FCC SAR Test Report

APPLICANT	**:**	**Motorola Mobility LLC**
EQUIPMENT	**:**	**Mobile Phone**
BRAND NAME	**:**	**Motorola**
MODEL NAME	**:**	**XT2097-7**
FCC ID	**:**	**IHDT56ZJ6**
STANDARD	**:**	**FCC 47 CFR Part 2 (2.1093)**

The product was received on Nov. 12, 2020 and testing was started from Dec. 08, 2020 and completed on Dec. 24, 2020. We, Sporton International (Kunshan) Inc, would like to declare that the tested sample has been evaluated in accordance with the procedures and had been in compliance with the applicable technical standards.

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

Rose Wang

Reviewed by: Rose Wang / Supervisor

Kat Yin

Approved by: Kat Yin / Manager

ilac-MRA ACCREDITED Cert #5145.02

Sporton International (Kunshan) Inc.
No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA0N1205-02	Rev. 01	Initial issue of report	Jan. 04, 2021
FA0N1205-02	Rev. 02	Modify the IMEI information	Jan. 08, 2021
FA0N1205-02	Rev. 03	Added the FCC ID information and updated WLAN 2.4GHz 802.11g power.	Mar. 01, 2021

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **Motorola Mobility LLC, Mobile Phone, XT2097-7,** are as follows.

<table>
<tr><th colspan="7">Highest 1g SAR Summary</th></tr>
<tr><th rowspan="2">Equipment Class</th><th rowspan="2" colspan="2">Frequency Band</th><th>Head (Separation 0mm)</th><th>Hotspot (Separation 5mm)</th><th>Body-worn (Separation 5mm)</th><th rowspan="2">Highest Simultaneous Transmission 1g SAR (W/kg)</th></tr>
<tr><th colspan="3">1g SAR (W/kg)</th></tr>
<tr><td rowspan="8">Licensed</td><td rowspan="2">GSM</td><td>GSM850</td><td>0.25</td><td>0.97</td><td>0.97</td><td rowspan="8">1.38</td></tr>
<tr><td>GSM1900</td><td>0.17</td><td>1.34</td><td>1.34</td></tr>
<tr><td rowspan="2">WCDMA</td><td>Band II</td><td>0.23</td><td>1.37</td><td>1.17</td></tr>
<tr><td>Band V</td><td>0.27</td><td>0.63</td><td>0.63</td></tr>
<tr><td rowspan="4">LTE</td><td>Band 2</td><td>0.23</td><td>1.04</td><td>1.01</td></tr>
<tr><td>Band 7</td><td>0.14</td><td>1.10</td><td>1.10</td></tr>
<tr><td>Band 26/5</td><td>0.13</td><td>0.61</td><td>0.61</td></tr>
<tr><td>Band 41/38</td><td><0.10</td><td>1.23</td><td>1.23</td></tr>
<tr><td>DTS</td><td>WLAN</td><td>2.4GHz WLAN</td><td>0.69</td><td>0.74</td><td>0.74</td><td>1.37</td></tr>
<tr><td>DSS</td><td>Bluetooth</td><td>2.4GHz Bluetooth</td><td><0.10</td><td><0.10</td><td><0.10</td><td>1.38</td></tr>
<tr><th colspan="7">Highest 10g SAR Summary</th></tr>
<tr><th>Equipment Class</th><th colspan="2">Frequency Band</th><th colspan="4">Product Specific 10g SAR (W/kg) (Separation 0mm)</th></tr>
<tr><td rowspan="5">Licensed</td><td>GSM</td><td>GSM1900</td><td colspan="4">2.65</td></tr>
<tr><td>WCDMA</td><td>Band II</td><td colspan="4">2.09</td></tr>
<tr><td rowspan="3">LTE</td><td>Band 2</td><td colspan="4">3.06</td></tr>
<tr><td>Band 7</td><td colspan="4">1.51</td></tr>
<tr><td>Band 41/38</td><td colspan="4">1.43</td></tr>
<tr><td colspan="3">Date of Testing:</td><td colspan="4">2020/12/8~2020/12/24</td></tr>
<tr><td colspan="7">Remark: This device supports LTE B5, B38 and B26, B41. Since the supported frequency span for LTE B5, B38 falls completely within the supports frequency span for LTE B26/B41, both LTE bands have the same target power, and both LTE bands share the same transmission path; therefore, SAR was only assessed for LTE B26/B41.</td></tr>
</table>

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

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

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

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

3. Guidance Applied

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

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

4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	Mobile Phone
Brand Name	Motorola
Model Name	XT2097-7
FCC ID	IHDT56ZJ6
IMEI Code	Sample 1 IMEI 1: 353913480007042 IMEI 2: 353913480032040 Sample 2 IMEI 1: 353913480008040 IMEI 2: 353913480033048
Wireless Technology and Frequency Range	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5 MHz LTE Band 26: 814.7 MHz ~ 848.3 MHz LTE Band 38: 2572.5 MHz ~ 2617.5 MHz LTE Band 41: 2537.5 MHz ~ 2652.5 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Mode	GSM/GPRS/EGPRS RMC/AMR 12.2Kbps HSDPA HSUPA DC-HSDPA HSPA+(16QAM uplink) LTE: QPSK, 16QAM, 64QAM WLAN 2.4GHz 802.11b/g/n HT20 Bluetooth BR/EDR/LE
HW Version	DVT2
SW Version	QOL30.277
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. 802.11n-HT40 is not supported in 2.4GHz WLAN.
2. This device supports VoIP in GPRS, EGPRS, WCDMA and LTE (e.g. for 3rd-party VoIP), LTE supports VoLTE operation.
3. This device 2.4GHz WLAN support hotspot operation and Bluetooth support tethering applications.
4. This device does not support DTM operation and supports GRPS/EGRPS mode up to multi-slot class 12.
5. The device implements receiver detect mechanism/hotspot trigger reduced power for the power management for SAR compliance at different exposure conditions (head, body-worn, hotspot, extremity). The device will invoke corresponding work scenarios power level, which are provided in the operational description.
6. For Some WWAN bands, Receiver off body-worn power level higher than hotspot reduced power level, so front/back Receiver off body-worn SAR can represent hotspot conservatively.
7. There are three samples, please refer the product equality declaration exhibit submitted. According to the difference, we chose sample 1 to perform full SAR testing and sample 2 verified the worst case of sample 1.
8. 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.
9. 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.

10. The device has two headsets, only supplier is different, so we chose headset 1 to perform full SAR testing.
11. The device has three batteries with the same battery capacity, only Manufacturer is different. We only chose battery 1 to perform full SAR testing.

4.2 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05	
Equipment Name	Mobile Phone
FCC ID	IHDT56ZJ6
Operating Frequency Range of each LTE transmission band	LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5 MHz LTE Band 26: 814.7 MHz ~ 848.3 MHz LTE Band 38: 2572.5 MHz ~ 2617.5 MHz LTE Band 41: 2537.5 MHz ~ 2652.5 MHz
Channel Bandwidth	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 26:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz LTE Band 38: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 41: 5MHz, 10MHz, 15MHz, 20MHz
uplink modulations used	QPSK / 16QAM / 64QAM
LTE Voice / Data requirements	Voice and Data
LTE Release Version	R11, Cat5
CA Support	Not supported
LTE MPR permanently built-in by design	See Table 6.2.3-1 below
LTE A-MPR	In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)
Spectrum plots for RB configuration	A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.
Power reduction applied to satisfy SAR compliance	Yes, hotspot will trigger reduced power for some LTE bands, the detail please referred to section 13.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3

Modulation	Channel bandwidth / Transmission bandwidth (N_{RB})						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2
64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3
256 QAM	≥ 1						≤ 5

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 26

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	26697	814.7	26705	815.5	26715	816.5	26740	819	26765	821.5
M	26865	831.5	26865	831.5	26865	831.5	26865	831.5	26865	831.5
H	27033	848.3	27025	847.5	27015	846.5	26990	844	26965	841.5

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

	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. RF Exposure Limits

5.1 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.

5.2 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.

6. Specific Absorption Rate (SAR)

6.1 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.

6.2 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:

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

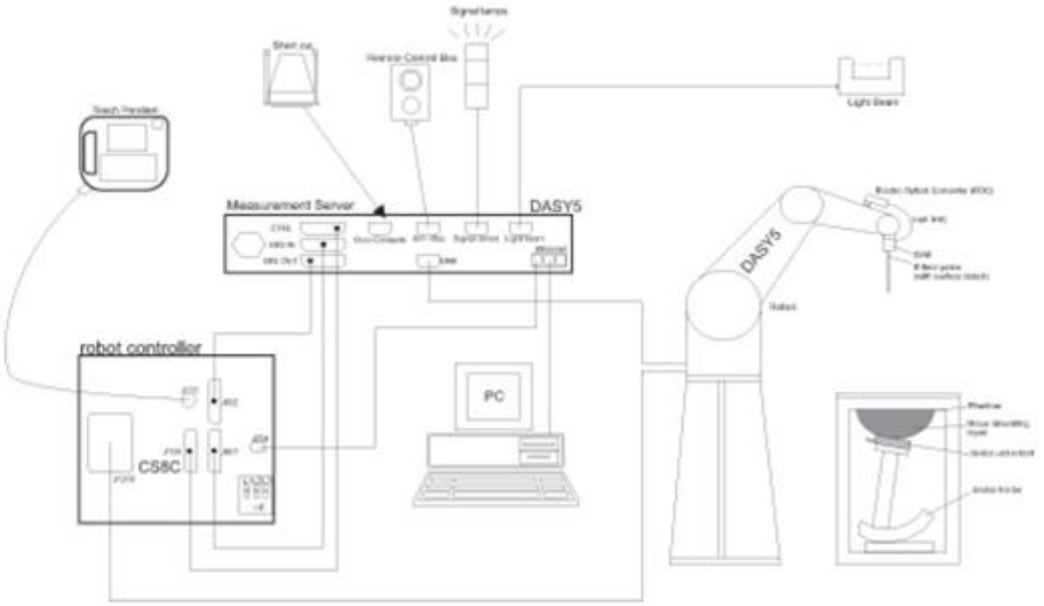
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

7. System Description and Setup

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



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

7.1 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	

7.2 Data Acquisition Electronics (DAE)

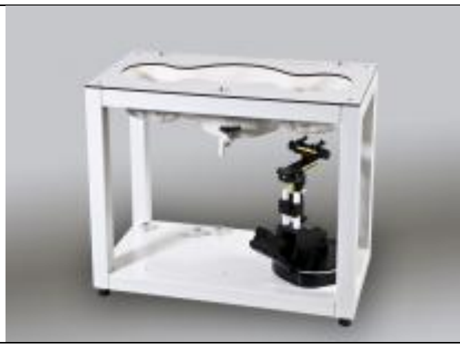
The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an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

7.3 Phantom

<SAM Twin Phantom>

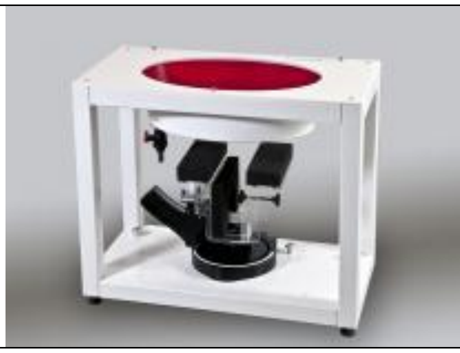
Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet
Measurement Areas	Left Hand, Right Hand, Flat Phantom



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.

7.4 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

8. 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

8.1 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

8.2 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.

8.3 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.	

8.4 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	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$	
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.

8.5 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.

8.6 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.

9. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	835MHz System Validation Kit	D835V2	4d151	2019/3/27	2022/3/26
SPEAG	1900MHz System Validation Kit	D1900V2	5d170	2019/3/26	2022/3/25
SPEAG	2450MHz System Validation Kit	D2450V2	908	2019/3/25	2022/3/24
SPEAG	2600MHz System Validation Kit	D2600V2	1061	2020/11/26	2021/11/25
SPEAG	Data Acquisition Electronics	DAE4	1338	2020/11/27	2021/11/26
SPEAG	Dosimetric E-Field Probe	EX3DV4	3843	2020/9/23	2021/9/22
SPEAG	SAM Twin Phantom	QD 000 P40 CB	TP-1753	NCR	NCR
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio Communication Analyzer	MT8821C	6201432831	2020/4/14	2021/4/13
Agilent	Wireless Communication Test Set	E5515C	MY52102706	2020/5/19	2021/5/18
Agilent	ENA Series Network Analyzer	E5071C	MY46106933	2020/8/1	2021/7/31
SPEAG	Dielectric Probe Kit	DAK-3.5	1138	2020/5/19	2021/5/18
Anritsu	Vector Signal Generator	MG3710A	6201682672	2020/1/8	2021/1/7
Rohde & Schwarz	Power Meter	NRVD	102081	2020/8/13	2021/8/12
Rohde & Schwarz	Power Sensor	NRV-Z5	100538	2020/8/13	2021/8/12
Rohde & Schwarz	Power Sensor	NRV-Z5	100539	2020/8/13	2021/8/12
R&S	CBT BLUETOOTH TESTER	CBT	101246	2020/4/14	2021/4/13
EXA	Spectrum Analyzer	FSV7	101631	2020/1/8	2021/1/7
Testo	Hygrometer	608-H1	1241332088	2020/1/8	2021/1/7
FLUKE	DIGITAC THERMOMETER	51II	97240029	2020/8/14	2021/8/13
BONN	POWER AMPLIFIER	BLMA 0830-3	087193A	Note 1	
BONN	POWER AMPLIFIER	BLMA 2060-2	087193B	Note 1	
ARRA	Power Divider	A3200-2	N/A	Note 1	
MCL	Attenuation1	BW-S10W5+	N/A	Note 1	
MCL	Attenuation2	BW-S10W5+	N/A	Note 1	
MCL	Attenuation3	BW-S10W5+	N/A	Note 1	
Agilent	Dual Directional Coupler	778D	20500	Note 1	
Agilent	Dual Directional Coupler	11691D	MY48151020	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.

10. System Verification

10.1 Tissue Simulating Liquids

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

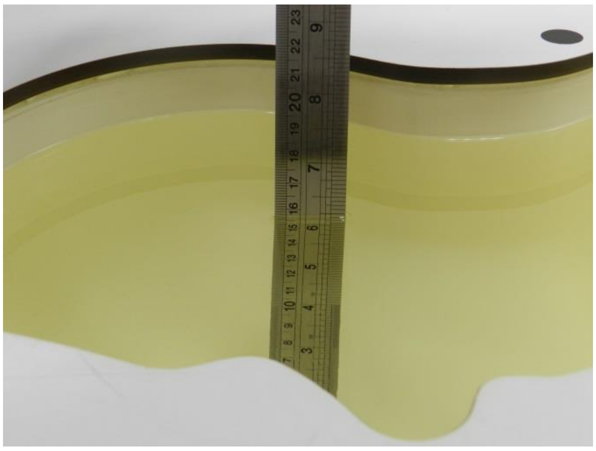


Fig 10.1 Photo of Liquid Height for Head SAR

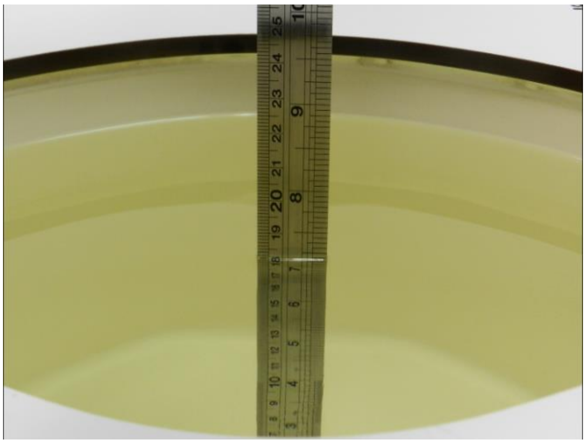


Fig 10.2 Photo of Liquid Height for Body SAR

10.2 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, 2000	55.2	0	0	0.3	0	44.5	1.40	40.0
2450	55.0	0	0	0	0	45.0	1.80	39.2
2600	54.8	0	0	0.1	0	45.1	1.96	39.0

<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	22.7	0.915	41.263	0.90	41.50	1.67	-0.57	±5	2020/12/8
1900	Head	22.6	1.401	40.146	1.40	40.00	0.07	0.37	±5	2020/12/12
2450	Head	22.9	1.863	38.595	1.80	39.20	3.50	-1.54	±5	2020/12/24
2600	Head	22.6	1.934	40.117	1.96	39.00	-1.33	2.86	±5	2020/12/16

10.3 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 (%)
2020/12/8	835	Head	250	4d151	3843	1338	2.25	9.30	9	-3.23
2020/12/12	1900	Head	250	5d170	3843	1338	10.10	39.00	40.4	3.59
2020/12/24	2450	Head	250	908	3843	1338	12.50	52.80	50	-5.30
2020/12/16	2600	Head	250	1061	3843	1338	15.10	56.60	60.4	6.71

<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 (%)
2020/12/8	835	Head	250	4d151	3843	1338	1.46	6.16	5.84	-5.19
2020/12/12	1900	Head	250	5d170	3843	1338	5.24	20.30	20.96	3.25
2020/12/24	2450	Head	250	908	3843	1338	5.82	24.20	23.28	-3.80
2020/12/16	2600	Head	250	1061	3843	1338	6.79	25.10	27.16	8.21

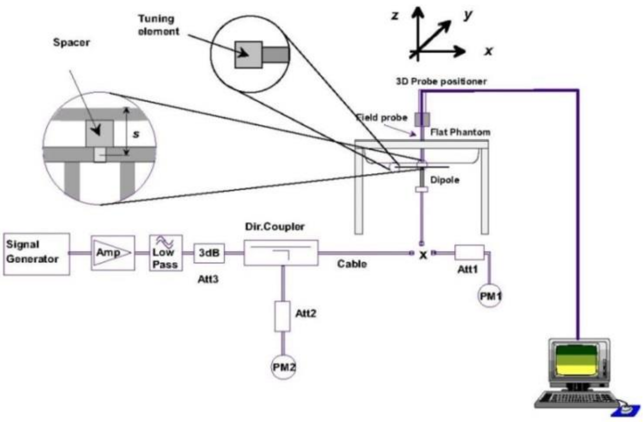


Fig 11.3.1 System Performance Check Setup

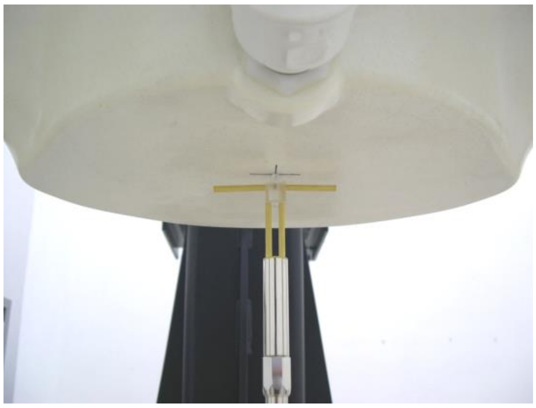


Fig 11.3.2 Setup Photo

11. RF Exposure Positions

11.1 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.

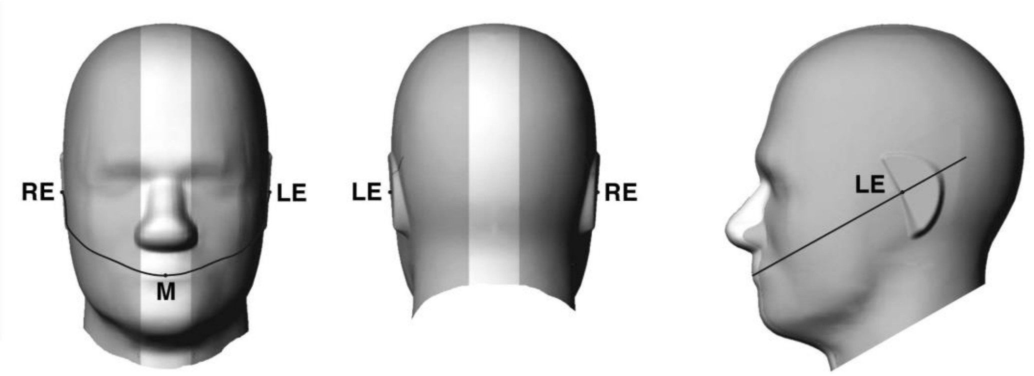


Fig 12.1.1 Front, back, and side views of SAM twin phantom

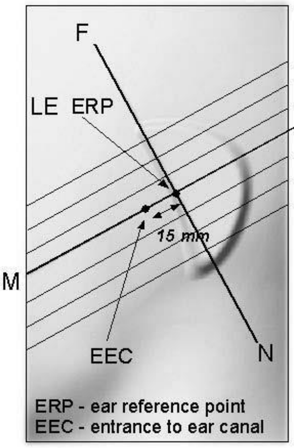


Fig 12.1.2 Close-up side view of phantom showing the ear region.

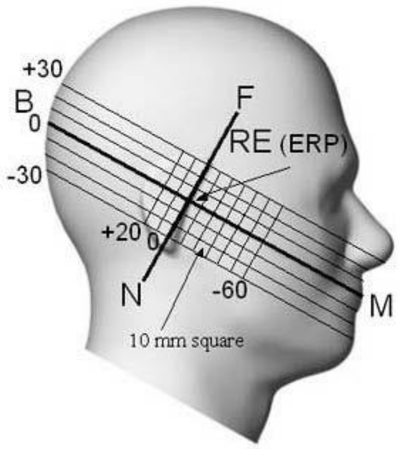


Fig 12.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

11.2 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.

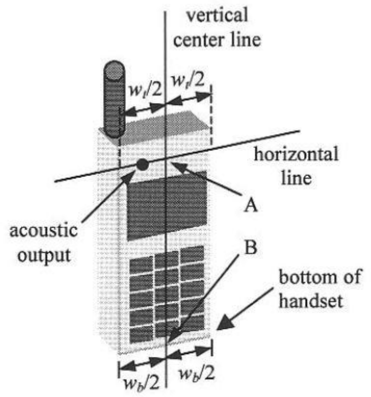


Fig 12.2.1 Handset vertical and horizontal reference lines—"fixed case

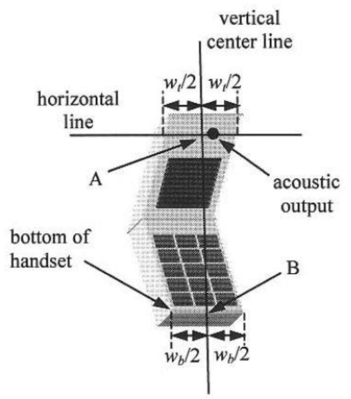


Fig 12.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

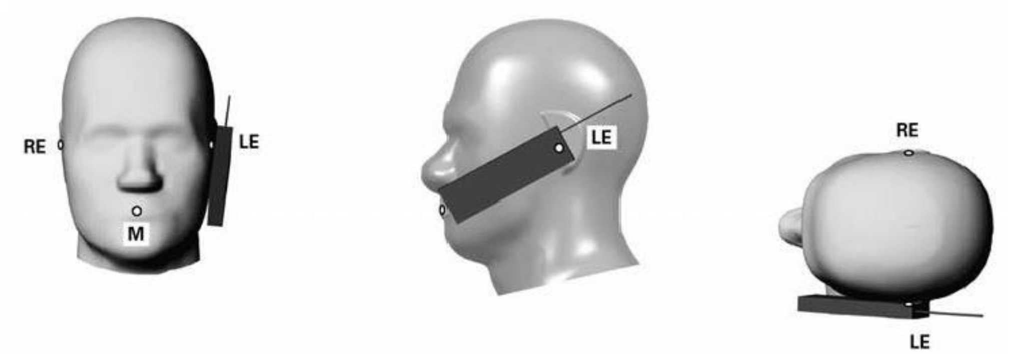


Fig 12.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

11.3 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

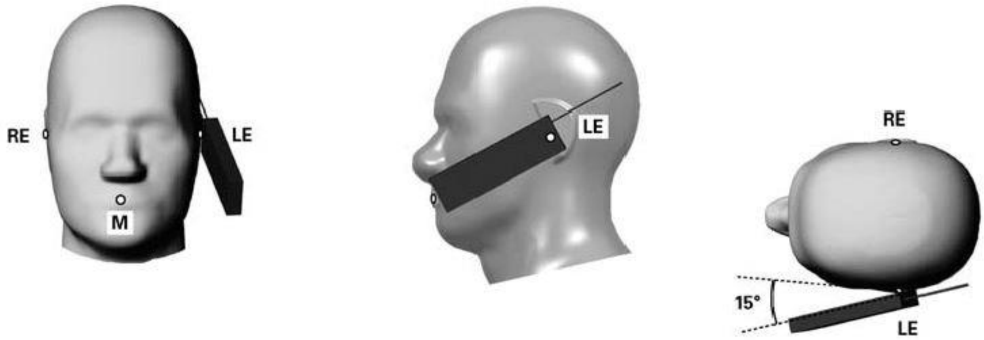


Fig 12.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

11.4 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 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.

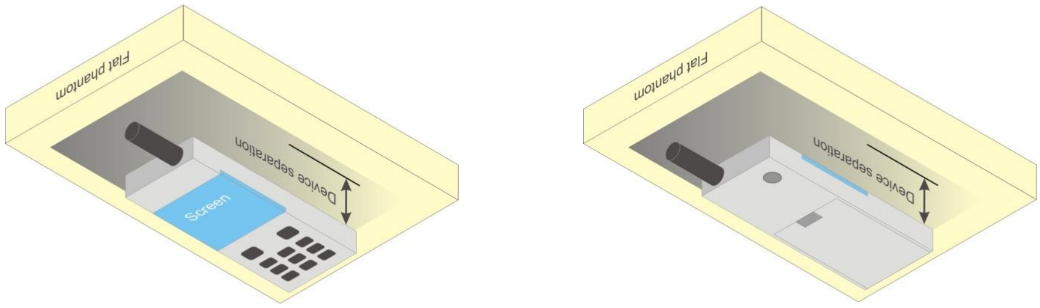


Fig 12.4 Body Worn Position

11.5 Product Specific 10g SAR Exposure

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

1. The normally required head and body-worn accessory SAR test procedures for handsets, including hotspot mode, must be applied.

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

11.6 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.

12. 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. Therefore, the GPRS 4Tx slots for GSM850/GSM1900 are considered as the primary mode.
3. Other configurations of GSM / GPRS / EDGE are considered as secondary modes. The 3G SAR test reduction procedure is applied, when the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ 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	β_{ed}1: 47/15 β_{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	Processes	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table. Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

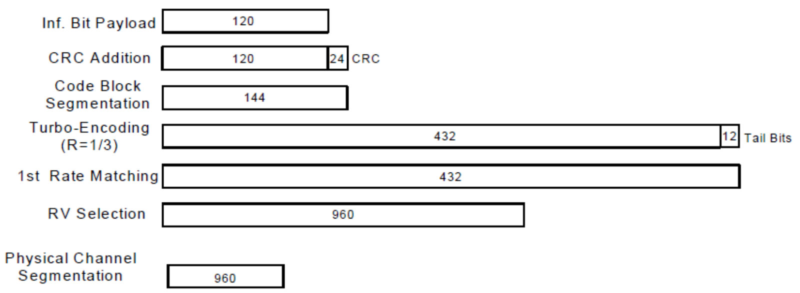


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

Setup Configuration

HSPA+ 3GPP release 7 (uplink category 7) 16QAM, Setup Configuration:

a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting * :
   i. Call Configs = 5.2E:HSPA+:UL with 16QAM
   ii. Set the Gain Factors (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 β_{hs} = 30/15 * β_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>

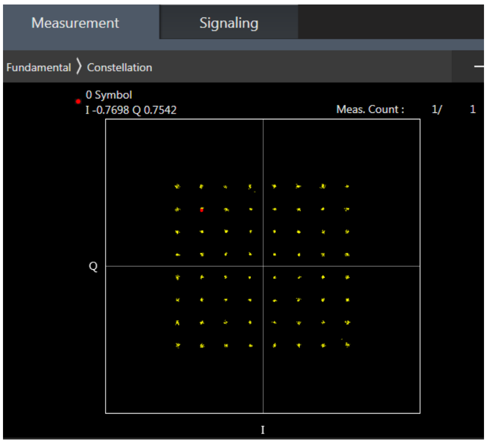
General Note:

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+

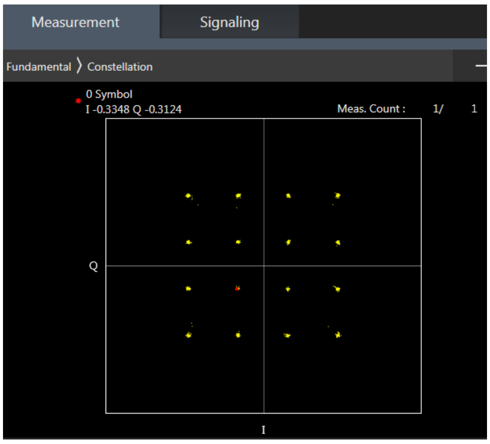
<LTE Conducted Power>

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/B26/B38 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
9. LTE B5/B38 SAR test was covered by B26/B41; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
   a. the maximum output power, including tolerance, for the smaller band is ≤ the larger band to qualify for the SAR test exclusion
   b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band
10. According to 2017 TCB workshop, for 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

<WLAN Conducted Power>

General Note:

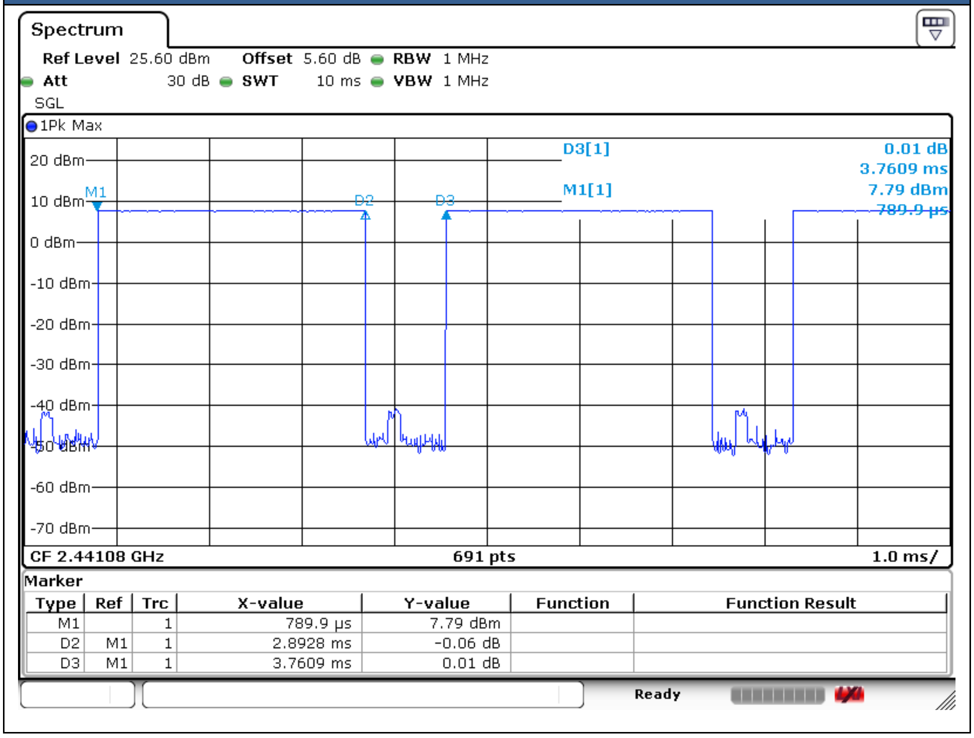
1. Per KDB 248227 D01v02r02, SAR test reduction is determined according to 802.11 transmission mode configurations and certain exposure conditions with multiple test positions. In the 2.4 GHz band, separate SAR procedures are applied to DSSS and OFDM configurations to simplify DSSS test requirements. 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 76.91 % 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



13. Antenna Location

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

14. SAR Test Results

General Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. For SAR testing of WLAN/Bluetooth signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
   c. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
   d. For BT/WLAN: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
   e. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result. The Reported TDD LTE SAR = 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. Pre KDB648474 D04v01r03, when the reported SAR for a 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 headset attached to the handset. When headset SAR is less than or equal than without headset SAR, no need to verify the remaining channels for headset SAR.
5. The device implements receiver detect mechanism/hotspot trigger reduced power for the power management for SAR compliance at different exposure conditions (head, body-worn, hotspot, extremity). The device will invoke corresponding work scenarios power level, which are provided in the operational description.
6. For Some WWAN bands, Receiver off body-worn power level higher than hotspot reduced power level, so front/back receiver off body-worn SAR can represent hotspot conservatively.
7. Per KDB648474 D04v01r03, for smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm, when hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg, however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power (for handheld on state, the maximum full power means reduced power), including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold.
   a. For this device SAR for WWAN transmitter scaled to maximum output power mode for product specific 10g SAR is higher than 1.2W/kg of GSM1900, WCDMA Band II, LTE Band 2/7/38/41 therefore product specific 10g SAR is necessary.
   b. When 10-g product specific 10g SAR is considered, SAR thresholds is specified in the procedures for SAR test reduction and exclusion should be multiplied by 2.5.
8. The device has two headsets, only supplier is different, so we chose headset 1 to perform full SAR testing.
9. The device has three batteries with the same battery capacity, only Manufacturer is different. We only chose battery 1 to perform full SAR testing.
10. There are three samples, please refer the product equality declaration exhibit submitted. According to the difference, we chose sample 1 to perform full SAR testing and sample 2 verified the worst case of sample 1.
11. 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.

GSM Note:

1. Per KDB 941225 D01v03r01, for SAR test reduction for GSM / GPRS / EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. Therefore, the GPRS 4Tx slots for GSM850/GSM1900 are considered as the primary mode.
2. Other configurations of GSM / GPRS / EDGE are considered as secondary modes. The 3G SAR test reduction procedure is applied, when the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ 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/B26/B38 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
7. LTE B5/B38 SAR test was covered by LTE B26/B41; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
   a. the maximum output power, including tolerance, for the smaller band is ≤ the larger band to qualify for the SAR test exclusion
   b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band

WLAN/ Bluetooth Note:

1. Per KDB 248227 D01v02r02, for 2.4GHz 802.11g/n SAR testing is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.
2. 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.
3. 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.
4. During SAR testing the WLAN transmission was verified using a spectrum analyzer.
5. Based on WLAN2.4GHz and Bluetooth share the same antenna, so Bluetooth RF exposure evaluation chose the worst positon of WLAN 2.4GHz Ant to perform Bluetooth SAR test, and used this Bluetooth SAR value conservatively represent other position do co-located analysis with WWAN.

14.1 Head SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Sample	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	GSM 850	GPRS 4 Tx slot	Right Cheek	1	189	836.4	29.36	30.00	1.159	0.03	0.154	0.178
	GSM 850	GPRS 4 Tx slot	Right Tilted	1	189	836.4	29.36	30.00	1.159	0.15	0.094	0.109
01	GSM 850	GPRS 4 Tx slot	Left Cheek	1	189	836.4	29.36	30.00	1.159	-0.04	0.211	**0.245**
	GSM 850	GPRS 4 Tx slot	Left Tilted	1	189	836.4	29.36	30.00	1.159	0.09	0.101	0.117
	GSM 1900	GPRS 4 Tx slot	Right Cheek	1	661	1880	26.43	27.50	1.279	0.06	0.112	0.143
	GSM 1900	GPRS 4 Tx slot	Right Tilted	1	661	1880	26.43	27.50	1.279	0.13	0.073	0.093
02	GSM 1900	GPRS 4 Tx slot	Left Cheek	1	661	1880	26.43	27.50	1.279	0.1	0.132	**0.169**
	GSM 1900	GPRS 4 Tx slot	Left Tilted	1	661	1880	26.43	27.50	1.279	0.11	0.088	0.113

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Sample	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA II	RMC 12.2Kbps	Right Cheek	1	9400	1880	23.85	24.50	1.161	0.12	0.141	0.164
	WCDMA II	RMC 12.2Kbps	Right Tilted	1	9400	1880	23.85	24.50	1.161	0.15	0.094	0.109
03	WCDMA II	RMC 12.2Kbps	Left Cheek	1	9400	1880	23.85	24.50	1.161	0.03	0.196	**0.228**
	WCDMA II	RMC 12.2Kbps	Left Tilted	1	9400	1880	23.85	24.50	1.161	0.16	0.100	0.116
	WCDMA V	RMC 12.2Kbps	Right Cheek	1	4182	836.4	23.30	24.50	1.318	0.07	0.141	0.186
	WCDMA V	RMC 12.2Kbps	Right Tilted	1	4182	836.4	23.30	24.50	1.318	0.08	0.093	0.123
04	WCDMA V	RMC 12.2Kbps	Left Cheek	1	4182	836.4	23.30	24.50	1.318	0.19	0.207	**0.273**
	WCDMA V	RMC 12.2Kbps	Left Tilted	1	4182	836.4	23.30	24.50	1.318	0.09	0.105	0.138

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Sample	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2	20M	QPSK	1	0	Right Cheek	1	18900	1880	23.40	24.00	1.148	0.07	0.184	0.211
	LTE Band 2	20M	QPSK	50	0	Right Cheek	1	18900	1880	22.36	23.00	1.159	-0.03	0.159	0.184
05	LTE Band 2	20M	QPSK	1	0	Right Tilted	1	18900	1880	23.40	24.00	1.148	-0.06	0.197	**0.226**
	LTE Band 2	20M	QPSK	50	0	Right Tilted	1	18900	1880	22.36	23.00	1.159	0.01	0.103	0.119
	LTE Band 2	20M	QPSK	1	0	Left Cheek	1	18900	1880	23.40	24.00	1.148	0.01	0.181	0.208
	LTE Band 2	20M	QPSK	50	0	Left Cheek	1	18900	1880	22.36	23.00	1.159	0.15	0.161	0.187
	LTE Band 2	20M	QPSK	1	0	Left Tilted	1	18900	1880	23.40	24.00	1.148	-0.05	0.129	0.148
	LTE Band 2	20M	QPSK	50	0	Left Tilted	1	18900	1880	22.36	23.00	1.159	-0.06	0.115	0.133
06	LTE Band 7	20M	QPSK	1	0	Right Cheek	1	21100	2535	23.58	24.00	1.102	0.18	0.129	**0.142**
	LTE Band 7	20M	QPSK	50	0	Right Cheek	1	21100	2535	22.54	23.00	1.112	0.09	0.115	0.128
	LTE Band 7	20M	QPSK	1	0	Right Tilted	1	21100	2535	23.58	24.00	1.102	0.02	0.093	0.102
	LTE Band 7	20M	QPSK	50	0	Right Tilted	1	21100	2535	22.54	23.00	1.112	0.12	0.088	0.098
	LTE Band 7	20M	QPSK	1	0	Left Cheek	1	21100	2535	23.58	24.00	1.102	0.01	0.078	0.086
	LTE Band 7	20M	QPSK	50	0	Left Cheek	1	21100	2535	22.54	23.00	1.112	0.09	0.072	0.080
	LTE Band 7	20M	QPSK	1	0	Left Tilted	1	21100	2535	23.58	24.00	1.102	0.12	0.065	0.072
	LTE Band 7	20M	QPSK	50	0	Left Tilted	1	21100	2535	22.54	23.00	1.112	0.03	0.059	0.066
	LTE Band 26	15M	QPSK	1	0	Right Cheek	1	26865	831.5	23.33	24.00	1.167	0.09	0.094	0.110
	LTE Band 26	15M	QPSK	36	0	Right Cheek	1	26865	831.5	22.27	23.00	1.183	0.09	0.085	0.101
	LTE Band 26	15M	QPSK	1	0	Right Tilted	1	26865	831.5	23.33	24.00	1.167	0.06	0.076	0.089
	LTE Band 26	15M	QPSK	36	0	Right Tilted	1	26865	831.5	22.27	23.00	1.183	-0.09	0.060	0.071
07	LTE Band 26	15M	QPSK	1	0	Left Cheek	1	26865	831.5	23.33	24.00	1.167	0.05	0.113	**0.132**
	LTE Band 26	15M	QPSK	36	0	Left Cheek	1	26865	831.5	22.27	23.00	1.183	0.05	0.103	0.122
	LTE Band 26	15M	QPSK	1	0	Left Tilted	1	26865	831.5	23.33	24.00	1.167	0.02	0.071	0.083
	LTE Band 26	15M	QPSK	36	0	Left Tilted	1	26865	831.5	22.27	23.00	1.183	0.03	0.064	0.076

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Sample	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)
08	LTE Band 41	20M	QPSK	1	0	Right Cheek	1	40670	2598	23.64	24.00	1.086	62.9	1.006	0.08	0.068	0.074
	LTE Band 41	20M	QPSK	50	0	Right Cheek	1	40670	2598	22.83	23.00	1.040	62.9	1.006	-0.02	0.056	0.059
	LTE Band 41	20M	QPSK	1	0	Right Tilted	1	40670	2598	23.64	24.00	1.086	62.9	1.006	0.18	0.063	0.069
	LTE Band 41	20M	QPSK	50	0	Right Tilted	1	40670	2598	22.83	23.00	1.040	62.9	1.006	0.14	0.051	0.053
	LTE Band 41	20M	QPSK	1	0	Left Cheek	1	40670	2598	23.64	24.00	1.086	62.9	1.006	0.01	0.033	0.036
	LTE Band 41	20M	QPSK	50	0	Left Cheek	1	40670	2598	22.83	23.00	1.040	62.9	1.006	0.08	0.025	0.026
	LTE Band 41	20M	QPSK	1	0	Left Tilted	1	40670	2598	23.64	24.00	1.086	62.9	1.006	0.01	0.036	0.039
	LTE Band 41	20M	QPSK	50	0	Left Tilted	1	40670	2598	22.83	23.00	1.040	62.9	1.006	-0.05	0.028	0.029

<WLAN2.4G SAR>

Plot No.	Band	Mode	Test Position	Sample	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	1	6	2437	17.58	18.00	1.102	100	1.000	-0.01	0.241	0.265
	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	1	6	2437	17.58	18.00	1.102	100	1.000	0.05	0.301	0.332
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	1	6	2437	17.58	18.00	1.102	100	1.000	0.08	0.516	0.568
09	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	1	6	2437	17.58	18.00	1.102	100	1.000	0.15	0.623	0.686
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	2	6	2437	17.58	18.00	1.102	100	1.000	0.08	0.412	0.454

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Sample	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)
10	Bluetooth	1Mbps	Left Tilted	1	39	2441	8.09	8.50	1.099	76.91	1.300	0.06	0.016	0.023

14.2 Hotspot SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Sample	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	GSM 850	GPRS 4 Tx slot	Front	5mm	1	189	836.4	29.36	30.00	1.159	0.12	0.312	0.362
	GSM 850	GPRS 4 Tx slot	Back	5mm	1	189	836.4	29.36	30.00	1.159	0.01	0.691	0.801
	GSM 850	GPRS 4 Tx slot	Left Side	5mm	1	189	836.4	29.36	30.00	1.159	0.08	0.200	0.232
	GSM 850	GPRS 4 Tx slot	Right Side	5mm	1	189	836.4	29.36	30.00	1.159	0.05	0.160	0.185
	GSM 850	GPRS 4 Tx slot	Bottom Side	5mm	1	189	836.4	29.36	30.00	1.159	-0.09	0.197	0.228
	GSM 850	GPRS 4 Tx slot	Back	5mm	1	128	824.2	29.35	30.00	1.161	0.09	0.626	0.727
11	GSM 850	GPRS 4 Tx slot	Back	5mm	1	251	848.8	29.26	30.00	1.186	-0.12	0.821	**0.974**
	GSM 850	GPRS 4 Tx slot	Back	5mm	2	251	848.8	29.26	30.00	1.186	-0.09	0.699	0.829
	GSM 1900	GPRS 4 Tx slot	Front	5mm	1	661	1880	24.84	26.00	1.306	-0.11	0.599	0.782
	GSM 1900	GPRS 4 Tx slot	Back	5mm	1	661	1880	24.84	26.00	1.306	0.03	0.826	1.079
12	GSM 1900	GPRS 4 Tx slot	Back	5mm	1	512	1850.2	24.82	26.00	1.312	-0.18	1.020	**1.338**
	GSM 1900	GPRS 4 Tx slot	Back	5mm	1	810	1909.8	24.79	26.00	1.321	-0.02	0.791	1.045
	GSM 1900	GPRS 4 Tx slot	Left Side	5mm	1	661	1880	22.45	23.50	1.274	0.01	0.169	0.215
	GSM 1900	GPRS 4 Tx slot	Right Side	5mm	1	661	1880	22.45	23.50	1.274	0.06	0.146	0.186
	GSM 1900	GPRS 4 Tx slot	Bottom Side	5mm	1	661	1880	22.45	23.50	1.274	0.01	1.010	1.286
	GSM 1900	GPRS 4 Tx slot	Bottom Side	5mm	1	512	1850.2	22.41	23.50	1.285	0.05	0.910	1.170
	GSM 1900	GPRS 4 Tx slot	Bottom Side	5mm	1	810	1909.8	22.36	23.50	1.300	0.05	0.948	1.233
	GSM 1900	GPRS 4 Tx slot	Back	5mm	2	512	1850.2	24.82	26.00	1.312	0.12	0.745	0.978

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Sample	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA II	RMC 12.2Kbps	Front	5mm	1	9400	1880	20.53	21.50	1.250	-0.12	0.588	0.735
	WCDMA II	RMC 12.2Kbps	Back	5mm	1	9400	1880	20.53	21.50	1.250	0.14	0.878	1.098
	WCDMA II	RMC 12.2Kbps	Back	5mm	1	9262	1852.4	20.41	21.50	1.285	-0.05	0.911	1.171
	WCDMA II	RMC 12.2Kbps	Back	5mm	1	9538	1907.6	20.44	21.50	1.276	0.01	0.895	1.142
	WCDMA II	RMC 12.2Kbps	Left Side	5mm	1	9400	1880	18.35	19.50	1.303	0.08	0.147	0.192
	WCDMA II	RMC 12.2Kbps	Right Side	5mm	1	9400	1880	18.35	19.50	1.303	0.06	0.098	0.128
13	WCDMA II	RMC 12.2Kbps	Bottom Side	5mm	1	9400	1880	18.35	19.50	1.303	0.04	1.050	**1.368**
	WCDMA II	RMC 12.2Kbps	Bottom Side	5mm	1	9262	1852.4	18.29	19.50	1.321	0.06	1.020	1.348
	WCDMA II	RMC 12.2Kbps	Bottom Side	5mm	1	9538	1907.6	18.32	19.50	1.312	-0.06	1.040	1.365
	WCDMA II	RMC 12.2Kbps	Bottom Side	5mm	2	9400	1880	18.35	19.50	1.303	0.02	0.995	1.297
	WCDMA V	RMC 12.2Kbps	Front	5mm	1	4182	836.4	23.30	24.50	1.318	0.11	0.310	0.409
14	WCDMA V	RMC 12.2Kbps	Back	5mm	1	4182	836.4	23.30	24.50	1.318	0.03	0.481	**0.634**
	WCDMA V	RMC 12.2Kbps	Left Side	5mm	1	4182	836.4	23.30	24.50	1.318	0.07	0.169	0.223
	WCDMA V	RMC 12.2Kbps	Right Side	5mm	1	4182	836.4	23.30	24.50	1.318	0.08	0.113	0.149
	WCDMA V	RMC 12.2Kbps	Bottom Side	5mm	1	4182	836.4	23.30	24.50	1.318	0.08	0.257	0.339

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Sample	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2	20M	QPSK	1	0	Front	5mm	1	18900	1880	20.54	21.00	1.112	0.01	0.432	0.480
	LTE Band 2	20M	QPSK	50	0	Front	5mm	1	18900	1880	19.45	20.00	1.135	0.08	0.376	0.427
	LTE Band 2	20M	QPSK	1	0	Back	5mm	1	18900	1880	20.54	21.00	1.112	0.01	0.740	0.823
	LTE Band 2	20M	QPSK	1	0	Back	5mm	1	18700	1860	20.39	21.00	1.151	-0.18	0.875	1.007
	LTE Band 2	20M	QPSK	1	0	Back	5mm	1	19100	1900	20.32	21.00	1.169	0.03	0.672	0.786
	LTE Band 2	20M	QPSK	50	0	Back	5mm	1	18900	1880	19.45	20.00	1.135	-0.04	0.712	0.808
	LTE Band 2	20M	QPSK	50	0	Back	5mm	1	18700	1860	19.38	20.00	1.153	0.05	0.692	0.798
	LTE Band 2	20M	QPSK	50	0	Back	5mm	1	19100	1900	19.4	20.00	1.148	-0.01	0.596	0.684
	LTE Band 2	20M	QPSK	100	0	Back	5mm	1	18900	1880	19.5	20.00	1.122	-0.02	0.624	0.700
	LTE Band 2	20M	QPSK	1	0	Left Side	5mm	1	18900	1880	18.34	19.00	1.164	0.18	0.122	0.142
	LTE Band 2	20M	QPSK	50	0	Left Side	5mm	1	18900	1880	17.28	18.00	1.180	0.14	0.107	0.126
	LTE Band 2	20M	QPSK	1	0	Right Side	5mm	1	18900	1880	18.34	19.00	1.164	0.01	0.122	0.142
	LTE Band 2	20M	QPSK	50	0	Right Side	5mm	1	18900	1880	17.28	18.00	1.180	0.08	0.105	0.124
	LTE Band 2	20M	QPSK	1	0	Bottom Side	5mm	1	18900	1880	18.34	19.00	1.164	0.08	0.769	0.895
15	LTE Band 2	20M	QPSK	1	0	Bottom Side	5mm	1	18700	1860	18.23	19.00	1.194	0.02	0.873	**1.042**
	LTE Band 2	20M	QPSK	1	0	Bottom Side	5mm	1	19100	1900	18.26	19.00	1.186	0.01	0.793	0.940
	LTE Band 2	20M	QPSK	50	0	Bottom Side	5mm	1	18900	1880	17.28	18.00	1.180	0.08	0.668	0.788
	LTE Band 2	20M	QPSK	50	0	Bottom Side	5mm	1	18700	1860	17.14	18.00	1.219	0.05	0.730	0.890
	LTE Band 2	20M	QPSK	50	0	Bottom Side	5mm	1	19100	1900	17.21	18.00	1.199	0.03	0.678	0.813
	LTE Band 2	20M	QPSK	100	0	Bottom Side	5mm	1	18900	1880	17.15	18.00	1.216	0.05	0.691	0.840
	LTE Band 7	20M	QPSK	1	0	Front	5mm	1	21100	2535	19.86	20.50	1.159	0.03	0.311	0.360
	LTE Band 7	20M	QPSK	50	0	Front	5mm	1	21100	2535	18.75	19.50	1.189	-0.05	0.259	0.308
16	LTE Band 7	20M	QPSK	1	0	Back	5mm	1	21100	2535	19.86	20.50	1.159	-0.02	0.950	**1.101**
	LTE Band 7	20M	QPSK	1	0	Back	5mm	1	20850	2510	19.63	20.50	1.222	0.02	0.823	1.006
	LTE Band 7	20M	QPSK	1	0	Back	5mm	1	21350	2560	19.72	20.50	1.197	-0.02	0.835	0.999
	LTE Band 7	20M	QPSK	50	0	Back	5mm	1	21100	2535	18.75	19.50	1.189	0.01	0.807	0.959
	LTE Band 7	20M	QPSK	50	0	Back	5mm	1	20850	2510	18.59	19.50	1.233	0.01	0.708	0.873
	LTE Band 7	20M	QPSK	50	0	Back	5mm	1	21350	2560	18.69	19.50	1.205	0.06	0.708	0.853
	LTE Band 7	20M	QPSK	100	0	Back	5mm	1	21100	2535	18.72	19.50	1.197	0.07	0.835	0.999
	LTE Band 7	20M	QPSK	1	0	Left Side	5mm	1	21100	2535	19.86	20.50	1.159	0.05	0.034	0.039
	LTE Band 7	20M	QPSK	50	0	Left Side	5mm	1	21100	2535	18.75	19.50	1.189	0.05	0.030	0.036
	LTE Band 7	20M	QPSK	1	0	Right Side	5mm	1	21100	2535	19.86	20.50	1.159	0.02	0.092	0.107
	LTE Band 7	20M	QPSK	50	0	Right Side	5mm	1	21100	2535	18.75	19.50	1.189	0.06	0.080	0.095
	LTE Band 7	20M	QPSK	1	0	Bottom Side	5mm	1	21100	2535	19.86	20.50	1.159	0.01	0.894	1.036
	LTE Band 7	20M	QPSK	1	0	Bottom Side	5mm	1	20850	2510	19.63	20.50	1.222	0.06	0.808	0.987
	LTE Band 7	20M	QPSK	1	0	Bottom Side	5mm	1	21350	2560	19.72	20.50	1.197	0.03	0.908	1.087
	LTE Band 7	20M	QPSK	50	0	Bottom Side	5mm	1	21100	2535	18.75	19.50	1.189	-0.07	0.759	0.902
	LTE Band 7	20M	QPSK	50	0	Bottom Side	5mm	1	20850	2510	18.59	19.50	1.233	0.01	0.702	0.866
	LTE Band 7	20M	QPSK	50	0	Bottom Side	5mm	1	21350	2560	18.69	19.50	1.205	0.11	0.802	0.966
	LTE Band 7	20M	QPSK	100	0	Bottom Side	5mm	1	21100	2535	18.72	19.50	1.197	0.12	0.813	0.973
	LTE Band 7	20M	QPSK	1	0	Back	5mm	2	21100	2535	19.86	20.50	1.159	0.01	0.911	1.056
	LTE Band 26	15M	QPSK	1	0	Front	5mm	1	26865	831.5	23.33	24.00	1.167	0.06	0.276	0.322
	LTE Band 26	15M	QPSK	36	0	Front	5mm	1	26865	831.5	22.27	23.00	1.183	-0.03	0.247	0.292
17	LTE Band 26	15M	QPSK	1	0	Back	5mm	1	26865	831.5	23.33	24.00	1.167	-0.05	0.521	**0.608**
	LTE Band 26	15M	QPSK	36	0	Back	5mm	1	26865	831.5	22.27	23.00	1.183	0.12	0.458	0.542
	LTE Band 26	15M	QPSK	1	0	Left side	5mm	1	26865	831.5	23.33	24.00	1.167	0.05	0.216	0.252
	LTE Band 26	15M	QPSK	36	0	Left side	5mm	1	26865	831.5	22.27	23.00	1.183	-0.14	0.191	0.226
	LTE Band 26	15M	QPSK	1	0	Right side	5mm	1	26865	831.5	23.33	24.00	1.167	-0.15	0.174	0.203
	LTE Band 26	15M	QPSK	36	0	Right side	5mm	1	26865	831.5	22.27	23.00	1.183	0.11	0.151	0.179
	LTE Band 26	15M	QPSK	1	0	Bottom side	5mm	1	26865	831.5	23.33	24.00	1.167	0.08	0.188	0.219
	LTE Band 26	15M	QPSK	36	0	Bottom side	5mm	1	26865	831.5	22.27	23.00	1.183	0.13	0.168	0.199

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Sample	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 41	20M	QPSK	1	0	Front	5mm	1	40670	2598	21.29	21.50	1.050	62.9	1.006	-0.15	0.375	0.396
	LTE Band 41	20M	QPSK	50	0	Front	5mm	1	40670	2598	20.18	20.50	1.076	62.9	1.006	0.11	0.307	0.332
18	LTE Band 41	20M	QPSK	1	0	Back	5mm	1	40670	2598	21.29	21.50	1.050	62.9	1.006	0.08	1.160	1.225
	LTE Band 41	20M	QPSK	1	0	Back	5mm	1	40140	2545	21.16	21.50	1.081	62.9	1.006	0.06	0.930	1.012
	LTE Band 41	20M	QPSK	1	0	Back	5mm	1	40400	2571	21.22	21.50	1.067	62.9	1.006	0.09	0.992	1.064
	LTE Band 41	20M	QPSK	1	0	Back	5mm	1	41140	2645	21.11	21.50	1.094	62.9	1.006	0.01	1.007	1.108
	LTE Band 41	20M	QPSK	50	0	Back	5mm	1	40670	2598	20.18	20.50	1.076	62.9	1.006	0.04	1.045	1.132
	LTE Band 41	20M	QPSK	50	0	Back	5mm	1	40140	2545	19.94	20.50	1.138	62.9	1.006	0.07	0.766	0.877
	LTE Band 41	20M	QPSK	50	0	Back	5mm	1	40400	2571	20.00	20.50	1.122	62.9	1.006	0.06	0.841	0.949
	LTE Band 41	20M	QPSK	50	0	Back	5mm	1	41140	2645	20.08	20.50	1.102	62.9	1.006	-0.02	0.846	0.937
	LTE Band 41	20M	QPSK	100	0	Back	5mm	1	40670	2598	20.15	20.50	1.084	62.9	1.006	0.01	0.968	1.056
	LTE Band 41	20M	QPSK	1	0	Left Side	5mm	1	40670	2598	21.29	21.50	1.050	62.9	1.006	0.15	0.041	0.043
	LTE Band 41	20M	QPSK	50	0	Left Side	5mm	1	40670	2598	20.18	20.50	1.076	62.9	1.006	-0.16	0.035	0.038
	LTE Band 41	20M	QPSK	1	0	Right Side	5mm	1	40670	2598	21.29	21.50	1.050	62.9	1.006	0.06	0.138	0.146
	LTE Band 41	20M	QPSK	50	0	Right Side	5mm	1	40670	2598	20.18	20.50	1.076	62.9	1.006	-0.03	0.112	0.121
	LTE Band 41	20M	QPSK	1	0	Bottom Side	5mm	1	40670	2598	21.29	21.50	1.050	62.9	1.006	0.04	0.866	0.914
	LTE Band 41	20M	QPSK	1	0	Bottom Side	5mm	1	40140	2545	21.16	21.50	1.081	62.9	1.006	0.05	0.762	0.829
	LTE Band 41	20M	QPSK	1	0	Bottom Side	5mm	1	40400	2571	21.22	21.50	1.067	62.9	1.006	0.02	0.810	0.869
	LTE Band 41	20M	QPSK	1	0	Bottom Side	5mm	1	41140	2645	21.11	21.50	1.094	62.9	1.006	0.09	0.713	0.785
	LTE Band 41	20M	QPSK	50	0	Bottom Side	5mm	1	40670	2598	20.18	20.50	1.076	62.9	1.006	0.05	0.688	0.745
	LTE Band 41	20M	QPSK	50	0	Bottom Side	5mm	1	40140	2545	19.94	20.50	1.138	62.9	1.006	0.12	0.634	0.726
	LTE Band 41	20M	QPSK	50	0	Bottom Side	5mm	1	40400	2571	20.00	20.50	1.122	62.9	1.006	0.01	0.683	0.771
	LTE Band 41	20M	QPSK	50	0	Bottom Side	5mm	1	41140	2645	20.08	20.50	1.102	62.9	1.006	0.09	0.591	0.655
	LTE Band 41	20M	QPSK	100	0	Bottom Side	5mm	1	40670	2598	20.15	20.50	1.084	62.9	1.006	-0.06	0.727	0.793
	LTE Band 41	20M	QPSK	1	0	Back	5mm	2	40670	2598	21.29	21.50	1.050	62.9	1.006	-0.08	0.975	1.029

<WLAN2.4G SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Sample	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Front	5mm	1	6	2437	17.58	18.00	1.102	100	1.000	-0.06	0.280	0.308
19	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	1	6	2437	17.58	18.00	1.102	100	1.000	-0.06	0.670	0.738
	WLAN2.4GHz	802.11b 1Mbps	Left Side	5mm	1	6	2437	17.58	18.00	1.102	100	1.000	-0.02	0.030	0.033
	WLAN2.4GHz	802.11b 1Mbps	Right Side	5mm	1	6	2437	17.58	18.00	1.102	100	1.000	0.01	0.010	0.011
	WLAN2.4GHz	802.11b 1Mbps	Top Side	5mm	1	6	2437	17.58	18.00	1.102	100	1.000	0.01	0.545	0.600
	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	2	6	2437	17.58	18.00	1.102	100	1.000	-0.06	0.409	0.451

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Sample	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)
20	Bluetooth	1Mbps	Back	5mm	1	39	2441	8.09	8.50	1.099	76.91	1.300	0.01	0.009	0.013

14.3 Body Worn Accessory SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Sample	Headset	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	GSM 850	GPRS 4 Tx slot	Front	5mm	1	-	189	836.4	29.36	30.00	1.159	0.12	0.312	0.362
	GSM 850	GPRS 4 Tx slot	Back	5mm	1	-	189	836.4	29.36	30.00	1.159	0.01	0.691	0.801
	GSM 850	GPRS 4 Tx slot	Back	5mm	1	-	128	824.2	29.35	30.00	1.161	0.09	0.626	0.727
21	GSM 850	GPRS 4 Tx slot	Back	5mm	1	-	251	848.8	29.26	30.00	1.186	-0.12	0.821	0.974
	GSM 850	GPRS 4 Tx slot	Back	5mm	2	-	251	848.8	29.26	30.00	1.186	-0.09	0.699	0.829
	GSM 1900	GPRS 4 Tx slot	Front	5mm	1	-	661	1880	24.84	26.00	1.306	-0.11	0.599	0.782
	GSM 1900	GPRS 4 Tx slot	Back	5mm	1	-	661	1880	24.84	26.00	1.306	0.03	0.826	1.079
22	GSM 1900	GPRS 4 Tx slot	Back	5mm	1	-	512	1850.2	24.82	26.00	1.312	-0.18	1.020	1.338
	GSM 1900	GPRS 4 Tx slot	Back	5mm	1	-	810	1909.8	24.79	26.00	1.321	-0.02	0.791	1.045
	GSM 1900	GPRS 4 Tx slot	Back	5mm	1	Headset	512	1850.2	24.82	26.00	1.312	0.07	0.911	1.195
	GSM 1900	GPRS 4 Tx slot	Back	5mm	2	-	512	1850.2	24.82	26.00	1.312	0.12	0.745	0.978

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Sample	Headset	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA II	RMC 12.2Kbps	Front	5mm	1	-	9400	1880	20.53	21.50	1.250	-0.12	0.588	0.735
	WCDMA II	RMC 12.2Kbps	Back	5mm	1	-	9400	1880	20.53	21.50	1.250	0.14	0.878	1.098
23	WCDMA II	RMC 12.2Kbps	Back	5mm	1	-	9262	1852.4	20.41	21.50	1.285	-0.05	0.911	1.171
	WCDMA II	RMC 12.2Kbps	Back	5mm	1	-	9538	1907.6	20.44	21.50	1.276	0.01	0.895	1.142
	WCDMA V	RMC 12.2Kbps	Front	5mm	1	-	4182	836.4	23.3	24.50	1.318	0.11	0.310	0.409
24	WCDMA V	RMC 12.2Kbps	Back	5mm	1	-	4182	836.4	23.3	24.50	1.318	0.03	0.481	0.634

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Sample	Headset	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2	20M	QPSK	1	0	Front	5mm	1	-	18900	1880	20.54	21.00	1.112	0.01	0.432	0.480
	LTE Band 2	20M	QPSK	50	0	Front	5mm	1	-	18900	1880	19.45	20.00	1.135	0.08	0.376	0.427
	LTE Band 2	20M	QPSK	1	0	Back	5mm	1	-	18900	1880	20.54	21.00	1.112	0.01	0.740	0.823
25	LTE Band 2	20M	QPSK	1	0	Back	5mm	1	-	18700	1860	20.39	21.00	1.151	-0.18	0.875	1.007
	LTE Band 2	20M	QPSK	1	0	Back	5mm	1	-	19100	1900	20.32	21.00	1.169	0.03	0.672	0.786
	LTE Band 2	20M	QPSK	50	0	Back	5mm	1	-	18900	1880	19.45	20.00	1.135	-0.04	0.712	0.808
	LTE Band 2	20M	QPSK	50	0	Back	5mm	1	-	18700	1860	19.38	20.00	1.153	0.05	0.692	0.798
	LTE Band 2	20M	QPSK	50	0	Back	5mm	1	-	19100	1900	19.4	20.00	1.148	-0.01	0.596	0.684
	LTE Band 2	20M	QPSK	100	0	Back	5mm	1	-	18900	1880	19.5	20.00	1.122	-0.02	0.624	0.700
	LTE Band 7	20M	QPSK	1	0	Front	5mm	1	-	21100	2535	19.86	20.50	1.159	0.03	0.311	0.360
	LTE Band 7	20M	QPSK	50	0	Front	5mm	1	-	21100	2535	18.75	19.50	1.189	-0.05	0.259	0.308
26	LTE Band 7	20M	QPSK	1	0	Back	5mm	1	-	21100	2535	19.86	20.50	1.159	-0.02	0.950	1.101
	LTE Band 7	20M	QPSK	1	0	Back	5mm	1	-	20850	2510	19.63	20.50	1.222	0.02	0.823	1.006
	LTE Band 7	20M	QPSK	1	0	Back	5mm	1	-	21350	2560	19.72	20.50	1.197	-0.02	0.835	0.999
	LTE Band 7	20M	QPSK	50	0	Back	5mm	1	-	21100	2535	18.75	19.50	1.189	0.01	0.807	0.959
	LTE Band 7	20M	QPSK	50	0	Back	5mm	1	-	20850	2510	18.59	19.50	1.233	0.01	0.708	0.873
	LTE Band 7	20M	QPSK	50	0	Back	5mm	1	-	21350	2560	18.69	19.50	1.205	0.06	0.708	0.853
	LTE Band 7	20M	QPSK	100	0	Back	5mm	1	-	21100	2535	18.72	19.50	1.197	0.07	0.835	0.999
	LTE Band 7	20M	QPSK	1	0	Back	5mm	2	-	21100	2535	19.86	20.50	1.159	0.01	0.911	1.056
	LTE Band 26	15M	QPSK	1	0	Front	5mm	1	-	26865	831.5	23.33	24.00	1.167	0.06	0.276	0.322
	LTE Band 26	15M	QPSK	36	0	Front	5mm	1	-	26865	831.5	22.27	23.00	1.183	-0.03	0.247	0.292
27	LTE Band 26	15M	QPSK	1	0	Back	5mm	1	-	26865	831.5	23.33	24.00	1.167	-0.05	0.521	0.608
	LTE Band 26	15M	QPSK	36	0	Back	5mm	1	-	26865	831.5	22.27	23.00	1.183	0.12	0.458	0.542

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Sample	Headset	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 41	20M	QPSK	1	0	Front	5mm	1	-	40670	2598	21.29	21.50	1.050	62.9	1.006	-0.15	0.375	0.396
	LTE Band 41	20M	QPSK	50	0	Front	5mm	1	-	40670	2598	20.18	20.50	1.076	62.9	1.006	0.11	0.307	0.332
28	LTE Band 41	20M	QPSK	1	0	Back	5mm	1	-	40670	2598	21.29	21.50	1.050	62.9	1.006	0.08	1.160	**1.225**
	LTE Band 41	20M	QPSK	1	0	Back	5mm	1	-	40140	2545	21.16	21.50	1.081	62.9	1.006	0.06	0.930	1.012
	LTE Band 41	20M	QPSK	1	0	Back	5mm	1	-	40400	2571	21.22	21.50	1.067	62.9	1.006	0.09	0.992	1.064
	LTE Band 41	20M	QPSK	1	0	Back	5mm	1	-	41140	2645	21.11	21.50	1.094	62.9	1.006	0.01	1.007	1.108
	LTE Band 41	20M	QPSK	50	0	Back	5mm	1	-	40670	2598	20.18	20.50	1.076	62.9	1.006	0.04	1.045	1.132
	LTE Band 41	20M	QPSK	50	0	Back	5mm	1	-	40140	2545	19.94	20.50	1.138	62.9	1.006	0.07	0.766	0.877
	LTE Band 41	20M	QPSK	50	0	Back	5mm	1	-	40400	2571	20.00	20.50	1.122	62.9	1.006	0.06	0.841	0.949
	LTE Band 41	20M	QPSK	50	0	Back	5mm	1	-	41140	2645	20.08	20.50	1.102	62.9	1.006	-0.02	0.846	0.937
	LTE Band 41	20M	QPSK	1	0	Back	5mm	1	Headset	40670	2598	21.29	21.50	1.050	62.9	1.006	0.01	0.957	1.010
	LTE Band 41	20M	QPSK	100	0	Back	5mm	1	-	40670	2598	20.15	20.50	1.084	62.9	1.006	0.01	0.968	1.056
	LTE Band 41	20M	QPSK	1	0	Back	5mm	2	-	40670	2598	21.29	21.50	1.050	62.9	1.006	-0.08	0.975	1.029

<WLAN2.4G SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Sample	Headset	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Front	5mm	1	-	6	2437	17.58	18.00	1.102	100	1.000	-0.06	0.280	0.308
29	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	1	-	6	2437	17.58	18.00	1.102	100	1.000	-0.06	0.670	**0.738**
	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	2	-	6	2437	17.58	18.00	1.102	100	1.000	-0.06	0.409	0.451

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Sample	Headset	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)
30	Bluetooth	1Mbps	Back	5mm	1	-	39	2441	8.09	8.50	1.099	76.91	1.300	0.01	0.009	**0.013**

14.4 Product specific 10g SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Sample	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	GSM 1900	GPRS 4 Tx slot	Back	0mm	1	661	1880	24.84	26.00	1.306	0.02	1.240	1.620
	GSM 1900	GPRS 4 Tx slot	Bottom Side	0mm	1	661	1880	24.84	26.00	1.306	0.06	1.900	2.482
31	GSM 1900	GPRS 4 Tx slot	Bottom Side	0mm	1	512	1850.2	24.82	26.00	1.312	-0.07	2.020	2.651
	GSM 1900	GPRS 4 Tx slot	Bottom Side	0mm	1	810	1909.8	24.79	26.00	1.321	0.07	1.750	2.312

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Sample	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
32	WCDMA II	RMC 12.2Kbps	Back	0mm	1	9400	1880	20.53	21.50	1.250	-0.03	1.670	2.088
	WCDMA II	RMC 12.2Kbps	Back	0mm	1	9262	1852.4	20.41	21.50	1.285	-0.03	1.520	1.954
	WCDMA II	RMC 12.2Kbps	Back	0mm	1	9538	1907.6	20.44	21.50	1.276	-0.01	1.490	1.902
	WCDMA II	RMC 12.2Kbps	Bottom Side	0mm	1	9400	1880	20.53	21.50	1.250	0.06	1.511	1.889

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Sample	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	LTE Band 2	20M	QPSK	1	0	Back	0mm	1	18900	1880	20.54	21.00	1.112	0.01	1.720	1.912
	LTE Band 2	20M	QPSK	50	0	Back	0mm	1	18900	1880	19.45	20.00	1.135	0.08	1.490	1.691
33	LTE Band 2	20M	QPSK	1	0	Bottom Side	0mm	1	18900	1880	20.54	21.00	1.112	-0.05	2.750	3.057
	LTE Band 2	20M	QPSK	1	0	Bottom Side	0mm	1	18700	1860	20.39	21.00	1.151	-0.01	2.610	3.004
	LTE Band 2	20M	QPSK	1	0	Bottom Side	0mm	1	19100	1900	20.32	21.00	1.169	-0.02	2.410	2.818
	LTE Band 2	20M	QPSK	50	0	Bottom Side	0mm	1	18900	1880	19.45	20.00	1.135	0.18	2.250	2.554
	LTE Band 2	20M	QPSK	50	0	Bottom Side	0mm	1	18700	1860	19.38	20.00	1.153	0.14	2.280	2.630
	LTE Band 2	20M	QPSK	50	0	Bottom Side	0mm	1	19100	1900	19.40	20.00	1.148	0.01	2.050	2.354
	LTE Band 2	20M	QPSK	100	0	Bottom Side	0mm	1	18900	1880	19.50	20.00	1.122	0.08	2.190	2.457
	LTE Band 2	20M	QPSK	1	0	Bottom Side	0mm	2	18900	1880	20.54	21.00	1.112	-0.03	2.011	2.236
34	LTE Band 7	20M	QPSK	1	0	Back	0mm	1	21100	2535	19.86	20.50	1.159	0.04	1.300	1.506
	LTE Band 7	20M	QPSK	50	0	Back	0mm	1	21100	2535	18.75	19.50	1.189	-0.03	1.120	1.331
	LTE Band 7	20M	QPSK	1	0	Bottom Side	0mm	1	21100	2535	19.86	20.50	1.159	0.02	0.817	0.947
	LTE Band 7	20M	QPSK	50	0	Bottom Side	0mm	1	21100	2535	18.75	19.50	1.189	0.02	0.714	0.849

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Sample	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)
35	LTE Band 41	20M	QPSK	1	0	Back	0mm	1	40670	2598	21.29	21.50	1.050	62.9	1.006	0.01	1.350	1.425
	LTE Band 41	20M	QPSK	50	0	Back	0mm	1	40670	2598	20.18	20.50	1.076	62.9	1.006	0.05	1.245	1.348
	LTE Band 41	20M	QPSK	1	0	Bottom Side	0mm	1	40670	2598	21.29	21.50	1.050	62.9	1.006	0.03	1.010	1.066
	LTE Band 41	20M	QPSK	50	0	Bottom Side	0mm	1	40670	2598	20.18	20.50	1.076	62.9	1.006	0.09	0.836	0.905
	LTE Band 41	20M	QPSK	1	0	Back	0mm	2	40670	2598	21.29	21.50	1.050	62.9	1.006	0.01	1.110	1.172

14.5 Repeated SAR Measurement

<1g>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	GSM 850	-	-	-	-	GPRS 4 Tx slot	Back	5mm	251	848.8	29.26	30.00	1.186		1.000	-0.12	0.821	1	0.974
2nd	GSM 850	-	-	-	-	GPRS 4 Tx slot	Back	5mm	251	848.8	29.26	30.00	1.186		1.000	-0.03	0.803	1.022	0.952
1st	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	9400	1880	18.35	19.50	1.303		1.000	0.04	1.050	1	1.368
2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	9400	1880	18.35	19.50	1.303		1.000	-0.02	0.983	1.068	1.281
1st	LTE Band 41	20M	QPSK	1	0		Back	5mm	40670	2598	21.29	21.50	1.050	62.9	1.006	0.08	1.160	1	1.225
2nd	LTE Band 41	20M	QPSK	1	0		Back	5mm	40670	2598	21.29	21.50	1.050	62.9	1.006	0.03	1.080	1.074	1.140

<10g>

No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Ratio	Reported 10g SAR (W/kg)
1st	GSM 1900	GPRS 4 Tx slot	Bottom Side	0mm	512	1850.2	24.82	26.00	1.312	-0.07	2.020	1	2.651
2nd	GSM 1900	GPRS 4 Tx slot	Bottom Side	0mm	512	1850.2	24.82	26.00	1.312	-0.04	1.910	1.058	2.506

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.

15. Simultaneous Transmission Analysis

No.	Simultaneous Transmission Configurations	Portable Handset			
		Head	Body-worn	Hotspot	Product specific 10g SAR
1.	GSM Voice + WLAN2.4GHz	Yes	Yes		Yes
2.	GPRS/EDGE + WLAN2.4GHz	Yes	Yes	Yes	Yes
3.	WCDMA + WLAN2.4GHz	Yes	Yes	Yes	Yes
4.	LTE + WLAN2.4GHz	Yes	Yes	Yes	Yes
5.	GSM Voice + Bluetooth	Yes	Yes		Yes
6.	GPRS/EDGE + Bluetooth	Yes	Yes	Yes	Yes
7.	WCDMA + Bluetooth	Yes	Yes	Yes	Yes
8.	LTE + 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. WLAN 2.4GHz and Bluetooth share the same antenna so can't transmit simultaneously.
5. Chose the worst zoom scan SAR of WLAN correspondingly for co-located with WWAN analysis.
6. The reported SAR summation is calculated based on the same configuration and test position.
7. 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 15.4.

15.1 Head Exposure Conditions

WWAN Band		Exposure Position	1	2	3	1+2	1+3
			WWAN	2.4GHz WLAN	Bluetooth	Summed	Summed
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
GSM	GSM 850	Right Cheek	0.178	0.265	0.023	0.44	0.20
		Right Tilted	0.109	0.332	0.023	0.44	0.13
		Left Cheek	0.245	0.568	0.023	0.81	0.27
		Left Tilted	0.117	0.686	0.023	0.80	0.14
	GSM 1900	Right Cheek	0.143	0.265	0.023	0.41	0.17
		Right Tilted	0.093	0.332	0.023	0.43	0.12
		Left Cheek	0.169	0.568	0.023	0.74	0.19
		Left Tilted	0.113	0.686	0.023	0.80	0.14
WCDMA	WCDMA II	Right Cheek	0.164	0.265	0.023	0.43	0.19
		Right Tilted	0.109	0.332	0.023	0.44	0.13
		Left Cheek	0.228	0.568	0.023	0.80	0.25
		Left Tilted	0.116	0.686	0.023	0.80	0.14
	WCDMA V	Right Cheek	0.186	0.265	0.023	0.45	0.21
		Right Tilted	0.123	0.332	0.023	0.46	0.15
		Left Cheek	0.273	0.568	0.023	0.84	0.30
		Left Tilted	0.138	0.686	0.023	0.82	0.16
LTE	LTE Band 2	Right Cheek	0.211	0.265	0.023	0.48	0.23
		Right Tilted	0.226	0.332	0.023	0.56	0.25
		Left Cheek	0.208	0.568	0.023	0.78	0.23
		Left Tilted	0.148	0.686	0.023	0.83	0.17
	LTE Band 7	Right Cheek	0.142	0.265	0.023	0.41	0.17
		Right Tilted	0.102	0.332	0.023	0.43	0.13
		Left Cheek	0.086	0.568	0.023	0.65	0.11
		Left Tilted	0.072	0.686	0.023	0.76	0.10
	LTE Band 26	Right Cheek	0.110	0.265	0.023	0.38	0.13
		Right Tilted	0.089	0.332	0.023	0.42	0.11
		Left Cheek	0.132	0.568	0.023	0.70	0.16
		Left Tilted	0.083	0.686	0.023	0.77	0.11
	LTE Band 41	Right Cheek	0.074	0.265	0.023	0.34	0.10
		Right Tilted	0.069	0.332	0.023	0.40	0.09
		Left Cheek	0.036	0.568	0.023	0.60	0.06
		Left Tilted	0.039	0.686	0.023	0.73	0.06

15.2 Hotspot Exposure Conditions

WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN 1g SAR (W/kg)	3 Bluetooth 1g SAR (W/kg)	1+2 Summed 1g SAR (W/kg)	Case No	SPLSR	1+3 Summed 1g SAR (W/kg)
GSM	GSM 850	Front	0.362	0.308	0.013	0.67			0.38
		Back	0.974	0.738	0.013	**1.71**	**#01**	**0.01**	0.99
		Left side	0.232	0.033	0.013	0.27			0.25
		Right side	0.185	0.011	0.013	0.20			0.20
		Top side		0.600	0.013	0.60			0.01
		Bottom side	0.228		0.013	0.23			0.24
	GSM 1900	Front	0.782	0.308	0.013	1.09			0.80
		Back	1.338	0.738	0.013	**2.08**	**#02**	**0.02**	1.35
		Left side	0.215	0.033	0.013	0.25			0.23
		Right side	0.186	0.011	0.013	0.20			0.20
		Top side		0.600	0.013	0.60			0.01
		Bottom side	1.286		0.013	1.29			1.30
WCDMA	WCDMA II	Front	0.735	0.308	0.013	1.04			0.75
		Back	1.171	0.738	0.013	**1.91**	**#03**	**0.02**	1.18
		Left side	0.192	0.033	0.013	0.23			0.21
		Right side	0.128	0.011	0.013	0.14			0.14
		Top side		0.600	0.013	0.60			0.01
		Bottom side	1.368		0.013	1.37			**1.38**
	WCDMA V	Front	0.409	0.308	0.013	0.72			0.42
		Back	0.634	0.738	0.013	**1.37**			0.65
		Left side	0.223	0.033	0.013	0.26			0.24
		Right side	0.149	0.011	0.013	0.16			0.16
		Top side		0.600	0.013	0.60			0.01
		Bottom side	0.339		0.013	0.34			0.35
LTE	LTE Band 2	Front	0.480	0.308	0.013	0.79			0.49
		Back	1.007	0.738	0.013	**1.75**	**#04**	**0.01**	1.02
		Left side	0.142	0.033	0.013	0.18			0.16
		Right side	0.142	0.011	0.013	0.15			0.16
		Top side		0.600	0.013	0.60			0.01
		Bottom side	1.042		0.013	1.04			1.06
	LTE Band 7	Front	0.360	0.308	0.013	0.67			0.37
		Back	1.101	0.738	0.013	**1.84**	**#05**	**0.02**	1.11
		Left side	0.039	0.033	0.013	0.07			0.05
		Right side	0.107	0.011	0.013	0.12			0.12
		Top side		0.600	0.013	0.60			0.01
		Bottom side	1.087		0.013	1.09			1.10
	LTE Band 26	Front	0.322	0.308	0.013	0.63			0.34
		Back	0.608	0.738	0.013	1.35			0.62
		Left side	0.252	0.033	0.013	0.29			0.27
		Right side	0.203	0.011	0.013	0.21			0.22
		Top side		0.600	0.013	0.60			0.01
		Bottom side	0.219		0.013	0.22			0.23
	LTE Band 41	Front	0.396	0.308	0.013	0.70			0.41
		Back	1.225	0.738	0.013	**1.96**	**#06**	**0.02**	1.24
		Left side	0.043	0.033	0.013	0.08			0.06
		Right side	0.146	0.011	0.013	0.16			0.16
		Top side		0.600	0.013	0.60			0.01
		Bottom side	0.914		0.013	0.91			0.93

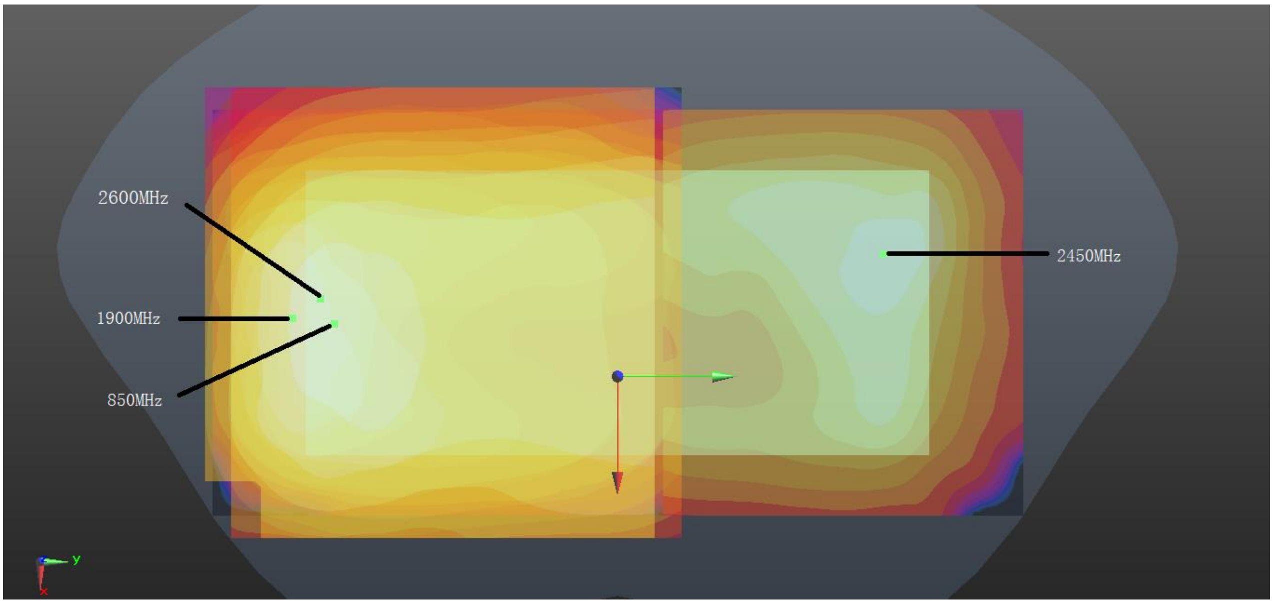
15.3 Body-Worn Accessory Exposure Conditions

WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN 1g SAR (W/kg)	3 Bluetooth 1g SAR (W/kg)	1+2 Summed 1g SAR (W/kg)	Case No	SPLSR	1+3 Summed 1g SAR (W/kg)
GSM	GSM 850	Front	0.362	0.308	0.013	0.67			0.38
		Back	0.974	0.738	0.013	**1.71**	**#01**	**0.01**	0.99
	GSM 1900	Front	0.782	0.308	0.013	1.09			0.80
		Back	1.338	0.738	0.013	**2.08**	**#02**	**0.02**	1.35
		Back with Headset	1.195			1.20			1.20
WCDMA	WCDMA II	Front	0.735	0.308	0.013	1.04			0.75
		Back	1.171	0.738	0.013	**1.91**	**#03**	**0.02**	1.18
	WCDMA V	Front	0.409	0.308	0.013	0.72			0.42
		Back	0.634	0.738	0.013	1.37			0.65
LTE	LTE Band 2	Front	0.480	0.308	0.013	0.79			0.49
		Back	1.007	0.738	0.013	**1.75**	**#04**	**0.01**	1.02
	LTE Band 7	Front	0.360	0.308	0.013	0.67			0.37
		Back	1.101	0.738	0.013	**1.84**	**#05**	**0.02**	1.11
	LTE Band 26	Front	0.322	0.308	0.013	0.63			0.34
		Back	0.608	0.738	0.013	1.35			0.62
	LTE Band 41	Front	0.396	0.308	0.013	0.70			0.41
		Back	1.225	0.738	0.013	**1.96**	**#06**	**0.02**	1.24
		Back with Headset	1.010			1.01			1.01

15.4 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.



Back for WWAN+WLAN2.4GHz_5mm

Case 01	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	GSM 850	Back	0.974	5mm	3	-80.3	-1.66	154.2	1.71	0.01	Not required
	WLAN2.4GHz		0.738	5mm	-15.6	72.8	-1.96				

Case 02	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	GSM 1900	Back	1.338	5mm	1.5	-86.5	-1.61	160.2	2.08	0.02	Not required
	WLAN2.4GHz		0.738	5mm	-15.6	72.8	-1.96				

Case 03	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	WCDMA II	Back	1.171	5mm	1.5	-85.4	-1.57	159.1	1.91	0.02	Not required
	WLAN2.4GHz		0.738	5mm	-15.6	72.8	-1.96				

Case 04	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 2	Back	1.007	5mm	-6	-86.9	-1.88	160.0	1.75	0.01	Not required
	WLAN2.4GHz		0.738	5mm	-15.6	72.8	-1.96				

Case 05	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 7	Back	1.101	5mm	-7.6	-78.2	-1.76	151.2	1.84	0.02	Not required
	WLAN2.4GHz		0.738	5mm	-15.6	72.8	-1.96				

Case 06	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 41	Back	1.225	5mm	13.8	-82.2	-1.5	157.8	1.96	0.02	Not required
	WLAN2.4GHz		0.738	5mm	-15.6	72.8	-1.96				

Test Engineer : Nick Hu, John Liu, Hank Chang, Yuankai Kong

16. Uncertainty Assessment

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

17. References

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

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

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

[4] SPEAG DASY System Handbook

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

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

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

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

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

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

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

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

------THE END------

Appendix A. Plots of System Performance Check

The plots are shown as follows.

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2020.12.8

System Check_Head_835MHz

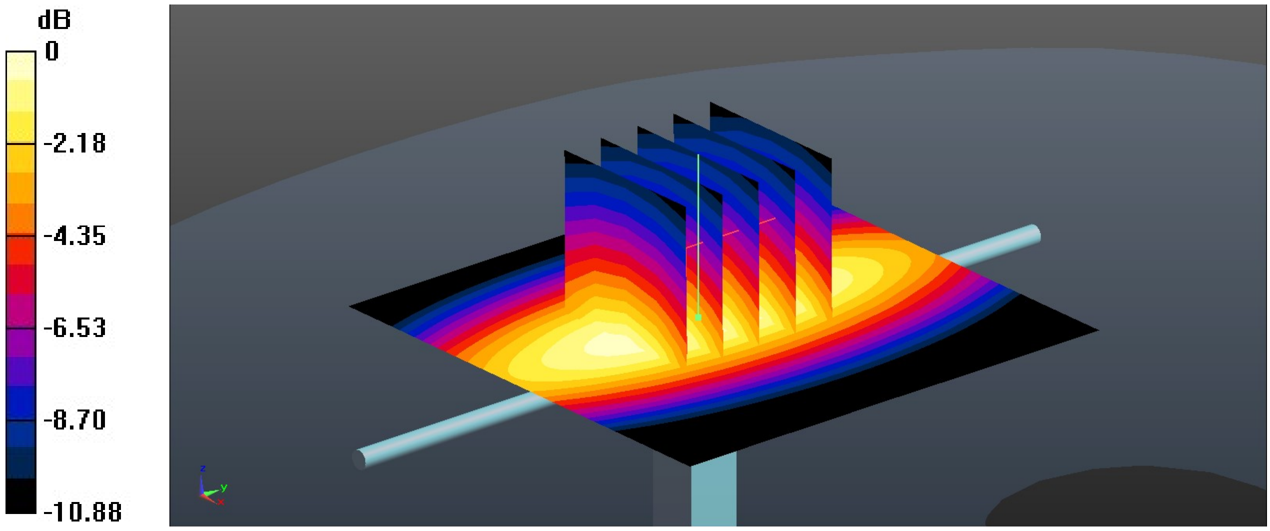
DUT: D835V2 - SN:4d151

Communication System: UID 0, CW (0); Frequency: 835 MHz;Duty Cycle: 1:1
Medium: HSL_835 Medium parameters used: f = 835 MHz; σ = 0.915 S/m; ε_r = 41.263; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(8.69, 8.69, 8.69); Calibrated: 2020.9.23
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2020.11.27
- Phantom: SAM1; Type: SAM; Serial: TP-1753
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.86 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 50.89 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 3.41 W/kg
SAR(1 g) = 2.25 W/kg; SAR(10 g) = 1.46 W/kg
Maximum value of SAR (measured) = 2.87 W/kg



0 dB = 2.87 W/kg = 4.58 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2020.12.12

System Check_Head_1900MHz

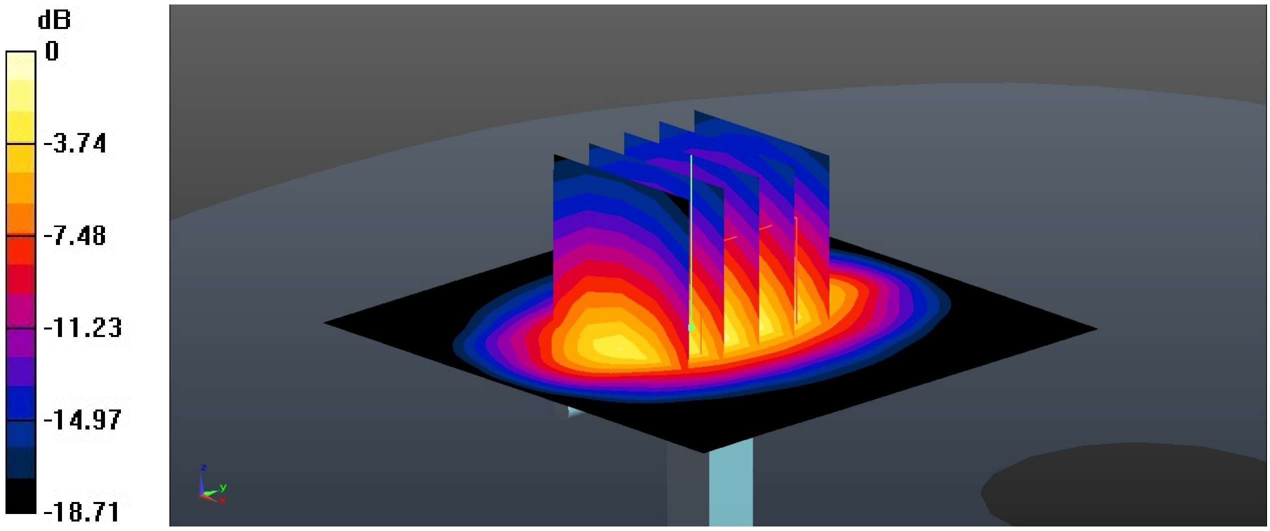
DUT: D1900V2 - SN:5d170

Communication System: UID 0, CW (0); Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: HSL_1900 Medium parameters used: f = 1900 MHz; σ = 1.401 S/m; ε_r = 40.146; ρ = 1000 kg/m^3
Ambient Temperature：23.1 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(7.41, 7.41, 7.41); Calibrated: 2020.9.23
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2020.11.27
- Phantom: SAM1; Type: SAM; Serial: TP-1753
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 12.9 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 97.69 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 18.9 W/kg
SAR(1 g) = 10.1 W/kg; SAR(10 g) = 5.24 W/kg
Maximum value of SAR (measured) = 12.8 W/kg



0 dB = 12.8 W/kg = 11.07 dBW/kg

System Check_Head_2450MHz

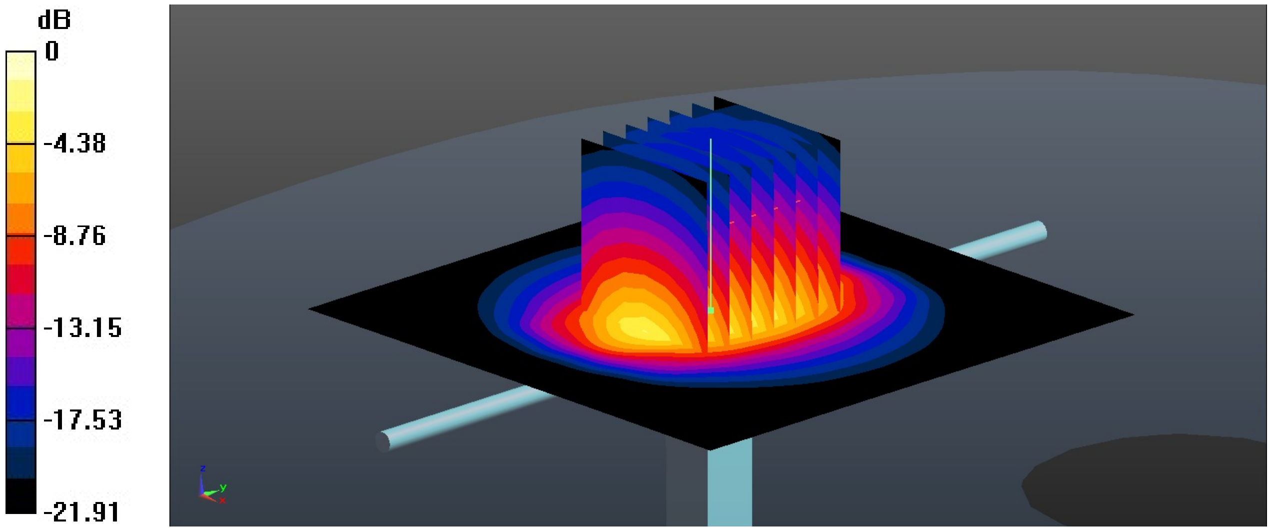
DUT: D2450V2 - SN:908

Communication System: UID 0, CW (0); Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: HSL_2450 Medium parameters used: f = 2450 MHz; σ = 1.863 S/m; ε_r = 38.595; ρ = 1000 kg/m^3
Ambient Temperature：23.3 °C; Liquid Temperature：22.9 °C

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(6.85, 6.85, 6.85); Calibrated: 2020.9.23
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2020.11.27
- Phantom: SAM1; Type: SAM; Serial: TP-1753
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=250mW/Area Scan (81x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 19.2 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 87.48 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 25.9 W/kg
SAR(1 g) = 12.5 W/kg; SAR(10 g) = 5.82 W/kg
Maximum value of SAR (measured) = 19.2 W/kg



0 dB = 19.2 W/kg = 12.83 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab   Date: 2020.12.16

System Check_Head_2600MHz

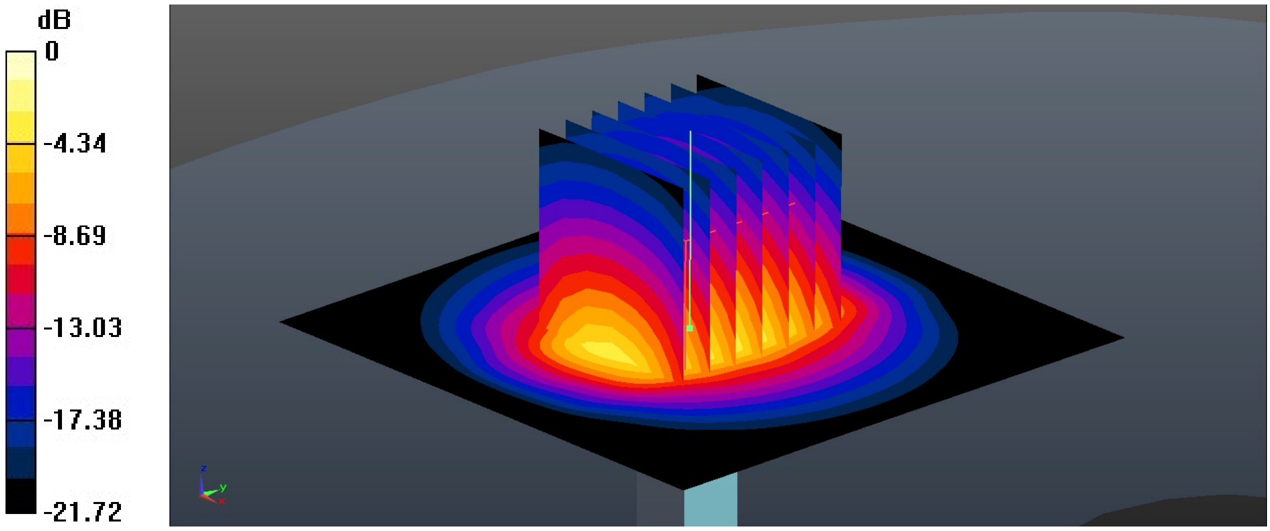
DUT: D2600V2 - SN:1061

Communication System: UID 0, CW (0); Frequency: 2600 MHz;Duty Cycle: 1:1
Medium: HSL_2600 Medium parameters used: f = 2600 MHz; σ = 1.934 S/m; ε_r = 40.117; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(6.76, 6.76, 6.76); Calibrated: 2020.9.23
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2020.11.27
- Phantom: SAM1; Type: SAM; Serial: TP-1753
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=250mW/Area Scan (71x71x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 23.5 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 93.98 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 31.4 W/kg
SAR(1 g) = 15.1 W/kg; SAR(10 g) = 6.79 W/kg
Maximum value of SAR (measured) = 23.5 W/kg



0 dB = 23.5 W/kg = 13.71 dBW/kg

Appendix B. Plots of High SAR Measurement

The plots are shown as follows.

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2020.12.8

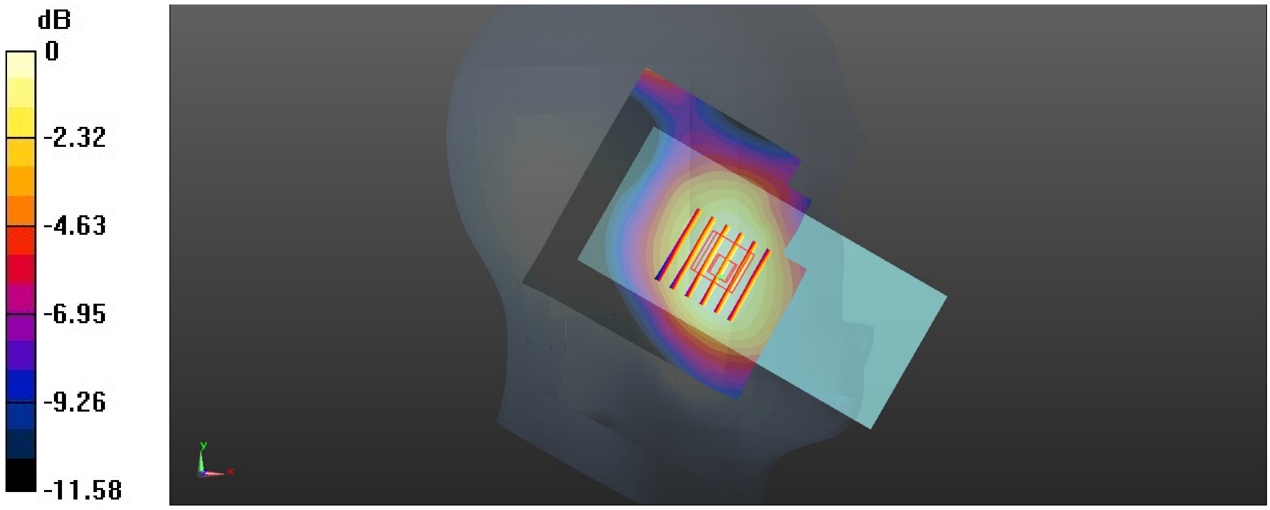
01_GSM850_GPRS 4Tx slots_Left Cheek_0mm_Ch189

Communication System: UID 0, GSM 4Tx slots (0); Frequency: 836.4 MHz;Duty Cycle: 1:2.08
Medium: HSL_835 Medium parameters used: f = 836.4 MHz; σ = 0.928 S/m; ε_r = 41.081; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(8.69, 8.69, 8.69); Calibrated: 2020.9.23
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2020.11.27
- Phantom: SAM1; Type: SAM; Serial: TP-1753
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (81x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.251 W/kg

Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.571 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.265 W/kg
SAR(1 g) = 0.211 W/kg; SAR(10 g) = 0.164 W/kg
Maximum value of SAR (measured) = 0.246 W/kg



0 dB = 0.246 W/kg = -6.09 dBW/kg

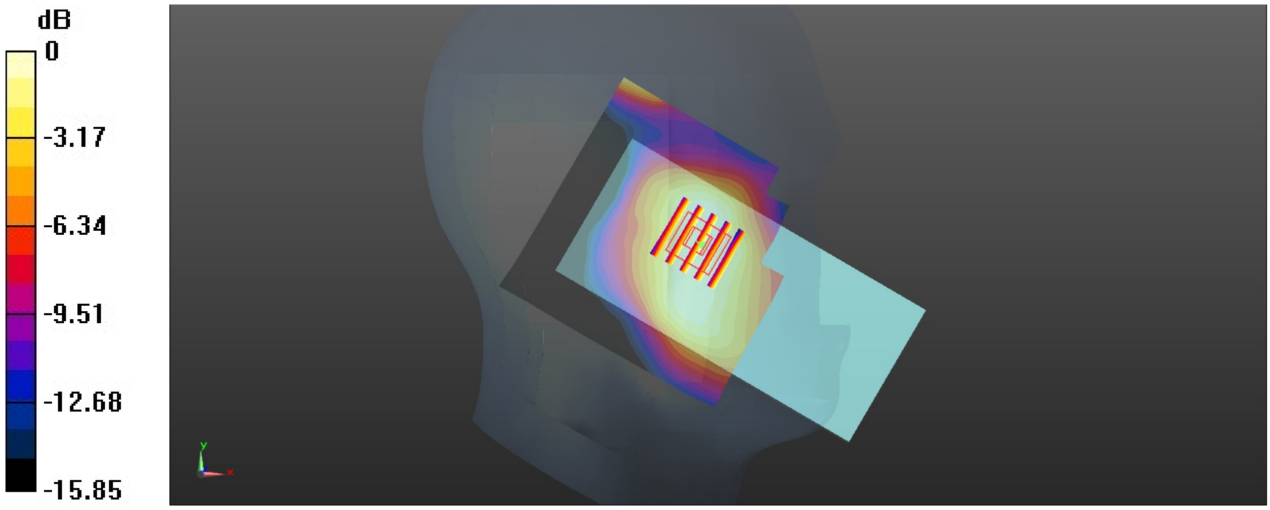
02_GSM1900_GPRS 4Tx slots_Left Cheek_0mm_Ch661

Communication System: UID 0, GSM 4Tx slots (0); Frequency: 1880 MHz;Duty Cycle: 1:2.08
Medium: HSL_1900 Medium parameters used: f = 1880 MHz; σ = 1.38 S/m; ε_r = 40.24; ρ = 1000 kg/m^3
Ambient Temperature：23.1 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(7.41, 7.41, 7.41); Calibrated: 2020.9.23
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2020.11.27
- Phantom: SAM1; Type: SAM; Serial: TP-1753
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (81x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.177 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.661 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.202 W/kg
SAR(1 g) = 0.132 W/kg; SAR(10 g) = 0.089 W/kg
Maximum value of SAR (measured) = 0.174 W/kg



0 dB = 0.174 W/kg = -7.59 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2020.12.12

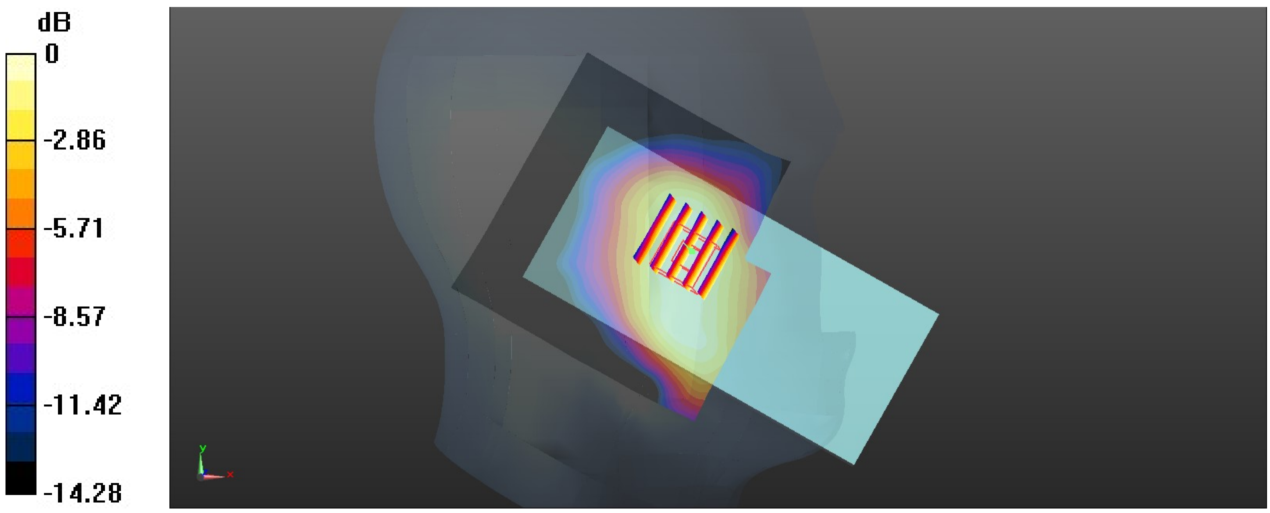
03_WCDMA II_RMC 12.2Kbps_Left Cheek_0mm_Ch9400

Communication System: UID 0, WCDMA (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: HSL_1900 Medium parameters used: f = 1880 MHz; σ = 1.38 S/m; ε_r = 40.24; ρ = 1000 kg/m^3
Ambient Temperature：23.1 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(7.41, 7.41, 7.41); Calibrated: 2020.9.23
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2020.11.27
- Phantom: SAM1; Type: SAM; Serial: TP-1753
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (81x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.290 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.067 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.298 W/kg
SAR(1 g) = 0.196 W/kg; SAR(10 g) = 0.133 W/kg
Maximum value of SAR (measured) = 0.260 W/kg



0 dB = 0.260 W/kg = -5.85 dBW/kg

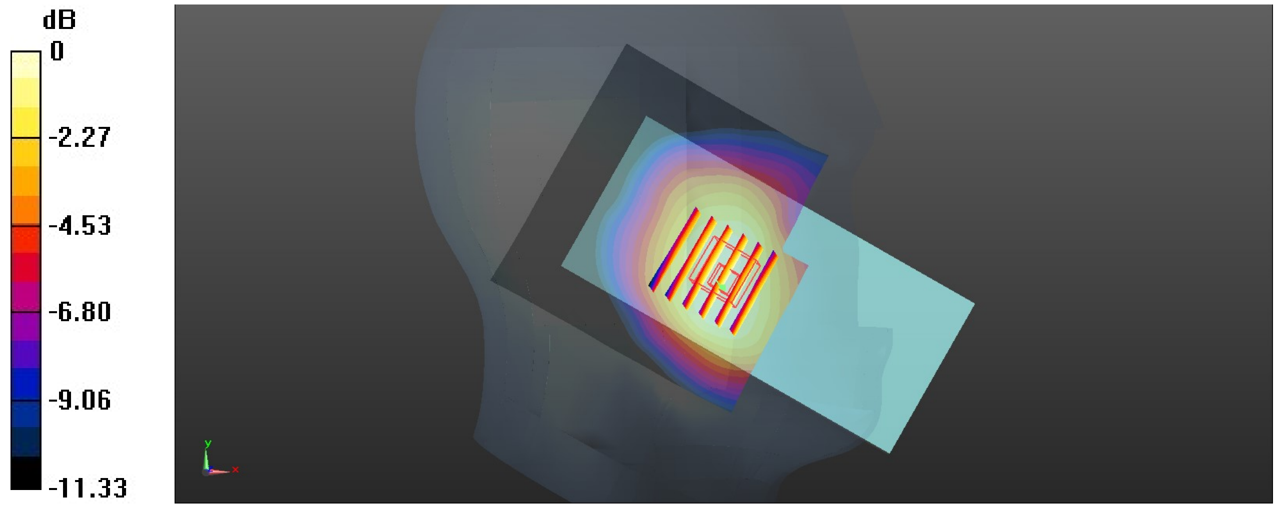
04_WCDMA V_RMC 12.2Kbps_Left Cheek_0mm_Ch4182

Communication System: UID 0, WCDMA (0); Frequency: 836.4 MHz;Duty Cycle: 1:1
Medium: HSL_850 Medium parameters used: f = 836.4 MHz; σ = 0.916 S/m; ε_r = 41.246; ρ = 1000 kg/m^3
Ambient Temperature：23.3 °C; Liquid Temperature：22.7 °C

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(8.69, 8.69, 8.69); Calibrated: 2020.9.23
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2020.11.27
- Phantom: SAM1; Type: SAM; Serial: TP-1753
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (81x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.244 W/kg

Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.765 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 0.259 W/kg
SAR(1 g) = 0.207 W/kg; SAR(10 g) = 0.160 W/kg
Maximum value of SAR (measured) = 0.242 W/kg



0 dB = 0.242 W/kg = -6.16 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab   Date: 2020.12.12

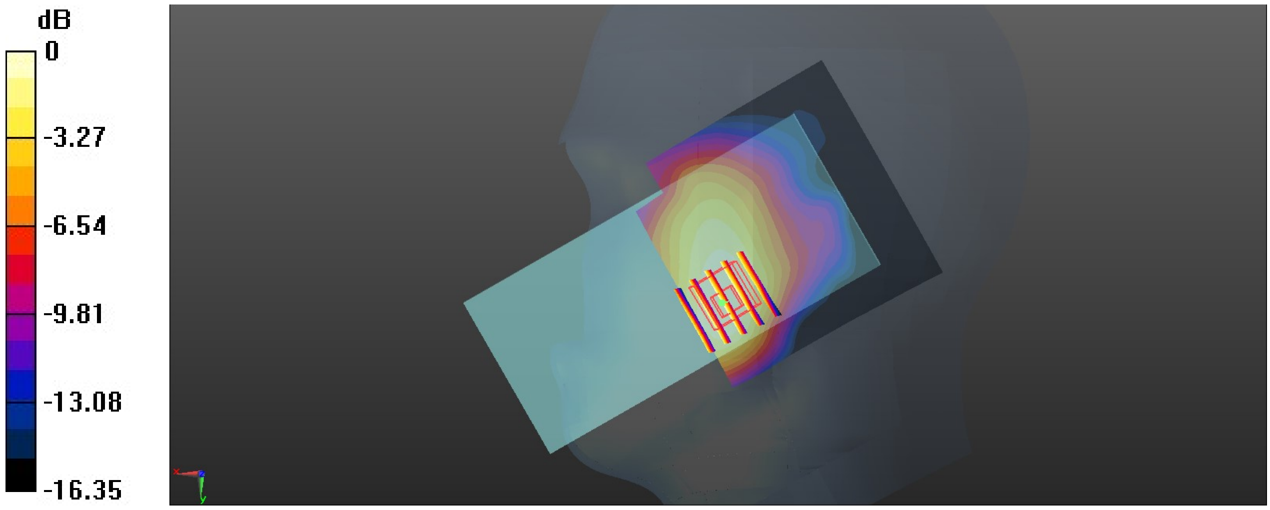
05_LTE Band 2_20M_QPSK_1RB_0Offset_Right Tilted_0mm_Ch18900

Communication System: UID 0, LTE FDD (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: HSL_1900 Medium parameters used: f = 1880 MHz; σ = 1.38 S/m; ε_r = 40.24; ρ = 1000 kg/m^3
Ambient Temperature：23.1 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(7.41, 7.41, 7.41); Calibrated: 2020.9.23
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2020.11.27
- Phantom: SAM1; Type: SAM; Serial: TP-1753
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (71x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.274 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.092 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 0.297 W/kg
SAR(1 g) = 0.197 W/kg; SAR(10 g) = 0.127 W/kg
Maximum value of SAR (measured) = 0.254 W/kg



0 dB = 0.254 W/kg = -5.95 dBW/kg