FCC SAR Test Report

APPLICANT	**:**	**Motorola Mobility LLC**
EQUIPMENT	**:**	**Mobile Cellular Phone**
BRAND NAME	**:**	**Motorola**
MODEL NAME	**:**	**XT2231-2**
FCC ID	**:**	**IHDT56AC3**
STANDARD	**:**	**FCC 47 CFR Part 2 (2.1093)**

We, Sporton International Inc. (Shenzhen), would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

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

Hank Huang

Reviewed by: Hank Huang / Supervisor

Johnny Chen

Approved by: Johnny Chen / Manager

ilac-MRA ACCREDITED Cert #5145.01

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People's Republic of China

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA1N1011-06	Rev. 01	Initial issue of report.	Feb. 07, 2022

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **Motorola Mobility LLC, Mobile Cellular Phone, XT2231-2 ,** are as follows.

Highest 1g SAR Summary						
Equipment Class	Frequency Band		Head (Separation 0mm) 1g SAR (W/kg)	Hotspot (Separation 5mm) 1g SAR (W/kg)	Body-worn (Separation 5mm) 1g SAR (W/kg)	Highest Simultaneous Transmission 1g SAR (W/kg)
Licensed	GSM	GSM850	0.45	1.26	1.26	1.49
		GSM1900	0.35	**1.41**	1.32	
	WCDMA	Band V	0.44	1.24	1.24	
		Band II	0.50	**1.41**	1.27	
	LTE	Band 5	0.44	1.25	1.25	
		Band 7	0.11	1.38	1.29	
		Band 41/Band 38	<0.10	1.38	**1.38**	
DTS	WLAN	2.4GHz WLAN	0.58	0.42	0.42	1.41
NII		5GHz WLAN	**0.64**	0.67	0.37	1.41
DSS	Bluetooth	2.4GHz Bluetooth	<0.10	0.12	0.12	1.49

Highest 10g SAR Summary				
Equipment Class	Frequency Band		Product Specific 10g SAR (W/kg) (Separation 0mm)	Highest Simultaneous Transmission 10g SAR (W/kg)
License	GSM	GSM850	2.50	3.87
		GSM1900	**3.47**	
	WCDMA	Band V	1.88	
		Band II	3.28	
	LTE	Band 5	1.86	
		Band 7	2.85	
		Band 41/Band 38	3.07	
NII	WLAN	5GHz WLAN	1.72	3.87
Date of Testing:			2022/1/10 ~ 2022/1/23	

Remark: This device supports both LTE B38 and B41. Since the supported frequency span for LTE B38 falls completely within the supports frequency span for LTE 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 B41.

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

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

2. Administration Data

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

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

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

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

3. Guidance Applied

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

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

4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT2231-2
FCC ID	IHDT56AC3
IMEI Code	Sample 1: IMEI 1: 359986690064404 IMEI 2: 359986690071003 Sample 2: IMEI 1: 356965730037466 IMEI 2: 356965730038266
Wireless Technology and Frequency Range	GSM850: 824 MHz ~ 849 MHz GSM1900: 1850 MHz ~ 1910 MHz WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2535 MHz ~ 2655 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5720 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz NFC: 13.56 MHz
Mode	GSM/GPRS/EGPRS RMC/AMR 12.2Kbps HSDPA/HSUPA DC-HSDPA HSPA+ (16QAM uplink is not supported) LTE: QPSK, 16QAM, 64QAM WLAN 2.4GHz 802.11b/g/n HT20 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE NFC: ASK
HW Version	PVT2
SW Version	STA32.48
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 5.2GHz WLAN/5.8GHz WLAN support hotspot operation, and 5.2GHz WLAN/5.8GHz WLAN supports WiFi Direct (GC/GO), and 5.3GHz / 5.5GHz supports WiFi Direct (GC only).
5. This device does not support DTM operation and supports GPRS/EGPRS mode up to multi-slot class 12.
6. The device implements the power management and proximity sensor /receiver detection/hotspot mode for SAR compliance at different exposure conditions (head, body-worn, hotspot, extremity) and the details about the power management decision and sensor detection are provided in the operational description. And the device will invoke corresponding work scenarios power level base on frequency bands/antennas, which can refer to power table at appendix E, WWAN power refer to Original Project.

7. There are two different types of EUT. They are single SIM card mobile and dual SIM card mobile. The others are the same including circuit design, PCB board, structure and all components. It is special to declare. After pre-scan two types of EUT, we found test result of the sample that dual SIM was the worst, so we chose dual SIM card mobile to perform all tests.
8. For dual SIM card mobile has two SIM slots and supports dual SIM dual standby. The WWAN radio transmission will be enabled by either one SIM at a time (single active). After pre-scan two SIM cards power, we found test result of the SIM1 was the worse, so we chose SIM1 slot to perform all tests.
9. For some WWAN bands, sensor on reduced power level is higher than hotspot reduced power level, so front/back sensor on SAR can represent hotspot conservatively.
10. The device has three headsets. For three headsets only suppliers are different. So we chose headset 1 to perform full SAR testing only.
11. This device has two batteries. For battery 1 was in sample 1, and battery 2 was in sample 2. They were all evaluated for SAR testing conservatively.
12. This is a variant report for XT2231-2 . For model change note, please refer to the XT2231-2 _Operational Description of Product Equality Declaration which is exhibited separately. According to the change, WLAN2.4 GHz and WLAN5.2/5.3/5.5/5.8 GHz full SAR testing and performed new measured power. And the other Bands were verified worse cases from original test report (Sporton Report Number FA1N1011-01).

4.2 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05	
FCC ID	IHDT56AC3
Equipment Name	Mobile Cellular Phone
Operating Frequency Range of each LTE transmission band	LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2535 MHz ~ 2655 MHz
Channel Bandwidth	LTE Band 5:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 7: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 38: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 41: 5MHz, 10MHz, 15MHz, 20MHz
uplink modulations used	QPSK / 16QAM / 64QAM
LTE Voice / Data requirements	Voice and Data
LTE Release Version	R11, Cat4
CA Support	Not Supported
LTE MPR permanently built-in by design	Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3

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

LTE A-MPR	In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)
Spectrum plots for RB configuration	A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.
Power reduction applied to satisfy SAR compliance	Yes, when operating in Proximity sensors/receiver/hotspot detect mechanism, head/body-worn/hotspot/extremity will trigger reduced power for some WWAN bands applied to satisfy SAR compliance, the detail please referred to section 13.

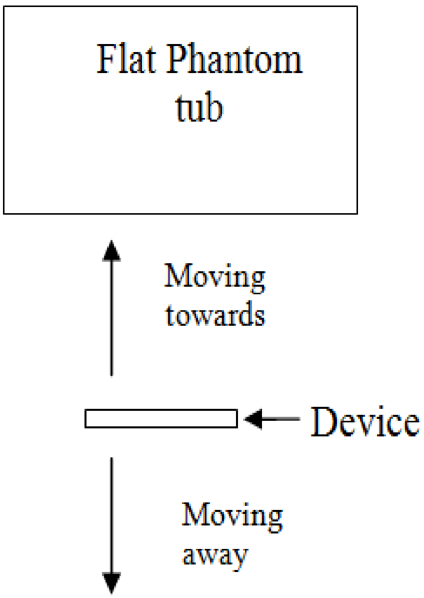
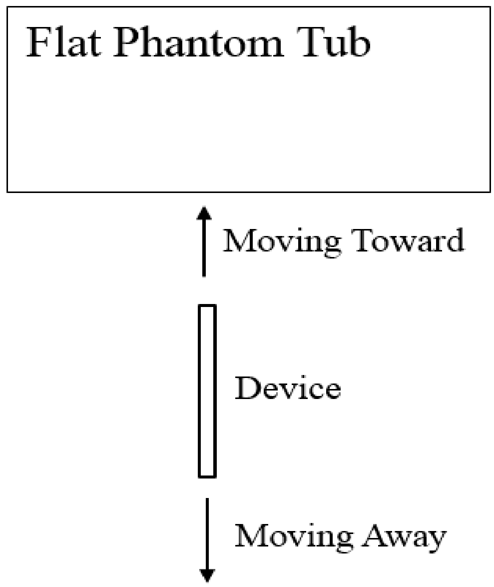
Transmission (H, M, L) channel numbers and frequencies in each LTE band								
LTE Band 5								
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20407	824.7	20415	825.5	20425	826.5	20450	829
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5
H	20643	848.3	20635	847.5	20625	846.5	20600	844
LTE Band 7								
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20775	2502.5	20800	2505	20825	2507.5	20850	2510
M	21100	2535	21100	2535	21100	2535	21100	2535
H	21425	2567.5	21400	2565	21375	2562.5	21350	2560

LTE Band 38								
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	37775	2572.5	37800	2575	37825	2577.5	37850	2580
M	38000	2595	38000	2595	38000	2595	38000	2595
H	38225	2617.5	38200	2615	38175	2612.5	38150	2610
LTE Band 41								
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	40065	2537.5	40090	2540	40115	2542.5	40140	2545
LM	40385	2569.5	40390	2570	40395	2570.5	40400	2571
HM	40705	2601.5	40690	2600	40685	2599.5	40670	2598
H	41215	2652.5	41190	2650	41165	2647.5	41140	2645

5. Proximity Sensor Triggering Test

<Proximity Sensor Triggering Distance>:

1. Proximity sensor triggering distance testing was performed according to the procedures outlined in KDB 616217 D04 section 6.2, and EUT moving further away from the flat phantom and EUT moving toward the flat phantom were both assessed and the tissue-equivalent medium for highest frequency (5850MHz) and lowest (835MHz) frequency was used for proximity sensor triggering testing.
2. Capacitive proximity sensors placed coincident with antenna elements at the top and bottom ends of the phone are utilized to determine when the device comes in proximity of the user's body at the front or back of the device. The output power will reduce to body worn power level when top and bottom sensor pad be detected.
3. The sensors used to detect the proximity of the user's body at the front or back surface of the device use a detection threshold distance. The data shown in the sections below shows the distance(s). When front or back body worn condition is detected reduced power will be active.
4. The device employs proximity sensors also can detect the presence of the user's a finger or hand when handheld state at the front/back /bottom side of the device. When front/back /bottom side of handheld condition is detected reduced power will be active.
5. For verification of compliance of power reduction scheme, additional SAR testing with EUT transmitting at full RF power at a conservative trigger distance -1mm was performed:

	
Sensor/Handheld detection test set-up, front and back sides	Handheld detection test set-up, bottom sides

<P-Sensor>

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

<Handheld for ANT1>

Proximity Sensor Triggering Distance (mm)						
Position	Front		Back		Bottom Side	
	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away
Minimum	5	5	8	8	14	14

6. RF Exposure Limits

6.1 Uncontrolled Environment

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

6.2 Controlled Environment

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

Limits for Occupational/Controlled Exposure (W/kg)

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

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

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

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

7. Specific Absorption Rate (SAR)

7.1 Introduction

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

7.2 SAR Definition

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

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

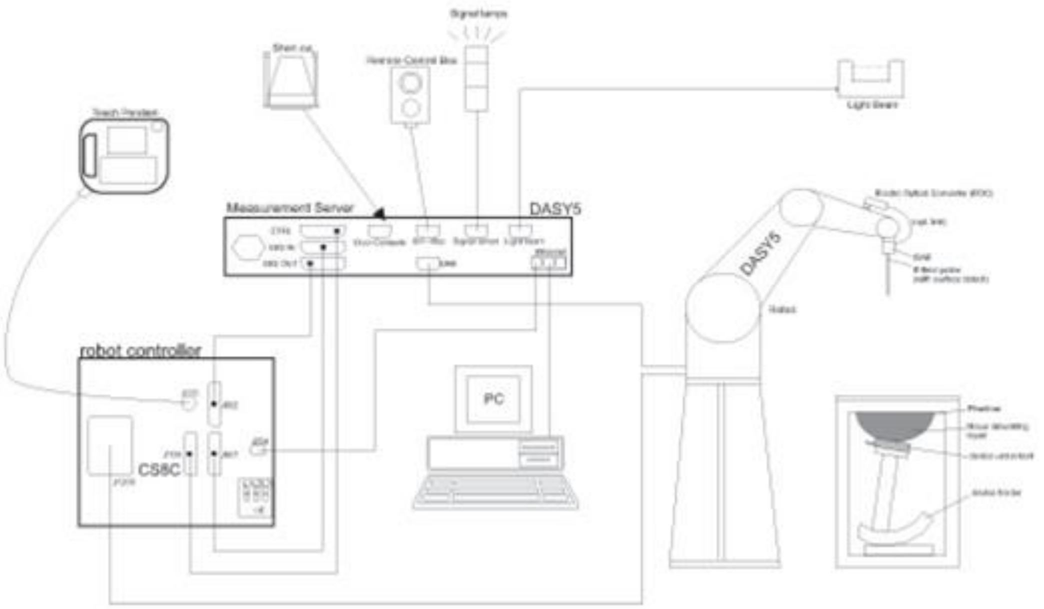
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

8. System Description and Setup

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



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

8.1 E-Field Probe

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

<EX3DV4 Probe>

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

8.2 Data Acquisition Electronics (DAE)

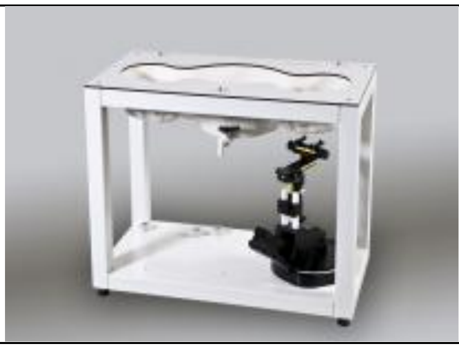
The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.
The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Photo of DAE

8.3 Phantom

<SAM Twin Phantom>

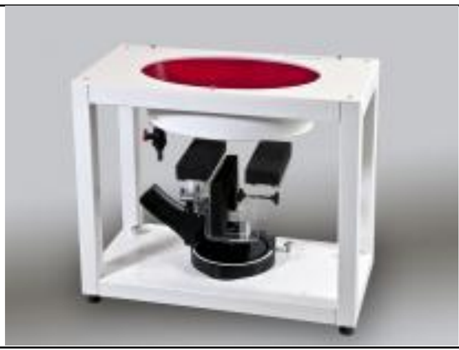
Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet
Measurement Areas	Left Hand, Right Hand, Flat Phantom



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

<ELI Phantom>

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



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

8.4 Device Holder

<Mounting Device for Hand-Held Transmitter>

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

Mounting Device for Hand-Held Transmitters

Mounting Device Adaptor for Wide-Phones

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

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

Mounting Device for Laptops

9. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

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

<SAR measurement>

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

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

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

9.1 Spatial Peak SAR Evaluation

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

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

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

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

9.2 Power Reference Measurement

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

9.3 Area Scan

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

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

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

9.4 Zoom Scan

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

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

<table>
<tr><td colspan="3"></td><td>≤ 3 GHz</td><td>> 3 GHz</td></tr>
<tr><td colspan="3">Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}</td><td>≤ 2 GHz: ≤ 8 mm
2 – 3 GHz: ≤ 5 mm*</td><td>3 – 4 GHz: ≤ 5 mm*
4 – 6 GHz: ≤ 4 mm*</td></tr>
<tr><td rowspan="3">Maximum zoom scan spatial resolution, normal to phantom surface</td><td colspan="2">uniform grid: $\Delta z_{Zoom}(n)$</td><td>≤ 5 mm</td><td>3 – 4 GHz: ≤ 4 mm
4 – 5 GHz: ≤ 3 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td rowspan="2">graded grid</td><td>$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface</td><td>≤ 4 mm</td><td>3 – 4 GHz: ≤ 3 mm
4 – 5 GHz: ≤ 2.5 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td>$\Delta z_{Zoom}(n>1)$: between subsequent points</td><td colspan="2">$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$</td></tr>
<tr><td>Minimum zoom scan volume</td><td colspan="2">x, y, z</td><td>≥ 30 mm</td><td>3 – 4 GHz: ≥ 28 mm
4 – 5 GHz: ≥ 25 mm
5 – 6 GHz: ≥ 22 mm</td></tr>
<tr><td colspan="5">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.</td></tr>
</table>

9.5 Volume Scan Procedures

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

9.6 Power Drift Monitoring

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

10. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	835MHz System Validation Kit	D835V2	4d258	2020/5/7	2023/5/6
SPEAG	1900MHz System Validation Kit	D1900V2	5d170	2019/3/26	2022/3/24
SPEAG	2450MHz System Validation Kit	D2450V2	924	2020/9/2	2023/9/1
SPEAG	2600MHz System Validation Kit	D2600V2	1061	2020/11/26	2023/11/25
SPEAG	5000MHz System Validation Kit	D5GHzV2	1113	2019/9/24	2022/9/22
SPEAG	Data Acquisition Electronics	DAE4	1664	2021/3/1	2022/2/28
SPEAG	Dosimetric E-Field Probe	EX3DV4	7641	2021/3/15	2022/3/14
SPEAG	SAM Twin Phantom	QD 000 P40 CD	1670	NCR	NCR
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio communication analyzer	MT8820C	6201300653	2021/7/14	2022/7/13
Anritsu	Radio communication analyzer	MT8821C	6262314715	2021/6/29	2022/6/28
Agilent	Wireless Communication Test Set	E5515C	MY50267224	2021/7/14	2022/7/13
Agilent	Network Analyzer	E5071C	MY46523671	2021/10/25	2022/10/24
Speag	Dielectric Assessment KIT	DAK-3.5	1138	2021/6/9	2022/6/8
Agilent	Signal Generator	N5181A	MY50145381	2021/12/28	2022/12/27
Anritsu	Power Sensor	MA2411B	1306099	2021/9/29	2022/9/28
Anritsu	Power Meter	ML2495A	1349001	2021/9/29	2022/9/28
R&S	Power Sensor	NRP50S	101254	2021/4/9	2022/4/8
R&S	Power Sensor	NRP8S	109228	2021/4/9	2022/4/8
R&S	CBT BLUETOOTH TESTER	CBT	101246	2021/4/12	2022/4/11
R&S	Spectrum Analyzer	FSP7	100818	2021/7/14	2022/7/13
TES	Hygrometer	1310	200505600	2021/7/17	2022/7/16
Anymetre	Thermo-Hygrometer	JR593	2018100801	2021/4/12	2022/4/11
SPEAG	Device Holder	N/A	N/A	N/A	N/A
AR	Amplifier	5S1G4	0333096	Note 1	
mini-circuits	Amplifier	ZVE-3W-83+	599201528	Note 1	
ARRA	Power Divider	A3200-2	N/A	Note 1	
ET Industries	Dual Directional Coupler	C-058-10	N/A	Note 1	
Weinschel	Attenuator 1	3M-10	N/A	Note 1	
Weinschel	Attenuator 2	3M-20	N/A	Note 1	

Note:

1. Prior to system verification and validation, the path loss from the signal generator to the system check source and the power meter, which includes the amplifier, cable, attenuator and directional coupler, was measured by the network analyzer. The reading of the power meter was offset by the path loss difference between the path to the power meter and the path to the system check source to monitor the actual power level fed to the system check
2. Referring to KDB 865664 D01v01r04, the dipole calibration interval can be extended to 3 years with justification. The dipoles are also not physically damaged, or repaired during the interval.
3. The justification data of dipole can be found in appendix C. The return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration.

11. System Verification

11.1 Tissue Simulating Liquids

For the measurement of the field distribution inside the SAM phantom with DASY, the phantom must be filled with around 25 liters of homogeneous body tissue simulating liquid. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 11.1. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 11.2.

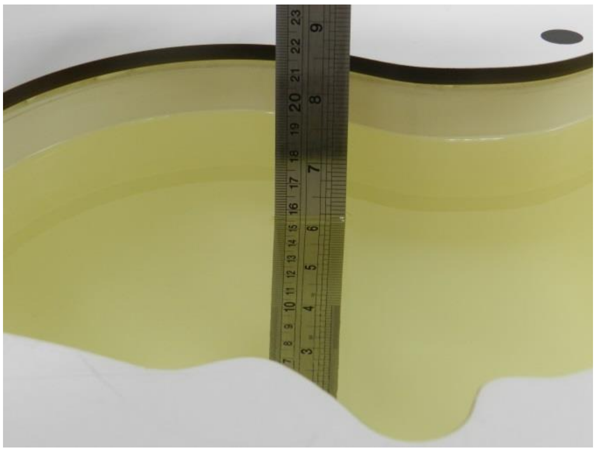


Fig 11.1 Photo of Liquid Height for Head SAR

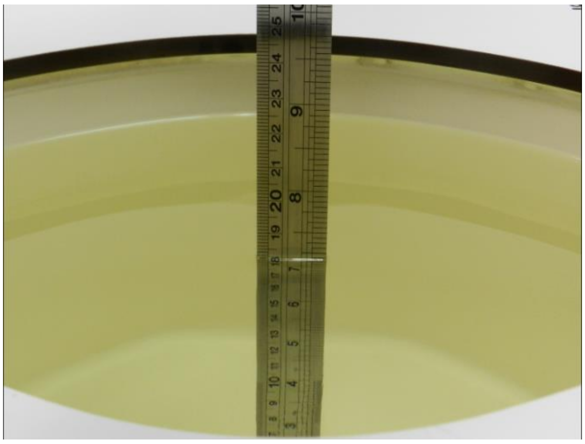


Fig 11.2 Photo of Liquid Height for Body SAR

11.2 Tissue Verification

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

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

Simulating Liquid for 5GHz, Manufactured by SPEAG

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

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Tissue Type	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
835	Head	22.6	0.916	41.029	0.90	41.50	1.78	-1.13	±5	2022/1/23
1900	Head	22.3	1.440	40.038	1.40	40.00	2.86	0.09	±5	2022/1/23
2450	Head	22.7	1.823	37.953	1.80	39.20	1.28	-3.18	±5	2022/1/10
2600	Head	22.2	1.894	40.240	1.96	39.00	-3.37	3.18	±5	2022/1/23
5250	Head	22.1	4.748	36.885	4.71	35.95	0.81	2.60	±5	2022/1/13
5600	Head	22.5	5.211	36.230	5.07	35.50	2.78	2.06	±5	2022/1/13
5750	Head	22.1	5.383	35.944	5.22	35.35	3.12	1.68	±5	2022/1/13

11.3 System Performance Check Results

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

<1g SAR>

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)
2022/1/23	835	Head	250	4d258	7641	1664	2.520	9.44	10.08	6.78
2022/1/23	1900	Head	250	5d170	7641	1664	9.940	39.00	39.76	1.95
2022/1/10	2450	Head	250	924	7641	1664	13.000	51.40	52	1.17
2022/1/23	2600	Head	250	1061	7641	1664	13.600	56.60	54.4	-3.89
2022/1/13	5250	Head	100	1113	7641	1664	8.630	80.50	86.3	7.20
2022/1/13	5600	Head	100	1113	7641	1664	9.030	83.40	90.3	8.27
2022/1/13	5750	Head	100	1113	7641	1664	8.760	80.00	87.6	9.50

<10g SAR>

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 10g SAR (W/kg)	Targeted 10g SAR (W/kg)	Normalized 10g SAR (W/kg)	Deviation (%)
2022/1/23	835	Head	250	4d258	7641	1664	1.670	6.13	6.68	8.97
2022/1/23	1900	Head	250	5d170	7641	1664	5.110	20.30	20.44	0.69
2022/1/10	2450	Head	250	924	7641	1664	6.040	24.00	24.16	0.67
2022/1/23	2600	Head	250	1061	7641	1664	6.050	25.10	24.2	-3.59
2022/1/13	5250	Head	100	1113	7641	1664	2.110	23.10	21.1	-8.66
2022/1/13	5600	Head	100	1113	7641	1664	2.610	23.80	26.1	9.66
2022/1/13	5750	Head	100	1113	7641	1664	2.420	22.80	24.2	6.14

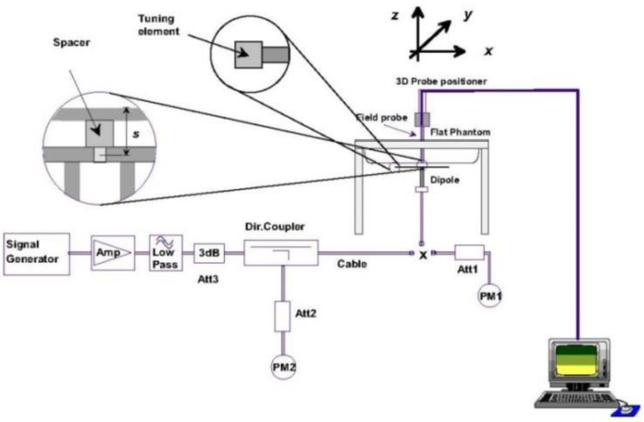


Fig 11.3.1 System Performance Check Setup

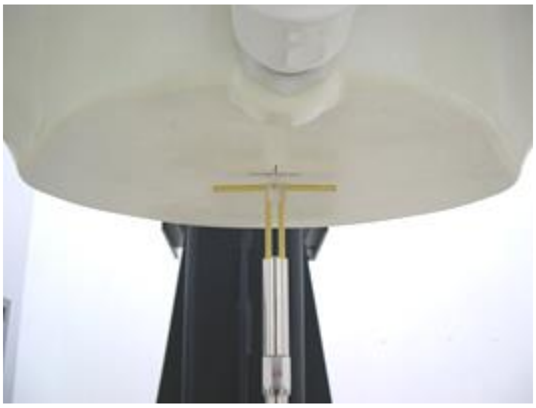


Fig 11.3.2 Setup Photo

12. RF Exposure Positions

12.1 Ear and handset reference point

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

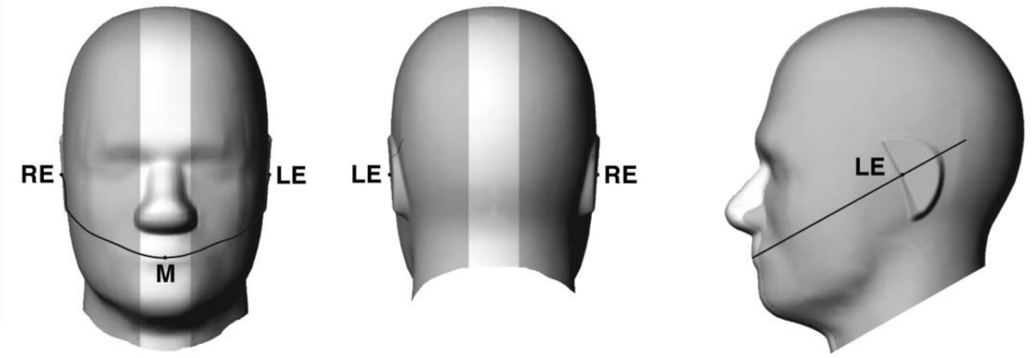


Fig 12.1.1 Front, back, and side views of SAM twin phantom

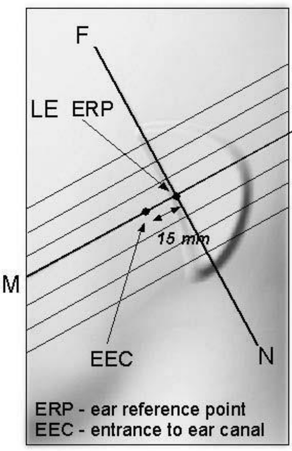


Fig 12.1.2 Close-up side view of phantom showing the ear region.

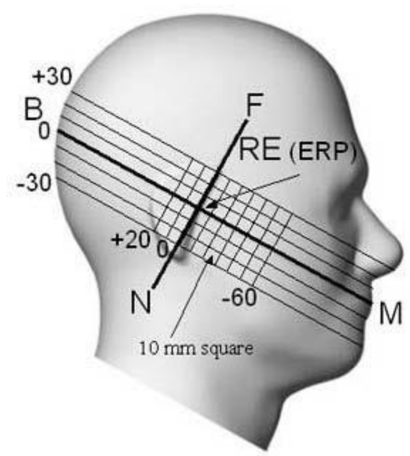


Fig 12.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

12.2 Definition of the cheek position

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

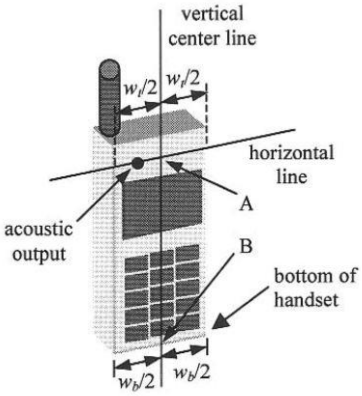


Fig 12.2.1 Handset vertical and horizontal reference lines—"fixed case

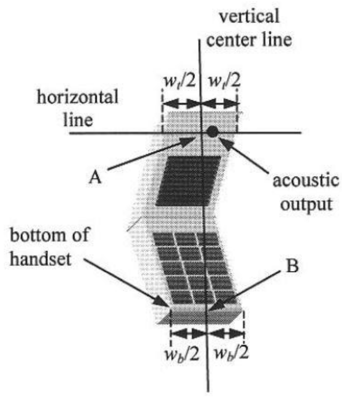


Fig 12.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

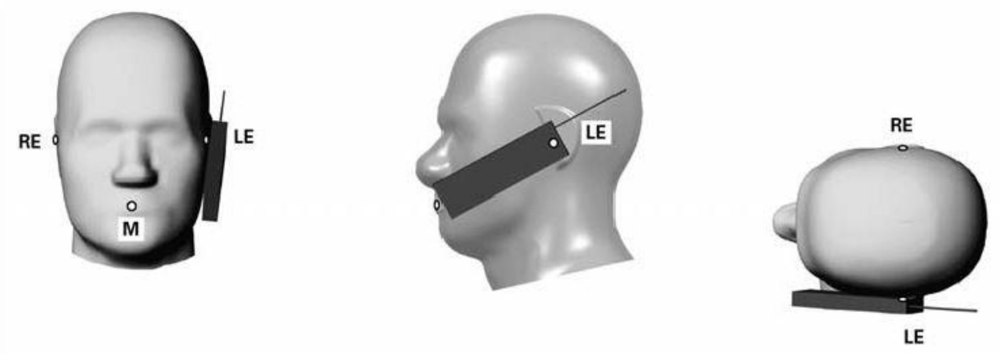


Fig 12.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

12.3 Definition of the tilt position

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

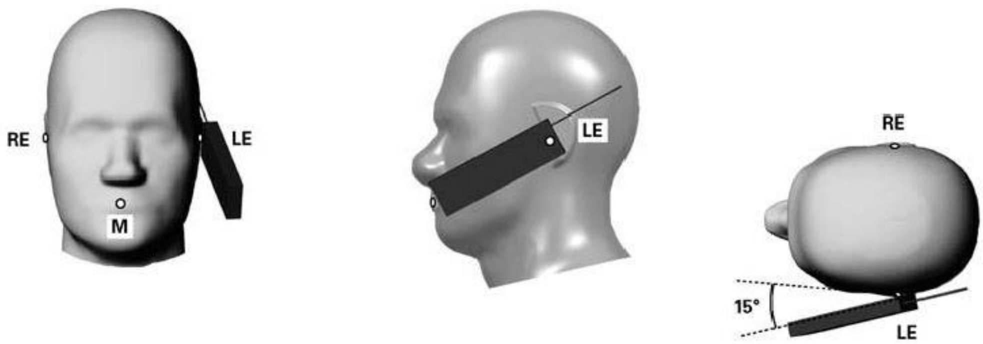


Fig 12.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

12.4 Body Worn Accessory

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

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

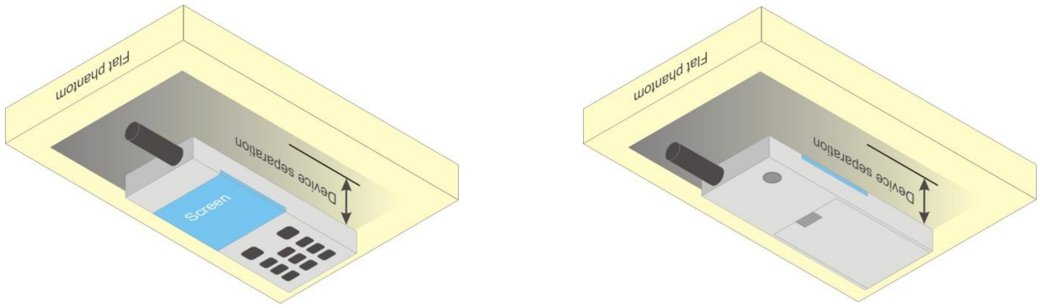


Fig 12.4 Body Worn Position

12.5 Product Specific 10g SAR Exposure

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

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

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

12.6 Wireless Router

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

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

13. Conducted RF Output Power (Unit: dBm)

The detailed conducted power table can refer to Appendix E.

<WLAN Conducted Power>

General Note:

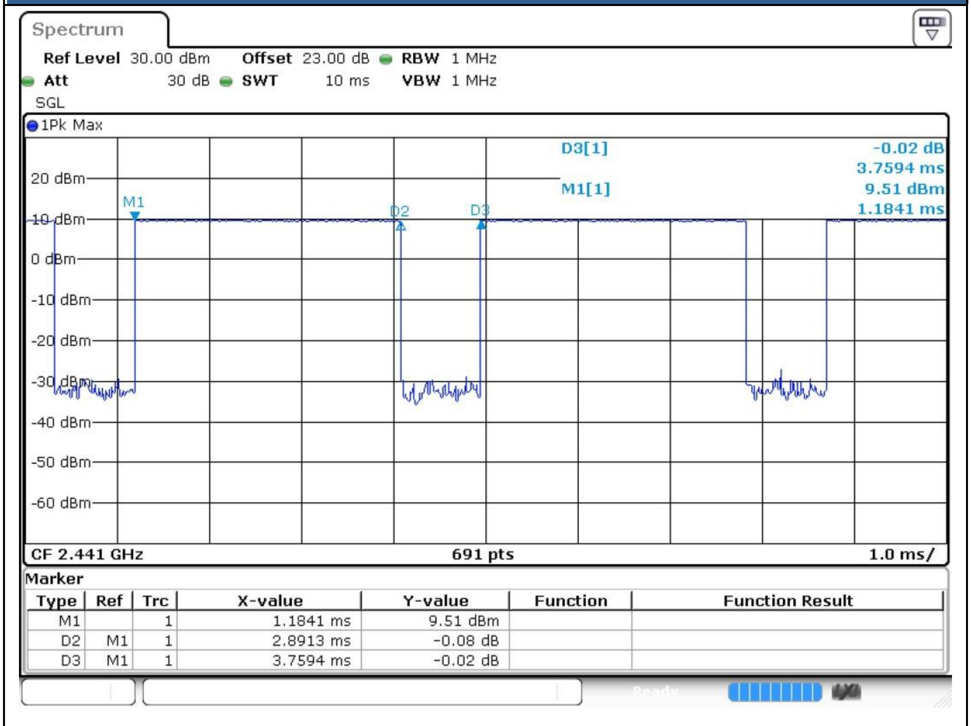
1. Per KDB 248227 D01v02r02, SAR test reduction is determined according to 802.11 transmission mode configurations and certain exposure conditions with multiple test positions. In the 2.4 GHz band, separate SAR procedures are applied to DSSS and OFDM configurations to simplify DSSS test requirements.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



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 BT/WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
   c. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
   d. For BT/WLAN: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
   e. For TDD LTE SAR measurement of power class 3, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result. The Reported TDD LTE SAR = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required when the measured SAR is ≥ 0.8W/kg. Per KDB 865664 D01v01r04, if the extremity repeated SAR is necessary, the same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.
4. The device implements the power management and proximity sensor /receiver detection/hotspot mode for SAR compliance at different exposure conditions (head, body-worn, hotspot, extremity) and the details about the power management decision and sensor detection are provided in the operational description. And the device will invoke corresponding work scenarios power level base on frequency bands/antennas, which can refer to power table at appendix E, WWAN power refer to Original Project.
5. For some WWAN bands, sensor on reduced power level is higher than hotspot reduced power level, so front/back sensor on SAR can represent hotspot conservatively.
6. For dual SIM card mobile has two SIM slots and supports dual SIM dual standby. The WWAN radio transmission will be enabled by either one SIM at a time (single active). After pre-scan two SIM cards power, we found test result of the SIM1 was the worse, so we chose SIM1 slot to perform all tests.
7. The device has three headsets. For three headsets only suppliers are different. So we chose headset 1 to perform full SAR testing only.
8. This device has two batteries. For battery 1 was in sample 1, and battery 2 was in sample 2. They were all evaluated for SAR testing conservatively.
9. Per KDB648474 D04v01r03, for smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm, when hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg, however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power, including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold.
   a. For this device SAR for WWAN/WLAN transmitter scaled to maximum output power mode for product specific 10g SAR is higher than 1.2W/kg of GSM850/1900, WCDMA Band II/V, LTE Band5/7/38/41, WLAN 2.4GHz/5.2GHz/5.8GHz, therefore product specific 10g SAR is necessary.
   b. WLAN 5.3/5.5GHz tested the product specific 10g SAR since it has no hotspot mode.
   c. When 10-g product specific 10g SAR is considered, SAR thresholds is specified in the procedures for SAR test reduction and exclusion should be multiplied by 2.5.
10. For distance SAR and non-distance SAR in body-worn, always chose higher SAR to do co-located analysis.

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 2Tx slots for GSM850 and 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 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 to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA, and according to the following RF output power, the output power results of the secondary modes (HSDPA / HSUPA / DC-HSDPA) are less than ¼ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA.

LTE Note:

1. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
2. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
3. Per KDB 941225 D05v02r05, for QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
4. Per KDB 941225 D05v02r05, 16QAM/64QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM/64QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B5 / B38 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
7. LTE B38 SAR test was covered by 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 Note:

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

14.1 Head SAR

<u><GSM SAR></u>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
01	GSM850	GPRS 2 Tx slots	Right Cheek	0mm	Ant 1	Full	251	848.8	1	30.96	32.00	1.271	-0.07	0.351	**0.446**
	GSM850	GPRS 2 Tx slots	Right Cheek	0mm	Ant 1	Full	251	848.8	2	30.96	32.00	1.271	0.11	0.295	0.375
02	GSM1900	GPRS 2 Tx slots	Right Cheek	0mm	Ant 1	Full	661	1880	1	27.94	29.50	1.432	-0.07	0.245	**0.351**

<u><WCDMA SAR></u>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
03	WCDMA V	RMC 12.2Kbps	Right Cheek	0mm	Ant 1	Full	4182	836.4	1	22.82	24.00	1.312	0.07	0.338	**0.444**
04	WCDMA II	RMC 12.2Kbps	Right Cheek	0mm	Ant 1	Full	9400	1880	1	22.80	24.00	1.318	0.06	0.380	**0.501**
	WCDMA II	RMC 12.2Kbps	Right Cheek	0mm	Ant 1	Full	9400	1880	2	22.80	24.00	1.318	-0.02	0.326	0.430

<u><FDD LTE SAR></u>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
05	LTE Band 5	10M	QPSK	1	25	Right Chee	0mm	Ant 1	Full	20525	836.5	1	22.96	24.00	1.271	0.13	0.345	**0.438**
06	LTE Band 7	20M	QPSK	1	49	Right Chee	0mm	Ant 1	Full	21100	2535	1	22.69	24.00	1.352	0.05	0.084	**0.113**

<u><TDD LTE SAR></u>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
07	LTE Band 41	20M	QPSK	1	49	Right Chee	0mm	Ant 1	Full	40400	2571	1	23.33	24.00	1.167	62.9	1.006	0.05	0.052	**0.060**

<u><WLAN2.4G SAR></u>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	Ant 3	Full	6	2437	1	16.80	17.50	1.175	99.27	1.007	0.03	0.276	0.327
	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	0mm	Ant 3	Full	6	2437	1	16.80	17.50	1.175	99.27	1.007	-0.06	0.268	0.317
08	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 3	Full	6	2437	1	16.80	17.50	1.175	99.27	1.007	-0.11	0.493	**0.583**
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Ant 3	Full	6	2437	2	16.80	17.50	1.175	99.27	1.007	0.05	0.450	0.532
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	Ant 3	Full	6	2437	1	16.80	17.50	1.175	99.27	1.007	0.14	0.441	0.522

<WLAN5G SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN5.3GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Ant 3	Reduced	58	5290	1	11.00	12.00	1.259	87.77	1.139	-0.03	0.168	0.241
	WLAN5.3GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Ant 3	Reduced	58	5290	1	11.00	12.00	1.259	87.77	1.139	-0.18	0.185	0.265
	WLAN5.3GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 3	Reduced	58	5290	1	11.00	12.00	1.259	87.77	1.139	0.07	0.232	0.333
09	WLAN5.3GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Ant 3	Reduced	58	5290	1	11.00	12.00	1.259	87.77	1.139	-0.07	0.306	**0.439**
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Ant 3	Reduced	122	5610	1	11.41	12.00	1.146	87.77	1.139	-0.19	0.215	0.281
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Ant 3	Reduced	122	5610	1	11.41	12.00	1.146	87.77	1.139	0.14	0.243	0.317
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 3	Reduced	122	5610	1	11.41	12.00	1.146	87.77	1.139	0.05	0.270	0.352
10	WLAN5.5GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Ant 3	Reduced	122	5610	1	11.41	12.00	1.146	87.77	1.139	0.19	0.295	**0.385**
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Ant 3	Reduced	155	5775	1	10.70	11.50	1.202	87.77	1.139	-0.16	0.278	0.381
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Ant 3	Reduced	155	5775	1	10.70	11.50	1.202	87.77	1.139	0.05	0.327	0.448
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Ant 3	Reduced	155	5775	1	10.70	11.50	1.202	87.77	1.139	0.07	0.341	0.467
11	WLAN5.8GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Ant 3	Reduced	155	5775	1	10.70	11.50	1.202	87.77	1.139	-0.15	0.468	**0.641**
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Ant 3	Reduced	155	5775	2	10.70	11.50	1.202	87.77	1.139	-0.15	0.321	0.440

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	Bluetooth	DH5 1Mbps	Right Cheek	0mm	Ant 3	Full	78	2480	1	10.50	12.00	1.413	76.91	1.300	-0.18	0.006	0.011
	Bluetooth	DH5 1Mbps	Right Tilted	0mm	Ant 3	Full	78	2480	1	10.50	12.00	1.413	76.91	1.300	0.19	0.001	0.002
12	Bluetooth	DH5 1Mbps	Left Cheek	0mm	Ant 3	Full	78	2480	1	10.50	12.00	1.413	76.91	1.300	-0.14	0.033	**0.061**
	Bluetooth	DH5 1Mbps	Left Tilted	0mm	Ant 3	Full	78	2480	1	10.50	12.00	1.413	76.91	1.300	0.04	0.013	0.024

14.2 Hotspot SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
13	GSM850	GPRS 2 Tx slots	Back	5mm	Ant 1	Reduced	251	848.8	1	29.26	30.50	1.330	-0.08	0.945	**1.257**
	GSM850	GPRS 2 Tx slots	Back	5mm	Ant 1	Reduced	251	848.8	2	29.26	30.50	1.330	0.14	0.902	1.200
14	GSM1900	GPRS 2 Tx slots	Bottom Side	5mm	Ant 1	Reduced	512	1850.2	1	22.81	24.50	1.476	0.03	0.957	**1.412**
	GSM1900	GPRS 2 Tx slots	Bottom Side	5mm	Ant 1	Reduced	512	1850.2	2	22.81	24.50	1.476	0.11	0.915	1.350

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
15	WCDMA V	RMC 12.2Kbps	Back	5mm	Ant 1	Reduced	4182	836.4	1	22.32	23.50	1.312	0.01	0.945	**1.240**
16	WCDMA II	RMC 12.2Kbps	Bottom Side	5mm	Ant 1	Reduced	9262	1852.4	1	15.40	17.00	1.445	0.03	0.976	**1.411**

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
17	LTE Band 5	10M	QPSK	1	25	Back	5mm	Ant 1	Reduced	20525	836.5	1	22.46	23.50	1.271	-0.12	0.983	**1.249**
18	LTE Band 7	20M	QPSK	1	49	Bottom Side	5mm	Ant 1	Reduced	21350	2560	1	12.68	14.00	1.355	-0.04	1.020	**1.382**
	LTE Band 7	20M	QPSK	1	49	Bottom Side	5mm	Ant 1	Reduced	21350	2560	2	12.68	14.00	1.355	0.13	0.956	1.296

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
19	LTE Band 41	20M	QPSK	1	49	Bottom Side	5mm	Ant 1	Reduced	40670	2598	1	15.05	16.50	1.396	62.9	1.006	0.11	0.982	**1.379**

<WLAN2.4 SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Front	5mm	Ant 3	Full	6	2437	1	16.80	17.50	1.175	99.27	1.007	0.02	0.174	0.206
20	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Ant 3	Full	6	2437	1	16.80	17.50	1.175	99.27	1.007	-0.04	0.351	**0.415**
	WLAN2.4GHz	802.11b 1Mbps	Right Side	5mm	Ant 3	Full	6	2437	1	16.80	17.50	1.175	99.27	1.007	-0.13	0.141	0.167
	WLAN2.4GHz	802.11b 1Mbps	Top Side	5mm	Ant 3	Full	6	2437	1	16.80	17.50	1.175	99.27	1.007	-0.1	0.278	0.329

<WLAN5G SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN5.2GHz	802.11ac-VHT80 MCS0	Front	5mm	Ant 3	Reduced	42	5210	1	11.00	12.00	1.259	87.77	1.139	-0.01	0.112	0.161
	WLAN5.2GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 3	Reduced	42	5210	1	11.00	12.00	1.259	87.77	1.139	0.01	0.162	0.232
	WLAN5.2GHz	802.11ac-VHT80 MCS0	Right Side	5mm	Ant 3	Reduced	42	5210	1	9.70	11.00	1.349	87.77	1.139	0.06	0.062	0.095
21	WLAN5.2GHz	802.11ac-VHT80 MCS0	Top Side	5mm	Ant 3	Reduced	42	5210	1	9.70	11.00	1.349	87.77	1.139	0.16	0.229	**0.352**
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Front	5mm	Ant 3	Reduced	155	5775	1	11.50	12.50	1.259	87.77	1.139	-0.07	0.151	0.217
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 3	Reduced	155	5775	1	11.50	12.50	1.259	87.77	1.139	0.04	0.258	0.370
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Right Side	5mm	Ant 3	Reduced	155	5775	1	9.90	11.00	1.288	87.77	1.139	-0.15	0.068	0.100
22	WLAN5.8GHz	802.11ac-VHT80 MCS0	Top Side	5mm	Ant 3	Reduced	155	5775	1	9.90	11.00	1.288	87.77	1.139	0.11	0.458	**0.672**
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Top Side	5mm	Ant 3	Reduced	155	5775	2	9.90	11.00	1.288	87.77	1.139	0.06	0.274	0.402

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	Bluetooth	DH5 1Mbps	Front	5mm	Ant 3	Full	78	2480	1	10.50	12.00	1.413	76.91	1.300	0.01	0.012	0.022
23	Bluetooth	DH5 1Mbps	Back	5mm	Ant 3	Full	78	2480	1	10.50	12.00	1.413	76.91	1.300	-0.03	0.064	**0.118**
	Bluetooth	DH5 1Mbps	Right Side	5mm	Ant 3	Full	78	2480	1	10.50	12.00	1.413	76.91	1.300	-0.05	0.060	0.110
	Bluetooth	DH5 1Mbps	Top Side	5mm	Ant 3	Full	78	2480	1	10.50	12.00	1.413	76.91	1.300	0.09	0.045	0.083

14.3 Body Worn Accessory SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Headset	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
24	GSM850	GPRS 2 Tx slots	Back	5mm	Ant 1	-	Reduced	251	848.8	1	29.26	30.50	1.330	-0.08	0.945	**1.257**
	GSM850	GPRS 2 Tx slots	Back	5mm	Ant 1	-	Reduced	251	848.8	2	29.26	30.50	1.330	0.14	0.902	1.200
25	GSM1900	GPRS 2 Tx slots	Back	5mm	Ant 1	-	Reduced	512	1850.2	1	24.28	26.00	1.486	0.14	0.889	**1.321**
	GSM1900	GPRS 2 Tx slots	Back	5mm	Ant 1	-	Reduced	512	1850.2	2	24.28	26.00	1.486	0.05	0.756	1.123

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Headset	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
26	WCDMA V	RMC 12.2Kbps	Back	5mm	Ant 1	-	Reduced	4182	836.4	1	22.32	23.50	1.312	0.01	0.945	**1.240**
27	WCDMA II	RMC 12.2Kbps	Back	5mm	Ant 1	-	Reduced	9538	1907.6	1	18.33	19.50	1.309	-0.1	0.969	**1.269**

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Headset	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
28	LTE Band 5	10M	QPSK	1	25	Back	5mm	Ant 1	-	Reduced	20525	836.5	1	22.46	23.50	1.271	-0.12	0.983	**1.249**
29	LTE Band 7	20M	QPSK	1	49	Back	5mm	Ant 1	-	Reduced	21350	2560	1	13.29	14.50	1.321	0.13	0.975	**1.288**

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Headset	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
30	LTE Band 41	20M	QPSK	1	49	Back	5mm	Ant 1	-	Reduced	40670	2598	1	15.77	17.00	1.327	62.9	1.006	-0.14	1.030	**1.375**
	LTE Band 41	20M	QPSK	1	49	Back	5mm	Ant 1	-	Reduced	40670	2598	2	15.77	17.00	1.327	62.9	1.006	0.02	0.912	1.218

<WLAN2.4G SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Headset	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Front	5mm	Ant 3	-	Full	6	2437	1	16.80	17.50	1.175	99.27	1.007	0.02	0.174	0.206
31	WLAN2.4GHz	802.11b 1Mbps	Back	5mm	Ant 3	-	Full	6	2437	1	16.80	17.50	1.175	99.27	1.007	-0.04	0.351	**0.415**

<WLAN5G SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Headset	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN5.3GHz	802.11ac-VHT80 MCS0	Front	5mm	Ant 3	-	Reduced	58	5290	1	11.00	12.00	1.259	87.77	1.139	0.05	0.145	0.208
32	WLAN5.3GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 3	-	Reduced	58	5290	1	11.00	12.00	1.259	87.77	1.139	0.01	0.256	**0.367**
	WLAN5.3GHz	802.11a 6Mbps	Front	14mm	Ant 3	-	Full	56	5280	1	17.48	18.00	1.127	96.97	1.031	0.09	0.134	0.156
	WLAN5.3GHz	802.11a 6Mbps	Back	18mm	Ant 3	-	Full	56	5280	1	17.48	18.00	1.127	96.97	1.031	0.12	0.167	0.194
	WLAN5.5GHz	802.11ac-VHT80 MCS0	Front	5mm	Ant 3	-	Reduced	122	5610	1	11.41	12.00	1.146	87.77	1.139	0.09	0.131	0.171
33	WLAN5.5GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 3	-	Reduced	122	5610	1	11.41	12.00	1.146	87.77	1.139	0.05	0.218	**0.284**
	WLAN5.5GHz	802.11a 6Mbps	Front	14mm	Ant 3	-	Full	100	5500	1	16.98	17.50	1.126	96.97	1.031	-0.18	0.125	0.145
	WLAN5.5GHz	802.11a 6Mbps	Back	18mm	Ant 3	-	Full	100	5500	1	16.98	17.50	1.126	96.97	1.031	0.04	0.184	0.214
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Front	5mm	Ant 3	-	Reduced	155	5775	1	11.50	12.50	1.259	87.77	1.139	-0.07	0.151	0.217
34	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 3	-	Reduced	155	5775	1	11.50	12.50	1.259	87.77	1.139	0.04	0.258	**0.370**
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 3	-	Reduced	155	5775	1	11.50	12.50	1.259	87.77	1.139	0.01	0.197	0.282
	WLAN5.8GHz	802.11ac-VHT80 MCS0	Back	5mm	Ant 3	-	Reduced	155	5775	2	11.50	12.50	1.259	87.77	1.139	0.01	0.197	0.282
	WLAN5.8GHz	802.11a 6Mbps	Front	14mm	Ant 3	-	Full	149	5745	1	16.81	17.50	1.171	96.97	1.031	0.01	0.074	0.089
	WLAN5.8GHz	802.11a 6Mbps	Back	18mm	Ant 3	-	Full	149	5745	1	16.57	17.50	1.238	96.97	1.031	-0.13	0.178	0.227

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Headset	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	Bluetooth	DH5 1Mbps	Front	5mm	Ant 3	-	Full	78	2480	1	10.50	12.00	1.413	76.91	1.300	0.01	0.012	0.022
35	Bluetooth	DH5 1Mbps	Back	5mm	Ant 3	-	Full	78	2480	1	10.50	12.00	1.413	76.91	1.300	-0.03	0.064	**0.118**

14.4 Product Specific SAR

<u><GSM SAR></u>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
36	GSM850	GPRS 2 Tx slots	Back	0mm	Ant 1	Reduced	128	824.2	1	30.43	31.50	1.279	-0.05	1.950	**2.495**
	GSM850	GPRS 2 Tx slots	Back	0mm	Ant 1	Reduced	128	824.2	2	30.43	31.50	1.279	0.16	1.840	2.354
37	GSM1900	GPRS 2 Tx slots	Bottom Side	0mm	Ant 1	Reduced	512	1850.2	1	27.22	29.00	1.507	0.02	2.300	**3.465**
	GSM1900	GPRS 2 Tx slots	Bottom Side	0mm	Ant 1	Reduced	512	1850.2	2	27.22	29.00	1.507	0.05	2.010	3.028

<u><WCDMA SAR></u>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
38	WCDMA V	RMC 12.2Kbps	Back	0mm	Ant 1	Full	4182	836.4	1	22.82	24.00	1.312	0.03	1.430	**1.876**
39	WCDMA II	RMC 12.2Kbps	Bottom Side	0mm	Ant 1	Reduced	9262	1852.4	1	20.20	21.50	1.349	0.18	2.430	**3.278**

<u><FDD LTE SAR></u>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
40	LTE Band 5	10M	QPSK	1	25	Back	0mm	Ant 1	Full	20525	836.5	1	22.96	24.00	1.271	0.03	1.460	**1.855**
41	LTE Band 7	20M	QPSK	1	49	Back	0mm	Ant 1	Reduced	21350	2560	1	16.74	18.00	1.337	0.03	2.130	**2.847**

<u><TDD LTE SAR></u>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
42	LTE Band 41	20M	QPSK	1	49	Back	0mm	Ant 1	Reduced	40400	2571	1	19.96	21.00	1.271	62.9	1.006	0.06	2.400	**3.068**
	LTE Band 41	20M	QPSK	1	49	Back	0mm	Ant 1	Reduced	40400	2571	2	19.96	21.00	1.271	62.9	1.006	0.03	2.280	2.914

<u><WLAN5G SAR></u>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
43	WLAN5.2GHz	802.11a 6Mbps	Top Side	0mm	Ant 3	Full	48	5240	1	16.25	17.50	1.334	96.97	1.031	-0.01	1.250	**1.719**
	WLAN5.2GHz	802.11a 6Mbps	Top Side	0mm	Ant 3	Full	48	5240	2	16.25	17.50	1.334	96.97	1.031	-0.07	0.984	1.353
	WLAN5.3GHz	802.11a 6Mbps	Front	0mm	Ant 3	Full	56	5280	1	17.48	18.00	1.127	96.97	1.031	-0.05	0.468	0.544
	WLAN5.3GHz	802.11a 6Mbps	Back	0mm	Ant 3	Full	56	5280	1	17.48	18.00	1.127	96.97	1.031	0.06	0.686	0.797
	WLAN5.3GHz	802.11a 6Mbps	Right Side	0mm	Ant 3	Full	56	5280	1	17.48	18.00	1.127	96.97	1.031	-0.1	0.311	0.361
44	WLAN5.3GHz	802.11a 6Mbps	Top Side	0mm	Ant 3	Full	56	5280	1	17.48	18.00	1.127	96.97	1.031	0.07	1.160	**1.348**
	WLAN5.5GHz	802.11a 6Mbps	Front	0mm	Ant 3	Full	100	5500	1	16.98	17.50	1.126	96.97	1.031	0.13	0.324	0.376
	WLAN5.5GHz	802.11a 6Mbps	Back	0mm	Ant 3	Full	100	5500	1	16.98	17.50	1.126	96.97	1.031	-0.09	0.564	0.655
	WLAN5.5GHz	802.11a 6Mbps	Right Side	0mm	Ant 3	Full	100	5500	1	16.98	17.50	1.126	96.97	1.031	-0.02	0.253	0.294
45	WLAN5.5GHz	802.11a 6Mbps	Top Side	0mm	Ant 3	Full	100	5500	1	16.98	17.50	1.126	96.97	1.031	0.15	0.941	**1.093**
46	WLAN5.8GHz	802.11a 6Mbps	Top Side	0mm	Ant 3	Full	149	5745	1	16.81	17.50	1.171	96.97	1.031	-0.16	1.360	**1.642**

14.5 Repeated SAR Measurement

<1g>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 1	Reduced	9262	1852.4	1	15.40	17.00	1.445	-	-	0.03	0.976	1	1.411
2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	5mm	Ant 1	Reduced	9262	1852.4	1	15.40	17.00	1.445	-	-	0.01	0.969	1.007	1.401
1st	LTE Band 5	10M	QPSK	1	25	-	Back	5mm	Ant 1	Reduced	20525	836.5	1	22.46	23.50	1.271	-	-	-0.12	0.983	1	1.249
2nd	LTE Band 5	10M	QPSK	1	25	-	Back	5mm	Ant 1	Reduced	20525	836.5	1	22.46	23.50	1.271	-	-	-0.13	0.977	1.006	1.241
1st	LTE Band 7	20M	QPSK	1	49	-	Bottom Side	5mm	Ant 1	Reduced	21350	2560	1	12.68	14.00	1.355	-	-	-0.04	1.020	1	1.382
2nd	LTE Band 7	20M	QPSK	1	49	-	Bottom Side	5mm	Ant 1	Reduced	21350	2560	1	12.68	14.00	1.355	-	-	0.09	1.000	1.020	1.355

<10g>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Ratio	Reported 10g SAR (W/kg)
1st	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	0mm	Ant 1	Reduced	9262	1852.4	1	20.20	21.50	1.349	-	-	0.18	2.430	1	3.278
2nd	WCDMA II	-	-	-	-	RMC 12.2Kbps	Bottom Side	0mm	Ant 1	Reduced	9262	1852.4	1	20.20	21.50	1.349	-	-	0.02	2.400	1.013	3.238
1st	LTE Band 41	20M	QPSK	1	49	-	Back	0mm	Ant 1	Reduced	40400	2571	1	19.96	21.00	1.271	62.9	1.006	0.06	2.400	1	3.068
2nd	LTE Band 41	20M	QPSK	1	49	-	Back	0mm	Ant 1	Reduced	40400	2571	1	19.96	21.00	1.271	62.9	1.006	0.01	2.370	1.013	3.029

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.	WWAN + WLAN2.4GHz	Yes	Yes	Yes	Yes
2.	WWAN + WLAN5GHz	Yes	Yes	Yes	Yes
3.	WWAN + Bluetooth	Yes	Yes	Yes	Yes

General Note:

1. This device supports VoIP in GPRS, EGPRS, WCDMA and LTE (e.g. for 3rd-party VoIP), LTE supports VoLTE operation.
2. EUT will choose each GSM, WCDMA and LTE according to the network signal condition; therefore, they will not operate simultaneouslyat any moment.
3. This device 2.4GHz WLAN support hotspot operation and Bluetooth support tethering applications.
4. This device 5.2GHz WLAN/5.8GHz WLAN support hotspot operation, and 5.2GHz WLAN/5.8GHz WLAN supports WLAN Direct (GC/GO), and 5.3GHz / 5.5GHz supports WLAN Direct (GC only).
5. WIFI 5.3/5.5GHz has no hotspot function.
6. The worst case 5 GHz WLAN SAR for each configuration was used for SAR summation.
7. WLAN 2.4GHz and Bluetooth share the same antenna so can't transmit simultaneously.
8. According to the EUT characteristic, WLAN 5GHz and Bluetooth can't transmit simultaneously.
9. The maximum SAR summation is calculated based on the same configuration and test position.
10. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
    i) 1g Scalar SAR summation < 1.6W/kg and 10g Scalar SAR summation < 4.0W/kg.
    ii) SPLSR = (SAR1 + SAR2)^1.5 / (min. separation distance, mm), and the peak separation distance is determined from the square root of [(x1-x2)2 + (y1-y2)2 + (z1-z2)2], where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
    iii) If SPLSR ≤ 0.04 for 1g SAR and SPLSR≤ 0.10 for 10g SAR, simultaneously transmission SAR measurement is not necessary.
    iv) Simultaneously transmission SAR measurement, and the reported multi-band 1g SAR < 1.6W/kg and 10g SAR < 4.0W/kg.
    v) The SPLSR calculated results please refer to section 15.5.

15.1 Head Exposure Conditions

WWAN Band	Exposure Position	1 WWAN 1g SAR (W/kg)	3 2.4GHz WLAN Ant 3 1g SAR (W/kg)	6 5GHz WLAN Ant 3 1g SAR (W/kg)	9 Bluetooth Ant 3 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	1+6 Summed 1g SAR (W/kg)	1+9 Summed 1g SAR (W/kg)
GSM850Ant 1	Right Cheek	0.446	0.327	0.381	0.011	0.77	0.83	0.46
	Right Tilted		0.317	0.448	0.002	0.32	0.45	0.00
	Left Cheek		0.583	0.467	0.061	0.58	0.47	0.06
	Left Tilted		0.522	0.641	0.024	0.52	0.64	0.02
GSM1900Ant 1	Right Cheek	0.351	0.327	0.381	0.011	0.68	0.73	0.36
	Right Tilted		0.317	0.448	0.002	0.32	0.45	0.00
	Left Cheek		0.583	0.467	0.061	0.58	0.47	0.06
	Left Tilted		0.522	0.641	0.024	0.52	0.64	0.02
WCDMA VAnt 1	Right Cheek	0.444	0.327	0.381	0.011	0.77	0.83	0.46
	Right Tilted		0.317	0.448	0.002	0.32	0.45	0.00
	Left Cheek		0.583	0.467	0.061	0.58	0.47	0.06
	Left Tilted		0.522	0.641	0.024	0.52	0.64	0.02
WCDMA IIAnt 1	Right Cheek	0.501	0.327	0.381	0.011	0.83	0.88	0.51
	Right Tilted		0.317	0.448	0.002	0.32	0.45	0.00
	Left Cheek		0.583	0.467	0.061	0.58	0.47	0.06
	Left Tilted		0.522	0.641	0.024	0.52	0.64	0.02
LTE Band 5Ant 1	Right Cheek	0.438	0.327	0.381	0.011	0.77	0.82	0.45
	Right Tilted		0.317	0.448	0.002	0.32	0.45	0.00
	Left Cheek		0.583	0.467	0.061	0.58	0.47	0.06
	Left Tilted		0.522	0.641	0.024	0.52	0.64	0.02
LTE Band 7Ant 1	Right Cheek	0.113	0.327	0.381	0.011	0.44	0.49	0.12
	Right Tilted		0.317	0.448	0.002	0.32	0.45	0.00
	Left Cheek		0.583	0.467	0.061	0.58	0.47	0.06
	Left Tilted		0.522	0.641	0.024	0.52	0.64	0.02
LTE Band 41Ant 1	Right Cheek	0.060	0.327	0.381	0.011	0.39	0.44	0.07
	Right Tilted		0.317	0.448	0.002	0.32	0.45	0.00
	Left Cheek		0.583	0.467	0.061	0.58	0.47	0.06
	Left Tilted		0.522	0.641	0.024	0.52	0.64	0.02

15.2 Hotspot Exposure Conditions

WWAN Band	Exposure Position	1	3	6	9	1+3	1+6	1+9	Case No
		WWAN	2.4GHz WLAN Ant 3	5GHz WLAN Ant 3	Bluetooth Ant 3	Summed	Summed	Summed	
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	
GSM850Ant 1	Front		0.206	0.217	0.022	0.21	0.22	0.02	
	Back	1.257	0.415	0.370	0.118	**1.67**	**1.63**	1.38	**Case1/8**
	Left side					0.00	0.00	0.00	
	Right side		0.167	0.100	0.110	0.17	0.10	0.11	
	Top side		0.329	0.672	0.083	0.33	0.67	0.08	
	Bottom side					0.00	0.00	0.00	
GSM1900Ant 1	Front		0.206	0.217	0.022	0.21	0.22	0.02	
	Back	1.321	0.415	0.370	0.118	**1.74**	**1.69**	1.44	**Case2/9**
	Left side					0.00	0.00	0.00	
	Right side		0.167	0.100	0.110	0.17	0.10	0.11	
	Top side		0.329	0.672	0.083	0.33	0.67	0.08	
	Bottom side	1.412				**1.41**	**1.41**	1.41	
WCDMA VAnt 1	Front		0.206	0.217	0.022	0.21	0.22	0.02	
	Back	1.240	0.415	0.370	0.118	**1.66**	**1.61**	1.36	**Case3/10**
	Left side					0.00	0.00	0.00	
	Right side		0.167	0.100	0.110	0.17	0.10	0.11	
	Top side		0.329	0.672	0.083	0.33	0.67	0.08	
	Bottom side					0.00	0.00	0.00	
WCDMA IIAnt 1	Front		0.206	0.217	0.022	0.21	0.22	0.02	
	Back	1.269	0.415	0.370	0.118	**1.68**	**1.64**	1.39	**Case4/11**
	Left side					0.00	0.00	0.00	
	Right side		0.167	0.100	0.110	0.17	0.10	0.11	
	Top side		0.329	0.672	0.083	0.33	0.67	0.08	
	Bottom side	1.411				1.41	1.41	1.41	
LTE Band 5Ant 1	Front		0.206	0.217	0.022	0.21	0.22	0.02	
	Back	1.249	0.415	0.370	0.118	**1.66**	**1.62**	1.37	**Case5/12**
	Left side					0.00	0.00	0.00	
	Right side		0.167	0.100	0.110	0.17	0.10	0.11	
	Top side		0.329	0.672	0.083	0.33	0.67	0.08	
	Bottom side					0.00	0.00	0.00	
LTE Band 7Ant 1	Front		0.206	0.217	0.022	0.21	0.22	0.02	
	Back	1.288	0.415	0.370	0.118	**1.70**	**1.66**	1.41	**Case6/13**
	Left side					0.00	0.00	0.00	
	Right side		0.167	0.100	0.110	0.17	0.10	0.11	
	Top side		0.329	0.672	0.083	0.33	0.67	0.08	
	Bottom side	1.382				1.38	1.38	1.38	
LTE Band 41Ant 1	Front		0.206	0.217	0.022	0.21	0.22	0.02	
	Back	1.375	0.415	0.370	0.118	**1.79**	**1.75**	1.49	**Case7/14**
	Left side					0.00	0.00	0.00	
	Right side		0.167	0.100	0.110	0.17	0.10	0.11	
	Top side		0.329	0.672	0.083	0.33	0.67	0.08	
	Bottom side	1.379				1.38	1.38	1.38	

15.3 Body-Worn Accessory Exposure Conditions

WWAN Band	Exposure Position	1	3	6	9	1+3	1+6	1+9	Case No
		WWAN	2.4GHz WLAN Ant 3	5GHz WLAN Ant 3	Bluetooth Ant 3	Summed	Summed	Summed	
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	
GSM850Ant 1	Front		0.206	0.217	0.022	0.21	0.22	0.02	
	Back	1.257	0.415	0.370	0.118	**1.67**	**1.63**	1.38	**Case1/8**
	Front with Headset					0.00	0.00	0.00	
	Back with Headset					0.00	0.00	0.00	
GSM1900Ant 1	Front		0.206	0.217	0.022	0.21	0.22	0.02	
	Back	1.321	0.415	0.370	0.118	**1.74**	**1.69**	1.44	**Case2/9**
	Front with Headset					0.00	0.00	0.00	
	Back with Headset					0.00	0.00	0.00	
WCDMA VAnt 1	Front		0.206	0.217	0.022	0.21	0.22	0.02	
	Back	1.240	0.415	0.370	0.118	**1.66**	**1.61**	1.36	**Case3/10**
	Front with Headset					0.00	0.00	0.00	
	Back with Headset					0.00	0.00	0.00	
WCDMA IIAnt 1	Front		0.206	0.217	0.022	0.21	0.22	0.02	
	Back	1.269	0.415	0.370	0.118	**1.68**	**1.64**	1.39	**Case4/11**
	Front with Headset					0.00	0.00	0.00	
	Back with Headset					0.00	0.00	0.00	
LTE Band 5Ant 1	Front		0.206	0.217	0.022	0.21	0.22	0.02	
	Back	1.249	0.415	0.370	0.118	**1.66**	**1.62**	1.37	**Case5/12**
	Front with Headset					0.00	0.00	0.00	
	Back with Headset					0.00	0.00	0.00	
LTE Band 7Ant 1	Front		0.206	0.217	0.022	0.21	0.22	0.02	
	Back	1.288	0.415	0.370	0.118	**1.70**	**1.66**	1.41	**Case6/13**
	Front with Headset					0.00	0.00	0.00	
	Back with Headset					0.00	0.00	0.00	
LTE Band 41Ant 1	Front		0.206	0.217	0.022	0.21	0.22	0.02	
	Back	1.375	0.415	0.370	0.118	**1.79**	**1.75**	**1.49**	**Case7/14**
	Front with Headset					0.00	0.00	0.00	
	Back with Headset					0.00	0.00	0.00	

15.4 Product Specific Exposure Conditions

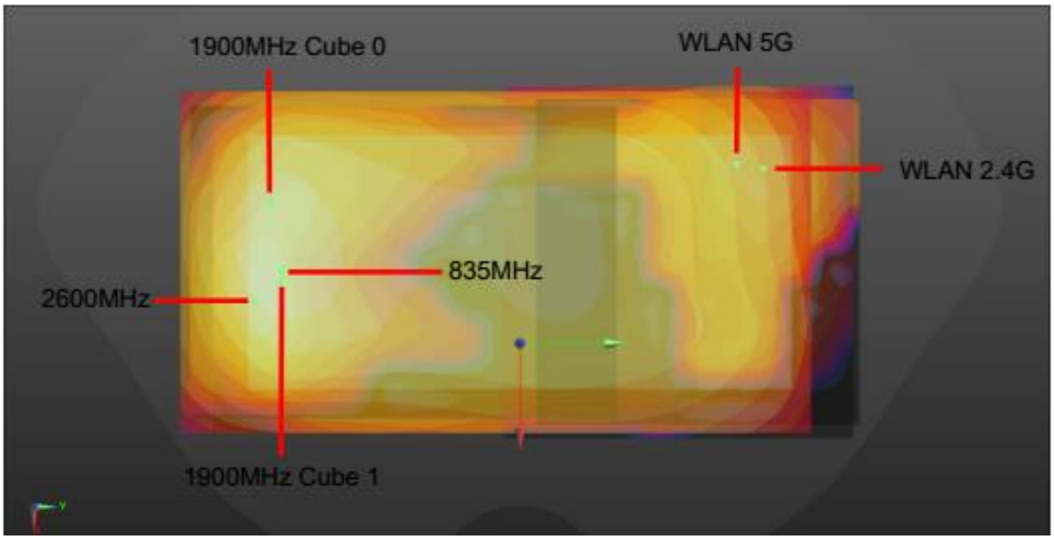
WWAN Band		Exposure Position	1 WWAN 10g SAR (W/kg)	5 5GHz WLAN Ant 3 10g SAR (W/kg)	1+5 Summed 10g SAR (W/kg)
GSM	GSM850Ant 1	Front		0.544	0.54
		Back	2.495	0.797	3.29
		Left side			0.00
		Right side		0.361	0.36
		Top side		1.719	1.72
		Bottom side			0.00
	GSM1900Ant 1	Front		0.544	0.54
		Back		0.797	0.80
		Left side			0.00
		Right side		0.361	0.36
		Top side		1.719	1.72
		Bottom side	3.465		3.47
WCDMA	WCDMA VAnt 1	Front		0.544	0.54
		Back	1.876	0.797	2.67
		Left side			0.00
		Right side		0.361	0.36
		Top side		1.719	1.72
		Bottom side			0.00
	WCDMA IIAnt 1	Front		0.544	0.54
		Back		0.797	0.80
		Left side			0.00
		Right side		0.361	0.36
		Top side		1.719	1.72
		Bottom side	3.278		3.28
LTE	LTE Band 5Ant 1	Front		0.544	0.54
		Back	1.855	0.797	2.65
		Left side			0.00
		Right side		0.361	0.36
		Top side		1.719	1.72
		Bottom side			0.00
	LTE Band 7Ant 1	Front		0.544	0.54
		Back	2.847	0.797	3.64
		Left side			0.00
		Right side		0.361	0.36
		Top side		1.719	1.72
		Bottom side			0.00
	LTE Band 41Ant 1	Front		0.544	0.54
		Back	3.068	0.797	3.87
		Left side			0.00
		Right side		0.361	0.36
		Top side		1.719	1.72
		Bottom side			0.00

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

15.5 SPLSR Evaluation and Analysis

General Note:

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



WWAN+WLAN2.4GHz /WLAN5GHz _Back 5mm

Case 1	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
	GSM850	Back	1.257	5	-0.022	-0.0735	-0.209	151.1	1.67	0.01	Not required
	WLAN 2.4G		0.415	5	-0.0538	0.0742	-0.209				

Case 2	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
	GSM1900 Cube 0	Back	1.321	5	-0.035	-0.077	-0.209	152.4	1.74	0.02	Not required
	WLAN 2.4G		0.415	5	-0.0538	0.0742	-0.209				
	GSM1900 Cube 1	Back	1.321	5	-0.035	-0.074	-0.209	149.4	1.74	0.02	Not required
	WLAN 2.4G		0.415	5	-0.0538	0.0742	-0.209				

Case 3	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
	WCDMA V	Back	1.24	5	-0.022	-0.072	-0.209	149.6	1.66	0.01	Not required
	WLAN 2.4G		0.415	5	-0.0538	0.0742	-0.209				

Case 4	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
	WCDMA II Cube 0	Back	1.269	5	-0.01	-0.07	-0.209	150.7	1.68	0.01	Not required
	WLAN 2.4G		0.415	5	-0.0538	0.0742	-0.209				
	WCDMA II Cube 1	Back	1.269	5	-0.0445	-0.077	-0.209	151.5	1.68	0.01	Not required
	WLAN 2.4G		0.415	5	-0.0538	0.0742	-0.209				

Case 5	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
	LTE B5	Back	1.249	5	-0.026	-0.072	-0.209	148.8	1.66	0.01	Not required
	WLAN 2.4G		0.415	5	-0.0538	0.0742	-0.209				

Case 6	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
	LTE B7	Back	1.288	5	-0.013	-0.0816	-0.209	161.1	1.70	0.01	Not required
	WLAN 2.4G		0.415	5	-0.0538	0.0742	-0.209				

Case 7	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
	LTE B41	Back	1.375	5	-0.0154	-0.0756	-0.209	154.6	1.79	0.02	Not required
	WLAN 2.4G		0.415	5	-0.0538	0.0742	-0.209				

Case 8	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
	GSM850	Back	1.257	5	-0.022	-0.0735	-0.209	145.5	1.63	0.01	Not required
	WLAN 5G		0.37	5	-0.056	0.068	-0.209				

Case 9	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
	GSM1900 Cube 0	Back	1.321	5	-0.035	-0.077	-0.209	146.5	1.69	0.02	Not required
	WLAN 5G		0.37	5	-0.056	0.068	-0.209				
	GSM1900 Cube 1	Back	1.321	5	-0.035	-0.074	-0.209	143.5	1.69	0.02	Not required
	WLAN 5G		0.37	5	-0.056	0.068	-0.209				

Case 10	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
	WCDMA V	Back	1.24	5	-0.022	-0.072	-0.209	144.1	1.61	0.01	Not required
	WLAN 5G		0.37	5	-0.056	0.068	-0.209				

Case 11	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
	WCDMA II Cube 0	Back	1.269	5	-0.01	-0.07	-0.209	145.5	1.64	0.01	Not required
	WLAN 5G		0.37	5	-0.056	0.068	-0.209				
	WCDMA II Cube 1	Back	1.269	5	-0.0445	-0.077	-0.209	145.5	1.64	0.01	Not required
	WLAN 5G		0.37	5	-0.056	0.068	-0.209				

Case 12	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE B5	Back	1.249	5	-0.026	-0.072	-0.209	143.2	1.62	0.01	Not required
	WLAN 5G		0.37	5	-0.056	0.068	-0.209				

Case 13	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE B7	Back	1.288	5	-0.013	-0.0816	-0.209	155.7	1.66	0.01	Not required
	WLAN 5G		0.37	5	-0.056	0.068	-0.209				

Case 14	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE B41	Back	1.375	5	-0.0154	-0.0756	-0.209	149.2	1.75	0.02	Not required
	WLAN 5G		0.37	5	-0.056	0.068	-0.209				

Test Engineer : Kevin Xu, David Dai, Bin He

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 616217 D04 v01r02, “SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers”, Oct 2015

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

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

[13] FCC KDB 941225 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.

System Check_835MHz

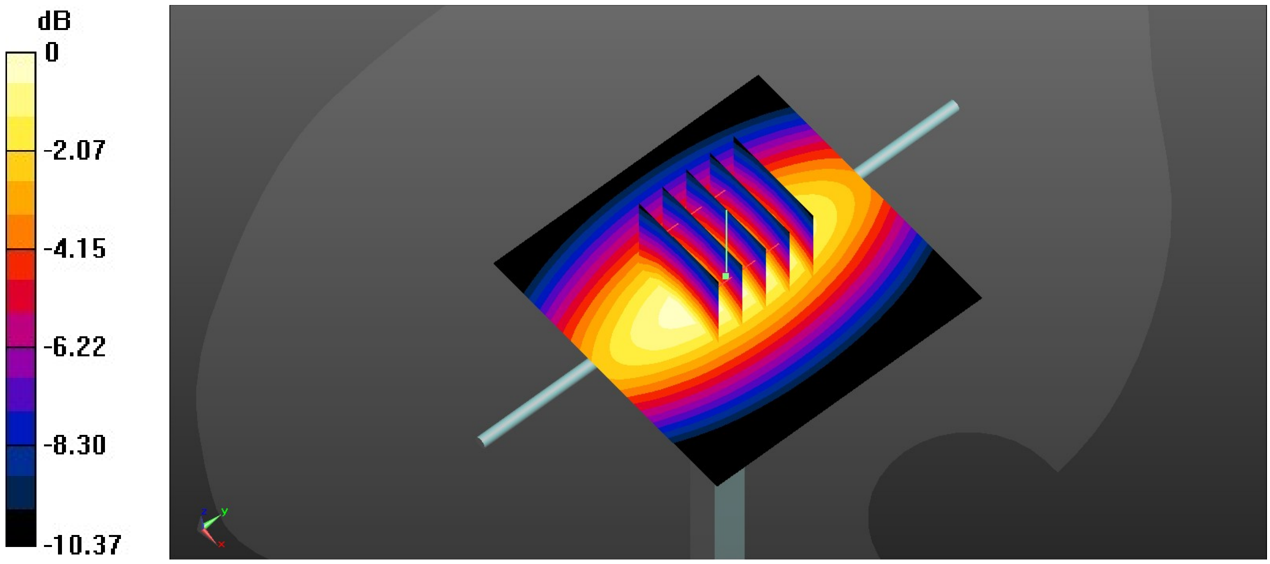
DUT: D835V2-SN:4d258

Communication System: UID 0, CW (0); Frequency: 835 MHz;Duty Cycle: 1:1
Medium: HSL_835_220123 Medium parameters used: f = 835 MHz; σ = 0.916 S/m; ε_r = 41.029; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7641; ConvF(10.9, 10.9, 10.9); Calibrated: 2021/3/15
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1664; Calibrated: 2021/3/1
- Phantom: Twin-SAM1(P1aP2a20); Type: QD 000 P40 CD; Serial: TP:1670
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 3.13 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 59.53 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 3.66 W/kg
SAR(1 g) = 2.52 W/kg; SAR(10 g) = 1.67 W/kg
Maximum value of SAR (measured) = 3.15 W/kg



0 dB = 3.15 W/kg

System Check_1900MHz

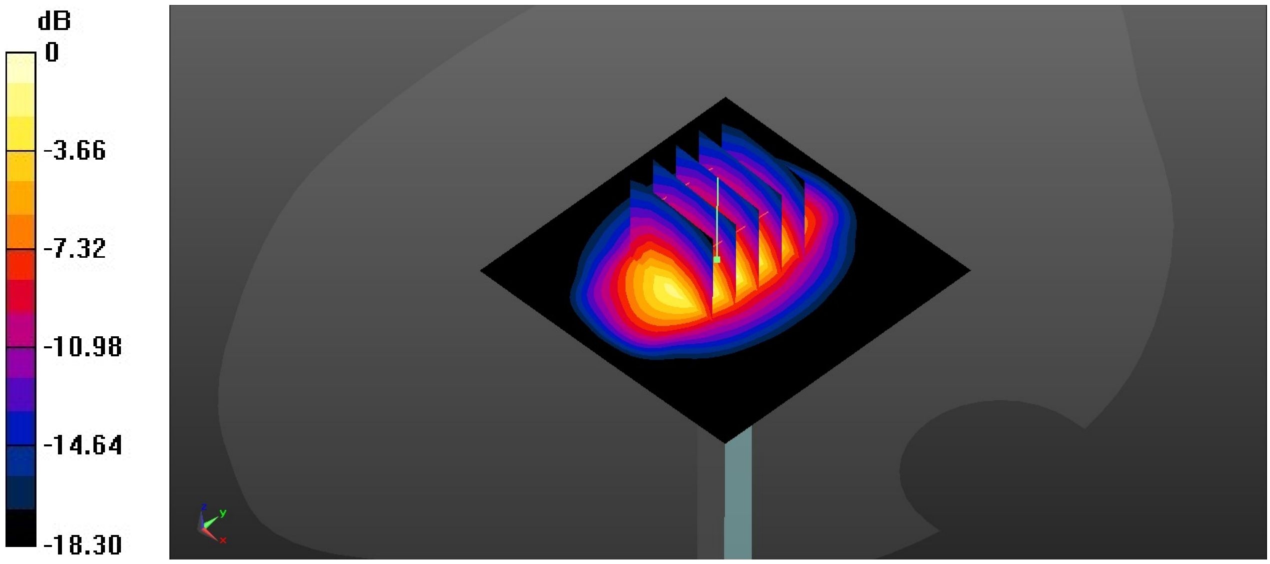
DUT: D1900V2-SN:5d170

Communication System: UID 0, CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: HSL_1900_220123 Medium parameters used: f = 1900 MHz; σ = 1.44 S/m; ε_r = 40.038; ρ = 1000 kg/m^3
Ambient Temperature : 23.6 ℃; Liquid Temperature : 22.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7641; ConvF(9.05, 9.05, 9.05); Calibrated: 2021/3/15
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1664; Calibrated: 2021/3/1
- Phantom: Twin-SAM1(P1aP2a20); Type: QD 000 P40 CD; Serial: TP:1670
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 15.2 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 97.22 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 18.8 W/kg
SAR(1 g) = 9.94 W/kg; SAR(10 g) = 5.11 W/kg
Maximum value of SAR (measured) = 15.7 W/kg



0 dB = 15.7 W/kg

System Check_2450MHz

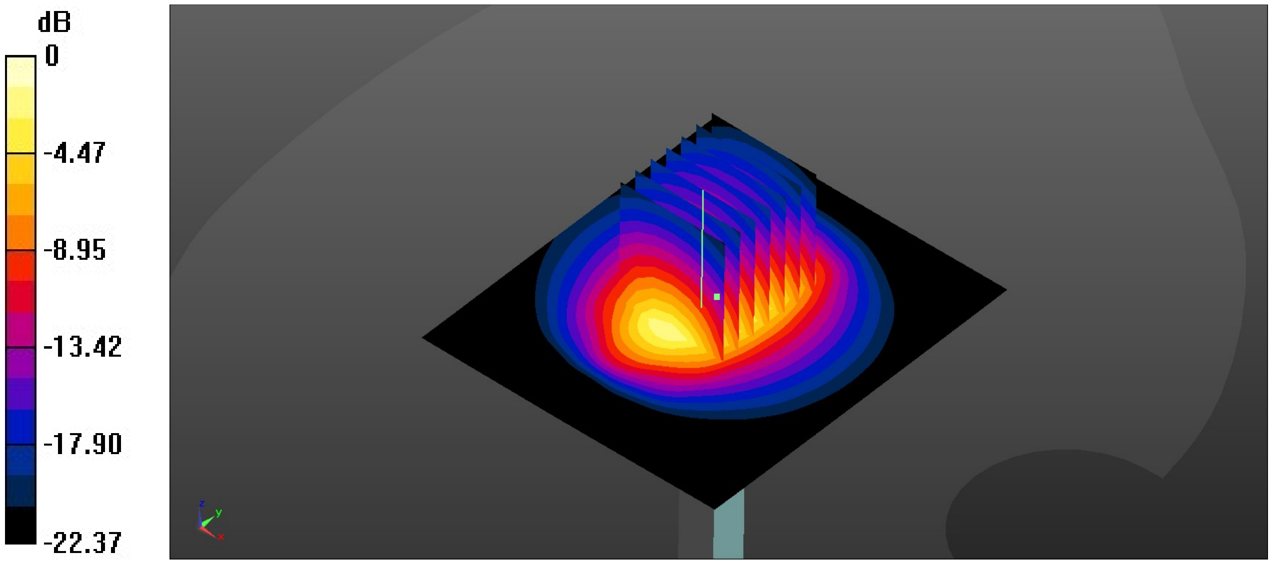
DUT: D2450V2-SN:924

Communication System: UID 0, CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: HSL_2450_220110 Medium parameters used: f = 2450 MHz; σ = 1.823 S/m; ε_r = 37.953; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7641; ConvF(8.29, 8.29, 8.29); Calibrated: 2021/3/15
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1664; Calibrated: 2021/3/1
- Phantom: Twin-SAM1(P1aP2a20); Type: QD 000 P40 CD; Serial: TP:1670
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

Pin=250mW/Area Scan (71x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 22.7 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 106.6 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 27.5 W/kg
SAR(1 g) = 13 W/kg; SAR(10 g) = 6.04 W/kg
Maximum value of SAR (measured) = 21.7 W/kg



0 dB = 21.7 W/kg

System Check_2600MHz

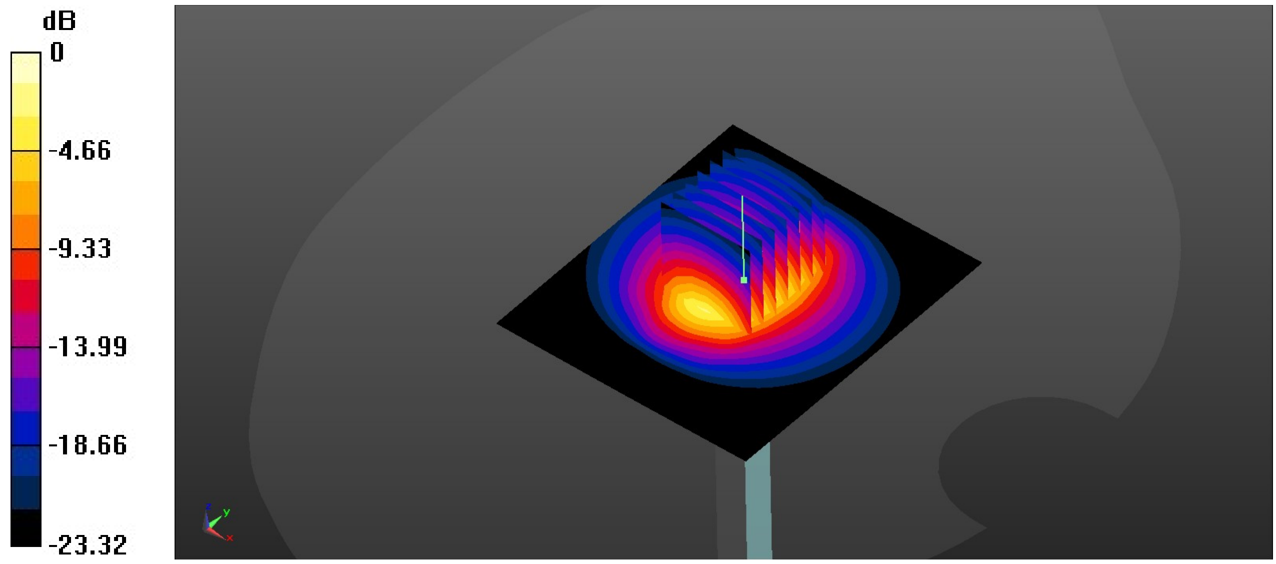
DUT: D2600V2-SN:1061

Communication System: UID 0, CW (0); Frequency: 2600 MHz;Duty Cycle: 1:1
Medium: HSL_2600_220123 Medium parameters used: f = 2600 MHz; σ = 1.894 S/m; ε_r = 40.24; ρ = 1000 kg/m^3
Ambient Temperature：23.1 ℃; Liquid Temperature：22.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7641; ConvF(7.94, 7.94, 7.94); Calibrated: 2021/3/15
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1664; Calibrated: 2021/3/1
- Phantom: Twin-SAM1(P1aP2a20); Type: QD 000 P40 CD; Serial: TP:1670
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

Pin=250mW/Area Scan (71x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 24.5 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 108.7 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 29.4 W/kg
SAR(1 g) = 13.6 W/kg; SAR(10 g) = 6.05 W/kg
Maximum value of SAR (measured) = 23.4 W/kg



0 dB = 23.4 W/kg

System Check_5250MHz

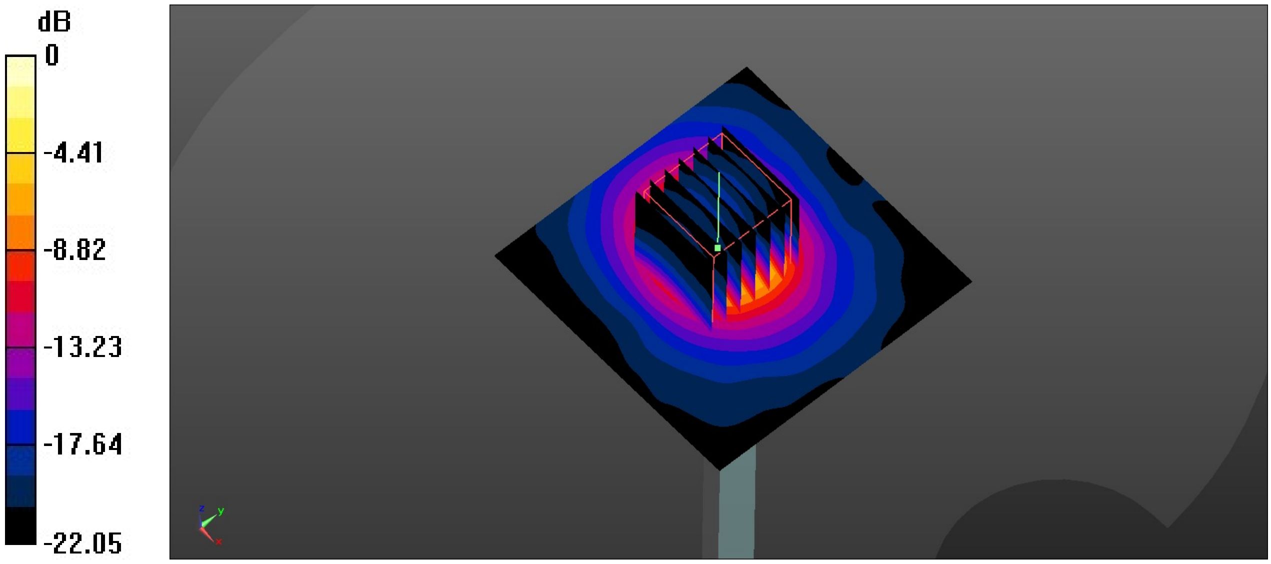
DUT: D5GHzV2-SN:1113

Communication System: UID 0, CW (0); Frequency: 5250 MHz;Duty Cycle: 1:1
Medium: HSL_5250_220113 Medium parameters used: f = 5250 MHz; σ = 4.748 S/m; ε_r = 36.885; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.1 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7641; ConvF(5.68, 5.68, 5.68); Calibrated: 2021/3/15
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1664; Calibrated: 2021/3/1
- Phantom: Twin-SAM1(P1aP2a20); Type: QD 000 P40 CD; Serial: TP:1670
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

Pin=100mW/Area Scan (71x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 13.7 W/kg

Pin=100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 38.22 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 22.0 W/kg
SAR(1 g) = 8.63 W/kg; SAR(10 g) = 2.11 W/kg
Maximum value of SAR (measured) = 13.9 W/kg



0 dB = 13.9 W/kg

System Check_5600MHz

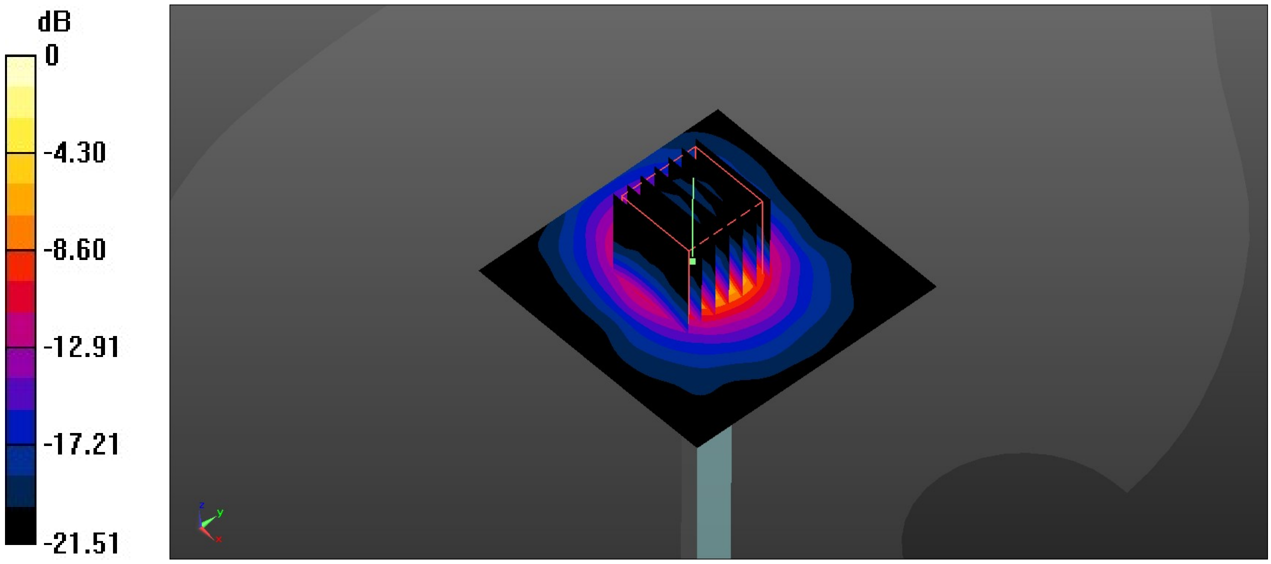
DUT: D5GHzV2-SN:1113

Communication System: UID 0, CW (0); Frequency: 5600 MHz;Duty Cycle: 1:1
Medium: HSL_5600_220113 Medium parameters used: f = 5600 MHz; σ = 5.211 S/m; ε_r = 36.23; ρ = 1000 kg/m^3
Ambient Temperature：23.9 ℃; Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7641; ConvF(5.03, 5.03, 5.03); Calibrated: 2021/3/15
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1664; Calibrated: 2021/3/1
- Phantom: Twin-SAM1(P1aP2a20); Type: QD 000 P40 CD; Serial: TP:1670
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

Pin=100mW/Area Scan (71x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 15.5 W/kg

Pin=100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 36.64 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 26.0 W/kg
SAR(1 g) = 9.03 W/kg; SAR(10 g) = 2.61 W/kg
Maximum value of SAR (measured) = 15.6 W/kg



0 dB = 15.6 W/kg

System Check_5750MHz

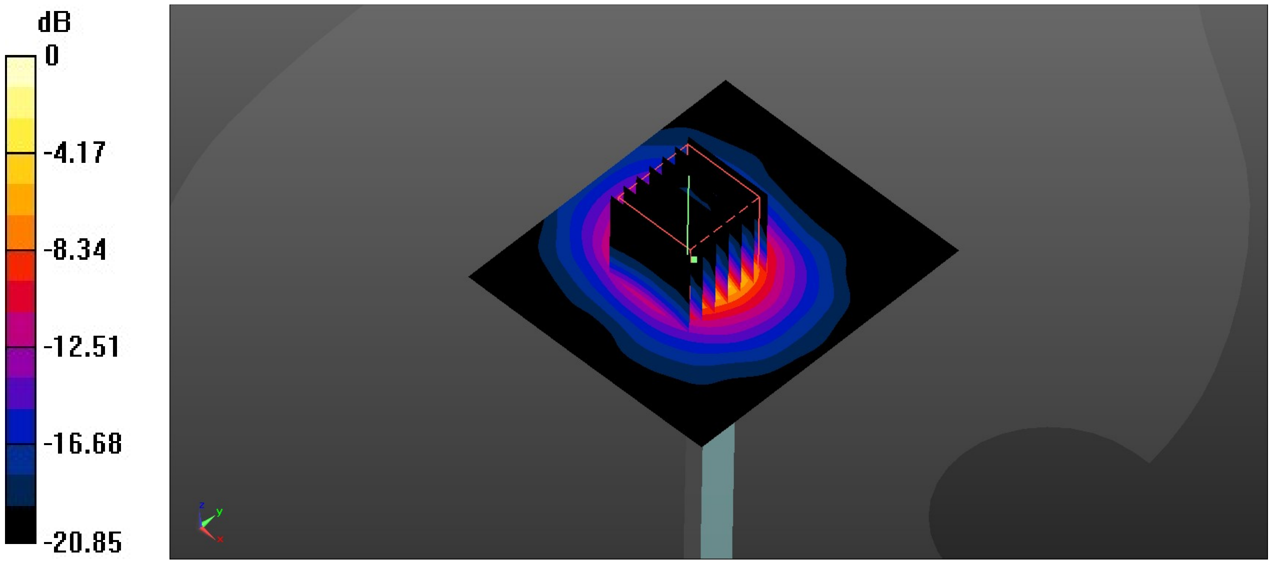
DUT: D5GHzV2-SN:1113

Communication System: UID 0, CW (0); Frequency: 5750 MHz;Duty Cycle: 1:1
Medium: HSL_5750_220113 Medium parameters used: f = 5750 MHz; σ = 5.383 S/m; ε_r = 35.944; ρ = 1000 kg/m^3
Ambient Temperature：23.1 ℃; Liquid Temperature：22.1 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7641; ConvF(5.3, 5.3, 5.3); Calibrated: 2021/3/15
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1664; Calibrated: 2021/3/1
- Phantom: Twin-SAM1(P1aP2a20); Type: QD 000 P40 CD; Serial: TP:1670
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

Pin=100mW/Area Scan (71x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 14.2 W/kg

Pin=100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 38.30 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 23.3 W/kg
SAR(1 g) = 8.76 W/kg; SAR(10 g) = 2.42 W/kg
Maximum value of SAR (measured) = 13.4 W/kg



0 dB = 13.4 W/kg

Appendix B. Plots of High SAR Measurement

The plots are shown as follows.

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab   Date: 2022/1/23

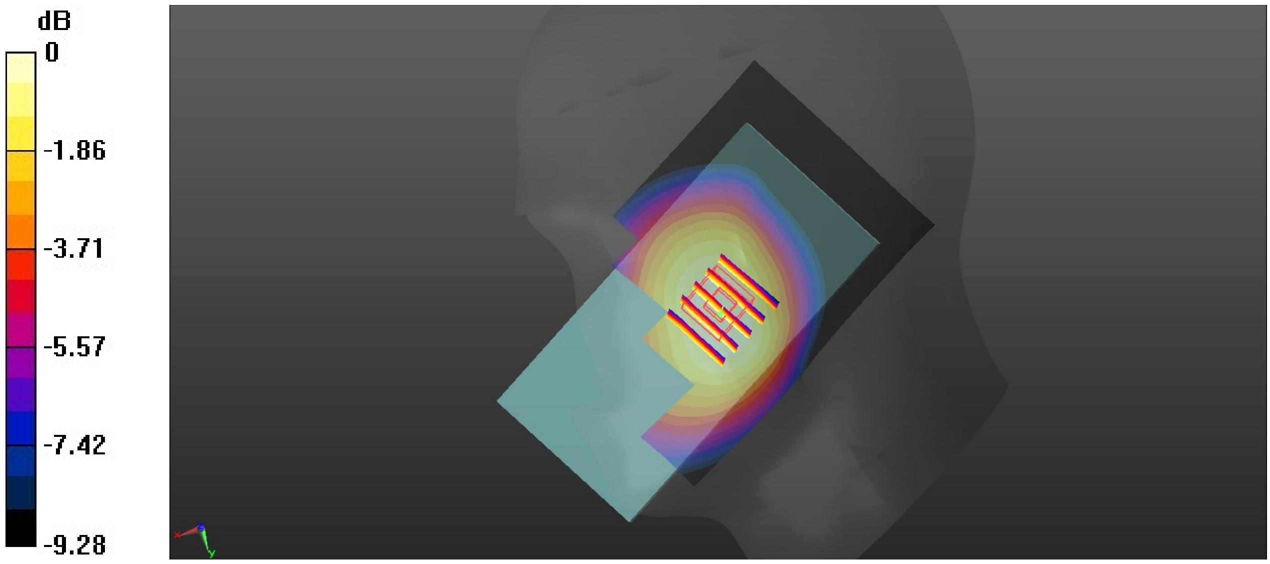
01_GSM850_GPRS 2 Tx slots_Right Cheek_Ch251

Communication System: UID 0, GPRS/EDGE10 (0); Frequency: 848.8 MHz;Duty Cycle: 1:4.15
Medium: HSL_835_220123 Medium parameters used: f = 849 MHz; σ = 0.884 S/m; ε_r = 41.566; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7641; ConvF(10.9, 10.9, 10.9); Calibrated: 2021/3/15
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1664; Calibrated: 2021/3/1
- Phantom: Twin-SAM1(P1aP2a20); Type: QD 000 P40 CD; Serial: TP:1670
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

Ch251/Area Scan (71x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.409 W/kg

Ch251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.232 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.439 W/kg
SAR(1 g) = 0.351 W/kg; SAR(10 g) = 0.270 W/kg
Maximum value of SAR (measured) = 0.406 W/kg



0 dB = 0.406 W/kg

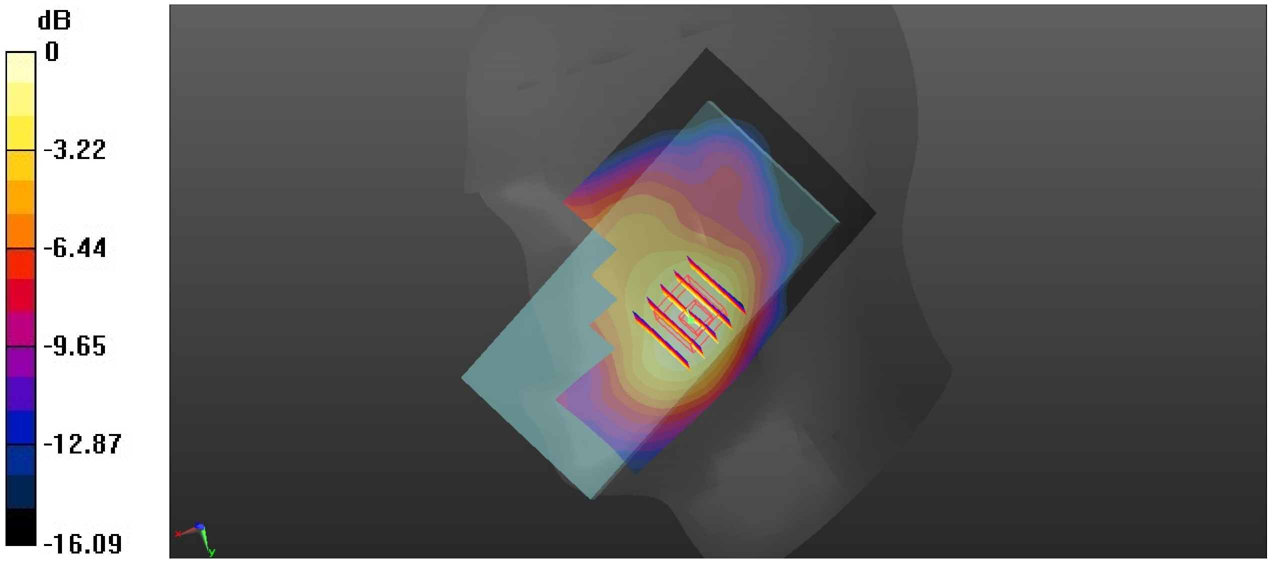
02_GSM1900_GPRS 2 Tx slots_Right Cheek_Ch661

Communication System: UID 0, GPRS/EDGE10 (0); Frequency: 1880 MHz;Duty Cycle: 1:4.15
Medium: HSL_1900_220123 Medium parameters used: f = 1880 MHz; σ = 1.37 S/m; ε_r = 38.824; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃; Liquid Temperature：22.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7641; ConvF(9.05, 9.05, 9.05); Calibrated: 2021/3/15
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1664; Calibrated: 2021/3/1
- Phantom: Twin-SAM1(P1aP2a20); Type: QD 000 P40 CD; Serial: TP:1670
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

Ch661/Area Scan (71x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.331 W/kg

Ch661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.953 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.387 W/kg
SAR(1 g) = 0.245 W/kg; SAR(10 g) = 0.153 W/kg
Maximum value of SAR (measured) = 0.318 W/kg



0 dB = 0.318 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2022/1/23

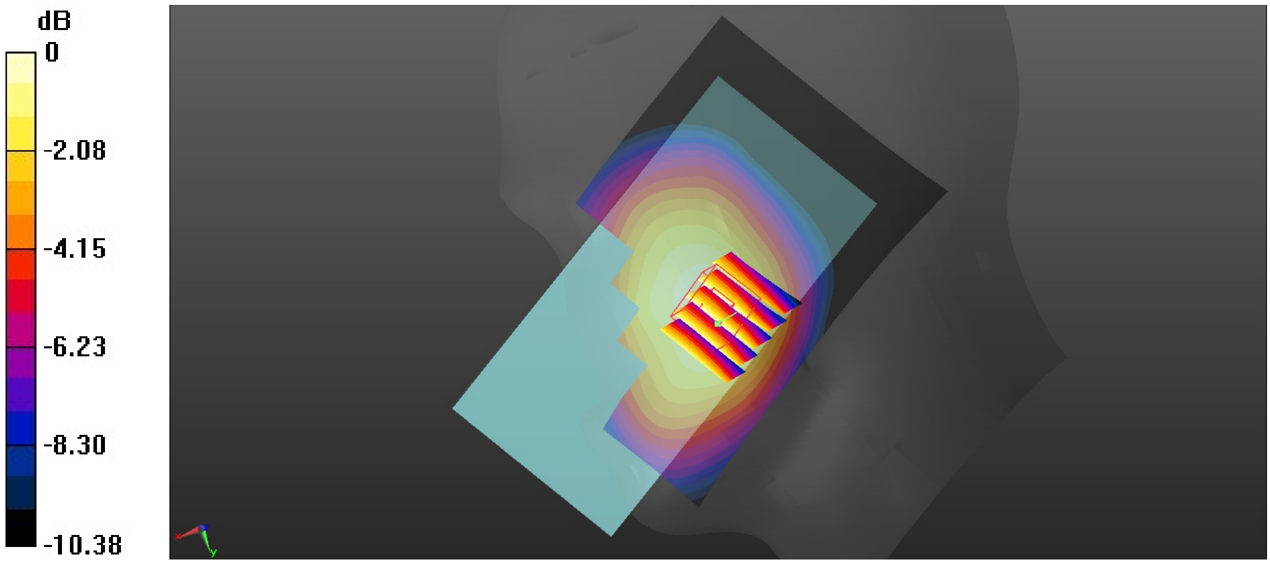
03_WCDMA V_RMC 12.2Kbps_Right Cheek_Ch4182

Communication System: UID 0, UMTS (0); Frequency: 836.4 MHz;Duty Cycle: 1:1
Medium: HSL_835_220123 Medium parameters used: f = 836.4 MHz; σ = 0.888 S/m; ε_r = 41.979; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7641; ConvF(10.9, 10.9, 10.9); Calibrated: 2021/3/15
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1664; Calibrated: 2021/3/1
- Phantom: Twin-SAM1(P1aP2a20); Type: QD 000 P40 CD; Serial: TP:1670
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

Ch4182/Area Scan (71x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.418 W/kg

Ch4182/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.910 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.443 W/kg
SAR(1 g) = 0.338 W/kg; SAR(10 g) = 0.253 W/kg
Maximum value of SAR (measured) = 0.403 W/kg



0 dB = 0.403 W/kg

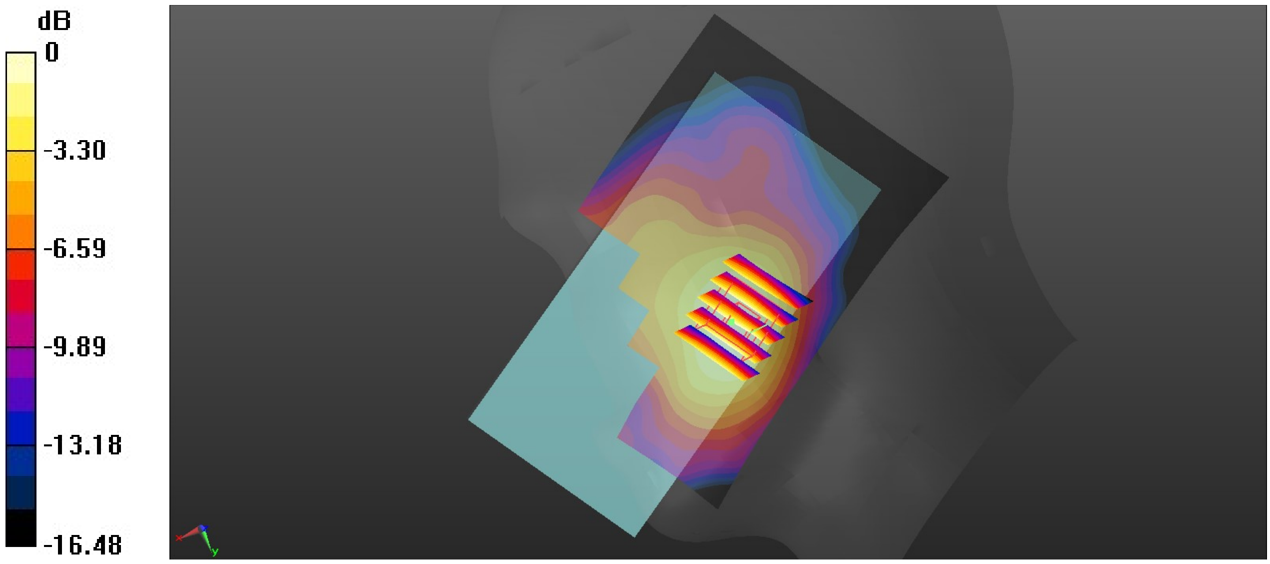
04_WCDMA II_RMC 12.2Kbps_Right Cheek_Ch9400

Communication System: UID 0, UMTS (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: HSL_1900_220123 Medium parameters used: f = 1880 MHz; σ = 1.37 S/m; ε_r = 38.824; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃; Liquid Temperature：22.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7641; ConvF(9.05, 9.05, 9.05); Calibrated: 2021/3/15
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1664; Calibrated: 2021/3/1
- Phantom: Twin-SAM1(P1aP2a20); Type: QD 000 P40 CD; Serial: TP:1670
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

Ch9400/Area Scan (71x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.519 W/kg

Ch9400/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.724 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.611 W/kg
SAR(1 g) = 0.380 W/kg; SAR(10 g) = 0.235 W/kg
Maximum value of SAR (measured) = 0.495 W/kg



0 dB = 0.495 W/kg

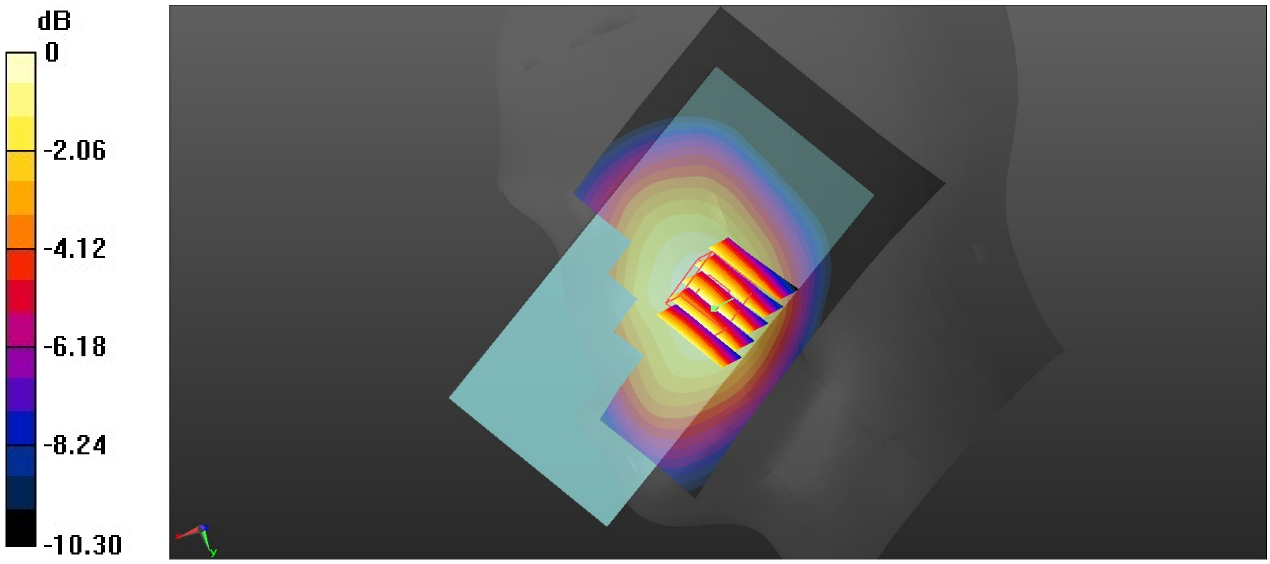
05_LTE Band 5_10M_QPSK_1RB_25Offset_Right Cheek_Ch20525

Communication System: UID 0, LTE (0); Frequency: 836.5 MHz;Duty Cycle: 1:1
Medium: HSL_835_220123 Medium parameters used: f = 836.5 MHz; σ = 0.888 S/m; ε_r = 41.978; ρ = 1000 kg/m^3
Ambient Temperature：23.5 °C; Liquid Temperature：22.6 °C

DASY5 Configuration:
- Probe: EX3DV4 - SN7641; ConvF(10.9, 10.9, 10.9); Calibrated: 2021/3/15
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1664; Calibrated: 2021/3/1
- Phantom: Twin-SAM1(P1aP2a20); Type: QD 000 P40 CD; Serial: TP:1670
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

Ch20525/Area Scan (71x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.424 W/kg

Ch20525/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.260 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 0.449 W/kg
SAR(1 g) = 0.345 W/kg; SAR(10 g) = 0.261 W/kg
Maximum value of SAR (measured) = 0.413 W/kg



0 dB = 0.413 W/kg