

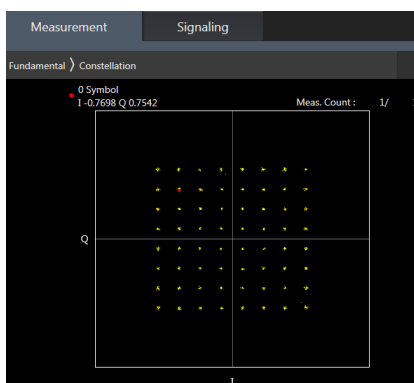
<LTE Conducted Power>

General Note:

1. Anritsu MT8820C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r05, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r05, for QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
6. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM/64QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B4 / B5 / B12 / B17 / B38/ B26 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
9. LTE band 2 / 4 / 5 /17 / 38 SAR test was covered by Band 25 / 66 / 26 /12 / 41; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
 - a. the maximum output power, including tolerance, for the smaller band is $\leq$ the larger band to qualify for the SAR test exclusion
 - b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band
10. According to May 2017 TCB workshop, for 16QAM and 64QAM should be verified by checking the signal constellation with a call box to avoid incorrect maximum power levels due to MPR and other requirements associated with signal modulation, and the following figure is taken from the "Fundamental Measurement >> Modulation Analysis >> constellation" mode of the device connect to the MT8821C base station, therefore, the device 64QAM and 16QAM signal modulation are correct.



16QAM



64QAM

<TDD LTE SAR Measurement>

TDD LTE configuration setup for SAR measurement

SAR was tested with a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by 3GPP.

- 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations
- “special subframe S” contains both uplink and downlink transmissions, it has been taken into consideration to determine the transmission duty factor according to the worst case uplink and downlink cyclic prefix requirements for UpPTS
- Establishing connections with base station simulators ensure a consistent means for testing SAR and recommended for evaluating SAR. The Anritsu MT8820C (firmware: #22.52#004) was used for LTE output power measurements and SAR testing.

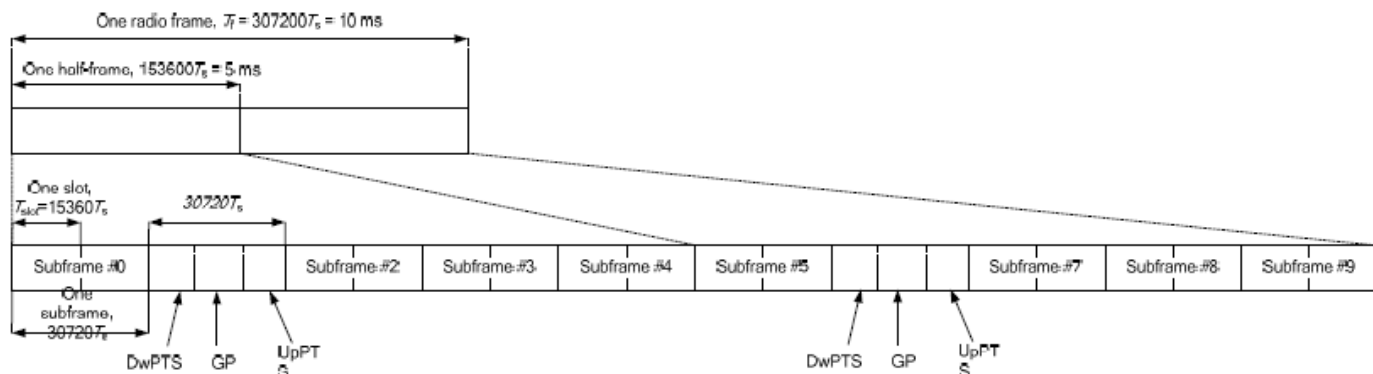


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

Table 4.2-2: Uplink-downlink configurations.

Uplink-downlink configuration	Downlink-to-Uplink Switch-point periodicity	Subframe number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS).

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	$6592 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$	$7680 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$7680 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
5	$6592 \cdot T_s$			$20480 \cdot T_s$		
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$	-	-
8	$24144 \cdot T_s$			-		
9	$13168 \cdot T_s$			-		

Special subframe (30720·T _s): Normal cyclic prefix in downlink (UpPTS)			
	Special subframe configuration	Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
Uplink duty factor in one special subframe	0~4	7.13%	8.33%
	5~9	14.3%	16.7%

Special subframe(30720·T _s): Extended cyclic prefix in downlink (UpPTS)			
	Special subframe configuration	Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
Uplink duty factor in one special subframe	0~3	7.13%	8.33%
	4~7	14.3%	16.7%

The highest duty factor is resulted from:

For LTE TDD Power class 3

- Uplink-downlink configuration: 0. In a half-frame consisted of 5 subframes, uplink operation is in 3 uplink subframes and 1 special subframe.
- special subframe configuration: 5-9 for normal cyclic prefix in downlink, 4-7 for extended cyclic prefix in downlink
- for special subframe with extended cyclic prefix in uplink, the total uplink duty factor in one half-frame is: $(3+0.167)/5 = 63.3\%$
- for special subframe with normal cyclic prefix in uplink, the total uplink duty factor in one half-frame is: $(3+0.143)/5 = 62.9\%$
- For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix $63.3\%/62.9\% = 1.006$ is applied to scale-up the measured SAR result. The scaled TDD LTE SAR = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.

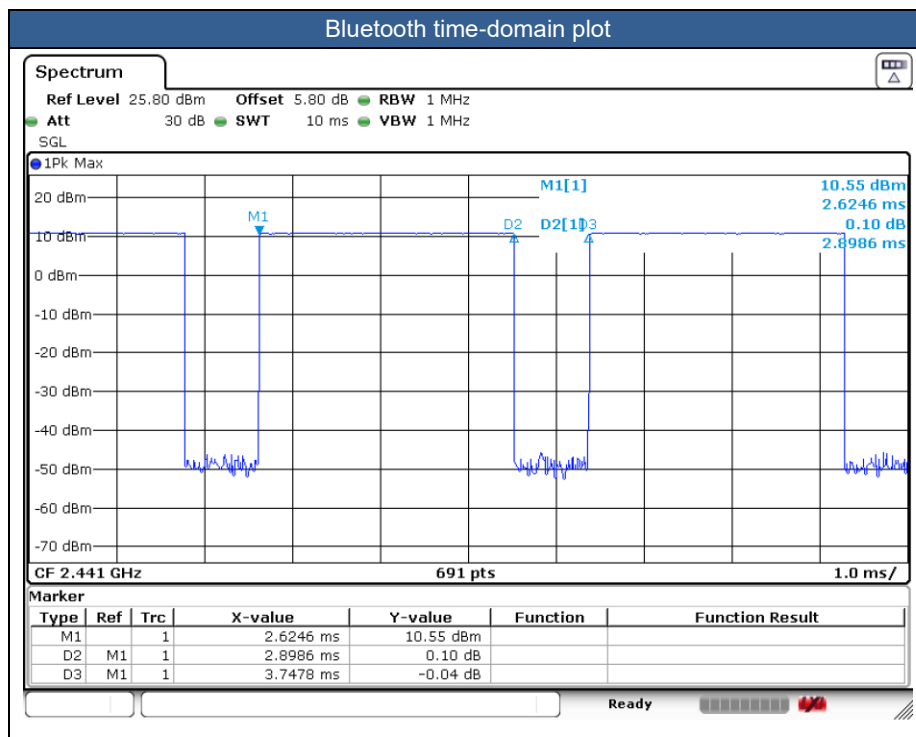
<WLAN Conducted Power>**General Note:**

1. The maximum output power specified for production units are determined for all applicable 802.11 transmission modes in each standalone and aggregated frequency band. Maximum output power is measured for the highest maximum output power configuration(s) in each frequency band according to the default power measurement procedures. For "Not required", SAR Test reduction was applied from KDB 248227 guidance, Sec. 2.1, b), 1) when the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration. Additional output power measurements were not necessary.
2. Per KDB 248227 D01v02r02, SAR test reduction is determined according to 802.11 transmission mode configurations and certain exposure conditions with multiple test positions. In the 2.4 GHz band, separate SAR procedures are applied to DSSS and OFDM configurations to simplify DSSS test requirements. For OFDM, in both 2.4 and 5 GHz bands, an initial test configuration must be determined for each standalone and aggregated frequency band, according to the transmission mode configuration with the highest maximum output power specified for production units to perform SAR measurements. If the same highest maximum output power applies to different combinations of channel bandwidths, modulations and data rates, additional procedures are applied to determine which test configurations require SAR measurement. When applicable, an initial test position may be applied to reduce the number of SAR measurements required for next to the ear, UMPC mini-tablet or hotspot mode configurations with multiple test positions.
3. For 2.4 GHz 802.11b DSSS, either the initial test position procedure for multiple exposure test positions or the DSSS procedure for fixed exposure position is applied; these are mutually exclusive. For 2.4 GHz and 5 GHz OFDM configurations, the initial test configuration is applied to measure SAR using either the initial test position procedure for multiple exposure test position configurations or the initial test configuration procedures for fixed exposure test conditions. Based on the reported SAR of the measured configurations and maximum output power of the transmission mode configurations that are not included in the initial test configuration, the subsequent test configuration and initial test position procedures are applied to determine if SAR measurements are required for the remaining OFDM transmission configurations. In general, the number of test channels that require SAR measurement is minimized based on maximum output power measured for the test sample(s).
4. For OFDM transmission configurations in the 2.4 GHz and 5 GHz bands, When the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel for each frequency band.
5. DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures.18 The initial test position procedure is described in the following:
 - a. When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band.
 - b. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
 - c. For all positions/configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

<2.4GHz Bluetooth>

General Note:

1. For 2.4GHz Bluetooth SAR testing was selected 1Mbps, due to its highest average power.
2. The Bluetooth duty cycle are 77.34% as following figure, Bluetooth SAR scaling need further consideration and the theoretical duty cycle is 83.3%, therefore the actual duty cycle will be scaled up to the theoretical value of Bluetooth reported SAR calculation.





13. Antenna Location

The detailed antenna location information can refer to SAR Test Setup Photos.

14. SAR Test Results

General Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
 - a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
 - b. For SAR testing of WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
 - c. For SAR testing of Bluetooth signal with 83.3% theoretical duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle) *83.3%".
 - d. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
 - e. For WLAN/Bluetooth: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
 - f. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result. The Reported TDD LTE SAR (W/kg) = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
 - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
 - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
 - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥ 0.8 W/kg.
4. For 10-g extremity SAR testing, only performed within a transmitting antenna located within 25mm from that surface or edge.
5. While 1-g SAR thresholds are specified in the procedures for SAR test reduction and exclusion, these thresholds should be multiplied by 2.5 when 10-g extremity SAR is considered.

WCDMA Note:

1. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all "1's".
2. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA / HSPA+ is $\leq \frac{1}{4}$ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA / HSPA+ to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+, and according to the following RF output power, the output power results of the secondary modes (HSDPA / HSUPA / DC-HSDPA / HSPA+) are less than $\frac{1}{4}$ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+.

LTE Note:

1. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
2. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
3. Per KDB 941225 D05v02r05, for QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
4. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is $> \text{not } \frac{1}{2}$ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM/64QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration is $> \text{not } \frac{1}{2}$ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B4 / B5 / B12 / B17 / B38/ B26 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
7. LTE B 2 / 4 / 5 / 17 / 38 SAR test was covered by Band 25 / 66 / 26 / 12 / 41; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
 - a. the maximum output power, including tolerance, for the smaller band is $\leq$ the larger band to qualify for the SAR test exclusion
 - b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band

WLAN/Bluetooth Note:

1. Per KDB 248227 D01v02r02, for 2.4GHz 802.11g/n SAR testing is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.
2. Per KDB 248227 D01v02r02, U-NII-1 SAR testing is not required when the U-NII-2A band highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band.
3. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
4. For all positions / configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions / configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.
5. During SAR testing the WLAN transmission was verified using a spectrum analyzer.



14.1 Body Worn SAR

【WCDMA SAR】

Plot No	Band	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-Up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA II	RMC 12.2Kbps	Front	10mm	Ant 0	Full Power	9400	1880	22.27	23.00	1.183	0.18	0.191	0.225
	WCDMA II	RMC 12.2Kbps	Back	10mm	Ant 0	Full Power	9400	1880	22.27	23.00	1.183	-0.06	0.700	0.828
	WCDMA II	RMC 12.2Kbps	Back	10mm	Ant 0	Full Power	9262	1852.4	22.22	23.00	1.197	0.07	0.614	0.734
01	WCDMA II	RMC 12.2Kbps	Back	10mm	Ant 0	Full Power	9538	1907.6	22.07	23.00	1.239	0.02	0.687	0.851
	WCDMA IV	RMC 12.2Kbps	Front	10mm	Ant 0	Full Power	1312	1712.4	23.65	24.00	1.084	0.14	0.148	0.161
02	WCDMA IV	RMC 12.2Kbps	Back	10mm	Ant 0	Full Power	1312	1712.4	23.65	24.00	1.084	0.09	0.450	0.488
	WCDMA V	RMC 12.2Kbps	Front	10mm	Ant 0	Full Power	4182	836.4	25.18	25.70	1.127	-0.15	0.178	0.200
03	WCDMA V	RMC 12.2Kbps	Back	10mm	Ant 0	Full Power	4182	836.4	25.18	25.70	1.127	0.04	0.249	0.281

【LTE SAR】

Plot No	Band	BW	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-Up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 7	20M	QPSK	1	0	Front	10mm	Ant 0	Full Power	20850	2510	24.06	25.00	1.242			-0.14	0.139	0.172
	LTE Band 7	20M	QPSK	50	0	Front	10mm	Ant 0	Full Power	20850	2510	22.74	24.00	1.337			-0.10	0.099	0.132
04	LTE Band 7	20M	QPSK	1	0	Back	10mm	Ant 0	Full Power	20850	2510	24.06	25.00	1.242			-0.10	0.962	1.195
	LTE Band 7	20M	QPSK	1	0	Back	10mm	Ant 0	Full Power	21100	2535	23.53	25.00	1.403			0.12	0.847	1.189
	LTE Band 7	20M	QPSK	1	49	Back	10mm	Ant 0	Full Power	21350	2560	23.35	25.00	1.462			-0.05	0.798	1.166
	LTE Band 7	20M	QPSK	50	0	Back	10mm	Ant 0	Full Power	20850	2510	22.74	24.00	1.337			-0.18	0.708	0.946
	LTE Band 7	20M	QPSK	50	0	Back	10mm	Ant 0	Full Power	21100	2535	22.14	24.00	1.535			-0.16	0.693	1.064
	LTE Band 7	20M	QPSK	50	0	Back	10mm	Ant 0	Full Power	21350	2560	22.55	24.00	1.396			-0.03	0.686	0.957
	LTE Band 7	20M	QPSK	100	0	Back	10mm	Ant 0	Full Power	20850	2510	22.94	24.00	1.276			0.12	0.671	0.856
	LTE Band 12	10M	QPSK	1	0	Front	10mm	Ant 0	Full Power	23095	707.5	24.59	25.70	1.291			-0.05	0.177	0.228
	LTE Band 12	10M	QPSK	25	0	Front	10mm	Ant 0	Full Power	23095	707.5	23.60	24.70	1.288			0.18	0.194	0.250
05	LTE Band 12	10M	QPSK	1	0	Back	10mm	Ant 0	Full Power	23095	707.5	24.59	25.70	1.291			0.06	0.395	0.510
	LTE Band 12	10M	QPSK	25	0	Back	10mm	Ant 0	Full Power	23095	707.5	23.60	24.70	1.288			-0.10	0.331	0.426
	LTE Band 13	10M	QPSK	1	0	Front	10mm	Ant 0	Full Power	23230	782	24.77	25.70	1.239			-0.15	0.291	0.361
	LTE Band 13	10M	QPSK	25	0	Front	10mm	Ant 0	Full Power	23230	782	23.99	24.70	1.178			0.05	0.280	0.329
06	LTE Band 13	10M	QPSK	1	0	Back	10mm	Ant 0	Full Power	23230	782	24.77	25.70	1.239			-0.03	0.453	0.561
	LTE Band 13	10M	QPSK	25	0	Back	10mm	Ant 0	Full Power	23230	782	23.99	24.70	1.178			-0.03	0.350	0.413
	LTE Band 14	10M	QPSK	1	0	Front	10mm	Ant 0	Full Power	23330	793	24.43	25.70	1.34			0.10	0.214	0.287
	LTE Band 14	10M	QPSK	25	0	Front	10mm	Ant 0	Full Power	23330	793	23.45	24.70	1.334			0.00	0.197	0.263
07	LTE Band 14	10M	QPSK	1	0	Back	10mm	Ant 0	Full Power	23330	793	24.43	25.70	1.34			-0.01	0.364	0.488
	LTE Band 14	10M	QPSK	25	0	Back	10mm	Ant 0	Full Power	23330	793	23.45	24.70	1.334			-0.01	0.249	0.333
	LTE Band 25	20M	QPSK	1	0	Front	10mm	Ant 0	Full Power	26340	1880	23.89	25.00	1.291			-0.18	0.359	0.464
	LTE Band 25	20M	QPSK	50	0	Front	10mm	Ant 0	Full Power	26340	1880	23.75	24.00	1.059			0.05	0.427	0.452
	LTE Band 25	20M	QPSK	1	0	Back	10mm	Ant 0	Full Power	26340	1880	23.89	25.00	1.291			-0.02	0.674	0.870
	LTE Band 25	20M	QPSK	1	0	Back	10mm	Ant 0	Full Power	26140	1860	23.75	25.00	1.334			0.03	0.670	0.894
08	LTE Band 25	20M	QPSK	1	0	Back	10mm	Ant 0	Full Power	26590	1905	23.66	25.00	1.361			0.03	0.696	0.947
	LTE Band 25	20M	QPSK	50	0	Back	10mm	Ant 0	Full Power	26340	1880	23.75	24.00	1.059			0.10	0.683	0.723
	LTE Band 25	20M	QPSK	100	0	Back	10mm	Ant 0	Full Power	26340	1880	23.72	24.00	1.067			-0.00	0.623	0.664
	LTE Band 26	15M	QPSK	1	0	Front	10mm	Ant 0	Full Power	26865	831.5	25.43	25.70	1.064			-0.17	0.203	0.216
	LTE Band 26	15M	QPSK	36	0	Front	10mm	Ant 0	Full Power	26865	831.5	24.53	24.70	1.04			-0.04	0.149	0.155
09	LTE Band 26	15M	QPSK	1	0	Back	10mm	Ant 0	Full Power	26865	831.5	25.43	25.70	1.064			0.01	0.259	0.276
	LTE Band 26	15M	QPSK	36	0	Back	10mm	Ant 0	Full Power	26865	831.5	24.53	24.70	1.04			-0.15	0.193	0.201
	LTE Band 66	20M	QPSK	1	0	Front	10mm	Ant 0	Full Power	132322	1745	23.35	24.00	1.161			0.12	0.199	0.231
	LTE Band 66	20M	QPSK	50	0	Front	10mm	Ant 0	Full Power	132322	1745	22.34	23.00	1.164			-0.08	0.161	0.188
10	LTE Band 66	20M	QPSK	1	0	Back	10mm	Ant 0	Full Power	132322	1745	23.35	24.00	1.161			0.15	0.457	0.531
	LTE Band 66	20M	QPSK	50	0	Back	10mm	Ant 0	Full Power	132322	1745	22.34	23.00	1.164			0.16	0.343	0.399
	LTE Band 41	20M	QPSK	1	0	Front	10mm	Ant 0	Full Power	40620	2593	23.50	24.00	1.122	62.9	1.006	0.16	0.086	0.097
	LTE Band 41	20M	QPSK	50	0	Front	10mm	Ant 0	Full Power	40620	2593	22.48	23.00	1.127	62.9	1.006	0.11	0.072	0.082
11	LTE Band 41	20M	QPSK	1	0	Back	10mm	Ant 0	Full Power	40620	2593	23.50	24.00	1.122	62.9	1.006	-0.08	0.485	0.547
	LTE Band 41	20M	QPSK	50	0	Back	10mm	Ant 0	Full Power	40620	2593	22.48	23.00	1.127	62.9	1.006	0.04	0.383	0.434

【WLAN 2.4GHz_5GHz SAR】

Plot No	Band	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-Up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	Ant 1	Full Power	6	2437	16.70	17.50	1.202	98.94	1.011	0.15	0.001	0.001
12	WLAN2.4GHz	802.11b 1Mbps	Back	10mm	Ant 1	Full Power	6	2437	16.70	17.50	1.202	98.94	1.011	-0.07	0.129	0.157
	WLAN5GHz	802.11a 6Mbps	Front	10mm	Ant 1	Full Power	60	5300	14.71	15.50	1.199	98.25	1.018	-0.19	0.072	0.087
13	WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 1	Full Power	60	5300	14.71	15.50	1.199	98.25	1.018	-0.07	0.279	0.341
	WLAN5GHz	802.11a 6Mbps	Front	10mm	Ant 1	Full Power	100	5500	13.87	15.00	1.297	98.25	1.018	0.15	0.068	0.090
14	WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 1	Full Power	100	5500	13.87	15.00	1.297	98.25	1.018	-0.01	0.389	0.514
	WLAN5GHz	802.11a 6Mbps	Front	10mm	Ant 1	Full Power	157	5785	13.91	15.00	1.285	98.25	1.018	0.03	0.060	0.079
15	WLAN5GHz	802.11a 6Mbps	Back	10mm	Ant 1	Full Power	157	5785	13.91	15.00	1.285	98.25	1.018	-0.09	0.244	0.319

【Bluetooth SAR】

Plot No	Band	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-Up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	Bluetooth	1Mbps	Front	10mm	Ant 1	Full Power	39	2441	10.77	12.00	1.327	77.34	1.077	0.01	0.012	0.016
16	Bluetooth	1Mbps	Back	10mm	Ant 1	Full Power	39	2441	10.77	12.00	1.327	77.34	1.077	-0.07	0.023	0.033

14.2 Extremity SAR

【WCDMA SAR】

Plot No	Band	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-Up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
17	WCDMA II	RMC 12.2Kbps	Front	0mm	Ant 0	Full Power	9400	1880	22.27	23.00	1.183	0.17	0.868	1.026
	WCDMA II	RMC 12.2Kbps	Back	0mm	Ant 0	Full Power	9400	1880	22.27	23.00	1.183	0.03	1.470	1.739
	WCDMA II	RMC 12.2Kbps	Left Side	0mm	Ant 0	Full Power	9400	1880	22.27	23.00	1.183	-0.13	0.126	0.149
	WCDMA II	RMC 12.2Kbps	Right Side	0mm	Ant 0	Full Power	9400	1880	22.27	23.00	1.183	-0.17	0.695	0.822
	WCDMA II	RMC 12.2Kbps	Top Side	0mm	Ant 0	Full Power	9400	1880	22.27	23.00	1.183	-0.12	0.076	0.089
	WCDMA II	RMC 12.2Kbps	Bottom Side	0mm	Ant 0	Full Power	9400	1880	22.27	23.00	1.183	-0.18	0.426	0.504
	WCDMA IV	RMC 12.2Kbps	Front	0mm	Ant 0	Full Power	1312	1712.4	23.65	24.00	1.084	0.17	0.519	0.563
	WCDMA IV	RMC 12.2Kbps	Back	0mm	Ant 0	Full Power	1312	1712.4	23.65	24.00	1.084	0.06	2.270	2.461
	WCDMA IV	RMC 12.2Kbps	Back	0mm	Ant 0	Full Power	1413	1732.6	23.21	24.00	1.199	0.13	2.000	2.398
	WCDMA IV	RMC 12.2Kbps	Back	0mm	Ant 0	Full Power	1513	1752.6	22.96	24.00	1.271	0.06	2.020	2.567
	WCDMA IV	RMC 12.2Kbps	Left Side	0mm	Ant 0	Full Power	1312	1712.4	23.65	24.00	1.084	-0.12	0.031	0.034
	WCDMA IV	RMC 12.2Kbps	Right Side	0mm	Ant 0	Full Power	1312	1712.4	23.65	24.00	1.084	0.01	0.934	1.013
	WCDMA IV	RMC 12.2Kbps	Top Side	0mm	Ant 0	Full Power	1312	1712.4	23.65	24.00	1.084	-0.05	0.059	0.064
	WCDMA IV	RMC 12.2Kbps	Bottom Side	0mm	Ant 0	Full Power	1312	1712.4	23.65	24.00	1.084	-0.12	0.247	0.268
	WCDMA V	RMC 12.2Kbps	Front	0mm	Ant 0	Full Power	4182	836.4	25.18	25.70	1.127	0.09	0.344	0.388
	WCDMA V	RMC 12.2Kbps	Back	0mm	Ant 0	Full Power	4182	836.4	25.18	25.70	1.127	0.11	0.365	0.411
	WCDMA V	RMC 12.2Kbps	Left Side	0mm	Ant 0	Full Power	4182	836.4	25.18	25.70	1.127	-0.11	0.102	0.115
	WCDMA V	RMC 12.2Kbps	Right Side	0mm	Ant 0	Full Power	4182	836.4	25.18	25.70	1.127	0.05	0.242	0.273
	WCDMA V	RMC 12.2Kbps	Top Side	0mm	Ant 0	Full Power	4182	836.4	25.18	25.70	1.127	0.13	0.001	0.001
	WCDMA V	RMC 12.2Kbps	Bottom Side	0mm	Ant 0	Full Power	4182	836.4	25.18	25.70	1.127	0.06	0.183	0.206

【LTE SAR】

Plot No	Band	BW	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-Up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	LTE Band 7	20M	QPSK	1	0	Front	0mm	Ant 0	Full Power	20850	2510	24.06	25.00	1.242			0.12	0.207	0.257
	LTE Band 7	20M	QPSK	50	0	Front	0mm	Ant 0	Full Power	20850	2510	22.74	24.00	1.337			-0.05	0.175	0.233
	LTE Band 7	20M	QPSK	1	0	Back	0mm	Ant 0	Full Power	20850	2510	24.06	25.00	1.242			0.16	1.420	1.764
	LTE Band 7	20M	QPSK	50	0	Back	0mm	Ant 0	Full Power	20850	2510	22.74	24.00	1.337			-0.15	1.170	1.564
	LTE Band 7	20M	QPSK	1	0	Left Side	0mm	Ant 0	Full Power	20850	2510	24.06	25.00	1.242			0.08	0.063	0.078
	LTE Band 7	20M	QPSK	50	0	Left Side	0mm	Ant 0	Full Power	20850	2510	22.74	24.00	1.337			-0.01	0.055	0.074
	LTE Band 7	20M	QPSK	1	0	Right Side	0mm	Ant 0	Full Power	20850	2510	24.06	25.00	1.242			0.06	0.059	0.073
	LTE Band 7	20M	QPSK	50	0	Right Side	0mm	Ant 0	Full Power	20850	2510	22.74	24.00	1.337			-0.11	0.469	0.628
	LTE Band 7	20M	QPSK	1	0	Top Side	0mm	Ant 0	Full Power	20850	2510	24.06	25.00	1.242			0.09	0.035	0.043
	LTE Band 7	20M	QPSK	50	0	Top Side	0mm	Ant 0	Full Power	20850	2510	22.74	24.00	1.337			0.18	0.030	0.040
	LTE Band 7	20M	QPSK	1	0	Bottom Side	0mm	Ant 0	Full Power	20850	2510	24.06	25.00	1.242			-0.05	0.720	0.894
	LTE Band 7	20M	QPSK	50	0	Bottom Side	0mm	Ant 0	Full Power	20850	2510	22.74	24.00	1.337			0.01	0.589	0.787
	LTE Band 12	10M	QPSK	1	0	Front	0mm	Ant 0	Full Power	23095	707.5	24.59	25.70	1.291			0.17	0.515	0.665
	LTE Band 12	10M	QPSK	25	0	Front	0mm	Ant 0	Full Power	23095	707.5	23.60	24.70	1.288			0.12	0.429	0.553
	LTE Band 12	10M	QPSK	1	0	Back	0mm	Ant 0	Full Power	23095	707.5	24.59	25.70	1.291			0.01	0.926	1.195
	LTE Band 12	10M	QPSK	25	0	Back	0mm	Ant 0	Full Power	23095	707.5	23.60	24.70	1.288			0.08	0.689	0.887
	LTE Band 12	10M	QPSK	1	0	Left Side	0mm	Ant 0	Full Power	23095	707.5	24.59	25.70	1.291			-0.07	0.197	0.255
	LTE Band 12	10M	QPSK	25	0	Left Side	0mm	Ant 0	Full Power	23095	707.5	23.60	24.70	1.288			0.07	0.173	0.222
	LTE Band 12	10M	QPSK	1	0	Right Side	0mm	Ant 0	Full Power	23095	707.5	24.59	25.70	1.291			0.16	0.139	0.179
	LTE Band 12	10M	QPSK	25	0	Right Side	0mm	Ant 0	Full Power	23095	707.5	23.60	24.70	1.288			0.09	0.155	0.200
	LTE Band 12	10M	QPSK	1	0	Top Side	0mm	Ant 0	Full Power	23095	707.5	24.59	25.70	1.291			-0.08	0.001	0.002
	LTE Band 12	10M	QPSK	25	0	Top Side	0mm	Ant 0	Full Power	23095	707.5	23.60	24.70	1.288			0.18	0.001	0.002
	LTE Band 12	10M	QPSK	1	0	Bottom Side	0mm	Ant 0	Full Power	23095	707.5	24.59	25.70	1.291			0.01	0.379	0.489
	LTE Band 12	10M	QPSK	25	0	Bottom Side	0mm	Ant 0	Full Power	23095	707.5	23.60	24.70	1.288			0.14	0.387	0.499
	LTE Band 13	10M	QPSK	1	0	Front	0mm	Ant 0	Full Power	23230	782	24.77	25.70	1.239			0.01	0.631	0.782
	LTE Band 13	10M	QPSK	25	0	Front	0mm	Ant 0	Full Power	23230	782	23.99	24.70	1.178			0.07	0.510	0.601
	LTE Band 13	10M	QPSK	1	0	Back	0mm	Ant 0	Full Power	23230	782	24.77	25.70	1.239			-0.19	0.414	0.513
	LTE Band 13	10M	QPSK	25	0	Back	0mm	Ant 0	Full Power	23230	782	23.99	24.70	1.178			-0.15	0.311	0.367
	LTE Band 13	10M	QPSK	1	0	Left Side	0mm	Ant 0	Full Power	23230	782	24.77	25.70	1.239			-0.16	0.226	0.280
	LTE Band 13	10M	QPSK	25	0	Left Side	0mm	Ant 0	Full Power	23230	782	23.99	24.70	1.178			0.07	0.180	0.213
	LTE Band 13	10M	QPSK	1	0	Right Side	0mm	Ant 0	Full Power	23230	782	24.77	25.70	1.239			-0.01	0.301	0.374
	LTE Band 13	10M	QPSK	25	0	Right Side	0mm	Ant 0	Full Power	23230	782	23.99	24.70	1.178			0.02	0.297	0.350
	LTE Band 13	10M	QPSK	1	0	Top Side	0mm	Ant 0	Full Power	23230	782	24.77	25.70	1.239			0.05	0.001	0.001
	LTE Band 13	10M	QPSK	25	0	Top Side	0mm	Ant 0	Full Power	23230	782	23.99	24.70	1.178			0.14	0.001	0.001
	LTE Band 13	10M	QPSK	1	0	Bottom Side	0mm	Ant 0	Full Power	23230	782	24.77	25.70	1.239			0.06	0.224	0.277
	LTE Band 13	10M	QPSK	25	0	Bottom Side	0mm	Ant 0	Full Power	23230	782	23.99	24.70	1.178			0.12	0.210	0.247
	LTE Band 14	10M	QPSK	1	0	Front	0mm	Ant 0	Full Power	23330	793	24.43	25.70	1.34			0.07	0.504	0.675
	LTE Band 14	10M	QPSK	25	0	Front	0mm	Ant 0	Full Power	23330	793	23.45	24.70	1.334			0.19	0.356	0.475
	LTE Band 14	10M	QPSK	1	0	Back	0mm	Ant 0	Full Power	23330	793	24.43	25.70	1.34			0.02	0.359	0.481
	LTE Band 14	10M	QPSK	25	0	Back	0mm	Ant 0	Full Power	23330	793	23.45	24.70	1.334			0.15	0.258	0.344
	LTE Band 14	10M	QPSK	1	0	Left Side	0mm	Ant 0	Full Power	23330	793	24.43	25.70	1.34			0.00	0.186	0.249



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	LTE Band 14	10M	QPSK	25	0	Left Side	0mm	Ant 0	Full Power	23330	793	23.45	24.70	1.334			-0.04	0.133	0.177
	LTE Band 14	10M	QPSK	1	0	Right Side	0mm	Ant 0	Full Power	23330	793	24.43	25.70	1.34			-0.01	0.262	0.351
	LTE Band 14	10M	QPSK	25	0	Right Side	0mm	Ant 0	Full Power	23330	793	23.45	24.70	1.334			-0.08	0.237	0.316
	LTE Band 14	10M	QPSK	1	0	Top Side	0mm	Ant 0	Full Power	23330	793	24.43	25.70	1.34			0.10	0.001	0.002
	LTE Band 14	10M	QPSK	25	0	Top Side	0mm	Ant 0	Full Power	23330	793	23.45	24.70	1.334			-0.03	0.001	0.002
	LTE Band 14	10M	QPSK	1	0	Bottom Side	0mm	Ant 0	Full Power	23330	793	24.43	25.70	1.34			-0.12	0.211	0.283
	LTE Band 14	10M	QPSK	25	0	Bottom Side	0mm	Ant 0	Full Power	23330	793	23.45	24.70	1.334			-0.17	0.199	0.265
	LTE Band 25	20M	QPSK	1	0	Front	0mm	Ant 0	Full Power	26340	1880	23.89	25.00	1.291			0.16	0.693	0.895
	LTE Band 25	20M	QPSK	50	0	Front	0mm	Ant 0	Full Power	26340	1880	23.75	24.00	1.059			0.09	0.742	0.786
	LTE Band 25	20M	QPSK	1	0	Back	0mm	Ant 0	Full Power	26340	1880	23.89	25.00	1.291			-0.06	1.400	1.807
	LTE Band 25	20M	QPSK	50	0	Back	0mm	Ant 0	Full Power	26340	1880	23.75	24.00	1.059			0.15	1.180	1.250
	LTE Band 25	20M	QPSK	1	0	Left Side	0mm	Ant 0	Full Power	26340	1880	23.89	25.00	1.291			0.05	0.066	0.085
	LTE Band 25	20M	QPSK	50	0	Left Side	0mm	Ant 0	Full Power	26340	1880	23.75	24.00	1.059			0.15	0.094	0.100
24	LTE Band 25	20M	QPSK	1	0	Right Side	0mm	Ant 0	Full Power	26340	1880	23.89	25.00	1.291			0.04	1.410	1.820
	LTE Band 25	20M	QPSK	50	0	Right Side	0mm	Ant 0	Full Power	26340	1880	23.75	24.00	1.059			0.15	1.140	1.207
	LTE Band 25	20M	QPSK	1	0	Top Side	0mm	Ant 0	Full Power	26340	1880	23.89	25.00	1.291			-0.19	0.047	0.061
	LTE Band 25	20M	QPSK	50	0	Top Side	0mm	Ant 0	Full Power	26340	1880	23.75	24.00	1.059			-0.17	0.061	0.064
	LTE Band 25	20M	QPSK	1	0	Bottom Side	0mm	Ant 0	Full Power	26340	1880	23.89	25.00	1.291			-0.15	0.517	0.667
	LTE Band 25	20M	QPSK	50	0	Bottom Side	0mm	Ant 0	Full Power	26340	1880	23.75	24.00	1.059			0.06	0.651	0.689
25	LTE Band 26	15M	QPSK	1	0	Front	0mm	Ant 0	Full Power	26865	831.5	25.43	25.70	1.064			0.06	0.424	0.451
	LTE Band 26	15M	QPSK	36	0	Front	0mm	Ant 0	Full Power	26865	831.5	24.53	24.70	1.04			-0.04	0.312	0.325
	LTE Band 26	15M	QPSK	1	0	Back	0mm	Ant 0	Full Power	26865	831.5	25.43	25.70	1.064			0.11	0.305	0.325
	LTE Band 26	15M	QPSK	36	0	Back	0mm	Ant 0	Full Power	26865	831.5	24.53	24.70	1.04			-0.17	0.227	0.236
	LTE Band 26	15M	QPSK	1	0	Left Side	0mm	Ant 0	Full Power	26865	831.5	25.43	25.70	1.064			0.09	0.133	0.142
	LTE Band 26	15M	QPSK	36	0	Left Side	0mm	Ant 0	Full Power	26865	831.5	24.53	24.70	1.04			-0.07	0.096	0.100
	LTE Band 26	15M	QPSK	1	0	Right Side	0mm	Ant 0	Full Power	26865	831.5	25.43	25.70	1.064			0.12	0.290	0.308
	LTE Band 26	15M	QPSK	36	0	Right Side	0mm	Ant 0	Full Power	26865	831.5	24.53	24.70	1.04			0.17	0.214	0.223
	LTE Band 26	15M	QPSK	1	0	Top Side	0mm	Ant 0	Full Power	26865	831.5	25.43	25.70	1.064			-0.01	0.001	0.001
	LTE Band 26	15M	QPSK	36	0	Top Side	0mm	Ant 0	Full Power	26865	831.5	24.53	24.70	1.04			-0.02	0.001	0.001
	LTE Band 26	15M	QPSK	1	0	Bottom Side	0mm	Ant 0	Full Power	26865	831.5	25.43	25.70	1.064			-0.01	0.226	0.240
	LTE Band 26	15M	QPSK	36	0	Bottom Side	0mm	Ant 0	Full Power	26865	831.5	24.53	24.70	1.04			0.15	0.168	0.174
	LTE Band 66	20M	QPSK	1	0	Front	0mm	Ant 0	Full Power	132322	1745	23.35	24.00	1.161			0.17	0.545	0.633
	LTE Band 66	20M	QPSK	50	0	Front	0mm	Ant 0	Full Power	132322	1745	22.34	23.00	1.164			0.01	0.430	0.501
	LTE Band 66	20M	QPSK	1	0	Back	0mm	Ant 0	Full Power	132322	1745	23.35	24.00	1.161			-0.01	2.150	2.496
	LTE Band 66	20M	QPSK	1	0	Back	0mm	Ant 0	Full Power	132072	1720	23.22	24.00	1.197			0.01	1.800	2.155
26	LTE Band 66	20M	QPSK	1	0	Back	0mm	Ant 0	Full Power	132572	1770	22.83	24.00	1.309			0.03	1.980	2.592
	LTE Band 66	20M	QPSK	50	0	Back	0mm	Ant 0	Full Power	132322	1745	22.34	23.00	1.164			-0.10	1.720	2.002
	LTE Band 66	20M	QPSK	50	0	Back	0mm	Ant 0	Full Power	132072	1720	22.22	23.00	1.197			0.06	1.770	2.119
	LTE Band 66	20M	QPSK	50	0	Back	0mm	Ant 0	Full Power	132572	1770	21.75	23.00	1.334			0.02	1.680	2.241
	LTE Band 66	20M	QPSK	100	0	Back	0mm	Ant 0	Full Power	132322	1745	22.03	23.00	1.25			0.13	1.770	2.213
	LTE Band 66	20M	QPSK	1	0	Left Side	0mm	Ant 0	Full Power	132322	1745	23.35	24.00	1.161			0.03	0.031	0.036
	LTE Band 66	20M	QPSK	50	0	Left Side	0mm	Ant 0	Full Power	132322	1745	22.34	23.00	1.164			0.05	0.026	0.031
	LTE Band 66	20M	QPSK	1	0	Right Side	0mm	Ant 0	Full Power	132322	1745	23.35	24.00	1.161			-0.05	1.270	1.474
	LTE Band 66	20M	QPSK	50	0	Right Side	0mm	Ant 0	Full Power	132322	1745	22.34	23.00	1.164			-0.10	1.060	1.234
	LTE Band 66	20M	QPSK	1	0	Top Side	0mm	Ant 0	Full Power	132322	1745	23.35	24.00	1.161			-0.05	0.056	0.065
	LTE Band 66	20M	QPSK	50	0	Top Side	0mm	Ant 0	Full Power	132322	1745	22.34	23.00	1.164			0.04	0.047	0.054
	LTE Band 66	20M	QPSK	1	0	Bottom Side	0mm	Ant 0	Full Power	132322	1745	23.35	24.00	1.161			-0.06	0.286	0.332
	LTE Band 66	20M	QPSK	50	0	Bottom Side	0mm	Ant 0	Full Power	132322	1745	22.34	23.00	1.164			-0.00	0.234	0.272
	LTE Band 41	20M	QPSK	1	0	Front	0mm	Ant 0	Full Power	40620	2593	23.50	24.00	1.122	62.9	1.006	-0.16	0.146	0.165
	LTE Band 41	20M	QPSK	50	0	Front	0mm	Ant 0	Full Power	40620	2593	22.48	23.00	1.127	62.9	1.006	-0.00	0.115	0.130
27	LTE Band 41	20M	QPSK	1	0	Back	0mm	Ant 0	Full Power	40620	2593	23.50	24.00	1.122	62.9	1.006	0.08	1.000	1.129
	LTE Band 41	20M	QPSK	50	0	Back	0mm	Ant 0	Full Power	40620	2593	22.48	23.00	1.127	62.9	1.006	-0.03	0.773	0.876
	LTE Band 41	20M	QPSK	1	0	Left Side	0mm	Ant 0	Full Power	40620	2593	23.50	24.00	1.122	62.9	1.006	0.16	0.062	0.070
	LTE Band 41	20M	QPSK	50	0	Left Side	0mm	Ant 0	Full Power	40620	2593	22.48	23.00	1.127	62.9	1.006	0.01	0.050	0.057
	LTE Band 41	20M	QPSK	1	0	Right Side	0mm	Ant 0	Full Power	40620	2593	23.50	24.00	1.122	62.9	1.006	0.12	0.324	0.366
	LTE Band 41	20M	QPSK	50	0	Right Side	0mm	Ant 0	Full Power	40620	2593	22.48	23.00	1.127	62.9	1.006	-0.17	0.260	0.295
	LTE Band 41	20M	QPSK	1	0	Top Side	0mm	Ant 0	Full Power	40620	2593	23.50	24.00	1.122	62.9	1.006	0.01	0.021	0.024
	LTE Band 41	20M	QPSK	50	0	Top Side	0mm	Ant 0	Full Power	40620	2593	22.48	23.00	1.127	62.9	1.006	0.14	0.001	0.001
	LTE Band 41	20M	QPSK	1	0	Bottom Side	0mm	Ant 0	Full Power	40620	2593	23.50	24.00	1.122	62.9	1.006	0.01	0.478	0.540
	LTE Band 41	20M	QPSK	50	0	Bottom Side	0mm	Ant 0	Full Power	40620	2593	22.48	23.00	1.127	62.9	1.006	0.01	0.486	0.551

**【WLAN 2.4GHz_5GHz SAR】**

Plot No	Band	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-Up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
28	WLAN2.4GHz	802.11b 1Mbps	Front	0mm	Ant 1	Full Power	6	2437	16.70	17.50	1.202	98.94	1.011	-0.07	0.056	0.067
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Ant 1	Full Power	6	2437	16.70	17.50	1.202	98.94	1.011	-0.06	0.288	0.350
	WLAN2.4GHz	802.11b 1Mbps	Left Side	0mm	Ant 1	Full Power	6	2437	16.70	17.50	1.202	98.94	1.011	-0.04	0.190	0.231
	WLAN2.4GHz	802.11b 1Mbps	Right Side	0mm	Ant 1	Full Power	6	2437	16.70	17.50	1.202	98.94	1.011	-0.04	0.001	0.001
	WLAN2.4GHz	802.11b 1Mbps	Top Side	0mm	Ant 1	Full Power	6	2437	16.70	17.50	1.202	98.94	1.011	0.01	0.101	0.122
	WLAN2.4GHz	802.11b 1Mbps	Bottom Side	0mm	Ant 1	Full Power	6	2437	16.70	17.50	1.202	98.94	1.011	0.11	0.001	0.001
29	WLAN5GHz	802.11a 6Mbps	Front	0mm	Ant 1	Full Power	60	5300	14.71	15.50	1.199	98.25	1.018	-0.06	0.066	0.080
	WLAN5GHz	802.11a 6Mbps	Back	0mm	Ant 1	Full Power	60	5300	14.71	15.50	1.199	98.25	1.018	0.00	0.372	0.454
	WLAN5GHz	802.11a 6Mbps	Left Side	0mm	Ant 1	Full Power	60	5300	14.71	15.50	1.199	98.25	1.018	0.17	0.249	0.304
	WLAN5GHz	802.11a 6Mbps	Right Side	0mm	Ant 1	Full Power	60	5300	14.71	15.50	1.199	98.25	1.018	0.00	0.001	0.001
	WLAN5GHz	802.11a 6Mbps	Top Side	0mm	Ant 1	Full Power	60	5300	14.71	15.50	1.199	98.25	1.018	0.11	0.107	0.130
	WLAN5GHz	802.11a 6Mbps	Bottom Side	0mm	Ant 1	Full Power	60	5300	14.71	15.50	1.199	98.25	1.018	0.11	0.014	0.017
30	WLAN5GHz	802.11a 6Mbps	Front	0mm	Ant 1	Full Power	100	5500	13.87	15.00	1.297	98.25	1.018	0.18	0.054	0.071
	WLAN5GHz	802.11a 6Mbps	Back	0mm	Ant 1	Full Power	100	5500	13.87	15.00	1.297	98.25	1.018	-0.10	0.511	0.675
	WLAN5GHz	802.11a 6Mbps	Left Side	0mm	Ant 1	Full Power	100	5500	13.87	15.00	1.297	98.25	1.018	0.13	0.221	0.292
	WLAN5GHz	802.11a 6Mbps	Right Side	0mm	Ant 1	Full Power	100	5500	13.87	15.00	1.297	98.25	1.018	0.06	0.001	0.001
	WLAN5GHz	802.11a 6Mbps	Top Side	0mm	Ant 1	Full Power	100	5500	13.87	15.00	1.297	98.25	1.018	0.04	0.134	0.177
	WLAN5GHz	802.11a 6Mbps	Bottom Side	0mm	Ant 1	Full Power	100	5500	13.87	15.00	1.297	98.25	1.018	0.17	0.001	0.001
31	WLAN5GHz	802.11a 6Mbps	Front	0mm	Ant 1	Full Power	157	5785	13.91	15.00	1.285	98.25	1.018	-0.06	0.044	0.058
	WLAN5GHz	802.11a 6Mbps	Back	0mm	Ant 1	Full Power	157	5785	13.91	15.00	1.285	98.25	1.018	-0.06	0.265	0.347
	WLAN5GHz	802.11a 6Mbps	Left Side	0mm	Ant 1	Full Power	157	5785	13.91	15.00	1.285	98.25	1.018	-0.10	0.161	0.211
	WLAN5GHz	802.11a 6Mbps	Right Side	0mm	Ant 1	Full Power	157	5785	13.91	15.00	1.285	98.25	1.018	-0.09	0.001	0.001
	WLAN5GHz	802.11a 6Mbps	Top Side	0mm	Ant 1	Full Power	157	5785	13.91	15.00	1.285	98.25	1.018	-0.08	0.110	0.143
	WLAN5GHz	802.11a 6Mbps	Bottom Side	0mm	Ant 1	Full Power	157	5785	13.91	15.00	1.285	98.25	1.018	0.13	0.001	0.001

【Bluetooth SAR】

Plot No	Band	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-Up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
32	Bluetooth	1Mbps	Front	0mm	Ant 1	Full Power	39	2441	10.77	12.00	1.327	77.34	1.077	-0.12	0.001	0.001
	Bluetooth	1Mbps	Back	0mm	Ant 1	Full Power	39	2441	10.77	12.00	1.327	77.34	1.077	-0.09	0.047	0.067
	Bluetooth	1Mbps	Left Side	0mm	Ant 1	Full Power	39	2441	10.77	12.00	1.327	77.34	1.077	-0.16	0.031	0.044
	Bluetooth	1Mbps	Right Side	0mm	Ant 1	Full Power	39	2441	10.77	12.00	1.327	77.34	1.077	-0.14	0.001	0.001
	Bluetooth	1Mbps	Top Side	0mm	Ant 1	Full Power	39	2441	10.77	12.00	1.327	77.34	1.077	-0.05	0.017	0.024
	Bluetooth	1Mbps	Bottom Side	0mm	Ant 1	Full Power	39	2441	10.77	12.00	1.327	77.34	1.077	0.01	0.001	0.001

14.3 Repeated SAR Measurement

【Repeat SAR 1g - FCC】

No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-Up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Ratio
1st	LTE Band 7	20M_QPSK_1_0	Back	10.0	Ant 0	Full Power	20850	2510	24.06	25.00	1.242			-0.10	0.962	1.195	-
2nd	LTE Band 7	20M_QPSK_1_0	Back	10.0	Ant 0	Full Power	20850	2510	24.06	25.00	1.242			-0.02	0.955	1.186	1.01

【Repeat SAR 10g - FCC】

No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-Up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)	Ratio
1st	WCDMA IV	RMC 12.2Kbps	Back	0.0	Ant 0	Full Power	1312	1712.4	23.65	24.00	1.084			0.06	2.270	2.461	-
2nd	WCDMA IV	RMC 12.2Kbps	Back	0.0	Ant 0	Full Power	1312	1712.4	23.65	24.00	1.084			0.03	2.200	2.385	1.03

General Note:

1. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is $\geq 0.8\text{W/kg}$.
2. Per KDB 865664 D01v01r04, if the ratio among the repeated measurement is ≤ 1.2 and the measured SAR $< 1.45\text{W/kg}$, only one repeated measurement is required.
3. Per KDB 865664 D01v01r04, if the extremity repeated SAR is necessary, the same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.
4. The ratio is the difference in percentage between original and repeated *measured SAR*.
5. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

15. Simultaneous Transmission Analysis

No.	Simultaneous Transmission Configurations	POS Terminal	
		Body-worn	Extremity
1.	WWAN + WLAN2.4GHz	Yes	Yes
2.	WWAN + WLAN5GHz	Yes	Yes
3.	WWAN + Bluetooth	Yes	Yes
4.	WWAN + WLAN2.4GHz + NFC		Yes
5.	WWAN + WLAN5GHz+ NFC		Yes
6.	WWAN + Bluetooth+ NFC		Yes

General Note:

- EUT will choose each WCDMA and LTE according to the network signal condition; therefore, they will not operate simultaneously at any moment.
- EUT will choose either WLAN 2.4GHz or WLAN 5GHz according to the network signal condition; therefore, 2.4GHz WLAN and 5GHz WLAN will not operate simultaneously at any moment though they have independent antenna.
- WLAN 2.4GHz and Bluetooth share the same antenna and they can't transmit simultaneously.
- NFC can transmit simultaneously with other Radios in extremity exposure condition.
- All licensed modes share the same antenna part and cannot transmit simultaneously.
- The reported SAR summation is calculated based on the same configuration and test position
- For standalone WWAN at Extremity Exposure Conditions, always choose the highest SAR among all WWAN bands for each exposure position to perform simultaneous transmission analysis with WLAN/BT. This is the worst co-located analysis and can represent each band.
- Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
 - 1g Scalar SAR summation < 1.6W/kg and 10g Scalar SAR summation < 4.0W/kg.
 - $SPLSR = (SAR1 + SAR2)^{1.5} / (\min. \text{ separation distance, mm})$, and the peak separation distance is determined from the square root of $[(x1-x2)^2 + (y1-y2)^2 + (z1-z2)^2]$, where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
 - If $SPLSR \leq 0.04$ for 1g SAR and $SPLSR \leq 0.10$ for 10g SAR, simultaneously transmission SAR measurement is not necessary.
 - Simultaneously transmission SAR measurement, and the reported multi-band 1g SAR < 1.6W/kg and 10g SAR < 4.0W/kg.
 - The SPLSR calculated results please refer to section 15.3.



15.1 Body-Worn Exposure Conditions

WWAN1		Exposure Position	1	3	4	5	1+3 Summed 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)	1+5 Summed 1g SAR (W/kg)	Note
			WWAN1	2.4GHz WLAN Ant 1	5GHz WLAN Ant 1	Bluetooth Ant 1				
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)				
WCDMA II	Ant 0	Front	0.225	0.001	0.090	0.016	0.23	0.32	0.24	
		Back	0.851	0.157	0.514	0.033	1.01	1.37	0.88	
WCDMA IV	Ant 0	Front	0.161	0.001	0.090	0.016	0.16	0.25	0.18	
		Back	0.488	0.157	0.514	0.033	0.65	1.00	0.52	
WCDMA V	Ant 0	Front	0.200	0.001	0.090	0.016	0.20	0.29	0.22	
		Back	0.281	0.157	0.514	0.033	0.44	0.80	0.31	
LTE Band 7	Ant 0	Front	0.172	0.001	0.090	0.016	0.17	0.26	0.19	
		Back	1.195	0.157	0.514	0.033	1.35	1.71	1.23	Case 1
LTE Band 12	Ant 0	Front	0.250	0.001	0.090	0.016	0.25	0.34	0.27	
		Back	0.510	0.157	0.514	0.033	0.67	1.02	0.54	
LTE Band 13	Ant 0	Front	0.361	0.001	0.090	0.016	0.36	0.45	0.38	
		Back	0.561	0.157	0.514	0.033	0.72	1.08	0.59	
LTE Band 14	Ant 0	Front	0.287	0.001	0.090	0.016	0.29	0.38	0.30	
		Back	0.488	0.157	0.514	0.033	0.65	1.00	0.52	
LTE Band 25	Ant 0	Front	0.464	0.001	0.090	0.016	0.47	0.55	0.48	
		Back	0.947	0.157	0.514	0.033	1.10	1.46	0.98	
LTE Band 26	Ant 0	Front	0.216	0.001	0.090	0.016	0.22	0.31	0.23	
		Back	0.276	0.157	0.514	0.033	0.43	0.79	0.31	
LTE Band 66	Ant 0	Front	0.231	0.001	0.090	0.016	0.23	0.32	0.25	
		Back	0.531	0.157	0.514	0.033	0.69	1.05	0.56	
LTE Band 41	Ant 0	Front	0.097	0.001	0.090	0.016	0.10	0.19	0.11	
		Back	0.547	0.157	0.514	0.033	0.70	1.06	0.58	

15.2 Extremity Exposure Conditions

<WWAN Full Power, WLAN Full Power, BT Full Power>

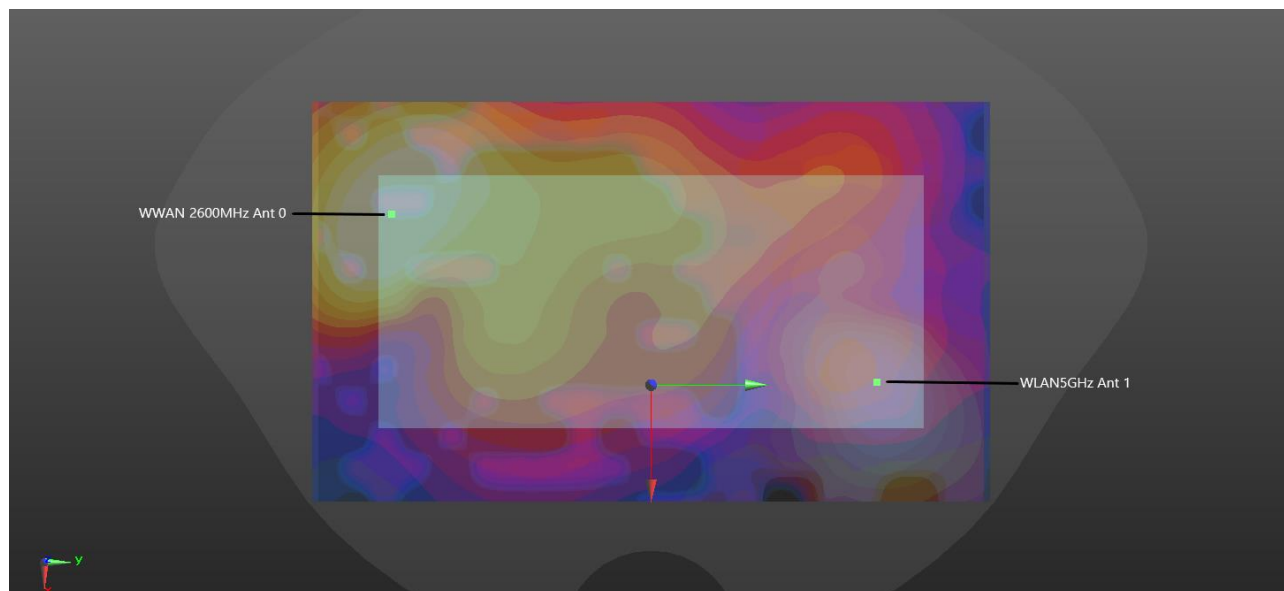
WWAN1		Exposure Position	1	3	4	5	6	1+3+6 Summed 10g SAR (W/kg)	1+4+6 Summed 10g SAR (W/kg)	1+5+6 Summed 10g SAR (W/kg)
			WWAN1	2.4GHz WLAN Ant 1	5GHz WLAN Ant 1	Bluetooth Ant 1	NFC			
			10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)			
All	Ant 0	Front	1.027	0.067	0.080	0.001	0.056	1.15	1.16	1.08
		Back	2.592	0.350	0.675	0.067	0.010	2.95	3.28	2.67
		Left Side	0.280	0.231	0.304	0.044	0.017	0.53	0.60	0.34
		Right Side	1.820	0.001	0.001	0.001	0.018	1.84	1.84	1.84
		Top Side	0.089	0.122	0.177	0.024	0.017	0.23	0.28	0.13
		Bottom Side	0.894	0.001	0.017	0.001	0.001	0.90	0.91	0.90

Note: NFC SAR value is from NFC SAR report (Sporton Report Number: FA593093A) which is submitted separately.

15.3 SPLSR Evaluation and Analysis

General Note:

1. When standalone SAR is measured for both antennas in the pair, the peak location separation distance is computed by the square root of $[(x_1-x_2)^2 + (y_1-y_2)^2 + (z_1-z_2)^2]$, where (x_1, y_1, z_1) and (x_2, y_2, z_2) are the coordinates in the area scans or extrapolated peak SAR locations in the zoom scans, as appropriate.
2. $SPLSR = (SAR_1 + SAR_2)1.5 / (\text{min. separation distance, mm})$. If $SPLSR \leq 0.04$ for 1g SAR, simultaneously transmission SAR measurement is not necessary.



Body worn WWAN+WLAN 10mm

<Body worn>

Case No	Band	Position	SAR 1g SAR (W/kg)	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 1	LTE Band 7_Ant 0	Back	1.195	10mm	-23.4	-79	-0.52	152.9	1.71	0.01	Not required
	WLAN5GHz_Ant 1		0.514	10mm	24	66.4	-0.51				

Test Engineer : Martin Li, Varus Wang, Light Wang, Ricky Gu

16. Uncertainty Assessment

Per KDB 865664 D01 SAR measurement 100MHz to 6GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg and the measured 10-g SAR within a frequency band is < 3.75 W/kg. The expanded SAR measurement uncertainty must be $\leq 30\%$, for a confidence interval of $k = 2$. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. For this device, the highest measured 1-g SAR is less 1.5W/kg and highest measured 10-g SAR is less 3.75W/kg. Therefore, the measurement uncertainty table is not required in this report.

17. References

- [1] FCC 47 CFR Part 2 "Frequency Allocations and Radio Treaty Matters; General Rules and Regulations"
- [2] ANSI/IEEE Std. C95.1-1992, "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz", September 1992
- [3] IEEE Std. 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", Sep 2013
- [4] SPEAG DASY System Handbook
- [5] FCC KDB 248227 D01 v02r02, "SAR Guidance for IEEE 802.11 (WiFi) Transmitters", Oct 2015.
- [6] FCC KDB 447498 D01 v06, "Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies", Oct 2015
- [7] FCC KDB 941225 D01 v03r01, "3G SAR MEAUREMENT PROCEDURES", Oct 2015
- [8] FCC KDB 941225 D05 v02r05, "SAR Evaluation Considerations for LTE Devices", Dec 2015
- [9] FCC KDB 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.
- [10] FCC KDB 865664 D02 v01r02, "RF Exposure Compliance Reporting and Documentation Considerations" Oct 2015.

Appendixes

Please refer to separated files for the following appendixes

Appendix A. Plots of System Performance Check

Appendix B. Plots of High SAR Measurement

Appendix C. DASY Calibration Certificate

Appendix D. Test Setup Photos

Appendix E. Conducted RF Output Power Table

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