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SAR TEST REPORT

Applicant Name: **SAMSUNG Electronics Co., Ltd.** 129, Samsung-ro, Yeongtong-gu, Suwon-Si, Gyeonggi-do, 16677 Rep. of Korea	**Date of Issue: 05. 16, 2016** **Test Report No.: HCT-A-1605-F004** **Test Site: HCT CO., LTD.**

FCC ID: **A3LSMC5000**

Equipment Type:	**Mobile Phone**
Model Name:	**SM-C5000**
Testing has been carried out in accordance with:	**47CFR §2.1093** **ANSI/ IEEE C95.1 - 2005** **IEEE 1528-2013**
Date of Test:	**04/27/ 2016 ~ 05/10/ 2016**

This device has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment/general population exposure limits specified in FCC KDB procedures and had been tested in accordance with the measurement procedures specified in FCC KDB procedures.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Tested By

Young-Seok Yoo
Test Engineer / SAR Team
Certification Division

Reviewed By

Dong-Seob Kim
Technical Manager / SAR Team
Certification Division

DOCUMENT HISTORY

Rev.	DATE	DESCRIPTION
HCT-A-1605-F004	05. 16, 2016	First Approval Report

Table of Contents

1. Attestation of Test Result of Device Under Test

Test Laboratory	
Company Name:	HCT Co., LTD
Address	74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of Korea
Telephone	+82 31 645 6300
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Attestation of SAR test result					
Applicant Name:	SAMSUNG Electronics Co., Ltd.				
FCC ID:	A3LSMC5000				
Model:	SM-C5000				
EUT Type	Mobile Phone				
Application Type:	Certification				
The Highest Reported SAR					
Band	**Tx. Frequency (MHz)**	**Equipment Class**	**Reported 1g SAR (W/kg)**		
			Head	**Body-Worn**	**Hotspot**
GSM/GPRS/ EDGE 850	824.2 - 848.8	PCE	0.38	0.45	0.84
GSM/GPRS/ EDGE 1900	1 850.2 ~ 1 909.8	PCE	0.39	0.26	0.44
UMTS 850	826.4 - 846.6	PCE	0.25	0.33	0.53
UMTS 1900	1 852.4 - 1 907.6	PCE	0.51	0.34	0.78
LTE TDD Band 41	2 555 ~ 2 655	PCE	0.15	0.10	0.20
802.11b	2 412 - 2 462	DTS	0.59	<0.10	0.19
U-NII-1	5 180 - 5 240	NII	N/A		
U-NII-2A	5 260 - 5 320	NII	0.76	0.11	N/A
U-NII-2C	5 500 - 5 700	NII	0.98	0.10	N/A
U-NII-3	5 745 - 5 850	NII	0.96	0.18	0.31
Bluetooth	2 402 - 2 480	DSS/DTS	N/A		
Simultaneous SAR per KDB 690783 D01v01r03			1.49	0.65	1.15
Date(s) of Tests:	04/27/2016 ~ 05/10/2016				

2. Device Under Test Description

2.1 DUT specification

Device Wireless specification overview		
Band & Mode	**Operating Mode**	**Tx Frequency**
GSM/GPRS/EDGE 850	Voice / Data	824.2 – 848.8 MHz
GSM/GPRS/EDGE 1900	Voice / Data	1 850.0 – 1 909.8 MHz
UMTS 850	Voice / Data	826.4 – 846.6 MHz
UMTS 1900	Voice / Data	1 852.4 – 1 907.6 MHz
LTE TDD Band 41	Voice / Data	2 555 – 2 655 MHz
2.4 GHz WLAN	Data	2 412 – 2 462 MHz
U-NII-1	Data	5 180 – 5 240 MHz
U-NII-2A	Data	5 260 – 5 320 MHz
U-NII-2C	Data	5 500 – 5 700 MHz
U-NII-3	Data	5 745 – 5 850 MHz
Bluetooth	Data	2 402 – 2 480 MHz
NFC	Data	13.56 MHz
ANT+	Data	2402 – 2480 MHz

Device Description		
Device Dimension	Overall (Length x Width) : 145 mm x 73 mm Overall Diagonal : 153 mm Display Diagonal : 133 mm	
Battery Options	Normal Batteries (EB-BC500ABE)	
Hardware Version:	REV1.0	
Software Version :	C5000.001	
Device Serial Numbers	Mode	Serial Number
	GSM 850/ 1900, WCDMA 850/ 1900, LTE41 (Lower Ant.)	R28H32NLKCW
	GSM 850/ 1900, WCDMA 850/ 1900, LTE41 (Upper Ant.)	R28H41ZFW0K
	2G/5G WIFI Body	R28H43FP33L
	2G/5G WIFI Head	8930c46f
	Several samples with identical hardware were used to SAR testing. The manufacturer has confirmed that the devices tested have the same physical, mechanical and thermal characteristics are within operational tolerances expected for production units.	

2.2 DUT Wireless mode

Wireless Modulation	Band	Operating Mode		Duty Cycle
GSM	850 1900	Voice(GMSK) GPRS (GMSK) EGPRS (8PSK)	GPRS/ EDGE Multi-Slot Class: Class 33 – 4 Up, 5 Down Mode class B	GSM Voice: 12.5% GPRS 1 Slot: 12.5% 2 Slots : 25% 3 Slots : 37.5% 4 Slots : 50%
WCDMA (UMTS)	Band 5 Band 2	UMTS Rel.99 (Voice / DATA) HSDPA (Rel. 5) HSUPA (Rel. 6) HSPA+ (Rel. 9) (Uplink QPSK Only)		100 %
LTE Band	41	Data (QPSK, 16QAM)		63.33 % (TDD)
2.4 GHz WLAN		Data	802.11 b, 802.11 g, 802.11 n (HT20)	98.94 %
5 GHz WLAN		Data	802.11 a, 802.11 n (HT20/HT40)	93.30 %
Bluetooth		Data	4.2 LE	N/A
Others		This EUT support dual SIM cards. SIM path is using same RF path. This device was tested with SIM 1.		

2.3 LTE information

Item.	Description
Frequency Range:	Band 41: 2 555 MHz ~ 2 655 MHz
Channel Bandwidths	Band 41: 5 MHz, 10 MHz, 15 MHz, 20 MHz

Channel Numbers& Frequencies(MHz):

Band 41							
5 MHz		10 MHz		15 MHz		20 MHz	
Ch.	Freq. (MHz)	Ch.	Freq. (MHz)	Ch.	Freq. (MHz)	Ch.	Freq. (MHz)
40265	2557.5	40290	2560	40315	2562.5	40340	2565
40740	2605.0	40740	2605	40740	2605.0	40740	2605
41215	2652.5	41190	2650	41165	2647.5	41140	2645

Item.	Description		
UE Category	UE Category 7		
LTE Carrier Aggregation Possible Combinations	LTE B41 (PCC) + LTE B41 (SCC) Contiguous CA		
	10MHz(B41)+20MHz(B41)	20MHz(B41)+10MHz(B41)	
	15MHz(B41)+15MHz(B41)	20MHz(B41)+15MHz(B41)	
	15MHz(B41)+20MHz(B41)	20MHz(B41)+20MHz(B41)	
	LTE B41 (PCC) + LTE B41 (SCC) non- Contiguous CA		
	10MHz(B41)+10MHz(B41)	10MHz(B41)+15MHz(B41)	10MHz(B41)+20MHz(B41)
	15MHz(B41)+10MHz(B41)	15MHz(B41)+15MHz(B41)	15MHz(B41)+20MHz(B41)
	20MHz(B41)+10MHz(B41)	20MHz(B41)+15MHz(B41)	20MHz(B41)+20MHz(B41)
Modulations Supported in UL	QPSK, 16QAM		
LTE voice/data requirements	Voice / DATA		
	This DUT support VOLTE. LTE Head SAR is also evaluated.		
LTE MPR options	The EUT incorporates MPR as per 3GPP TS 36.101 sec. 6.2.3 ~ 6.2.5		
	The MPR is permanently built-in by design as a mandatory.		
	A-MPR is not implemented in the DUT.		
Power reduction explanation	This device doesn't implements power reduction.		
LTE Carrier Aggregation	This device only supports downlink Carrier Aggregation.		
LTE Release 10 Additional Information	This device does not support full CA feature on 3GPP Release 10. It supports a maximum of 2 carriers in the downlink. All uplink communications are identical to the Release 8 specifications. Uplink communications are done on the PCC. Due to carrier capability, only the combinations listed above are supported. The following LTE release 10 features are not supported: Replay, HetNet, Enhanced MIMO, eICI, WIFI offloading, MDH, eMBHA, Cross-Carrier Scheduling, Enhanced SC-FDMA.		
Description of the test equipment, software, etc.	LTE SAR Testing was performed using a CMW500. UE transmits with maximum output power during SAR testing.		

2.4 TEST METHODOLOGY and Procedures

The tests documented in this report were performed in accordance with IEEE Standard 1528-2013 & IEEE 1528-2005 and the following published KDB procedures.

- FCC KDB Publication 941225 D01 3G SAR Procedures v03r01
- FCC KDB Publication 941225 D06 Hot Spot SAR v02r01
- FCC KDB Publication 941225 D05 SAR for LTE Devices v02r05
- FCC KDB Publication 941225 D05A LTE Rel.10 KDB Inquiry sheet v01r02
- FCC KDB Publication 248227 D01 802.11 Wi-Fi SAR v02r02
- FCC KDB Publication 447498 D01 General SAR Guidance v06
- FCC KDB Publication 648474 D04 Handset SAR v01r03
- FCC KDB Publication 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04
- FCC KDB Publication 865664 D02 SAR Reporting v01r02
- October 2013 TCB Workshop Notes (GPRS testing criteria)
- April 2015 TCB Workshop Notes (Simultaneous transmission summation clarified)

2.5 Nominal and Maximum Output Power Specifications

This device operates using the following maximum output power specifications. SAR values were scaled to the maximum allowed power to determine compliance per KDB publication 447498 D01v06.

2.5.1 Maximum Output Power

Mode / Band		Voice (dBm)	Burst Average GMSK (dBm) GPRS				Burst Average 8-PSK (dBm) EDGE			
		1 Tx Slot	1 Tx Slot	2 Tx Slot	3 Tx Slot	4 Tx Slot	1 Tx Slot	2 Tx Slot	3 Tx Slot	4 Tx Slot
GSM/GPRS/EDGE 850	Maximum	33.0	33.0	30.5	28.5	26.5	27.0	26.0	25.0	24.0
	Nominal	32.5	32.5	30.0	28.0	26.0	26.5	25.5	24.5	23.5
GSM/GPRS/EDGE 1900	Maximum	30.0	30.0	28.0	26.0	24.0	26.5	25.2	24.5	23.8
	Nominal	29.5	29.5	27.5	25.5	23.5	26.0	24.7	24.0	23.3

Mode / Band		3GPP WCDMA (dBm)	3GPP HSDPA (dBm)	3GPP HSUPA (dBm)
UMTS Band 5 (850 MHz)	Maximum	23.0	22.0	22.0
	Nominal	22.5	21.5	21.5
UMTS Band 2 (1900 MHz)	Maximum	23.0	22.0	22.0
	Nominal	22.5	21.5	21.5

Mode / Band		Modulated Average (dBm)
LTE Band 41	Maximum	23.8
	Nominal	23.3

Mode / Band			Modulated Average (dBm)
IEEE 802.11b (2.4 GHz)		Maximum	15.5
		Nominal	15.0
IEEE 802.11g (2.4 GHz)		Maximum	12.5
		Nominal	12.0
IEEE 802.11n (2.4 GHz)		Maximum	10.5
		Nominal	10.0
5 GHz WIFI (20MHz BW)	IEE 802.11a	Maximum	13.5
		Nominal	13.0
	IEEE 802.11n	Maximum	11.5
		Nominal	11.0
Bluetooth		Maximum	11.5
		Nominal	11.0
Bluetooth LE		Maximum	1.5
		Nominal	1.0

2.6 DUT Antenna Locations

Device Edges / Sides for SAR Testing							
Mode	ANT	Rear	Front	Left	Right	Bottom	Top
GSM/GPRS/ EDGE 850	Ant.1 (Primary)	Yes	Yes	Yes	Yes	Yes	No
GSM/GPRS/ EDGE 1900	Ant.1 (Primary)	Yes	Yes	Yes	Yes	Yes	No
UMTS 850	Ant.1 (Primary)	Yes	Yes	Yes	Yes	Yes	No
UMTS 1900	Ant.1 (Primary)	Yes	Yes	Yes	Yes	Yes	No
LTE Band 41	Ant.1 (Primary)	Yes	Yes	Yes	Yes	Yes	No
GSM/GPRS/ EDGE 850	Ant. 2(Diversity)	Yes	Yes	No	Yes	No	Yes
GSM/GPRS/ EDGE 1900	Ant. 2 (Diversity)	Yes	Yes	No	Yes	No	Yes
UMTS 850	Ant. 2(Diversity)	Yes	Yes	No	Yes	No	Yes
UMTS 1900	Ant. 2 (Diversity)	Yes	Yes	No	Yes	No	Yes
LTE Band 41	Ant. 2 (Diversity)	Yes	Yes	No	Yes	No	Yes
2.4 GHz WLAN	N/A	Yes	Yes	Yes	No	No	Yes
5 GHz WLAN	N/A	Yes	Yes	Yes	No	No	Yes

Particular EUT edges were not required to be evaluated for Wireless Router SAR if the edges were > 25 mm from the transmitting antenna according to FCC KDB 941225 D06v02r01 on page 2. The distance between the transmit antennas and the edges of the device are included in the filing. The A diagram showing device antenna can be found in SAR_setup_photos. When wireless router mode is enabled, U-NII-1, U-NII-2A, U-NII-2C operation are disabled. Therefore U-NII-1, U-NII-2A, U-NII-2C operations are not considered in this section.

Note: All test configurations are based on front view.

2.7 Near Field Communications (NFC) Antenna

This EUT has NFC operations. The NFC antenna is integrated into the device for this model. Therefore, all SAR tests were performed with the device which already incorporates the NFC antenna. A diagram showing the location of the NFC antenna can be found in SAR_setup_photos.

2.8 SAR Summation Scenario

According to FCC KDB 447498 D01v06, transmitters are considered to be transmitting simultaneously when there is overlapping transmission, with the exception of transmissions during network hand-offs with maximum hand-off duration less than 30 seconds. Possible transmission paths for the EUT are shown below paths and are mode in same rectangle to indicate communication modes which share the same path. Modes which share the same transmission path cannot transmit simultaneously with one another.

Simultaneous transmission paths

This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis according to FCC KDB 447498 D01v06.

Simultaneous Transmission Scenarios				
Applicable Combination	ANT	Head	Body-Worn	Hotspot
GSM Voice + 2.4 GHz WiFi	1 (Primary)	Yes	Yes	N/A
GSM Voice + 5 GHz WiFi		Yes	Yes	N/A
GSM Voice + 2.4 GHz Bluetooth		N/A	Yes	N/A
GPRS + 2.4 GHz WiFi		N/A	N/A	Yes
GPRS + 5 GHz WiFi		N/A	N/A	Yes
GPRS + 2.4 GHz Bluetooth		N/A	N/A	N/A
UMTS + 2.4 GHz WiFi		Yes	Yes	Yes
UMTS + 5 GHz WiFi		Yes	Yes	Yes
UMTS + 2.4 GHz Bluetooth		N/A	Yes	N/A
LTE + 2.4 GHz WiFi		Yes	Yes	Yes
LTE + 5 GHz WiFi		Yes	Yes	Yes
LTE+ 2.4 GHz Bluetooth		N/A	Yes	N/A
GSM Voice + 2.4 GHz WiFi	2 (Diversity)	N/A	Yes	N/A
GSM Voice + 5 GHz WiFi		N/A	Yes	N/A
GSM Voice + 2.4 GHz Bluetooth		N/A	Yes	N/A
GPRS + 2.4 GHz WiFi		N/A	N/A	Yes
GPRS + 5 GHz WiFi		N/A	N/A	Yes
GPRS + 2.4 GHz Bluetooth		N/A	N/A	N/A
UMTS + 2.4 GHz WiFi		N/A	Yes	Yes
UMTS + 5 GHz WiFi		N/A	Yes	Yes
UMTS + 2.4 GHz Bluetooth		N/A	Yes	N/A
LTE + 2.4 GHz WiFi		N/A	Yes	Yes
LTE + 5 GHz WiFi		N/A	Yes	Yes
LTE+ 2.4 GHz Bluetooth		N/A	Yes	N/A

1. Ant 1 and Ant 2 operate in a switched condition only and cannot transmit simultaneously.
2. Ant 1 and Ant 2 share the same conducted power, since Ant 2 (Diversity) is fed by the same set of identical hardware.
3. Ant 2 (Diversity) is not operating voice and VoIP mode by manufacturer.
4. 2.4 GHz WLAN, 5GHz WLAN and 2.4 GHz Bluetooth share antenna path and cannot transmit simultaneously.
5. All licensed modes share the same antenna path and cannot transmit simultaneously.
6. UMTS +WLAN scenario also represents the UMTS Voice/DATA + WLAN hotspot scenario.
7. Per the manufacturer, GPRS does not support VOIP service.
8. Per the manufacturer, WIFI Direct is not expected to be used in conjunction with a held-to-ear or body-worn accessory voice call. Therefore, there are no simultaneous transmission scenarios involving WIFI direct beyond that listed in the above table.
9. This device supports VoLTE.
10. The highest reported SAR for each exposure condition is used for SAR summation purpose.
11. 5 GHz wireless Mobile Hotspot is only supported for the U-NII-3 Band, therefore , U-NII1,U-NII-2A and U-NII-2C bands were not evaluated for Mobile Hotspot conditions.

2.9 SAR Test Exclusions Applied

(A) WiFi

Since wireless router operations are not allowed by the chipset firmware using U-NII-1, U-NII-2A & U-NII-2C WiFi, WiFi Hotspot SAR test and combinations are considered only 2.4 GHz and U-NII-3 for SAR with respected to wireless router configurations according to FCC KDB 941225 D06v02.

Since U-NII-1 and U-NII-2A bands have the same maximum output power and the highest reported SAR for U-NII-2A is less than 1.2 W/kg for 1g SAR and is less than 3.0 W/kg for 10g SAR, SAR is not required for U-NII-1 band according to FCC KDB 248227 D01v02r02.

(B) BT & BT LE

Per FCC KDB 447498 D01v06, The SAR exclusion threshold for distance < 50mm is defined by the following equation:

$$\frac{Max\ Power\ of\ Channel(mW)}{Test\ \ Separation\ Distance\ (mm)} * \sqrt{Frequency(GHz)} \leq 3.0$$

Mode	Frequency	Maximum Allowed Power	Separation Distance	≤ 3.0
	[MHz]	[mW]	[mm]	
Bluetooth	2 480	14	15	1.5
Bluetooth LE	2 480	1	15	0.1

Based on the maximum conducted power of Bluetooth and antenna to use separation distance, Bluetooth SAR was not required [(14/15)*√2.480] = 1.5 < 3.0.
Based on the maximum conducted power of Bluetooth LE and antenna to use separation distance, Bluetooth LE SAR was not required [(1/15)*√2.480] = 0.1 < 3.0.

This device contains transmitters that may operate simultaneously. Therefore simultaneous transmission analysis is required. Per FCC KDB 447498 D01v06 IV.C.1iii, simultaneous transmission SAR test exclusion may be applied when the sum of the 1-g SAR for all the simultaneous transmitting antennas in a specific a physical test configuration is ≤ 1.6W/kg. When standalone SAR is not required to be measured per FCC KDB 447498 D01v06 4.3.22, the following equation must be used to estimate the standalone 1-g SAR for simultaneous transmission assessment involving that transmitter.

$$Estimated\ SAR = \frac{\sqrt{f(GHZ)}}{7.5} * \frac{(Max\ Power\ of\ channel\ mW)}{Min\ Seperation\ Distance}.$$

Mode	Frequency	Maximum Allowed Power	Separation Distance (Body)	Estimated SAR (Body)
	[MHz]	[mW]	[mm]	[W/kg]
Bluetooth	2 480	14	15	0.196
Bluetooth LE	2 480	1	15	0.014

Note :
1) Held-to ear configurations are not applicable to Bluetooth and Bluetooth LE operations and therefore were not considered for simultaneous transmission. The Estimated SAR results were determined according to FCC KDB447498 D01v06.
.
2) The frequency of Bluetooth and Bluetooth LE using for estimated SAR was selected highest channel of Bluetooth LE for highest estimated SAR.

(C) Licensed Transmitter(s)

GSM/GPRS/EDGE is not supported for US bands. Therefore, the GSM Voice modes in this report do not transmit simultaneously with GPRS/EDGE Data.

This device is only capable of QPSK HSUPA in the uplink. Therefore, no additional SAR tests are required beyond that described for devices with HSUPA in KDB 941225 D01v03r01.

LTE SAR for the higher modulations and lower bandwidths were not tested since the maximum average output power of all required channels and configurations was not more than 0.5 dB higher than the highest bandwidth; and the reported LTE SAR for the highest bandwidth was less than 1.45 W/kg for all configurations according to FCC KDB 941225 D05v02r05.

This device supports LTE Carrier Aggregation (CA) in the downlink only. All uplink communications are identical to Release 8 specifications. Per FCC KDB publication 941225 D05A v01r02, SAR for LTE CA operations was not needed since the maximum average output power in LTE CA mode was not >0.25 dB higher than the maximum output power when downlink carrier aggregation was inactive.

Per FCC KDB 941225 D01v03r01, 12.2 kbps RMC is the primary mode and HSPA (HSUPA/HSDPA with RMC) is the secondary mode.

Per FCC KDB 941225 D01v03r01, The SAR test exclusion is applied to the secondary mode by the following equation.

$$\text{Adjusted SAR} = \text{Highest Reported SAR} * \frac{Secondary\ Max\ tune - up\ (mW)}{Primary\ Max\ tune\ tune - up(mW)} \leq 1.2\ \text{W/kg}.$$

Based on the highest Reported SAR, the secondary mode is not required.

[0.779 * (158/200)] = 0.619 W/kg ≤ 1.2 W/kg

And the maximum output power and tune-up tolerance in secondary mode is ≤ 0.25 dB higher than the primary mode.

3. INTRODUCTION

The FCC has adopted the guidelines for evaluating the environmental effects of radio frequency radiation in ET Docket 93-62 on Aug. 6, 1996 to protect the public and workers from the potential hazards of RF emissions due to FCC-regulated portable devices.

The safety limits used for the environmental evaluation measurements are based on the criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (SAR) in IEEE/ANSI C95.1-2005 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz. 1992 by the Institute of Electrical and Electronics Engineers, Inc., New York 10017. The measurement procedure described in IEEE/ANSI C95.3-1992 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave is used for guidance in measuring SAR due to the RF radiation exposure from the Equipment Under Test (EUT). These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields," NCRP Report No. 86 NCRP, 1986, Bethesda, MD 20814. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards.

SAR Definition

Specific Absorption Rate (SAR) is defined as the time derivative of the incremental electromagnetic energy (d*W*) absorbed by (dissipated in) an incremental mass (d*m*) contained in a volume element (d*V*) of a given density (*r*). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body.

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

Figure 1. SAR Mathematical Equation

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

$$SAR = \sigma E^2 / \rho$$

Where:

σ = conductivity of the tissue-simulant material (S/m)

ρ = mass density of the tissue-simulant material (kg/㎥)

E = Total RMS electric field strength (V/m)

NOTE: The primary factors that control rate of energy absorption were found to be the wavelength of the incident field in relations to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces, and whether conductive contact is made by the organism with a ground plane.

4. DESCRIPTION OF TEST EQUIPMENT

4.1 SAR MEASUREMENT SETUP

These measurements are performed using the DASY4 automated dosimetric assessment system. It is made by Schmid & Partner Engineering AG (SPEAG) in Zurich, Switzerland. It consists of high precision robotics system (Staubli), robot controller, Pentium III computer, near-field probe, probe alignment sensor, and the generic twin phantom containing the brain equivalent material. The robot is a six-axis industrial robot performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF) (see Figure.2).

A cell controller system contains the power supply, robot controller, teach pendant (Joystick), and remote control, is used to drive the robot motors. The PC with Windows XP or Windows 7 is working with SAR Measurement system DASY4 & DASY5, A/D interface card, monitor, mouse, and keyboard. The Staubli Robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card.

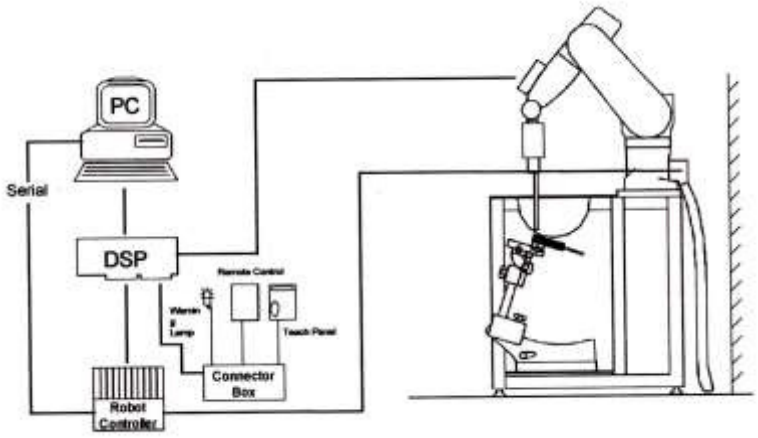


Figure 2. HCT SAR Lab. Test Measurement Set-up

The 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 PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer. The system is described in detail in.

4.2 SAM Phantom

The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.

Shell Thickness	2.0 mm ± 0.2 mm (6 ± 0.2 mm at ear point)
Filling Volume	about 25 L
Dimensions	810 mm x 1 000 mm x 500 mm (H x L x W)

Fig. 4-1 SAM Phantom

Triple Modular Phantom consists of tree identical modules which can be installed and removed separately without emptying the liquid. It includes three reference points for phantom installation. Covers prevent evaporation of the liquid. Phantom material is resistant to DGBE based tissue simulating liquids. The MFP V5.1 will be delivered including wooden support only (non-standard SPEAG support).
Applicable for system performance Cheek from 700 MHz to 6 GHz (MFP V5.1C) as well as dosimetric evaluations for body-worn operation.

Shell Thickness	2.0 mm ± 0.2 mm
Filling Volume	approx. 8.1 L
Dimensions	830 mm x 500 mm (L x W)

Fig. 4-2. MFP V5.1C

4.4 Device Holder for Transmitters

In combination with the SAM Phantom V 4.0, the Mounting Device (POM) enables the rotation of the mounted transmitter in spherical coordinates whereby the rotation points is the ear opening. The devices can be easily, accurately, and repeatable positioned according to the FCC and CENELEC specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).

Note: A simulating human hand is not used due to the complex anatomical and geometrical structure of the hand that may produced infinite number of configurations. To produce the Worst-case condition (the hand absorbs antenna output power), the hand is omitted during the tests.

Fig. 4-3. Device Holder

5. SAR MEASUREMENT PROCEDURE

The evaluation was performed with the following procedure:

1. The SAR distribution at the exposed side of the head or body was measured at a distance no more than 5.0 mm from the inner surface of the shell. The area covered the entire dimension of the DUT's head and body area and the horizontal grid resolution was depending on the FCC KDB 865664 D01v01r04 table 4-1 & IEEE 1528-2013.

2. Based on step, the area of the maximum absorption was determined by sophisticated interpolations routines implemented in DASY software. When an Area Scan has measured all reachable point. DASY system computes the field maximal found in the scanned are, within a range of the maximum. SAR at this fixed point was measured and used as a reference value.

3. Around this point, a volume was assessed according to the measurement resolution and volume size requirements of FCC KDB 865664 D01v01r04 table 4-1 and IEEE 1528-2013. On the basis of this data set, the spatial peak SAR value was evaluated with the following procedure (reference from the DASY manual.)

   a. The data at the surface were extrapolated, since the center of the dipoles is no more than 2.7 mm away from the tip of the probe (it is different from the probe type) and the distance between the surface and the lowest measuring point is 1.2 mm. The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.

   b. The maximum interpolated value was searched with a straight-forward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g or 10 g) were computed using the 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the "Not a knot" condition (in x, y, and z directions. The volume was integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the average.

   c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

4. The SAR reference value, at the same location as step 2, was re-measured after the zoom scan. If the value changed by more than 5 %, the SAR evaluation and drift measurements were repeated.

Area scan and zoom scan resolution setting follow KDB 865664 D01v01r04 quoted below.

			≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface			5±1 mm	$^1/_2 \cdot \delta \cdot \ln(2) \pm 0.5$ mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location			30°±1°	20°±1°
Maximum area scan Spatial resolution: 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.	
Maximum zoom scan Spatial resolution: Δx_{zoom}, Δy_{zoom}			≤ 2 GHz: ≤8mm 2-3 GHz: ≤5mm*	3-4 GHz: ≤5 mm* 4-6 GHz: ≤4 mm*
Maximum zoom scan Spatial resolution normal to phantom surface	uniform grid: $\Delta z_{zoom}(n)$		≤ 5 mm	3-4 GHz: ≤4 mm 4-5 GHz: ≤3 mm 5-6 GHz: ≤2 mm
	graded grid	$\Delta z_{zoom}(1)$: between 1st two Points closest to phantom surface	≤ 4 mm	3-4 GHz: ≤3 mm 4-5 GHz: ≤2.5 mm 5-6 GHz: ≤2 mm
		$\Delta z_{zoom}(n>1)$: between subsequent Points	$\leq 1.5 \cdot \Delta z_{zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3-4 GHz: ≥28 mm 4-5 GHz: ≥25 mm 5-6 GHz: ≥22 mm

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

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

6. DESCRIPTION OF TEST POSITION

6.1 EAR REFERENCE POINT

Figure 6-2 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 on the B-M (back-mouth) line located 15 mm behind the entrance-to-ear-canal (EEC) point, as shown in Figure 6-1. The Reference Plane is defined as passing through the two ear reference point and point M. The line N-F (Neck-Front), also called the Reference Pivoting Line, is not perpendicular to the reference plane (See Figure 5-1), Line B-M is perpendicular to the N-F line. Both N-F and B-M lines are marked on the external phantom shell to facilitate handset positioning.

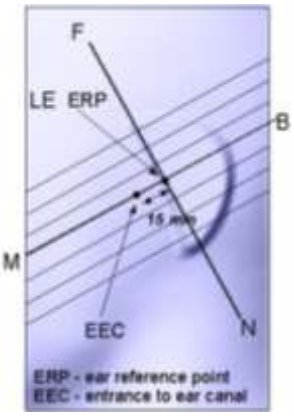


Figure 6-1
Close-up side view of ERP

6.2 HEAD POSITION

Two imaginary lines on the handset were established: the vertical centerline and the horizontal line. The device under test was placed in a normal operating position with the acoustic output located along the “vertical centerline” on the front of the device aligned to the “ear reference point”(see Figure 6-3). The acoustic output was than located at the same level as the center of the ear reference point. The device under test was positioned so that the “vertical centerline” was bisecting the front surface of the handset at its top and bottom edges, positioning the “ear reference point” on the outer surface of the both the left and right head phantoms on the ear reference point.

Figure 6-2
Front, back and side views of SAM Twin Phantom

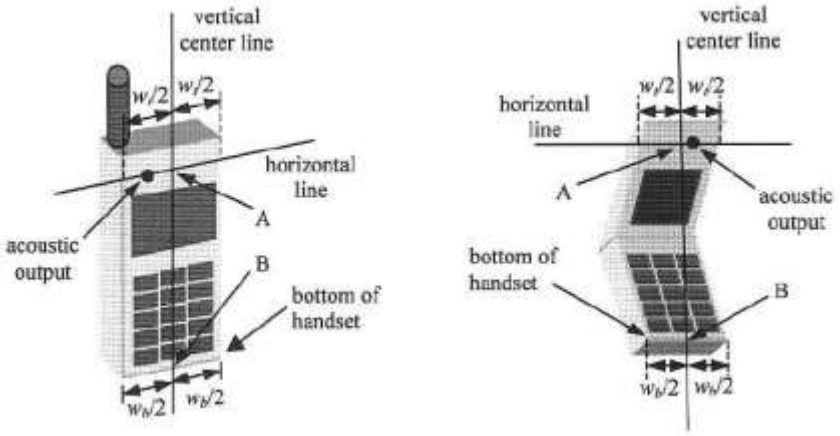


Figure 6-3. Handset vertical and horizontal reference lines

6.3 Body Holster/Belt Clip Configurations

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. A device with a headset output is tested with a headset connected to the device. Body dielectric parameters are used.

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

Body-worn accessories may not always be supplied or available as options for some Devices intended to be authorized for body-worn use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used.

Since this EUT does not supply any body worn accessory to the end user a distance of 1.5 cm from the EUT back surface to the liquid interface is configured for the generic test.

"See the Test SET-UP Photo"

Transmitters that are designed to operate in front of a person's face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessory(ies), Including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.

In all cases SAR measurements are performed to investigate the worst-case positioning. Worst case positioning is then documented and used to perform Body SAR testing.

6.4 Body-Worn Accessory Configurations

Body-worn operating configurations are tested with the belt-dips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 6-4). Per FCC KDB Publication 648474 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 Publication 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 a body- worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body- worn accessory with a headset attached to the handset.

Figure 6-4
Sample Body-Worn Diagram

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

Body-worn accessories may not always be supplied or available as options for some devices intended to be authorized for Body-worn use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used. Test position spacing was documented.

Transmitters that are designed to operate in front of a person's face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom in head fluid. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters. SAR compliance is tested with the accessories, including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.

6.5 Wireless Router Configurations

Some battery-operated handsets have the capability to transmit and receive user data through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06v02r01 where SAR test considerations for handsets (LxW≥9cmx5 cm) are based on *a* composite test separation distance of 10 mm from the front back and edges of the device containing transmitting antennas within 2.5 cm of their edges, determined from general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the Body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some Body-worn accessory SAR tests.

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

7. ANSI/ IEEE C95.1 - 2005 RF EXPOSURE LIMITS

HUMAN EXPOSURE	UNCONTROLLED ENVIRONMENT General Population	CONTROLLED ENVIRONMENT Occupational
	(W/kg) or (mW/g)	(W/kg) or (mW/g)
SPATIAL PEAK SAR * (Brain)	1.60	8.00
SPATIAL AVERAGE SAR ** (Whole Body)	0.08	0.40
SPATIAL PEAK SAR *** (Hands / Feet / Ankle / Wrist)	4.00	20.00

Table 8.1 Safety Limits for Partial Body Exposure

NOTES:

* The Spatial Peak value of the SAR averaged over any 1 g of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

** The Spatial Average value of the SAR averaged over the whole-body.

*** The Spatial Peak value of the SAR averaged over any 10 g of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

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 mad 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.

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. This 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.

8. FCC SAR GENERAL MEASUREMENT PROCEDURES

8.1 Measured and Reported SAR

Per FCC KDB Publication 447498 D01v06, when SAR is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance. For simultaneous transmission, the measured aggregate SAR must be scaled according to the sum of the differences between the maximum tune-up tolerance and actual power used to test each transmitter. When SAR is measured at or scaled to the maximum tune-up tolerance limit, the results are referred to as Reported SAR. The highest reported SAR results are identified on the grant of equipment authorization according to procedures in KDB 690783 D01v01r03.

8.2 3G SAR Test Reduction Procedure

In FCC KDB 941225 D01v03, certain transmission modes within a frequency band and wireless mode evaluated for SAR are defined as primary modes. The equivalent modes considered for SAR test reduction are denoted as secondary modes. When the maximum output power including tune-up tolerance specified for production units in a secondary mode is ≤ 0.25 dB higher than the primary mode or when the highest reported SAR of the primary mode, scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode, is ≤ 1.2 W/kg, SAR measurements are not required for the secondary mode. These criteria are referred to as the 3G SAR test reduction procedure. When the 3G SAR test reduction procedure is not satisfied, SAR measurements are additionally required for the secondary mode.

8.3 GSM, GPRS AND EDGE

The following procedures may be considered for each frequency band to determine SAR test reduction for devices operating in GSM/GPRS/EDGE modes to demonstrate RF exposure compliance. GSM voice mode transmits with 1 time slot. GPRS and EDGE may transmit up to 4 time slots in the 8 time-slot frame according to the multi-slot class implemented in a device.

8.3.1 SAR Test Reduction

In FCC KDB 941225 D01v03r01, certain transmission modes within a frequency band and wireless mode evaluated for SAR are defined as primary modes. The equivalent modes considered for SAR test reduction are denoted as secondary modes. When the maximum output power including tune-up tolerance specified for production units in a secondary mode is ≤ 0.25 dB higher than the primary mode or when the highest reported SAR of the primary mode, scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode, is ≤ 1.2 W/kg, SAR measurements are not required for the secondary mode. These criteria are referred to as the 3G SAR test reduction procedure. When the 3G SAR test reduction procedure is not satisfied, SAR measurements are additionally required for the secondary mode.

SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power specified for production units, including tune-up tolerance. The data 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

8.3.2 Procedures Used to Establish RF Signal for SAR

The following procedures are according to FCC KDB 941225 D01v03r01 - 3G SAR Measurement Procedures The handset was placed into a simulated call using a base station simulator in a shielded chamber. Such test signals offer a consistent means for testing SAR and are recommended for evaluation SAR measurements were taken with a fully charged battery. In order to verify that the device was tested and maintained at full power, this was configured with the base station simulator. The SAR measurement Software calculates a reference point at the start and end of the test to Cheek for power drifts. If conducted Power deviations of more than 5 % occurred, the tests were repeated.

8.4 SAR Measurement Conditions for UMTS

8.4.1 Output Power Verification

Maximum output power is verified on the High, Middle and Low channels according to the general descriptions in sec. 5.2 of 3GPP TS 34.121, using the appropriate RMC with TPC (transmit power control) set to all “1s” or applying the required inner loop power control procedures to maintain maximum output power while HSUPA is active. Results for all applicable physical channel configurations (DPCCH, DPDCHn and spreading codes, HS-DPCCH etc) are tabulated in this test report. All configurations that are not supported by the DUT or cannot be measured due to technical or equipment limitations are identified.

8.4.2 Head SAR Measurements

SAR for next to the ear head exposure is measured using a 12.2 kbps RMC with TPC bits configured to all “1’s”. The 3G SAR test reduction procedure is applied to AMR configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for 12.2 kbps AMR in 3.4 kbps SRB (signaling radio bearer) using the highest reported SAR configuration in 12.2 kbps RMC for head exposure.

8.4.3 Body SAR measurements

SAR for body exposure configurations is measured using the 12.2kbps RMC with the TPC bits all “1s”. the 3G SAR test reduction procedure is applied to other spreading codes and multiple DPDCHn configurations supported by the handset with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured using and applicable RMC configuration with the corresponding spreading code or DPDCHn, for the highest reported SAR configuration in 12.2kbps RMC.

8.4.4 SAR Measurements with Rel. 5 HSDPA

The 3G SAR test reduction procedure is applied to HSDPA body configurations with 12.2 kbps RMC as the primary mode. Otherwise, Body SAR for HSDPA is measured using and FRC with H-SET 1 in Sub-test and a 12.2 kbps RMC without HSDPA. Handsets with both HSDPA and HSUPA are tested according to release 6 HSPA test procedures. 8.4.5 SAR Measurement with Rel 6 HSUPA The 3G SAR test Reduction Procedure is applied to HSPA (HSUPA/HSDPA with RMC) body configurations with 12.2 kbps RMC as the primary mode. Otherwise, Body SAR for HSPA is measured with E-DCH Sub-test 5, Using H-Set 1 and QPSK for FRC and a 12.2kbps RMC configured in Test Loop Mode 1 and Power Control algorithm 2, according to the highest reported body SAR configuration in 12.2 kbps RMC without HSPA. When VOIP applies to head exposure, the 3G SAR test reduction procedure is applied with 12.2 kbps RMC as the primary mode; otherwise, the same HSPA configuration used for body SAR measurements are applied to head exposure testing.

8.4.5 SAR Measurements with Rel. 6 HSUPA

The 3G SAR test reduction procedure is applied to HSPA (HSUPA/HSDPA with RMC) body configurations with 12.2 kbps RMC as the primary mode. Otherwise, Body SAR for HSPA is measured with E-DCH Sub-test 5, using H-Set1 and QPSK for FRC and a 12.2 kbps RMC configured in Test Loop Mode 1 and power control algorithm 2, according to the highest reported body SAR configuration in 12.2 kbps RMC without HSPA.

8.5 SAR Measurement Conditions for LTE

LTE modes are tested according to FCC KDB 941225 D05v02r05 publication. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluation SAR [4]. The R&S CMW500 or Anritsu MT8820C simulators are used for LTE output power measurements and SAR testing. Closed loop power control was used so the UE transmits with maximum output power during SAR testing. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

8.5.1 Spectrum Plots for RB Configurations

A properly configured base station simulator was used for SAR tests and power measurements. Therefore, spectrum plots for RB configurations were not required to be included in this report.

8.5.2 MPR

MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36. 101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.

8.5.3 A-MPR

A-MPR(Additional MPR) has been disabled for all SAR tests by setting NS=01 on the base station simulator.

8.5.4 Required RB Size and RB offsets for SAR testing

According to FCC KDB 941225 D05v02r05

a. Per sec 4.2.1, SAR is required for QPSK 1 RB Allocation for the largest bandwidth
   i. The required channel and offset combination with the highest maximum output power is required for SAR.
   ii. When the reported SAR is ≤ 0.8 W/Kg, testing of the remaining RB offset configurations and required test channels is not required. Otherwise, SAR is required for the remaining required test channels using the RB offset configuration with highest output power for that channel.
   iii. When the reported SAR for a required test channel is > 1.45 W/kg, SAR is required for all RB offset configurations for that channel.

b. Per Sec 4.2.2, SAR is required for 50% RB allocation using the largest bandwidth following the same procedures outlined in Sec 4.2.1.

c. Per Sec. 4.2.3, QPSK SAR is not required for the 100% all0cation when the highest maximum output power for the 100% allocation is less than the highest maximum output power of the 1 RB and 50% RB allocations and the reported SAR for the 1 RB and 50% RB allocations is < 0.8 W/kg.

d. Per Sec. 4.2.4 and 4.3, SAR test for higher order modulations and lower bandwidths configurations are not required when the conducted power of the required test configurations determined by Sec. 4.2.1 through 4.2.3 is less than or equal to 1/2 dB higher than the equivalent configuration using QPSK modulation and when the QPSK SAR for those configurations is < 1.45 W/Kg.

8.5.5 LTE(TDD) Considerations

According to KDB 941225 D05v02r05, for Time-Division Duplex (TDD) systems, SAR must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP LTE TDD configurations.

SAR was tested with the highest transmission duty factor (63.33 %) using Uplink-downlink configuration 0 and Special subframe configuration 6.

LTE TDD Band 41 supports 3GPP TS 36.211 section 4.2 for Type 2 Frame and Table 4.2-2 for uplink-downlink configurations and Table 4.2-1 for Special subframe configurations.

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

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

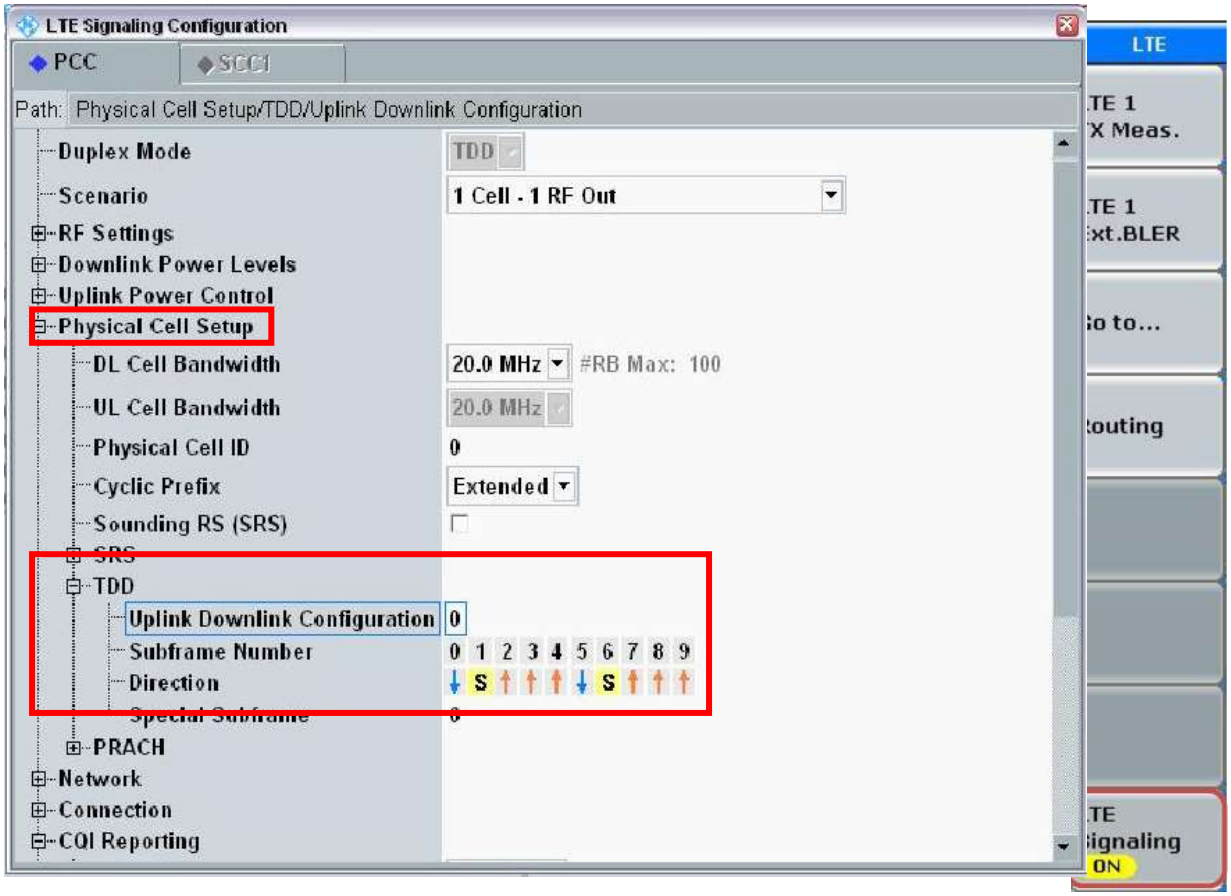
Table 4.2-2: Uplink-downlink configurations.

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

Calculated Duty Cycle – Extended cyclic prefix in uplink x (T_s) x # of S + # of U
Example for calculated Duty Cycle for Uplink-Downlink Configuration 0:
Calculated Duty Cycle = 5120 x [1/(15000 x 2048)] x 2 + 6 ms = 63.33 %
Where
T_s = 1/(15000 x 2048) seconds

LTE Band 41
Conducted Power Measured Results
LTE TDD Band 41 setup method (CMW-500).

- Physical Cell Setup Menu
- Sub-menu “TDD” and set “Uplink Downlink Configuration” to “0”
- Turn the cell on using “ON : OFF” Key



8.6 SAR Testing with 802.11 Transmitters

The normal network operating configurations of 802.11 transmitters are not suitable for SAR measurements. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure the results are consistent and reliable. See KDB Publication 248227 D01v02r02 for more details.

8.6.1 General Device Setup

Chipset based test mode software is hardware dependent and generally varies among manufacturers. The device operating parameters established in test mode for SAR measurements must be identical to those programmed in production units, including output power levels, amplifier gain settings and other RF performance tuning parameters.

A periodic duty factor is required for current generation SAR system to measure SAR. When 802.11 frame gaps are accounted for in the transmission, a maximum transmission duty factor of 92-96% is typically achievable in most test mode configurations. A minimum transmission duty factor of 85% is required to avoid certain hardware and device implementation issues related to wide range SAR scaling. The reported SAR is scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit.

8.6.2 U-NII-1 and U-NII-2A

For devices that operate in both U-NII-1 and U-NII2A bands, when the same maximum output power is specified for both bands, SAR measurement using OFDM SAR test procedures is not required for U-NII-1 unless the highest reported SAR for U-NII-2A is > 1.2 W/kg for 1g SAR or > 3.0 W/kg for 10g SAR. When different maximum output powers are specified for the bands, SAR measurement for the U-NII band with the lower maximum output power is not required unless the highest reported SAR for the U-NII band with the higher maximum output power, adjusted by the ratio of lower to higher specified maximum output power for the two bands, is > 1.2 W/kg for 1g SAR or > 3.0 W/kg for 10g SAR.

8.6.3 U-NII-C and U-NII-3

The frequency range covered by U-NII-2C and U-NII-3 is 380MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. When Terminal Doppler Weather Radar (TDWR) restriction applies, the channels at 5.60 -5.65 GHz in U-NII-2C band must be disabled with acceptable mechanisms and documented in the equipment certification.
Unless band gap channels are permanently disabled, SAR must be considered for these channels.

8.6.4 Initial Test Position Procedure

For exposure conditions with multiple test positions, such as handset operating nest to the ear, devices with hotspot mode or UMPC mini-tablet, procedures for initial test position can be applied. Using the transmission mode determined by the DSSS procedure or initial test configuration, area scans are measured for all positions in an exposure condition. The test position with the highest extrapolated (peak) SAR is used as the initial test position. When reported SAR for the initial test position is ≤ 0.4 W/kg for 1g SAR and ≤ 1.0 W/kg for 10g SAR, no additional testing for the remaining test position is required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is ≤ 0.8 W/kg for 1g SAR and ≤ 2.0 W/kg for 10g SAR or all test positions are measured.

8.6.5 2.4 GHz SAR test Requirements

SAR is measured for 2.4 GHz 802.11b DSSS using either the fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:

1) When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS is that exposure configuration.
2) When the reported SAR is > 0.8 W/kg, SAR is required for that position using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

2.4 GHz 802.11 g/n OFDM are additionally evaluated for SAR if the highest reported SAR for 802.11b, adjusted by the ratio of the OFDM to DSSS specified maximum output power, is > 1.2 W/kg. When SAR is required for OFDM modes in 2.4 GHz band, the Initial Test Configuration Procedures should be followed.

8.6.6 OFDM Transmission Mode and SAR Test channel Selection

For the 2.4 GHz and 5 GHz bands, when the same maximum output power was specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration with the largest channel bandwidth, lowest order modulation and lowest data rate and lowest order 802.11 a/g/n/ac mode. When the maximum output power of a channel is the same for equivalent OFDM configurations; for example, 802.11a, 802.11n and 802.11 ac or 802.11g and 802.11n with the same channel bandwidth, modulation and data rate etc., the lower order 802.11 mode i.2., 802.11a, then 802.11n and 802.11ac or 802.11g then 802.11n, is used for SAR measurement. When the maximum output power are the same for multiple test channels, either according to the default or additional power measurement requirements, SAR is measured using the channel closest to the middle of the frequency band or aggregated band. When there are multiple channels with the same maximum output power, SAR is measured using the higher number channel.

8.6.7 Initial Test configuration Procedure

For OFDM, in both 2.4 GHZ and 5 GHz bands, an initial test configuration is determined for each frequency band and aggregated band, according to the transmission mode with the highest maximum output power specified for SAR measurements. When the same maximum output power is specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration(s) with the largest channel bandwidth, lowest order modulation, and lowest data rate. If the average RF output powers of the highest identical transmission modes are within 0.25 dB of each other, mid channel of the transmission mode with highest average RF output power is the initial test channel. Otherwise, the channel of the transmission mode with the highest average RF output conducted power will be the initial test configuration.

When the reported SAR is ≤ 0.8 W/kg, no additional measurements on other test channels are required. Otherwise, SAR is evaluated using the subsequent highest average RF output channel until the reported SAR result is 1.2 W/kg or all channels are measured. When there are multiple untested channels having the same subsequent highest average RF output power, the channel with higher frequency from the lowest 802.11 mode is considered for SAR measurements.

8.6.8 Subsequent Test Configuration Procedures

For OFDM configurations in each frequency band and aggregated band, SAR is evaluated for initial test configuration using the fixed test position or the initial test position on procedure. When the highest reported SAR (for the initial test configuration), adjusted by the ratio of the specified maximum output power of the subsequent test configuration to initial test configuration, is ≤ 1.2 W/kg for 1g SAR and ≤ 3.0 W/kg for 10g SAR, no additional SAR tests for the subsequent test configurations are required.

9. Output Power Specifications

This device operates using the following maximum output power specifications. SAR values were scaled to the maximum allowed power to determine compliance per KDB publication 447498 D01v06.

9.1 GSM

GSM Conducted output powers (Burst-Average)

Band	Channel	Voice	GPRS(GMSK) Data – CS1				EDGE Data			
		GSM (dBm)	GPRS 1 TX Slot (dBm)	GPRS 2 TX Slot (dBm)	GPRS 3 TX Slot (dBm)	GPRS 4 TX Slot (dBm)	EDGE 1 TX Slot (dBm)	EDGE 2 TX Slot (dBm)	EDGE 3 TX Slot (dBm)	EDGE 4 TX Slot (dBm)
GSM 850	128	32.61	32.61	29.97	27.53	25.94	26.77	25.64	24.49	23.80
	190	32.38	32.39	29.71	27.57	25.92	26.85	25.63	24.47	23.84
	251	32.52	32.53	29.93	27.80	26.08	26.92	25.77	24.66	23.97
GSM 1900	512	28.65	28.65	26.92	24.95	22.94	24.99	24.86	24.15	23.59
	661	28.57	28.58	26.61	24.67	22.69	24.73	24.53	23.91	23.30
	810	28.39	28.41	26.58	24.62	22.52	24.68	24.55	23.82	23.24

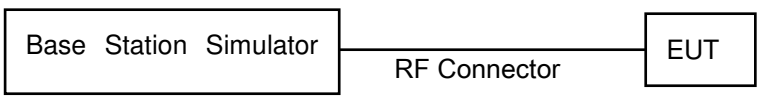
GSM Conducted output powers (Frame-Average)

Band	Channel	Voice	GPRS(GMSK) Data – CS1				EDGE Data			
		GSM (dBm)	GPRS 1 TX Slot (dBm)	GPRS 2 TX Slot (dBm)	GPRS 3 TX Slot (dBm)	GPRS 4 TX Slot (dBm)	EDGE 1 TX Slot (dBm)	EDGE 2 TX Slot (dBm)	EDGE 3 TX Slot (dBm)	EDGE 4 TX Slot (dBm)
GSM 850	128	23.58	23.58	23.95	23.27	22.93	17.74	19.62	20.23	20.79
	190	23.35	23.36	23.69	23.31	22.91	17.82	19.61	20.21	20.83
	251	23.49	23.50	23.91	23.54	23.07	17.89	19.75	20.40	20.96
GSM 1900	512	19.62	19.62	20.90	20.69	19.93	15.96	18.84	19.89	20.58
	661	19.54	19.55	20.59	20.41	19.68	15.70	18.51	19.65	20.29
	810	19.36	19.38	20.56	20.36	19.51	15.65	18.53	19.56	20.23

Note:

Time slot average factor is as follows:
1 Tx slot = 9.03 dB, Frame-Average output power = Burst-Average output power – 9.03 dB
2 Tx slot = 6.02 dB, Frame-Average output power = Burst-Average output power – 6.02 dB
3 Tx slot = 4.26 dB, Frame-Average output power = Burst-Average output power – 4.26 dB
4 Tx slot = 3.01 dB, Frame-Average output power = Burst-Average output power – 3.01 dB

GSM Class : B
GSM voice: Head SAR , Body worn SAR
GPRS/EDGE Multi-slots 33 : Hotspot SAR with GPRS/EDGE
Multi-slot Class 33 with CS 1 (GMSK)



9.2 UMTS

HSPA+

This DUT is only capable of QPSK HSPA+ in uplink. Therefore, the RF conducted power is not measured according to 941225 D01 3G SAR.

WCDMA850 Maximum Conducted Power

3GPP Release Version	Mode	3GPP 34.121	WCDMA Band 5 [dBm]		
		Subtest	UL 4132 DL 4357	UL 4183 DL 4408	UL 4233 DL 4458
99	WCDMA	12.2 kbps RMC	22.49	22.40	22.55
99	WCDMA	12.2 kbps AMR	22.47	22.38	22.56
5	HSDPA	Subtest 1	21.25	21.28	21.31
5		Subtest 2	21.23	21.28	21.31
5		Subtest 3	19.93	19.96	20.00
5		Subtest 4	19.94	19.98	20.01
6	HSUPA	Subtest 1	21.26	21.20	21.32
6		Subtest 2	19.36	19.29	19.48
6		Subtest 3	20.29	20.31	20.35
6		Subtest 4	19.36	19.28	19.47
6		Subtest 5	21.26	21.18	21.31

WCDMA Average Conducted output powers

WCDMA1900 Maximum Conducted Power

3GPP Release Version	Mode	3GPP 34.121	WCDMA Band 2 [dBm]		
		Subtest	UL 9262 DL 9662	UL 9400 DL 9800	UL 9538 DL 9938
99	WCDMA	12.2 kbps RMC	22.48	22.15	22.29
99	WCDMA	12.2 kbps AMR	22.47	22.14	22.28
5	HSDPA	Subtest 1	21.36	21.17	21.36
5		Subtest 2	21.36	21.21	21.37
5		Subtest 3	20.36	20.16	20.34
5		Subtest 4	20.36	20.18	20.34
6	HSUPA	Subtest 1	21.42	21.20	21.37
6		Subtest 2	19.44	19.33	19.36
6		Subtest 3	20.42	20.28	20.39
6		Subtest 4	19.43	19.29	19.45
6		Subtest 5	21.42	21.16	21.35

WCDMA Average Conducted output powers

9.3 LTE

- LTE TDD Band 41 Maximum Conducted Power

Bandwidth	Modulation	RB Size	RB Offset	Max.Average Power (dBm)			MPR Allowed Per 3GPP	MPR
				40265	40740	41215	[dB]	[dB]
				2557.5 MHz	2605 MHz	2652.5 MHz		
5 MHz	QPSK	1	0	23.04	22.94	22.76	0	0
		1	12	23.18	23.21	23.39	0	0
		1	24	23.18	23.00	23.02	0	0
		12	0	21.09	21.37	21.15	0-1	1
		12	6	21.15	21.33	21.31	0-1	1
		12	11	21.00	21.28	21.56	0-1	1
		25	0	21.11	21.21	21.17	0-1	1
	16QAM	1	0	22.23	22.27	22.00	0-1	1
		1	12	22.36	21.99	22.79	0-1	1
		1	24	22.39	21.66	22.26	0-1	1
		12	0	20.12	20.28	20.14	0-2	2
		12	6	20.24	20.45	20.32	0-2	2
		12	11	20.10	20.33	20.21	0-2	2
		25	0	19.97	20.30	20.54	0-2	2

Bandwidth	Modulation	RB Size	RB Offset	Max.Average Power (dBm)			MPR Allowed Per 3GPP	MPR
				40290	40740	41190	[dB]	[dB]
				2560 MHz	2605 MHz	2650 MHz		
10 MHz	QPSK	1	0	23.17	23.37	23.15	0	0
		1	24	22.97	23.24	23.13	0	0
		1	49	23.04	23.19	23.08	0	0
		25	0	21.16	21.41	21.35	0-1	1
		25	12	21.18	21.42	21.32	0-1	1
		25	24	21.21	21.35	21.21	0-1	1
		50	0	21.21	21.43	21.31	0-1	1
	16QAM	1	0	21.97	21.73	21.84	0-1	1
		1	24	22.10	22.00	21.83	0-1	1
		1	49	22.13	22.28	21.59	0-1	1
		25	0	20.29	20.45	20.17	0-2	2
		25	12	20.30	20.34	20.32	0-2	2
		25	24	20.32	20.17	20.28	0-2	2
		50	0	20.11	20.33	20.33	0-2	2

Bandwidth	Modulation	RB Size	RB Offset	Max.Average Power (dBm)			MPR Allowed Per 3GPP	MPR
				40315	40740	41165	[dB]	[dB]
				2562.5 MHz	2605 MHz	2647.5 MHz		
15 MHz	QPSK	1	0	23.01	23.38	23.59	0	0
		1	36	23.32	23.45	23.17	0	0
		1	74	23.11	23.35	23.18	0	0
		36	0	21.24	21.42	21.52	0-1	1
		36	18	21.16	21.41	21.39	0-1	1
		36	39	21.44	21.26	21.38	0-1	1
		75	0	21.28	21.35	21.34	0-1	1
	16QAM	1	0	22.52	22.74	22.12	0-1	1
		1	36	22.78	22.55	21.73	0-1	1
		1	74	23.15	22.34	21.76	0-1	1
		36	0	20.10	20.24	20.55	0-2	2
		36	18	20.30	20.25	20.42	0-2	2
		36	39	20.40	20.26	20.43	0-2	2
		75	0	20.21	20.32	20.42	0-2	2

Bandwidth	Modulation	RB Size	RB Offset	Max.Average Power (dBm)			MPR Allowed Per 3GPP	MPR
				40340	40740	41140	[dB]	[dB]
				2565 MHz	2605 MHz	2645 MHz		
20 MHz	QPSK	1	0	22.96	23.02	23.01	0	0
		1	49	23.75	23.38	23.78	0	0
		1	99	23.41	23.21	23.46	0	0
		50	0	21.30	21.44	21.64	0-1	1
		50	25	21.46	21.42	21.56	0-1	1
		50	49	21.60	21.32	21.45	0-1	1
		100	0	21.40	21.46	21.44	0-1	1
	16QAM	1	0	22.10	22.02	22.04	0-1	1
		1	49	22.36	22.09	22.05	0-1	1
		1	99	22.15	21.77	21.82	0-1	1
		50	0	20.42	20.39	20.38	0-2	2
		50	25	20.53	20.34	20.44	0-2	2
		50	49	20.69	20.20	20.31	0-2	2
		100	0	20.44	20.49	20.42	0-2	2

Note;

The EUT enables maximum power reduction in accordance with 3GPP 36.101. The MPR settings are configured during the manufacture process and are not configurable by the network, carrier, or end user.

LTE Carrier Aggregation

This device supports intra-band/inter-band LTE Carrier Aggregation (CA) in the downlink only. All uplink communications are identical to Release 8 specifications. Per FCC KDB Publication 941225 D05A v01r02, SAR for LTE CA operations was not needed since the maximum average output power in LTE CA mode was not >0.25 dB higher than the maximum output power when downlink carrier aggregation was inactive.

Downlink Carrier Aggregation

LTE Carrier Aggregation (CA) measurement are made in accordance to 3GPP TS 36.521-1 V10.4.0(2012-12). The RRC connection is only handled by one cell, the Primary component carrier(PCC) for downlink and uplink communications. After making a data connection to the PCC, the UE device adds the Secondary component carrier (SCC) on the downlink only. All uplink communications and acknowledgements remain identical to release 8 specifications on the PCC. Additional output powers are measured using two carriers in the downlink for the release 8 configurations with the highest SAR among all channels, RB configurations and bandwidths for each uplink band. Per FCC KDB Publication 941225 D05A v01r02, no SAR measurements are required when the average output power with downlink carrier aggregation active is not more than 0.25 dB higher than the average output power with downlink carrier aggregation inactive.

LTE Carrier Aggregation Contiguous Conducted Powers

PCC(2645 MHz / ch 41140)+ SCC(2625MHz / ch 40940	PCC UL#RB	PCC UL RB offset	LTE Rel 10 Tx Power (dBm)	LTE Rel 8 Tx Power (dBm)
	1	49	23.29	23.78

Band 41(PCC) 20 MHz BW + Band 41 (SCC) 20 MHz BW

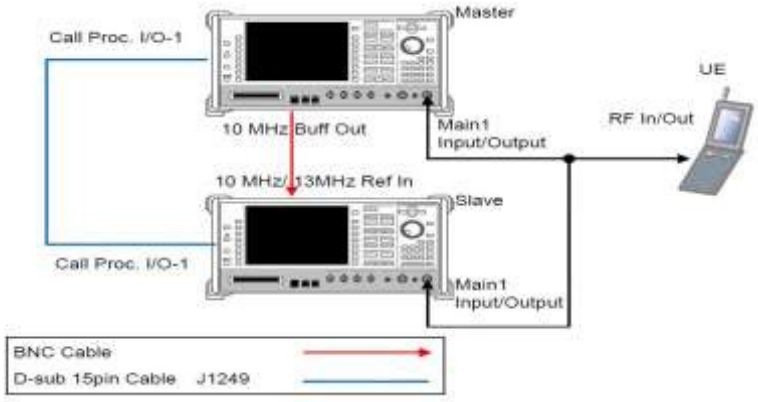
LTE Carrier Aggregation Conducted Powers

LTE Carrier Aggregation Non- Contiguous Conducted Powers

PCC(2645 MHz / ch 41140)+ SCC(2575MHz / ch 40440	PCC UL#RB	PCC UL RB offset	LTE Rel 10 Tx Power (dBm)	LTE Rel 8 Tx Power (dBm)
	1	49	23.47	23.78

Band 41(PCC) 20 MHz BW + Band 41 (SCC) 20 MHz BW

LTE Carrier Aggregation Conducted Powers



Notes:

This device only supports downlink Carrier Aggregation. Uplink Carrier Aggregation is not supported. For every supported combination of downlink carrier aggregation , power measurements were performed with the downlink carrier aggregation active for the configuration with highest measured maximum conducted power with downlink carrier aggregation inactive measured among the channel bandwidth, modulation and RB combinations in each frequency band.

9.4 WiFi

IEEE 802.11 Average RF Power

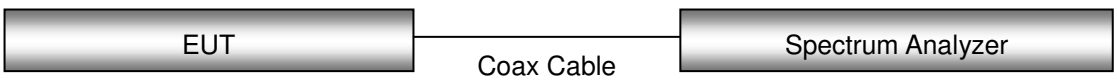
Mode	Freq. [MHz]	Channel	IEEE 802.11 (2.4 GHz) Conducted Power [dBm]
802.11b	2412	1	14.38
	2437	6	14.20
	2462	11	14.12
802.11g	2412	1	11.53
	2437	6	11.21
	2462	11	11.30
802.11n	2412	1	9.54
	2437	6	9.26
	2462	11	9.52

IEEE 802.11a Average RF Power– 20 MHz Bandwidth

Mode	Freq. [MHz]	Channel	IEEE 802.11 (5 GHz) Conducted Power [dBm]
802.11a	5 180	36	13.29
	5 200	40	13.25
	5 220	44	13.21
	5 240	48	13.02
	5 260	52	13.25
	5 280	56	13.16
	5 300	60	13.18
	5 320	64	13.08
	5 500	100	12.95
	5 520	104	12.85
	5 580	116	12.90
	5 600	120	12.80
	5 620	124	12.84
	5 700	140	12.54
	5 745	149	12.59
	5 785	157	12.46
	5 825	165	12.60

Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02:
▪ Power measurements were performed for the transmission mode configuration with the highest maximum output power specified for production units.
▪ For transmission mode with the same maximum output power specification, powers were measured for the largest channel bandwidth, lowest order modulation and lowest data rate.
▪ For transmission modes with identical maximum specified output power, channel bandwidth, modulation and data rates, power measurements were required for all identical configurations.
▪ For each transmission mode configuration, powers were measured for the highest and lowest channels; and at the mid-band channel(s) when there were at least 3 channels supported. For configurations with multiple mid-band channels, due to an even number of channels, both channels were measured.
▪ Output power and SAR measurement is not required for 802.11n channels when the specified tune-up tolerances for 802.11n are lower than 802.11a by more than 1/2dB and the measured SAR is ≤ 1.2 W/kg

Test Configuration



10. SYSTEM VERIFICATION

10.1 Tissue Verification

The Head /body simulating material is calibrated by HCT using the DAKS 3.5 to determine the conductivity and permittivity.

Table for Head Tissue Verification

Date of Tests	Tissue Temp	Tissue Type	Freq. (MHz)	Measured Conductivity σ (S/m)	Measured Dielectric Constant, ε	Target Conductivity σ (S/m)	Target Dielectric Constant, ε	% dev σ	% dev ε
04/27/2016	20.1	835H	820	0.904	41.532	0.899	41.578	0.56%	-0.11%
			835	0.917	41.300	0.900	41.500	1.89%	-0.48%
			850	0.936	41.163	0.916	41.500	2.18%	-0.81%
05/02/2016	19.8	1900H	1850	1.362	40.325	1.400	40.000	-2.71%	0.81%
			1900	1.420	40.100	1.400	40.000	1.43%	0.25%
			1910	1.420	40.145	1.400	40.000	1.43%	0.36%
05/04/2016	20.3	2450H	2400	1.766	39.190	1.756	39.290	0.57%	-0.25%
			2450	1.810	38.900	1.800	39.200	0.56%	-0.77%
			2500	1.874	38.724	1.855	39.140	1.02%	-1.06%
05/10/2016	20.3	2600H	2500	1.868	40.179	1.855	39.140	0.70%	2.65%
			2600	1.960	39.900	1.964	39.010	-0.20%	2.28%
			2700	2.072	39.784	2.073	38.880	-0.05%	2.33%
05/04/2016	21.8	5200H-5800H	5250	4.650	36.600	4.723	35.918	-1.55%	1.90%
			5260	4.65	36.500	4.723	35.918	-1.55%	1.62%
			5300	4.678	36.413	4.785	35.846	-2.24%	1.58%
			5500	4.948	35.985	4.963	35.640	-0.30%	0.97%
			5600	5.090	35.700	5.065	35.530	0.49%	0.48%
			5745	5.260	35.400	5.221	35.365	0.75%	0.10%
			5750	5.260	35.400	5.221	35.365	0.75%	0.10%
			5800	5.352	35.068	5.270	35.300	1.56%	-0.66%
			5825	5.390	35.100	5.303	35.27	1.64%	-0.48%
			5850	5.428	35.211	5.303	35.270	2.36%	-0.17%

Table for Body Tissue Verification									
Date of Tests	Tissue Temp	Tissue Type	Freq. (MHz)	Measured Conductivity σ (S/m)	Measured Dielectric Constant, ε	Target Conductivity σ (S/m)	Target Dielectric Constant, ε	% dev σ	% dev ε
05/03/2016	20.8	835B	820	0.960	56.747	0.969	55.258	-0.93%	2.69%
			835	0.974	56.600	0.970	55.200	0.41%	2.54%
			850	0.992	56.502	0.988	55.154	0.40%	2.44%
05/02/2016	19.8	1900B	1850	1.490	54.054	1.520	53.300	-1.97%	1.41%
			1900	1.550	53.900	1.520	53.300	1.97%	1.13%
			1910	1.553	53.965	1.520	53.300	2.17%	1.25%
05/04/2016	20.5	2450B	2400	1.871	52.636	1.902	52.770	-1.63%	-0.25%
			2450	1.930	52.600	1.950	52.700	-1.03%	-0.19%
			2500	1.997	52.493	2.021	52.640	-1.19%	-0.28%
05/09/2016	20.6	2600B	2500	2.064	52.359	2.021	52.640	2.13%	-0.53%
			2600	2.170	52.000	2.163	52.510	0.32%	-0.97%
			2700	2.290	51.828	2.305	52.380	-0.65%	-1.05%
05/04/2016	20.5	5200B-5800B	5250	5.320	48.600	5.358	48.950	-0.71%	-0.72%
			5260	5.330	48.600	5.377	48.936	-0.87%	-0.69%
			5300	5.376	48.5825	5.416	48.880	-0.74%	-0.61%
			5500	5.721	48.0334	5.650	48.610	1.26%	-1.19%
			5600	5.870	47.700	5.766	48.470	1.80%	-1.59%
			5745	6.080	47.400	5.944	48.277	2.29%	-1.82%
			5750	6.090	47.400	5.944	48.277	2.46%	-1.82%
			5800	6.153	47.246	6.000	48.200	2.55%	-1.98%
			5825	6.200	47.200	6.037	48.165	2.70%	-2.00%
			5850	6.249	47.182	6.037	48.165	3.51%	-2.04%

10.2 System Verification

Prior to assessment, the system is verified to the ± 10 % of the specifications at 835 MHz / 1 900 MHz / 2 450 MHz/ 2 600 MHz/ 5 250 MHz /5 600 MHz / 5 750 MHz by using the system Verification kit. (Graphic Plots Attached)

System Verification Results

Freq.	Date	Probe (S/N)	Dipole (S/N)	Liquid	Amb. Temp.	Liquid Temp.	1 W Target SAR_{1g} (SPEAG)	Measured SAR_{1g}	1 W Normalized SAR_{1g}	Deviation	Limit [%]
[MHz]					[°C]	[°C]	[W/kg]	[W/kg]	[W/kg]	[%]	[%]
835	04/27/2016	3967	4d165	Head	20.3	20.1	9.06	0.917	9.17	+ 1.21	± 10
835	05/03/2016	3967		Body	21.0	20.8	9.47	0.937	9.37	- 1.06	± 10
1 900	05/02/2016	3967	5d032	Head	20.0	19.8	41.1	4.2	42	+ 2.19	± 10
1 900	05/02/2016	3967		Body	20.0	19.8	40.9	4.21	42.1	+ 2.93	± 10
2 450	05/04/2016	3967	743	Head	20.5	20.3	53.4	5.48	54.8	+ 2.62	± 10
2 450	05/04/2016	3967		Body	20.7	20.5	52.1	4.97	49.7	- 4.61	± 10
2 600	05/10/2016	3967	1106	Head	20.5	20.3	55.1	5.59	55.9	+ 1.45	± 10
2 600	05/09/2016	3967		Body	20.8	20.6	53.4	5.25	52.5	- 1.69	± 10
5 250	05/04/2016	7370	1107	Head	22.0	21.8	77.8	7.9	79	+ 1.54	± 10
5 250	05/04/2016	3967		Body	20.7	20.5	74.0	7.14	71.4	- 3.51	± 10
5 600	05/04/2016	7370		Head	22.0	21.8	80.5	7.97	79.7	- 0.99	± 10
5 600	05/04/2016	3967		Body	20.7	20.5	78.9	7.87	78.7	- 0.25	± 10
5 750	05/04/2016	7370		Head	22.0	21.8	76.8	7.79	77.9	+ 1.43	± 10
5 750	05/04/2016	3967		Body	20.7	20.5	74.9	7.61	76.1	+ 1.60	± 10

10.3 System Verification Procedure

SAR measurement was prior to assessment, the system is verified to the ± 10 % of the specifications at each frequency band by using the system Verification kit. (Graphic Plots Attached)

- Cabling the system, using the Verification kit equipments.
- Generate about 100 mW Input Level from the Signal generator to the Dipole Antenna.
- Dipole Antenna was placed below the Flat phantom.
- The measured one-gram SAR at the surface of the phantom above the dipole feed-point should be within 10 % of the target reference value.
- The results are normalized to 1 W input power.

NOTE;
SAR Verification was performed according to the FCC KDB 865664 D01v01r04.

11. SAR TEST DATA SUMMARY

11.1 HEAD SAR Measurement Results

GSM 850 Head SAR												
Frequency		Mode	Tune-Up Limit	Meas. Power	Power Drift	Test Position	Antenna Config.	Duty Cycle	Meas. SAR	Scaling Factor	Scaled SAR	Plot No.
MHz	Ch.		(dB)	(dB)	(dB)				(W/kg)		(W/kg)	
836.6	190	Voice	33.0	32.38	-0.186	Left Cheek	Ant. 1	1:8.3	0.199	1.153	0.229	-
836.6	190	Voice	33.0	32.38	-0.009	Left Tilt	Ant. 1	1:8.3	0.144	1.153	0.166	-
836.6	190	Voice	33.0	32.38	0.043	Right Cheek	Ant. 1	1:8.3	0.326	1.153	**0.376**	1
836.6	190	Voice	33.0	32.38	0.166	Right Tilt	Ant. 1	1:8.3	0.171	1.153	0.197	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Head 1.6 W/kg (mW/g) Averaged over 1 gram						

GSM 1900 Head SAR												
Frequency		Mode	Tune-Up Limit	Meas. Power	Power Drift	Test Position	Antenna Config.	Duty Cycle	Meas. SAR	Scaling Factor	Scaled SAR	Plot No.
MHz	Ch.		(dB)	(dB)	(dB)				(W/kg)		(W/kg)	
1 880.0	661	Voice	30.0	28.57	-0.110	Left Cheek	Ant.1	1:8.3	0.152	1.390	0.211	-
1 880.0	661	Voice	30.0	28.57	0.089	Left Tilt	Ant.1	1:8.3	0.105	1.390	0.146	-
1 880.0	661	Voice	30.0	28.57	-0.123	Right Cheek	Ant.1	1:8.3	0.278	1.390	**0.386**	2
1 880.0	661	Voice	30.0	28.57	0.036	Right Tilt	Ant.1	1:8.3	0.090	1.390	0.125	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Head 1.6 W/kg (mW/g) Averaged over 1 gram						

UMTS 850 Head SAR												
Frequency		Mode	Tune-Up Limit	Meas. Power	Power Drift	Test Position	Antenna Config.	Duty Cycle	Meas. SAR	Scaling Factor	Scaled SAR	Plot No.
MHz	Ch.		(dB)	(dB)	(dB)				(W/kg)		(W/kg)	
836.6	4183	RMC	23.0	22.40	-0.057	Left Cheek	Ant. 1	1:1	0.135	1.148	0.155	-
836.6	4183	RMC	23.0	22.40	0.082	Left Tilt	Ant. 1	1:1	0.099	1.148	0.114	-
836.6	4183	RMC	23.0	22.40	-0.126	Right Cheek	Ant. 1	1:1	0.217	1.148	**0.249**	3
836.6	4183	RMC	23.0	22.40	0.034	Right Tilt	Ant. 1	1:1	0.120	1.148	0.138	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Head 1.6 W/kg (mW/g) Averaged over 1 gram						

UMTS 1900 Head SAR

Frequency		Mode	Tune-Up Limit	Meas. Power	Power Drift	Test Position	Antenna Config.	Duty Cycle	Meas. SAR	Scaling Factor	Scaled SAR	Plot No.
MHz	Ch.		(dB)	(dB)	(dB)				(W/kg)		(W/kg)	
1 880.0	9400	RMC	23.0	22.15	-0.151	Left Cheek	Ant. 1	1:1	0.234	1.216	0.285	-
1 880.0	9400	RMC	23.0	22.15	0.059	Left Tilt	Ant. 1	1:1	0.157	1.216	0.191	-
1 880.0	9400	RMC	23.0	22.15	-0.063	Right Cheek	Ant. 1	1:1	0.418	1.216	**0.508**	4
1 880.0	9400	RMC	23.0	22.15	0.103	Right Tilt	Ant. 1	1:1	0.138	1.216	0.168	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Head 1.6 W/kg (mW/g) Averaged over 1 gram						

LTE Band 41 Head SAR

Frequency		Mode	Band width	Tune-Up Limit	Meas. Power	Power Drift	Test Position	Antenna Config.	MPR	RB Size	RB offset	Duty Cycle	Meas. SAR	Scaling Factor	Scaled SAR	Plot No.
MHz	Ch.		(MHz)	(dBm)	(dBm)	(dB)			(dB)				(W/kg)		(W/kg)	
2 645	41140	QPSK	20	23.8	23.78	-0.176	Left Cheek	Ant. 1	0	1	49	1:1.58	0.144	1.005	**0.145**	5
2 645	41140	QPSK	20	22.8	21.64	0.094	Left Cheek	Ant. 1	1	50	0	1:1.58	0.108	1.306	0.141	-
2 645	41140	QPSK	20	23.8	23.78	0.016	Left Tilt	Ant. 1	0	1	49	1:1.58	0.042	1.005	0.042	-
2 645	41140	QPSK	20	22.8	21.64	0.099	Left Tilt	Ant. 1	1	50	0	1:1.58	0.029	1.306	0.038	-
2 645	41140	QPSK	20	23.8	23.78	0.139	Right Cheek	Ant. 1	0	1	49	1:1.58	0.056	1.005	0.056	-
2 645	41140	QPSK	20	22.8	21.64	-0.007	Right Cheek	Ant. 1	1	50	0	1:1.58	0.040	1.306	0.052	-
2 645	41140	QPSK	20	23.8	23.78	-0.020	Right Tilt	Ant. 1	0	1	49	1:1.58	0.069	1.005	0.069	-
2 645	41140	QPSK	20	22.8	21.64	0.050	Right Tilt	Ant. 1	1	50	0	1:1.58	0.048	1.306	0.063	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population							Head 1.6 W/kg (mW/g) Averaged over 1 gram									

DTS Head SAR

Frequency		Mode	Band width	Data Rate	Tune-Up Limit	Meas. Power	Power Drift	Test Position	Duty Cycle	Area Scan Peak SAR	Meas. SAR	Scaling Factor	Scaling Factor	Scaled SAR	Plot No.
MHz	Ch.		(MHz)	(Mbps)	(dBm)	(dBm)	(dB)			(W/kg)	(W/kg)		(Duty)	(W/kg)	
2 412	1	802.11b	22	1	15.5	14.38		Left Cheek	98.94	0.210		1.294	1.011		-
2 412	1	802.11b	22	1	15.5	14.38		Left Tilt	98.94	0.143		1.294	1.011		-
2 412	1	802.11b	22	1	15.5	14.38	0.140	Right Cheek	98.94	0.713	0.447	1.294	1.011	**0.585**	6
2 412	1	802.11b	22	1	15.5	14.38	0.142	Right Tilt	98.94	0.650	0.316	1.294	1.011	0.413	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population								Head 1.6 W/kg (mW/g) Averaged over 1 gram							

NII Head SAR																
Frequency		Mode	Band width	Data Rate	Tune-Up Limit	Meas. Power	Power Drift	Test Position	Duty Cycle	Distance	Area Scan Peak SAR	Meas. SAR	Scaling Factor	Scaling Factor	Scaled SAR	Plot No.
MHz	Ch.		(MHz)	(Mbps)	(dBm)	(dBm)	(dB)			(mm)	(W/kg)	(W/kg)		(Duty)	(W/kg)	
5 260	52	802.11a	20	6Mbps	13.5	13.25		Left Cheek	93.30	0	0.7		1.059	1.072		-
5 260	52	802.11a	20	6Mbps	13.5	13.25		Left Tilt	93.30	0	0.628		1.059	1.072		-
5 260	52	802.11a	20	6Mbps	13.5	13.25	-0.042	Right Cheek	93.30	0	1.86	0.672	1.059	1.072	0.763	-
5 260	52	802.11a	20	6Mbps	13.5	13.25	-0.035	Right Tilt	93.30	0	1.25	0.489	1.059	1.072	0.555	-
5 500	100	802.11a	20	6Mbps	13.5	12.95		Left Cheek	93.30	0	1.29		1.135	1.072		-
5 500	100	802.11a	20	6Mbps	13.5	12.95		Left Tilt	93.30	0	1.22		1.135	1.072		-
5 500	100	802.11a	20	6Mbps	13.5	12.95	0.068	Right Cheek	93.30	0	1.63	0.782	1.135	1.072	0.951	-
5 580	116	802.11a	20	6Mbps	13.5	12.90	-0.063	Right Cheek	93.30	0	2.28	0.794	1.148	1.072	**0.977**	7
5 500	100	802.11a	20	6Mbps	13.5	12.95	-0.186	Right Tilt	93.30	0	1.4	0.564	1.135	1.072	0.686	-
5 745	149	802.11a	20	6Mbps	13.5	12.59	-0.043	Left Cheek	93.30	0	1.31	0.447	1.233	1.072	0.591	
5 825	165	802.11a	20	6Mbps	13.5	12.60	-0.071	Left Cheek	93.30	0	1.75	0.609	1.230	1.072	0.803	-
5 825	165	802.11a	20	6Mbps	13.5	12.6		Left Tilt	93.30	0	1.44		1.230	1.072		-
5 745	149	802.11a	20	6Mbps	13.5	12.59	-0.009	Right Cheek	93.30	0	1.88	0.728	1.233	1.072	0.962	-
5 825	165	802.11a	20	6Mbps	13.5	12.60	0.044	Right Cheek	93.30	0	2.06	0.704	1.230	1.072	0.928	-
5 825	165	802.11a	20	6Mbps	13.5	12.60	-0.118	Right Tilt	93.30	0	1.51	0.568	1.230	1.072	0.749	-
ANSI/ IEEE C95.1 - 2005– Safety Limit Spatial Peak Uncontrolled Exposure/ General Population								Head 1.6 W/kg (mW/g) Averaged over 1 gram								

11.2 Body-worn SAR Measurement Results

GSM/UMTS Body-Worn SAR														
Frequency		Mode		Tune-Up Limit	Meas. Power	Power Drift	Test Position	Antenna Config.	Duty Cycle	Distance	Meas. SAR	Scaling Factor	Scaled SAR	Plot No.
MHz	Ch.			(dB)	(dB)	(dB)				(mm)	(W/kg)		(W/kg)	
836.6	190	GSM	Voice	33.0	32.38	-0.018	Rear	Ant. 1	1:8.3	15	0.334	1.153	0.385	-
836.6	190	GSM	Voice	33.0	32.38	-0.019	Front	Ant. 1	1:8.3	15	0.389	1.153	**0.449**	8
836.6	190	GSM	Voice	33.0	32.38	-0.013	Rear	Ant. 2	1:8.3	15	0.092	1.153	**0.106**	9
836.6	190	GSM	Voice	33.0	32.38	0.009	Front	Ant. 2	1:8.3	15	0.064	1.153	0.074	-
1 880.0	661	GSM	Voice	30.0	28.57	-0.033	Rear	Ant. 1	1:8.3	15	0.185	1.390	**0.257**	10
1 880.0	661	GSM	Voice	30.0	28.57	0.068	Front	Ant. 1	1:8.3	15	0.116	1.390	0.161	-
1 880.0	661	GSM	Voice	30.0	28.57	-0.040	Rear	Ant. 2	1:8.3	15	0.074	1.390	**0.103**	11
1 880.0	661	GSM	Voice	30.0	28.57	-0.028	Front	Ant. 2	1:8.3	15	0.060	1.390	0.083	-
836.6	4183	RMC		23.0	22.40	-0.016	Rear	Ant. 1	1:1	15	0.240	1.148	0.276	-
836.6	4183	RMC		23.0	22.40	0.077	Front	Ant. 1	1:1	15	0.284	1.148	**0.326**	12
836.6	4183	RMC		23.0	22.40	-0.109	Rear	Ant. 2	1:1	15	0.114	1.148	**0.131**	13
836.6	4183	RMC		23.0	22.40	-0.032	Front	Ant. 2	1:1	15	0.044	1.148	0.051	-
1 880.0	9400	RMC		23.0	22.15	0.017	Rear	Ant. 1	1:1	15	0.281	1.216	**0.342**	14
1 880.0	9400	RMC		23.0	22.15	0.015	Front	Ant. 1	1:1	15	0.171	1.216	0.208	-
1 880.0	9400	RMC		23.0	22.15	0.023	Rear	Ant. 2	1:1	15	0.115	1.216	**0.140**	15
1 880.0	9400	RMC		23.0	22.15	-0.103	Front	Ant. 2	1:1	15	0.088	1.216	0.107	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population							Head 1.6 W/kg (mW/g) Averaged over 1 gram							

LTE Band 41 Body-Worn SAR																	
Frequency		Mode	Band width	Tune-Up Limit	Meas. Power	Power Drift	Test Position	Ant. Config.	MPR	RB Size	RB offset	Duty Cycle	Distance	Meas. SAR	Scaling Factor	Scaled SAR	Plot No.
MHz	Ch.		(MHz)	(dBm)	(dBm)	(dB)			(dB)				(mm)	(W/kg)		(W/kg)	
2 645	41140	QPSK	20	23.8	23.78	-0.142	Rear	Ant.1	0	1	49	1:1.58	15	0.096	1.005	**0.096**	16
2 645	41140	QPSK	20	22.8	21.64	0.065	Rear	Ant.1	1	50	0	1:1.58	15	0.069	1.306	0.090	-
2 645	41140	QPSK	20	23.8	23.78	0.005	Front	Ant.1	0	1	49	1:1.58	15	0.087	1.005	0.087	-
2 645	41140	QPSK	20	22.8	21.64	0.053	Front	Ant.1	1	50	0	1:1.58	15	0.060	1.306	0.078	-
2 645	41140	QPSK	20	23.8	23.78	-0.022	Rear	Ant.2	0	1	49	1:1.58	15	0.027	1.005	0.027	-
2 645	41140	QPSK	20	22.8	21.64	0.039	Rear	Ant.2	1	50	0	1:1.58	15	0.024	1.306	0.031	-
2 645	41140	QPSK	20	23.8	23.78	0.035	Front	Ant.2	0	1	49	1:1.58	15	0.037	1.005	**0.037**	17
2 645	41140	QPSK	20	22.8	21.64	0.055	Front	Ant.2	1	50	0	1:1.58	15	0.023	1.306	0.030	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population							Head 1.6 W/kg (mW/g) Averaged over 1 gram										

DTS Body-Worn SAR

Frequency		Mode	Band width	Data Rate	Tune-Up Limit	Meas. Power	Power Drift	Test Position	Duty Cycle	Distance	Area Scan Peak SAR	Meas. SAR	Scaling Factor	Scaling Factor	Scaled SAR	Plot No.
MHz	Ch.		(MHz)	(Mbps)	(dBm)	(dBm)	(dB)			(mm)	(W/kg)	(W/kg)		(Duty)	(W/kg)	
2 412	1	802.11b	22	1	15.5	14.38	-0.002	Rear	98.94	15	0.095	0.063	1.294	1.011	**0.082**	18
2 412	1	802.11b	22	1	15.5	14.38		Front	98.94	15	0.092		1.294	1.011		-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population								Head 1.6 W/kg (mW/g) Averaged over 1 gram								

NII Body-Worn SAR

Frequency		Mode	Band width	Data Rate	Tune-Up Limit	Meas. Power	Power Drift	Test Position	Duty Cycle	Distance	Area Scan Peak SAR	Meas. SAR	Scaling Factor	Scaling Factor	Scaled SAR	Plot No.
MHz	Ch.		(MHz)	(Mbps)	(dBm)	(dBm)	(dB)			(mm)	(W/kg)	(W/kg)		(Duty)	(W/kg)	
5 260	52	802.11a	20	6Mbps	13.5	13.25		Rear	93.30	15	0.067		1.059	1.072		-
5 260	52	802.11a	20	6Mbps	13.5	13.25	-0.010	Front	93.30	15	0.192	0.097	1.059	1.072	0.110	-
5 500	100	802.11a	20	6Mbps	13.5	12.95		Rear	93.30	15	0.164		1.135	1.072		-
5 500	100	802.11a	20	6Mbps	13.5	12.95	-0.070	Front	93.30	15	0.188	0.080	1.135	1.072	0.097	-
5 825	165	802.11a	20	6Mbps	13.5	12.60		Rear	93.30	15	0.082		1.230	1.072		-
5 825	165	802.11a	20	6Mbps	13.5	12.60	-0.035	Front	93.30	15	0.338	0.137	1.230	1.072	**0.181**	19
ANSI/ IEEE C95.1 - 2005– Safety Limit Spatial Peak Uncontrolled Exposure/ General Population								Head 1.6 W/kg (mW/g) Averaged over 1 gram								

11.3 Hotspot SAR Measurement Results

GSM 850 Hotspot SAR

Frequency		Mode	Tune-Up Limit	Meas. Power	Power Drift	Test Position	Antenna Config.	Duty Cycle	Distance	Meas. SAR	Scaling Factor	Scaled SAR	Plot No.
MHz	Ch.		(dB)	(dB)	(dB)				(mm)	(W/kg)		(W/kg)	
836.6	190	GPRS 3Tx	28.5	27.57	-0.066	Rear	Ant. 1	1:2.77	10	0.613	1.239	0.760	-
824.2	128	GPRS 3Tx	28.5	27.53	-0.053	Front	Ant. 1	1:2.77	10	0.674	1.250	**0.843**	20
836.6	190	GPRS 3Tx	28.5	27.57	-0.007	Front	Ant. 1	1:2.77	10	0.674	1.239	0.835	21
848.8	251	GPRS 3Tx	28.5	27.80	-0.029	Front	Ant. 1	1:2.77	10	0.631	1.175	0.741	-
836.6	190	GPRS 3Tx	28.5	27.57	0.000	Left	Ant. 1	1:2.77	10	0.174	1.239	0.216	-
836.6	190	GPRS 3Tx	28.5	27.57	0.013	Right	Ant. 1	1:2.77	10	0.460	1.239	0.570	-
836.6	190	GPRS 3Tx	28.5	27.57	-0.001	Bottom	Ant. 1	1:2.77	10	0.211	1.239	0.261	-
836.6	190	GPRS 3Tx	28.5	27.57	-0.167	Rear	Ant. 2	1:2.77	10	0.206	1.239	**0.255**	22
836.6	190	GPRS 3Tx	28.5	27.57	0.023	Front	Ant. 2	1:2.77	10	0.121	1.239	0.150	-
836.6	190	GPRS 3Tx	28.5	27.57	-0.073	Right	Ant. 2	1:2.77	10	0.106	1.239	0.131	-
836.6	190	GPRS 3Tx	28.5	27.57	-0.051	Top	Ant. 2	1:2.77	10	0.080	1.239	0.099	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Body 1.6 W/kg (mW/g) Averaged over 1 gram							

GSM 1900 Hotspot SAR

Frequency		Mode	Tune-Up Limit	Meas. Power	Power Drift	Test Position	Antenna Config.	Duty Cycle	Distance	Meas. SAR	Scaling Factor	Scaled SAR	Plot No.
MHz	Ch.		(dB)	(dB)	(dB)				(mm)	(W/kg)		(W/kg)	
1 880.0	661	GPRS 3Tx	26.0	24.67	0.042	Rear	Ant. 1	1:2.77	10	0.322	1.358	**0.437**	23
1 880.0	661	GPRS 3Tx	26.0	24.67	-0.059	Front	Ant. 1	1:2.77	10	0.187	1.358	0.254	-
1 880.0	661	GPRS 3Tx	26.0	24.67	0.121	Left	Ant. 1	1:2.77	10	0.024	1.358	0.033	-
1 880.0	661	GPRS 3Tx	26.0	24.67	0.181	Right	Ant. 1	1:2.77	10	0.179	1.358	0.243	-
1 880.0	661	GPRS 3Tx	26.0	24.67	-0.027	Bottom	Ant. 1	1:2.77	10	0.227	1.358	0.308	-
1 880.0	661	GPRS 3Tx	26.0	24.67	-0.033	Rear	Ant. 2	1:2.77	10	0.122	1.358	0.166	-
1 880.0	661	GPRS 3Tx	26.0	24.67	-0.010	Front	Ant. 2	1:2.77	10	0.099	1.358	0.134	-
1 880.0	661	GPRS 3Tx	26.0	24.67	-0.061	Right	Ant. 2	1:2.77	10	0.091	1.358	0.124	-
1 880.0	661	GPRS 3Tx	26.0	24.67	0.005	Top	Ant. 2	1:2.77	10	0.154	1.358	**0.209**	24
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Body 1.6 W/kg (mW/g) Averaged over 1 gram							

UMTS 850 Hotspot SAR													
Frequency		Mode	Tune-Up Limit	Meas. Power	Power Drift	Test Position	Antenna Config.	Duty Cycle	Distance	Meas. SAR	Scaling Factor	Scaled SAR	Plot No.
MHz	Ch.		(dB)	(dB)	(dB)				(mm)	(W/kg)		(W/kg)	
836.6	4183	RMC	23.0	22.40	0.091	Rear	Ant. 1	1:1	10	0.410	1.148	0.471	-
836.6	4183	RMC	23.0	22.40	0.008	Front	Ant. 1	1:1	10	0.462	1.148	**0.530**	25
836.6	4183	RMC	23.0	22.40	0.086	Left	Ant. 1	1:1	10	0.116	1.148	0.133	-
836.6	4183	RMC	23.0	22.40	0.071	Right	Ant. 1	1:1	10	0.330	1.148	0.379	-
836.6	4183	RMC	23.0	22.40	-0.092	Bottom	Ant. 1	1:1	10	0.157	1.148	0.180	-
836.6	4183	RMC	23.0	22.40	0.021	Rear	Ant. 2	1:1	10	0.124	1.148	**0.142**	26
836.6	4183	RMC	23.0	22.40	-0.028	Front	Ant. 2	1:1	10	0.088	1.148	0.101	-
836.6	4183	RMC	23.0	22.40	0.000	Right	Ant. 2	1:1	10	0.078	1.148	0.090	-
836.6	4183	RMC	23.0	22.40	0.075	Top	Ant. 2	1:1	10	0.055	1.148	0.063	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Body 1.6 W/kg (mW/g) Averaged over 1 gram							

UMTS 1900 Hotspot SAR													
Frequency		Mode	Tune-Up Limit	Meas. Power	Power Drift	Test Position	Antenna Config.	Duty Cycle	Distance	Meas. SAR	Scaling Factor	Scaled SAR	Plot No.
MHz	Ch.		(dB)	(dB)	(dB)				(mm)	(W/kg)		(W/kg)	
1 880.0	9400	RMC	23.0	22.15	-0.037	Rear	Ant. 1	1:1	10	0.641	1.216	**0.779**	27
1 880.0	9400	RMC	23.0	22.15	0.022	Front	Ant. 1	1:1	10	0.387	1.216	0.471	-
1 880.0	9400	RMC	23.0	22.15	0.001	Left	Ant. 1	1:1	10	0.053	1.216	0.064	-
1 880.0	9400	RMC	23.0	22.15	-0.017	Right	Ant. 1	1:1	10	0.393	1.216	0.478	-
1 880.0	9400	RMC	23.0	22.15	-0.051	Bottom	Ant. 1	1:1	10	0.425	1.216	0.517	-
1 880.0	9400	RMC	23.0	22.15	-0.039	Rear	Ant. 2	1:1	10	0.250	1.216	0.304	-
1 880.0	9400	RMC	23.0	22.15	0.099	Front	Ant. 2	1:1	10	0.180	1.216	0.219	-
1 880.0	9400	RMC	23.0	22.15	0.027	Right	Ant. 2	1:1	10	0.140	1.216	0.170	-
1 880.0	9400	RMC	23.0	22.15	0.091	Top	Ant. 2	1:1	10	0.298	1.216	**0.362**	28
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Body 1.6 W/kg (mW/g) Averaged over 1 gram							

LTE Band 41 Hotspot SAR

Frequency		Mode	Band width	Tune-Up Limit	Meas. Power	Power Drift	Test Position	Antenna Config.	MPR	RB Size	RB offset	Duty Cycle	Distance	Meas. SAR	Scaling Factor	Scaled SAR	Plot No.
MHz	Ch.		(MHz)	(dBm)	(dBm)	(dB)			(dB)				(mm)	(W/kg)		(W/kg)	
2 645	41140	QPSK	20	23.8	23.78	-0.130	Rear	Ant. 1	0	1	49	1:1.58	10	0.203	1.005	**0.204**	29
2 645	41140	QPSK	20	22.8	21.64	0.045	Rear	Ant. 1	1	50	0	1:1.58	10	0.152	1.306	0.199	-
2 645	41140	QPSK	20	23.8	23.78	0.044	Front	Ant. 1	0	1	49	1:1.58	10	0.160	1.005	0.161	-
2 645	41140	QPSK	20	22.8	21.64	-0.051	Front	Ant. 1	1	50	0	1:1.58	10	0.119	1.306	0.155	-
2 645	41140	QPSK	20	23.8	23.78	0.026	Left	Ant. 1	0	1	49	1:1.58	10	0.159	1.005	0.160	-
2 645	41140	QPSK	20	22.8	21.64	-0.082	Left	Ant. 1	1	50	0	1:1.58	10	0.119	1.306	0.155	-
2 645	41140	QPSK	20	23.8	23.78	0.041	Right	Ant. 1	0	1	49	1:1.58	10	0.00324	1.005	0.003	-
2 645	41140	QPSK	20	22.8	21.64	-0.004	Right	Ant. 1	1	50	0	1:1.58	10	0.00206	1.306	0.003	-
2 645	41140	QPSK	20	23.8	23.78	0.072	Bottom	Ant. 1	0	1	49	1:1.58	10	0.056	1.005	0.056	-
2 645	41140	QPSK	20	22.8	21.64	-0.011	Bottom	Ant. 1	1	50	0	1:1.58	10	0.039	1.306	0.051	-
2 645	41140	QPSK	20	23.8	23.78	-0.063	Rear	Ant. 2	0	1	49	1:1.58	10	0.096	1.005	**0.096**	30
2 645	41140	QPSK	20	22.8	21.64	-0.088	Rear	Ant. 2	1	50	0	1:1.58	10	0.063	1.306	0.082	-
2 645	41140	QPSK	20	23.8	23.78	0.050	Front	Ant. 2	0	1	49	1:1.58	10	0.076	1.005	0.076	-
2 645	41140	QPSK	20	22.8	21.64	-0.003	Front	Ant. 2	1	50	0	1:1.58	10	0.049	1.306	0.064	-
2 645	41140	QPSK	20	23.8	23.78	-0.073	Right	Ant. 2	0	1	49	1:1.58	10	0.059	1.005	0.059	-
2 645	41140	QPSK	20	22.8	21.64	-0.002	Right	Ant. 2	1	50	0	1:1.58	10	0.055	1.306	0.072	-
2 645	41140	QPSK	20	23.8	23.78	0.060	Top	Ant. 2	0	1	49	1:1.58	10	0.029	1.005	0.029	-
2 645	41140	QPSK	20	22.8	21.64	0.060	Top	Ant. 2	1	50	0	1:1.58	10	0.027	1.306	0.035	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population								Body 1.6 W/kg (mW/g) Averaged over 1 gram									

DTS Hotspot SAR

Frequency		Mode	Band width	Data Rate	Tune-Up Limit	Meas. Power	Power Drift	Test Position	Duty Cycle	Distance	Area Scan Peak SAR	Meas. SAR	Scaling Factor	Scaling Factor	Scaled SAR	Plot No.
MHz	Ch.		(MHz)	(Mbps)	(dBm)	(dBm)	(dB)			(mm)	(W/kg)	(W/kg)		(Duty)	(W/kg)	
2 412	1	802.11b	22	1	15.5	14.38		Rear	98.94	10	0.183		1.294	1.011		-
2 412	1	802.11b	22	1	15.5	14.38	0.158	Front	98.94	10	0.199	0.142	1.294	1.011	**0.186**	31
2 412	1	802.11b	22	1	15.5	14.38		Left	98.94	10	0.140		1.294	1.011		-
2 412	1	802.11b	22	1	15.5	14.38		Top	98.94	10	0.114		1.294	1.011		-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population								Body 1.6 W/kg (mW/g) Averaged over 1 gram								

5GHz WLAN Hotspot SAR																
Frequency		Mode	Band width	Data Rate	Tune-Up Limit	Meas. Power	Power Drift	Test Position	Duty Cycle	Distance	Area Scan Peak SAR	Meas. SAR	Scaling Factor	Scaling Factor	Scaled SAR	Plot No.
MHz	Ch.		(MHz)	(Mbps)	(dBm)	(dBm)	(dB)			(mm)	(W/kg)	(W/kg)		(Duty)	(W/kg)	
5 825	165	802.11a	20	6Mbps	13.5	12.60		Rear	93.30	10	0.127		1.230	1.072		-
5 825	165	802.11a	20	6Mbps	13.5	12.60	-0.043	Front	93.30	10	0.446	0.232	1.230	1.072	**0.306**	32
5 825	165	802.11a	20	6Mbps	13.5	12.60		Left	93.30	10	0.065		1.230	1.072		-
5 825	165	802.11a	20	6Mbps	13.5	12.60		Top	93.30	10	0.09		1.230	1.072		-
ANSI/ IEEE C95.1 - 2005– Safety Limit Spatial Peak Uncontrolled Exposure/ General Population								Body 1.6 W/kg (mW/g) Averaged over 1 gram								

11.4 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2013, FCC KDB Procedure.
2. Batteries are fully charged at the beginning of the SAR measurements. A standard battery was used for all SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB 447498 D01v06.
6. Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 15 mm was considered because the manufacturer has determined that there will be body-worn accessories available in the marketplace for users to support this separation distance.
7. Per FCC KDB 648474 D04v01r03, SAR was evaluated without a headset connected to the device. Since the standalone reported SAR was ≤ 1.2 W/kg, no additional SAR evaluation using a headset cable were required.
8. Per FCC KDB 865664 D01v01r04, variability SAR tests were not performed since the measured SAR results for all frequency bands were less than 0.8 W/kg. Please see Section 13 for variability analysis information.

GSM/GPRS Test Notes:

1. This EUT'S GSM and GPRS device class is B.
2. Body-Worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.
3. Justification for reduced test configurations per KDB 941225 D01v03r01: The source-based time-averaged output power was evaluated for all multi-slot operations. The multi-slot configuration with the highest frame averaged output power including tolerance was evaluated for SAR.
4. Per FCC KDB 447498 D01v06, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is 1/2 dB, instead of the middle channel, the highest output power channel must be used.
5. Justification for reduced test configurations per KDB Publication 941225 D01v03r01 and October 2013 TCB Workshop Notes: The source-based frame-averaged output power was evaluated for all GPRS/EDGE slot configurations. The configuration with the highest target frame averaged output power was evaluated for hotspot SAR. When the maximum frame-averaged powers are equivalent across two or more slots (within 0.25 dB), the configuration with the most number of time slots was tested.

UMTS Notes:

1. The 12.2 kbps RMC mode is the primary mode per KDB 941225 D01v03r01.
2. UMTS mode in Body SAR was tested under RMC 12.2 kbps with HSPA inactive per KDB 941225 D01v03r01. HSPA SAR was not required since the average output power of the HSPA subtests was not more than 0.25 dB higher than the RMC level and Adjusted SAR value was less than 1.2 W/kg.
3. Per FCC KDB 447498 D01v06, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the channel highest output power channel was used.
4. UMTS SAR was tested under RMC 12.2 kbps with HSPA inactive per KDB publication 941225 D01v03r01. HSPA SAR was not required since the average output power of the HSPA subtests was not more than 0.25 dB higher than the RMC level and SAR was less than 1.2 W/kg.

LTE Notes:

1. LTE Considerations: LTE test configurations are determined according to SAR Evaluation Consideration for LTE Devices in FCC KDB 941225 D05v02r05.
2. According to FCC KDB 941225 D05v02r05:
   When the reported SAR is ≤ 0.8 W/kg, testing of the 100%RB allocation and required test channels is not required. Otherwise, SAR is required for the remaining required test channels using the 1RB, 50%RB and 100%RB allocation with highest output power for that channel.
   Only one channel, and as reported SAR values for 1RB allocation and 50%RB allocation were less than 1.45W/Kg only the highest power RB offset for each allocation was required.
3. MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to target MPR is indicated alongside the SAR results.
4. A-MPR was disabled for all SAR tests by setting NS=01 on the base station simulator.
5. Pre-installed VOIP applications are considered.
6. TDD LTE was tested using UL-DL configuration 0 with 6 UL subframes and 2S subframes using extended cyclic prefix only and special subframe configuration 6. SAR tests were performed at maximum output power and worst-case transmission duty factor in extended cyclic prefix. Per 3GPP 36.211 Sec. 4**,** the duty factor using extended cyclic prefix is 0.633(cf=1.58).
7. Per KDB 941225 D05Av01r02, SAR for LTE Carrier Aggregation operations was not needed because the maximum average output power in LTE CA mode was not > 0.25 dB higher than the maximum output power when downlink CA was not activated.
8. SAR test reduction is applied using the following criteria:
   Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB, and 50% RB allocation, using the RB offset and required test channel combination with the highest maximum output power among RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is >0.8 W/kg, testing for other Channels is performed at the highest output power level for 1RB, and 50% RB configuration for that channel. Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are >0.8 W/kg, Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation <1.45 W/kg. Testing for 16-QAM modulation is not required because the reported SAR for QPSK is <1.45 W/kg and its output power is not more than 0.5 dB higher than that a QPSK. Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is <1.45 W/kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.

WLAN Notes:

1. For held-to-ear and hotspot operations, the initial test position procedures were applied. For initial test position, the highest extrapolated peak SAR will be used. When reported SAR for the initial test position is ≤ 0.4 W/kg for 1g SAR and ≤ 1.0 W/kg for 10g SAR, no additional testing for the remaining test positions was required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR results is ≤ 0.8 W/kg for 1g SAR and ≤ 2.0 W/kg for 10g SAR or all test position are measured.
2. Per KDB 248227 D01v02r02 justification for test configurations of 2.4 GHz WiFi Single transmission chain operations, the highest measured maximum output power channel for DSSS was selected for SAR measurement. SAR for OFDM modes (2.4 GHz 802.11 g/n) was not required due to the maximum allowed powers and the highest reported DSSS SAR.
3. Per KDB 248227 D01v02r02 justification for test configurations of 5 GHz WiFi Single transmission chain operations, the initial test configuration was selected according to the transmission mode with the highest maximum allowed powers. Other transmission mode were not investigated since the highest reported SAR for initial test configuration adjusted by the ration of maximum output powers is less than 1.2 W/kg for 1g SAR and less than 3.0 W/kg for 10 g SAR.
4. When the maximum reported 1g averaged SAR is ≤ 0.8 W/kg, SAR testing on additional channels was not required. Otherwise, SAR for the next highest output power channel was required until the reported SAR result was ≤ 1.20 W/kg or all test channels were measured.
5. The device was configured to transmit continuously at the required data rated, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools. The reported SAR was scaled to the 100% transmission duty factor to determine compliance. Procedures used to measure the duty factor are identical to that in the associated WLAN test reports.
6. Only channels in the U-NII-2C (> 5.65 GHz WIFI) & U-NII-3 aggregate band that support wireless router were considered for hotspot SAR tests.

12. Simultaneous SAR Analysis

12.1 Simultaneous Transmission Summation for Head

Simultaneous Transmission Summation Scenario with 2.4 GHz WLAN				
Exposure condition	Band	WWAN SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	∑ 1-g SAR (W/kg)
Head SAR	GSM 850	0.376	0.585	0.961
	GSM 1900	0.386	0.585	0.971
	UMTS 850	0.249	0.585	0.834
	UMTS 1900	0.508	0.585	1.093
	LTE Band 41	0.145	0.585	0.730

Simultaneous Transmission Summation Scenario with 5 GHz WLAN				
Exposure condition	Band	WWAN SAR (W/kg)	5 GHz WLAN SAR (W/kg)	∑ 1-g SAR (W/kg)
Head SAR	GSM 850	0.376	0.977	1.353
	GSM 1900	0.386	0.977	1.363
	UMTS 850	0.249	0.977	1.226
	UMTS 1900	0.508	0.977	**1.485**
	LTE Band 41	0.145	0.977	1.122

12.2 Simultaneous Transmission Summation for Body-Worn

Simultaneous Transmission Summation Scenario with 2.4 GHz WLAN					
Exposure condition	Distance (mm)	Band	WWAN SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	∑ 1-g SAR (W/kg)
Body-worn	15	GSM 850	0.449	0.082	0.531
		GSM 1900	0.257	0.082	0.339
		UMTS 850	0.326	0.082	0.408
		UTMS 1900	0.342	0.082	0.424
		LTE Band 41	0.096	0.082	0.178

Simultaneous Transmission Summation Scenario with 5 GHz WLAN					
Exposure condition	Distance (mm)	Band	WWAN SAR (W/kg)	5 GHz WLAN SAR (W/kg)	∑ 1-g SAR (W/kg)
Body-worn	15	GSM 850	0.449	0.181	0.630
		GSM 1900	0.257	0.181	0.438
		UMTS 850	0.326	0.181	0.507
		UTMS 1900	0.342	0.181	0.523
		LTE Band 41	0.096	0.181	0.277

Simultaneous Transmission Summation Scenario with Bluetooth					
Exposure condition	Distance (mm)	Band	WWAN SAR (W/kg)	Bluetooth Estimated SAR (W/kg)	∑ 1-g SAR (W/kg)
Body-worn	15	GSM 850	0.449	0.196	**0.645**
		GSM 1900	0.257	0.196	0.453
		UMTS 850	0.326	0.196	0.522
		UTMS 1900	0.342	0.196	0.538
		LTE Band 41	0.096	0.196	0.292

Note:
Bluetooth SAR was not required to be measured per FCC KDB 447498 D01v06. Estimated SAR results were used for SAR summation for body-worn back side at 15 mm to determine simultaneous transmission SAR test exclusion.

12.3 Simultaneous Transmission Summation for Hotspot

Simultaneous Transmission Summation Scenario with 2.4 GHz WLAN					
Exposure condition	Distance (mm)	Band	WWAN SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	∑ 1-g SAR (W/kg)
Hotspot	10	GSM 850	0.843	0.186	1.029
		GSM 1900	0.437	0.186	0.623
		UMTS 850	0.530	0.186	0.716
		UTMS 1900	0.779	0.186	0.965
		LTE Band 41	0.204	0.186	0.390

Simultaneous Transmission Summation Scenario with 5 GHz WLAN					
Exposure condition	Distance (mm)	Band	WWAN SAR (W/kg)	5 GHz WLAN SAR (W/kg)	∑ 1-g SAR (W/kg)
Hotspot	10	GSM 850	0.843	0.306	**1.149**
		GSM 1900	0.437	0.306	0.743
		UMTS 850	0.530	0.306	0.836
		UTMS 1900	0.779	0.306	1.085
		LTE Band 41	0.204	0.306	0.510

12.4 Simultaneous Transmission Conclusion

The above numerical summed SAR results for all the worst-case simultaneous transmission conditions were below the SAR limit. Therefore, the above analysis is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit. And therefore no measured volumetric simultaneous SAR summation is required per FCC KDB Publication 447498 D01v06 and IEEE 1528-2013.

13. SAR Measurement Variability and Uncertainty

In accordance with KDB procedure 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz, SAR additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

SAR Measurement variability was assessed using the following procedures for each frequency band:

1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg for 1g SAR or < 2.0 W/kg for 10g SAR ; steps 2) through 4) do not apply.

2) When the original highest measured 1g SAR is ≥ 0.80 W/kg or 10g SAR ≥ 2.0W/kg, repeat that measurement once.

3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg for 1g SAR or ≥ 3.625 W/kg for 10g SAR (~ 10% from the 1-g SAR limit).

4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥1.5 W/kg for 1g SAR or ≥3.75 W/kg for 10g SAR and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

14. MEASUREMENT UNCERTAINTY

Uncertainty (700 MHz ~ 5000 MHz)						
Error Description	Tol (± %)	Prob. dist.	Div.	c_i	Standard Uncertainty (± %)	v_{eff}
1. Measurement System						
Probe Calibration	6.55	N	1	1	6.55	∞
Axial Isotropy	4.70	R	1.73	0.7	1.90	∞
Hemispherical Isotropy	9.60	R	1.73	0.7	3.88	∞
Boundary Effects	1.00	R	1.73	1	0.58	∞
Linearity	4.70	R	1.73	1	2.71	∞
System Detection Limits	1.00	R	1.73	1	0.58	∞
Readout Electronics	0.30	N	1.00	1	0.30	∞
Response Time	0.8	R	1.73	1	0.46	∞
Integration Time	2.6	R	1.73	1	1.50	∞
RF Ambient Conditions	3.00	R	1.73	1	1.73	∞
Probe Positioner	0.40	R	1.73	1	0.23	∞
Probe Positioning	2.90	R	1.73	1	1.67	∞
Max SAR Eval	1.00	R	1.73	1	0.58	∞
2.Test Sample Related						
Device Positioning	2.25	N	1.00	1	2.25	9
Device Holder	3.60	N	1.00	1	3.60	∞
Power Drift	5.00	R	1.73	1	2.89	∞
3.Phantom and Setup						
Phantom Uncertainty	4.00	R	1.73	1	2.31	∞
Liquid Conductivity(target)	5.00	R	1.73	0.64	1.85	∞
Liquid Conductivity(meas.)	3.00	N	1	0.64	1.73	∞
Liquid Permitivity(target)	5.00	R	1.73	0.6	1.73	∞
Liquid Permitivity(meas.)	2.30	N	1	0.6	1.14	∞
Combind Standard Uncertainty					10.99	
Coverage Factor for 95 %					*k*=2	
Expanded STD Uncertainty					21.98	

15. SAR TEST EQUIPMENT

Manufacturer	Type / Model	S/N	Calib. Date	Calib.Interval	Calib.Due
SPEAG	SAM Phantom	-	N/A	N/A	N/A
SPEAG	Triple Modular Phantom	-	N/A	N/A	N/A
HP	SAR System Control PC	-	N/A	N/A	N/A
Staubli	CS7MB	F05/ 510XA1/ C/ 01	N/A	N/A	N/A
Staubli	CS7MB	F01/ 5L76A1/ C/ 01	N/A	N/A	N/A
Staubli	CS7MB	F01/ 5K08A1/ C/ 01	N/A	N/A	N/A
Staubli	RX60B L	F05/ 510XA1/ A/ 01	N/A	N/A	N/A
Staubli	RX90B L	F01/ 5L76A1/ A/ 01	N/A	N/A	N/A
Staubli	RX90B L	F01/ 5K08A1/ A/ 01	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	D22134002 2	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	D22134006 A	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	D22134001 1	N/A	N/A	N/A
SPEAG	DAE3	446	01/25/2016	Annual	01/25/2017
SPEAG	DAE4	869	10/07/2015	Annual	10/07/2016
SPEAG	E-Field Probe EX3DV4	3967	12/16/2015	Annual	12/16/2016
SPEAG	E-Field Probe EX3DV4	7370	09/01/2015	Annual	09/01/2016
SPEAG	Dipole D835V2	4d165	11/24/2015	Annual	11/24/2016
SPEAG	Dipole D1900V2	5d032	05/20/2015	Annual	05/20/2016
SPEAG	Dipole D2450V2	743	05/19/2015	Annual	05/19/2016
SPEAG	Dipole D2600V2	1106	02/18/2016	Annual	02/18/2017
SPEAG	Dipole D5GHzV2	1107	01/29/2016	Annual	01/29/2017
Agilent	Power Meter N1991A	MY45101406	10/03/2015	Annual	10/03/2016
Agilent	Power Sensor N1921A	MY55220026	08/19/2015	Annual	08/19/2016
SPEAG	DAKS 3.5	1038	05/26/2015	Annual	05/26/2016
HP	Directional Bridge	86205A	05/20/2015	Annual	05/20/2016
Agilent	Base Station E5515C	GB44400269	02/05/2016	Annual	02/05/2017
HP	Signal Generator N5182A	MY4770230	05/13/2015	Annual	05/13/2016
Hewlett Packard	11636B/Power Divider	58698	02/27/2016	Annual	02/27/2017
TESTO	175-H1/Thermometer	40332651310	02/12/2016	Annual	02/12/2017
TESTO	175-H1/Thermometer	40331939309	02/12/2016	Annual	02/12/2017
EMPOWER	RF Power amplifier	1011	10/20/2015	Annual	10/20/2016
Agilent	Attenuator(3dB)	52744	10/20/2015	Annual	10/20/2016
Agilent	Attenuator(20dB)	52664	10/20/2015	Annual	10/20/2016
HP	Notebook(DAKS)	-	N/A	N/A	N/A
HP	Dual Directional Coupler	16072	10/20/2015	Annual	10/20/2016
R&S	Wideband Radio Communication Tester CMW500	115733	09/18/2015	Annual	09/18/2016

NOTE:
1. The E-field probe was calibrated by SPEAG, by the waveguide technique procedure. Dipole Verification measurement is performed by HCT Lab. before each test. The brain/body simulating material is calibrated by HCT using the DAKS 3.5 to determine the conductivity and permittivity (dielectric constant) of the brain/body-equivalent material.

16. CONCLUSION

The SAR measurement indicates that the EUT complies with the RF radiation exposure limits of the ANSI/ IEEE C95.1- 2005.

These measurements are taken to simulate the RF effects exposure under worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests.

The SAR measurement indicates that the EUT complies with the RF radiation exposure limits of the FCC and Industry Canada. These measurements were taken to simulate the RF effects of RF exposure under worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests. The results and statements relate only to the item(s) tested.

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Attachment 1. – SAR Test Plots

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	20.1 ℃
Ambient Temperature:	20.3 ℃
Test Date:	04/27/2016
Plot No.:	1

DUT: SM-C5000; Type: Bar

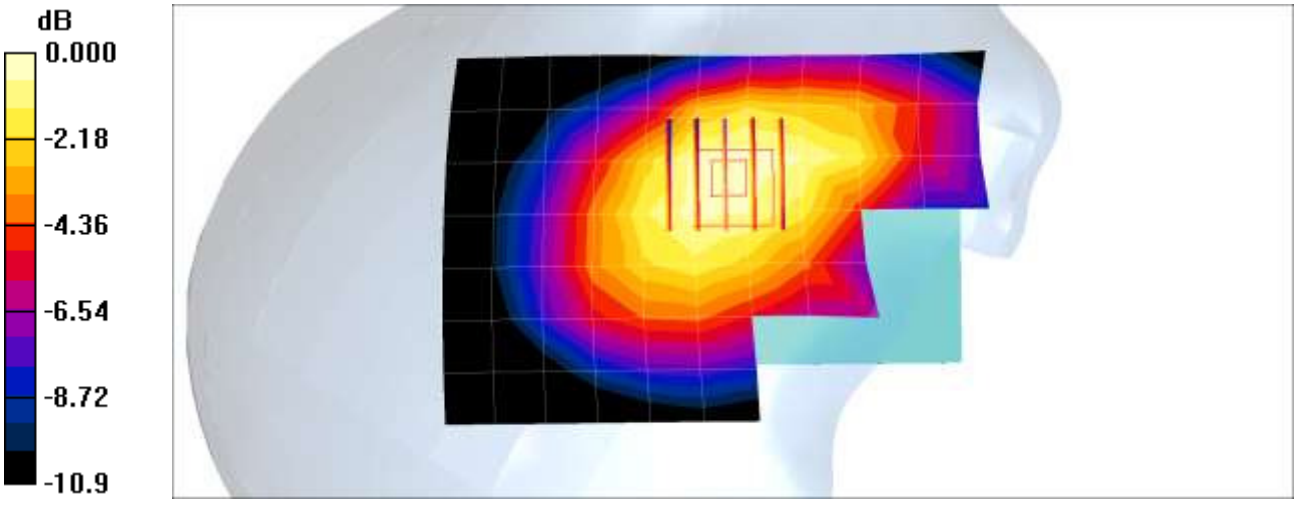
Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.92 mho/m; ε_r = 40.5; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(9.87, 9.87, 9.87); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: SAM
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

GSM850 Head Right Touch 190ch/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.356 mW/g

GSM850 Head Right Touch 190ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.42 V/m; Power Drift = 0.043 dB
Peak SAR (extrapolated) = 0.410 W/kg
SAR(1 g) = 0.326 mW/g; SAR(10 g) = 0.252 mW/g
Maximum value of SAR (measured) = 0.371 mW/g



0 dB = 0.371mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	19.8 ℃
Ambient Temperature:	20.0 ℃
Test Date:	05/02/2016
Plot No.:	2

DUT: SM-C5000; Type: Bar

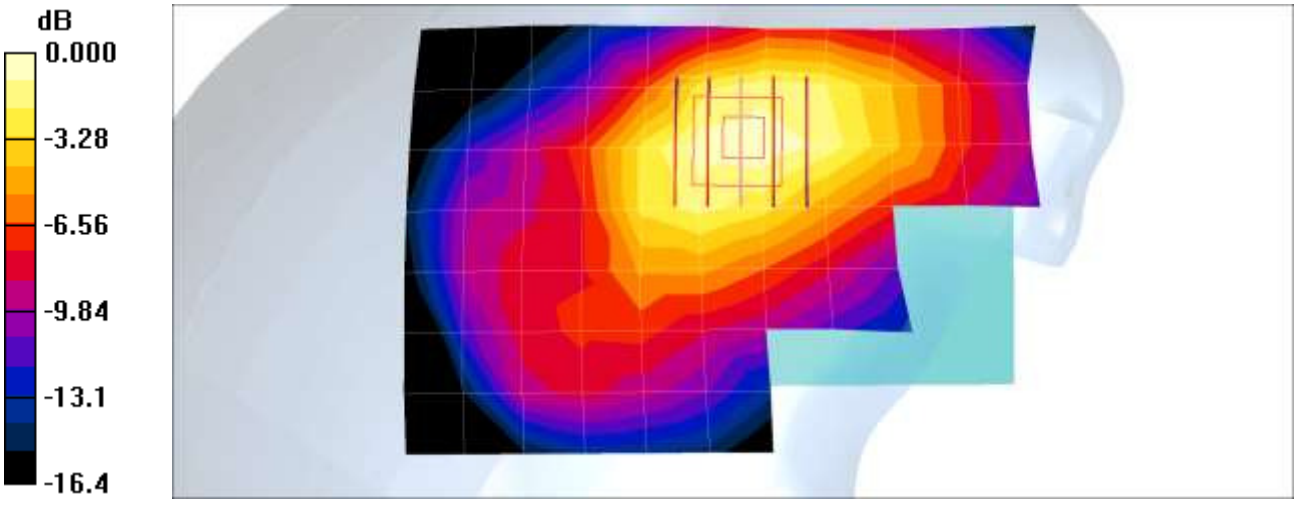
Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.4 mho/m; ε_r = 40.2; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(8.11, 8.11, 8.11); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: SAM
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

GSM1900 Head Right Touch 661ch/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.344 mW/g

GSM1900 Head Right Touch 661ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.41 V/m; Power Drift = -0.123 dB
Peak SAR (extrapolated) = 0.424 W/kg
SAR(1 g) = 0.278 mW/g; SAR(10 g) = 0.181 mW/g
Maximum value of SAR (measured) = 0.350 mW/g



0 dB = 0.350mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	20.1 ℃
Ambient Temperature:	20.3 ℃
Test Date:	04/27/2016
Plot No.:	3

DUT: SM-C5000; Type: Bar

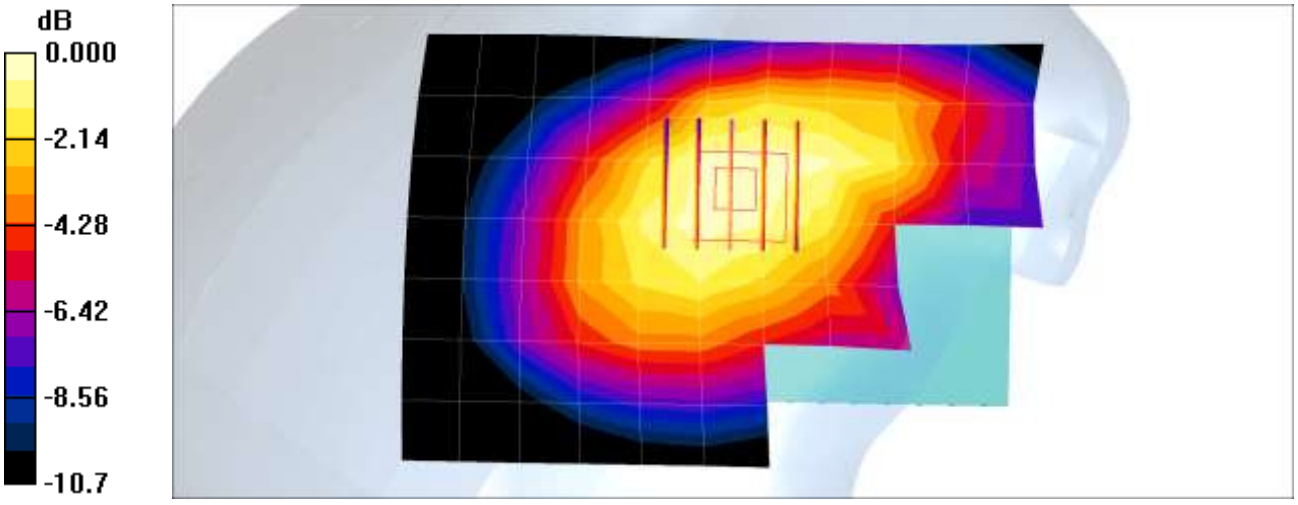
Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.92 mho/m; ε_r = 40.5; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(9.87, 9.87, 9.87); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: SAM
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

WCDMA850 Right Touch 4183ch/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.236 mW/g

WCDMA850 Right Touch 4183ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.56 V/m; Power Drift = -0.126 dB
Peak SAR (extrapolated) = 0.270 W/kg
SAR(1 g) = 0.217 mW/g; SAR(10 g) = 0.169 mW/g
Maximum value of SAR (measured) = 0.244 mW/g



0 dB = 0.244mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	19.8 ℃
Ambient Temperature:	20.0 ℃
Test Date:	05/02/2016
Plot No.:	4

DUT: SM-C5000; Type: Bar

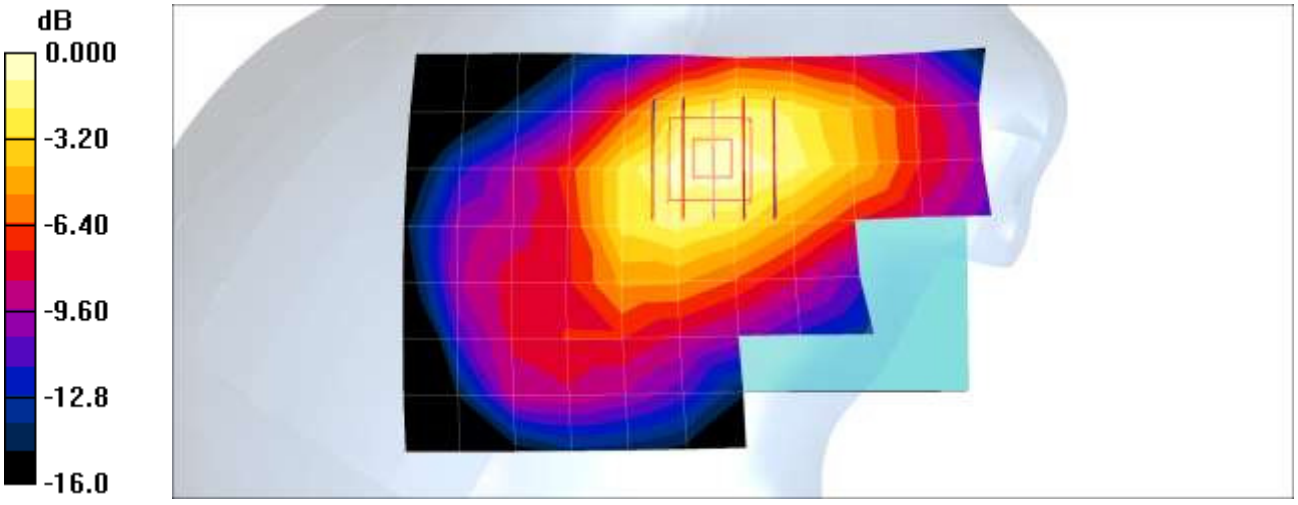
Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.4 mho/m; ε_r = 40.2; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(8.11, 8.11, 8.11); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: SAM
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

WCDMA1900 Head Right Touch 9400ch/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.519 mW/g

WCDMA1900 Head Right Touch 9400ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.67 V/m; Power Drift = -0.063 dB
Peak SAR (extrapolated) = 0.631 W/kg
SAR(1 g) = 0.418 mW/g; SAR(10 g) = 0.272 mW/g
Maximum value of SAR (measured) = 0.526 mW/g



0 dB = 0.526mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	20.3 ℃
Ambient Temperature:	20.5 ℃
Test Date:	05/10/2016
Plot No.:	5

DUT: SM-C5000; Type: Bar

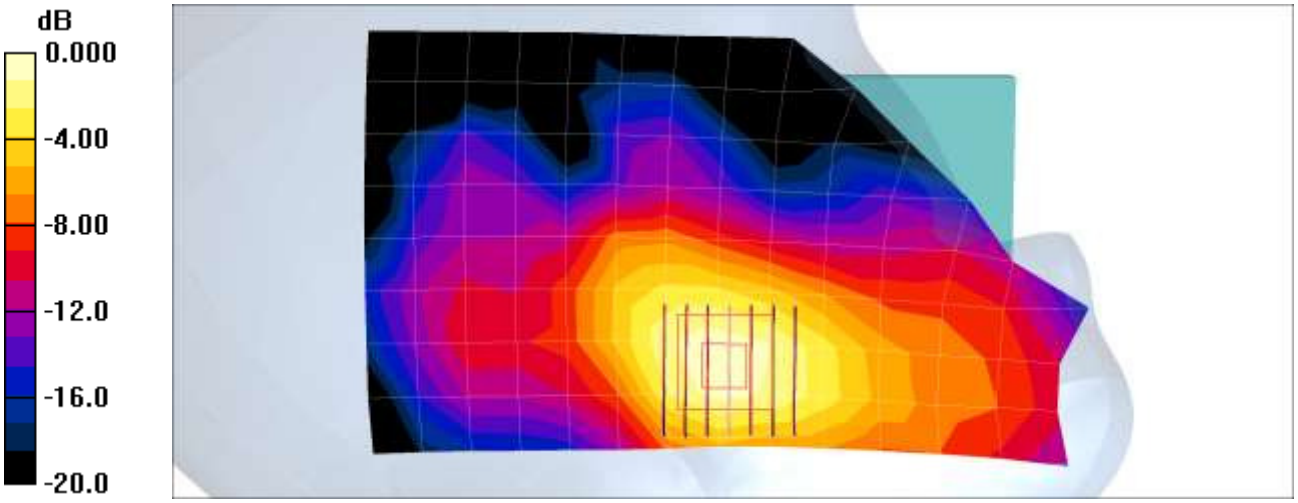
Communication System: LTE Band 41 (FCC); Frequency: 2645 MHz;Duty Cycle: 1:1.58
Medium parameters used (interpolated): f = 2645 MHz; σ = 2.01 mho/m; ε_r = 39.7; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(7.17, 7.17, 7.17); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: SAM
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

LTE Band 41 Head Left Touch QPSK 20MHz 1RB 49offset 41140ch/Area Scan (9x14x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.185 mW/g

LTE Band 41 Head Left Touch QPSK 20MHz 1RB 49offset 41140ch/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.49 V/m; Power Drift = -0.176 dB
Peak SAR (extrapolated) = 0.260 W/kg
SAR(1 g) = 0.144 mW/g; SAR(10 g) = 0.076 mW/g
Maximum value of SAR (measured) = 0.203 mW/g



0 dB = 0.203mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	20.3 ℃
Ambient Temperature:	20.5 ℃
Test Date:	05/04/2016
Plot No.:	6

DUT: SM-C5000; Type: Bar

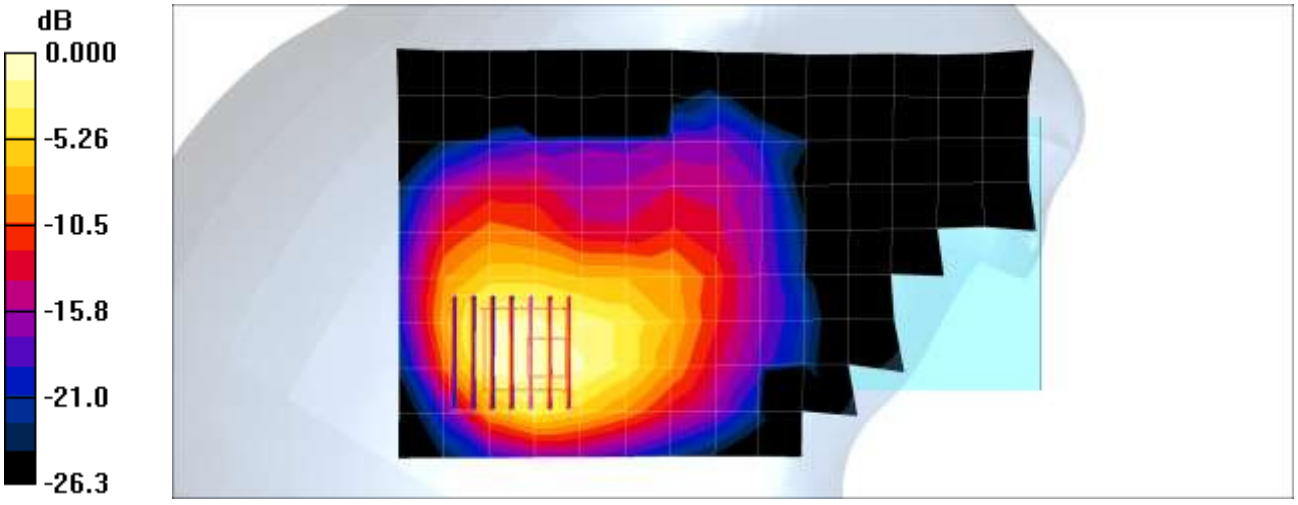
Communication System: 2450MHz FCC; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2412 MHz; σ = 1.77 mho/m; ε_r = 39.1; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(7.42, 7.42, 7.42); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: SAM
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

802.11b Head Right Touch 1Mbps 1ch/Area Scan (10x15x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.591 mW/g

802.11b Head Right Touch 1Mbps 1ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.33 V/m; Power Drift = 0.140 dB
Peak SAR (extrapolated) = 0.835 W/kg
SAR(1 g) = 0.447 mW/g; SAR(10 g) = 0.217 mW/g
Maximum value of SAR (measured) = 0.613 mW/g



0 dB = 0.613mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	21.8 ℃
Ambient Temperature:	22.0 ℃
Test Date:	05/04/2016
Plot No.:	7

DUT: SM-C5000; Type: Bar

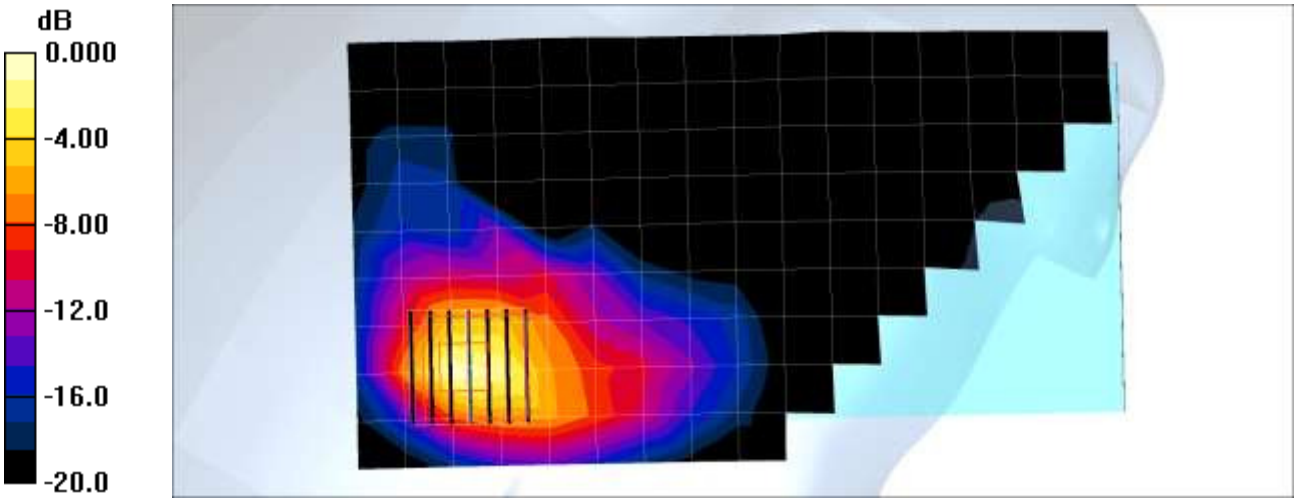
Communication System: WIFI 5GHz; Frequency: 5580 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5580 MHz; σ = 5.06 mho/m; ε_r = 35.7; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY4 Configuration:

- Probe: EX3DV4 - SN7370; ConvF(4.35, 4.35, 4.35); Calibrated: 2015-09-01
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2015-10-07
- Phantom: SAM
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

802.11a Head Right Touch 116ch 6Mbps/Area Scan (10x17x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.95 mW/g

802.11a Head Right Touch 116ch 6Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio:1.4
Reference Value = 5.52 V/m; Power Drift = -0.063 dB
Peak SAR (extrapolated) = 3.83 W/kg
SAR(1 g) = 0.794 mW/g; SAR(10 g) = 0.225 mW/g
Maximum value of SAR (measured) = 2.08 mW/g



0 dB = 2.08mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	20.8 ℃
Ambient Temperature:	21.0 ℃
Test Date:	05/03/2016
Plot No.:	8

DUT: SM-C5000; Type: Bar

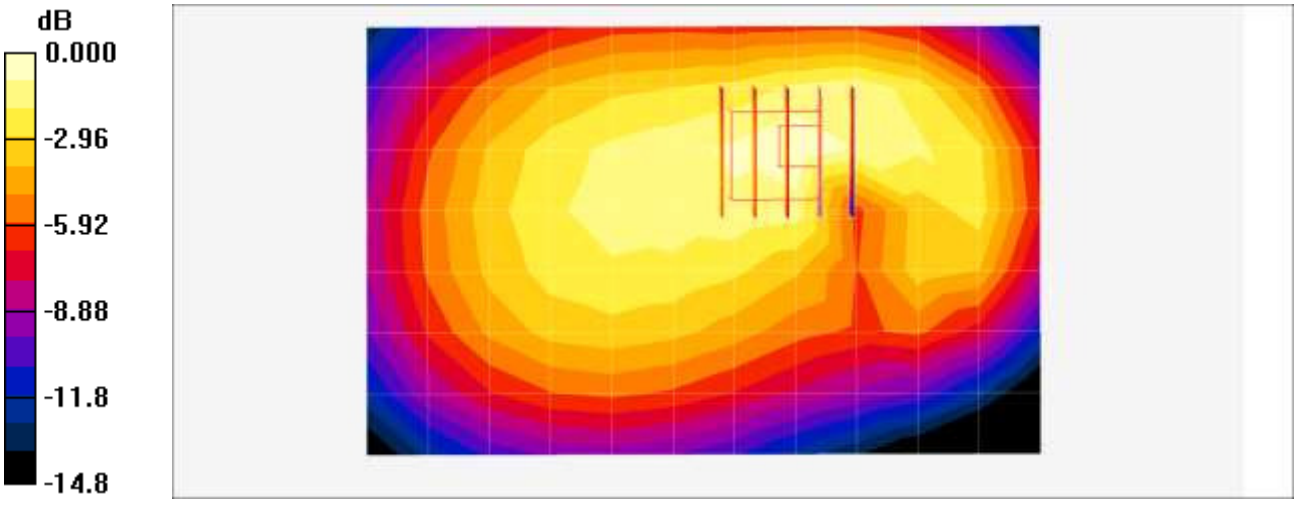
Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.977 mho/m; ε_r = 56.6; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(9.76, 9.76, 9.76); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

GSM850 Body Worn Front 190ch/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.465 mW/g

GSM850 Body Worn Front 190ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.3 V/m; Power Drift = -0.019 dB
Peak SAR (extrapolated) = 0.528 W/kg
SAR(1 g) = 0.389 mW/g; SAR(10 g) = 0.268 mW/g
Maximum value of SAR (measured) = 0.463 mW/g



0 dB = 0.463mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	20.8 ℃
Ambient Temperature:	21.0 ℃
Test Date:	05/03/2016
Plot No.:	9

DUT: SM-C5000; Type: Bar

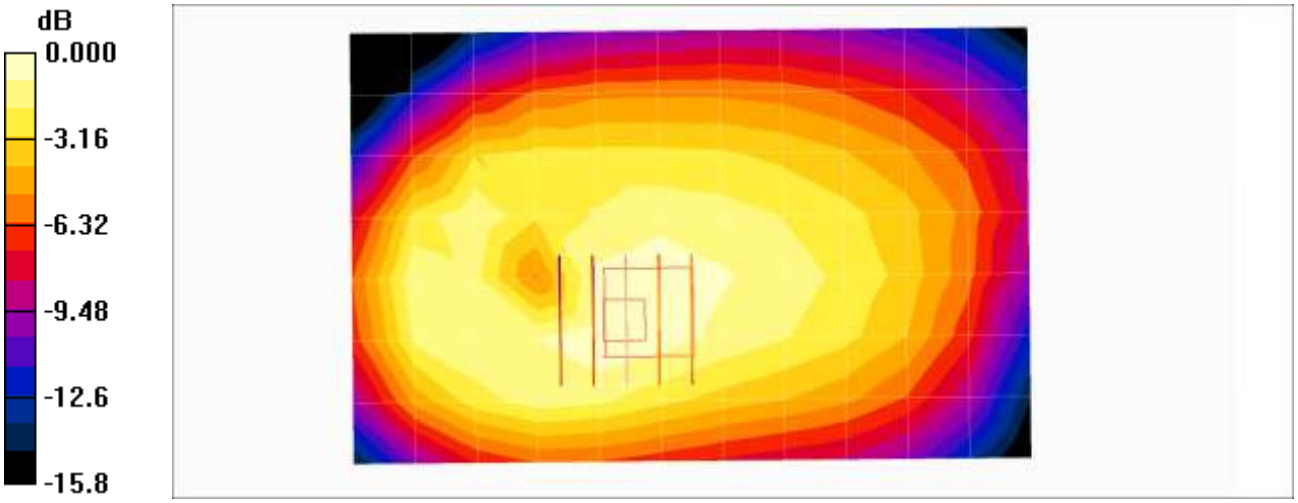
Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.977 mho/m; ε_r = 56.6; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(9.76, 9.76, 9.76); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

GSM850 Body Worn Rear 190ch/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.108 mW/g

GSM850 Body Worn Rear 190ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.92 V/m; Power Drift = -0.013 dB
Peak SAR (extrapolated) = 0.122 W/kg
SAR(1 g) = 0.092 mW/g; SAR(10 g) = 0.066 mW/g



0 dB = 0.108mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	19.8 ℃
Ambient Temperature:	20.0 ℃
Test Date:	05/02/2016
Plot No.:	10

DUT: SM-C5000; Type: Bar

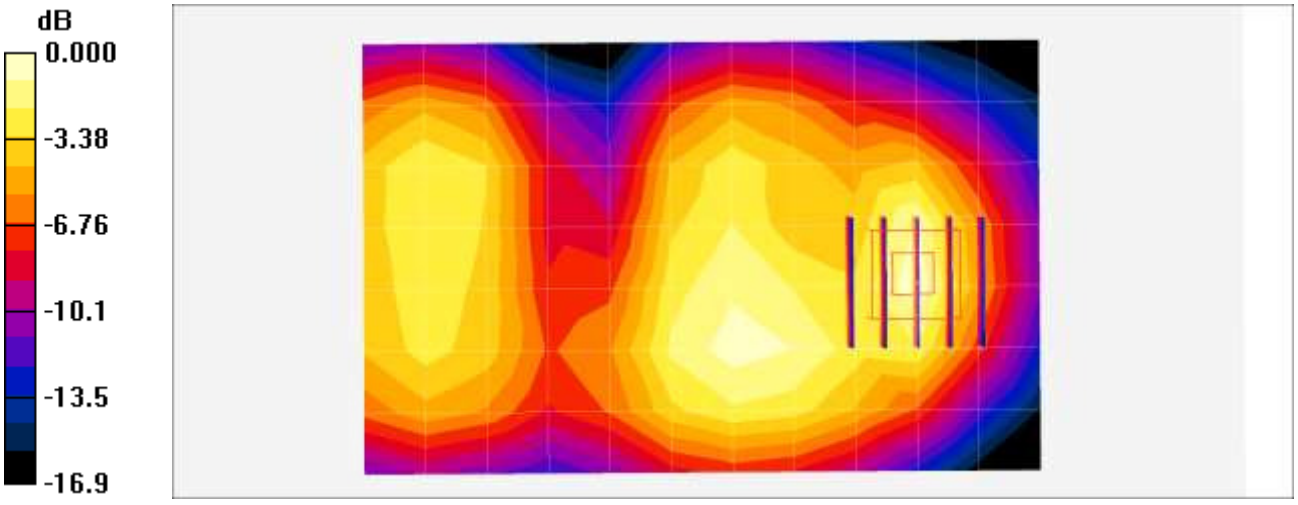
Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 53.9; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(7.95, 7.95, 7.95); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

GSM1900 Body Worn Rear 661ch/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.243 mW/g

GSM1900 Body Worn Rear 661ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.07 V/m; Power Drift = -0.033 dB
Peak SAR (extrapolated) = 0.311 W/kg
SAR(1 g) = 0.185 mW/g; SAR(10 g) = 0.103 mW/g
Maximum value of SAR (measured) = 0.252 mW/g



0 dB = 0.252mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	19.8 ℃
Ambient Temperature:	20.0 ℃
Test Date:	05/02/2016
Plot No.:	11

DUT: SM-C5000; Type: Bar

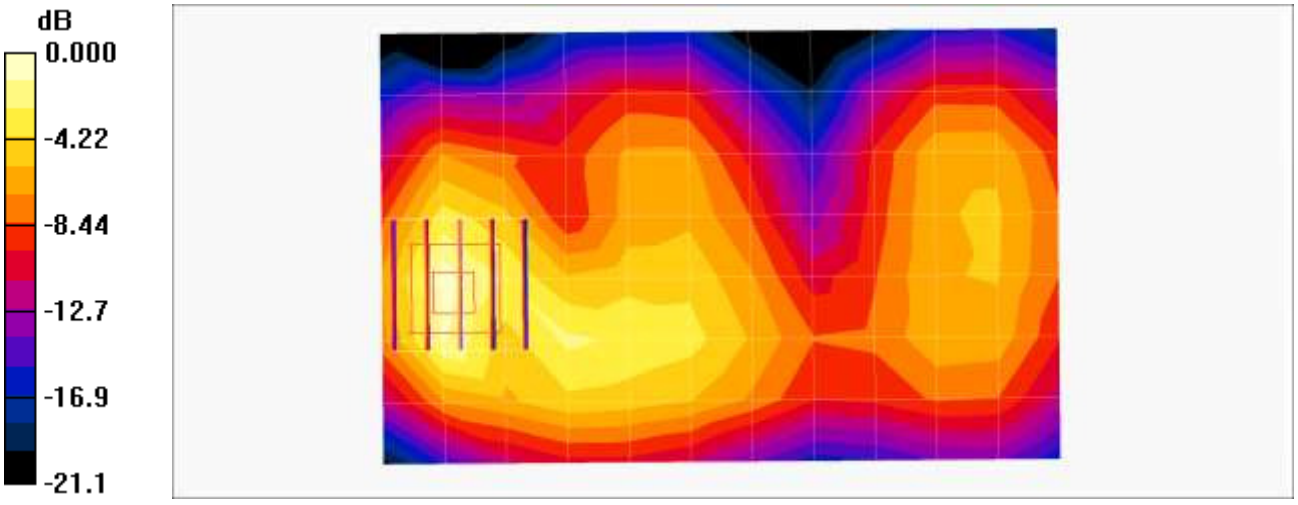
Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 53.9; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(7.95, 7.95, 7.95); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

GSM1900 Body Worn Rear 661ch/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.094 mW/g

GSM1900 Body Worn Rear 661ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.33 V/m; Power Drift = -0.040 dB
Peak SAR (extrapolated) = 0.131 W/kg
SAR(1 g) = 0.074 mW/g; SAR(10 g) = 0.039 mW/g
Maximum value of SAR (measured) = 0.104 mW/g



0 dB = 0.104mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	20.8 ℃
Ambient Temperature:	21.0 ℃
Test Date:	05/03/2016
Plot No.:	12

DUT: SM-C5000; Type: Bar

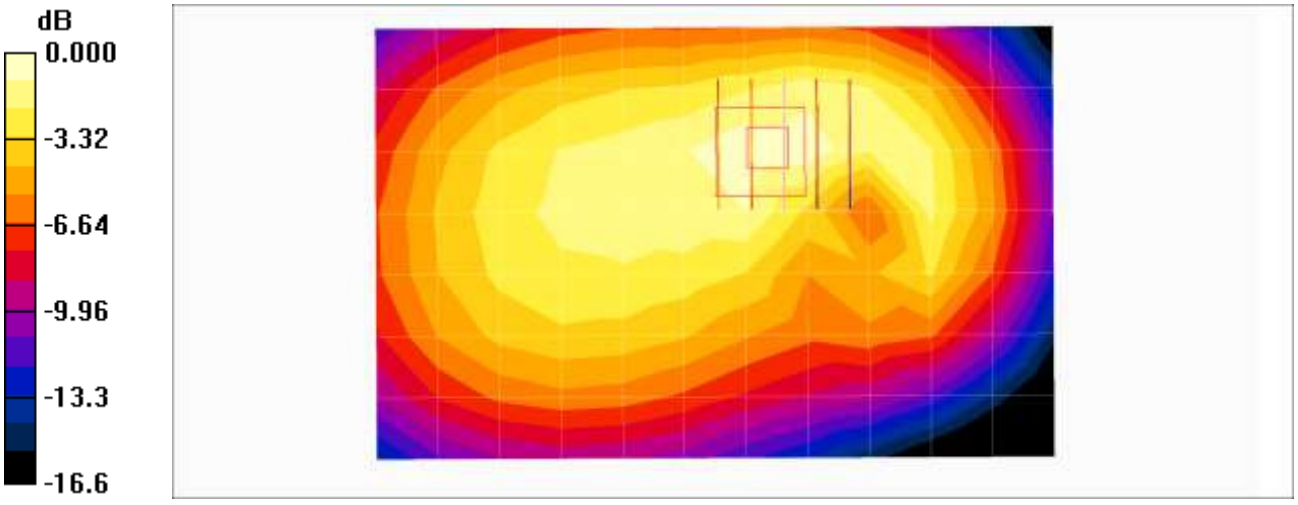
Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.977 mho/m; ε_r = 56.6; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(9.76, 9.76, 9.76); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

WCDMA850 Body Worn Front 4183ch/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.325 mW/g

WCDMA850 Body Worn Front 4183ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.4 V/m; Power Drift = 0.077 dB
Peak SAR (extrapolated) = 0.388 W/kg
SAR(1 g) = 0.284 mW/g; SAR(10 g) = 0.194 mW/g
Maximum value of SAR (measured) = 0.344 mW/g



0 dB = 0.344mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	20.8 ℃
Ambient Temperature:	21.0 ℃
Test Date:	05/03/2016
Plot No.:	13

DUT: SM-C5000; Type: Bar

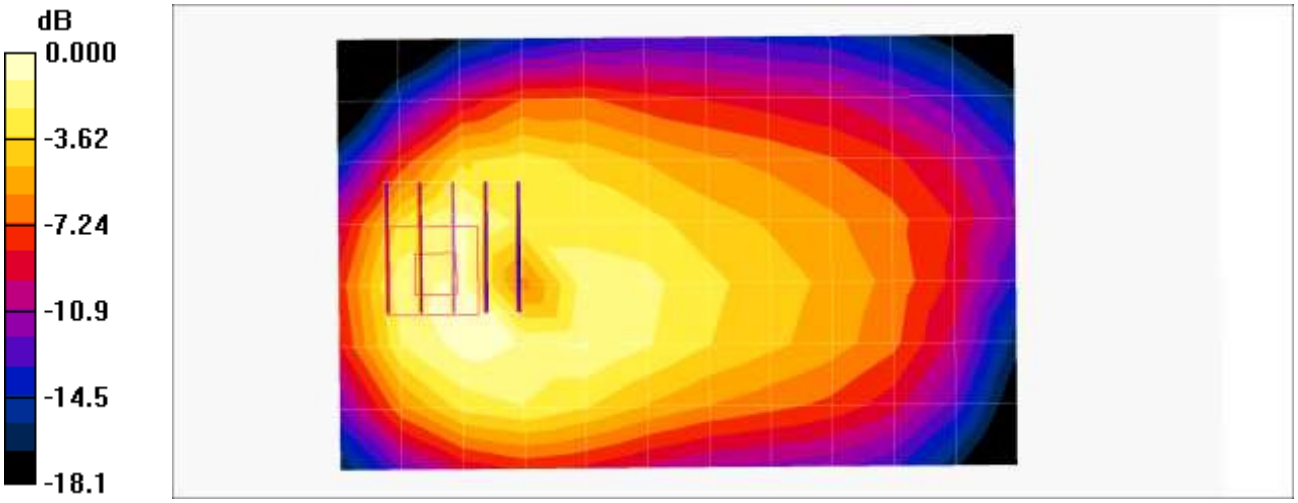
Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.977 mho/m; ε_r = 56.6; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(9.76, 9.76, 9.76); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

WCDMA850 Body Worn Rear 4183ch/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.136 mW/g

WCDMA850 Body Worn Rear 4183ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.85 V/m; Power Drift = -0.109 dB
Peak SAR (extrapolated) = 0.201 W/kg
SAR(1 g) = 0.114 mW/g; SAR(10 g) = 0.063 mW/g
Maximum value of SAR (measured) = 0.153 mW/g



0 dB = 0.153mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	19.8 ℃
Ambient Temperature:	20.0 ℃
Test Date:	05/02/2016
Plot No.:	14

DUT: SM-C5000; Type: Bar

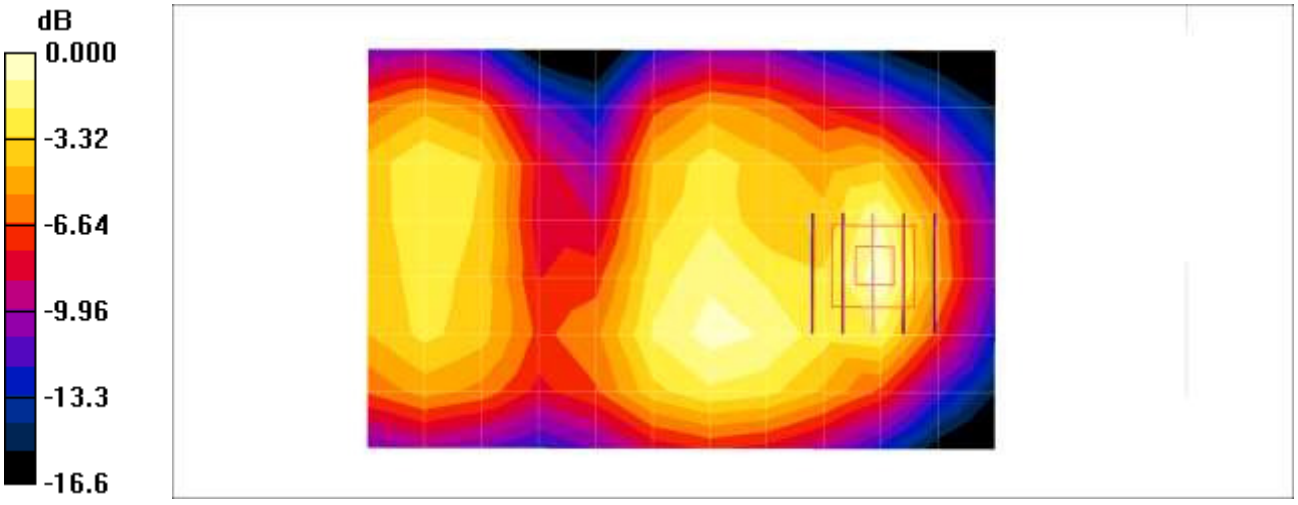
Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 53.9; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(7.95, 7.95, 7.95); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

WCDMA1900 Body Worn Rear 9400ch/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.364 mW/g

WCDMA1900 Body Worn Rear 9400ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.1 V/m; Power Drift = 0.017 dB
Peak SAR (extrapolated) = 0.470 W/kg
SAR(1 g) = 0.281 mW/g; SAR(10 g) = 0.157 mW/g
Maximum value of SAR (measured) = 0.383 mW/g



0 dB = 0.383mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	19.8 ℃
Ambient Temperature:	20.0 ℃
Test Date:	05/02/2016
Plot No.:	15

DUT: SM-C5000; Type: Bar

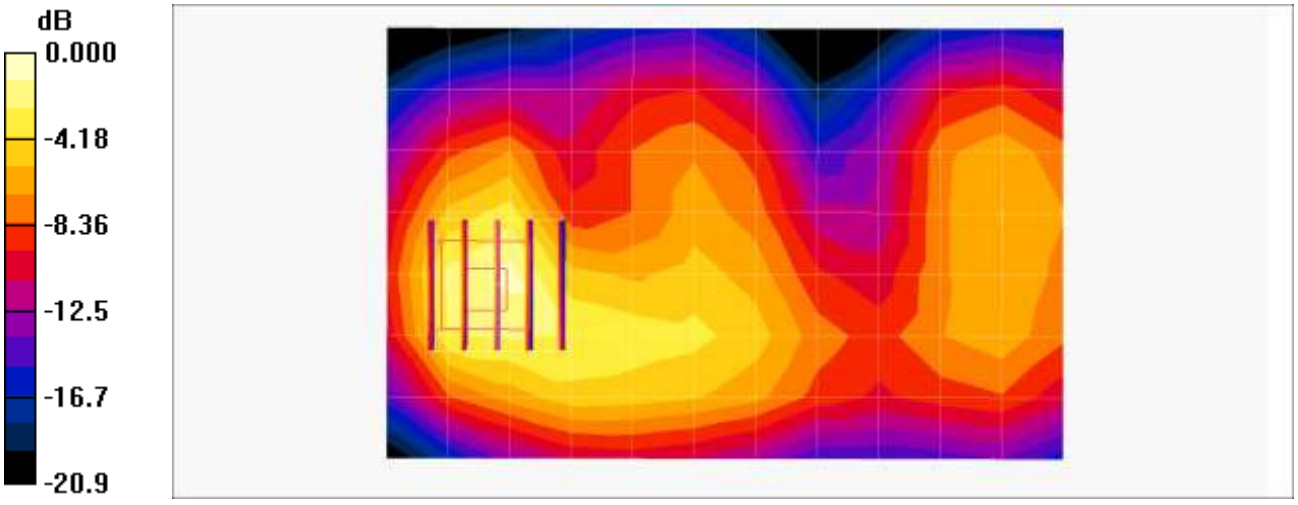
Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 53.9; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(7.95, 7.95, 7.95); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

WCDMA1900 Body Worn Rear 9400ch/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.134 mW/g

WCDMA1900 Body Worn Rear 9400ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.34 V/m; Power Drift = 0.023 dB
Peak SAR (extrapolated) = 0.205 W/kg
SAR(1 g) = 0.115 mW/g; SAR(10 g) = 0.060 mW/g
Maximum value of SAR (measured) = 0.162 mW/g



0 dB = 0.162mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	20.6 ℃
Ambient Temperature:	20.8 ℃
Test Date:	05/09/2016
Plot No.:	16

DUT: SM-C5000; Type: Bar

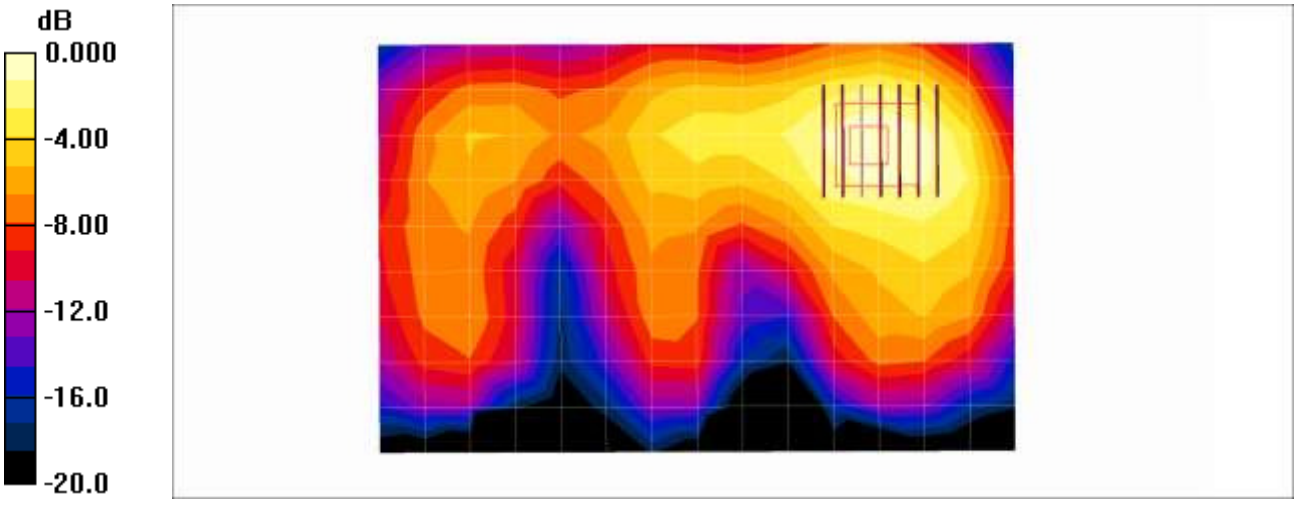
Communication System: LTE Band 41 (FCC); Frequency: 2645 MHz;Duty Cycle: 1:1.58
Medium parameters used (interpolated): f = 2645 MHz; σ = 2.21 mho/m; ε_r = 51.9; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(7.19, 7.19, 7.19); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

LTE Band 41 Body Rear QPSK 20MHz 1RB 49offset 41140ch/Area Scan (10x15x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.139 mW/g

LTE Band 41 Body Rear QPSK 20MHz 1RB 49offset 41140ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.82 V/m; Power Drift = -0.142 dB
Peak SAR (extrapolated) = 0.184 W/kg
SAR(1 g) = 0.096 mW/g; SAR(10 g) = 0.051 mW/g
Maximum value of SAR (measured) = 0.137 mW/g



0 dB = 0.137mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	20.6 ℃
Ambient Temperature:	20.8 ℃
Test Date:	05/09/2016
Plot No.:	17

DUT: SM-C5000; Type: Bar

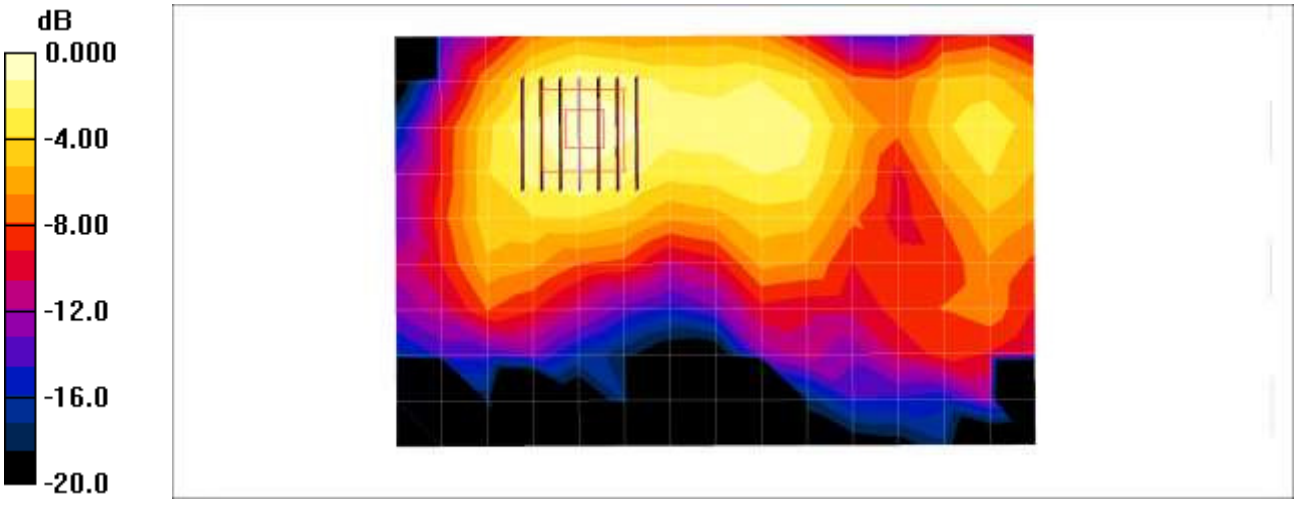
Communication System: LTE Band 41 (FCC); Frequency: 2645 MHz;Duty Cycle: 1:1.58
Medium parameters used (interpolated): f = 2645 MHz; σ = 2.21 mho/m; ε_r = 51.9; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(7.19, 7.19, 7.19); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

LTE Band 41 Body Worn Front QPSK 20MHz 1RB 49offset 41140ch/Area Scan (10x15x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.054 mW/g

LTE Band 41 Body Worn Front QPSK 20MHz 1RB 49offset 41140ch/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.40 V/m; Power Drift = 0.035 dB
Peak SAR (extrapolated) = 0.074 W/kg
SAR(1 g) = 0.037 mW/g; SAR(10 g) = 0.019 mW/g
Maximum value of SAR (measured) = 0.055 mW/g



0 dB = 0.055mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	20.5 ℃
Ambient Temperature:	20.7 ℃
Test Date:	05/04/2016
Plot No.:	18

DUT: SM-C5000; Type: Bar

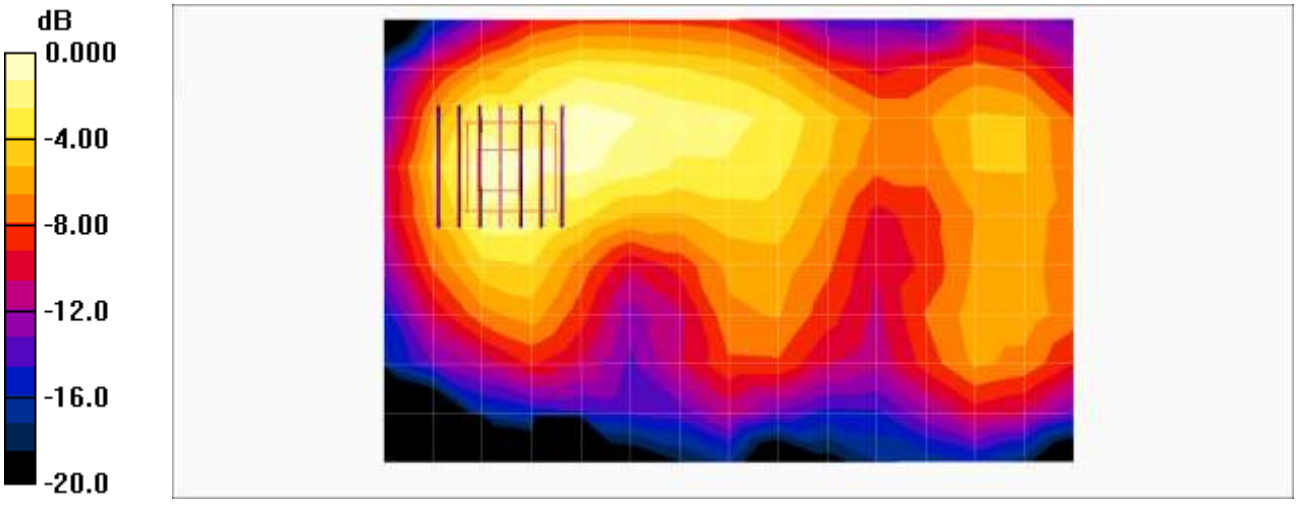
Communication System: 2450MHz FCC; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2412 MHz; σ = 1.88 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(7.31, 7.31, 7.31); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

802.11b Body Worn Rear 1Mbps 1ch/Area Scan (10x15x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.088 mW/g

802.11b Body Worn Rear 1Mbps 1ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.99 V/m; Power Drift = -0.002 dB
Peak SAR (extrapolated) = 0.121 W/kg
SAR(1 g) = 0.063 mW/g; SAR(10 g) = 0.032 mW/g
Maximum value of SAR (measured) = 0.092 mW/g



0 dB = 0.092mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	20.5 ℃
Ambient Temperature:	20.7 ℃
Test Date:	05/04/2016
Plot No.:	19

DUT: SM-C5000; Type: Bar

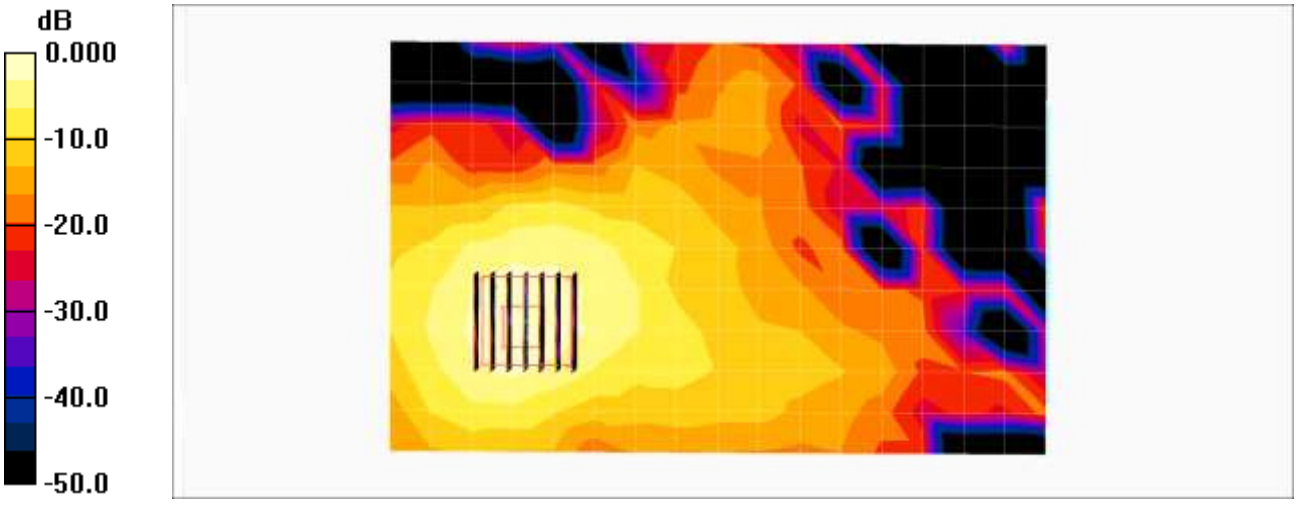
Communication System: WIFI 5GHz; Frequency: 5825 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5825 MHz; σ = 6.2 mho/m; ε_r = 47.2; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(3.82, 3.82, 3.82); Calibrated: 2015-12-16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

802.11a Body Worn Front 6Mbps 165ch/Area Scan (11x17x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.330 mW/g

802.11a Body Worn Front 6Mbps 165ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio:1.4
Reference Value = 1.53 V/m; Power Drift = -0.035 dB
Peak SAR (extrapolated) = 0.566 W/kg
SAR(1 g) = 0.137 mW/g; SAR(10 g) = 0.050 mW/g
Maximum value of SAR (measured) = 0.338 mW/g



0 dB = 0.338mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	20.8 ℃
Ambient Temperature:	21.0 ℃
Test Date:	05/03/2016
Plot No.:	20

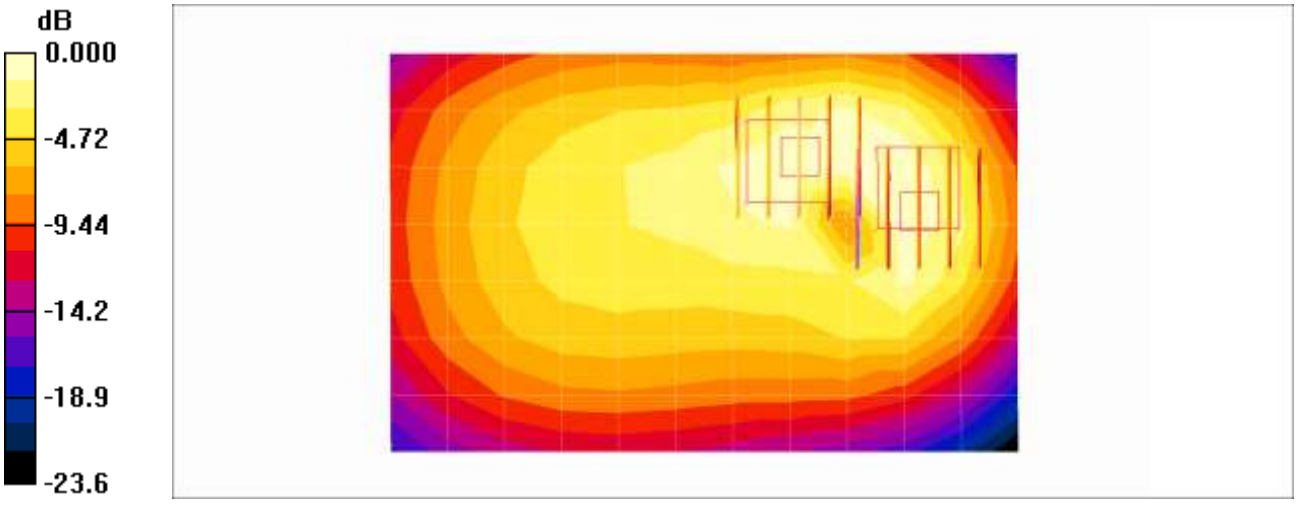
DUT: SM-C5000; Type: Bar

Communication System: GSM 850; Frequency: 824.2 MHz;Duty Cycle: 1:2.77
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.963 mho/m; ε_r = 56.7; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(9.76, 9.76, 9.76); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

GSM850 Body Front 3Tx 128ch/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.820 mW/g
GSM850 Body Front 3Tx 128ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.6 V/m; Power Drift = -0.053 dB
Peak SAR (extrapolated) = 1.02 W/kg
SAR(1 g) = 0.674 mW/g; SAR(10 g) = 0.424 mW/g
Maximum value of SAR (measured) = 0.841 mW/g
GSM850 Body Front 3Tx 128ch/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.6 V/m; Power Drift = -0.053 dB
Peak SAR (extrapolated) = 0.985 W/kg
SAR(1 g) = 0.553 mW/g; SAR(10 g) = 0.320 mW/g
Maximum value of SAR (measured) = 0.762 mW/g



0 dB = 0.762mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	20.8 ℃
Ambient Temperature:	21.0 ℃
Test Date:	05/03/2016
Plot No.:	21

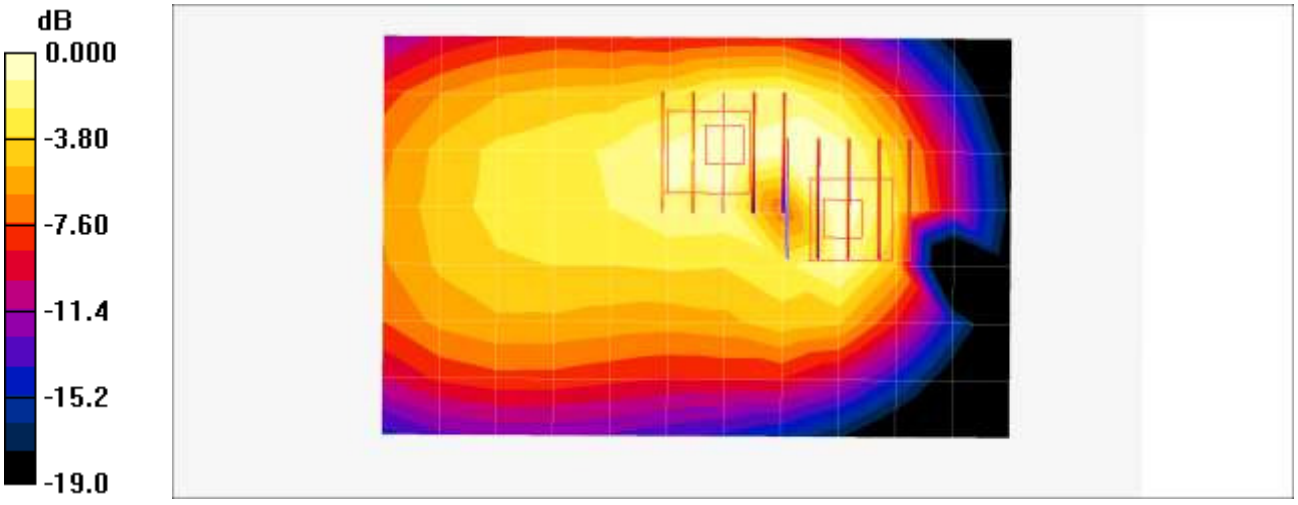
DUT: SM-C5000; Type: Bar

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:2.77
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.977 mho/m; ε_r = 56.6; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(9.76, 9.76, 9.76); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

GSM850 Body Front 3Tx 190ch/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.858 mW/g
GSM850 Body Front 3Tx 190ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.2 V/m; Power Drift = -0.007 dB
Peak SAR (extrapolated) = 1.02 W/kg
SAR(1 g) = 0.674 mW/g; SAR(10 g) = 0.430 mW/g
Maximum value of SAR (measured) = 0.842 mW/g
GSM850 Body Front 3Tx 190ch/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.2 V/m; Power Drift = -0.007 dB
Peak SAR (extrapolated) = 1.04 W/kg
SAR(1 g) = 0.566 mW/g; SAR(10 g) = 0.312 mW/g
Maximum value of SAR (measured) = 0.770 mW/g



0 dB = 0.770mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	20.8 ℃
Ambient Temperature:	21.0 ℃
Test Date:	05/03/2016
Plot No.:	22

DUT: SM-C5000; Type: Bar

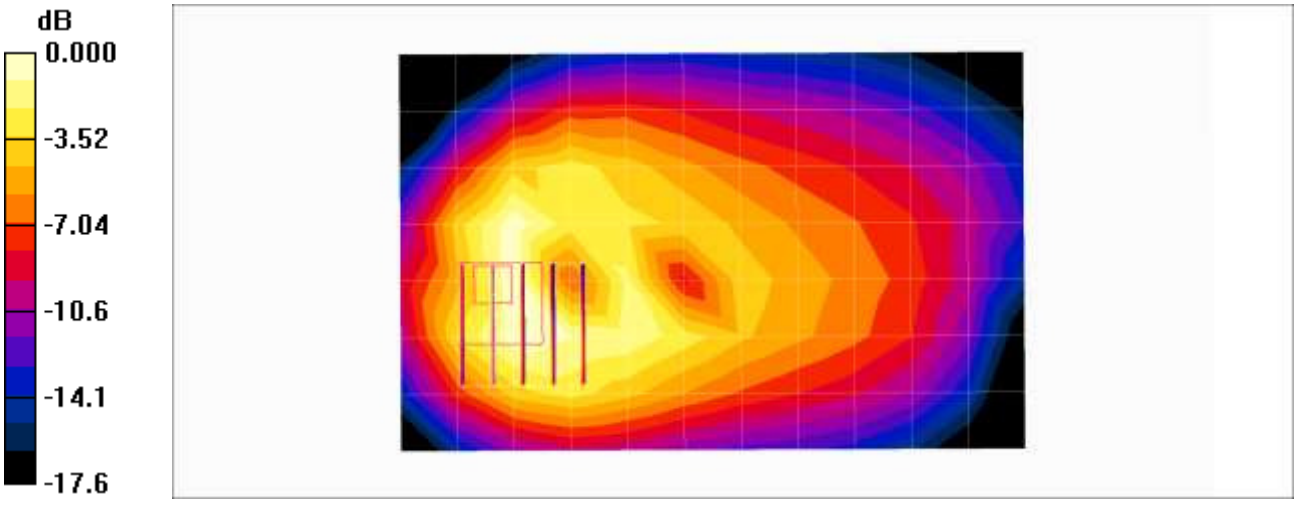
Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:2.77
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.977 mho/m; ε_r = 56.6; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(9.76, 9.76, 9.76); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

GSM850 Body Rear 3Tx 190ch/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.265 mW/g

GSM850 Body Rear 3Tx 190ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.4 V/m; Power Drift = -0.167 dB
Peak SAR (extrapolated) = 0.386 W/kg
SAR(1 g) = 0.206 mW/g; SAR(10 g) = 0.110 mW/g
Maximum value of SAR (measured) = 0.277 mW/g



0 dB = 0.277mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	19.8 ℃
Ambient Temperature:	20.0 ℃
Test Date:	05/02/2016
Plot No.:	23

DUT: SM-C5000; Type: Bar

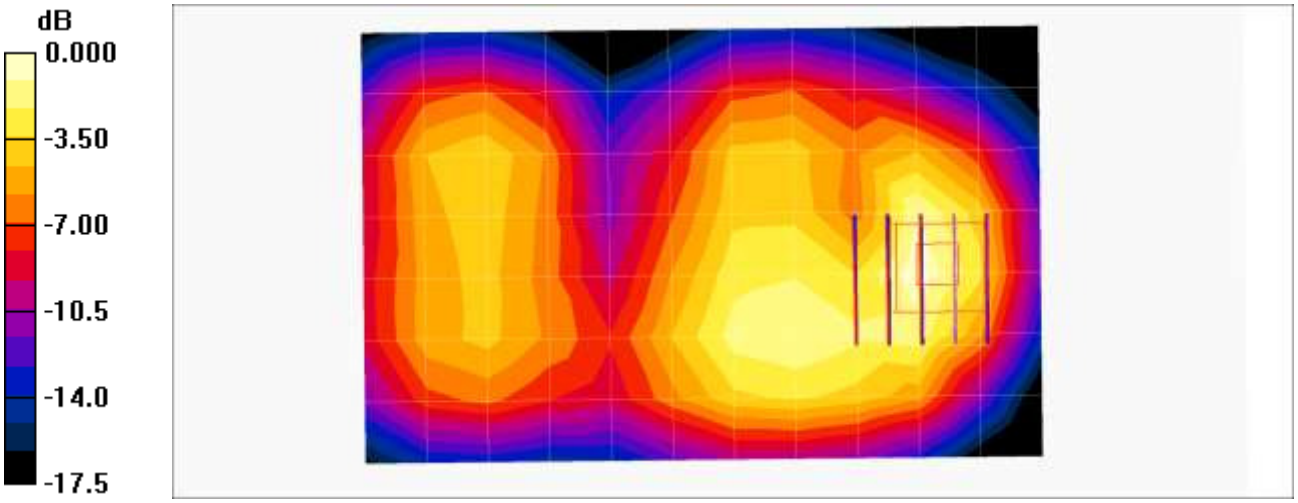
Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:2.77
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 53.9; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(7.95, 7.95, 7.95); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

GSM1900 Body Rear 3Tx 661ch/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.388 mW/g

GSM1900 Body Rear 3Tx 661ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.89 V/m; Power Drift = 0.042 dB
Peak SAR (extrapolated) = 0.572 W/kg
SAR(1 g) = 0.322 mW/g; SAR(10 g) = 0.168 mW/g
Maximum value of SAR (measured) = 0.401 mW/g



0 dB = 0.401mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	19.8 ℃
Ambient Temperature:	20.0 ℃
Test Date:	05/02/2016
Plot No.:	24

DUT: SM-C5000; Type: Bar

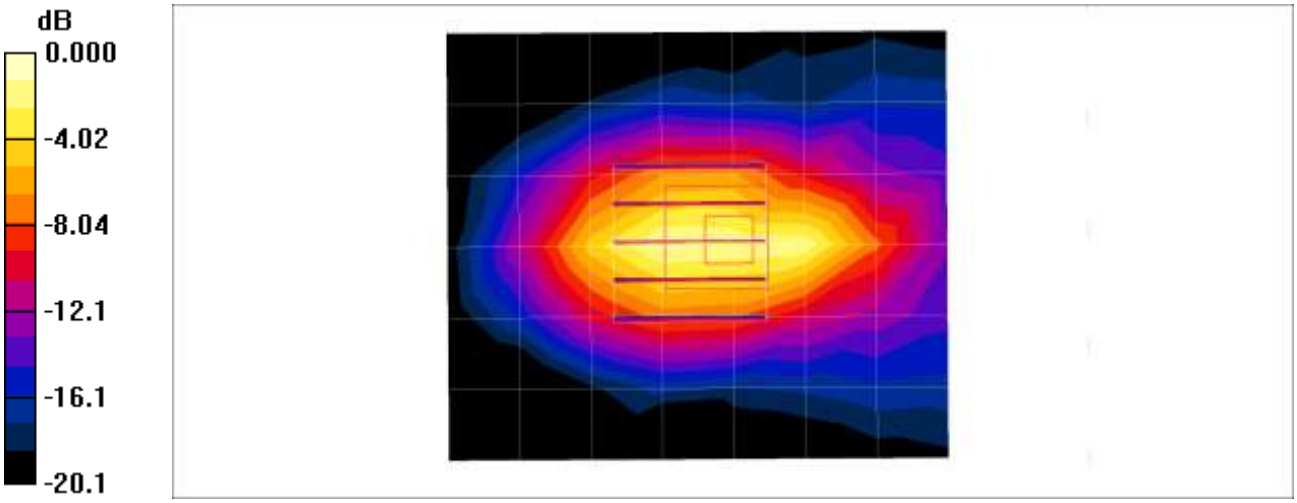
Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:2.77
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 53.9; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(7.95, 7.95, 7.95); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

GSM1900 Body Top 3Tx 661ch/Area Scan (8x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.165 mW/g

GSM1900 Body Top 3Tx 661ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.6 V/m; Power Drift = 0.005 dB
Peak SAR (extrapolated) = 0.268 W/kg
SAR(1 g) = 0.154 mW/g; SAR(10 g) = 0.081 mW/g
Maximum value of SAR (measured) = 0.215 mW/g



0 dB = 0.215mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	20.8 ℃
Ambient Temperature:	21.0 ℃
Test Date:	05/03/2016
Plot No.:	25

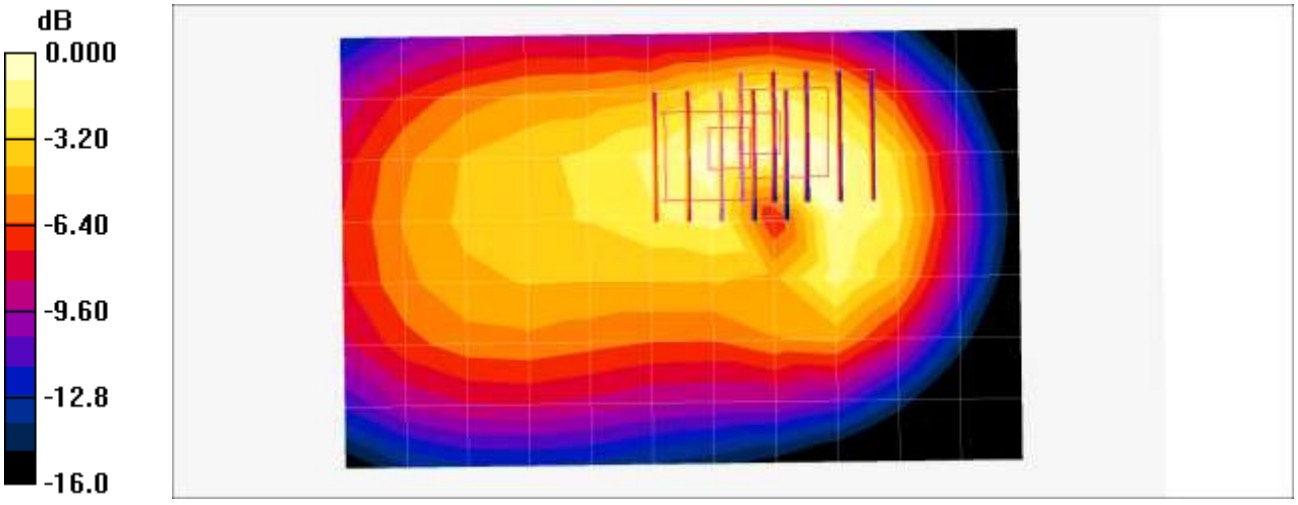
DUT: SM-C5000; Type: Bar

Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.977 mho/m; ε_r = 56.6; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(9.76, 9.76, 9.76); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

WCDMA850 Body Front 4183ch/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.559 mW/g
WCDMA850 Body Front 4183ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.5 V/m; Power Drift = 0.008 dB
Peak SAR (extrapolated) = 0.700 W/kg
SAR(1 g) = 0.462 mW/g; SAR(10 g) = 0.294 mW/g
Maximum value of SAR (measured) = 0.569 mW/g
WCDMA850 Body Front 4183ch/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.5 V/m; Power Drift = 0.008 dB
Peak SAR (extrapolated) = 0.699 W/kg
SAR(1 g) = 0.435 mW/g; SAR(10 g) = 0.246 mW/g
Maximum value of SAR (measured) = 0.583 mW/g



0 dB = 0.583mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	20.8 ℃
Ambient Temperature:	21.0 ℃
Test Date:	05/03/2016
Plot No.:	26

DUT: SM-C5000; Type: Bar

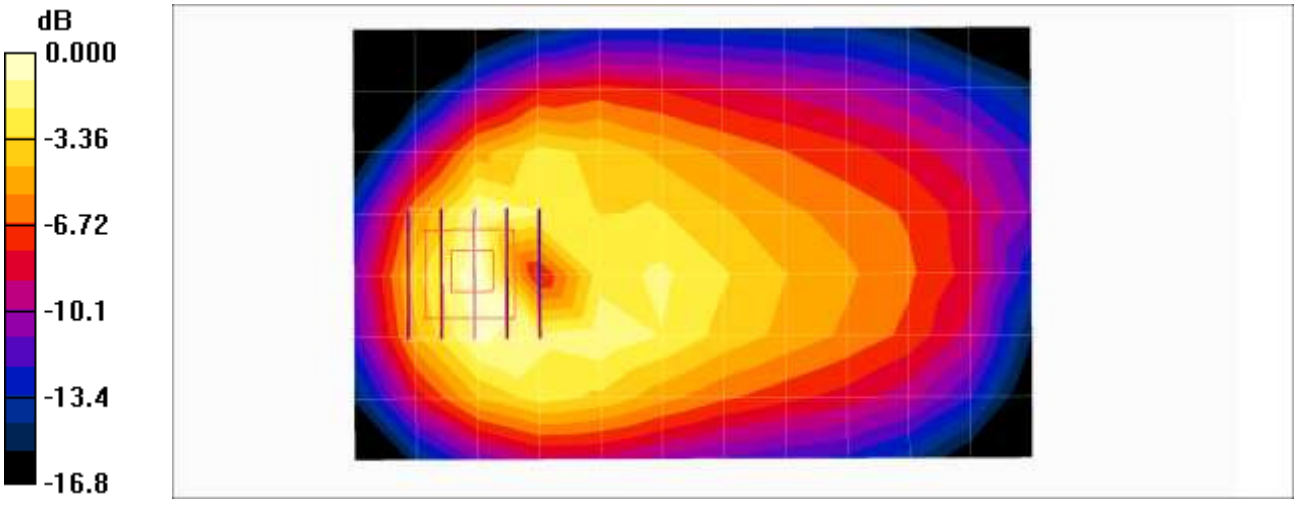
Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.977 mho/m; ε_r = 56.6; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(9.76, 9.76, 9.76); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

WCDMA850 Body Rear 4183ch/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.173 mW/g

WCDMA850 Body Rear 4183ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.2 V/m; Power Drift = 0.021 dB
Peak SAR (extrapolated) = 0.219 W/kg
SAR(1 g) = 0.124 mW/g; SAR(10 g) = 0.070 mW/g
Maximum value of SAR (measured) = 0.174 mW/g



0 dB = 0.174mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	19.8 ℃
Ambient Temperature:	20.0 ℃
Test Date:	05/02/2016
Plot No.:	27

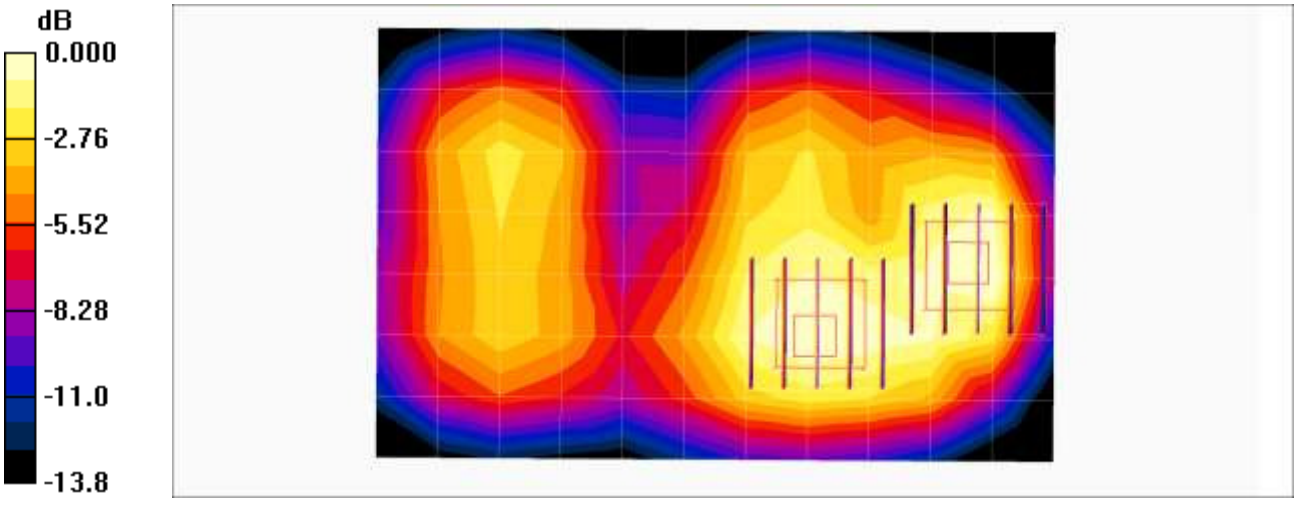
DUT: SM-C5000; Type: Bar

Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 53.9; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(7.95, 7.95, 7.95); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

WCDMA1900 Body Rear 9400ch/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.635 mW/g
WCDMA1900 Body Rear 9400ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.73 V/m; Power Drift = -0.037 dB
Peak SAR (extrapolated) = 1.12 W/kg
SAR(1 g) = 0.641 mW/g; SAR(10 g) = 0.342 mW/g
Maximum value of SAR (measured) = 0.879 mW/g
WCDMA1900 Body Rear 9400ch/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.73 V/m; Power Drift = -0.037 dB
Peak SAR (extrapolated) = 0.723 W/kg
SAR(1 g) = 0.489 mW/g; SAR(10 g) = 0.322 mW/g
Maximum value of SAR (measured) = 0.603 mW/g



0 dB = 0.603mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	19.8 ℃
Ambient Temperature:	20.0 ℃
Test Date:	05/02/2016
Plot No.:	28

DUT: SM-C5000; Type: Bar

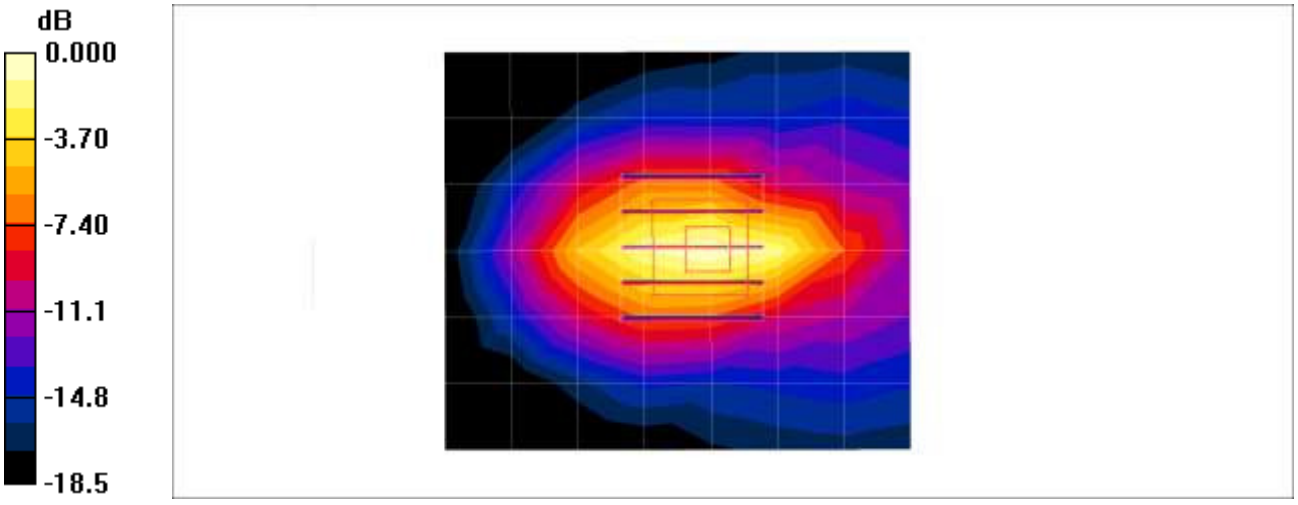
Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 53.9; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(7.95, 7.95, 7.95); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

WCDMA1900 Body Top 9400ch/Area Scan (8x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.406 mW/g

WCDMA1900 Body Top 9400ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.9 V/m; Power Drift = 0.091 dB
Peak SAR (extrapolated) = 0.529 W/kg
SAR(1 g) = 0.298 mW/g; SAR(10 g) = 0.156 mW/g
Maximum value of SAR (measured) = 0.416 mW/g



0 dB = 0.416mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	20.6 ℃
Ambient Temperature:	20.8 ℃
Test Date:	05/09/2016
Plot No.:	29

DUT: SM-C5000; Type: Bar

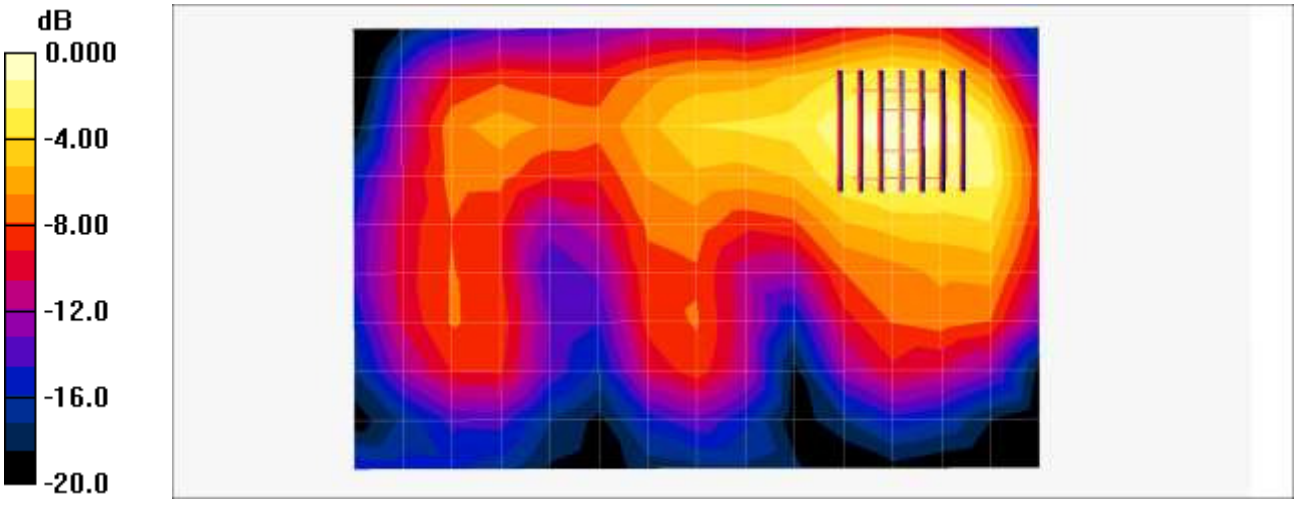
Communication System: LTE Band 41 (FCC); Frequency: 2645 MHz;Duty Cycle: 1:1.58
Medium parameters used (interpolated): f = 2645 MHz; σ = 2.21 mho/m; ε_r = 51.9; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(7.19, 7.19, 7.19); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

LTE Band 41 Body Rear QPSK 20MHz 1RB 49offset 41140ch/Area Scan (10x15x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.283 mW/g

LTE Band 41 Body Rear QPSK 20MHz 1RB 49offset 41140ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.27 V/m; Power Drift = -0.130 dB
Peak SAR (extrapolated) = 0.386 W/kg
SAR(1 g) = 0.203 mW/g; SAR(10 g) = 0.105 mW/g
Maximum value of SAR (measured) = 0.294 mW/g



0 dB = 0.294mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	20.6 ℃
Ambient Temperature:	20.8 ℃
Test Date:	05/09/2016
Plot No.:	30

DUT: SM-C5000; Type: Bar

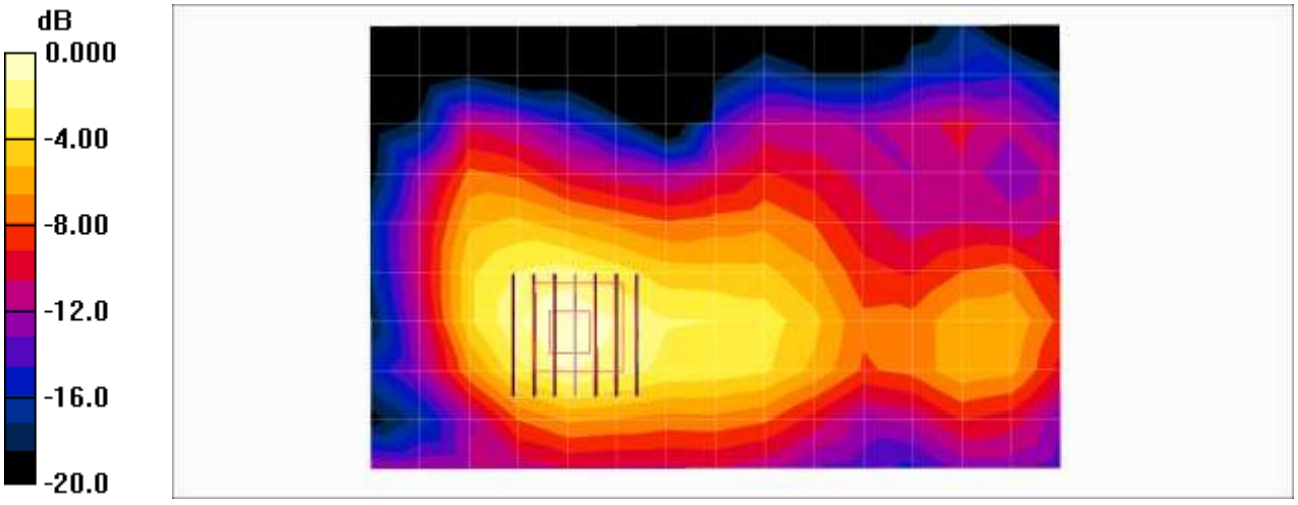
Communication System: LTE Band 41 (FCC); Frequency: 2645 MHz;Duty Cycle: 1:1.58
Medium parameters used (interpolated): f = 2645 MHz; σ = 2.21 mho/m; ε_r = 51.9; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(7.19, 7.19, 7.19); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

LTE Band 41 Body Rear QPSK 20MHz 1RB 49offset 41140ch/Area Scan (10x15x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.138 mW/g

LTE Band 41 Body Rear QPSK 20MHz 1RB 49offset 41140ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.86 V/m; Power Drift = -0.063 dB
Peak SAR (extrapolated) = 0.185 W/kg
SAR(1 g) = 0.096 mW/g; SAR(10 g) = 0.049 mW/g



0 dB = 0.138mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	20.5 ℃
Ambient Temperature:	20.7 ℃
Test Date:	05/04/2016
Plot No.:	31

DUT: SM-C5000; Type: Bar

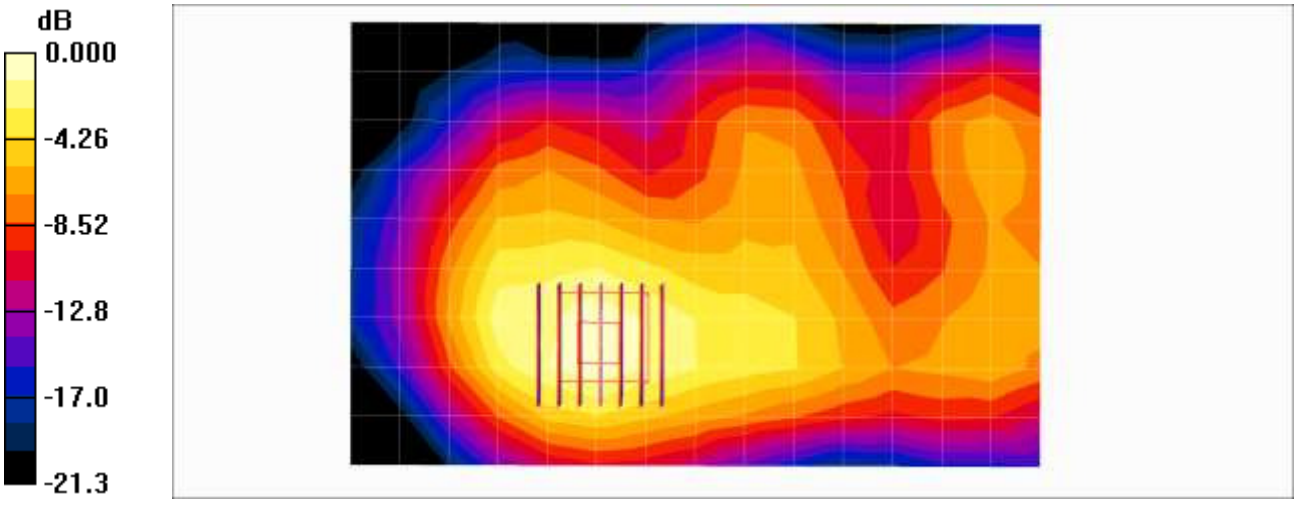
Communication System: 2450MHz FCC; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2412 MHz; σ = 1.88 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(7.31, 7.31, 7.31); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

802.11b Body Front 1Mbps 1ch/Area Scan (10x15x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.180 mW/g

802.11b Body Front 1Mbps 1ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.26 V/m; Power Drift = 0.158 dB
Peak SAR (extrapolated) = 0.247 W/kg
SAR(1 g) = 0.142 mW/g; SAR(10 g) = 0.078 mW/g
Maximum value of SAR (measured) = 0.196 mW/g



0 dB = 0.196mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Mobile Phone
Liquid Temperature:	20.5 ℃
Ambient Temperature:	20.7 ℃
Test Date:	05/04/2016
Plot No.:	32

DUT: SM-C5000; Type: Bar

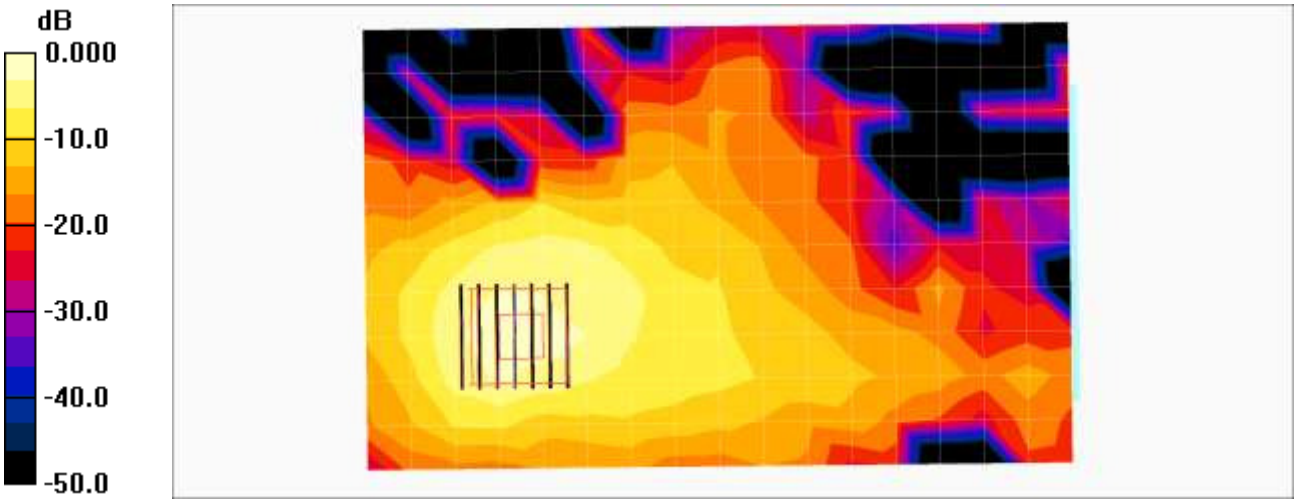
Communication System: WIFI 5GHz; Frequency: 5825 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5825 MHz; σ = 6.2 mho/m; ε_r = 47.2; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(3.82, 3.82, 3.82); Calibrated: 2015-12-16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

802.11a Body Front 6Mbps 165ch/Area Scan (11x17x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.420 mW/g

802.11a Body Front 6Mbps 165ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio:1.4
Reference Value = 2.23 V/m; Power Drift = -0.043 dB
Peak SAR (extrapolated) = 0.970 W/kg
SAR(1 g) = 0.232 mW/g; SAR(10 g) = 0.077 mW/g
Maximum value of SAR (measured) = 0.470 mW/g



0 dB = 0.470mW/g

Attachment 2. – Dipole Verification Plots

■ Verification Data (835 MHz Head)

Test Laboratory: HCT CO., LTD
Input Power 100 mW (20 dBm)
Liquid Temp: 20.1 ℃
Test Date: 04/27/2016

DUT: Dipole 835 MHz; Type: D835V2

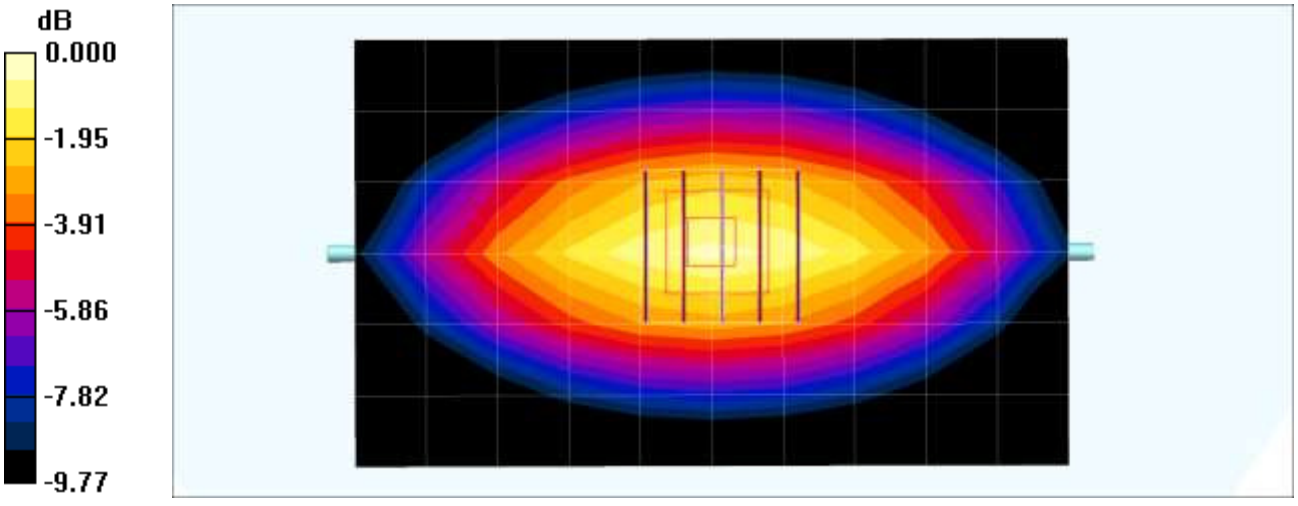
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 835 MHz; σ = 0.917 mho/m; ε_r = 41.3; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(9.87, 9.87, 9.87); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: SAM
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

835MHz Head Verification/Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.03 mW/g

835MHz Head Verification/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 34.7 V/m; Power Drift = -0.052 dB
Peak SAR (extrapolated) = 1.27 W/kg
SAR(1 g) = 0.917 mW/g; SAR(10 g) = 0.619 mW/g
Maximum value of SAR (measured) = 1.13 mW/g



0 dB = 1.13mW/g

■ Verification Data (835 MHz Body)

Test Laboratory: HCT CO., LTD
Input Power 100 mW (20 dBm)
Liquid Temp: 20.8 ℃
Test Date: 05/03/2016

DUT: Dipole 835 MHz; Type: D835V2

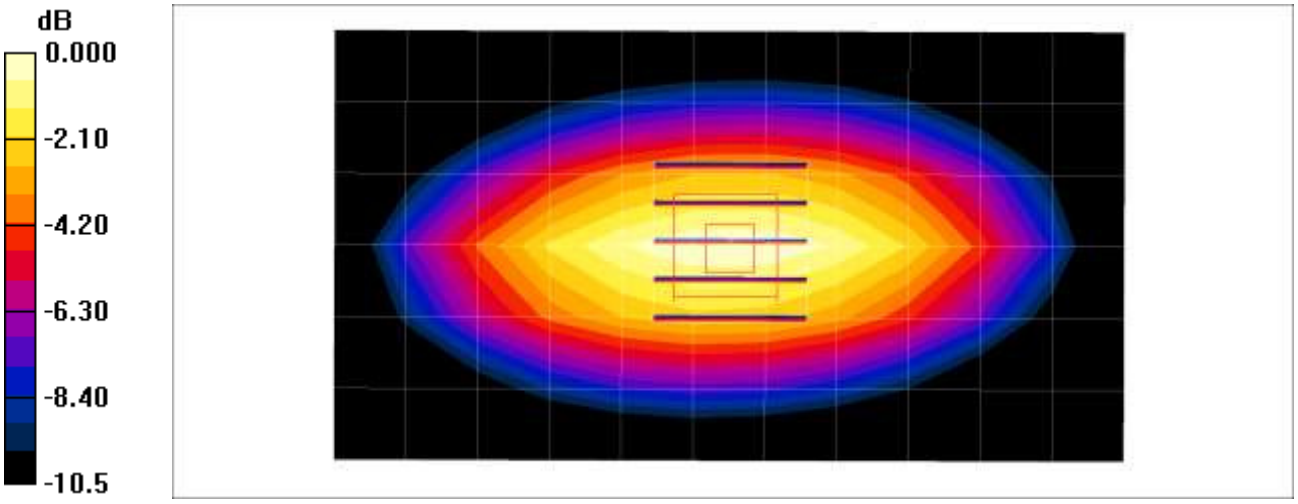
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 835 MHz; σ = 0.974 mho/m; ε_r = 56.6; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(9.76, 9.76, 9.76); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

835MHz Body Verification/Area Scan (12x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.16 mW/g

835MHz Body Verification/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 35.7 V/m; Power Drift = -0.011 dB
Peak SAR (extrapolated) = 1.38 W/kg
SAR(1 g) = 0.937 mW/g; SAR(10 g) = 0.615 mW/g
Maximum value of SAR (measured) = 1.18 mW/g



0 dB = 1.18mW/g

■ Verification Data (1 900 MHz Head)

Test Laboratory:	HCT CO., LTD
Input Power	100 mW (20 dBm)
Liquid Temp:	19.8 ℃
Test Date:	05/02/2016

DUT: Dipole 1900 MHz; Type: D1900V2

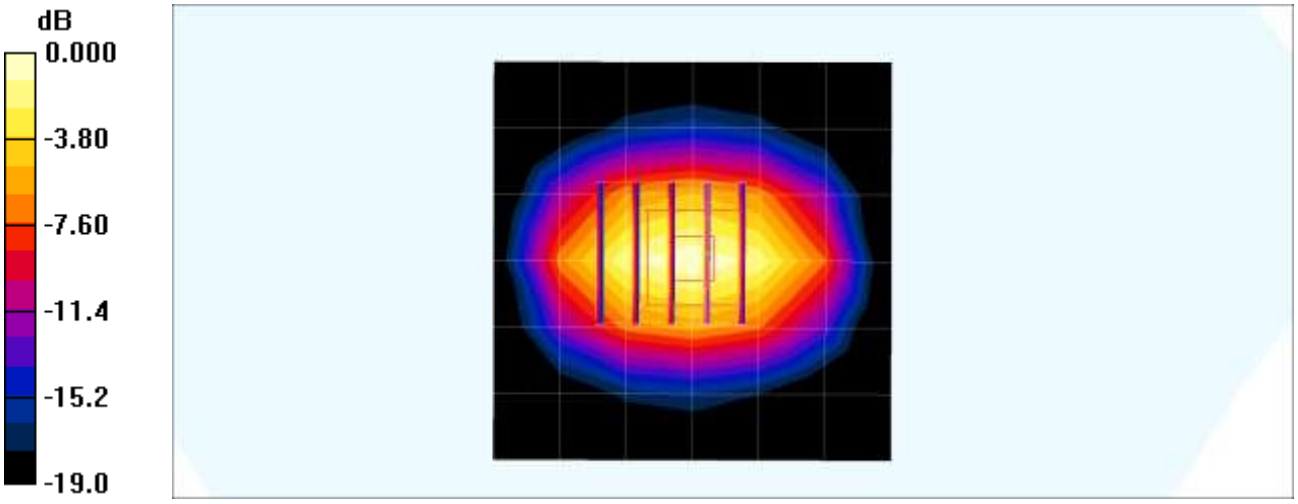
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.42 mho/m; ε_r = 40.1; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(8.11, 8.11, 8.11); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: SAM
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

1900MHz Head Verification/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 4.63 mW/g

1900MHz Head Verification/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 57.2 V/m; Power Drift = 0.051 dB
Peak SAR (extrapolated) = 7.77 W/kg
SAR(1 g) = 4.2 mW/g; SAR(10 g) = 2.19 mW/g
Maximum value of SAR (measured) = 4.65 mW/g



0 dB = 4.65mW/g

■ Verification Data (1 900 MHz Body)

Test Laboratory: HCT CO., LTD
Input Power 100 mW (20 dBm)
Liquid Temp: 19.8 ℃
Test Date: 05/02/2016

DUT: Dipole 1900 MHz; Type: D1900V2

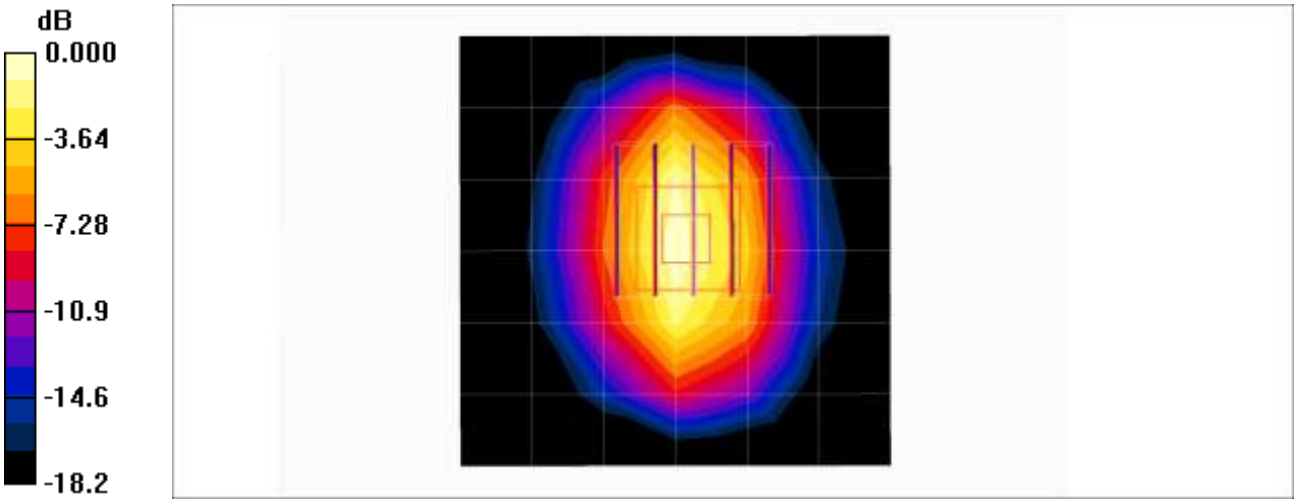
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.55 mho/m; ε_r = 53.9; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(7.95, 7.95, 7.95); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

1900MHz Body Verification/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 4.56 mW/g

1900MHz Body Verification/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 54.8 V/m; Power Drift = -0.046 dB
Peak SAR (extrapolated) = 7.59 W/kg
SAR(1 g) = 4.21 mW/g; SAR(10 g) = 2.21 mW/g
Maximum value of SAR (measured) = 4.61 mW/g



0 dB = 4.61mW/g

■ Verification Data (2 450 MHz Head)

Test Laboratory:	HCT CO., LTD
Input Power	100 mW (20 dBm)
Liquid Temp:	20.3 ℃
Test Date:	05/04/2016

DUT: Dipole 2450 MHz; Type: D2450V2

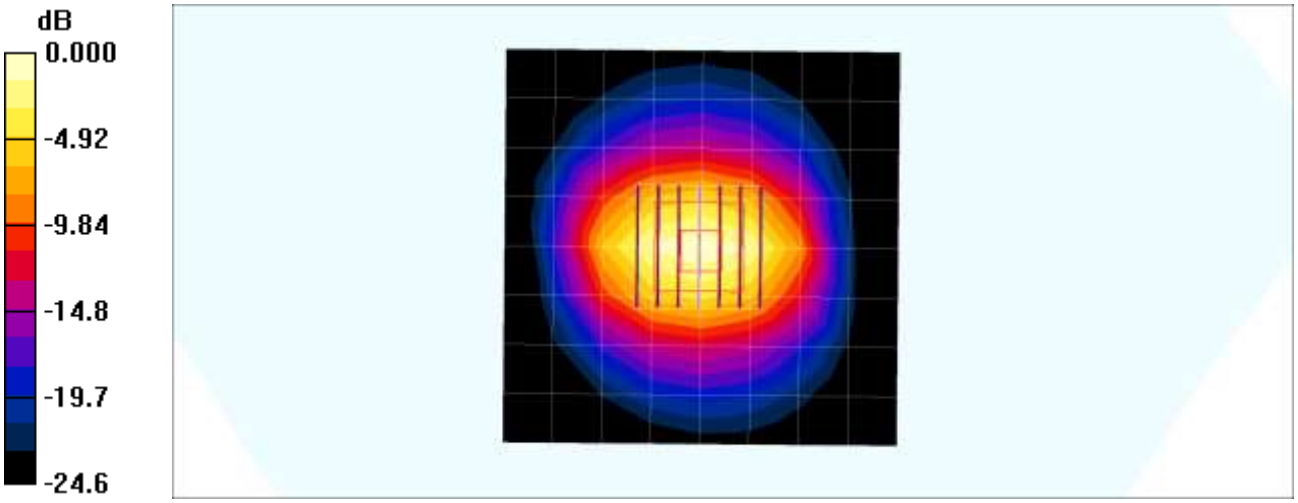
Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.81 mho/m; ε_r = 38.9; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(7.42, 7.42, 7.42); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: SAM
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

2450MHz Head Verification/Area Scan (9x9x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 8.61 mW/g

2450MHz Head Verification/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 58.7 V/m; Power Drift = -0.017 dB
Peak SAR (extrapolated) = 12.2 W/kg
SAR(1 g) = 5.48 mW/g; SAR(10 g) = 2.44 mW/g
Maximum value of SAR (measured) = 8.64 mW/g



0 dB = 8.64mW/g

Verification Data (2 450 MHz Body)

Test Laboratory: HCT CO., LTD
Input Power 100 mW (20 dBm)
Liquid Temp: 20.5 ℃
Test Date: 05/04/2016

DUT: Dipole 2450 MHz; Type: D2450V2

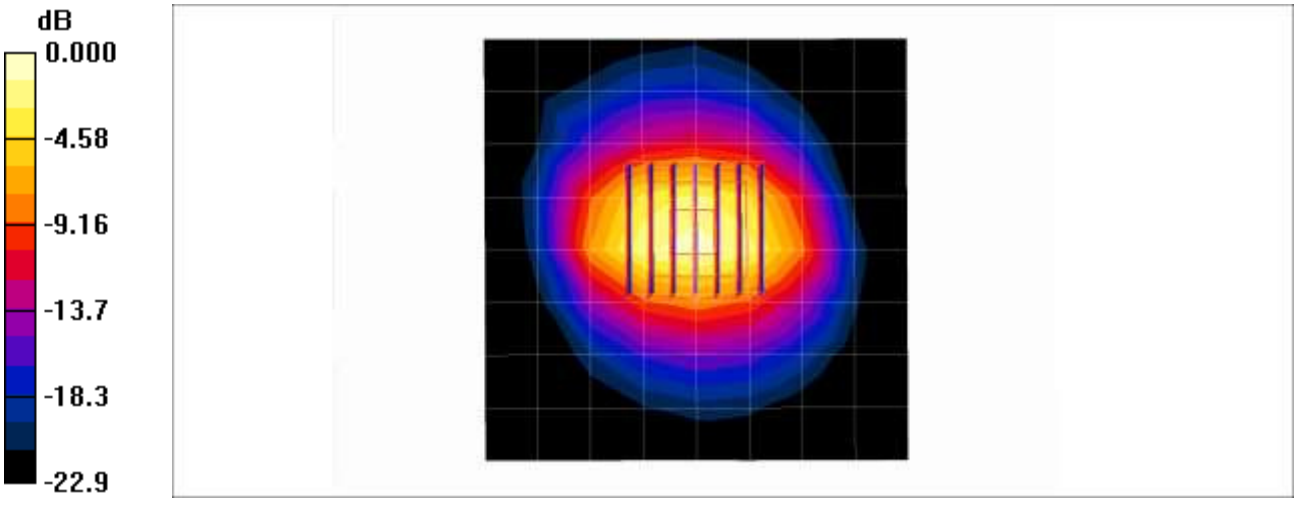
Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.93 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(7.31, 7.31, 7.31); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

Verification 2450MHz/Area Scan (9x9x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 6.83 mW/g

Verification 2450MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 51.9 V/m; Power Drift = -0.015 dB
Peak SAR (extrapolated) = 10.5 W/kg
SAR(1 g) = 4.97 mW/g; SAR(10 g) = 2.25 mW/g
Maximum value of SAR (measured) = 7.71 mW/g



0 dB = 7.71mW/g

Verification Data (2 600 MHz Head)

Test Laboratory: HCT CO., LTD
Input Power 100 mW (20 dBm)
Liquid Temp: 20.3 ℃
Test Date: 05/10/2016

DUT: Dipole 2600 MHz; Type: D2600V2

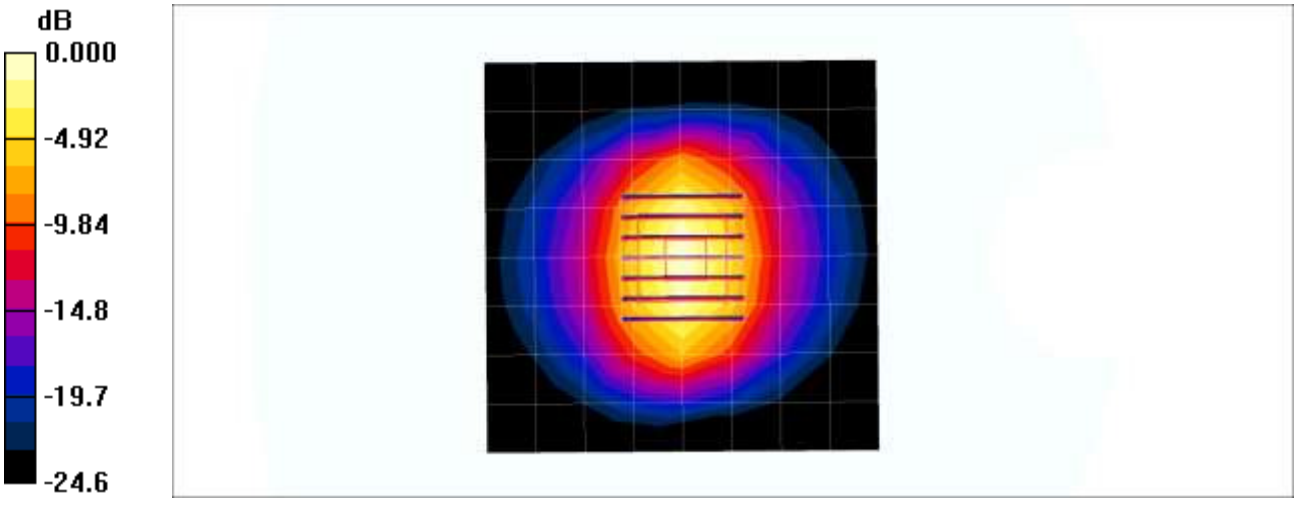
Communication System: CW; Frequency: 2600 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2600 MHz; σ = 1.96 mho/m; ε_r = 39.9; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(7.17, 7.17, 7.17); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: SAM
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

2600MHz Head Verification/Area Scan (9x9x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 8.87 mW/g

2600MHz Head Verification/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.3 V/m; Power Drift = -0.023 dB
Peak SAR (extrapolated) = 12.5 W/kg
SAR(1 g) = 5.59 mW/g; SAR(10 g) = 2.49 mW/g
Maximum value of SAR (measured) = 8.89 mW/g



0 dB = 8.89mW/g

Verification Data (2 600 MHz Body)

Test Laboratory: HCT CO., LTD
Input Power 100 mW (20 dBm)
Liquid Temp: 20.6 ℃
Test Date: 05/09/2016

DUT: Dipole 2600 MHz; Type: D2600V2

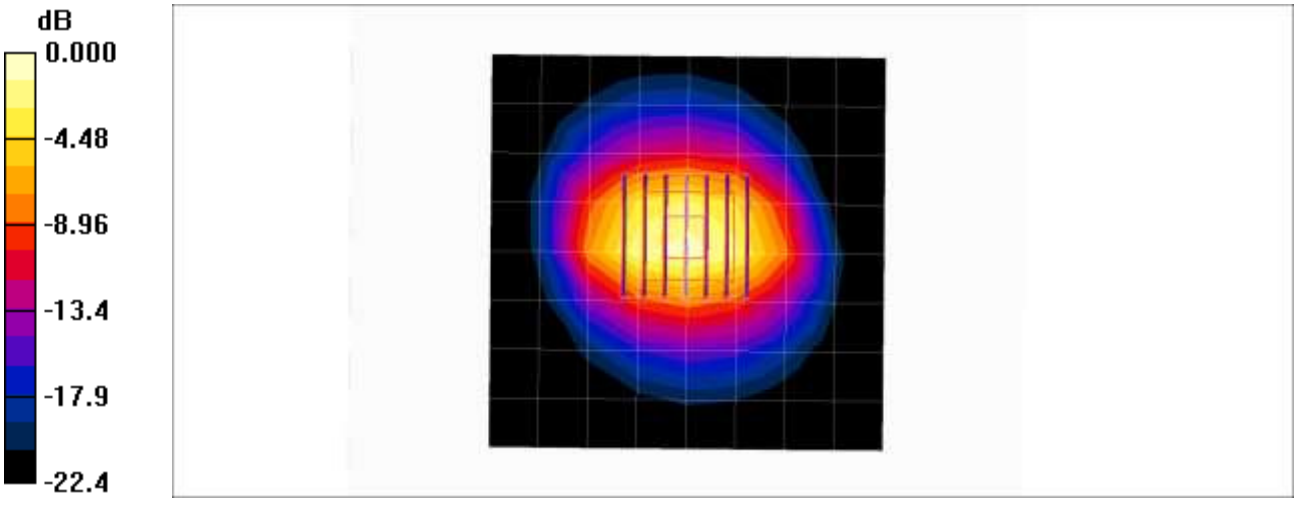
Communication System: CW; Frequency: 2600 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2600 MHz; σ = 2.17 mho/m; ε_r = 52; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(7.19, 7.19, 7.19); Calibrated: 2015-12-16
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

2600MHz Body Verification/Area Scan (9x9x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 7.10 mW/g

2600MHz Body Verification/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 49.8 V/m; Power Drift = 0.002 dB
Peak SAR (extrapolated) = 10.9 W/kg
SAR(1 g) = 5.25 mW/g; SAR(10 g) = 2.39 mW/g
Maximum value of SAR (measured) = 8.10 mW/g



0 dB = 8.10mW/g

■ Verification Data (5.25 GHz Head)

Test Laboratory:	HCT CO., LTD
Input Power	100 mW (20 dBm)
Liquid Temp:	21.8 ℃
Test Date:	05/04/2016

DUT: Dipole 5GHz; Type: D5000V2

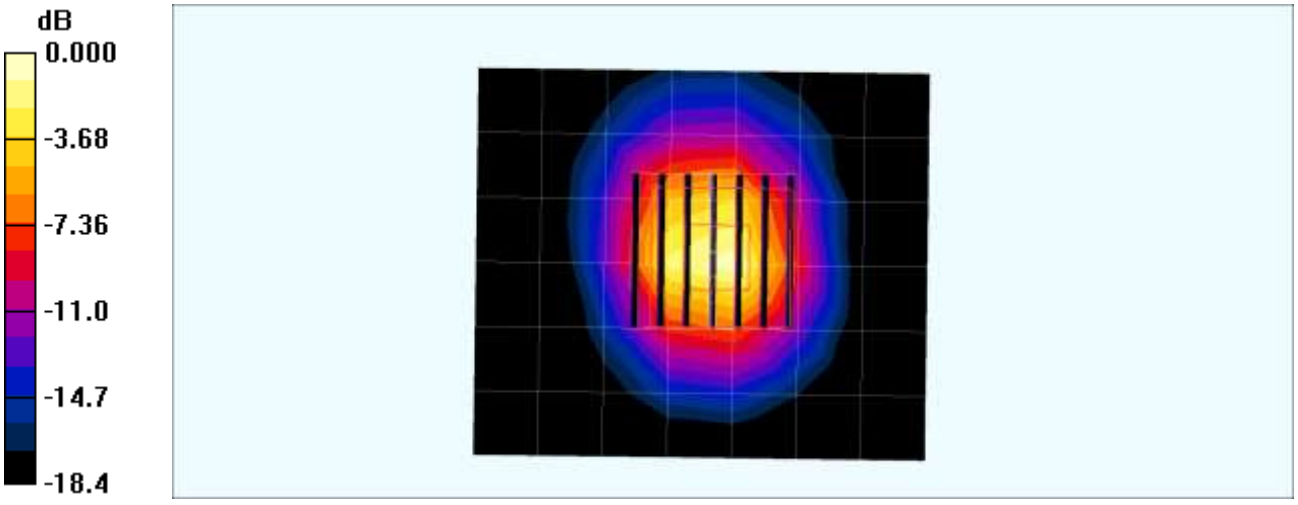
Communication System: CW; Frequency: 5250 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5250 MHz; σ = 4.65 mho/m; ε_r = 36.6; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN7370; ConvF(5.13, 5.13, 5.13); Calibrated: 2015-09-01
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2015-10-07
- Phantom: SAM
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

5250MHz Head Verification/Area Scan (7x8x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 17.4 mW/g

5250MHz Head Verification/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 70.3 V/m; Power Drift = -0.076 dB
Peak SAR (extrapolated) = 32.3 W/kg
SAR(1 g) = 7.9 mW/g; SAR(10 g) = 2.25 mW/g
Maximum value of SAR (measured) = 19.7 mW/g



0 dB = 19.7mW/g

■ Verification Data (5.25 GHz Body)

Test Laboratory:	HCT CO., LTD
Input Power	100 mW (20 dBm)
Liquid Temp:	20.5 ℃
Test Date:	05/04/2016

DUT: Dipole 5GHz; Type: D5000V2

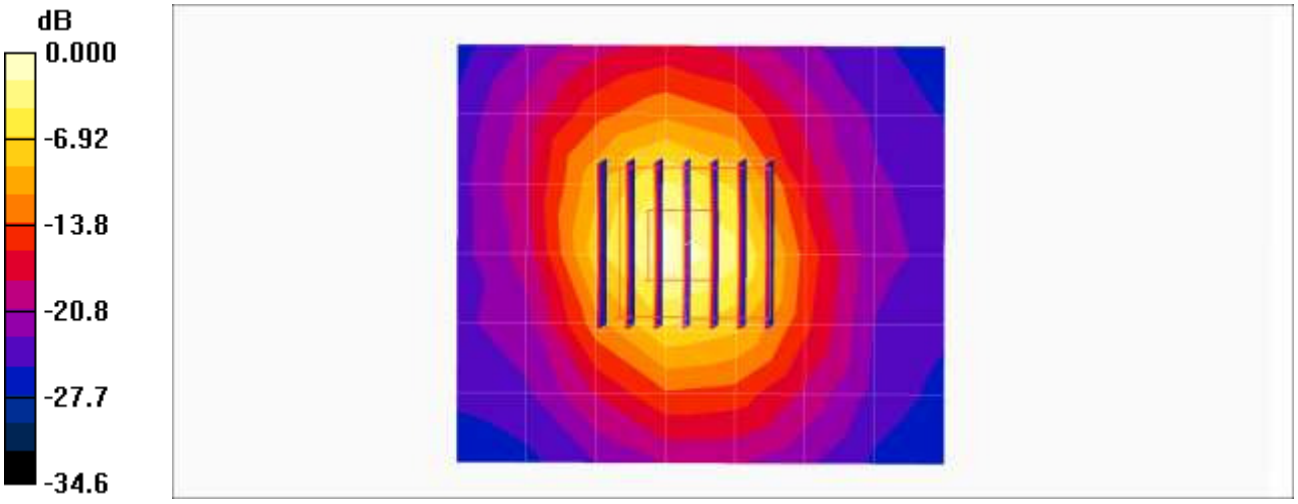
Communication System: CW; Frequency: 5250 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5250 MHz; σ = 5.32 mho/m; ε_r = 48.6; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(4.32, 4.32, 4.32); Calibrated: 2015-12-16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

5250MHz Body Verification/Area Scan (7x8x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 16.6 mW/g

5250MHz Body Verification/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 61.9 V/m; Power Drift = 0.027 dB
Peak SAR (extrapolated) = 27.6 W/kg
SAR(1 g) = 7.14 mW/g; SAR(10 g) = 2.01 mW/g
Maximum value of SAR (measured) = 18.0 mW/g



0 dB = 18.0mW/g

■ Verification Data (5.6 GHz Head)

Test Laboratory:	HCT CO., LTD
Input Power	100 mW (20 dBm)
Liquid Temp:	21.8 ℃
Test Date:	05/04/2016

DUT: Dipole 5GHz; Type: D5000V2

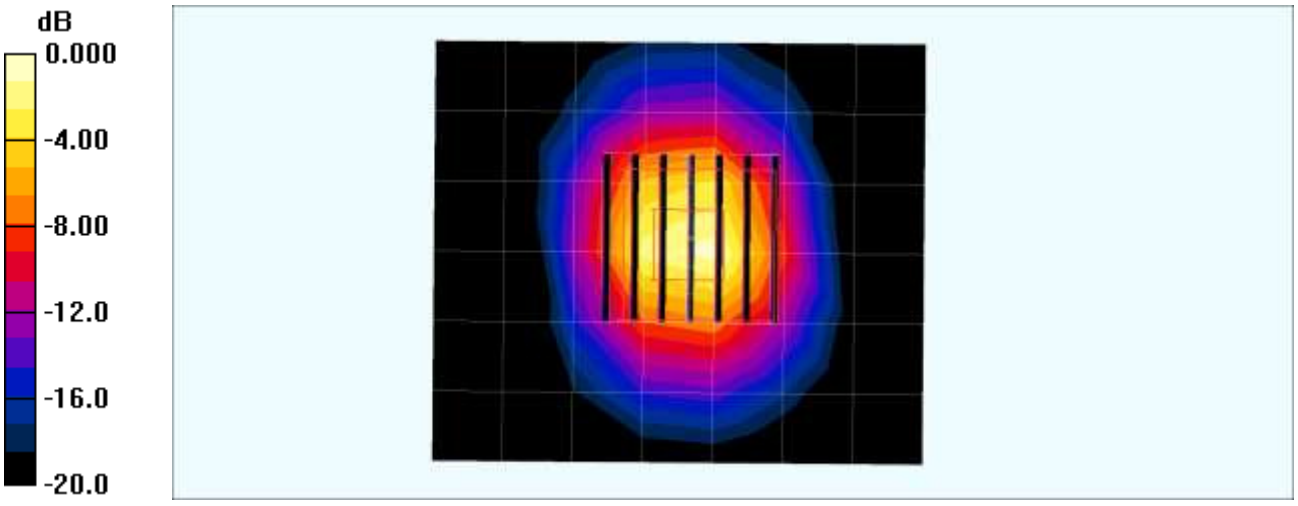
Communication System: CW; Frequency: 5600 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5600 MHz; σ = 5.09 mho/m; ε_r = 35.7; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN7370; ConvF(4.35, 4.35, 4.35); Calibrated: 2015-09-01
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2015-10-07
- Phantom: SAM
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

5600MHz Head Verification/Area Scan (7x8x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 18.0 mW/g

5600MHz Head Verification/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 69.8 V/m; Power Drift = -0.053 dB
Peak SAR (extrapolated) = 34.4 W/kg
SAR(1 g) = 7.97 mW/g; SAR(10 g) = 2.24 mW/g
Maximum value of SAR (measured) = 20.7 mW/g



0 dB = 20.7mW/g

■ Verification Data (5.6 GHz Body)

Test Laboratory:	HCT CO., LTD
Input Power	100 mW (20 dBm)
Liquid Temp:	20.5 ℃
Test Date:	05/04/2016

DUT: Dipole 5GHz; Type: D5000V2

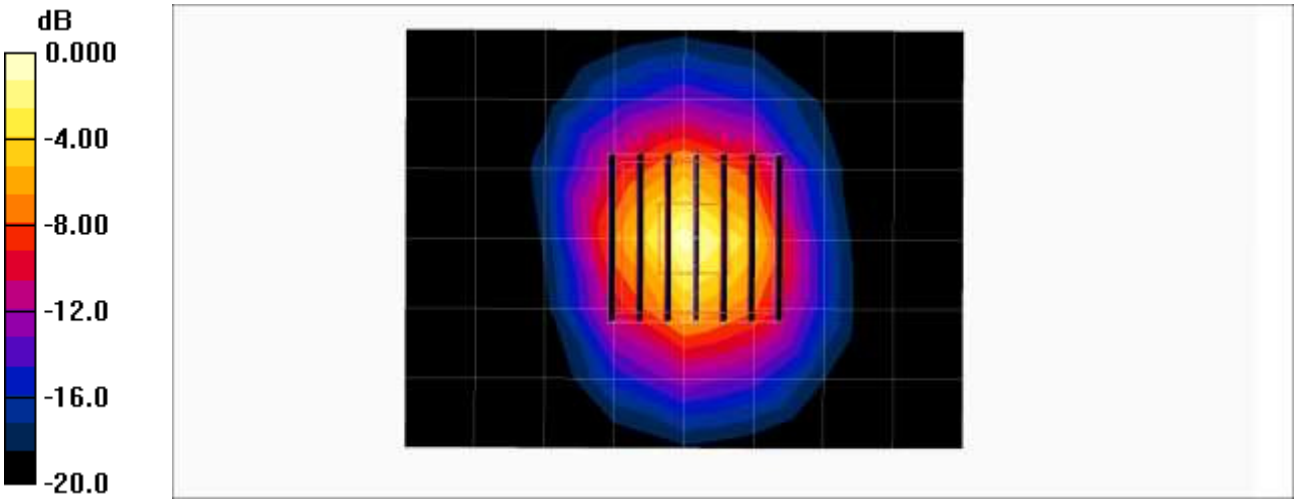
Communication System: CW; Frequency: 5600 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5600 MHz; σ = 5.87 mho/m; ε_r = 47.7; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(3.7, 3.7, 3.7); Calibrated: 2015-12-16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

5600MHz Body Verification/Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 18.4 mW/g

5600MHz Body Verification/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 66.5 V/m; Power Drift = -0.004 dB
Peak SAR (extrapolated) = 30.4 W/kg
SAR(1 g) = 7.87 mW/g; SAR(10 g) = 2.22 mW/g
Maximum value of SAR (measured) = 20.5 mW/g



0 dB = 20.5mW/g

■ Verification Data (5.75 GHz Head)

Test Laboratory:	HCT CO., LTD
Input Power	100 mW (20 dBm)
Liquid Temp:	21.8 ℃
Test Date:	05/04/2016

DUT: Dipole 5GHz; Type: D5000V2

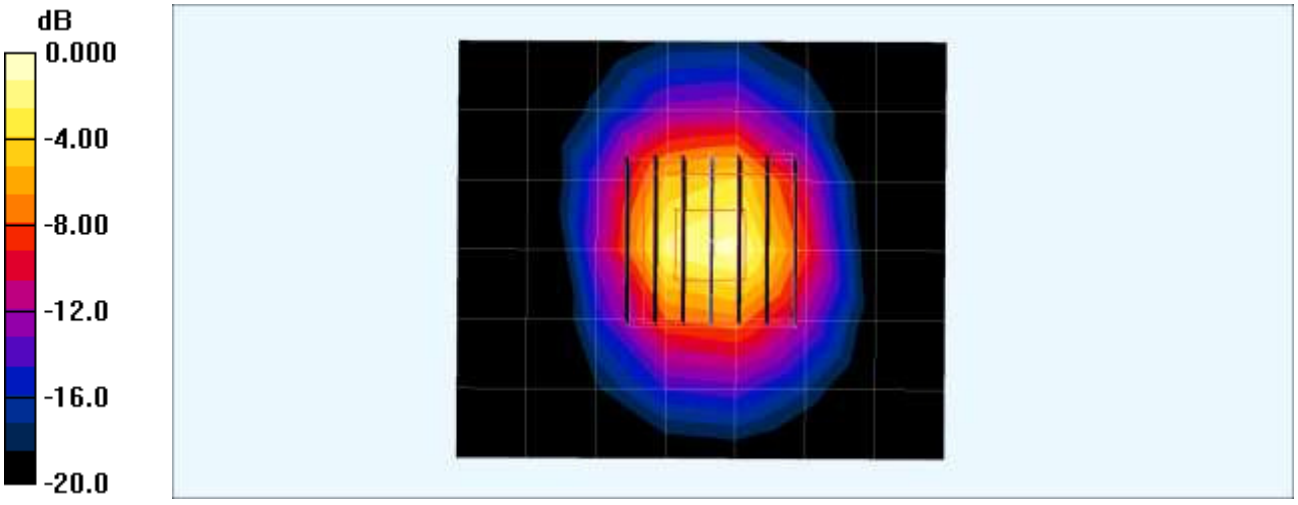
Communication System: CW; Frequency: 5750 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5750 MHz; σ = 5.26 mho/m; ε_r = 35.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN7370; ConvF(4.53, 4.53, 4.53); Calibrated: 2015-09-01
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2015-10-07
- Phantom: SAM
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

5750MHz Head Verification/Area Scan (7x8x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 17.6 mW/g

5750MHz Head Verification/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 67.9 V/m; Power Drift = -0.053 dB
Peak SAR (extrapolated) = 33.6 W/kg
SAR(1 g) = 7.79 mW/g; SAR(10 g) = 2.19 mW/g
Maximum value of SAR (measured) = 20.3 mW/g



0 dB = 20.3mW/g

■ Verification Data (5.75 GHz Body)

Test Laboratory:	HCT CO., LTD
Input Power	100 mW (20 dBm)
Liquid Temp:	20.5 ℃
Test Date:	05/04/2016

DUT: Dipole 5GHz; Type: D5000V2

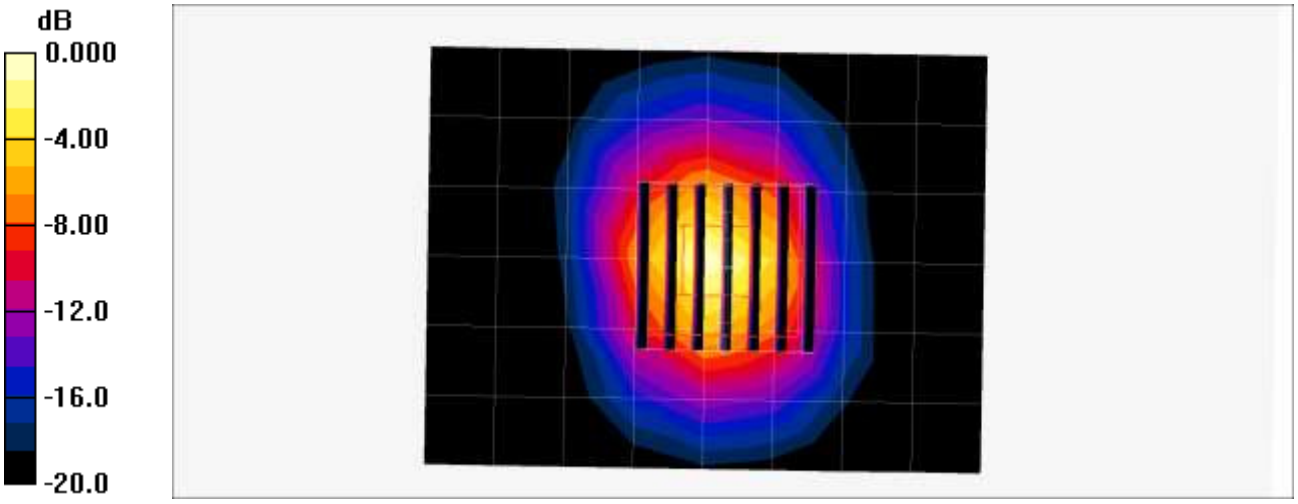
Communication System: CW; Frequency: 5750 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5750 MHz; σ = 6.09 mho/m; ε_r = 47.4; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3967; ConvF(3.82, 3.82, 3.82); Calibrated: 2015-12-16
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2016-01-25
- Phantom: Triple Flat Phantom
- Measurement SW: DASY4, V4.7 Build 80
- Postprocessing SW: SEMCAD, V1.8 Build 186

5750MHz Body Verification/Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 18.0 mW/g

5750MHz Body Verification/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 64.3 V/m; Power Drift = 0.011 dB
Peak SAR (extrapolated) = 28.2 W/kg
SAR(1 g) = 7.61 mW/g; SAR(10 g) = 2.16 mW/g
Maximum value of SAR (measured) = 19.0 mW/g



0 dB = 19.0mW/g