

# FCC SAR Test Report

**APPLICANT** : Motorola Mobility LLC  
**EQUIPMENT** : Mobile Cellular Phone  
**BRAND NAME** : Motorola  
**MODEL NAME** : XT2423-6, XT2423-1  
**FCC ID** : IHDT56AP1  
**STANDARD** : FCC 47 CFR Part 2 (2.1093)

We, Sporton International Inc. (Shenzhen), would like to declare that the tested sample has been evaluated in accordance with the test procedures given in 47 CFR Part 2.1093 and FCC KDB and has 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 Inc. (Shenzhen), the test report shall not be reproduced except in full.



Approved by: Si Zhang

**Sporton International Inc. (Shenzhen)**

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People's Republic of China**



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### Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA3O1717	Rev. 01	Initial issue of report	Nov. 13, 2023



### 1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **Motorola Mobility LLC, Mobile Cellular Phone, XT2423-6, XT2423-1**, are as follows.

Highest 1g SAR Summary						
Equipment Class	Frequency Band		Head (Separation 0mm)	Hotspot (Separation 5mm)	Body-worn (Separation 5mm)	Highest Simultaneous Transmission 1g SAR (W/kg)
			1g SAR (W/kg)			
Licensed	GSM	GSM850	0.59	<b>1.43</b>	<b>1.43</b>	1.59
		GSM1900	0.24	<b>1.43</b>	1.30	
	WCDMA	WCDMA V	0.53	<b>1.43</b>	<b>1.43</b>	
		WCDMA IV	0.38	1.41	1.41	
		WCDMA II	0.37	1.38	1.38	
	LTE	LTE Band 13	0.45	<b>1.43</b>	<b>1.43</b>	
		LTE Band 26/5	0.46	1.35	1.35	
		LTE Band 66/4	0.33	1.41	1.39	
		LTE Band 2	0.32	1.40	1.39	
		LTE Band 7	0.20	1.38	1.30	
		LTE Band 38	<0.10	1.38	1.38	
DTS	WLAN	WLAN2.4GHz	<b>1.17</b>	1.15	1.15	1.58
NII		WLAN5GHz	1.15	1.16	1.18	1.56
DSS	Bluetooth	Bluetooth	0.29	0.21	0.21	1.59

Highest 10g SAR Summary				
Equipment Class	Frequency Band		Product Specific 10g SAR (W/kg) (Separation 0mm)	Highest Simultaneous Transmission 10g SAR (W/kg)
Licensed	GSM	GSM850	3.46	3.77
		GSM1900	<b>3.58</b>	
	WCDMA	WCDMA V	2.62	
		WCDMA IV	3.51	
		WCDMA II	3.57	
	LTE	LTE Band 13	2.17	
		LTE Band 26/5	2.46	
		LTE Band 66/4	3.49	
		LTE Band 2	3.37	
		LTE Band 7	3.13	
		LTE Band 38	3.37	
DTS	WLAN	WLAN2.4GHz	1.60	3.77
NII		WLAN5GHz	2.44	3.74
Date of Testing:			2023/10/22~2023/11/9	

**Remark:** This device supports LTE B4 / B5 and B66 / B26. Since the supported frequency span for LTE B4 / B5 falls completely within the supports frequency span for LTE B66 / B26, both LTE bands have the same target power, and both LTE bands share the same transmission path; therefore, SAR was only assessed for LTE B66 / B26.



**Declaration of Conformity:**

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

**Comments and Explanations:**

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

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 Inc. (Shenzhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Testing Laboratory			
Test Firm	Sporton International Inc. (Shenzhen)		
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	SAR02-SZ, SAR03-SZ, SAR05-SZ	CN1256	421272

Applicant	
Company Name	Motorola Mobility LLC
Address	222 W,Merchandise Mart Plaza, Chicago IL 60654 USA

Manufacturer	
Company Name	Motorola Mobility LLC
Address	222 W,Merchandise Mart Plaza, Chicago IL 60654 USA

## 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 Cellular Phone
Brand Name	Motorola
Model Name	XT2423-6, XT2423-1
FCC ID	IHDT56AP1
IMEI Code	Sample 1: IMEI 1: 357674240008673 IMEI 2: 357674240013244 Sample 2: IMEI 1: 357674240018144 IMEI 2: 357674240019381 Sample 3: IMEI 1: 359598830011748 IMEI 2: 359598830013462 Sample 4: IMEI 1: 359598830015335 IMEI 2: 359598830016465
Frequency Band	GSM850: 824 MHz ~ 849 MHz GSM1900: 1850 MHz ~ 1910 MHz WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band IV: 1710 MHz ~ 1755 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 66: 1710 MHz ~ 1780 MHz LTE Band 38: 2570 MHz ~ 2620 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 ~ 5720 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Mode	GSM/GPRS/EGPRS AMR / RMC 12.2Kbps HSDPA HSUPA DC-HSDPA HSPA+ (16QAM uplink is supported) LTE: QPSK, 16QAM, 64QAM WLAN 2.4GHz : 802.11b/g/n HT20/ HT40 WLAN 5GHz : 802.11a/n/ac HT20/HT40/VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE
HW Version	DVT2
SW Version	UTA34.66
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:**

1. This device supports VoIP in GPRS, EGPRS, WCDMA and LTE (e.g. for 3rd-party VoIP), LTE supports VoLTE operation.
2. This device 2.4GHz WLAN support hotspot operation and Bluetooth support tethering applications.
3. This device 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).
4. This device does not support DTM operation and supports GPRS/EGPRS mode up to multi-slot class 12.
5. For dual SIM card mobile has two SIM slots and supports dual SIM dual standby. The WWAN radio transmission will be enabled by either one SIM at a time (single active). After pre-scan two SIM cards power, we found test result of the SIM1 was the worse, so we chose SIM1 slot to perform all tests.
6. There are two different types of EUT. They are single SIM card mobile and dual SIM card mobile. The others are the same including circuit design, PCB board, structure and all components. After pre-scan two types of EUT, we found test result of the sample that dual SIM was the worst, so we chose dual SIM card mobile to perform all tests.
7. The device implements the power management and proximity sensor /receiver detection/hotspot mode for SAR compliance at different exposure conditions (head, body-worn, hotspot, extremity). Details about the power management decision and sensor detection are provided in the operational description. And the device will invoke corresponding work scenarios power level base on frequency bands/antennas, which can refer to power table at appendix E.
8. There are four samples, the different between them refer to the XT2423-6, XT2423-1\_Operational Description of Product Equality Declaration which is exhibit separately. According to the differences, sample 1 was chosen to perform full SAR testing and sample 2/3/4 verified the worst case of sample 1, the detail samples list are as follows.

Sample 1	XT2423-1	1 <sup>st</sup> source
Sample 2	XT2423-1	2 <sup>nd</sup> source
Sample 3	XT2423-6	1 <sup>st</sup> source
Sample 4	XT2423-6	2 <sup>nd</sup> source





4.2 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05																																																															
FCC ID	IHDT56AP1																																																														
Equipment Name	Mobile Cellular Phone																																																														
Operating Frequency Range of each LTE transmission band	LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 66: 1710 MHz ~ 1780 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 13: 5MHz, 10MHz LTE Band 17: 5MHz, 10MHz LTE Band 26: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz LTE Band 38: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 66: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz																																																														
Uplink Modulations used	QPSK / 16QAM / 64QAM																																																														
LTE Voice / Data requirements	Voice and Data																																																														
LTE Release Version	R9, Cat 5																																																														
CA Support	Not Supported																																																														
LTE MPR permanently built-in by design	<p style="text-align: center;"><b>Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3</b></p> <table border="1"> <thead> <tr> <th rowspan="2">Modulation</th> <th colspan="6">Channel bandwidth / Transmission bandwidth (N<sub>RB</sub>)</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> </thead> <tbody> <tr> <td>QPSK</td> <td>&gt; 5</td> <td>&gt; 4</td> <td>&gt; 8</td> <td>&gt; 12</td> <td>&gt; 16</td> <td>&gt; 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>&gt; 5</td> <td>&gt; 4</td> <td>&gt; 8</td> <td>&gt; 12</td> <td>&gt; 16</td> <td>&gt; 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>&gt; 5</td> <td>&gt; 4</td> <td>&gt; 8</td> <td>&gt; 12</td> <td>&gt; 16</td> <td>&gt; 18</td> <td>≤ 3</td> </tr> <tr> <td>256 QAM</td> <td colspan="6" style="text-align: center;">≥ 1</td> <td>≤ 5</td> </tr> </tbody> </table>	Modulation	Channel bandwidth / Transmission bandwidth (N <sub>RB</sub> )						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
Modulation	Channel bandwidth / Transmission bandwidth (N <sub>RB</sub> )						MPR (dB)																																																								
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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, when operating in Proximity sensors/receiver/hotspot detect mechanism, head/body -worn /hotspot/extremity will trigger reduced power for some bands applied to satisfy SAR compliance, the detail please referred to section 13.																																																														



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		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	20407	824.7	20415	825.5	20425	826.5	20450	829	20450	829	20450	829
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5	20525	836.5	20525	836.5
H	20643	848.3	20635	847.5	20625	846.5	20600	844	20600	844	20600	844
LTE Band 7												
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 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	20850	2510	20850	2510
M	21100	2535	21100	2535	21100	2535	21100	2535	21100	2535	21100	2535
H	21425	2567.5	21400	2565	21375	2562.5	21350	2560	21350	2560	21350	2560
LTE Band 13												
	Bandwidth 5 MHz				Bandwidth 10 MHz				Bandwidth 10 MHz			
	Channel #		Freq.(MHz)		Channel #		Freq.(MHz)		Channel #		Freq.(MHz)	
L	23205		779.5		23230		782		23230		782	
M	23230		782									
H	23255		784.5									
LTE Band 26												
	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	26697	814.7	26705	815.5	26715	816.5	26740	819	26740	819	26765	821.5
M	26865	831.5	26865	831.5	26865	831.5	26865	831.5	26865	831.5	26865	831.5
H	27033	848.3	27025	847.5	27015	846.5	26990	844	26990	844	26965	841.5
LTE Band 38												
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 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	37775	2572.5	37800	2575	37825	2577.5	37850	2580	37850	2580	37850	2580
M	38000	2595	38000	2595	38000	2595	38000	2595	38000	2595	38000	2595
H	38225	2617.5	38200	2615	38175	2612.5	38150	2610	38150	2610	38150	2610
LTE Band 66												
	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	131979	1710.7	131987	1711.5	131997	1712.5	132022	1715	132047	1717.5	132072	1720
M	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745
H	132665	1779.3	132657	1778.5	132647	1777.5	132622	1775	132597	1772.5	132572	1770

**<For LTE Overlap Bands Description>**

1) LTE Bands BW

Band	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz
LTE Band 4	Yes	Yes	Yes	Yes	Yes	Yes
LTE Band 66	Yes	Yes	Yes	Yes	Yes	Yes
LTE Band 5	Yes	Yes	Yes	Yes		
LTE Band 26	Yes	Yes	Yes	Yes	Yes	

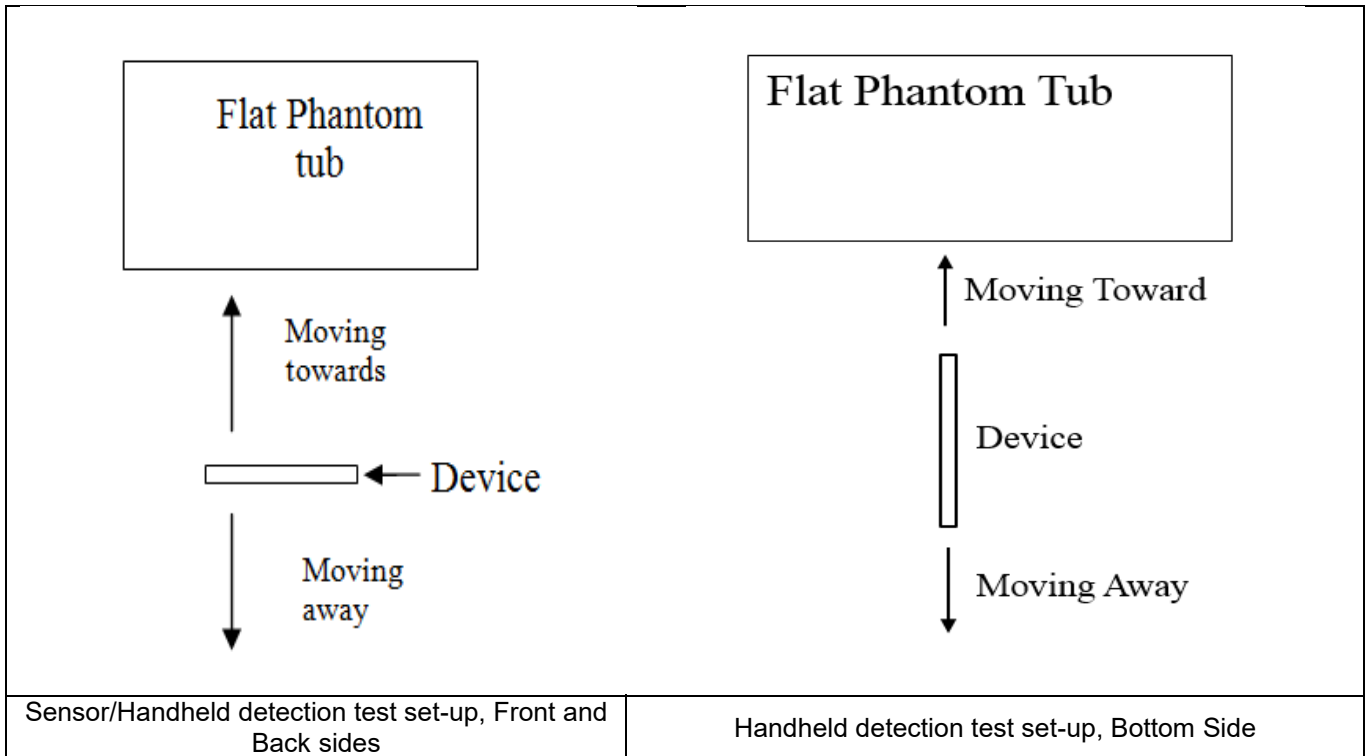
2) LTE Bands tune up:

Band	Default(DSI4)	DSI 2	DSI 3	DSI 7	DSI 6
		Receiver on	Sensor on	Hotspot on	Healheld
	Tune-up Limit	Tune-up Limit	Tune-up Limit	Tune-up Limit	Tune-up Limit
LTE Band 4	24.00	24.00	17.50	16.50	21.00
LTE Band 66	24.00	24.00	17.50	16.50	21.00
LTE Band 5	24.00	24.00	23.00	23.00	24.00
LTE Band 26	24.00	24.00	23.00	23.00	24.00

### 5. Proximity Sensor Triggering Test

**<Proximity Sensor Triggering Distance>:**

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 (5850MHz) and lowest (835MHz) frequency was used for proximity sensor triggering testing.
2. Capacitive proximity sensors placed coincident with antenna elements at the top and bottom ends of the phone are utilized to determine when the device comes in proximity of the user's body at the front or back of the device.
3. The output power will reduce to body worn power level when top and bottom sensor pad be detected.
4. The sensors used to detect the proximity of the user's body at the front or back surface of the device use a detection threshold distance. The data shown in the sections below shows the distance(s). When front or back body worn condition is detected reduced power will be active.
5. The device employs proximity sensors also can detect the presence of the user's a finger or hand when handheld state at the front/back/bottom sides of the device. When front/back/bottom sides of handheld condition is detected reduced power will be active.
6. For verification of compliance of power reduction scheme, additional SAR testing with EUT transmitting at full RF power at a conservative trigger distance -1mm was performed.



**<P-Sensor>**

Proximity Sensor Triggering Distance (mm)				
Position	Front		Back	
	Moving towards	Moving away	Moving towards	Moving away
Minimum	17	20	28	29

**<Handheld>**

Proximity Sensor Triggering Distance (mm)						
Position	Front		Back		Bottom Side	
	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away
Minimum	10	15	15	18	15	18

## **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 ( $\rho$ ). The equation description is as below:

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

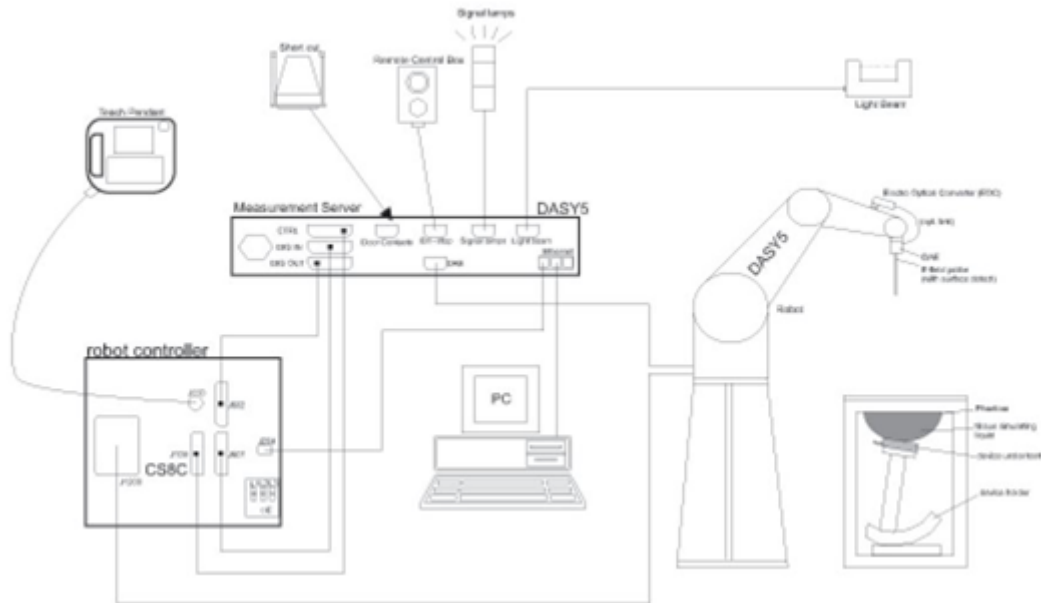
SAR is expressed in units of Watts per kilogram (W/kg)

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

Where:  $\sigma$  is the conductivity of the tissue,  $\rho$  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 DASY 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>**

<b>Construction</b>	Symmetric design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
<b>Frequency</b>	10 MHz – >6 GHz Linearity: ±0.2 dB (30 MHz – 6 GHz)	
<b>Directivity</b>	±0.3 dB in TSL (rotation around probe axis) ±0.5 dB in TSL (rotation normal to probe axis)	
<b>Dynamic Range</b>	10 µW/g – >100 mW/g Linearity: ±0.2 dB (noise: typically <1 µW/g)	
<b>Dimensions</b>	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	

**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>**

<b>Shell Thickness</b>	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm	
<b>Filling Volume</b>	Approx. 25 liters	
<b>Dimensions</b>	Length: 1000 mm; Width: 500 mm; Height: adjustable feet	
<b>Measurement Areas</b>	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>**

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

The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices or for evaluating transmitters operating at low frequencies. ELI 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 dB) 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° ± 1°	20° ± 1°
Maximum area scan spatial resolution: $\Delta x_{Area}$ , $\Delta y_{Area}$	≤ 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 ≤ 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 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 shoes 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: $\Delta x_{Zoom}, \Delta y_{Zoom}$		$\leq 2$ GHz: $\leq 8$ mm 2 – 3 GHz: $\leq 5$ mm*	3 – 4 GHz: $\leq 5$ mm* 4 – 6 GHz: $\leq 4$ mm*	
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$	$\leq 5$ mm	3 – 4 GHz: $\leq 4$ mm 4 – 5 GHz: $\leq 3$ mm 5 – 6 GHz: $\leq 2$ mm	
	graded grid	$\Delta z_{Zoom}(1)$ : between 1 <sup>st</sup> two points closest to phantom surface	$\leq 4$ mm	3 – 4 GHz: $\leq 3$ mm 4 – 5 GHz: $\leq 2.5$ mm 5 – 6 GHz: $\leq 2$ mm
		$\Delta z_{Zoom}(n>1)$ : between subsequent points	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z	$\geq 30$ mm	3 – 4 GHz: $\geq 28$ mm 4 – 5 GHz: $\geq 25$ mm 5 – 6 GHz: $\geq 22$ mm	
Note: $\delta$ 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 $\leq 1.4$ W/kg, $\leq 8$ mm, $\leq 7$ mm and $\leq 5$ 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 for 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	1099	Dec. 15, 2021	Dec. 14, 2024
SPEAG	835MHz System Validation Kit	D835V2	4d162	Dec. 17, 2021	Dec. 16, 2024
SPEAG	1750MHz System Validation Kit	D1750V2	1090	Feb. 24, 2022	Feb. 23, 2025
SPEAG	1900MHz System Validation Kit	D1900V2	5d182	Dec. 20, 2021	Dec. 19, 2024
SPEAG	2450MHz System Validation Kit	D2450V2	1040	Apr. 25, 2023	Apr. 24, 2024
SPEAG	2600MHz System Validation Kit	D2600V2	1070	Dec. 20, 2021	Dec. 19, 2024
SPEAG	5000MHz System Validation Kit	D5GHzV2	1341	Dec. 13, 2021	Dec. 12, 2024
SPEAG	Data Acquisition Electronics	DAE4	1664	Jun. 06, 2023	Jun. 05, 2024
SPEAG	Data Acquisition Electronics	DAE3	360	Dec. 28, 2022	Dec. 27, 2023
SPEAG	Data Acquisition Electronics	DAE4	715	Jan. 23, 2023	Jan. 22, 2024
SPEAG	Dosimetric E-Field Probe	EX3DV4	7641	Apr. 24, 2023	Apr. 23, 2024
SPEAG	Dosimetric E-Field Probe	EX3DV4	7577	Nov. 23, 2022	Nov. 22, 2023
SPEAG	Dosimetric E-Field Probe	EX3DV4	3975	Jun. 22, 2023	Jun. 21, 2024
SPEAG	SAM Twin Phantom	QD 000 P40 CD	1670	NCR	NCR
SPEAG	SAM Twin Phantom	QD 000 P40 CD	1795	NCR	NCR
SPEAG	SAM Twin Phantom	QD 000 P41 AA	2033	NCR	NCR
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio communication analyzer	MT8820C	6201300653	Jul. 05, 2023	Jul. 04, 2024
Anritsu	Radio communication analyzer	MT8820C	6201341952	Dec. 27, 2022	Dec. 26, 2023
Anritsu	Radio communication analyzer	MT8821C	6262314715	Jul. 05, 2023	Jul. 04, 2024
Anritsu	Radio communication analyzer	MT8821C	6272278319	Jul. 05, 2023	Jul. 04, 2024
Anritsu	Radio communication analyzer	MT8821C	6272416837	Apr. 03, 2023	Apr. 02, 2024
Keysight	Network Analyzer	E5071C	MY46523671	Oct. 16, 2023	Oct. 15, 2024
Speag	Dielectric Assessment KIT	DAK-3.5	1071	Feb. 20, 2023	Feb. 19, 2024
Agilent	Signal Generator	N5181A	MY50145381	Dec. 27, 2022	Dec. 26, 2023
Anritsu	Power Sensor	MA2411B	1306099	Oct. 16, 2023	Oct. 15, 2024
Anritsu	Power Meter	ML2495A	1349001	Oct. 16, 2023	Oct. 15, 2024
Anritsu	Power Sensor	MA2411B	1542004	Dec. 27, 2022	Dec. 26, 2023
Anritsu	Power Meter	ML2495A	1339473	Dec. 27, 2022	Dec. 26, 2023
R&S	Power Sensor	NRP8S	109228	Apr. 06, 2023	Apr. 05, 2024
R&S	CBT BLUETOOTH TESTER	CBT	100963	Dec. 27, 2022	Dec. 26, 2023
R&S	Spectrum Analyzer	FSP7	100818	Jul. 05, 2023	Jul. 04, 2024
TES	Hygrometer	1310	200505600	Jul. 08, 2023	Jul. 07, 2024
Anymetre	Thermo-Hygrometer	JR593	2015030903	Dec. 30, 2022	Dec. 29, 2023
Anymetre	Thermo-Hygrometer	JR593	2015102801	Dec. 30, 2022	Dec. 29, 2023
Anymetre	Thermo-Hygrometer	JR593	2020062101	Jul. 08, 2023	Jul. 07, 2024
AR	Amplifier	5S1G4	0333096	Note 1	
Mini-Circuits	Amplifier	ZVE-3W-83+	599201528	Note 1	
Mini-Circuits	Amplifier	ZVA-183W-S+	726202215	Note 1	
SPEAG	Device Holder	N/A	N/A	Note 1	
ARRA	Power Divider	A3200-2	N/A	Note 1	
ET Industries	Dual Directional Coupler	C-058-10	N/A	Note 1	
Jinkexinhua	Attenuator	10db-8G	N/A	Note 1	

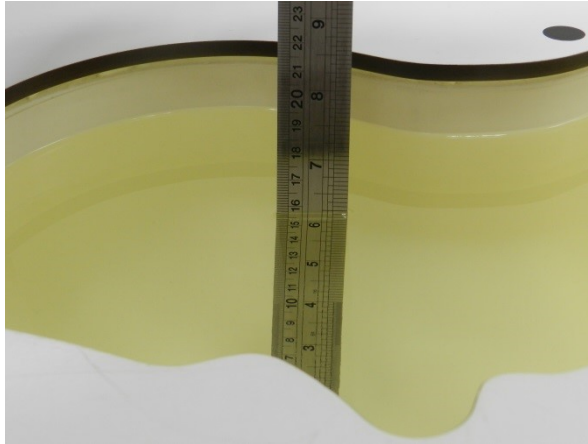
**Note:**

1. 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.
2. The dipole calibration interval can be extended to 3 years with justification according to KDB 865664 D01. The dipoles are also not physically damaged, or repaired during the interval. The justification data in appendix C can be found which the return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration for each dipole.

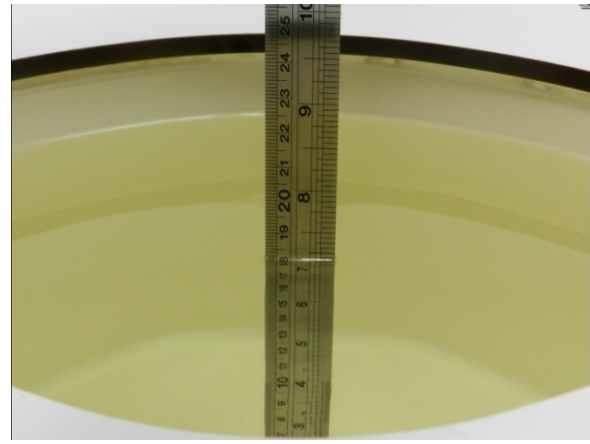
## 11. System Verification

### 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 10.1** Photo of Liquid Height for Head SAR



**Fig 10.2** 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 (εr)
<b>For Head</b>								
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
900	40.3	57.9	0.2	1.4	0.2	0	0.97	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
<b>For Body</b>								
750	51.7	47.2	0	0.9	0.1	0	0.96	55.5
835	50.8	48.2	0	0.9	0.1	0	0.97	55.2
1800, 1900, 2000	70.2	0	0	0.4	0	29.4	1.52	53.3
2450	68.6	0	0	0	0	31.4	1.95	52.7
2600	68.1	0	0	0.1	0	31.8	2.16	52.5

#### 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 <sub>r</sub> )	Conductivity Target (σ)	Permittivity Target (ε <sub>r</sub> )	Delta (σ) (%)	Delta (ε <sub>r</sub> ) (%)	Limit (%)	Date
750	Head	22.1	0.883	40.810	0.89	41.90	-0.79	-2.60	±5	2023/10/22
750	Head	22.3	0.911	42.879	0.89	41.90	2.36	2.34	±5	2023/10/31
835	Head	22.5	0.930	42.770	0.90	41.50	3.33	3.06	±5	2023/10/31
835	Head	22.5	0.904	42.080	0.90	41.50	0.44	1.40	±5	2023/11/1
835	Head	22.6	0.915	41.980	0.90	41.50	1.67	1.16	±5	2023/11/3
1750	Head	22.7	1.356	40.425	1.37	40.10	-1.02	0.81	±5	2023/10/27
1750	Head	22.5	1.363	41.115	1.37	40.10	-0.51	2.53	±5	2023/11/2
1900	Head	22.4	1.417	40.994	1.40	40.00	1.21	2.49	±5	2023/10/26
1900	Head	22.3	1.436	38.697	1.40	40.00	2.57	-3.26	±5	2023/11/3
1900	Head	22.7	1.427	41.191	1.40	40.00	1.93	2.98	±5	2023/11/6
2450	Head	22.4	1.825	39.664	1.80	39.20	1.39	1.18	±5	2023/11/1
2450	Head	22.4	1.843	40.377	1.80	39.20	2.39	3.00	±5	2023/11/5
2450	Head	22.2	1.878	40.464	1.80	39.20	4.33	3.22	±5	2023/11/6
2600	Head	22.3	1.912	38.499	1.96	39.00	-2.45	-1.28	±5	2023/11/2
2600	Head	22.2	1.904	38.499	1.96	39.00	-2.86	-1.28	±5	2023/11/4
2600	Head	22.2	2.056	37.284	1.96	39.00	4.90	-4.40	±5	2023/11/8
5250	Head	22.3	4.803	37.045	4.71	35.95	1.97	3.05	±5	2023/10/28
5250	Head	22.5	4.617	35.683	4.71	35.95	-1.97	-0.74	±5	2023/11/6
5250	Head	22.5	4.595	36.652	4.71	35.95	-2.44	1.95	±5	2023/11/7
5600	Head	22.2	5.238	36.275	5.07	35.50	3.31	2.18	±5	2023/10/29
5600	Head	22.3	4.970	35.188	5.07	35.50	-1.97	-0.88	±5	2023/11/7
5600	Head	22.8	5.125	35.435	5.07	35.50	1.08	-0.18	±5	2023/11/8
5750	Head	22.5	5.413	35.968	5.22	35.35	3.70	1.75	±5	2023/10/29
5750	Head	22.7	5.009	36.365	5.22	35.35	-4.04	2.87	±5	2023/11/7
5750	Head	22.6	5.127	34.965	5.22	35.35	-1.78	-1.09	±5	2023/11/9

**11.3 System Performance Check Results**

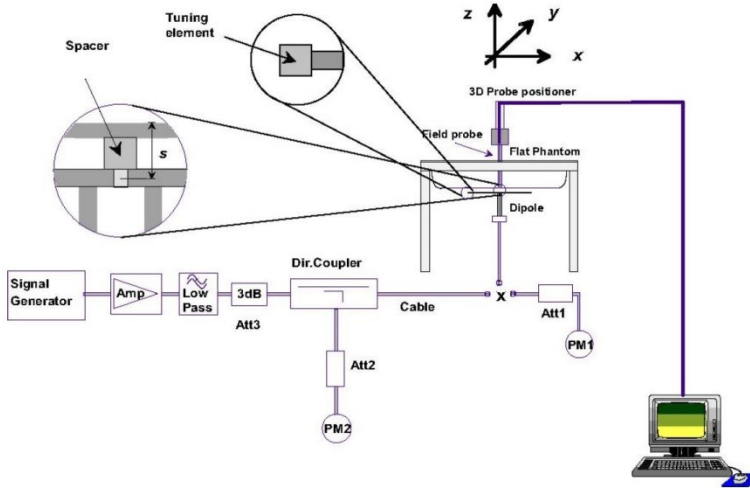
Comparing to the original SAR value provided by SPEAG, the verification data should be within its specification of 10 %. Below table shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion and the 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 (%)
2023/10/22	750	Head	250	1099	3975	715	2.020	8.540	8.08	-5.39
2023/10/31	750	Head	250	1099	7577	360	2.130	8.540	8.52	-0.23
2023/10/31	835	Head	250	4d162	3975	715	2.510	9.640	10.04	4.15
2023/11/1	835	Head	250	4d162	7577	360	2.290	9.640	9.16	-4.98
2023/11/3	835	Head	250	4d162	7641	1664	2.430	9.640	9.72	0.83
2023/10/27	1750	Head	250	1090	3975	715	8.660	37.000	34.64	-6.38
2023/11/2	1750	Head	250	1090	7577	360	8.720	37.000	34.88	-5.73
2023/10/26	1900	Head	250	5d182	3975	715	9.780	39.600	39.12	-1.21
2023/11/3	1900	Head	250	5d182	7577	360	9.230	39.600	36.92	-6.77
2023/11/6	1900	Head	250	5d182	7641	1664	9.370	39.600	37.48	-5.35
2023/11/1	2450	Head	250	1040	7641	1664	12.300	52.700	49.2	-6.64
2023/11/5	2450	Head	250	1040	7577	360	12.700	52.700	50.8	-3.61
2023/11/6	2450	Head	250	1040	3975	715	13.500	52.700	54	2.47
2023/11/2	2600	Head	250	1070	3975	715	14.200	56.200	56.8	1.07
2023/11/4	2600	Head	250	1070	7577	360	13.300	56.200	53.2	-5.34
2023/11/8	2600	Head	250	1070	7641	1664	14.100	56.200	56.4	0.36
2023/10/28	5250	Head	100	1341	3975	715	7.550	80.700	75.5	-6.44
2023/11/6	5250	Head	100	1341	7577	360	7.870	80.700	78.7	-2.48
2023/11/7	5250	Head	100	1341	7641	1664	7.510	80.700	75.1	-6.94
2023/10/29	5600	Head	100	1341	3975	715	7.950	84.500	79.5	-5.92
2023/11/7	5600	Head	100	1341	7577	360	8.150	84.500	81.5	-3.55
2023/11/8	5600	Head	100	1341	7641	1664	7.890	84.500	78.9	-6.63
2023/10/29	5750	Head	100	1341	3975	715	7.950	80.600	79.5	-1.36
2023/11/7	5750	Head	100	1341	7641	1664	7.410	80.600	74.1	-8.06
2023/11/9	5750	Head	100	1341	7577	360	7.760	80.600	77.6	-3.72

**<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 (%)
2023/10/22	750	Head	250	1099	3975	715	1.350	5.650	5.4	-4.42
2023/10/31	750	Head	250	1099	7577	360	1.360	5.650	5.44	-3.72
2023/10/31	835	Head	250	4d162	3975	715	1.660	6.260	6.64	6.07
2023/11/1	835	Head	250	4d162	7577	360	1.510	6.260	6.04	-3.51
2023/11/3	835	Head	250	4d162	7641	1664	1.550	6.260	6.2	-0.96
2023/10/27	1750	Head	250	1090	3975	715	4.720	19.500	18.88	-3.18
2023/11/2	1750	Head	250	1090	7577	360	4.750	19.500	19	-2.56
2023/10/26	1900	Head	250	5d182	3975	715	5.170	20.200	20.68	2.38
2023/11/3	1900	Head	250	5d182	7577	360	4.780	20.200	19.12	-5.35
2023/11/6	1900	Head	250	5d182	7641	1664	4.850	20.200	19.4	-3.96
2023/11/1	2450	Head	250	1040	7641	1664	5.700	24.600	22.8	-7.32
2023/11/5	2450	Head	250	1040	7577	360	5.890	24.600	23.56	-4.23
2023/11/6	2450	Head	250	1040	3975	715	6.410	24.600	25.64	4.23
2023/11/2	2600	Head	250	1070	3975	715	6.070	24.600	24.28	-1.30
2023/11/4	2600	Head	250	1070	7577	360	6.090	24.600	24.36	-0.98
2023/11/8	2600	Head	250	1070	7641	1664	6.120	24.600	24.48	-0.49
2023/10/28	5250	Head	100	1341	3975	715	2.230	23.100	22.3	-3.46
2023/11/6	5250	Head	100	1341	7577	360	2.400	23.100	24	3.90
2023/11/7	5250	Head	100	1341	7641	1664	2.150	23.100	21.5	-6.93
2023/10/29	5600	Head	100	1341	3975	715	2.260	24.000	22.6	-5.83
2023/11/7	5600	Head	100	1341	7577	360	2.470	24.000	24.7	2.92
2023/11/8	5600	Head	100	1341	7641	1664	2.250	24.000	22.5	-6.25
2023/10/29	5750	Head	100	1341	3975	715	2.360	22.700	23.6	3.96
2023/11/7	5750	Head	100	1341	7641	1664	2.120	22.700	21.2	-6.61
2023/11/9	5750	Head	100	1341	7577	360	2.350	22.700	23.5	3.52



**Fig 10.3.1 System Performance Check Setup**



**Fig 10.3.2 Setup Photo**

## 12. RF Exposure Positions

### 12.1 Ear and handset reference point

Figure 11.1.1 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 11.1.2 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 11.1.3). 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 11.1.2. The ear truncation is introduced to preclude the ear lobe from interfering with handset tilt, which could lead to unstable positioning at the cheek.

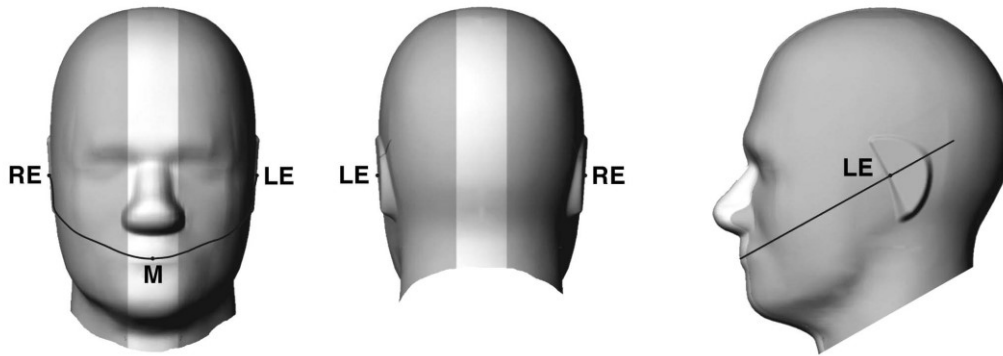


Fig 11.1.1 Front, back, and side views of SAM twin phantom

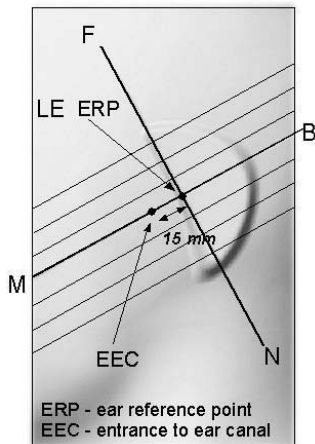


Fig 11.1.2 Close-up side view of phantom showing the ear region.

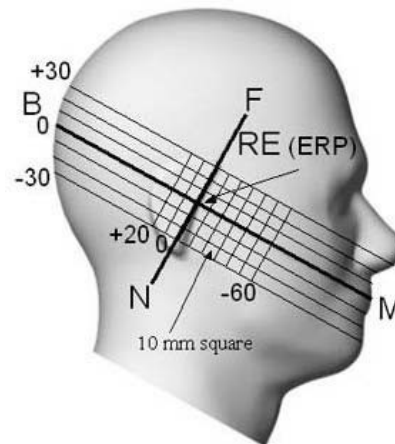


Fig 11.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

## 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 11.2.1 and Figure 11.2.2), 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 11.2.1). 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 11.2.2), 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 11.2.3), 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 11.2.3. The actual rotation angles should be documented in the test report.

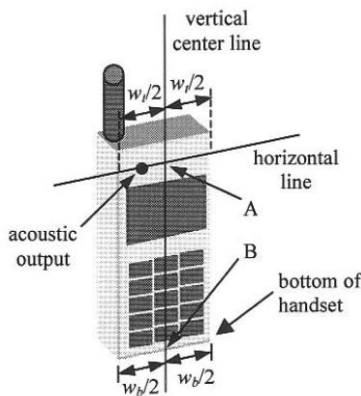


Fig 11.2.1 Handset vertical and horizontal reference lines—“fixed case”

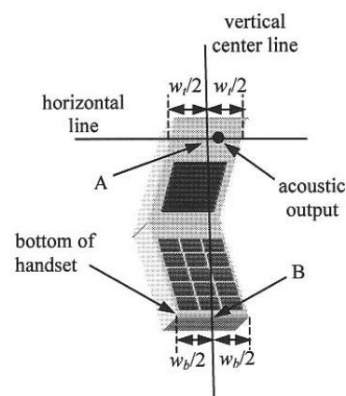


Fig 11.2.2 Handset vertical and horizontal reference lines—“clam-shell case”

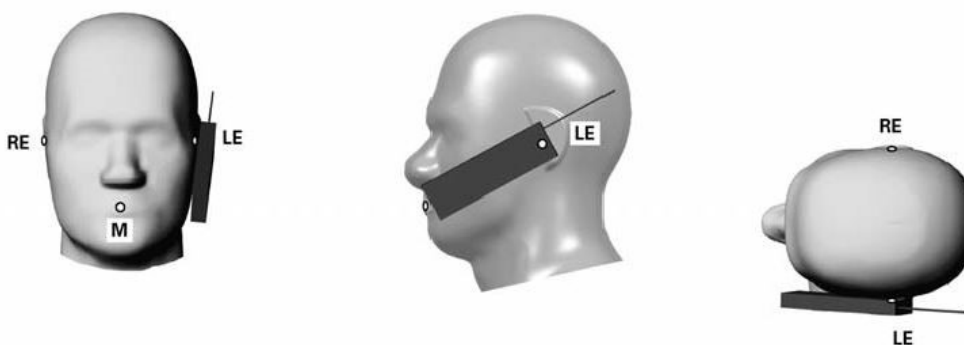
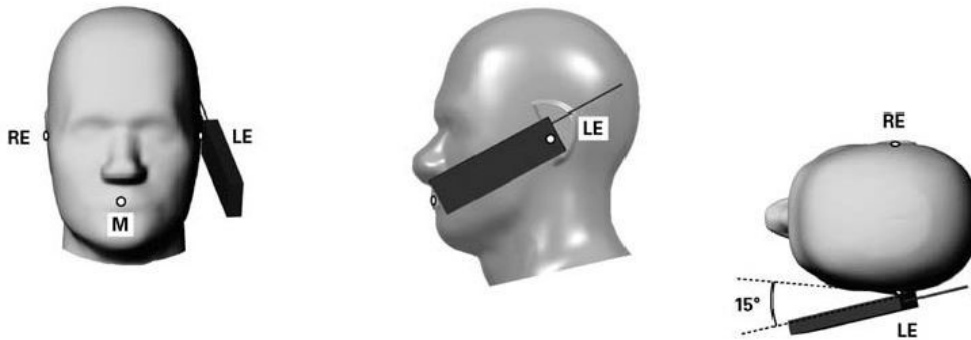


Fig 11.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

**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 11.3.1. 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 11.3.1 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 11.4). 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.

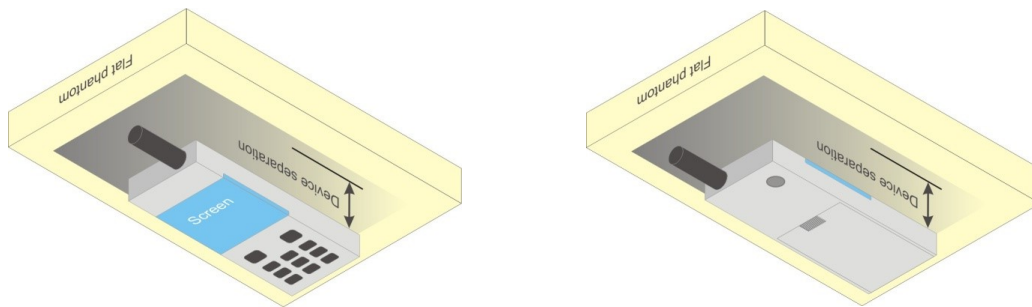


Fig 11.4 Body Worn Position



## **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 can provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets and 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  $\leq 25$  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.<sup>6</sup> 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)

The detailed conducted power table can refer to Appendix E.

### <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 GSM (1Tx slots) for GSM850/GSM1900 is 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.

### <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 HSPA+ devices supporting 16 QAM in the uplink, power measurements procedure is according to the configurations in Table C.11.1.4 of 3GPP TS 34.121-1.
4. 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 ( $\beta_c$  and  $\beta_d$ ) 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:  $\beta$  values for transmitter characteristics tests with HS-DPCCH**

Sub-test	$\beta_c$	$\beta_d$	$\beta_d$ (SF)	$\beta_c/\beta_d$	$\beta_{HS}$ (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:  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  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,  $\Delta_{ACK}$  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 DPDCH, DPCCH 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  $\beta_c/\beta_d$  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 ( $\beta_c$  and  $\beta_d$ ) 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-TFCl
  - viii. Confirm that E-TFCl is equal to the target E-TFCl of 75 for sub-test 1, and other subtest's E-TFCl
- d. The transmitted maximum output power was recorded.

**Table C.11.1.3:  $\beta$  values for transmitter characteristics tests with HS-DPCCH and E-DCH**

Sub-test	$\beta_c$	$\beta_d$	$\beta_d$ (SF)	$\beta_c/\beta_d$	$\beta_{HS}$ (Note1)	$\beta_{ec}$	$\beta_{ed}$ (Note 4) (Note 5)	$\beta_{ed}$ (SF)	$\beta_{ed}$ (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2) (Note 6)	AG Index (Note 5)	E-TFCl
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 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,  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 30/15$  with  $\beta_{hs} = 30/15 * \beta_c$ . For sub-test 5,  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 5/15$  with  $\beta_{hs} = 5/15 * \beta_c$ .

Note 2: CM = 1 for  $\beta_c/\beta_d = 12/15$ ,  $\beta_{hs}/\beta_c = 24/15$ . 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  $\beta_c/\beta_d$  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:  $\beta_{ed}$  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 ( $\beta_c$  and  $\beta_d$ ) 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**

**HSPA+ 3GPP release 7 (uplink category 7) 16QAM, 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 = 5.2E:HSPA+:UL with 16QAM
  - ii. Set the Gain Factors ( $\beta_c$  and  $\beta_d$ ) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.4, quoted from the TS 34.121-1 s5.2E
  - iii. Set Channel Parm
  - iv. Set Cell Power = -86 dBm
  - v. Set Channel Type = HSPA
  - vi. Set UE Target Power =21 dBm
  - vii. Power Ctrl Mode= All Up Bits
  - viii. Set Manual Uplink DPCH Bc/Bd = Manual
  - ix. Set Manual Uplink DPCH Bc and Bd=15,15(for 34.121-1 v8.10.0 table C11.1.4 sub-test 1)
  - x. Set HSPA Conn DL Channel Levels
  - xi. Set HS-SCCH Configs
  - xii. Set RB Test Mode Setup
  - xiii. Set Common HSUPA Parameters
  - xiv. Set Serving Grant
  - xv. Confirm that E-TFCI is equal to the target E-TFCI of 105 for sub-test 1, and other subtest's E-TFCI
- d. The transmitted maximum output power was recorded.

**Table C.11.1.4:  $\beta$  values for transmitter characteristics tests with HS-DPCCH and E-DCH with 16QAM**

Sub-test	$\beta_c$ (Note 3)	$\beta_d$	$\beta_{HS}$ (Note 1)	$\beta_{ec}$	$\beta_{ed}$ (2xSF2) (Note 4)	$\beta_{ed}$ (2xSF4) (Note 4)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 4)	E-TFCI (Note 5)	E-TFCI (boost)
1	1	0	30/15	30/15	$\beta_{ed1}$ : 30/15 $\beta_{ed2}$ : 30/15	$\beta_{ed3}$ : 24/15 $\beta_{ed4}$ : 24/15	3.5	2.5	14	105	105

Note 1:  $\Delta_{ACK}, \Delta_{NACK}$  and  $\Delta_{CQI} = 30/15$  with  $\beta_{HS} = 30/15 * \beta_c$ .

Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).

Note 3: DPDCH is not configured, therefore the  $\beta_c$  is set to 1 and  $\beta_d = 0$  by default.

Note 4:  $\beta_{ed}$  can not be set directly; it is set by Absolute Grant Value.

Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signaled to use the extrapolation algorithm.

**Setup Configuration**

**<WCDMA Conducted Power>**

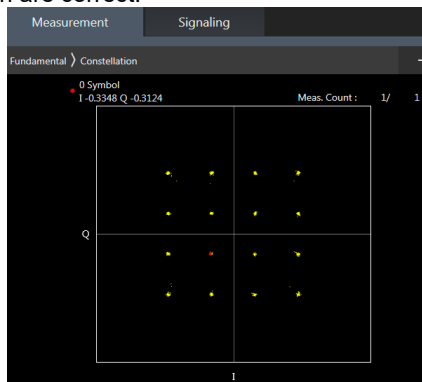
**General Note:**

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 / HSPA+ is  $\leq 1/4$  dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA / HSPA+ to RMC12.2Kbps and the adjusted SAR is  $\leq 1.2$  W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+, and according to the following RF output power, the output power results of the secondary modes (HSDPA / HSUPA / DC-HSDPA / HSPA+) are less than  $1/4$  dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+.

**<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  $\leq 0.8$  W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is  $> 1.45$  W/kg, the remaining required test channels must also be tested.
6. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is  $>$  not  $\frac{1}{2}$  dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r05, 16QAM 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  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B4 / B5 / B26 / B38 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 B4 /B5 SAR test was covered by B66 / B26; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
  - a. the maximum output power, including tolerance, for the smaller band is  $\leq$  the larger band to qualify for the SAR test exclusion
  - b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band
10. According to May 2017 TCB workshop, for 16QAM and 64QAM should be verified by checking the signal constellation with a call box to avoid incorrect maximum power levels due to MPR and other requirements associated with signal modulation, and the following figure is taken from the "Fundamental Measurement >> Modulation Analysis >> constellation" mode of the device connect to the MT8821C base station, therefore, the device 64QAM and 16QAM signal modulation are correct.



**16QAM**



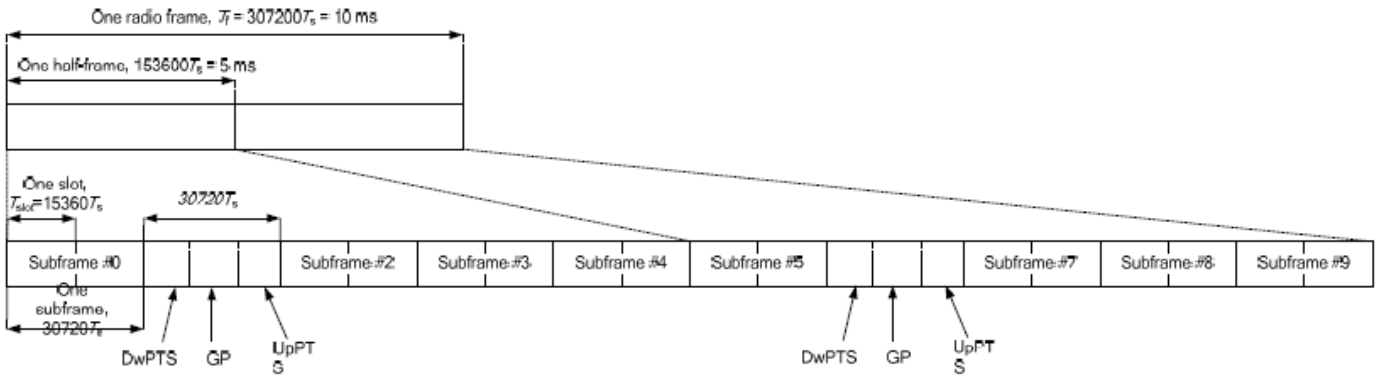
**64QAM**

**<TDD LTE SAR Measurement>**

TDD LTE configuration setup for SAR measurement

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

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



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

**Table 4.2-2: Uplink-downlink configurations.**

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

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

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

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

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

The highest duty factor is resulted from:

For LTE TDD Power class 3

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





<WLAN Conducted Power>

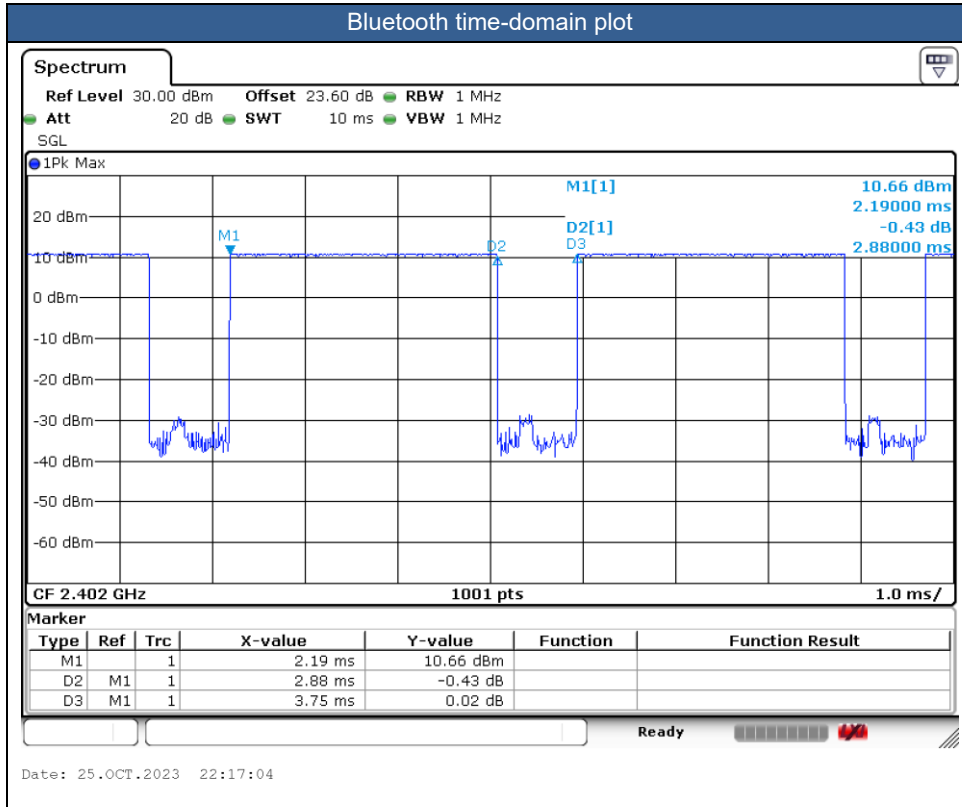
General Note:

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

**<2.4GHz Bluetooth>**

**General Note:**

1. For 2.4GHz Bluetooth SAR testing was selected 1Mbps, due to its highest average power.
2. The Bluetooth duty cycle is 76.80 % as following figure, according to Oct. 2016 TCB workshop for Bluetooth SAR scaling need further consideration and the maximum duty cycle is 100%, therefore the actual duty cycle will be scaled up to 100% for Bluetooth reported SAR calculation.





## **14. Antenna Location**

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

## 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/Bluetooth 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
  - e. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result. The Reported TDD LTE SAR (W/kg) = measured SAR (W/kg)\* Tune-up Scaling Factor\* scaling factor for extended cyclic prefix
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
  - $\leq 0.8$  W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is  $\leq 100$  MHz
  - $\leq 0.6$  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
  - $\leq 0.4$  W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is  $\geq 200$  MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is  $\geq 0.8$ W/kg.
4. Per KDB 648474 D04v01r03, when the reported SAR for a body-worn accessory measured without a headset connected to the handset is  $\leq 1.2$  W/kg, SAR testing with a headset connected to the handset is not required.
5. The device implements the power management and proximity sensor /receiver detection/hotspot mode for SAR compliance at different exposure conditions (head, body-worn, hotspot, extremity). Details about the power management decision and sensor detection are provided in the operational description. And the device will invoke corresponding work scenarios power level base on frequency bands/antennas, which can refer to power table at appendix E.
6. Per KDB648474 D04v01r03, for smart phones with a display diagonal dimension > 15cm or an overall diagonal dimension > 16cm, 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, in this report all the hotspot mode results are < 1.2W/kg.
7. 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 extremity 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 (for handheld on state, the maximum full power means reduced power), including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold.
  - a. For this device SAR for WWAN/WLAN transmitter scaled to maximum output power mode for product specific 10g SAR is higher than 1.2W/kg of GSM850/1900, WCDMA Band II/IV/V, LTE Band 2/4/5/7/13/26/38/66 and WLAN 2.4GHz /WLAN 5.2/5.8GHz therefore product specific 10g SAR is necessary.
  - b. WLAN 5.3/5.5GHz tested the product specific 10g SAR since it has no hotspot mode.
  - c. When 10-g product specific 10g SAR is considered, SAR thresholds is specified in the procedures for SAR test reduction and exclusion should be multiplied by 2.5.
8. Although the headset SAR is greater than 0.8 W/kg, the headset SAR verified the worst of the non-headset SAR and less than non-headset SAR, so there is no need to be tested other channels.

### 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.
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 / HSPA+ is  $\leq \frac{1}{4}$  dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA / HSPA+ to RMC12.2Kbps and the adjusted SAR is  $\leq 1.2$  W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+, and according to the following RF output power, the output power results of the secondary modes (HSDPA / HSUPA / DC-HSDPA / HSPA+) are less than  $\frac{1}{4}$  dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+.

**LTE Note:**

1. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
2. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
3. Per KDB 941225 D05v02r05, for QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are  $\leq 0.8$  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  $\leq 1.45$  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  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B4 / B5 / B26 / B38 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 B4/B5 SAR test was covered by B66 / B26; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
  - a. the maximum output power, including tolerance, for the smaller band is  $\leq$  the larger band to qualify for the SAR test exclusion
  - b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band

**WLAN/Bluetooth Note:**

1. Per KDB 248227 D01v02r02, for 2.4GHz 802.11g/n SAR testing is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is  $\leq 1.2$  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  $\leq 1.2$  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  $\leq 0.8$  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  $\leq 1.2$  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

Table with columns: Plot No., Band, BW (MHz), Modulation, RB Size, RB offset, Mode, Test Position, Gap (mm), Power State, Ch., Freq. (MHz), Sample, 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). Rows are grouped by frequency bands: 750MHz, 835MHz, 1750MHz, and 1900MHz.



	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	DSI2	9400	1880	1	23.30	24.00	1.175	-	-	-0.04	0.163	0.192
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	DSI2	9400	1880	1	23.30	24.00	1.175	-	-	0.03	0.169	0.199
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	DSI2	9400	1880	1	23.30	24.00	1.175	-	-	0.12	0.161	0.189
09	LTE Band 2	20M	QPSK	1	49	-	Right Cheek	0mm	DSI2	18900	1880	1	23.00	24.00	1.259	-	-	-0.05	0.255	<b>0.321</b>
	LTE Band 2	20M	QPSK	1	49	-	Right Tilted	0mm	DSI2	18900	1880	1	23.00	24.00	1.259	-	-	-0.05	0.126	0.159
	LTE Band 2	20M	QPSK	1	49	-	Left Cheek	0mm	DSI2	18900	1880	1	23.00	24.00	1.259	-	-	-0.16	0.150	0.189
	LTE Band 2	20M	QPSK	1	49	-	Left Tilted	0mm	DSI2	18900	1880	1	23.00	24.00	1.259	-	-	0.14	0.171	0.215
	LTE Band 2	20M	QPSK	50	0	-	Right Cheek	0mm	DSI2	18900	1880	1	21.93	23.00	1.279	-	-	0.06	0.176	0.225
	LTE Band 2	20M	QPSK	50	0	-	Right Tilted	0mm	DSI2	18900	1880	1	21.93	23.00	1.279	-	-	0.16	0.099	0.127
	LTE Band 2	20M	QPSK	50	0	-	Left Cheek	0mm	DSI2	18900	1880	1	21.93	23.00	1.279	-	-	0.02	0.118	0.151
	LTE Band 2	20M	QPSK	50	0	-	Left Tilted	0mm	DSI2	18900	1880	1	21.93	23.00	1.279	-	-	-0.16	0.133	0.170
<b>2600MHz</b>																				
10	LTE Band 7	20M	QPSK	1	49	-	Right Cheek	0mm	DSI2	21100	2535	1	22.99	24.00	1.262	-	-	-0.06	0.158	<b>0.199</b>
	LTE Band 7	20M	QPSK	1	49	-	Right Tilted	0mm	DSI2	21100	2535	1	22.99	24.00	1.262	-	-	-0.15	0.038	0.048
	LTE Band 7	20M	QPSK	1	49	-	Left Cheek	0mm	DSI2	21100	2535	1	22.99	24.00	1.262	-	-	-0.17	0.083	0.105
	LTE Band 7	20M	QPSK	1	49	-	Left Tilted	0mm	DSI2	21100	2535	1	22.99	24.00	1.262	-	-	-0.14	0.065	0.082
	LTE Band 7	20M	QPSK	50	0	-	Right Cheek	0mm	DSI2	21100	2535	1	21.96	23.00	1.271	-	-	-0.19	0.130	0.165
	LTE Band 7	20M	QPSK	50	0	-	Right Tilted	0mm	DSI2	21100	2535	1	21.96	23.00	1.271	-	-	0.02	0.029	0.037
	LTE Band 7	20M	QPSK	50	0	-	Left Cheek	0mm	DSI2	21100	2535	1	21.96	23.00	1.271	-	-	-0.15	0.065	0.083
	LTE Band 7	20M	QPSK	50	0	-	Left Tilted	0mm	DSI2	21100	2535	1	21.96	23.00	1.271	-	-	0.13	0.050	0.064
11	LTE Band 38	20M	QPSK	1	49	-	Right Cheek	0mm	DSI2	38000	2595	1	23.03	24.00	1.250	62.9	1.006	0.04	0.069	<b>0.087</b>
	LTE Band 38	20M	QPSK	1	49	-	Right Tilted	0mm	DSI2	38000	2595	1	23.03	24.00	1.250	62.9	1.006	-0.05	0.050	0.063
	LTE Band 38	20M	QPSK	1	49	-	Left Cheek	0mm	DSI2	38000	2595	1	23.03	24.00	1.250	62.9	1.006	-0.09	0.036	0.045
	LTE Band 38	20M	QPSK	1	49	-	Left Tilted	0mm	DSI2	38000	2595	1	23.03	24.00	1.250	62.9	1.006	-0.14	0.020	0.025
	LTE Band 38	20M	QPSK	50	0	-	Right Cheek	0mm	DSI2	38000	2595	1	21.91	23.00	1.285	62.9	1.006	0.01	0.056	0.072
	LTE Band 38	20M	QPSK	50	0	-	Right Tilted	0mm	DSI2	38000	2595	1	21.91	23.00	1.285	62.9	1.006	0.08	0.041	0.053
	LTE Band 38	20M	QPSK	50	0	-	Left Cheek	0mm	DSI2	38000	2595	1	21.91	23.00	1.285	62.9	1.006	0.18	0.029	0.037
	LTE Band 38	20M	QPSK	50	0	-	Left Tilted	0mm	DSI2	38000	2595	1	21.91	23.00	1.285	62.9	1.006	0.11	0.015	0.019



# FCC SAR Test Report

Report No. : FA301717

Plot No.	Band	Mode	Test Position	Gap (mm)	Power State	Ch.	Freq. (MHz)	Sample	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)
<b>BT/WLAN2.4GHz</b>																
	Bluetooth	DH5 1Mbps	Right Cheek	0mm	Full	39	2441	1	10.90	12.00	1.288	76.8	1.302	0.03	0.065	0.109
	Bluetooth	DH5 1Mbps	Right Tilted	0mm	Full	39	2441	1	10.90	12.00	1.288	76.8	1.302	-0.09	0.034	0.057
12	Bluetooth	DH5 1Mbps	Left Cheek	0mm	Full	39	2441	1	10.90	12.00	1.288	76.8	1.302	0.07	0.174	<b>0.292</b>
	Bluetooth	DH5 1Mbps	Left Tilted	0mm	Full	39	2441	1	10.90	12.00	1.288	76.8	1.302	-0.12	0.094	0.158
	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	Receiver on	1	2412	1	15.20	16.00	1.202	100	1.000	0.16	0.230	0.277
	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	0mm	Receiver on	1	2412	1	15.20	16.00	1.202	100	1.000	-0.09	0.259	0.311
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Receiver on	1	2412	1	15.20	16.00	1.202	100	1.000	-0.04	0.790	0.950
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	Receiver on	1	2412	1	15.20	16.00	1.202	100	1.000	-0.02	0.377	0.453
13	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Receiver on	6	2437	1	14.90	16.00	1.288	100	1.000	0.15	0.905	<b>1.166</b>
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Receiver on	6	2437	3	14.90	16.00	1.288	100	1.000	0.15	0.744	0.958
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Receiver on	6	2437	4	14.90	16.00	1.288	100	1.000	0.03	0.534	0.688
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Receiver on	6	2437	2	14.90	16.00	1.288	100	1.000	-0.08	0.474	0.611
<b>WLAN5GHz</b>																
	WLAN5.3GHz	802.11n-HT40 MCS0	Right Cheek	0mm	Receiver on	54	5270	1	16.19	18.00	1.517	93.53	1.069	0.11	0.349	0.566
	WLAN5.3GHz	802.11n-HT40 MCS0	Right Tilted	0mm	Receiver on	54	5270	1	16.19	18.00	1.517	93.53	1.069	-0.15	0.428	0.694
	WLAN5.3GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Receiver on	54	5270	1	16.19	18.00	1.517	93.53	1.069	0.1	0.663	1.075
14	WLAN5.3GHz	802.11n-HT40 MCS0	Left Tilted	0mm	Receiver on	54	5270	1	16.19	18.00	1.517	93.53	1.069	-0.02	0.709	<b>1.150</b>
	WLAN5.3GHz	802.11n-HT40 MCS0	Left Tilted	0mm	Receiver on	54	5270	3	16.19	18.00	1.517	93.53	1.069	0.09	0.571	0.926
	WLAN5.3GHz	802.11n-HT40 MCS0	Left Tilted	0mm	Receiver on	54	5270	4	16.19	18.00	1.517	93.53	1.069	0.08	0.354	0.574
	WLAN5.3GHz	802.11n-HT40 MCS0	Left Tilted	0mm	Receiver on	54	5270	2	16.19	18.00	1.517	93.53	1.069	-0.11	0.342	0.555
	WLAN5.3GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Receiver on	62	5310	1	15.14	17.00	1.534	93.53	1.069	0.1	0.525	0.861
	WLAN5.3GHz	802.11n-HT40 MCS0	Left Tilted	0mm	Receiver on	62	5310	1	15.14	17.00	1.534	93.53	1.069	-0.06	0.551	0.904
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Receiver on	138	5690	1	14.20	15.50	1.349	87.8	1.139	0.02	0.410	0.630
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Receiver on	138	5690	1	14.20	15.50	1.349	87.8	1.139	0.13	0.486	0.747
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Receiver on	138	5690	1	14.20	15.50	1.349	87.8	1.139	0.14	0.556	0.854
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Receiver on	138	5690	1	14.20	15.50	1.349	87.8	1.139	-0.18	0.715	1.099
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Receiver on	122	5610	1	14.05	15.50	1.396	87.8	1.139	0.08	0.551	0.876
15	WLAN5.5GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Receiver on	122	5610	1	14.05	15.50	1.396	87.8	1.139	-0.12	0.693	<b>1.102</b>
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Receiver on	155	5775	1	13.32	15.00	1.472	87.8	1.139	-0.19	0.414	0.694
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Receiver on	155	5775	1	13.32	15.00	1.472	87.8	1.139	0.1	0.505	0.847
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Receiver on	155	5775	1	13.32	15.00	1.472	87.8	1.139	0.03	0.570	0.956
16	WLAN5.8GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Receiver on	155	5775	1	13.32	15.00	1.472	87.8	1.139	0.02	0.604	<b>1.013</b>





15.2 Hotspot SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Power State	Ch.	Freq. (MHz)	Sample	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)
<b>750MHz</b>																				
17	LTE Band 13	10M	QPSK	1	25	-	Front	5mm	DSI3	23230	782	1	22.91	24.00	1.285	-	-	-0.12	0.563	0.724
	LTE Band 13	10M	QPSK	1	25	-	Back	5mm	DSI3	23230	782	1	22.91	24.00	1.285	-	-	-0.07	1.110	<b>1.427</b>
	LTE Band 13	10M	QPSK	1	25	-	Left side	5mm	DSI7	23230	782	1	22.91	24.00	1.285	-	-	0.16	0.366	0.470
	LTE Band 13	10M	QPSK	1	25	-	Right side	5mm	DSI7	23230	782	1	22.91	24.00	1.285	-	-	-0.11	0.641	0.824
	LTE Band 13	10M	QPSK	1	25	-	Bottom side	5mm	DSI7	23230	782	1	22.91	24.00	1.285	-	-	0.15	0.773	0.994
	LTE Band 13	10M	QPSK	25	0	-	Front	5mm	DSI3	23230	782	1	21.83	23.00	1.309	-	-	0	0.466	0.610
	LTE Band 13	10M	QPSK	25	0	-	Back	5mm	DSI3	23230	782	1	21.83	23.00	1.309	-	-	0.11	0.971	1.271
	LTE Band 13	10M	QPSK	25	0	-	Left side	5mm	DSI7	23230	782	1	21.83	23.00	1.309	-	-	-0.01	0.309	0.405
	LTE Band 13	10M	QPSK	25	0	-	Right side	5mm	DSI7	23230	782	1	21.83	23.00	1.309	-	-	-0.01	0.523	0.685
	LTE Band 13	10M	QPSK	25	0	-	Bottom side	5mm	DSI7	23230	782	1	21.83	23.00	1.309	-	-	-0.04	0.602	0.788
	LTE Band 13	10M	QPSK	50	0	-	Back	5mm	DSI3	23230	782	1	21.80	23.00	1.318	-	-	-0.11	0.868	1.144
	LTE Band 13	10M	QPSK	50	0	-	Right side	5mm	DSI7	23230	782	1	21.80	23.00	1.318	-	-	0.17	0.518	0.683
	LTE Band 13	10M	QPSK	50	0	-	Bottom side	5mm	DSI7	23230	782	1	21.80	23.00	1.318	-	-	0.07	0.619	0.816
	<b>835MHz</b>																			
18	GSM850	-	-	-	-	GPRS (2 Tx slots)	Front	5mm	DSI3	189	836.4	1	27.83	29.00	1.309	-	-	0.01	0.511	0.669
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Back	5mm	DSI3	189	836.4	1	27.83	29.00	1.309	-	-	-0.19	0.932	1.220
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Left side	5mm	DSI7	189	836.4	1	27.83	29.00	1.309	-	-	0.03	0.202	0.264
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Right side	5mm	DSI7	189	836.4	1	27.83	29.00	1.309	-	-	-0.04	0.414	0.542
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Bottom side	5mm	DSI7	189	836.4	1	27.83	29.00	1.309	-	-	0.15	0.537	0.703
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Back	5mm	DSI3	128	824.2	1	27.73	29.00	1.340	-	-	-0.07	0.741	0.993
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Back	5mm	DSI3	251	848.8	1	27.81	29.00	1.315	-	-	0.09	1.090	<b>1.434</b>
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Back	5mm	DSI3	251	848.8	3	27.81	29.00	1.315	-	-	-0.06	1.040	1.368
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Back	5mm	DSI3	251	848.8	4	27.81	29.00	1.315	-	-	-0.07	0.817	1.075
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Back	5mm	DSI3	251	848.8	2	27.81	29.00	1.315	-	-	-0.02	0.968	1.273
19	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	5mm	DSI3	4182	836.4	1	21.39	22.50	1.291	-	-	-0.18	0.508	0.656
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	DSI3	4182	836.4	1	21.39	22.50	1.291	-	-	0.15	0.961	1.241
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left side	5mm	DSI7	4182	836.4	1	21.39	22.50	1.291	-	-	0.06	0.250	0.323
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right side	5mm	DSI7	4182	836.4	1	21.39	22.50	1.291	-	-	-0.03	0.416	0.537
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Bottom side	5mm	DSI7	4182	836.4	1	21.39	22.50	1.291	-	-	-0.15	0.510	0.659
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	DSI3	4132	826.4	1	21.35	22.50	1.303	-	-	-0.13	0.834	1.087
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	DSI3	4233	846.6	1	21.37	22.50	1.297	-	-	0.03	1.100	<b>1.427</b>
	LTE Band 26	15M	QPSK	1	37	-	Front	5mm	DSI3	26865	831.5	1	21.87	23.00	1.297	-	-	0.03	0.554	0.719
	LTE Band 26	15M	QPSK	1	37	-	Back	5mm	DSI3	26865	831.5	1	21.87	23.00	1.297	-	-	0.06	1.040	<b>1.349</b>
	LTE Band 26	15M	QPSK	1	37	-	Left side	5mm	DSI7	26865	831.5	1	21.87	23.00	1.297	-	-	-0.05	0.295	0.383
LTE Band 26	15M	QPSK	1	37	-	Right side	5mm	DSI7	26865	831.5	1	21.87	23.00	1.297	-	-	0	0.468	0.607	
LTE Band 26	15M	QPSK	1	37	-	Bottom side	5mm	DSI7	26865	831.5	1	21.87	23.00	1.297	-	-	0.17	0.480	0.623	
LTE Band 26	15M	QPSK	36	0	-	Front	5mm	DSI3	26865	831.5	1	20.76	22.00	1.330	-	-	0.09	0.410	0.545	
LTE Band 26	15M	QPSK	36	0	-	Back	5mm	DSI3	26865	831.5	1	20.76	22.00	1.330	-	-	-0.09	0.815	1.084	
LTE Band 26	15M	QPSK	36	0	-	Left side	5mm	DSI7	26865	831.5	1	20.76	22.00	1.330	-	-	0.12	0.230	0.306	
LTE Band 26	15M	QPSK	36	0	-	Right side	5mm	DSI7	26865	831.5	1	20.76	22.00	1.330	-	-	-0.11	0.358	0.476	
LTE Band 26	15M	QPSK	36	0	-	Bottom side	5mm	DSI7	26865	831.5	1	20.76	22.00	1.330	-	-	0.15	0.344	0.458	
LTE Band 26	15M	QPSK	75	0	-	Back	5mm	DSI3	26865	831.5	1	20.73	22.00	1.340	-	-	-0.08	0.806	1.080	
<b>1750MHz</b>																				
21	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	5mm	DSI3	1413	1732.6	1	15.41	16.50	1.285	-	-	-0.06	0.350	0.450
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	5mm	DSI3	1413	1732.6	1	15.41	16.50	1.285	-	-	-0.04	0.898	1.154
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Left side	5mm	DSI7	1413	1732.6	1	14.57	15.50	1.239	-	-	0.02	0.059	0.073
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Right side	5mm	DSI7	1413	1732.6	1	14.57	15.50	1.239	-	-	-0.16	0.063	0.078
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom side	5mm	DSI7	1413	1732.6	1	14.57	15.50	1.239	-	-	-0.11	0.928	1.150
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom side	5mm	DSI7	1312	1712.4	1	14.47	15.50	1.268	-	-	-0.16	1.090	1.382
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom side	5mm	DSI7	1513	1752.6	1	14.52	15.50	1.253	-	-	-0.11	0.836	1.048
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	5mm	DSI3	1312	1712.4	1	15.39	16.50	1.291	-	-	0.14	1.090	<b>1.407</b>



Table with columns for WCDMA IV, LTE Band 66, GSM1900, WCDMA II, and LTE Band 2. Rows include test parameters like Modulation, Power, Frequency, and SAR values. Specific rows are highlighted in yellow, such as row 22 with SAR 1.407 and row 23 with SAR 1.430.



	LTE Band 2	20M	QPSK	50	0	-	Bottom side	5mm	DSI7	18900	1880	1	12.87	14.00	1.297	-	-	-0.02	0.784	1.017
	LTE Band 2	20M	QPSK	50	0	-	Bottom side	5mm	DSI7	18700	1860	1	12.80	14.00	1.318	-	-	0.06	0.843	1.111
	LTE Band 2	20M	QPSK	50	0	-	Bottom side	5mm	DSI7	19100	1900	1	12.84	14.00	1.306	-	-	0.02	0.766	1.001
	LTE Band 2	20M	QPSK	50	0	-	Back	5mm	DSI3	18700	1860	1	13.92	15.00	1.282	-	-	0.15	0.893	1.145
	LTE Band 2	20M	QPSK	50	0	-	Back	5mm	DSI3	19100	1900	1	14.00	15.00	1.259	-	-	0.07	0.731	0.920
	LTE Band 2	20M	QPSK	100	0	-	Back	5mm	DSI3	18900	1880	1	14.01	15.00	1.256	-	-	-0.05	0.770	0.967
	LTE Band 2	20M	QPSK	100	0	-	Bottom side	5mm	DSI7	18900	1880	1	12.86	14.00	1.300	-	-	0.18	0.795	1.034
<b>2600MHz</b>																				
	LTE Band 7	20M	QPSK	1	49	-	Front	5mm	DSI3	21100	2535	1	12.50	13.50	1.259	-	-	0.18	0.448	0.564
	LTE Band 7	20M	QPSK	1	49	-	Back	5mm	DSI3	21100	2535	1	12.50	13.50	1.259	-	-	0.12	1.030	1.297
	LTE Band 7	20M	QPSK	1	49	-	Left side	5mm	DSI7	21100	2535	1	11.49	12.50	1.262	-	-	0.19	0.028	0.035
	LTE Band 7	20M	QPSK	1	49	-	Right side	5mm	DSI7	21100	2535	1	11.49	12.50	1.262	-	-	0.04	0.011	0.014
	LTE Band 7	20M	QPSK	1	49	-	Bottom side	5mm	DSI7	21100	2535	1	11.49	12.50	1.262	-	-	-0.01	1.000	1.262
26	LTE Band 7	20M	QPSK	1	49	-	Bottom side	5mm	DSI7	20850	2510	1	11.27	12.50	1.327	-	-	0.07	1.040	1.380
	LTE Band 7	20M	QPSK	1	49	-	Bottom side	5mm	DSI7	20850	2510	3	11.27	12.50	1.327	-	-	-0.06	0.819	1.087
	LTE Band 7	20M	QPSK	1	49	-	Bottom side	5mm	DSI7	20850	2510	4	11.27	12.50	1.327	-	-	0.16	0.739	0.981
	LTE Band 7	20M	QPSK	1	49	-	Bottom side	5mm	DSI7	20850	2510	2	11.27	12.50	1.327	-	-	0.01	0.692	0.919
	LTE Band 7	20M	QPSK	1	49	-	Bottom side	5mm	DSI7	21350	2560	1	11.33	12.50	1.309	-	-	-0.13	0.911	1.193
	LTE Band 7	20M	QPSK	1	49	-	Back	5mm	DSI3	20850	2510	1	12.33	13.50	1.309	-	-	0.18	0.914	1.197
	LTE Band 7	20M	QPSK	1	49	-	Back	5mm	DSI3	21350	2560	1	12.38	13.50	1.294	-	-	0.08	0.943	1.220
	LTE Band 7	20M	QPSK	50	0	-	Front	5mm	DSI3	21100	2535	1	11.24	12.50	1.337	-	-	0.09	0.345	0.461
	LTE Band 7	20M	QPSK	50	0	-	Back	5mm	DSI3	21100	2535	1	11.24	12.50	1.337	-	-	-0.1	0.884	1.182
	LTE Band 7	20M	QPSK	50	0	-	Left side	5mm	DSI7	21100	2535	1	10.42	11.50	1.282	-	-	0.1	0.021	0.027
	LTE Band 7	20M	QPSK	50	0	-	Right side	5mm	DSI7	21100	2535	1	10.42	11.50	1.282	-	-	-0.13	0.008	0.010
	LTE Band 7	20M	QPSK	50	0	-	Bottom side	5mm	DSI7	21100	2535	1	10.42	11.50	1.282	-	-	-0.08	0.891	1.143
	LTE Band 7	20M	QPSK	50	0	-	Bottom side	5mm	DSI7	20850	2510	1	10.34	11.50	1.306	-	-	-0.05	0.927	1.211
	LTE Band 7	20M	QPSK	50	0	-	Bottom side	5mm	DSI7	21350	2560	1	10.36	11.50	1.300	-	-	-0.1	0.812	1.056
	LTE Band 7	20M	QPSK	50	0	-	Back	5mm	DSI3	20850	2510	1	11.22	12.50	1.343	-	-	0.19	0.790	1.061
	LTE Band 7	20M	QPSK	50	0	-	Back	5mm	DSI3	21350	2560	1	11.20	12.50	1.349	-	-	0.18	0.798	1.076
	LTE Band 7	20M	QPSK	100	0	-	Back	5mm	DSI3	21100	2535	1	11.27	12.50	1.327	-	-	0.18	0.887	1.177
	LTE Band 7	20M	QPSK	100	0	-	Bottom side	5mm	DSI7	21100	2535	1	10.39	11.50	1.291	-	-	-0.06	0.855	1.104
	LTE Band 38	20M	QPSK	1	49	-	Front	5mm	DSI3	38000	2595	1	14.43	15.50	1.279	62.9	1.006	-0.04	0.552	0.710
27	LTE Band 38	20M	QPSK	1	49	-	Back	5mm	DSI3	38000	2595	1	14.43	15.50	1.279	62.9	1.006	0.15	1.070	1.377
	LTE Band 38	20M	QPSK	1	49	-	Left side	5mm	DSI7	38000	2595	1	13.47	14.50	1.268	62.9	1.006	-0.01	0.022	0.028
	LTE Band 38	20M	QPSK	1	49	-	Right side	5mm	DSI7	38000	2595	1	13.47	14.50	1.268	62.9	1.006	0.13	0.015	0.019
	LTE Band 38	20M	QPSK	1	49	-	Bottom side	5mm	DSI7	38000	2595	1	13.47	14.50	1.268	62.9	1.006	-0.11	1.070	1.365
	LTE Band 38	20M	QPSK	50	0	-	Front	5mm	DSI3	38000	2595	1	13.26	14.50	1.330	62.9	1.006	0.06	0.434	0.581
	LTE Band 38	20M	QPSK	50	0	-	Back	5mm	DSI3	38000	2595	1	13.26	14.50	1.330	62.9	1.006	0.13	0.901	1.206
	LTE Band 38	20M	QPSK	50	0	-	Left side	5mm	DSI7	38000	2595	1	12.36	13.50	1.300	62.9	1.006	0	0.017	0.022
	LTE Band 38	20M	QPSK	50	0	-	Right side	5mm	DSI7	38000	2595	1	12.36	13.50	1.300	62.9	1.006	0.04	0.010	0.013
	LTE Band 38	20M	QPSK	50	0	-	Bottom side	5mm	DSI7	38000	2595	1	12.36	13.50	1.300	62.9	1.006	-0.09	0.900	1.177
	LTE Band 38	20M	QPSK	100	0	-	Back	5mm	DSI3	38000	2595	1	13.15	14.50	1.365	62.9	1.006	-0.08	0.835	1.146
	LTE Band 38	20M	QPSK	100	0	-	Bottom side	5mm	DSI7	38000	2595	1	12.26	13.50	1.330	62.9	1.006	-0.05	0.899	1.203



Plot No.	Band	Mode	Test Position	Gap (mm)	Power State	Ch.	Freq. (MHz)	Sample	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)
<b>BT/WLAN2.4GHz</b>																
	Bluetooth	DH5 1Mbps	Front	5mm	Full	39	2441	1	10.90	12.00	1.288	76.8	1.302	-0.05	0.073	0.122
28	Bluetooth	DH5 1Mbps	Back	5mm	Full	39	2441	1	10.90	12.00	1.288	76.8	1.302	0.03	0.125	<b>0.210</b>
	Bluetooth	DH5 1Mbps	Left side	5mm	Full	39	2441	1	10.90	12.00	1.288	76.8	1.302	0	0.011	0.018
	Bluetooth	DH5 1Mbps	Right side	5mm	Full	39	2441	1	10.90	12.00	1.288	76.8	1.302	0.02	0.075	0.126
	Bluetooth	DH5 1Mbps	Top Side	5mm	Full	39	2441	1	10.90	12.00	1.288	76.8	1.302	0.01	0.068	0.114
	WLAN2.4GHz	802.11b 1Mbps	Front	5mm	Reduced	1	2412	1	16.70	17.50	1.202	100	1.000	0.04	0.444	0.534
	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Reduced	1	2412	1	16.70	17.50	1.202	100	1.000	0.08	0.755	0.908
	WLAN2.4GHz	802.11b 1Mbps	Left side	5mm	Reduced	1	2412	1	16.70	17.50	1.202	100	1.000	-0.17	0.065	0.078
	WLAN2.4GHz	802.11b 1Mbps	Right side	5mm	Reduced	1	2412	1	16.70	17.50	1.202	100	1.000	-0.11	0.465	0.559
	WLAN2.4GHz	802.11b 1Mbps	Top Side	5mm	Reduced	1	2412	1	16.70	17.50	1.202	100	1.000	0.17	0.401	0.482
29	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Reduced	6	2437	1	16.40	17.50	1.288	100	1.000	-0.11	0.893	<b>1.150</b>
<b>WLAN5GHz</b>																
	WLAN5.2GHz	802.11ac-VHT80 MCS0	Front	5mm	Reduced	42	5210	1	12.20	14.00	1.514	87.8	1.139	0.08	0.114	0.197
30	WLAN5.2GHz	802.11ac-VHT80 MCS0	Back	5mm	Reduced	42	5210	1	12.20	14.00	1.514	87.8	1.139	0.16	0.599	<b>1.033</b>
	WLAN5.2GHz	802.11ac-VHT80 MCS0	Left side	5mm	Reduced	42	5210	1	12.20	14.00	1.514	87.8	1.139	-0.04	0.051	0.088
	WLAN5.2GHz	802.11ac-VHT80 MCS0	Right side	5mm	Reduced	42	5210	1	12.20	14.00	1.514	87.8	1.139	0.1	0.277	0.478
	WLAN5.2GHz	802.11ac-VHT80 MCS0	Top Side	5mm	Reduced	42	5210	1	12.20	14.00	1.514	87.8	1.139	-0.12	0.377	0.650
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Front	5mm	Reduced	155	5775	1	11.85	13.50	1.462	87.8	1.139	-0.14	0.152	0.253
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	5mm	Reduced	155	5775	1	11.85	13.50	1.462	87.8	1.139	-0.06	0.659	1.098
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Left side	5mm	Reduced	155	5775	1	11.33	13.00	1.469	87.8	1.139	-0.18	0.015	0.025
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right side	5mm	Reduced	155	5775	1	11.33	13.00	1.469	87.8	1.139	0.11	0.242	0.405
31	WLAN5.8GHz	802.11ac-VHT80 MCS0	Top Side	5mm	Reduced	155	5775	1	11.33	13.00	1.469	87.8	1.139	0.03	0.693	<b>1.159</b>
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Top Side	5mm	Reduced	155	5775	3	11.33	13.00	1.469	87.8	1.139	-0.13	0.692	1.158
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Top Side	5mm	Reduced	155	5775	4	11.33	13.00	1.469	87.8	1.139	-0.09	0.492	0.823
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Top Side	5mm	Reduced	155	5775	2	11.33	13.00	1.469	87.8	1.139	0.06	0.452	0.756



15.3 Body Worn Accessory SAR

Table with columns: Plot No., Band, BW (MHz), Modulation, RB Size, RB offset, Mode, Test Position, Gap (mm), Headset, Power State, Ch., Freq. (MHz), Sample, 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). Rows are grouped by frequency bands: 750MHz, 835MHz, 1750MHz.



	LTE Band 66	20M	QPSK	50	0	-	Back	5mm	-	DSI3	132072	1720	1	15.68	16.50	1.208	-	-	0.04	0.925	1.117
	LTE Band 66	20M	QPSK	50	0	-	Back	5mm	-	DSI3	132572	1770	1	15.56	16.50	1.242	-	-	-0.09	0.583	0.724
	LTE Band 66	20M	QPSK	100	0	-	Back	5mm	-	DSI3	132322	1745	1	15.61	16.50	1.227	-	-	-0.05	0.658	0.808
<b>1900MHz</b>																					
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Front	5mm	-	DSI3	512	1850.2	1	17.46	18.50	1.271	-	-	0.07	0.388	0.493
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Back	5mm	-	DSI3	512	1850.2	1	17.46	18.50	1.271	-	-	0.14	0.955	1.213
38	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Back	5mm	-	DSI3	661	1880	1	17.32	18.50	1.312	-	-	0.14	0.988	<b>1.296</b>
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Back	5mm	-	DSI3	810	1909.8	1	17.30	18.50	1.318	-	-	-0.06	0.861	1.135
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Back	5mm	Headset	DSI3	661	1880	1	17.32	18.50	1.312	-	-	-0.1	0.978	1.283
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Front	16mm	-	DSI4	512	1850.2	1	27.55	28.50	1.245	-	-	0	0.231	0.287
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Back	27mm	-	DSI4	661	1880	1	27.37	28.50	1.297	-	-	-0.09	0.305	0.396
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	5mm	-	DSI3	9400	1880	1	14.34	15.50	1.306	-	-	0.01	0.343	0.448
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	-	DSI3	9400	1880	1	14.34	15.50	1.306	-	-	-0.02	1.010	1.319
39	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	-	DSI3	9262	1852.4	1	14.32	15.50	1.312	-	-	-0.09	1.050	<b>1.378</b>
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	-	DSI3	9538	1907.6	1	14.33	15.50	1.309	-	-	-0.09	0.956	1.252
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Headset	DSI3	9262	1852.4	1	14.32	15.50	1.312	-	-	-0.07	1.030	1.352
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	16mm	-	DSI4	9400	1880	1	23.30	24.00	1.175	-	-	-0.11	0.597	0.701
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	27mm	-	DSI4	9400	1880	1	23.30	24.00	1.175	-	-	-0.04	0.454	0.533
	LTE Band 2	20M	QPSK	1	49	-	Front	5mm	-	DSI3	18900	1880	1	14.99	16.00	1.262	-	-	-0.11	0.309	0.390
	LTE Band 2	20M	QPSK	1	49	-	Back	5mm	-	DSI3	18900	1880	1	14.99	16.00	1.262	-	-	0.09	1.000	1.262
40	LTE Band 2	20M	QPSK	1	49	-	Back	5mm	-	DSI3	18700	1860	1	14.91	16.00	1.285	-	-	-0.14	1.080	<b>1.388</b>
	LTE Band 2	20M	QPSK	1	49	-	Back	5mm	-	DSI3	19100	1900	1	14.98	16.00	1.265	-	-	-0.09	0.904	1.143
	LTE Band 2	20M	QPSK	1	49	-	Back	5mm	Headset	DSI3	18700	1860	1	14.91	16.00	1.285	-	-	-0.17	1.070	1.375
	LTE Band 2	20M	QPSK	1	49	-	Front	16mm	-	DSI4	18900	1880	1	23.00	24.00	1.259	-	-	0.12	0.459	0.578
	LTE Band 2	20M	QPSK	1	49	-	Back	27mm	-	DSI4	18700	1860	1	22.89	24.00	1.291	-	-	0.19	0.440	0.568
	LTE Band 2	20M	QPSK	50	0	-	Front	5mm	-	DSI3	18900	1880	1	14.05	15.00	1.245	-	-	-0.16	0.255	0.317
	LTE Band 2	20M	QPSK	50	0	-	Back	5mm	-	DSI3	18900	1880	1	14.05	15.00	1.245	-	-	0.13	0.771	0.960
	LTE Band 2	20M	QPSK	50	0	-	Back	5mm	-	DSI3	18700	1860	1	13.92	15.00	1.282	-	-	0.15	0.893	1.145
	LTE Band 2	20M	QPSK	50	0	-	Back	5mm	-	DSI3	19100	1900	1	14.00	15.00	1.259	-	-	0.07	0.731	0.920
	LTE Band 2	20M	QPSK	100	0	-	Back	5mm	-	DSI3	18900	1880	1	14.01	15.00	1.256	-	-	-0.05	0.770	0.967
<b>2600MHz</b>																					
	LTE Band 7	20M	QPSK	1	49	-	Front	5mm	-	DSI3	21100	2535	1	12.50	13.50	1.259	-	-	0.18	0.448	0.564
41	LTE Band 7	20M	QPSK	1	49	-	Back	5mm	-	DSI3	21100	2535	1	12.50	13.50	1.259	-	-	0.12	1.030	<b>1.297</b>
	LTE Band 7	20M	QPSK	1	49	-	Back	5mm	-	DSI3	20850	2510	1	12.33	13.50	1.309	-	-	0.18	0.914	1.197
	LTE Band 7	20M	QPSK	1	49	-	Back	5mm	-	DSI3	21350	2560	1	12.38	13.50	1.294	-	-	0.08	0.943	1.220
	LTE Band 7	20M	QPSK	1	49	-	Back	5mm	Headset	DSI3	21100	2535	1	12.50	13.50	1.259	-	-	0.09	1.010	1.272
	LTE Band 7	20M	QPSK	1	49	-	Front	16mm	-	DSI4	21100	2535	1	22.99	24.00	1.262	-	-	-0.11	0.740	0.934
	LTE Band 7	20M	QPSK	1	49	-	Front	16mm	-	DSI4	20850	2510	1	22.94	24.00	1.276	-	-	-0.11	0.711	0.908
	LTE Band 7	20M	QPSK	1	49	-	Front	16mm	-	DSI4	21350	2560	1	22.93	24.00	1.279	-	-	-0.11	0.722	0.924
	LTE Band 7	20M	QPSK	1	49	-	Back	27mm	-	DSI4	21100	2535	1	22.99	24.00	1.262	-	-	0.01	0.556	0.702
	LTE Band 7	20M	QPSK	50	0	-	Front	5mm	-	DSI3	21100	2535	1	11.24	12.50	1.337	-	-	0.09	0.345	0.461
	LTE Band 7	20M	QPSK	50	0	-	Back	5mm	-	DSI3	21100	2535	1	11.24	12.50	1.337	-	-	-0.1	0.884	1.182
	LTE Band 7	20M	QPSK	50	0	-	Back	5mm	-	DSI3	20850	2510	1	11.22	12.50	1.343	-	-	0.19	0.790	1.061
	LTE Band 7	20M	QPSK	50	0	-	Back	5mm	-	DSI3	21350	2560	1	11.20	12.50	1.349	-	-	0.18	0.798	1.076
	LTE Band 7	20M	QPSK	100	0	-	Back	5mm	-	DSI3	21100	2535	1	11.27	12.50	1.327	-	-	0.18	0.887	1.177
	LTE Band 38	20M	QPSK	1	49	-	Front	5mm	-	DSI3	38000	2595	1	14.43	15.50	1.279	62.9	1.006	-0.04	0.552	0.710
42	LTE Band 38	20M	QPSK	1	49	-	Back	5mm	-	DSI3	38000	2595	1	14.43	15.50	1.279	62.9	1.006	0.15	1.070	<b>1.377</b>
	LTE Band 38	20M	QPSK	1	49	-	Back	5mm	-	DSI3	38000	2595	3	14.43	15.50	1.279	62.9	1.006	-0.14	1.010	1.300
	LTE Band 38	20M	QPSK	1	49	-	Back	5mm	-	DSI3	38000	2595	4	14.43	15.50	1.279	62.9	1.006	-0.08	0.709	0.913
	LTE Band 38	20M	QPSK	1	49	-	Back	5mm	-	DSI3	38000	2595	2	14.43	15.50	1.279	62.9	1.006	-0.17	0.818	1.053
	LTE Band 38	20M	QPSK	1	49	-	Back	5mm	Headset	DSI3	38000	2595	1	14.43	15.50	1.279	62.9	1.006	0.09	1.050	1.351
	LTE Band 38	20M	QPSK	1	49	-	Front	16mm	-	DSI4	38000	2595	1	23.03	24.00	1.250	62.9	1.006	-0.15	0.454	0.571
	LTE Band 38	20M	QPSK	1	49	-	Back	27mm	-	DSI4	38000	2595	1	23.03	24.00	1.250	62.9	1.006	0.03	0.268	0.337
	LTE Band 38	20M	QPSK	50	0	-	Front	5mm	-	DSI3	38000	2595	1	13.26	14.50	1.330	62.9	1.006	0.06	0.434	0.581
	LTE Band 38	20M	QPSK	50	0	-	Back	5mm	-	DSI3	38000	2595	1	13.26	14.50	1.330	62.9	1.006	0.13	0.868	1.162
	LTE Band 38	20M	QPSK	100	0	-	Back	5mm	-	DSI3	38000	2595	1	13.15	14.50	1.365	62.9	1.006	-0.08	0.835	1.146



Plot No.	Band	Mode	Test Position	Gap (mm)	Headset	Power State	Ch.	Freq. (MHz)	Sample	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)
<b>BT/WLAN2.4GHz</b>																	
	Bluetooth	DH5 1Mbps	Front	5mm	-	Full	39	2441	1	10.90	12.00	1.288	76.8	1.302	-0.05	0.073	0.122
43	Bluetooth	DH5 1Mbps	Back	5mm	-	Full	39	2441	1	10.90	12.00	1.288	76.8	1.302	0.03	0.125	<b>0.210</b>
	WLAN2.4GHz	802.11b 1Mbps	Front	5mm	-	Reduced	1	2412	1	16.70	17.50	1.202	100	1.000	0.04	0.444	0.534
	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	-	Reduced	1	2412	1	16.70	17.50	1.202	100	1.000	0.08	0.755	0.908
44	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	-	Reduced	6	2437	1	16.40	17.50	1.288	100	1.000	-0.11	0.893	<b>1.150</b>
	WLAN2.4GHz	802.11b 1Mbps	Front	16mm	-	Full	1	2412	1	19.10	20.00	1.230	100	1.000	0.05	0.231	0.284
	WLAN2.4GHz	802.11b 1Mbps	Back	27mm	-	Full	6	2437	1	18.70	20.00	1.349	100	1.000	0.02	0.155	0.209
<b>WLAN5GHz</b>																	
	WLAN5.3GHz	802.11ac-VHT80 MCS0	Front	5mm	-	Reduced	58	5290	1	12.11	14.00	1.545	87.8	1.139	-0.11	0.162	0.285
45	WLAN5.3GHz	802.11ac-VHT80 MCS0	Back	5mm	-	Reduced	58	5290	1	12.11	14.00	1.545	87.8	1.139	0.04	0.633	<b>1.114</b>
	WLAN5.3GHz	802.11a 6Mbps	Front	16mm	-	Full	60	5300	1	17.74	19.50	1.500	96.53	1.036	0.12	0.123	0.191
	WLAN5.3GHz	802.11a 6Mbps	Back	27mm	-	Full	60	5300	1	17.74	19.50	1.500	96.53	1.036	-0.17	0.554	0.861
	WLAN5.3GHz	802.11a 6Mbps	Back	27mm	-	Full	52	5260	1	17.73	19.50	1.502	96.53	1.036	0.04	0.533	0.829
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Front	5mm	-	Reduced	138	5690	1	11.72	13.50	1.507	87.8	1.139	-0.19	0.122	0.209
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Back	5mm	-	Reduced	138	5690	1	11.72	13.50	1.507	87.8	1.139	-0.18	0.618	1.061
46	WLAN5.5GHz	802.11ac-VHT80 MCS0	Back	5mm	-	Reduced	122	5610	1	11.55	13.50	1.567	87.8	1.139	0.12	0.662	<b>1.181</b>
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Back	5mm	-	Reduced	122	5610	3	11.55	13.50	1.567	87.8	1.139	0.1	0.640	1.142
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Back	5mm	-	Reduced	122	5610	4	11.55	13.50	1.567	87.8	1.139	-0.13	0.458	0.817
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Back	5mm	-	Reduced	122	5610	2	11.55	13.50	1.567	87.8	1.139	0.04	0.465	0.830
	WLAN5.5GHz	802.11a 6Mbps	Front	16mm	-	Full	144	5720	1	17.72	19.50	1.507	96.53	1.036	-0.19	0.125	0.195
	WLAN5.5GHz	802.11a 6Mbps	Back	27mm	-	Full	144	5720	1	17.72	19.50	1.507	96.53	1.036	0.08	0.393	0.613
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Front	5mm	-	Reduced	155	5775	1	11.85	13.50	1.462	87.8	1.139	-0.14	0.152	0.253
47	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	5mm	-	Reduced	155	5775	1	11.85	13.50	1.462	87.8	1.139	-0.06	0.659	<b>1.098</b>
	WLAN5.8GHz	802.11a 6Mbps	Front	16mm	-	Full	149	5745	1	17.82	19.50	1.471	96.53	1.036	0.02	0.174	0.265
	WLAN5.8GHz	802.11a 6Mbps	Back	27mm	-	Full	149	5745	1	17.82	19.50	1.471	96.53	1.036	0.13	0.509	0.776

**15.4 Product specific 10g SAR**

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Power State	Ch.	Freq. (MHz)	Sample	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)
<b>750MHz</b>																				
48	LTE Band 13	10M	QPSK	1	25	-	Back	0mm	DSi6	23230	782	1	22.91	24.00	1.285	-	-	0.03	1.690	2.172
	LTE Band 13	10M	QPSK	25	0	-	Back	0mm	DSi6	23230	782	1	21.83	23.00	1.309	-	-	-0.04	1.270	1.663
	LTE Band 13	10M	QPSK	50	0	-	Back	0mm	DSi6	23230	782	1	21.80	23.00	1.318	-	-	0.06	1.180	1.556
<b>835MHz</b>																				
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Back	0mm	DSi6	189	836.4	1	30.38	31.50	1.294	-	-	-0.03	1.900	2.459
49	GSM850	-	-	-	-	GPRS (2 Tx slots)	Back	0mm	DSi6	128	824.2	1	30.29	31.50	1.321	-	-	-0.05	2.620	3.462
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Back	0mm	DSi6	128	824.2	3	30.29	31.50	1.321	-	-	-0.08	2.570	3.396
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Back	0mm	DSi6	128	824.2	4	30.29	31.50	1.321	-	-	0.01	2.110	2.788
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Back	0mm	DSi6	128	824.2	2	30.29	31.50	1.321	-	-	0.08	2.080	2.748
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Back	0mm	DSi6	128	824.2	1	30.29	31.50	1.321	-	-	-0.03	2.060	2.722
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Back	0mm	DSi6	251	848.8	1	30.28	31.50	1.324	-	-	0.12	1.540	2.039
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Bottom side	0mm	DSi6	189	836.4	1	30.38	31.50	1.294	-	-	0.03	1.810	2.342
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Bottom side	0mm	DSi6	128	824.2	1	30.29	31.50	1.321	-	-	0.13	1.670	2.207
	GSM850	-	-	-	-	GPRS (2 Tx slots)	Bottom side	0mm	DSi6	251	848.8	1	30.28	31.50	1.324	-	-	0.19	1.880	2.490
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	0mm	DSi6	4182	836.4	1	22.95	24.00	1.274	-	-	-0.08	1.920	2.445
50	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	0mm	DSi6	4132	826.4	1	22.90	24.00	1.288	-	-	-0.09	2.030	2.615
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	0mm	DSi6	4233	846.6	1	22.83	24.00	1.309	-	-	0.08	1.890	2.474
51	LTE Band 26	15M	QPSK	1	37	-	Back	0mm	DSi6	26865	831.5	1	22.92	24.00	1.282	-	-	0.16	1.920	2.462
	LTE Band 26	15M	QPSK	36	0	-	Back	0mm	DSi6	26865	831.5	1	21.85	23.00	1.303	-	-	-0.18	1.530	1.994
	LTE Band 26	15M	QPSK	75	0	-	Back	0mm	DSi6	26865	831.5	1	21.78	23.00	1.324	-	-	-0.11	1.490	1.973
<b>1750MHz</b>																				
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	0mm	DSi6	1413	1732.6	1	19.71	20.50	1.199	-	-	0.08	1.010	1.211
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	0mm	DSi6	1413	1732.6	1	19.71	20.50	1.199	-	-	0.17	1.640	1.967
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	0mm	DSi6	1312	1712.4	1	19.67	20.50	1.211	-	-	0.09	2.010	2.433
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	0mm	DSi6	1513	1752.6	1	19.58	20.50	1.236	-	-	0.1	1.560	1.928
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom side	0mm	DSi6	1413	1732.6	1	19.71	20.50	1.199	-	-	-0.06	2.550	3.059
52	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom side	0mm	DSi6	1312	1712.4	1	19.67	20.50	1.211	-	-	0.07	2.900	3.511
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom side	0mm	DSi6	1513	1752.6	1	19.58	20.50	1.236	-	-	-0.04	2.490	3.078
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Front	9mm	DSi4	1413	1732.6	1	23.12	24.00	1.225	-	-	0.03	0.596	0.730
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Back	14mm	DSi4	1312	1712.4	1	23.11	24.00	1.227	-	-	0.08	0.694	0.852
	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom side	14mm	DSi4	1312	1712.4	1	23.11	24.00	1.227	-	-	-0.04	0.923	1.133
	LTE Band 66	20M	QPSK	1	49	-	Front	0mm	DSi6	132322	1745	1	20.11	21.00	1.227	-	-	-0.07	0.981	1.204
	LTE Band 66	20M	QPSK	1	49	-	Back	0mm	DSi6	132322	1745	1	20.11	21.00	1.227	-	-	-0.01	1.680	2.062
	LTE Band 66	20M	QPSK	1	49	-	Back	0mm	DSi6	132072	1720	1	19.95	21.00	1.274	-	-	-0.07	1.990	2.534
	LTE Band 66	20M	QPSK	1	49	-	Back	0mm	DSi6	132572	1770	1	19.98	21.00	1.265	-	-	0.18	1.740	2.201
	LTE Band 66	20M	QPSK	1	49	-	Bottom side	0mm	DSi6	132322	1745	1	20.11	21.00	1.227	-	-	-0.18	2.670	3.277
53	LTE Band 66	20M	QPSK	1	49	-	Bottom side	0mm	DSi6	132072	1720	1	19.95	21.00	1.274	-	-	0.04	2.740	3.489
	LTE Band 66	20M	QPSK	1	49	-	Bottom side	0mm	DSi6	132572	1770	1	19.98	21.00	1.265	-	-	0.04	2.680	3.389
	LTE Band 66	20M	QPSK	1	49	-	Front	9mm	DSi4	132322	1745	1	23.12	24.00	1.225	-	-	-0.02	0.410	0.502
	LTE Band 66	20M	QPSK	1	49	-	Back	14mm	DSi4	132072	1720	1	23.07	24.00	1.239	-	-	-0.08	0.452	0.560
	LTE Band 66	20M	QPSK	1	49	-	Bottom side	14mm	DSi4	132072	1720	1	23.07	24.00	1.239	-	-	-0.16	0.635	0.787
	LTE Band 66	20M	QPSK	50	0	-	Front	0mm	DSi6	132322	1745	1	19.06	20.00	1.242	-	-	0.16	0.772	0.959
	LTE Band 66	20M	QPSK	50	0	-	Back	0mm	DSi6	132322	1745	1	19.06	20.00	1.242	-	-	-0.18	1.350	1.676
	LTE Band 66	20M	QPSK	50	0	-	Bottom side	0mm	DSi6	132322	1745	1	19.06	20.00	1.242	-	-	0.18	2.150	2.670
	LTE Band 66	20M	QPSK	50	0	-	Bottom side	0mm	DSi6	132072	1720	1	18.99	20.00	1.262	-	-	-0.18	2.420	3.054
	LTE Band 66	20M	QPSK	50	0	-	Bottom side	0mm	DSi6	132572	1770	1	18.86	20.00	1.300	-	-	0.16	2.220	2.886
	LTE Band 66	20M	QPSK	100	0	-	Back	0mm	DSi6	132322	1745	1	18.95	20.00	1.274	-	-	-0.09	1.340	1.706
	LTE Band 66	20M	QPSK	100	0	-	Bottom side	0mm	DSi6	132322	1745	1	18.95	20.00	1.274	-	-	0.03	2.11	2.687
<b>1900MHz</b>																				
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Front	0mm	DSi6	512	1850.2	1	24.45	25.50	1.274	-	-	0.05	1.320	1.681





	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Back	0mm	DSI6	512	1850.2	1	24.45	25.50	1.274	-	-	0.14	2.170	2.764
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Back	0mm	DSI6	661	1880	1	24.29	25.50	1.321	-	-	0.09	2.260	2.986
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Back	0mm	DSI6	810	1909.8	1	24.18	25.50	1.355	-	-	0.12	2.130	2.887
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Bottom side	0mm	DSI6	512	1850.2	1	24.45	25.50	1.274	-	-	-0.03	2.680	3.413
54	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Bottom side	0mm	DSI6	661	1880	1	24.29	25.50	1.321	-	-	0.05	2.710	3.581
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Bottom side	0mm	DSI6	661	1880	3	24.29	25.50	1.321	-	-	-0.12	2.460	3.250
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Bottom side	0mm	DSI6	661	1880	4	24.29	25.50	1.321	-	-	-0.11	2.240	2.960
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Bottom side	0mm	DSI6	661	1880	2	24.29	25.50	1.321	-	-	0.01	2.500	3.303
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Bottom side	0mm	DSI6	810	1909.8	1	24.18	25.50	1.355	-	-	-0.07	2.480	3.361
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Front	9mm	DSI4	512	1850.2	1	27.55	28.50	1.245	-	-	0.11	0.451	0.561
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Back	14mm	DSI4	661	1880	1	27.37	28.50	1.297	-	-	0.11	0.570	0.739
	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Bottom side	14mm	DSI4	661	1880	1	27.37	28.50	1.297	-	-	-0.08	0.874	1.134
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	0mm	DSI6	9400	1880	1	18.83	20.00	1.309	-	-	-0.11	1.020	1.335
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	0mm	DSI6	9400	1880	1	18.83	20.00	1.309	-	-	0.05	2.180	2.854
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	0mm	DSI6	9262	1852.4	1	18.77	20.00	1.327	-	-	-0.19	2.360	3.133
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	0mm	DSI6	9538	1907.6	1	18.80	20.00	1.318	-	-	0.12	2.020	2.663
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom side	0mm	DSI6	9400	1880	1	18.83	20.00	1.309	-	-	0.13	2.530	3.312
55	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom side	0mm	DSI6	9262	1852.4	1	18.77	20.00	1.327	-	-	0.05	2.690	3.571
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom side	0mm	DSI6	9538	1907.6	1	18.80	20.00	1.318	-	-	-0.01	2.390	3.151
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	9mm	DSI4	9400	1880	1	23.30	24.00	1.175	-	-	0.01	0.625	0.734
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	14mm	DSI4	9262	1852.4	1	22.84	24.00	1.306	-	-	-0.07	0.882	1.152
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom side	14mm	DSI4	9262	1852.4	1	22.84	24.00	1.306	-	-	-0.02	0.993	1.297
	LTE Band 2	20M	QPSK	1	49	-	Front	0mm	DSI6	18900	1880	1	18.88	20.00	1.294	-	-	0.04	0.996	1.289
	LTE Band 2	20M	QPSK	1	49	-	Back	0mm	DSI6	18900	1880	1	18.88	20.00	1.294	-	-	0.04	2.130	2.757
	LTE Band 2	20M	QPSK	1	49	-	Back	0mm	DSI6	18700	1860	1	18.74	20.00	1.337	-	-	0.03	2.270	3.034
	LTE Band 2	20M	QPSK	1	49	-	Back	0mm	DSI6	19100	1900	1	18.86	20.00	1.300	-	-	0.06	2.020	2.626
	LTE Band 2	20M	QPSK	1	49	-	Bottom side	0mm	DSI6	18900	1880	1	18.88	20.00	1.294	-	-	0.11	2.470	3.197
56	LTE Band 2	20M	QPSK	1	49	-	Bottom side	0mm	DSI6	18700	1860	1	18.74	20.00	1.337	-	-	0.12	2.520	3.368
	LTE Band 2	20M	QPSK	1	49	-	Bottom side	0mm	DSI6	19100	1900	1	18.86	20.00	1.300	-	-	0.07	2.380	3.094
	LTE Band 2	20M	QPSK	1	49	-	Front	9mm	DSI4	18900	1880	1	23.00	24.00	1.259	-	-	-0.13	0.522	0.657
	LTE Band 2	20M	QPSK	1	49	-	Back	14mm	DSI4	18700	1860	1	22.89	24.00	1.291	-	-	-0.08	0.710	0.917
	LTE Band 2	20M	QPSK	1	49	-	Bottom side	14mm	DSI4	18700	1860	1	22.89	24.00	1.291	-	-	0.08	1.030	1.330
	LTE Band 2	20M	QPSK	50	0	-	Front	0mm	DSI6	18900	1880	1	17.92	19.00	1.282	-	-	-0.01	0.782	1.003
	LTE Band 2	20M	QPSK	50	0	-	Back	0mm	DSI6	18900	1880	1	17.92	19.00	1.282	-	-	-0.08	1.720	2.206
	LTE Band 2	20M	QPSK	50	0	-	Back	0mm	DSI6	18700	1860	1	17.83	19.00	1.309	-	-	0.09	1.840	2.409
	LTE Band 2	20M	QPSK	50	0	-	Back	0mm	DSI6	19100	1900	1	17.85	19.00	1.303	-	-	-0.12	1.620	2.111
	LTE Band 2	20M	QPSK	50	0	-	Bottom side	0mm	DSI6	18900	1880	1	17.92	19.00	1.282	-	-	-0.06	2.010	2.577
	LTE Band 2	20M	QPSK	50	0	-	Bottom side	0mm	DSI6	18700	1860	1	17.83	19.00	1.309	-	-	-0.03	2.060	2.697
	LTE Band 2	20M	QPSK	50	0	-	Bottom side	0mm	DSI6	19100	1900	1	17.85	19.00	1.303	-	-	-0.16	1.970	2.567
	LTE Band 2	20M	QPSK	100	0	-	Back	0mm	DSI6	18900	1880	1	17.88	19.00	1.294	-	-	0.04	1.590	2.058
	LTE Band 2	20M	QPSK	100	0	-	Bottom side	0mm	DSI6	18900	1880	1	17.88	19.00	1.294	-	-	0.01	1.980	2.563
<b>2600MHz</b>																				
	LTE Band 7	20M	QPSK	1	49	-	Front	0mm	DSI6	21100	2535	1	17.47	18.50	1.268	-	-	0.14	1.290	1.635
	LTE Band 7	20M	QPSK	1	49	-	Back	0mm	DSI6	21100	2535	1	17.47	18.50	1.268	-	-	-0.14	2.350	2.979
57	LTE Band 7	20M	QPSK	1	49	-	Back	0mm	DSI6	20850	2510	1	17.39	18.50	1.291	-	-	-0.01	2.420	3.125
	LTE Band 7	20M	QPSK	1	49	-	Back	0mm	DSI6	21350	2560	1	17.39	18.50	1.291	-	-	0.13	2.110	2.724
	LTE Band 7	20M	QPSK	1	49	-	Bottom side	0mm	DSI6	21100	2535	1	17.47	18.50	1.268	-	-	0.17	0.947	1.200
	LTE Band 7	20M	QPSK	1	49	-	Front	9mm	DSI4	21100	2535	1	22.99	24.00	1.262	-	-	-0.09	0.802	1.012
	LTE Band 7	20M	QPSK	1	49	-	Back	14mm	DSI4	20850	2510	1	22.94	24.00	1.276	-	-	-0.17	1.020	1.302
	LTE Band 7	20M	QPSK	1	49	-	Bottom side	14mm	DSI4	21100	2535	1	22.99	24.00	1.262	-	-	-0.18	1.540	1.943
	LTE Band 7	20M	QPSK	50	0	-	Front	0mm	DSI6	21100	2535	1	16.39	17.50	1.291	-	-	0.16	1.090	1.407
	LTE Band 7	20M	QPSK	50	0	-	Back	0mm	DSI6	21100	2535	1	16.39	17.50	1.291	-	-	0.13	1.910	2.466
	LTE Band 7	20M	QPSK	50	0	-	Back	0mm	DSI6	20850	2510	1	16.38	17.50	1.294	-	-	-0.1	2.000	2.588
	LTE Band 7	20M	QPSK	50	0	-	Back	0mm	DSI6	21350	2560	1	16.30	17.50	1.318	-	-	0.09	1.860	2.452
	LTE Band 7	20M	QPSK	50	0	-	Bottom side	0mm	DSI6	21100	2535	1	16.39	17.50	1.291	-	-	0.06	0.779	1.006
	LTE Band 7	20M	QPSK	100	0	-	Back	0mm	DSI6	21100	2535	1	16.37	17.50	1.297	-	-	0.04	1.850	2.400



	LTE Band 38	20M	QPSK	1	49	-	Front	0mm	DSI6	38000	2595	1	19.95	21.00	1.274	62.9	1.006	-0.12	1.470	1.883
58	LTE Band 38	20M	QPSK	1	49	-	Back	0mm	DSI6	38000	2595	1	19.95	21.00	1.274	62.9	1.006	0.18	2.630	3.369
	LTE Band 38	20M	QPSK	1	49	-	Back	0mm	DSI6	38000	2595	3	19.95	21.00	1.274	62.9	1.006	-0.18	2.380	3.049
	LTE Band 38	20M	QPSK	1	49	-	Back	0mm	DSI6	38000	2595	4	19.95	21.00	1.274	62.9	1.006	0	1.720	2.204
	LTE Band 38	20M	QPSK	1	49	-	Back	0mm	DSI6	38000	2595	2	19.95	21.00	1.274	62.9	1.006	0.11	1.700	2.178
	LTE Band 38	20M	QPSK	1	49	-	Bottom side	0mm	DSI6	38000	2595	1	19.95	21.00	1.274	62.9	1.006	0.19	0.799	1.024
	LTE Band 38	20M	QPSK	1	49	-	Front	9mm	DSI4	38000	2595	1	23.03	24.00	1.250	62.9	1.006	-0.12	0.430	0.541
	LTE Band 38	20M	QPSK	1	49	-	Back	14mm	DSI4	38000	2595	1	23.03	24.00	1.250	62.9	1.006	-0.19	0.497	0.625
	LTE Band 38	20M	QPSK	1	49	-	Bottom side	14mm	DSI4	38000	2595	1	23.03	24.00	1.250	62.9	1.006	0.05	0.763	0.960
	LTE Band 38	20M	QPSK	50	0	-	Front	0mm	DSI6	38000	2595	1	18.87	20.00	1.297	62.9	1.006	0.02	1.200	1.566
	LTE Band 38	20M	QPSK	50	0	-	Back	0mm	DSI6	38000	2595	1	18.87	20.00	1.297	62.9	1.006	-0.07	1.850	2.414
	LTE Band 38	20M	QPSK	50	0	-	Bottom side	0mm	DSI6	38000	2595	1	18.87	20.00	1.297	62.9	1.006	0	0.640	0.835
	LTE Band 38	20M	QPSK	100	0	-	Back	0mm	DSI6	38000	2595	1	18.74	20.00	1.337	62.9	1.006	-0.1	1.810	2.434

Plot No.	Band	Mode	Test Position	Gap (mm)	Power State	Ch.	Freq. (MHz)	Sample	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)
<b>BT/WLAN2.4GHz</b>																
59	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Full	1	2412	1	19.10	20.00	1.230	100	1.000	0.09	1.300	1.599
<b>WLAN5GHz</b>																
	WLAN5.2GHz	802.11a 6Mbps	Back	0mm	Full	36	5180	1	17.84	19.50	1.466	96.53	1.036	-0.01	1.410	2.141
60	WLAN5.2GHz	802.11a 6Mbps	Back	0mm	Full	48	5240	1	17.83	19.50	1.468	96.53	1.036	-0.12	1.450	2.205
	WLAN5.2GHz	802.11a 6Mbps	Right side	0mm	Full	36	5180	1	17.84	19.50	1.466	96.53	1.036	0.11	1.310	1.989
	WLAN5.2GHz	802.11a 6Mbps	Top Side	0mm	Full	36	5180	1	17.84	19.50	1.466	96.53	1.036	0.14	1.380	2.095
	WLAN5.2GHz	802.11a 6Mbps	Top Side	0mm	Full	48	5240	1	17.83	19.50	1.468	96.53	1.036	0.02	1.390	2.114
	WLAN5.3GHz	802.11a 6Mbps	Front	0mm	Full	60	5300	1	17.74	19.50	1.500	96.53	1.036	0.15	0.454	0.705
61	WLAN5.3GHz	802.11a 6Mbps	Back	0mm	Full	60	5300	1	17.74	19.50	1.500	96.53	1.036	0.13	1.570	2.439
	WLAN5.3GHz	802.11a 6Mbps	Left side	0mm	Full	60	5300	1	17.74	19.50	1.500	96.53	1.036	0.06	0.045	0.070
	WLAN5.3GHz	802.11a 6Mbps	Right side	0mm	Full	60	5300	1	17.74	19.50	1.500	96.53	1.036	-0.16	1.190	1.849
	WLAN5.3GHz	802.11a 6Mbps	Top Side	0mm	Full	60	5300	1	17.74	19.50	1.500	96.53	1.036	-0.03	1.220	1.895
	WLAN5.3GHz	802.11a 6Mbps	Back	0mm	Full	52	5260	1	17.73	19.50	1.502	96.53	1.036	0.17	1.270	1.976
	WLAN5.5GHz	802.11a 6Mbps	Front	0mm	Full	144	5720	1	17.72	19.50	1.507	96.53	1.036	-0.12	0.347	0.542
	WLAN5.5GHz	802.11a 6Mbps	Back	0mm	Full	144	5720	1	17.72	19.50	1.507	96.53	1.036	0.07	1.290	2.013
62	WLAN5.5GHz	802.11a 6Mbps	Back	0mm	Full	116	5580	1	17.71	19.50	1.510	96.53	1.036	0.07	1.560	2.441
	WLAN5.5GHz	802.11a 6Mbps	Back	0mm	Full	116	5580	3	17.71	19.50	1.510	96.53	1.036	-0.14	1.540	2.409
	WLAN5.5GHz	802.11a 6Mbps	Back	0mm	Full	116	5580	4	17.71	19.50	1.510	96.53	1.036	0.08	1.390	2.175
	WLAN5.5GHz	802.11a 6Mbps	Back	0mm	Full	116	5580	2	17.71	19.50	1.510	96.53	1.036	-0.18	1.160	1.815
	WLAN5.5GHz	802.11a 6Mbps	Left side	0mm	Full	144	5720	1	17.72	19.50	1.507	96.53	1.036	0.03	0.048	0.075
	WLAN5.5GHz	802.11a 6Mbps	Right side	0mm	Full	144	5720	1	17.72	19.50	1.507	96.53	1.036	-0.09	0.672	1.049
	WLAN5.5GHz	802.11a 6Mbps	Top Side	0mm	Full	144	5720	1	17.72	19.50	1.507	96.53	1.036	-0.19	1.080	1.686
63	WLAN5.8GHz	802.11a 6Mbps	Back	0mm	Full	149	5745	1	17.82	19.00	1.311	96.53	1.036	0.05	1.480	2.010
	WLAN5.8GHz	802.11a 6Mbps	Back	0mm	Full	157	5785	1	17.74	19.00	1.336	96.53	1.036	0.06	1.320	1.826
	WLAN5.8GHz	802.11a 6Mbps	Right side	0mm	Full	149	5745	1	17.82	19.00	1.311	96.53	1.036	0.04	0.755	1.026
	WLAN5.8GHz	802.11a 6Mbps	Top Side	0mm	Full	149	5745	1	17.82	19.00	1.311	96.53	1.036	0.1	1.450	1.970

15.5 Repeated SAR Measurement

<1g>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Power State	Ch.	Freq. (MHz)	Sample	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	WLAN2.4GHz	-	-	-	-	802.11b 1Mbps	Left Cheek	0mm	Receiver on	6	2437	1	14.90	16.00	1.288	100	1.000	0.15	0.905	1	1.166
2nd	WLAN2.4GHz	-	-	-	-	802.11b 1Mbps	Left Cheek	0mm	Receiver on	6	2437	1	14.90	16.00	1.288	100	1.000	0.03	0.901	1.00	1.161
1st	LTE Band 13	10M	QPSK	1	25	-	Back	5mm	DSI3	23230	782	1	22.91	24.00	1.285	-	-	-0.07	1.110	1	1.427
2nd	LTE Band 13	10M	QPSK	1	25	-	Back	5mm	DSI3	23230	782	1	22.91	24.00	1.285	-	-	0.11	1.080	1.03	1.388
1st	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	DSI3	4233	846.6	1	21.37	22.50	1.297	-	-	0.03	1.100	1	1.427
2nd	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	DSI3	4233	846.6	1	21.37	22.50	1.297	-	-	0.01	1.070	1.03	1.388
1st	LTE Band 66	20M	QPSK	1	49	-	Bottom side	5mm	DSI7	132072	1720	1	15.70	16.50	1.202	-	-	-0.15	1.170	1	1.407
2nd	LTE Band 66	20M	QPSK	1	49	-	Bottom side	5mm	DSI7	132072	1720	1	15.70	16.50	1.202	-	-	-0.03	1.140	1.03	1.371
1st	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Bottom side	5mm	DSI7	661	1880	1	17.32	18.50	1.312	-	-	0.05	1.090	1	1.430
2nd	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Bottom side	5mm	DSI7	661	1880	1	17.32	18.50	1.312	-	-	-0.09	1.050	1.04	1.378
1st	LTE Band 38	20M	QPSK	1	49	-	Back	5mm	DSI3	38000	2595	1	14.43	15.50	1.279	62.9	1.006	0.15	1.070	1	1.377
2nd	LTE Band 38	20M	QPSK	1	49	-	Back	5mm	DSI3	38000	2595	1	14.43	15.50	1.279	62.9	1.006	0.09	1.020	1.05	1.313

<10g>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Power State	Ch.	Freq. (MHz)	Sample	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)	Ratio	Reported 10g SAR (W/kg)
1st	GSM850	-	-	-	-	GPRS (2 Tx slots)	Back	0mm	DSI6	128	824.2	1	30.29	31.50	1.321	-	-	-0.05	2.620	1	3.462
2nd	GSM850	-	-	-	-	GPRS (2 Tx slots)	Back	0mm	DSI6	128	824.2	1	30.29	31.50	1.321	-	-	0.02	2.590	1.01	3.422
1st	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom side	0mm	DSI6	1312	1712.4	1	19.67	20.50	1.211	-	-	0.07	2.900	1	3.511
2nd	WCDMA IV	-	-	-	-	RMC 12.2Kbps	Bottom side	0mm	DSI6	1312	1712.4	1	19.67	20.50	1.211	-	-	0.09	2.860	1.01	3.462
1st	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Bottom side	0mm	DSI6	661	1880	1	24.29	25.50	1.321	-	-	0.05	2.710	1	3.581
2nd	GSM1900	-	-	-	-	GPRS (2 Tx slots)	Bottom side	0mm	DSI6	661	1880	1	24.29	25.50	1.321	-	-	0.01	2.680	1.01	3.541
1st	LTE Band 38	20M	QPSK	1	49	-	Back	0mm	DSI6	38000	2595	1	19.95	21.00	1.274	62.9	1.006	0.18	2.630	1	3.369
2nd	LTE Band 38	20M	QPSK	1	49	-	Back	0mm	DSI6	38000	2595	1	19.95	21.00	1.274	62.9	1.006	0.13	2.610	1.01	3.344

General Note:

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

## 16. Simultaneous Transmission Analysis

NO.	Simultaneous Transmission Configurations	Mobile Cellular Phone			
		Head	Body	Hotspot	Product specific 10g SAR
1.	WWAN + WLAN2.4GHz	Yes	Yes	Yes	Yes
2.	WWAN + WLAN5GHz	Yes	Yes	Yes	Yes
3.	WWAN + Bluetooth	Yes	Yes	Yes	Yes

**General Note:**

1. This device supports VoIP in GPRS, EGPRS, WCDMA and LTE (e.g. for 3rd-party VoIP), and LTE supports VoLTE function.
2. EUT will choose each GSM, WCDMA and LTE according to the network signal condition; therefore, they will not operate simultaneously at any moment.
3. This device WLAN 2.4GHz supports hotspot operation and Bluetooth support tethering applications.
4. 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).
5. According to the EUT characteristic, WLAN 5GHz and Bluetooth cannot transmit simultaneously.
6. According to the EUT characteristic, WLAN 5GHz and WLAN 2.4GHz cannot transmit simultaneously.
7. WLAN 2.4GHz and Bluetooth share the same antenna and they cannot transmit simultaneously.
8. The worst case 5 GHz WLAN SAR for each configuration was used for SAR summation.
9. When stand-alone SAR is not required for a transmitter or antenna, its SAR is considered zero in the SAR summing process to assess Multi-band transmission SAR compliance.
10. The maximum SAR summation is calculated based on the same configuration and test position.
11. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
  - i) 1g Scalar SAR summation < 1.6W/kg and 10g Scalar SAR summation < 4.0W/kg.
  - ii)  $SPLSR = (SAR1 + SAR2)^{1.5} / (\text{min. separation distance, mm})$ , 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.
  - iii) If  $SPLSR \leq 0.04$  for 1g SAR and  $SPLSR \leq 0.10$  for 10g SAR, simultaneously transmission SAR measurement is not necessary.
  - iv) Simultaneously transmission SAR measurement, and the reported multi-band 1g SAR < 1.6W/kg and 10g SAR < 4.0W/kg.
  - v) The SPLSR calculated results please refer to section 16.5.



16.1 Head Exposure Conditions

WWAN Band	Exposure Position	1	3	4	5	1+3	1+4	1+5
		WWAN	WLAN2.4GHz	WLAN5GHz	Bluetooth	Summed	Summed	Summed
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
LTE Band 13 Ant 0	Right Cheek	0.451	0.277	0.694	0.109	0.73	1.15	0.56
	Right Tilted	0.292	0.311	0.847	0.057	0.60	1.14	0.35
	Left Cheek	0.414	1.166	1.075	0.292	1.58	1.49	0.71
	Left Tilted	0.261	0.453	1.150	0.158	0.71	1.41	0.42
GSM850 Ant 0	Right Cheek	0.588	0.277	0.694	0.109	0.87	1.28	0.70
	Right Tilted	0.252	0.311	0.847	0.057	0.56	1.10	0.31
	Left Cheek	0.405	1.166	1.075	0.292	1.57	1.48	0.70
	Left Tilted	0.251	0.453	1.150	0.158	0.70	1.40	0.41
WCDMA V Ant 0	Right Cheek	0.530	0.277	0.694	0.109	0.81	1.22	0.64
	Right Tilted	0.257	0.311	0.847	0.057	0.57	1.10	0.31
	Left Cheek	0.408	1.166	1.075	0.292	1.57	1.48	0.70
	Left Tilted	0.232	0.453	1.150	0.158	0.69	1.38	0.39
LTE Band 26 Ant 0	Right Cheek	0.463	0.277	0.694	0.109	0.74	1.16	0.57
	Right Tilted	0.263	0.311	0.847	0.057	0.57	1.11	0.32
	Left Cheek	0.405	1.166	1.075	0.292	1.57	1.48	0.70
	Left Tilted	0.185	0.453	1.150	0.158	0.64	1.34	0.34
WCDMA IV Ant 0	Right Cheek	0.383	0.277	0.694	0.109	0.66	1.08	0.49
	Right Tilted	0.192	0.311	0.847	0.057	0.50	1.04	0.25
	Left Cheek	0.282	1.166	1.075	0.292	1.45	1.36	0.57
	Left Tilted	0.196	0.453	1.150	0.158	0.65	1.35	0.35
LTE Band 66 Ant 0	Right Cheek	0.328	0.277	0.694	0.109	0.61	1.02	0.44
	Right Tilted	0.164	0.311	0.847	0.057	0.48	1.01	0.22
	Left Cheek	0.250	1.166	1.075	0.292	1.42	1.33	0.54
	Left Tilted	0.205	0.453	1.150	0.158	0.66	1.36	0.36
GSM1900 Ant 0	Right Cheek	0.239	0.277	0.694	0.109	0.52	0.93	0.35
	Right Tilted	0.107	0.311	0.847	0.057	0.42	0.95	0.16
	Left Cheek	0.116	1.166	1.075	0.292	1.28	1.19	0.41
	Left Tilted	0.103	0.453	1.150	0.158	0.56	1.25	0.26
WCDMA II Ant 0	Right Cheek	0.369	0.277	0.694	0.109	0.65	1.06	0.48
	Right Tilted	0.192	0.311	0.847	0.057	0.50	1.04	0.25
	Left Cheek	0.199	1.166	1.075	0.292	1.37	1.27	0.49
	Left Tilted	0.189	0.453	1.150	0.158	0.64	1.34	0.35
LTE Band 2 Ant 0	Right Cheek	0.321	0.277	0.694	0.109	0.60	1.02	0.43
	Right Tilted	0.159	0.311	0.847	0.057	0.47	1.01	0.22
	Left Cheek	0.189	1.166	1.075	0.292	1.36	1.26	0.48
	Left Tilted	0.215	0.453	1.150	0.158	0.67	1.37	0.37
LTE Band 7 Ant 0	Right Cheek	0.199	0.277	0.694	0.109	0.48	0.89	0.31
	Right Tilted	0.048	0.311	0.847	0.057	0.36	0.90	0.11
	Left Cheek	0.105	1.166	1.075	0.292	1.27	1.18	0.40
	Left Tilted	0.082	0.453	1.150	0.158	0.54	1.23	0.24
LTE Band 38 Ant 0	Right Cheek	0.087	0.277	0.694	0.109	0.36	0.78	0.20
	Right Tilted	0.063	0.311	0.847	0.057	0.37	0.91	0.12
	Left Cheek	0.045	1.166	1.075	0.292	1.21	1.12	0.34
	Left Tilted	0.025	0.453	1.150	0.158	0.48	1.18	0.18

**16.2 Hotspot Exposure Conditions**

WWAN Band	Exposure Position	1	3	4	5	1+3	1+4	1+5	Case No
		WWAN	WLAN2.4GHz	WLAN5GHz	Bluetooth	Summed	Summed	Summed	
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	
LTE Band 13 Ant 0	Front	0.724	0.534	0.253	0.122	1.26	0.98	0.85	
	Back	1.427	1.150	1.098	0.210	<b>2.58</b>	<b>2.53</b>	<b>1.64</b>	Case1/2/3
	Left side	0.470	0.078	0.088	0.018	0.55	0.56	0.49	
	Right side	0.824	0.559	0.478	0.126	1.38	1.30	0.95	
	Top side		0.482	1.159	0.114	0.48	1.16	0.11	
	Bottom side	0.994				0.99	0.99	0.99	
GSM850 Ant 0	Front	0.707	0.534	0.253	0.122	1.24	0.96	0.83	
	Back	1.434	1.150	1.098	0.210	<b>2.58</b>	<b>2.53</b>	<b>1.64</b>	Case4/5/6
	Left side	0.264	0.078	0.088	0.018	0.34	0.35	0.28	
	Right side	0.542	0.559	0.478	0.126	1.10	1.02	0.67	
	Top side		0.482	1.159	0.114	0.48	1.16	0.11	
	Bottom side	0.703				0.70	0.70	0.70	
WCDMA V Ant 0	Front	0.656	0.534	0.253	0.122	1.19	0.91	0.78	
	Back	1.427	1.150	1.098	0.210	<b>2.58</b>	<b>2.53</b>	<b>1.64</b>	Case7/8/9
	Left side	0.323	0.078	0.088	0.018	0.40	0.41	0.34	
	Right side	0.537	0.559	0.478	0.126	1.10	1.02	0.66	
	Top side		0.482	1.159	0.114	0.48	1.16	0.11	
	Bottom side	0.659				0.66	0.66	0.66	
LTE Band 26 Ant 0	Front	0.719	0.534	0.253	0.122	1.25	0.97	0.84	
	Back	1.349	1.150	1.098	0.210	<b>2.50</b>	<b>2.45</b>	1.56	Case10/11
	Left side	0.383	0.078	0.088	0.018	0.46	0.47	0.40	
	Right side	0.607	0.559	0.478	0.126	1.17	1.09	0.73	
	Top side		0.482	1.159	0.114	0.48	1.16	0.11	
	Bottom side	0.623				0.62	0.62	0.62	
WCDMA IV Ant 0	Front	0.450	0.534	0.253	0.122	0.98	0.70	0.57	
	Back	1.407	1.150	1.098	0.210	<b>2.56</b>	<b>2.51</b>	<b>1.62</b>	Case 12/13/14
	Left side	0.073	0.078	0.088	0.018	0.15	0.16	0.09	
	Right side	0.078	0.559	0.478	0.126	0.64	0.56	0.20	
	Top side		0.482	1.159	0.114	0.48	1.16	0.11	
	Bottom side	1.382				1.38	1.38	1.38	
LTE Band 66 Ant 0	Front	0.385	0.534	0.253	0.122	0.92	0.64	0.51	
	Back	1.391	1.150	1.098	0.210	<b>2.54</b>	<b>2.49</b>	<b>1.60</b>	Case 15/16/17
	Left side	0.095	0.078	0.088	0.018	0.17	0.18	0.11	
	Right side	0.077	0.559	0.478	0.126	0.64	0.56	0.20	
	Top side		0.482	1.159	0.114	0.48	1.16	0.11	
	Bottom side	1.407				1.41	1.41	1.41	
GSM1900 Ant 0	Front	0.493	0.534	0.253	0.122	1.03	0.75	0.62	
	Back	1.296	1.150	1.098	0.210	<b>2.45</b>	<b>2.39</b>	1.51	Case 18/19
	Left side	0.017	0.078	0.088	0.018	0.10	0.11	0.04	
	Right side	0.102	0.559	0.478	0.126	0.66	0.58	0.23	
	Top side		0.482	1.159	0.114	0.48	1.16	0.11	
	Bottom side	1.430				1.43	1.43	1.43	
WCDMA II Ant 0	Front	0.448	0.534	0.253	0.122	0.98	0.70	0.57	
	Back	1.378	1.150	1.098	0.210	<b>2.53</b>	<b>2.48</b>	<b>1.59</b>	Case 20/21
	Left side	0.016	0.078	0.088	0.018	0.09	0.10	0.03	
	Right side	0.083	0.559	0.478	0.126	0.64	0.56	0.21	
	Top side		0.482	1.159	0.114	0.48	1.16	0.11	
	Bottom side	1.345				1.35	1.35	1.35	
LTE Band 2 Ant 0	Front	0.390	0.534	0.253	0.122	0.92	0.64	0.51	
	Back	1.388	1.150	1.098	0.210	<b>2.54</b>	<b>2.49</b>	<b>1.60</b>	Case 22/23/24
	Left side	0.056	0.078	0.088	0.018	0.13	0.14	0.07	



	Right side	0.085	0.559	0.478	0.126	0.64	0.56	0.21	
	Top side		0.482	1.159	0.114	0.48	1.16	0.11	
	Bottom side	1.404				1.40	1.40	1.40	
LTE Band 7 Ant 0	Front	0.564	0.534	0.253	0.122	1.10	0.82	0.69	
	Back	1.297	1.150	1.098	0.210	<b>2.45</b>	<b>2.40</b>	1.51	<b>Case 25/26</b>
	Left side	0.035	0.078	0.088	0.018	0.11	0.12	0.05	
	Right side	0.014	0.559	0.478	0.126	0.57	0.49	0.14	
	Top side		0.482	1.159	0.114	0.48	1.16	0.11	
	Bottom side	1.380				1.38	1.38	1.38	
LTE Band 38 Ant 0	Front	0.710	0.534	0.253	0.122	1.24	0.96	0.83	
	Back	1.377	1.150	1.098	0.210	<b>2.53</b>	<b>2.48</b>	1.59	<b>Case 27/28</b>
	Left side	0.028	0.078	0.088	0.018	0.11	0.12	0.05	
	Right side	0.019	0.559	0.478	0.126	0.58	0.50	0.15	
	Top side		0.482	1.159	0.114	0.48	1.16	0.11	
	Bottom side	1.365				1.37	1.37	1.37	

**16.3 Body-Worn Accessory Exposure Conditions**

WWAN Band	Exposure Position	1	3	4	5	1+3	1+4	1+5	Case No
		WWAN	WLAN2.4GHz	WLAN5GHz	Bluetooth	Summed	Summed	Summed	
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	
LTE Band 13 Ant 0	Front	0.724	0.534	0.285	0.122	1.26	1.01	0.85	
	Back	1.427	1.150	1.181	0.210	<b>2.58</b>	<b>2.61</b>	<b>1.64</b>	Case1/30/3
	Front with Headset					0.00	0.00	0.00	
	Back with Headset	1.388				1.39	1.39	1.39	
GSM850 Ant 0	Front	0.707	0.534	0.285	0.122	1.24	0.99	0.83	
	Back	1.434	1.150	1.181	0.210	<b>2.58</b>	<b>2.62</b>	<b>1.64</b>	Case4/31/6
	Front with Headset					0.00	0.00	0.00	
	Back with Headset	1.150				1.15	1.15	1.15	
WCDMA V Ant 0	Front	0.656	0.534	0.285	0.122	1.19	0.94	0.78	
	Back	1.427	1.150	1.181	0.210	<b>2.58</b>	<b>2.61</b>	<b>1.64</b>	Case7/32/9
	Front with Headset					0.00	0.00	0.00	
	Back with Headset	1.195				1.20	1.20	1.20	
LTE Band 26 Ant 0	Front	0.719	0.534	0.285	0.122	1.25	1.00	0.84	
	Back	1.349	1.150	1.181	0.210	<b>2.50</b>	<b>2.53</b>	1.56	Case10/33
	Front with Headset					0.00	0.00	0.00	
	Back with Headset	1.284				1.28	1.28	1.28	
WCDMA IV Ant 0	Front	0.450	0.534	0.285	0.122	0.98	0.74	0.57	
	Back	1.407	1.150	1.181	0.210	<b>2.56</b>	<b>2.59</b>	<b>1.62</b>	Case 12/34/14
	Front with Headset					0.00	0.00	0.00	
	Back with Headset	1.356				1.36	1.36	1.36	
LTE Band 66 Ant 0	Front	0.385	0.534	0.285	0.122	0.92	0.67	0.51	
	Back	1.391	1.150	1.181	0.210	<b>2.54</b>	<b>2.57</b>	<b>1.60</b>	Case 15/35/17
	Front with Headset					0.00	0.00	0.00	
	Back with Headset	1.367				1.37	1.37	1.37	
GSM1900 Ant 0	Front	0.493	0.534	0.285	0.122	1.03	0.78	0.62	
	Back	1.296	1.150	1.181	0.210	<b>2.45</b>	<b>2.48</b>	1.51	Case 18/36
	Front with Headset					0.00	0.00	0.00	
	Back with Headset	1.283				1.28	1.28	1.28	
WCDMA II Ant 0	Front	0.448	0.534	0.285	0.122	0.98	0.73	0.57	
	Back	1.378	1.150	1.181	0.210	<b>2.53</b>	<b>2.56</b>	1.59	Case 20/37
	Front with Headset					0.00	0.00	0.00	
	Back with Headset	1.352				1.35	1.35	1.35	
LTE Band 2 Ant 0	Front	0.390	0.534	0.285	0.122	0.92	0.68	0.51	
	Back	1.388	1.150	1.181	0.210	<b>2.54</b>	<b>2.57</b>	<b>1.60</b>	Case 22/38/24
	Front with Headset					0.00	0.00	0.00	
	Back with Headset	1.375				1.38	1.38	1.38	
LTE Band 7 Ant 0	Front	0.564	0.534	0.285	0.122	1.10	0.85	0.69	
	Back	1.297	1.150	1.181	0.210	<b>2.45</b>	<b>2.48</b>	1.51	Case 25/39
	Front with Headset					0.00	0.00	0.00	
	Back with Headset	1.272				1.27	1.27	1.27	
LTE Band 38 Ant 0	Front	0.710	0.534	0.285	0.122	1.24	1.00	0.83	
	Back	1.377	1.150	1.181	0.210	<b>2.53</b>	<b>2.56</b>	1.59	Case 27/40
	Front with Headset					0.00	0.00	0.00	
	Back with Headset	1.351				1.35	1.35	1.35	





**Sensor-off**

WWAN Band	Exposure Position	1	3	4	1+3	1+4
		WWAN	WLAN2.4GHz	WLAN5GHz	Summed	Summed
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
GSM850 Ant 0	Front	0.409	0.284	0.265	0.69	0.67
	Back	0.413	0.209	0.861	0.62	1.27
WCDMA V Ant 0	Front	0.364	0.284	0.265	0.65	0.63
	Back	0.373	0.209	0.861	0.58	1.23
LTE Band 26 Ant 0	Front	0.371	0.284	0.265	0.66	0.64
	Back	0.405	0.209	0.861	0.61	1.27
WCDMA IV Ant 0	Front	0.531	0.284	0.265	0.82	0.80
	Back	0.314	0.209	0.861	0.52	1.18
LTE Band 66 Ant 0	Front	0.429	0.284	0.265	0.71	0.69
	Back	0.282	0.209	0.861	0.49	1.14
GSM1900 Ant 0	Front	0.287	0.284	0.265	0.57	0.55
	Back	0.396	0.209	0.861	0.61	1.26
WCDMA II Ant 0	Front	0.701	0.284	0.265	0.99	0.97
	Back	0.533	0.209	0.861	0.74	1.39
LTE Band 2 Ant 0	Front	0.578	0.284	0.265	0.86	0.84
	Back	0.568	0.209	0.861	0.78	1.43
LTE Band 7 Ant 0	Front	0.934	0.284	0.265	1.22	1.20
	Back	0.702	0.209	0.861	0.91	1.56
LTE Band 38 Ant 0	Front	0.571	0.284	0.265	0.86	0.84
	Back	0.337	0.209	0.861	0.55	1.20

**16.4 Product specific 10g SAR Exposure Conditions**

**Remark:**

1. For Bluetooth Product specific 10g stand-alone SAR is not required for a transmitter or antenna, due to 1g hotspot SAR is <1.2W/kg.

WWAN Band	Exposure Position	1	3	4	1+3	1+4	Case No
		WWAN	WLAN2.4GHz	WLAN5GHz	Summed	Summed	
		10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	
LTE Band 13 Ant 0	Front			0.705	0.00	0.71	
	Back	2.172	1.599	2.441	<b>3.77</b>	<b>4.61</b>	<b>Case 41</b>
	Left side			0.075	0.00	0.08	
	Right side			1.989	0.00	1.99	
	Top side			2.114	0.00	2.11	
	Bottom side				0.00	0.00	
GSM850 Ant 0	Front			0.705	0.00	0.71	
	Back	3.462	1.599	2.441	<b>5.06</b>	<b>5.90</b>	<b>Case 42/43</b>
	Left side			0.075	0.00	0.08	
	Right side			1.989	0.00	1.99	
	Top side			2.114	0.00	2.11	
	Bottom side	2.490			2.49	2.49	
WCDMA V Ant 0	Front			0.705	0.00	0.71	
	Back	2.615	1.599	2.441	<b>4.21</b>	<b>5.06</b>	<b>Case 44/45</b>
	Left side			0.075	0.00	0.08	
	Right side			1.989	0.00	1.99	
	Top side			2.114	0.00	2.11	
	Bottom side				0.00	0.00	
LTE Band 26 Ant 0	Front			0.705	0.00	0.71	
	Back	2.462	1.599	2.441	<b>4.06</b>	<b>4.90</b>	<b>Case 46/47</b>
	Left side			0.075	0.00	0.08	
	Right side			1.989	0.00	1.99	
	Top side			2.114	0.00	2.11	
	Bottom side				0.00	0.00	
WCDMA IV Ant 0	Front	1.211		0.705	1.21	1.92	
	Back	2.433	1.599	2.441	<b>4.03</b>	<b>4.87</b>	<b>Case 48/49</b>
	Left side			0.075	0.00	0.08	
	Right side			1.989	0.00	1.99	
	Top side			2.114	0.00	2.11	
	Bottom side	3.511			3.51	3.51	
LTE Band 66 Ant 0	Front	1.204		0.705	1.20	1.91	
	Back	2.534	1.599	2.441	<b>4.13</b>	<b>4.98</b>	<b>Case 50/51</b>
	Left side			0.075	0.00	0.08	
	Right side			1.989	0.00	1.99	
	Top side			2.114	0.00	2.11	
	Bottom side	3.489			3.49	3.49	
GSM1900 Ant 0	Front	1.681		0.705	1.68	2.39	
	Back	2.986	1.599	2.441	<b>4.59</b>	<b>5.43</b>	<b>Case 52/53</b>
	Left side			0.075	0.00	0.08	
	Right side			1.989	0.00	1.99	
	Top side			2.114	0.00	2.11	
	Bottom side	3.581			3.58	3.58	
WCDMA II Ant 0	Front	1.335		0.705	1.34	2.04	
	Back	3.133	1.599	2.441	<b>4.73</b>	<b>5.57</b>	<b>Case 54/55</b>
	Left side			0.075	0.00	0.08	
	Right side			1.989	0.00	1.99	
	Top side			2.114	0.00	2.11	
	Bottom side	3.571			3.57	3.57	
LTE Band 2 Ant 0	Front	1.289		0.705	1.29	1.99	



	Back	3.034	1.599	2.441	<b>4.63</b>	<b>5.48</b>	<b>Case 56/57</b>
	Left side			0.075	0.00	0.08	
	Right side			1.989	0.00	1.99	
	Top side			2.114	0.00	2.11	
	Bottom side	3.368			3.37	3.37	
LTE Band 7 Ant 0	Front	1.635		0.705	1.64	2.34	
	Back	3.125	1.599	2.441	<b>4.72</b>	<b>5.57</b>	<b>Case 58/59</b>
	Left side			0.075	0.00	0.08	
	Right side			1.989	0.00	1.99	
	Top side			2.114	0.00	2.11	
	Bottom side	1.200			1.20	1.20	
LTE Band 38 Ant 0	Front	1.883		0.705	1.88	2.59	
	Back	3.369	1.599	2.441	<b>4.97</b>	<b>5.81</b>	<b>Case 60/61</b>
	Left side			0.075	0.00	0.08	
	Right side			1.989	0.00	1.99	
	Top side			2.114	0.00	2.11	
	Bottom side	1.024			1.02	1.02	

**Sensor-off**

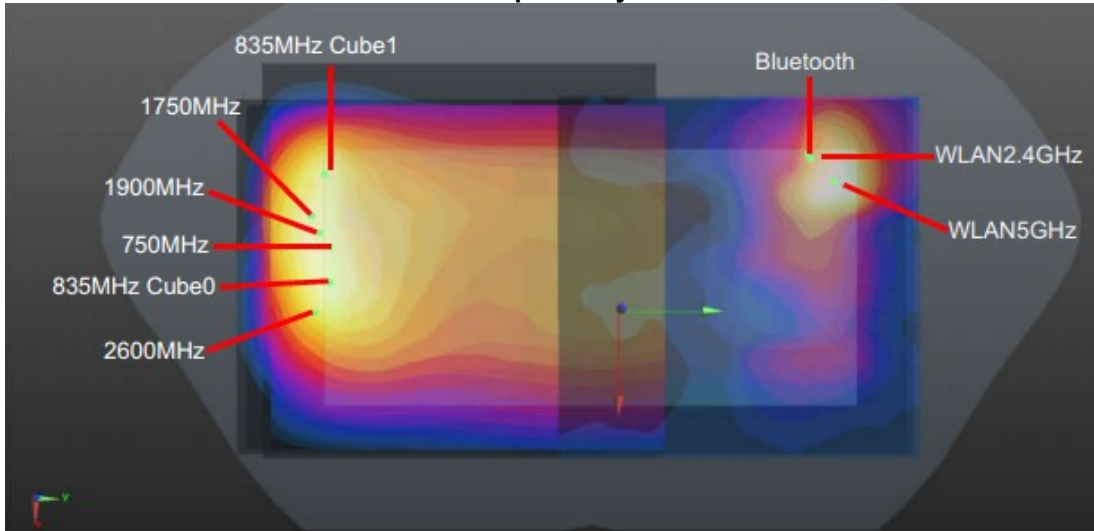
WWAN Band	Exposure Position	1	3	4	1+3	1+4
		WWAN	WLAN2.4GHz	WLAN5GHz	Summed	Summed
		10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)
WCDMA IV Ant 0	Front	0.730		0.705	0.73	1.44
	Back	0.852	1.599	2.441	2.45	3.29
	Bottom side	1.133			1.13	1.13
LTE Band 66 Ant 0	Front	0.502		0.705	0.50	1.21
	Back	0.560	1.599	2.441	2.16	3.00
	Bottom side	0.787			0.79	0.79
GSM1900 Ant 0	Front	0.561		0.705	0.56	1.27
	Back	0.739	1.599	2.441	2.34	3.18
	Bottom side	1.134			1.13	1.13
WCDMA II Ant 0	Front	0.734		0.705	0.73	1.44
	Back	1.152	1.599	2.441	2.75	3.59
	Bottom side	1.297			1.30	1.30
LTE Band 2 Ant 0	Front	0.657		0.705	0.66	1.36
	Back	0.917	1.599	2.441	2.52	3.36
	Bottom side	1.330			1.33	1.33
LTE Band 7 Ant 0	Front	1.012		0.705	1.01	1.72
	Back	1.302	1.599	2.441	2.90	3.74
	Bottom side	1.943			1.94	1.94
LTE Band 38 Ant 0	Front	0.541		0.705	0.54	1.25
	Back	0.625	1.599	2.441	2.22	3.07
	Bottom side	0.960			0.96	0.96

### 16.5 SPLSR Evaluation and Analysis

**General Note:**

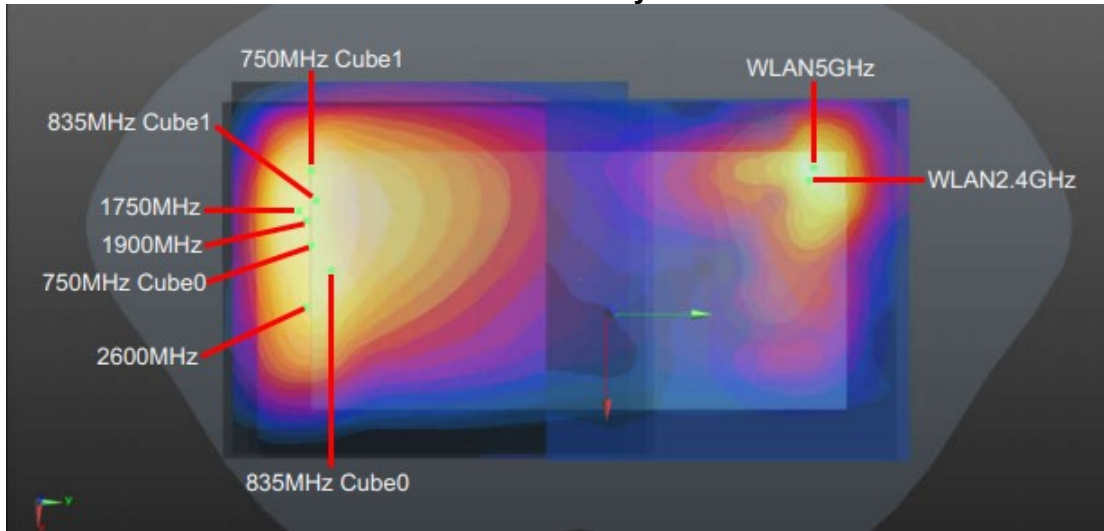
1. When standalone SAR is measured for both antennas in the pair, the peak location separation distance is computed by the square root of  $[(x1-x2)^2 + (y1-y2)^2 + (z1-z2)^2]$ , where  $(x1, y1, z1)$  and  $(x2, y2, z2)$  are the coordinates in the area scans or extrapolated peak SAR locations in the zoom scans, as appropriate.
2.  $SPLSR = (SAR1 + SAR2)1.5 / (\text{min. separation distance, mm})$ . If  $SPLSR \leq 0.04$  for 1g SAR and  $SPLSR \leq 0.10$  for 10g SAR, simultaneously transmission SAR measurement is not necessary.

**For Hotspot/Body-worn**



**WWAN + WLAN 5GHz/2.4GHz + Bluetooth Back\_5mm**

**For Extremity**



**WWAN + WLAN 5GHz/2.4GHz Back\_0mm**

**For Hotspot**

Case	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Case 1	LTE Band 13	Back	1.427	5	-0.018	-0.0795	-0.206	150.4	2.58	0.03	Not required
	WLAN2.4GHz		1.15	5	-0.053	0.0668	-0.205				
Case 2	LTE Band 13	Back	1.427	5	-0.018	-0.0795	-0.206	160.6	2.53	0.02	Not required
	WLAN5GHz		1.098	5	-0.044	0.079	-0.207				
Case 3	LTE Band 13	Back	1.427	5	-0.018	-0.0795	-0.206	149.9	1.64	0.01	Not required
	Bluetooth		0.21	5	-0.0542	0.066	-0.205				
Case 4	GSM850	Back	1.434	5	-0.022	-0.0815	-0.206	151.5	2.58	0.03	Not required
	WLAN2.4GHz		1.15	5	-0.053	0.0668	-0.205				
Case 5	GSM850	Back	1.434	5	-0.022	-0.0815	-0.206	162.0	2.53	0.02	Not required
	WLAN5GHz		1.098	5	-0.044	0.079	-0.207				
Case 6	GSM850	Back	1.434	5	-0.022	-0.0815	-0.206	151.0	1.64	0.01	Not required
	Bluetooth		0.21	5	-0.0542	0.066	-0.205				
Case 7	WCDMA V	Back	1.427	5	-0.0185	-0.083	-0.206	153.7	2.58	0.03	Not required
	WLAN2.4GHz		1.15	5	-0.053	0.0668	-0.205				
Case 8	WCDMA V	Back	1.427	5	-0.0185	-0.083	-0.206	164.0	2.53	0.02	Not required
	WLAN5GHz		1.098	5	-0.044	0.079	-0.207				
Case 9	WCDMA V	Back	1.427	5	-0.0185	-0.083	-0.206	153.2	1.64	0.01	Not required
	Bluetooth		0.21	5	-0.0542	0.066	-0.205				
Case 10	LTE Band 26 Cube 0	Back	1.349	5	-0.0155	-0.0795	-0.206	151.0	2.50	0.03	Not required
	WLAN2.4GHz		1.15	5	-0.053	0.0668	-0.205				
Case 11	LTE Band 26 Cube 0	Back	1.349	5	-0.0155	-0.0795	-0.206	161.0	2.45	0.02	Not required
	WLAN5GHz		1.098	5	-0.044	0.079	-0.207				
Case 10	LTE Band 26 Cube 1	Back	1.349	5	-0.0325	-0.089	-0.206	157.1	2.50	0.03	Not required
	WLAN2.4GHz		1.15	5	-0.053	0.0668	-0.205				
Case 11	LTE Band 26 Cube 1	Back	1.349	5	-0.0325	-0.089	-0.206	168.4	2.45	0.02	Not required
	WLAN5GHz		1.098	5	-0.044	0.079	-0.207				

Case	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Case 12	WCDMA IV	Back	1.407	5	-0.038	-0.085	-0.207	152.6	2.56	0.03	Not required
	WLAN2.4GHz		1.15	5	-0.053	0.0668	-0.205				
Case 13	WCDMA IV	Back	1.407	5	-0.038	-0.085	-0.207	164.1	2.51	0.02	Not required
	WLAN5GHz		1.098	5	-0.044	0.079	-0.207				
Case 14	WCDMA IV	Back	1.407	5	-0.038	-0.085	-0.207	151.9	1.62	0.01	Not required
	Bluetooth		0.21	5	-0.0542	0.066	-0.205				
Case 15	LTE Band 66	Back	1.391	5	-0.0355	-0.085	-0.206	152.8	2.54	0.03	Not required
	WLAN2.4GHz		1.15	5	-0.053	0.0668	-0.205				
Case 16	LTE Band 66	Back	1.391	5	-0.0355	-0.085	-0.206	164.2	2.49	0.02	Not required
	WLAN5GHz		1.098	5	-0.044	0.079	-0.207				
Case 17	LTE Band 66	Back	1.391	5	-0.0355	-0.085	-0.206	152.2	1.60	0.01	Not required
	Bluetooth		0.21	5	-0.0542	0.066	-0.205				
Case 18	GSM1900	Back	1.296	5	-0.0305	-0.0825	-0.207	151.0	2.45	0.03	Not required
	WLAN2.4GHz		1.15	5	-0.053	0.0668	-0.205				
Case 19	GSM1900	Back	1.296	5	-0.0305	-0.0825	-0.207	162.1	2.39	0.02	Not required
	WLAN5GHz		1.098	5	-0.044	0.079	-0.207				
Case 20	WCDMA II	Back	1.378	5	-0.035	-0.0825	-0.206	150.4	2.53	0.03	Not required
	WLAN2.4GHz		1.15	5	-0.053	0.0668	-0.205				
Case 21	WCDMA II	Back	1.378	5	-0.035	-0.0825	-0.206	161.8	2.48	0.02	Not required
	WLAN5GHz		1.098	5	-0.044	0.079	-0.207				
Case 22	LTE Band 2	Back	1.388	5	-0.0305	-0.0825	-0.206	151.0	2.54	0.03	Not required
	WLAN2.4GHz		1.15	5	-0.053	0.0668	-0.205				
Case 23	LTE Band 2	Back	1.388	5	-0.0305	-0.0825	-0.206	162.1	2.49	0.02	Not required
	WLAN5GHz		1.098	5	-0.044	0.079	-0.207				
Case 24	LTE Band 2	Back	1.388	5	-0.0305	-0.0825	-0.206	150.4	1.60	0.01	Not required
	Bluetooth		0.21	5	-0.0542	0.066	-0.205				



Case	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Case 25	LTE Band 7	Back	1.297	5	-0.0038	-0.0834	-0.205	158.1	2.45	0.02	Not required
	WLAN2.4GHz		1.15	5	-0.053	0.0668	-0.205				
Case 26	LTE Band 7	Back	1.297	5	-0.0038	-0.0834	-0.205	167.3	2.40	0.02	Not required
	WLAN5GHz		1.098	5	-0.044	0.079	-0.207				
Case 27	LTE Band 38	Back	1.377	5	-0.0062	-0.084	-0.205	157.9	2.53	0.03	Not required
	WLAN2.4GHz		1.15	5	-0.053	0.0668	-0.205				
Case 28	LTE Band 38	Back	1.377	5	-0.0062	-0.084	-0.205	167.3	2.48	0.02	Not required
	WLAN5GHz		1.098	5	-0.044	0.079	-0.207				

For Body

Case	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
Case 30	LTE Band 13	Back	1.377	5	-0.018	-0.0795	-0.206	159.8	2.56	0.03	Not required
	WLAN5GHz		1.181	5	-0.045	0.078	-0.207				
Case 31	GSM850	Back	1.434	5	-0.022	-0.0815	-0.206	161.2	2.62	0.03	Not required
	WLAN5GHz		1.181	5	-0.045	0.078	-0.207				
Case 32	WCDMA V	Back	1.427	5	-0.0185	-0.083	-0.206	163.2	2.61	0.03	Not required
	WLAN5GHz		1.181	5	-0.045	0.078	-0.207				
Case 33	LTE Band 26 Cube 0	Back	1.349	5	-0.0155	-0.0795	-0.206	160.2	2.53	0.03	Not required
	WLAN5GHz		1.181	5	-0.045	0.078	-0.207				
Case 33	LTE Band 26 Cube 1	Back	1.349	5	-0.0325	-0.089	-0.206	167.5	2.53	0.02	Not required
	WLAN5GHz		1.181	5	-0.045	0.078	-0.207				
Case 34	WCDMA IV	Back	1.407	5	-0.038	-0.085	-0.207	163.2	2.59	0.03	Not required
	WLAN5GHz		1.181	5	-0.045	0.078	-0.207				
Case 35	LTE Band 66	Back	1.391	5	-0.0355	-0.085	-0.206	163.3	2.57	0.03	Not required
	WLAN5GHz		1.181	5	-0.045	0.078	-0.207				
Case 36	GSM1900	Back	1.296	5	-0.0305	-0.0825	-0.207	161.2	2.48	0.02	Not required
	WLAN5GHz		1.181	5	-0.045	0.078	-0.207				
Case 37	WCDMA II	Back	1.378	5	-0.035	-0.0825	-0.206	160.8	2.56	0.03	Not required
	WLAN5GHz		1.181	5	-0.045	0.078	-0.207				
Case 38											



	LTE Band 2	Back	1.388	5	-0.0305	-0.0825	-0.206	161.2	2.57	0.03	Not required
	WLAN5GHz		1.181	5	-0.045	0.078	-0.207				
Case 39	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m) X Y Z			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 7	Back	1.297	5	-0.0038	-0.0834	-0.205	166.6	2.48	0.02	Not required
WLAN5GHz	1.181		5	-0.045	0.078	-0.207					
Case 40	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m) X Y Z			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 38	Back	1.377	5	-0.0062	-0.084	-0.205	166.6	2.56	0.02	Not required
WLAN5GHz	1.181		5	-0.045	0.078	-0.207					

**For Extremity**

Case 41	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m) X Y Z			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 13 Cube 0			0	-0.0195	-0.081	-0.206				
	WLAN5GHz		2.441	0	-0.054	0.069	-0.207	153.9	4.61	0.06	Not required
Case 41	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m) X Y Z			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 13 Cube 1			0	-0.05	-0.081	-0.206				
	WLAN5GHz		2.441	0	-0.054	0.069	-0.207	150.1	4.61	0.07	Not required
Case 42	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m) X Y Z			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	GSM850			0	-0.0275	-0.08	-0.206				
	WLAN2.4GHz		1.599	0	-0.0518	0.0696	-0.205	151.6	5.06	0.08	Not required
Case 43	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m) X Y Z			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	GSM850			0	-0.0275	-0.08	-0.206				
	WLAN2.4GHz		2.441	0	-0.0518	0.0696	-0.205	151.6	5.90	0.09	Not required
Case 44	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m) X Y Z			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	WCDMA V Cube 0			0	-0.0445	-0.0825	-0.206				
	WLAN2.4GHz		1.599	0	-0.0518	0.0696	-0.205	152.3	4.21	0.06	Not required
Case 45	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m) X Y Z			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	WCDMA V Cube 0			0	-0.0445	-0.0825	-0.206				
	WLAN5GHz		2.441	0	-0.054	0.069	-0.207	151.8	5.06	0.07	Not required
Case 44	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m) X Y Z			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	WCDMA V Cube 1			0	-0.0395	-0.083	-0.206				
	WLAN2.4GHz		1.599	0	-0.0518	0.0696	-0.205	153.1	4.21	0.06	Not required
Case 45	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m) X Y Z			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	WCDMA V Cube 1			0	-0.0395	-0.083	-0.206				
	WLAN5GHz		2.441	0	-0.054	0.069	-0.207	152.7	5.06	0.07	Not required
Case 46	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m) X Y Z			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 26			0	-0.046	-0.084	-0.206				
	WLAN2.4GHz		1.599	0	-0.0518	0.0696	-0.205	153.7	4.06	0.05	Not required
Case 47	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m) X Y Z			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 26			0	-0.046	-0.084	-0.206				
	WLAN5GHz		2.441	0	-0.054	0.069	-0.207	153.2	4.90	0.07	Not required
Case 48	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m) X Y Z			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	WCDMA IV			0	-0.03	-0.0855	-0.207				
	WLAN2.4GHz		1.599	0	-0.0518	0.0696	-0.205	156.6	4.03	0.05	Not required



Case 49	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	WCDMA IV	Back	2.433	0	-0.03	-0.0855	-0.207	156.4	4.87	0.07	Not required
	WLAN5GHz		2.441	0	-0.054	0.069	-0.207				

Case 50	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	LTE Band 66	Back	2.534	0	-0.0375	-0.0845	-0.206	154.8	4.13	0.05	Not required
	WLAN2.4GHz		1.599	0	-0.0518	0.0696	-0.205				

Case 51	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	LTE Band 66	Back	2.534	0	-0.0375	-0.0845	-0.206	154.4	4.98	0.07	Not required
	WLAN5GHz		2.441	0	-0.054	0.069	-0.207				

Case 52	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	GSM1900	Back	2.986	0	-0.0355	-0.083	-0.207	153.5	4.59	0.06	Not required
	WLAN2.4GHz		1.599	0	-0.0518	0.0696	-0.205				

Case 53	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	GSM1900	Back	2.986	0	-0.0355	-0.083	-0.207	153.1	5.43	0.08	Not required
	WLAN5GHz		2.441	0	-0.054	0.069	-0.207				

Case 54	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	WCDMA II	Back	3.133	0	-0.0345	-0.083	-0.206	153.6	4.73	0.07	Not required
	WLAN2.4GHz		1.599	0	-0.0518	0.0696	-0.205				

Case 55	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	WCDMA II	Back	3.133	0	-0.0345	-0.083	-0.206	153.2	5.57	0.09	Not required
	WLAN5GHz		2.441	0	-0.054	0.069	-0.207				

Case 56	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	LTE Band 2	Back	3.034	0	-0.0355	-0.083	-0.206	153.5	4.63	0.06	Not required
	WLAN2.4GHz		1.599	0	-0.0518	0.0696	-0.205				

Case 57	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	LTE Band 2	Back	3.034	0	-0.0355	-0.083	-0.206	153.1	5.48	0.08	Not required
	WLAN5GHz		2.441	0	-0.054	0.069	-0.207				

Case 58	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	LTE Band 7	Back	3.125	0	-0.0086	-0.0868	-0.205	162.3	4.72	0.06	Not required
	WLAN2.4GHz		1.599	0	-0.0518	0.0696	-0.205				

Case 59	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	LTE Band 7	Back	3.125	0	-0.0086	-0.0868	-0.205	162.3	5.57	0.08	Not required
	WLAN5GHz		2.441	0	-0.054	0.069	-0.207				

Case 60	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	LTE Band 38	Back	3.369	0	-0.0038	-0.0846	-0.205	161.5	4.97	0.07	Not required
	WLAN2.4GHz		1.599	0	-0.0518	0.0696	-0.205				

Case 61	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
					X	Y	Z				
	LTE Band 38	Back	3.369	0	-0.0038	-0.0846	-0.205	161.6	5.81	0.09	Not required
	WLAN5GHz		2.441	0	-0.054	0.069	-0.207				

Test Engineer : Hank Huang, Kevin Xu, David Dai, Bin He



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

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