FCC SAR Test Report

APPLICANT	**:**	**Motorola Mobility LLC**
EQUIPMENT	**:**	**Mobile Cellular Phone**
BRAND NAME	**:**	**Motorola**
MODEL NAME	**:**	**XT2333-3**
FCC ID	**:**	**IHDT56AH8**
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.

Si Zhang

Approved by: Si Zhang

ACCREDITED Cert #5145.01

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
FA282609	Rev. 01	Initial issue of report.	Nov. 01, 2022

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **Motorola Mobility LLC, Mobile Cellular Phone, XT2333-3,** 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	0.31	1.17	1.17	1.55
		GSM1900	0.11	1.23	1.27	
	WCDMA	Band V	0.29	1.36	1.36	
		Band II	0.30	1.39	1.29	
	LTE	Band 5	0.33	**1.42**	**1.42**	
		Band 2	0.40	1.33	1.40	
		Band 7	0.66	1.25	1.25	
		Band 38	0.80	1.41	1.41	
		Band 41	0.24	1.29	1.38	
DTS	WLAN	2.4GHz WLAN	1.06	1.02	1.02	1.40
NII		5GHz WLAN	**1.19**	1.19	1.19	1.54
DSS	Bluetooth	2.4GHz Bluetooth	0.14	0.13	0.13	1.55

Highest 10g SAR Summary				
Equipment Class	Frequency Band		Product Specific 10g SAR (W/kg) (Separation 0mm)	Highest Simultaneous Transmission
				10g SAR (W/kg)
License	GSM	GSM850	2.14	3.97
		GSM1900	3.28	
	WCDMA	Band V	2.63	
		Band II	3.41	
	LTE	Band 5	2.39	
		Band 2	**3.57**	
		Band 7	2.01	
		Band 38	2.02	
		Band 41	1.56	
NII	WLAN	5GHz WLAN	1.61	3.97
Date of Testing:			2022/10/2 ~ 2022/10/17	

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	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 616217 D04 SAR for laptop and tablets v01r02
- FCC KDB 941225 D01 3G SAR Procedures v03r01
- FCC KDB 941225 D05 SAR for LTE Devices v02r05
- FCC KDB 941225 D05A Rel.10 LTE SAR Test Guidance v01r02
- FCC KDB 941225 D06 Hotspot Mode SAR v02r01

4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT2333-3
FCC ID	IHDT56AH8
IMEI Code	Sample 1: IMEI 1: 357758180018972 IMEI 2: 357758180018980 Sample 2: IMEI 1: 357758180025092 IMEI 2: 357758180025100
Wireless Technology and Frequency Range	GSM850: 824 MHz ~ 849 MHz GSM1900: 1850 MHz ~ 1910 MHz WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2535 MHz ~ 2655 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 NFC: 13.56 MHz
Mode	GSM/GPRS/EGPRS RMC/AMR 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 HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE NFC: ASK
HW Version	DVT2
SW Version	THA33.23
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. This device has NFC operations, the NFC antenna is integrated into the device for this model, therefore, all SAR test were performed with the device which already incorporates the NFC antenna. A diagram showing the location of the antenna can be found in the operational description. According to FCC KDB publication 447498 D01v06, transmitters are consider to be operating simultaneously when there is overlapping transmission, with the exception of transmission during network hand-offs with maximum hand-off duration less than 30 seconds.

6. 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) and the 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.
7. 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. It is special to declare. 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.
8. 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.
9. For some WWAN bands, sensor on power level is higher than hotspot power level, so front/back sensor on SAR can represent hotspot conservatively.
10. There are two samples. The difference between them could be referred to the XT2333-3_Operational Description of Product Equality Declaration which is exhibited separately. According to the difference, we choose sample 1 for full testing and sample 2 for worst case verification.
11. The device has two headsets. Only suppliers are different, so we chose headset 1 to perform full SAR testing only.
12. This device has two batteries. Only suppliers are different, so we chose battery 1 to perform full SAR testing only.

4.2 General LTE SAR Test and Reporting Considerations

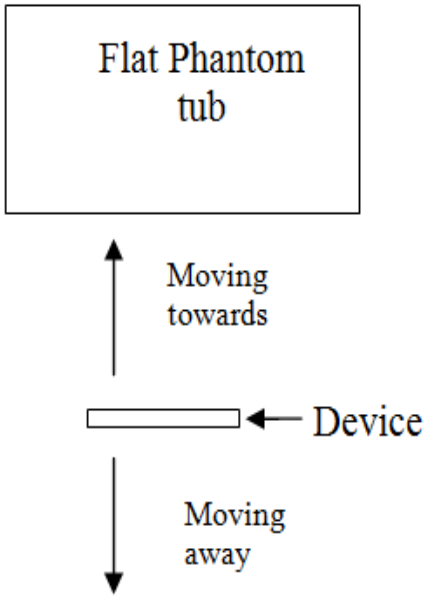
<table>
<tr><th colspan="2">Summarized necessary items addressed in KDB 941225 D05 v02r05</th></tr>
<tr><td>FCC ID</td><td>IHDT56AH8</td></tr>
<tr><td>Equipment Name</td><td>Mobile Cellular Phone</td></tr>
<tr><td>Operating Frequency Range of each LTE transmission band</td><td>LTE Band 2: 1850 MHz ~ 1910 MHz
LTE Band 5: 824 MHz ~ 849 MHz
LTE Band 7: 2500 MHz ~ 2570 MHz
LTE Band 38: 2570 MHz ~ 2620 MHz
LTE Band 41: 2535 MHz ~ 2655 MHz</td></tr>
<tr><td>Channel Bandwidth</td><td>LTE Band 2:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 5:1.4MHz, 3MHz, 5MHz, 10MHz
LTE Band 7: 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 38: 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 41: 5MHz, 10MHz, 15MHz, 20MHz</td></tr>
<tr><td>uplink modulations used</td><td>QPSK / 16QAM / 64QAM</td></tr>
<tr><td>LTE Voice / Data requirements</td><td>Voice and Data</td></tr>
<tr><td>LTE Release Version</td><td>R12, Cat13</td></tr>
<tr><td>CA Support</td><td>Yes, Downlink only</td></tr>
<tr><td>LTE MPR permanently built-in by design</td><td>
Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3
<table>
<tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (N_{RB})</th><th rowspan="2">MPR (dB)</th></tr>
<tr><th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr>
<tr><td>QPSK</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 2</td></tr>
<tr><td>64 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 2</td></tr>
<tr><td>64 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 3</td></tr>
<tr><td>256 QAM</td><td colspan="6">≥ 1</td><td>≤ 5</td></tr>
</table>
</td></tr>
<tr><td>LTE A-MPR</td><td>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)</td></tr>
<tr><td>Spectrum plots for RB configuration</td><td>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.</td></tr>
<tr><td>Power reduction applied to satisfy SAR compliance</td><td>Yes, when operating in Proximity sensors/receiver/hotspot detect mechanism, head/ body-worn/hotspot/extremity will trigger reduced power for some WWAN bands applied to satisfy SAR compliance, the detail please referred to section 13.</td></tr>
<tr><td>LTE Carrier Aggregation Combinations</td><td>Intra-Band and Inter-Band possible combinations and the detail power verification please referred to section 13.</td></tr>
<tr><td>LTE Carrier Aggregation Additional Information</td><td>This device supports maximum of 2 carriers in the downlink. Additional following LTE Release features are not supported: Relay, HetNet, Enhanced MIMO, eICI, WiFi Offloading, MDH, eMBMA, Cross-Carrier Scheduling, Enhanced SC-FDMA.</td></tr>
</table>

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 5												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)				
L	20407	824.7	20415	825.5	20425	826.5	20450	829				
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5				
H	20643	848.3	20635	847.5	20625	846.5	20600	844				
LTE Band 7												
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)				
L	20775	2502.5	20800	2505	20825	2507.5	20850	2510				
M	21100	2535	21100	2535	21100	2535	21100	2535				
H	21425	2567.5	21400	2565	21375	2562.5	21350	2560				
LTE Band 38												
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)				
L	37775	2572.5	37800	2575	37825	2577.5	37850	2580				
M	38000	2595	38000	2595	38000	2595	38000	2595				
H	38225	2617.5	38200	2615	38175	2612.5	38150	2610				
LTE Band 41(2535~2655)												
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)				
L	40065	2537.5	40090	2540	40115	2542.5	40140	2545				
LM	40385	2569.5	40390	2570	40395	2570.5	40400	2571				
HM	40705	2601.5	40690	2600	40685	2599.5	40670	2598				
H	41215	2652.5	41190	2650	41165	2647.5	41140	2645				

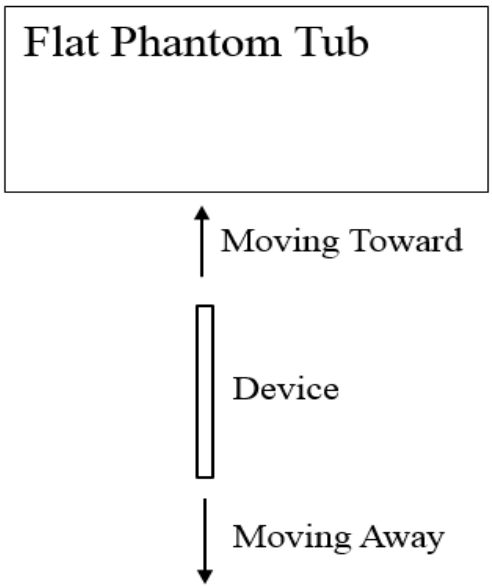
5. Proximity Sensor Triggering Test

<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 (5825MHz) 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. The output power will reduce to body worn power level when top and bottom sensor pad be detected.
3. 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.
4. 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/left/right side of the device. When front/back/bottom/left/right side of handheld condition is detected reduced power will be active.
5. 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:



Sensor/Handheld detection test set-up, Front and Back sides



Handheld detection test set-up, Bottom Side/Right/Left Side

<P-Sensor>

Proximity Sensor Triggering Distance (mm)				
Position	Front		Back	
	Moving towards	Moving away	Moving towards	Moving away
Minimum	15	15	19	22

<Handheld for ANT0>

Proximity Sensor Triggering Distance (mm)								
Position	Front		Back		Right side		Bottom Side	
	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away
Minimum	15	17	19	24	6	9	21	24

<Handheld for ANT1>

Proximity Sensor Triggering Distance (mm)								
Position	Front		Back		Left side		Bottom Side	
	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away
Minimum	7	9	15	18	9	11	15	17

6. RF Exposure Limits

6.1 Uncontrolled Environment

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

6.2 Controlled Environment

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

Limits for Occupational/Controlled Exposure (W/kg)

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

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

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

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

7. Specific Absorption Rate (SAR)

7.1 Introduction

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

7.2 SAR Definition

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

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

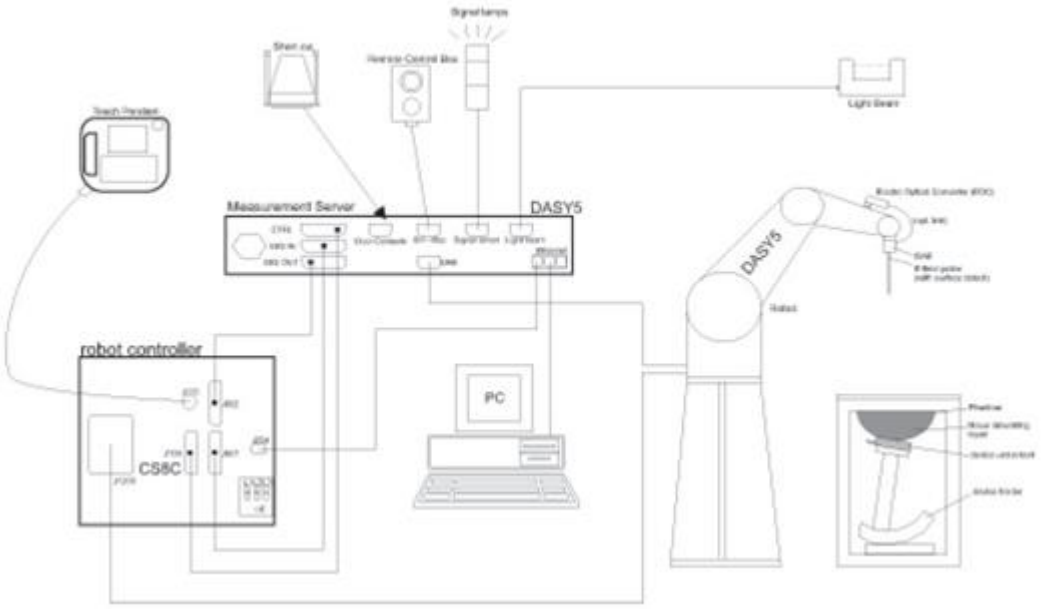
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

8. System Description and Setup

The DASY5 system used for performing compliance tests consists of the following items:



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

8.1 E-Field Probe

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

<EX3DV4 Probe>

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

8.2 Data Acquisition Electronics (DAE)

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

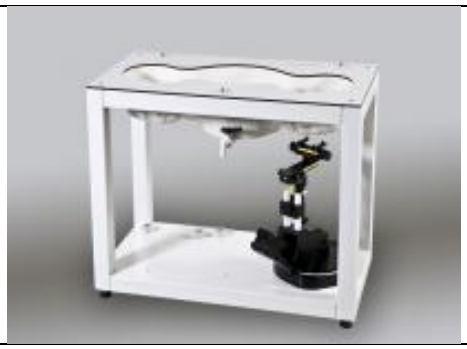
The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Photo of DAE

8.3 Phantom

<SAM Twin Phantom>

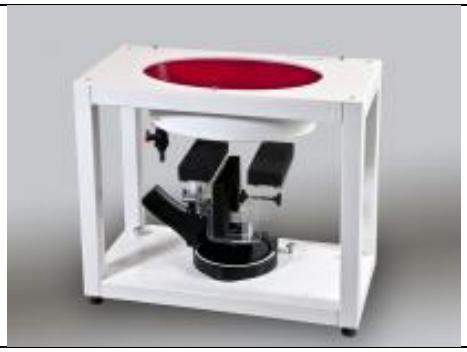
Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet
Measurement Areas	Left Hand, Right Hand, Flat Phantom



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

<ELI Phantom>

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



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

8.4 Device Holder

<Mounting Device for Hand-Held Transmitter>

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

Mounting Device for Hand-Held Transmitters

Mounting Device Adaptor for Wide-Phones

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

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

Mounting Device for Laptops

9. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

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

<SAR measurement>

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

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

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

9.1 Spatial Peak SAR Evaluation

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

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

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

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

9.2 Power Reference Measurement

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

9.3 Area Scan

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

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

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	½·δ·ln(2) ± 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: Δx_{Area}, Δy_{Area}	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ 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: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	≤ 1.5·$\Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.

* When zoom scan is required and the *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

9.5 Volume Scan Procedures

The volume scan is used 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	835MHz System Validation Kit	D835V2	4d162	Dec. 17, 2021	Dec. 16, 2022
SPEAG	1900MHz System Validation Kit	D1900V2	5d182	Dec. 20, 2021	Dec. 19, 2022
SPEAG	2450MHz System Validation Kit	D2450V2	1040	May 06, 2020	May 04, 2023
SPEAG	2600MHz System Validation Kit	D2600V2	1070	Dec. 20, 2021	Dec. 19, 2022
SPEAG	5000MHz System Validation Kit	D5GHzV2	1341	Dec. 13, 2021	Dec. 12, 2022
SPEAG	Data Acquisition Electronics	DAE4	1210	Apr. 12, 2022	Apr. 11, 2023
SPEAG	Dosimetric E-Field Probe	EX3DV4	7576	Jul. 28, 2022	Jul. 27, 2023
SPEAG	SAM Twin Phantom	QD 000 P40 CD	1670	NCR	NCR
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio communication analyzer	MT8820C	6201300653	Jul. 07, 2022	Jul. 06, 2023
Anritsu	Radio communication analyzer	MT8821C	6272416863	Apr. 06, 2022	Apr. 05, 2023
Agilent	Wireless Communication Test Set	E5515C	MY50267224	Jul. 07, 2022	Jul. 06, 2023
Keysight	Network Analyzer	E5071C	MY46523671	Oct. 25, 2021	Oct. 24, 2022
Speag	Dielectric Assessment KIT	DAK-3.5	1071	Jan. 24, 2022	Jan. 23, 2023
Agilent	Signal Generator	N5181A	MY50145381	Dec. 28, 2021	Dec. 27, 2022
Anritsu	Power Sensor	MA2411B	1542004	Dec. 28, 2021	Dec. 27, 2022
Anritsu	Power Meter	ML2495A	1339473	Dec. 28, 2021	Dec. 27, 2022
R&S	Power Sensor	NRP8S	109228	Apr. 07, 2022	Apr. 06, 2023
R&S	CBT BLUETOOTH TESTER	CBT	100963	Dec. 28, 2021	Dec. 27, 2022
R&S	Spectrum Analyzer	FSP7	100818	Jul. 07, 2022	Jul. 06, 2023
TES	Hygrometer	1310	200505600	Jul. 12, 2022	Jul. 11, 2023
Anymetre	Thermo-Hygrometer	JR593	2015030903	Dec. 30, 2021	Dec. 29, 2022
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	
Weinschel	Attenuator 1	3M-10	N/A	Note 1	
Weinschel	Attenuator 2	3M-20	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
2. Referring to KDB 865664 D01v01r04, the dipole calibration interval can be extended to 3 years with justification. The dipoles are also not physically damaged, or repaired during the interval.
3. The justification data of dipole can be found in appendix C. The return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration.

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. 11.1. 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. 11.2.

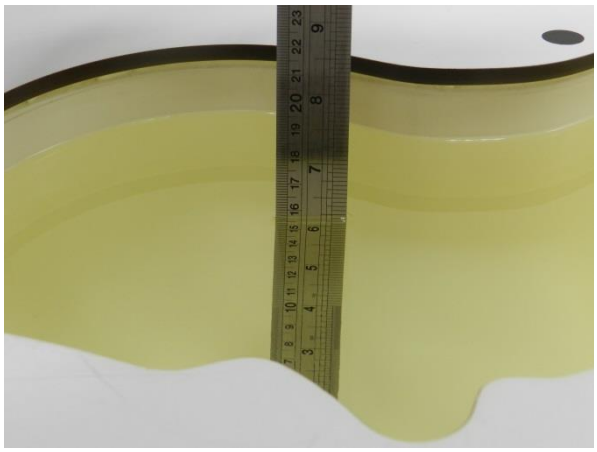


Fig 11.1 Photo of Liquid Height for Head SAR

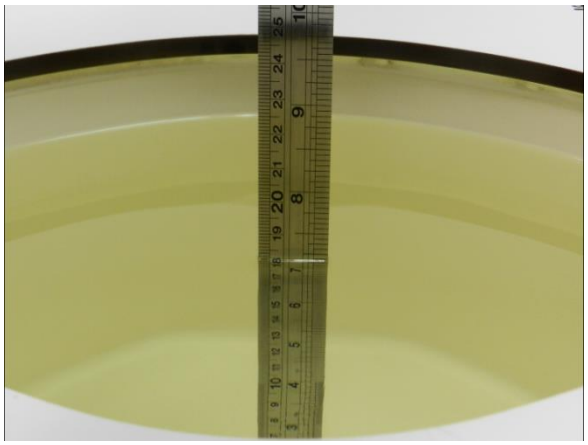


Fig 11.2 Photo of Liquid Height for Body SAR

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)
For Head								
835	40.3	57.9	0.2	1.4	0.2	0	0.90	41.5
1800, 1900	55.2	0	0	0.3	0	44.5	1.40	40.0
2450	55.0	0	0	0	0	45.0	1.80	39.2
2600	54.8	0	0	0.1	0	45.1	1.96	39.0

Simulating Liquid for 5GHz, Manufactured by SPEAG

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

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Tissue Type	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
835	Head	22.3	0.927	42.674	0.90	41.50	3.00	2.83	±5	2022/10/2
835	Head	22.1	0.897	40.781	0.90	41.50	-0.33	-1.73	±5	2022/10/6
1900	Head	22.5	1.440	40.038	1.40	40.00	2.86	0.09	±5	2022/10/3
1900	Head	22.4	1.412	39.311	1.40	40.00	0.86	-1.72	±5	2022/10/7
2450	Head	22.1	1.822	37.986	1.80	39.20	1.22	-3.10	±5	2022/10/9
2450	Head	22.6	1.881	37.273	1.80	39.20	4.50	-4.92	±5	2022/10/13
2600	Head	22.2	2.053	38.007	1.96	39.00	4.74	-2.55	±5	2022/10/4
2600	Head	22.3	1.894	40.240	1.96	39.00	-3.37	3.18	±5	2022/10/8
5250	Head	22.2	4.766	36.972	4.71	35.95	1.19	2.84	±5	2022/10/8
5250	Head	22.1	4.764	36.963	4.71	35.95	1.15	2.82	±5	2022/10/15
5600	Head	22.6	4.996	36.130	5.07	35.50	-1.46	1.77	±5	2022/10/9
5600	Head	22.2	5.006	36.080	5.07	35.50	-1.26	1.63	±5	2022/10/16
5750	Head	22.3	5.119	35.497	5.22	35.35	-1.93	0.42	±5	2022/10/10
5750	Head	22.4	5.298	35.158	5.22	35.35	1.49	-0.54	±5	2022/10/17

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 (%)
2022/10/2	835	Head	250	4d162	7576	1210	2.520	9.640	10.08	4.56
2022/10/6	835	Head	250	4d162	7576	1210	2.470	9.640	9.88	2.49
2022/10/3	1900	Head	250	5d182	7576	1210	9.920	39.600	39.68	0.20
2022/10/7	1900	Head	250	5d182	7576	1210	10.500	39.600	42	6.06
2022/10/9	2450	Head	250	1040	7576	1210	13.000	51.800	52	0.39
2022/10/13	2450	Head	250	1040	7576	1210	13.900	51.800	55.6	7.34
2022/10/4	2600	Head	250	1070	7576	1210	14.400	56.200	57.6	2.49
2022/10/8	2600	Head	250	1070	7576	1210	13.600	56.200	54.4	-3.20
2022/10/8	5250	Head	100	1341	7576	1210	7.890	80.700	78.9	-2.23
2022/10/15	5250	Head	100	1341	7576	1210	8.700	80.700	87	7.81
2022/10/9	5600	Head	100	1341	7576	1210	8.810	84.500	88.1	4.26
2022/10/16	5600	Head	100	1341	7576	1210	9.030	84.500	90.3	6.86
2022/10/10	5750	Head	100	1341	7576	1210	7.960	80.600	79.6	-1.24
2022/10/17	5750	Head	100	1341	7576	1210	8.170	80.600	81.7	1.36

<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 (%)
2022/10/2	835	Head	250	4d162	7576	1210	1.660	6.260	6.64	6.07
2022/10/6	835	Head	250	4d162	7576	1210	1.640	6.260	6.56	4.79
2022/10/3	1900	Head	250	5d182	7576	1210	5.090	20.200	20.36	0.79
2022/10/7	1900	Head	250	5d182	7576	1210	5.370	20.200	21.48	6.34
2022/10/9	2450	Head	250	1040	7576	1210	6.030	24.000	24.12	0.50
2022/10/13	2450	Head	250	1040	7576	1210	6.510	24.000	26.04	8.50
2022/10/4	2600	Head	250	1070	7576	1210	6.270	24.600	25.08	1.95
2022/10/8	2600	Head	250	1070	7576	1210	6.200	24.600	24.8	0.81
2022/10/8	5250	Head	100	1341	7576	1210	2.260	23.100	22.6	-2.16
2022/10/15	5250	Head	100	1341	7576	1210	2.440	23.100	24.4	5.63
2022/10/9	5600	Head	100	1341	7576	1210	2.500	24.000	25	4.17
2022/10/16	5600	Head	100	1341	7576	1210	2.590	24.000	25.9	7.92
2022/10/10	5750	Head	100	1341	7576	1210	2.260	22.700	22.6	-0.44
2022/10/17	5750	Head	100	1341	7576	1210	2.340	22.700	23.4	3.08

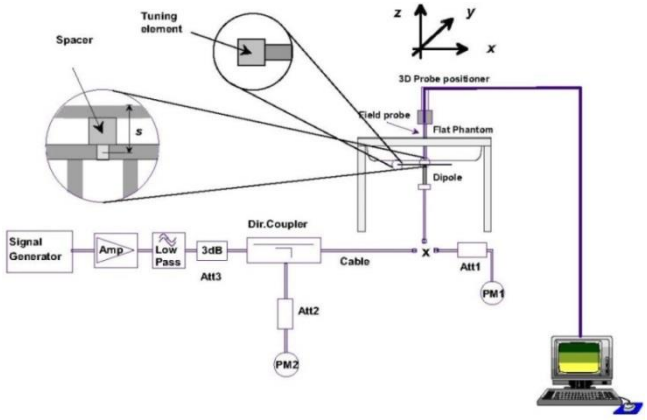


Fig 11.3.1 System Performance Check Setup

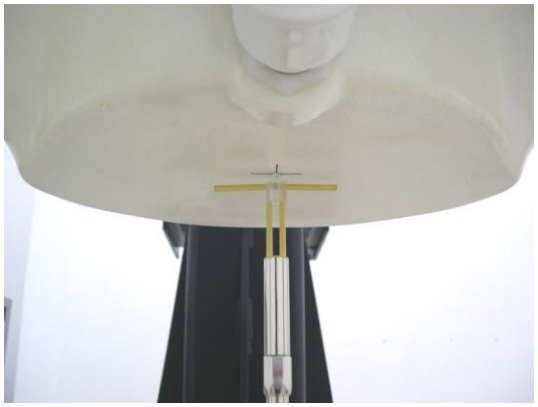


Fig 11.3.2 Setup Photo

12. RF Exposure Positions

12.1 Ear and handset reference point

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

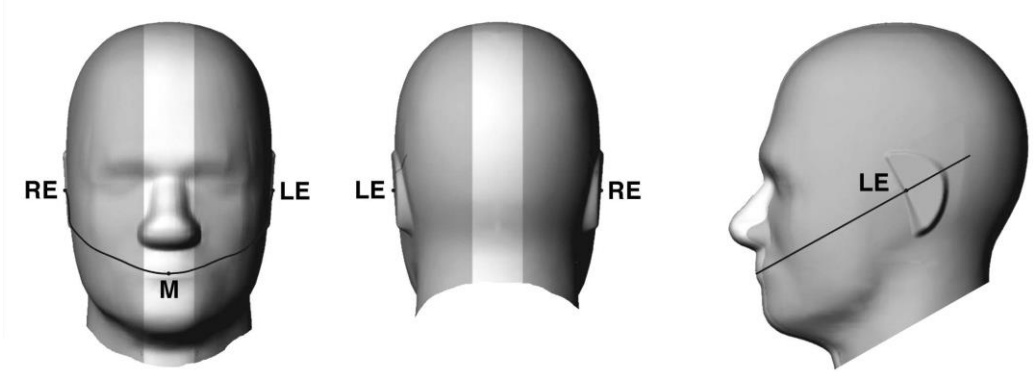


Fig 12.1.1 Front, back, and side views of SAM twin phantom

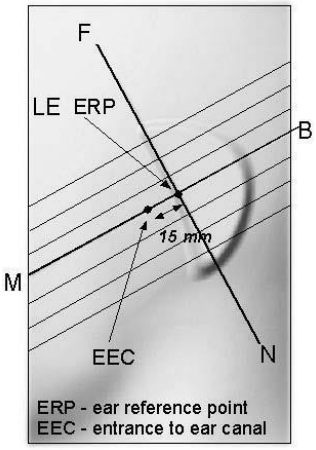


Fig 12.1.2 Close-up side view of phantom showing the ear region.

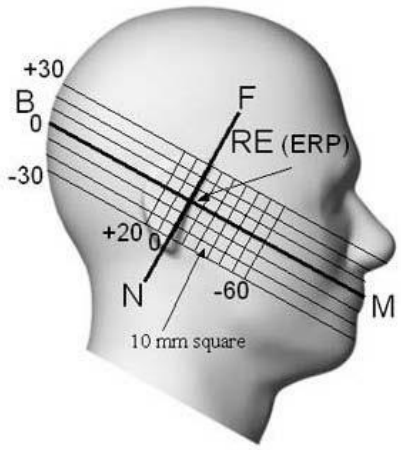


Fig 12.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

12.2 Definition of the cheek position

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

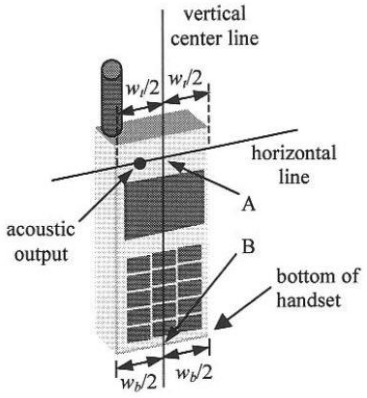


Fig 12.2.1 Handset vertical and horizontal reference lines—"fixed case

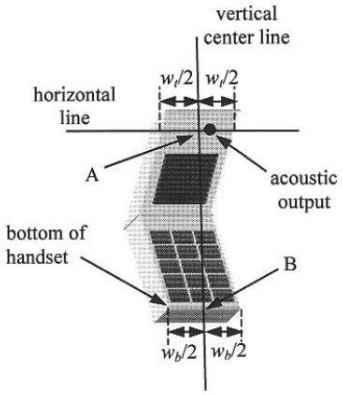


Fig 12.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

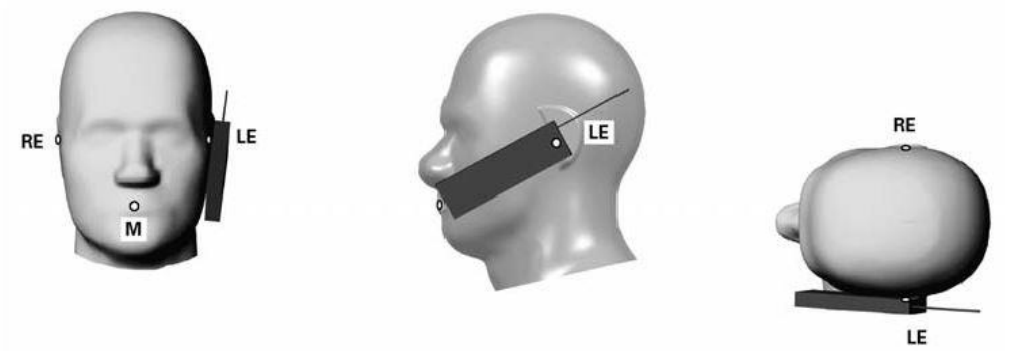


Fig 12.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

12.3 Definition of the tilt position

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

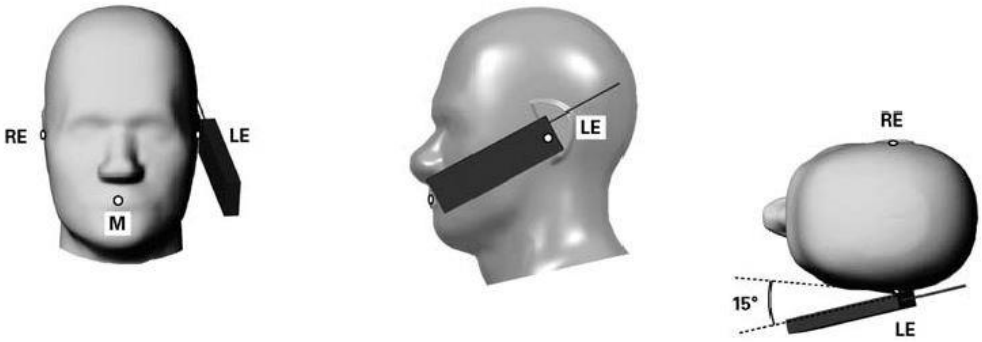


Fig 12.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

12.4 Body Worn Accessory

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

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

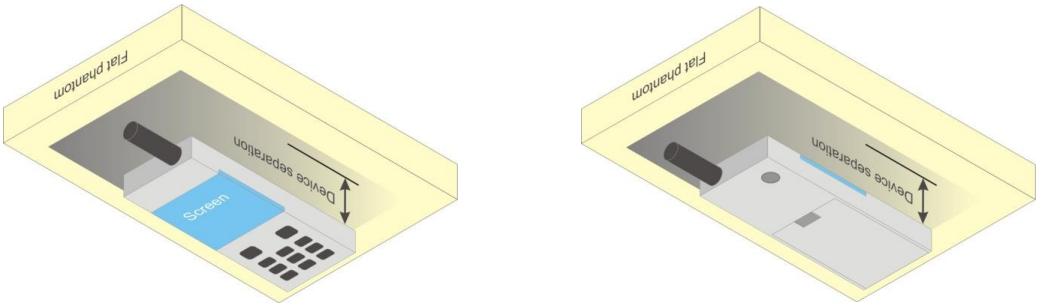


Fig 12.4 Body Worn Position

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 ≤ 25 mm from that surface or edge, in direct contact with a flat phantom, for 10-g extremity SAR according to the body-equivalent tissue dielectric parameters in KDB 865664 to address interactive hand use exposure conditions.6 The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg.

12.6 Wireless Router

Some battery-operated handsets have the capability to transmit and receive user through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06 v02r01 where SAR test considerations for handsets (L x W ≥ 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 form 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>

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.
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 ≤ ¼ 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 (β_c and β_d) and parameters were set according to each
   ii. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
   iii. Set RMC 12.2Kbps + HSDPA mode.
   iv. Set Cell Power = -86 dBm
   v. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
   vi. Select HSDPA Uplink Parameters
   vii. Set Delta ACK, Delta NACK and Delta CQI = 8
   viii. Set Ack-Nack Repetition Factor to 3
   ix. Set CQI Feedback Cycle (k) to 4 ms
   x. Set CQI Repetition Factor to 2
   xi. Power Ctrl Mode = All Up bits
d. The transmitted maximum output power was recorded.

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

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and Δ_{NACK} = 30/15 with β_{hs} = 30/15 * β_c, and Δ_{CQI} = 24/15 with β_{hs} = 24/15 * β_c.

Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_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 β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

Setup Configuration

HSUPA Setup Configuration:

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

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

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (Note 4) (Note 5)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2) (Note 6)	AG Index (Note 5)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	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	$\beta_{ed}1$: 47/15 $\beta_{ed}2$: 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, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c. For sub-test 5, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 5/15 with β_{hs} = 5/15 * β_c.

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

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

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

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

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

Setup Configuration

DC-HSDPA 3GPP release 8 Setup Configuration:

a. The EUT was connected to Base Station referred to the Setup Configuration below
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting:
   i. Set RMC 12.2Kbps + HSDPA mode.
   ii. Set Cell Power = -25 dBm
   iii. Set HS-DSCH Configuration Type to FRC (H-set 12, QPSK)
   iv. Select HSDPA Uplink Parameters
   v. Set Gain Factors (β_c and β_d) and parameters were set according to each Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
      a). Subtest 1: β_c/β_d=2/15
      b). Subtest 2: β_c/β_d=12/15
      c). Subtest 3: β_c/β_d=15/8
      d). Subtest 4: β_c/β_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	Proces ses	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.		

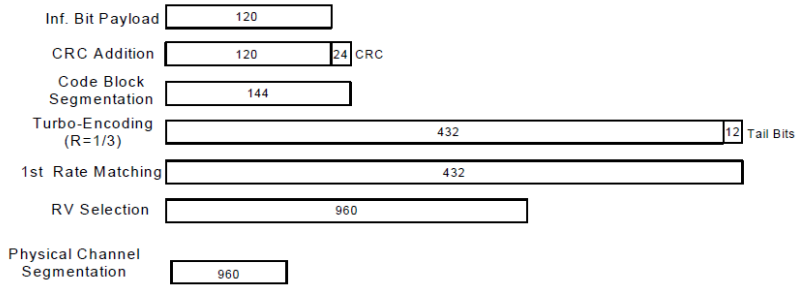


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

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 (β_c and β_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 Parms
   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: β values for transmitter characteristics tests with HS-DPCCH and E-DCH with 16QAM

Sub-test	β_c (Note3)	β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (2xSF2) (Note 4)	β_{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	β_{ed}1: 30/15 β_{ed}2: 30/15	β_{ed}3: 24/15 β_{ed}4: 24/15	3.5	2.5	14	105	105

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{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 β_c is set to 1 and β_d = 0 by default.
Note 4: β_{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>

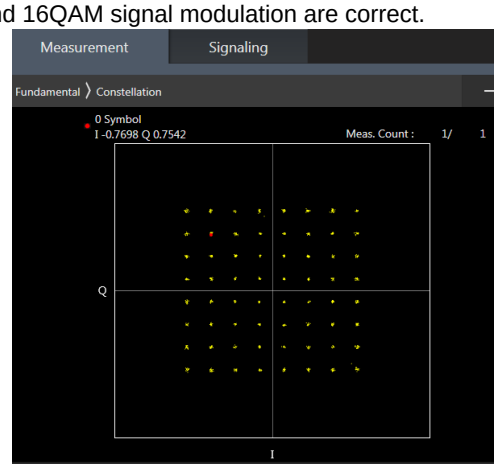
General Note:

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 ≤ ¼ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA / HSPA+ to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+ , and according to the following RF output power, the output power results of the secondary modes (HSDPA / HSUPA / DC-HSDPA / HSPA+) are less than ¼ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+.

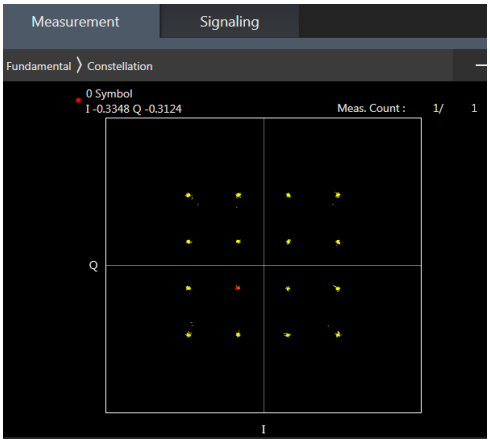
<LTE Conducted Power>

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 ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
6. Per KDB 941225 D05v02r05, 16QAM/64QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM/64QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B5/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. According to May 2017 TCB workshop, for 64 QAM and 16 QAM should be verified by checking the signal constellation with a call box to avoid incorrect maximum power levels due to MPR and other requirements associated with signal modulation, and the following figure is taken from the "Fundamental Measurement >> Modulation Analysis >> constellation" mode of the device connect to the MT8821C base station, therefore, the device 64QAM and 16QAM signal modulation are correct.



64QAM



16QAM

<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.

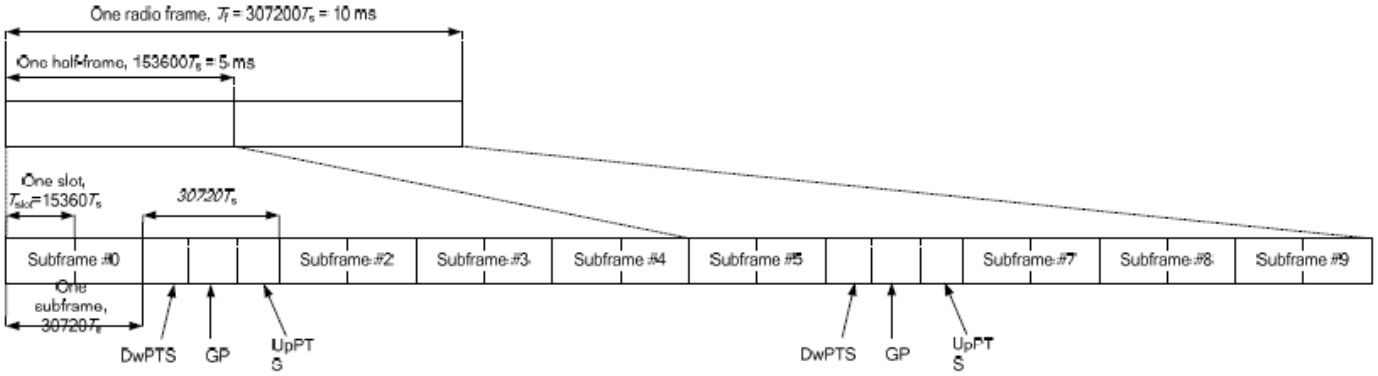


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

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	$6592 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$	$7680 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$			$7680 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
5	$6592 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$20480 \cdot T_s$		
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-	-	-
9	$13168 \cdot T_s$			-	-	-

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

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

The highest duty factor is resulted from:

For Power class 3

i. Uplink-downlink configuration: 0. In a half-frame consisted of 5 subfames, 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.

<LTE Carrier Aggregation>

General Note:

1. This device supports Carrier Aggregation on downlink for inter and intra band. For the device supports bands and bandwidths and configurations are provided as follow table was according to 3GPP.
2. In applying the existing power measurement procedures of KDB 941225 D05A for DL CA SAR test exclusion, only the subset with the largest number of combinations of frequency bands and CCs in each row need combination, and for this device that all the configurations were choose to power measurement.
3. All permutations exist. No restrictions on Pcell & Scell combinations.

2CC Downlink Carrier Aggregation	
Number	Combination
2CC #1	CA_5A-7A
2CC #2	CA_7B
2CC #3	CA_7C
2CC #4	CA_7A-7A
2CC #5	CA_41C
2CC #6	CA_41A-41A
2CC #7	CA_38A_38A

LTE Carrier Aggregation Conducted Power (Downlink)

i. According to KDB941225 D05A v01r02, Uplink maximum output power measurement with downlink carrier aggregation active should be measured, using the highest output channel measured without downlink carrier aggregation, to confirm that uplink maximum output power with downlink carrier aggregation active remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output measured without downlink carrier aggregation active.

ii. Uplink maximum output power with downlink carrier aggregation active does not show more than ¼ dB higher than the maximum output power without downlink carrier aggregation active, therefore SAR evaluation with downlink carrier aggregation active can be excluded.

iii. The device supports downlink two carrier aggregation. For power measurement were control and acknowledge data is sent on uplink channels that operate identical to specifications when downlink carrier aggregation is inactive.

iv. Selected highest measured power when downlink carrier aggregation is inactive for conducted power comparison with downlink carrier aggregation is active, to confirm that when downlink carrier aggregation is active uplink maximum output power remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output power measured when downlink carrier aggregation inactive.

v. For inter-band CA, the SCC selected highest bandwidth and near the middle of its transmission band. For SCC DL RB size and offset will base on the PCC corresponding RB allocation.

vi. For non-contiguous intra-band CA, the SCC selected to provide maximum separation from the PCC and must remain fully within the downlink transmission band.

vii. For Intra-band, contiguous CA, the downlink channels selected to perform the uplink power measurement must satisfy 3GPP channel spacing (5.4.1A of 3GPP TS 36.521 or equivalent) and channel bandwidth (5.4.2A) requirements.

$$\text{Nominal channel spacing} = \left\lfloor \frac{BW_{Channel(1)} + BW_{Channel(2)} - 0.1\left|BW_{Channel(1)} - BW_{Channel(2)}\right|}{0.6} \right\rfloor 0.3 \ \ [\text{MHz}]$$

<WLAN Conducted Power>

General Note:

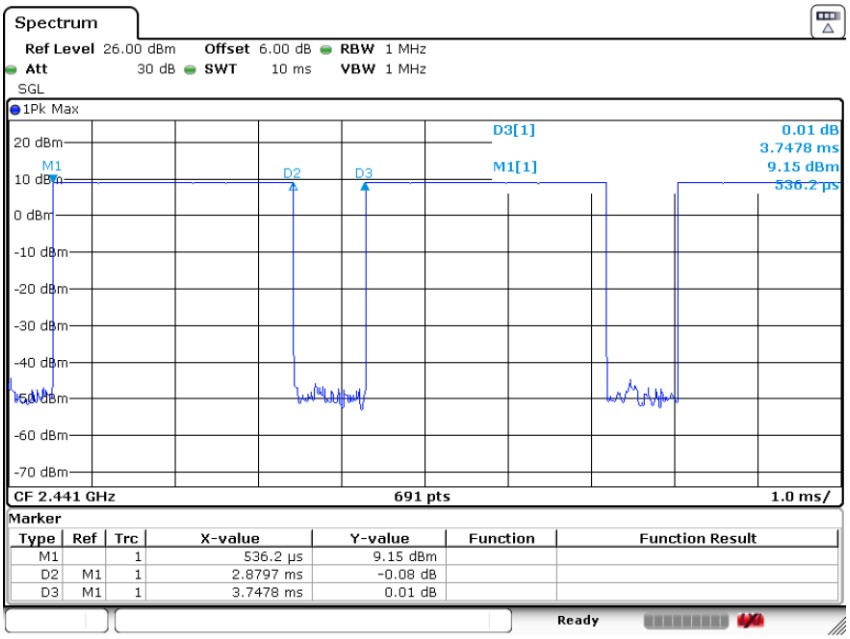
1. Per KDB 248227 D01v02r02, SAR test reduction is determined according to 802.11 transmission mode configurations and certain exposure conditions with multiple test positions. In the 2.4 GHz band, separate SAR procedures are applied to DSSS and OFDM configurations to simplify DSSS test requirements.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

<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 76.84% as following figure, according to 2016 Oct. 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 to100% for Bluetooth reported SAR calculation.

Bluetooth time-domain plot



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 BT/WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
   c. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
   d. For BT/WLAN: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
   e. For TDD LTE SAR measurement of power class 3, 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 = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required when the measured SAR is ≥ 0.8W/kg. Per KDB 865664 D01v01r04, if the extremity repeated SAR is necessary, the same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.
4. The device implements the power management and proximity sensor /receiver detection/hotspot mode for SAR compliance at different exposure conditions (head, body-worn, hotspot, extremity) and the 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.
5. For some WWAN bands, sensor on power level is higher than hotspot power level, so front/back sensor on SAR can represent hotspot conservatively.
6. 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.
7. There are two samples. The difference between them could be referred to the XT2333-3_Operational Description of Product Equality Declaration which is exhibited separately. According to the difference, we choose sample 1 for full testing and sample 2 for worst case verification.
8. The device has two headsets. Only suppliers are different, so we chose headset 1 to perform full SAR testing only.
9. This device has two batteries. Only suppliers are different, so we chose battery 1 to perform full SAR testing only.
10. 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, 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/V, LTE Band 2/5/7/38/41 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.
11. For the distance SAR and non-distance SAR of extremity exposure conditions, always chose higher SAR to do co-located analysis.
12. The following table “n/a” in the result means the SAR cube is too small to be found.

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 ≤ ¼ 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 ≤ ¼ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA / HSPA+ to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+, and according to the following RF output power, the output power results of the secondary modes (HSDPA / HSUPA / DC-HSDPA / HSPA+) are less than ¼ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+.

LTE Note:

1. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
2. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
3. Per KDB 941225 D05v02r05, for QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
4. Per KDB 941225 D05v02r05, 16QAM/64QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM/64QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B5/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.

WLAN Note:

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

15.1 Head SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
835MHz																				
01	GSM850	-	-	-	-	GPRS (4 TX slots)	Right Cheek	0mm	Ant 0	Full Power	189	836.4	29.25	30.00	1.189	-	-	0.02	0.264	**0.314**
	GSM850	-	-	-	-	GPRS (4 TX slots)	Right Tilted	0mm	Ant 0	Full Power	189	836.4	29.25	30.00	1.189	-	-	0.1	0.194	0.231
	GSM850	-	-	-	-	GPRS (4 TX slots)	Left Cheek	0mm	Ant 0	Full Power	189	836.4	29.25	30.00	1.189	-	-	-0.11	0.258	0.307
	GSM850	-	-	-	-	GPRS (4 TX slots)	Left Tilted	0mm	Ant 0	Full Power	189	836.4	29.25	30.00	1.189	-	-	-0.02	0.174	0.207
02	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 0	Full Power	4182	836.4	22.49	24.00	1.416	-	-	0.05	0.207	**0.293**
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 0	Full Power	4182	836.4	22.49	24.00	1.416	-	-	0.05	0.139	0.197
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 0	Full Power	4182	836.4	22.49	24.00	1.416	-	-	0.06	0.204	0.289
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Ant 0	Full Power	4182	836.4	22.49	24.00	1.416	-	-	0.03	0.115	0.163
03	LTE Band 5	10M	QPSK	1	25	-	Right Cheek	0mm	Ant 0	Full Power	20525	836.5	22.62	24.00	1.374	-	-	0.02	0.241	**0.331**
	LTE Band 5	10M	QPSK	1	25	-	Right Tilted	0mm	Ant 0	Full Power	20525	836.5	22.62	24.00	1.374	-	-	0.11	0.129	0.177
	LTE Band 5	10M	QPSK	1	25	-	Left Cheek	0mm	Ant 0	Full Power	20525	836.5	22.62	24.00	1.374	-	-	0.03	0.210	0.289
	LTE Band 5	10M	QPSK	1	25	-	Left Tilted	0mm	Ant 0	Full Power	20525	836.5	22.62	24.00	1.374	-	-	0.14	0.114	0.157
	LTE Band 5	10M	QPSK	25	0	-	Right Cheek	0mm	Ant 0	Full Power	20525	836.5	21.44	23.00	1.432	-	-	-0.06	0.197	0.282
	LTE Band 5	10M	QPSK	25	0	-	Right Tilted	0mm	Ant 0	Full Power	20525	836.5	21.44	23.00	1.432	-	-	-0.18	0.098	0.140
	LTE Band 5	10M	QPSK	25	0	-	Left Cheek	0mm	Ant 0	Full Power	20525	836.5	21.44	23.00	1.432	-	-	0.05	0.163	0.233
	LTE Band 5	10M	QPSK	25	0	-	Left Tilted	0mm	Ant 0	Full Power	20525	836.5	21.44	23.00	1.432	-	-	-0.13	0.088	0.126
1900MHz																				
04	GSM1900	-	-	-	-	GPRS (4 TX slots)	Right Cheek	0mm	Ant 0	Full Power	512	1850.2	26.71	27.00	1.069	-	-	0.13	0.107	**0.114**
	GSM1900	-	-	-	-	GPRS (4 TX slots)	Right Tilted	0mm	Ant 0	Full Power	512	1850.2	26.71	27.00	1.069	-	-	0.14	0.078	0.083
	GSM1900	-	-	-	-	GPRS (4 TX slots)	Left Cheek	0mm	Ant 0	Full Power	512	1850.2	26.71	27.00	1.069	-	-	-0.07	0.084	0.090
	GSM1900	-	-	-	-	GPRS (4 TX slots)	Left Tilted	0mm	Ant 0	Full Power	512	1850.2	26.71	27.00	1.069	-	-	-0.09	0.086	0.092
05	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Cheek	0mm	Ant 0	Full Power	9538	1907.6	22.58	24.00	1.387	-	-	0.03	0.216	**0.300**
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Tilted	0mm	Ant 0	Full Power	9538	1907.6	22.58	24.00	1.387	-	-	-0.01	0.126	0.175
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Cheek	0mm	Ant 0	Full Power	9538	1907.6	22.58	24.00	1.387	-	-	-0.17	0.141	0.196
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Tilted	0mm	Ant 0	Full Power	9538	1907.6	22.58	24.00	1.387	-	-	0.01	0.155	0.215
06	LTE Band 2	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 0	Full Power	18900	1880	22.57	24.00	1.390	-	-	0.05	0.285	**0.396**
	LTE Band 2	20M	QPSK	1	49	-	Right Tilted	0mm	Ant 0	Full Power	18900	1880	22.57	24.00	1.390	-	-	-0.07	0.144	0.200
	LTE Band 2	20M	QPSK	1	49	-	Left Cheek	0mm	Ant 0	Full Power	18900	1880	22.57	24.00	1.390	-	-	0.07	0.161	0.224
	LTE Band 2	20M	QPSK	1	49	-	Left Tilted	0mm	Ant 0	Full Power	18900	1880	22.57	24.00	1.390	-	-	0.12	0.172	0.239
	LTE Band 2	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 0	Full Power	18900	1880	21.52	23.00	1.406	-	-	0.19	0.182	0.256
	LTE Band 2	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 0	Full Power	18900	1880	21.52	23.00	1.406	-	-	-0.03	0.116	0.163
	LTE Band 2	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 0	Full Power	18900	1880	21.52	23.00	1.406	-	-	0.1	0.131	0.184
	LTE Band 2	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 0	Full Power	18900	1880	21.52	23.00	1.406	-	-	-0.02	0.135	0.190
2600MHz																				
	LTE Band 7	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 1	Full Power	21350	2560	22.90	24.00	1.288	-	-	-0.03	0.157	0.202
	LTE Band 7	20M	QPSK	1	49	-	Right Tilted	0mm	Ant 1	Full Power	21350	2560	22.90	24.00	1.288	-	-	0.04	0.128	0.165
07	LTE Band 7	20M	QPSK	1	49	-	Left Cheek	0mm	Ant 1	Full Power	21350	2560	22.90	24.00	1.288	-	-	0.02	0.510	**0.657**
	LTE Band 7	20M	QPSK	1	49	-	Left Tilted	0mm	Ant 1	Full Power	21350	2560	22.90	24.00	1.288	-	-	0.02	0.100	0.129
	LTE Band 7	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 1	Full Power	21350	2560	21.93	23.00	1.279	-	-	0.13	0.148	0.189
	LTE Band 7	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 1	Full Power	21350	2560	21.93	23.00	1.279	-	-	-0.04	0.207	0.265
	LTE Band 7	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 1	Full Power	21350	2560	21.93	23.00	1.279	-	-	0.05	0.400	0.512
	LTE Band 7	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 1	Full Power	21350	2560	21.93	23.00	1.279	-	-	0.17	0.104	0.133
	LTE Band 38	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 1	Full Power	38000	2595	22.61	24.00	1.377	62.9	1.006	0.18	0.204	0.283
	LTE Band 38	20M	QPSK	1	49	-	Right Tilted	0mm	Ant 1	Full Power	38000	2595	22.61	24.00	1.377	62.9	1.006	-0.13	0.147	0.204
08	LTE Band 38	20M	QPSK	1	49	-	Left Cheek	0mm	Ant 1	Full Power	38000	2595	22.61	24.00	1.377	62.9	1.006	-0.1	0.574	**0.795**
	LTE Band 38	20M	QPSK	1	49	-	Left Tilted	0mm	Ant 1	Full Power	38000	2595	22.61	24.00	1.377	62.9	1.006	0.08	0.130	0.180
	LTE Band 38	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 1	Full Power	38000	2595	21.48	23.00	1.419	62.9	1.006	0.15	0.160	0.228
	LTE Band 38	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 1	Full Power	38000	2595	21.48	23.00	1.419	62.9	1.006	0.02	0.097	0.138
	LTE Band 38	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 1	Full Power	38000	2595	21.48	23.00	1.419	62.9	1.006	-0.11	0.291	0.415
	LTE Band 38	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 1	Full Power	38000	2595	21.48	23.00	1.419	62.9	1.006	-0.18	0.099	0.141

	LTE Band 41	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 1	Full Power	40400	2571	23.83	24.00	1.040	62.9	1.006	0.15	0.159	0.166
	LTE Band 41	20M	QPSK	1	49	-	Right Tilted	0mm	Ant 1	Full Power	40400	2571	23.83	24.00	1.040	62.9	1.006	-0.16	0.108	0.113
09	LTE Band 41	20M	QPSK	1	49	-	Left Cheek	0mm	Ant 1	Full Power	40400	2571	23.83	24.00	1.040	62.9	1.006	0.14	0.232	**0.243**
	LTE Band 41	20M	QPSK	1	49	-	Left Tilted	0mm	Ant 1	Full Power	40400	2571	23.83	24.00	1.040	62.9	1.006	-0.13	0.093	0.097
	LTE Band 41	20M	QPSK	50	0	-	Right Cheek	0mm	Ant 1	Full Power	40400	2571	22.98	23.00	1.005	62.9	1.006	0.09	0.127	0.128
	LTE Band 41	20M	QPSK	50	0	-	Right Tilted	0mm	Ant 1	Full Power	40400	2571	22.98	23.00	1.005	62.9	1.006	0.09	0.076	0.077
	LTE Band 41	20M	QPSK	50	0	-	Left Cheek	0mm	Ant 1	Full Power	40400	2571	22.98	23.00	1.005	62.9	1.006	-0.04	0.228	0.230
	LTE Band 41	20M	QPSK	50	0	-	Left Tilted	0mm	Ant 1	Full Power	40400	2571	22.98	23.00	1.005	62.9	1.006	0.03	0.071	0.072

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
2450MHz																
	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	Ant 4	Reduced	11	2462	17.46	19.00	1.426	99.31	1.007	-0.01	0.236	0.339
	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	0mm	Ant 4	Reduced	11	2462	17.46	19.00	1.426	99.31	1.007	-0.09	0.223	0.320
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 4	Reduced	11	2462	17.46	19.00	1.426	99.31	1.007	0.1	0.580	0.833
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	Ant 4	Reduced	11	2462	17.46	19.00	1.426	99.31	1.007	0.19	0.442	0.635
10	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 4	Reduced	1	2412	17.43	19.00	1.435	99.31	1.007	-0.08	0.730	**1.055**
	Bluetooth	DH5 1Mbps	Right Cheek	0mm	Ant 4	Full Power	39	2441	9.56	11.00	1.392	76.84	1.301	-	n/a	n/a
	Bluetooth	DH5 1Mbps	Right Tilted	0mm	Ant 4	Full Power	39	2441	9.56	11.00	1.392	76.84	1.301	-	n/a	n/a
11	Bluetooth	DH5 1Mbps	Left Cheek	0mm	Ant 4	Full Power	39	2441	9.56	11.00	1.392	76.84	1.301	0.13	0.079	**0.143**
	Bluetooth	DH5 1Mbps	Left Tilted	0mm	Ant 4	Full Power	39	2441	9.56	11.00	1.392	76.84	1.301	0.04	0.041	0.074
5000MHz																
	WLAN5.3GHz	802.11a 6Mbps	Right Cheek	0mm	Ant 4	Full Power	56	5280	18.00	19.50	1.413	96.97	1.031	-0.1	0.314	0.457
	WLAN5.3GHz	802.11a 6Mbps	Right Tilted	0mm	Ant 4	Full Power	56	5280	18.00	19.50	1.413	96.97	1.031	-0.04	0.203	0.296
	WLAN5.3GHz	802.11a 6Mbps	Left Cheek	0mm	Ant 4	Full Power	56	5280	18.00	19.50	1.413	96.97	1.031	-0.06	0.281	0.409
12	WLAN5.3GHz	802.11a 6Mbps	Left Tilted	0mm	Ant 4	Full Power	56	5280	18.00	19.50	1.413	96.97	1.031	0.04	0.574	**0.836**
	WLAN5.3GHz	802.11a 6Mbps	Left Tilted	0mm	Ant 4	Full Power	64	5320	17.97	19.50	1.421	96.97	1.031	0.18	0.566	0.829
	WLAN5.5GHz	802.11a 6Mbps	Right Cheek	0mm	Ant 4	Reduced	100	5500	17.26	19.00	1.492	96.97	1.031	0.17	0.276	0.424
	WLAN5.5GHz	802.11a 6Mbps	Right Tilted	0mm	Ant 4	Reduced	100	5500	17.26	19.00	1.492	96.97	1.031	0.11	0.316	0.486
	WLAN5.5GHz	802.11a 6Mbps	Left Cheek	0mm	Ant 4	Reduced	100	5500	17.26	19.00	1.492	96.97	1.031	-0.04	0.481	0.740
13	WLAN5.5GHz	802.11a 6Mbps	Left Tilted	0mm	Ant 4	Reduced	100	5500	17.26	19.00	1.492	96.97	1.031	-0.19	0.775	**1.192**
	WLAN5.5GHz	802.11a 6Mbps	Left Tilted	0mm	Ant 4	Reduced	116	5580	17.08	19.00	1.556	96.97	1.031	-0.12	0.541	0.868
	WLAN5.8GHz	802.11a 6Mbps	Right Cheek	0mm	Ant 4	Full Power	157	5785	18.20	19.50	1.348	96.97	1.031	-0.08	0.111	0.154
	WLAN5.8GHz	802.11a 6Mbps	Right Tilted	0mm	Ant 4	Full Power	157	5785	18.20	19.50	1.348	96.97	1.031	-0.01	0.152	0.211
	WLAN5.8GHz	802.11a 6Mbps	Left Cheek	0mm	Ant 4	Full Power	157	5785	18.20	19.50	1.348	96.97	1.031	0.14	0.212	0.295
14	WLAN5.8GHz	802.11a 6Mbps	Left Tilted	0mm	Ant 4	Full Power	157	5785	18.20	19.50	1.348	96.97	1.031	-0.03	0.371	**0.516**

15.2 Hotspot SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
835MHz																				
	GSM850	-	-	-	-	GPRS (4 TX slots)	Front	5mm	Ant 0	Reduced	189	836.4	28.39	29.00	1.151	-	-	0.14	0.470	0.541
15	GSM850	-	-	-	-	GPRS (4 TX slots)	Back	5mm	Ant 0	Reduced	189	836.4	28.39	29.00	1.151	-	-	0.07	1.020	**1.174**
	GSM850	-	-	-	-	GPRS (4 TX slots)	Left Side	5mm	Ant 0	Reduced	189	836.4	28.39	29.00	1.151	-	-	-0.17	0.281	0.323
	GSM850	-	-	-	-	GPRS (4 TX slots)	Right Side	5mm	Ant 0	Reduced	189	836.4	28.39	29.00	1.151	-	-	0.06	0.404	0.465
	GSM850	-	-	-	-	GPRS (4 TX slots)	Bottom Side	5mm	Ant 0	Reduced	189	836.4	28.39	29.00	1.151	-	-	0.13	0.512	0.589
	GSM850	-	-	-	-	GPRS (4 TX slots)	Back	5mm	Ant 0	Reduced	128	824.2	28.29	29.00	1.178	-	-	0.1	0.924	1.088
	GSM850	-	-	-	-	GPRS (4 TX slots)	Back	5mm	Ant 0	Reduced	251	848.8	28.35	29.00	1.161	-	-	-0.14	1.010	1.173
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 0	Reduced	4182	836.4	21.51	23.00	1.409	-	-	-0.18	0.332	0.468
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	Reduced	4182	836.4	21.51	23.00	1.409	-	-	-0.01	0.747	1.053
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Side	5mm	Ant 0	Reduced	4182	836.4	21.51	23.00	1.409	-	-	-0.17	0.172	0.242
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Right Side	5mm	Ant 0	Reduced	4182	836.4	21.51	23.00	1.409	-	-	-0.06	0.318	0.448
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 0	Reduced	4182	836.4	21.51	23.00	1.409	-	-	0.02	0.428	0.603
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	Reduced	4132	826.4	21.32	23.00	1.472	-	-	0.05	0.687	1.011
16	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	Reduced	4233	846.6	21.45	23.00	1.429	-	-	-0.02	0.951	**1.359**
	LTE Band 5	10M	QPSK	1	25	-	Front	5mm	Ant 0	Full Power	20525	836.5	22.62	24.00	1.374	-	-	0.05	0.419	0.576
	LTE Band 5	10M	QPSK	1	25	-	Back	5mm	Ant 0	Full Power	20525	836.5	22.62	24.00	1.374	-	-	-0.11	0.952	1.308
	LTE Band 5	10M	QPSK	1	25	-	Left Side	5mm	Ant 0	Full Power	20525	836.5	22.62	24.00	1.374	-	-	-0.13	0.215	0.295
	LTE Band 5	10M	QPSK	1	25	-	Right Side	5mm	Ant 0	Full Power	20525	836.5	22.62	24.00	1.374	-	-	0.04	0.444	0.610
	LTE Band 5	10M	QPSK	1	25	-	Bottom Side	5mm	Ant 0	Full Power	20525	836.5	22.62	24.00	1.374	-	-	0.03	0.575	0.790
	LTE Band 5	10M	QPSK	1	25	-	Back	5mm	Ant 0	Full Power	20450	829	22.61	24.00	1.377	-	-	-0.1	0.971	1.337
17	LTE Band 5	10M	QPSK	1	25	-	Back	5mm	Ant 0	Full Power	20600	844	22.45	24.00	1.429	-	-	-0.03	0.994	**1.420**
	LTE Band 5	10M	QPSK	25	0	-	Front	5mm	Ant 0	Full Power	20525	836.5	21.44	23.00	1.432	-	-	-0.11	0.329	0.471
	LTE Band 5	10M	QPSK	25	0	-	Back	5mm	Ant 0	Full Power	20525	836.5	21.44	23.00	1.432	-	-	-0.07	0.756	1.083
	LTE Band 5	10M	QPSK	25	0	-	Left Side	5mm	Ant 0	Full Power	20525	836.5	21.44	23.00	1.432	-	-	-0.05	0.174	0.249
	LTE Band 5	10M	QPSK	25	0	-	Right Side	5mm	Ant 0	Full Power	20525	836.5	21.44	23.00	1.432	-	-	-0.1	0.344	0.493
	LTE Band 5	10M	QPSK	25	0	-	Bottom Side	5mm	Ant 0	Full Power	20525	836.5	21.44	23.00	1.432	-	-	0.17	0.477	0.683
	LTE Band 5	10M	QPSK	25	0	-	Back	5mm	Ant 0	Full Power	20450	829	21.40	23.00	1.445	-	-	-0.01	0.819	1.184
	LTE Band 5	10M	QPSK	25	0	-	Back	5mm	Ant 0	Full Power	20600	844	21.32	23.00	1.472	-	-	-0.01	0.915	1.347
	LTE Band 5	10M	QPSK	50	0	-	Back	5mm	Ant 0	Full Power	20525	836.5	21.43	23.00	1.435	-	-	-0.16	0.750	1.077
1900MHz																				
	GSM1900	-	-	-	-	GPRS (4 TX slots)	Front	5mm	Ant 0	Reduced	512	1850.2	21.41	21.50	1.021	-	-	-0.07	0.485	0.495
	GSM1900	-	-	-	-	GPRS (4 TX slots)	Back	5mm	Ant 0	Reduced	512	1850.2	21.41	21.50	1.021	-	-	0.19	0.839	0.857
	GSM1900	-	-	-	-	GPRS (4 TX slots)	Left Side	5mm	Ant 0	Reduced	512	1850.2	21.41	21.50	1.021	-	-	-0.04	0.094	0.096
	GSM1900	-	-	-	-	GPRS (4 TX slots)	Right Side	5mm	Ant 0	Reduced	512	1850.2	21.41	21.50	1.021	-	-	-0.01	0.122	0.125
	GSM1900	-	-	-	-	GPRS (4 TX slots)	Bottom Side	5mm	Ant 0	Reduced	512	1850.2	21.41	21.50	1.021	-	-	0.1	1.070	1.092
18	GSM1900	-	-	-	-	GPRS (4 TX slots)	Bottom Side	5mm	Ant 0	Reduced	661	1880	20.74	21.50	1.191	-	-	0.03	1.030	**1.227**
	GSM1900	-	-	-	-	GPRS (4 TX slots)	Bottom Side	5mm	Ant 0	Reduced	810	1909.8	20.95	21.50	1.135	-	-	0.07	0.972	1.103
	GSM1900	-	-	-	-	GPRS (4 TX slots)	Back	5mm	Ant 0	Reduced	661	1880	20.74	21.50	1.191	-	-	0.17	0.824	0.982
	GSM1900	-	-	-	-	GPRS (4 TX slots)	Back	5mm	Ant 0	Reduced	810	1909.8	20.95	21.50	1.135	-	-	-0.15	0.665	0.755
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 0	Reduced	9538	1907.6	14.57	16.00	1.390	-	-	0.02	0.341	0.474
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	Reduced	9538	1907.6	14.57	16.00	1.390	-	-	-0.14	0.679	0.944
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Left Side	5mm	Ant 0	Reduced	9538	1907.6	14.57	16.00	1.390	-	-	0.09	0.063	0.088
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Right Side	5mm	Ant 0	Reduced	9538	1907.6	14.57	16.00	1.390	-	-	0.17	0.074	0.103
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 0	Reduced	9538	1907.6	14.57	16.00	1.390	-	-	-0.03	0.871	1.211
19	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 0	Reduced	9262	1852.4	14.53	16.00	1.403	-	-	0.1	0.991	**1.390**
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 0	Reduced	9400	1880	14.52	16.00	1.406	-	-	0.1	0.959	1.348
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	Reduced	9262	1852.4	14.53	16.00	1.403	-	-	-0.14	0.720	1.010
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	Reduced	9400	1880	14.52	16.00	1.406	-	-	0.13	0.719	1.011
	LTE Band 2	20M	QPSK	1	49	-	Front	5mm	Ant 0	Reduced	18900	1880	14.62	16.00	1.374	-	-	-0.01	0.389	0.535
	LTE Band 2	20M	QPSK	1	49	-	Back	5mm	Ant 0	Reduced	18900	1880	14.62	16.00	1.374	-	-	-0.09	0.713	0.980

	LTE Band 2	20M	QPSK	1	49	-	Left Side	5mm	Ant 0	Reduced	18900	1880	14.62	16.00	1.374	-	-	-0.05	0.078	0.107
	LTE Band 2	20M	QPSK	1	49	-	Right Side	5mm	Ant 0	Reduced	18900	1880	14.62	16.00	1.374	-	-	-0.01	0.093	0.128
	LTE Band 2	20M	QPSK	1	49	-	Bottom Side	5mm	Ant 0	Reduced	18900	1880	14.62	16.00	1.374	-	-	0.05	0.932	1.281
20	LTE Band 2	20M	QPSK	1	49	-	Bottom Side	5mm	Ant 0	Reduced	18700	1860	14.57	16.00	1.390	-	-	0.01	0.953	**1.325**
	LTE Band 2	20M	QPSK	1	49	-	Bottom Side	5mm	Ant 0	Reduced	19100	1900	14.51	16.00	1.409	-	-	-0.03	0.912	1.285
	LTE Band 2	20M	QPSK	1	49	-	Back	5mm	Ant 0	Reduced	18700	1860	14.57	16.00	1.390	-	-	-0.14	0.710	0.987
	LTE Band 2	20M	QPSK	1	49	-	Back	5mm	Ant 0	Reduced	19100	1900	14.51	16.00	1.409	-	-	0.01	0.668	0.941
	LTE Band 2	20M	QPSK	50	0	-	Front	5mm	Ant 0	Reduced	18900	1880	13.52	15.00	1.406	-	-	0.04	0.302	0.425
	LTE Band 2	20M	QPSK	50	0	-	Back	5mm	Ant 0	Reduced	18900	1880	13.52	15.00	1.406	-	-	0.01	0.579	0.814
	LTE Band 2	20M	QPSK	50	0	-	Left Side	5mm	Ant 0	Reduced	18900	1880	13.52	15.00	1.406	-	-	0.01	0.064	0.090
	LTE Band 2	20M	QPSK	50	0	-	Right Side	5mm	Ant 0	Reduced	18900	1880	13.52	15.00	1.406	-	-	-0.09	0.073	0.103
	LTE Band 2	20M	QPSK	50	0	-	Bottom Side	5mm	Ant 0	Reduced	18900	1880	13.52	15.00	1.406	-	-	0.16	0.751	1.056
	LTE Band 2	20M	QPSK	50	0	-	Bottom Side	5mm	Ant 0	Reduced	18700	1860	13.51	15.00	1.409	-	-	-0.19	0.778	1.096
	LTE Band 2	20M	QPSK	50	0	-	Bottom Side	5mm	Ant 0	Reduced	19100	1900	13.46	15.00	1.426	-	-	0.07	0.737	1.051
	LTE Band 2	20M	QPSK	50	0	-	Back	5mm	Ant 0	Reduced	18700	1860	13.51	15.00	1.409	-	-	-0.12	0.537	0.757
	LTE Band 2	20M	QPSK	50	0	-	Back	5mm	Ant 0	Reduced	19100	1900	13.46	15.00	1.426	-	-	0.19	0.538	0.767
	LTE Band 2	20M	QPSK	100	0	-	Back	5mm	Ant 0	Reduced	18900	1880	13.51	15.00	1.409	-	-	-0.01	0.578	0.815
	LTE Band 2	20M	QPSK	100	0	-	Bottom Side	5mm	Ant 0	Reduced	18900	1880	13.51	15.00	1.409	-	-	0.01	0.745	1.050
2600MHz																				
	LTE Band 7	20M	QPSK	1	49	-	Front	5mm	Ant 1	Reduced	21350	2560	17.32	18.50	1.312	-	-	-0.19	0.442	0.580
21	LTE Band 7	20M	QPSK	1	49	-	Back	5mm	Ant 1	Reduced	21350	2560	17.32	18.50	1.312	-	-	-0.09	0.950	**1.247**
	LTE Band 7	20M	QPSK	1	49	-	Left Side	5mm	Ant 1	Reduced	21350	2560	17.32	18.50	1.312	-	-	0.18	0.444	0.583
	LTE Band 7	20M	QPSK	1	49	-	Right Side	5mm	Ant 1	Reduced	21350	2560	17.32	18.50	1.312	-	-	0.09	0.080	0.105
	LTE Band 7	20M	QPSK	1	49	-	Bottom Side	5mm	Ant 1	Reduced	21350	2560	17.32	18.50	1.312	-	-	-0.1	0.463	0.608
	LTE Band 7	20M	QPSK	1	49	-	Back	5mm	Ant 1	Reduced	20850	2510	17.31	18.50	1.315	-	-	0.13	0.829	1.090
	LTE Band 7	20M	QPSK	1	49	-	Back	5mm	Ant 1	Reduced	21100	2535	17.28	18.50	1.324	-	-	0.08	0.870	1.152
	LTE Band 7	20M	QPSK	50	0	-	Front	5mm	Ant 1	Reduced	21350	2560	16.30	17.50	1.318	-	-	-0.01	0.343	0.452
	LTE Band 7	20M	QPSK	50	0	-	Back	5mm	Ant 1	Reduced	21350	2560	16.30	17.50	1.318	-	-	0.15	0.673	0.887
	LTE Band 7	20M	QPSK	50	0	-	Left Side	5mm	Ant 1	Reduced	21350	2560	16.30	17.50	1.318	-	-	0.09	0.344	0.453
	LTE Band 7	20M	QPSK	50	0	-	Right Side	5mm	Ant 1	Reduced	21350	2560	16.30	17.50	1.318	-	-	-0.08	0.063	0.083
	LTE Band 7	20M	QPSK	50	0	-	Bottom Side	5mm	Ant 1	Reduced	21350	2560	16.30	17.50	1.318	-	-	-0.18	0.362	0.477
	LTE Band 7	20M	QPSK	50	0	-	Back	5mm	Ant 1	Reduced	20850	2510	16.17	17.50	1.358	-	-	0.16	0.649	0.882
	LTE Band 7	20M	QPSK	50	0	-	Back	5mm	Ant 1	Reduced	21100	2535	16.04	17.50	1.400	-	-	0.14	0.694	0.971
	LTE Band 7	20M	QPSK	100	0	-	Back	5mm	Ant 1	Reduced	21350	2560	16.27	17.50	1.327	-	-	-0.08	0.659	0.875
	LTE Band 38	20M	QPSK	1	49	-	Front	5mm	Ant 1	Reduced	38000	2595	19.76	21.00	1.330	62.9	1.006	0.09	0.482	0.645
	LTE Band 38	20M	QPSK	1	49	-	Back	5mm	Ant 1	Reduced	38000	2595	19.76	21.00	1.330	62.9	1.006	0.14	0.911	1.219
	LTE Band 38	20M	QPSK	1	49	-	Left Side	5mm	Ant 1	Reduced	38000	2595	19.76	21.00	1.330	62.9	1.006	0.12	0.492	0.659
	LTE Band 38	20M	QPSK	1	49	-	Right Side	5mm	Ant 1	Reduced	38000	2595	19.76	21.00	1.330	62.9	1.006	0.19	0.096	0.128
	LTE Band 38	20M	QPSK	1	49	-	Bottom Side	5mm	Ant 1	Reduced	38000	2595	19.76	21.00	1.330	62.9	1.006	0.13	0.523	0.700
22	LTE Band 38	20M	QPSK	1	49	-	Back	5mm	Ant 1	Reduced	37850	2580	19.74	21.00	1.337	62.9	1.006	-0.01	1.050	**1.412**
	LTE Band 38	20M	QPSK	1	49	-	Back	5mm	Ant 1	Reduced	38150	2610	19.68	21.00	1.355	62.9	1.006	0.07	0.927	1.264
	LTE Band 38	20M	QPSK	50	0	-	Front	5mm	Ant 1	Reduced	38000	2595	18.72	20.00	1.343	62.9	1.006	-0.14	0.374	0.505
	LTE Band 38	20M	QPSK	50	0	-	Back	5mm	Ant 1	Reduced	38000	2595	18.72	20.00	1.343	62.9	1.006	0.06	0.704	0.951
	LTE Band 38	20M	QPSK	50	0	-	Left Side	5mm	Ant 1	Reduced	38000	2595	18.72	20.00	1.343	62.9	1.006	0.01	0.371	0.501
	LTE Band 38	20M	QPSK	50	0	-	Right Side	5mm	Ant 1	Reduced	38000	2595	18.72	20.00	1.343	62.9	1.006	0.18	0.070	0.095
	LTE Band 38	20M	QPSK	50	0	-	Bottom Side	5mm	Ant 1	Reduced	38000	2595	18.72	20.00	1.343	62.9	1.006	-0.07	0.410	0.554
	LTE Band 38	20M	QPSK	50	0	-	Back	5mm	Ant 1	Reduced	37850	2580	18.71	20.00	1.346	62.9	1.006	-0.04	0.716	0.969
	LTE Band 38	20M	QPSK	50	0	-	Back	5mm	Ant 1	Reduced	38150	2610	18.66	20.00	1.361	62.9	1.006	0.17	0.722	0.989
	LTE Band 38	20M	QPSK	100	0	-	Back	5mm	Ant 1	Reduced	38000	2595	18.62	20.00	1.374	62.9	1.006	-0.11	0.717	0.991
	LTE Band 41	20M	QPSK	1	49	-	Front	5mm	Ant 1	Reduced	40400	2571	20.90	21.00	1.023	62.9	1.006	0.15	0.505	0.520
	LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 1	Reduced	40400	2571	20.90	21.00	1.023	62.9	1.006	0.11	0.910	0.937
	LTE Band 41	20M	QPSK	1	49	-	Left Side	5mm	Ant 1	Reduced	40400	2571	20.90	21.00	1.023	62.9	1.006	0.02	0.479	0.493
	LTE Band 41	20M	QPSK	1	49	-	Right Side	5mm	Ant 1	Reduced	40400	2571	20.90	21.00	1.023	62.9	1.006	0.16	0.090	0.093
	LTE Band 41	20M	QPSK	1	49	-	Bottom Side	5mm	Ant 1	Reduced	40400	2571	20.90	21.00	1.023	62.9	1.006	0.06	0.498	0.513
	LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 1	Reduced	40140	2545	19.60	21.00	1.380	62.9	1.006	-0.03	0.868	1.205
	LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 1	Reduced	40670	2598	20.15	21.00	1.216	62.9	1.006	0.15	0.950	1.162

23	LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 1	Reduced	41140	2645	19.73	21.00	1.340	62.9	1.006	-0.11	0.958	**1.291**
	LTE Band 41	20M	QPSK	50	0	-	Front	5mm	Ant 1	Reduced	40400	2571	19.95	20.00	1.012	62.9	1.006	-0.04	0.372	0.379
	LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 1	Reduced	40400	2571	19.95	20.00	1.012	62.9	1.006	0.08	0.663	0.675
	LTE Band 41	20M	QPSK	50	0	-	Left Side	5mm	Ant 1	Reduced	40400	2571	19.95	20.00	1.012	62.9	1.006	0.18	0.373	0.380
	LTE Band 41	20M	QPSK	50	0	-	Right Side	5mm	Ant 1	Reduced	40400	2571	19.95	20.00	1.012	62.9	1.006	0.15	0.072	0.073
	LTE Band 41	20M	QPSK	50	0	-	Bottom Side	5mm	Ant 1	Reduced	40400	2571	19.95	20.00	1.012	62.9	1.006	-0.06	0.401	0.408
	LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 1	Reduced	40140	2545	18.54	20.00	1.400	62.9	1.006	0.18	0.603	0.849
	LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 1	Reduced	40670	2598	19.22	20.00	1.197	62.9	1.006	0.02	0.694	0.836
	LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 1	Reduced	41140	2645	18.72	20.00	1.343	62.9	1.006	-0.12	0.717	0.969
	LTE Band 41	20M	QPSK	100	0	-	Back	5mm	Ant 1	Reduced	40400	2571	19.84	20.00	1.038	62.9	1.006	-0.17	0.671	0.700

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
2450MHz																
	WLAN2.4GHz	802.11b 1Mbps	Front	5mm	Ant 4	Full Power	11	2462	18.31	20.00	1.476	99.31	1.007	-0.18	0.337	0.501
	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Ant 4	Full Power	11	2462	18.31	20.00	1.476	99.31	1.007	-0.18	0.610	0.906
	WLAN2.4GHz	802.11b 1Mbps	Left Side	5mm	Ant 4	Full Power	11	2462	18.31	20.00	1.476	99.31	1.007	-	n/a	n/a
	WLAN2.4GHz	802.11b 1Mbps	Right Side	5mm	Ant 4	Full Power	11	2462	18.31	20.00	1.476	99.31	1.007	0.16	0.349	0.519
	WLAN2.4GHz	802.11b 1Mbps	Top Side	5mm	Ant 4	Full Power	11	2462	18.31	20.00	1.476	99.31	1.007	0.01	0.429	0.638
24	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Ant 4	Full Power	1	2412	18.21	20.00	1.510	99.31	1.007	-0.01	0.669	**1.017**
	Bluetooth	DH5 1Mbps	Front	5mm	Ant 4	Full Power	39	2441	9.56	11.00	1.392	76.84	1.301	-	n/a	n/a
25	Bluetooth	DH5 1Mbps	Back	5mm	Ant 4	Full Power	39	2441	9.56	11.00	1.392	76.84	1.301	-0.08	0.072	**0.130**
	Bluetooth	DH5 1Mbps	Left Side	5mm	Ant 4	Full Power	39	2441	9.56	11.00	1.392	76.84	1.301	-	n/a	n/a
	Bluetooth	DH5 1Mbps	Right Side	5mm	Ant 4	Full Power	39	2441	9.56	11.00	1.392	76.84	1.301	-	n/a	n/a
	Bluetooth	DH5 1Mbps	Top Side	5mm	Ant 4	Full Power	39	2441	9.56	11.00	1.392	76.84	1.301	-	n/a	n/a
5000MHz																
	WLAN5.2GHz	802.11n-HT40 MCS0	Front	5mm	Ant 4	Reduced	46	5230	16.62	18.50	1.541	93.73	1.067	0.17	0.144	0.237
26	WLAN5.2GHz	802.11n-HT40 MCS0	Back	5mm	Ant 4	Reduced	46	5230	16.62	18.50	1.541	93.73	1.067	-0.12	0.722	**1.187**
	WLAN5.2GHz	802.11n-HT40 MCS0	Left Side	5mm	Ant 4	Reduced	46	5230	16.62	18.50	1.541	93.73	1.067	-	n/a	n/a
	WLAN5.2GHz	802.11n-HT40 MCS0	Right Side	5mm	Ant 4	Reduced	46	5230	16.62	18.50	1.541	93.73	1.067	-0.13	0.147	0.242
	WLAN5.2GHz	802.11n-HT40 MCS0	Top Side	5mm	Ant 4	Reduced	46	5230	16.62	18.50	1.541	93.73	1.067	-0.17	0.417	0.686
	WLAN5.2GHz	802.11n-HT40 MCS0	Back	5mm	Ant 4	Reduced	38	5190	16.61	18.50	1.545	93.73	1.067	-0.12	0.607	1.000
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Front	5mm	Ant 4	Reduced	155	5775	13.49	15.00	1.415	88.23	1.133	-	n/a	n/a
27	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 4	Reduced	155	5775	13.49	15.00	1.415	88.23	1.133	0	0.705	**1.130**
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Left Side	5mm	Ant 4	Reduced	155	5775	13.49	15.00	1.415	88.23	1.133	-	n/a	n/a
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Side	5mm	Ant 4	Reduced	155	5775	13.49	15.00	1.415	88.23	1.133	0.09	0.189	0.303
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Top Side	5mm	Ant 4	Reduced	155	5775	13.49	15.00	1.415	88.23	1.133	0.06	0.233	0.373

15.3 Body Worn Accessory SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Headset	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
835MHz																					
	GSM850	-	-	-	-	GPRS (4 TX slots)	Front	5mm	Ant 0	-	Reduced	189	836.4	28.39	29.00	1.151	-	-	0.14	0.470	0.541
28	GSM850	-	-	-	-	GPRS (4 TX slots)	Back	5mm	Ant 0	-	Reduced	189	836.4	28.39	29.00	1.151	-	-	0.07	1.020	**1.174**
	GSM850	-	-	-	-	GPRS (4 TX slots)	Back	5mm	Ant 0	-	Reduced	128	824.2	28.29	29.00	1.178	-	-	0.1	0.924	1.088
	GSM850	-	-	-	-	GPRS (4 TX slots)	Back	5mm	Ant 0	-	Reduced	251	848.8	28.35	29.00	1.161	-	-	-0.14	1.010	1.173
	GSM850	-	-	-	-	GPRS (4 TX slots)	Front	14mm	Ant 0	-	Full Power	189	836.4	29.25	30.00	1.189	-	-	-0.01	0.256	0.304
	GSM850	-	-	-	-	GPRS (4 TX slots)	Back	18mm	Ant 0	-	Full Power	189	836.4	29.25	30.00	1.189	-	-	0.05	0.306	0.364
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 0	-	Reduced	4182	836.4	21.51	23.00	1.409	-	-	-0.18	0.332	0.468
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	-	Reduced	4182	836.4	21.51	23.00	1.409	-	-	-0.01	0.747	1.053
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	-	Reduced	4132	826.4	21.32	23.00	1.472	-	-	0.05	0.687	1.011
29	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	-	Reduced	4233	846.6	21.45	23.00	1.429	-	-	-0.02	0.951	**1.359**
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	Headset	Reduced	4233	846.6	21.45	23.00	1.429	-	-	-0.04	0.930	1.329
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Front	14mm	Ant 0	-	Full Power	4182	836.4	22.49	24.00	1.416	-	-	-0.01	0.184	0.261
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	18mm	Ant 0	-	Full Power	4233	846.6	22.48	24.00	1.419	-	-	-0.04	0.240	0.341
	LTE Band 5	10M	QPSK	1	25	-	Front	5mm	Ant 0	-	Full Power	20525	836.5	22.62	24.00	1.374	-	-	0.05	0.419	0.576
	LTE Band 5	10M	QPSK	1	25	-	Back	5mm	Ant 0	-	Full Power	20525	836.5	22.62	24.00	1.374	-	-	-0.11	0.952	1.308
	LTE Band 5	10M	QPSK	1	25	-	Back	5mm	Ant 0	-	Full Power	20450	829	22.61	24.00	1.377	-	-	-0.1	0.971	1.337
30	LTE Band 5	10M	QPSK	1	25	-	Back	5mm	Ant 0	-	Full Power	20600	844	22.45	24.00	1.429	-	-	-0.03	0.994	**1.420**
	LTE Band 5	10M	QPSK	1	25	-	Back	5mm	Ant 0	Headset	Full Power	20600	844	22.45	24.00	1.429	-	-	0.18	0.979	1.399
	LTE Band 5	10M	QPSK	25	0	-	Front	5mm	Ant 0	-	Full Power	20525	836.5	21.44	23.00	1.432	-	-	-0.11	0.329	0.471
	LTE Band 5	10M	QPSK	25	0	-	Back	5mm	Ant 0	-	Full Power	20525	836.5	21.44	23.00	1.432	-	-	-0.07	0.756	1.083
	LTE Band 5	10M	QPSK	25	0	-	Back	5mm	Ant 0	-	Full Power	20450	829	21.40	23.00	1.445	-	-	-0.01	0.819	1.184
	LTE Band 5	10M	QPSK	25	0	-	Back	5mm	Ant 0	-	Full Power	20600	844	21.32	23.00	1.472	-	-	-0.01	0.915	1.347
	LTE Band 5	10M	QPSK	50	0	-	Back	5mm	Ant 0	-	Full Power	20525	836.5	21.43	23.00	1.435	-	-	-0.16	0.750	1.077
1900MHz																					
	GSM1900	-	-	-	-	GPRS (4 TX slots)	Front	5mm	Ant 0	-	Reduced	512	1850.2	22.40	22.50	1.023	-	-	-0.1	0.535	0.547
	GSM1900	-	-	-	-	GPRS (4 TX slots)	Back	5mm	Ant 0	-	Reduced	512	1850.2	22.40	22.50	1.023	-	-	-0.01	1.100	1.126
31	GSM1900	-	-	-	-	GPRS (4 TX slots)	Back	5mm	Ant 0	-	Reduced	661	1880	21.77	22.50	1.183	-	-	0.08	1.070	**1.266**
	GSM1900	-	-	-	-	GPRS (4 TX slots)	Back	5mm	Ant 0	-	Reduced	810	1909.8	21.93	22.50	1.140	-	-	0.17	0.852	0.971
	GSM1900	-	-	-	-	GPRS (4 TX slots)	Back	5mm	Ant 0	Headset	Reduced	661	1880	21.77	22.50	1.183	-	-	-0.05	0.979	1.158
	GSM1900	-	-	-	-	GPRS (4 TX slots)	Front	14mm	Ant 0	-	Full Power	512	1850.2	26.71	27.00	1.069	-	-	-0.14	0.420	0.449
	GSM1900	-	-	-	-	GPRS (4 TX slots)	Back	18mm	Ant 0	-	Full Power	661	1880	26.06	27.00	1.242	-	-	0.07	0.438	0.544
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	5mm	Ant 0	-	Reduced	9538	1907.6	14.95	16.50	1.429	-	-	0.12	0.370	0.529
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	-	Reduced	9538	1907.6	14.95	16.50	1.429	-	-	0.18	0.776	1.109
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	-	Reduced	9262	1852.4	14.92	16.50	1.439	-	-	0.01	0.864	1.243
32	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	-	Reduced	9400	1880	14.91	16.50	1.442	-	-	-0.04	0.897	**1.294**
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	5mm	Ant 0	Headset	Reduced	9400	1880	14.91	16.50	1.442	-	-	0.11	0.773	1.115
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	14mm	Ant 0	-	Full Power	9538	1907.6	22.58	24.00	1.387	-	-	-0.14	0.532	0.738
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	18mm	Ant 0	-	Full Power	9400	1880	22.46	24.00	1.426	-	-	0.07	0.662	0.944
	LTE Band 2	20M	QPSK	1	49	-	Front	5mm	Ant 0	-	Reduced	18900	1880	15.35	17.00	1.462	-	-	-0.16	0.489	0.715
33	LTE Band 2	20M	QPSK	1	49	-	Back	5mm	Ant 0	-	Reduced	18900	1880	15.35	17.00	1.462	-	-	0.16	0.956	**1.398**
	LTE Band 2	20M	QPSK	1	49	-	Back	5mm	Ant 0	-	Reduced	18700	1860	15.23	17.00	1.503	-	-	-0.14	0.911	1.369
	LTE Band 2	20M	QPSK	1	49	-	Back	5mm	Ant 0	-	Reduced	19100	1900	15.31	17.00	1.476	-	-	0.07	0.821	1.212
	LTE Band 2	20M	QPSK	1	49	-	Back	5mm	Ant 0	Headset	Reduced	18900	1880	15.35	17.00	1.462	-	-	0.04	0.905	1.323
	LTE Band 2	20M	QPSK	1	49	-	Front	14mm	Ant 0	-	Full Power	18900	1880	22.57	24.00	1.390	-	-	0.11	0.619	0.860
	LTE Band 2	20M	QPSK	1	49	-	Back	18mm	Ant 0	-	Full Power	18900	1880	22.57	24.00	1.390	-	-	-0.01	0.630	0.876
	LTE Band 2	20M	QPSK	50	0	-	Front	5mm	Ant 0	-	Reduced	18900	1880	14.33	16.00	1.469	-	-	0.09	0.384	0.564
	LTE Band 2	20M	QPSK	50	0	-	Back	5mm	Ant 0	-	Reduced	18900	1880	14.33	16.00	1.469	-	-	0.11	0.693	1.018
	LTE Band 2	20M	QPSK	50	0	-	Back	5mm	Ant 0	-	Reduced	18700	1860	14.27	16.00	1.489	-	-	0.11	0.700	1.043
	LTE Band 2	20M	QPSK	50	0	-	Back	5mm	Ant 0	-	Reduced	19100	1900	14.22	16.00	1.507	-	-	-0.01	0.667	1.005
	LTE Band 2	20M	QPSK	100	0	-	Back	5mm	Ant 0	-	Reduced	18900	1880	14.25	16.00	1.496	-	-	0.1	0.689	1.031

2600MHz																					
	LTE Band 7	20M	QPSK	1	49	-	Front	5mm	Ant 1	-	Reduced	21350	2560	17.32	18.50	1.312	-	-	-0.19	0.442	0.580
34	LTE Band 7	20M	QPSK	1	49	-	Back	5mm	Ant 1	-	Reduced	21350	2560	17.32	18.50	1.312	-	-	-0.09	0.950	**1.247**
	LTE Band 7	20M	QPSK	1	49	-	Back	5mm	Ant 1	-	Reduced	20850	2510	17.31	18.50	1.315	-	-	0.13	0.829	1.090
	LTE Band 7	20M	QPSK	1	49	-	Back	5mm	Ant 1	-	Reduced	21100	2535	17.28	18.50	1.324	-	-	0.08	0.870	1.152
	LTE Band 7	20M	QPSK	1	49	-	Back	5mm	Ant 1	Headset	Reduced	21350	2560	17.32	18.50	1.312	-	-	0.03	0.908	1.191
	LTE Band 7	20M	QPSK	1	49	-	Front	14mm	Ant 1	-	Full Power	21350	2560	22.90	24.00	1.288	-	-	0.14	0.381	0.491
	LTE Band 7	20M	QPSK	1	49	-	Back	18mm	Ant 1	-	Full Power	21350	2560	22.90	24.00	1.288	-	-	-0.01	0.361	0.465
	LTE Band 7	20M	QPSK	50	0	-	Front	5mm	Ant 1	-	Reduced	21350	2560	16.30	17.50	1.318	-	-	-0.03	0.343	0.452
	LTE Band 7	20M	QPSK	50	0	-	Back	5mm	Ant 1	-	Reduced	21350	2560	16.30	17.50	1.318	-	-	0.15	0.673	0.887
	LTE Band 7	20M	QPSK	50	0	-	Back	5mm	Ant 1	-	Reduced	20850	2510	16.17	17.50	1.358	-	-	0.16	0.649	0.882
	LTE Band 7	20M	QPSK	50	0	-	Back	5mm	Ant 1	-	Reduced	21100	2535	16.04	17.50	1.400	-	-	0.14	0.694	0.971
	LTE Band 7	20M	QPSK	100	0	-	Back	5mm	Ant 1	-	Reduced	21350	2560	16.27	17.50	1.327	-	-	-0.08	0.659	0.875
	LTE Band 38	20M	QPSK	1	49	-	Front	5mm	Ant 1	-	Reduced	38000	2595	19.76	21.00	1.330	62.9	1.006	0.09	0.482	0.645
	LTE Band 38	20M	QPSK	1	49	-	Back	5mm	Ant 1	-	Reduced	38000	2595	19.76	21.00	1.330	62.9	1.006	0.14	0.911	1.219
35	LTE Band 38	20M	QPSK	1	49	-	Back	5mm	Ant 1	-	Reduced	37850	2580	19.74	21.00	1.337	62.9	1.006	-0.01	1.050	**1.412**
	LTE Band 38	20M	QPSK	1	49	-	Back	5mm	Ant 1	-	Reduced	38150	2610	19.68	21.00	1.355	62.9	1.006	0.07	0.927	1.264
	LTE Band 38	20M	QPSK	1	49	-	Back	5mm	Ant 1	Headset	Reduced	37850	2580	19.74	21.00	1.337	62.9	1.006	-0.14	0.921	1.238
	LTE Band 38	20M	QPSK	1	49	-	Front	14mm	Ant 1	-	Full Power	38000	2595	22.61	24.00	1.377	62.9	1.006	-0.06	0.236	0.327
	LTE Band 38	20M	QPSK	1	49	-	Back	18mm	Ant 1	-	Full Power	37850	2580	22.58	24.00	1.387	62.9	1.006	-0.11	0.212	0.296
	LTE Band 38	20M	QPSK	50	0	-	Front	5mm	Ant 1	-	Reduced	38000	2595	18.72	20.00	1.343	62.9	1.006	-0.14	0.374	0.505
	LTE Band 38	20M	QPSK	50	0	-	Back	5mm	Ant 1	-	Reduced	38000	2595	18.72	20.00	1.343	62.9	1.006	0.06	0.704	0.951
	LTE Band 38	20M	QPSK	50	0	-	Back	5mm	Ant 1	-	Reduced	37850	2580	18.71	20.00	1.346	62.9	1.006	-0.04	0.716	0.969
	LTE Band 38	20M	QPSK	50	0	-	Back	5mm	Ant 1	-	Reduced	38150	2610	18.66	20.00	1.361	62.9	1.006	0.17	0.722	0.989
	LTE Band 38	20M	QPSK	100	0	-	Back	5mm	Ant 1	-	Reduced	38000	2595	18.62	20.00	1.374	62.9	1.006	-0.11	0.717	0.991
	LTE Band 41	20M	QPSK	1	49	-	Front	5mm	Ant 1	-	Reduced	40400	2571	20.90	21.00	1.023	62.9	1.006	0.15	0.505	0.520
	LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 1	-	Reduced	40400	2571	20.90	21.00	1.023	62.9	1.006	0.11	0.910	0.937
	LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 1	-	Reduced	40140	2545	19.60	21.00	1.380	62.9	1.006	-0.03	0.868	1.205
	LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 1	-	Reduced	40670	2598	20.15	21.00	1.216	62.9	1.006	0.15	0.950	1.162
	LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 1	-	Reduced	41140	2645	19.73	21.00	1.340	62.9	1.006	-0.11	0.958	1.291
36	LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 1	Headset	Reduced	41140	2645	19.73	21.00	1.340	62.9	1.006	0.14	1.020	**1.375**
	LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 1	Headset	Reduced	40400	2571	20.90	21.00	1.023	62.9	1.006	0.15	1.010	1.040
	LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 1	Headset	Reduced	40140	2545	19.60	21.00	1.380	62.9	1.006	0.08	0.990	1.375
	LTE Band 41	20M	QPSK	1	49	-	Back	5mm	Ant 1	Headset	Reduced	40670	2598	20.15	21.00	1.216	62.9	1.006	0.06	0.920	1.126
	LTE Band 41	20M	QPSK	1	49	-	Front	14mm	Ant 1	-	Full Power	40400	2571	23.83	24.00	1.040	62.9	1.006	-0.06	0.183	0.191
	LTE Band 41	20M	QPSK	1	49	-	Back	18mm	Ant 1	Headset	Full Power	41140	2645	22.69	24.00	1.352	62.9	1.006	0.03	0.182	0.248
	LTE Band 41	20M	QPSK	50	0	-	Front	5mm	Ant 1	-	Reduced	40400	2571	19.95	20.00	1.012	62.9	1.006	-0.19	0.372	0.379
	LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 1	-	Reduced	40400	2571	19.95	20.00	1.012	62.9	1.006	0.08	0.663	0.675
	LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 1	-	Reduced	40140	2545	18.54	20.00	1.400	62.9	1.006	0.18	0.603	0.849
	LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 1	-	Reduced	40670	2598	19.22	20.00	1.197	62.9	1.006	-0.05	0.694	0.836
	LTE Band 41	20M	QPSK	50	0	-	Back	5mm	Ant 1	-	Reduced	41140	2645	18.72	20.00	1.343	62.9	1.006	-0.12	0.717	0.969
	LTE Band 41	20M	QPSK	100	0	-	Back	5mm	Ant 1	-	Reduced	40400	2571	19.84	20.00	1.038	62.9	1.006	-0.17	0.671	0.700

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Headset	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
2450MHz																	
	WLAN2.4GHz	802.11b 1Mbps	Front	5mm	Ant 4	-	Full Power	11	2462	18.31	20.00	1.476	99.31	1.007	-0.18	0.337	0.501
	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Ant 4	-	Full Power	11	2462	18.31	20.00	1.476	99.31	1.007	-0.18	0.610	0.906
37	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Ant 4	-	Full Power	1	2412	18.21	20.00	1.510	99.31	1.007	-0.01	0.669	**1.017**
	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Ant 4	-	Full Power	6	2437	18.18	20.00	1.521	99.31	1.007	-0.12	0.508	0.778
	Bluetooth	DH5 1Mbps	Front	5mm	Ant 4	-	Full Power	39	2441	9.56	11.00	1.392	76.84	1.301	-	n/a	n/a
38	Bluetooth	DH5 1Mbps	Back	5mm	Ant 4	-	Full Power	39	2441	9.56	11.00	1.392	76.84	1.301	-0.08	0.072	**0.130**
5000MHz																	
	WLAN5.3GHz	802.11n-HT40 MCS0	Front	5mm	Ant 4	-	Reduced	54	5270	16.65	18.50	1.531	93.73	1.067	-0.02	0.232	0.379
39	WLAN5.3GHz	802.11n-HT40 MCS0	Back	5mm	Ant 4	-	Reduced	54	5270	16.65	18.50	1.531	93.73	1.067	-0.11	0.589	**0.962**
	WLAN5.3GHz	802.11n-HT40 MCS0	Back	5mm	Ant 4	-	Reduced	62	5310	16.17	18.00	1.524	93.73	1.067	0.05	0.542	0.881
	WLAN5.3GHz	802.11a 6Mbps	Front	14mm	Ant 4	-	Full Power	56	5280	18.00	19.50	1.413	96.97	1.031	-0.06	0.072	0.105
	WLAN5.3GHz	802.11a 6Mbps	Back	18mm	Ant 4	-	Full Power	56	5280	18.00	19.50	1.413	96.97	1.031	0.14	0.143	0.208
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Front	5mm	Ant 4	-	Reduced	106	5530	14.61	16.50	1.544	88.23	1.133	0.09	0.161	0.282
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 4	-	Reduced	106	5530	14.61	16.50	1.544	88.23	1.133	0.01	0.631	1.104
40	WLAN5.5GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 4	-	Reduced	122	5610	14.52	16.50	1.576	88.23	1.133	0	0.665	**1.188**
	WLAN5.5GHz	802.11a 6Mbps	Front	14mm	Ant 4	-	Full Power	100	5500	17.94	19.50	1.431	96.97	1.031	0.09	0.085	0.125
	WLAN5.5GHz	802.11a 6Mbps	Back	18mm	Ant 4	-	Full Power	100	5500	17.94	19.50	1.431	96.97	1.031	0.14	0.229	0.338
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Front	5mm	Ant 4	-	Reduced	155	5775	13.49	15.00	1.415	88.23	1.133	0.07	0.042	0.067
41	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 4	-	Reduced	155	5775	13.49	15.00	1.415	88.23	1.133	0	0.705	**1.130**
	WLAN5.8GHz	802.11a 6Mbps	Front	14mm	Ant 4	-	Full Power	157	5785	18.20	19.50	1.348	96.97	1.031	-	n/a	n/a
	WLAN5.8GHz	802.11a 6Mbps	Back	18mm	Ant 4	-	Full Power	157	5785	18.20	19.50	1.348	96.97	1.031	-0.06	0.359	0.499

15.4 Product Specific SAR

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
835MHz																				
	GSM850	-	-	-	-	GPRS (4 TX slots)	Back	0mm	Ant 0	Full Power	189	836.4	29.25	30.00	1.189	-	-	0.05	1.690	2.009
42	GSM850	-	-	-	-	GPRS (4 TX slots)	Back	0mm	Ant 0	Full Power	128	824.2	29.10	30.00	1.230	-	-	0.13	1.740	**2.141**
	GSM850	-	-	-	-	GPRS (4 TX slots)	Back	0mm	Ant 0	Full Power	251	848.8	29.23	30.00	1.194	-	-	-0.16	1.680	2.006
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	0mm	Ant 0	Full Power	4182	836.4	22.49	24.00	1.416	-	-	-0.06	1.710	2.421
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	0mm	Ant 0	Full Power	4132	826.4	22.42	24.00	1.439	-	-	-0.1	1.730	2.489
43	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	0mm	Ant 0	Full Power	4233	846.6	22.48	24.00	1.419	-	-	-0.04	1.850	**2.625**
	LTE Band 5	10M	QPSK	1	25	-	Back	0mm	Ant 0	Full Power	20525	836.5	22.62	24.00	1.374	-	-	0.16	1.610	2.212
	LTE Band 5	10M	QPSK	1	25	-	Back	0mm	Ant 0	Full Power	20450	829	22.61	24.00	1.377	-	-	0.15	1.540	2.121
44	LTE Band 5	10M	QPSK	1	25	-	Back	0mm	Ant 0	Full Power	20600	844	22.45	24.00	1.429	-	-	0.13	1.670	**2.386**
	LTE Band 5	10M	QPSK	25	0	-	Back	0mm	Ant 0	Full Power	20525	836.5	21.44	23.00	1.432	-	-	0.01	1.450	2.077
	LTE Band 5	10M	QPSK	25	0	-	Back	0mm	Ant 0	Full Power	20450	829	21.40	23.00	1.445	-	-	-0.13	1.310	1.894
	LTE Band 5	10M	QPSK	25	0	-	Back	0mm	Ant 0	Full Power	20600	844	21.32	23.00	1.472	-	-	-0.11	1.420	2.091
	LTE Band 5	10M	QPSK	50	0	-	Back	0mm	Ant 0	Full Power	20525	836.5	21.43	23.00	1.435	-	-	-0.19	1.350	1.938
1900MHz																				
	GSM1900	-	-	-	-	GPRS (4 TX slots)	Front	0mm	Ant 0	Reduced	512	1850.2	26.26	26.50	1.057	-	-	0.05	1.830	1.934
	GSM1900	-	-	-	-	GPRS (4 TX slots)	Back	0mm	Ant 0	Reduced	512	1850.2	26.26	26.50	1.057	-	-	0.01	2.700	2.853
45	GSM1900	-	-	-	-	GPRS (4 TX slots)	Back	0mm	Ant 0	Reduced	661	1880	25.66	26.50	1.213	-	-	0.09	2.700	**3.276**
	GSM1900	-	-	-	-	GPRS (4 TX slots)	Back	0mm	Ant 0	Reduced	810	1909.8	25.84	26.50	1.164	-	-	-0.19	2.270	2.643
	GSM1900	-	-	-	-	GPRS (4 TX slots)	Bottom Side	0mm	Ant 0	Reduced	512	1850.2	26.26	26.50	1.057	-	-	0.16	2.160	2.283
	GSM1900	-	-	-	-	GPRS (4 TX slots)	Bottom Side	0mm	Ant 0	Reduced	661	1880	25.66	26.50	1.213	-	-	0.19	1.820	2.208
	GSM1900	-	-	-	-	GPRS (4 TX slots)	Bottom Side	0mm	Ant 0	Reduced	810	1909.8	25.84	26.50	1.164	-	-	-0.02	1.770	2.061
	GSM1900	-	-	-	-	GPRS (4 TX slots)	Front	14mm	Ant 0	Full Power	512	1850.2	26.71	27.00	1.069	-	-	0.03	0.260	0.278
	GSM1900	-	-	-	-	GPRS (4 TX slots)	Back	18mm	Ant 0	Full Power	661	1880	26.06	27.00	1.242	-	-	0.03	0.262	0.325
	GSM1900	-	-	-	-	GPRS (4 TX slots)	Bottom Side	20mm	Ant 0	Full Power	512	1850.2	26.71	27.00	1.069	-	-	0.07	0.327	0.350
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	0mm	Ant 0	Reduced	9538	1907.6	18.89	20.50	1.449	-	-	-0.15	1.210	1.753
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	0mm	Ant 0	Reduced	9538	1907.6	18.89	20.50	1.449	-	-	-0.19	2.040	2.955
46	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	0mm	Ant 0	Reduced	9262	1852.4	18.83	20.50	1.469	-	-	0.02	2.320	**3.408**
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	0mm	Ant 0	Reduced	9400	1880	18.88	20.50	1.452	-	-	0.12	2.250	3.267
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	0mm	Ant 0	Reduced	9538	1907.6	18.89	20.50	1.449	-	-	-0.03	1.500	2.173
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	0mm	Ant 0	Reduced	9262	1852.4	18.83	20.50	1.469	-	-	0.1	1.970	2.894
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	0mm	Ant 0	Reduced	9400	1880	18.88	20.50	1.452	-	-	-0.16	1.720	2.498
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Front	14mm	Ant 0	Full Power	9538	1907.6	22.58	24.00	1.387	-	-	-0.14	0.304	0.422
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Back	18mm	Ant 0	Full Power	9262	1852.4	22.51	24.00	1.409	-	-	0.09	0.446	0.629
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	20mm	Ant 0	Full Power	9262	1852.4	22.51	24.00	1.409	-	-	-0.03	0.551	0.777
	LTE Band 2	20M	QPSK	1	49	-	Front	0mm	Ant 0	Reduced	18900	1880	19.60	21.00	1.380	-	-	0.16	1.570	2.167
	LTE Band 2	20M	QPSK	1	49	-	Front	0mm	Ant 0	Reduced	18700	1860	19.51	21.00	1.409	-	-	-0.16	1.640	2.311
	LTE Band 2	20M	QPSK	1	49	-	Front	0mm	Ant 0	Reduced	19100	1900	19.57	21.00	1.390	-	-	0.1	1.410	1.960
	LTE Band 2	20M	QPSK	1	49	-	Back	0mm	Ant 0	Reduced	18900	1880	19.60	21.00	1.380	-	-	0.08	2.420	3.341
47	LTE Band 2	20M	QPSK	1	49	-	Back	0mm	Ant 0	Reduced	18700	1860	19.51	21.00	1.409	-	-	0.05	2.530	**3.566**
	LTE Band 2	20M	QPSK	1	49	-	Back	0mm	Ant 0	Reduced	19100	1900	19.57	21.00	1.390	-	-	0.08	2.340	3.252
	LTE Band 2	20M	QPSK	1	49	-	Bottom Side	0mm	Ant 0	Reduced	18900	1880	19.60	21.00	1.380	-	-	-0.1	1.930	2.664
	LTE Band 2	20M	QPSK	1	49	-	Bottom Side	0mm	Ant 0	Reduced	18700	1860	19.51	21.00	1.409	-	-	-0.1	2.120	2.988
	LTE Band 2	20M	QPSK	1	49	-	Bottom Side	0mm	Ant 0	Reduced	19100	1900	19.57	21.00	1.390	-	-	-0.03	1.740	2.419
	LTE Band 2	20M	QPSK	1	49	-	Front	14mm	Ant 0	Full Power	18700	1860	22.35	24.00	1.462	-	-	-0.09	0.380	0.556
	LTE Band 2	20M	QPSK	1	49	-	Back	18mm	Ant 0	Full Power	18700	1860	22.35	24.00	1.462	-	-	0.16	0.427	0.624
	LTE Band 2	20M	QPSK	1	49	-	Bottom Side	20mm	Ant 0	Full Power	18700	1860	22.35	24.00	1.462	-	-	-0.19	0.508	0.743
	LTE Band 2	20M	QPSK	50	0	-	Front	0mm	Ant 0	Reduced	18900	1880	18.62	20.00	1.374	-	-	0.17	1.250	1.718
	LTE Band 2	20M	QPSK	50	0	-	Back	0mm	Ant 0	Reduced	18900	1880	18.62	20.00	1.374	-	-	-0.14	2.020	2.776
	LTE Band 2	20M	QPSK	50	0	-	Back	0mm	Ant 0	Reduced	18700	1860	18.48	20.00	1.419	-	-	-0.09	2.120	3.008
	LTE Band 2	20M	QPSK	50	0	-	Back	0mm	Ant 0	Reduced	19100	1900	18.57	20.00	1.390	-	-	-0.12	1.940	2.697

	LTE Band 2	20M	QPSK	50	0	-	Bottom Side	0mm	Ant 0	Reduced	18900	1880	18.62	20.00	1.374	-	-	0.11	1.640	2.253
	LTE Band 2	20M	QPSK	50	0	-	Bottom Side	0mm	Ant 0	Reduced	18700	1860	18.48	20.00	1.419	-	-	0.11	1.860	2.639
	LTE Band 2	20M	QPSK	50	0	-	Bottom Side	0mm	Ant 0	Reduced	19100	1900	18.57	20.00	1.390	-	-	0.07	1.520	2.113
	LTE Band 2	20M	QPSK	100	0	-	Front	0mm	Ant 0	Reduced	18900	1880	18.59	20.00	1.384	-	-	-0.07	1.240	1.716
	LTE Band 2	20M	QPSK	100	0	-	Back	0mm	Ant 0	Reduced	18900	1880	18.59	20.00	1.384	-	-	-0.01	2.000	2.767
	LTE Band 2	20M	QPSK	100	0	-	Bottom Side	0mm	Ant 0	Reduced	18900	1880	18.59	20.00	1.384	-	-	0.17	1.500	2.075
2600MHz																				
	LTE Band 7	20M	QPSK	1	49	-	Front	0mm	Ant 1	Reduced	21350	2560	17.32	18.50	1.312	-	-	-0.07	0.604	0.793
48	LTE Band 7	20M	QPSK	1	49	-	Back	0mm	Ant 1	Reduced	21350	2560	17.32	18.50	1.312	-	-	0.07	1.530	**2.008**
	LTE Band 7	20M	QPSK	1	49	-	Left Side	0mm	Ant 1	Reduced	21350	2560	17.32	18.50	1.312	-	-	0.12	0.812	1.066
	LTE Band 7	20M	QPSK	1	49	-	Bottom Side	0mm	Ant 1	Reduced	21350	2560	17.32	18.50	1.312	-	-	-0.16	0.766	1.005
	LTE Band 7	20M	QPSK	1	49	-	Back	0mm	Ant 1	Reduced	20850	2510	17.31	18.50	1.315	-	-	0.19	1.320	1.736
	LTE Band 7	20M	QPSK	1	49	-	Back	0mm	Ant 1	Reduced	21100	2535	17.28	18.50	1.324	-	-	0.13	1.440	1.907
	LTE Band 7	20M	QPSK	1	49	-	Front	6mm	Ant 1	Full Power	21350	2560	22.90	24.00	1.288	-	-	0.15	0.601	0.774
	LTE Band 7	20M	QPSK	1	49	-	Back	14mm	Ant 1	Full Power	21350	2560	22.90	24.00	1.288	-	-	0.09	0.321	0.414
	LTE Band 7	20M	QPSK	1	49	-	Left Side	8mm	Ant 1	Full Power	21350	2560	22.90	24.00	1.288	-	-	-0.08	0.497	0.640
	LTE Band 7	20M	QPSK	1	49	-	Bottom Side	14mm	Ant 1	Full Power	21350	2560	22.90	24.00	1.288	-	-	-0.18	0.231	0.298
	LTE Band 7	20M	QPSK	50	0	-	Front	0mm	Ant 1	Reduced	21350	2560	16.30	17.50	1.318	-	-	0.09	0.466	0.614
	LTE Band 7	20M	QPSK	50	0	-	Back	0mm	Ant 1	Reduced	21350	2560	16.30	17.50	1.318	-	-	-0.14	0.991	1.306
	LTE Band 7	20M	QPSK	50	0	-	Left Side	0mm	Ant 1	Reduced	21350	2560	16.30	17.50	1.318	-	-	-0.09	0.628	0.828
	LTE Band 7	20M	QPSK	50	0	-	Bottom Side	0mm	Ant 1	Reduced	21350	2560	16.30	17.50	1.318	-	-	0.02	0.604	0.796
	LTE Band 7	20M	QPSK	100	0	-	Back	0mm	Ant 1	Reduced	21350	2560	16.27	17.50	1.327	-	-	0.07	1.020	1.354
	LTE Band 38	20M	QPSK	1	49	-	Front	0mm	Ant 1	Reduced	38000	2595	19.76	21.00	1.330	62.9	1.006	-0.15	0.652	0.873
49	LTE Band 38	20M	QPSK	1	49	-	Back	0mm	Ant 1	Reduced	38000	2595	19.76	21.00	1.330	62.9	1.006	-0.15	1.510	**2.021**
	LTE Band 38	20M	QPSK	1	49	-	Left Side	0mm	Ant 1	Reduced	38000	2595	19.76	21.00	1.330	62.9	1.006	-0.07	0.853	1.142
	LTE Band 38	20M	QPSK	1	49	-	Bottom Side	0mm	Ant 1	Reduced	38000	2595	19.76	21.00	1.330	62.9	1.006	-0.04	0.793	1.061
	LTE Band 38	20M	QPSK	1	49	-	Back	0mm	Ant 1	Reduced	37850	2580	19.74	21.00	1.337	62.9	1.006	0.06	1.480	1.990
	LTE Band 38	20M	QPSK	1	49	-	Back	0mm	Ant 1	Reduced	38150	2610	19.68	21.00	1.355	62.9	1.006	0.01	1.320	1.800
	LTE Band 38	20M	QPSK	1	49	-	Front	6mm	Ant 1	Full Power	38000	2595	22.61	24.00	1.377	62.9	1.006	0.12	0.628	0.870
	LTE Band 38	20M	QPSK	1	49	-	Back	14mm	Ant 1	Full Power	38000	2595	22.61	24.00	1.377	62.9	1.006	0.12	0.180	0.249
	LTE Band 38	20M	QPSK	1	49	-	Left Side	8mm	Ant 1	Full Power	38000	2595	22.61	24.00	1.377	62.9	1.006	0.19	0.278	0.385
	LTE Band 38	20M	QPSK	1	49	-	Bottom Side	14mm	Ant 1	Full Power	38000	2595	22.61	24.00	1.377	62.9	1.006	0.13	0.146	0.202
	LTE Band 38	20M	QPSK	50	0	-	Front	0mm	Ant 1	Reduced	38000	2595	18.72	20.00	1.343	62.9	1.006	-0.15	0.506	0.684
	LTE Band 38	20M	QPSK	50	0	-	Back	0mm	Ant 1	Reduced	38000	2595	18.72	20.00	1.343	62.9	1.006	0.13	1.050	1.418
	LTE Band 38	20M	QPSK	50	0	-	Left Side	0mm	Ant 1	Reduced	38000	2595	18.72	20.00	1.343	62.9	1.006	0.06	0.674	0.910
	LTE Band 38	20M	QPSK	50	0	-	Bottom Side	0mm	Ant 1	Reduced	38000	2595	18.72	20.00	1.343	62.9	1.006	-0.04	0.582	0.786
	LTE Band 38	20M	QPSK	100	0	-	Back	0mm	Ant 1	Reduced	38000	2595	18.62	20.00	1.374	62.9	1.006	-0.15	0.509	0.704
	LTE Band 41	20M	QPSK	1	49	-	Back	0mm	Ant 1	Reduced	40400	2571	20.90	21.00	1.023	62.9	1.006	0.12	1.460	1.503
50	LTE Band 41	20M	QPSK	1	49	-	Back	0mm	Ant 1	Reduced	40140	2545	19.60	21.00	1.380	62.9	1.006	0.08	1.120	**1.555**
	LTE Band 41	20M	QPSK	1	49	-	Back	0mm	Ant 1	Reduced	40670	2598	20.15	21.00	1.216	62.9	1.006	0.01	1.020	1.248
	LTE Band 41	20M	QPSK	1	49	-	Back	0mm	Ant 1	Reduced	41140	2645	19.73	21.00	1.340	62.9	1.006	0.01	1.080	1.456
	LTE Band 41	20M	QPSK	1	49	-	Back	14mm	Ant 1	Full Power	40140	2545	22.65	24.00	1.365	62.9	1.006	0.02	0.116	0.159
	LTE Band 41	20M	QPSK	50	0	-	Back	0mm	Ant 1	Reduced	40400	2571	19.95	20.00	1.012	62.9	1.006	0.08	1.050	1.069

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
5000MHz																
53	WLAN5.2GHz	802.11a 6Mbps	Back	0mm	Ant 4	Full Power	48	5240	17.88	19.50	1.451	99.31	1.007	0.05	0.562	**0.821**
	WLAN5.3GHz	802.11a 6Mbps	Front	0mm	Ant 4	Full Power	56	5280	18.00	19.50	1.413	96.97	1.031	0.13	0.209	0.304
	WLAN5.3GHz	802.11a 6Mbps	Back	0mm	Ant 4	Full Power	56	5280	18.00	19.50	1.413	96.97	1.031	0.04	0.597	0.869
	WLAN5.3GHz	802.11a 6Mbps	Left Side	0mm	Ant 4	Full Power	56	5280	18.00	19.50	1.413	96.97	1.031	0.09	0.027	0.039
	WLAN5.3GHz	802.11a 6Mbps	Right Side	0mm	Ant 4	Full Power	56	5280	18.00	19.50	1.413	96.97	1.031	0.16	0.206	0.300
51	WLAN5.3GHz	802.11a 6Mbps	Top Side	0mm	Ant 4	Full Power	56	5280	18.00	19.50	1.413	96.97	1.031	-0.17	0.699	**1.018**
	WLAN5.5GHz	802.11a 6Mbps	Front	0mm	Ant 4	Full Power	100	5500	17.94	19.50	1.431	96.97	1.031	-0.16	0.329	0.485
	WLAN5.5GHz	802.11a 6Mbps	Back	0mm	Ant 4	Full Power	100	5500	17.94	19.50	1.431	96.97	1.031	-0.12	1.070	1.579
	WLAN5.5GHz	802.11a 6Mbps	Left Side	0mm	Ant 4	Full Power	100	5500	17.94	19.50	1.431	96.97	1.031	-	n/a	n/a
	WLAN5.5GHz	802.11a 6Mbps	Right Side	0mm	Ant 4	Full Power	100	5500	17.94	19.50	1.431	96.97	1.031	0.17	0.471	0.695
52	WLAN5.5GHz	802.11a 6Mbps	Top Side	0mm	Ant 4	Full Power	100	5500	17.94	19.50	1.431	96.97	1.031	0.04	1.090	**1.608**
54	WLAN5.8GHz	802.11a 6Mbps	Back	0mm	Ant 4	Full Power	157	5785	18.20	19.50	1.349	96.97	1.031	0.15	0.550	**0.765**

15.5 Worse case verification for Sample 2

General Note:

1. In this report section 15.1 / 15.2 / 15.3 / 15.4 that the full SAR test result for sample 1 at head, hotspot, body-worn and extremity exposure condition, according to the difference for two samples, so sample 2 verified the worst case of sample 1 at each exposure condition.

<Head>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
835MHz																				
	LTE Band 5	10M	QPSK	1	25	-	Right Cheek	0mm	Ant 0	Full Power	20525	836.5	22.62	24.00	1.374	-	-	0.01	0.235	0.323
1900MHz																				
	LTE Band 2	20M	QPSK	1	49	-	Right Cheek	0mm	Ant 0	Full Power	18900	1880	22.57	24.00	1.390	-	-	0.03	0.234	0.325
2450MHz																				
	WLAN2.4GHz	-	-	-	-	802.11b 1Mbps	Left Cheek	0mm	Ant 4	Reduced	1	2412	17.43	19.00	1.435	99.31	1.007	0.02	0.582	0.841
5000MHz																				
	WLAN5.5GHz	-	-	-	-	802.11a 6Mbps	Left Tilted	0mm	Ant 4	Reduced	100	5500	17.26	19.00	1.492	96.97	1.031	0.05	0.648	0.996

<Hotspot>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
835MHz																				
	LTE Band 5	10M	QPSK	1	25	-	Back	5mm	Ant 0	Full Power	20600	844	22.45	24.00	1.429	-	-	0.02	0.918	1.312
1900MHz																				
	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 0	Reduced	9262	1852.4	14.53	16.00	1.403	-	-	0.02	0.911	1.278
2600MHz																				
	LTE Band 38	20M	QPSK	1	49	-	Back	5mm	Ant 1	Reduced	37850	2580	19.74	21.00	1.337	62.9	1.006	0.05	0.825	1.109
5000MHz																				
	WLAN5.2GHz	-	-	-	-	802.11n-HT40 MCS0	Back	5mm	Ant 4	Reduced	46	5230	16.62	18.50	1.541	93.73	1.067	0.06	0.637	1.048

<Body-worn>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
835MHz																				
	LTE Band 5	10M	QPSK	1	25	-	Back	5mm	Ant 0	Full Power	20600	844	22.45	24.00	1.429	-	-	0.02	0.918	1.312
1900MHz																				
	LTE Band 2	20M	QPSK	1	49	-	Back	5mm	Ant 0	Reduced	18900	1880	15.35	17.00	1.462	-	-	0.03	0.872	1.275
2600MHz																				
	LTE Band 38	20M	QPSK	1	49	-	Back	5mm	Ant 1	Reduced	37850	2580	19.74	21.00	1.337	62.9	1.006	0.06	0.825	1.109
5000MHz																				
	WLAN5.5GHz	-	-	-	-	802.11ac-VHT80 MCS0	Back	5mm	Ant 4	Reduced	122	5610	14.52	16.50	1.576	88.23	1.133	0.05	0.620	1.107

<Extremity>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
835MHz																				
	WCDMA V	-	-	-	-	RMC 12.2Kbps	Back	0mm	Ant 0	Full Power	4233	846.6	22.48	24.00	1.419	-	-	0.05	1.460	2.072
1900MHz																				
	LTE Band 2	20M	QPSK	1	49	-	Back	0mm	Ant 0	Reduced	18700	1860	19.51	21.00	1.409	-	-	0.06	2.370	3.340
2600MHz																				
	LTE Band 38	20M	QPSK	1	49	-	Back	0mm	Ant 1	Reduced	38000	2595	19.76	21.00	1.330	62.9	1.006	0.03	1.210	1.620
5000MHz																				
	WLAN5.5GHz	-	-	-	-	802.11a 6Mbps	Top Side	0mm	Ant 4	Full Power	100	5500	17.94	19.50	1.431	96.97	1.031	0.02	0.949	1.400

15.6 Repeated SAR Measurement

<1g>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	GSM850	-	-	-	-	GPRS (4 TX slots)	Back	5mm	Ant 0	Reduced	189	836.4	28.39	29.00	1.151	-	-	0.07	1.020	1	1.174
2nd	GSM850	-	-	-	-	GPRS (4 TX slots)	Back	5mm	Ant 0	Reduced	189	836.4	28.39	29.00	1.151	-	-	0.03	0.958	1.058	1.102
1st	LTE Band 38	20M	QPSK	1	49	-	Back	5mm	Ant 1	Reduced	37850	2580	19.74	21.00	1.337	62.9	1.006	-0.01	1.050	1	1.412
2nd	LTE Band 38	20M	QPSK	1	49	-	Back	5mm	Ant 1	Reduced	37850	2580	19.74	21.00	1.337	62.9	1.006	-0.11	0.998	1.010	1.342
1st	GSM1900	-	-	-	-	GPRS (4 TX slots)	Back	5mm	Ant 0	Reduced	512	1850.2	22.40	22.50	1.023	-	-	-0.01	1.100	1	1.126
2nd	GSM1900	-	-	-	-	GPRS (4 TX slots)	Back	5mm	Ant 0	Reduced	512	1850.2	22.40	22.50	1.023	-	-	0.05	1.020	1.078	1.044

<10g>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	GSM1900	-	-	-	-	GPRS (4 TX slots)	Back	0mm	Ant 0	Reduced	661	1880	25.66	26.50	1.213	-	-	0.09	2.700	1	3.276
2nd	GSM1900	-	-	-	-	GPRS (4 TX slots)	Back	0mm	Ant 0	Reduced	661	1880	25.66	26.50	1.213	-	-	0.09	2.520	1.051	3.058

General Note:

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

16. Simultaneous Transmission Analysis

No.	Simultaneous Transmission Configurations	Portable Handset			
		Head	Body-worn	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), LTE supports VoLTE operation.
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 2.4GHz WLAN support hotspot operation and Bluetooth support tethering applications.
4. This device 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. EUT will choose either WLAN 2.4GHz or WLAN 5GHz according to the network signal condition; therefore, 2.4GHz WLAN and 5GHz WLAN will not operate simultaneously at any moment though they have independent antenna.
6. The worst case 5 GHz WLAN SAR for each configuration was used for SAR summation.
7. WLAN 2.4GHz and Bluetooth share the same antenna so can't transmit simultaneously.
8. According to the EUT characteristic, WLAN 5GHz and Bluetooth can't transmit simultaneously.
9. The maximum SAR summation is calculated based on the same configuration and test position.
10. 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 / (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 ≤ 0.04 for 1g SAR and SPLSR≤ 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	6	9	1+3	1+6	1+9	Case No
		WWAN	WLAN2.4GHz Ant 4	WLAN5GHz Ant 4	Bluetooth Ant 4	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)	
GSM850 Ant 0	Right Cheek	0.314	0.339	0.457		0.65	0.77	0.31	
	Right Tilted	0.231	0.320	0.486		0.55	0.72	0.23	
	Left Cheek	0.307	1.055	0.740	0.143	1.36	1.05	0.45	
	Left Tilted	0.207	0.635	1.192	0.074	0.84	1.40	0.28	
WCDMA V Ant 0	Right Cheek	0.293	0.339	0.457		0.63	0.75	0.29	
	Right Tilted	0.197	0.320	0.486		0.52	0.68	0.20	
	Left Cheek	0.289	1.055	0.740	0.143	1.34	1.03	0.43	
	Left Tilted	0.163	0.635	1.192	0.074	0.80	1.36	0.24	
LTE Band 5 Ant 0	Right Cheek	0.331	0.339	0.457		0.67	0.79	0.33	
	Right Tilted	0.177	0.320	0.486		0.50	0.66	0.18	
	Left Cheek	0.289	1.055	0.740	0.143	1.34	1.03	0.43	
	Left Tilted	0.157	0.635	1.192	0.074	0.79	1.35	0.23	
GSM1900 Ant 0	Right Cheek	0.114	0.339	0.457		0.45	0.57	0.11	
	Right Tilted	0.083	0.320	0.486		0.40	0.57	0.08	
	Left Cheek	0.090	1.055	0.740	0.143	1.15	0.83	0.23	
	Left Tilted	0.092	0.635	1.192	0.074	0.73	1.28	0.17	
WCDMA II Ant 0	Right Cheek	0.300	0.339	0.457		0.64	0.76	0.30	
	Right Tilted	0.175	0.320	0.486		0.50	0.66	0.18	
	Left Cheek	0.196	1.055	0.740	0.143	1.25	0.94	0.34	
	Left Tilted	0.215	0.635	1.192	0.074	0.85	1.41	0.29	
LTE Band 2 Ant 0	Right Cheek	0.396	0.339	0.457		0.74	0.85	0.40	
	Right Tilted	0.200	0.320	0.486		0.52	0.69	0.20	
	Left Cheek	0.224	1.055	0.740	0.143	1.28	0.96	0.37	
	Left Tilted	0.239	0.635	1.192	0.074	0.87	1.43	0.31	
LTE Band 7 Ant 1	Right Cheek	0.202	0.339	0.457		0.54	0.66	0.20	
	Right Tilted	0.265	0.320	0.486		0.59	0.75	0.27	
	Left Cheek	0.657	1.055	0.740	0.143	**1.71**	1.40	0.80	**Case 1**
	Left Tilted	0.133	0.635	1.192	0.074	0.77	1.33	0.21	
LTE Band 38 Ant 1	Right Cheek	0.283	0.339	0.457		0.62	0.74	0.28	
	Right Tilted	0.204	0.320	0.486		0.52	0.69	0.20	
	Left Cheek	0.795	1.055	0.740	0.143	**1.85**	**1.54**	0.94	**Case 2**
	Left Tilted	0.180	0.635	1.192	0.074	0.82	1.37	0.25	
LTE Band 41 Ant 1	Right Cheek	0.166	0.339	0.457		0.51	0.62	0.17	
	Right Tilted	0.113	0.320	0.486		0.43	0.60	0.11	
	Left Cheek	0.243	1.055	0.740	0.143	1.30	0.98	0.39	
	Left Tilted	0.097	0.635	1.192	0.074	0.73	1.29	0.17	

16.2 Hotspot Exposure Conditions

WWAN Band	Exposure Position	1	3	6	9	1+3	1+6	1+9	Case No
		WWAN	WLAN2.4GHz Ant 4	WLAN5GHz Ant 4	Bluetooth Ant 4	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)	
GSM850 Ant 0	Front	0.541	0.501	0.237		1.04	0.78	0.54	
	Back	1.174	1.017	1.187	0.130	**2.19**	**2.36**	1.30	**Case 3/4**
	Left side	0.323				0.32	0.32	0.32	
	Right side	0.465	0.519	0.303		0.98	0.77	0.47	
	Top side		0.638	0.686		0.64	0.69	0.00	
	Bottom side	0.589				0.59	0.59	0.59	
WCDMA V Ant 0	Front	0.468	0.501	0.237		0.97	0.71	0.47	
	Back	1.359	1.017	1.187	0.130	**2.38**	**2.55**	1.49	**Case 5/6**
	Left side	0.242				0.24	0.24	0.24	
	Right side	0.448	0.519	0.303		0.97	0.75	0.45	
	Top side		0.638	0.686		0.64	0.69	0.00	
	Bottom side	0.603				0.60	0.60	0.60	
LTE Band 5 Ant 0	Front	0.576	0.501	0.237		1.08	0.81	0.58	
	Back	1.420	1.017	1.187	0.130	**2.44**	**2.61**	**1.55**	**Case 7/8**
	Left side	0.295				0.30	0.30	0.30	
	Right side	0.610	0.519	0.303		1.13	0.91	0.61	
	Top side		0.638	0.686		0.64	0.69	0.00	
	Bottom side	0.790				0.79	0.79	0.79	
GSM1900 Ant 0	Front	0.547	0.501	0.237		1.05	0.78	0.55	
	Back	1.266	1.017	1.187	0.130	**2.28**	**2.45**	1.40	**Case 9/10**
	Left side	0.096				0.10	0.10	0.10	
	Right side	0.125	0.519	0.303		0.64	0.43	0.13	
	Top side		0.638	0.686		0.64	0.69	0.00	
	Bottom side	1.227				1.23	1.23	1.23	
WCDMA II Ant 0	Front	0.529	0.501	0.237		1.03	0.77	0.53	
	Back	1.294	1.017	1.187	0.130	**2.31**	**2.48**	1.42	**Case 11/12**
	Left side	0.088				0.09	0.09	0.09	
	Right side	0.103	0.519	0.303		0.62	0.41	0.10	
	Top side		0.638	0.686		0.64	0.69	0.00	
	Bottom side	1.390				1.39	1.39	1.39	
LTE Band 2 Ant 0	Front	0.715	0.501	0.237		1.22	0.95	0.72	
	Back	1.398	1.017	1.187	0.130	**2.42**	**2.59**	1.53	**Case 13/14**
	Left side	0.107				0.11	0.11	0.11	
	Right side	0.128	0.519	0.303		0.65	0.43	0.13	
	Top side		0.638	0.686		0.64	0.69	0.00	
	Bottom side	1.325				1.33	1.33	1.33	
LTE Band 7 Ant 1	Front	0.580	0.501	0.237		1.08	0.82	0.58	
	Back	1.247	1.017	1.187	0.130	**2.26**	**2.43**	1.38	**Case 15/16**
	Left side	0.583				0.58	0.58	0.58	
	Right side	0.105	0.519	0.303		0.62	0.41	0.11	
	Top side		0.638	0.686		0.64	0.69	0.00	
	Bottom side	0.608				0.61	0.61	0.61	
LTE Band 38 Ant 1	Front	0.645	0.501	0.237		1.15	0.88	0.65	
	Back	1.412	1.017	1.187	0.130	**2.43**	**2.60**	1.54	**Case 17/18**
	Left side	0.659				0.66	0.66	0.66	
	Right side	0.128	0.519	0.303		0.65	0.43	0.13	
	Top side		0.638	0.686		0.64	0.69	0.00	
	Bottom side	0.700				0.70	0.70	0.70	
LTE Band 41 Ant 1	Front	0.520	0.501	0.237		1.02	0.76	0.52	
	Back	1.291	1.017	1.187	0.130	**2.31**	**2.48**	1.42	**Case 31/32**
	Left side	0.493				0.49	0.49	0.49	
	Right side	0.093	0.519	0.303		0.61	0.40	0.09	
	Top side		0.638	0.686		0.64	0.69	0.00	
	Bottom side	0.513				0.51	0.51	0.51	

16.3 Body-Worn Accessory Exposure Conditions

WWAN Band	Exposure Position	1	3	6	9	1+3	1+6	1+9	Case No
		WWAN	WLAN2.4GHz Ant 4	WLAN5GHz Ant 4	Bluetooth Ant 4	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)	
GSM850 Ant 0	Front	0.541	0.501	0.379		1.04	0.92	0.54	
	Back	1.174	1.017	1.188	0.130	2.19	2.36	1.30	**Case 3/23**
	Front with Headset					0.00	0.00	0.00	
	Back with Headset					0.00	0.00	0.00	
WCDMA V Ant 0	Front	0.468	0.501	0.379		0.97	0.85	0.47	
	Back	1.359	1.017	1.188	0.130	2.38	2.55	1.49	**Case 5/24**
	Front with Headset					0.00	0.00	0.00	
	Back with Headset	1.329				1.33	1.33	1.33	
LTE Band 5 Ant 0	Front	0.576	0.501	0.379		1.08	0.96	0.58	
	Back	1.420	1.017	1.188	0.130	2.44	2.61	1.55	**Case 7/25**
	Front with Headset					0.00	0.00	0.00	
	Back with Headset	1.399				**1.40**	1.40	1.40	
GSM1900 Ant 0	Front	0.547	0.501	0.379		1.05	0.93	0.55	
	Back	1.266	1.017	1.188	0.130	2.28	2.45	1.40	**Case 9/26**
	Front with Headset					0.00	0.00	0.00	
	Back with Headset	1.158				1.16	1.16	1.16	
WCDMA II Ant 0	Front	0.529	0.501	0.379		1.03	0.91	0.53	
	Back	1.294	1.017	1.188	0.130	2.31	2.48	1.42	**Case 11/27**
	Front with Headset					0.00	0.00	0.00	
	Back with Headset	1.115				1.12	1.12	1.12	
LTE Band 2 Ant 0	Front	0.715	0.501	0.379		1.22	1.09	0.72	
	Back	1.398	1.017	1.188	0.130	2.42	2.59	1.53	**Case 13/28**
	Front with Headset					0.00	0.00	0.00	
	Back with Headset	1.323				1.32	1.32	1.32	
LTE Band 7 Ant 1	Front	0.580	0.501	0.379		1.08	0.96	0.58	
	Back	1.247	1.017	1.188	0.130	2.26	2.44	1.38	**Case 15/29**
	Front with Headset					0.00	0.00	0.00	
	Back with Headset	1.191				1.19	1.19	1.19	
LTE Band 38 Ant 1	Front	0.645	0.501	0.379		1.15	1.02	0.65	
	Back	1.412	1.017	1.188	0.130	2.43	2.60	1.54	**Case 17/30**
	Front with Headset					0.00	0.00	0.00	
	Back with Headset	1.238				1.24	1.24	1.24	
LTE Band 41 Ant 1	Front	0.520	0.501	0.379		1.02	0.90	0.52	
	Back	1.291	1.017	1.188	0.130	2.31	2.48	1.42	**Case 31/33**
	Front with Headset					0.00	0.00	0.00	
	Back with Headset	1.375				1.38	1.38	1.38	

Sensor off

WWAN Band	Exposure Position	1	6	1+6
		WWAN	WLAN5GHz Ant 4	Summed
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
GSM850 Ant 0	Front at 14mm	0.304	0.125	0.43
	Back at 18mm	0.364	0.499	0.86
WCDMA V Ant 0	Front at 14mm	0.261	0.125	0.39
	Back at 18mm	0.341	0.499	0.84
LTE Band 5 Ant 0	Front at 14mm		0.125	0.13
	Back at 18mm		0.499	0.50
GSM1900 Ant 0	Front at 14mm	0.449	0.125	0.57
	Back at 18mm	0.544	0.499	1.04
WCDMA II Ant 0	Front at 14mm	0.738	0.125	0.86
	Back at 18mm	0.944	0.499	1.44
LTE Band 2 Ant 0	Front at 14mm	0.860	0.125	0.99
	Back at 18mm	0.876	0.499	1.38
LTE Band 7 Ant 1	Front at 14mm	0.491	0.125	0.62
	Back at 18mm	0.465	0.499	0.96
LTE Band 38 Ant 1	Front at 14mm	0.327	0.125	0.45
	Back at 18mm	0.296	0.499	0.80
LTE Band 41 Ant 1	Front at 14mm	0.191	0.125	0.32
	Back with Headset at 18mm	0.248	0.499	0.75

16.4 Product Specific Exposure Conditions

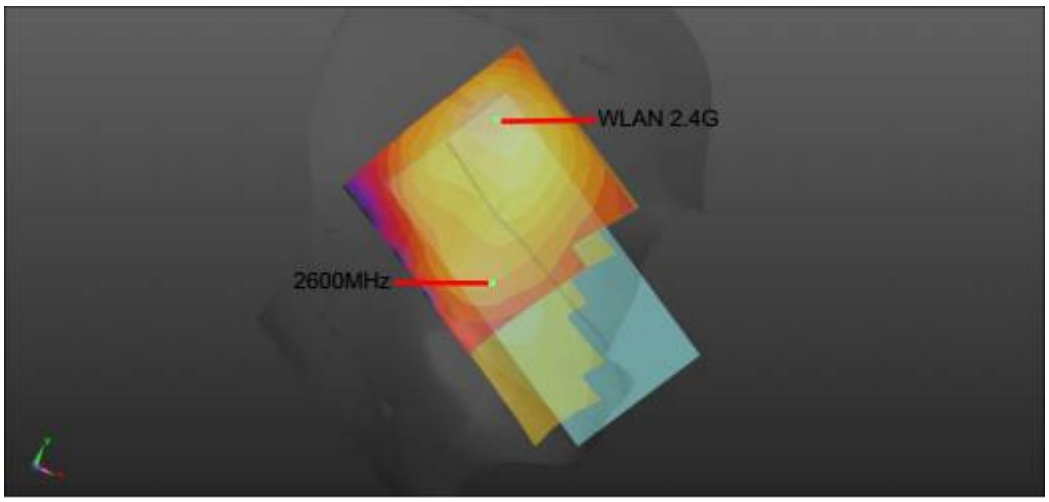
Note: For WLAN 2.4GHz/Bluetooth Product specific 10g stand-alone SAR is not required for a transmitter or antenna, due to 1g hotspot SAR is <1.2W/kg.

WWAN Band	Exposure Position	1	6	1+6	Case No
		WWAN	WLAN5GHz Ant 4	Summed	
		10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)	
GSM850 Ant 0	Front		0.485	0.49	
	Back	2.141	1.579	3.72	
	Left side		0.039	0.04	
	Right side		0.695	0.70	
	Top side		1.608	1.61	
	Bottom side			0.00	
WCDMA V Ant 0	Front		0.485	0.49	
	Back	2.625	1.579	**4.20**	**Case 19**
	Left side		0.039	0.04	
	Right side		0.695	0.70	
	Top side		1.608	1.61	
	Bottom side			0.00	
LTE Band 5 Ant 0	Front		0.485	0.49	
	Back	2.386	1.579	**3.97**	
	Left side		0.039	0.04	
	Right side		0.695	0.70	
	Top side		1.608	1.61	
	Bottom side			0.00	
GSM1900 Ant 0	Front	1.934	0.485	2.42	
	Back	3.276	1.579	**4.86**	**Case 20**
	Left side		0.039	0.04	
	Right side		0.695	0.70	
	Top side		1.608	1.61	
	Bottom side	2.283		2.28	
WCDMA II Ant 0	Front	1.753	0.485	2.24	
	Back	3.408	1.579	**4.99**	**Case 21**
	Left side		0.039	0.04	
	Right side		0.695	0.70	
	Top side		1.608	1.61	
	Bottom side	2.894		2.89	
LTE Band 2 Ant 0	Front	2.311	0.485	2.80	
	Back	3.566	1.579	**5.15**	**Case 22**
	Left side		0.039	0.04	
	Right side		0.695	0.70	
	Top side		1.608	1.61	
	Bottom side	2.988		2.99	
LTE Band 7 Ant 1	Front	0.793	0.485	1.28	
	Back	2.008	1.579	3.59	
	Left side	1.066	0.039	1.11	
	Right side		0.695	0.70	
	Top side		1.608	1.61	
	Bottom side	1.005		1.01	
LTE Band 38 Ant 1	Front	0.873	0.485	1.36	
	Back	2.021	1.579	3.60	
	Left side	1.142	0.039	1.18	
	Right side		0.695	0.70	
	Top side		1.608	1.61	
	Bottom side	1.061		1.06	
LTE Band 41 Ant 1	Front		0.485	0.49	
	Back	1.555	1.579	3.13	
	Left side		0.039	0.04	
	Right side		0.695	0.70	
	Top side		1.608	1.61	
	Bottom side			0.00	

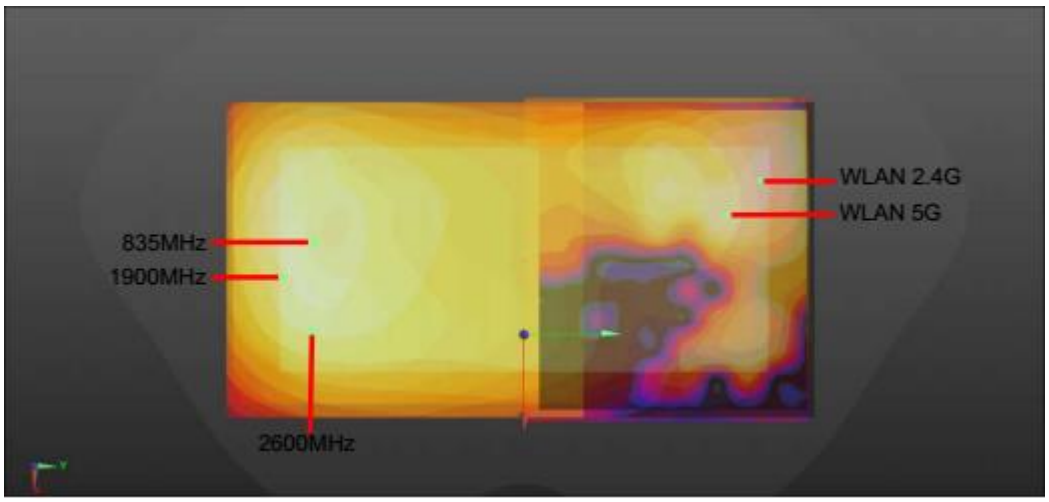
16.5 SPLSR Evaluation and Analysis

General Note:

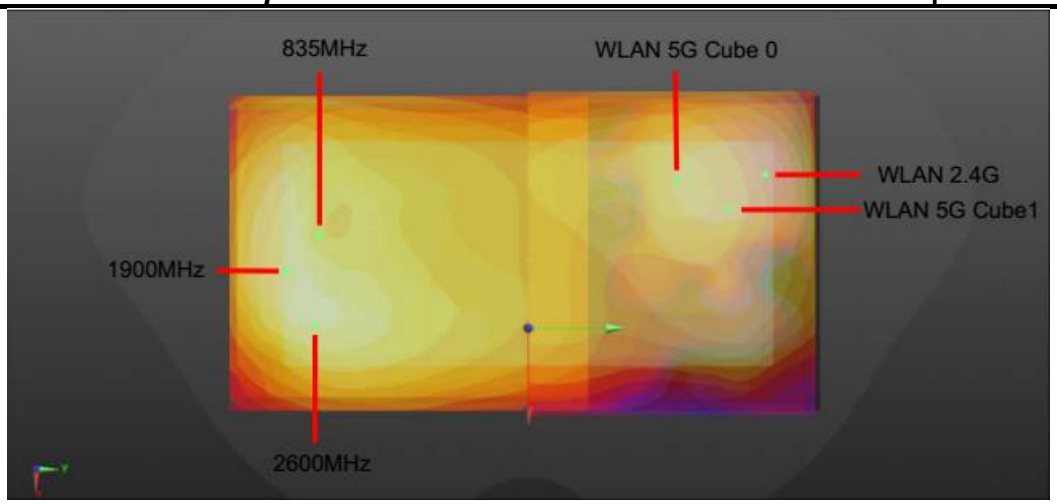
1. When standalone SAR is measured for both antennas in the pair, the peak location separation distance is computed by the square root of [(x1−x2)2 + (y1−y2)2 + (z1−z2)2], where (x1, y1, z1) and (x2, y2, z2) are the coordinates in the area scans or extrapolated peak SAR locations in the zoom scans, as appropriate.
2. SPLSR = (SAR1 + SAR2)1.5 / (min. separation distance, mm). If SPLSR ≤ 0.04 for 1g SAR and SPLSR ≤ 0.10 for 10g SAR, simultaneously transmission SAR measurement is not necessary.
3. The SAR values of Cube 0 and Cube 1 at below tables are different, so selected a larger SAR value for conservative evaluation respectively.



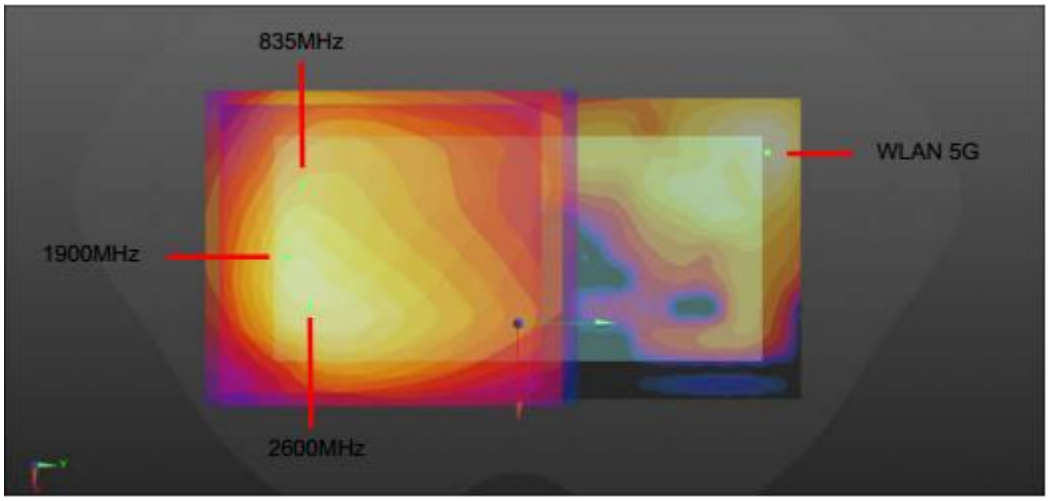
Head Left Cheek 0mm



Hotspot Back 5mm



Back 5mm



Back 0mm

For Head:

Case 1	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
	LTE Band 7	Left Cheek	0.657	0mm	0.0541	0.254	-0.177	85.2	1.71	0.03	Not required
	WLAN2.4GHz		1.055	0mm	0.0177	0.331	-0.175				
Case 2	**Band**	**Position**	**SAR (W/kg)**	**Gap**	**SAR peak location (m)**			**3D distance (mm)**	**Summed SAR (W/kg)**	**SPLSR Results**	**Simultaneous SAR**
				(mm)	**X**	**Y**	**Z**				
	LTE Band 38	Left Cheek	0.795	0mm	0.0527	0.251	-0.177	87.3	1.85	0.03	Not required
	WLAN2.4GHz		1.055	0mm	0.0177	0.331	-0.175				

For Hotspot:

	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 3	GSM850	Back	1.174	5mm	-0.039	-0.078	-0.209	157.7	2.19	0.02	Not required
	WLAN2.4GHz		1.017	5mm	-0.0514	0.0792	-0.208				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (cm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 4	GSM850	Back	1.174	5mm	-0.039	-0.078	-0.209	143.0	2.36	0.03	Not required
	WLAN5GHz		1.187	5mm	-0.041	0.065	-0.208				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 5	WCDMA V	Back	1.359	5mm	-0.039	-0.078	-0.21	157.7	2.38	0.02	Not required
	WLAN2.4GHz		1.017	5mm	-0.0514	0.0792	-0.208				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 6	WCDMA V	Back	1.359	5mm	-0.039	-0.078	-0.21	143.0	2.55	0.03	Not required
	WLAN5GHz		1.187	5mm	-0.041	0.065	-0.208				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 7	LTE Band 5	Back	1.42	5mm	-0.033	-0.078	-0.209	158.3	2.44	0.02	Not required
	WLAN2.4GHz		1.017	5mm	-0.0514	0.0792	-0.208				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 8	LTE Band 5	Back	1.42	5mm	-0.033	-0.078	-0.209	143.2	2.61	0.03	Not required
	WLAN5GHz		1.187	5mm	-0.041	0.065	-0.208				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 9	GSM1900	Back	1.266	5mm	-0.019	-0.081	-0.209	163.4	2.28	0.02	Not required
	WLAN2.4GHz		1.017	5mm	-0.0514	0.0792	-0.208				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 10	GSM1900	Back	1.266	5mm	-0.019	-0.081	-0.209	147.7	2.45	0.03	Not required
	WLAN5GHz		1.187	5mm	-0.041	0.065	-0.208				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 11	WCDMA II	Back	1.294	5mm	-0.022	-0.081	-0.209	162.9	2.31	0.02	Not required
	WLAN2.4GHz		1.017	5mm	-0.0514	0.0792	-0.208				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 12	WCDMA II	Back	1.294	5mm	-0.022	-0.081	-0.209	147.2	2.48	0.03	Not required
	WLAN5GHz		1.187	5mm	-0.041	0.065	-0.208				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 13	LTE Band 2	Back	1.398	5mm	-0.022	-0.0765	-0.209	158.5	2.42	0.02	Not required
	WLAN2.4GHz		1.017	5mm	-0.0514	0.0792	-0.208				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 14	LTE Band 2	Back	1.398	5mm	-0.022	-0.0765	-0.209	142.8	2.59	0.03	Not required
	WLAN5GHz		1.187	5mm	-0.041	0.065	-0.208				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 15	LTE Band 7	Back	1.247	5mm	0.004	-0.0662	-0.21	155.6	2.26	0.02	Not required
	WLAN2.4GHz		1.017	5mm	-0.0514	0.0792	-0.208				

	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 16	LTE Band 7	Back	1.247	5mm	0.004	-0.0662	-0.21	138.7	2.43	0.03	Not required
	WLAN5GHz		1.187	5mm	-0.041	0.065	-0.208				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 17	LTE Band 38	Back	1.412	5mm	-0.0002	-0.07	-0.21	157.8	2.43	0.02	Not required
	WLAN2.4GHz		1.017	5mm	-0.0514	0.0792	-0.208				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 18	LTE Band 38	Back	1.412	5mm	-0.0002	-0.07	-0.21	141.0	2.60	0.03	Not required
	WLAN5GHz		1.187	5mm	-0.041	0.065	-0.208				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 31	LTE Band 41	Back	1.291	5mm	-0.0002	-0.07	-0.209	157.7	2.31	0.02	Not required
	WLAN2.4GHz		1.017	5mm	-0.0514	0.0792	-0.208				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 32	LTE Band 41	Back	1.291	5mm	-0.0002	-0.07	-0.209	141.0	2.48	0.03	Not required
	WLAN5GHz		1.187	5mm	-0.041	0.065	-0.208				

For Body Worn:

	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 3	GSM850	Back	1.174	5mm	-0.039	-0.078	-0.209	157.7	2.19	0.02	Not required
	WLAN2.4GHz		1.017	5mm	-0.0514	0.0792	-0.208				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (cm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 23	GSM850	Back	1.174	5mm	-0.039	-0.078	-0.209	145.0	2.36	0.03	Not required
	WLAN5GHz Cube 0		1.188	5mm	-0.042	0.067	-0.208				
	GSM850	Back	1.174	5mm	-0.039	-0.078	-0.209	146.0	2.36	0.02	Not required
	WLAN5GHz Cube1		1.188	5mm	-0.041	0.068	-0.208				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 5	WCDMA V	Back	1.359	5mm	-0.039	-0.078	-0.21	157.7	2.38	0.02	Not required
	WLAN2.4GHz		1.017	5mm	-0.0514	0.0792	-0.208				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 24	WCDMA V	Back	1.359	5mm	-0.039	-0.078	-0.21	145.0	2.55	0.03	Not required
	WLAN5GHz Cube 0		1.188	5mm	-0.042	0.067	-0.208				
	WCDMA V	Back	1.359	5mm	-0.039	-0.078	-0.21	146.0	2.55	0.03	Not required
	WLAN5GHz Cube 1		1.188	5mm	-0.041	0.068	-0.208				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 7	LTE Band 5	Back	1.42	5mm	-0.033	-0.078	-0.209	158.3	2.44	0.02	Not required
	WLAN2.4GHz		1.017	5mm	-0.0514	0.0792	-0.208				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 25	LTE Band 5	Back	1.42	5mm	-0.033	-0.078	-0.209	145.3	2.61	0.03	Not required
	WLAN5GHz Cube 0		1.188	5mm	-0.042	0.067	-0.208				
	LTE Band 5	Back	1.42	5mm	-0.033	-0.078	-0.209	146.2	2.61	0.03	Not required
	WLAN5GHz Cube 1		1.188	5mm	-0.041	0.068	-0.208				

	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 9	GSM1900	Back	1.266	5mm	-0.019	-0.081	-0.209	163.4	2.28	0.02	Not required
	WLAN2.4GHz		1.017	5mm	-0.0514	0.0792	-0.208				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 26	GSM1900	Back	1.266	5mm	-0.019	-0.081	-0.209	149.8	2.45	0.03	Not required
	WLAN5GHz Cube 0		1.188	5mm	-0.042	0.067	-0.208				
	GSM1900	Back	1.266	5mm	-0.019	-0.081	-0.209	150.6	2.45	0.03	Not required
	WLAN5GHz Cube 1		1.188	5mm	-0.041	0.068	-0.208				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 11	WCDMA II	Back	1.294	5mm	-0.022	-0.081	-0.209	162.9	2.31	0.02	Not required
	WLAN2.4GHz		1.017	5mm	-0.0514	0.0792	-0.208				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 27	WCDMA II	Back	1.294	5mm	-0.022	-0.081	-0.209	149.3	2.48	0.03	Not required
	WLAN5GHz Cube 0		1.188	5mm	-0.042	0.067	-0.208				
	WCDMA II	Back	1.294	5mm	-0.022	-0.081	-0.209	150.2	2.48	0.03	Not required
	WLAN5GHz Cube 1		1.188	5mm	-0.041	0.068	-0.208				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 13	LTE Band 2	Back	1.398	5mm	-0.022	-0.0765	-0.209	158.5	2.42	0.02	Not required
	WLAN2.4GHz		1.017	5mm	-0.0514	0.0792	-0.208				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 28	LTE Band 2	Back	1.398	5mm	-0.022	-0.0765	-0.209	144.9	2.59	0.03	Not required
	WLAN5GHz Cube 0		1.188	5mm	-0.042	0.067	-0.208				
	LTE Band 2	Back	1.398	5mm	-0.022	-0.0765	-0.209	145.7	2.59	0.03	Not required
	WLAN5GHz Cube 1		1.188	5mm	-0.041	0.068	-0.208				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 15	LTE Band 7	Back	1.247	5mm	0.004	-0.0662	-0.21	155.6	2.26	0.02	Not required
	WLAN2.4GHz		1.017	5mm	-0.0514	0.0792	-0.208				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 29	LTE Band 7	Back	1.247	5mm	0.004	-0.0662	-0.21	140.9	2.44	0.03	Not required
	WLAN5GHz Cube 0		1.188	5mm	-0.042	0.067	-0.208				
	LTE Band 7	Back	1.247	5mm	0.004	-0.0662	-0.21	141.6	2.44	0.03	Not required
	WLAN5GHz Cube 1		1.188	5mm	-0.041	0.068	-0.208				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 17	LTE Band 38	Back	1.412	5mm	-0.0002	-0.07	-0.21	157.8	2.43	0.02	Not required
	WLAN2.4GHz		1.017	5mm	-0.0514	0.0792	-0.208				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 30	LTE Band 38	Back	1.412	5mm	-0.0002	-0.07	-0.21	143.2	2.60	0.03	Not required
	WLAN5GHz Cube 0		1.188	5mm	-0.042	0.067	-0.208				
	LTE Band 38	Back	1.412	5mm	-0.0002	-0.07	-0.21	143.9	2.60	0.03	Not required
	WLAN5GHz Cube 1		1.188	5mm	-0.041	0.068	-0.208				
	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 31	LTE Band 41	Back	1.291	5mm	-0.0002	-0.07	-0.209	157.7	2.31	0.02	Not required

	WLAN2.4GHz		1.017	5mm	-0.0514	0.0792	-0.208				
Case 32	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 41	Back	1.291	5mm	-0.0002	-0.07	-0.209	143.2	2.48	0.03	Not required
	WLAN5GHz Cube 0		1.188	5mm	-0.042	0.067	-0.208				
	LTE Band 41	Back	1.291	5mm	-0.0002	-0.07	-0.209	143.9	2.48	0.03	Not required
	WLAN5GHz Cube 1		1.188	5mm	-0.041	0.068	-0.208				

For 10g SAR:

Case 19	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	Back	2.625	0mm	-0.054	-0.072	-0.21	157.1	4.20	0.05	Not required
	WLAN5GHz		1.579	0mm	-0.058	0.085	-0.208				
Case 20	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
	GSM1900	Back	3.276	0mm	-0.022	-0.0775	-0.208	166.4	4.86	0.06	Not required
	WLAN5GHz		1.579	0mm	-0.058	0.085	-0.208				
Case 21	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 II	Back	3.408	0mm	-0.022	-0.0805	-0.208	169.4	4.99	0.07	Not required
	WLAN5GHz		1.579	0mm	-0.058	0.085	-0.208				
Case 22	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 2	Back	3.566	0mm	-0.022	-0.0765	-0.208	165.5	5.15	0.07	Not required
	WLAN5GHz		1.579	0mm	-0.058	0.085	-0.208				

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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 ≤ 30%, for a confidence interval of k = 2. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. For this device, the highest measured 1-g SAR is less 1.5W/kg and highest measured 10-g SAR is less 3.75W/kg. Therefore, the measurement uncertainty table is not required in this report.

18. References

[1] FCC 47 CFR Part 2 “Frequency Allocations and Radio Treaty Matters; General Rules and Regulations”

[2] ANSI/IEEE Std. C95.1-1992, “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz”, September 1992

[3] IEEE Std. 1528-2013, “IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”, Sep 2013

[4] SPEAG DASY System Handbook

[5] FCC KDB 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.

[6] FCC KDB 865664 D02 v01r02, “RF Exposure Compliance Reporting and Documentation Considerations” Oct 2015.

[7] FCC KDB 447498 D01 v06, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, Oct 2015

[8] FCC KDB 648474 D04 v01r03, “SAR Evaluation Considerations for Wireless Handsets”, Oct 2015.

[9] FCC KDB 248227 D01 v02r02, “SAR Guidance for IEEE 802.11 (WiFi) Transmitters”, Oct 2015.

[10] FCC KDB 616217 D04 v01r02, “SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers”, Oct 2015

[11] FCC KDB 941225 D01 v03r01, “3G SAR MEAUREMENT PROCEDURES”, Oct 2015

[12] FCC KDB 941225 D05 v02r05, “SAR Evaluation Considerations for LTE Devices”, Dec 2015

[13] FCC KDB 941225 D05A v01r02, “Rel. 10 LTE SAR Test Guidance and KDB Inquiries”, Oct 2015

[14] FCC KDB 941225 D06 v02r01, "SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities", Oct 2015.

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