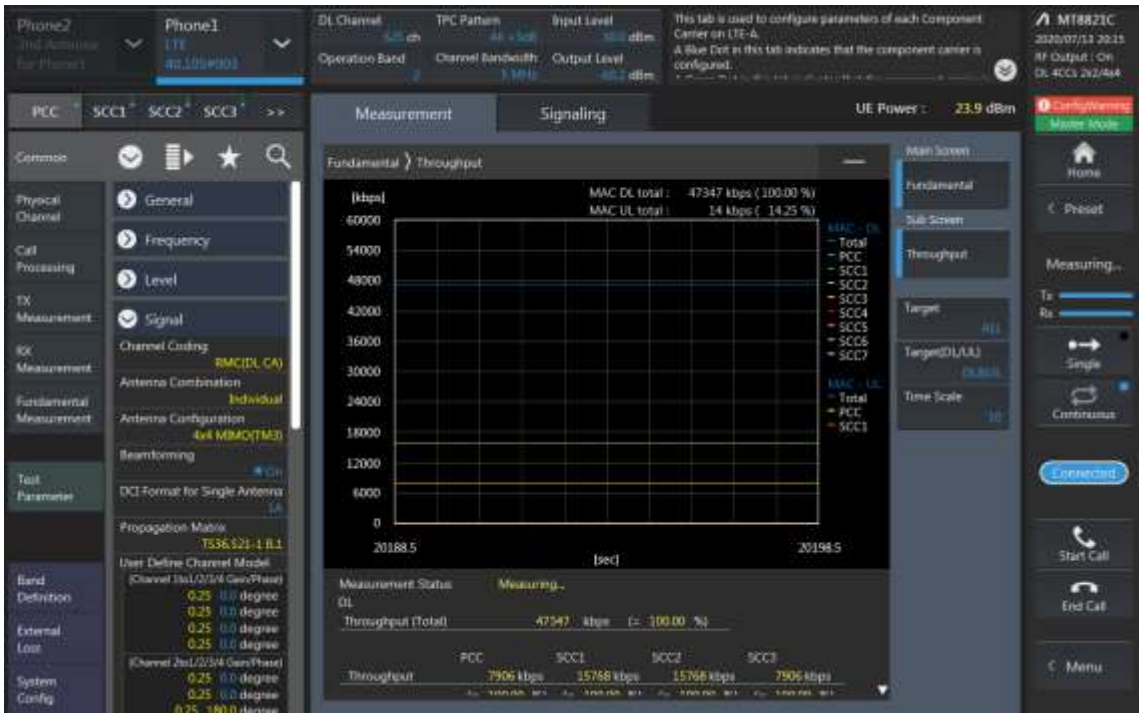


LTE Downlink 3CA 4X4 MIMO Maximum Conducted Power

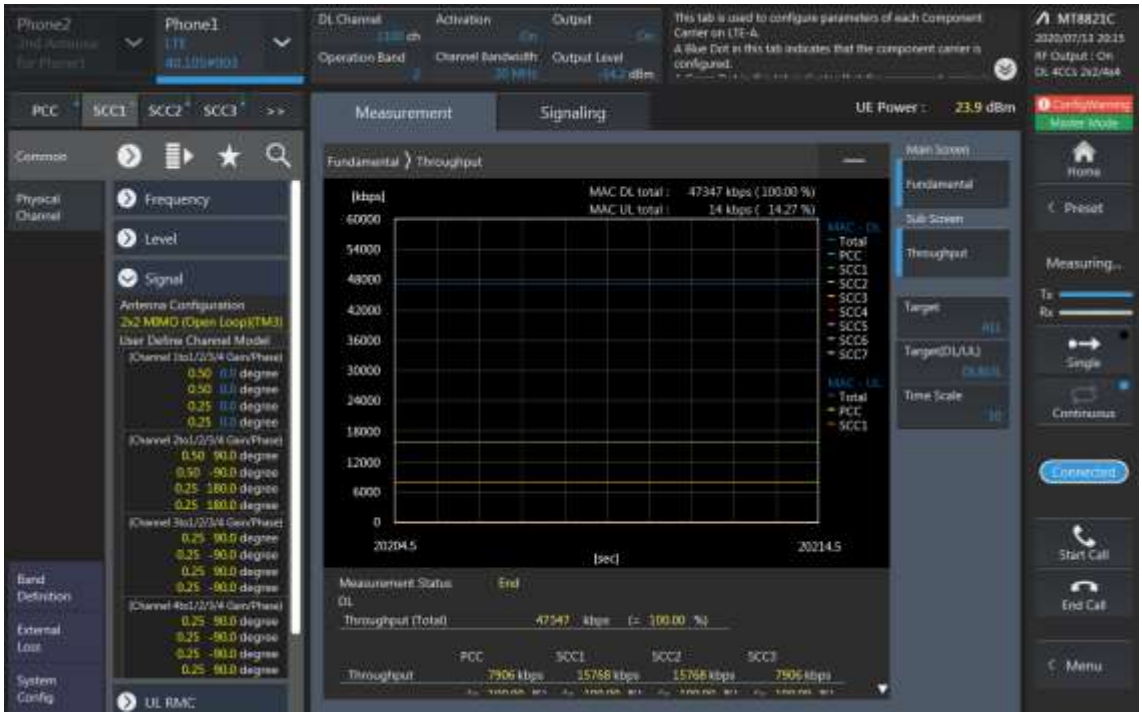
Combination	PCC									SCC				SCC				Tx Power		
	Band	BW	PCC UL Channel	PCC UL Frequency	PCC DL Channel	PCC DL Frequency	Modulation	RB	offset	Band	BW	SCC DL Channel	SCC DL Frequency	Band	BW	SCC DL Channel	SCC DL Frequency	LTE Single Carrier Tx Power (dBm) (1)	LTE Tx Power with DL CA Enabled(dBm) (2)	Deviaion (2)-(1)
2A-[4A]-5A	2	15	18675	1857.5	675	1937.5	QPSK	1	36	4	20	2175	2132.5	5	10	2525	881.5	22.67	22.65	-0.02
2A-[4A]-13A	2	15	18675	1857.5	675	1937.5	QPSK	1	36	4	20	2175	2132.5	13	10	5230	751	22.67	22.64	-0.03
[4A]-2A-5A	4	5	20375	1752.5	2375	2152.5	QPSK	1	12	2	20	900	1960	5	10	2525	881.5	22.82	22.81	-0.01
[4A]-2A-13A	4	5	20375	1752.5	2375	2152.5	QPSK	1	12	2	20	900	1960	13	10	5230	751	22.82	22.8	-0.02
4A-[4A]-12A(0)	4	5	20375	1752.5	2375	2152.5	QPSK	1	12	4	20	2050	2120	12	10	5095	737.5	22.82	22.81	-0.01
4A-[4A]-12A(1)	4	5	20375	1752.5	2375	2152.5	QPSK	1	12	4	10	2000	2115	12	10	5095	737.5	22.82	22.79	-0.03
[4A]-4A-12A(0)	4	5	20375	1752.5	2375	2152.5	QPSK	1	12	4	20	2050	2120	12	10	5095	737.5	22.82	22.78	-0.04
[4A]-4A-12A(1)	4	5	20375	1752.5	2375	2152.5	QPSK	1	12	4	10	2000	2115	12	10	5095	737.5	22.82	22.79	-0.03
[4A]-[4A]-12A(0)	4	5	20375	1752.5	2375	2152.5	QPSK	1	12	4	20	2050	2120	12	10	5095	737.5	22.82	22.77	-0.05
[4A]-[4A]-12A(1)	4	5	20375	1752.5	2375	2152.5	QPSK	1	12	4	10	2000	2115	12	10	5095	737.5	22.82	22.78	-0.04
5A-2A-[4A]	5	5	20625	846.5	2625	891.5	QPSK	1	0	2	20	900	1960	4	20	2175	2132.5	24.08	24.06	-0.02
5A-66A-[66A]	5	5	20625	846.5	2625	891.5	QPSK	1	0	66	20	66786	2145	66	20	67236	2190	24.08	24.07	-0.01
5A-[66A]-66A	5	5	20625	846.5	2625	891.5	QPSK	1	0	66	20	66786	2145	66	20	67236	2190	24.08	24.05	-0.03
5A-[66A]-[66A]	5	5	20625	846.5	2625	891.5	QPSK	1	0	66	20	66786	2145	66	20	67236	2190	24.08	24.06	-0.02
12A-4A-[4A](1)	12	10	23095	707.5	5095	737.5	QPSK	1	24	4	10	2175	2132.5	4	10	2000	2115	24.57	24.55	-0.02
12A-[4A]-4A(1)	12	10	23095	707.5	5095	737.5	QPSK	1	24	4	10	2175	2132.5	4	10	2000	2115	24.57	24.53	-0.04
12A-[4A]-[4A](1)	12	10	23095	707.5	5095	737.5	QPSK	1	24	4	10	2175	2132.5	4	10	2000	2115	24.57	24.51	-0.06
12A-66A-[66A]	12	10	23095	707.5	5095	737.5	QPSK	1	24	66	20	66786	2145	66	20	67236	2190	24.57	24.56	-0.01
12A-[66A]-66A	12	10	23095	707.5	5095	737.5	QPSK	1	24	66	20	66786	2145	66	20	67236	2190	24.57	24.55	-0.02
12A-[66A]-[66A]	12	10	23095	707.5	5095	737.5	QPSK	1	24	66	20	66786	2145	66	20	67236	2190	24.57	24.53	-0.04
13A-2A-[4A]	13	10	23230	782	5230	751	QPSK	1	0	2	20	900	1960	4	20	2175	2132.5	24.37	24.32	-0.05
26A-[41C]	26	10	27015	846.5	9015	891.5	QPSK	1	24	41	20	40620	2593	4	20	40818	2612.8	24.11	24.09	-0.02
41A-[41C]	41	5	40620	2593	40620	2593	QPSK	1	12	41	20	39750	2506	41	20	39948	2525.8	24.65	24.62	-0.03
[41A]-41C	41	5	40620	2593	40620	2593	QPSK	1	12	41	20	39750	2506	41	20	39948	2525.8	24.65	24.63	-0.02
[41A]-[41C]	41	5	40620	2593	40620	2593	QPSK	1	12	41	20	39750	2506	41	20	39948	2525.8	24.65	24.61	-0.04
41C-[41A]	41	5	40620	2593	40620	2593	QPSK	1	12	41	20	40818	2612.8	41	20	39750	2506	24.65	24.6	-0.05
[41C]-41A	41	5	40620	2593	40620	2593	QPSK	1	12	41	20	40818	2612.8	41	20	39750	2506	24.65	24.62	-0.03
[41C]-[41A]	41	5	40620	2593	40620	2593	QPSK	1	12	41	20	40818	2612.8	41	20	39750	2506	24.65	24.63	-0.02
66A-[66A]-5A	66	5	132322	1745	2145	66786	QPSK	1	0	66	20	67236	2190	5	10	2525	881.5	22.92	22.89	-0.03
[66A]-66A-5A	66	5	132322	1745	2145	66786	QPSK	1	0	66	20	67236	2190	5	10	2525	881.5	22.92	22.81	-0.11
[66A]-[66A]-5A	66	5	132322	1745	2145	66786	QPSK	1	0	66	20	67236	2190	5	10	2525	881.5	22.92	22.79	-0.13
66A-[66A]-12A	66	5	132322	1745	2145	66786	QPSK	1	0	66	20	67236	2190	12	10	5095	737.5	22.92	22.87	-0.05
[66A]-66A-12A	66	5	132322	1745	2145	66786	QPSK	1	0	66	20	67236	2190	12	10	5095	737.5	22.92	22.85	-0.07
[66A]-[66A]-12A	66	5	132322	1745	2145	66786	QPSK	1	0	66	20	67236	2190	12	10	5095	737.5	22.92	22.81	-0.11

LTE Down Link 4CA 4x4 MIMO Call Setup

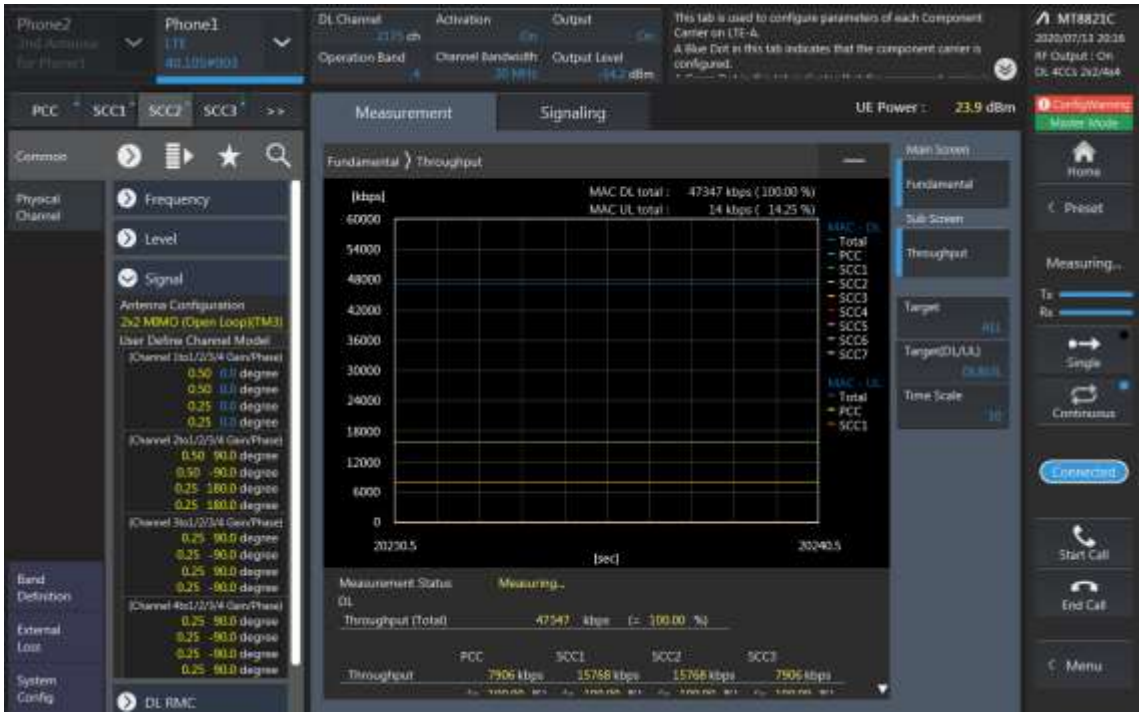
PCC Setting: Channel /RB/BW/Modulation



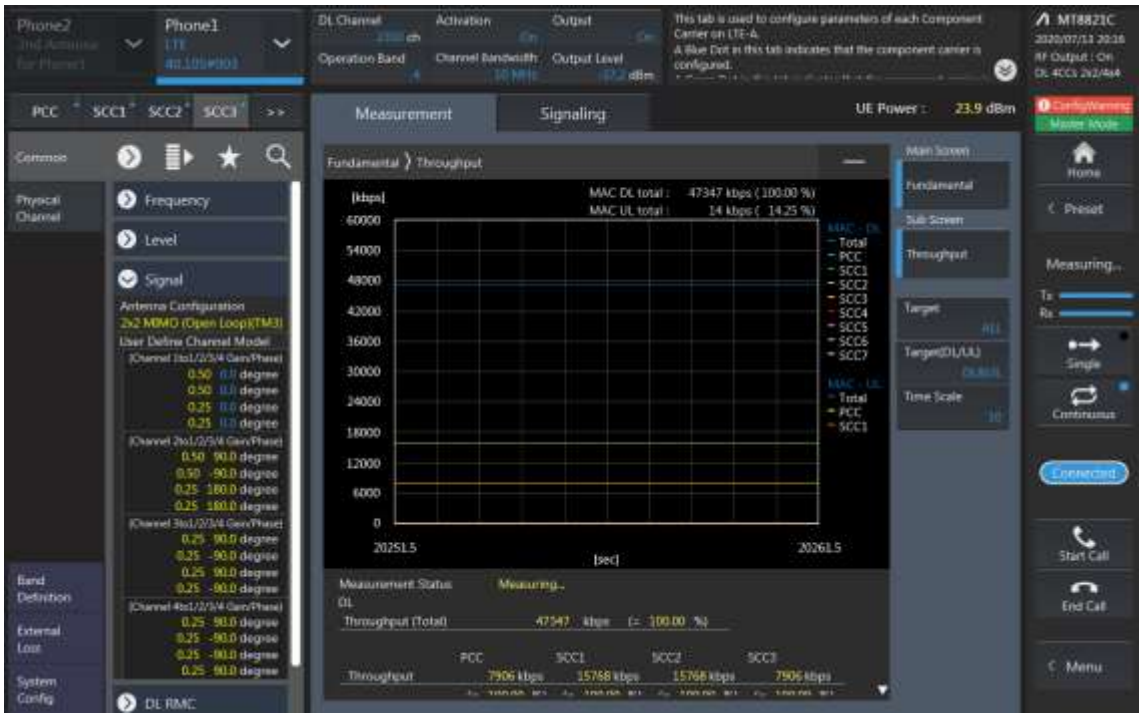
SCC1 Setting : Channel /RB/BW/Modulation



SCC2 Setting (Channel /RB/BW/Modulation) and call Connection



SCC3 Setting (Channel /RB/BW/Modulation) and call Connection



LTE Downlink 4CA 4X4 MIMO Maximum Conducted Power

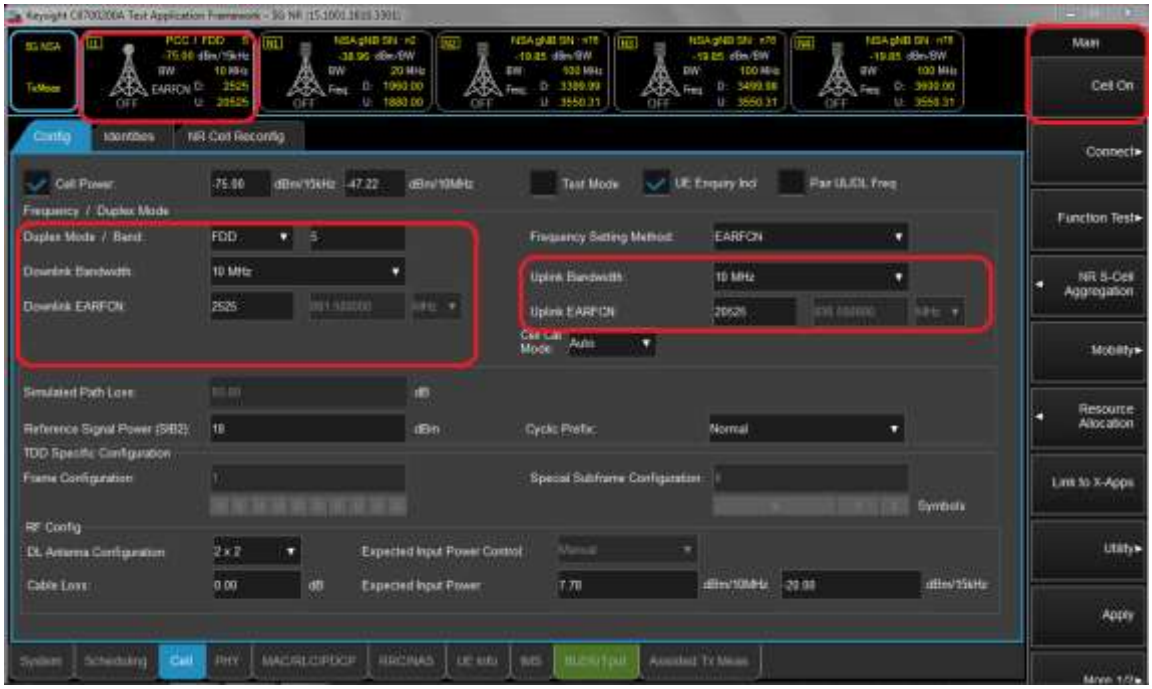
Combination	PCC									SCC				SCC				SCC				Tx Power		
	Band	BW	PCC UL Channel	PCC UL Frequency	PCC DL Channel	PCC DL Frequency	Modulation	RB	offset	Band	BW	SCC DL Channel	SCC DL Frequency	Band	BW	SCC DL Channel	SCC DL Frequency	Band	BW	SCC DL Channel	SCC DL Frequency	LTE Single Carrier Tx Power (dBm) (1)	LTE Tx Power with DL CA Enabled(dBm) (2)	Devision (2)-(1)
41A-[41D]	41	5	40620	2593	40620	2593	QPSK	1	12	41	20	39750	2506	41	20	39948	2525.8	41	20	40146	2545.6	24.65	24.62	-0.03
[41A]-41D	41	5	40620	2593	40620	2593	QPSK	1	12	41	20	39750	2506	41	20	39948	2525.8	41	20	40146	2545.6	24.65	24.52	-0.13
[41A]-[41D]	41	5	40620	2593	40620	2593	QPSK	1	12	41	20	39750	2506	41	20	39948	2525.8	41	20	40146	2545.6	24.65	24.55	-0.1
41D-[41A]	41	5	40620	2593	40620	2593	QPSK	1	12	41	20	40737	2604.7	41	20	40935	2624.5	41	20	39750	2506	24.65	24.63	-0.02
[41D]-41A	41	5	40620	2593	40620	2593	QPSK	1	12	41	20	40737	2604.7	41	20	40935	2624.5	41	20	39750	2506	24.65	24.58	-0.07
[41D]-[41A]	41	5	40620	2593	40620	2593	QPSK	1	12	41	20	40737	2604.7	41	20	40935	2624.5	41	20	39750	2506	24.65	24.54	-0.11

2. 5G NR Call Box Setup

Procedure used to establish output Power measurement for NR Bands

Select operating band, BW and Channel.

- Click Cell on button in the right of Test application screen.
- Turn the LTE Cell On using “ON/OFF” Key.

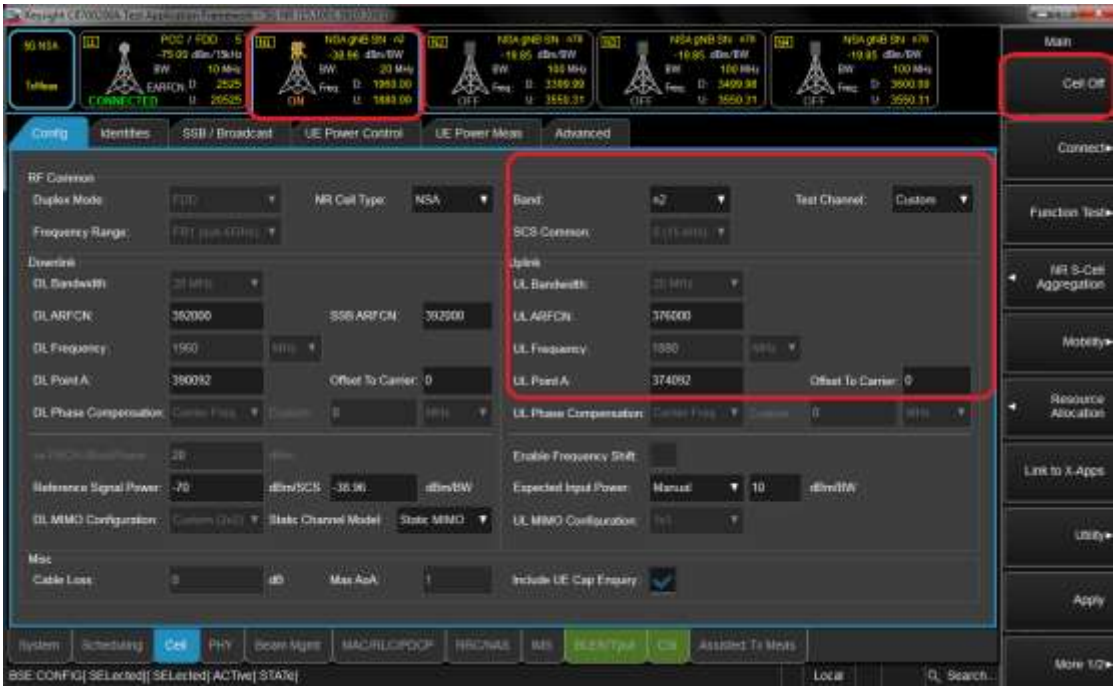


- Turn the Airplane Mode On and then turn the Airplane mode off.
- Select All down bits for UL Power control Mode in LTE.

Setup for NR Band

- Select waveform for Setting NR Band (PHY->PUSCH->Enable Transform Precoder)
  - Enable : DFT-s-OFDM, Disable : CP-OFDM

- Select operating band, BW, SCS and Channel.
- Turn the NR Cell On using “ON/OFF” Key.

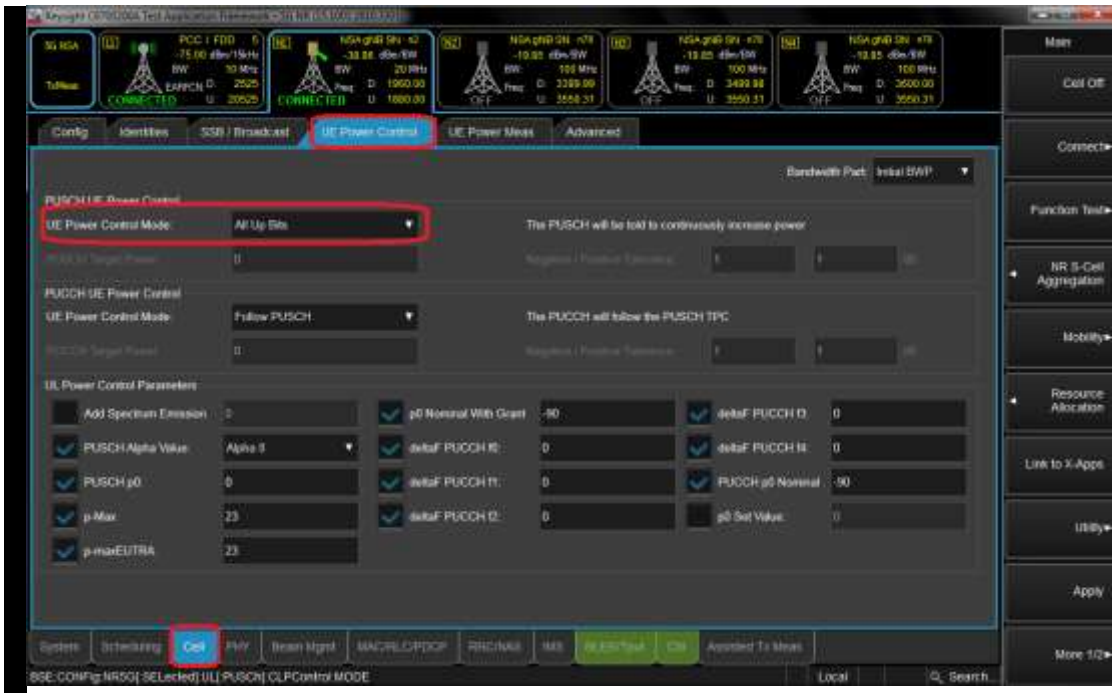


Connect NR S-Cell Aggregation

- Click NR S-Cell Aggregation
- Check the Cell 1's DL and UL box(PCC) and than Click Apply.
- Check the message summary If message shows NR Msg 5, It is connected.

Max Power setting

- Click "Cell in the bottom of screen.
- Click "UE Power control" than change UE Power control mode to All Up bits.



Selecting Start RB/Count/MCS

- Select the each test configurating (Start RB, Count, MCS).

View Tx Power

- Click “Link to X-Apps.”(Please refer to Figure-7)
- Select “Channel Power”.