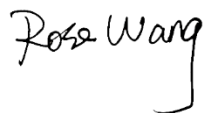


FCC SAR Test Report

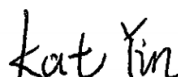
APPLICANT : HMD Global Oy
EQUIPMENT : Mobile Phone
BRAND NAME : Nokia
MODEL NAME : TA-1187
FCC ID : 2AJOTTA-1187
STANDARD : FCC 47 CFR Part 2 (2.1093)
ANSI/IEEE C95.1-1992
IEEE 1528-2013

The product was received on May 27, 2019 and testing was started from Jun. 28, 2019 and completed on Jul. 09, 2019. We, Sporton International (Kunshan) Inc., would like to declare that the tested sample has been evaluated in accordance with the procedures and had been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International (Kunshan) Inc., the test report shall not be reproduced except in full.



Reviewed by: Rose Wang / Supervisor



Approved by: Kat Yin / Manager



Sporton International (Kunshan) Inc.

**No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300
People's Republic of China**



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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA952702	Rev. 01	Initial issue of report	Aug. 05, 2019



1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **HMD Global Oy, Mobile Phone, TA-1187**, are as follows.

Highest 1g SAR Summary						
Equipment Class	Frequency Band		Head (Separation 0mm)	Hotspot (Separation 10mm)	Body-worn (Separation 10mm)	Highest Simultaneous Transmission 1g SAR (W/kg)
			1g SAR (W/kg)			
Licensed	GSM	GSM850	1.03	0.61	0.61	1.59
		GSM1900	0.87	0.97	0.97	
	WCDMA	Band V	0.54	0.28	0.28	
		Band II	0.83	1.14	1.05	
		Band IV	1.04	0.80	0.80	
	LTE	Band 5	0.45	0.26	0.26	
		Band 12/Band 17	0.20	0.25	0.25	
		Band 28	0.19	0.20	0.20	
		Band 2	0.85	0.97	0.97	
		Band 4	0.92	0.90	0.90	
		Band 7	0.87	0.72	0.72	
DTS	WLAN	2.4GHz WLAN	0.75	0.21	0.21	1.40
NII		5GHz WLAN	1.02	0.87	0.93	1.59
DSS	Bluetooth	Bluetooth	0.10	<0.10	<0.10	1.59
Highest 10g SAR Summary						
Equipment Class		Frequency Band		Product Specific 10g SAR (W/kg) (Separation 0mm)		
NII		WLAN	5GHz WLAN	1.29		
Date of Testing:			2019/6/28 ~ 2019/7/9			
Remark : This device supports both LTE B12 and B17.Since the supported frequency span for LTE B17 falls completely within the supports frequency span for LTE B12, both LTE bands have the same target power, and both LTE bands share the same transmission path: therefore, SAR was only assessed for LTE B12.						

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg for Partial-Body 1g SAR, 4.0 W/kg for Product Specific 10g SAR) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications.

2. Administration Data

Sporton International (Kunshan) Inc. is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Testing Laboratory		
Test Firm	Sporton International (Kunshan) Inc.	
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158 FAX : +86-512-57900958	
Test Site No.	FCC Designation No.	FCC Test Firm Registration No.
	CN1257	314309

Applicant	
Company Name	HMD Global Oy
Address	Bertel Jungin aukio 9, 02600 ESPOO. FINLAND

3. Guidance Applied

The Specific Absorption Rate (SAR) testing specification, method, and procedure for this device is in accordance with the following standards:

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB 865664 D02 SAR Reporting v01r02
- FCC KDB 447498 D01 General RF Exposure Guidance v06
- FCC KDB 648474 D04 SAR Evaluation Considerations for Wireless Handsets v01r03
- FCC KDB 248227 D01 802.11 Wi-Fi SAR v02r02
- FCC KDB 941225 D01 3G SAR Procedures v03r01
- FCC KDB 941225 D05 SAR for LTE Devices v02r05
- FCC KDB 941225 D06 Hotspot Mode SAR v02r01
- FCC KDB 616217 D04 SAR for laptop and tablets v01r02

4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	Mobile Phone
Brand Name	Nokia
Model Name	TA-1187
FCC ID	2AJOTTA-1187
IMEI Code	354209100006088
Wireless Technology and Frequency Range	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz WCDMA Band IV: 1712.4 MHz ~ 1752.6 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5 MHz LTE Band 12: 699.7 MHz ~ 715.3 MHz LTE Band 17: 706.5 MHz ~ 713.5 MHz LTE Band 28: 704.5 MHz ~ 746.5 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5700 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz NFC : 13.56 MHz
Mode	GSM/GPRS/EGPRS RMC/AMR 12.2Kbps HSDPA HSUPA DC-HSDPA HSPA+ (16QAM uplink is not supported) LTE: QPSK, 16QAM, 64QAM WLAN 2.4GHz 802.11b/g/n HT20 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE NFC:ASK
HW Version	LLDM490B
SW Version	LLDB7016
GSM / (E)GPRS Transfer mode	Class B – EUT cannot support Packet Switched and Circuit Switched Network simultaneously but can automatically switch between Packet and Circuit Switched Network.
EUT Stage	Identical Prototype
Remark: 802.11n-HT40 is not supported in 2.4GHz WLAN. - This device supports VoIP in GPRS, EGPRS, CDMA, WCDMA and LTE (e.g. for 3rd-party VoIP), LTE supports VoLTE operation. - This device 2.4GHz WLAN support hotspot operation and Bluetooth support tethering applications. - This device 2.4GHz WLAN/5.2GHz WLAN/5.8GHz WLAN support hotspot operation, and 5.2GHz WLAN/5.8GHz WLAN supports WiFi Direct (GC/GO), and 5.3GHz / 5.5GHz supports WiFi Direct (GC only). - This device does not support DTM operation and supports GRPS/EGPRS mode up to multi-slot class 33. - This device has two WWAN transmit antennas. WWAN bottom antenna is located at the bottom edge of the device, and WWAN top antenna is located at the top edge of the device which can refer to antenna location chapter. Top and Bottom antenna support the same WWAN frequency bands, and they can't transmit simultaneously. - For top WWAN antenna and WLAN antenna: - When the phone is in talking mode and receiver worked, then power reduction will be implemented immediately in GSM1900, WCDMA band 2/4, LTE B2/4/7 and WLAN 5.5/5.8GHz.	



- b. When hotspot mode is enabled, power reduction will be activated to GSM1900, WCDMA band 2/4 and LTE B2/4/7.
 - c. The device employs proximity sensors that detect the presence of the user's body also a finger or hand at the front or back or top faces of the device. When front or back or top of body condition or when the device is in handheld state is detected, GSM1900, WCDMA band 2/4 and LTE B2/4/7 reduced power will be active. (P-sensor can't work at detecting presence of the user's body at the three edges of the device.)
8. For bottom WWAN antenna:
- a. When hotspot mode is enabled, power reduction will be activated to GSM1900, WCDMA band 2/4, LTE band 2/4.
 - b. The device employs proximity sensors that detect the presence of the user's body also a finger or hand at the front or back or bottom faces of the device. When front or back or bottom of body condition or when the device is in handheld state is detected, GSM1900, WCDMA band 2/4 and LTE B2/4 reduced power will be active. (P-sensor can't work at detecting presence of the user's body at the three edges of the device.)

4.2 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05																																																																													
FCC ID	2AJOTTA-1187																																																																												
Equipment Name	Mobile Phone																																																																												
Operating Frequency Range of each LTE transmission band	LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5 MHz LTE Band 12: 699.7 MHz ~ 715.3 MHz LTE Band 17: 706.5 MHz ~ 713.5 MHz LTE Band 28: 704.5 MHz ~ 746.5 MHz																																																																												
Channel Bandwidth	LTE Band 2:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 4:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 5:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 7: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 12:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 17: 5MHz, 10MHz LTE Band 28: 3MHz, 5MHz, 10MHz, 15MHz, 20MHz																																																																												
uplink modulations used	QPSK / 16QAM / 64QAM																																																																												
LTE Voice / Data requirements	Voice and Data																																																																												
LTE Release Version	R12, Cat4																																																																												
CA Support	Not Supported																																																																												
LTE MPR permanently built-in by design	<table><tr><th colspan="8">Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3</th></tr><tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (N_{RB})</th><th rowspan="2">MPR (dB)</th></tr><tr><th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr><tr><td>QPSK</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 1</td></tr><tr><td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr><tr><td>16 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 2</td></tr><tr><td>64 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 2</td></tr><tr><td>64 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 3</td></tr><tr><td>256 QAM</td><td colspan="6">≥ 1</td><td>≤ 5</td></tr></table>							Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3								Modulation	Channel bandwidth / Transmission bandwidth (N _{RB})						MPR (dB)	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1	16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1	16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2	64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2	64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3	256 QAM	≥ 1						≤ 5
Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3																																																																													
Modulation	Channel bandwidth / Transmission bandwidth (N _{RB})						MPR (dB)																																																																						
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz																																																																							
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1																																																																						
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1																																																																						
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2																																																																						
64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2																																																																						
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3																																																																						
256 QAM	≥ 1						≤ 5																																																																						
LTE A-MPR	In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)																																																																												
Spectrum plots for RB configuration	A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.																																																																												
Power reduction applied to satisfy SAR compliance	Yes, Hotspot mode / Proximity sensor triggered reduced power for LTE band 2/4/7.																																																																												

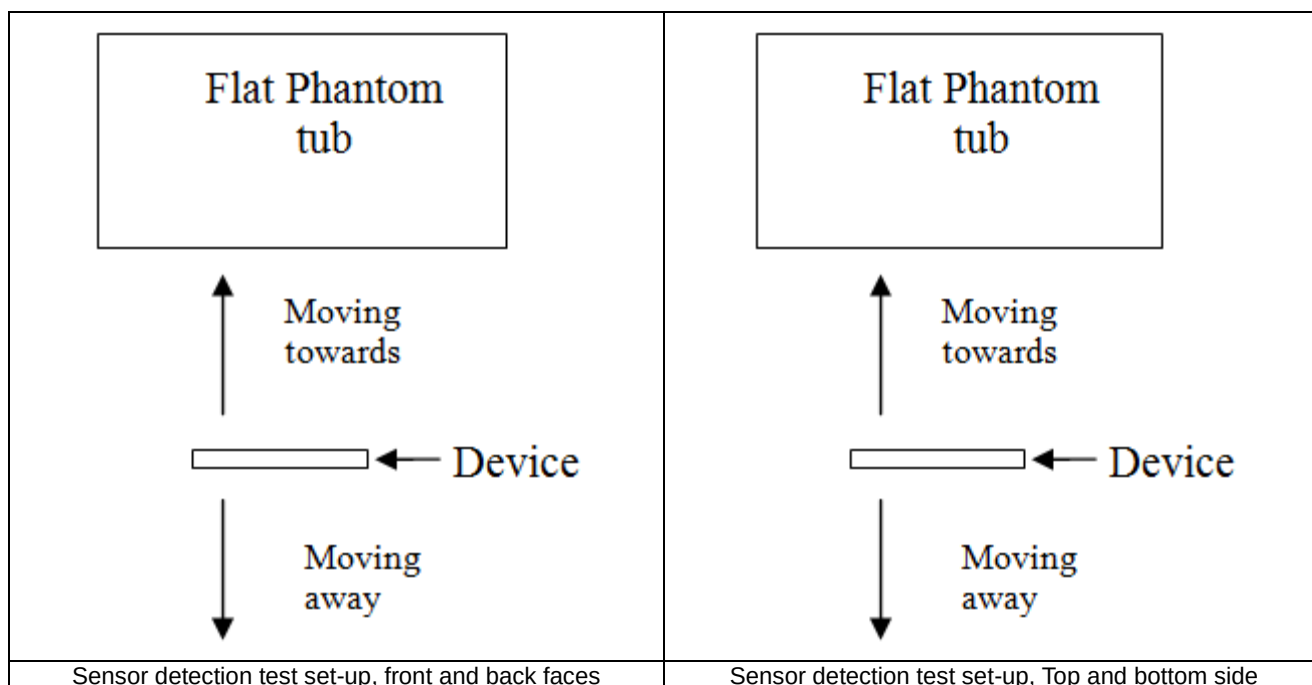


Transmission (H, M, L) channel numbers and frequencies in each LTE band												
LTE Band 2												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900
LTE Band 4												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745
LTE Band 5												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20407	824.7	20415	825.5	20425	826.5	20450	829				
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5				
H	20643	848.3	20635	847.5	20625	846.5	20600	844				
LTE Band 7												
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20775	2502.5	20800	2505	20825	2507.5	20850	2510				
M	21100	2535	21100	2535	21100	2535	21100	2535				
H	21425	2567.5	21400	2565	21375	2562.5	21350	2560				
LTE Band 12												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	23017	699.7	23025	700.5	23035	701.5	23060	704				
M	23095	707.5	23095	707.5	23095	707.5	23095	707.5				
H	23173	715.3	23165	714.5	23155	713.5	23130	711				
LTE Band 17												
	Bandwidth 5 MHz				Bandwidth 10 MHz							
	Channel #		Freq.(MHz)		Channel #		Freq. (MHz)					
L	23755		706.5		23780		709					
M	23790		710		23790		710					
H	23825		713.5		23800		711					
LTE Band 28												
	Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz			
	Channel #	Freq.(MHz)	Channel #	Freq.(MHz)	Channel #	Freq.(MHz)	Channel #	Freq.(MHz)	Channel #	Freq.(MHz)	Channel #	Freq.(MHz)
L	27225	704.5	27235	705.5	27260	708	27285	710.5	27310	713		
M	27410	723	27410	723	27410	723	27410	723	27410	723		
H	27645	746.5	27635	745.5	27610	743	27585	740.5	27560	738		

5. Proximity Sensor Triggering Test

5.1 Proximity sensor triggering distances(Per KDB616217§6.2)

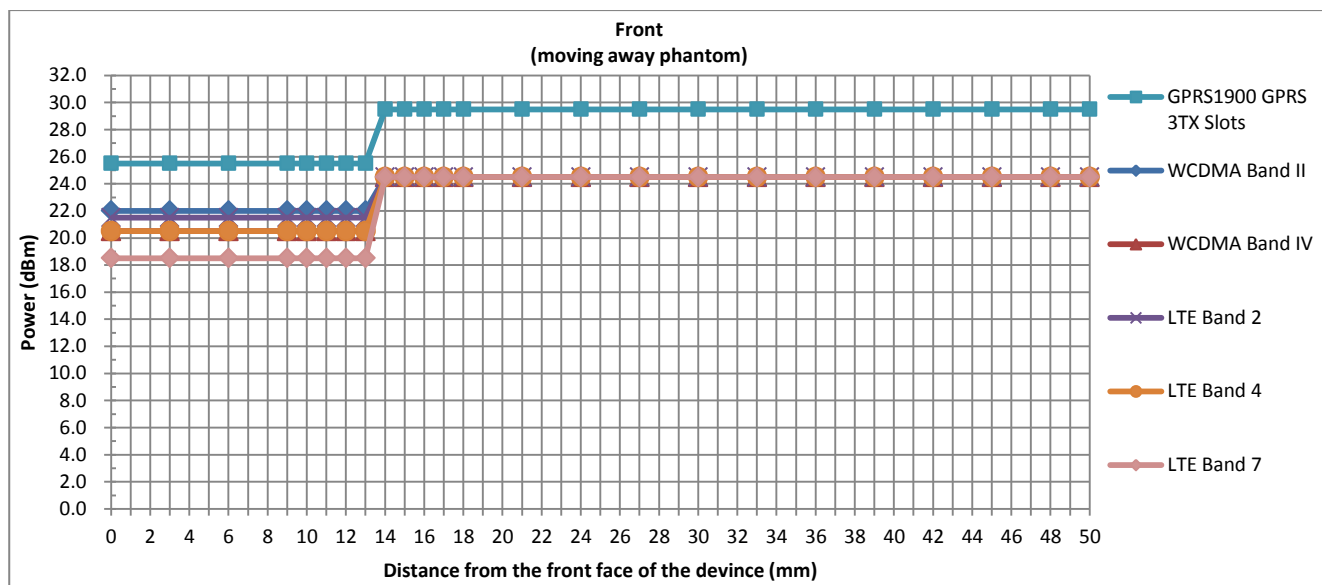
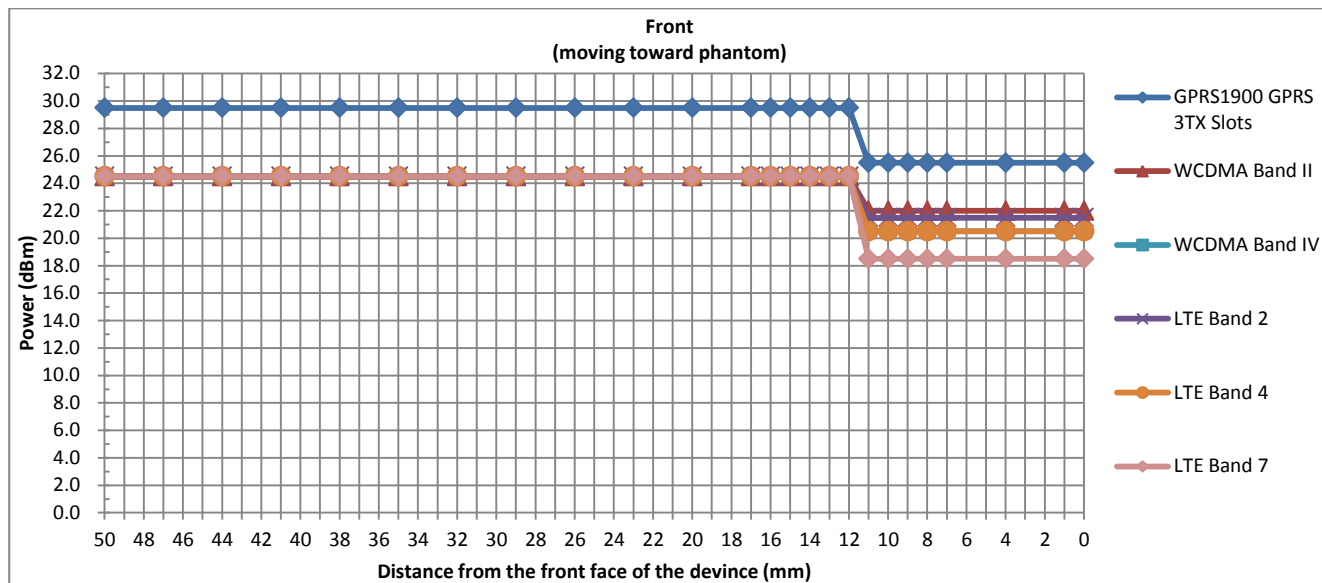
1. Proximity sensor triggering distance testing was performed according to the procedures outlined in KDB 616217 D04 section 6.2, and EUT moving further away from the flat phantom and EUT moving toward the flat phantom were both assessed and the tissue-equivalent medium for highest frequency (2600MHz) and lowest (1750MHz) frequency was used for proximity sensor triggering testing.
2. Capacitive proximity sensor pad placed coincident with antenna elements at the top and bottom WWAN antennas of the phone are utilized to determine when the device comes in proximity of the user's body at the front, back, top or bottom side surface of the device. There is no need to do sensor coverage testing for the proximity sensor is designed to support sufficient detection range and sensitivity to cover regions of the sensors in all applicable directions since the proximity sensor entirely covers the antenna.
3. For Top Antenna when the sensor is active, GSM1900, WCDMA B2 / B4, and LTE B2 / B4 / B7 reduced power will be active.
4. For Bottom Antenna when the sensor is active, GSM1900, WCDMA B2 / B4, and LTE B2 / B4 reduced power will be active.
5. The sensors used to detect the proximity of the user's body at the front, back, Top or bottom side surface of the device use a detection threshold distance. The data shown in the sections below shows the distance(s).

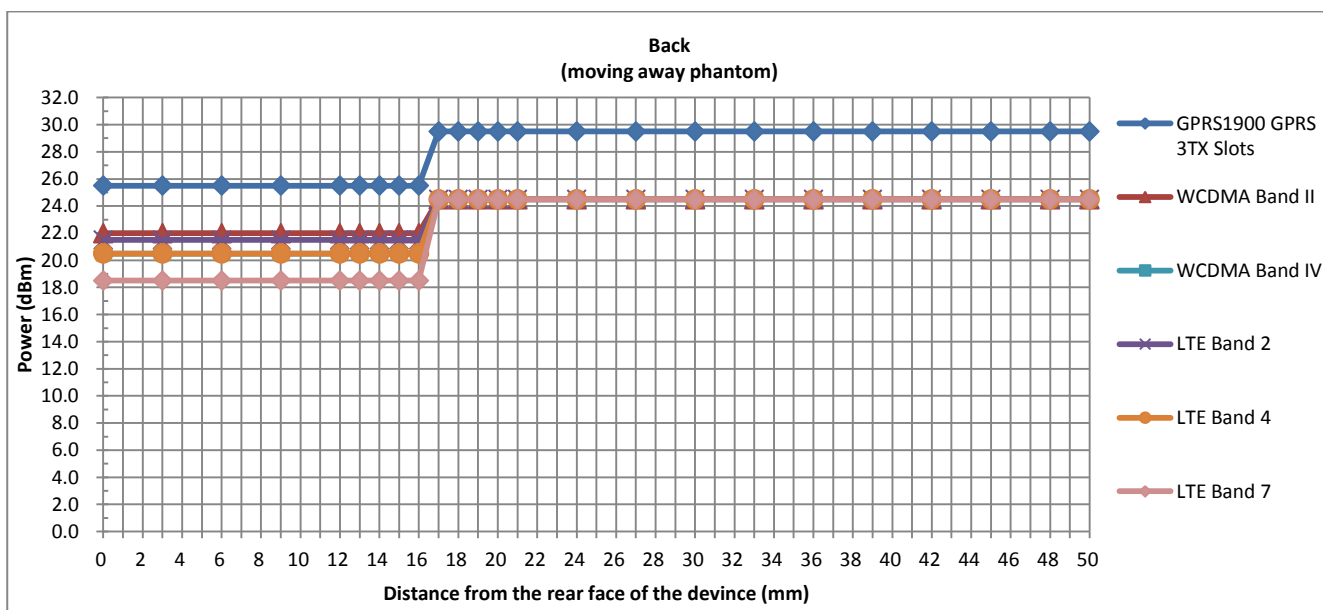
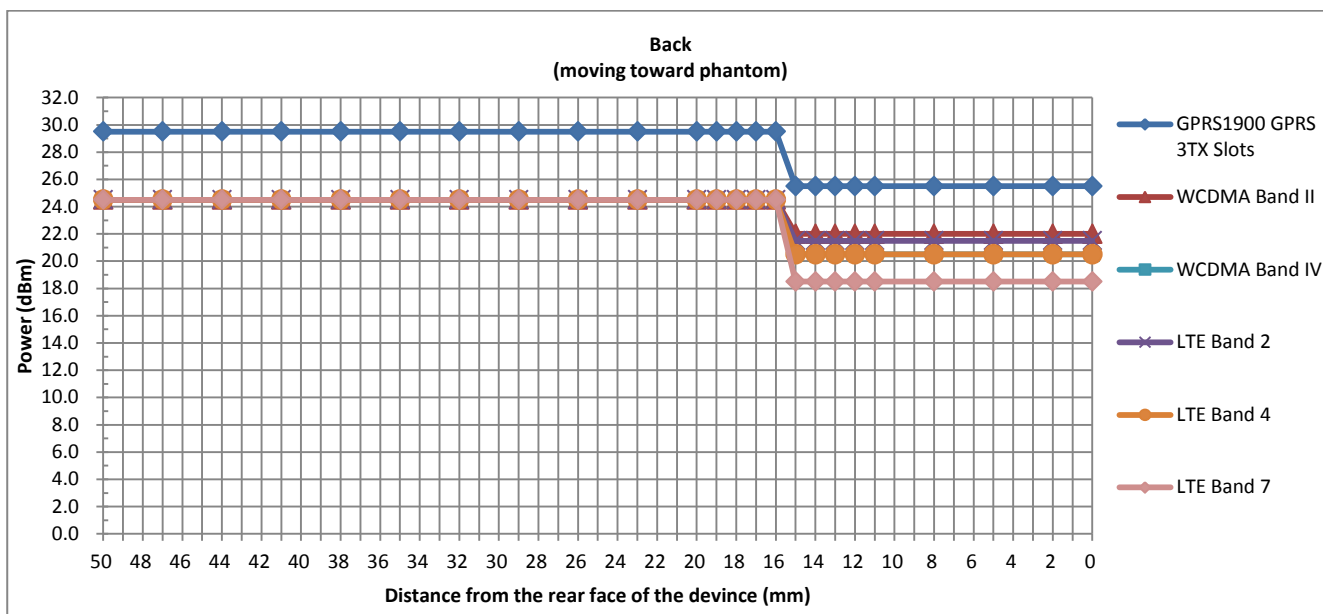


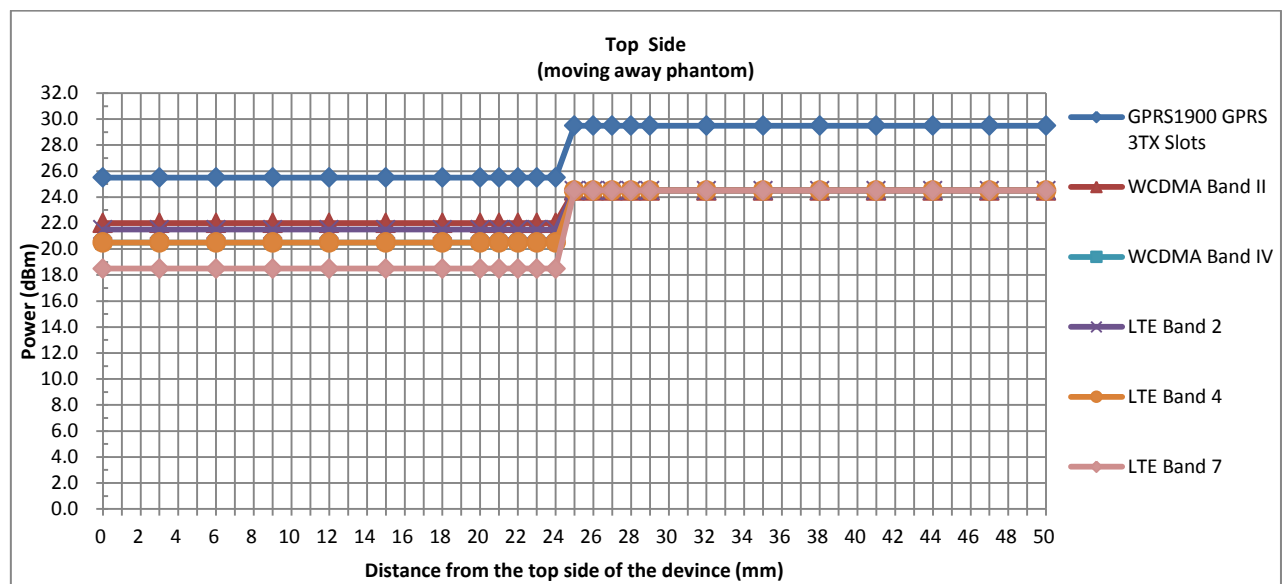
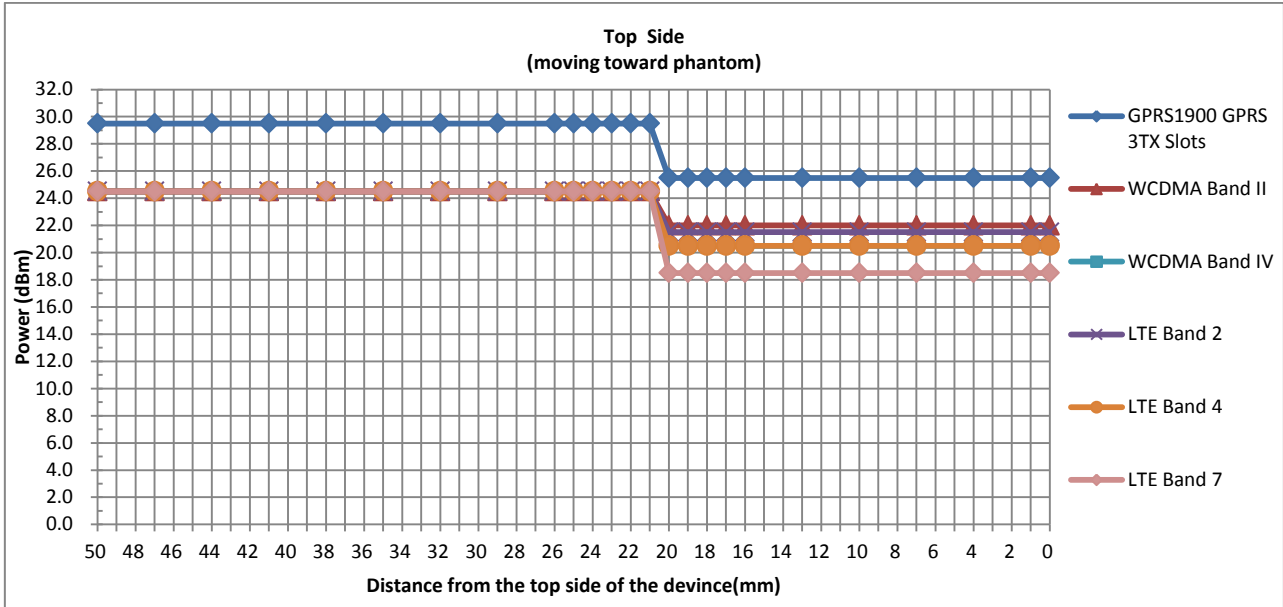
Top Antenna

Proximity Sensor Triggering Distance (mm)						
Position	Front		Back		Top Side	
	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away
Minimum	11	13	15	16	20	24

<Sensor Trigger Distance and Measured Power>



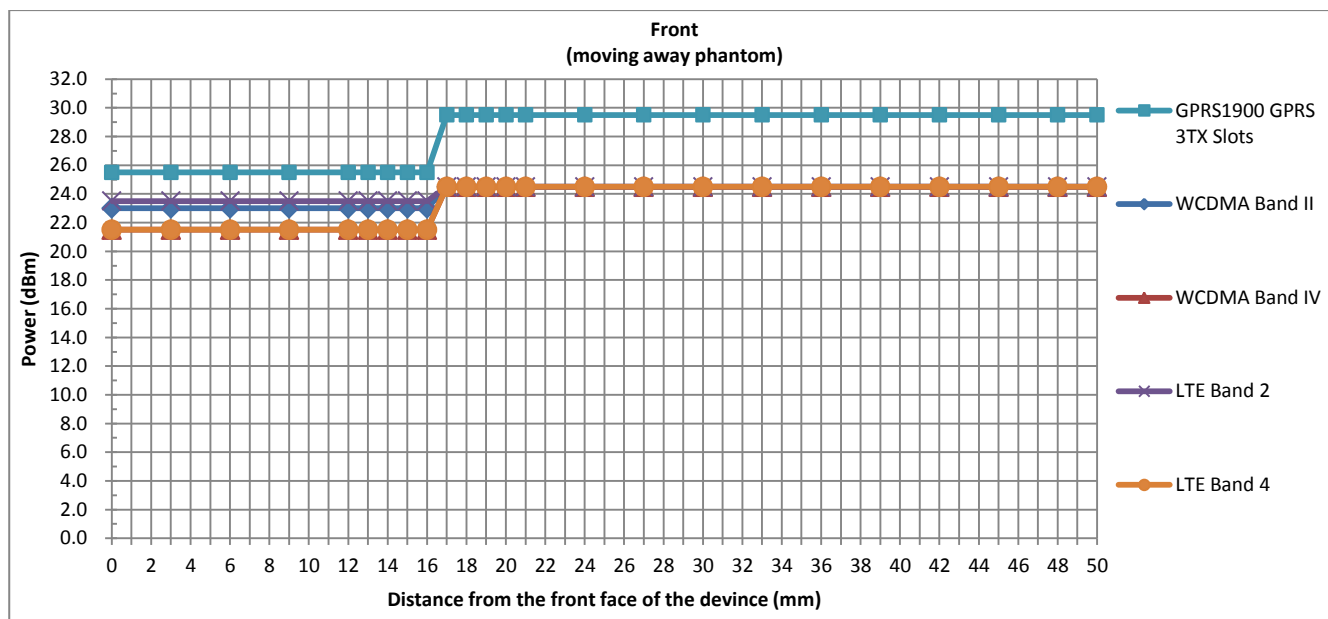
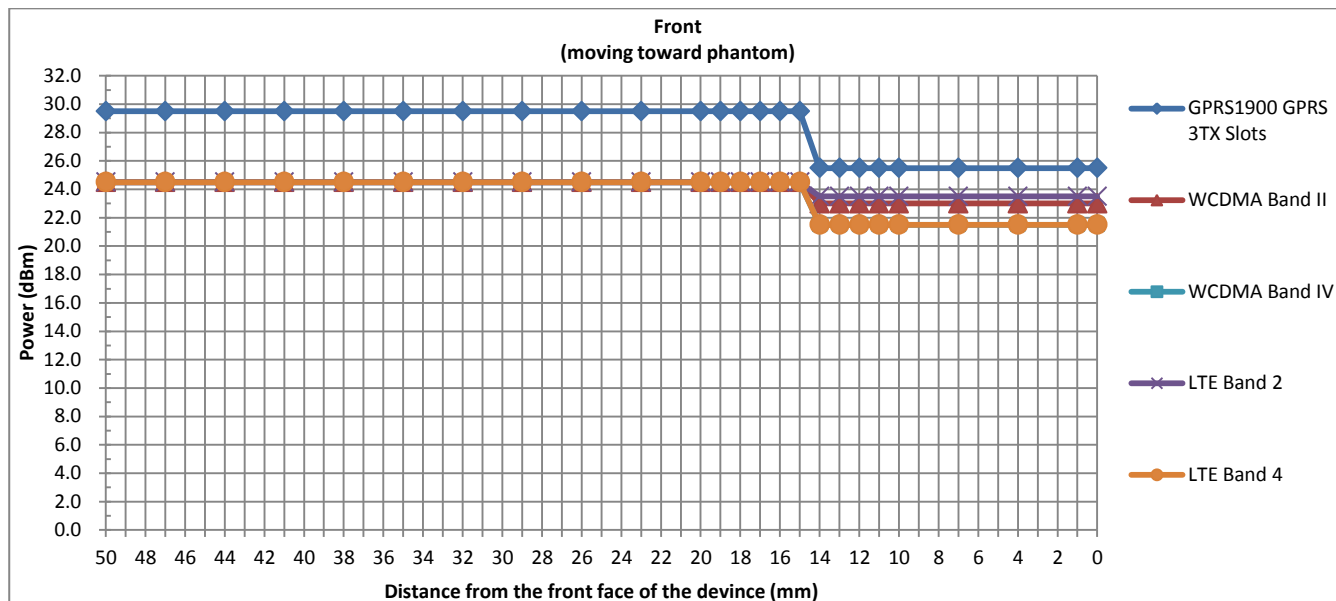


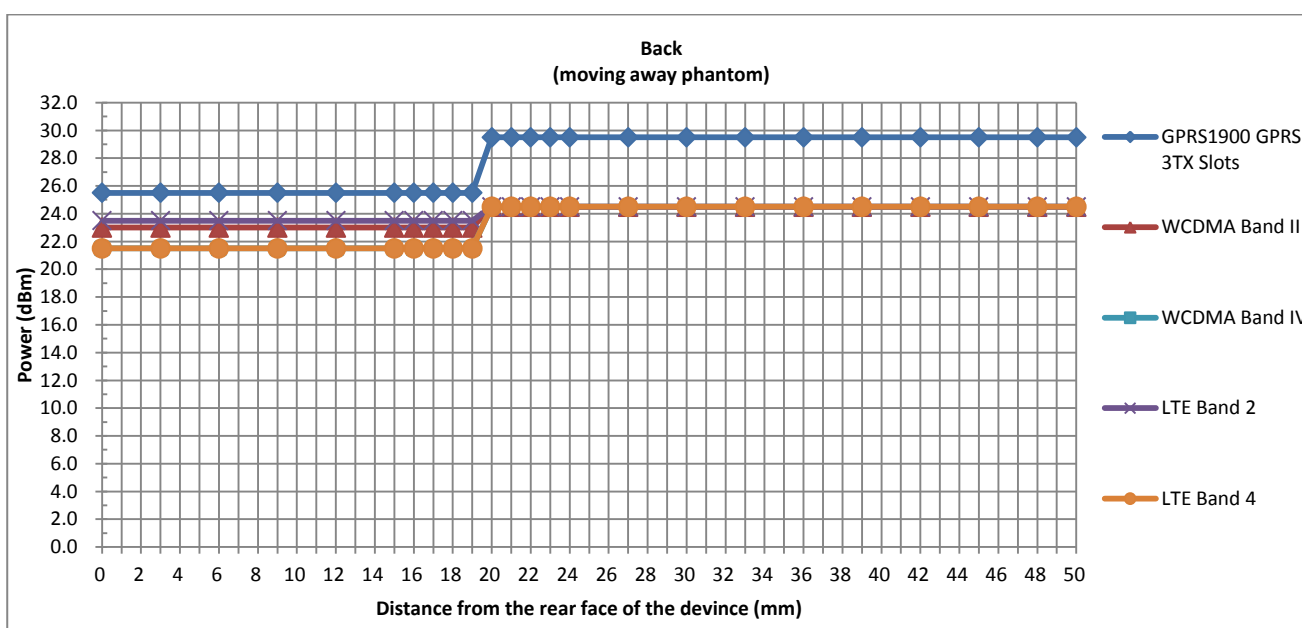
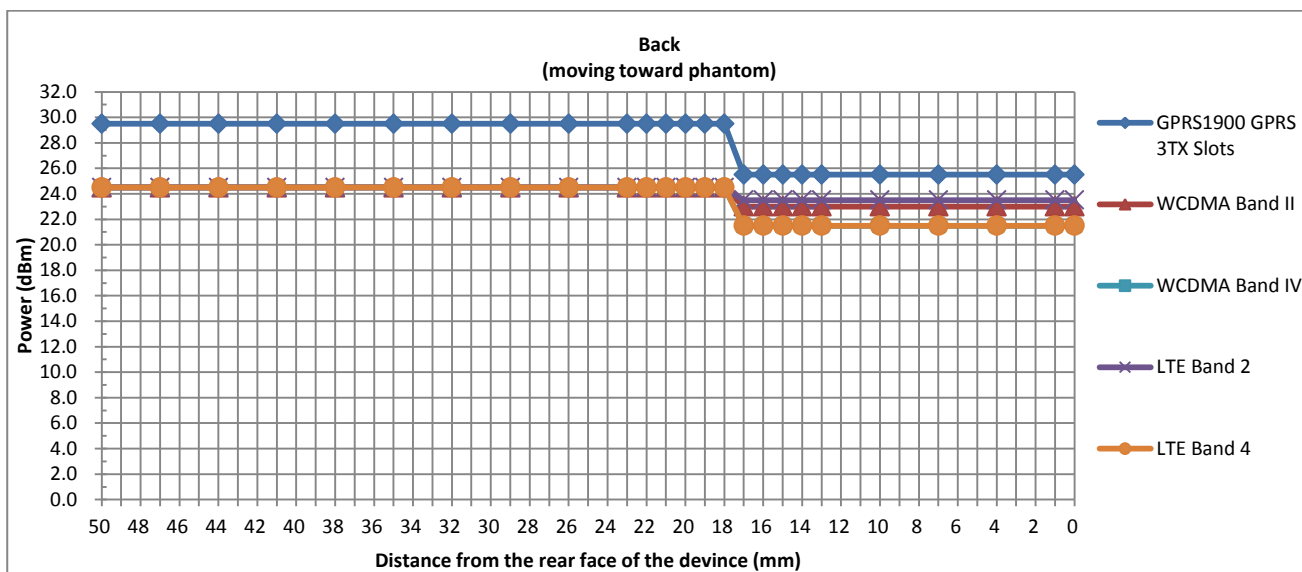


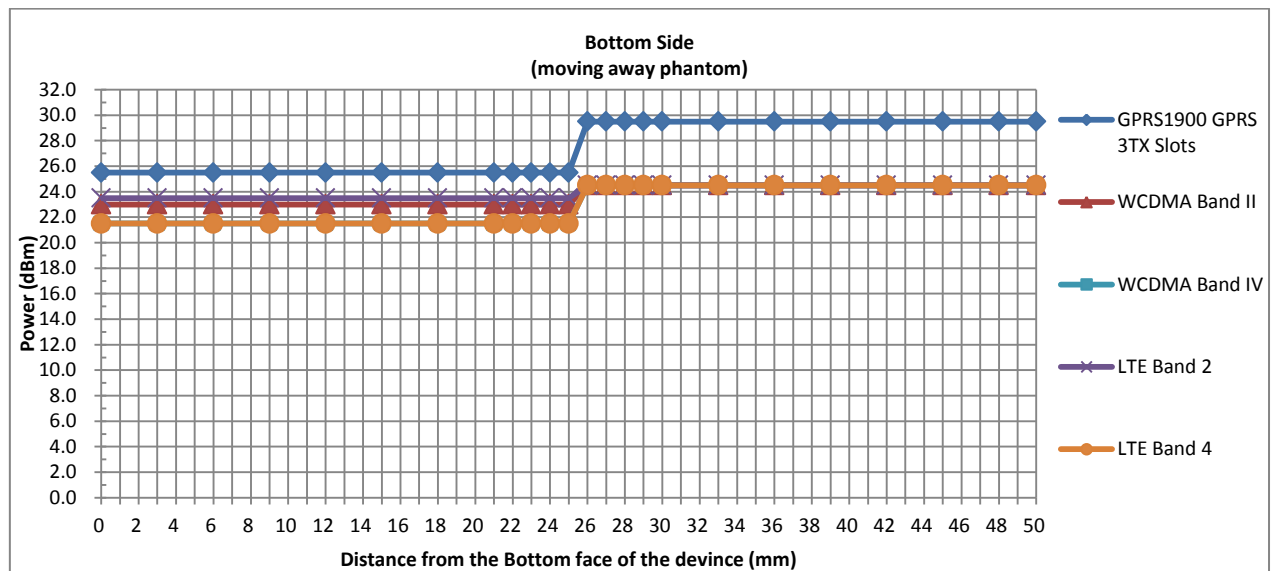
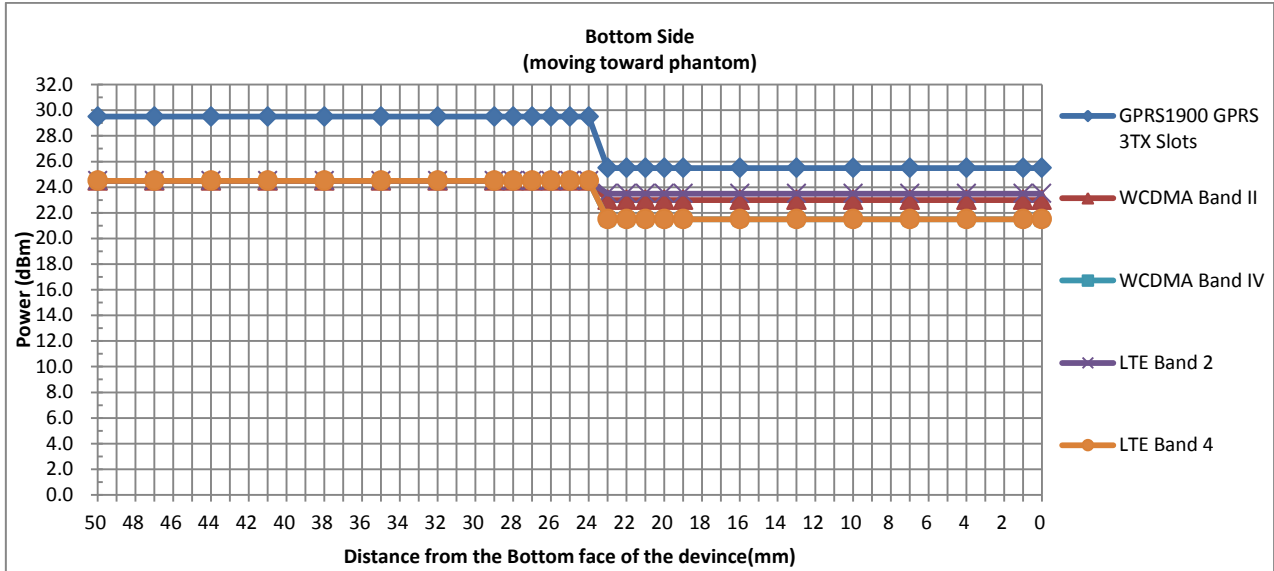
Bottom Antenna

Proximity Sensor Triggering Distance (mm)						
Position	Front		Back		Bottom Side	
	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away
Minimum	14	16	17	19	23	25

<Sensor Trigger Distance and Measured Power>



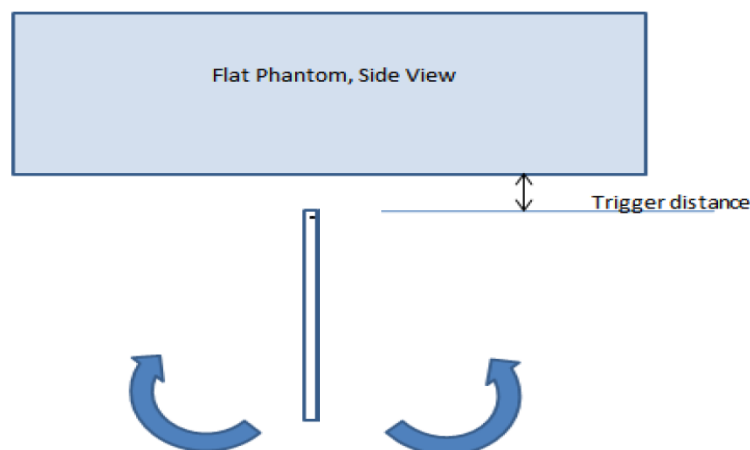




5.2 Tilt angle influences to proximity sensor triggering(Per KDB616217 §6.4)

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 top/bottom side for angles up to $\pm 45^\circ$. 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 to $\pm 45^\circ$.



Proximity Sensor Coverage Assesment(Top/Bottom Side)

Table: Summary of Tablet Tilt Angle Influence to Proximity Sensor Triggering (Top Side)

Main ant Band(MHz)	Minimum trigger distance at which power reduction was maintained over ±45°	Power Reduction Status											
		-45°	-35°	-25°	-15°	-5°	0°	5°	15°	25°	35°	45°	
GSM 1900	20mm	on	on	on	on	on	on	on	on	on	on	on	
WCDMA Band II	20mm	on	on	on	on	on	on	on	on	on	on	on	
WCDMA Band IV	20mm	on	on	on	on	on	on	on	on	on	on	on	
LTE Band 2	20mm	on	on	on	on	on	on	on	on	on	on	on	
LTE Band 4	20mm	on	on	on	on	on	on	on	on	on	on	on	
LTE Band 7	20mm	on	on	on	on	on	on	on	on	on	on	on	

Conclusion: As is shown from the validation data, it can be ensured that the proximity sensor can be valid triggered for the DUT tilt coverage exposure condition.

Table: Summary of Tablet Tilt Angle Influence to Proximity Sensor Triggering (Bottom Side)

Main ant Band(MHz)	Minimum trigger distance at which power reduction was maintained over ±45°	Power Reduction Status											
		-45°	-35°	-25°	-15°	-5°	0°	5°	15°	25°	35°	45°	
GSM 1900	23mm	on	on	on	on	on	on	on	on	on	on	on	
WCDMA Band II	23mm	on	on	on	on	on	on	on	on	on	on	on	
WCDMA Band IV	23mm	on	on	on	on	on	on	on	on	on	on	on	
LTE Band 2	23mm	on	on	on	on	on	on	on	on	on	on	on	
LTE Band 4	23mm	on	on	on	on	on	on	on	on	on	on	on	

Conclusion: As is shown from the validation data, it can be ensured that the proximity sensor can be valid triggered for the DUT tilt coverage exposure condition.

6. RF Exposure Limits

6.1 Uncontrolled Environment

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

6.2 Controlled Environment

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. The exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Limits for Occupational/Controlled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.4	8.0	20.0

Limits for General Population/Uncontrolled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.08	1.6	4.0

Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1gram of tissue defined as a tissue volume in the shape of a cube. SAR for hands, wrists, feet and ankles is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.

7. Specific Absorption Rate (SAR)

7.1 Introduction

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

7.2 SAR Definition

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). The equation description is as below:

$$SAR = \frac{d}{dt} \left(\frac{dW}{dm} \right) = \frac{d}{dt} \left(\frac{dW}{\rho dv} \right)$$

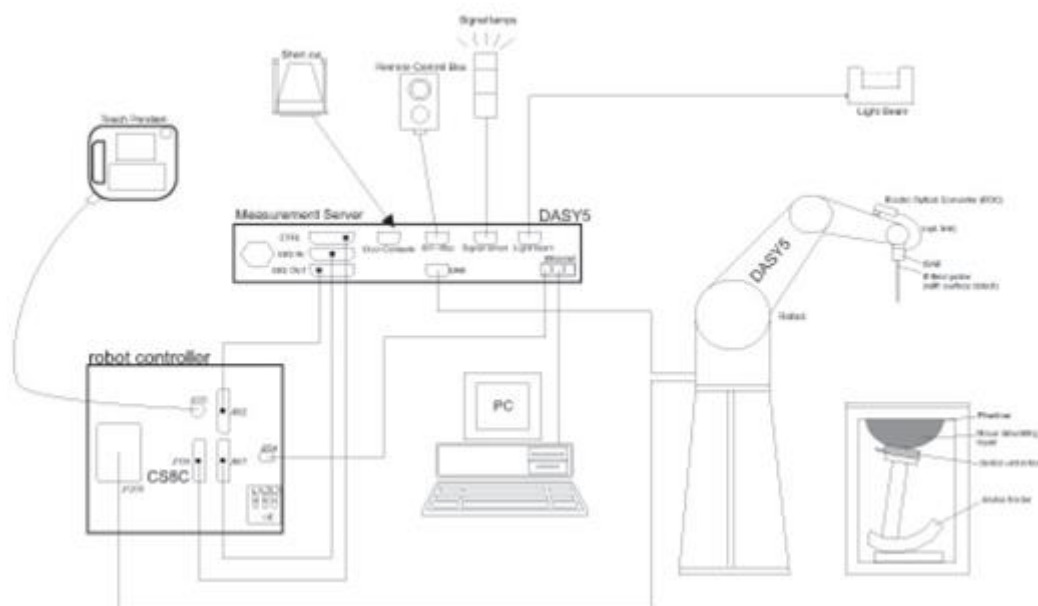
SAR is expressed in units of Watts per kilogram (W/kg)

$$SAR = \frac{\sigma |E|^2}{\rho}$$

Where: σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the RMS electrical field strength.

8. System Description and Setup

The DASY system used for performing compliance tests consists of the following items:



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP or Win7 and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

8.1 E-Field Probe

The SAR measurement is conducted with the dosimetric probe (manufactured by SPEAG). The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency. This probe has a built in optical surface detection system to prevent from collision with phantom.

<EX3DV4 Probe>

Construction	Symmetric design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	10 MHz – >6 GHz Linearity: ± 0.2 dB (30 MHz – 6 GHz)	
Directivity	± 0.3 dB in TSL (rotation around probe axis) ± 0.5 dB in TSL (rotation normal to probe axis)	
Dynamic Range	10 μ W/g – >100 mW/g Linearity: ± 0.2 dB (noise: typically <1 μ W/g)	
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 2.5 mm (body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm	

<ES3DV3 Probe>

Construction	Symmetric design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	10 MHz – 4 GHz; Linearity: ± 0.2 dB (30 MHz – 4 GHz)	
Directivity	± 0.2 dB in TSL (rotation around probe axis) ± 0.3 dB in TSL (rotation normal to probe axis)	
Dynamic Range	5 μ W/g – >100 mW/g; Linearity: ± 0.2 dB	
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 3.9 mm (body: 12 mm) Distance from probe tip to dipole centers: 3.0 mm	

8.2 Data Acquisition Electronics (DAE)

The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.

The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.



Photo of DAE

8.3 Phantom

<SAM Twin Phantom>

Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm	
Filling Volume	Approx. 25 liters	
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet	
Measurement Areas	Left Hand, Right Hand, Flat Phantom	

The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

<ELI Phantom>

Shell Thickness	2 ± 0.2 mm (sagging: <1%)	
Filling Volume	Approx. 30 liters	
Dimensions	Major ellipse axis: 600 mm Minor axis: 400 mm	

The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with standard and all known tissue simulating liquids.

8.4 Device Holder

<Mounting Device for Hand-Held Transmitter>

In combination with the Twin SAM V5.0/V5.0c or ELI phantoms, the Mounting Device for Hand-Held Transmitters enables rotation of the mounted transmitter device to specified spherical coordinates. At the heads, the rotation axis is at the ear opening. Transmitter devices can be easily and accurately positioned according to IEC 62209-1, IEEE 1528, FCC, or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat). And upgrade kit to Mounting Device to enable easy mounting of wider devices like big smart-phones, e-books, small tablets, etc. It holds devices with width up to 140 mm.



Mounting Device for Hand-Held Transmitters



Mounting Device Adaptor for Wide-Phones

<Mounting Device for Laptops and other Body-Worn Transmitters>

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the mounting device in place of the phone positioned. The extension is fully compatible with the SAM Twin and ELI phantoms.



Mounting Device for Laptops

9. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

- (a) For WWAN power measurement, use base station simulator to configure EUT WWAN transmission in conducted connection with RF cable, at maximum power in each supported wireless interface and frequency band.
- (b) Read the WWAN RF power level from the base station simulator.
- (c) For WLAN/BT power measurement, use engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power in each supported wireless interface and frequency band
- (d) Connect EUT RF port through RF cable to the power meter, and measure WLAN/BT output power

<SAR measurement>

- (a) Use base station simulator to configure EUT WWAN transmission in radiated connection, and engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power, in the highest power channel.
- (b) Place the EUT in the positions as Appendix D demonstrates.
- (c) Set scan area, grid size and other setting on the DASY software.
- (d) Measure SAR results for the highest power channel on each testing position.
- (e) Find out the largest SAR result on these testing positions of each band
- (f) Measure SAR results for other channels in worst SAR testing position if the reported SAR of highest power channel is larger than 0.8 W/kg

According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

- (a) Power reference measurement
- (b) Area scan
- (c) Zoom scan
- (d) Power drift measurement

9.1 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine (SEMCAD). The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

- (a) Extraction of the measured data (grid and values) from the Zoom Scan
- (b) Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
- (c) Generation of a high-resolution mesh within the measured volume
- (d) Interpolation of all measured values from the measurement grid to the high-resolution grid
- (e) Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
- (f) Calculation of the averaged SAR within masses of 1g and 10g

9.2 Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

9.3 Area Scan

The area scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum found in the scanned area, within a range of the global maximum. The range (in dB0) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan), if only one zoom scan follows the area scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of zoom scans has to be increased accordingly.

Area scan parameters extracted from FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5$ mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	$30^\circ \pm 1^\circ$	$20^\circ \pm 1^\circ$
Maximum area scan spatial resolution: Δx_{Area} , Δy_{Area}	≤ 2 GHz: ≤ 15 mm $2 - 3$ GHz: ≤ 12 mm	$3 - 4$ GHz: ≤ 12 mm $4 - 6$ GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be $\leq$ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

9.4 Zoom Scan

Zoom scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 gram and 10 gram of simulated tissue. The zoom scan measures points (refer to table below) within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the zoom scan evaluates the averaged SAR for 1 gram and 10 gram and displays these values next to the job's label.

Zoom scan parameters extracted from FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

			≤ 3 GHz	> 3 GHz
Maximum zoom scan spatial resolution: $\Delta x_{\text{Zoom}}, \Delta y_{\text{Zoom}}$			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{\text{Zoom}}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{\text{Zoom}}(1)$: between 1 st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{\text{Zoom}}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{\text{Zoom}}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm
Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.				
* When zoom scan is required and the <i>reported</i> SAR from the <i>area scan based 1-g SAR estimation</i> procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.				

9.5 Volume Scan Procedures

The volume scan is used to assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the EUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing. When all volume scan were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

9.6 Power Drift Monitoring

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In DASy measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drifts more than 5%, the SAR will be retested.



10. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1087	2019/3/27	2020/3/26
SPEAG	835MHz System Validation Kit	D835V2	4d151	2019/3/27	2020/3/26
SPEAG	1750MHz System Validation Kit	D1750V2	1090	2019/3/27	2020/3/26
SPEAG	1900MHz System Validation Kit	D1900V2	5d170	2019/3/26	2020/3/25
SPEAG	2450MHz System Validation Kit	D2450V2	908	2019/3/25	2020/3/24
SPEAG	2600MHz System Validation Kit	D2600V2	1061	2018/12/7	2019/12/6
SPEAG	5000MHz System Validation Kit	D5GHzV2	1006	2018/9/27	2019/9/26
SPEAG	Data Acquisition Electronics	DAE4	1210	2019/1/25	2020/1/24
SPEAG	Data Acquisition Electronics	DAE4	1338	2018/12/3	2019/12/2
SPEAG	Dosimetric E-Field Probe	ES3DV3	3293	2018/10/25	2019/10/24
SPEAG	Dosimetric E-Field Probe	EX3DV4	3954	2019/4/25	2020/4/24
SPEAG	SAM Twin Phantom	QD 000 P40 CB	TP-1503	NCR	NCR
SPEAG	SAM Twin Phantom	QD 000 P40 CB	TP-1842	NCR	NCR
SPEAG	SAM Twin Phantom	QD 000 P40 CB	TP-1697	NCR	NCR
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio Communication Analyzer	MT8821C	6201432831	2019/4/17	2020/4/16
Agilent	Wireless Communication Test Set	E5515C	MY52102706	2019/4/18	2020/4/17
Agilent	ENA Series Network Analyzer	E5071C	MY46111157	2019/4/18	2020/4/17
SPEAG	Dielectric Probe Kit	DAK-3.5	1138	2018/11/20	2019/11/19
Anritsu	Vector Signal Generator	MG3710A	6201682672	2019/1/14	2020/1/13
R&S	Power Meter	NRVD	102081	2018/8/20	2019/8/19
R&S	Power Sensor	NRV-Z5	100538	2018/8/20	2019/8/19
R&S	Power Sensor	NRV-Z5	100539	2018/8/20	2019/8/19
R&S	CBT BLUETOOTH TESTER	CBT	101641	2019/1/14	2020/1/13
EXA	Spectrum Analyzer	FSV7	101631	2019/1/14	2020/1/13
Testo	Hygrometer	608-H1	1241332126	2018/8/21	2019/8/20
FLUKE	DIGITAC THERMOMETER	51II	97240029	2018/8/8	2019/8/7
ARRA	Power Divider	A3200-2	N/A	Note	
MCL	Attenuation1	BW-S10W5+	N/A	Note	
MCL	Attenuation2	BW-S10W5+	N/A	Note	
MCL	Attenuation3	BW-S10W5+	N/A	Note	
BONN	POWER AMPLIFIER	BLMA 0830-3	087193A	Note	
BONN	POWER AMPLIFIER	BLMA 2060-2	087193B	Note	
Agilent	Dual Directional Coupler	778D	20500	Note	
Agilent	Dual Directional Coupler	11691D	MY48151020	Note	

Note: Prior to system verification and validation, the path loss from the signal generator to the system check source and the power meter, which includes the amplifier, cable, attenuator and directional coupler, was measured by the network analyzer. The reading of the power meter was offset by the path loss difference between the path to the power meter and the path to the system check source to monitor the actual power level fed to the system check source.

11. System Verification

11.1 Tissue Simulating Liquids

For the measurement of the field distribution inside the SAM phantom with DASY, the phantom must be filled with around 25 liters of homogeneous body tissue simulating liquid. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 10.1. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 10.2.

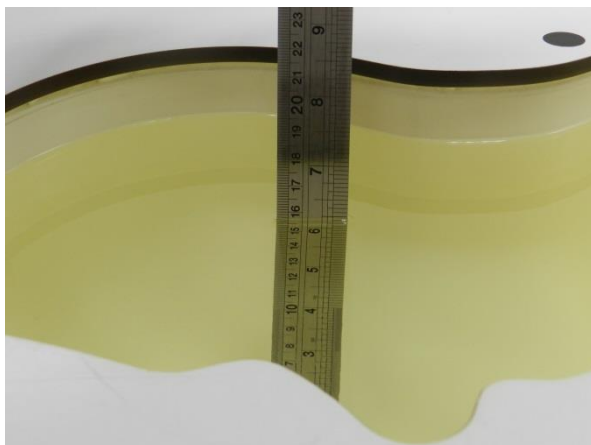


Fig 11.1.1Photo of Liquid Height for Head SAR



Fig 11.1.2 Photo of Liquid Height for Body SAR

11.2 Tissue Verification

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (ϵ_r)
For Head								
750	41.1	57.0	0.2	1.4	0.2	0	0.89	41.9
835	40.3	57.9	0.2	1.4	0.2	0	0.90	41.5
1800, 1900, 2000	55.2	0	0	0.3	0	44.5	1.40	40.0
2450	55.0	0	0	0	0	45.0	1.80	39.2
2600	54.8	0	0	0.1	0	45.1	1.96	39.0

Simulating Liquid for 5GHz, Manufactured by SPEAG

Ingredients	(% by weight)
Water	64~78%
Mineral oil	11~18%
Emulsifiers	9~15%
Additives and Salt	2~3%

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Tissue Type	Liquid Temp. (°C)	Conductivity (σ)	Permittivity (ϵ_r)	Conductivity Target (σ)	Permittivity Target (ϵ_r)	Delta (σ) (%)	Delta (ϵ_r) (%)	Limit (%)	Date
750	Head	22.7	0.881	40.783	0.89	41.90	-1.01	-2.67	±5	2019/6/28
835	Head	22.6	0.913	40.859	0.90	41.50	1.44	-1.54	±5	2019/6/29
1750	Head	22.8	1.378	41.731	1.37	40.10	0.58	4.07	±5	2019/7/5
1900	Head	22.7	1.440	39.914	1.40	40.00	2.86	-0.21	±5	2019/7/6
2450	Head	22.9	1.850	40.924	1.80	39.20	2.78	4.40	±5	2019/7/9
2600	Head	22.8	2.012	38.206	1.96	39.00	2.65	-2.04	±5	2019/7/2
5250	Head	22.7	4.555	36.804	4.71	35.90	-3.29	2.52	±5	2019/7/3
5600	Head	22.7	4.948	36.230	5.07	35.50	-2.41	2.06	±5	2019/7/3
5750	Head	22.7	5.125	35.988	5.22	35.40	-1.82	1.66	±5	2019/7/3

11.3 System Performance Check Results

Comparing to the original SAR value provided by SPEAG, the verification data should be within its specification of 10 %. Below table shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion and the plots can be referred to Appendix A of this report.

<1g SAR>

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)
2019/6/28	750	Head	250	1087	3293	1210	1.97	8.36	7.88	-5.74
2019/6/29	835	Head	250	4d151	3293	1210	2.23	9.30	8.92	-4.09
2019/7/5	1750	Head	250	1090	3293	1210	9.05	36.40	36.2	-0.55
2019/7/6	1900	Head	250	5d170	3293	1210	10.40	39.00	41.6	6.67
2019/7/9	2450	Head	250	908	3293	1210	13.60	52.80	54.4	3.03
2019/7/2	2600	Head	250	1061	3293	1210	13.90	57.70	55.6	-3.64
2019/7/3	5250	Head	100	1006	3954	1338	7.87	80.70	78.7	-2.48
2019/7/3	5600	Head	100	1006	3954	1338	8.40	83.30	84	0.84
2019/7/3	5750	Head	100	1006	3954	1338	7.97	80.40	79.7	-0.87

<10g SAR>

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 10g SAR (W/kg)	Targeted 10g SAR (W/kg)	Normalized 10g SAR (W/kg)	Deviation (%)
2019/7/3	5250	Head	100	1006	3954	1338	2.34	23.20	23.4	0.86
2019/7/3	5600	Head	100	1006	3954	1338	2.46	23.80	24.6	3.36

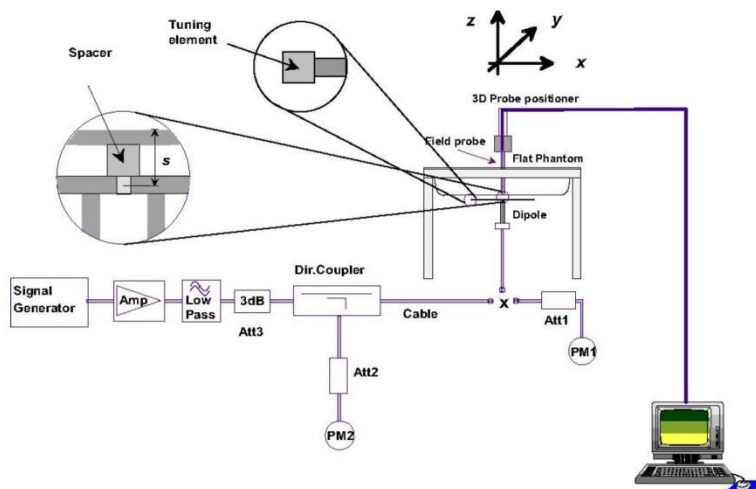


Fig 11.3.1 System Performance Check Setup



Fig 11.3.2 Setup Photo

12. RF Exposure Positions

12.1 Ear and handset reference point

Figure 12.1.1 shows the front, back, and side views of the SAM phantom. The center-of-mouth reference point is labeled "M," the left ear reference point (ERP) is marked "LE," and the right ERP is marked "RE." Each ERP is 15 mm along the B-M (back-mouth) line behind the entrance-to-ear-canal (EEC) point, as shown in Figure 12.1.2. The Reference Plane is defined as passing through the two ear reference points and point M. The line N-F (neck-front), also called the reference pivoting line, is normal to the Reference Plane and perpendicular to both a line passing through RE and LE and the B-M line (see Figure 12.1.3). Both N-F and B-M lines should be marked on the exterior of the phantom shell to facilitate handset positioning. Posterior to the N-F line the ear shape is a flat surface with 6 mm thickness at each ERP, and forward of the N-F line the ear is truncated, as illustrated in Figure 12.1.2. The ear truncation is introduced to preclude the ear lobe from interfering with handset tilt, which could lead to unstable positioning at the cheek.

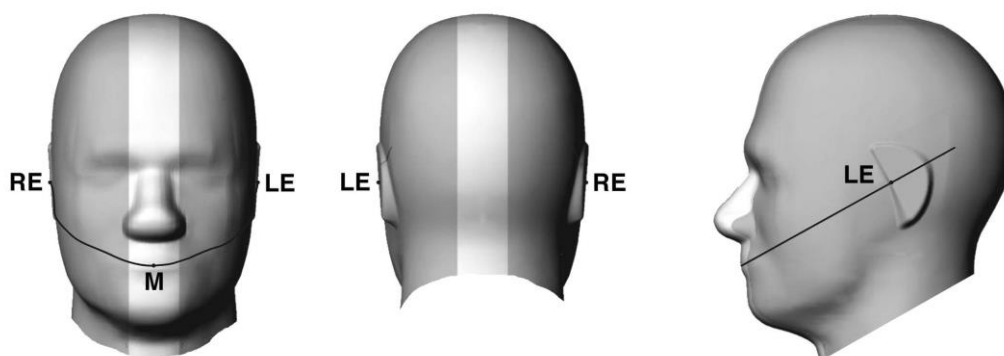


Fig 12.1.1 Front, back, and side views of SAM twin phantom

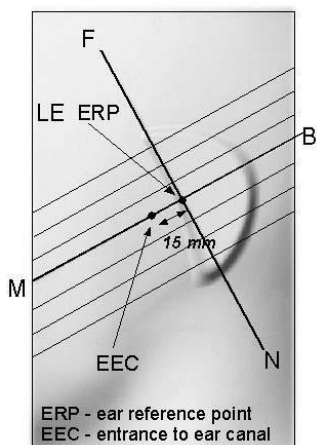


Fig 12.1.2 Close-up side view of phantom showing the ear region.

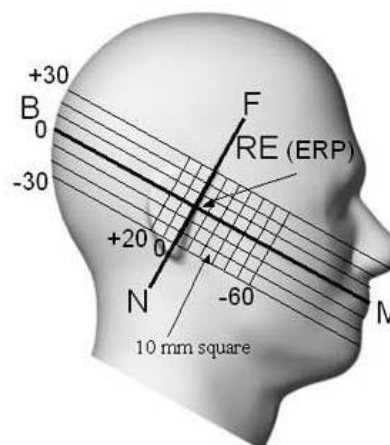


Fig 12.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

12.2 Definition of the cheek position

1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. Define two imaginary lines on the handset—the vertical centerline and the horizontal line. The vertical centerline passes through two points on the front side of the handset—the midpoint of the width w_t of the handset at the level of the acoustic output (point A in Figure 12.2.1 and Figure 12.2.2), and the midpoint of the width w_b of the bottom of the handset (point B). The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output (see Figure 12.2.1). The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset (see Figure 12.2.2), especially for clamshell handsets, handsets with flip covers, and other irregularly-shaped handsets.
3. Position the handset close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 12.2.3), such that the plane defined by the vertical centerline and the horizontal line of the handset is approximately parallel to the sagittal plane of the phantom.
4. Translate the handset towards the phantom along the line passing through RE and LE until handset point A touches the pinna at the ERP.
5. While maintaining the handset in this plane, rotate it around the LE-RE line until the vertical centerline is in the plane normal to the plane containing B-M and N-F lines, i.e., the Reference Plane.
6. Rotate the handset around the vertical centerline until the handset (horizontal line) is parallel to the N-F line.
7. While maintaining the vertical centerline in the Reference Plane, keeping point A on the line passing through RE and LE, and maintaining the handset contact with the pinna, rotate the handset about the N-F line until any point on the handset is in contact with a phantom point below the pinna on the cheek. See Figure 12.2.3. The actual rotation angles should be documented in the test report.

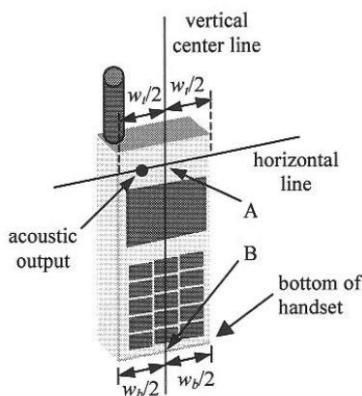


Fig 12.2.1 Handset vertical and horizontal reference lines—"fixed case"

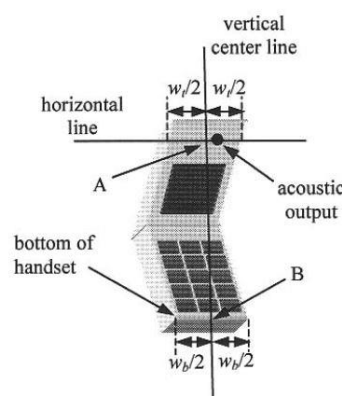


Fig 12.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

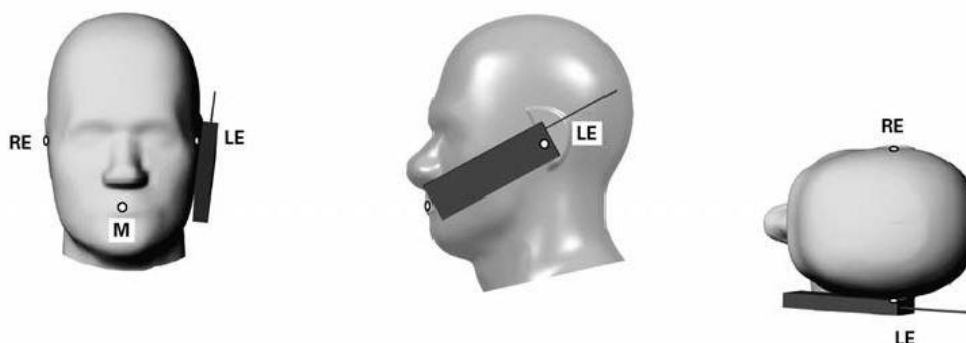


Fig 12.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

12.3 Definition of the tilt position

1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. While maintaining the orientation of the handset, move the handset away from the pinna along the line passing through RE and LE far enough to allow a rotation of the handset away from the cheek by 15° .
3. Rotate the handset around the horizontal line by 15° .
4. While maintaining the orientation of the handset, move the handset towards the phantom on the line passing through RE and LE until any part of the handset touches the ear. The tilt position is obtained when the contact point is on the pinna. See Figure 12.3.1. If contact occurs at any location other than the pinna, e.g., the antenna at the back of the phantom head, the angle of the handset should be reduced. In this case, the tilt position is obtained if any point on the handset is in contact with the pinna and a second point

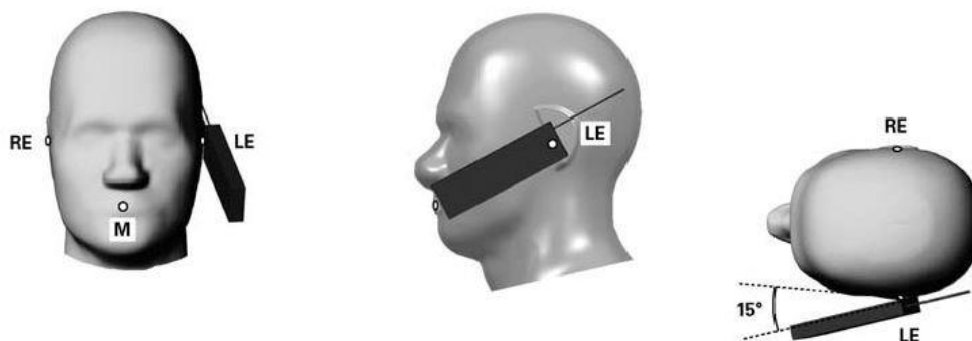


Fig 12.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

12.4 Body Worn Accessory

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 12.4). Per KDB648474 D04v01r03, body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB 447498 D01v06 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for body-worn accessory, measured without a headset connected to the handset is $> 1.2 \text{ W/kg}$, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a handset attached to the handset.

Accessories for body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are test with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-chip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

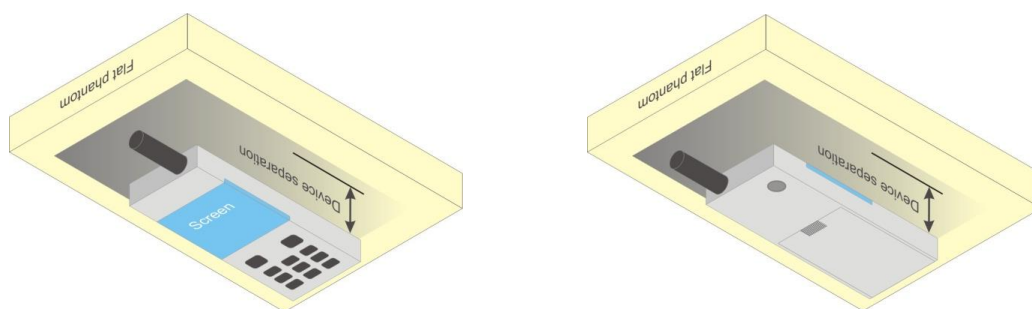


Fig 12.4.1 Body Worn Position



12.5 Product Specific 10g SAR Exposure

For smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear, According to KDB648474 D04v01r03, the following phablet procedures should be applied to evaluate SAR compliance for each applicable wireless modes and frequency band. Devices marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance

1. The normally required head and body-worn accessory SAR test procedures for handsets, including hotspot mode, must be applied.
2. The UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge, in direct contact with a flat phantom, for 10-g extremity SAR according to the body-equivalent tissue dielectric parameters in KDB 865664 to address interactive hand use exposure conditions.⁶ The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg.

12.6 Wireless Router

Some battery-operated handsets have the capability to transmit and receive user through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06 v02r01 where SAR test considerations for handsets ($L \times W \geq 9$ cm x 5 cm) are based on a composite test separation distance of 10mm from the front, back and edges of the device containing transmitting antennas within 2.5cm of their edges, determined from general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests.

When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WIFI transmitter and another licensed transmitter. Both transmitters often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions due to the limitations of the SAR assessment probes. Therefore, SAR must be evaluated for each frequency transmission and mode separately and spatially summed with the WIFI transmitter according to FCC KDB Publication 447498 D01v06 publication procedures. The "Portable Hotspot" feature on the handset was NOT activated during SAR assessments, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.

13. Conducted RF Output Power (Unit: dBm)

<GSM Conducted Power>

General Note:

1. Per KDB 447498 D01v06, the maximum output power channel is used for SAR testing and for further SAR test reduction.
2. Per KDB 941225 D01v03r01, for SAR test reduction for GSM / GPRS / EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. Therefore, the GPRS 3Tx slots for GSM850/GSM1900 are considered as the primary mode.
3. Other configurations of GSM / GPRS / EDGE are considered as secondary modes. The 3G SAR test reduction procedure is applied, when the maximum output power and tune-up tolerance specified for production units in a secondary mode is $\leq \frac{1}{4}$ dB higher than the primary mode, SAR measurement is not required for the secondary mode.

<WWAN Top/Bottom Antenna--Full Power Mode>

GSM850	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
Tx Channel	128	189	251		128	189	251	
Frequency (MHz)	824.2	836.4	848.8		824.2	836.4	848.8	
GSM 1 Tx slot	33.08	33.21	33.29	34.50	24.08	24.21	24.29	25.50
GPRS 1 Tx slot	33.06	33.20	33.27	34.50	24.06	24.20	24.27	25.50
GPRS 2 Tx slots	32.49	32.60	32.71	33.50	26.49	26.60	26.71	27.50
GPRS 3 Tx slots	31.15	31.19	31.17	32.00	26.89	26.93	26.91	27.74
GPRS 4 Tx slots	28.70	28.79	28.80	29.50	25.70	25.79	25.80	26.50
EDGE 1 Tx slot	27.52	27.61	27.69	28.50	18.52	18.61	18.69	19.50
EDGE 2 Tx slots	27.42	27.49	27.60	28.50	21.42	21.49	21.60	22.50
EDGE 3 Tx slots	26.37	26.34	26.38	27.50	22.11	22.08	22.12	23.24
EDGE 4 Tx slots	24.11	24.15	24.30	25.00	21.11	21.15	21.30	22.00
GSM1900	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
Tx Channel	512	661	810		512	661	810	
Frequency (MHz)	1850.2	1880	1909.8		1850.2	1880	1909.8	
GSM 1 Tx slot	29.89	29.85	29.66	30.00	20.89	20.85	20.66	21.00
GPRS 1 Tx slot	29.87	29.84	29.64	30.00	20.87	20.84	20.64	21.00
GPRS 2 Tx slots	29.41	29.36	29.17	30.00	23.41	23.36	23.17	24.00
GPRS 3 Tx slots	28.81	28.76	28.53	29.50	24.55	24.50	24.27	25.24
GPRS 4 Tx slots	26.77	26.78	26.57	27.50	23.77	23.78	23.57	24.50
EDGE 1 Tx slot	26.50	26.48	26.50	27.00	17.50	17.48	17.50	18.00
EDGE 2 Tx slots	26.46	26.40	26.43	27.00	20.46	20.40	20.43	21.00
EDGE 3 Tx slots	25.73	25.58	25.58	26.50	21.47	21.32	21.32	22.24
EDGE 4 Tx slots	23.58	23.51	23.55	24.50	20.58	20.51	20.55	21.50

Remark: The frame-averaged power is linearly scaled the maximum burst averaged power over 8 time slots.

The calculated method are shown as below:

Frame-averaged power = Maximum burst averaged power (1 Tx Slot) - 9 dB

Frame-averaged power = Maximum burst averaged power (2 Tx Slots) - 6 dB

Frame-averaged power = Maximum burst averaged power (3 Tx Slots) - 4.26 dB

Frame-averaged power = Maximum burst averaged power (4 Tx Slots) - 3 dB

**<WWAN Top/Bottom Antenna --Reduced Power for Receiver On/P-Sensor
On/Hotspot On/Handheld On>**

GSM1900 Tx Channel	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
	512	661	810		512	661	810	
Frequency (MHz)	1850.2	1880	1909.8		1850.2	1880	1909.8	
GSM 1 Tx slot	29.89	29.85	29.66	30.00	20.89	20.85	20.66	21.00
GPRS 1 Tx slot	29.87	29.84	29.64	30.00	20.87	20.84	20.64	21.00
GPRS 2 Tx slots	26.68	26.81	26.70	27.00	20.68	20.81	20.70	21.00
GPRS 3 Tx slots	25.20	25.10	25.03	25.50	20.94	20.84	20.77	21.24
GPRS 4 Tx slots	23.47	23.46	23.51	24.00	20.47	20.46	20.51	21.00
EDGE 1 Tx slot	26.48	26.46	26.49	27.00	17.48	17.46	17.49	18.00
EDGE 2 Tx slots	26.45	26.35	26.41	27.00	20.45	20.35	20.41	21.00
EDGE 3 Tx slots	23.99	23.91	23.96	25.00	19.73	19.65	19.70	20.74
EDGE 4 Tx slots	22.00	21.82	21.91	23.00	19.00	18.82	18.91	20.00

Remark: The frame-averaged power is linearly scaled the maximum burst averaged power over 8 time slots.

The calculated method are shown as below:

Frame-averaged power = Maximum burst averaged power (1 Tx Slot) - 9 dB

Frame-averaged power = Maximum burst averaged power (2 Tx Slots) - 6 dB

Frame-averaged power = Maximum burst averaged power (3 Tx Slots) - 4.26 dB

Frame-averaged power = Maximum burst averaged power (4 Tx Slots) - 3 dB

<WCDMA Conducted Power>

1. The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.
2. The procedures in KDB 941225 D01v03r01 are applied for 3GPP Rel. 6 HSPA to configure the device in the required sub-test mode(s) to determine SAR test exclusion.
3. For DC-HSDPA, the device was configured according to the H-Set 12, Fixed Reference Channel (FRC) configuration in Table C.8.1.12 of 3GPP TS 34.121-1, with the primary and the secondary serving HS-DSCH Cell enabled during the power measurement.

A summary of these settings are illustrated below:

HSDPA Setup Configuration:

- a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting:
 - i. Set Gain Factors (β_c and β_d) and parameters were set according to each
 - ii. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
 - iii. Set RMC 12.2Kbps + HSDPA mode.
 - iv. Set Cell Power = -86 dBm
 - v. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
 - vi. Select HSDPA Uplink Parameters
 - vii. Set Delta ACK, Delta NACK and Delta CQI = 8
 - viii. Set Ack-Nack Repetition Factor to 3
 - ix. Set CQI Feedback Cycle (k) to 4 ms
 - x. Set CQI Repetition Factor to 2
 - xi. Power Ctrl Mode = All Up bits
- d. The transmitted maximum output power was recorded.

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs} (Note 1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5
Note 1: Δ_{ACK}, Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$. Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and $\Delta_{NACK} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$, and $\Delta_{CQI} = 24/15$ with $\beta_{hs} = 24/15 * \beta_c$. Note 3: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. For all other combinations of DPCCH, DPDCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases. Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$.							

Setup Configuration

HSUPA Setup Configuration:

- a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting * :
 - i. Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
 - ii. Set the Gain Factors (β_c and β_d) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.3, quoted from the TS 34.121
 - iii. Set Cell Power = -86 dBm
 - iv. Set Channel Type = 12.2k + HSPA
 - v. Set UE Target Power
 - vi. Power Ctrl Mode= Alternating bits
 - vii. Set and observe the E-TFCI
 - viii. Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1, and other subtest's E-TFCI
- d. The transmitted maximum output power was recorded.

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note 1)	β_{ec}	β_{ed} (Note 4) (Note 5)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2) (Note 6)	AG Index (Note 5)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/25	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	$\beta_{ed1}: 47/15$ $\beta_{ed2}: 47/15$	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15	0	-	-	5/15	5/15	47/15	4	1	1.0	0.0	12	67

Note 1: For sub-test 1 to 4, Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$. For sub-test 5, Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 5/15$ with $\beta_{hs} = 5/15 * \beta_c$.

Note 2: CM = 1 for $\beta_d/\beta_c = 12/15$, $\beta_{hs}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 10/15$ and $\beta_d = 15/15$.

Note 4: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 5: β_{ed} can not be set directly; it is set by Absolute Grant Value.

Note 6: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

Setup Configuration

DC-HSDPA 3GPP release 8 Setup Configuration:

- a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration below
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting:
 - i. Set RMC 12.2Kbps + HSDPA mode.
 - ii. Set Cell Power = -25 dBm
 - iii. Set HS-DSCH Configuration Type to FRC (H-set 12, QPSK)
 - iv. Select HSDPA Uplink Parameters
 - v. Set Gain Factors (β_c and β_d) and parameters were set according to each Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
 - a). Subtest 1: $\beta_c/\beta_d=2/15$
 - b). Subtest 2: $\beta_c/\beta_d=12/15$
 - c). Subtest 3: $\beta_c/\beta_d=15/8$
 - d). Subtest 4: $\beta_c/\beta_d=15/4$
 - vi. Set Delta ACK, Delta NACK and Delta CQI = 8
 - vii. Set Ack-Nack Repetition Factor to 3
 - viii. Set CQI Feedback Cycle (k) to 4 ms
 - ix. Set CQI Repetition Factor to 2
 - x. Power Ctrl Mode = All Up bits
- d. The transmitted maximum output power was recorded.

The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification. A summary of these settings are illustrated below:

C.8.1.12 Fixed Reference Channel Definition H-Set 12

Table C.8.1.12: Fixed Reference Channel H-Set 12

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table.		
Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

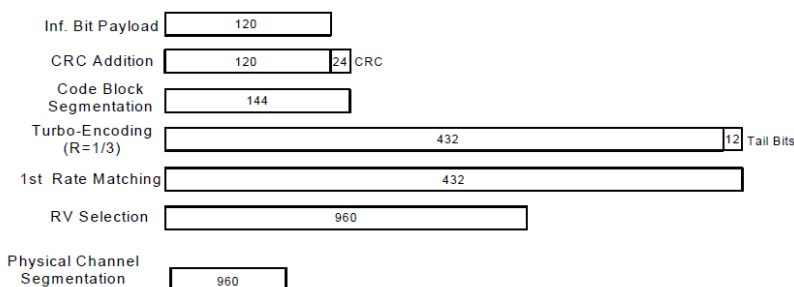


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

Setup Configuration



<WCDMA Conducted Power>

General 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 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 to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA, and according to the following RF output power, the output power results of the secondary modes (HSDPA / HSUPA / DC-HSDPA) are less than $\frac{1}{4}$ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA.

<WWAN Top/Bottom Antenna--Full Power Mode>

Band		WCDMA Band II			Tune-up Limit (dBm)	WCDMA Band IV			Tune-up Limit (dBm)	WCDMA Band V			Tune-up Limit (dBm)
Tx Channel		9262	9400	9538		1312	1413	1513		4132	4182	4233	
Rx Channel		9662	9800	9938		1537	1638	1738		4357	4407	4458	
Frequency (MHz)		1852.4	1880	1907.6		1712.4	1732.6	1752.6		826.4	836.4	846.6	
3GPP Rel 99	AMR 12.2Kbps	23.89	23.95	24.01	24.50	23.70	23.74	23.78	24.50	23.74	23.80	23.91	24.50
3GPP Rel 99	RMC 12.2Kbps	23.90	23.97	24.03	24.50	23.72	23.75	23.79	24.50	23.75	23.81	23.93	24.50
3GPP Rel 6	HSDPA Subtest-1	22.78	23.10	22.98	23.50	22.74	22.89	22.97	23.50	22.89	22.94	22.92	23.50
3GPP Rel 6	HSDPA Subtest-2	22.84	23.11	23.04	23.50	22.83	22.92	23.01	23.50	22.88	22.93	22.95	23.50
3GPP Rel 6	HSDPA Subtest-3	22.44	22.60	22.49	23.00	22.35	22.42	22.49	23.00	22.40	22.44	22.40	23.00
3GPP Rel 6	HSDPA Subtest-4	22.42	22.66	22.51	23.00	22.33	22.40	22.46	23.00	22.32	22.46	22.43	23.00
3GPP Rel 8	DC-HSDPA Subtest-1	22.75	23.06	22.96	23.50	22.72	22.86	22.92	23.50	22.86	22.92	22.87	23.50
3GPP Rel 8	DC-HSDPA Subtest-2	22.81	23.07	23.02	23.50	22.81	22.89	22.96	23.50	22.85	22.91	22.90	23.50
3GPP Rel 8	DC-HSDPA Subtest-3	22.41	22.56	22.47	23.00	22.33	22.39	22.44	23.00	22.37	22.42	22.35	23.00
3GPP Rel 8	DC-HSDPA Subtest-4	22.39	22.62	22.49	23.00	22.31	22.37	22.41	23.00	22.29	22.44	22.38	23.00
3GPP Rel 6	HSUPA Subtest-1	22.95	23.18	23.07	23.50	22.84	22.99	23.08	23.50	22.96	22.94	22.81	23.50
3GPP Rel 6	HSUPA Subtest-2	20.99	21.15	21.08	21.50	20.87	21.00	21.06	21.50	21.00	20.77	20.82	21.50
3GPP Rel 6	HSUPA Subtest-3	22.00	22.17	22.10	22.50	21.88	22.02	22.13	22.50	21.99	21.81	21.82	22.50
3GPP Rel 6	HSUPA Subtest-4	21.03	21.16	21.11	21.50	20.88	20.98	21.08	21.50	20.87	20.85	20.84	21.50
3GPP Rel 6	HSUPA Subtest-5	23.01	23.21	23.11	23.50	22.93	23.03	23.03	23.50	22.90	22.90	22.90	23.50



<WWAN Top Antenna --Reduced Power for Receiver On>

Band		WCDMA Band II			Tune-up Limit (dBm)	WCDMA Band IV			Tune-up Limit (dBm)
Tx Channel		9262	9400	9538		1312	1413	1513	
Rx Channel		9662	9800	9938		1537	1638	1738	
Frequency (MHz)		1852.4	1880	1907.6		1712.4	1732.6	1752.6	
3GPP Rel 99	AMR 12.2Kbps	20.60	20.71	20.75	21.00	20.91	21.05	21.08	21.50
3GPP Rel 99	RMC 12.2Kbps	20.61	20.75	20.79	21.00	20.95	21.07	21.09	21.50
3GPP Rel 6	HSDPA Subtest-1	19.64	19.84	19.79	20.00	20.09	20.20	20.26	20.50
3GPP Rel 6	HSDPA Subtest-2	19.68	19.88	19.80	20.00	20.08	20.23	20.28	20.50
3GPP Rel 6	HSDPA Subtest-3	19.17	19.39	19.29	19.50	19.60	19.71	19.75	20.00
3GPP Rel 6	HSDPA Subtest-4	19.18	19.36	18.89	19.50	19.59	19.69	19.73	20.00
3GPP Rel 8	DC-HSDPA Subtest-1	19.58	19.78	19.75	20.00	20.01	20.02	20.19	20.50
3GPP Rel 8	DC-HSDPA Subtest-2	19.61	19.81	19.81	20.00	20.19	20.12	20.15	20.50
3GPP Rel 8	DC-HSDPA Subtest-3	19.05	19.32	19.23	19.50	19.58	19.68	19.71	20.00
3GPP Rel 8	DC-HSDPA Subtest-4	19.12	19.31	19.15	19.50	19.49	19.58	19.68	20.00
3GPP Rel 6	HSUPA Subtest-1	19.58	19.84	19.75	20.00	20.05	20.19	20.18	20.50
3GPP Rel 6	HSUPA Subtest-2	17.60	17.80	17.69	18.00	18.06	18.16	18.20	18.50
3GPP Rel 6	HSUPA Subtest-3	18.65	18.87	18.81	19.00	19.06	19.21	19.22	19.50
3GPP Rel 6	HSUPA Subtest-4	17.59	17.79	17.76	18.00	18.03	18.16	18.18	18.50
3GPP Rel 6	HSUPA Subtest-5	19.70	19.80	19.80	20.00	20.00	20.20	20.20	20.50

<WWAN Top Antenna --Reduced Power for P-Sensor On/Hotspot On/Handheld On>

Band		WCDMA Band II			Tune-up Limit (dBm)	WCDMA Band IV			Tune-up Limit (dBm)
Tx Channel		9262	9400	9538		1312	1413	1513	
Rx Channel		9662	9800	9938		1537	1638	1738	
Frequency (MHz)		1852.4	1880	1907.6		1712.4	1732.6	1752.6	
3GPP Rel 99	AMR 12.2Kbps	21.40	21.45	21.47	22.00	19.71	19.80	19.82	20.50
3GPP Rel 99	RMC 12.2Kbps	21.41	21.47	21.48	22.00	19.75	19.82	19.83	20.50
3GPP Rel 6	HSDPA Subtest-1	20.34	20.45	20.46	21.00	18.73	18.76	18.79	19.50
3GPP Rel 6	HSDPA Subtest-2	20.42	20.49	20.48	21.00	18.69	18.80	18.80	19.50
3GPP Rel 6	HSDPA Subtest-3	19.94	19.97	20.01	20.50	18.19	18.30	18.30	19.00
3GPP Rel 6	HSDPA Subtest-4	19.93	19.97	19.96	20.50	18.25	18.30	18.30	19.00
3GPP Rel 8	DC-HSDPA Subtest-1	20.31	20.41	20.38	21.00	18.75	18.72	18.79	19.50
3GPP Rel 8	DC-HSDPA Subtest-2	20.38	20.43	20.41	21.00	18.71	18.68	18.71	19.50
3GPP Rel 8	DC-HSDPA Subtest-3	19.78	19.87	20.12	20.50	18.25	18.12	18.25	19.00
3GPP Rel 8	DC-HSDPA Subtest-4	19.85	19.86	19.98	20.50	18.12	18.28	18.26	19.00
3GPP Rel 6	HSUPA Subtest-1	20.34	20.42	20.44	21.00	18.67	18.72	18.78	19.50
3GPP Rel 6	HSUPA Subtest-2	18.31	18.46	18.41	19.00	16.64	16.69	16.70	17.50
3GPP Rel 6	HSUPA Subtest-3	19.41	19.44	19.37	20.00	17.58	17.68	17.73	18.50
3GPP Rel 6	HSUPA Subtest-4	18.32	18.39	18.40	19.00	16.65	16.72	16.75	17.50
3GPP Rel 6	HSUPA Subtest-5	20.40	20.40	20.40	21.00	18.70	18.70	18.70	19.50



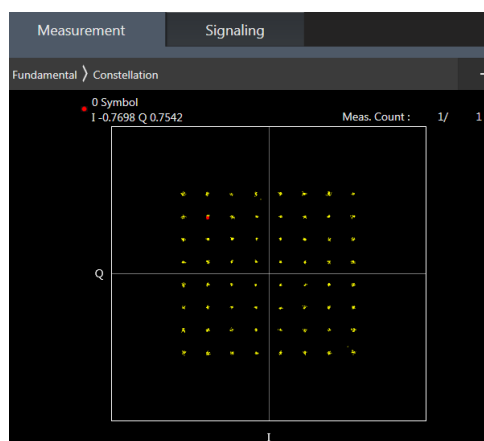
**<WWAN Bottom Antenna -- Reduced Power for P-Sensor On/Hotspot
On/Handheld On>**

Band		WCDMA Band II			Tune-up Limit (dBm)	WCDMA Band IV			Tune-up Limit (dBm)
Tx Channel		9262	9400	9538		1312	1413	1513	
Rx Channel		9662	9800	9938		1537	1638	1738	
Frequency (MHz)		1852.4	1880	1907.6		1712.4	1732.6	1752.6	
3GPP Rel 99	AMR 12.2Kbps	22.51	22.72	22.71	23.00	20.88	21.04	21.03	21.50
3GPP Rel 99	RMC 12.2Kbps	22.56	22.73	22.74	23.00	20.95	21.05	21.07	21.50
3GPP Rel 6	HSDPA Subtest-1	21.78	21.88	21.77	22.00	19.11	19.24	19.24	20.50
3GPP Rel 6	HSDPA Subtest-2	21.80	21.89	21.82	22.00	19.17	19.24	19.28	20.50
3GPP Rel 6	HSDPA Subtest-3	21.38	21.26	21.28	21.50	18.61	18.64	18.58	20.00
3GPP Rel 6	HSDPA Subtest-4	21.26	21.24	21.30	21.50	18.61	18.70	18.60	20.00
3GPP Rel 8	DC-HSDPA Subtest-1	21.71	21.78	21.75	22.00	19.15	19.18	19.18	20.50
3GPP Rel 8	DC-HSDPA Subtest-2	21.78	21.83	21.71	22.00	19.15	19.35	19.25	20.50
3GPP Rel 8	DC-HSDPA Subtest-3	21.36	21.18	21.18	21.50	18.60	18.63	18.42	20.00
3GPP Rel 8	DC-HSDPA Subtest-4	21.26	21.19	21.16	21.50	18.58	18.71	18.49	20.00
3GPP Rel 6	HSUPA Subtest-1	21.61	21.86	21.79	22.00	19.08	19.19	19.22	20.50
3GPP Rel 6	HSUPA Subtest-2	19.61	19.87	19.75	20.00	17.07	17.22	17.24	18.50
3GPP Rel 6	HSUPA Subtest-3	20.63	20.83	20.83	21.00	18.11	18.17	18.23	19.50
3GPP Rel 6	HSUPA Subtest-4	19.65	19.88	19.71	20.00	17.07	17.21	17.22	18.50
3GPP Rel 6	HSUPA Subtest-5	21.70	21.80	21.80	22.00	19.10	19.20	19.30	20.50

<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/64QAM 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 4 / B5 / B12 / B28 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 17 SAR test was covered by Band 12; 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 2017 TCB workshop, for 64QAM and 16QAM 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.



64QAM



16QAM



<WWAN Top/Bottom Antenna-- Full Power Mode>

<LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				18700	18900	19100		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	23.66	23.57	23.41	24.5	0
20	QPSK	1	49	23.53	23.50	23.39		
20	QPSK	1	99	23.55	23.42	23.28		
20	QPSK	50	0	22.64	22.62	22.49	23.5	1
20	QPSK	50	24	22.65	22.62	22.47		
20	QPSK	50	50	22.65	22.54	22.41		
20	QPSK	100	0	22.66	22.55	22.44	23.5	1
20	16QAM	1	0	22.93	22.83	22.65		
20	16QAM	1	49	22.84	22.69	22.69		
20	16QAM	1	99	22.89	22.64	22.56	22.5	2
20	16QAM	50	0	21.72	21.64	21.55		
20	16QAM	50	24	21.72	21.62	21.57		
20	16QAM	50	50	21.74	21.56	21.49	22.5	2
20	16QAM	100	0	21.77	21.53	21.51		
20	64QAM	1	0	21.88	21.83	21.68	22.5	2
20	64QAM	1	49	21.85	21.72	21.70		
20	64QAM	1	99	21.85	21.63	21.59		
20	64QAM	50	0	20.82	20.71	20.64	21.5	3
20	64QAM	50	24	20.81	20.72	20.65		
20	64QAM	50	50	20.81	20.63	20.59		
20	64QAM	100	0	20.88	20.65	20.61		
Channel				18675	18900	19125		
Frequency (MHz)				1857.5	1880	1902.5	Tune-up limit (dBm)	MPR (dB)
15	QPSK	1	0	23.58	23.53	23.44	24.5	0
15	QPSK	1	37	23.58	23.51	23.41		
15	QPSK	1	74	23.47	23.39	23.32		
15	QPSK	36	0	22.66	22.57	22.43	23.5	1
15	QPSK	36	20	22.66	22.60	22.46		
15	QPSK	36	39	22.58	22.51	22.44		
15	QPSK	75	0	22.60	22.57	22.43	23.5	1
15	16QAM	1	0	22.86	22.76	22.67		
15	16QAM	1	37	22.88	22.69	22.67		
15	16QAM	1	74	22.76	22.66	22.55	22.5	2
15	16QAM	36	0	21.61	21.59	21.52		
15	16QAM	36	20	21.67	21.59	21.54		
15	16QAM	36	39	21.66	21.55	21.47	22.5	2
15	16QAM	75	0	21.66	21.56	21.48		
15	64QAM	1	0	21.89	21.79	21.70		
15	64QAM	1	37	21.85	21.70	21.68	22.5	2
15	64QAM	1	74	21.78	21.61	21.57		
15	64QAM	36	0	20.80	20.69	20.62		
15	64QAM	36	20	20.84	20.70	20.65	21.5	3
15	64QAM	36	39	20.77	20.68	20.57		
15	64QAM	75	0	20.77	20.64	20.58		



Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	23.60	23.65	23.44	24.5	0
10	QPSK	1	25	23.62	23.55	23.41		
10	QPSK	1	49	23.60	23.53	23.34		
10	QPSK	25	0	22.67	22.61	22.48	23.5	1
10	QPSK	25	12	22.68	22.63	22.47		
10	QPSK	25	25	22.59	22.57	22.40		
10	QPSK	50	0	22.65	22.60	22.46	23.5	1
10	16QAM	1	0	22.92	22.84	22.71		
10	16QAM	1	25	22.86	22.75	22.70		
10	16QAM	1	49	22.86	22.74	22.58	22.5	2
10	16QAM	25	0	21.71	21.65	21.50		
10	16QAM	25	12	21.74	21.63	21.49		
10	16QAM	25	25	21.68	21.58	21.49	22.5	2
10	16QAM	50	0	21.70	21.60	21.51		
10	64QAM	1	0	21.96	21.86	21.70	22.5	2
10	64QAM	1	25	21.91	21.74	21.69		
10	64QAM	1	49	21.88	21.75	21.61		
10	64QAM	25	0	20.82	20.72	20.60	21.5	3
10	64QAM	25	12	20.84	20.72	20.61		
10	64QAM	25	25	20.77	20.67	20.59		
10	64QAM	50	0	20.80	20.71	20.60	21.5	3
Channel				18625	18900	19175		
Frequency (MHz)				1852.5	1880	1907.5	Tune-up limit (dBm)	MPR (dB)
5	QPSK	1	0	23.60	23.54	23.38		
5	QPSK	1	12	23.60	23.53	23.38	24.5	0
5	QPSK	1	24	23.56	23.46	23.33		
5	QPSK	12	0	22.63	22.60	22.44	23.5	1
5	QPSK	12	7	22.66	22.60	22.44		
5	QPSK	12	13	22.61	22.54	22.43		
5	QPSK	25	0	22.61	22.58	22.41	23.5	1
5	16QAM	1	0	22.85	22.73	22.65		
5	16QAM	1	12	22.86	22.72	22.64		
5	16QAM	1	24	22.78	22.68	22.56	22.5	2
5	16QAM	12	0	21.71	21.59	21.48		
5	16QAM	12	7	21.70	21.57	21.51		
5	16QAM	12	13	21.68	21.52	21.47	22.5	2
5	16QAM	25	0	21.68	21.58	21.50		
5	64QAM	1	0	21.84	21.71	21.67		
5	64QAM	1	12	21.88	21.77	21.66	22.5	2
5	64QAM	1	24	21.81	21.66	21.58		
5	64QAM	12	0	20.79	20.65	20.56		
5	64QAM	12	7	20.78	20.67	20.59	21.5	3
5	64QAM	12	13	20.75	20.62	20.54		
5	64QAM	25	0	20.79	20.69	20.59		



Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	23.55	23.57	23.50	24.5	0
3	QPSK	1	8	23.57	23.64	23.50		
3	QPSK	1	14	23.53	23.60	23.48		
3	QPSK	8	0	22.64	22.69	22.53	23.5	1
3	QPSK	8	4	22.68	22.73	22.56		
3	QPSK	8	7	22.62	22.66	22.55		
3	QPSK	15	0	22.65	22.70	22.58	23.5	1
3	16QAM	1	0	22.79	22.84	22.73		
3	16QAM	1	8	22.82	22.82	22.75		
3	16QAM	1	14	22.77	22.81	22.69	22.5	2
3	16QAM	8	0	21.67	21.70	21.61		
3	16QAM	8	4	21.72	21.71	21.66		
3	16QAM	8	7	21.69	21.66	21.61	22.5	2
3	16QAM	15	0	21.73	21.73	21.62		
3	64QAM	1	0	21.81	21.81	21.78	22.5	2
3	64QAM	1	8	21.85	21.87	21.75		
3	64QAM	1	14	21.84	21.81	21.73		
3	64QAM	8	0	20.75	20.77	20.69	21.5	3
3	64QAM	8	4	20.78	20.79	20.71		
3	64QAM	8	7	20.73	20.74	20.68		
3	64QAM	15	0	20.79	20.81	20.69	21.5	3
Channel				18607	18900	19193		
Frequency (MHz)				1850.7	1880	1909.3	Tune-up limit (dBm)	MPR (dB)
1.4	QPSK	1	0	23.38	23.43	23.27	24.5	0
1.4	QPSK	1	3	23.43	23.47	23.33		
1.4	QPSK	1	5	23.37	23.42	23.26		
1.4	QPSK	3	0	23.43	23.47	23.30		
1.4	QPSK	3	1	23.49	23.53	23.36		
1.4	QPSK	3	3	23.43	23.46	23.32		
1.4	QPSK	6	0	22.43	22.49	22.33	23.5	1
1.4	16QAM	1	0	22.59	22.61	22.51	23.5	1
1.4	16QAM	1	3	22.66	22.71	22.61		
1.4	16QAM	1	5	22.57	22.62	22.50		
1.4	16QAM	3	0	22.43	22.45	22.33		
1.4	16QAM	3	1	22.49	22.52	22.38		
1.4	16QAM	3	3	22.44	22.47	22.34	22.5	2
1.4	16QAM	6	0	21.55	21.55	21.43		
1.4	64QAM	1	0	21.64	21.64	21.52	22.5	2
1.4	64QAM	1	3	21.67	21.75	21.56		
1.4	64QAM	1	5	21.64	21.62	21.51		
1.4	64QAM	3	0	21.57	21.62	21.46		
1.4	64QAM	3	1	21.63	21.64	21.51		
1.4	64QAM	3	3	21.56	21.59	21.46		
1.4	64QAM	6	0	20.57	20.60	20.48	21.5	3



<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20050	20175	20300		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	23.34	23.55	23.50	24.5	0
20	QPSK	1	49	23.24	23.41	23.46		
20	QPSK	1	99	23.34	23.30	23.32		
20	QPSK	50	0	22.29	22.47	22.41	23.5	1
20	QPSK	50	24	22.38	22.48	22.41		
20	QPSK	50	50	22.45	22.42	22.47		
20	QPSK	100	0	22.39	22.44	22.41	23.5	1
20	16QAM	1	0	22.57	22.55	22.72		
20	16QAM	1	49	22.50	22.64	22.82		
20	16QAM	1	99	22.56	22.66	22.53	22.5	2
20	16QAM	50	0	21.39	21.53	21.52		
20	16QAM	50	24	21.49	21.54	21.53		
20	16QAM	50	50	21.51	21.47	21.55	22.5	2
20	16QAM	100	0	21.44	21.48	21.46		
20	64QAM	1	0	21.56	21.59	21.73		
20	64QAM	1	49	21.52	21.68	21.85	22.5	2
20	64QAM	1	99	21.59	21.64	21.58		
20	64QAM	50	0	20.51	20.61	20.61	21.5	3
20	64QAM	50	24	20.57	20.64	20.61		
20	64QAM	50	50	20.58	20.57	20.64		
20	64QAM	100	0	20.56	20.60	20.60		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	23.19	23.34	23.41	24.5	0
15	QPSK	1	37	23.23	23.37	23.42		
15	QPSK	1	74	23.21	23.30	23.34		
15	QPSK	36	0	22.26	22.42	22.43	23.5	1
15	QPSK	36	20	22.37	22.44	22.47		
15	QPSK	36	39	22.28	22.38	22.46		
15	QPSK	75	0	22.35	22.43	22.36	23.5	1
15	16QAM	1	0	22.55	22.53	22.75		
15	16QAM	1	37	22.52	22.63	22.75		
15	16QAM	1	74	22.48	22.67	22.53	22.5	2
15	16QAM	36	0	21.36	21.52	21.53		
15	16QAM	36	20	21.45	21.53	21.58		
15	16QAM	36	39	21.41	21.51	21.52	22.5	2
15	16QAM	75	0	21.45	21.49	21.48		
15	64QAM	1	0	21.89	21.79	21.70		
15	64QAM	1	37	21.85	21.70	21.68	22.5	2
15	64QAM	1	74	21.78	21.61	21.57		
15	64QAM	36	0	20.80	20.69	20.62		
15	64QAM	36	20	20.84	20.70	20.65	21.5	3
15	64QAM	36	39	20.77	20.68	20.57		
15	64QAM	75	0	20.77	20.64	20.58		



Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	23.18	23.44	23.51	24.5	0
10	QPSK	1	25	23.25	23.39	23.47		
10	QPSK	1	49	23.18	23.33	23.38		
10	QPSK	25	0	22.30	22.45	22.49	23.5	1
10	QPSK	25	12	22.29	22.45	22.52		
10	QPSK	25	25	22.25	22.37	22.45		
10	QPSK	50	0	22.26	22.42	22.49		
10	16QAM	1	0	22.56	22.65	22.81	23.5	1
10	16QAM	1	25	22.61	22.70	22.69		
10	16QAM	1	49	22.44	22.65	22.60		
10	16QAM	25	0	21.41	21.50	21.61	22.5	2
10	16QAM	25	12	21.39	21.49	21.56		
10	16QAM	25	25	21.29	21.50	21.53		
10	16QAM	50	0	21.35	21.48	21.57		
10	64QAM	1	0	21.96	21.86	21.70	22.5	2
10	64QAM	1	25	21.91	21.74	21.69		
10	64QAM	1	49	21.88	21.75	21.61		
10	64QAM	25	0	20.82	20.72	20.60	21.5	3
10	64QAM	25	12	20.84	20.72	20.61		
10	64QAM	25	25	20.77	20.67	20.59		
10	64QAM	50	0	20.80	20.71	20.60		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	23.11	23.38	23.45	24.5	0
5	QPSK	1	12	23.13	23.40	23.40		
5	QPSK	1	24	23.20	23.31	23.38		
5	QPSK	12	0	22.18	22.41	22.47	23.5	1
5	QPSK	12	7	22.29	22.42	22.50		
5	QPSK	12	13	22.25	22.37	22.43		
5	QPSK	25	0	22.25	22.39	22.46		
5	16QAM	1	0	22.49	22.61	22.68	23.5	1
5	16QAM	1	12	22.52	22.66	22.63		
5	16QAM	1	24	22.53	22.61	22.59		
5	16QAM	12	0	21.29	21.48	21.52	22.5	2
5	16QAM	12	7	21.42	21.53	21.54		
5	16QAM	12	13	21.37	21.50	21.51		
5	16QAM	25	0	21.36	21.45	21.50		
5	64QAM	1	0	21.84	21.71	21.67	22.5	2
5	64QAM	1	12	21.88	21.77	21.66		
5	64QAM	1	24	21.81	21.66	21.58		
5	64QAM	12	0	20.79	20.65	20.56	21.5	3
5	64QAM	12	7	20.78	20.67	20.59		
5	64QAM	12	13	20.75	20.62	20.54		
5	64QAM	25	0	20.79	20.69	20.59		



Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	23.12	23.36	23.42	24.5	0
3	QPSK	1	8	23.13	23.38	23.42		
3	QPSK	1	14	23.09	23.36	23.38		
3	QPSK	8	0	22.16	22.39	22.47	23.5	1
3	QPSK	8	4	22.17	22.44	22.48		
3	QPSK	8	7	22.13	22.41	22.44		
3	QPSK	15	0	22.15	22.39	22.45	23.5	1
3	16QAM	1	0	22.52	22.64	22.63		
3	16QAM	1	8	22.54	22.62	22.64		
3	16QAM	1	14	22.41	22.58	22.57	22.5	2
3	16QAM	8	0	21.35	21.51	21.51		
3	16QAM	8	4	21.32	21.55	21.55		
3	16QAM	8	7	21.30	21.51	21.48	22.5	2
3	16QAM	15	0	21.26	21.50	21.53		
3	64QAM	1	0	21.81	21.81	21.78	22.5	2
3	64QAM	1	8	21.85	21.87	21.75		
3	64QAM	1	14	21.84	21.81	21.73		
3	64QAM	8	0	20.75	20.77	20.69	21.5	3
3	64QAM	8	4	20.78	20.79	20.71		
3	64QAM	8	7	20.73	20.74	20.68		
3	64QAM	15	0	20.79	20.81	20.69	21.5	3
3	64QAM	15	0	20.79	20.81	20.69		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	23.19	23.42	23.50	24.5	0
1.4	QPSK	1	3	23.28	23.52	23.47		
1.4	QPSK	1	5	23.17	23.44	23.48		
1.4	QPSK	3	0	23.21	23.49	23.54		
1.4	QPSK	3	1	23.29	23.53	23.47		
1.4	QPSK	3	3	23.26	23.52	23.54		
1.4	QPSK	6	0	22.24	22.50	22.54	23.5	1
1.4	16QAM	1	0	22.57	22.70	22.71	23.5	1
1.4	16QAM	1	3	22.64	22.77	22.75		
1.4	16QAM	1	5	22.52	22.64	22.69		
1.4	16QAM	3	0	22.34	22.50	22.49		
1.4	16QAM	3	1	22.40	22.56	22.58		
1.4	16QAM	3	3	22.35	22.50	22.52	22.5	2
1.4	16QAM	6	0	21.43	21.63	21.66		
1.4	64QAM	1	0	21.64	21.64	21.52	22.5	2
1.4	64QAM	1	3	21.67	21.75	21.56		
1.4	64QAM	1	5	21.64	21.62	21.51		
1.4	64QAM	3	0	21.57	21.62	21.46		
1.4	64QAM	3	1	21.63	21.64	21.51		
1.4	64QAM	3	3	21.56	21.59	21.46		
1.4	64QAM	6	0	20.57	20.60	20.48	21.5	3



<LTE Band 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20450	20525	20600		
Frequency (MHz)				829	836.5	844		
10	QPSK	1	0	23.80	23.87	24.05	24.5	0
10	QPSK	1	25	23.88	23.89	24.00		
10	QPSK	1	49	23.87	23.88	24.00		
10	QPSK	25	0	22.93	22.97	23.10	23.5	1
10	QPSK	25	12	22.94	22.96	23.11		
10	QPSK	25	25	22.97	22.91	23.04		
10	QPSK	50	0	22.90	22.97	23.09	23.5	1
10	16QAM	1	0	23.14	23.20	23.37		
10	16QAM	1	25	23.22	23.19	23.32		
10	16QAM	1	49	23.20	23.19	23.37	22.5	2
10	16QAM	25	0	22.06	22.06	22.20		
10	16QAM	25	12	22.04	22.07	22.20		
10	16QAM	25	25	22.11	22.00	22.15	22.5	2
10	16QAM	50	0	22.02	22.04	22.19		
10	64QAM	1	0	22.04	22.10	22.27		
10	64QAM	1	25	22.16	22.12	22.25	22.5	2
10	64QAM	1	49	22.13	22.13	22.27		
10	64QAM	25	0	21.03	21.05	21.18	21.5	3
10	64QAM	25	12	21.04	21.05	21.20		
10	64QAM	25	25	21.09	21.01	21.10		
10	64QAM	50	0	20.99	21.04	21.15		
Channel				20425	20525	20625		
Frequency (MHz)				826.5	836.5	846.5	Tune-up limit (dBm)	MPR (dB)
5	QPSK	1	0	23.80	23.91	23.98	24.5	0
5	QPSK	1	12	23.80	23.87	23.86		
5	QPSK	1	24	23.85	23.93	24.00		
5	QPSK	12	0	22.84	22.94	23.01	23.5	1
5	QPSK	12	7	22.98	22.99	23.18		
5	QPSK	12	13	22.93	22.91	23.12		
5	QPSK	25	0	22.92	22.95	23.03	23.5	1
5	16QAM	1	0	23.14	23.23	23.26		
5	16QAM	1	12	23.11	23.18	23.39		
5	16QAM	1	24	23.20	23.22	23.35	22.5	2
5	16QAM	12	0	21.96	22.03	22.13		
5	16QAM	12	7	22.09	22.10	22.26		
5	16QAM	12	13	22.06	22.00	22.22	22.5	2
5	16QAM	25	0	22.06	22.05	22.13		
5	64QAM	1	0	22.03	22.11	22.18		
5	64QAM	1	12	22.03	22.04	22.31	22.5	2
5	64QAM	1	24	22.11	22.14	22.23		
5	64QAM	12	0	20.90	21.03	21.12		
5	64QAM	12	7	21.08	21.04	21.24	21.5	3
5	64QAM	12	13	21.03	20.97	21.20		
5	64QAM	25	0	21.04	21.05	21.11		



Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	23.82	23.65	23.85	24.5	0
3	QPSK	1	8	23.67	23.64	23.82		
3	QPSK	1	14	23.59	23.60	23.82		
3	QPSK	8	0	22.64	22.71	22.92	23.5	1
3	QPSK	8	4	22.66	22.72	22.94		
3	QPSK	8	7	22.64	22.65	22.87		
3	QPSK	15	0	22.62	22.71	22.90	23.5	1
3	16QAM	1	0	22.92	22.94	23.20		
3	16QAM	1	8	23.01	22.96	23.17		
3	16QAM	1	14	22.96	22.90	23.14	22.5	2
3	16QAM	8	0	21.71	21.86	22.07		
3	16QAM	8	4	21.76	21.86	22.08		
3	16QAM	8	7	21.71	21.79	22.02	22.5	2
3	16QAM	15	0	21.69	21.82	22.02		
3	64QAM	1	0	21.79	21.87	22.08	22.5	2
3	64QAM	1	8	21.76	21.84	22.09		
3	64QAM	1	14	21.75	21.79	22.05		
3	64QAM	8	0	20.71	20.80	21.02	21.5	3
3	64QAM	8	4	20.71	20.83	21.06		
3	64QAM	8	7	20.68	20.78	20.99		
3	64QAM	15	0	20.67	20.80	21.01	21.5	3
Channel				20407	20525	20643		
Frequency (MHz)				824.7	836.5	848.3	Tune-up limit (dBm)	MPR (dB)
1.4	QPSK	1	0	23.55	23.63	23.81		
1.4	QPSK	1	3	23.63	23.71	23.90	24.5	0
1.4	QPSK	1	5	23.53	23.61	23.80		
1.4	QPSK	3	0	23.60	23.69	23.89		
1.4	QPSK	3	1	23.64	23.71	23.90	24.5	0
1.4	QPSK	3	3	23.60	23.67	23.88		
1.4	QPSK	6	0	22.60	22.72	22.91		
1.4	QPSK	6	0	22.60	22.72	22.91	23.5	1
1.4	16QAM	1	0	22.85	22.97	23.11	23.5	1
1.4	16QAM	1	3	22.93	22.98	23.20		
1.4	16QAM	1	5	22.86	22.88	23.12		
1.4	16QAM	3	0	22.65	22.78	22.95	23.5	1
1.4	16QAM	3	1	22.72	22.80	22.98		
1.4	16QAM	3	3	22.67	22.71	22.91		
1.4	16QAM	6	0	21.73	21.88	22.04	22.5	2
1.4	64QAM	1	0	21.77	21.81	22.04	22.5	2
1.4	64QAM	1	3	21.87	21.86	22.09		
1.4	64QAM	1	5	21.72	21.81	22.06		
1.4	64QAM	3	0	21.73	21.75	21.96	22.5	2
1.4	64QAM	3	1	21.76	21.82	22.04		
1.4	64QAM	3	3	21.68	21.78	21.96		
1.4	64QAM	6	0	20.68	20.77	20.97	21.5	3



<LTE Band 7>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20850	21100	21350		
Frequency (MHz)				2510	2535	2560		
20	QPSK	1	0	23.80	23.84	23.87	24.5	0
20	QPSK	1	49	23.82	23.84	23.80		
20	QPSK	1	99	23.83	23.92	23.72		
20	QPSK	50	0	23.08	23.09	22.74	23.5	1
20	QPSK	50	24	22.93	22.92	22.79		
20	QPSK	50	50	22.85	22.94	22.80		
20	QPSK	100	0	22.84	22.92	22.76	23.5	1
20	16QAM	1	0	23.11	23.19	22.91		
20	16QAM	1	49	23.16	23.15	22.97		
20	16QAM	1	99	23.09	23.18	22.81	22.5	2
20	16QAM	50	0	22.07	22.00	21.82		
20	16QAM	50	24	22.11	22.01	21.87		
20	16QAM	50	50	22.04	22.03	21.87	22.5	2
20	16QAM	100	0	21.96	22.02	21.87		
20	64QAM	1	0	22.02	22.09	21.86		
20	64QAM	1	49	22.11	22.06	21.90	22.5	2
20	64QAM	1	99	22.20	22.10	21.75		
20	64QAM	50	0	21.04	20.99	20.83		
20	64QAM	50	24	21.11	21.00	20.86	21.5	3
20	64QAM	50	50	21.04	21.00	20.87		
20	64QAM	100	0	20.98	21.03	20.85		
Channel				20825	21100	21375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	23.81	23.81	23.63	24.5	0
15	QPSK	1	37	23.76	23.77	23.61		
15	QPSK	1	74	23.81	23.87	23.85		
15	QPSK	36	0	23.00	22.86	22.69	23.5	1
15	QPSK	36	20	23.03	22.87	22.70		
15	QPSK	36	39	23.07	22.86	22.70		
15	QPSK	75	0	23.00	22.86	22.68	23.5	1
15	16QAM	1	0	23.06	23.14	22.90		
15	16QAM	1	37	23.08	23.09	22.92		
15	16QAM	1	74	23.10	23.07	22.78	22.5	2
15	16QAM	36	0	21.99	21.96	21.78		
15	16QAM	36	20	22.06	21.98	21.79		
15	16QAM	36	39	22.07	21.95	21.79	22.5	2
15	16QAM	75	0	22.04	21.96	21.78		
15	64QAM	1	0	21.99	22.12	21.82		
15	64QAM	1	37	21.99	22.00	21.83	22.5	2
15	64QAM	1	74	22.21	22.05	22.00		
15	64QAM	36	0	20.96	20.96	20.77		
15	64QAM	36	20	21.01	20.99	20.81	21.5	3
15	64QAM	36	39	21.08	20.95	20.79		
15	64QAM	75	0	21.04	20.96	20.77		

Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	23.88	23.78	23.61	24.5	0
10	QPSK	1	25	23.88	23.79	23.60		
10	QPSK	1	49	23.85	23.83	23.43		
10	QPSK	25	0	22.96	22.79	22.63	23.5	1
10	QPSK	25	12	22.99	22.83	22.63		
10	QPSK	25	25	22.96	22.83	22.63		
10	QPSK	50	0	22.93	22.84	22.65	23.5	1
10	16QAM	1	0	23.07	23.07	22.84		
10	16QAM	1	25	23.07	23.07	22.86		
10	16QAM	1	49	23.20	23.06	22.85	22.5	2
10	16QAM	25	0	21.99	21.91	21.72		
10	16QAM	25	12	22.01	21.91	21.75		
10	16QAM	25	25	22.02	21.93	21.75	22.5	2
10	16QAM	50	0	22.02	21.92	21.72		
10	64QAM	1	0	21.94	22.01	21.72	22.5	2
10	64QAM	1	25	22.01	21.97	21.79		
10	64QAM	1	49	22.07	22.01	21.82		
10	64QAM	25	0	20.94	20.88	20.71	21.5	3
10	64QAM	25	12	21.01	20.91	20.75		
10	64QAM	25	25	21.01	20.92	20.71		
10	64QAM	50	0	20.96	20.89	20.71	21.5	3
Channel				20775	21100	21425		
Frequency (MHz)				2502.5	2535	2567.5	Tune-up limit (dBm)	MPR (dB)
5	QPSK	1	0	23.84	23.76	23.54		
5	QPSK	1	12	23.87	23.77	23.56	24.5	0
5	QPSK	1	24	23.91	23.78	23.59		
5	QPSK	12	0	22.88	22.78	22.61	23.5	1
5	QPSK	12	7	22.93	22.83	22.62		
5	QPSK	12	13	22.93	22.81	22.63		
5	QPSK	25	0	22.92	22.81	22.61	23.5	1
5	16QAM	1	0	23.04	23.04	22.82		
5	16QAM	1	12	23.03	23.09	22.88		
5	16QAM	1	24	23.01	23.02	22.88	22.5	2
5	16QAM	12	0	21.92	21.88	21.71		
5	16QAM	12	7	21.98	21.89	21.74		
5	16QAM	12	13	21.96	21.91	21.72	22.5	2
5	16QAM	25	0	21.94	21.87	21.71		
5	64QAM	1	0	21.98	21.95	21.76		
5	64QAM	1	12	21.97	21.96	21.77	22.5	2
5	64QAM	1	24	22.00	21.95	21.78		
5	64QAM	12	0	20.93	20.88	20.68		
5	64QAM	12	7	20.95	20.90	20.74	21.5	3
5	64QAM	12	13	20.93	20.86	20.71		
5	64QAM	25	0	20.97	20.89	20.72		



<LTE Band 12>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23060	23095	23130		
Frequency (MHz)				704	707.5	711		
10	QPSK	1	0	23.41	23.45	23.55	24.5	0
10	QPSK	1	25	23.46	23.57	23.63		
10	QPSK	1	49	23.57	23.61	23.43		
10	QPSK	25	0	22.66	22.63	22.58	23.5	1
10	QPSK	25	12	22.67	22.62	22.59		
10	QPSK	25	25	22.63	22.59	22.63		
10	QPSK	50	0	22.62	22.60	22.56	23.5	1
10	16QAM	1	0	22.72	22.64	22.89		
10	16QAM	1	25	22.57	22.87	22.91		
10	16QAM	1	49	22.86	22.94	22.98	22.5	2
10	16QAM	25	0	21.70	21.73	21.64		
10	16QAM	25	12	21.73	21.69	21.65		
10	16QAM	25	25	21.73	21.66	21.70	22.5	2
10	16QAM	50	0	21.71	21.70	21.62		
10	64QAM	1	0	21.62	21.95	21.72		
10	64QAM	1	25	21.65	21.78	21.82	22.5	2
10	64QAM	1	49	21.78	21.86	21.86		
10	64QAM	25	0	20.71	20.66	20.66		
10	64QAM	25	12	20.73	20.70	20.64	21.5	3
10	64QAM	25	25	20.72	20.65	20.71		
10	64QAM	50	0	20.70	20.66	20.60		
Channel				23035	23095	23155	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				701.5	707.5	713.5		
5	QPSK	1	0	23.44	23.58	23.58	24.5	0
5	QPSK	1	12	23.46	23.54	23.60		
5	QPSK	1	24	23.46	23.54	23.61		
5	QPSK	12	0	22.66	22.58	22.61	23.5	1
5	QPSK	12	7	22.68	22.61	22.63		
5	QPSK	12	13	22.67	22.57	22.57		
5	QPSK	25	0	22.67	22.59	22.60	23.5	1
5	16QAM	1	0	22.96	22.88	22.89		
5	16QAM	1	12	23.00	22.83	22.87		
5	16QAM	1	24	22.90	22.77	22.92	22.5	2
5	16QAM	12	0	21.76	21.69	21.69		
5	16QAM	12	7	21.79	21.69	21.71		
5	16QAM	12	13	21.72	21.65	21.70	22.5	2
5	16QAM	25	0	21.77	21.65	21.68		
5	64QAM	1	0	21.82	21.80	21.73		
5	64QAM	1	12	21.80	21.73	21.78	22.5	2
5	64QAM	1	24	21.65	21.70	21.80		
5	64QAM	12	0	20.73	20.63	20.66		
5	64QAM	12	7	20.76	20.66	20.72	21.5	3
5	64QAM	12	13	20.70	20.60	20.67		
5	64QAM	25	0	20.74	20.64	20.68		



Channel				23025	23095	23165	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				700.5	707.5	714.5		
3	QPSK	1	0	23.31	23.39	23.18	24.5	0
3	QPSK	1	8	22.99	23.40	23.36		
3	QPSK	1	14	22.95	23.37	23.32		
3	QPSK	8	0	22.50	22.42	22.40	23.5	1
3	QPSK	8	4	22.53	22.43	22.52		
3	QPSK	8	7	22.48	22.38	22.47		
3	QPSK	15	0	22.52	22.43	22.43	23.5	1
3	16QAM	1	0	22.58	22.68	22.65		
3	16QAM	1	8	22.70	22.69	22.78		
3	16QAM	1	14	22.66	22.64	22.69	22.5	2
3	16QAM	8	0	21.62	21.54	21.51		
3	16QAM	8	4	21.64	21.54	21.65		
3	16QAM	8	7	21.64	21.48	21.61	22.5	2
3	16QAM	15	0	21.60	21.50	21.51		
3	64QAM	1	0	21.82	21.80	21.73	22.5	2
3	64QAM	1	8	21.50	21.73	21.78		
3	64QAM	1	14	21.67	21.70	21.80		
3	64QAM	8	0	20.73	20.63	20.66	21.5	3
3	64QAM	8	4	20.76	20.66	20.72		
3	64QAM	8	7	20.70	20.60	20.67		
3	64QAM	15	0	20.74	20.64	20.68	21.5	3
Channel				23017	23095	23173		
Frequency (MHz)				699.7	707.5	715.3	Tune-up limit (dBm)	MPR (dB)
1.4	QPSK	1	0	23.45	23.46	23.42		
1.4	QPSK	1	3	23.35	23.43	23.30	24.5	0
1.4	QPSK	1	5	23.46	23.41	23.43		
1.4	QPSK	3	0	23.52	23.43	23.48		
1.4	QPSK	3	1	23.45	23.44	23.54	24.5	0
1.4	QPSK	3	3	23.47	23.47	23.47		
1.4	QPSK	6	0	22.54	22.45	22.47		
1.4	16QAM	1	0	22.83	22.35	22.73	23.5	1
1.4	16QAM	1	3	22.72	22.48	22.78		
1.4	16QAM	1	5	22.79	22.71	22.64		
1.4	16QAM	3	0	22.64	22.57	22.54	23.5	1
1.4	16QAM	3	1	22.61	22.21	22.58		
1.4	16QAM	3	3	22.55	22.20	22.47		
1.4	16QAM	6	0	21.70	21.63	21.62	22.5	2
1.4	64QAM	1	0	21.64	21.90	21.64	22.5	2
1.4	64QAM	1	3	21.65	21.76	21.66		
1.4	64QAM	1	5	21.48	21.45	21.56		
1.4	64QAM	3	0	21.55	21.56	21.56	22.5	2
1.4	64QAM	3	1	21.55	21.24	21.59		
1.4	64QAM	3	3	21.37	21.19	21.50		
1.4	64QAM	6	0	20.55	20.59	20.54	21.5	3



<LTE Band 17>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23780	23790	23800		
Frequency (MHz)				709	710	711		
10	QPSK	1	0	23.43	23.41	23.38	24.5	0
10	QPSK	1	25	23.39	23.46	23.38		
10	QPSK	1	49	23.31	23.31	23.38		
10	QPSK	25	0	22.45	22.43	22.40	23.5	1
10	QPSK	25	12	22.45	22.44	22.43		
10	QPSK	25	25	22.41	22.42	22.37		
10	QPSK	50	0	22.42	22.39	22.40	23.5	1
10	16QAM	1	0	22.50	22.54	22.70		
10	16QAM	1	25	22.70	22.69	22.70		
10	16QAM	1	49	22.72	22.66	22.71	22.5	2
10	16QAM	25	0	21.50	21.50	21.49		
10	16QAM	25	12	21.53	21.51	21.51		
10	16QAM	25	25	21.49	21.47	21.44	22.5	2
10	16QAM	50	0	21.49	21.49	21.45		
10	64QAM	1	0	21.50	21.49	21.57		
10	64QAM	1	25	21.58	21.58	21.56	22.5	2
10	64QAM	1	49	21.61	21.59	21.57		
10	64QAM	25	0	20.51	20.49	20.49		
10	64QAM	25	12	20.51	20.54	20.50	21.5	3
10	64QAM	25	25	20.50	20.49	20.44		
10	64QAM	50	0	20.48	20.49	20.44		
Channel				23755	23790	23825	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				706.5	710	713.5		
5	QPSK	1	0	23.24	23.38	23.44	24.5	0
5	QPSK	1	12	23.39	23.36	23.22		
5	QPSK	1	24	23.39	23.44	23.27		
5	QPSK	12	0	22.36	22.40	22.45	23.5	1
5	QPSK	12	7	22.49	22.42	22.57		
5	QPSK	12	13	22.44	22.40	22.52		
5	QPSK	25	0	22.43	22.39	22.43	23.5	1
5	16QAM	1	0	22.34	22.65	22.74		
5	16QAM	1	12	22.71	22.65	22.65		
5	16QAM	1	24	22.71	22.75	22.69	22.5	2
5	16QAM	12	0	21.44	21.48	21.54		
5	16QAM	12	7	21.59	21.51	21.66		
5	16QAM	12	13	21.51	21.47	21.60	22.5	2
5	16QAM	25	0	21.53	21.46	21.52		
5	64QAM	1	0	21.60	21.56	21.69		
5	64QAM	1	12	21.62	21.54	21.75	22.5	2
5	64QAM	1	24	21.55	21.62	21.61		
5	64QAM	12	0	20.42	20.43	20.51		
5	64QAM	12	7	20.55	20.48	20.64	21.5	3
5	64QAM	12	13	20.52	20.41	20.58		
5	64QAM	25	0	20.50	20.47	20.51		



<LTE Band 28>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				27310	27460	27560		
Frequency (MHz)				713	728	738		
20	QPSK	1	0	23.77	23.82	23.83	24.5	0
20	QPSK	1	49	24.01	24.04	24.02		
20	QPSK	1	99	23.98	24.03	23.97		
20	QPSK	50	0	23.00	23.03	23.07	23.5	1
20	QPSK	50	24	22.99	23.04	23.09		
20	QPSK	50	50	23.06	23.22	23.17		
20	QPSK	100	0	23.17	22.99	23.07	23.5	1
20	16QAM	1	0	23.37	23.21	23.05		
20	16QAM	1	49	23.12	23.36	23.22		
20	16QAM	1	99	22.93	23.40	23.39	22.5	2
20	16QAM	50	0	22.10	22.00	21.99		
20	16QAM	50	24	22.06	22.14	22.12		
20	16QAM	50	50	22.16	22.28	22.29	22.5	2
20	16QAM	100	0	21.94	21.99	21.94		
20	64QAM	1	0	22.29	21.87	21.89		
20	64QAM	1	49	22.12	22.07	22.05	22.5	2
20	64QAM	1	99	22.14	22.34	22.13		
20	64QAM	50	0	21.09	21.13	21.15		
20	64QAM	50	24	21.04	21.06	21.09	21.5	3
20	64QAM	50	50	21.02	21.17	21.09		
20	64QAM	100	0	20.99	21.15	21.00		
Channel				27285	27435	27585		
Frequency (MHz)				710.5	725.5	740.5		
15	QPSK	1	0	23.82	23.87	23.91	24.5	0
15	QPSK	1	37	23.96	23.95	23.89		
15	QPSK	1	74	23.99	23.98	23.91		
15	QPSK	36	0	23.00	22.99	22.97	23.5	1
15	QPSK	36	20	23.03	23.13	22.98		
15	QPSK	36	39	22.96	22.99	23.06		
15	QPSK	75	0	23.00	23.02	23.06	23.5	1
15	16QAM	1	0	23.03	23.09	23.14		
15	16QAM	1	37	23.08	23.37	23.42		
15	16QAM	1	74	23.09	23.49	23.18	22.5	2
15	16QAM	36	0	22.03	21.98	21.93		
15	16QAM	36	20	22.10	22.10	21.99		
15	16QAM	36	39	22.00	22.04	22.02	22.5	2
15	16QAM	75	0	21.98	22.00	21.99		
15	64QAM	1	0	21.97	22.00	21.96		
15	64QAM	1	37	22.16	22.18	22.02	21.5	3
15	64QAM	1	74	22.30	22.09	22.45		
15	64QAM	36	0	21.14	21.02	21.13		
15	64QAM	36	20	21.22	21.28	20.99	21.5	3
15	64QAM	36	39	21.15	21.19	21.19		
15	64QAM	75	0	21.08	21.13	21.13		



Channel				27260	27410	27610	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				708	723	743		
10	QPSK	1	0	23.90	23.93	24.00	24.5	0
10	QPSK	1	25	23.86	23.93	23.99		
10	QPSK	1	49	23.96	24.01	24.03		
10	QPSK	25	0	22.99	23.00	23.09	23.5	1
10	QPSK	25	12	23.10	23.04	23.10		
10	QPSK	25	25	23.06	23.09	23.06		
10	QPSK	50	0	23.14	23.09	23.09	23.5	1
10	16QAM	1	0	23.10	23.14	23.21		
10	16QAM	1	25	23.10	23.20	23.18		
10	16QAM	1	49	23.20	23.23	23.24	22.5	2
10	16QAM	25	0	22.02	22.04	22.10		
10	16QAM	25	12	22.10	22.07	22.11		
10	16QAM	25	25	22.06	22.12	22.08	22.5	2
10	16QAM	50	0	22.10	22.12	22.12		
10	64QAM	1	0	22.15	22.19	22.22	22.5	2
10	64QAM	1	25	22.13	22.23	22.29		
10	64QAM	1	49	22.25	22.30	22.34		
10	64QAM	25	0	21.13	21.16	21.23	21.5	3
10	64QAM	25	12	21.23	21.20	21.25		
10	64QAM	25	25	21.20	21.25	21.21		
10	64QAM	50	0	21.23	21.25	21.21	21.5	3
Channel				27235	27385	27635		
Frequency (MHz)				705.5	720.5	745.5	Tune-up limit (dBm)	MPR (dB)
5	QPSK	1	0	23.90	23.94	23.97		
5	QPSK	1	12	23.89	23.93	23.91	24.5	0
5	QPSK	1	24	23.88	23.94	23.84		
5	QPSK	12	0	22.95	23.03	23.03		
5	QPSK	12	7	22.99	23.04	23.13	23.5	1
5	QPSK	12	13	22.96	23.02	23.09		
5	QPSK	25	0	22.97	23.04	23.05		
5	16QAM	1	0	23.08	23.15	23.16	23.5	1
5	16QAM	1	12	23.10	23.19	23.27		
5	16QAM	1	24	23.04	23.21	23.23		
5	16QAM	12	0	21.99	22.04	22.05	22.5	2
5	16QAM	12	7	22.04	22.06	22.17		
5	16QAM	12	13	21.97	22.04	22.13		
5	16QAM	25	0	22.01	22.08	22.07	22.5	2
5	64QAM	1	0	22.16	22.21	22.19		
5	64QAM	1	12	22.15	22.21	22.32		
5	64QAM	1	24	22.08	22.22	22.27	21.5	3
5	64QAM	12	0	21.10	21.18	21.15		
5	64QAM	12	7	21.16	21.22	21.29		
5	64QAM	12	13	21.12	21.16	21.24	21.5	3
5	64QAM	25	0	21.13	21.19	21.19		

Channel				27225	27375	27645	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				704.5	719.5	746.5		
3	QPSK	1	0	23.91	23.99	23.85	24.5	0
3	QPSK	1	8	23.88	23.96	23.84		
3	QPSK	1	14	23.94	23.96	23.85		
3	QPSK	8	0	22.96	23.05	23.11	23.5	1
3	QPSK	8	4	23.00	23.04	23.16		
3	QPSK	8	7	22.96	23.04	23.11		
3	QPSK	15	0	22.99	23.06	23.14	23.5	1
3	16QAM	1	0	23.12	23.12	23.27		
3	16QAM	1	8	23.14	23.21	23.29		
3	16QAM	1	14	23.11	23.19	23.24	22.5	2
3	16QAM	8	0	22.04	22.10	22.13		
3	16QAM	8	4	22.06	22.15	22.17		
3	16QAM	8	7	22.02	22.11	22.13	22.5	2
3	16QAM	15	0	22.05	22.12	22.18		
3	64QAM	1	0	22.19	22.20	22.30	22.5	2
3	64QAM	1	8	22.20	22.29	22.31		
3	64QAM	1	14	22.12	22.23	22.31		
3	64QAM	8	0	21.16	21.20	21.25	21.5	3
3	64QAM	8	4	21.17	21.25	21.24		
3	64QAM	8	7	21.09	21.21	21.24		
3	64QAM	15	0	21.15	21.25	21.28		



<WWAN Top Antenna --Reduced Power for Receiver On>

<LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				18700	18900	19100	21	0
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	20.41	20.36	20.31	21	0
20	QPSK	1	49	20.38	20.31	20.29		
20	QPSK	1	99	20.29	20.29	20.25		
20	QPSK	50	0	20.45	20.39	20.35	21	0
20	QPSK	50	24	20.45	20.35	20.39		
20	QPSK	50	50	20.40	20.39	20.31		
20	QPSK	100	0	20.43	20.42	20.37	21	0
20	16QAM	1	0	20.68	20.74	20.60		
20	16QAM	1	49	20.64	20.70	20.62		
20	16QAM	1	99	20.64	20.61	20.60	21	0
20	16QAM	50	0	20.49	20.54	20.44		
20	16QAM	50	24	20.45	20.54	20.47		
20	16QAM	50	50	20.50	20.49	20.44	21	0
20	16QAM	100	0	20.50	20.50	20.43		
20	64QAM	1	0	20.58	20.60	20.49		
20	64QAM	1	49	20.52	20.59	20.53	21	0
20	64QAM	1	99	20.53	20.53	20.48		
20	64QAM	50	0	20.46	20.51	20.44		
20	64QAM	50	24	20.43	20.55	20.45	21	0
20	64QAM	50	50	20.51	20.48	20.42		
20	64QAM	100	0	20.51	20.51	20.44		
Channel				18675	18900	19125	21	0
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	20.31	20.37	20.33	21	0
15	QPSK	1	37	20.27	20.38	20.28		
15	QPSK	1	74	20.18	20.25	20.23		
15	QPSK	36	0	20.33	20.40	20.36	21	0
15	QPSK	36	20	20.35	20.44	20.33		
15	QPSK	36	39	20.30	20.37	20.37		
15	QPSK	75	0	20.31	20.40	20.32	21	0
15	16QAM	1	0	20.63	20.70	20.60		
15	16QAM	1	37	20.61	20.67	20.60		
15	16QAM	1	74	20.54	20.58	20.59	21	0
15	16QAM	36	0	20.42	20.49	20.40		
15	16QAM	36	20	20.48	20.51	20.47		
15	16QAM	36	39	20.38	20.44	20.42	21	0
15	16QAM	75	0	20.40	20.51	20.39		
15	64QAM	1	0	20.54	20.57	20.52		
15	64QAM	1	37	20.52	20.58	20.51	21	0
15	64QAM	1	74	20.44	20.48	20.49		
15	64QAM	36	0	20.44	20.47	20.40		
15	64QAM	36	20	20.47	20.49	20.47	21	0
15	64QAM	36	39	20.36	20.43	20.42		
15	64QAM	75	0	20.39	20.51	20.38		



Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	20.39	20.49	20.32	21	0
10	QPSK	1	25	20.31	20.41	20.27		
10	QPSK	1	49	20.29	20.36	20.25		
10	QPSK	25	0	20.37	20.46	20.36	21	0
10	QPSK	25	12	20.36	20.45	20.37		
10	QPSK	25	25	20.30	20.42	20.29		
10	QPSK	50	0	20.33	20.45	20.36	21	0
10	16QAM	1	0	20.70	20.82	20.60		
10	16QAM	1	25	20.65	20.71	20.64		
10	16QAM	1	49	20.64	20.68	20.58	21	0
10	16QAM	25	0	20.46	20.54	20.41		
10	16QAM	25	12	20.44	20.52	20.42		
10	16QAM	25	25	20.39	20.47	20.41	21	0
10	16QAM	50	0	20.45	20.53	20.43		
10	64QAM	1	0	20.61	20.72	20.51		
10	64QAM	1	25	20.55	20.63	20.58	21	0
10	64QAM	1	49	20.54	20.59	20.46		
10	64QAM	25	0	20.44	20.52	20.41		
10	64QAM	25	12	20.43	20.51	20.42	21	0
10	64QAM	25	25	20.38	20.46	20.40		
10	64QAM	50	0	20.43	20.49	20.41		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	20.30	20.39	20.29	21	0
5	QPSK	1	12	20.30	20.39	20.28		
5	QPSK	1	24	20.25	20.34	20.22		
5	QPSK	12	0	20.35	20.44	20.35	21	0
5	QPSK	12	7	20.36	20.44	20.36		
5	QPSK	12	13	20.33	20.40	20.32		
5	QPSK	25	0	20.32	20.42	20.33	21	0
5	16QAM	1	0	20.64	20.68	20.61		
5	16QAM	1	12	20.66	20.74	20.62		
5	16QAM	1	24	20.61	20.64	20.59	21	0
5	16QAM	12	0	20.45	20.52	20.42		
5	16QAM	12	7	20.47	20.50	20.45		
5	16QAM	12	13	20.39	20.48	20.39	21	0
5	16QAM	25	0	20.41	20.49	20.41		
5	64QAM	1	0	20.52	20.56	20.50		
5	64QAM	1	12	20.50	20.57	20.48	21	0
5	64QAM	1	24	20.50	20.49	20.45		
5	64QAM	12	0	20.42	20.52	20.39		
5	64QAM	12	7	20.45	20.50	20.43	21	0
5	64QAM	12	13	20.38	20.47	20.38		
5	64QAM	25	0	20.42	20.48	20.39		



Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	20.26	20.37	20.26	21	0
3	QPSK	1	8	20.30	20.38	20.27		
3	QPSK	1	14	20.23	20.34	20.24		
3	QPSK	8	0	20.32	20.41	20.33	21	0
3	QPSK	8	4	20.38	20.46	20.32		
3	QPSK	8	7	20.32	20.39	20.32		
3	QPSK	15	0	20.31	20.40	20.30	21	0
3	16QAM	1	0	20.58	20.67	20.63		
3	16QAM	1	8	20.67	20.70	20.65		
3	16QAM	1	14	20.57	20.66	20.59	21	0
3	16QAM	8	0	20.42	20.53	20.45		
3	16QAM	8	4	20.50	20.55	20.50		
3	16QAM	8	7	20.40	20.48	20.41	21	0
3	16QAM	15	0	20.43	20.50	20.44		
3	64QAM	1	0	20.45	20.58	20.48	21	0
3	64QAM	1	8	20.52	20.58	20.54		
3	64QAM	1	14	20.46	20.54	20.46		
3	64QAM	8	0	20.43	20.48	20.43	21	0
3	64QAM	8	4	20.44	20.53	20.45		
3	64QAM	8	7	20.41	20.47	20.37		
3	64QAM	15	0	20.41	20.48	20.43	21	0
Channel				18607	18900	19193		
Frequency (MHz)				1850.7	1880	1909.3	Tune-up limit (dBm)	MPR (dB)
1.4	QPSK	1	0	20.24	20.34	20.17		
1.4	QPSK	1	3	20.29	20.38	20.27	21	0
1.4	QPSK	1	5	20.24	20.31	20.19		
1.4	QPSK	3	0	20.26	20.35	20.22		
1.4	QPSK	3	1	20.31	20.37	20.25	21	0
1.4	QPSK	3	3	20.24	20.33	20.25		
1.4	QPSK	6	0	20.30	20.38	20.24		
1.4	16QAM	1	0	20.54	20.54	20.51	21	0
1.4	16QAM	1	3	20.57	20.66	20.58		
1.4	16QAM	1	5	20.58	20.59	20.54		
1.4	16QAM	3	0	20.34	20.43	20.36	21	0
1.4	16QAM	3	1	20.41	20.47	20.40		
1.4	16QAM	3	3	20.30	20.39	20.35		
1.4	16QAM	6	0	20.43	20.52	20.41	21	0
1.4	64QAM	1	0	20.40	20.50	20.43	21	0
1.4	64QAM	1	3	20.49	20.61	20.50		
1.4	64QAM	1	5	20.42	20.50	20.39		
1.4	64QAM	3	0	20.35	20.46	20.39	21	0
1.4	64QAM	3	1	20.45	20.49	20.41		
1.4	64QAM	3	3	20.41	20.43	20.36		
1.4	64QAM	6	0	20.35	20.42	20.33	21	0



<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20050	20175	20300		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	20.68	20.91	20.85	21.5	0
20	QPSK	1	49	20.69	20.81	20.91		
20	QPSK	1	99	20.74	20.76	20.76		
20	QPSK	50	0	20.75	20.90	20.88	21.5	0
20	QPSK	50	24	20.90	20.91	20.85		
20	QPSK	50	50	20.88	20.81	20.85		
20	QPSK	100	0	20.83	20.87	20.84	21.5	0
20	16QAM	1	0	21.06	21.18	21.18		
20	16QAM	1	49	21.07	21.17	21.32		
20	16QAM	1	99	21.09	21.09	21.09	21.5	0
20	16QAM	50	0	20.87	20.99	20.96		
20	16QAM	50	24	20.96	20.98	20.96		
20	16QAM	50	50	20.97	20.91	20.95	21.5	0
20	16QAM	100	0	20.90	20.94	20.88		
20	64QAM	1	0	20.92	21.04	21.13		
20	64QAM	1	49	20.98	21.09	21.22	21.5	0
20	64QAM	1	99	20.98	21.00	20.99		
20	64QAM	50	0	20.87	20.98	20.92	21.5	0
20	64QAM	50	24	20.93	20.97	20.93		
20	64QAM	50	50	20.95	20.90	20.95		
20	64QAM	100	0	20.91	20.95	20.91		
Channel				20025	20175	20325		
Frequency (MHz)				1717.5	1732.5	1747.5	Tune-up limit (dBm)	MPR (dB)
15	QPSK	1	0	20.68	20.81	20.84	21.5	0
15	QPSK	1	37	20.71	20.83	20.88		
15	QPSK	1	74	20.70	20.76	20.77		
15	QPSK	36	0	20.80	20.91	20.83	21.5	0
15	QPSK	36	20	20.89	20.88	20.92		
15	QPSK	36	39	20.78	20.85	20.90		
15	QPSK	75	0	20.85	20.87	20.81	21.5	0
15	16QAM	1	0	21.08	21.17	21.24		
15	16QAM	1	37	21.06	21.17	21.26		
15	16QAM	1	74	21.09	21.14	21.13	21.5	0
15	16QAM	36	0	20.84	20.96	20.92		
15	16QAM	36	20	20.93	20.98	21.02		
15	16QAM	36	39	20.90	20.93	20.98	21.5	0
15	16QAM	75	0	20.93	20.94	20.90		
15	64QAM	1	0	20.98	21.05	21.11		
15	64QAM	1	37	20.93	21.06	21.13	21.5	0
15	64QAM	1	74	20.96	20.99	21.00		
15	64QAM	36	0	20.83	20.95	20.93		
15	64QAM	36	20	20.94	20.96	21.01	21.5	0
15	64QAM	36	39	20.89	20.91	20.98		
15	64QAM	75	0	20.93	20.94	20.90		



Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	20.70	20.89	20.94	21.5	0
10	QPSK	1	25	20.72	20.82	20.89		
10	QPSK	1	49	20.62	20.77	20.81		
10	QPSK	25	0	20.80	20.90	20.93	21.5	0
10	QPSK	25	12	20.79	20.89	20.91		
10	QPSK	25	25	20.70	20.85	20.84		
10	QPSK	50	0	20.76	20.91	20.90	21.5	0
10	16QAM	1	0	21.04	21.21	21.32		
10	16QAM	1	25	21.11	21.23	21.26		
10	16QAM	1	49	21.02	21.14	21.16	21.5	0
10	16QAM	25	0	20.87	20.98	21.00		
10	16QAM	25	12	20.85	20.97	20.99		
10	16QAM	25	25	20.78	20.94	20.93	21.5	0
10	16QAM	50	0	20.81	20.95	21.00		
10	64QAM	1	0	20.94	21.11	21.21		
10	64QAM	1	25	20.98	21.10	21.17	21.5	0
10	64QAM	1	49	20.94	21.03	21.06		
10	64QAM	25	0	20.86	20.94	21.01		
10	64QAM	25	12	20.85	20.95	20.97	21.5	0
10	64QAM	25	25	20.79	20.90	20.94		
10	64QAM	50	0	20.80	20.95	20.98		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	20.63	20.86	20.87	21.5	0
5	QPSK	1	12	20.63	20.84	20.87		
5	QPSK	1	24	20.66	20.81	20.79		
5	QPSK	12	0	20.71	20.88	20.90	21.5	0
5	QPSK	12	7	20.70	20.93	20.92		
5	QPSK	12	13	20.73	20.87	20.90		
5	QPSK	25	0	20.74	20.88	20.89	21.5	0
5	16QAM	1	0	20.99	21.15	21.20		
5	16QAM	1	12	21.01	21.19	21.22		
5	16QAM	1	24	21.05	21.11	21.14	21.5	0
5	16QAM	12	0	20.78	20.96	20.98		
5	16QAM	12	7	20.84	20.98	21.01		
5	16QAM	12	13	20.88	20.92	20.97	21.5	0
5	16QAM	25	0	20.81	20.93	20.96		
5	64QAM	1	0	20.89	21.10	21.14		
5	64QAM	1	12	20.90	21.11	21.15	21.5	0
5	64QAM	1	24	20.93	21.04	21.08		
5	64QAM	12	0	20.76	20.95	20.97		
5	64QAM	12	7	20.80	20.96	20.99	21.5	0
5	64QAM	12	13	20.84	20.91	20.95		
5	64QAM	25	0	20.83	20.93	20.98		



Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	20.61	20.83	20.83	21.5	0
3	QPSK	1	8	20.63	20.81	20.84		
3	QPSK	1	14	20.60	20.79	20.81		
3	QPSK	8	0	20.69	20.88	20.88	21.5	0
3	QPSK	8	4	20.71	20.90	20.92		
3	QPSK	8	7	20.64	20.86	20.87		
3	QPSK	15	0	20.68	20.90	20.89	21.5	0
3	16QAM	1	0	21.05	21.16	21.16		
3	16QAM	1	8	21.04	21.18	21.19		
3	16QAM	1	14	20.96	21.17	21.14	21.5	0
3	16QAM	8	0	20.79	20.97	21.00		
3	16QAM	8	4	20.83	21.00	21.04		
3	16QAM	8	7	20.83	20.98	20.99	21.5	0
3	16QAM	15	0	20.75	20.95	20.97		
3	64QAM	1	0	20.89	21.06	21.11	21.5	0
3	64QAM	1	8	20.92	21.06	21.07		
3	64QAM	1	14	20.84	21.05	21.01		
3	64QAM	8	0	20.76	20.92	20.95	21.5	0
3	64QAM	8	4	20.77	20.94	21.01		
3	64QAM	8	7	20.78	20.90	20.96		
3	64QAM	15	0	20.73	20.93	20.95	21.5	0
Channel				19957	20175	20393		
Frequency (MHz)				1710.7	1732.5	1754.3	Tune-up limit (dBm)	MPR (dB)
1.4	QPSK	1	0	20.54	20.75	20.77	21.5	0
1.4	QPSK	1	3	20.62	20.83	20.85		
1.4	QPSK	1	5	20.54	20.75	20.74		
1.4	QPSK	3	0	20.60	20.81	20.83		
1.4	QPSK	3	1	20.63	20.82	20.84		
1.4	QPSK	3	3	20.60	20.81	20.84		
1.4	QPSK	6	0	20.59	20.82	20.82	21.5	0
1.4	16QAM	1	0	20.96	21.13	21.12	21.5	0
1.4	16QAM	1	3	21.04	21.18	21.18		
1.4	16QAM	1	5	20.94	21.06	21.10		
1.4	16QAM	3	0	20.75	20.89	20.93		
1.4	16QAM	3	1	20.79	20.93	20.96		
1.4	16QAM	3	3	20.67	20.89	20.90		
1.4	16QAM	6	0	20.75	20.96	20.99	21.5	0
1.4	64QAM	1	0	20.81	20.99	21.00	21.5	0
1.4	64QAM	1	3	20.88	21.06	21.14		
1.4	64QAM	1	5	20.81	20.98	21.04		
1.4	64QAM	3	0	20.79	20.89	20.93		
1.4	64QAM	3	1	20.81	20.96	20.96		
1.4	64QAM	3	3	20.75	20.94	20.94		
1.4	64QAM	6	0	20.67	20.89	20.89	21.5	0



<LTE Band 7>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20850	21100	21350		
Frequency (MHz)				2510	2535	2560		
20	QPSK	1	0	19.73	19.61	19.48	20	0
20	QPSK	1	49	19.74	19.62	19.50		
20	QPSK	1	99	19.71	19.75	19.57		
20	QPSK	50	0	19.80	19.85	19.60	20	0
20	QPSK	50	24	19.84	19.70	19.60		
20	QPSK	50	50	19.73	19.77	19.60		
20	QPSK	100	0	19.73	19.73	19.62	20	0
20	16QAM	1	0	19.82	19.66	19.49		
20	16QAM	1	49	19.82	19.68	19.51		
20	16QAM	1	99	19.82	19.86	19.68	20	0
20	16QAM	50	0	19.59	19.49	19.34		
20	16QAM	50	24	19.68	19.55	19.43		
20	16QAM	50	50	19.58	19.52	19.43	20	0
20	16QAM	100	0	19.52	19.49	19.36		
20	64QAM	1	0	19.73	19.54	19.41		
20	64QAM	1	49	19.72	19.58	19.44	20	0
20	64QAM	1	99	19.70	19.70	19.57		
20	64QAM	50	0	19.61	19.50	19.35		
20	64QAM	50	24	19.65	19.54	19.42	20	0
20	64QAM	50	50	19.55	19.51	19.41		
20	64QAM	100	0	19.53	19.48	19.37		
Channel				20825	21100	21375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	19.73	19.64	19.52	20	0
15	QPSK	1	37	19.75	19.63	19.52		
15	QPSK	1	74	19.83	19.74	19.60		
15	QPSK	36	0	19.82	19.68	19.57	20	0
15	QPSK	36	20	19.82	19.76	19.63		
15	QPSK	36	39	19.87	19.74	19.60		
15	QPSK	75	0	19.82	19.74	19.59	20	0
15	16QAM	1	0	19.87	19.69	19.56		
15	16QAM	1	37	19.79	19.70	19.53		
15	16QAM	1	74	19.97	19.78	19.76	20	0
15	16QAM	36	0	19.64	19.52	19.39		
15	16QAM	36	20	19.65	19.52	19.37		
15	16QAM	36	39	19.69	19.53	19.40	20	0
15	16QAM	75	0	19.67	19.49	19.40		
15	64QAM	1	0	19.74	19.60	19.44		
15	64QAM	1	37	19.69	19.58	19.47	20	0
15	64QAM	1	74	19.86	19.66	19.63		
15	64QAM	36	0	19.62	19.51	19.37		
15	64QAM	36	20	19.63	19.52	19.42	20	0
15	64QAM	36	39	19.66	19.52	19.38		
15	64QAM	75	0	19.66	19.48	19.39		

Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	19.70	19.61	19.51	20	0
10	QPSK	1	25	19.74	19.67	19.51		
10	QPSK	1	49	19.78	19.69	19.54		
10	QPSK	25	0	19.78	19.67	19.52	20	0
10	QPSK	25	12	19.78	19.70	19.60		
10	QPSK	25	25	19.82	19.67	19.58		
10	QPSK	50	0	19.81	19.66	19.54	20	0
10	16QAM	1	0	19.83	19.69	19.51		
10	16QAM	1	25	19.81	19.73	19.55		
10	16QAM	1	49	19.88	19.74	19.65	20	0
10	16QAM	25	0	19.60	19.48	19.34		
10	16QAM	25	12	19.61	19.49	19.35		
10	16QAM	25	25	19.59	19.51	19.40	20	0
10	16QAM	50	0	19.63	19.51	19.37		
10	64QAM	1	0	19.69	19.57	19.46		
10	64QAM	1	25	19.71	19.57	19.47	20	0
10	64QAM	1	49	19.78	19.61	19.51		
10	64QAM	25	0	19.60	19.43	19.32		
10	64QAM	25	12	19.60	19.46	19.36	20	0
10	64QAM	25	25	19.58	19.51	19.39		
10	64QAM	50	0	19.62	19.50	19.34		
Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	19.73	19.60	19.50	20	0
5	QPSK	1	12	19.75	19.63	19.52		
5	QPSK	1	24	19.75	19.66	19.56		
5	QPSK	12	0	19.75	19.68	19.52	20	0
5	QPSK	12	7	19.82	19.68	19.58		
5	QPSK	12	13	19.78	19.69	19.55		
5	QPSK	25	0	19.76	19.68	19.56	20	0
5	16QAM	1	0	19.82	19.70	19.57		
5	16QAM	1	12	19.79	19.73	19.61		
5	16QAM	1	24	19.82	19.72	19.63	20	0
5	16QAM	12	0	19.56	19.48	19.33		
5	16QAM	12	7	19.62	19.52	19.36		
5	16QAM	12	13	19.58	19.50	19.37	20	0
5	16QAM	25	0	19.56	19.51	19.38		
5	64QAM	1	0	19.66	19.59	19.43		
5	64QAM	1	12	19.70	19.58	19.49	20	0
5	64QAM	1	24	19.69	19.61	19.49		
5	64QAM	12	0	19.59	19.45	19.31		
5	64QAM	12	7	19.60	19.49	19.33	20	0
5	64QAM	12	13	19.62	19.47	19.35		
5	64QAM	25	0	19.62	19.51	19.38		

<WWAN Top Antenna --Reduced Power for P-Sensor On/Hotspot On/Handheld On><LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				18700	18900	19100		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	21.13	21.03	20.95	21.5	0
20	QPSK	1	49	20.99	21.05	20.92		
20	QPSK	1	99	20.90	20.93	20.86		
20	QPSK	50	0	21.07	21.09	21.01	21.5	0
20	QPSK	50	24	21.15	21.09	21.01		
20	QPSK	50	50	20.98	21.02	20.97		
20	QPSK	100	0	20.99	21.08	21.00	21.5	0
20	16QAM	1	0	21.03	21.13	21.08		
20	16QAM	1	49	21.12	21.15	21.12		
20	16QAM	1	99	21.06	21.09	21.04	21.5	0
20	16QAM	50	0	20.94	21.04	20.91		
20	16QAM	50	24	20.96	20.99	20.95		
20	16QAM	50	50	20.87	20.92	20.86	21.5	0
20	16QAM	100	0	20.91	20.96	20.86		
20	64QAM	1	0	20.92	21.05	21.00		
20	64QAM	1	49	21.05	21.04	21.01	21.5	0
20	64QAM	1	99	20.94	20.97	20.92		
20	64QAM	50	0	20.93	21.01	20.92		
20	64QAM	50	24	20.96	21.00	20.93	21.5	0
20	64QAM	50	50	20.85	20.91	20.84		
20	64QAM	100	0	20.92	20.97	20.86		



Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	20.91	21.05	20.94	21.5	0
15	QPSK	1	37	20.84	21.01	20.94		
15	QPSK	1	74	20.87	20.91	20.86		
15	QPSK	36	0	20.95	21.06	20.96	21.5	0
15	QPSK	36	20	21.01	21.12	21.04		
15	QPSK	36	39	20.99	21.02	20.97		
15	QPSK	75	0	20.99	21.04	21.00	21.5	0
15	16QAM	1	0	21.02	21.19	21.07		
15	16QAM	1	37	21.02	21.15	21.09		
15	16QAM	1	74	21.02	21.02	21.05	21.5	0
15	16QAM	36	0	20.84	21.02	20.91		
15	16QAM	36	20	20.98	21.02	20.90		
15	16QAM	36	39	20.88	20.93	20.88	21.5	0
15	16QAM	75	0	20.88	20.94	20.86		
15	64QAM	1	0	20.94	21.11	20.99		
15	64QAM	1	37	20.90	21.04	21.02	21.5	0
15	64QAM	1	74	20.91	20.89	20.90		
15	64QAM	36	0	20.83	20.96	20.88		
15	64QAM	36	20	20.97	21.00	20.89	21.5	0
15	64QAM	36	39	20.87	20.90	20.89		
15	64QAM	75	0	20.88	20.94	20.86		
Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	21.01	21.16	20.95	21.5	0
10	QPSK	1	25	20.89	21.05	20.95		
10	QPSK	1	49	20.98	21.05	20.88		
10	QPSK	25	0	20.93	21.11	20.96	21.5	0
10	QPSK	25	12	20.95	21.09	20.98		
10	QPSK	25	25	20.97	21.06	20.94		
10	QPSK	50	0	21.04	21.10	20.98	21.5	0
10	16QAM	1	0	21.15	21.29	21.11		
10	16QAM	1	25	21.04	21.19	21.15		
10	16QAM	1	49	21.10	21.14	21.03	21.5	0
10	16QAM	25	0	20.85	21.01	20.90		
10	16QAM	25	12	20.85	21.00	20.89		
10	16QAM	25	25	20.89	20.94	20.84	21.5	0
10	16QAM	50	0	20.94	20.99	20.85		
10	64QAM	1	0	21.02	21.21	21.00		
10	64QAM	1	25	20.94	21.07	21.04	21.5	0
10	64QAM	1	49	21.04	21.08	20.92		
10	64QAM	25	0	20.85	21.00	20.89		
10	64QAM	25	12	20.87	21.00	20.88	21.5	0
10	64QAM	25	25	20.87	20.92	20.88		
10	64QAM	50	0	20.93	20.98	20.88		



Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	20.88	21.02	20.91	21.5	0
5	QPSK	1	12	20.86	21.06	20.90		
5	QPSK	1	24	20.79	20.99	20.84		
5	QPSK	12	0	20.91	21.06	20.96	21.5	0
5	QPSK	12	7	20.93	21.11	20.99		
5	QPSK	12	13	20.83	21.04	20.93		
5	QPSK	25	0	20.87	21.05	20.93	21.5	0
5	16QAM	1	0	20.94	21.16	21.08		
5	16QAM	1	12	21.01	21.12	21.06		
5	16QAM	1	24	20.90	21.04	21.02	21.5	0
5	16QAM	12	0	20.81	20.97	20.86		
5	16QAM	12	7	20.82	20.95	20.92		
5	16QAM	12	13	20.76	20.91	20.85	21.5	0
5	16QAM	25	0	20.76	20.95	20.84		
5	64QAM	1	0	20.88	21.09	20.99	21.5	0
5	64QAM	1	12	20.92	21.01	20.97		
5	64QAM	1	24	20.82	20.94	20.90		
5	64QAM	12	0	20.79	20.95	20.88	21.5	0
5	64QAM	12	7	20.79	20.94	20.89		
5	64QAM	12	13	20.77	20.92	20.82		
5	64QAM	25	0	20.81	20.94	20.81	21.5	0
Channel				18615	18900	19185		
Frequency (MHz)				1851.5	1880	1908.5	Tune-up limit (dBm)	MPR (dB)
3	QPSK	1	0	20.84	21.00	20.92		
3	QPSK	1	8	20.82	21.02	20.90	21.5	0
3	QPSK	1	14	20.81	20.96	20.87		
3	QPSK	8	0	20.87	21.06	20.93	21.5	0
3	QPSK	8	4	20.90	21.07	20.98		
3	QPSK	8	7	20.85	21.03	20.94		
3	QPSK	15	0	20.88	21.05	20.95	21.5	0
3	16QAM	1	0	20.99	21.12	21.06		
3	16QAM	1	8	20.99	21.08	21.05		
3	16QAM	1	14	20.94	21.05	21.00	21.5	0
3	16QAM	8	0	20.80	20.95	20.90		
3	16QAM	8	4	20.86	20.99	20.91		
3	16QAM	8	7	20.82	20.97	20.86	21.5	0
3	16QAM	15	0	20.81	20.96	20.90		
3	64QAM	1	0	20.88	21.03	20.99		
3	64QAM	1	8	20.87	21.04	20.98	21.5	0
3	64QAM	1	14	20.86	20.98	20.91		
3	64QAM	8	0	20.80	20.92	20.87		
3	64QAM	8	4	20.81	20.96	20.90	21.5	0
3	64QAM	8	7	20.74	20.93	20.84		
3	64QAM	15	0	20.81	20.97	20.85		

Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	20.79	20.99	20.83	21.5	0
1.4	QPSK	1	3	20.85	21.02	20.92		
1.4	QPSK	1	5	20.75	20.93	20.84		
1.4	QPSK	3	0	20.86	20.99	20.90		
1.4	QPSK	3	1	20.88	21.03	20.92		
1.4	QPSK	3	3	20.82	20.97	20.86		
1.4	QPSK	6	0	20.87	21.02	20.91	21.5	0
1.4	16QAM	1	0	20.90	21.06	20.97	21.5	0
1.4	16QAM	1	3	21.03	21.18	21.07		
1.4	16QAM	1	5	20.95	21.02	20.96		
1.4	16QAM	3	0	20.75	20.90	20.77		
1.4	16QAM	3	1	20.82	20.94	20.83		
1.4	16QAM	3	3	20.70	20.87	20.77		
1.4	16QAM	6	0	20.83	20.98	20.86	21.5	0
1.4	64QAM	1	0	20.86	20.97	20.89	21.5	0
1.4	64QAM	1	3	20.96	21.05	20.91		
1.4	64QAM	1	5	20.78	20.94	20.80		
1.4	64QAM	3	0	20.76	20.93	20.85		
1.4	64QAM	3	1	20.83	20.97	20.88		
1.4	64QAM	3	3	20.75	20.91	20.79		
1.4	64QAM	6	0	20.74	20.91	20.79	21.5	0



<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20050	20175	20300		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	19.88	19.93	19.90		
20	QPSK	1	49	19.84	19.86	19.86	20.5	0
20	QPSK	1	99	19.74	19.76	19.68		
20	QPSK	50	0	19.89	19.94	19.88		
20	QPSK	50	24	19.99	19.91	19.87	20.5	0
20	QPSK	50	50	19.94	19.87	19.83		
20	QPSK	100	0	19.95	19.93	19.86		
20	16QAM	1	0	20.11	20.19	20.18	20.5	0
20	16QAM	1	49	20.16	20.19	20.17		
20	16QAM	1	99	20.09	20.02	20.00		
20	16QAM	50	0	19.91	19.96	19.88	20.5	0
20	16QAM	50	24	20.01	19.90	19.87		
20	16QAM	50	50	19.90	19.86	19.82		
20	16QAM	100	0	19.96	19.88	19.88	20.5	0
20	64QAM	1	0	20.12	20.15	20.06		
20	64QAM	1	49	20.05	20.04	20.04		
20	64QAM	1	99	20.00	19.92	19.86	20.5	0
20	64QAM	50	0	19.87	19.94	19.89		
20	64QAM	50	24	19.99	19.92	19.87		
20	64QAM	50	50	19.89	19.83	19.81	20.5	0
20	64QAM	100	0	20.00	19.90	19.89		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	19.94	19.95	19.86		
15	QPSK	1	37	19.85	19.87	19.82	20.5	0
15	QPSK	1	74	19.82	19.81	19.69		
15	QPSK	36	0	19.93	19.98	19.90	20.5	0
15	QPSK	36	20	20.02	19.98	19.86		
15	QPSK	36	39	19.96	19.88	19.81		
15	QPSK	75	0	20.00	19.91	19.86	20.5	0
15	16QAM	1	0	20.12	20.15	20.17		
15	16QAM	1	37	20.18	20.15	20.11		
15	16QAM	1	74	20.16	19.83	20.00	20.5	0
15	16QAM	36	0	19.94	19.89	19.88		
15	16QAM	36	20	20.04	19.91	19.87		
15	16QAM	36	39	19.96	19.85	19.83	20.5	0
15	16QAM	75	0	20.00	19.89	19.86		
15	64QAM	1	0	20.11	20.13	20.07		
15	64QAM	1	37	20.04	20.02	19.98	20.5	0
15	64QAM	1	74	20.02	19.99	19.88		
15	64QAM	36	0	19.94	19.92	19.86		
15	64QAM	36	20	20.03	19.93	19.88	20.5	0
15	64QAM	36	39	19.95	19.84	19.80		
15	64QAM	75	0	19.99	19.90	19.85		



Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	19.93	19.91	19.87	20.5	0
10	QPSK	1	25	19.88	19.87	19.81		
10	QPSK	1	49	19.77	19.80	19.73		
10	QPSK	25	0	19.93	19.91	19.86	20.5	0
10	QPSK	25	12	19.90	19.94	19.86		
10	QPSK	25	25	19.85	19.87	19.79		
10	QPSK	50	0	19.88	19.88	19.83	20.5	0
10	16QAM	1	0	20.13	20.18	20.17		
10	16QAM	1	25	20.16	20.14	20.11		
10	16QAM	1	49	20.10	20.11	20.03	20.5	0
10	16QAM	25	0	19.91	19.91	19.87		
10	16QAM	25	12	19.91	19.93	19.88		
10	16QAM	25	25	19.83	19.85	19.78	20.5	0
10	16QAM	50	0	19.88	19.88	19.85		
10	64QAM	1	0	20.09	20.10	20.08	20.5	0
10	64QAM	1	25	20.04	20.04	19.99		
10	64QAM	1	49	19.95	20.01	19.93		
10	64QAM	25	0	19.90	19.91	19.88	20.5	0
10	64QAM	25	12	19.90	19.91	19.87		
10	64QAM	25	25	19.83	19.85	19.79		
10	64QAM	50	0	19.85	19.86	19.81	20.5	0
Channel				19975	20175	20375		
Frequency (MHz)				1712.5	1732.5	1752.5	Tune-up limit (dBm)	MPR (dB)
5	QPSK	1	0	19.88	19.87	19.80		
5	QPSK	1	12	19.86	19.87	19.80	20.5	0
5	QPSK	1	24	19.79	19.83	19.74		
5	QPSK	12	0	19.94	19.92	19.86	20.5	0
5	QPSK	12	7	19.96	19.92	19.86		
5	QPSK	12	13	19.87	19.86	19.80		
5	QPSK	25	0	19.93	19.88	19.82	20.5	0
5	16QAM	1	0	20.16	20.15	20.07		
5	16QAM	1	12	20.18	20.14	20.12		
5	16QAM	1	24	20.08	20.10	20.03	20.5	0
5	16QAM	12	0	19.94	19.92	19.85		
5	16QAM	12	7	19.97	19.93	19.85		
5	16QAM	12	13	19.90	19.87	19.85	20.5	0
5	16QAM	25	0	19.87	19.88	19.82		
5	64QAM	1	0	20.08	20.07	19.98		
5	64QAM	1	12	20.06	20.05	20.04	20.5	0
5	64QAM	1	24	19.97	19.99	19.92		
5	64QAM	12	0	19.92	19.91	19.84		
5	64QAM	12	7	19.93	19.91	19.82	20.5	0
5	64QAM	12	13	19.87	19.87	19.80		
5	64QAM	25	0	19.88	19.87	19.80		



Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	19.87	19.89	19.83	20.5	0
3	QPSK	1	8	19.89	19.89	19.78		
3	QPSK	1	14	19.86	19.80	19.76		
3	QPSK	8	0	19.91	19.91	19.84	20.5	0
3	QPSK	8	4	19.97	19.93	19.85		
3	QPSK	8	7	19.89	19.91	19.85		
3	QPSK	15	0	19.89	19.92	19.82	20.5	0
3	16QAM	1	0	20.20	20.18	20.10		
3	16QAM	1	8	20.21	20.20	20.11		
3	16QAM	1	14	20.15	20.13	20.08	20.5	0
3	16QAM	8	0	20.00	19.95	19.90		
3	16QAM	8	4	20.00	20.00	19.92		
3	16QAM	8	7	19.98	19.96	19.89	20.5	0
3	16QAM	15	0	19.90	19.93	19.84		
3	64QAM	1	0	20.04	20.05	19.99	20.5	0
3	64QAM	1	8	20.09	20.04	19.96		
3	64QAM	1	14	20.04	19.97	19.96		
3	64QAM	8	0	19.96	19.89	19.84	20.5	0
3	64QAM	8	4	19.96	19.93	19.88		
3	64QAM	8	7	19.93	19.90	19.83		
3	64QAM	15	0	19.88	19.90	19.82	20.5	0
Channel				19957	20175	20393		
Frequency (MHz)				1710.7	1732.5	1754.3	Tune-up limit (dBm)	MPR (dB)
1.4	QPSK	1	0	19.80	19.81	19.72		
1.4	QPSK	1	3	19.85	19.89	19.77	20.5	0
1.4	QPSK	1	5	19.78	19.79	19.71		
1.4	QPSK	3	0	19.86	19.86	19.75		
1.4	QPSK	3	1	19.87	19.90	19.83	20.5	0
1.4	QPSK	3	3	19.82	19.84	19.77		
1.4	QPSK	6	0	19.82	19.83	19.78		
1.4	16QAM	1	0	20.10	20.08	20.00	20.5	0
1.4	16QAM	1	3	20.20	20.18	20.14		
1.4	16QAM	1	5	20.06	20.05	20.04		
1.4	16QAM	3	0	19.89	19.89	19.84	20.5	0
1.4	16QAM	3	1	19.94	19.94	19.84		
1.4	16QAM	3	3	19.85	19.86	19.77		
1.4	16QAM	6	0	19.92	19.91	19.81	20.5	0
1.4	64QAM	1	0	19.99	19.99	19.90	20.5	0
1.4	64QAM	1	3	20.07	20.06	19.96		
1.4	64QAM	1	5	20.00	19.96	19.88		
1.4	64QAM	3	0	19.90	19.93	19.86	20.5	0
1.4	64QAM	3	1	19.95	19.97	19.85		
1.4	64QAM	3	3	19.89	19.87	19.83		
1.4	64QAM	6	0	19.84	19.83	19.76	20.5	0



<LTE Band 7>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20850	21100	21350		
Frequency (MHz)				2510	2535	2560		
20	QPSK	1	0	17.97	17.82	17.64		
20	QPSK	1	49	17.97	17.84	17.67	18.5	0
20	QPSK	1	99	17.93	17.98	17.74		
20	QPSK	50	0	18.03	18.14	17.77		
20	QPSK	50	24	18.05	17.94	17.77	18.5	0
20	QPSK	50	50	17.96	17.95	17.75		
20	QPSK	100	0	17.92	17.93	17.78		
20	16QAM	1	0	18.16	18.01	17.82	18.5	0
20	16QAM	1	49	18.16	18.04	17.85		
20	16QAM	1	99	18.15	18.07	17.94		
20	16QAM	50	0	17.99	17.88	17.71	18.5	0
20	16QAM	50	24	18.04	17.86	17.71		
20	16QAM	50	50	17.93	17.90	17.75		
20	16QAM	100	0	17.93	17.87	17.68	18.5	0
20	64QAM	1	0	18.08	17.90	17.78		
20	64QAM	1	49	18.09	17.93	17.75		
20	64QAM	1	99	18.06	17.97	17.83	18.5	0
20	64QAM	50	0	18.09	17.96	17.78		
20	64QAM	50	24	18.13	17.99	17.82		
20	64QAM	50	50	18.00	17.98	17.81	18.5	0
20	64QAM	100	0	18.04	17.97	17.77		
Channel				20825	21100	21375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	17.99	17.86	17.67		
15	QPSK	1	37	17.98	17.82	17.67	18.5	0
15	QPSK	1	74	18.08	17.91	17.75		
15	QPSK	36	0	18.02	17.87	17.74	18.5	0
15	QPSK	36	20	18.10	17.90	17.79		
15	QPSK	36	39	18.08	17.94	17.78		
15	QPSK	75	0	18.05	17.94	17.73	18.5	0
15	16QAM	1	0	18.19	18.06	17.86		
15	16QAM	1	37	18.22	18.05	17.86		
15	16QAM	1	74	18.27	18.13	17.96	18.5	0
15	16QAM	36	0	18.00	17.82	17.65		
15	16QAM	36	20	18.04	17.87	17.71		
15	16QAM	36	39	18.02	17.88	17.70	18.5	0
15	16QAM	75	0	18.05	17.88	17.67		
15	64QAM	1	0	18.09	18.01	17.76		
15	64QAM	1	37	18.09	17.97	17.76	18.5	0
15	64QAM	1	74	18.15	18.02	17.83		
15	64QAM	36	0	18.06	17.91	17.76		
15	64QAM	36	20	18.13	17.95	17.82	18.5	0
15	64QAM	36	39	18.12	17.94	17.81		
15	64QAM	75	0	18.14	17.98	17.77		

Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	17.94	17.85	17.67	18.5	0
10	QPSK	1	25	18.00	17.85	17.65		
10	QPSK	1	49	18.03	17.91	17.70		
10	QPSK	25	0	18.03	17.88	17.70	18.5	0
10	QPSK	25	12	18.03	17.93	17.77		
10	QPSK	25	25	18.06	17.88	17.73		
10	QPSK	50	0	18.05	17.88	17.71		
10	16QAM	1	0	18.21	18.06	17.86	18.5	0
10	16QAM	1	25	18.19	18.07	17.87		
10	16QAM	1	49	18.23	18.08	17.93		
10	16QAM	25	0	17.96	17.84	17.68	18.5	0
10	16QAM	25	12	17.98	17.87	17.66		
10	16QAM	25	25	18.00	17.85	17.66		
10	16QAM	50	0	17.98	17.85	17.70		
10	64QAM	1	0	18.10	17.93	17.76	18.5	0
10	64QAM	1	25	18.11	17.96	17.73		
10	64QAM	1	49	18.10	17.95	17.83		
10	64QAM	25	0	18.06	17.95	17.78	18.5	0
10	64QAM	25	12	18.14	17.95	17.77		
10	64QAM	25	25	18.09	17.96	17.76		
10	64QAM	50	0	18.07	17.96	17.78		
Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	17.99	17.85	17.68	18.5	0
5	QPSK	1	12	18.00	17.87	17.68		
5	QPSK	1	24	18.02	17.86	17.68		
5	QPSK	12	0	18.01	17.89	17.69	18.5	0
5	QPSK	12	7	18.08	17.89	17.76		
5	QPSK	12	13	18.08	17.89	17.70		
5	QPSK	25	0	18.03	17.91	17.71		
5	16QAM	1	0	18.17	18.01	17.85	18.5	0
5	16QAM	1	12	18.21	18.07	17.84		
5	16QAM	1	24	18.22	18.09	17.93		
5	16QAM	12	0	17.99	17.85	17.63	18.5	0
5	16QAM	12	7	18.02	17.85	17.68		
5	16QAM	12	13	18.01	17.86	17.68		
5	16QAM	25	0	17.98	17.85	17.68		
5	64QAM	1	0	18.07	17.94	17.73	18.5	0
5	64QAM	1	12	18.11	17.94	17.73		
5	64QAM	1	24	18.13	17.99	17.79		
5	64QAM	12	0	18.06	17.93	17.71	18.5	0
5	64QAM	12	7	18.10	17.94	17.78		
5	64QAM	12	13	18.08	17.94	17.75		
5	64QAM	25	0	18.06	17.91	17.76		



**<WWAN Bottom Antenna -- Reduced Power for P-Sensor On/Hotspot
On/Handheld On>**

<LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				18700	18900	19100		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	22.66	22.64	22.52	23.5	0
20	QPSK	1	49	22.59	22.57	22.51		
20	QPSK	1	99	22.64	22.50	22.45		
20	QPSK	50	0	22.68	22.68	22.59	23.5	0
20	QPSK	50	24	22.69	22.69	22.60		
20	QPSK	50	50	22.61	22.63	22.54		
20	QPSK	100	0	22.75	22.67	22.56	23.5	0
20	16QAM	1	0	22.91	22.86	22.78		
20	16QAM	1	49	22.86	22.83	22.73		
20	16QAM	1	99	22.87	22.76	22.71	22.5	1
20	16QAM	50	0	21.75	21.71	21.64		
20	16QAM	50	24	21.74	21.69	21.66		
20	16QAM	50	50	21.75	21.68	21.61	22.5	1
20	16QAM	100	0	21.79	21.62	21.58		
20	64QAM	1	0	21.85	21.81	21.70	22.5	1
20	64QAM	1	49	21.80	21.75	21.64		
20	64QAM	1	99	21.79	21.67	21.62		
20	64QAM	50	0	20.73	20.70	20.63	21.5	2
20	64QAM	50	24	20.77	20.69	20.65		
20	64QAM	50	50	20.75	20.62	20.59		
20	64QAM	100	0	20.79	20.66	20.60		



Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	22.65	22.64	22.54	23.5	0
15	QPSK	1	37	22.63	22.59	22.52		
15	QPSK	1	74	22.58	22.54	22.47		
15	QPSK	36	0	22.71	22.68	22.56	23.5	0
15	QPSK	36	20	22.70	22.69	22.63		
15	QPSK	36	39	22.64	22.63	22.58		
15	QPSK	75	0	22.68	22.64	22.57	23.5	0
15	16QAM	1	0	22.91	22.89	22.76		
15	16QAM	1	37	22.88	22.86	22.81		
15	16QAM	1	74	22.80	22.75	22.74	22.5	1
15	16QAM	36	0	21.77	21.71	21.62		
15	16QAM	36	20	21.75	21.74	21.63		
15	16QAM	36	39	21.69	21.66	21.59	22.5	1
15	16QAM	75	0	21.74	21.70	21.62		
15	64QAM	1	0	21.79	21.81	21.66	22.5	1
15	64QAM	1	37	21.76	21.74	21.71		
15	64QAM	1	74	21.73	21.68	21.69		
15	64QAM	36	0	20.73	20.70	20.61	21.5	2
15	64QAM	36	20	20.72	20.72	20.64		
15	64QAM	36	39	20.68	20.63	20.60		
15	64QAM	75	0	20.70	20.70	20.62	21.5	2
Channel				18650	18900	19150		
Frequency (MHz)				1855	1880	1905	Tune-up limit (dBm)	MPR (dB)
10	QPSK	1	0	22.62	22.75	22.52		
10	QPSK	1	25	22.53	22.62	22.53	23.5	0
10	QPSK	1	49	22.50	22.60	22.42		
10	QPSK	25	0	22.62	22.71	22.59	23.5	0
10	QPSK	25	12	22.60	22.71	22.58		
10	QPSK	25	25	22.54	22.63	22.56		
10	QPSK	50	0	22.54	22.69	22.57	23.5	0
10	16QAM	1	0	22.85	22.97	22.75		
10	16QAM	1	25	22.78	22.89	22.79		
10	16QAM	1	49	22.76	22.83	22.71	22.5	1
10	16QAM	25	0	21.65	21.72	21.61		
10	16QAM	25	12	21.65	21.72	21.63		
10	16QAM	25	25	21.58	21.66	21.57	22.5	1
10	16QAM	50	0	21.63	21.70	21.64		
10	64QAM	1	0	21.73	21.86	21.67		
10	64QAM	1	25	21.67	21.73	21.67	22.5	1
10	64QAM	1	49	21.68	21.78	21.62		
10	64QAM	25	0	20.64	20.72	20.62		
10	64QAM	25	12	20.64	20.73	20.62	21.5	2
10	64QAM	25	25	20.58	20.63	20.56		
10	64QAM	50	0	20.62	20.68	20.62		

Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	22.60	22.60	22.49	23.5	0
5	QPSK	1	12	22.60	22.62	22.53		
5	QPSK	1	24	22.54	22.59	22.47		
5	QPSK	12	0	22.67	22.62	22.57	23.5	0
5	QPSK	12	7	22.67	22.68	22.60		
5	QPSK	12	13	22.63	22.62	22.52		
5	QPSK	25	0	22.67	22.66	22.53	23.5	0
5	16QAM	1	0	22.84	22.82	22.77		
5	16QAM	1	12	22.87	22.82	22.78		
5	16QAM	1	24	22.84	22.75	22.72	22.5	1
5	16QAM	12	0	21.71	21.67	21.64		
5	16QAM	12	7	21.69	21.68	21.65		
5	16QAM	12	13	21.66	21.62	21.62	22.5	1
5	16QAM	25	0	21.71	21.66	21.63		
5	64QAM	1	0	21.75	21.75	21.64	22.5	1
5	64QAM	1	12	21.78	21.76	21.71		
5	64QAM	1	24	21.72	21.66	21.65		
5	64QAM	12	0	20.68	20.67	20.60	21.5	2
5	64QAM	12	7	20.68	20.67	20.65		
5	64QAM	12	13	20.53	20.63	20.61		
5	64QAM	25	0	20.66	20.68	20.60	21.5	2
Channel				18615	18900	19185		
Frequency (MHz)				1851.5	1880	1908.5	Tune-up limit (dBm)	MPR (dB)
3	QPSK	1	0	22.57	22.63	22.53		
3	QPSK	1	8	22.56	22.66	22.51	23.5	0
3	QPSK	1	14	22.51	22.64	22.50		
3	QPSK	8	0	22.60	22.69	22.57	23.5	0
3	QPSK	8	4	22.61	22.71	22.62		
3	QPSK	8	7	22.57	22.67	22.56		
3	QPSK	15	0	22.60	22.68	22.58	23.5	0
3	16QAM	1	0	22.74	22.85	22.81		
3	16QAM	1	8	22.80	22.87	22.82		
3	16QAM	1	14	22.74	22.80	22.74	22.5	1
3	16QAM	8	0	21.63	21.72	21.67		
3	16QAM	8	4	21.66	21.76	21.70		
3	16QAM	8	7	21.63	21.72	21.64	22.5	1
3	16QAM	15	0	21.63	21.73	21.65		
3	64QAM	1	0	21.67	21.75	21.70		
3	64QAM	1	8	21.72	21.79	21.73	22.5	1
3	64QAM	1	14	21.67	21.75	21.66		
3	64QAM	8	0	20.60	20.69	20.62		
3	64QAM	8	4	20.65	20.73	20.67	21.5	2
3	64QAM	8	7	20.60	20.68	20.59		
3	64QAM	15	0	20.62	20.71	20.65		



Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	22.51	22.57	22.46	23.5	0
1.4	QPSK	1	3	22.54	22.67	22.53		
1.4	QPSK	1	5	22.48	22.60	22.47		
1.4	QPSK	3	0	22.54	22.62	22.50		
1.4	QPSK	3	1	22.58	22.67	22.55		
1.4	QPSK	3	3	22.53	22.62	22.51		
1.4	QPSK	6	0	22.56	22.65	22.54	23.5	0
1.4	16QAM	1	0	22.76	22.81	22.74	23.5	0
1.4	16QAM	1	3	22.79	22.87	22.78		
1.4	16QAM	1	5	22.70	22.79	22.71		
1.4	16QAM	3	0	22.55	22.63	22.52		
1.4	16QAM	3	1	22.58	22.68	22.57		
1.4	16QAM	3	3	22.55	22.61	22.52		
1.4	16QAM	6	0	21.65	21.74	21.67	22.5	1
1.4	64QAM	1	0	21.65	21.75	21.64	22.5	1
1.4	64QAM	1	3	21.67	21.77	21.67		
1.4	64QAM	1	5	21.60	21.70	21.66		
1.4	64QAM	3	0	21.61	21.68	21.59		
1.4	64QAM	3	1	21.68	21.71	21.62		
1.4	64QAM	3	3	21.59	21.66	21.55		
1.4	64QAM	6	0	20.58	20.66	20.61	21.5	2



<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20050	20175	20300	21.5	0
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	20.16	20.37	20.33	21.5	0
20	QPSK	1	49	20.19	20.34	20.36		
20	QPSK	1	99	20.22	20.20	20.24		
20	QPSK	50	0	20.25	20.40	20.33	21.5	0
20	QPSK	50	24	20.33	20.41	20.35		
20	QPSK	50	50	20.36	20.30	20.36		
20	QPSK	100	0	20.35	20.36	20.33	21.5	0
20	16QAM	1	0	20.58	20.68	20.73		
20	16QAM	1	49	20.57	20.72	20.75		
20	16QAM	1	99	20.64	20.61	20.62	21.5	0
20	16QAM	50	0	20.39	20.55	20.45		
20	16QAM	50	24	20.46	20.50	20.48		
20	16QAM	50	50	20.50	20.44	20.47	21.5	0
20	16QAM	100	0	20.41	20.47	20.39		
20	64QAM	1	0	20.46	20.59	20.60		
20	64QAM	1	49	20.49	20.59	20.71	21.5	0
20	64QAM	1	99	20.53	20.55	20.54		
20	64QAM	50	0	20.39	20.52	20.45		
20	64QAM	50	24	20.44	20.50	20.46	21.5	0
20	64QAM	50	50	20.45	20.43	20.45		
20	64QAM	100	0	20.45	20.48	20.42		
Channel				20025	20175	20325	21.5	0
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	20.18	20.32	20.34	21.5	0
15	QPSK	1	37	20.16	20.31	20.34		
15	QPSK	1	74	20.20	20.25	20.29		
15	QPSK	36	0	20.24	20.36	20.31	21.5	0
15	QPSK	36	20	20.39	20.41	20.45		
15	QPSK	36	39	20.28	20.33	20.39		
15	QPSK	75	0	20.35	20.34	20.29	21.5	0
15	16QAM	1	0	20.62	20.68	20.74		
15	16QAM	1	37	20.61	20.71	20.78		
15	16QAM	1	74	20.60	20.66	20.64	21.5	0
15	16QAM	36	0	20.38	20.47	20.47		
15	16QAM	36	20	20.48	20.54	20.57		
15	16QAM	36	39	20.39	20.47	20.49	21.5	0
15	16QAM	75	0	20.42	20.48	20.44		
15	64QAM	1	0	20.45	20.55	20.62		
15	64QAM	1	37	20.51	20.62	20.65	21.5	0
15	64QAM	1	74	20.48	20.52	20.53		
15	64QAM	36	0	20.40	20.47	20.48		
15	64QAM	36	20	20.48	20.53	20.57	21.5	0
15	64QAM	36	39	20.39	20.46	20.48		
15	64QAM	75	0	20.43	20.47	20.44		

Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	20.16	20.37	20.42	21.5	0
10	QPSK	1	25	20.24	20.35	20.40		
10	QPSK	1	49	20.15	20.24	20.28		
10	QPSK	25	0	20.24	20.42	20.43	21.5	0
10	QPSK	25	12	20.23	20.40	20.44		
10	QPSK	25	25	20.24	20.35	20.36		
10	QPSK	50	0	20.22	20.39	20.37	21.5	0
10	16QAM	1	0	20.56	20.75	20.74		
10	16QAM	1	25	20.65	20.74	20.72		
10	16QAM	1	49	20.54	20.65	20.66	21.5	0
10	16QAM	25	0	20.38	20.52	20.58		
10	16QAM	25	12	20.36	20.52	20.55		
10	16QAM	25	25	20.33	20.48	20.48	21.5	0
10	16QAM	50	0	20.35	20.51	20.51		
10	64QAM	1	0	20.45	20.70	20.71		
10	64QAM	1	25	20.55	20.65	20.68	21.5	0
10	64QAM	1	49	20.41	20.55	20.59		
10	64QAM	25	0	20.37	20.52	20.56		
10	64QAM	25	12	20.37	20.51	20.55	21.5	0
10	64QAM	25	25	20.34	20.48	20.46		
10	64QAM	50	0	20.32	20.49	20.48		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	20.14	20.35	20.37	21.5	0
5	QPSK	1	12	20.14	20.31	20.35		
5	QPSK	1	24	20.17	20.30	20.28		
5	QPSK	12	0	20.18	20.39	20.43	21.5	0
5	QPSK	12	7	20.22	20.42	20.42		
5	QPSK	12	13	20.26	20.35	20.39		
5	QPSK	25	0	20.23	20.37	20.36	21.5	0
5	16QAM	1	0	20.51	20.67	20.68		
5	16QAM	1	12	20.58	20.69	20.74		
5	16QAM	1	24	20.54	20.69	20.65	21.5	0
5	16QAM	12	0	20.33	20.49	20.54		
5	16QAM	12	7	20.33	20.54	20.57		
5	16QAM	12	13	20.38	20.49	20.51	21.5	0
5	16QAM	25	0	20.36	20.48	20.49		
5	64QAM	1	0	20.38	20.58	20.67		
5	64QAM	1	12	20.41	20.61	20.65	21.5	0
5	64QAM	1	24	20.47	20.55	20.55		
5	64QAM	12	0	20.30	20.46	20.53		
5	64QAM	12	7	20.32	20.53	20.54	21.5	0
5	64QAM	12	13	20.38	20.47	20.49		
5	64QAM	25	0	20.34	20.47	20.48		



Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	20.12	20.29	20.29	21.5	0
3	QPSK	1	8	20.10	20.30	20.32		
3	QPSK	1	14	20.06	20.23	20.31		
3	QPSK	8	0	20.14	20.34	20.36	21.5	0
3	QPSK	8	4	20.17	20.38	20.36		
3	QPSK	8	7	20.12	20.34	20.35		
3	QPSK	15	0	20.14	20.34	20.34	21.5	0
3	16QAM	1	0	20.52	20.69	20.73		
3	16QAM	1	8	20.55	20.68	20.70		
3	16QAM	1	14	20.49	20.61	20.61	21.5	0
3	16QAM	8	0	20.31	20.47	20.49		
3	16QAM	8	4	20.33	20.54	20.55		
3	16QAM	8	7	20.31	20.50	20.48	21.5	0
3	16QAM	15	0	20.26	20.46	20.47		
3	64QAM	1	0	20.38	20.59	20.63		
3	64QAM	1	8	20.38	20.58	20.61	21.5	0
3	64QAM	1	14	20.38	20.57	20.56		
3	64QAM	8	0	20.26	20.42	20.44		
3	64QAM	8	4	20.29	20.45	20.51	21.5	0
3	64QAM	8	7	20.24	20.47	20.46		
3	64QAM	15	0	20.24	20.44	20.43		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	20.04	20.24	20.26	21.5	0
1.4	QPSK	1	3	20.10	20.31	20.36		
1.4	QPSK	1	5	20.01	20.23	20.26		
1.4	QPSK	3	0	20.08	20.32	20.30		
1.4	QPSK	3	1	20.13	20.33	20.35		
1.4	QPSK	3	3	20.08	20.31	20.30		
1.4	QPSK	6	0	20.09	20.32	20.34	21.5	0
1.4	16QAM	1	0	20.48	20.68	20.70	21.5	0
1.4	16QAM	1	3	20.54	20.73	20.70		
1.4	16QAM	1	5	20.50	20.68	20.64		
1.4	16QAM	3	0	20.23	20.43	20.43		
1.4	16QAM	3	1	20.28	20.46	20.48		
1.4	16QAM	3	3	20.20	20.46	20.43		
1.4	16QAM	6	0	20.29	20.49	20.51	21.5	0
1.4	64QAM	1	0	20.34	20.59	20.55	21.5	0
1.4	64QAM	1	3	20.40	20.61	20.61		
1.4	64QAM	1	5	20.30	20.54	20.56		
1.4	64QAM	3	0	20.28	20.43	20.49		
1.4	64QAM	3	1	20.32	20.51	20.53		
1.4	64QAM	3	3	20.26	20.48	20.48		
1.4	64QAM	6	0	20.19	20.41	20.42	21.5	0

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

1. 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.
2. 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).
3. 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.
4. 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.

<Full Power>

<2.4GHz WLAN>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	17.71	18.50	100.00
		6	2437	17.98	18.50	
		11	2462	17.67	18.50	
	802.11g 6Mbps	1	2412	15.82	17.00	95.34
		6	2437	16.16	17.00	
		11	2462	15.94	17.00	
	802.11n-HT20 MCS0	1	2412	15.55	17.00	96.64
		6	2437	15.52	17.00	
		11	2462	15.75	17.00	

<5GHz WLAN>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	15.14	16.50	95.64
		40	5200	15.00	16.50	
		44	5220	15.20	16.50	
		48	5240	15.41	16.50	
	802.11n-HT20 MCS0	36	5180	15.09	16.50	94.91
		40	5200	14.88	16.50	
		44	5220	15.04	16.50	
		48	5240	15.38	16.50	
	802.11n-HT40 MCS0	38	5190	11.76	13.00	90.97
		46	5230	15.18	16.00	
	802.11ac-VHT20 MCS0	36	5180	15.14	16.50	95.02
		40	5200	15.01	16.50	
		44	5220	15.15	16.50	
		48	5240	15.40	16.50	
	802.11ac-VHT40 MCS0	38	5190	12.18	13.00	90.41
		46	5230	15.62	16.00	
	802.11ac-VHT80 MCS0	42	5210	10.70	12.00	85.11



5.3GHz WLAN	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
	802.11a 6Mbps	52	5260	15.31	16.50	95.64
		56	5280	15.04	16.50	
		60	5300	15.02	16.50	
		64	5320	15.24	16.50	
	802.11n-HT20 MCS0	52	5260	15.29	16.50	94.91
		56	5280	14.97	16.50	
		60	5300	14.96	16.50	
		64	5320	15.12	16.50	
	802.11n-HT40 MCS0	54	5270	15.17	16.00	90.97
		62	5310	12.87	13.00	
	802.11ac-VHT20 MCS0	52	5260	15.34	16.50	95.02
		56	5280	14.98	16.50	
		60	5300	14.88	16.50	
		64	5320	15.17	16.50	
	802.11ac-VHT40 MCS0	54	5270	15.50	16.00	90.41
		62	5310	13.15	14.00	
	802.11ac-VHT80 MCS0	58	5290	11.68	12.00	85.11

5.5GHz WLAN	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	=Duty Cycle %
	802.11a 6Mbps	100	5500	15.12	16.50	95.64
		116	5580	15.30	16.50	
		124	5620	14.65	16.50	
		132	5660	15.13	16.50	
		140	5700	15.20	16.50	
	802.11n-HT20 MCS0	100	5500	14.05	16.00	94.91
		116	5580	15.07	16.00	
		124	5620	14.48	16.00	
		132	5660	15.18	16.00	
		140	5700	14.02	16.00	
	802.11n-HT40 MCS0	102	5510	13.04	15.00	90.97
		110	5550	15.09	16.00	
		126	5630	14.76	16.00	
		134	5670	13.79	15.00	
	802.11ac-VHT20 MCS0	100	5500	14.07	16.00	95.02
		116	5580	15.18	16.00	
		124	5620	14.43	16.00	
		132	5660	15.00	16.00	
		140	5700	14.10	16.00	
	802.11ac-VHT40 MCS0	102	5510	13.42	14.00	90.41
		110	5550	15.52	16.00	
		126	5630	14.91	16.00	
		134	5670	14.58	16.00	
	802.11ac-VHT80 MCS0	106	5530	11.49	12.00	85.11
		122	5610	14.04	16.00	

5.8GHz WLAN	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
	802.11a MCS0	149	5745	15.63	16.50	95.64
		157	5785	15.40	16.50	
		165	5825	15.32	16.50	
	802.11n-HT20 MCS0	149	5745	15.58	16.50	94.91
		157	5785	15.28	16.50	
		165	5825	15.26	16.50	
	802.11n-HT40 MCS0	151	5755	15.59	16.00	90.97
		159	5795	15.38	16.00	
	802.11ac-VHT20 MCS0	149	5745	15.59	16.50	95.02
		157	5785	15.31	16.50	
		165	5825	15.27	16.50	
	802.11ac-VHT40 MCS0	151	5755	15.98	16.00	90.41
		159	5795	15.81	16.00	
	802.11ac-VHT80 MCS0	155	5775	14.62	16.00	85.11

<Reduced Power for Receiver On >

<5GHz WLAN >

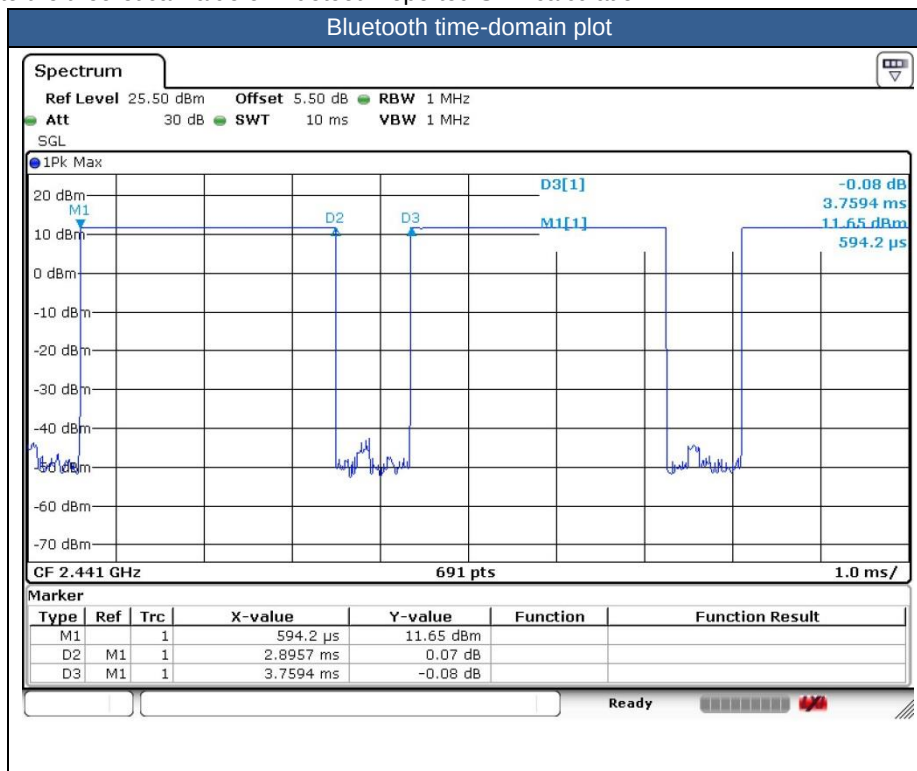
5.5GHz WLAN	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	=Duty Cycle %
	802.11a 6Mbps	100	5500	14.38	15.00	95.64
		116	5580	14.41	15.00	
		124	5620	13.92	15.00	
		132	5660	14.20	15.00	
		140	5700	14.17	15.00	
	802.11n-HT20 MCS0	100	5500	13.62	15.00	94.91
		116	5580	13.60	15.00	
		124	5620	13.20	15.00	
		132	5660	13.25	15.00	
		140	5700	12.98	15.00	
	802.11n-HT40 MCS0	102	5510	13.04	14.50	90.97
		110	5550	13.56	14.50	
		126	5630	13.14	14.50	
		134	5670	12.85	14.50	
	802.11ac-VHT20 MCS0	100	5500	13.78	15.00	95.02
		116	5580	13.80	15.00	
		124	5620	13.39	15.00	
		132	5660	13.28	15.00	
		140	5700	13.01	15.00	
	802.11ac-VHT40 MCS0	102	5510	13.42	14.50	90.41
		110	5550	13.50	14.50	
		126	5630	13.01	14.50	
		134	5670	12.58	14.50	
	802.11ac-VHT80 MCS0	106	5530	11.49	14.50	85.11
		122	5610	13.63	14.50	

5.8GHz WLAN	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
	802.11a MCS0	149	5745	13.65	15.00	95.64
		157	5785	13.58	15.00	
		165	5825	13.88	15.00	
	802.11n-HT20 MCS0	149	5745	12.75	14.50	94.91
		157	5785	12.34	14.50	
		165	5825	12.97	14.50	
	802.11n-HT40 MCS0	151	5755	12.48	14.50	90.97
		159	5795	12.52	14.50	
	802.11ac-VHT20 MCS0	149	5745	12.99	14.50	95.02
		157	5785	12.73	14.50	
		165	5825	12.91	14.50	
	802.11ac-VHT40 MCS0	151	5755	12.56	14.50	90.41
		159	5795	12.50	14.50	
	802.11ac-VHT80 MCS0	155	5775	13.04	14.50	85.11

<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 is 77.03 % as following figure, according to 2016 Oct. TCB workshop for 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.

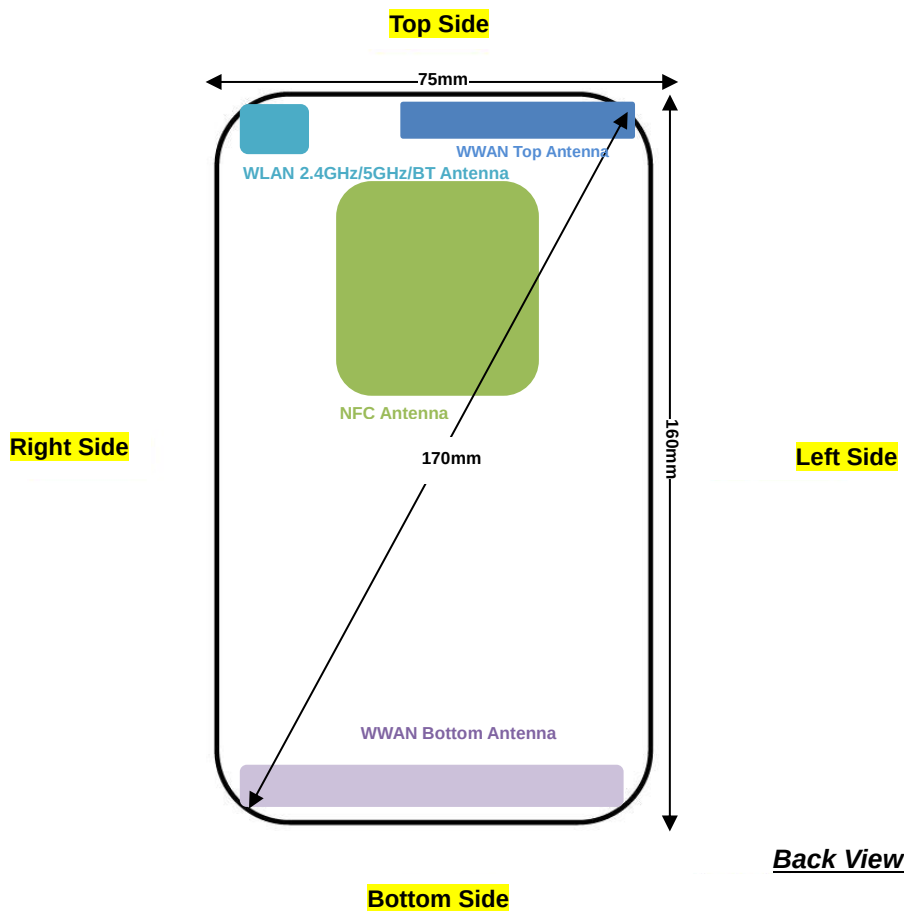


Mode	Channel	Frequency (MHz)	Data Rate
			1Mbps
BR/EDR	CH 00	2402	11.91
	CH 39	2441	11.75
	CH 78	2480	11.79
Tune-up Limit			12.00

Mode	Channel	Frequency (MHz)	Average power (dBm)
			GFSK
v4.0/v4.1/v4.2 LE	CH 00	2402	-0.03
	CH 19	2440	1.32
	CH 39	2480	1.83
Tune-up Limit			2.00

Mode	Channel	Frequency (MHz)	Average power (dBm)
			GFSK
v5.0 LE	CH 00	2402	0.12
	CH 19	2440	1.42
	CH 39	2480	1.98
Tune-up Limit			2.00

14. Antenna Location



Antenna	Support Band
WWAN Top Antenna	GSM: 850 / 1900 WCDMA: B2 / B4 / B5 LTE: B2 / B4 / B5 / B7 / B12 / B17 / B28
WWAN Bottom Antenna	GSM: 850 / 1900 WCDMA: B2 / B4 / B5 LTE: B2 / B4 / B5 / B7 / B12 / B17 / B28
WLAN 2.4GHz/5GHz/BT Antenna	WLAN 2.4GHz WLAN 5GHz Bluetooth
NFC Antenna	NFC

Distance of the Antenna to the EUT surface/edge						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN Top Antenna	≤ 25mm	≤ 25mm	≤ 25mm	>25mm	>25mm	≤ 25mm
WWAN Bottom Antenna	≤ 25mm	≤ 25mm	>25mm	≤ 25mm	≤ 25mm	≤ 25mm
WLAN 2.4GHz/5GHz/BT Antenna	≤ 25mm	≤ 25mm	≤ 25mm	>25mm	≤ 25mm	>25mm

Distance of the Antenna to the EUT surface/edge						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN Top Antenna	Yes	Yes	Yes	No	No	Yes
WWAN Bottom Antenna	Yes	Yes	No	Yes	Yes	Yes
WLAN 2.4GHz/5GHz/BT Antenna	Yes	Yes	Yes	No	Yes	No

General Note:

Referring to KDB 941225 D06 v02r01, when the overall device length and width are $\geq 9\text{cm} \times 5\text{cm}$, the test distance is 10 mm. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge.

15. 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 WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
 - d. For WLAN/Bluetooth: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
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 for 1g SAR, the measured SAR is ≥ 2.0 W/kg for 10g SAR.
4. Per KDB 648474 D04v01r03, when the reported SAR for a body-worn accessory measured without a headset connected to the handset is ≤ 1.2 W/kg, SAR testing with a headset connected to the handset is not required.
5. Per KDB648474 D04v01r03, for smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm, when hotspot mode applies, 10-g product specific SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg, however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power, including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold, for this device WWAN/WLAN/BT hotspot mode SAR include scaled SAR are all less than 1.2 W/kg, so no need to consider 10g product specific SAR.
6. For 5.3 GHz / 5.5 GHz WLAN product specific SAR is necessary, due to an overall diagonal dimension is > 16 cm.
7. This device has two WWAN transmit antennas. WWAN bottom antenna is located at the bottom edge of the device, and WWAN top antenna is located at the top edge of the device which can refer to antenna location chapter. Top and Bottom antenna support the same WWAN frequency bands, and they can't transmit simultaneously.
8. For top WWAN antenna and WLAN antenna:
 - a. When the phone is in talking mode and receiver worked, then power reduction will be implemented immediately in GSM1900, WCDMA band 2/4, LTE B2/4/7 and WLAN 5.5/5.8GHz.
 - b. When hotspot mode is enabled, power reduction will be activated to GSM1900, WCDMA band 2/4 and LTE B2/4/7.
 - c. The device employs proximity sensors that detect the presence of the user's body also a finger or hand at the front or back or top faces of the device. When front or back or top of body condition or when the device is in handheld state is detected, GSM1900, WCDMA band 2/4 and LTE B2/4/7 reduced power will be active. (P-sensor can't work at detecting presence of the user's body at the three edges of the device.)
10. For bottom WWAN antenna:
 - a. When hotspot mode is enabled, power reduction will be activated to GSM1900, WCDMA band II/IV, LTE band 2/4.
 - b. The device employs proximity sensors that detect the presence of the user's body also a finger or hand at the front or back or bottom faces of the device. When front or back or bottom of body condition or when the device is in handheld state is detected, GSM1900, WCDMA band 2/4 and LTE B2/4 reduced power will be active. (P-sensor can't work at detecting presence of the user's body at the three edges of the device.)

**GSM Note:**

1. Per KDB 941225 D01v03r01, for SAR test reduction for GSM / GPRS / EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. Therefore, the GPRS 3Tx slots for GSM850/GSM1900 are considered as the primary mode.
2. Other configurations of GSM / GPRS / EDGE are considered as secondary modes. The 3G SAR test reduction procedure is applied, when the maximum output power and tune-up tolerance specified for production units in a secondary mode is $\leq \frac{1}{4}$ dB higher than the primary mode, SAR measurement is not required for the secondary mode.

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 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 to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA, and according to the following RF output power, the output power results of the secondary modes (HSDPA / HSUPA / DC-HSDPA) are less than $\frac{1}{4}$ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA.

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/64QAM 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.
5. 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.
6. For LTE B4 / B5 / B12 / B28 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 17 SAR test was covered by LTE B12; 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 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.



15.1 Head SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Antenna	Power Mode	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)
01	GSM 850	GPRS 3 Tx slots	Right Cheek	Top	Full	189	836.4	31.19	32.00	1.205	0.01	0.767	0.924
	GSM 850	GPRS 3 Tx slots	Right Cheek	Top	Full	128	824.2	31.15	32.00	1.216	-0.03	0.576	0.701
	GSM 850	GPRS 3 Tx slots	Right Cheek	Top	Full	251	848.8	31.17	32.00	1.211	0.04	0.851	1.030
	GSM 850	GPRS 3 Tx slots	Right Tilted	Top	Full	189	836.4	31.19	32.00	1.205	-0.01	0.725	0.874
	GSM 850	GPRS 3 Tx slots	Right Tilted	Top	Full	128	824.2	31.15	32.00	1.216	-0.01	0.535	0.651
	GSM 850	GPRS 3 Tx slots	Right Tilted	Top	Full	251	848.8	31.17	32.00	1.211	-0.01	0.637	0.771
	GSM 850	GPRS 3 Tx slots	Left Cheek	Top	Full	189	836.4	31.19	32.00	1.205	0.01	0.540	0.651
	GSM 850	GPRS 3 Tx slots	Left Tilted	Top	Full	189	836.4	31.19	32.00	1.205	-0.04	0.402	0.484
	GSM 850	GPRS 3 Tx slots	Right Cheek	Bottom	Full	189	836.4	31.19	32.00	1.205	0.01	0.263	0.317
	GSM 850	GPRS 3 Tx slots	Right Cheek	Bottom	Full	128	824.2	31.15	32.00	1.216	0.01	0.211	0.257
	GSM 850	GPRS 3 Tx slots	Right Cheek	Bottom	Full	251	848.8	31.17	32.00	1.211	0.01	0.279	0.338
	GSM 850	GPRS 3 Tx slots	Right Tilted	Bottom	Full	189	836.4	31.19	32.00	1.205	0.01	0.133	0.160
	GSM 850	GPRS 3 Tx slots	Left Cheek	Bottom	Full	189	836.4	31.19	32.00	1.205	0.06	0.245	0.295
02	GSM 850	GPRS 3 Tx slots	Left Tilted	Bottom	Full	189	836.4	31.19	32.00	1.205	0.01	0.127	0.153
	GSM 1900	GPRS 3 Tx slots	Right Cheek	Top	Reduced	512	1850.2	25.20	25.50	1.072	0.04	0.815	0.873
	GSM 1900	GPRS 3 Tx slots	Right Cheek	Top	Reduced	661	1880	25.10	25.50	1.096	-0.18	0.734	0.805
	GSM 1900	GPRS 3 Tx slots	Right Cheek	Top	Reduced	810	1909.8	25.03	25.50	1.114	0.06	0.598	0.666
	GSM 1900	GPRS 3 Tx slots	Right Tilted	Top	Reduced	512	1850.2	25.20	25.50	1.072	0.06	0.494	0.529
	GSM 1900	GPRS 3 Tx slots	Left Cheek	Top	Reduced	512	1850.2	25.20	25.50	1.072	0.09	0.346	0.371
	GSM 1900	GPRS 3 Tx slots	Left Tilted	Top	Reduced	512	1850.2	25.20	25.50	1.072	0.04	0.368	0.394
	GSM 1900	GPRS 3 Tx slots	Right Cheek	Bottom	Full	512	1850.2	28.81	29.50	1.172	0.01	0.149	0.175
	GSM 1900	GPRS 3 Tx slots	Right Tilted	Bottom	Full	512	1850.2	28.81	29.50	1.172	0.02	0.143	0.168
	GSM 1900	GPRS 3 Tx slots	Left Cheek	Bottom	Full	512	1850.2	28.81	29.50	1.172	0.01	0.204	0.239
	GSM 1900	GPRS 3 Tx slots	Left Cheek	Bottom	Full	661	1880	28.76	29.50	1.186	0.01	0.117	0.139
	GSM 1900	GPRS 3 Tx slots	Left Cheek	Bottom	Full	810	1909.8	28.53	29.50	1.250	0.02	0.158	0.198
	GSM 1900	GPRS 3 Tx slots	Left Tilted	Bottom	Full	512	1850.2	28.81	29.50	1.172	0.05	0.139	0.163

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Antenna	Power Mode	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)
03	WCDMA V	RMC 12.2Kbps	Right Cheek	Top	Full	4233	846.6	23.93	24.50	1.140	0.09	0.453	0.517
	WCDMA V	RMC 12.2Kbps	Right Cheek	Top	Full	4132	826.4	23.75	24.50	1.189	-0.01	0.426	0.506
	WCDMA V	RMC 12.2Kbps	Right Cheek	Top	Full	4182	836.4	23.81	24.50	1.172	0.09	0.457	0.536
	WCDMA V	RMC 12.2Kbps	Right Tilted	Top	Full	4233	846.6	23.93	24.50	1.140	0.04	0.356	0.406
	WCDMA V	RMC 12.2Kbps	Left Cheek	Top	Full	4233	846.6	23.93	24.50	1.140	0.01	0.283	0.323
	WCDMA V	RMC 12.2Kbps	Left Tilted	Top	Full	4233	846.6	23.93	24.50	1.140	-0.05	0.219	0.250
	WCDMA V	RMC 12.2Kbps	Right Cheek	Bottom	Full	4233	846.6	23.93	24.50	1.140	0.06	0.253	0.288
	WCDMA V	RMC 12.2Kbps	Right Cheek	Bottom	Full	4132	826.4	23.75	24.50	1.189	0.02	0.166	0.197
	WCDMA V	RMC 12.2Kbps	Right Cheek	Bottom	Full	4182	836.4	23.81	24.50	1.172	0.07	0.171	0.200
	WCDMA V	RMC 12.2Kbps	Right Tilted	Bottom	Full	4233	846.6	23.93	24.50	1.140	0.06	0.151	0.172
	WCDMA V	RMC 12.2Kbps	Left Cheek	Bottom	Full	4233	846.6	23.93	24.50	1.140	0.01	0.237	0.270
	WCDMA V	RMC 12.2Kbps	Left Tilted	Bottom	Full	4233	846.6	23.93	24.50	1.140	0.01	0.137	0.156
04	WCDMA II	RMC 12.2Kbps	Right Cheek	Top	Reduced	9538	1907.6	20.79	21.00	1.050	0.09	0.707	0.742
	WCDMA II	RMC 12.2Kbps	Right Cheek	Top	Reduced	9262	1852.4	20.61	21.00	1.094	0.11	0.756	0.827
	WCDMA II	RMC 12.2Kbps	Right Cheek	Top	Reduced	9400	1880	20.75	21.00	1.059	0.01	0.597	0.632
	WCDMA II	RMC 12.2Kbps	Right Tilted	Top	Reduced	9538	1907.6	20.79	21.00	1.050	0.01	0.503	0.528
	WCDMA II	RMC 12.2Kbps	Left Cheek	Top	Reduced	9538	1907.6	20.79	21.00	1.050	0.06	0.368	0.386
	WCDMA II	RMC 12.2Kbps	Left Tilted	Top	Reduced	9538	1907.6	20.79	21.00	1.050	0.01	0.404	0.424
	WCDMA II	RMC 12.2Kbps	Right Cheek	Bottom	Full	9538	1907.6	24.03	24.50	1.114	0.01	0.167	0.186
	WCDMA II	RMC 12.2Kbps	Right Cheek	Bottom	Full	9262	1852.4	23.90	24.50	1.148	0.03	0.130	0.149
	WCDMA II	RMC 12.2Kbps	Right Cheek	Bottom	Full	9400	1880	23.97	24.50	1.130	0.01	0.134	0.151
	WCDMA II	RMC 12.2Kbps	Right Tilted	Bottom	Full	9538	1907.6	24.03	24.50	1.114	-0.03	0.123	0.137
	WCDMA II	RMC 12.2Kbps	Left Cheek	Bottom	Full	9538	1907.6	24.03	24.50	1.114	0.04	0.152	0.169
	WCDMA II	RMC 12.2Kbps	Left Tilted	Bottom	Full	9538	1907.6	24.03	24.50	1.114	-0.02	0.107	0.119
05	WCDMA IV	RMC 12.2Kbps	Right Cheek	Top	Reduced	1513	1752.6	21.09	21.50	1.099	-0.01	0.944	1.037
	WCDMA IV	RMC 12.2Kbps	Right Cheek	Top	Reduced	1312	1712.4	20.95	21.50	1.135	0.02	0.840	0.953
	WCDMA IV	RMC 12.2Kbps	Right Cheek	Top	Reduced	1413	1732.6	21.07	21.50	1.104	0.01	0.889	0.982
	WCDMA IV	RMC 12.2Kbps	Right Tilted	Top	Reduced	1513	1752.6	21.09	21.50	1.099	-0.03	0.554	0.609
	WCDMA IV	RMC 12.2Kbps	Left Cheek	Top	Reduced	1513	1752.6	21.09	21.50	1.099	0.04	0.488	0.536
	WCDMA IV	RMC 12.2Kbps	Left Tilted	Top	Reduced	1513	1752.6	21.09	21.50	1.099	-0.02	0.423	0.465
	WCDMA IV	RMC 12.2Kbps	Right Cheek	Bottom	Full	1513	1752.6	23.79	24.50	1.178	-0.07	0.144	0.170
	WCDMA IV	RMC 12.2Kbps	Right Cheek	Bottom	Full	1312	1712.4	23.72	24.50	1.197	0.01	0.117	0.140
	WCDMA IV	RMC 12.2Kbps	Right Cheek	Bottom	Full	1413	1732.6	23.75	24.50	1.189	0.03	0.125	0.149
	WCDMA IV	RMC 12.2Kbps	Right Tilted	Bottom	Full	1513	1752.6	23.79	24.50	1.178	0.02	0.048	0.056
	WCDMA IV	RMC 12.2Kbps	Left Cheek	Bottom	Full	1513	1752.6	23.79	24.50	1.178	0.06	0.047	0.055
	WCDMA IV	RMC 12.2Kbps	Left Tilted	Bottom	Full	1513	1752.6	23.79	24.50	1.178	0.04	0.041	0.049



<LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Antenna	Power Mode	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)
06	LTE Band 5	10M	QPSK	1	0	Right Cheek	Top	Full	20525	836.5	23.87	24.50	1.156	-0.01	0.392	0.453
	LTE Band 5	10M	QPSK	25	12	Right Cheek	Top	Full	20525	836.5	22.96	23.50	1.132	0.06	0.307	0.348
	LTE Band 5	10M	QPSK	1	0	Right Tilted	Top	Full	20525	836.5	23.87	24.50	1.156	0.04	0.285	0.329
	LTE Band 5	10M	QPSK	25	12	Right Tilted	Top	Full	20525	836.5	22.96	23.50	1.132	0.06	0.228	0.258
	LTE Band 5	10M	QPSK	1	0	Left Cheek	Top	Full	20525	836.5	23.87	24.50	1.156	0.01	0.279	0.323
	LTE Band 5	10M	QPSK	25	12	Left Cheek	Top	Full	20525	836.5	22.96	23.50	1.132	0.06	0.224	0.254
	LTE Band 5	10M	QPSK	1	0	Left Tilted	Top	Full	20525	836.5	23.87	24.50	1.156	0.04	0.198	0.229
	LTE Band 5	10M	QPSK	25	12	Left Tilted	Top	Full	20525	836.5	22.96	23.50	1.132	0.06	0.158	0.179
	LTE Band 5	10M	QPSK	1	0	Right Cheek	Bottom	Full	20525	836.5	23.87	24.50	1.156	0.01	0.162	0.187
	LTE Band 5	10M	QPSK	25	12	Right Cheek	Bottom	Full	20525	836.5	22.96	23.50	1.132	0.01	0.131	0.148
	LTE Band 5	10M	QPSK	1	0	Right Tilted	Bottom	Full	20525	836.5	23.87	24.50	1.156	0.03	0.084	0.097
	LTE Band 5	10M	QPSK	25	12	Right Tilted	Bottom	Full	20525	836.5	22.96	23.50	1.132	0.06	0.068	0.076
	LTE Band 5	10M	QPSK	1	0	Left Cheek	Bottom	Full	20525	836.5	23.87	24.50	1.156	0.10	0.155	0.179
	LTE Band 5	10M	QPSK	25	12	Left Cheek	Bottom	Full	20525	836.5	22.96	23.50	1.132	0.02	0.125	0.142
	LTE Band 5	10M	QPSK	1	0	Left Tilted	Bottom	Full	20525	836.5	23.87	24.50	1.156	-0.01	0.124	0.143
	LTE Band 5	10M	QPSK	25	12	Left Tilted	Bottom	Full	20525	836.5	22.96	23.50	1.132	0.01	0.072	0.082
07	LTE Band 12	10M	QPSK	1	25	Right Cheek	Top	Full	23095	707.5	23.57	24.50	1.239	0.04	0.159	0.197
	LTE Band 12	10M	QPSK	25	12	Right Cheek	Top	Full	23095	707.5	22.62	23.50	1.225	-0.02	0.115	0.141
	LTE Band 12	10M	QPSK	1	25	Right Tilted	Top	Full	23095	707.5	23.57	24.50	1.239	0.08	0.118	0.146
	LTE Band 12	10M	QPSK	25	12	Right Tilted	Top	Full	23095	707.5	22.62	23.50	1.225	0.06	0.087	0.107
	LTE Band 12	10M	QPSK	1	25	Left Cheek	Top	Full	23095	707.5	23.57	24.50	1.239	0.04	0.087	0.108
	LTE Band 12	10M	QPSK	25	12	Left Cheek	Top	Full	23095	707.5	22.62	23.50	1.225	0.04	0.063	0.077
	LTE Band 12	10M	QPSK	1	25	Left Tilted	Top	Full	23095	707.5	23.57	24.50	1.239	0.06	0.065	0.080
	LTE Band 12	10M	QPSK	25	12	Left Tilted	Top	Full	23095	707.5	22.62	23.50	1.225	0.06	0.047	0.058
	LTE Band 12	10M	QPSK	1	25	Right Cheek	Bottom	Full	23095	707.5	23.57	24.50	1.239	0.01	0.095	0.117
	LTE Band 12	10M	QPSK	25	12	Right Cheek	Bottom	Full	23095	707.5	22.62	23.50	1.225	0.06	0.078	0.095
	LTE Band 12	10M	QPSK	1	25	Right Tilted	Bottom	Full	23095	707.5	23.57	24.50	1.239	0.01	0.049	0.061
	LTE Band 12	10M	QPSK	25	12	Right Tilted	Bottom	Full	23095	707.5	22.62	23.50	1.225	0.01	0.040	0.049
	LTE Band 12	10M	QPSK	1	25	Left Cheek	Bottom	Full	23095	707.5	23.57	24.50	1.239	0.02	0.091	0.113
	LTE Band 12	10M	QPSK	25	12	Left Cheek	Bottom	Full	23095	707.5	22.62	23.50	1.225	0.01	0.078	0.096
	LTE Band 12	10M	QPSK	1	25	Left Tilted	Bottom	Full	23095	707.5	23.57	24.50	1.239	0.01	0.049	0.061
	LTE Band 12	10M	QPSK	25	12	Left Tilted	Bottom	Full	23095	707.5	22.62	23.50	1.225	0.06	0.041	0.050



FCC SAR Test Report

Report No. : FA952702

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Antenna	Power Mode	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)
08	LTE Band 28	20M	QPSK	1	49	Right Cheek	Top	Full	27460	728	24.04	24.50	1.112	0.03	0.169	0.188
	LTE Band 28	20M	QPSK	50	50	Right Cheek	Top	Full	27460	728	23.22	23.50	1.067	0.01	0.140	0.149
	LTE Band 28	20M	QPSK	1	49	Right Tilted	Top	Full	27460	728	24.04	24.50	1.112	0.03	0.128	0.142
	LTE Band 28	20M	QPSK	50	50	Right Tilted	Top	Full	27460	728	23.22	23.50	1.067	0.08	0.124	0.132
	LTE Band 28	20M	QPSK	1	49	Left Cheek	Top	Full	27460	728	24.04	24.50	1.112	-0.02	0.094	0.105
	LTE Band 28	20M	QPSK	50	50	Left Cheek	Top	Full	27460	728	23.22	23.50	1.067	0.05	0.078	0.083
	LTE Band 28	20M	QPSK	1	49	Left Tilted	Top	Full	27460	728	24.04	24.50	1.112	0.12	0.072	0.080
	LTE Band 28	20M	QPSK	50	50	Left Tilted	Top	Full	27460	728	23.22	23.50	1.067	0.15	0.067	0.071
	LTE Band 28	20M	QPSK	1	49	Right Cheek	Bottom	Full	27460	728	24.04	24.50	1.112	0.03	0.107	0.119
	LTE Band 28	20M	QPSK	50	50	Right Cheek	Bottom	Full	27460	728	23.22	23.50	1.067	0.08	0.084	0.089
	LTE Band 28	20M	QPSK	1	49	Right Tilted	Bottom	Full	27460	728	24.04	24.50	1.112	0.02	0.059	0.066
	LTE Band 28	20M	QPSK	50	50	Right Tilted	Bottom	Full	27460	728	23.22	23.50	1.067	0.11	0.048	0.051
	LTE Band 28	20M	QPSK	1	49	Left Cheek	Bottom	Full	27460	728	24.04	24.50	1.112	0.03	0.098	0.109
	LTE Band 28	20M	QPSK	50	50	Left Cheek	Bottom	Full	27460	728	23.22	23.50	1.067	0.01	0.078	0.084
	LTE Band 28	20M	QPSK	1	49	Left Tilted	Bottom	Full	27460	728	24.04	24.50	1.112	0.12	0.054	0.060
	LTE Band 28	20M	QPSK	50	50	Left Tilted	Bottom	Full	27460	728	23.22	23.50	1.067	0.02	0.043	0.046
09	LTE Band 2	20M	QPSK	1	0	Right Cheek	Top	Reduced	18700	1860	20.41	21.00	1.146	0.06	0.745	0.853
	LTE Band 2	20M	QPSK	1	0	Right Cheek	Top	Reduced	18900	1880	20.36	21.00	1.159	0.01	0.670	0.776
	LTE Band 2	20M	QPSK	1	0	Right Cheek	Top	Reduced	19100	1900	20.31	21.00	1.172	0.06	0.587	0.688
	LTE Band 2	20M	QPSK	50	24	Right Cheek	Top	Reduced	18700	1860	20.45	21.00	1.135	0.05	0.704	0.799
	LTE Band 2	20M	QPSK	100	0	Right Cheek	Top	Reduced	18700	1860	20.43	21.00	1.140	0.06	0.703	0.802
	LTE Band 2	20M	QPSK	1	0	Right Tilted	Top	Reduced	18700	1860	20.41	21.00	1.146	0.04	0.485	0.556
	LTE Band 2	20M	QPSK	50	24	Right Tilted	Top	Reduced	18700	1860	20.45	21.00	1.135	-0.02	0.485	0.550
	LTE Band 2	20M	QPSK	1	0	Left Cheek	Top	Reduced	18700	1860	20.41	21.00	1.146	0.01	0.297	0.340
	LTE Band 2	20M	QPSK	50	24	Left Cheek	Top	Reduced	18700	1860	20.45	21.00	1.135	0.06	0.296	0.336
	LTE Band 2	20M	QPSK	1	0	Left Tilted	Top	Reduced	18700	1860	20.41	21.00	1.146	0.04	0.274	0.314
	LTE Band 2	20M	QPSK	50	24	Left Tilted	Top	Reduced	18700	1860	20.45	21.00	1.135	0.01	0.291	0.330
	LTE Band 2	20M	QPSK	1	0	Right Cheek	Bottom	Full	18700	1860	23.66	24.50	1.213	0.07	0.147	0.178
	LTE Band 2	20M	QPSK	1	0	Right Cheek	Bottom	Full	18900	1880	23.57	24.50	1.239	0.01	0.128	0.159
	LTE Band 2	20M	QPSK	1	0	Right Cheek	Bottom	Full	19100	1900	23.41	24.50	1.285	0.01	0.130	0.167
	LTE Band 2	20M	QPSK	50	24	Right Cheek	Bottom	Full	18700	1860	22.65	23.50	1.216	0.03	0.118	0.144
	LTE Band 2	20M	QPSK	1	0	Right Tilted	Bottom	Full	18700	1860	23.66	24.50	1.213	0.02	0.087	0.106
	LTE Band 2	20M	QPSK	50	24	Right Tilted	Bottom	Full	18700	1860	22.65	23.50	1.216	0.05	0.074	0.090
	LTE Band 2	20M	QPSK	1	0	Left Cheek	Bottom	Full	18700	1860	23.66	24.50	1.213	0.06	0.103	0.125
	LTE Band 2	20M	QPSK	50	24	Left Cheek	Bottom	Full	18700	1860	22.65	23.50	1.216	0.04	0.091	0.110
	LTE Band 2	20M	QPSK	1	0	Left Tilted	Bottom	Full	18700	1860	23.66	24.50	1.213	-0.02	0.085	0.103
	LTE Band 2	20M	QPSK	50	24	Left Tilted	Bottom	Full	18700	1860	22.65	23.50	1.216	0.01	0.074	0.090



Plot No.	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Antenna	Power Mode	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)
10	LTE Band 4	20M	QPSK	1	0	Right Cheek	Top	Reduced	20175	1732.5	20.91	21.50	1.146	0.05	0.772	0.884
	LTE Band 4	20M	QPSK	50	24	Right Cheek	Top	Reduced	20175	1732.5	20.91	21.50	1.146	0.02	0.787	0.902
	LTE Band 4	20M	QPSK	100	0	Right Cheek	Top	Reduced	20175	1732.5	20.87	21.50	1.156	0.12	0.794	0.918
	LTE Band 4	20M	QPSK	1	0	Right Tilted	Top	Reduced	20175	1732.5	20.91	21.50	1.146	0.04	0.479	0.549
	LTE Band 4	20M	QPSK	50	24	Right Tilted	Top	Reduced	20175	1732.5	20.91	21.50	1.146	-0.04	0.470	0.538
	LTE Band 4	20M	QPSK	1	0	Left Cheek	Top	Reduced	20175	1732.5	20.91	21.50	1.146	0.01	0.400	0.458
	LTE Band 4	20M	QPSK	50	24	Left Cheek	Top	Reduced	20175	1732.5	20.91	21.50	1.146	0	0.416	0.477
	LTE Band 4	20M	QPSK	1	0	Left Tilted	Top	Reduced	20175	1732.5	20.91	21.50	1.146	0.1	0.410	0.470
	LTE Band 4	20M	QPSK	50	24	Left Tilted	Top	Reduced	20175	1732.5	20.91	21.50	1.146	0.01	0.415	0.475
	LTE Band 4	20M	QPSK	1	0	Right Cheek	Bottom	Full	20175	1732.5	23.55	24.50	1.245	0.04	0.135	0.168
11	LTE Band 4	20M	QPSK	50	24	Right Cheek	Bottom	Full	20175	1732.5	22.48	23.50	1.265	0.01	0.109	0.138
	LTE Band 4	20M	QPSK	1	0	Right Tilted	Bottom	Full	20175	1732.5	23.55	24.50	1.245	0.03	0.035	0.043
	LTE Band 4	20M	QPSK	50	24	Right Tilted	Bottom	Full	20175	1732.5	22.48	23.50	1.265	0.02	0.029	0.036
	LTE Band 4	20M	QPSK	1	0	Left Cheek	Bottom	Full	20175	1732.5	23.55	24.50	1.245	0.05	0.054	0.067
	LTE Band 4	20M	QPSK	50	24	Left Cheek	Bottom	Full	20175	1732.5	22.48	23.50	1.265	0.06	0.044	0.055
	LTE Band 4	20M	QPSK	1	0	Left Tilted	Bottom	Full	20175	1732.5	23.55	24.50	1.245	0.06	0.030	0.037
	LTE Band 4	20M	QPSK	50	24	Left Tilted	Bottom	Full	20175	1732.5	22.48	23.50	1.265	0.04	0.028	0.036
	LTE Band 7	20M	QPSK	1	99	Right Cheek	Top	Reduced	21100	2535	19.75	20.00	1.059	0.06	0.646	0.684
	LTE Band 7	20M	QPSK	50	0	Right Cheek	Top	Reduced	21100	2535	19.85	20.00	1.035	0.03	0.659	0.682
	LTE Band 7	20M	QPSK	1	99	Right Tilted	Top	Reduced	21100	2535	19.75	20.00	1.059	0.05	0.628	0.665
	LTE Band 7	20M	QPSK	50	0	Right Tilted	Top	Reduced	21100	2535	19.85	20.00	1.035	0.06	0.671	0.695
	LTE Band 7	20M	QPSK	50	0	Right Tilted	Top	Reduced	20850	2510	19.80	20.00	1.047	0.03	0.761	0.797
	LTE Band 7	20M	QPSK	50	0	Right Tilted	Top	Reduced	21350	2560	19.60	20.00	1.096	0.07	0.794	0.871
	LTE Band 7	20M	QPSK	100	0	Right Tilted	Top	Reduced	21100	2535	19.73	20.00	1.064	-0.02	0.664	0.707
	LTE Band 7	20M	QPSK	1	99	Left Cheek	Top	Reduced	21100	2535	19.75	20.00	1.059	-0.01	0.295	0.312
	LTE Band 7	20M	QPSK	50	0	Left Cheek	Top	Reduced	21100	2535	19.85	20.00	1.035	-0.06	0.310	0.321
	LTE Band 7	20M	QPSK	1	99	Left Tilted	Top	Reduced	21100	2535	19.75	20.00	1.059	0.02	0.379	0.401
	LTE Band 7	20M	QPSK	50	0	Left Tilted	Top	Reduced	21100	2535	19.85	20.00	1.035	0.12	0.386	0.400
	LTE Band 7	20M	QPSK	1	99	Right Cheek	Bottom	Full	21100	2535	23.92	24.50	1.143	-0.01	0.069	0.079
	LTE Band 7	20M	QPSK	50	0	Right Cheek	Bottom	Full	21100	2535	23.09	23.50	1.099	0.06	0.050	0.055
	LTE Band 7	20M	QPSK	1	99	Right Tilted	Bottom	Full	21100	2535	23.92	24.50	1.143	-0.05	0.066	0.076
	LTE Band 7	20M	QPSK	50	0	Right Tilted	Bottom	Full	21100	2535	23.09	23.50	1.099	0.04	0.051	0.056
	LTE Band 7	20M	QPSK	1	99	Left Cheek	Bottom	Full	21100	2535	23.92	24.50	1.143	0.03	0.133	0.152
	LTE Band 7	20M	QPSK	1	99	Left Cheek	Bottom	Full	20850	2510	23.83	24.50	1.167	0.01	0.052	0.061
	LTE Band 7	20M	QPSK	1	99	Left Cheek	Bottom	Full	21350	2560	23.72	24.50	1.197	0.06	0.076	0.091
	LTE Band 7	20M	QPSK	50	0	Left Cheek	Bottom	Full	21100	2535	23.09	23.50	1.099	0.04	0.102	0.112
	LTE Band 7	20M	QPSK	1	99	Left Tilted	Bottom	Full	21100	2535	23.92	24.50	1.143	0.07	0.049	0.056
	LTE Band 7	20M	QPSK	50	0	Left Tilted	Bottom	Full	21100	2535	23.09	23.50	1.099	0.13	0.038	0.041

<WLAN2.4GHz SAR>

Plot No.	Band	Mode	Test Position	Power Mode	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	Right Cheek	Full	6	2437	17.98	18.50	1.127	100	1.000	0.03	0.263	0.296
	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	Full	6	2437	17.98	18.50	1.127	100	1.000	0.03	0.223	0.251
12	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	Full	6	2437	17.98	18.50	1.127	100	1.000	0.09	0.667	0.752
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	Full	1	2412	17.71	18.50	1.199	100	1.000	0.01	0.306	0.367
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	Full	11	2462	17.67	18.50	1.211	100	1.000	0.04	0.614	0.743
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	Full	6	2437	17.98	18.50	1.127	100	1.000	0.06	0.487	0.549

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	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	Right Cheek	0	2402	11.91	12.00	1.021	77.03	1.081	0.03	0.034	0.038
	Bluetooth	1Mbps	Right Tilted	0	2402	11.91	12.00	1.021	77.03	1.081	0.04	0.032	0.035
13	Bluetooth	1Mbps	Left Cheek	0	2402	11.91	12.00	1.021	77.03	1.081	-0.09	0.087	0.096
	Bluetooth	1Mbps	Left Cheek	39	2441	11.75	12.00	1.059	77.03	1.081	0.06	0.083	0.095
	Bluetooth	1Mbps	Left Cheek	78	2480	11.79	12.00	1.050	77.03	1.081	0.08	0.082	0.093
	Bluetooth	1Mbps	Left Tilted	0	2402	11.91	12.00	1.021	77.03	1.081	0.01	0.069	0.076

<WLAN5GHz SAR>

Plot No.	Band	Mode	Test Position	Power Mode	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)
	WLAN5.3GHz	802.11a 6Mbps	Right Cheek	Full	52	5260	15.31	16.50	1.315	95.64	1.046	0.09	0.291	0.400
	WLAN5.3GHz	802.11a 6Mbps	Right Tilted	Full	52	5260	15.31	16.50	1.315	95.64	1.046	0.01	0.313	0.431
	WLAN5.3GHz	802.11a 6Mbps	Left Cheek	Full	52	5260	15.31	16.50	1.315	95.64	1.046	0.06	0.509	0.700
	WLAN5.3GHz	802.11a 6Mbps	Left Tilted	Full	52	5260	15.31	16.50	1.315	95.64	1.046	0.09	0.542	0.746
14	WLAN5.3GHz	802.11a 6Mbps	Left Tilted	Full	56	5280	15.04	16.50	1.400	95.64	1.046	0.02	0.644	0.943
	WLAN5.3GHz	802.11a 6Mbps	Left Tilted	Full	64	5320	15.24	16.50	1.335	95.64	1.046	-0.02	0.666	0.930
	WLAN5.5GHz	802.11a 6Mbps	Right Cheek	Reduced	116	5580	14.41	15.00	1.146	95.64	1.046	0.01	0.340	0.407
	WLAN5.5GHz	802.11a 6Mbps	Right Tilted	Reduced	116	5580	14.41	15.00	1.146	95.64	1.046	0.01	0.396	0.474
	WLAN5.5GHz	802.11a 6Mbps	Left Cheek	Reduced	116	5580	14.41	15.00	1.146	95.64	1.046	0.01	0.536	0.642
	WLAN5.5GHz	802.11a 6Mbps	Left Tilted	Reduced	116	5580	14.41	15.00	1.146	95.64	1.046	0.01	0.587	0.703
	WLAN5.5GHz	802.11a 6Mbps	Left Tilted	Reduced	100	5500	14.38	15.00	1.152	95.64	1.046	0.09	0.634	0.764
15	WLAN5.5GHz	802.11a 6Mbps	Left Tilted	Reduced	140	5700	14.17	15.00	1.210	95.64	1.046	-0.09	0.688	0.870
	WLAN 5.8GHz	802.11a 6Mbps	Right Cheek	Reduced	165	5825	13.88	15.00	1.294	95.64	1.046	-0.01	0.371	0.502
	WLAN 5.8GHz	802.11a 6Mbps	Right Tilted	Reduced	165	5825	13.88	15.00	1.294	95.64	1.046	0.04	0.406	0.550
	WLAN 5.8GHz	802.11a 6Mbps	Left Cheek	Reduced	165	5825	13.88	15.00	1.294	95.64	1.046	0.06	0.561	0.759
	WLAN 5.8GHz	802.11a 6Mbps	Left Tilted	Reduced	165	5825	13.88	15.00	1.294	95.64	1.046	0.09	0.562	0.761
16	WLAN 5.8GHz	802.11a 6Mbps	Left Tilted	Reduced	149	5745	13.65	15.00	1.365	95.64	1.046	0.01	0.712	1.016
	WLAN 5.8GHz	802.11a 6Mbps	Left Tilted	Reduced	157	5785	13.58	15.00	1.387	95.64	1.046	-0.02	0.569	0.825



15.2 Hotspot SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Mode	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)
	GSM 850	GPRS 3 Tx slots	Front	10	Top	Full	189	836.4	31.19	32.00	1.205	0.01	0.203	0.245
	GSM 850	GPRS 3 Tx slots	Back	10	Top	Full	189	836.4	31.19	32.00	1.205	0.05	0.265	0.319
	GSM 850	GPRS 3 Tx slots	Back	10	Top	Full	128	824.2	31.15	32.00	1.216	-0.03	0.262	0.319
	GSM 850	GPRS 3 Tx slots	Back	10	Top	Full	251	848.8	31.17	32.00	1.211	0.02	0.366	0.443
	GSM 850	GPRS 3 Tx slots	Left Side	10	Top	Full	189	836.4	31.19	32.00	1.205	-0.01	0.086	0.104
	GSM 850	GPRS 3 Tx slots	Top Side	10	Top	Full	189	836.4	31.19	32.00	1.205	0.04	0.177	0.213
	GSM 850	GPRS 3 Tx slots	Front	10	Bottom	Full	189	836.4	31.19	32.00	1.205	0.05	0.303	0.365
	GSM 850	GPRS 3 Tx slots	Back	10	Bottom	Full	189	836.4	31.19	32.00	1.205	0.11	0.455	0.548
	GSM 850	GPRS 3 Tx slots	Back	10	Bottom	Full	128	824.2	31.15	32.00	1.216	-0.08	0.392	0.477
17	GSM 850	GPRS 3 Tx slots	Back	10	Bottom	Full	251	848.8	31.17	32.00	1.211	0.01	0.504	0.610
	GSM 850	GPRS 3 Tx slots	Left Side	10	Bottom	Full	189	836.4	31.19	32.00	1.205	-0.03	0.192	0.231
	GSM 850	GPRS 3 Tx slots	Right Side	10	Bottom	Full	189	836.4	31.19	32.00	1.205	0.02	0.352	0.424
	GSM 850	GPRS 3 Tx slots	Bottom Side	10	Bottom	Full	189	836.4	31.19	32.00	1.205	0.15	0.121	0.146
	GSM 1900	GPRS 3 Tx slots	Front	10	Top	Reduced	512	1850.2	25.20	25.50	1.072	0.03	0.225	0.241
	GSM 1900	GPRS 3 Tx slots	Back	10	Top	Reduced	512	1850.2	25.20	25.50	1.072	0.01	0.549	0.588
	GSM 1900	GPRS 3 Tx slots	Back	10	Top	Reduced	661	1880	25.10	25.50	1.096	-0.01	0.507	0.556
	GSM 1900	GPRS 3 Tx slots	Back	10	Top	Reduced	810	1909.8	25.03	25.50	1.114	0.04	0.564	0.628
	GSM 1900	GPRS 3 Tx slots	Left Side	10	Top	Reduced	512	1850.2	25.20	25.50	1.072	0.03	0.085	0.091
	GSM 1900	GPRS 3 Tx slots	Top Side	10	Top	Reduced	512	1850.2	25.20	25.50	1.072	-0.03	0.253	0.271
	GSM 1900	GPRS 3 Tx slots	Front	10	Bottom	Reduced	512	1850.2	25.20	25.50	1.072	0.01	0.497	0.533
18	GSM 1900	GPRS 3 Tx slots	Back	10	Bottom	Reduced	512	1850.2	25.20	25.50	1.072	-0.01	0.908	0.973
	GSM 1900	GPRS 3 Tx slots	Back	10	Bottom	Reduced	661	1880	25.10	25.50	1.096	0.08	0.753	0.826
	GSM 1900	GPRS 3 Tx slots	Back	10	Bottom	Reduced	810	1909.8	25.03	25.50	1.114	0.13	0.828	0.923
	GSM 1900	GPRS 3 Tx slots	Left Side	10	Bottom	Reduced	512	1850.2	25.20	25.50	1.072	0.04	0.084	0.090
	GSM 1900	GPRS 3 Tx slots	Right Side	10	Bottom	Reduced	512	1850.2	25.20	25.50	1.072	0.03	0.253	0.271
	GSM 1900	GPRS 3 Tx slots	Bottom Side	10	Bottom	Reduced	512	1850.2	25.20	25.50	1.072	0.01	0.739	0.792



<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Mode	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 V	RMC 12.2Kbps	Front	10	Top	Full	4233	846.6	23.93	24.50	1.140	0.03	0.089	0.102
	WCDMA V	RMC 12.2Kbps	Back	10	Top	Full	4233	846.6	23.93	24.50	1.140	0.02	0.178	0.203
	WCDMA V	RMC 12.2Kbps	Back	10	Top	Full	4132	826.4	23.75	24.50	1.189	-0.02	0.166	0.197
	WCDMA V	RMC 12.2Kbps	Back	10	Top	Full	4182	836.4	23.81	24.50	1.172	0.03	0.186	0.218
	WCDMA V	RMC 12.2Kbps	Left Side	10	Top	Full	4233	846.6	23.93	24.50	1.140	0.07	0.054	0.061
	WCDMA V	RMC 12.2Kbps	Top Side	10	Top	Full	4233	846.6	23.93	24.50	1.140	-0.02	0.044	0.051
	WCDMA V	RMC 12.2Kbps	Front	10	Bottom	Full	4233	846.6	23.93	24.50	1.140	-0.01	0.155	0.177
	WCDMA V	RMC 12.2Kbps	Back	10	Bottom	Full	4233	846.6	23.93	24.50	1.140	0.09	0.241	0.275
19	WCDMA V	RMC 12.2Kbps	Back	10	Bottom	Full	4132	826.4	23.75	24.50	1.189	0.09	0.238	0.283
	WCDMA V	RMC 12.2Kbps	Back	10	Bottom	Full	4182	836.4	23.81	24.50	1.172	0.03	0.212	0.249
	WCDMA V	RMC 12.2Kbps	Left Side	10	Bottom	Full	4233	846.6	23.93	24.50	1.140	0.02	0.146	0.166
	WCDMA V	RMC 12.2Kbps	Right Side	10	Bottom	Full	4233	846.6	23.93	24.50	1.140	-0.02	0.190	0.217
	WCDMA V	RMC 12.2Kbps	Bottom Side	10	Bottom	Full	4233	846.6	23.93	24.50	1.140	0.08	0.062	0.071
	WCDMA II	RMC 12.2Kbps	Front	10	Top	Reduced	9538	1907.6	21.48	22.00	1.127	0.04	0.234	0.264
	WCDMA II	RMC 12.2Kbps	Back	10	Top	Reduced	9538	1907.6	21.48	22.00	1.127	0.02	0.457	0.515
	WCDMA II	RMC 12.2Kbps	Back	10	Top	Reduced	9262	1852.4	21.41	22.00	1.146	0.07	0.407	0.466
	WCDMA II	RMC 12.2Kbps	Back	10	Top	Reduced	9400	1880	21.47	22.00	1.130	-0.03	0.477	0.539
	WCDMA II	RMC 12.2Kbps	Left Side	10	Top	Reduced	9538	1907.6	21.48	22.00	1.127	0.05	0.162	0.183
	WCDMA II	RMC 12.2Kbps	Top Side	10	Top	Reduced	9538	1907.6	21.48	22.00	1.127	0.05	0.419	0.472
	WCDMA II	RMC 12.2Kbps	Front	10	Bottom	Reduced	9538	1907.6	22.74	23.00	1.062	0.02	0.423	0.449
	WCDMA II	RMC 12.2Kbps	Back	10	Bottom	Reduced	9538	1907.6	22.74	23.00	1.062	0.02	0.809	0.859
	WCDMA II	RMC 12.2Kbps	Back	10	Bottom	Reduced	9262	1852.4	22.56	23.00	1.107	0.06	0.759	0.840
	WCDMA II	RMC 12.2Kbps	Back	10	Bottom	Reduced	9400	1880	22.73	23.00	1.064	0.17	0.989	1.052
	WCDMA II	RMC 12.2Kbps	Left Side	10	Bottom	Reduced	9538	1907.6	22.74	23.00	1.062	0.01	0.026	0.028
	WCDMA II	RMC 12.2Kbps	Right Side	10	Bottom	Reduced	9538	1907.6	22.74	23.00	1.062	0.06	0.126	0.134
	WCDMA II	RMC 12.2Kbps	Bottom Side	10	Bottom	Reduced	9538	1907.6	22.74	23.00	1.062	0.02	0.886	0.941
20	WCDMA II	RMC 12.2Kbps	Bottom Side	10	Bottom	Reduced	9262	1852.4	22.56	23.00	1.107	0.01	1.030	1.140
	WCDMA II	RMC 12.2Kbps	Bottom Side	10	Bottom	Reduced	9400	1880	22.73	23.00	1.064	0.01	0.753	0.801
	WCDMA IV	RMC 12.2Kbps	Front	10	Top	Reduced	1513	1752.6	19.83	20.50	1.167	0.07	0.118	0.138
	WCDMA IV	RMC 12.2Kbps	Back	10	Top	Reduced	1513	1752.6	19.83	20.50	1.167	-0.1	0.260	0.303
	WCDMA IV	RMC 12.2Kbps	Back	10	Top	Reduced	1312	1712.4	19.75	20.50	1.189	-0.03	0.215	0.256
	WCDMA IV	RMC 12.2Kbps	Back	10	Top	Reduced	1413	1732.6	19.82	20.50	1.169	0.06	0.236	0.276
	WCDMA IV	RMC 12.2Kbps	Left Side	10	Top	Reduced	1513	1752.6	19.83	20.50	1.167	0.05	0.122	0.142
	WCDMA IV	RMC 12.2Kbps	Top Side	10	Top	Reduced	1513	1752.6	19.83	20.50	1.167	-0.12	0.154	0.180
	WCDMA IV	RMC 12.2Kbps	Front	10	Bottom	Reduced	1513	1752.6	21.07	21.50	1.104	0.01	0.231	0.255
	WCDMA IV	RMC 12.2Kbps	Back	10	Bottom	Reduced	1513	1752.6	21.07	21.50	1.104	0.01	0.681	0.752
	WCDMA IV	RMC 12.2Kbps	Back	10	Bottom	Reduced	1312	1712.4	20.95	21.50	1.135	0.06	0.704	0.799
21	WCDMA IV	RMC 12.2Kbps	Back	10	Bottom	Reduced	1413	1732.6	21.05	21.50	1.109	0.07	0.722	0.801
	WCDMA IV	RMC 12.2Kbps	Left Side	10	Bottom	Reduced	1513	1752.6	21.07	21.50	1.104	0.01	0.006	0.006
	WCDMA IV	RMC 12.2Kbps	Right Side	10	Bottom	Reduced	1513	1752.6	21.07	21.50	1.104	0.03	0.112	0.124
	WCDMA IV	RMC 12.2Kbps	Bottom Side	10	Bottom	Reduced	1513	1752.6	21.07	21.50	1.104	0.03	0.680	0.751



<LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Antenna	Power Mode	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)
	LTE Band 5	10M	QPSK	1	0	Front	10	Top	Full	20525	836.5	23.87	24.50	1.156	0.06	0.090	0.103
	LTE Band 5	10M	QPSK	25	12	Front	10	Top	Full	20525	836.5	22.96	23.50	1.132	0.06	0.070	0.079
	LTE Band 5	10M	QPSK	1	0	Back	10	Top	Full	20525	836.5	23.87	24.50	1.156	0.09	0.190	0.220
	LTE Band 5	10M	QPSK	25	12	Back	10	Top	Full	20525	836.5	22.96	23.50	1.132	0.06	0.161	0.182
	LTE Band 5	10M	QPSK	1	0	Left Side	10	Top	Full	20525	836.5	23.87	24.50	1.156	0.13	0.048	0.055
	LTE Band 5	10M	QPSK	25	12	Left Side	10	Top	Full	20525	836.5	22.96	23.50	1.132	0.07	0.039	0.044
	LTE Band 5	10M	QPSK	1	0	Top Side	10	Top	Full	20525	836.5	23.87	24.50	1.156	0.02	0.101	0.117
	LTE Band 5	10M	QPSK	25	12	Top Side	10	Top	Full	20525	836.5	22.96	23.50	1.132	0.03	0.079	0.089
	LTE Band 5	10M	QPSK	1	0	Front	10	Bottom	Full	20525	836.5	23.87	24.50	1.156	0.03	0.153	0.177
	LTE Band 5	10M	QPSK	25	12	Front	10	Bottom	Full	20525	836.5	22.96	23.50	1.132	0.05	0.121	0.137
22	LTE Band 5	10M	QPSK	1	0	Back	10	Bottom	Full	20525	836.5	23.87	24.50	1.156	0.07	0.226	0.261
	LTE Band 5	10M	QPSK	25	12	Back	10	Bottom	Full	20525	836.5	22.96	23.50	1.132	0.01	0.177	0.200
	LTE Band 5	10M	QPSK	1	0	Left Side	10	Bottom	Full	20525	836.5	23.87	24.50	1.156	0.05	0.154	0.178
	LTE Band 5	10M	QPSK	25	12	Left Side	10	Bottom	Full	20525	836.5	22.96	23.50	1.132	0.09	0.126	0.143
	LTE Band 5	10M	QPSK	1	0	Right Side	10	Bottom	Full	20525	836.5	23.87	24.50	1.156	0.01	0.211	0.244
	LTE Band 5	10M	QPSK	25	12	Right Side	10	Bottom	Full	20525	836.5	22.96	23.50	1.132	0.01	0.174	0.197
	LTE Band 5	10M	QPSK	1	0	Bottom Side	10	Bottom	Full	20525	836.5	23.87	24.50	1.156	0.02	0.072	0.083
	LTE Band 5	10M	QPSK	25	12	Bottom Side	10	Bottom	Full	20525	836.5	22.96	23.50	1.132	0.02	0.055	0.062
	LTE Band 12	10M	QPSK	1	25	Front	10	Top	Full	23095	707.5	23.57	24.50	1.239	0.02	0.034	0.042
	LTE Band 12	10M	QPSK	25	12	Front	10	Top	Full	23095	707.5	22.62	23.50	1.225	0.06	0.027	0.033
	LTE Band 12	10M	QPSK	1	25	Back	10	Top	Full	23095	707.5	23.57	24.50	1.239	0.05	0.077	0.096
	LTE Band 12	10M	QPSK	25	12	Back	10	Top	Full	23095	707.5	22.62	23.50	1.225	0.04	0.064	0.078
	LTE Band 12	10M	QPSK	1	25	Left Side	10	Top	Full	23095	707.5	23.57	24.50	1.239	0.03	0.040	0.050
	LTE Band 12	10M	QPSK	25	12	Left Side	10	Top	Full	23095	707.5	22.62	23.50	1.225	0.02	0.030	0.036
	LTE Band 12	10M	QPSK	1	25	Top Side	10	Top	Full	23095	707.5	23.57	24.50	1.239	0.05	0.033	0.041
	LTE Band 12	10M	QPSK	25	12	Top Side	10	Top	Full	23095	707.5	22.62	23.50	1.225	0.07	0.028	0.034
	LTE Band 12	10M	QPSK	1	25	Front	10	Bottom	Full	23095	707.5	23.57	24.50	1.239	0.02	0.133	0.165
	LTE Band 12	10M	QPSK	25	12	Front	10	Bottom	Full	23095	707.5	22.62	23.50	1.225	0.05	0.107	0.131
23	LTE Band 12	10M	QPSK	1	25	Back	10	Bottom	Full	23095	707.5	23.57	24.50	1.239	0.04	0.201	0.249
	LTE Band 12	10M	QPSK	25	12	Back	10	Bottom	Full	23095	707.5	22.62	23.50	1.225	0.05	0.155	0.190
	LTE Band 12	10M	QPSK	1	25	Left Side	10	Bottom	Full	23095	707.5	23.57	24.50	1.239	0.03	0.148	0.183
	LTE Band 12	10M	QPSK	25	12	Left Side	10	Bottom	Full	23095	707.5	22.62	23.50	1.225	0.06	0.108	0.132
	LTE Band 12	10M	QPSK	1	25	Right Side	10	Bottom	Full	23095	707.5	23.57	24.50	1.239	0.13	0.189	0.234
	LTE Band 12	10M	QPSK	25	12	Right Side	10	Bottom	Full	23095	707.5	22.62	23.50	1.225	0.03	0.139	0.170
	LTE Band 12	10M	QPSK	1	25	Bottom Side	10	Bottom	Full	23095	707.5	23.57	24.50	1.239	0.05	0.001	0.001
	LTE Band 12	10M	QPSK	25	12	Bottom Side	10	Bottom	Full	23095	707.5	22.62	23.50	1.225	0.03	0.001	0.001



FCC SAR Test Report

Report No. : FA952702

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Antenna	Power Mode	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)
	LTE Band 28	20M	QPSK	1	49	Front	10	Top	Full	27460	728	24.04	24.50	1.112	0.02	0.029	0.033
	LTE Band 28	20M	QPSK	50	50	Front	10	Top	Full	27460	728	23.22	23.50	1.067	0.05	0.025	0.026
	LTE Band 28	20M	QPSK	1	49	Back	10	Top	Full	27460	728	24.04	24.50	1.112	0.12	0.064	0.071
	LTE Band 28	20M	QPSK	50	50	Back	10	Top	Full	27460	728	23.22	23.50	1.067	0.1	0.059	0.063
	LTE Band 28	20M	QPSK	1	49	Left Side	10	Top	Full	27460	728	24.04	24.50	1.112	0.03	0.034	0.038
	LTE Band 28	20M	QPSK	50	50	Left Side	10	Top	Full	27460	728	23.22	23.50	1.067	0.11	0.030	0.032
	LTE Band 28	20M	QPSK	1	49	Top Side	10	Top	Full	27460	728	24.04	24.50	1.112	0.02	0.020	0.022
	LTE Band 28	20M	QPSK	50	50	Top Side	10	Top	Full	27460	728	23.22	23.50	1.067	0.08	0.016	0.017
	LTE Band 28	20M	QPSK	1	49	Front	10	Bottom	Full	27460	728	24.04	24.50	1.112	0.09	0.122	0.136
	LTE Band 28	20M	QPSK	50	50	Front	10	Bottom	Full	27460	728	23.22	23.50	1.067	0.01	0.099	0.105
24	LTE Band 28	20M	QPSK	1	49	Back	10	Bottom	Full	27460	728	24.04	24.50	1.112	0.08	0.182	0.202
	LTE Band 28	20M	QPSK	50	50	Back	10	Bottom	Full	27460	728	23.22	23.50	1.067	-0.03	0.142	0.151
	LTE Band 28	20M	QPSK	1	49	Left Side	10	Bottom	Full	27460	728	24.04	24.50	1.112	0.06	0.108	0.120
	LTE Band 28	20M	QPSK	50	50	Left Side	10	Bottom	Full	27460	728	23.22	23.50	1.067	-0.12	0.088	0.094
	LTE Band 28	20M	QPSK	1	49	Right Side	10	Bottom	Full	27460	728	24.04	24.50	1.112	0.06	0.144	0.160
	LTE Band 28	20M	QPSK	50	50	Right Side	10	Bottom	Full	27460	728	23.22	23.50	1.067	0.09	0.117	0.125
	LTE Band 28	20M	QPSK	1	49	Bottom Side	10	Bottom	Full	27460	728	24.04	24.50	1.112	0.02	0.032	0.035
	LTE Band 28	20M	QPSK	50	50	Bottom Side	10	Bottom	Full	27460	728	23.22	23.50	1.067	-0.08	0.026	0.028
	LTE Band 2	20M	QPSK	1	0	Front	10	Top	Reduced	18700	1860	21.13	21.50	1.089	0.02	0.237	0.258
	LTE Band 2	20M	QPSK	50	24	Front	10	Top	Reduced	18700	1860	21.15	21.50	1.084	-0.03	0.234	0.254
	LTE Band 2	20M	QPSK	1	0	Back	10	Top	Reduced	18700	1860	21.13	21.50	1.089	0.01	0.483	0.526
	LTE Band 2	20M	QPSK	50	24	Back	10	Top	Reduced	18700	1860	21.15	21.50	1.084	-0.01	0.541	0.586
	LTE Band 2	20M	QPSK	50	24	Back	10	Top	Reduced	18900	1880	21.09	21.50	1.099	0.05	0.376	0.413
	LTE Band 2	20M	QPSK	50	24	Back	10	Top	Reduced	19100	1900	21.01	21.50	1.119	-0.01	0.413	0.462
	LTE Band 2	20M	QPSK	1	0	Left Side	10	Top	Reduced	18700	1860	21.13	21.50	1.089	0.03	0.186	0.203
	LTE Band 2	20M	QPSK	50	24	Left Side	10	Top	Reduced	18700	1860	21.15	21.50	1.084	0.01	0.183	0.198
	LTE Band 2	20M	QPSK	1	0	Top Side	10	Top	Reduced	18700	1860	21.13	21.50	1.089	0.01	0.340	0.370
	LTE Band 2	20M	QPSK	50	24	Top Side	10	Top	Reduced	18700	1860	21.15	21.50	1.084	-0.03	0.355	0.385
	LTE Band 2	20M	QPSK	1	0	Front	10	Bottom	Reduced	18700	1860	22.66	23.50	1.213	0.01	0.355	0.431
	LTE Band 2	20M	QPSK	50	24	Front	10	Bottom	Reduced	18700	1860	22.69	23.50	1.205	0.07	0.352	0.424
25	LTE Band 2	20M	QPSK	1	0	Back	10	Bottom	Reduced	18700	1860	22.66	23.50	1.213	-0.03	0.799	0.969
	LTE Band 2	20M	QPSK	1	0	Back	10	Bottom	Reduced	18900	1880	22.64	23.50	1.219	0.08	0.733	0.894
	LTE Band 2	20M	QPSK	1	0	Back	10	Bottom	Reduced	19100	1900	22.52	23.50	1.253	0.01	0.631	0.791
	LTE Band 2	20M	QPSK	50	24	Back	10	Bottom	Reduced	18700	1860	22.69	23.50	1.205	0.06	0.786	0.947
	LTE Band 2	20M	QPSK	50	24	Back	10	Bottom	Reduced	18900	1880	22.69	23.50	1.205	0.01	0.721	0.869
	LTE Band 2	20M	QPSK	50	24	Back	10	Bottom	Reduced	19100	1900	22.60	23.50	1.230	0.01	0.624	0.768
	LTE Band 2	20M	QPSK	100	0	Back	10	Bottom	Reduced	18700	1860	22.75	23.50	1.189	0.07	0.789	0.938
	LTE Band 2	20M	QPSK	1	0	Left Side	10	Bottom	Reduced	18700	1860	22.66	23.50	1.213	-0.03	0.100	0.121
	LTE Band 2	20M	QPSK	50	24	Left Side	10	Bottom	Reduced	18700	1860	22.69	23.50	1.205	0.08	0.098	0.118
	LTE Band 2	20M	QPSK	1	0	Right Side	10	Bottom	Reduced	18700	1860	22.66	23.50	1.213	0.01	0.177	0.215
	LTE Band 2	20M	QPSK	50	24	Right Side	10	Bottom	Reduced	18700	1860	22.69	23.50	1.205	0.06	0.170	0.205
	LTE Band 2	20M	QPSK	1	0	Bottom Side	10	Bottom	Reduced	18700	1860	22.66	23.50	1.213	0.01	0.744	0.903
	LTE Band 2	20M	QPSK	1	0	Bottom Side	10	Bottom	Reduced	18900	1880	22.64	23.50	1.219	-0.03	0.703	0.857
	LTE Band 2	20M	QPSK	1	0	Bottom Side	10	Bottom	Reduced	19100	1900	22.52	23.50	1.253	0.08	0.634	0.794
	LTE Band 2	20M	QPSK	50	24	Bottom Side	10	Bottom	Reduced	18700	1860	22.69	23.50	1.205	0.01	0.729	0.878
	LTE Band 2	20M	QPSK	50	24	Bottom Side	10	Bottom	Reduced	18900	1880	22.69	23.50	1.205	0.06	0.667	0.804
	LTE Band 2	20M	QPSK	50	24	Bottom Side	10	Bottom	Reduced	19100	1900	22.60	23.50	1.230	0.01	0.610	0.750
	LTE Band 2	20M	QPSK	100	0	Bottom Side	10	Bottom	Reduced	18700	1860	22.75	23.50	1.189	0.06	0.730	0.868



Plot No.	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Antenna	Power Mode	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)
	LTE Band 4	20M	QPSK	1	0	Front	10	Top	Reduced	20175	1732.5	19.93	20.50	1.140	0.01	0.099	0.113
	LTE Band 4	20M	QPSK	50	24	Front	10	Top	Reduced	20175	1732.5	19.91	20.50	1.146	-0.01	0.112	0.128
	LTE Band 4	20M	QPSK	1	0	Back	10	Top	Reduced	20175	1732.5	19.93	20.50	1.140	-0.03	0.223	0.254
	LTE Band 4	20M	QPSK	50	24	Back	10	Top	Reduced	20175	1732.5	19.91	20.50	1.146	0.02	0.249	0.285
	LTE Band 4	20M	QPSK	1	0	Left Side	10	Top	Reduced	20175	1732.5	19.93	20.50	1.140	0.01	0.106	0.121
	LTE Band 4	20M	QPSK	50	24	Left Side	10	Top	Reduced	20175	1732.5	19.91	20.50	1.146	0.09	0.113	0.129
	LTE Band 4	20M	QPSK	1	0	Top Side	10	Top	Reduced	20175	1732.5	19.93	20.50	1.140	0.02	0.153	0.174
	LTE Band 4	20M	QPSK	50	24	Top Side	10	Top	Reduced	20175	1732.5	19.91	20.50	1.146	-0.04	0.152	0.174
	LTE Band 4	20M	QPSK	1	0	Front	10	Bottom	Reduced	20175	1732.5	20.37	21.50	1.297	0.01	0.264	0.342
	LTE Band 4	20M	QPSK	50	24	Front	10	Bottom	Reduced	20175	1732.5	20.41	21.50	1.285	0.09	0.248	0.319
	LTE Band 4	20M	QPSK	1	0	Back	10	Bottom	Reduced	20175	1732.5	20.37	21.50	1.297	0.01	0.673	0.873
	LTE Band 4	20M	QPSK	50	24	Back	10	Bottom	Reduced	20175	1732.5	20.41	21.50	1.285	0.01	0.685	0.880
26	LTE Band 4	20M	QPSK	100	0	Back	10	Bottom	Reduced	20175	1732.5	20.36	21.50	1.300	-0.03	0.689	0.896
	LTE Band 4	20M	QPSK	1	0	Left Side	10	Bottom	Reduced	20175	1732.5	20.37	21.50	1.297	0.02	0.011	0.014
	LTE Band 4	20M	QPSK	50	24	Left Side	10	Bottom	Reduced	20175	1732.5	20.41	21.50	1.285	0.09	0.011	0.014
	LTE Band 4	20M	QPSK	1	0	Right Side	10	Bottom	Reduced	20175	1732.5	20.37	21.50	1.297	0.08	0.079	0.102
	LTE Band 4	20M	QPSK	50	24	Right Side	10	Bottom	Reduced	20175	1732.5	20.41	21.50	1.285	0.02	0.074	0.095
	LTE Band 4	20M	QPSK	1	0	Bottom Side	10	Bottom	Reduced	20175	1732.5	20.37	21.50	1.297	0.01	0.621	0.806
	LTE Band 4	20M	QPSK	50	24	Bottom Side	10	Bottom	Reduced	20175	1732.5	20.41	21.50	1.285	-0.13	0.663	0.852
	LTE Band 4	20M	QPSK	100	0	Bottom Side	10	Bottom	Reduced	20175	1732.5	20.36	21.50	1.300	0.06	0.663	0.862
	LTE Band 7	20M	QPSK	1	99	Front	10	Top	Reduced	21100	2535	17.98	18.50	1.127	0.11	0.181	0.204
	LTE Band 7	20M	QPSK	50	0	Front	10	Top	Reduced	21100	2535	18.14	18.50	1.086	0.05	0.183	0.199
	LTE Band 7	20M	QPSK	1	99	Back	10	Top	Reduced	21100	2535	17.98	18.50	1.127	-0.01	0.529	0.596
	LTE Band 7	20M	QPSK	50	0	Back	10	Top	Reduced	21100	2535	18.14	18.50	1.086	0.01	0.553	0.601
	LTE Band 7	20M	QPSK	50	0	Back	10	Top	Reduced	20850	2510	18.03	18.50	1.114	0.01	0.405	0.451
	LTE Band 7	20M	QPSK	50	0	Back	10	Top	Reduced	21350	2560	17.77	18.50	1.183	0.07	0.501	0.593
	LTE Band 7	20M	QPSK	1	99	Left Side	10	Top	Reduced	21100	2535	17.98	18.50	1.127	-0.13	0.230	0.259
	LTE Band 7	20M	QPSK	50	0	Left Side	10	Top	Reduced	21100	2535	18.14	18.50	1.086	0.06	0.232	0.252
	LTE Band 7	20M	QPSK	1	99	Top Side	10	Top	Reduced	21100	2535	17.98	18.50	1.127	-0.04	0.498	0.561
	LTE Band 7	20M	QPSK	50	0	Top Side	10	Top	Reduced	21100	2535	18.14	18.50	1.086	0.05	0.504	0.548
	LTE Band 7	20M	QPSK	1	99	Front	10	Bottom	Full	21100	2535	23.92	24.50	1.143	0.06	0.293	0.335
	LTE Band 7	20M	QPSK	50	0	Front	10	Bottom	Full	21100	2535	23.09	23.50	1.099	0.06	0.193	0.212
	LTE Band 7	20M	QPSK	1	99	Back	10	Bottom	Full	21100	2535	23.92	24.50	1.143	0.05	0.562	0.642
	LTE Band 7	20M	QPSK	1	99	Back	10	Bottom	Full	20850	2510	23.83	24.50	1.167	0.06	0.406	0.474
27	LTE Band 7	20M	QPSK	1	99	Back	10	Bottom	Full	21350	2560	23.72	24.50	1.197	0.09	0.599	0.717
	LTE Band 7	20M	QPSK	50	0	Back	10	Bottom	Full	21100	2535	23.09	23.50	1.099	0.06	0.364	0.400
	LTE Band 7	20M	QPSK	1	99	Left Side	10	Bottom	Full	21100	2535	23.92	24.50	1.143	-0.1	0.220	0.251
	LTE Band 7	20M	QPSK	50	0	Left Side	10	Bottom	Full	21100	2535	23.09	23.50	1.099	0.03	0.173	0.190
	LTE Band 7	20M	QPSK	1	99	Right Side	10	Bottom	Full	21100	2535	23.92	24.50	1.143	0.07	0.046	0.052
	LTE Band 7	20M	QPSK	50	0	Right Side	10	Bottom	Full	21100	2535	23.09	23.50	1.099	0.06	0.037	0.041
	LTE Band 7	20M	QPSK	1	99	Bottom Side	10	Bottom	Full	21100	2535	23.92	24.50	1.143	0.02	0.309	0.353
	LTE Band 7	20M	QPSK	50	0	Bottom Side	10	Bottom	Full	21100	2535	23.09	23.50	1.099	0.01	0.222	0.244

<WLAN 2.4GHz SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Power Mode	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	10	Full	6	2437	17.98	18.50	1.127	100	1.000	0.07	0.092	0.104
	WLAN2.4GHz	802.11b 1Mbps	Back	10	Full	6	2437	17.98	18.50	1.127	100	1.000	0.01	0.146	0.165
	WLAN2.4GHz	802.11b 1Mbps	Right Side	10	Full	6	2437	17.98	18.50	1.127	100	1.000	0.07	0.131	0.148
	WLAN2.4GHz	802.11b 1Mbps	Top Side	10	Full	6	2437	17.98	18.50	1.127	100	1.000	0.06	0.128	0.144
	WLAN2.4GHz	802.11b 1Mbps	Back	10	Full	1	2412	17.71	18.50	1.199	100	1.000	0.06	0.106	0.127
28	WLAN2.4GHz	802.11b 1Mbps	Back	10	Full	11	2462	17.67	18.50	1.211	100	1.000	0.07	0.172	0.208

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	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	10	0	2402	11.91	12.00	1.021	77.03	1.081	0.01	0.017	0.018
29	Bluetooth	1Mbps	Back	10	0	2402	11.91	12.00	1.021	77.03	1.081	-0.01	0.028	0.031
	Bluetooth	1Mbps	Right Side	10	0	2402	11.91	12.00	1.021	77.03	1.081	0.01	0.016	0.018
	Bluetooth	1Mbps	Top Side	10	0	2402	11.91	12.00	1.021	77.03	1.081	-0.03	0.016	0.018
	Bluetooth	1Mbps	Back	10	39	2441	11.75	12.00	1.059	77.03	1.081	0.03	0.027	0.031
	Bluetooth	1Mbps	Back	10	78	2480	11.79	12.00	1.050	77.03	1.081	0.03	0.026	0.029



<WLAN 5GHz SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Power Mode	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)
	WLAN5.2GHz	802.11a 6Mbps	Front	10	Full	48	5240	15.41	16.50	1.285	95.64	1.046	0.04	0.094	0.126
30	WLAN5.2GHz	802.11a 6Mbps	Back	10	Full	48	5240	15.41	16.50	1.285	95.64	1.046	-0.04	0.448	0.602
	WLAN5.2GHz	802.11a 6Mbps	Right Side	10	Full	48	5240	15.41	16.50	1.285	95.64	1.046	0.09	0.214	0.288
	WLAN5.2GHz	802.11a 6Mbps	Top Side	10	Full	48	5240	15.41	16.50	1.285	95.64	1.046	0.01	0.358	0.481
	WLAN5.2GHz	802.11a 6Mbps	Back	10	Full	36	5180	15.14	16.50	1.368	95.64	1.046	0.07	0.351	0.502
	WLAN5.2GHz	802.11a 6Mbps	Back	10	Full	44	5220	15.20	16.50	1.349	95.64	1.046	0.07	0.425	0.600
	WLAN5.8GHz	802.11a 6Mbps	Front	10	Full	149	5745	15.63	16.50	1.222	95.64	1.046	-0.11	0.162	0.207
31	WLAN5.8GHz	802.11a 6Mbps	Back	10	Full	149	5745	15.63	16.50	1.222	95.64	1.046	-0.19	0.684	0.874
	WLAN5.8GHz	802.11a 6Mbps	Right Side	10	Full	149	5745	15.63	16.50	1.222	95.64	1.046	0.07	0.325	0.415
	WLAN5.8GHz	802.11a 6Mbps	Top Side	10	Full	149	5745	15.63	16.50	1.222	95.64	1.046	0.07	0.514	0.657
	WLAN5.8GHz	802.11a 6Mbps	Back	10	Full	157	5785	15.40	16.50	1.288	95.64	1.046	0.02	0.460	0.620
	WLAN5.8GHz	802.11a 6Mbps	Back	10	Full	165	5825	15.32	16.50	1.312	95.64	1.046	0.06	0.400	0.549

15.3 Body Worn Accessory SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Mode	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)
	GSM 850	GPRS 3 Tx slots	Front	10	Top	Full	189	836.4	31.19	32.00	1.205	0.01	0.203	0.245
	GSM 850	GPRS 3 Tx slots	Back	10	Top	Full	189	836.4	31.19	32.00	1.205	0.05	0.265	0.319
	GSM 850	GPRS 3 Tx slots	Back	10	Top	Full	128	824.2	31.15	32.00	1.216	-0.03	0.262	0.319
	GSM 850	GPRS 3 Tx slots	Back	10	Top	Full	251	848.8	31.17	32.00	1.211	0.02	0.366	0.443
	GSM 850	GPRS 3 Tx slots	Front	10	Bottom	Full	189	836.4	31.19	32.00	1.205	0.05	0.303	0.365
	GSM 850	GPRS 3 Tx slots	Back	10	Bottom	Full	189	836.4	31.19	32.00	1.205	0.11	0.455	0.548
	GSM 850	GPRS 3 Tx slots	Back	10	Bottom	Full	128	824.2	31.15	32.00	1.216	-0.08	0.392	0.477
32	GSM 850	GPRS 3 Tx slots	Back	10	Bottom	Full	251	848.8	31.17	32.00	1.211	0.01	0.504	0.610
	GSM 1900	GPRS 3 Tx slots	Front	10	Top	Reduced	512	1850.2	25.20	25.50	1.072	0.03	0.225	0.241
	GSM 1900	GPRS 3 Tx slots	Back	10	Top	Reduced	512	1850.2	25.20	25.50	1.072	0.01	0.549	0.588
	GSM 1900	GPRS 3 Tx slots	Back	10	Top	Reduced	661	1880	25.10	25.50	1.096	-0.01	0.507	0.556
	GSM 1900	GPRS 3 Tx slots	Back	10	Top	Reduced	810	1909.8	25.03	25.50	1.114	0.04	0.564	0.628
	GSM 1900	GPRS 3 Tx slots	Front	10	Bottom	Reduced	512	1850.2	25.20	25.50	1.072	0.01	0.497	0.533
33	GSM 1900	GPRS 3 Tx slots	Back	10	Bottom	Reduced	512	1850.2	25.20	25.50	1.072	-0.01	0.908	0.973
	GSM 1900	GPRS 3 Tx slots	Back	10	Bottom	Reduced	661	1880	25.10	25.50	1.096	0.08	0.753	0.826
	GSM 1900	GPRS 3 Tx slots	Back	10	Bottom	Reduced	810	1909.8	25.03	25.50	1.114	0.13	0.828	0.923



<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Mode	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 V	RMC 12.2Kbps	Front	10	Top	Full	4233	846.6	23.93	24.50	1.140	0.03	0.089	0.102
	WCDMA V	RMC 12.2Kbps	Back	10	Top	Full	4233	846.6	23.93	24.50	1.140	0.02	0.178	0.203
	WCDMA V	RMC 12.2Kbps	Back	10	Top	Full	4132	826.4	23.75	24.50	1.189	-0.02	0.166	0.197
	WCDMA V	RMC 12.2Kbps	Back	10	Top	Full	4182	836.4	23.81	24.50	1.172	0.03	0.186	0.218
	WCDMA V	RMC 12.2Kbps	Front	10	Bottom	Full	4233	846.6	23.93	24.50	1.140	-0.01	0.155	0.177
	WCDMA V	RMC 12.2Kbps	Back	10	Bottom	Full	4233	846.6	23.93	24.50	1.140	0.09	0.241	0.275
34	WCDMA V	RMC 12.2Kbps	Back	10	Bottom	Full	4132	826.4	23.75	24.50	1.189	0.09	0.238	0.283
	WCDMA V	RMC 12.2Kbps	Back	10	Bottom	Full	4182	836.4	23.81	24.50	1.172	0.03	0.212	0.249
	WCDMA II	RMC 12.2Kbps	Front	10	Top	Reduced	9538	1907.6	21.48	22.00	1.127	0.04	0.234	0.264
	WCDMA II	RMC 12.2Kbps	Back	10	Top	Reduced	9538	1907.6	21.48	22.00	1.127	0.02	0.457	0.515
	WCDMA II	RMC 12.2Kbps	Back	10	Top	Reduced	9262	1852.4	21.41	22.00	1.146	0.07	0.407	0.466
	WCDMA II	RMC 12.2Kbps	Back	10	Top	Reduced	9400	1880	21.47	22.00	1.130	-0.03	0.477	0.539
	WCDMA II	RMC 12.2Kbps	Front	10	Bottom	Reduced	9538	1907.6	22.74	23.00	1.062	0.02	0.423	0.449
	WCDMA II	RMC 12.2Kbps	Back	10	Bottom	Reduced	9538	1907.6	22.74	23.00	1.062	0.02	0.809	0.859
	WCDMA II	RMC 12.2Kbps	Back	10	Bottom	Reduced	9262	1852.4	22.56	23.00	1.107	0.06	0.759	0.840
35	WCDMA II	RMC 12.2Kbps	Back	10	Bottom	Reduced	9400	1880	22.73	23.00	1.064	0.17	0.989	1.052
	WCDMA IV	RMC 12.2Kbps	Front	10	Top	Reduced	1513	1752.6	19.83	20.50	1.167	0.07	0.118	0.138
	WCDMA IV	RMC 12.2Kbps	Back	10	Top	Reduced	1513	1752.6	19.83	20.50	1.167	-0.1	0.260	0.303
	WCDMA IV	RMC 12.2Kbps	Back	10	Top	Reduced	1312	1712.4	19.75	20.50	1.189	-0.03	0.215	0.256
	WCDMA IV	RMC 12.2Kbps	Back	10	Top	Reduced	1413	1732.6	19.82	20.50	1.169	0.06	0.236	0.276
	WCDMA IV	RMC 12.2Kbps	Front	10	Bottom	Reduced	1513	1752.6	21.07	21.50	1.104	0.01	0.231	0.255
	WCDMA IV	RMC 12.2Kbps	Back	10	Bottom	Reduced	1513	1752.6	21.07	21.50	1.104	0.01	0.681	0.752
	WCDMA IV	RMC 12.2Kbps	Back	10	Bottom	Reduced	1312	1712.4	20.95	21.50	1.135	0.06	0.704	0.799
36	WCDMA IV	RMC 12.2Kbps	Back	10	Bottom	Reduced	1413	1732.6	21.05	21.50	1.109	0.07	0.722	0.801



<LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Antenna	Power Mode	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)
	LTE Band 5	10M	QPSK	1	0	Front	10	Top	Full	20525	836.5	23.87	24.50	1.156	0.06	0.090	0.103
	LTE Band 5	10M	QPSK	25	12	Front	10	Top	Full	20525	836.5	22.96	23.50	1.132	0.06	0.070	0.079
	LTE Band 5	10M	QPSK	1	0	Back	10	Top	Full	20525	836.5	23.87	24.50	1.156	0.09	0.190	0.220
	LTE Band 5	10M	QPSK	25	12	Back	10	Top	Full	20525	836.5	22.96	23.50	1.132	0.06	0.161	0.182
	LTE Band 5	10M	QPSK	1	0	Front	10	Bottom	Full	20525	836.5	23.87	24.50	1.156	0.03	0.153	0.177
	LTE Band 5	10M	QPSK	25	12	Front	10	Bottom	Full	20525	836.5	22.96	23.50	1.132	0.05	0.121	0.137
37	LTE Band 5	10M	QPSK	1	0	Back	10	Bottom	Full	20525	836.5	23.87	24.50	1.156	0.07	0.226	0.261
	LTE Band 5	10M	QPSK	25	12	Back	10	Bottom	Full	20525	836.5	22.96	23.50	1.132	0.01	0.177	0.200
	LTE Band 12	10M	QPSK	1	25	Front	10	Top	Full	23095	707.5	23.57	24.50	1.239	0.02	0.034	0.042
	LTE Band 12	10M	QPSK	25	12	Front	10	Top	Full	23095	707.5	22.62	23.50	1.225	0.06	0.027	0.033
	LTE Band 12	10M	QPSK	1	25	Back	10	Top	Full	23095	707.5	23.57	24.50	1.239	0.05	0.077	0.096
	LTE Band 12	10M	QPSK	25	12	Back	10	Top	Full	23095	707.5	22.62	23.50	1.225	0.04	0.064	0.078
	LTE Band 12	10M	QPSK	1	25	Front	10	Bottom	Full	23095	707.5	23.57	24.50	1.239	0.02	0.133	0.165
	LTE Band 12	10M	QPSK	25	12	Front	10	Bottom	Full	23095	707.5	22.62	23.50	1.225	0.05	0.107	0.131
38	LTE Band 12	10M	QPSK	1	25	Back	10	Bottom	Full	23095	707.5	23.57	24.50	1.239	0.04	0.201	0.249
	LTE Band 12	10M	QPSK	25	12	Back	10	Bottom	Full	23095	707.5	22.62	23.50	1.225	0.05	0.155	0.190



FCC SAR Test Report

Report No. : FA952702

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Antenna	Power Mode	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)
	LTE Band 28	20M	QPSK	1	49	Front	10	Top	Full	27460	728	24.04	24.50	1.112	0.02	0.029	0.033
	LTE Band 28	20M	QPSK	50	50	Front	10	Top	Full	27460	728	23.22	23.50	1.067	0.05	0.025	0.026
	LTE Band 28	20M	QPSK	1	49	Back	10	Top	Full	27460	728	24.04	24.50	1.112	0.12	0.064	0.071
	LTE Band 28	20M	QPSK	50	50	Back	10	Top	Full	27460	728	23.22	23.50	1.067	0.1	0.059	0.063
	LTE Band 28	20M	QPSK	1	49	Front	10	Bottom	Full	27460	728	24.04	24.50	1.112	0.09	0.122	0.136
	LTE Band 28	20M	QPSK	50	50	Front	10	Bottom	Full	27460	728	23.22	23.50	1.067	0.01	0.099	0.105
39	LTE Band 28	20M	QPSK	1	49	Back	10	Bottom	Full	27460	728	24.04	24.50	1.112	0.08	0.182	0.202
	LTE Band 28	20M	QPSK	50	50	Back	10	Bottom	Full	27460	728	23.22	23.50	1.067	-0.03	0.142	0.151
	LTE Band 2	20M	QPSK	1	0	Front	10	Top	Reduced	18700	1860	21.13	21.50	1.089	0.02	0.237	0.258
	LTE Band 2	20M	QPSK	50	24	Front	10	Top	Reduced	18700	1860	21.15	21.50	1.084	-0.03	0.234	0.254
	LTE Band 2	20M	QPSK	1	0	Back	10	Top	Reduced	18700	1860	21.13	21.50	1.089	0.01	0.483	0.526
	LTE Band 2	20M	QPSK	50	24	Back	10	Top	Reduced	18700	1860	21.15	21.50	1.084	-0.01	0.541	0.586
	LTE Band 2	20M	QPSK	50	24	Back	10	Top	Reduced	18900	1880	21.09	21.50	1.099	0.05	0.376	0.413
	LTE Band 2	20M	QPSK	50	24	Back	10	Top	Reduced	19100	1900	21.01	21.50	1.119	-0.01	0.413	0.462
	LTE Band 2	20M	QPSK	1	0	Front	10	Bottom	Reduced	18700	1860	22.66	23.50	1.213	0.01	0.355	0.431
	LTE Band 2	20M	QPSK	50	24	Front	10	Bottom	Reduced	18700	1860	22.69	23.50	1.205	0.07	0.352	0.424
40	LTE Band 2	20M	QPSK	1	0	Back	10	Bottom	Reduced	18700	1860	22.66	23.50	1.213	-0.03	0.799	0.969
	LTE Band 2	20M	QPSK	1	0	Back	10	Bottom	Reduced	18900	1880	22.64	23.50	1.219	0.08	0.733	0.894
	LTE Band 2	20M	QPSK	1	0	Back	10	Bottom	Reduced	19100	1900	22.52	23.50	1.253	0.01	0.631	0.791
	LTE Band 2	20M	QPSK	50	24	Back	10	Bottom	Reduced	18700	1860	22.69	23.50	1.205	0.06	0.786	0.947
	LTE Band 2	20M	QPSK	50	24	Back	10	Bottom	Reduced	18900	1880	22.69	23.50	1.205	0.01	0.721	0.869
	LTE Band 2	20M	QPSK	50	24	Back	10	Bottom	Reduced	19100	1900	22.60	23.50	1.230	0.01	0.624	0.768
	LTE Band 2	20M	QPSK	100	0	Back	10	Bottom	Reduced	18700	1860	22.75	23.50	1.189	0.07	0.789	0.938



Plot No.	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Antenna	Power Mode	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)
	LTE Band 4	20M	QPSK	1	0	Front	10	Top	Reduced	20175	1732.5	19.93	20.50	1.140	0.01	0.099	0.113
	LTE Band 4	20M	QPSK	50	24	Front	10	Top	Reduced	20175	1732.5	19.91	20.50	1.146	-0.01	0.112	0.128
	LTE Band 4	20M	QPSK	1	0	Back	10	Top	Reduced	20175	1732.5	19.93	20.50	1.140	-0.03	0.223	0.254
	LTE Band 4	20M	QPSK	50	24	Back	10	Top	Reduced	20175	1732.5	19.91	20.50	1.146	0.02	0.249	0.285
	LTE Band 4	20M	QPSK	1	0	Front	10	Bottom	Reduced	20175	1732.5	20.37	21.50	1.297	0.01	0.264	0.342
	LTE Band 4	20M	QPSK	50	24	Front	10	Bottom	Reduced	20175	1732.5	20.41	21.50	1.285	0.09	0.248	0.319
	LTE Band 4	20M	QPSK	1	0	Back	10	Bottom	Reduced	20175	1732.5	20.37	21.50	1.297	0.01	0.673	0.873
	LTE Band 4	20M	QPSK	50	24	Back	10	Bottom	Reduced	20175	1732.5	20.41	21.50	1.285	0.01	0.685	0.880
41	LTE Band 4	20M	QPSK	100	0	Back	10	Bottom	Reduced	20175	1732.5	20.36	21.50	1.300	-0.03	0.689	0.896
	LTE Band 7	20M	QPSK	1	99	Front	10	Top	Reduced	21100	2535	17.98	18.50	1.127	0.11	0.181	0.204
	LTE Band 7	20M	QPSK	50	0	Front	10	Top	Reduced	21100	2535	18.14	18.50	1.086	0.05	0.183	0.199
	LTE Band 7	20M	QPSK	1	99	Back	10	Top	Reduced	21100	2535	17.98	18.50	1.127	-0.01	0.529	0.596
	LTE Band 7	20M	QPSK	50	0	Back	10	Top	Reduced	21100	2535	18.14	18.50	1.086	0.01	0.553	0.601
	LTE Band 7	20M	QPSK	50	0	Back	10	Top	Reduced	20850	2510	18.03	18.50	1.114	0.01	0.405	0.451
	LTE Band 7	20M	QPSK	50	0	Back	10	Top	Reduced	21350	2560	17.77	18.50	1.183	0.07	0.501	0.593
	LTE Band 7	20M	QPSK	1	99	Front	10	Bottom	Full	21100	2535	23.92	24.50	1.143	0.06	0.293	0.335
	LTE Band 7	20M	QPSK	50	0	Front	10	Bottom	Full	21100	2535	23.09	23.50	1.099	0.06	0.193	0.212
	LTE Band 7	20M	QPSK	1	99	Back	10	Bottom	Full	21100	2535	23.92	24.50	1.143	0.05	0.562	0.642
	LTE Band 7	20M	QPSK	1	99	Back	10	Bottom	Full	20850	2510	23.83	24.50	1.167	0.06	0.406	0.474
42	LTE Band 7	20M	QPSK	1	99	Back	10	Bottom	Full	21350	2560	23.72	24.50	1.197	0.09	0.599	0.717
	LTE Band 7	20M	QPSK	50	0	Back	10	Bottom	Full	21100	2535	23.09	23.50	1.099	0.06	0.364	0.400

<WLAN 2.4GHz SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Power Mode	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	10	Full	6	2437	17.98	18.50	1.127	100	1.000	0.07	0.092	0.104
	WLAN2.4GHz	802.11b 1Mbps	Back	10	Full	6	2437	17.98	18.50	1.127	100	1.000	0.01	0.146	0.165
	WLAN2.4GHz	802.11b 1Mbps	Back	10	Full	1	2412	17.71	18.50	1.199	100	1.000	0.06	0.106	0.127
43	WLAN2.4GHz	802.11b 1Mbps	Back	10	Full	11	2462	17.67	18.50	1.211	100	1.000	0.07	0.172	0.208

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	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	10	0	2402	11.91	12.00	1.021	77.03	1.081	0.01	0.017	0.018
44	Bluetooth	1Mbps	Back	10	0	2402	11.91	12.00	1.021	77.03	1.081	-0.01	0.028	0.031
	Bluetooth	1Mbps	Back	10	39	2441	11.75	12.00	1.059	77.03	1.081	0.03	0.027	0.031
	Bluetooth	1Mbps	Back	10	78	2480	11.79	12.00	1.050	77.03	1.081	0.03	0.026	0.029

<WLAN 5GHz SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Power Mode	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)
	WLAN5.3GHz	802.11a 6Mbps	Front	10	Full	52	5260	15.31	16.50	1.315	95.64	1.046	0.07	0.092	0.126
	WLAN5.3GHz	802.11a 6Mbps	Back	10	Full	52	5260	15.31	16.50	1.315	95.64	1.046	0.04	0.486	0.669
45	WLAN5.3GHz	802.11a 6Mbps	Back	10	Full	56	5280	15.04	16.50	1.400	95.64	1.046	0.02	0.487	0.713
	WLAN5.3GHz	802.11a 6Mbps	Back	10	Full	64	5320	15.24	16.50	1.335	95.64	1.046	0.02	0.498	0.696
	WLAN5.5GHz	802.11a 6Mbps	Front	10	Full	116	5580	15.30	16.50	1.318	95.64	1.046	-0.06	0.139	0.192
	WLAN5.5GHz	802.11a 6Mbps	Back	10	Full	116	5580	15.30	16.50	1.318	95.64	1.046	0.01	0.437	0.603
46	WLAN5.5GHz	802.11a 6Mbps	Back	10	Full	140	5700	15.20	16.50	1.349	95.64	1.046	-0.02	0.656	0.926
	WLAN5.5GHz	802.11a 6Mbps	Back	10	Full	100	5500	15.12	16.50	1.374	95.64	1.046	-0.07	0.507	0.729
	WLAN5.8GHz	802.11a 6Mbps	Front	10	Full	149	5745	15.63	16.50	1.222	95.64	1.046	-0.11	0.162	0.207
47	WLAN5.8GHz	802.11a 6Mbps	Back	10	Full	149	5745	15.63	16.50	1.222	95.64	1.046	-0.19	0.684	0.874
	WLAN5.8GHz	802.11a 6Mbps	Back	10	Full	157	5785	15.40	16.50	1.288	95.64	1.046	0.02	0.460	0.620
	WLAN5.8GHz	802.11a 6Mbps	Back	10	Full	165	5825	15.32	16.50	1.312	95.64	1.046	0.06	0.400	0.549

15.4 Product specific 10g SAR
<WLAN 5GHz SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Power Mode	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)
	WLAN5.3GHz	802.11a 6Mbps	Front	0	Full	52	5260	15.31	16.50	1.315	95.64	1.046	0.01	0.038	0.053
	WLAN5.3GHz	802.11a 6Mbps	Back	0	Full	52	5260	15.31	16.50	1.315	95.64	1.046	-0.03	0.163	0.224
48	WLAN5.3GHz	802.11a 6Mbps	Right Side	0	Full	52	5260	15.31	16.50	1.315	95.64	1.046	0.04	0.652	0.897
	WLAN5.3GHz	802.11a 6Mbps	Top Side	0	Full	52	5260	15.31	16.50	1.315	95.64	1.046	0.01	0.377	0.519
	WLAN5.3GHz	802.11a 6Mbps	Right Side	0	Full	56	5280	15.04	16.50	1.400	95.64	1.046	-0.11	0.491	0.719
	WLAN5.3GHz	802.11a 6Mbps	Right Side	0	Full	64	5320	15.24	16.50	1.335	95.64	1.046	-0.03	0.439	0.613
	WLAN5.5GHz	802.11a 6Mbps	Front	0	Full	116	5580	15.30	16.50	1.318	95.64	1.046	0.01	0.319	0.440
49	WLAN5.5GHz	802.11a 6Mbps	Back	0	Full	116	5580	15.30	16.50	1.318	95.64	1.046	0.09	0.934	1.288
	WLAN5.5GHz	802.11a 6Mbps	Right Side	0	Full	116	5580	15.30	16.50	1.318	95.64	1.046	-0.03	0.337	0.465
	WLAN5.5GHz	802.11a 6Mbps	Top Side	0	Full	116	5580	15.30	16.50	1.318	95.64	1.046	-0.08	0.683	0.942
	WLAN5.5GHz	802.11a 6Mbps	Back	0	Full	140	5700	15.20	16.50	1.349	95.64	1.046	-0.02	0.708	0.999
	WLAN5.5GHz	802.11a 6Mbps	Back	0	Full	100	5500	15.12	16.50	1.374	95.64	1.046	-0.13	0.714	1.026

**15.5 Repeated SAR Measurement****<1g SAR>**

No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Mode	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)	Ratio	Reported 1g SAR (W/kg)
1st	GSM 850	GPRS 3 Tx slots	Right Cheek	0	Top	Full	251	848.8	31.17	32.00	1.211	-	1.000	0.04	0.851	1	1.030
2nd	GSM 850	GPRS 3 Tx slots	Right Cheek	0	Top	Full	251	848.8	31.17	32.00	1.211	-	1.000	0.02	0.845	1.007	1.023
1st	WCDMA IV	RMC 12.2Kbps	Right Cheek	0	Top	Reduced	1513	1752.6	21.09	21.50	1.099	-	1.000	-0.01	0.944	1	1.037
2nd	WCDMA IV	RMC 12.2Kbps	Right Cheek	0	Top	Reduced	1513	1752.6	21.09	21.50	1.099	-	1.000	0.06	0.938	1.006	1.031
1st	WCDMA II	RMC 12.2Kbps	Bottom Side	10	Bottom	Reduced	9262	1852.4	22.56	23.00	1.107	-	1.000	0.01	1.030	1	1.140
2nd	WCDMA II	RMC 12.2Kbps	Bottom Side	10	Bottom	Reduced	9262	1852.4	22.56	23.00	1.107	-	1.000	0.09	1.010	1.020	1.118

General Note:

1. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥ 0.8 W/kg.
2. The ratio is the difference in percentage between original and repeated *measured SAR*.
3. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

16. Simultaneous Transmission Analysis

No.	Simultaneous Transmission Configurations	Portable Handset		
		Head	Body-worn	Hotspot
1.	GSM Voice + WLAN2.4GHz	Yes	Yes	
2.	GPRS/EDGE + WLAN2.4GHz	Yes	Yes	Yes
3.	WCDMA + WLAN2.4GHz	Yes	Yes	Yes
4.	LTE + WLAN2.4GHz	Yes	Yes	Yes
5.	GSM Voice + WLAN5.3/5.5GHz	Yes	Yes	
6.	GPRS/EDGE + WLAN5.3/5.5GHz	Yes	Yes	
7.	WCDMA + WLAN5.3/5.5GHz	Yes	Yes	
8.	LTE + WLAN5.3/5.5GHz	Yes	Yes	
9.	GSM Voice + WLAN5.2/5.8GHz	Yes	Yes	
10.	GPRS/EDGE + WLAN5.2/5.8GHz	Yes	Yes	Yes
11.	WCDMA + WLAN5.2/5.8GHz	Yes	Yes	Yes
12.	LTE + WLAN5.2/5.8GHz	Yes	Yes	Yes
13.	GSM Voice + Bluetooth	Yes	Yes	
14.	GPRS/EDGE + Bluetooth	Yes	Yes	Yes
15.	WCDMA + Bluetooth	Yes	Yes	Yes
16.	LTE + Bluetooth	Yes	Yes	Yes
17.	Bluetooth + WLAN5GHz	Yes	Yes	Yes
18.	GSM Voice + Bluetooth + WLAN5.3/5.5GHz	Yes	Yes	
19.	GPRS/EDGE + Bluetooth + WLAN5.3/5.5GHz	Yes	Yes	
20.	WCDMA + Bluetooth + WLAN5.3/5.5GHz	Yes	Yes	
21.	LTE + Bluetooth + WLAN5.3/5.5GHz	Yes	Yes	
22.	GSM Voice + Bluetooth + WLAN5.2/5.8GHz	Yes	Yes	
23.	GPRS/EDGE + Bluetooth + WLAN5.2/5.8GHz	Yes	Yes	Yes
24.	WCDMA + Bluetooth + WLAN5.2/5.8GHz	Yes	Yes	Yes
25.	LTE + Bluetooth + WLAN5.2/5.8GHz	Yes	Yes	Yes

General Note:

- This device supports VoIP in GPRS, EGPRS, WCDMA and LTE (e.g. for 3rd-party VoIP), LTE supports VoLTE operation.
- EUT will choose each GSM, WCDMA and LTE according to the network signal condition; therefore, they will not operate simultaneously at any moment.
- WLAN2.4GHz antenna and Bluetooth share the same antenna, so can't transmit simultaneously.
- This device 2.4GHz WLAN support hotspot operation and Bluetooth support tethering applications.
- This device 2.4GHz WLAN/ 5.2GHz WLAN/5.8GHz WLAN support hotspot operation, and 5.2GHz WLAN/5.8GHz WLAN supports WLAN Direct (GC/GO), and 5.3GHz / 5.5GHz supports WLAN Direct (GC only).
- The worst case 5 GHz WLAN SAR for each configuration was used for SAR summation.
- For simultaneously analysis, since the SAR summation of 3 transmitters can cover others combination of 2 transmitters, therefore in this section did not additional to evaluate 2TX combination of simultaneously transmission.
- The reported SAR summation is calculated based on the same configuration and test position.
- Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
 - Scalar SAR summation $< 1.6\text{W/kg}$.
 - $\text{SPLSR} = (\text{SAR1} + \text{SAR2})^{1.5} / (\text{min. separation distance, mm})$, 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 $\text{SPLSR} \leq 0.04$, simultaneous transmission SAR measurement is not necessary.
 - Simultaneously transmission SAR measurement, and the reported multi-band SAR $< 1.6\text{W/kg}$.

16.1 Head Exposure Conditions

UAT: Top Antenna; LAT: Bottom Antenna

WWAN Band		Exposure Position	1	2	3	4	1+2	1+3+4
			WWAN	2.4GHz WLAN	5GHz WLAN	Bluetooth	Summed 1g SAR (W/kg)	Summed 1g SAR (W/kg)
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)		
GSM	GSM 850-UAT	Right Cheek	1.030	0.296	0.502	0.038	1.33	1.57
		Right Tilted	0.874	0.251	0.550	0.035	1.13	1.46
		Left Cheek	0.651	0.752	0.759	0.096	1.40	1.51
		Left Tilted	0.484	0.549	1.016	0.076	1.03	1.58
	GSM 850-LAT	Right Cheek	0.338	0.296	0.502	0.038	0.63	0.88
		Right Tilted	0.160	0.251	0.550	0.035	0.41	0.75
		Left Cheek	0.295	0.752	0.759	0.096	1.05	1.15
		Left Tilted	0.153	0.549	1.016	0.076	0.70	1.25
	GSM 1900-UAT	Right Cheek	0.873	0.296	0.502	0.038	1.17	1.41
		Right Tilted	0.529	0.251	0.550	0.035	0.78	1.11
		Left Cheek	0.371	0.752	0.759	0.096	1.12	1.23
		Left Tilted	0.394	0.549	1.016	0.076	0.94	1.49
	GSM 1900-LAT	Right Cheek	0.175	0.296	0.502	0.038	0.47	0.72
		Right Tilted	0.168	0.251	0.550	0.035	0.42	0.75
		Left Cheek	0.239	0.752	0.759	0.096	0.99	1.09
		Left Tilted	0.163	0.549	1.016	0.076	0.71	1.26
WCDMA	WCDMA V-UAT	Right Cheek	0.536	0.296	0.502	0.038	0.83	1.08
		Right Tilted	0.406	0.251	0.550	0.035	0.66	0.99
		Left Cheek	0.323	0.752	0.759	0.096	1.08	1.18
		Left Tilted	0.250	0.549	1.016	0.076	0.80	1.34
	WCDMA V-LAT	Right Cheek	0.288	0.296	0.502	0.038	0.58	0.83
		Right Tilted	0.172	0.251	0.550	0.035	0.42	0.76
		Left Cheek	0.270	0.752	0.759	0.096	1.02	1.13
		Left Tilted	0.156	0.549	1.016	0.076	0.71	1.25
	WCDMA II-UAT	Right Cheek	0.827	0.296	0.502	0.038	1.12	1.37
		Right Tilted	0.528	0.251	0.550	0.035	0.78	1.11
		Left Cheek	0.386	0.752	0.759	0.096	1.14	1.24
		Left Tilted	0.424	0.549	1.016	0.076	0.97	1.52
	WCDMA II-LAT	Right Cheek	0.186	0.296	0.502	0.038	0.48	0.73
		Right Tilted	0.137	0.251	0.550	0.035	0.39	0.72
		Left Cheek	0.169	0.752	0.759	0.096	0.92	1.02
		Left Tilted	0.119	0.549	1.016	0.076	0.67	1.21

WWAN Band		Exposure Position	1	2	3	4	1+2	1+3+4
			WWAN	2.4GHz WLAN	5GHz WLAN	Bluetooth	Summed 1g SAR (W/kg)	Summed 1g SAR (W/kg)
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)		
WCDMA	WCDMA IV-UAT	Right Cheek	1.037	0.296	0.502	0.038	1.33	1.58
		Right Tilted	0.609	0.251	0.550	0.035	0.86	1.19
		Left Cheek	0.536	0.752	0.759	0.096	1.29	1.39
		Left Tilted	0.465	0.549	1.016	0.076	1.01	1.56
	WCDMA IV-LAT	Right Cheek	0.170	0.296	0.502	0.038	0.47	0.71
		Right Tilted	0.056	0.251	0.550	0.035	0.31	0.64
		Left Cheek	0.055	0.752	0.759	0.096	0.81	0.91
		Left Tilted	0.049	0.549	1.016	0.076	0.60	1.14
LTE	Band 5-UAT	Right Cheek	0.453	0.296	0.502	0.038	0.75	0.99
		Right Tilted	0.329	0.251	0.550	0.035	0.58	0.91
		Left Cheek	0.323	0.752	0.759	0.096	1.08	1.18
		Left Tilted	0.229	0.549	1.016	0.076	0.78	1.32
	Band 5-LAT	Right Cheek	0.187	0.296	0.502	0.038	0.48	0.73
		Right Tilted	0.097	0.251	0.550	0.035	0.35	0.68
		Left Cheek	0.179	0.752	0.759	0.096	0.93	1.03
		Left Tilted	0.143	0.549	1.016	0.076	0.69	1.24
	Band 12-UAT	Right Cheek	0.197	0.296	0.502	0.038	0.49	0.74
		Right Tilted	0.146	0.251	0.550	0.035	0.40	0.73
		Left Cheek	0.108	0.752	0.759	0.096	0.86	0.96
		Left Tilted	0.080	0.549	1.016	0.076	0.63	1.17
	Band 12-LAT	Right Cheek	0.117	0.296	0.502	0.038	0.41	0.66
		Right Tilted	0.061	0.251	0.550	0.035	0.31	0.65
		Left Cheek	0.113	0.752	0.759	0.096	0.87	0.97
		Left Tilted	0.061	0.549	1.016	0.076	0.61	1.15
	Band 28-UAT	Right Cheek	0.188	0.296	0.502	0.038	0.48	0.73
		Right Tilted	0.142	0.251	0.550	0.035	0.39	0.73
		Left Cheek	0.105	0.752	0.759	0.096	0.86	0.96
		Left Tilted	0.080	0.549	1.016	0.076	0.63	1.17
	Band 28-LAT	Right Cheek	0.119	0.296	0.502	0.038	0.42	0.66
		Right Tilted	0.066	0.251	0.550	0.035	0.32	0.65
		Left Cheek	0.109	0.752	0.759	0.096	0.86	0.96
		Left Tilted	0.060	0.549	1.016	0.076	0.61	1.15

WWAN Band		Exposure Position	1	2	3	4	1+2	1+3+4
			WWAN	2.4GHz WLAN	5GHz WLAN	Bluetooth	Summed 1g SAR (W/kg)	Summed 1g SAR (W/kg)
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)		
LTE	Band 2-UAT	Right Cheek	0.853	0.296	0.502	0.038	1.15	1.39
		Right Tilted	0.556	0.251	0.550	0.035	0.81	1.14
		Left Cheek	0.340	0.752	0.759	0.096	1.09	1.20
		Left Tilted	0.330	0.549	1.016	0.076	0.88	1.42
	Band 2-LAT	Right Cheek	0.178	0.296	0.502	0.038	0.47	0.72
		Right Tilted	0.106	0.251	0.550	0.035	0.36	0.69
		Left Cheek	0.125	0.752	0.759	0.096	0.88	0.98
		Left Tilted	0.103	0.549	1.016	0.076	0.65	1.20
	Band 4-UAT	Right Cheek	0.918	0.296	0.502	0.038	1.21	1.46
		Right Tilted	0.549	0.251	0.550	0.035	0.80	1.13
		Left Cheek	0.477	0.752	0.759	0.096	1.23	1.33
		Left Tilted	0.475	0.549	1.016	0.076	1.02	1.57
	Band 4-LAT	Right Cheek	0.168	0.296	0.502	0.038	0.46	0.71
		Right Tilted	0.043	0.251	0.550	0.035	0.29	0.63
		Left Cheek	0.067	0.752	0.759	0.096	0.82	0.92
		Left Tilted	0.037	0.549	1.016	0.076	0.59	1.13
	Band 7-UAT	Right Cheek	0.684	0.296	0.502	0.038	0.98	1.22
		Right Tilted	0.871	0.251	0.550	0.035	1.12	1.46
		Left Cheek	0.321	0.752	0.759	0.096	1.07	1.18
		Left Tilted	0.401	0.549	1.016	0.076	0.95	1.49
	Band 7-LAT	Right Cheek	0.079	0.296	0.502	0.038	0.38	0.62
		Right Tilted	0.076	0.251	0.550	0.035	0.33	0.66
		Left Cheek	0.152	0.752	0.759	0.096	0.90	1.01
		Left Tilted	0.056	0.549	1.016	0.076	0.61	1.15



16.2 Hotspot Exposure Conditions

UAT: Top Antenna; LAT: Bottom Antenna

WWAN Band		Exposure Position	1	2	3	4	1+2	1+3+4		
			WWAN	2.4GHz WLAN	5GHz WLAN	Bluetooth	Summed 1g SAR (W/kg)	Summed 1g SAR (W/kg)	SPLSR	Case No
GSM	GSM 850- UAT	Front	0.245	0.104	0.207	0.018	0.35	0.47		
		Back	0.443	0.208	0.874	0.031	0.65	1.35		
		Left side	0.104				0.10	0.10		
		Right side		0.148	0.415	0.018	0.15	0.43		
		Top side	0.213	0.144	0.657	0.018	0.36	0.89		
	GSM 850-LAT	Front	0.365	0.104	0.207	0.018	0.47	0.59		
		Back	0.610	0.208	0.874	0.031	0.82	1.52		
		Left side	0.231				0.23	0.23		
		Right side	0.424	0.148	0.415	0.018	0.57	0.86		
		Top side		0.144	0.657	0.018	0.14	0.68		
		Bottom side	0.146				0.15	0.15		
	GSM 1900-UAT	Front	0.241	0.104	0.207	0.018	0.35	0.47		
		Back	0.628	0.208	0.874	0.031	0.84	1.53		
		Left side	0.091				0.09	0.09		
		Right side		0.148	0.415	0.018	0.15	0.43		
		Top side	0.271	0.144	0.657	0.018	0.42	0.95		
	GSM 1900-LAT	Front	0.533	0.104	0.207	0.018	0.64	0.76		
		Back	0.973	0.208	0.874	0.031	1.18	1.88	0.02	#01
		Left side	0.090				0.09	0.09		
		Right side	0.271	0.148	0.415	0.018	0.42	0.70		
		Top side		0.144	0.657	0.018	0.14	0.68		
		Bottom side	0.792				0.79	0.79		
WCDMA	WCDMAV-UAT	Front	0.102	0.104	0.207	0.018	0.21	0.33		
		Back	0.218	0.208	0.874	0.031	0.43	1.12		
		Left side	0.061				0.06	0.06		
		Right side		0.148	0.415	0.018	0.15	0.43		
		Top side	0.051	0.144	0.657	0.018	0.20	0.73		
	WCDMA V-LAT	Front	0.177	0.104	0.207	0.018	0.28	0.40		
		Back	0.283	0.208	0.874	0.031	0.49	1.19		
		Left side	0.166				0.17	0.17		
		Right side	0.217	0.148	0.415	0.018	0.37	0.65		
		Top side		0.144	0.657	0.018	0.14	0.68		
		Bottom side	0.071				0.07	0.07		



WWAN Band		Exposure Position	1	2	3	4	1+2	1+3+4		
			WWAN	2.4GHz WLAN	5GHz WLAN	Bluetooth	Summed 1g SAR (W/kg)	Summed 1g SAR (W/kg)	SPLSR	Case No
WCDMA	WCDMA II-UAT	Front	0.264	0.104	0.207	0.018	0.37	0.49		
		Back	0.539	0.208	0.874	0.031	0.75	1.44		
		Left side	0.183				0.18	0.18		
		Right side		0.148	0.415	0.018	0.15	0.43		
		Top side	0.472	0.144	0.657	0.018	0.62	1.15		
	WCDMA II-LAT	Front	0.449	0.104	0.207	0.018	0.55	0.67		
		Back	1.052	0.208	0.874	0.031	1.26	1.96	0.02	#02
		Left side	0.028				0.03	0.03		
		Right side	0.134	0.148	0.415	0.018	0.28	0.57		
		Top side		0.144	0.657	0.018	0.14	0.68		
		Bottom side	1.140				1.14	1.14		
	WCDMA IV-UAT	Front	0.138	0.104	0.207	0.018	0.24	0.36		
		Back	0.303	0.208	0.874	0.031	0.51	1.21		
		Left side	0.142				0.14	0.14		
		Right side		0.148	0.415	0.018	0.15	0.43		
		Top side	0.180	0.144	0.657	0.018	0.32	0.86		
	WCDMA IV-LAT	Front	0.255	0.104	0.207	0.018	0.36	0.48		
		Back	0.801	0.208	0.874	0.031	1.01	1.71	0.01	#03
		Left side	0.006				0.01	0.01		
		Right side	0.124	0.148	0.415	0.018	0.27	0.56		
		Top side		0.144	0.657	0.018	0.14	0.68		
		Bottom side	0.751				0.75	0.75		
LTE	Band 5-UAT	Front	0.103	0.104	0.207	0.018	0.21	0.33		
		Back	0.220	0.208	0.874	0.031	0.43	1.13		
		Left side	0.055				0.06	0.06		
		Right side		0.148	0.415	0.018	0.15	0.43		
		Top side	0.117	0.144	0.657	0.018	0.26	0.79		
	Band 5-LAT	Front	0.177	0.104	0.207	0.018	0.28	0.40		
		Back	0.261	0.208	0.874	0.031	0.47	1.17		
		Left side	0.178				0.18	0.18		
		Right side	0.244	0.148	0.415	0.018	0.39	0.68		
		Top side		0.144	0.657	0.018	0.14	0.68		
		Bottom side	0.083				0.08	0.08		



WWAN Band		Exposure Position	1	2	3	4	1+2	1+3+4		
			WWAN	2.4GHz WLAN	5GHz WLAN	Bluetooth	Summed 1g SAR (W/kg)	Summed 1g SAR (W/kg)	SPLSR	Case No
LTE	Band 12-UAT	Front	0.042	0.104	0.207	0.018	0.15	0.27		
		Back	0.096	0.208	0.874	0.031	0.30	1.00		
		Left side	0.050				0.05	0.05		
		Right side		0.148	0.415	0.018	0.15	0.43		
		Top side	0.041	0.144	0.657	0.018	0.19	0.72		
	Band 12-LAT	Front	0.165	0.104	0.207	0.018	0.27	0.39		
		Back	0.249	0.208	0.874	0.031	0.46	1.15		
		Left side	0.183				0.18	0.18		
		Right side	0.234	0.148	0.415	0.018	0.38	0.67		
		Top side		0.144	0.657	0.018	0.14	0.68		
		Bottom side	0.001				<0.01	<0.01		
	Band 28-UAT	Front	0.033	0.104	0.207	0.018	0.14	0.26		
		Back	0.071	0.208	0.874	0.031	0.28	0.98		
		Left side	0.038				0.04	0.04		
		Right side		0.148	0.415	0.018	0.15	0.43		
		Top side	0.022	0.144	0.657	0.018	0.17	0.70		
	Band 28-LAT	Front	0.136	0.104	0.207	0.018	0.24	0.36		
		Back	0.202	0.208	0.874	0.031	0.41	1.11		
		Left side	0.120				0.12	0.12		
		Right side	0.160	0.148	0.415	0.018	0.31	0.59		
		Top side		0.144	0.657	0.018	0.14	0.68		
		Bottom side	0.035				0.04	0.04		
	Band 2-UAT	Front	0.258	0.104	0.207	0.018	0.36	0.48		
		Back	0.586	0.208	0.874	0.031	0.79	1.49		
		Left side	0.203				0.20	0.20		
		Right side		0.148	0.415	0.018	0.15	0.43		
		Top side	0.370	0.144	0.657	0.018	0.51	1.05		
	Band 2-LAT	Front	0.431	0.104	0.207	0.018	0.54	0.66		
		Back	0.969	0.208	0.874	0.031	1.18	1.87	0.02	#04
		Left side	0.121				0.12	0.12		
		Right side	0.215	0.148	0.415	0.018	0.36	0.65		
		Top side		0.144	0.657	0.018	0.14	0.68		
		Bottom side	0.903				0.90	0.90		



WWAN Band		Exposure Position	1	2	3	4	1+2	1+3+4		
			WWAN	2.4GHz WLAN	5GHz WLAN	Bluetooth	Summed 1g SAR (W/kg)	Summed 1g SAR (W/kg)	SPLSR	Case No
LTE	Band 4-UAT	Front	0.128	0.104	0.207	0.018	0.23	0.35		
		Back	0.285	0.208	0.874	0.031	0.49	1.19		
		Left side	0.129				0.13	0.13		
		Right side		0.148	0.415	0.018	0.15	0.43		
		Top side	0.174	0.144	0.657	0.018	0.32	0.85		
	Band 4-LAT	Front	0.342	0.104	0.207	0.018	0.45	0.57		
		Back	0.896	0.208	0.874	0.031	1.10	1.80	0.02	#05
		Left side	0.014				0.01	0.01		
		Right side	0.102	0.148	0.415	0.018	0.25	0.54		
		Top side		0.144	0.657	0.018	0.14	0.68		
		Bottom side	0.862				0.86	0.86		
	Band 7-UAT	Front	0.204	0.104	0.207	0.018	0.31	0.43		
		Back	0.601	0.208	0.874	0.031	0.81	1.51		
		Left side	0.259				0.26	0.26		
		Right side		0.148	0.415	0.018	0.15	0.43		
		Top side	0.561	0.144	0.657	0.018	0.71	1.24		
	Band 7-LAT	Front	0.335	0.104	0.207	0.018	0.44	0.56		
		Back	0.717	0.208	0.874	0.031	0.93	1.62	0.01	#06
		Left side	0.251				0.25	0.25		
		Right side	0.052	0.148	0.415	0.018	0.20	0.49		
		Top side		0.144	0.657	0.018	0.14	0.68		
		Bottom side	0.353				0.35	0.35		



16.3 Body-Worn Accessory Exposure Conditions

UAT: Top Antenna; LAT: Bottom Antenna

WWAN Band		Exposure Position	1	2	3	4	1+2	1+3+4		
			WWAN	2.4GHz WLAN	5GHz WLAN	Bluetooth	Summed 1g SAR (W/kg)	Summed 1g SAR (W/kg)	SPLSR	Case No
GSM	GSM850-UAT	Front	0.245	0.104	0.207	0.018	0.35	0.47		
		Back	0.443	0.208	0.926	0.031	0.65	1.40		
	GSM850-LAT	Front	0.365	0.104	0.207	0.018	0.47	0.59		
		Back	0.610	0.208	0.926	0.031	0.82	1.57		
	GSM1900-UAT	Front	0.241	0.104	0.207	0.018	0.35	0.47		
		Back	0.628	0.208	0.926	0.031	0.84	1.59		
	GSM 1900-LAT	Front	0.533	0.104	0.207	0.018	0.64	0.76		
		Back	0.973	0.208	0.926	0.031	1.18	1.93	0.02	#07
WCDMA	WCDMAV-UAT	Front	0.102	0.104	0.207	0.018	0.21	0.33		
		Back	0.218	0.208	0.926	0.031	0.43	1.18		
	WCDMA V-LAT	Front	0.177	0.104	0.207	0.018	0.28	0.40		
		Back	0.283	0.208	0.926	0.031	0.49	1.24		
	WCDMAII-UAT	Front	0.264	0.104	0.207	0.018	0.37	0.49		
		Back	0.539	0.208	0.926	0.031	0.75	1.50		
	WCDMA II-LAT	Front	0.449	0.104	0.207	0.018	0.55	0.67		
		Back	1.052	0.208	0.926	0.031	1.26	2.01	0.02	#08
	WCDMAIV-UAT	Front	0.138	0.104	0.207	0.018	0.24	0.36		
		Back	0.303	0.208	0.926	0.031	0.51	1.26		
	WCDMAIV-LAT	Front	0.255	0.104	0.207	0.018	0.36	0.48		
		Back	0.801	0.208	0.926	0.031	1.01	1.76	0.01	#09
LTE	Band 5-UAT	Front	0.103	0.104	0.207	0.018	0.21	0.33		
		Back	0.220	0.208	0.926	0.031	0.43	1.18		
	Band 5-LAT	Front	0.177	0.104	0.207	0.018	0.28	0.40		
		Back	0.261	0.208	0.926	0.031	0.47	1.22		
	Band 12-UAT	Front	0.042	0.104	0.207	0.018	0.15	0.27		
		Back	0.096	0.208	0.926	0.031	0.30	1.05		
	Band 12-LAT	Front	0.165	0.104	0.207	0.018	0.27	0.39		
		Back	0.249	0.208	0.926	0.031	0.46	1.21		
	Band 28-UAT	Front	0.033	0.104	0.207	0.018	0.14	0.26		
		Back	0.071	0.208	0.926	0.031	0.28	1.03		
	Band 28-LAT	Front	0.136	0.104	0.207	0.018	0.24	0.36		
		Back	0.202	0.208	0.926	0.031	0.41	1.16		



FCC SAR Test Report

Report No. : FA952702

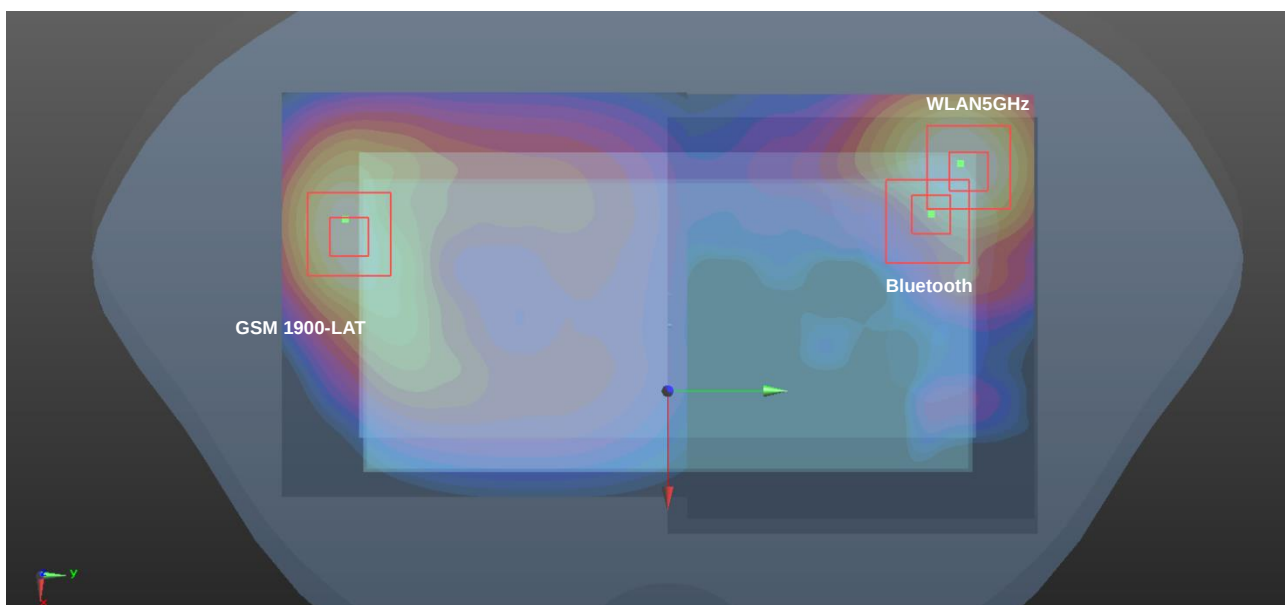
WWAN Band		Exposure Position	1	2	3	4	1+2	1+3+4		
			WWAN	2.4GHz WLAN	5GHz WLAN	Bluetooth	Summed 1g SAR (W/kg)	Summed 1g SAR (W/kg)	SPLSR	Case No
LTE	Band 2-UAT	Front	0.258	0.104	0.207	0.018	0.36	0.48		
		Back	0.586	0.208	0.926	0.031	0.79	1.54		
	Band 2-LAT	Front	0.431	0.104	0.207	0.018	0.54	0.66		
		Back	0.969	0.208	0.926	0.031	1.18	1.93	0.02	#10
	Band 4-UAT	Front	0.128	0.104	0.207	0.018	0.23	0.35		
		Back	0.285	0.208	0.926	0.031	0.49	1.24		
	Band 4-LAT	Front	0.342	0.104	0.207	0.018	0.45	0.57		
		Back	0.896	0.208	0.926	0.031	1.10	1.85	0.02	#11
	Band 7-UAT	Front	0.204	0.104	0.207	0.018	0.31	0.43		
		Back	0.601	0.208	0.926	0.031	0.81	1.56		
	Band 7-LAT	Front	0.335	0.104	0.207	0.018	0.44	0.56		
		Back	0.717	0.208	0.926	0.031	0.93	1.67	0.01	#12

16.4 SPLSR Evaluation and Analysis

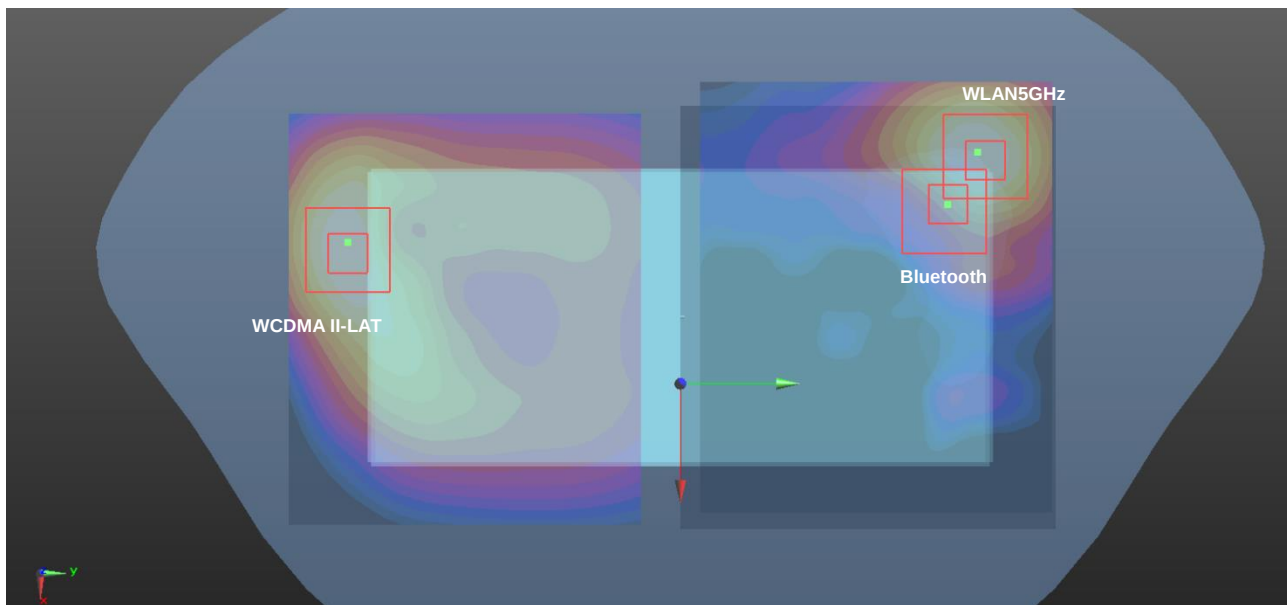
General Note:

- 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.
- $SPLSR = (SAR_1 + SAR_2)1.5 / (\text{min. separation distance, mm})$. If $SPLSR \leq 0.04$ for 1g SAR and $SPLSR \leq 0.10$ for 10g SAR, simultaneously transmission SAR measurement is not necessary.

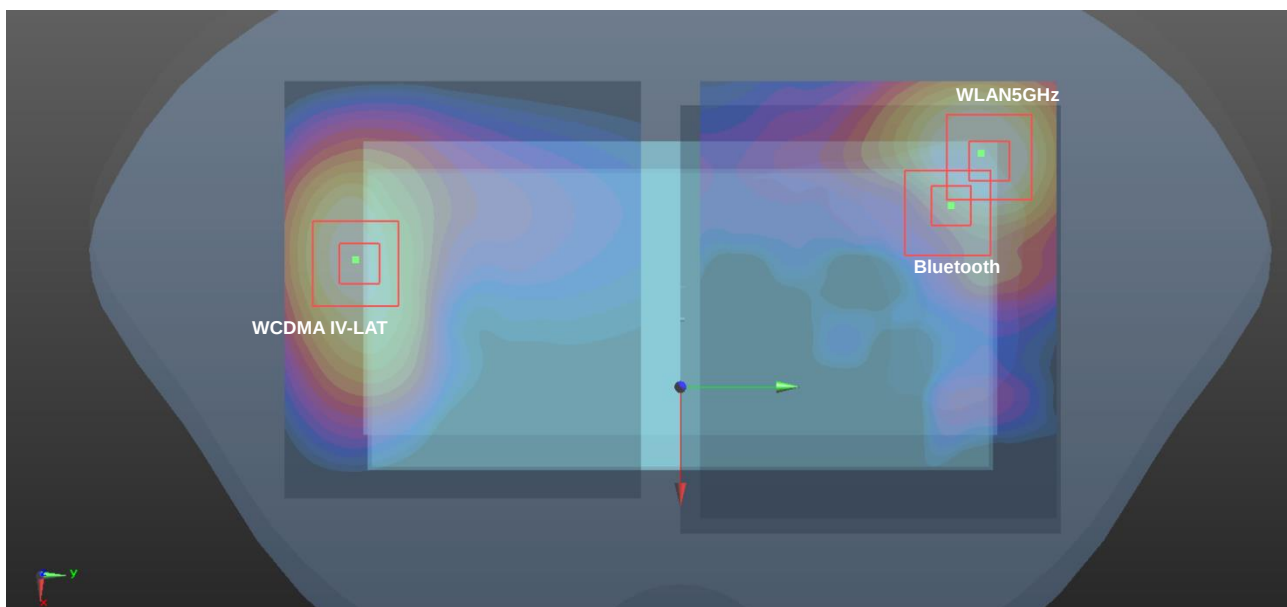
	Band	Position	1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Case #01	GSM 1900-LAT	Back	0.973	10	-14.7	-81.9	1.52	167.1	1.88	0.02	Not required
	WLAN5GHz		0.874	10	-39.6	78.4	-1.51				
	Bluetooth		0.031	10	-38.8	83.4	-0.42				
	GSM 1900-LAT	Back	0.973	10	-14.7	-81.9	1.52	162.3	1.88	0.02	Not required
	Bluetooth		0.031	10	-38.8	83.4	-0.42				
	WLAN5GHz		0.874	10	-39.6	78.4	-1.51				



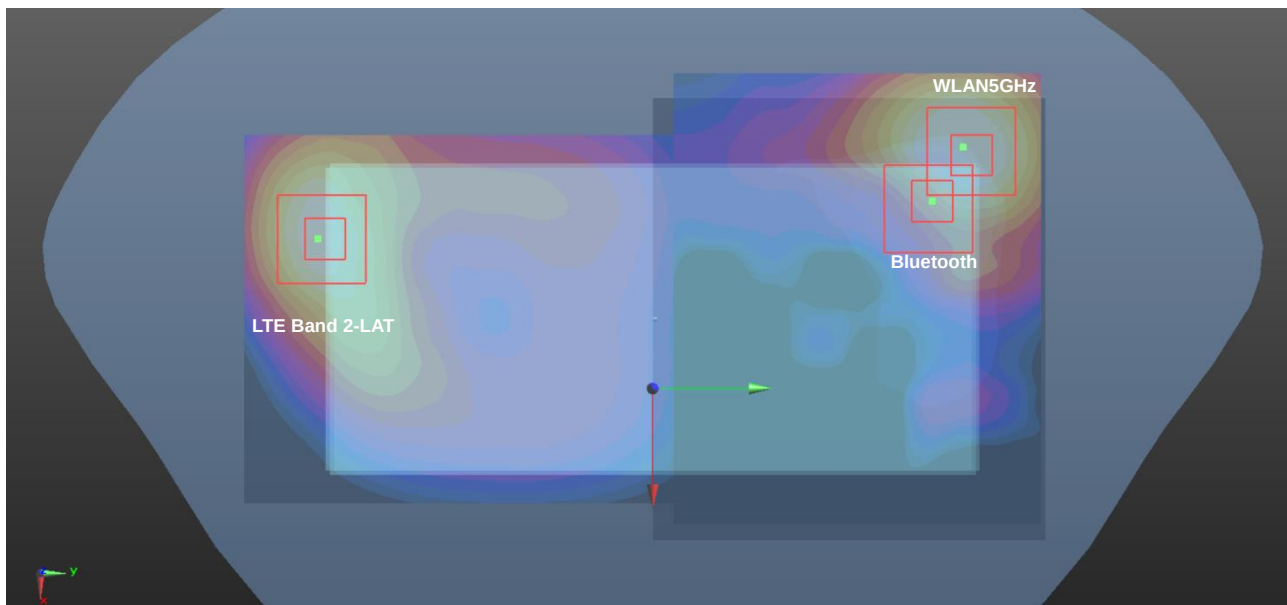
Case #02	Band	Position	1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	WCDMA II-LAT	Back	1.052	10	-15.8	-85	-0.73	170.0	1.96	0.02	Not required
	WLAN5GHz		0.874	10	-39.6	78.4	-1.51				
	Bluetooth		0.031	10	-38.8	83.4	-0.42				
	WCDMA II-LAT	Back	1.052	10	-15.8	-85	-0.73	165.1	1.96	0.02	Not required
	Bluetooth		0.031	10	-38.8	83.4	-0.42				
	WLAN5GHz		0.874	10	-39.6	78.4	-1.51				



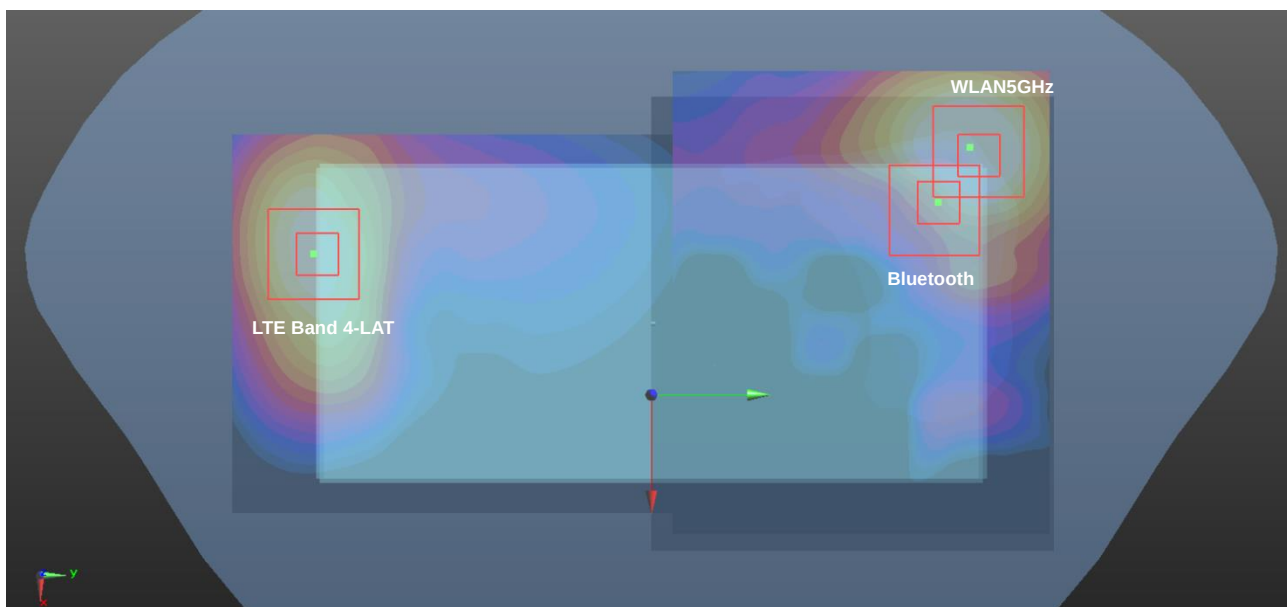
Case #03	Band	Position	1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	WCDMA IV-LAT	Back	0.801	10	-7	-80.4	1.9	166.9	1.71	0.01	Not required
	WLAN5GHz		0.874	10	-39.6	78.4	-1.51				
	Bluetooth		0.031	10	-38.8	83.4	-0.42				
	WCDMA IV-LAT	Back	0.801	10	-7	-80.4	1.9	162.1	1.71	0.01	Not required
	Bluetooth		0.031	10	-38.8	83.4	-0.42				
	WLAN5GHz		0.874	10	-39.6	78.4	-1.51				



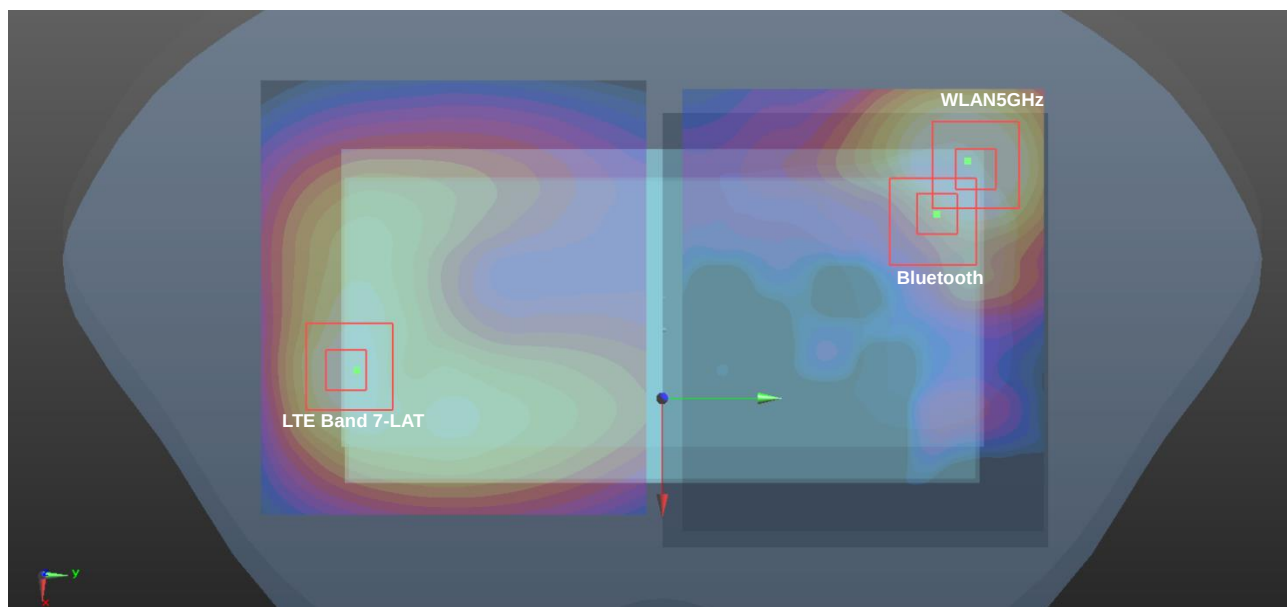
Case #04	Band	Position	1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	LTE Band 2-LAT	Back	0.969	10	-19.5	-80.4	-1.89	164.9	1.87	0.02	Not required
	WLAN5GHz		0.874	10	-39.6	78.4	-1.51				
	Bluetooth		0.031	10	-38.8	83.4	-0.42				
	LTE Band 2-LAT	Back	0.969	10	-19.5	-80.4	-1.89	160.1	1.87	0.02	Not required
	Bluetooth		0.031	10	-38.8	83.4	-0.42				
	WLAN5GHz		0.874	10	-39.6	78.4	-1.51				



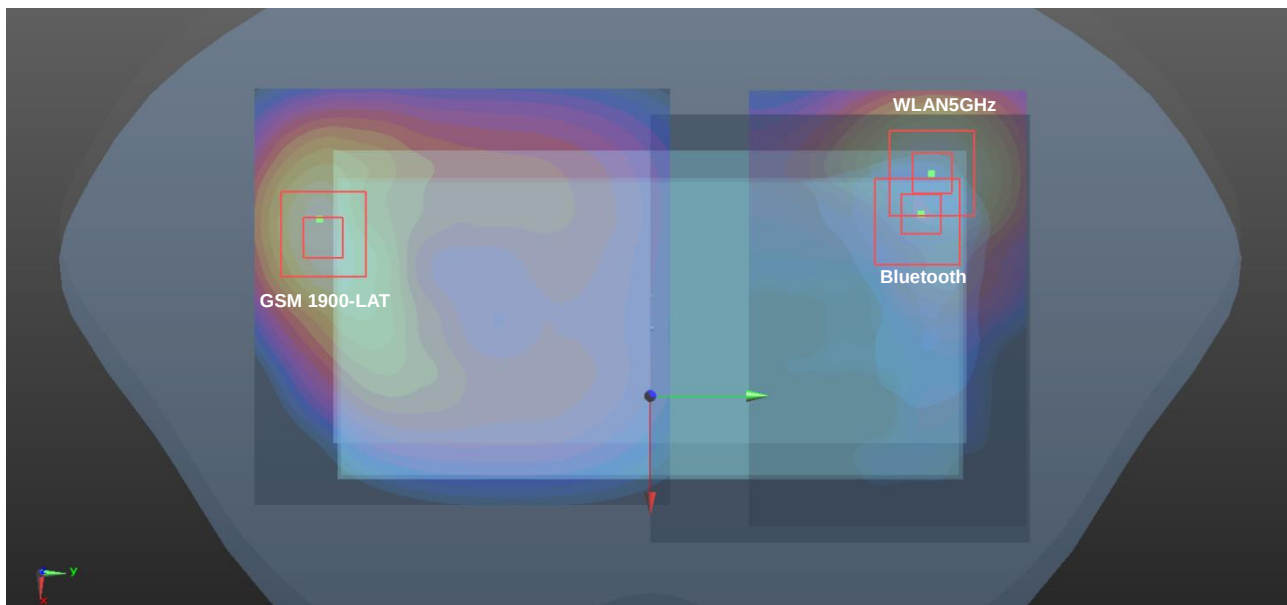
Case #05	Band	Position	1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	LTE Band 4-LAT	Back	0.896	10	-18.1	-78.9	-1.85	163.6	1.80	0.01	Not required
	WLAN5GHz		0.874	10	-39.6	78.4	-1.51				
	Bluetooth		0.031	10	-38.8	83.4	-0.42				
	LTE Band 4-LAT	Back	0.896	10	-18.1	-78.9	-1.85	158.8	1.80	0.02	Not required
	Bluetooth		0.031	10	-38.8	83.4	-0.42				
	WLAN5GHz		0.874	10	-39.6	78.4	-1.51				



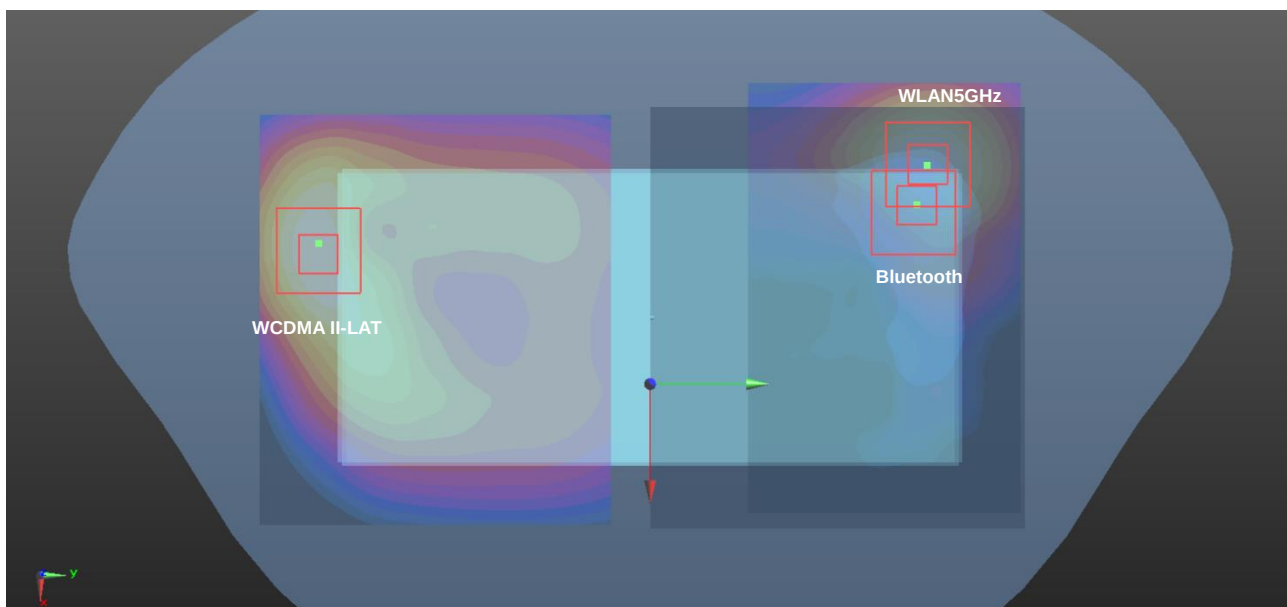
Case #06	Band	Position	1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	LTE Band 7-LAT	Back	0.717	10	18	-78	-0.39	171.1	1.62	0.01	Not required
	WLAN5GHz		0.874	10	-39.6	78.4	-1.51				
	Bluetooth		0.031	10	-38.8	83.4	-0.42				
	LTE Band 7-LAT	Back	0.717	10	18	-78	-0.39	166.7	1.62	0.01	Not required
	Bluetooth		0.031	10	-38.8	83.4	-0.42				
	WLAN5GHz		0.874	10	-39.6	78.4	-1.51				



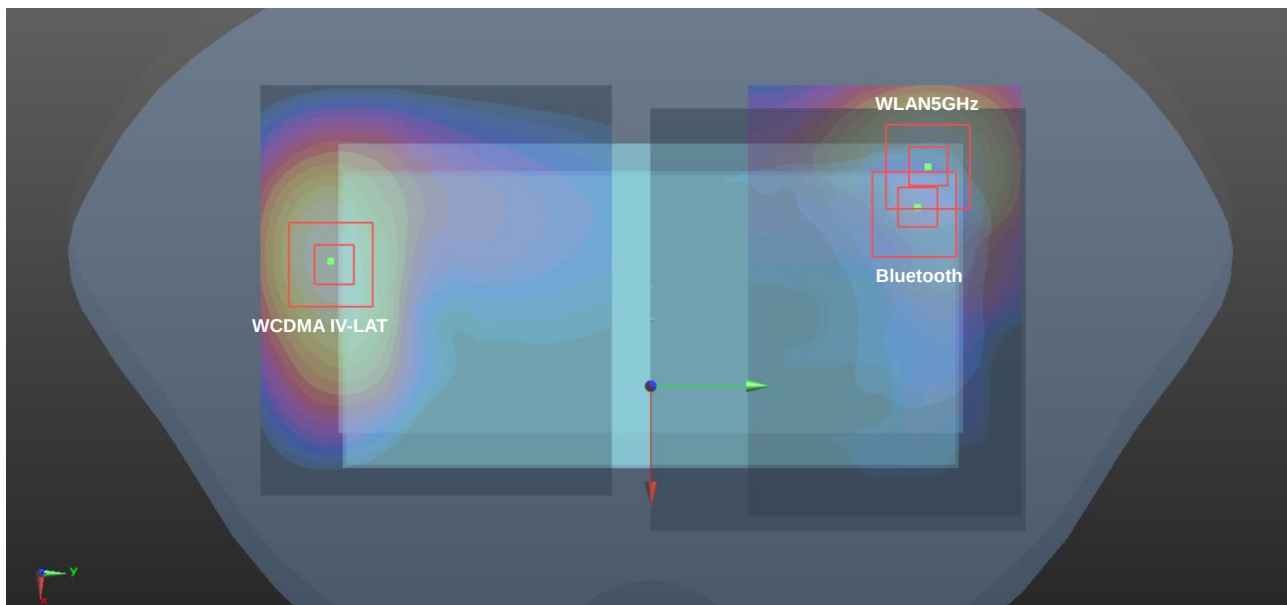
Case #07	Band	Position	1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	GSM 1900-LAT	Back	0.973	10	-14.7	-81.9	1.52	167.1	1.93	0.02	Not required
	WLAN5GHz		0.926	10	-39	71.8	-1.51				
	Bluetooth		0.031	10	-38.8	83.4	-0.42				
	GSM 1900-LAT	Back	0.973	10	-14.7	-81.9	1.52	155.6	1.93	0.02	Not required
	Bluetooth		0.031	10	-38.8	83.4	-0.42				
	WLAN5GHz		0.926	10	-39	71.8	-1.51				



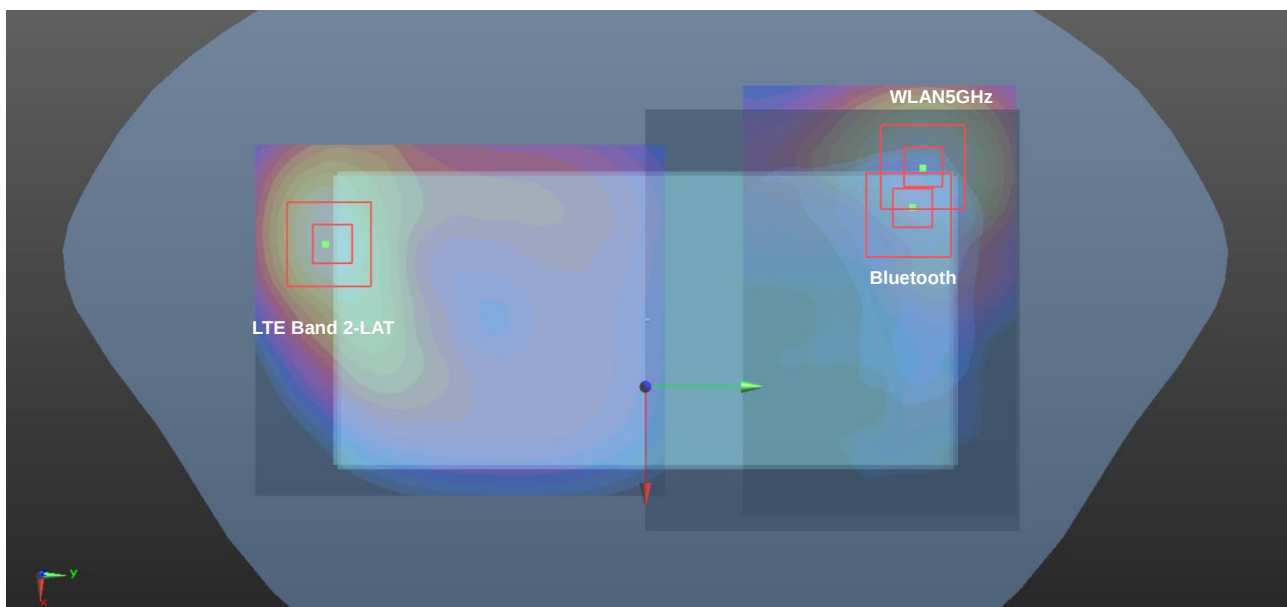
Case #08	Band	Position	1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	WCDMA II-LAT	Back	1.052	10	-15.8	-85	-0.73	170.0	2.01	0.02	Not required
	WLAN5GHz		0.926	10	-39	71.8	-1.51				
	Bluetooth		0.031	10	-38.8	83.4	-0.42				
	WCDMA II-LAT	Back	1.052	10	-15.8	-85	-0.73	158.5	2.01	0.02	Not required
	Bluetooth		0.031	10	-38.8	83.4	-0.42				
	WLAN5GHz		0.926	10	-39	71.8	-1.51				



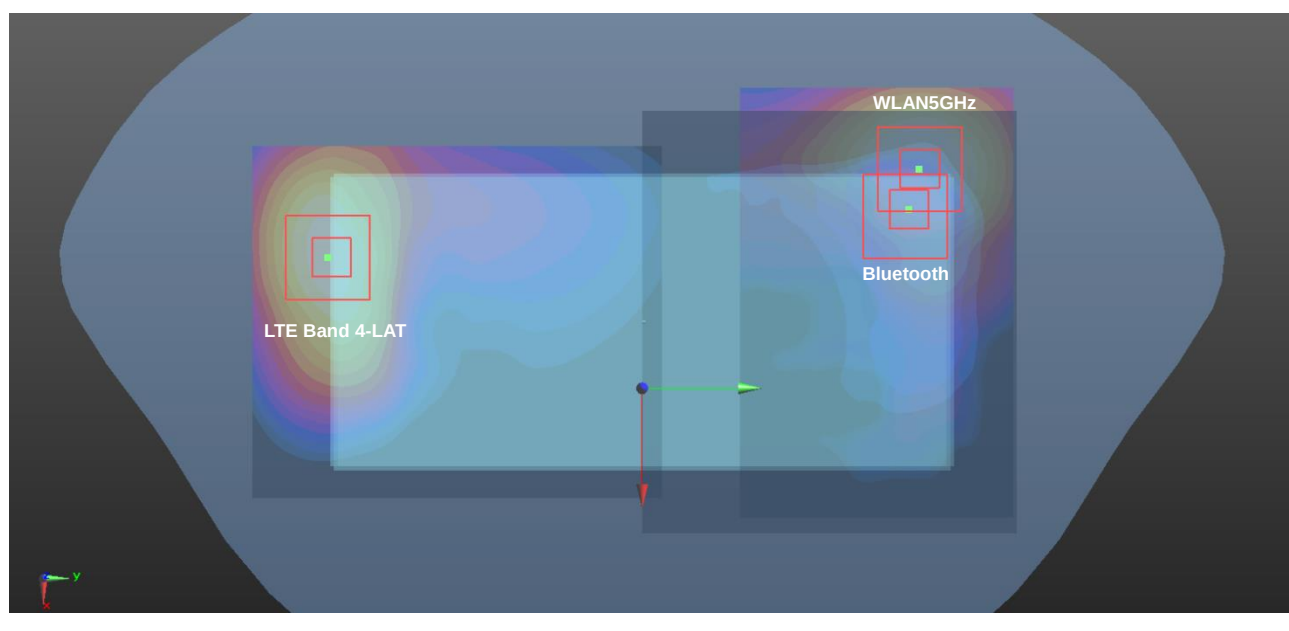
Case #09	Band	Position	1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	WCDMA IV-LAT	Back	0.801	10	-7	-80.4	1.9	166.9	1.76	0.01	Not required
	WLAN5GHz		0.926	10	-39	71.8	-1.51				
	Bluetooth		0.031	10	-38.8	83.4	-0.42				
	WCDMA IV-LAT	Back	0.801	10	-7	-80.4	1.9	155.6	1.76	0.01	Not required
	Bluetooth		0.031	10	-38.8	83.4	-0.42				
	WLAN5GHz		0.926	10	-39	71.8	-1.51				



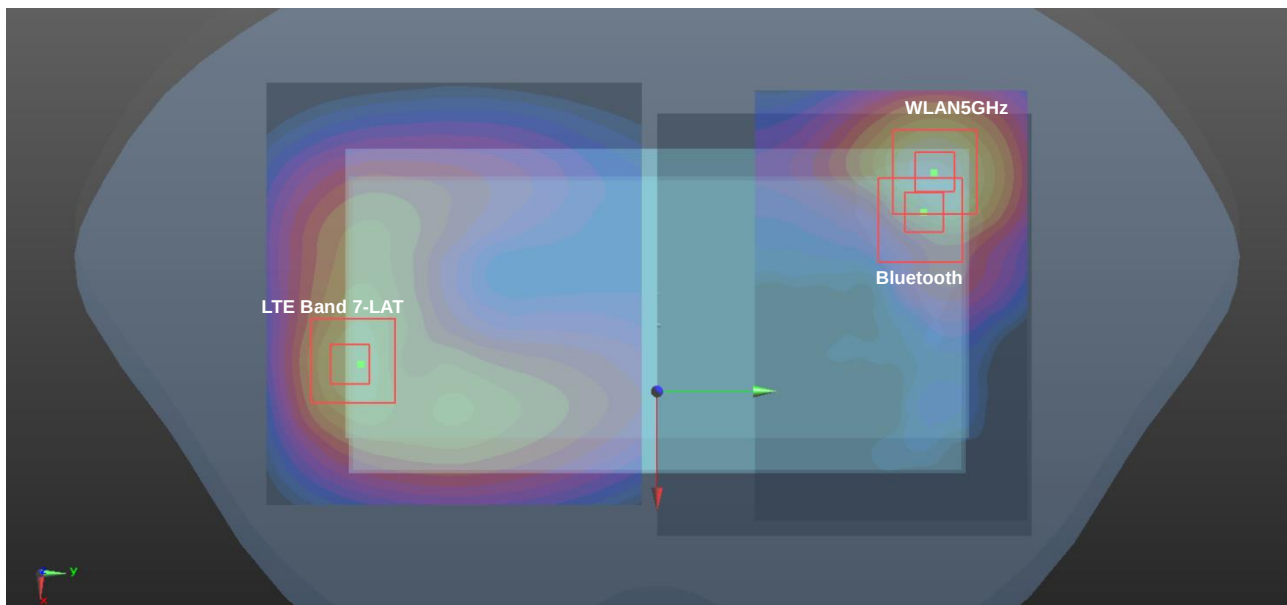
Case #10	Band	Position	1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	LTE Band 2-LAT	Back	0.969	10	-19.5	-80.4	-1.89	164.9	1.93	0.02	Not required
	WLAN5GHz		0.926	10	-39	71.8	-1.51				
	Bluetooth		0.031	10	-38.8	83.4	-0.42				
	LTE Band 2-LAT	Back	0.969	10	-19.5	-80.4	-1.89	153.4	1.93	0.02	Not required
	Bluetooth		0.031	10	-38.8	83.4	-0.42				
	WLAN5GHz		0.926	10	-39	71.8	-1.51				



Case #11	Band	Position	1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	LTE Band 4-LAT	Back	0.896	10	-18.1	-78.9	-1.85	163.6	1.85	0.02	Not required
	WLAN5GHz		0.926	10	-39	71.8	-1.51				
	Bluetooth		0.031	10	-38.8	83.4	-0.42				
	LTE Band 4-LAT	Back	0.896	10	-18.1	-78.9	-1.85	152.1	1.85	0.02	Not required
	Bluetooth		0.031	10	-38.8	83.4	-0.42				
	WLAN5GHz		0.926	10	-39	71.8	-1.51				



Case #12	Band	Position	1g SAR (W/kg)	Gap (mm)	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	LTE Band 7-LAT	Back	0.717	10	18	-78	-0.39	171.1	1.67	0.01	Not required
	WLAN5GHz		0.926	10	-39	71.8	-1.51				
	Bluetooth		0.031	10	-38.8	83.4	-0.42				
	LTE Band 7-LAT	Back	0.717	10	18	-78	-0.39	160.3	1.67	0.01	Not required
	Bluetooth		0.031	10	-38.8	83.4	-0.42				
	WLAN5GHz		0.926	10	-39	71.8	-1.51				



Test Engineer : Nick Hu, Yuan Zhao, Jiaxing Chang, Yuankai Kong

17. 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.

18. 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 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.
- [6] FCC KDB 865664 D02 v01r02, "RF Exposure Compliance Reporting and Documentation Considerations" Oct 2015.
- [7] FCC KDB 447498 D01 v06, "Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies", Oct 2015
- [8] FCC KDB 648474 D04 v01r03, "SAR Evaluation Considerations for Wireless Handsets", Oct 2015.
- [9] FCC KDB 248227 D01 v02r02, "SAR Guidance for IEEE 802.11 (WiFi) Transmitters", Oct 2015.
- [10] FCC KDB 941225 D01 v03r01, "3G SAR MEAUREMENT PROCEDURES", Oct 2015
- [11] FCC KDB 941225 D05 v02r05, "SAR Evaluation Considerations for LTE Devices", Dec 2015
- [12] FCC KDB 941225 D06 v02r01, "SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities", Oct 2015.
- [13] FCC KDB 616217 D04 v01r02, "SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers", Oct 2015



Appendix A. Plots of System Performance Check

The plots are shown as follows.

System Check_Head_750MHz**DUT: D750V3 - SN:1087**

Communication System: UID 0, CW (0); Frequency: 750 MHz; Duty Cycle: 1:1

Medium: HSL_750 Medium parameters used: $f = 750$ MHz; $\sigma = 0.881$ S/m; $\epsilon_r = 40.783$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.4 °C; Liquid Temperature : 22.7 °C

DASY5 Configuration:

- Probe: ES3DV3 - SN3293; ConvF(6.78, 6.78, 6.78); Calibrated: 2018.10.25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.1.25
- Phantom: SAM2; Type: SAM; Serial: TP-1503
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 2.48 W/kg

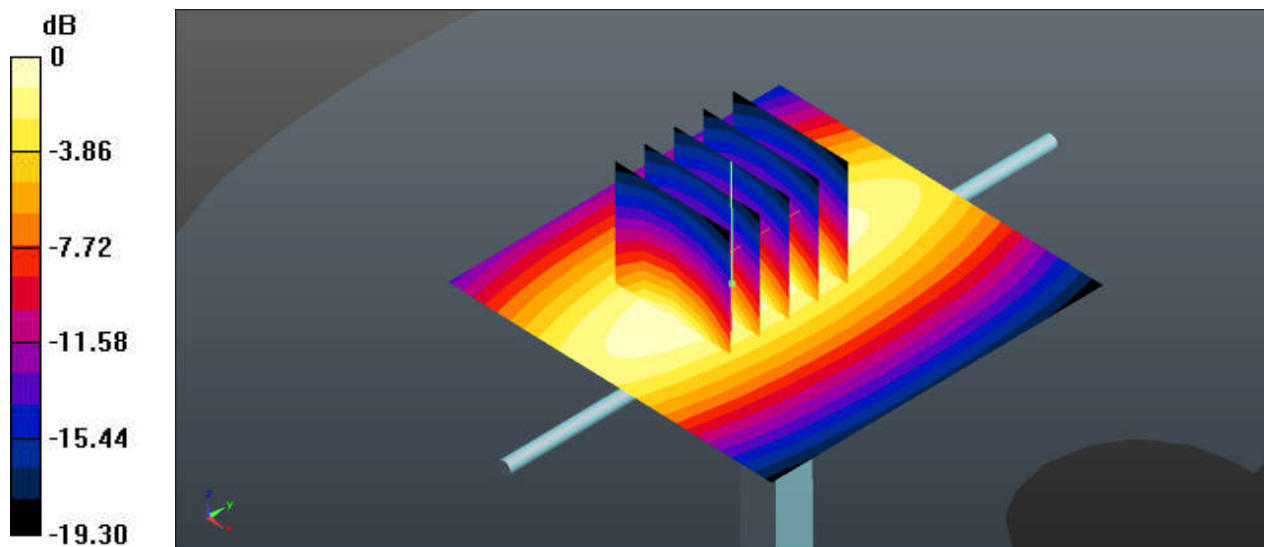
Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 45.71 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 3.02 W/kg

SAR(1 g) = 1.97 W/kg; SAR(10 g) = 1.36 W/kg

Maximum value of SAR (measured) = 2.50 W/kg



0 dB = 2.48 W/kg = 3.94 dBW/kg

System Check_Head_835MHz**DUT: D835V2 - SN:4d151**

Communication System: UID 0, CW (0); Frequency: 835 MHz; Duty Cycle: 1:1

Medium: HSL_835 Medium parameters used: $f = 835$ MHz; $\sigma = 0.913$ S/m; $\epsilon_r = 40.859$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.3 °C; Liquid Temperature : 22.6 °C

DASY5 Configuration:

- Probe: ES3DV3 - SN3293; ConvF(6.47, 6.47, 6.47); Calibrated: 2018.10.25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.1.25
- Phantom: SAM2; Type: SAM; Serial: TP-1503
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 3.25 W/kg

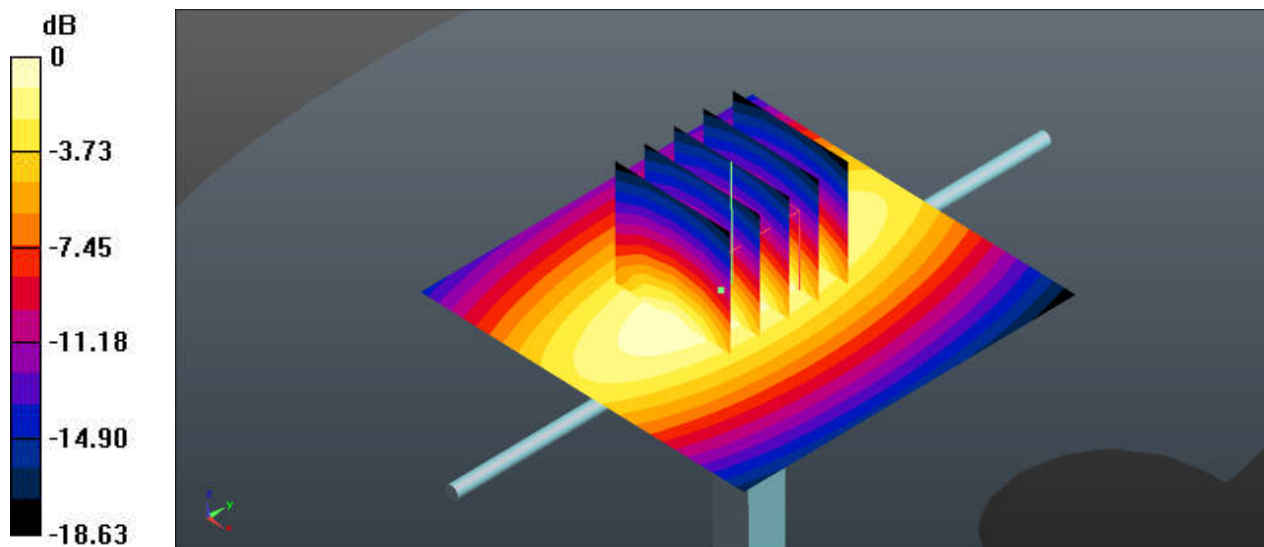
Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 44.66 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 3.39 W/kg

SAR(1 g) = 2.23 W/kg; SAR(10 g) = 1.53 W/kg

Maximum value of SAR (measured) = 3.26 W/kg



0 dB = 3.25 W/kg = 0.97 dBW/kg

System Check_Head_1750MHz**DUT: D1750V2 - SN:1090**

Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium: HSL_1750 Medium parameters used: $f = 1750$ MHz; $\sigma = 1.378$ S/m; $\epsilon_r = 41.731$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.4 °C; Liquid Temperature : 22.8 °C

DASY5 Configuration:

- Probe: ES3DV3 - SN3293; ConvF(5.4, 5.4, 5.4); Calibrated: 2018.10.25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.1.25
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 13.5 W/kg

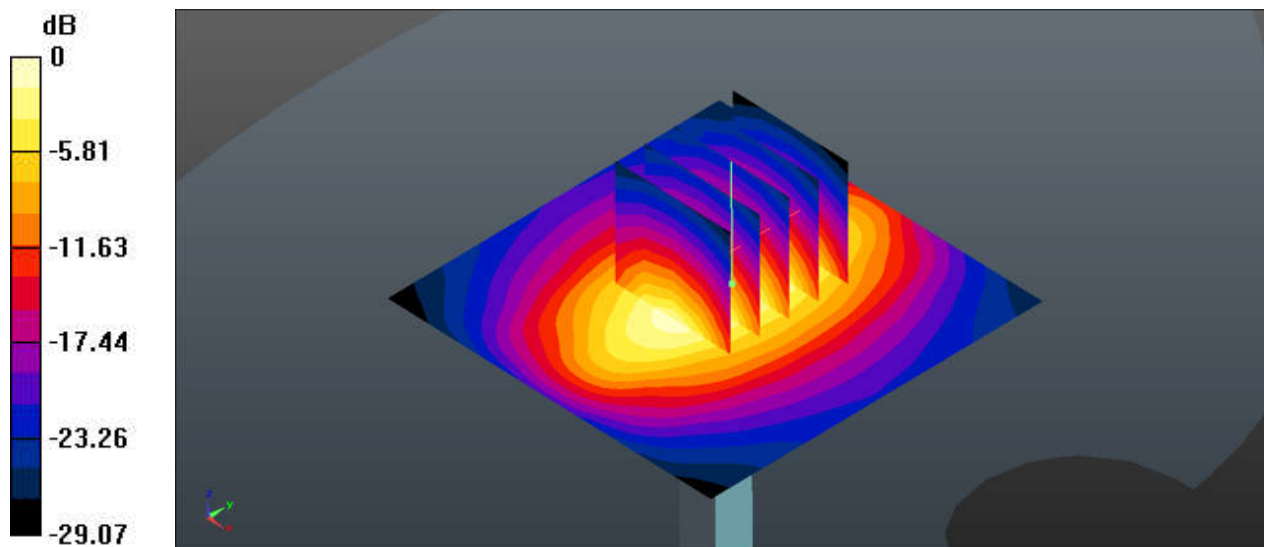
Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 84.72 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 17.1 W/kg

SAR(1 g) = 9.05 W/kg; SAR(10 g) = 4.73 W/kg

Maximum value of SAR (measured) = 13.1 W/kg



0 dB = 13.5 W/kg = 11.30 dBW/kg

System Check_Head_1900MHz**DUT: D1900V2 - SN:5d170**

Communication System: UID 0, CW (0); Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: HSL_1900 Medium parameters used: $f = 1900$ MHz; $\sigma = 1.44$ S/m; $\epsilon_r = 39.914$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.3 °C; Liquid Temperature : 22.7 °C

DASY5 Configuration:

- Probe: ES3DV3 - SN3293; ConvF(5.19, 5.19, 5.19); Calibrated: 2018.10.25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.1.25
- Phantom: SAM2; Type: SAM; Serial: TP-1503
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 13.2 W/kg

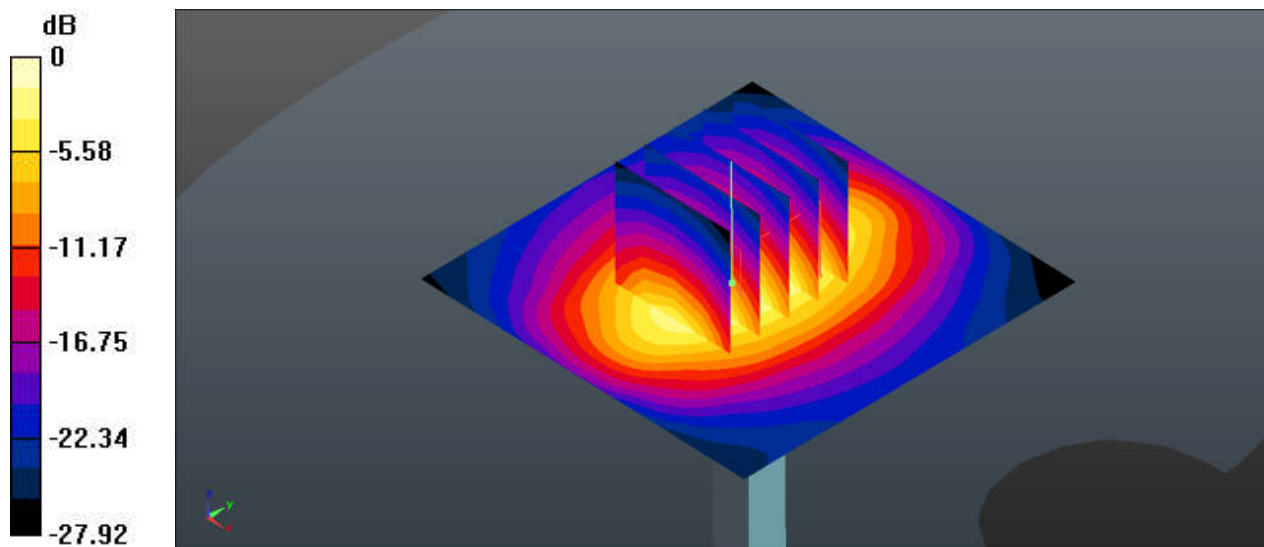
Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 97.69 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 19.4 W/kg

SAR(1 g) = 10.4 W/kg; SAR(10 g) = 5.36 W/kg

Maximum value of SAR (measured) = 13.1 W/kg



0 dB = 13.2 W/kg = 11.21 dBW/kg

System Check_Head_2450MHz**DUT: D2450V2 - SN:908**

Communication System: UID 0, CW (0); Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: HSL_2450 Medium parameters used: $f = 2450$ MHz; $\sigma = 1.85$ S/m; $\epsilon_r = 40.924$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.3 °C ; Liquid Temperature : 22.9 °C

DASY5 Configuration:

- Probe: ES3DV3 - SN3293; ConvF(4.53, 4.53, 4.53); Calibrated: 2018.10.25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.1.25
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=250mW/Area Scan (71x71x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 21.1 W/kg

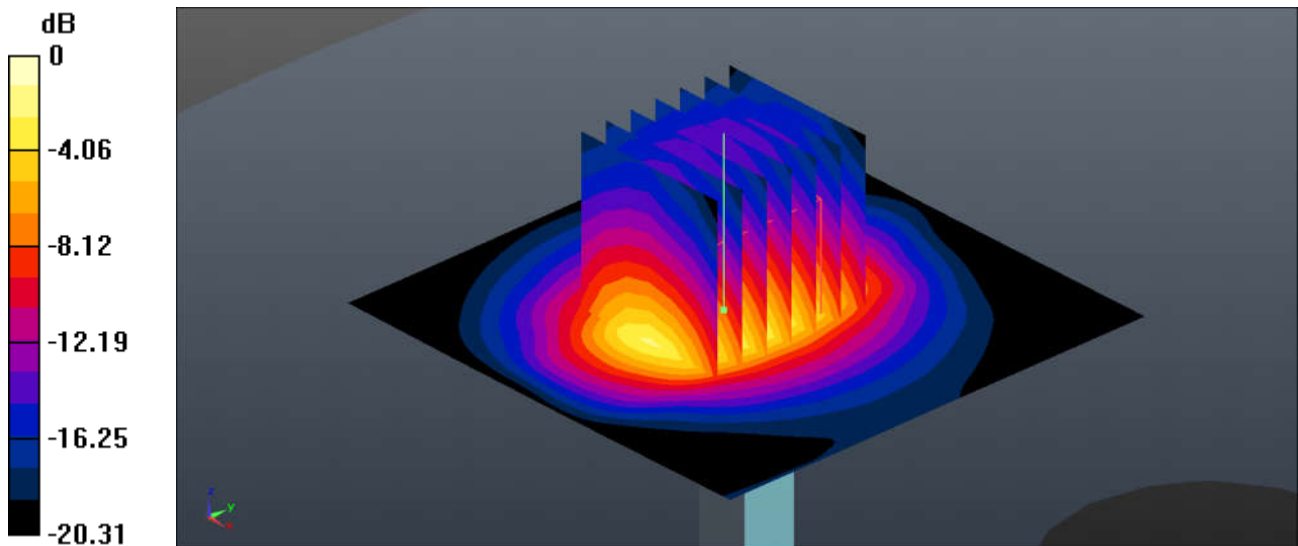
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 88.47 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 27.7 W/kg

SAR(1 g) = 13.6 W/kg; SAR(10 g) = 6.42 W/kg

Maximum value of SAR (measured) = 20.6 W/kg



0 dB = 20.6 W/kg = 13.14 dBW/kg

System Check_Head_2600MHz**DUT: D2600V2 - SN:1061**

Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1

Medium: HSL_2600 Medium parameters used: $f = 2600$ MHz; $\sigma = 2.012$ S/m; $\epsilon_r = 38.206$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.4 °C; Liquid Temperature : 22.8 °C

DASY5 Configuration:

- Probe: ES3DV3 - SN3293; ConvF(4.44, 4.44, 4.44); Calibrated: 2018.10.25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.1.25
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=250mW/Area Scan (71x71x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm Maximum value of SAR (interpolated) = 24.0 W/kg

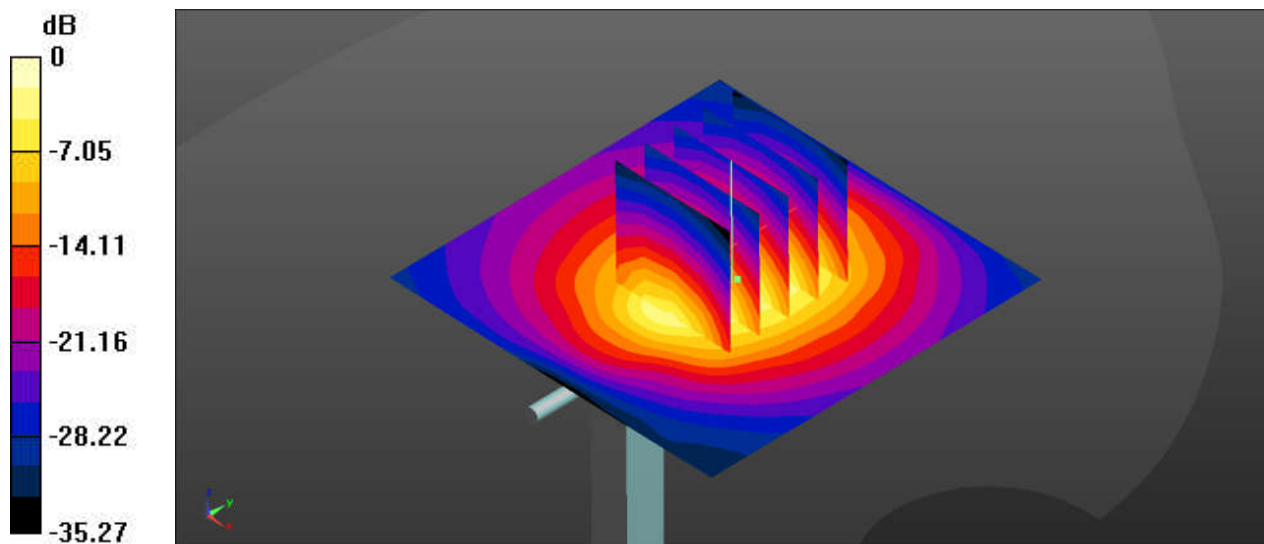
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 74.99 V/m; Power Drift = -0.16 dB

Peak SAR (extrapolated) = 27.3 W/kg

SAR(1 g) = 13.9 W/kg; SAR(10 g) = 6.77 W/kg

Maximum value of SAR (measured) = 24.2 W/kg



0 dB = 24.0 W/kg = 11.46 dBW/kg

System Check_HSL_5250MHz**DUT: D5GHzV2 - SN:1006**

Communication System: UID 0, CW (0); Frequency: 5250 MHz; Duty Cycle: 1:1

Medium: HSL_5000 Medium parameters used: $f = 5250$ MHz; $\sigma = 4.555$ S/m; $\epsilon_r = 36.804$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.3 °C ; Liquid Temperature : 22.7 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3954; ConvF(4.98, 4.98, 4.98); Calibrated: 2019.4.25
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2018.12.3
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=100mW/Area Scan (71x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 18.3 W/kg

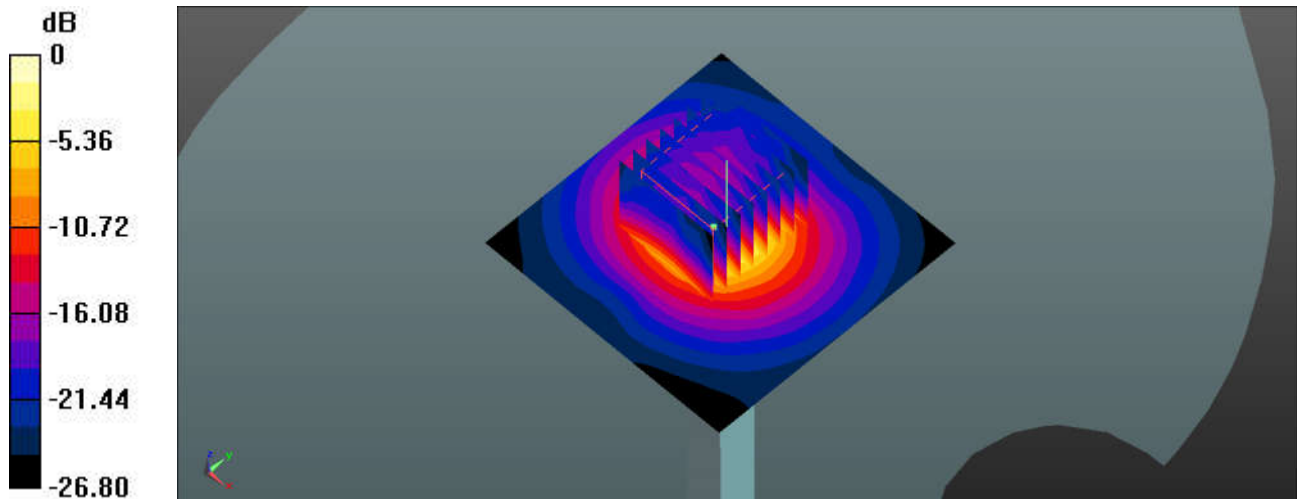
Pin=100mW/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 40.05 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 29.4 W/kg

SAR(1 g) = 7.87 W/kg; SAR(10 g) = 2.34 W/kg

Maximum value of SAR (measured) = 18.1 W/kg



0 dB = 18.3 W/kg = 12.62 dBW/kg

System Check_HSL_5600MHz**DUT: D5GHzV2 - SN:1006**

Communication System: UID 0, CW (0); Frequency: 5600 MHz; Duty Cycle: 1:1

Medium: HSL_5000 Medium parameters used: $f = 5600$ MHz; $\sigma = 4.948$ S/m; $\epsilon_r = 36.23$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.3 °C ; Liquid Temperature : 22.7 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3954; ConvF(4.51, 4.51, 4.51); Calibrated: 2019.4.25
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2018.12.3
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=100mW/Area Scan (71x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 20.9 W/kg

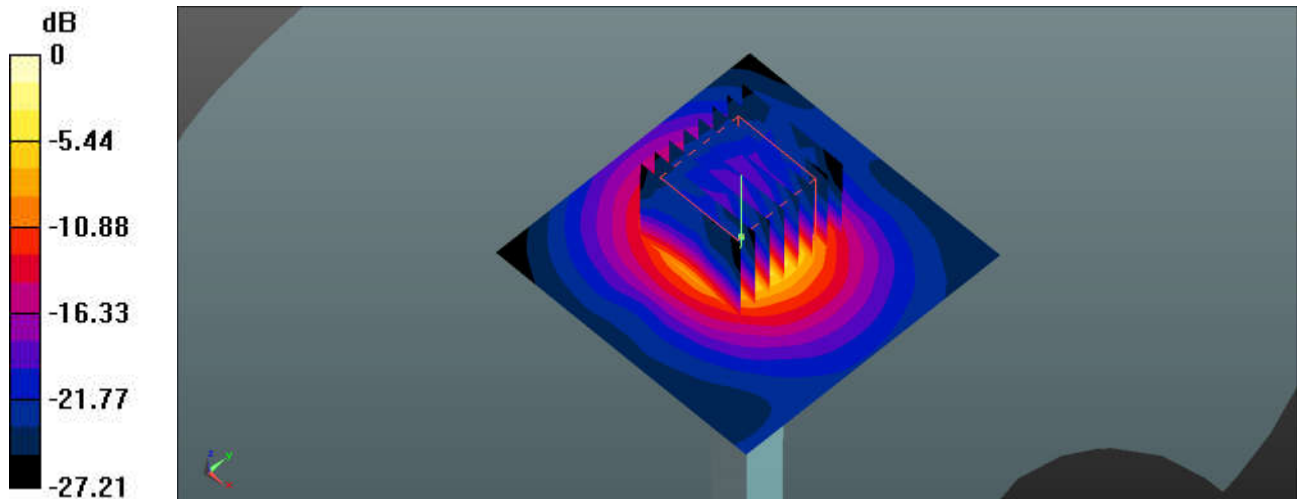
Pin=100mW/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 40.01 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 34.3 W/kg

SAR(1 g) = 8.4 W/kg; SAR(10 g) = 2.46 W/kg

Maximum value of SAR (measured) = 20.0 W/kg



0 dB = 20.9 W/kg = 13.20 dBW/kg

System Check_HSL_5750MHz**DUT: D5GHzV2 - SN:1006**

Communication System: UID 0, CW (0); Frequency: 5750 MHz; Duty Cycle: 1:1

Medium: HSL_5000 Medium parameters used: $f = 5750$ MHz; $\sigma = 5.125$ S/m; $\epsilon_r = 35.988$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.3 °C ; Liquid Temperature : 22.7 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3954; ConvF(4.65, 4.65, 4.65); Calibrated: 2019.4.25
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2018.12.3
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=100mW/Area Scan (71x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 20.3 W/kg

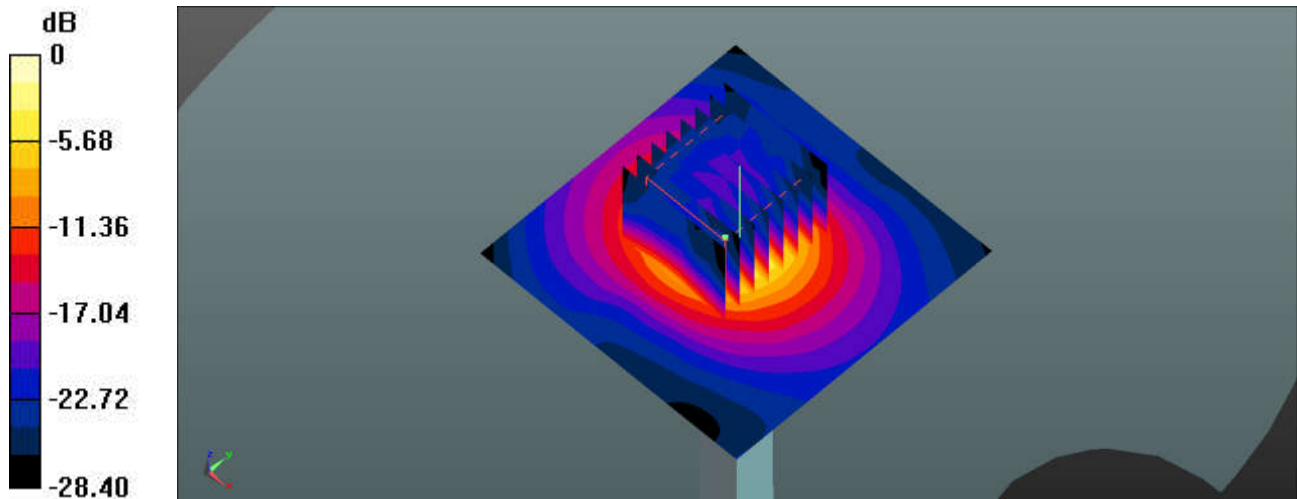
Pin=100mW/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 37.93 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 33.8 W/kg

SAR(1 g) = 7.97 W/kg; SAR(10 g) = 2.33 W/kg

Maximum value of SAR (measured) = 18.8 W/kg



0 dB = 20.3 W/kg = 13.07 dBW/kg



Appendix B. Plots of High SAR Measurement

The plots are shown as follows.

01_GSM 850-UAT_GPRS 3 Tx slots_Right Cheek_0mm_Ch251

Communication System: UID 0, GSM850 (0); Frequency: 848.8 MHz; Duty Cycle: 1:2.77

Medium: HSL_835 Medium parameters used: $f = 849$ MHz; $\sigma = 0.925$ S/m; $\epsilon_r = 40.705$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.3 °C ; Liquid Temperature : 22.6 °C

DASY5 Configuration:

- Probe: ES3DV3 - SN3293; ConvF(6.47, 6.47, 6.47); Calibrated: 2018.10.25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.1.25
- Phantom: SAM2; Type: SAM; Serial: TP-1503
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch251/Area Scan (71x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.27 W/kg

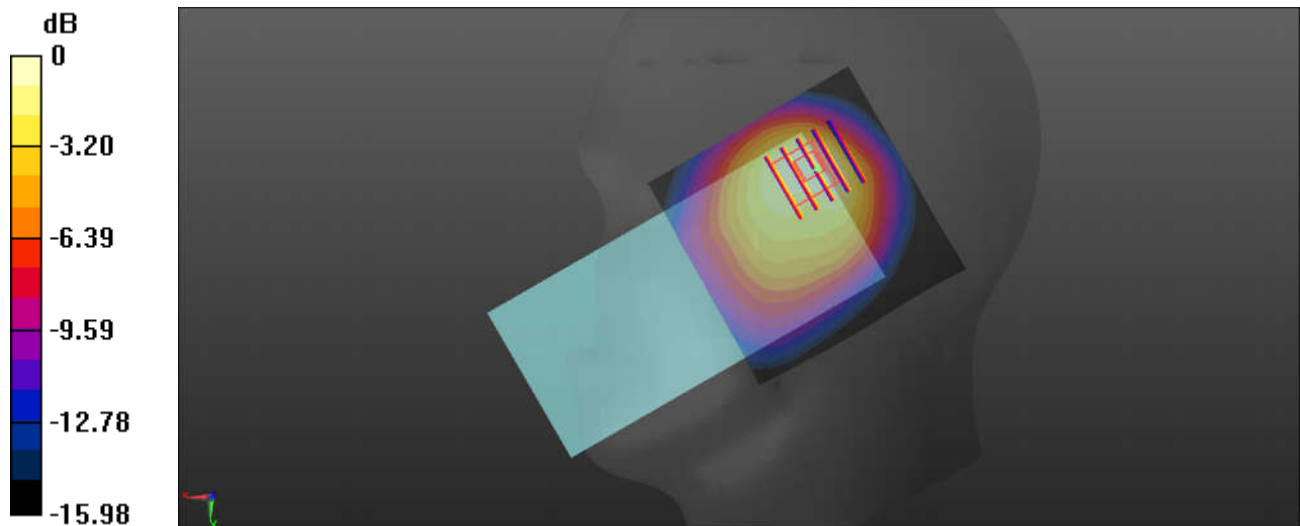
Ch251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 24.83 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 1.56 W/kg

SAR(1 g) = 0.851 W/kg; SAR(10 g) = 0.505 W/kg

Maximum value of SAR (measured) = 1.02 W/kg



0 dB = 1.02 W/kg = 0.09 dBW/kg

02_GSM 1900-UAT_GPRS 3 Tx slots_Right Cheek_0mm_Ch512

Communication System: UID 0, PCS (0); Frequency: 1850.2 MHz; Duty Cycle: 1:2.77

Medium: HSL_1900 Medium parameters used: $f = 1850.2$ MHz; $\sigma = 1.394$ S/m; $\epsilon_r = 40.094$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.3 °C ; Liquid Temperature : 22.7 °C

DASY5 Configuration:

- Probe: ES3DV3 - SN3293; ConvF(5.19, 5.19, 5.19); Calibrated: 2018.10.25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.1.25
- Phantom: SAM2; Type: SAM; Serial: TP-1503
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch512/Area Scan (71x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.08 W/kg

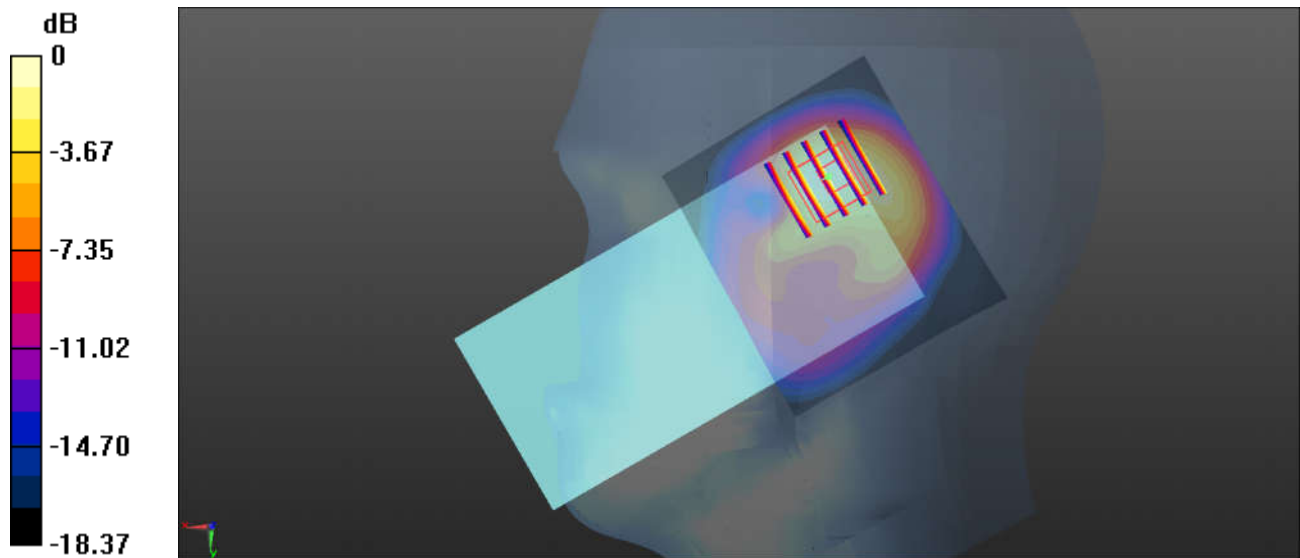
Ch512/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 13.38 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 1.48 W/kg

SAR(1 g) = 0.815 W/kg; SAR(10 g) = 0.439 W/kg

Maximum value of SAR (measured) = 0.987 W/kg



03_WCDMA V-UAT_RMC 12.2Kbps_Right Cheek_0mm_Ch4182

Communication System: UID 0, WCDMA (0); Frequency: 836.4 MHz; Duty Cycle: 1:1
Medium: HSL_835 Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.914$ S/m; $\epsilon_r = 40.842$; $\rho = 1000$ kg/m³
Ambient Temperature : 23.3 °C ; Liquid Temperature : 22.6 °C

DASY5 Configuration:

- Probe: ES3DV3 - SN3293; ConvF(6.47, 6.47, 6.47); Calibrated: 2018.10.25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.1.25
- Phantom: SAM2; Type: SAM; Serial: TP-1503
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch4182/Area Scan (71x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.581 W/kg

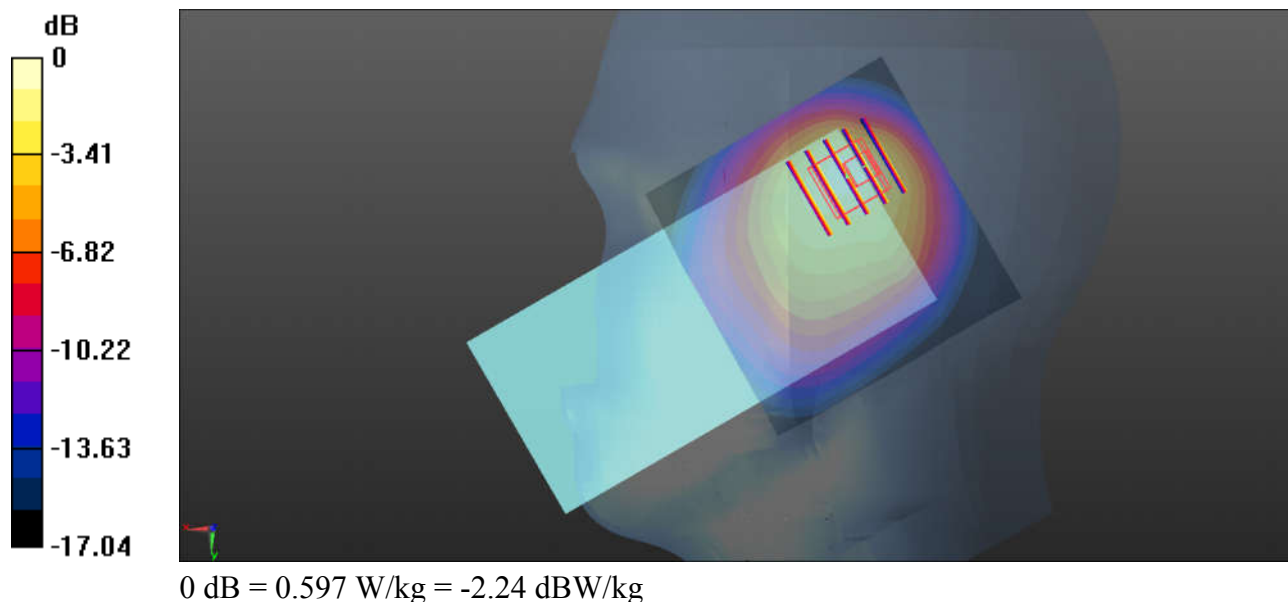
Ch4182/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 17.52 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.983 W/kg

SAR(1 g) = 0.457 W/kg; SAR(10 g) = 0.254 W/kg

Maximum value of SAR (measured) = 0.597 W/kg



04_WCDMA II-UAT_RMC 12.2Kbps_Right Cheek_0mm_Ch9262

Communication System: UID 0, WCDMA (0); Frequency: 1852.4 MHz; Duty Cycle: 1:1
Medium: HSL_1900 Medium parameters used: $f = 1852.4$ MHz; $\sigma = 1.396$ S/m; $\epsilon_r = 40.087$; $\rho = 1000$ kg/m³
Ambient Temperature : 23.3 °C ; Liquid Temperature : 22.7 °C

DASY5 Configuration:

- Probe: ES3DV3 - SN3293; ConvF(5.19, 5.19, 5.19); Calibrated: 2018.10.25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.1.25
- Phantom: SAM2; Type: SAM; Serial: TP-1503
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch9262/Area Scan (71x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.982 W/kg

Ch9262/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.87 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 1.41 W/kg
SAR(1 g) = 0.756 W/kg; SAR(10 g) = 0.408 W/kg
Maximum value of SAR (measured) = 0.928 W/kg

