Shenzhen GTI Technology Co., Ltd.

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TEST REPORT

Product Name	:	LTE mobile phone
Trademark	:	NUU
Model/Type reference	:	X1
Listed Model(s)	:	X1 Series
Model difference	:	X1 other series model No. are all the same with main model X1, except for body color, RAM and LOGO to meet different customer requirements
FCC ID	:	**2ADINNUUX1**
Applicant	:	Sun Cupid Technology (HK) Ltd.
Address of applicant	:	16/F, CEO Tower, 77 Wing Hong St, Cheung Sha Wan, Kowloon, Hong Kong
Date of Receipt	:	Oct.20, 2014
Date of Test Date	:	Oct.21, 2014 - Nov.05 2014
Data of issue.	:	Nov.21, 2014

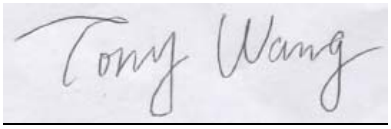
Test result	**Pass ***

* In the configuration tested, the EUT complied with the standards specified above

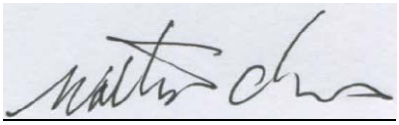
GENERAL DESCRIPTION OF EUT	
Equipment:	LTE Mobile Phone
Model Name:	X1
Manufacturer:	Sun Cupid Technology (Shenzhen) Ltd.
Manufacturer Address:	10A, No.3 Bldg, China Academy of Sci & Tech Development, No.1 High-Tech South St. Nanshan district, Shenzhen, China.
Power Source:	DC 3.8V from Li-ion battery
Power Rating:	Input: 100-240VAC, 50/60Hz 0.2A MAX Output: 5V⎓1.0A

Compiled By: 

(Allen Wang)

Reviewed By: 

(Tony Wang)

Approved By: 

(Walter Chen)

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1. SUMMARY

1.1. Test Standards

FCC 47CFR §2.1093: Radiofrequency Radiation Exposure Evaluation: Portable Devices

ANSI C95.1-1992: Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz. (IEEE Std C95.1-1991)

IEEE Std 1528™-2003: IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques.

KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r03: SAR Measurement Requirements for 100 MHz to 6 GHz

KDB 447498 D01 Mobile Portable RF Exposure v05r02: Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies

KDB 648474 D04 Handset SAR v01r02: SAR Evaluation Considerations for Wireless Handsets.

KDB 941225 D01 SAR test for 3G devices v03: SAR Measurement Procedures CDMA 20001x RTT, 1x Ev-Do, WCDMA, HSDPA/HSPA

KDB 941225 D06 Hotspot Mode SAR v02: SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities

KDB 941225 D05 SAR for LTE Devices v02r03: SAR Evaluation Considerations for LTE Devices

KDB 248227 D01 SAR meas for 802 11 a b g v01r02: SAR Measurement Procedures for 802.11a/b/g Transmitters.

1.2. Summary of Maximum SAR Value

The maximum results of Specific Absorption Rate (SAR) found during testing for EUT are as follows:

Head SAR Configuration

Mode	Test Position	Channel /Frequency(MHz)	Limit SAR_{1g} 1.6 W/kg	
			Measured SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
GSM 850	Left Cheek	190/836.6	0.171	0.193
GSM 1900	Left Cheek	661/1880	0.130	0.150
UMTS Band II	Right Cheek	9400/1880	0.378	0.395
UMTS Band V	Right Cheek	4183/836.6	0.559	0.571
LTE Band 4	Right Cheek	20175/1732.5	0.263	0.265
LTE Band 7	Left Cheek	20850/2510	0.095	0.114
WiFi(802.11b)	Left Cheek	11/2462	0.286	0.314

Body Worn Configuration

Mode	Test Position	Channel /Frequency(MHz)	Limit SAR_{1g} 1.6 W/kg	
			Measured SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
GSM 850,	Back Side	190/836.6	0.327	0.369
GSM 1900,	Back Side	661/1880	0.259	0.299
UMTS Band II	Back Side	9400/1880	0.739	0.772
UMTS Band V	Back Side	4233/846.6	0.885	0.908
LTE Band 4	Back Side	20175/1732.5	0.440	0.443
LTE Band7	Back Side	20850/2510	0.211	0.253
WiFi(802.11b)	Back Side	11/2462	0.093	0.102

Hotspot SAR Configuration

Mode	Test Position	Channel /Frequency(MHz)	Limit SAR_{1g} 1.6 W/kg	
			Measured SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
GPRS 850, 2 Txslots	Back Side	190/836.6	0.345	0.365
GPRS 1900, 4 Txslots	Bottom Edge	661/1880	0.369	0.421
UMTS Band II	Bottom Edge	9538/1907.6	0.935	1.169
UMTS Band V	Back Side	4233/846.6	0.885	0.908
LTE Band 4	Bottom Edge	20175/1732.5	0.677	0.682
LTE Band 7	Bottom Edge	20850/2510	0.586	0.701
WiFi(802.11b)	Back Side	11/2462	0.093	0.102

Note:

1. This device is compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6W/Kg) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1, and had been tested in accordance with measurement methods and procedures specified in IEEE 1528-2003 and the relevant KDB files like KDB 941225 D01 , KDB 865664 D02 etc.
2. This EUT owns two SIM cards, after we perform the pretest for these two SIM cards; we found the SIM 1 is the worst case, so its result is recorded in this report

1.3. Test Facility

1.3.1 Address of the test laboratory

Shenzhen General Testing & Inspection Technology Co., Ltd.

Add: 1F, 2 Block, Jiaquan Building, Guanlan High-tech Park Baoan District, Shenzhen, Guangdong, China.

1.3.2 Laboratory accreditation

The test facility is recognized, certified, or accredited by the following organizations:

IC Registration No.: 9783A

The 3m alternate test site of Shenzhen GTI Technology Co., Ltd.EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 9783A on Aug, 2011.

FCC-Registration No.: 214666

Shenzhen GTI Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 214666, Sep 19, 2011

1.4. Measurement Uncertainty (300MHz-3GHz)

No.	Error Description	Type	Uncertainty Value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement System										
1	Probe calibration	B	5.50%	N	1	1	1	5.50%	5.50%	∞
2	Axial isotropy	B	4.70%	R	$\sqrt{3}$	0.7	0.7	1.90%	1.90%	∞
3	Hemispherical isotropy	B	9.60%	R	$\sqrt{3}$	0.7	0.7	3.90%	3.90%	∞
4	Boundary Effects	B	1.00%	R	$\sqrt{3}$	1	1	0.60%	0.60%	∞
5	Probe Linearity	B	4.70%	R	$\sqrt{3}$	1	1	2.70%	2.70%	∞
6	Detection limit	B	1.00%	R	$\sqrt{3}$	1	1	0.60%	0.60%	∞
7	RF ambient conditions-noise	B	0.00%	R	$\sqrt{3}$	1	1	0.00%	0.00%	∞
8	RF ambient conditions-reflection	B	0.00%	R	$\sqrt{3}$	1	1	0.00%	0.00%	∞
9	Response time	B	0.80%	R	$\sqrt{3}$	1	1	0.50%	0.50%	∞
10	Integration time	B	5.00%	R	$\sqrt{3}$	1	1	2.90%	2.90%	∞
11	RF ambient	B	3.00%	R	$\sqrt{3}$	1	1	1.70%	1.70%	∞
12	Probe positioned mech. restrictions	B	0.40%	R	$\sqrt{3}$	1	1	0.20%	0.20%	∞

13	Probe positioning with respect to phantom shell	B	2.90%	R	$\sqrt{3}$	1	1	1.70%	1.70%	∞
14	Max.SAR evaluation	B	3.90%	R	$\sqrt{3}$	1	1	2.30%	2.30%	∞
Test Sample Related										
15	Test sample positioning	A	1.86%	N	1	1	1	1.86%	1.86%	∞
16	Device holder uncertainty	A	1.70%	N	1	1	1	1.70%	1.70%	∞
17	Drift of output power	B	5.00%	R	$\sqrt{3}$	1	1	2.90%	2.90%	∞
Phantom and Set-up										
18	Phantom uncertainty	B	4.00%	R	$\sqrt{3}$	1	1	2.30%	2.30%	∞
19	Liquid conductivity (target)	B	5.00%	R	$\sqrt{3}$	0.64	0.43	1.80%	1.20%	∞
20	Liquid conductivity (meas.)	A	0.50%	N	1	0.64	0.43	0.32%	0.26%	∞
21	Liquid permittivity (target)	B	5.00%	R	$\sqrt{3}$	0.64	0.43	1.80%	1.20%	∞
22	Liquid permittivity (meas.)	A	0.16%	N	1	0.64	0.43	0.10%	0.07%	∞
Combined standard uncertainty	$u_c = \sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$		/	/	/	/	/	10.20%	10.00 %	∞
Expanded uncertainty (confidence interval of 95 %)	$u_e = 2u_c$		/	R	K=2	/	/	20.40%	20.00 %	∞

2. GENERAL INFORMATION

2.1. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature	Min. = 18°C, Max. = 25 °C
Relative humidity	Min. = 30%, Max. = 70%
Ground system resistance	< 0.5 Ω
Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

2.2. General Description of EUT

Product Name:	LTE Mobile phone
Model/Type reference:	X1
Test Device:	Prototype
Power supply:	DC 3.8V from 2400mAh Li-ion battery
Hardware version:	UALC04 VER E
Software version:	X1-US-01
2G	
Operation Band:	GSM850, PCS1900
Supported Type:	GSM/GPRS/EGPRS
Power Class:	GSM850:Power Class 4 PCS1900:Power Class 1
Modulation Type:	GMSK for GSM/GPRS,8PSK for EDGE
GSM Release Version	R99
GPRS /EGPRS Class	Class B
GPRS Multislot Class	12
EGPRS Multislot Class	12
WCDMA	
Operation Band:	FDD Band V, FDD II
Power Class:	Power Class 3
Modulation Type:	QPSK for WCDMA/HSUPA/HSDPA
WCDMA Release Version:	R8
HSDPA Release Version:	Release 8
HSUPA Release Version:	Release 6

LTE	
Operation Band:	FDD Band 4, FDD Band7
Power Class:	Power Class 3
Modulation Type:	QPSK,16QAM
Bandwidth support:	FDD Band 4: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz FDD Band7: 5MHz, 10MHz, 15MHz, 20MHz
LTE Release Version:	R9
Carrier aggregation	Not Supported
WIFI	
Supported type:	802.11b/802.11g/802.11n(H20)/802.11n(H40)
Modulation:	802.11b: DSSS 802.11g/802.11n(H20)/802.11n(H40): OFDM
Operation frequency:	802.11b/802.11g/802.11n(H20): 2412MHz~2462MHz 802.11n(H40): 2422MHz~2452MHz
Channel number:	802.11b/802.11g/802.11n(H20): 11 802.11n(H40): 7
Channel separation:	5MHz
Antenna type:	PIFA Antenna
Antenna gain:	1.6 dBi
Bluetooth 3.0	
Version:	Supported BT3.0
Modulation:	GFSK, π/4DQPSK, 8DPSK
Operation frequency:	2402MHz~2480MHz
Channel number:	79
Channel separation:	1MHz
Antenna type:	PIFA Antenna
Antenna gain:	1.6 dBi
Bluetooth 4.0	
Supported type:	Version 4.0 for low Energy
Modulation:	GFSK
Operation frequency:	2402MHz to 2480MHz
Channel number:	40
Channel separation:	2 MHz
Antenna type:	PIFA Antenna
Antenna gain:	1.6 dBi

2.3. Description of Test Modes

The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power the EUT has been tested under typical operating condition and The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

2.4. Measurement Instruments List

Test Equipment	Type/Model	Serial Number	Calibration Date	Calibrated until
Data Acquisition Electronics DAEx	DAE4	1315	November 25,2013	November 24,2014
E-field Probe	EX3DV4	3842	June 06,2014	June 05,2015
E-field Probe	EX3DV4	3977	February 17,2014	February 16,2015
System Validation Dipole 835V2	D835V2	4d134	December 13,2013	December 12,2014
System Validation Dipole D1750V2	D1750V2	1062	December 12,2013	December 11,2014
System Validation Dipole 1900V2	D1900V2	5d150	December 12,2013	December 11,2014
System Validation Dipole 2450V2	D2450V2	884	December 11,2013	December 10,2014
System Validation Dipole 2600V2	D2600V2	1021	July 16,2014	July 15,2015
Dielectric Probe Kit	85070E	US44020288	/	/
Power meter	E4417A	GB41292254	November 26,2013	November 25,2014
Power sensor	8481H	MY41095360	November 26,2013	November 25,2014
Power sensor	E9327A	US40441622	January 1, 2014	December 31, 2014
Network analyzer	8753E	US37390562	November 25,2013	November 24,2014
Universal Radio Communication Tester	CMW 500	113643	November 25,2013	November 24,2014
Dual directional coupler	778D-012	50519	March 24, 2014	March 23, 2015
Dual directional coupler	777D	50146	March 24, 2014	March 23, 2015
Temperature Probe	JM222	AA1009129	March 13, 2014	March 12, 2015
Hygrothermograph	WS-1	64591	September 16, 2014	September 15, 2015

Note: 1. The Cal. Interval was one year.

3. SAR MEASUREMENTS SYSTEM CONFIGURATION

3.1. SAR MEASUREMENT SET-UP

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

A standard high precision 6-axis robot (Stäubli RX family) with controller and software.

An arm extension for accommodating the data acquisition electronics (DAE).

A dosimetric probe, i.e. an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.

A data acquisition electronic (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.

A unit to operate the optical surface detector which is connected to the EOC.

The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY5 measurement server.

The DASY5 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation. A computer operating Windows 2003. DASY5 software and SEMCAD data evaluation software.

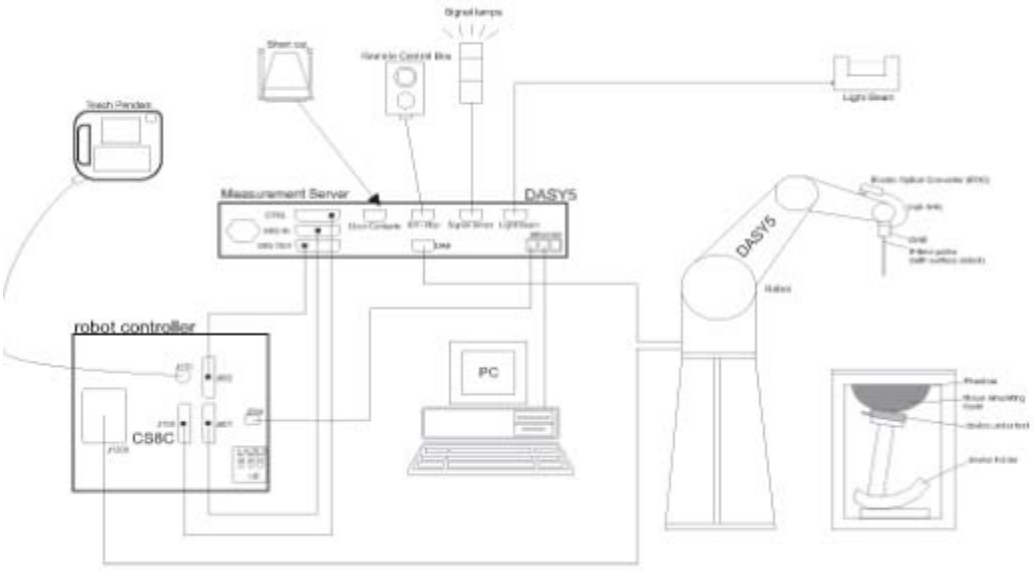
Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.

The generic twin phantom enabling the testing of left-hand and right-hand usage.

The device holder for handheld Mobile Phones.

Tissue simulating liquid mixed according to the given recipes.

System validation dipoles allowing to validate the proper functioning of the system.



3.2. DASY5 E-FIELD PROBE SYSTEM

The SAR measurements were conducted with the dosimetric probe ES3DV3 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation.

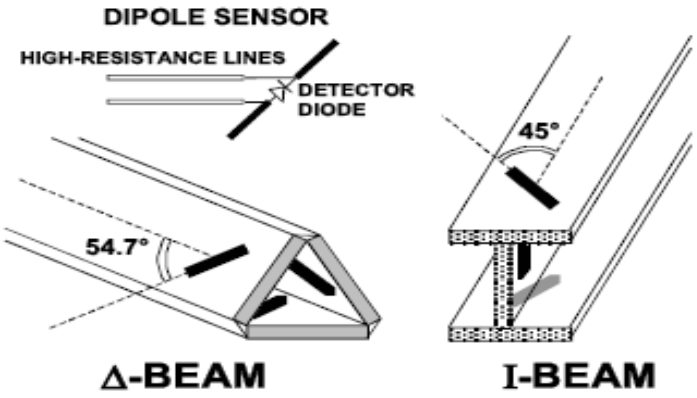
Probe Specification:

Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
Frequency	10 MHz to 4 GHz; Linearity: ± 0.2 dB (30 MHz to 4 GHz)
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.3 dB in tissue material (rotation normal to probe axis)
Dynamic Range	5 μW/g to > 100 mW/g; Linearity: ± 0.2 dB
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 3.9 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.0 mm
Application	General dosimetry up to 4 GHz Dosimetry in strong gradient fields Compliance tests of Mobile Phones
Compatibility	DASY3, DASY4, DASY52 SAR and higher, EASY4/MRI

Isotropic E-Field Probe:

The isotropic E-Field probe has been fully calibrated and assessed for isotropicity, and boundary effect within a controlled environment. Depending on the frequency for which the probe is calibrated the method utilized for calibration will change.

The E-Field probe utilizes a triangular sensor arrangement as detailed in the diagram below:



3.3. PHANTOMS

The phantom used for all tests i.e. for both system checks and device testing, was the twin-headed "SAM Phantom", manufactured by SPEAG. The SAM twin phantom is a fibreglass shell phantom with 2mm shell thickness (except the ear region, where shell thickness increases to 6mm).
System checking was performed using the flat section, whilst Head SAR tests used the left and right head profile sections. Body SAR testing also used the flat section between the head profiles.

SAM Twin Phantom

3.4. DEVICE HOLDER

The device was placed in the device holder (illustrated below) that is supplied by SPEAG as an integral part of the DASY system.
The DASY device holder is designed to cope with the different positions given in the standard. It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation center for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.

Device holder supplied by SPEAG

3.5. SCANNING PROCEDURE

The DASY5 installation includes predefined files with recommended procedures for measurements and validation. They are read-only document files and destined as fully defined but unmeasured masks. All test positions (head or body-worn) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.

The “reference” and “drift” measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure. The indicated drift is mainly the variation of the DUT’s output power and should vary max. ± 5 %.

The “surface check” measurement tests the optical surface detection system of the DASY5 system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above ± 0.1mm). To prevent wrong results tests are only executed when the liquid is free of air bubbles. The difference between the optical surface detection and the actual surface depends on the probe and is specified with each probe (It does not depend on the surface reflectivity or the probe angle to the surface within ± 30°.)

Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values before running a detailed measurement around the hot spot. Before starting the area scan a grid spacing is set according to FCC KDB Publication 865664. During scan the distance of the probe to the phantom remains unchanged. After finishing area scan, the field maxima within a range of 2 dB will be ascertained.

Zoom Scan

After the maximum interpolated values were calculated between the points in the cube, the SAR was averaged over the spatial volume (1g or 10g) using a 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 then integrated with the trapezoidal algorithm

Table 1: Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01

Frequency	Maximum Area Scan Resolution (mm) (Δx_{area}, Δy_{area})	Maximum Zoom Scan Resolution (mm) (Δx_{zoom}, Δy_{zoom})	Maximum Zoom Scan Spatial Resolution (mm) $\Delta z_{zoom}(n)$	Minimum Zoom Scan Volume (mm) (x,y,z)
≤ 2 GHz	≤ 15	≤ 8	≤ 5	≥ 30
2-3 GHz	≤ 12	≤ 5	≤ 5	≥ 30
3-4 GHz	≤ 12	≤ 5	≤ 4	≥ 28
4-5 GHz	≤ 10	≤ 4	≤ 3	≥ 25
5-6 GHz	≤ 10	≤ 4	≤ 2	≥ 22

Spatial Peak Detection

The procedure for spatial peak SAR evaluation has been implemented and can determine values of masses of 1g and 10g, as well as for user-specific masses. The DASY5 system allows evaluations that combine measured data and robot positions, such as:

- maximum search
- extrapolation
- boundary correction
- peak search for averaged SAR

During a maximum search, global and local maxima searches are automatically performed in 2-Dafter each Area Scan measurement with at least 6 measurement points. It is based on the evaluation of the local SAR gradient calculated by the Quadratic Shepard's method. The algorithm will find the global maximum and all local maxima within -2 dB of the global maxima for all SAR distributions.
Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. Several measurements at different distances are necessary for the extrapolation. Extrapolation routines require at least 10 measurement points in 3-D space. They are used in the Zoom Scan to obtain SAR values between the lowest measurement points and the inner phantom surface. The routine uses the modified Quadratic Shepard's method for extrapolation.

3.6. DATA STORAGE AND EVALUATION

Data Storage

The DASY5 software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension ".DA4". The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated.

The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [mW/g], [mW/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

Data Evaluation

The SEMCAD software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

Probe parameters:	- Sensitivity	Normi, ai0, ai1, ai2
	- Conversion factor	ConvFi
	- Diode compression point	Dcpi
Device parameters:	- Frequency	f
	- Crest factor	cf
Media parameters:	- Conductivity	σ
	- Density	ρ

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY5 components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics. If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$V_i = U_i + U_i^2 \cdot \frac{cf}{dcp_i}$$

With Vi = compensated signal of channel i (i = x, y, z)
Ui = input signal of channel i (i = x, y, z)
cf = crest factor of exciting field (DASY parameter)
dcpi = diode compression point (DASY parameter)

From the compensated input signals the primary field data for each channel can be evaluated:

$$\mathrm{E-fieldprobes:} \qquad E_i = \sqrt{\frac{V_i}{Norm_i \cdot ConvF}}$$

$$\mathrm{H-fieldprobes:} \qquad H_i = \sqrt{V_i} \cdot \frac{a_{i0} + a_{i1} f + a_{i2} f^2}{f}$$

With Vi = compensated signal of channel i (i = x, y, z)
Normi = sensor sensitivity of channel i (i = x, y, z)
[mV/(V/m)2] for E-field Probes
ConvF = sensitivity enhancement in solution
aij = sensor sensitivity factors for H-field probes
f = carrier frequency [GHz]
Ei = electric field strength of channel i in V/m
Hi = magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude):

$$E_{tot} = \sqrt{E_x^2 + E_y^2 + E_z^2}$$

The primary field data are used to calculate the derived field units.

$$SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1'000}$$

With SAR = local specific absorption rate in mW/g
Etot = total field strength in V/m
σ = conductivity in [mho/m] or [Siemens/m]
ρ = equivalent tissue density in g/cm3

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid.

4. TISSUE SIMULATING LIQUID

For SAR measurement of the field distribution inside the phantom, the phantom must be filled with homogeneous tissue simulating liquid to a depth of at least 15cm. For head SAR testing the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15cm For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15cm.The nominal dielectric values of the tissue simulating liquids in the phantom and the tolerance of 5% are listed in 4.2

4.1. The composition of the tissue simulating liquid

Ingredient	835MHz		1900MHz		1750 MHz		2450MHz		2600MHz	
(% Weight)	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	41.45	52.5	55.242	69.91	55.782	69.82	62.7	73.2	62.3	72.6
Salt	1.45	1.40	0.306	0.13	0.401	0.12	0.50	0.10	0.20	0.10
Sugar	56	45.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Preventol	0.10	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HEC	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DGBE	0.00	0.00	44.452	29.96	43.817	30.06	36.8	26.7	37.5	27.3

4.2. Tissue Calibration Result

The dielectric parameters of the liquids were verified prior to the SAR evaluation using COMOSAR Dielectric Probe Kit and R&S Network Analyzer ZVL6.

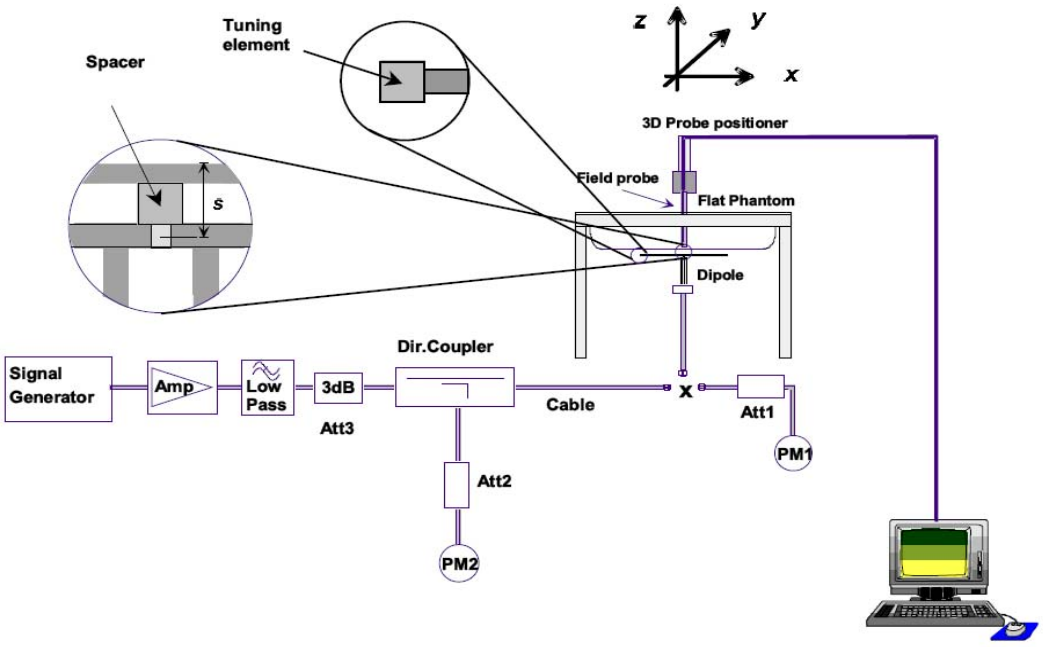
Frequency	Test Date	Temp ℃	Measured Dielectric Parameters		Target Dielectric Parameters		Limit (Within ±5%)	
			ε_r	σ(s/m)	ε_r	σ(s/m)	Dev ε_r(%)	Dev σ(%)
835MHz (head)	2014-10-28	21.5	41.3	0.92	41.5	0.90	-0.48%	2.22%
1900MHz (head)	2014-10-21	21.5	39.6	1.43	40.0	1.40	-1.00%	2.14%
1750MHz (Head)	2014-10-23	21.5	39.7	1.32	40.1	1.37	-1.00	-3.65
2450MHz (head)	2014-11-01	21.5	39.1	1.80	39.2	1.80	-0.26%	0.00%
2600MHz (head)	2014-11-03	21.5	38.6	1.98	39.0	1.96	-1.03%	1.02%
835MHz (body)	2014-10-30	21.5	55.8	0.98	55.2	0.97	1.09%	1.03%
1900MHz (body)	2014-10-29	21.5	53.1	1.52	53.3	1.52	-0.38%	0.00%
1750MHz (body)	2014-10-31	21.5	53.2	1.50	53.4	1.49	-0.37%	0.67%
2450MHz (body)	2014-11-04	21.5	52.1	1.99	52.7	1.95	-1.14%	2.05%
2600MHz (body)	2014-11-05	21.5	52.3	2.2	52.5	2.16	-0.38%	1.85%

5. System Check

The purpose of the system check is to verify that the system operates within its specifications at the device test frequency. The system check is simple check of repeatability to make sure that the system works correctly at the time of the compliance test;

System check results have to be equal or near the values determined during dipole calibration with the relevant liquids and test system (±10 %).

System check is performed regularly on all frequency bands where tests are performed with the DASY5 system.



The output power on dipole port must be calibrated to 24 dBm (250mW) before dipole is connected.

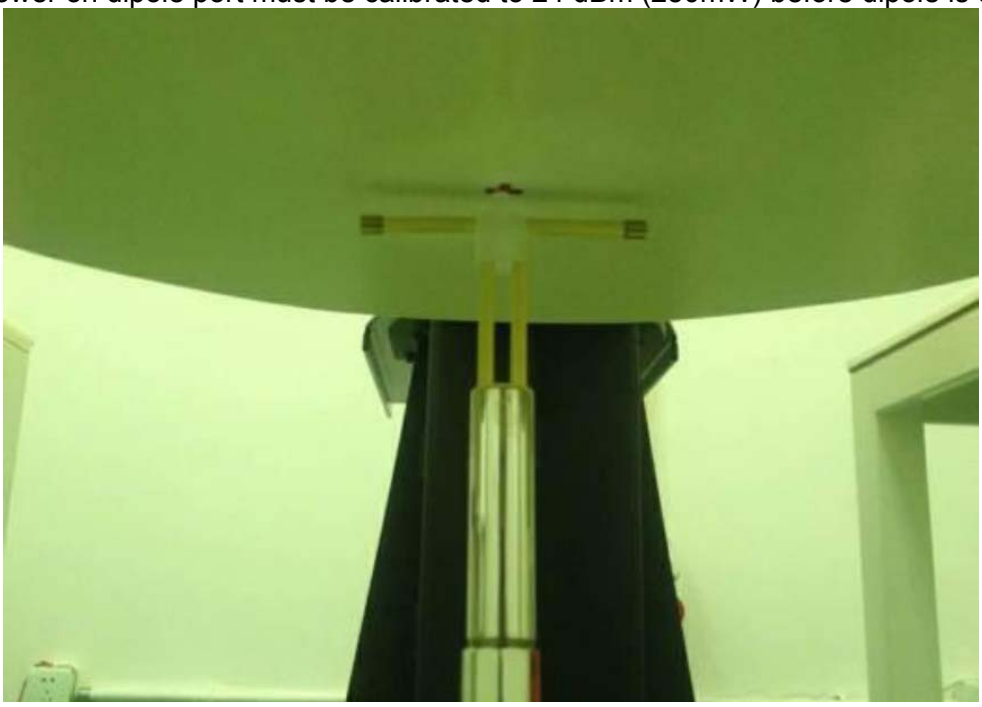


Photo of Dipole Setup

Table 2: System Check in Head Tissue Simulating Liquid

Frequency	Test Date	Dielectric Parameters		250mW Measured SAR_{1g}	1W Normalized SAR_{1g}	1W Target SAR_{1g}	Limit (±10% Deviation)
		ε_r	σ(s/m)	(W/kg)			
835MHz	2014-10-28	41.3	0.92	2.44	9.76	9.66	1.03%
1900MHz	2014-10-21	39.6	1.43	9.48	37.92	38.3	-0.99%
1750MHz	2014-10-23	39.7	1.32	9.78	39.12	39.2	-0.20%
2450MHz	2014-11-01	39.1	1.80	12.70	50.80	51.7	-1.74%
2600MHz	2014-11-03	38.6	1.98	14.90	59.60	58.60	1.71%

Note：1. The graph results see Chapter9.
2. Target Values used derive from the calibration certificate

Table 3: System Check in Body Tissue Simulating Liquid

Frequency	Test Date	Dielectric Parameters		250mW Measured SAR_{1g}	1W Normalized SAR_{1g}	1W Target SAR_{1g}	Limit (±10% Deviation)
		ε_r	σ(s/m)	(W/kg)			
835MHz	2014-10-30	55.8	0.98	2.41	9.64	9.36	2.99%
1900MHz	2014-10-29	53.1	1.52	9.93	39.72	39.9	-0.45%
1750MHz	2014-10-31	53.2	1.50	9.59	38.36	39.3	-2.39%
2450MHz	2014-11-04	52.1	1.99	12.50	50.00	51.8	-3.47%
2600MHz	2014-11-05	52.3	2.2	14.50	58.00	57.6	0.70%

Note：1. The graph results see Chapter 9.
2. Target Values used derive from the calibration certificate

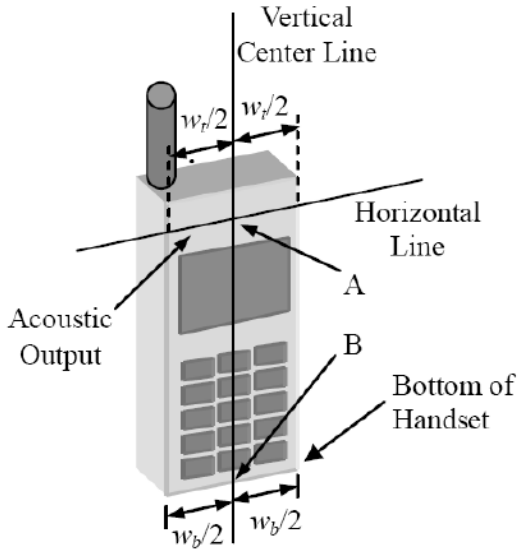
6. EUT TEST POSITION

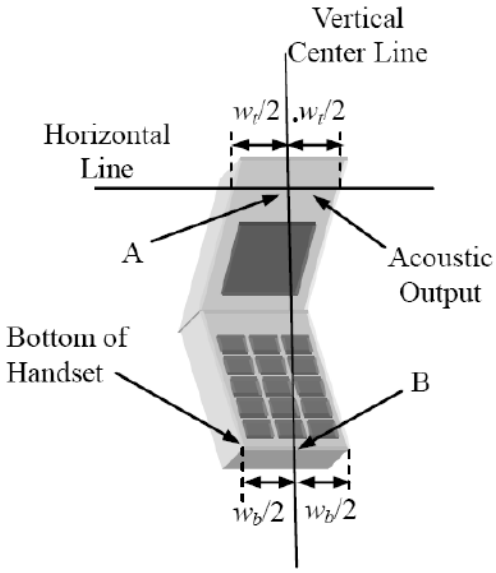
6.1. Define Two Imaginary Lines on the Handset

(1) The vertical centerline passes through two points on the front side of the handset the midpoint of the width wt of the handset at the level of the acoustic output, and the midpoint of the width wb of the handset.

(2) The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output. The horizontal line is also tangential to the face of the handset at point A.

(3) The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily to the front face of the handset, especially for clamshell handsets, handsets with flip covers, and other irregularly shaped handsets.

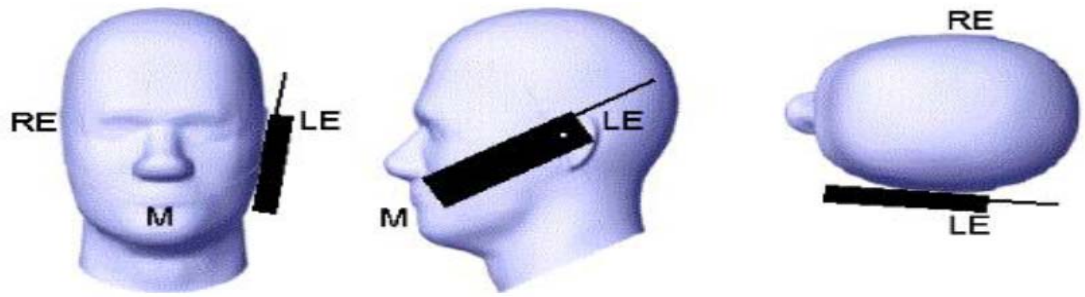




6.2. Cheek Position

(1) To position the device with the vertical center line of the body of the device and the horizontal line crossing the center picec in a plane parallel to the sagittal plane of the phantom. While maintaining the device in this plane, align the vertical center line with the reference plane containing the ear and mouth reference point (M: Mouth, RE: Right Ear, and LE: Left Ear) and align the center of the ear piece with the line RE-LE.

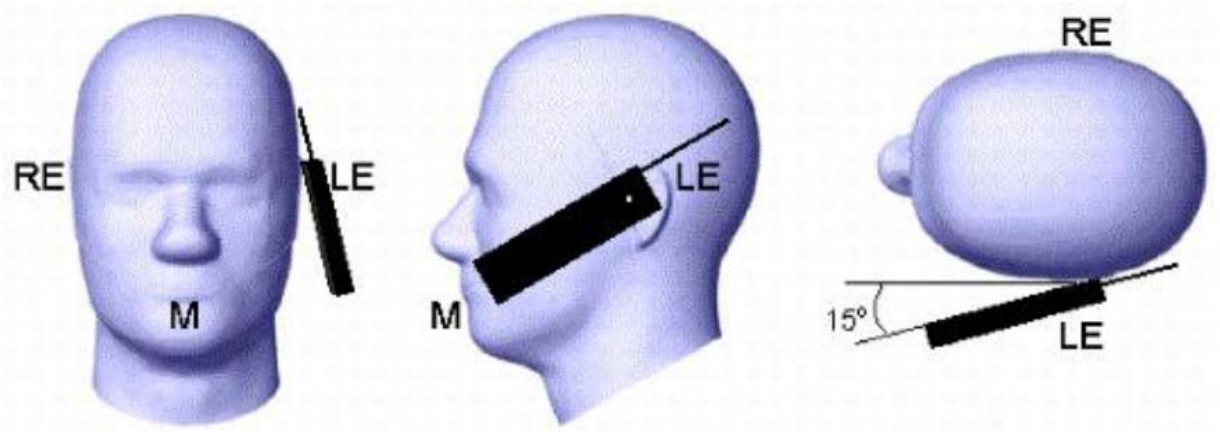
(2) To move the device towards the phantom with the ear piece aligned with the line LE-RE until the phone touched the ear. While maintaining the device in the reference plane and maintaining the phone contact with ear, move the bottom of the phone until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost



6.3. Title Position

(1) To position the device in the —cheek position described above.

(2) While maintaining the device in the reference plane described above and pivoting against the ear, moves it outward away from the mouth by an angle of 15 degrees or until with the ear is lost.

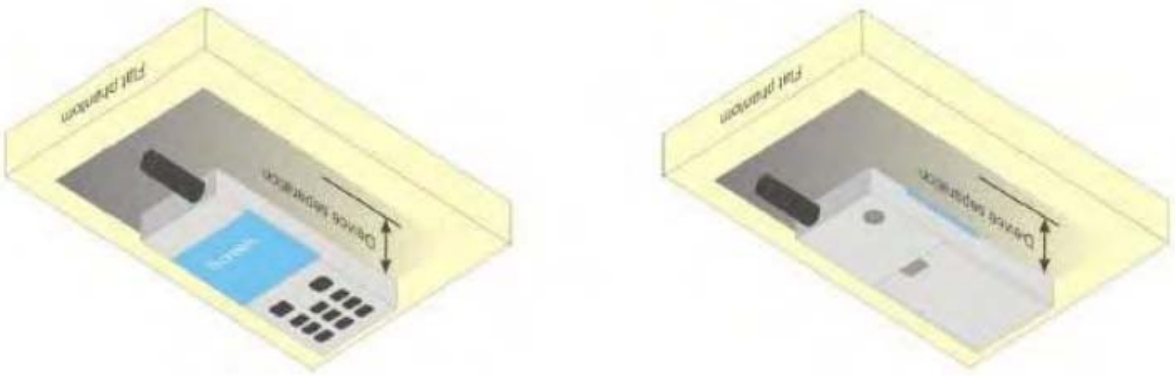


6.4. Body Worn Position

(1) To position the EUT parallel to the phantom surface.

(2) To adjust the EUT parallel to the flat phantom.

(3) To adjust the distance between the EUT surface and the flat phantom to 10mm.



7. Measurement Procedures

The measurement procedures are as follows:

7.1 Conducted power measurement

a) For WWAN power measurement, use base station simulator connection with RF cable, at maximum power in each supported wireless interface and frequency band.

b) Read the WWAN RF power level from the base station simulator.

c) For WLAN/BT power measurement, use engineering software to configure EUT WLAN/BT continuously Transmission, at maximum RF power in each supported wireless interface and frequency band.

d) Connect EUT RF port through RF cable to the power meter, and measure WLAN/BT output power.

7.2 SAR measurement

7.2.1 GSM Test Configuration

SAR tests for GSM 850 and GSM 1900, a communication link is set up with a System Simulator (SS) by air link. Using E5515C the power level is set to “5” for GSM 850, set to “0” for GSM 1900. Since the GPRS class is 12 for this EUT, it has at most 4 timeslots in uplink and at most 4 timeslots in downlink, the maximum total timeslots is 5. The EGPRS class is 12 for this EUT, it has at most 4 timeslots in uplink and at most 4 timeslots in downlink, the maximum total timeslots is 5.

When SAR tests for EGPRS mode is necessary, GMSK modulation should be used to minimize SAR measurement error due to higher peak-to-average power (PAR) ratios inherent in 8-PSK.

According to specification 3GPP TS 51.010, the maximum power of the GSM can do the power reduction for the multi-slot. The allowed power reduction in the multi-slot configuration is as following:

Output power of reductions:

7.2.2 UMTS Test Configuration

7.2.2.1 3G SAR Test Reduction Procedure

In the following procedures, the mode tested for SAR is referred to as the primary mode. The equivalent modes considered for SAR test reduction are denoted as secondary modes. Both primary and secondary modes must be in the same frequency band. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.3 This is referred to as the 3G SAR test reduction procedure in the following SAR test guidance, where the primary mode is identified in the applicable wireless mode test procedures and the secondary mode is wireless mode being considered for SAR test reduction by that procedure. When the 3G SAR test reduction procedure is not satisfied, it is identified as “otherwise” in the applicable procedures; SAR measurement is required for the secondary mode.

7.2.2.2 Output power Verification

Maximum output power is verified on the high, middle and low channels according to procedures described in section 5.2 of 3GPP TS 34.121, using the appropriate RMC or AMR with TPC (transmit power control) set to all “1’s” for WCDMA/HSDPA or by 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, HSDPA, HSPA) are requied

in the SAR report. All configurations that are not supported by the handset or cannot be measured due to technical or equipment limitations must be clearly identified.

7.2.2.3 Head SAR

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.

7.2.2.4 Body-Worn Accessory SAR

SAR for body-worn accessory configurations 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 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 an applicable RMC configuration with the corresponding spreaing code or DPDCHn, for the highest reported body-worn accessory exposure SAR configuration in 12.2 kbps RMC. When more than 2 DPDCHn are supported by the handset, it may be necessary to configure additional DPDCHn using FTM (Factory Test Mode) or other chipset based test approaches with parameters similar to those used in 384 kbps and 768 kbps RMC.

7.2.2.5 Handsets with Release 5 HSDPA

The 3G SAR test reduction procedure is applied to HSDPA body-worn accessory configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSDPA using the HSDPA body SAR procedures in the “Release 5 HSDPA Data Devices” section of this document, for the highest reported SAR body-worn accessory exposure configuration in 12.2 kbps RMC. Handsets with both HSDPA and HSUPA are tested according to Release 6 HSPA test procedures.
HSDPA should be configured according to the UE category of a test device. The number of HSDSCH/ HS-PDSCHs, HARQ processes, minimum inter-TTI interval, transport block sizes and RV coding sequence are defined by the H-set. To maintain a consistent test configuration and stable transmission conditions, QPSK is used in the H-set for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 4 ms with a CQI repetition factor of 2 to maintain a constant rate of active CQI slots. DPCCH and DPDCH gain factors (βc, βd), and HS-DPCCH power offset parameters (ΔACK, ΔNACK, ΔCQI) should be set according to values indicated in the Table below. The CQI value is determined by the UE category, transport block size, number of HS-PDSCHs and modulation used in the H-set.

Table 4: Subtests for UMTS Release 5 HSDPA

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

Note1: $\triangle_{ACK}$, $\triangle_{NACK}$ and $\triangle_{CQI}$= 8 ⇆ $A_{hs} = \beta_{hs}/\beta_c$=30/15⇆ β_{hs}=30/15*β_c
Note2: CM=1 for β_c/β_d =12/15, β_{hs}/β_c=24/15.
Note3: For subtest 2 the $\beta_c\beta_d$ ratio of 12/15 for the TFC during the measurement period(TF1,TF0) is achieved by setting the signaled gain factors for the reference TFC (TFC1,TF1) to β_c=11/15 and β_d=15/15.

7.2.2.6 HSUPA Test Configuration

The 3G SAR test reduction procedure is applied to HSPA (HSUPA/HSDPA with RMC) body-worn accessory configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSPA using the HSPA body SAR procedures in the “Release 6 HSPA Data Devices” section of this document, for the highest reported body-worn accessory exposure SAR configuration in 12.2 kbps RMC. When VOIP is applicable for next to the ear head exposure in HSPA, the 3G SAR test reduction procedure is applied to HSPA with 12.2 kbps RMC as the primary mode; otherwise, the same HSPA configuration used for body-worn accessory measurements is tested for next to the ear head exposure.

Due to inner loop power control requirements in HSPA, a communication test set is required for output power and SAR tests. The 12.2 kbps RMC, FRC H-set 1 and E-DCH configurations for HSPA are configured according to the β values indicated in Table 2 and other applicable procedures described in the ‘WCDMA Handset’ and ‘Release 5 HSDPA Data Devices’ sections of this document

Table 5：Sub-Test 5 Setup for Release 6 HSUPA

Sub-set	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs} (1)	β_{ec}	β_{ed}	β_{ed} (SF)	β_{ed} (codes)	CM (2) (dB)	MPR (dB)	AG (4) Index	E-TFCI
1	11/15 (3)	15/15 (3)	64	11/15 (3)	22/15	209/225	1039/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1}:47/15 β_{ed2}:47/15	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 (4)	15/15 (4)	64	15/15 (4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, ΔNACK and Δ_{CQI} = 8 $\Leftrightarrow$ A_{hs} = β_{hs}/β_c = 30/15 $\Leftrightarrow$ β_{hs}= 30/15 *β_c.
Note 2: CM = 1 for βc/βd =12/15, β_{hs}/β_c =24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the βc/βd ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to βc = 10/15 and βd = 15/15.
Note 4: For subtest 5 the βc/βd ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to βc = 14/15 and βd = 15/15.
Note 5: Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Figure 5.1g.
Note 6: βed can not be set directly; it is set by Absolute Grant Value.

Table 6: HSUPA UE category

UE E-DCH Category	Maximum E-DCH Codes Transmitted	Number of HARQ Processes	E-DCH TTI (ms)	Minimum Spreading Factor	Maximum E-DCH Transport Block Bits	Max Rate (Mbps)
1	1	4	10	4	7110	0.7296
2	2	8	2	4	2798	1.4592
	2	4	10	4	14484	
3	2	4	10	4	14484	1.4592
4	2	8	2	2	5772	2.9185
	2	4	10	2	20000	2.00
5	2	4	10	2	20000	2.00
6 (No DPDCH)	4	8	2	2 SF2 & 2 SF4	11484	5.76
	4	4	10		20000	2.00
7 (No DPDCH)	4	8	2	2 SF2 & 2 SF4	22996	?
	4	4	10		20000	?

NOTE: When 4 codes are transmitted in parallel, two codes shall be transmitted with SF2 and two with SF4.
UE Categories 1 to 6 supports QPSK only. UE Category 7 supports QPSK and 16QAM. (TS25.306-7.3.0)

HSPA, HSPA+ and DC-HSDPA Test Configuration

Measurement is required for HSPA, HSPA+ or DC-HSDPA, a KDB inquiry is required to confirm that the wireless mode configurations in the test setup have remained stable throughout the SAR measurements.35 without prior KDB confirmation to determine the SAR results are acceptable, a PBA is required for TCB approval.

SAR test exclusion for HSPA, HSPA+ and DC-HSDPA is determined according to the following:

1) The HSPA procedures are applied to configure 3GPP Rel. 6 HSPA devices in the required sub-test mode(s) to determine SAR test exclusion.

2) SAR is required for Rel. 7 HSPA+ when SAR is required for Rel. 6 HSPA; otherwise, the 3G SAR test reduction procedure is applied to (uplink) HSPA+ with 12.2 kbps RMC as the primary mode.36 Power is measured for HSPA+ that supports uplink 16 QAM according to configurations in Table C.11.1.4 of 3GPP TS 34.121-1 to determine SAR test reduction.

3) SAR is required for Rel. 8 DC-HSDPA when SAR is required for Rel. 5 HSDPA; otherwise, the 3G SAR test reduction procedure is applied to DC-HSDPA with 12.2 kbps RMC as the primary mode. Power is measured for DC-HSDPA according to the H-Set 12, FRC configuration in Table C.8.1.12 of 3GPP TS 34.121-1 to determine SAR test reduction. A primary and a secondary serving HS-DSCH Cell are required to perform the power measurement and for the results to be acceptable.

4) Regardless of whether a PBA is required, the following information must be verified and included in the SAR report for devices supporting HSPA, HSPA+ or DC-HSDPA: a) The output power measurement results and applicable release version(s) of 3GPP TS 34.121.

   a) Power measurement difficulties due to test equipment setup or availability must be resolved between the grantee and its test lab.

   b) The power measurement results are in agreement with the individual device implementation and specifications. When Enhanced MPR (E-MPR) applies, the normal MPR targets may be modified according to the Cubic Metric (CM) measured by the device, which must be taken into consideration.

   c) The UE category, operating parameters, such as the β and Δ values used to configure the device for testing, power setback procedures described in 3GGPP TS 34.121 for the power measurements, and HSPA/HSPA+ channel conditions (active and stable) for the entire duration of the measurement according to the required E-TFCI and AG index values.

5) When SAR measurement is required, the test configurations, procedures and power measurement results must be clearly described to confirm that the required test parameters are used, including E-TFCI and AG index stability and output power conditions.

Table 7: HS-DSCH UE category

Table 5.1a: FDD HS-DSCH physical layer categories

HS-DSCH category	Maximum number of HS-DSCH codes received	Minimum inter-TTI interval	Maximum number of bits of an HS-DSCH transport block received within an HS-DSCH TTI NOTE 1	Total number of soft channel bits	Supported modulations without MIMO operation or dual cell operation	Supported modulations with MIMO operation and without dual cell operation	Supported modulations with dual cell operation
Category 1	5	3	7298	19200	QPSK, 16QAM	Not applicable (MIMO not supported)	Not applicable (dual cell operation not supported)
Category 2	5	3	7298	28800			
Category 3	5	2	7298	28800			
Category 4	5	2	7298	38400			
Category 5	5	1	7298	57600			
Category 6	5	1	7298	67200			
Category 7	10	1	14411	115200			
Category 8	10	1	14411	134400			
Category 9	15	1	20251	172800			
Category 10	15	1	27952	172800			
Category 11	5	2	3630	14400	QPSK		
Category 12	5	1	3630	28800			
Category 13	15	1	35280	259200	QPSK, 16QAM, 64QAM		
Category 14	15	1	42192	259200			
Category 15	15	1	23370	345600	QPSK, 16QAM		
Category 16	15	1	27952	345600			
Category 17 NOTE 2	15	1	35280	259200	QPSK, 16QAM, 64QAM	–	
			23370	345600	–	QPSK, 16QAM	
Category 18 NOTE 3	15	1	42192	259200	QPSK, 16QAM, 64QAM	–	
			27952	345600	–	QPSK, 16QAM	
Category 19	15	1	35280	518400	QPSK, 16QAM, 64QAM		
Category 20	15	1	42192	518400			
Category 21	15	1	23370	345600	-	-	QPSK, 16QAM
Category 22	15	1	27952	345600			
Category 23	15	1	35280	518400			QPSK, 16QAM, 64QAM
Category 24	15	1	42192	518400			

7.2.3 LTE Test Configuration

LTE modes were tested according to FCC KDB 941225 D05 publication. Please see notes after the tabulated SAR data for required test configurations. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. The R&S CMW500 was used for LTE output power measurements and SAR testing. Max power control was used so the UE transmits with maximum output power during SAR testing. SAR must be measured with the maximum TTI (transmit time interval) supported by the device in each LTE configuration.

A) 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.

B) 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.

C) A-MPR

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

D) Largest channel bandwidth standalone SAR test requirements

1) QPSK with 1 RB allocation

Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel. When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

2) QPSK with 50% RB allocation

The procedures required for 1 RB allocation in 1) are applied to measure the SAR for QPSK with 50% RB allocation.

3) QPSK with 100% RB allocation

For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in 1) and 2) are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

4) Higher order modulations

For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in above sections to determine the QAM configurations that may need SAR measurement. For each configuration identified as required for testing, SAR is required only when the highest maximum output

power for the configuration in the higher order modulation is > ½ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

E) Other channel bandwidth standalone SAR test requirements

For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in section A) to determine the channels and RB configurations that need SAR testing and only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is > ½ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the *reported* SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg.

7.2.4 WIFI Test Configuration

For WLAN SAR testing, WLAN engineering testing software installed on the DUT can provide continuous transmitting RF signal. The Tx power is set to 14.5 for 802.11 b mode by software. This RF signal utilized in SAR measurement has almost 100% duty cycle and its crest factor is 1.

For the 802.11b/g/n SAR tests, a communication link is set up with the test mode software for WIFI mode test. During the test, at the each test frequency channel, the EUT is operated at the RF continuous emission mode. Each channel should be tested at the lowest data rate. Testing at higher data rates is not required when the maximum average output power is less than 0.25dB higher than those measured at the lowest data rate.

802.11b/g/n operating modes are tested independently according to the service requirements in each frequency band. 802.11b/g/n modes are tested on the maximum average output channel.

SAR is not required for 802.11g/n channels when the maximum average output power is less than 0.25dB higher than that measured on the corresponding 802.11b channels.

8. TEST CONDITIONS AND RESULTS

8.1. Conducted Power Results

Max Conducted power measurement results and power drift from tune-up tolerance provide by manufacturer:

Table 8 Conducted Power Measurement Results (GSM 850/1900)

GSM 850		Burst Conducted Power(dBm)			/	Average power(dBm)		
		Channel/Frequency(MHz)				Channel/Frequency(MHz)		
		128/824.2	190/836.6	251/848.8		128/824.2	190/836.6	251/848.8
GSM		32.87	32.97	32.93	-9.03dB	23.84	23.94	23.90
GPRS (GMSK)	1Txslot	32.82	32.84	32.69	-9.03dB	23.79	23.81	23.66
	2Txslots	31.30	31.26	30.91	-6.02dB	**25.28**	**25.24**	**24.89**
	3Txslots	28.78	28.34	28.20	-4.26dB	24.52	24.08	23.94
	4Txslots	27.34	27.28	26.94	-3.01dB	24.33	24.27	23.93
EGPRS (GMSK)	1Txslot	32.85	32.70	32.72	-9.03dB	23.82	23.67	23.69
	2Txslots	31.38	31.02	31.02	-6.02dB	**25.36**	**25.00**	**25.00**
	3Txslots	28.83	28.22	28.24	-4.26dB	24.57	23.96	23.98
	4Txslots	27.36	27.25	26.95	-3.01dB	24.35	24.24	23.94
EGPRS (8PSK)	1Txslot	27.09	26.74	26.91	-9.03dB	18.06	17.71	17.88
	2Txslots	26.91	26.51	26.72	-6.02dB	20.89	20.49	20.70
	3Txslots	25.22	24.87	25.05	-4.26dB	20.96	20.61	20.79
	4Txslots	24.06	23.79	23.86	-3.01dB	21.05	20.78	20.85
GSM 1900		**Burst Conducted Power(dBm)**			/	**Average power(dBm)**		
		Channel/Frequency(MHz)				Channel/Frequency(MHz)		
		512/1850.2	661/1880	810/1909.8		512/1850.2	661/1880	810/1909.8
GSM		29.47	29.37	29.34	-9.03dB	20.44	20.34	20.31
GPRS (GMSK)	1Txslot	29.75	29.64	29.48	-9.03dB	20.72	20.61	20.45
	2Txslots	27.67	27.82	27.86	-6.02dB	21.65	21.80	21.84
	3Txslots	26.41	26.51	26.49	-4.26dB	22.15	22.25	22.23
	4Txslots	25.35	25.43	25.41	-3.01dB	**22.34**	**22.42**	**22.40**
EGPRS (GMSK)	1Txslot	29.63	29.51	29.45	-9.03dB	20.60	20.48	20.42
	2Txslots	27.82	27.75	27.72	-6.02dB	21.80	21.73	21.70
	3Txslots	26.48	26.41	26.36	-4.26dB	22.22	22.15	22.10
	4Txslots	25.41	25.43	25.35	-3.01dB	**22.40**	**22.42**	**22.34**
EGPRS	1Txslot	25.23	25.15	25.35	-9.03dB	16.20	16.12	16.32

(8PSK)	2Txslots	25.11	25.41	25.20	-6.02dB	19.09	19.21	19.18
	3Txslots	24.45	24.35	24.56	-4.26dB	20.19	20.09	20.30
	4Txslots	23.32	23.27	23.44	-3.01dB	20.31	20.26	20.43

Note:

1) Division Factors

To average the power, the division factor is as follows:

1Txslot = 1 transmit time slot out of 8 time slots
=> conducted power divided by (8/1) => -9.03 dB

2Txslots = 2 transmit time slots out of 8 time slots
=> conducted power divided by (8/2) => -6.02 dB

3Txslots = 3 transmit time slots out of 8 time slots
=> conducted power divided by (8/3) => -4.26 dB

4Txslots = 4 transmit time slots out of 8 time slots
=> conducted power divided by (8/4) => -3.01 dB

2) Average power numbers

The maximum power numbers are marks in bold.

Table 9 Conducted Power Measurement Results (UMTS Band II/V)

UMTS Band II		Conducted Power (dBm)		
		Channel/Frequency(MHz)		
		9262/1852.4	9400/1880	9538/1907.6
RMC	12.2kbps RMC	22.67	22.81	22.03
	64kbps RMC	22.65	22.62	22.01
	144kbps RMC	22.61	22.57	21.97
	384kbps RMC	22.55	22.49	21.89
HSDPA	Sub - Test 1	22.56	22.70	22.25
	Sub - Test 2	22.54	22.51	22.11
	Sub - Test 3	21.36	21.78	21.66
	Sub - Test 4	21.32	21.57	21.53
HSUPA	Sub - Test 1	22.68	22.44	22.20
	Sub - Test 2	22.14	22.14	22.24
	Sub - Test 3	21.35	21.40	21.10
	Sub - Test 4	21.33	21.32	21.41
	Sub - Test 5	22.10	22.15	22.44
UMTS Band V		Conducted Power (dBm)		
		Channel/Frequency(MHz)		
		4132/826.4	4183/836.6	4233/846.6
RMC	12.2kbps RMC	22.81	22.91	22.89
	64kbps RMC	22.77	22.82	22.79
	144kbps RMC	22.69	22.73	22.67
	384kbps RMC	22.61	22.65	22.53
HSDPA	Sub - Test 1	22.24	22.36	22.54
	Sub - Test 2	22.25	22.65	22.32
	Sub - Test 3	21.15	21.45	21.26
	Sub - Test 4	21.33	21.68	21.46
HSUPA	Sub - Test 1	22.25	22.44	22.36
	Sub - Test 2	22.45	22.32	22.24
	Sub - Test 3	21.36	21.24	21.30
	Sub - Test 4	21.26	21.36	21.14
	Sub - Test 5	22.24	22.34	22.32

Table 10 Conducted Power Measurement Results (LTE Band 4/7)

LTE Band 4						
Bandwidth	Modulation	RB Configuration		Channel/Frequency(MHz)		
		Size	Offset	19957/1710.7	20175/1732.5	20393/1754.3
1.4 MHz	QPSK	1	0	23.67	23.71	23.47
		1	3	23.68	23.76	23.52
		1	5	23.58	23.66	23.40
		3	0	23.67	23.76	23.40
		3	2	23.70	23.77	23.42
		3	3	23.67	23.73	23.39
		6	0	22.75	22.82	22.54
	16QAM	1	0	22.89	22.90	22.50
		1	3	22.94	23.00	22.57
		1	5	22.81	22.95	22.48
		3	0	22.78	22.76	22.37
		3	2	22.70	22.78	22.39
		3	3	22.71	22.75	22.37
		6	0	21.64	21.61	21.59
Bandwidth	Modulation	RB Configuration		Channel/Frequency(MHz)		
		Size	Offset	19965/1711.5	20175/1732.5	20385/1753.5
3 MHz	QPSK	1	0	23.65	23.68	23.67
		1	7	23.63	23.75	23.51
		1	14	23.56	23.81	23.45
		8	0	22.70	22.78	22.61
		8	4	22.67	22.78	22.55
		8	7	22.63	22.78	22.54
		15	0	22.73	22.80	22.52
	16QAM	1	0	22.90	22.94	22.77
		1	7	22.79	22.94	22.65
		1	14	22.87	22.97	22.61
		8	0	21.67	21.69	21.52
		8	4	21.67	21.76	21.47
		8	7	21.61	21.72	21.44
		15	0	21.67	21.73	21.48
Bandwidth	Modulation	RB Configuration		Channel/Frequency(MHz)		
		Size	Offset	19975/1712.5	20175/1732.5	20375/1752.5
5 MHz	QPSK	1	0	23.64	23.64	23.55
		1	12	22.74	23.69	23.49
		1	24	23.69	23.81	23.46
		12	0	22.72	22.70	22.63
		12	6	22.65	22.75	22.49
		12	13	22.63	22.79	22.51
		25	0	22.69	22.76	22.47
	16QAM	1	0	22.88	22.86	22.77
		1	12	22.77	22.90	22.59
		1	24	22.84	23.00	22.62
		12	0	21.86	21.86	21.75
		12	6	21.82	21.89	21.64
		12	13	21.77	21.94	21.66
		25	0	21.71	21.77	21.53

Bandwidth	Modulation	RB Configuration		Channel/Frequency(MHz)		
		Size	Offset	20000/1715	20175/1732.5	20350/1750
10 MHz	QPSK	1	0	23.66	23.72	23.60
		1	24	23.58	23.88	23.44
		1	49	23.57	23.75	23.29
		25	0	22.66	22.78	22.58
		25	12	22.69	22.78	22.52
		25	25	22.65	22.82	22.49
		50	0	22.76	22.80	22.56
	16QAM	1	0	22.82	22.88	22.83
		1	24	22.80	23.00	22.65
		1	49	22.81	22.96	22.44
		25	0	21.68	21.67	21.59
		25	12	21.62	21.75	21.55
		25	25	21.62	21.80	21.50
		50	0	21.76	21.77	21.60
Bandwidth	Modulation	RB Configuration		Channel/Frequency(MHz)		
		Size	Offset	20025/1717.5	20175/1732.5	20325/1747.5
15 MHz	QPSK	1	0	23.60	23.63	23.69
		1	37	23.57	23.67	23.40
		1	74	23.59	23.78	23.24
		37	0	22.77	22.81	22.77
		37	18	22.75	22.87	22.59
		37	38	22.70	22.90	22.51
		75	0	22.87	22.85	22.81
	16QAM	1	0	22.90	22.87	23.00
		1	37	22.81	23.00	22.77
		1	74	22.91	22.57	22.53
		37	0	21.73	21.72	21.80
		37	18	21.63	21.83	21.60
		37	38	21.62	21.80	21.51
		75	0	21.83	21.84	21.78
Bandwidth	Modulation	RB Configuration		Channel/Frequency(MHz)		
		Size	Offset	20050/1720	20175/1732.5	20300/1745
20MHz	QPSK	1	0	23.55	23.59	23.62
		1	49	23.51	23.97	23.65
		1	99	23.56	23.68	23.16
		50	0	22.79	22.82	22.81
		50	25	22.68	22.87	22.64
		50	50	22.66	22.84	22.47
		100	0	22.81	22.80	22.68
	16QAM	1	0	22.56	22.53	22.47
		1	49	22.58	22.77	22.47
		1	99	22.50	22.64	22.33
		50	0	21.72	21.76	21.79
		50	25	21.67	21.85	21.68
		50	50	21.64	21.84	21.53
		100	0	21.75	21.76	21.70

LTE Band 7						
Bandwidth	Modulation	RB Configuration		Channel/Frequency(MHz)		
		Size	Offset	20775/2502.5	21100/2535	21425/2567.5
5MHz	QPSK	1	0	22.03	21.99	21.94
		1	12	22.22	21.96	22.19
		1	24	21.94	21.89	21.95
		12	0	20.90	20.92	20.97
		12	6	21.08	21.08	20.82
		12	13	21.00	20.89	21.05
		25	0	20.90	21.02	20.87
	16QAM	1	0	21.06	21.29	21.00
		1	12	21.22	21.06	20.86
		1	24	20.85	20.82	21.09
		12	0	19.72	19.84	19.99
		12	6	19.59	19.96	19.79
		12	13	19.71	20.09	19.62
		25	0	19.69	19.89	19.57
Bandwidth	Modulation	RB Configuration		Channel/Frequency(MHz)		
		Size	Offset	20800/2505	21100/2535	21400/2565
10 MHz	QPSK	1	0	21.90	21.84	21.97
		1	24	21.95	22.08	21.86
		1	49	22.03	22.15	21.74
		25	0	20.96	20.86	20.58
		25	12	20.73	20.69	21.08
		25	25	20.97	20.92	20.59
		50	0	21.00	20.56	20.38
	16QAM	1	0	21.07	20.66	20.55
		1	24	21.08	20.82	20.86
		1	49	20.98	20.83	20.82
		25	0	20.01	19.72	19.80
		25	12	20.07	20.10	20.02
		25	25	19.88	19.91	20.13
		50	0	19.95	19.56	19.53
Bandwidth	Modulation	RB Configuration		Channel/Frequency(MHz)		
		Size	Offset	20825/2507.5	21100/2535	21375/2562.5
15 MHz	QPSK	1	0	22.18	22.21	22.13
		1	37	21.89	21.96	21.96
		1	74	22.02	21.78	21.77
		37	0	20.75	20.92	20.71
		37	18	20.71	20.71	20.59
		37	38	20.70	20.87	20.65
		75	0	20.48	20.54	20.38
	16QAM	1	0	20.78	20.98	20.85
		1	37	20.99	21.00	20.90
		1	74	20.75	20.72	20.62
		37	0	20.05	19.68	19.96
		37	18	19.75	19.86	19.69
		37	38	19.96	19.77	19.53
		75	0	19.81	19.90	19.49

Bandwidth	Modulation	RB Configuration		Channel/Frequency(MHz)		
		Size	Offset	20850/2510	21100/2535	21350/2560
20 MHz	QPSK	1	0	22.21	22.18	21.85
		1	49	22.07	22.15	22.00
		1	99	22.22	22.17	21.70
		50	0	20.65	20.65	20.78
		50	25	20.85	20.53	20.89
		50	50	20.93	20.92	20.56
		100	0	20.82	20.69	20.51
	16QAM	1	0	20.73	20.82	20.75
		1	49	20.79	20.81	20.86
		1	99	20.79	20.57	20.80
		50	0	19.88	19.44	19.72
		50	25	19.44	19.45	19.44
		50	50	19.51	19.63	19.64
		100	0	19.72	19.72	19.67

Table 11 Conducted Power Measurement Results (Bluetooth)

BT	**PK Conducted Power (dBm)**		
	Channel/Frequency(MHz)		
	Ch 0/2402 MHz	Ch 39/2441 MHz	Ch 78/2480 MHz
GFSK	-0.43	0.22	0.64
π/4DQPSK	-1.62	-1.25	-1.16
8DPSK	-1.34	-0.94	-0.85
BT 4.0	Ch 0/2402 MHz	Ch 19/2440 MHz	Ch 39/2480 MHz
GFSK	-4.51	-4.21	-4.48

Note:
Per KDB 447498 D01v05r02, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances≤50 mm are determined by:
[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] . [√f(GHz)] ≤ 3 for 1-g SAR and] ≤ 7.5 for 10-g extremity SAR

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

Table 12 Conducted Power Measurement Results (Wifi 802.11 b/g/n)

Mode	Channel/ Frequency(MHz)	Data rate (Mbps)	AV Power (dBm)
802.11b	1/2412	1	14.70
		2	14.20
		5.5	14.00
		11	13.70
	6/2437	1	15.20
		2	14.90
		5.5	14.70
		11	14.50
	11/2462	1	15.60
		2	15.50
		5.5	15.30
		11	15.00
802.11g	1/2412	6	13.00
		9	12.80
		12	12.50
		18	12.10
		24	11.70
		36	11.20
		48	10.50
		54	10.30
	6/2437	6	13.70
		9	13.50
		12	13.10
		18	12.80
		24	12.30
		36	12.00
		48	11.60
		54	11.10
	11/2462	6	14.30
		9	14.00
		12	13.80
		18	13.40
		24	13.00
		36	12.50
		48	11.90
		54	11.70
802.11n HT20	1/2412	MCS0	9.90
		MCS1	9.40
		MCS2	9.00
		MCS3	8.70
		MCS4	8.00
		MCS5	7.50
		MCS6	7.40
		MCS7	7.10
	6/2437	MCS0	10.70
		MCS1	10.20

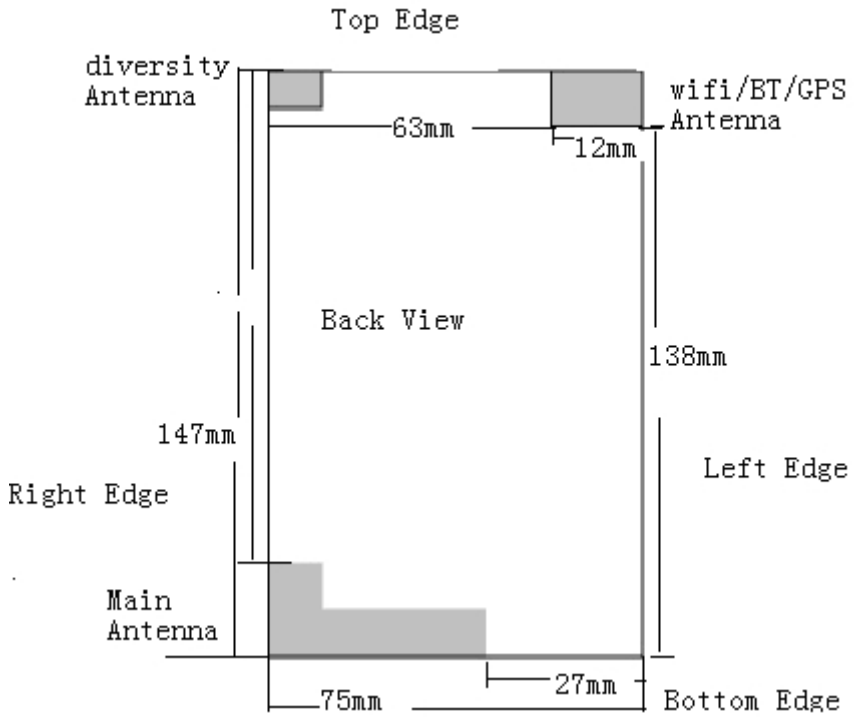
		MCS2	9.70
		MCS3	9.40
		MCS4	8.70
		MCS5	8.30
		MCS6	8.10
		MCS7	7.90
	11/2462	MCS0	11.30
		MCS1	10.80
		MCS2	10.40
		MCS3	9.50
		MCS4	9.40
		MCS5	8.90
		MCS6	8.70
		MCS7	8.50
802.11n HT40	3/2422	MCS0	9.70
		MCS1	9.60
		MCS2	9.20
		MCS3	8.60
		MCS4	8.10
		MCS5	7.70
		MCS6	7.60
		MCS7	7.20
	6/2437	MCS0	10.50
		MCS1	10.20
		MCS2	9.60
		MCS3	9.80
		MCS4	8.50
		MCS5	8.20
		MCS6	8.10
		MCS7	7.70
	9/2452	MCS0	11.20
		MCS1	10.70
		MCS2	10.50
		MCS3	9.70
		MCS4	9.60
		MCS5	8.70
		MCS6	8.80
		MCS7	8.60

Per FCC KDB 447498 D01, the SAR exclusion threshold for distances <50mm is defined by the following equation:

$$\frac{\text{(max. power of channel, including tune-up tolerance, mW)}}{\text{(min. test separation distance, mm)}} * \sqrt{\text{Frequency (GHz)}} \leq 3.0$$

Band	Configuration	Frequency (MHz)	Maximum Power (dBm)	Separation Distance (mm)	Calculation Result	SAR Exclusion Thresholds	Standalone SAR
Bluetooth	Head	2480	2	5	0.5	3.0	No
	Body	2480	2	10	0.2	3.0	No
Wifi 2.4GHz	Head	2462	16	5	12.5	3.0	Yes
	Body	2462	16	10	6.2	3.0	Yes

8.2. Antenna Location



SAR Measurement Positions

According to the KDB941225 D06 Hot Spot SAR v01, the edges with less than 2.5 cm distance to the antennas need to be tested for SAR.

SAR measurement positions						
Mode	Front	Rear	Left edge	Right edge	Top edge	Bottom edge
Main antenna(GSM/WCDMA/LTE)	Yes	Yes	No	Yes	No	Yes
WLAN/Bluetooth	Yes	Yes	Yes	No	Yes	No

8.3. TEST RESULTS

8.3.1 SAR Test Results Summary

Test position and configuration

Head SAR was performed with the device configured in the positions according to IEEE1528, and Body SAR was performed with the device 0mm from the phantom; Body SAR was also performed with the headset attached and without.

Operation Mode ·

- According to KDB 447498 D01 v05r02, for each exposure position, if the highest 1-g SAR is ≤ 0.8 W/kg, testing for low and high channel is optional.
- Per KDB 865664 D01 v01r01, for each frequency band, if the measured SAR is ≥0.8W/Kg, testing for repeated SAR measurement is required, that the highest measured SAR is only to be tested. When the SAR results are near the limit, the following procedures are required for each device to verify these types of SAR measurement related variation concerns by repeating the highest measured SAR configuration in each frequency band.

1) When the original highest measured SAR is ≥0.8W/Kg, repeat that measurement once.
2) 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.
3) Perform a third repeated measurement only if the original, first and second repeated measurement is ≥1.5 W/Kg and ratio of largest to smallest SAR for the original, first and second measurement is ≥1.20. ·

- Body-worn exposure conditions are intended to voice call operations, therefore GSM voice call mode is selected to be test.
- According to KDB 648474 D04 v01r01,when the reported SAR for a body-worn accessory measured without a headset connected to the handset is ≤1.2W/Kg, SAR testing with a headset connected is not required. ·
- According to 941225 D06, when the overall device length and width are＞9cm×5cm, Hotspot mode with a test separation distance of 10mm. For device with form factors smaller than 9cm×5cm, Hotspot mode with a test separation distance of 5mm. Body SAR was also performed with the headset attached and without.
- According to 941225 D06,Phablet SAR test considerations，For smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm, When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg..
- According to 248227 D01, SAR is not required for 802.11g channels when the maximum average output power is less than 1/4dB higher than measured on the corresponding 802.11b channels. ·
- Maximum Scaling SAR in order to calculate the Maximum SAR values to test under the standard Peak Power, Calculation method is as follows:
  Maximum Scaling SAR =tested SAR (Max.) × [maximum turn-up power (mw)/ maximum measurement output power(mw)]

8.3.2 Standalone SAR

Table 13: SAR Values [GSM 850 (GSM/GPRS)]

Test Position	Channel/ Frequency(MHz)	Time slot	Duty Cycle	Maximum Allowed Power (dBm)	Conducted Power (dBm)	Drift ± 0.21dB	Limit SAR_{1g} 1.6 W/kg			
						Drift (dB)	Measured SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)	Graph Results
Test Position of Head										
Left/Cheek	190/836.6	GSM	1:8.3	33.5	32.97	0.029	0.171	1.13	0.193	Figure. 1
Left/Tilt	190/836.6	GSM	1:8.3	33.5	32.97	0.027	0.074	1.13	0.084	N/A
Right/Cheek	190/836.6	GSM	1:8.3	33.5	32.97	-0.040	0.131	1.13	0.148	N/A
Right/Tilt	190/836.6	GSM	1:8.3	33.5	32.97	0.140	0.081	1.13	0.091	N/A
Test position of Body (Body- worn, Distance 10mm)										
Back Side	190/836.6	GSM	1:8.3	33.5	32.97	-0.140	0.327	1.13	0.369	N/A
Front Side	190/836.6	GSM	1:8.3	33.5	32.97	-0.146	0.251	1.13	0.284	N/A
Test position of Body (Hotspot Open, Distance 10mm)										
Back Side	190/836.6	2Txslots	1:4.15	31.5	31.26	-0.160	0.345	1.06	0.365	N/A
Front Side	190/836.6	2Txslots	1:4.15	31.5	31.26	-0.010	0.197	1.06	0.208	N/A
Left Edge	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Right Edge	190/836.6	2Txslots	1:4.15	31.5	31.26	0.025	0.040	1.06	0.042	N/A
Top Edge	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bottom Edge	190/836.6	2Txslots	1:4.15	31.5	31.26	-0.040	0.152	1.06	0.161	N/A
Worst Case Position of Body with EGPRS (Distance 10mm)										
Back Side	190/836.6	2Txslots	1:4.15	31.5	31.02	-0.190	0.417	1.12	0.466	Figure.2

Note: 1.The value with blue color is the maximum SAR Value of each test band.
2. When multiple slots are used, SAR should be tested to account for the maximum source-based time-averaged output power.
3. Per FCC KDB Publication 648474 D04, SAR was evaluated without a headset connected to the device. Since the reported SAR was ≤ 1.2 W/kg, no additional SAR evaluations using a headset cable were required.

Table 14: SAR Values [GSM 1900 (GSM/GPRS)]

Test Position	Channel/ Frequency (MHz)	Time slot	Duty Cycle	Maximum Allowed Power (dBm)	Conducted Power (dBm)	Drift ± 0.21dB	Limit SAR_{1g} 1.6 W/kg			
						Drift (dB)	Measured SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)	Graph Results
Test Position of Head										
Left Cheek	661/1880	GSM	1:8.3	30	29.37	0.056	0.130	1.16	0.150	Figure.3
Left Tilt	661/1880	GSM	1:8.3	30	29.37	0.035	0.046	1.16	0.054	N/A
Right Cheek	661/1880	GSM	1:8.3	30	29.37	-0.160	0.118	1.16	0.136	N/A
Right Tilt	661/1880	GSM	1:8.3	30	29.37	0.170	0.040	1.16	0.046	N/A
Test position of Body (Distance 10mm)										
Back Side	661/1880	GSM	1:8.3	30	29.37	-0.070	0.259	1.16	0.299	N/A
Front Side	661/1880	GSM	1:8.3	30	29.37	-0.110	0.141	1.16	0.163	N/A
Test position of Body (Hotspot Open, Distance 10mm)										
Back Side	661/1880	4 Txslots	1:2.07	26	25.43	0.070	0.355	1.14	0.405	N/A
Front Side	661/1880	4 Txslots	1:2.07	26	25.43	0.020	0.225	1.14	0.257	N/A
Left Edge	661/1880	4 Txslots	1:2.07	26	25.43	0.023	0.114	1.14	0.130	N/A
Right Edge	661/1880	4 Txslots	1:2.07	26	25.43	0.050	0.068	1.14	0.078	N/A
Top Edge	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bottom Edge	661/1880	4 Txslots	1:2.07	26	25.43	0.110	0.362	1.14	0.413	N/A
Worst Case Position of Body With EGPRS (Distance 10mm)										
Bottom Edge	661/1880	4 Txslots	1:2.07	26	25.43	-0.070	0.369	1.14	0.421	Figure.4

Note: 1.The value with blue color is the maximum SAR Value of each test band.
2. Per FCC KDB Publication 447498 D01, 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 optional for such test configuration(s).
3. When multiple slots are used, SAR should be tested to account for the maximum source-based time-averaged output power.
4. Per FCC KDB Publication 648474 D04, SAR was evaluated without a headset connected to the device. Since the reported SAR was ≤ 1.2 W/kg; no additional SAR evaluations using a headset cable were required.

Table 15: SAR Values [UMTS Band II (WCDMA/HSDPA/HSUPA)]

Test Position	Channel/ Frequency (MHz)	Channel Type	Duty Cycle	Maximum Allowed Power (dBm)	Conducted Power (dBm)	Drift ± 0.21dB	Limit SAR_{1g} 1.6 W/kg			
						Drift (dB)	Measured SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)	Graph Results
Test Position of Head										
Left Cheek	9400/1880	RMC 12.2K	1:1	23	22.81	0.070	0.344	1.04	0.359	N/A
Left Tilt	9400/1880	RMC 12.2K	1:1	23	22.81	0.080	0.141	1.04	0.147	N/A
Right Cheek	9400/1880	RMC 12.2K	1:1	23	22.81	-0.070	0.378	1.04	0.395	Figure.5
Right Tilt	9400/1880	RMC 12.2K	1:1	23	22.81	-0.170	0.119	1.04	0.124	N/A
Test position of Body (Distance 10mm)										
Back Side	9400/1880	RMC 12.2K	1:1	23	22.81	0.030	0.739	1.04	0.772	N/A
Front Side	9400/1880	RMC 12.2K	1:1	23	22.81	-0.080	0.702	1.04	0.733	N/A
Left Edge	9400/1880	RMC 12.2K	1:1	23	22.81	0.050	0.211	1.04	0.220	N/A
Right Edge	9400/1880	RMC 12.2K	1:1	23	22.81	0.010	0.193	1.04	0.202	N/A
Top Edge	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bottom Edge	9538/1907.6	RMC 12.2K	1:1	23	22.03	-0.080	0.935	1.25	1.169	Figure.6
	9400/1880	RMC 12.2K	1:1	23	22.81	-0.020	1.050	1.04	1.097	N/A
	9262/1852.4	RMC 12.2K	1:1	23	22.67	-0.130	0.816	1.08	0.880	N/A
Worst Case Position of SAR (1st Repeated SAR, Distance 10mm)										
Bottom Edge	9538/1907.6	RMC 12.2K	1:1	23	22.03	0.040	0.904	1.25	1.130	N/A

Note: 1.The value with blue color is the maximum SAR Value of each test band.
2. Per FCC KDB Publication 447498 D01, 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 optional for such test configuration(s).
3. Per FCC KDB Publication 648474 D04, SAR was evaluated without a headset connected to the device. Since the reported SAR was ≤ 1.2 W/kg, no additional SAR evaluations using a headset cable were required.
4.When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode

Table 16: SAR Measurement Variability Results [UMTS Band II (WCDMA/HSDPA/HSUPA)]

Test Position	Channel/ Frequency (MHz)	Measured SAR (1g)	1st Repeated SAR (1g)	Ratio	2nd Repeated SAR (1g)	3rd Repeated SAR (1g)
Bottom Edge	9538/1907.6	0.935	0.904	1.03	N/A	N/A

Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.
2) A second repeated measurement was preformed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).
3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.
4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg

Table 17: SAR Values [UMTS Band V (WCDMA/HSDPA/HSUPA)]

Test Position	Channel/ Frequency (MHz)	Channel Type	Duty Cycle	Maximum Allowed Power (dBm)	Conducted Power (dBm)	Drift ± 0.21dB	Limit SAR_{1g} 1.6 W/kg			
						Drift (dB)	Measured SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)	Graph Results
Test Position of Head										
Left Cheek	4183/836.6	RMC 12.2K	1:1	23	22.91	0.020	0.436	1.02	0.445	N/A
Left Tilt	4183/836.6	RMC 12.2K	1:1	23	22.91	-0.120	0.303	1.02	0.309	N/A
Right Cheek	4183/836.6	RMC 12.2K	1:1	23	22.91	0.060	0.559	1.02	0.571	Figure.7
Right Tilt	4183/836.6	RMC 12.2K	1:1	23	22.91	0.010	0.341	1.02	0.348	N/A
Test position of Body (Distance 10mm)										
Back Side	4233/846.6	RMC 12.2K	1:1	23	22.89	-0.020	0.870	1.03	0.892	N/A
	4183/836.6	RMC 12.2K	1:1	23	22.91	0.110	0.811	1.02	0.828	N/A
	4132/826.4	RMC 12.2K	1:1	23	22.81	0.090	0.839	1.04	0.877	N/A
Front Side	4183/836.6	RMC 12.2K	1:1	23	22.91	0.140	0.63	1.02	0.643	N/A
Left Edge	4183/836.6	RMC 12.2K	1:1	23	22.91	-0.020	0.346	1.02	0.353	N/A
Right Edge	4183/836.6	RMC 12.2K	1:1	23	22.91	-0.060	0.292	1.02	0.298	N/A
Top Edge	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bottom Edge	4183/836.6	RMC 12.2K	1:1	23	22.91	0.030	0.137	1.02	0.140	N/A
Worst Case Position of SAR (1st Repeated SAR, Distance 10mm)										
Back Side	4233/846.6	RMC 12.2K	1:1	23	22.89	0.020	0.885	1.03	0.908	Figure.8

Note: 1.The value with blue color is the maximum SAR Value of each test band.
2. Per FCC KDB Publication 447498 D01, 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 optional for such test configuration(s).
3. Per FCC KDB Publication 648474 D04, SAR was evaluated without a headset connected to the device. Since the reported SAR was ≤ 1.2 W/kg, no additional SAR evaluations using a headset cable were required.
4.When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode

Table 18: SAR Measurement Variability Results [UMTS Band V (WCDMA/HSDPA/HSUPA)]

Test Position	Channel/ Frequency (MHz)	Measured SAR (1g)	1st Repeated SAR (1g)	Ratio	2nd Repeated SAR (1g)	3rd Repeated SAR (1g)
Back Side	4233/846.6	0.870	0.885	1.02	N/A	N/A

Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.
2) A second repeated measurement was preformed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).
3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.
4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg

Table 19: SAR Values [LTE Band 7]

Test Position	Channel/ Frequency (MHz)	Mode	Duty Cycle	Maximum Allowed Power (dBm)	Conducted Power (dBm)	Drift ± 0.21dB	Limit SAR_{1g} 1.6 W/kg			
						Drift (dB)	Measured SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)	Graph Results
Test Position of Head with 1RB										
Left/Cheek	20850/2510	1RB 99 Offset	1:1	23	22.22	0.130	0.095	1.20	0.114	Figure.9
Left/Tilt	20850/2510	1RB 99 Offset	1:1	23	22.22	0.092	0.059	1.20	0.071	N/A
Right/Cheek	20850/2510	1RB 99 Offset	1:1	23	22.22	0.037	0.064	1.20	0.077	N/A
Right/Tilt	20850/2510	1RB 99 Offset	1:1	23	22.22	0.052	0.054	1.20	0.065	N/A
Test Position of Head with 50% RB										
Left/Cheek	20850/2510	50%RB 50 Offset	1:1	22	20.93	0.066	0.069	1.28	0.088	N/A
Left/Tilt	20850/2510	50%RB 50 Offset	1:1	22	20.93	0.113	0.044	1.28	0.056	N/A
Right/Cheek	20850/2510	50%RB 50 Offset	1:1	22	20.93	0.066	0.051	1.28	0.065	N/A
Right/Tilt	20850/2510	50%RB 50 Offset	1:1	22	20.93	0.048	0.044	1.28	0.056	N/A
Test position of Body with 1RB (Hotspot Open, Distance 10mm)										
Back Side	20850/2510	1RB 99 Offset	1:1	23	22.22	-0.025	0.211	1.20	0.253	N/A
Front Side	20850/2510	1RB 99 Offset	1:1	23	22.22	0.031	0.153	1.20	0.183	N/A
Left Edge	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Right Edge	20850/2510	1RB 99 Offset	1:1	23	22.22	0.053	0.049	1.20	0.059	N/A
Top Edge	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bottom Edge	20850/2510	1RB 99 Offset	1:1	23	22.22	0.050	0.586	1.20	0.701	Figure.10
Test position of Body with 50%RB (Hotspot Open, Distance 10mm)										
Back Side	20850/2510	50%RB 50 Offset	1:1	22	20.93	0.021	0.213	1.28	0.273	N/A
Front Side	20850/2510	50%RB 50 Offset	1:1	22	20.93	0.034	0.153	1.28	0.196	N/A
Left Edge	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Right Edge	20850/2510	50%RB 50 Offset	1:1	22	20.93	0.122	0.044	1.28	0.056	N/A
Top Edge	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bottom Edge	20850/2510	50%RB 50 Offset	1:1	22	20.93	0.160	0.503	1.28	0.644	N/A
Note: 1.The value with blue color is the maximum SAR Value of each test band.										

Table 20: SAR Values [LTE Band 4]

Test Position	Channel/ Frequency (MHz)	Mode	Duty Cycle	Maximum Allowed Power (dBm)	Conducted Power (dBm)	Drift ± 0.21dB	Limit SAR_{1g} 1.6 W/kg			
						Drift (dB)	Measured SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)	Graph Results
Test Position of Head with 1RB										
Left/Cheek	20175/1732.5	1RB 49 Offset	1:1	24	23.97	0.025	0.245	1.01	0.247	N/A
Left/Tilt	20175/1732.5	1RB 49 Offset	1:1	24	23.97	0.032	0.189	1.01	0.190	N/A
Right/Cheek	20175/1732.5	1RB 49 Offset	1:1	24	23.97	-0.041	0.263	1.01	0.265	Figure.3
Right/Tilt	20175/1732.5	1RB 49 Offset	1:1	24	23.97	0.132	0.112	1.01	0.113	N/A
Test Position of Head with 50% RB										
Left/Cheek	20175/1732.5	50RB 25Offset	1:1	23	22.87	0.021	0.144	1.03	0.148	N/A
Left/Tilt	20175/1732.5	50RB 25Offset	1:1	23	22.87	0.032	0.120	1.03	0.124	N/A
Right/Cheek	20175/1732.5	50RB 25Offset	1:1	23	22.87	0.034	0.167	1.03	0.172	N/A
Right/Tilt	20175/1732.5	50RB 25Offset	1:1	23	22.87	0.121	0.106	1.03	0.109	N/A
Test position of Body with 1RB (Distance 10mm)										
Back Side	20175/1732.5	1RB 49 Offset	1:1	24	23.97	0.150	0.440	1.01	0.443	N/A
Front Side	20175/1732.5	1RB 49 Offset	1:1	24	23.97	0.081	0.285	1.01	0.287	N/A
Left Edge	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Right Edge	20175/1732.5	1RB 49 Offset	1:1	24	23.97	0.024	0.132	1.01	0.133	N/A
Top Edge	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bottom Edge	20175/1732.5	1RB 49 Offset	1:1	24	23.97	0.015	0.677	1.01	0.682	Figure.12
Test position of Body with 50%RB (Distance 10mm)										
Back Side	20175/1732.5	50RB 25Offset	1:1	23	22.87	0.154	0.368	1.03	0.379	N/A
Front Side	20175/1732.5	50RB 25Offset	1:1	23	22.87	0.043	0.173	1.03	0.178	N/A
Left Edge	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Right Edge	20175/1732.5	50RB 25Offset	1:1	23	22.87	0.015	0.117	1.03	0.121	N/A
Top Edge	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bottom Edge	20175/1732.5	50RB 25Offset	1:1	23	22.87	0.015	0.437	1.03	0.450	N/A

Note: 1.The value with blue color is the maximum SAR Value of each test band.

Table 21: SAR Values (802.11b/g/n)

Test Position	Channel/ Frequency (MHz)	Service	Duty Cycle	Maximum Allowed Power (dBm)	Conducted Power (dBm)	Drift ± 0.21dB	Limit of SAR 1.6 W/kg			
						Drift (dB)	Measured SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)	Graph Results
Test Position of Head										
Left Cheek	11/2462	DSSS	1:1	16	15.6	0.030	0.286	1.10	0.314	Figure.4
Left Tilt	11/2462	DSSS	1:1	16	15.6	0.120	0.260	1.10	0.285	N/A
Right Cheek	11/2462	DSSS	1:1	16	15.6	0.180	0.152	1.10	0.167	N/A
Right Tilt	11/2462	DSSS	1:1	16	15.6	0.120	0.113	1.10	0.124	N/A
Test position of Body (Distance 10mm)										
Back Side	11/2462	DSSS	1:1	16	15.6	0.066	0.093	1.10	0.102	Figure.5
Front Side	11/2462	DSSS	1:1	16	15.6	0.080	0.069	1.10	0.076	N/A
Left Edge	11/2462	DSSS	1:1	16	15.6	-0.050	0.050	1.10	0.055	N/A
Right Edge	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Top Edge	11/2462	DSSS	1:1	16	15.6	0.123	0.008	1.10	0.009	N/A
Bottom Edge	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Note: 1. The value with blue color is the maximum SAR Value of each test band.
2. Per FCC KDB Publication 447498 D01, 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 optional for such test configuration(s).
3. KDB 248227-SAR is not required for 802.11g/n channels when the maximum average output power is less than ¼ dB higher than measured on the corresponding 802.11b channels.

8.3.2 Simultaneous SAR Evaluation

Application Simultaneous Transmission information:

Air-Interface	Band (MHz)	Type	Simultaneous Transmissions Note: Not to be tested	Voice Over Digital Transport (Data)
GSM	850	Voice	Yes WIFI or BT	NA
	1900	Voice		NA
	GPRS	Data	Yes WIFI or BT	NA
WCDMA	Band II	Voice	Yes WIFI or BT	NA
	Band V	Voice	Yes WIFI or BT	NA
	HSDPA/HSUPA/RMC/	Data	Yes WIFI or BT	NA
LTE	Band 4	Data	Yes WIFI or BT	NA
	Band 7	Data	Yes WIFI or BT	NA
WIFI	2450	Data	Yes GSM,GPRS, HSDPA/HSUPA/RMC/ DC-HSDPA	Yes
Bluetooth (BT)	2450	Data	Yes GSM,GPRS, HSDPA/HSUPA/RMC/ DC-HSDPA	NA

When standalone SAR is not required to be measured per FCC KDB 447498 D01, the following equation must be used to estimate the standalone 1g SAR for simultaneous transmission assessment involving that transmitter.

$$\textbf{Estimated SAR}=\frac{\textbf{(max. power of channel, including tune-up tolerance, mW)}}{\textbf{(min. test separation distance, mm)}}*\frac{\sqrt{\textbf{f (GHz)}}}{\textbf{7.5}}$$

Band	Configuration	Frequency (MHz)	Maximum Power (dBm)	Separation Distance (mm)	Estimated SAR (W/kg)
Bluetooth	Head	2480	2	5	0.067
	Body	2480	2	10	0.034

Per FCC KDB 447498 D01, 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 ≤1.6 W/kg. When the sum is greater than the SAR limit, SAR test exclusion is determined by the SAR to peak location separation ratio.

$$\textbf{Ratio}=\frac{(\textbf{SAR}_1+\textbf{SAR}_2)^{1.5}}{\textbf{(peak location separation, mm)}}<0.04$$

Simultaneous transmission SAR for Bluetooth and GSM/UMTS/LTE

SAR_{1g}(W/kg) Test Position	GSM 850	GSM 1900	UMTS Band II	UMTS Band V	LTE 4	LTE 7	Bluetooth	MAX. ΣSAR_{1g}	Peak location separation ratio
Left, Touch	0.193	0.150	0.359	**0.445**	0.247	0.114	0.067	0.512	No
Left, Tilt	0.084	0.054	0.147	**0.309**	0.190	0.071	0.067	0.376	No
Right, Touch	0.148	0.136	0.395	**0.571**	0.265	0.077	0.067	0.638	No
Right, Tilt	0.091	0.046	0.124	**0.348**	0.113	0.065	0.067	0.415	No
Back Side	0.466	0.405	0.772	**0.908**	0.443	0.273	0.034	0.942	No
Front Side	0.284	0.257	**0.733**	0.643	0.287	0.196	0.034	0.767	No
Left Edge	N/A	N/A	N/A	N/A	N/A	N/A	0.034	0.034	No
Right Edge	0.042	0.078	0.202	**0.298**	0.133	0.059	0.034	0.332	No
Top Edge	N/A	N/A	N/A	N/A	N/A	N/A	0.034	0.034	No
Bottom Edge	0.161	0.421	**1.169**	0.140	0.682	0.701	0.034	1.203	No

Note: 1.The value with blue color is the maximum ΣSAR_{1g} Value.
2. MAX. ΣSAR_{1g} =Unlicensed SAR_{MAX} +Licensed SAR_{MAX}

MAX. ΣSAR_{1g} = 1.274 W/kg <1.6 W/kg, so the Simultaneous transmission SAR with volume scan are not required for BT and GSM/UMTS /LTE antenna.

Simultaneous transmission SAR for WIFI and GSM/UMTS/LTE

SAR_{1g}(W/kg) Test Position	GSM 850	GSM 1900	UMTS Band II	UMTS Band V	LTE 4	LTE 7	WIFI	MAX. ΣSAR_{1g}	Peak location separation ratio
Left, Touch	0.193	0.150	0.359	**0.445**	0.247	0.114	**0.314**	0.759	No
Left, Tilt	0.084	0.054	0.147	**0.309**	0.190	0.071	**0.285**	0.594	No
Right, Touch	0.148	0.136	0.395	**0.571**	0.265	0.077	**0.167**	0.738	No
Right, Tilt	0.091	0.046	0.124	**0.348**	0.113	0.065	**0.124**	0.472	No
Back Side	0.466	0.405	0.772	**0.908**	0.443	0.273	**0.102**	1.01	No
Front Side	0.284	0.257	**0.733**	0.643	0.287	0.196	**0.076**	0.809	No
Left Edge	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NA	No
Right Edge	0.042	0.078	0.202	**0.298**	0.133	0.059	**0.055**	0.353	No
Top Edge	N/A	N/A	N/A	N/A	N/A	N/A	**0.009**	0.009	No
Bottom Edge	0.161	0.421	**1.169**	0.140	0.682	0.701	N/A	1.169	No

Note: 1.The value with blue color is the maximum ΣSAR_{1g} Value.
2. MAX. ΣSAR_{1g} =Unlicensed SAR_{MAX} +Licensed SAR_{MAX}

MAX. ΣSAR_{1g} = 1.169W/kg <1.6 W/kg, so the Simultaneous transmission SAR with volume scan are not required for WIFI and GSM/UMTS /LTE antenna

9. System Check Results

System Performance Check at 835 MHz Head TSL

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d134

Date: 10/28/2014

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1

Medium parameters used: f = 835 MHz; σ = 0.92 mho/m; ε_r = 41.3 ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3842; ConvF(8.83, 8.83, 8.83); Calibrated 06/06/2014;

Electronics: DAE4 Sn1315; Calibrated: 11/25/2013

Phantom: SAM 1; Type: QD000P40CD; Serial: TP:1666

Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

d=15mm, Pin=250mW/Area Scan (41x121x1): Measurement grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 2.64 mW/g

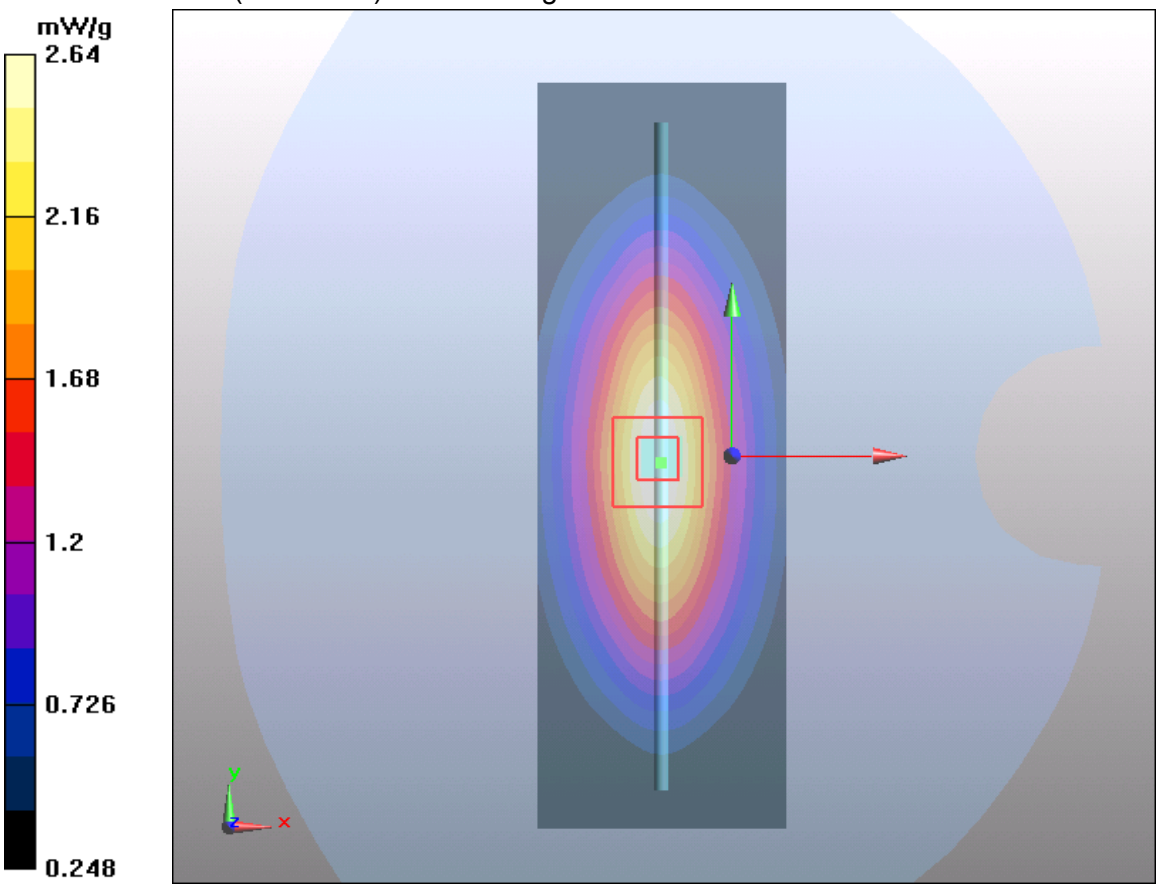
d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 54.4 V/m; Power Drift = -0.076 dB

Peak SAR (extrapolated) = 3.67 W/kg

SAR(1 g) = 2.44 mW/g; SAR(10 g) = 1.6 mW/g

Maximum value of SAR (measured) = 2.64 mW/g



System Performance Check at 835 MHz Body TSL

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d134

Date: 10/30/2014

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1

Medium parameters used: f = 835 MHz; σ = 0.98 mho/m; ε_r = 55.8; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3842; ConvF(9.09, 9.09, 9.09); Calibrated:06/06/2014;

Electronics: DAE4 Sn1315; Calibrated: 11/25/2013

Phantom: SAM 1; Type: QD000P40CD; Serial: TP:1666

Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

d=15mm, Pin=250mW/Area Scan (41x121x1): Measurement grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 2.58 mW/g

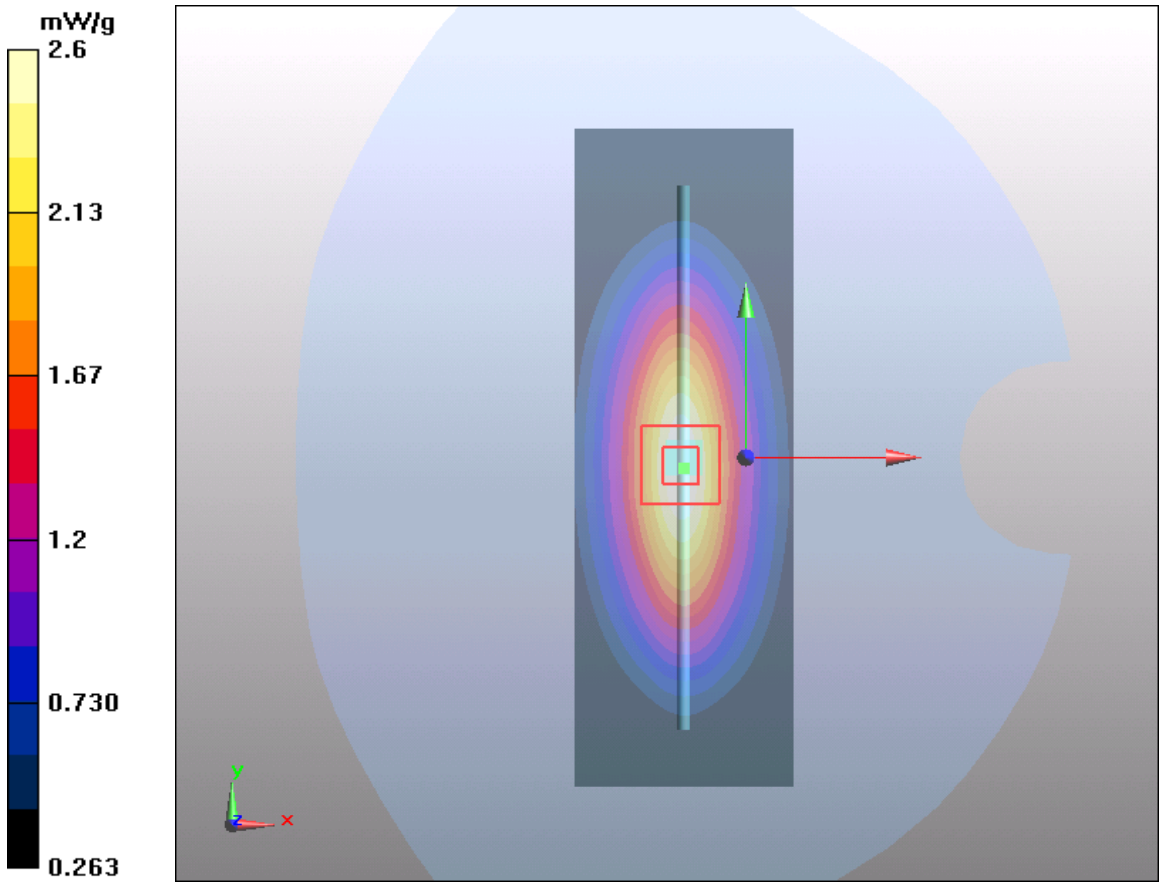
d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 51.9 V/m; Power Drift = -0.058 dB

Peak SAR (extrapolated) = 3.5 W/kg

SAR(1 g) = 2.41 mW/g; SAR(10 g) = 1.6 mW/g

Maximum value of SAR (measured) = 2.6 mW/g



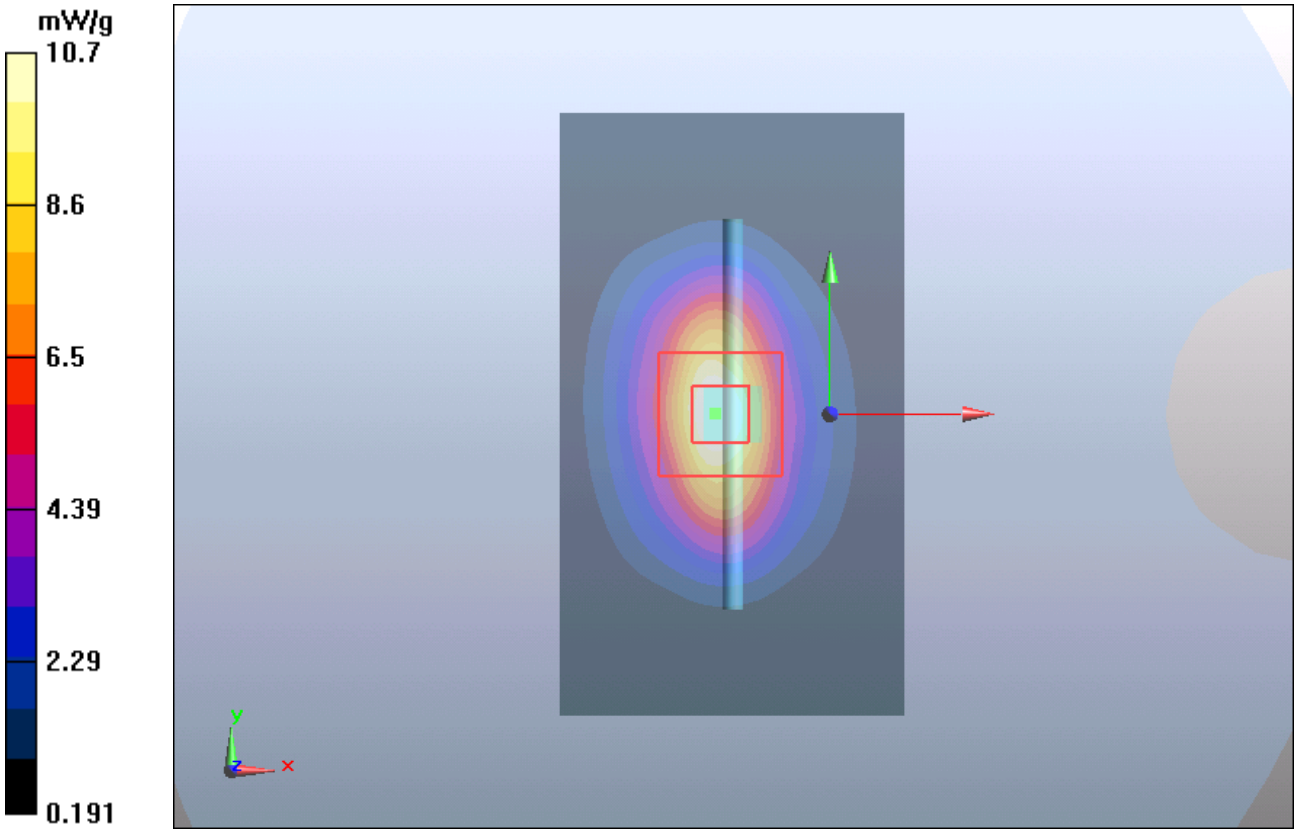
System Performance Check at 1900 MHz Head TSL

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d150

Date: 10/21/2014
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.43 mho/m; ε_r = 39.6; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3842; ConvF(7.55, 7.55, 7.55); Calibrated: 06/06/2014;
Electronics: DAE4 Sn1315; Calibrated: 11/25/2013
Phantom: SAM 2; Type: QD000P40CD; Serial: TP1667
Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

d=10mm, Pin=250mW/Area Scan (41x71x1): Measurement grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 11.3 mW/g

d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 85.5 V/m; Power Drift = 0.028 dB
Peak SAR (extrapolated) = 17.8 W/kg
SAR(1 g) = 9.48 mW/g; SAR(10 g) = 4.9 mW/g
Maximum value of SAR (measured) = 10.7 mW/g



System Performance Check at 1900 MHz Body TSL

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d150

Date: 10/29/2014

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1900 MHz; σ = 1.52 mho/m; ε_r = 53.1; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3842; ConvF(7.43, 7.43, 7.43); Calibrated: 06/06/2014;

Electronics: DAE4 Sn1315; Calibrated: 11/25/2013

Phantom: SAM 2; Type: QD000P40CD; Serial: TP1667

Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

d=10mm, Pin=250mW/Area Scan (41x71x1): Measurement grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 12.2 mW/g

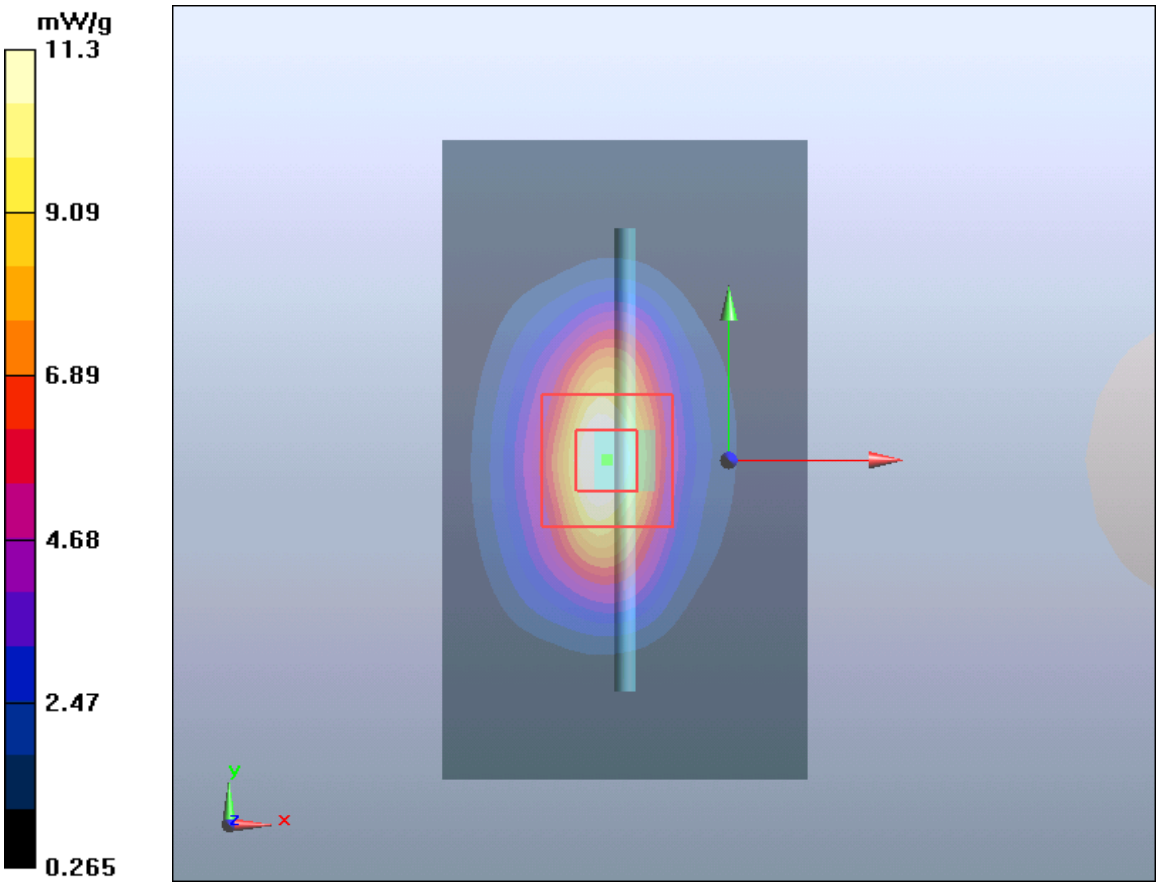
d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 82.3 V/m; Power Drift = 0.068 dB

Peak SAR (extrapolated) = 17.8 W/kg

SAR(1 g) = 9.93 mW/g; SAR(10 g) = 5.25 mW/g

Maximum value of SAR (measured) = 11.3 mW/g



System Performance Check at 2450 MHz Head TSL

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 884

Date: 11/1/2014

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1

Medium parameters used: f = 2450 MHz; σ = 1.80 mho/m; ε_r = 39.1; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3842; ConvF(7.26, 7.26, 7.26); Calibrated: 06/06/2014;

Electronics: DAE4 Sn1315; Calibrated: 11/25/2013

Phantom: SAM 2; Type: QD000P40CD; Serial: TP1667

Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

d=10mm, Pin=250mW/Area Scan (41x71x1): Measurement grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 18.2 mW/g

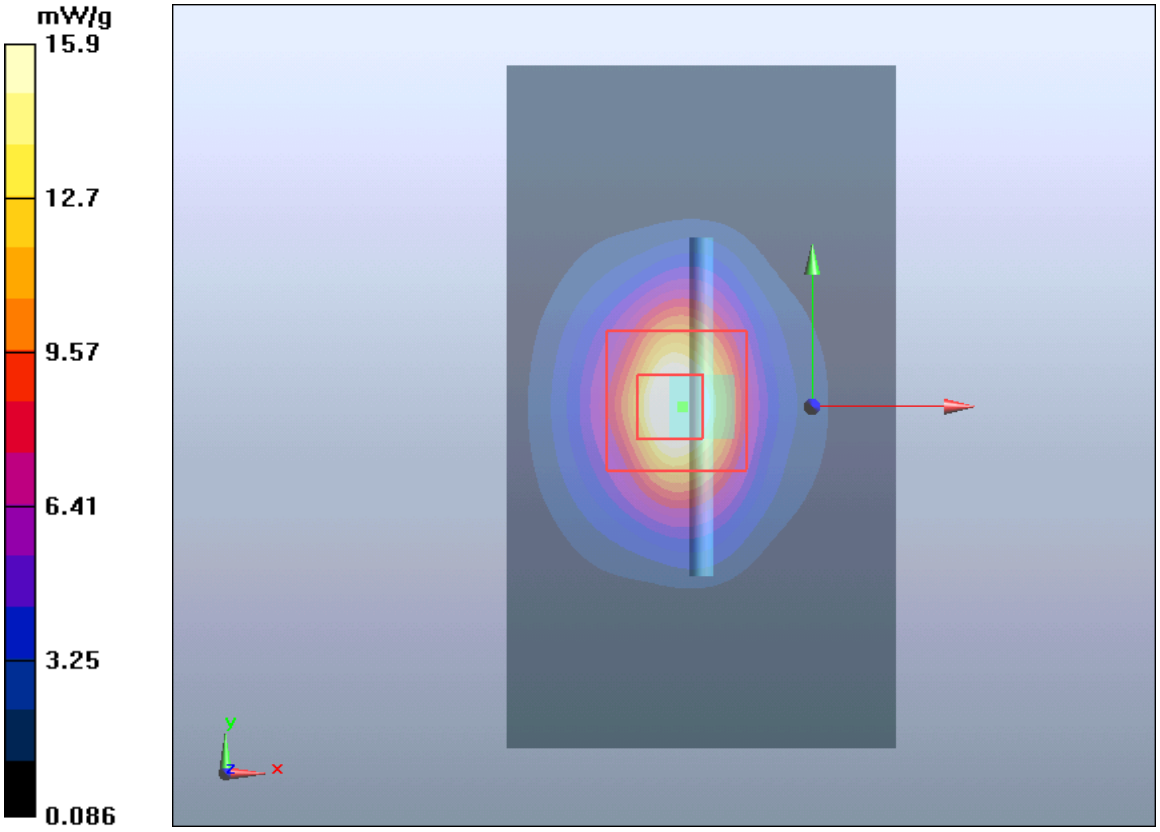
d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 88.8 V/m; Power Drift = 0.075 dB

Peak SAR (extrapolated) = 30 W/kg

SAR(1 g) = 12.7 mW/g; SAR(10 g) = 6.22 mW/g

Maximum value of SAR (measured) = 15.9 mW/g



System Performance Check at 2450 MHz Body TSL

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 884

Date: 11/4/2014

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1

Medium parameters used: f = 2450 MHz; σ = 1.99 mho/m; ε_r = 52.1; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3842; ConvF(6.93, 6.93, 6.93); Calibrated: 06/06/2014;

Electronics: DAE4 Sn1315; Calibrated: 11/25/2013

Phantom: SAM 2; Type: QD000P40CD; Serial: TP1667

Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

d=10mm, Pin=250mW/Area Scan (41x71x1): Measurement grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 16 mW/g

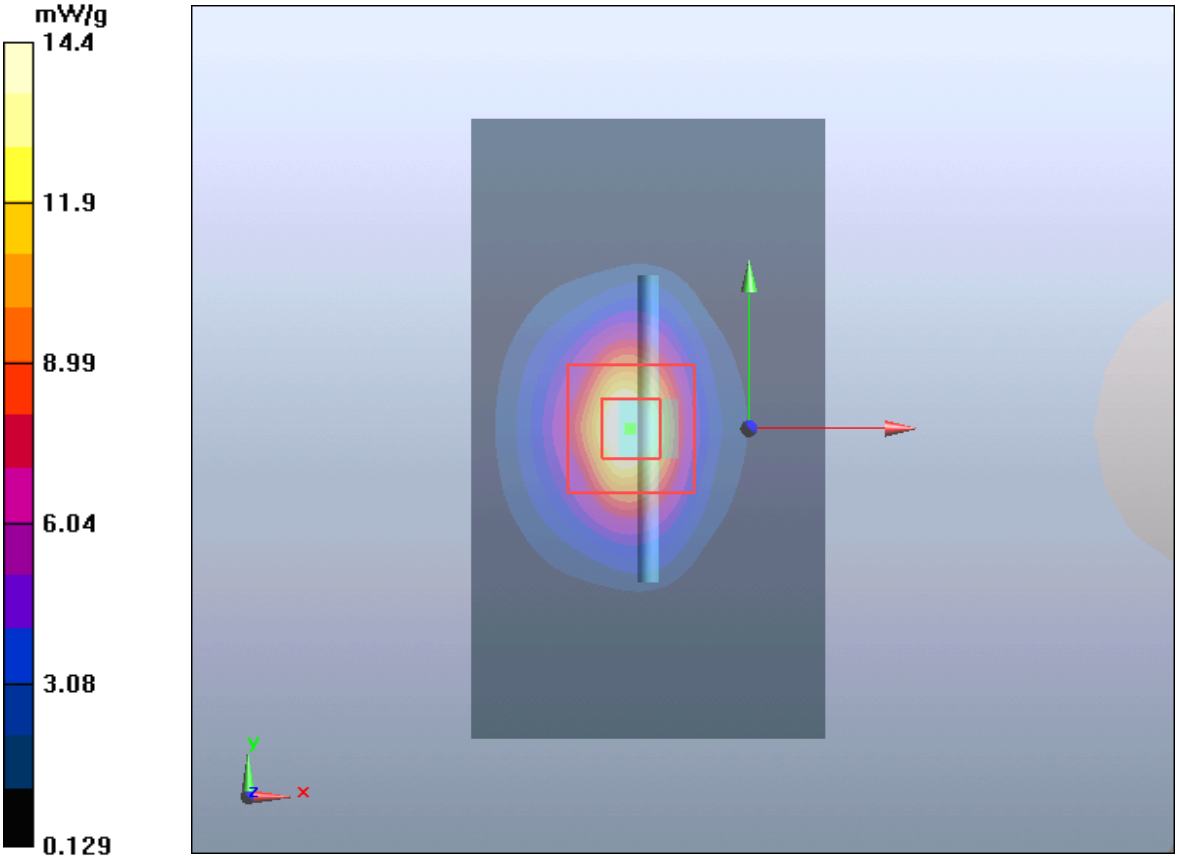
d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 81.2 V/m; Power Drift = 0.003 dB

Peak SAR (extrapolated) = 25.4 W/kg

SAR(1 g) = 12.5 mW/g; SAR(10 g) = 6.20 mW/g

Maximum value of SAR (measured) = 14.4 mW/g



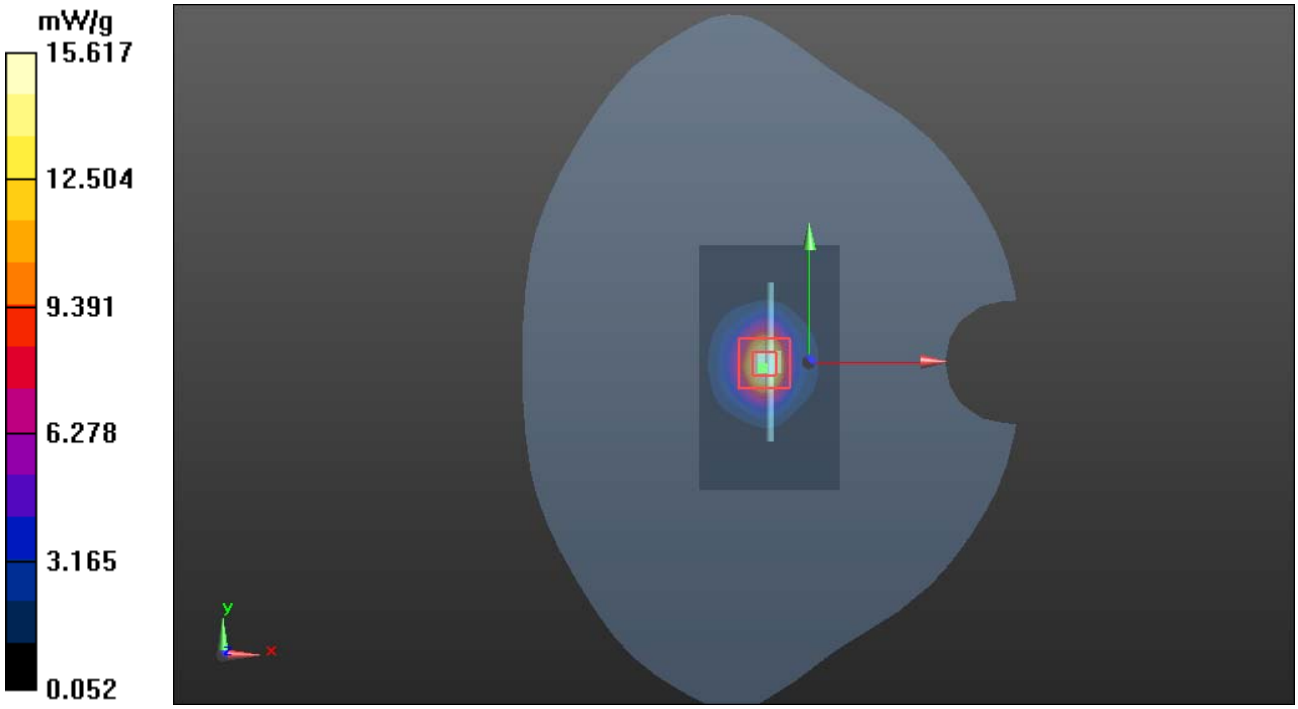
System Performance Check at 2600 MHz Head TSL

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN: 1021

Date/Time: 11/03/2014
Communication System: CW; Frequency: 2600 MHz
Medium parameters used: f = 2600 MHz; σ = 1.98 mho/m; ε_r = 38.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN3977; ConvF(7.07, 7.07, 7.07); Calibrated: 2/17/2014;
Electronics: DAE4 Sn1315; Calibrated: 11/25/2013
Phantom: SAM1; Type: SAM; Serial: TP-1534
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

d=10mm, Pin=250mW/Area Scan (41x71x1): Measurement grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 17.439 mW/g

d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 87.998 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 31.858 W/kg
SAR(1 g) = 14.9 mW/g; SAR(10 g) = 6.27 mW/g
Maximum value of SAR (measured) = 15.617 mW/g



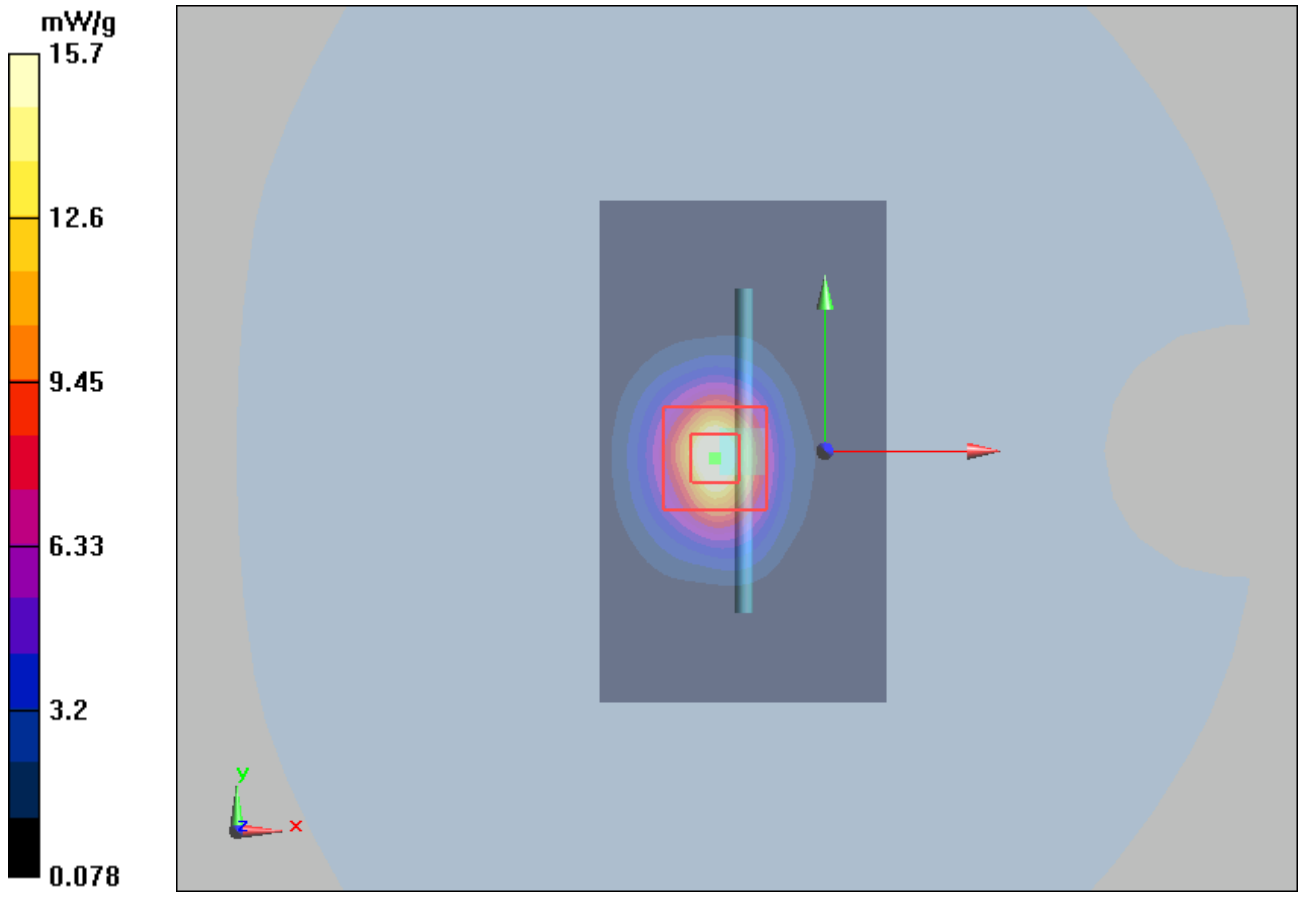
System Performance Check at 2600 MHz Body TSL

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN: 1021

Date/Time: 11/05/2014
Communication System: CW; Frequency: 2600 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2600 MHz; σ = 2.20 mho/m; ε_r = 52.3; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN3977; ConvF(6.68, 6.68, 6.68); Calibrated: 2/17/2014;
Electronics: DAE4 Sn1315; Calibrated: 11/25/2013
Phantom: SAM1; Type: SAM; Serial: TP-1534
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

d=10mm, Pin=250mW /Area Scan (41x71x1): Measurement grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 17.7 mW/g

d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 74 V/m; Power Drift = -0.0027 dB
Peak SAR (extrapolated) = 28.5 W/kg
SAR(1 g) = 14.5 mW/g; SAR(10 g) = 6.19 mW/g
Maximum value of SAR (measured) = 15.7 mW/g



System Performance Check at 1750 MHz HSL

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN: 1033

Date: 10/23/2014

Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1750 MHz; σ = 1.32 mho/m; ε_r = 39.7; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3977; ConvF(8.14,8.14, 8.14); Calibrated: 2/17/2014;

Electronics: DAE4 Sn1315; Calibrated: 11/25/2013

Phantom: SAM2; Type: SAM; Serial: TP-1524

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

d=10mm, Pin=250mW/Area Scan (51x81x1): Measurement grid: dx=1.500mm, dy=1.500mm

Maximum value of SAR (interpolated) = 9.78 mW/g

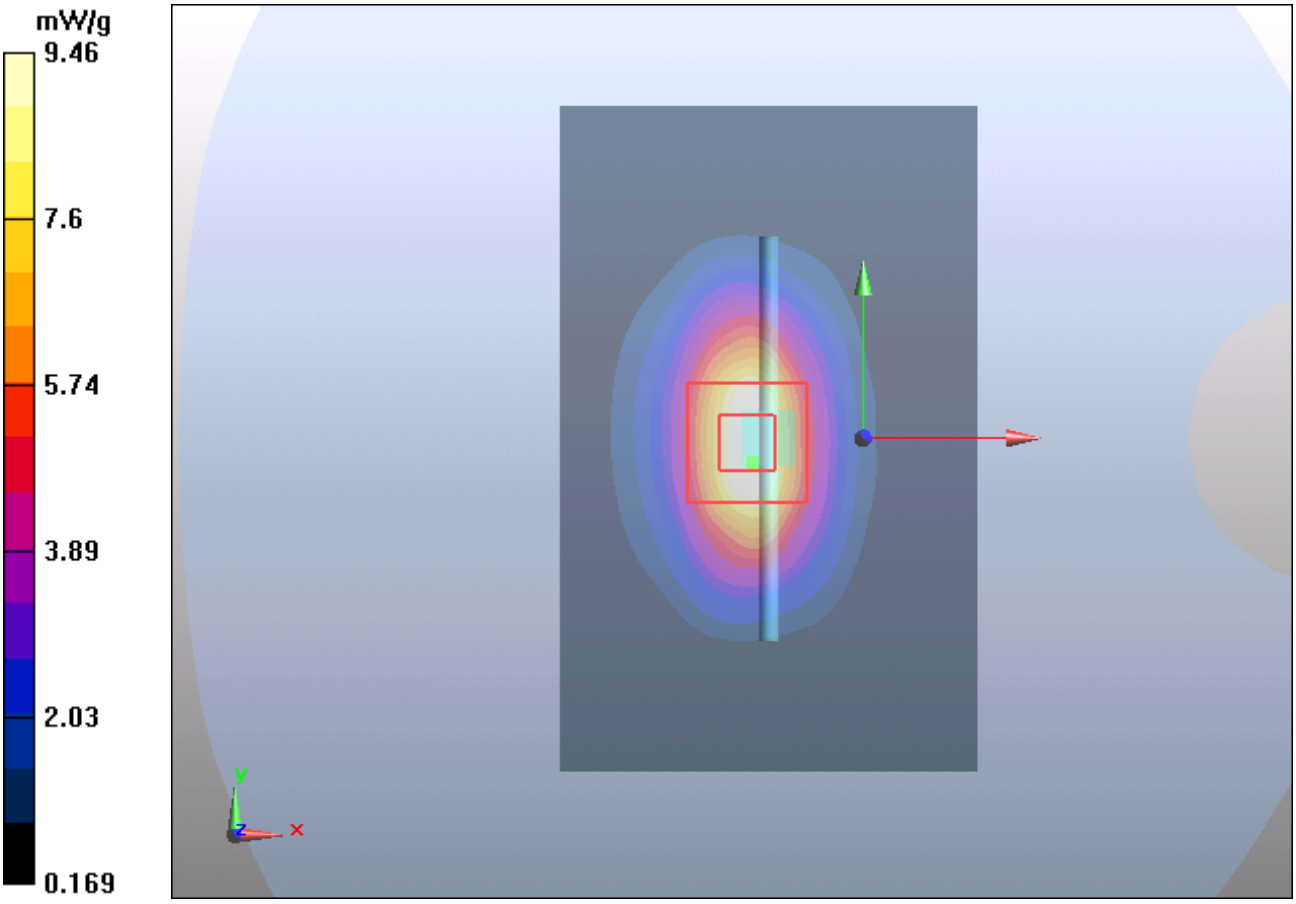
d=10mm, Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 80 V/m; Power Drift = 0.075 dB

Peak SAR (extrapolated) = 15.5 W/kg

SAR(1 g) = 9.78 mW/g; SAR(10 g) = 5.35 mW/g

Maximum value of SAR (measured) = 9.46 mW/g

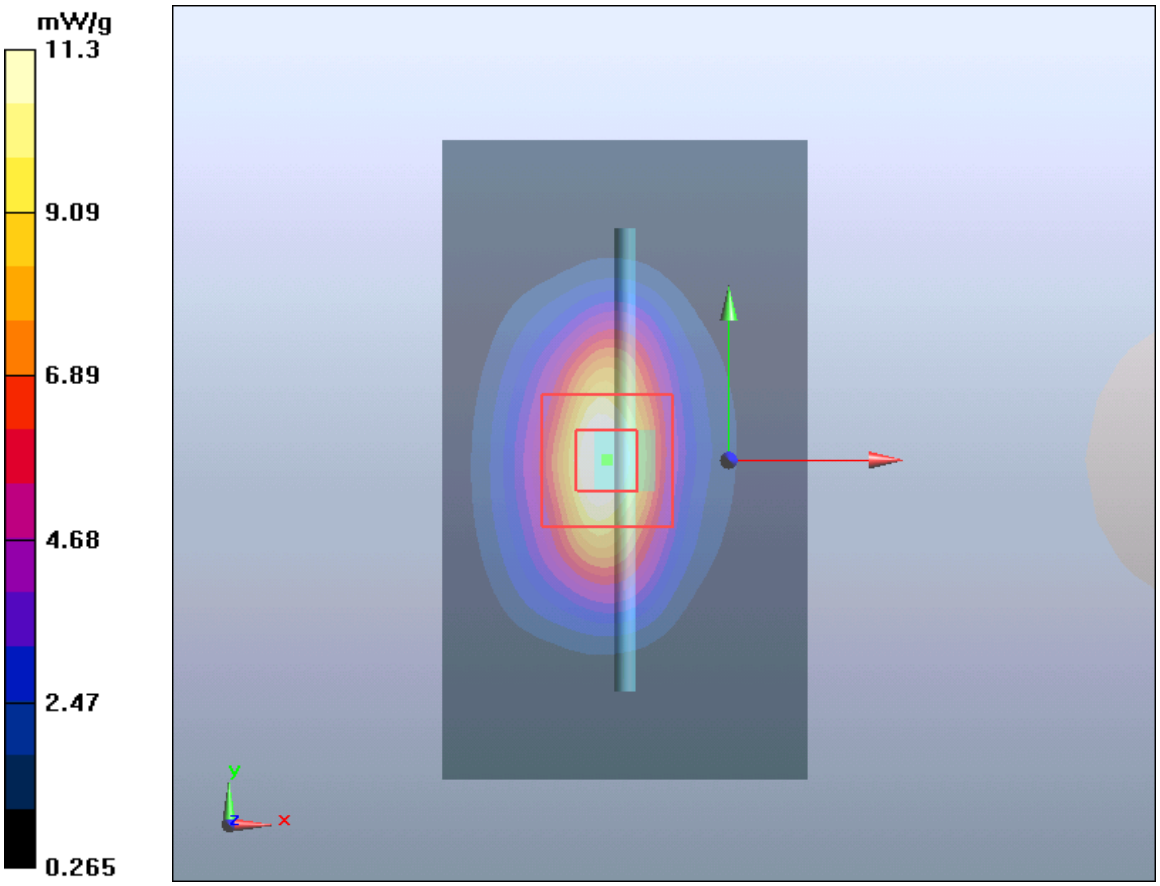


System Performance Check at 1750 MHz MSL

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN: 1033

Date/Time: 10/31/2014
Communication System: CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1750 MHz; σ = 1.50 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;
Electronics: DAE4 Sn1315; Calibrated: 11/25/2013
Phantom: SAM2; Type: SAM; Serial: TP-1524
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

d=10mm, Pin=250mW/Area Scan (41x71x1): Measurement grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 12.2 mW/g
d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 81.3 V/m; Power Drift = 0.038 dB
Peak SAR (extrapolated) = 16.9 W/kg
SAR(1 g) = 9.59 mW/g; SAR(10 g) = 5.45 mW/g
Maximum value of SAR (measured) = 11.3 mW/g



10. SAR Test Graph Results

GSM 850 Left Cheek Middle
Date: 10/28/2014
Communication System: UID 0, GSM (0); Frequency: 836.6 MHz; Duty Cycle: 1:8.30042
Medium parameters used: f = 837 MHz; σ = 0.932 S/m; ε_r = 41.357; ρ = 1000 kg/m^3
Ambient Temperature: 22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Left Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 - SN3842; ConvF (8.83, 8.83, 8.83); Calibrated: 06/06/2014;
Electronics: DAE4 Sn1315; Calibrated: 11/25/2013
Phantom: SAM1; Type: SAM; Serial: TP-1534
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Left Cheek Middle/Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.179 W/kg

Left Cheek Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.024 V/m; Power Drift = 0.029 dB
Peak SAR (extrapolated) = 0.213 W/kg
SAR(1 g) = 0.171 W/kg; SAR(10 g) = 0.129 W/kg
Maximum value of SAR (measured) = 0.180 W/kg

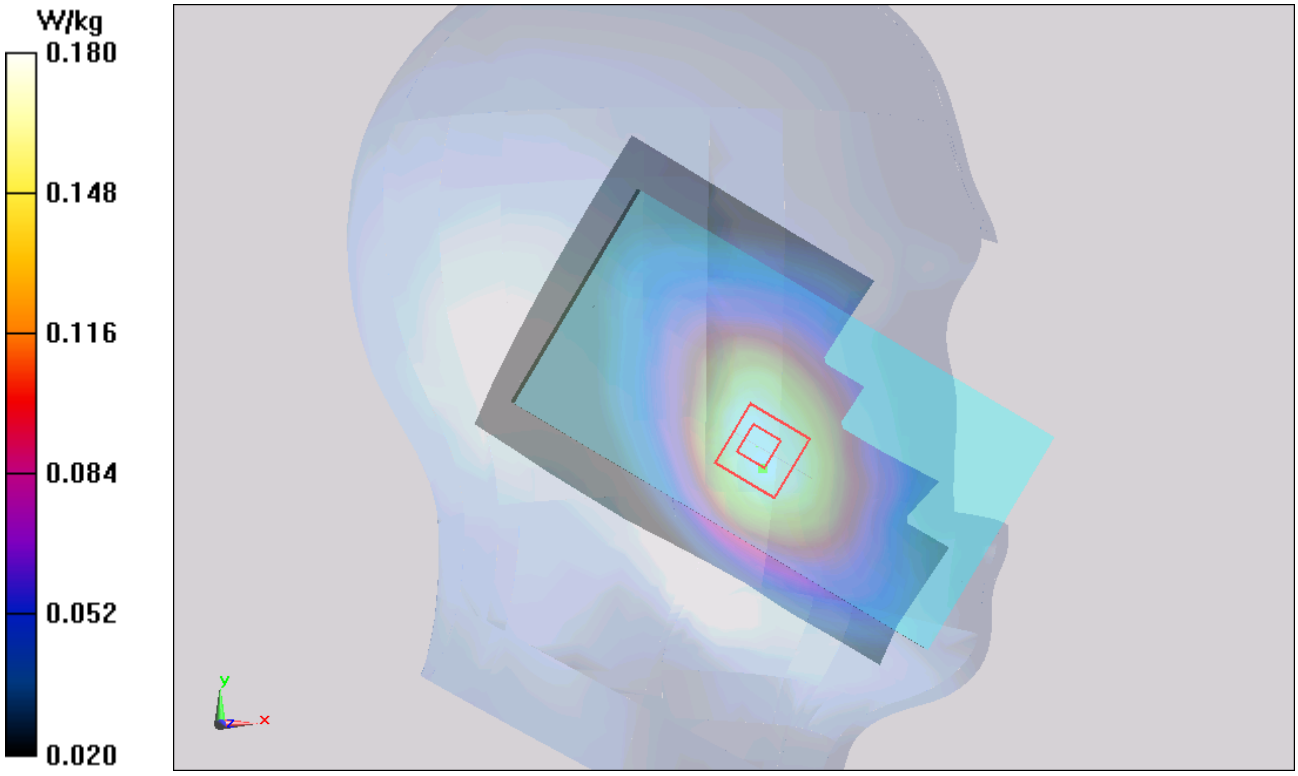


Figure 1 Left Hand Touch Cheek GSM 850 Channel 190

GSM 850 EGPRS (2Txslots) Back Side Middle
Date: 10/30/2014
Communication System: UID 0, EGPRS 2TX (0); Frequency: 836.6 MHz; Duty Cycle: 1:4.15
Medium parameters used: f = 837 MHz; σ = 0.992 S/m; ε_r = 55.882; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 - SN3842; ConvF (9.09, 9.09, 9.09); Calibrated: 06/06/2014;
Electronics: DAE4 Sn1315; Calibrated: 11/25/2013
Phantom: SAM1; Type: SAM; Serial: TP-1534
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Back Side Middle/Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.472 W/kg

Back Side Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.376 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 0.674 W/kg
SAR(1 g) = 0.417 W/kg; SAR(10 g) = 0.249 W/kg
Maximum value of SAR (measured) = 0.437 W/kg

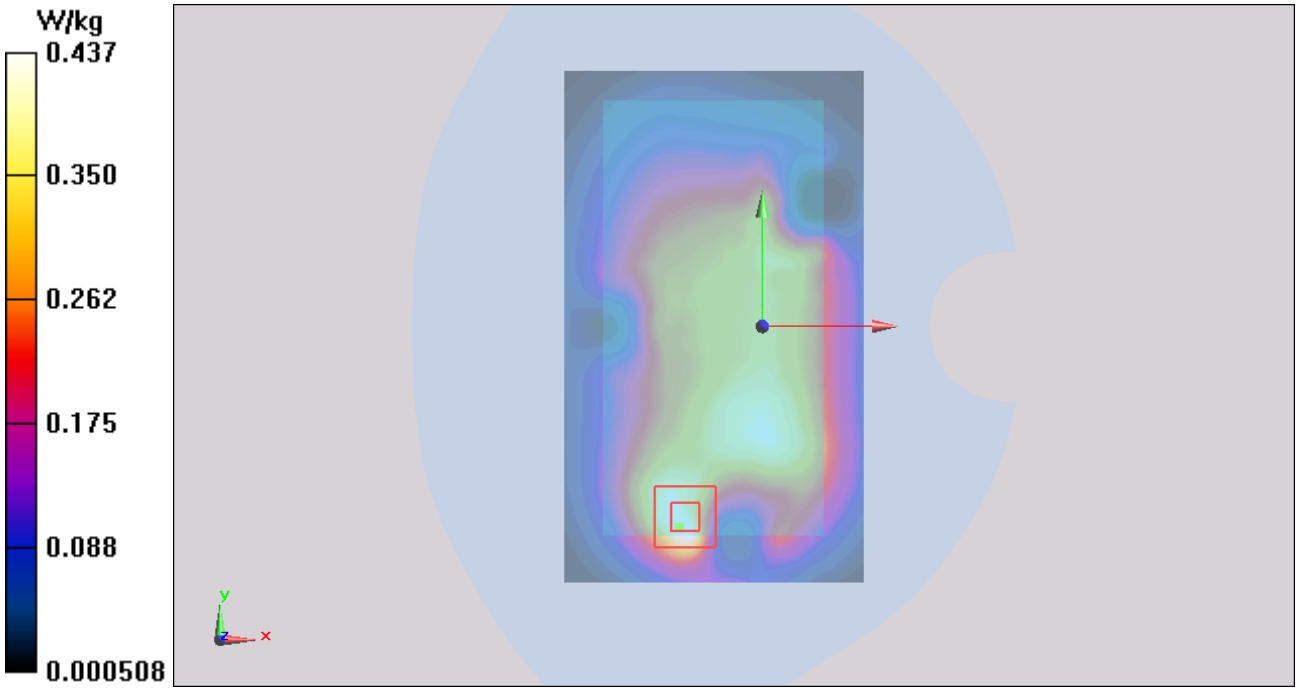


Figure 2 : Body, Back Side, GSM 850 EGPRS (2Txslots) Channel 190

GSM 1900 Left Cheek Middle

Date: 10/21/2014
Communication System: UID 0, GSM (0); Frequency: 1880 MHz; Duty Cycle: 1:8.30042
Medium parameters used: f = 1880 MHz; σ = 1.413 S/m; ε_r = 39.689; ρ = 1000 kg/m^3
Ambient Temperature: 22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Left Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 - SN3842; ConvF (7.55, 7.55, 7.55); Calibrated: 06/06/2014;
Electronics: DAE4 Sn1315; Calibrated: 11/25/2013
Phantom: SAM 2; Type: SAM;
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Left Cheek Middle/Area Scan (61x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.133 W/kg

Left Cheek Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.043 V/m; Power Drift = 0.056 dB
Peak SAR (extrapolated) = 0.207 W/kg
SAR(1 g) = 0.130 W/kg; SAR(10 g) = 0.076 W/kg
Maximum value of SAR (measured) = 0.141 W/kg

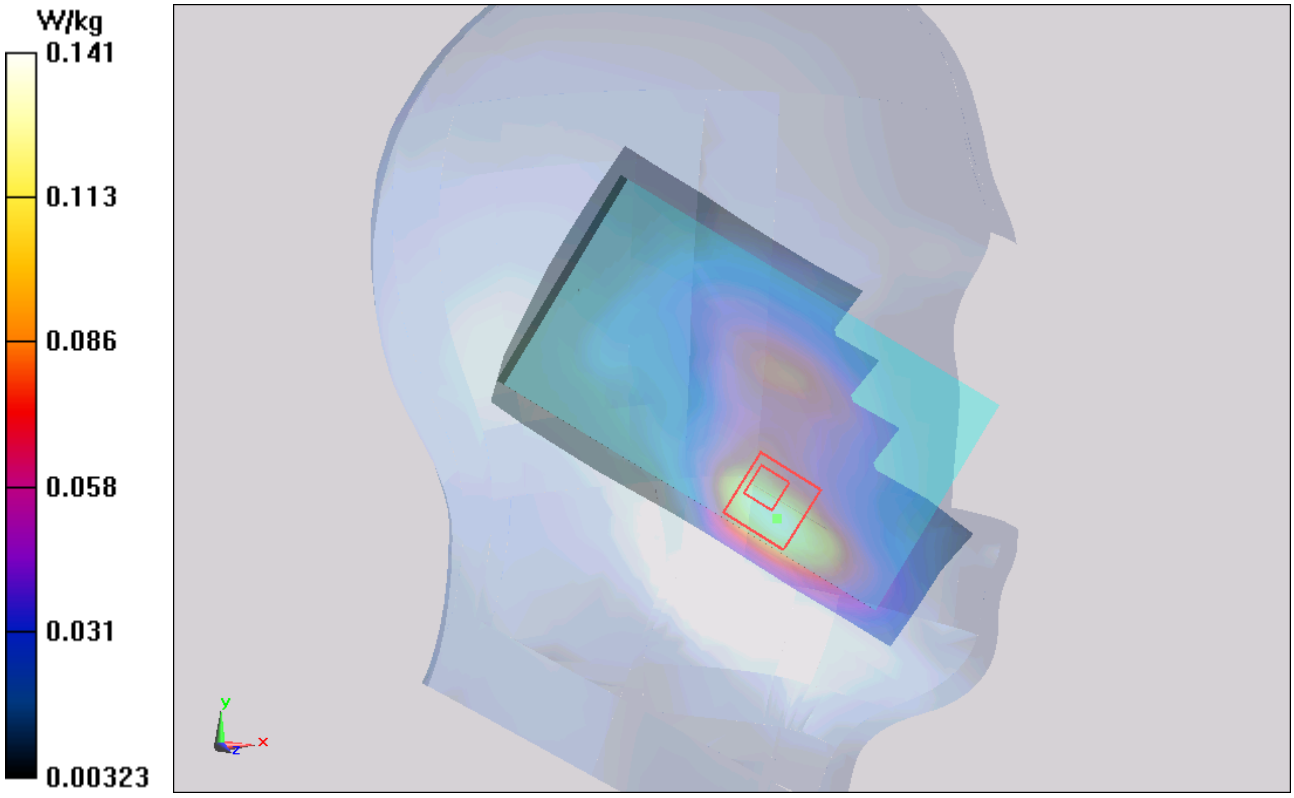


Figure 3 Left Hand Touch Cheek GSM 1900 Channel 661

GSM 1900 GPRS (4Txslots) Bottom Edge Middle
Date: 10/29/2014
Communication System: UID 0, GPRS 4TX (0); Frequency: 1880 MHz;Duty Cycle: 1:2.07491
Medium parameters used: f = 1880 MHz; σ = 1.504 S/m; ε_r = 53.137; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 - SN3842; ConvF(7.43, 7.43, 7.43); Calibrated: 06/06/2014;
Electronics: DAE4 Sn1315; Calibrated: 11/25/2013
Phantom: SAM 2; Type: SAM;
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Bottom Edge Middle/Area Scan (51x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.422 W/kg

Bottom Edge Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.582 V/m; Power Drift = -0.070 dB
Peak SAR (extrapolated) = 0.610 W/kg
SAR(1 g) = 0.369 W/kg; SAR(10 g) = 0.209 W/kg
Maximum value of SAR (measured) = 0.382 W/kg

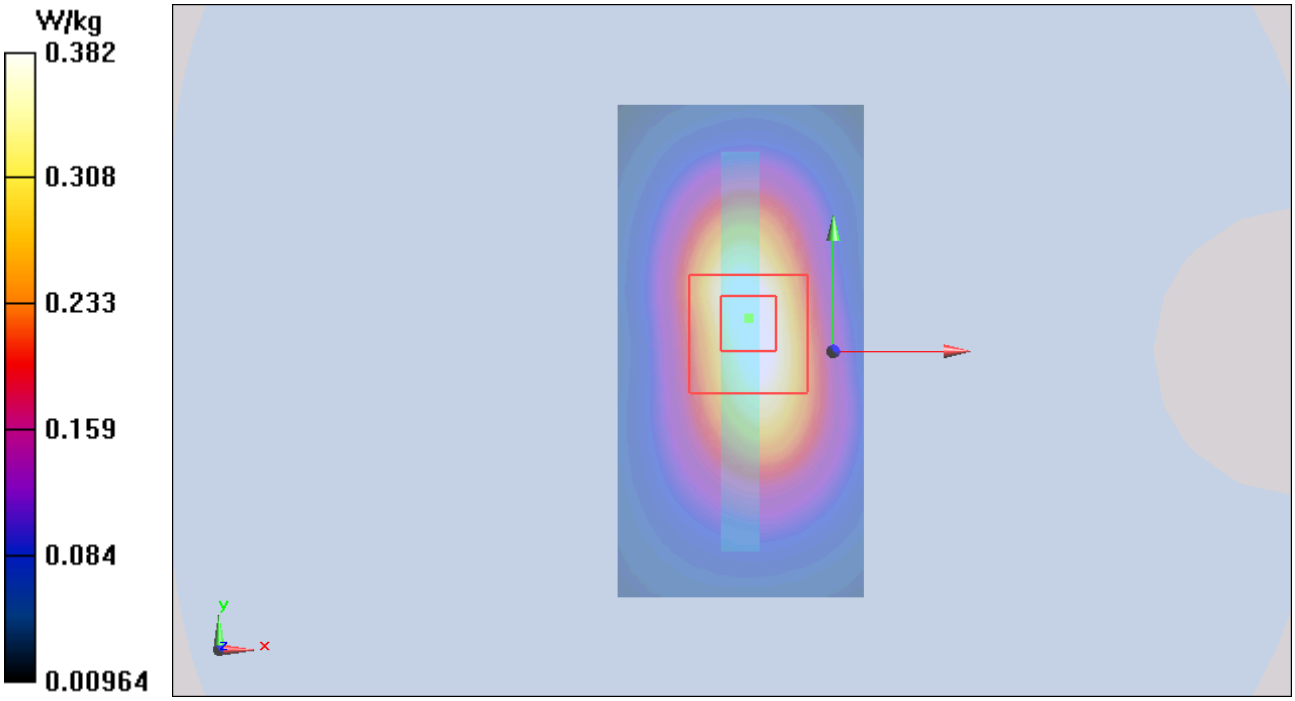


Figure 4 : Body Back Side, GSM 1900 GPRS (4Txslots) Channel 661

UMTS Band II Right Cheek Middle

Date: 10/21/2014
Communication System: UID 0, WCDMA (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.413 S/m; ε_r = 39.689; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Right Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 - SN3842; ConvF(7.55, 7.55, 7.55); Calibrated: 06/06/2014;
Electronics: DAE4 Sn1315; Calibrated: 11/25/2013
Phantom: SAM 2; Type: SAM;
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Right Cheek Middle/Area Scan (61x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.418 W/kg

Right Cheek Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.558 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.576 W/kg
SAR(1 g) = 0.378 W/kg; SAR(10 g) = 0.229 W/kg
Maximum value of SAR (measured) = 0.414 W/kg

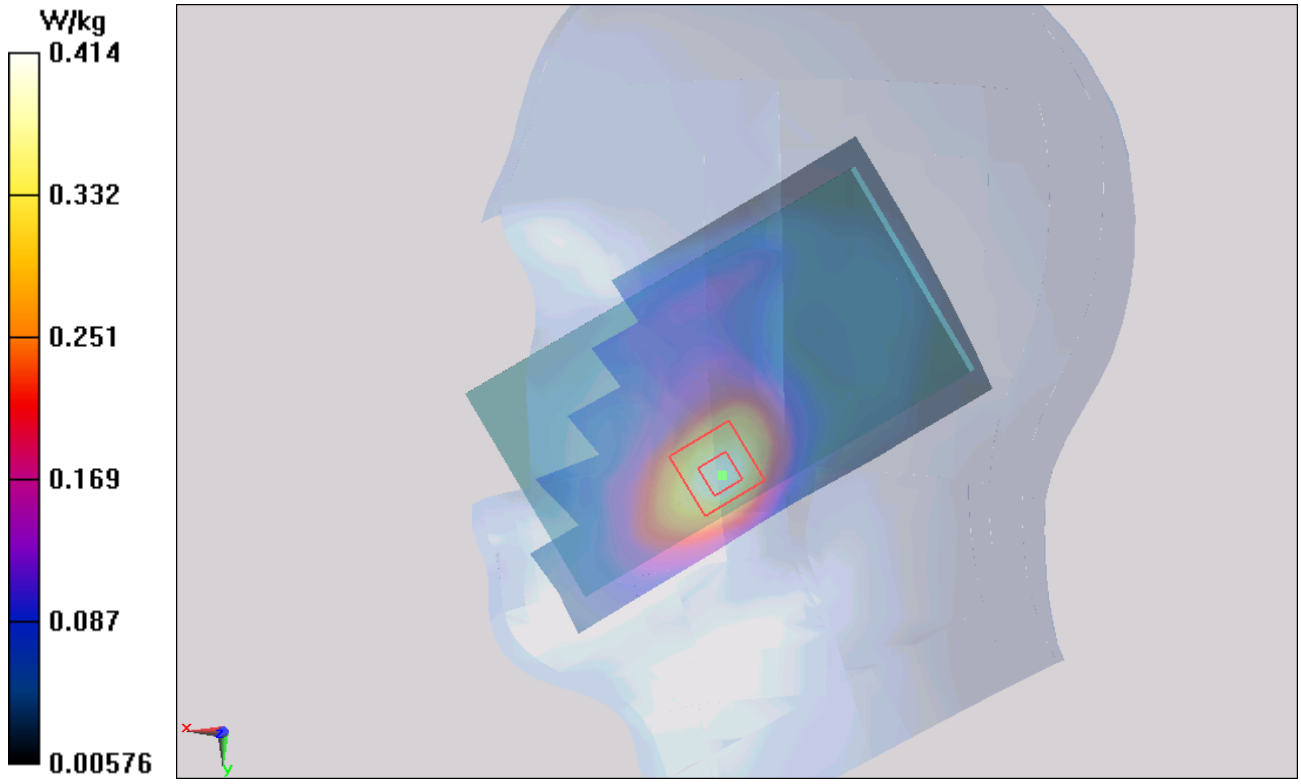


Figure 5: Right Hand Touch Cheek UMTS Band II Channel 9400

UMTS Band II Bottom Edge High

Date: 10/29/2014
Communication System: UID 0, WCDMA (0); Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1908 MHz; σ = 1.532 S/m; ε_r = 53.111; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 - SN3842; ConvF(7.43, 7.43, 7.43); Calibrated: 06/06/2014;
Electronics: DAE4 Sn1315; Calibrated: 11/25/2013
Phantom: SAM 2; Type: SAM;
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Bottom Edge High/Area Scan (51x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.04 W/kg

Bottom Edge High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 24.837 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 1.54 W/kg
SAR(1 g) = 0.935 W/kg; SAR(10 g) = 0.494 W/kg
Maximum value of SAR (measured) = 0.900 W/kg

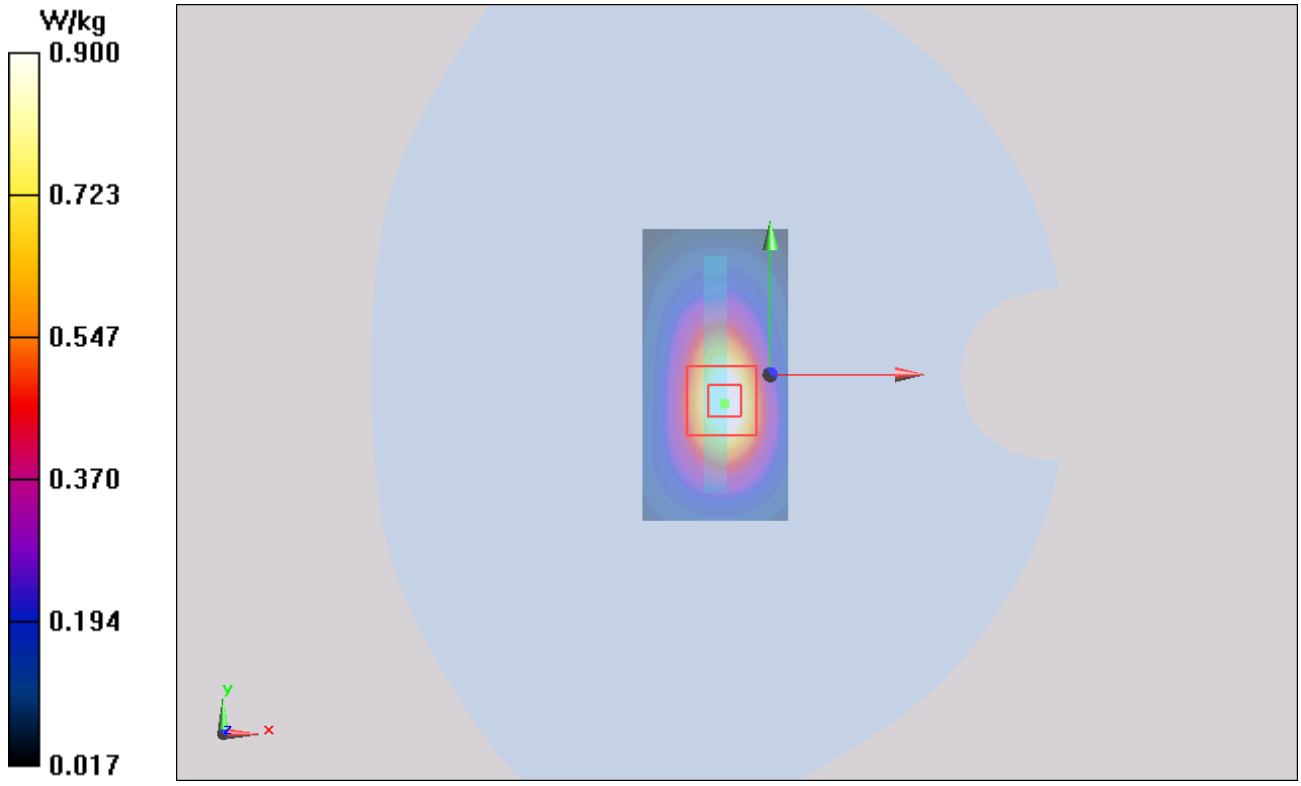


Figure 6 : Body, Bottom Edge, UMTS Band II Channel 9538

UMTS Band V Right Cheek Middle

Date: 10/28/2014
Communication System: UID 0, WCDMA (0); Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used: f = 837 MHz; σ = 0.932 S/m; ε_r = 41.357; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Right Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3842; ConvF(8.83, 8.83, 8.83); Calibrated: 06/06/2014;
Electronics: DAE4 Sn1315; Calibrated: 11/25/2013
Phantom: SAM1; Type: SAM; Serial: TP-1534
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Right Cheek Middle/Area Scan (61x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.599 W/kg

Right Cheek Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.792 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.674 W/kg
SAR(1 g) = 0.559 W/kg; SAR(10 g) = 0.434 W/kg
Maximum value of SAR (measured) = 0.582 W/kg

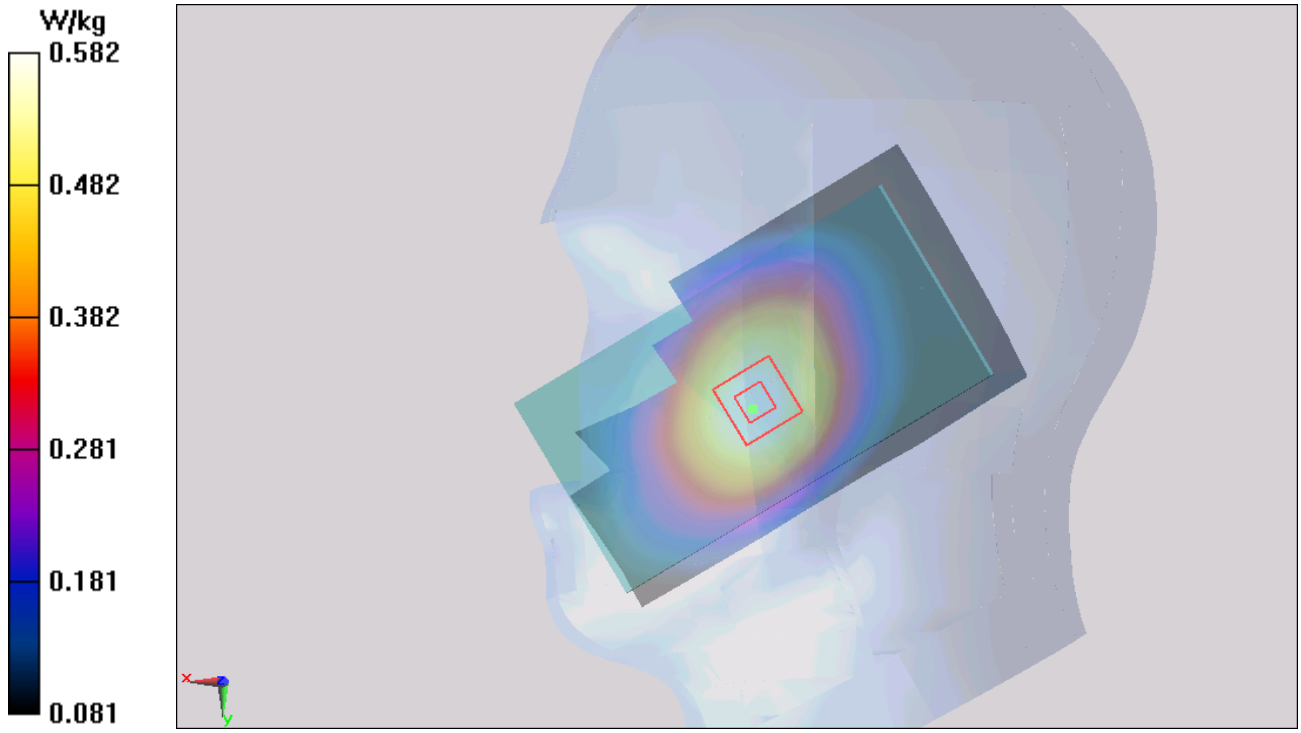


Figure 7 Right Hand Touch Cheek UMTS Band V Channel 4183

UMTS Band V Back Side High (1st Repeated SAR)
Date: 10/30/2014
Communication System: UID 0, WCDMA (0); Frequency: 846.6 MHz;Duty Cycle: 1:1
Medium parameters used: f = 847 MHz; σ = 1.004 S/m; ε_r = 55.772; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3842; ConvF(9.09, 9.09, 9.09); Calibrated: 06/06/2014;
Electronics: DAE4 Sn1315; Calibrated: 11/25/2014
Phantom: SAM1; Type: SAM; Serial: TP-1534
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Back Side High/Area Scan (61x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.930 W/kg

Back Side High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.748 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 1.11 W/kg
SAR(1 g) = 0.885 W/kg; SAR(10 g) = 0.672 W/kg
Maximum value of SAR (measured) = 0.915 W/kg

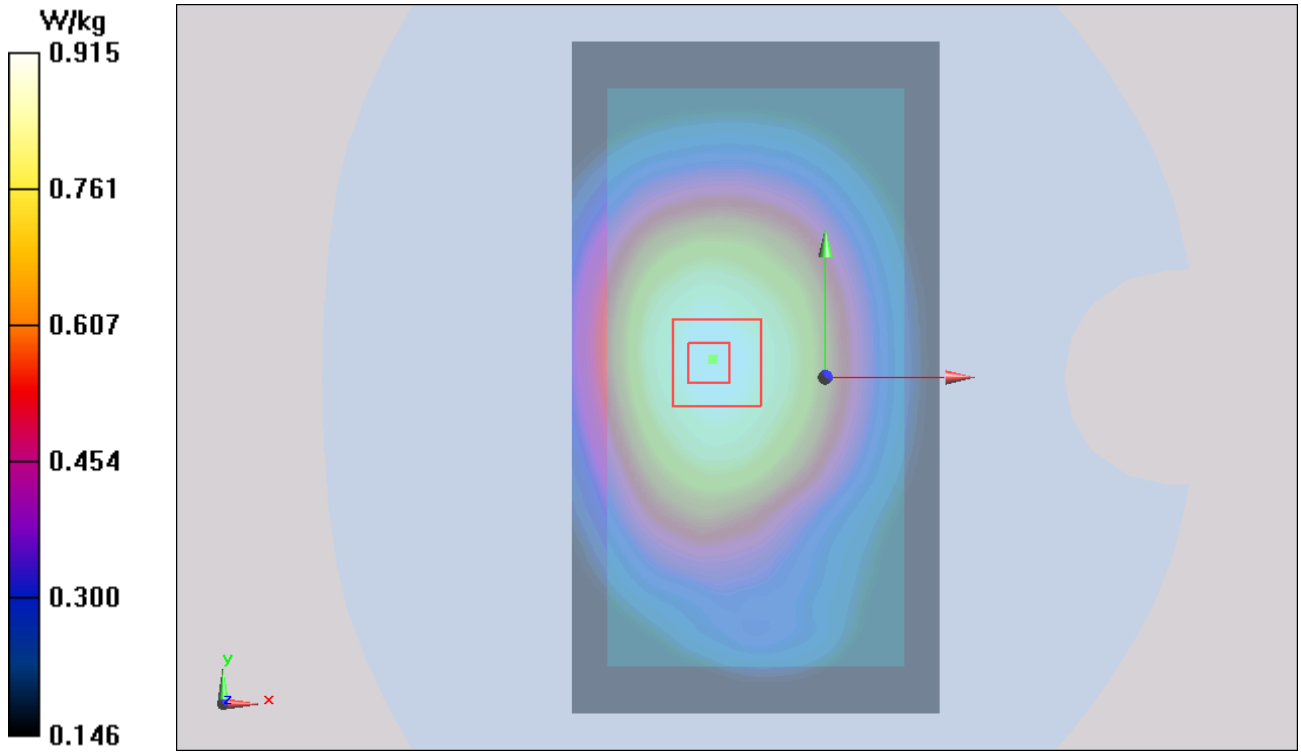
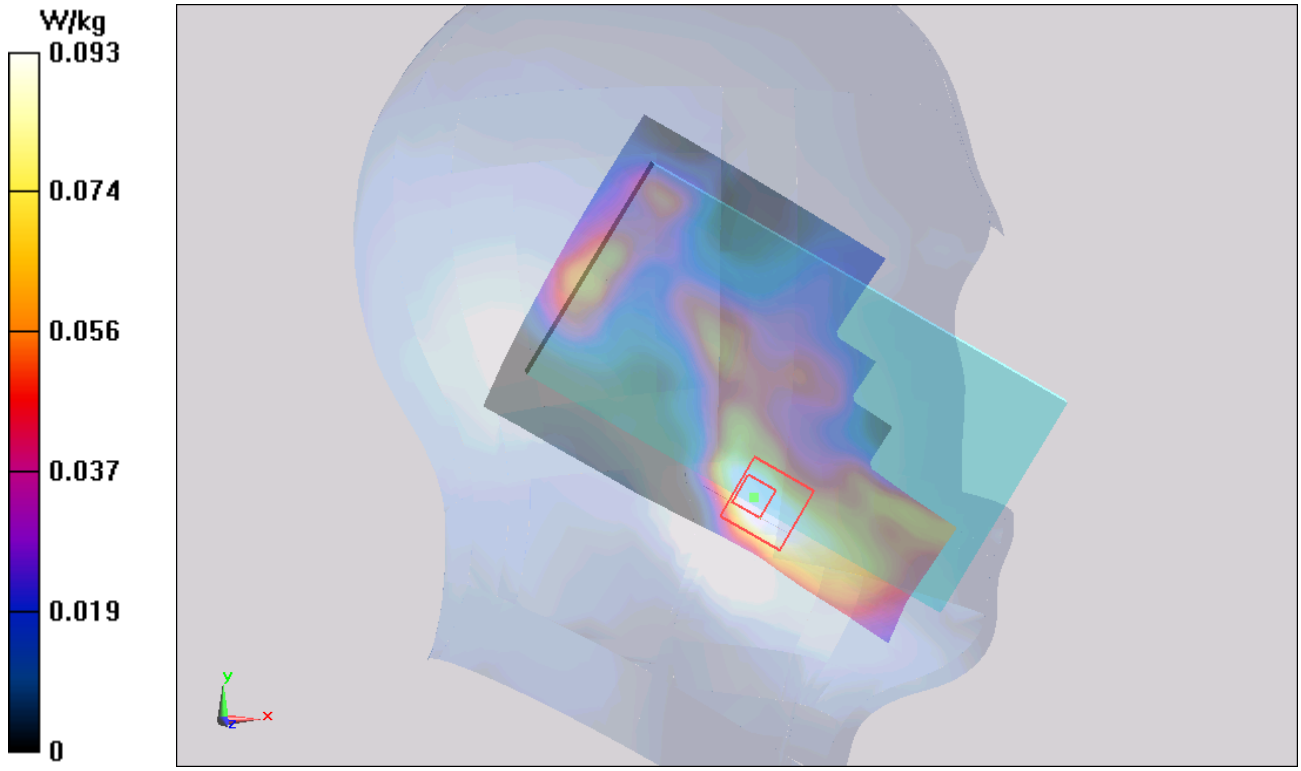


Figure 8: Body, Back Side, UMTS Band V Channel 4233

LTE Band 7 1RB Left Cheek Low
Date: 11/03/2014
Communication System: UID 0, LTE (0); Frequency: 2510 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2510 MHz; σ = 1.889 S/m; ε_r = 38.958; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Left Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 - SN3977; ConvF (7.07, 7.07, 7.07); Calibrated: 2/17/2014;
Electronics: DAE4 Sn1315; Calibrated: 11/25/2013
Phantom: SAM 2; Type: SAM;
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Left Cheek Low/Area Scan (91x151x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.122 W/kg

Left Cheek Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.528 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 0.157 W/kg
SAR(1 g) = 0.095 W/kg; SAR(10 g) = 0.051 W/kg
Maximum value of SAR (measured) = 0.0925 W/kg



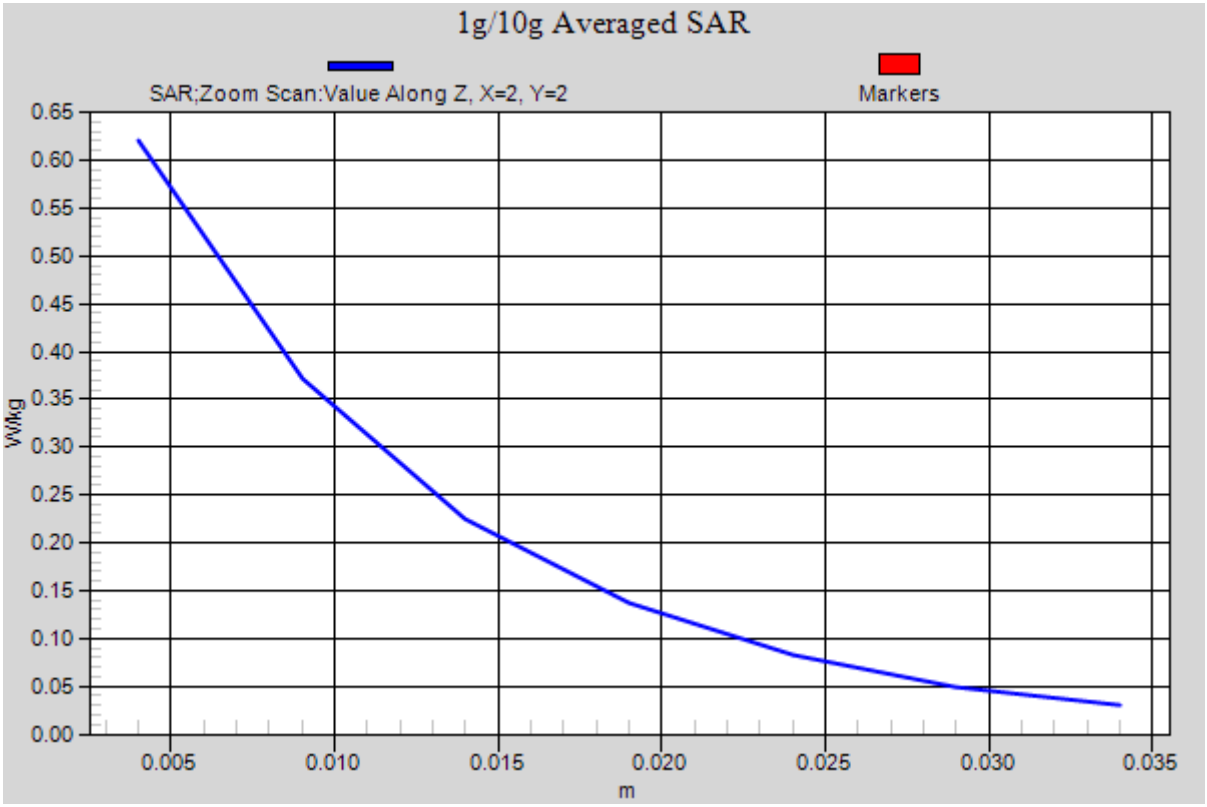


Figure 9 : Left Hand Touch Cheek LTE Band 7 1RB Channel 20850

LTE Band 7 1RB Bottom Edge Low

Date: 11/05/2014
Communication System: UID 0, LTE (0); Frequency: 2510 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2510 MHz; σ = 2.121 S/m; ε_r = 52.544; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 - SN3977; ConvF(6.68, 6.68, 6.68); Calibrated: 2/17/2014;
Electronics: DAE4 Sn1315; Calibrated: 11/25/2013
Phantom: SAM 2; Type: SAM;
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Bottom Edge Middle/Area Scan (51x111x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.694 W/kg

Bottom Edge Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.976 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 1.09 W/kg
SAR(1 g) = 0.586 W/kg; SAR(10 g) = 0.283 W/kg
Maximum value of SAR (measured) = 0.602 W/kg

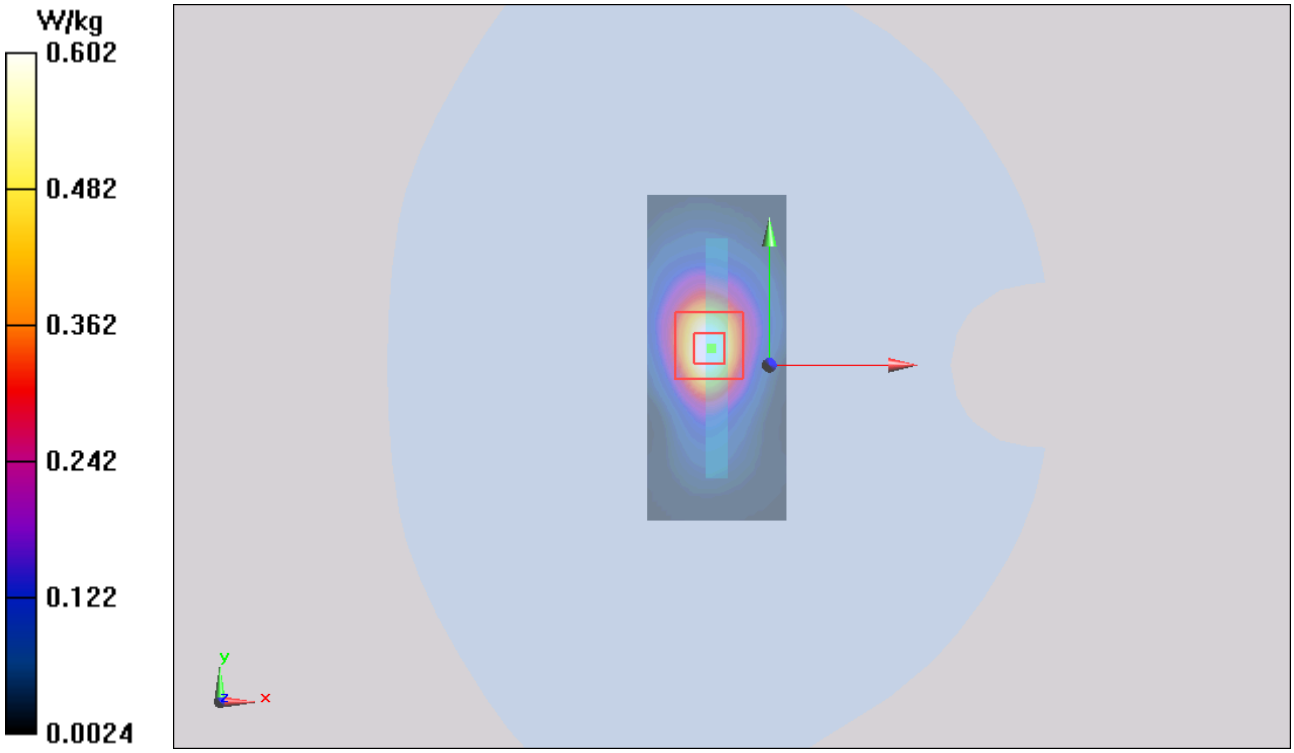


Figure 10: Body, Bottom Edge, LTE Band 7 1RB Channel 20850

LTE Band 4 1RB Right Cheek Middle

Date: 10/23/2014
Communication System: UID 0, LTE (0); Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1732 MHz; σ = 1.32 S/m; ε_r = 39.6; ρ = 1000 kg/m^3
Ambient Temperature: 22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Right Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 - SN3977; ConvF (8.14, 8.14, 8.14); Calibrated: 2/17/2014;
Electronics: DAE4 Sn1315; Calibrated: 11/25/2013
Phantom: SAM 2; Type: SAM;
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Right Cheek Low/Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.290 W/kg
Right Cheek Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.794 V/m; Power Drift = 0.063 dB
Peak SAR (extrapolated) = 0.375 W/kg
SAR(1 g) = 0.263 W/kg; SAR(10 g) = 0.170 W/kg
Maximum value of SAR (measured) = 0.275 W/kg

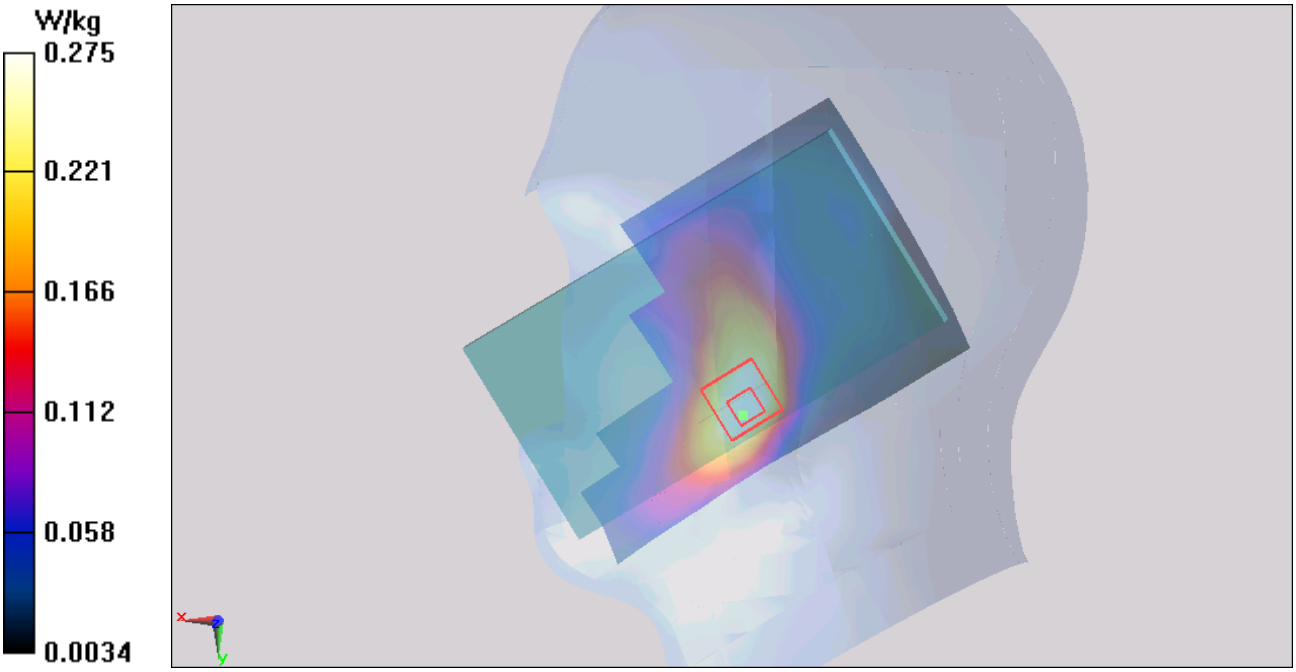


Figure 11: Right Hand Touch Cheek LTE Band 4 Channel 20175

LTE Band 4 1RB Bottom Edge Middle
Date: 10/31/2014
Communication System: UID 0, LTE (0); Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1732.5 MHz; σ = 1.47 S/m; ε_r = 53.4; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 - SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;
Electronics: DAE4 Sn1315; Calibrated: 11/25/2013
Phantom: SAM 2; Type: SAM;
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Bottom Edge Middle/Area Scan (51x111x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.694 W/kg

Bottom Edge Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.976 V/m; Power Drift = 0.015 dB
Peak SAR (extrapolated) = 1.19 W/kg
SAR(1 g) = 0.677 W/kg; SAR(10 g) = 0.380 W/kg
Maximum value of SAR (measured) = 0.733 W/kg

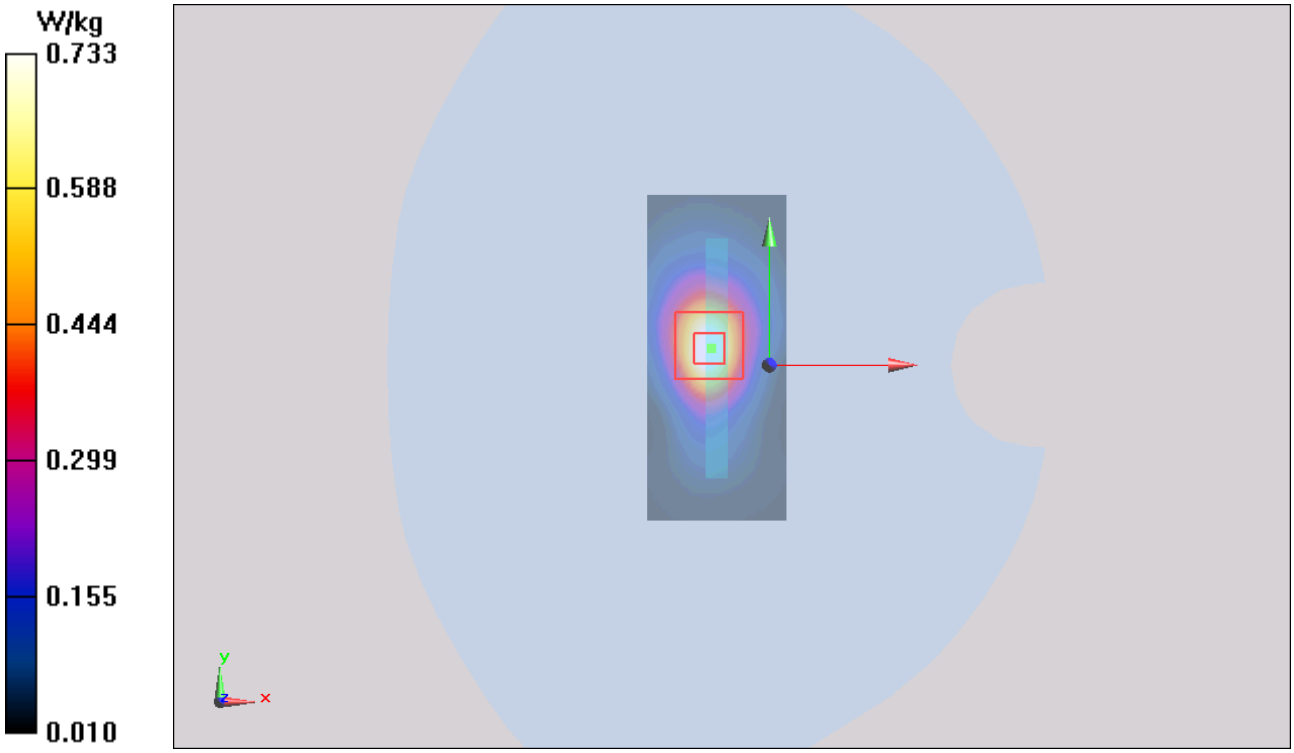


Figure 12: Body, Bottom Edge, LTE Band 4 1RB Channel 20175

802.11b Left Cheek High
Date: 11/1/2014
Communication System: UID 0, 802.11b (0); Frequency: 2462 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2462 MHz; σ = 1.824 S/m; ε_r = 38.584; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Left Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3842; ConvF(7.26, 7.26, 7.26); Calibrated: 06/06/2014;
Electronics: DAE4 Sn1315; Calibrated: 11/25/2013
Phantom: SAM 2; Type: SAM;
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Left Cheek High/Area Scan (81x141x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.332 W/kg

Left Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.962 V/m; Power Drift = 0.030 dB
Peak SAR (extrapolated) = 0.628 W/kg
SAR(1 g) = 0.286 W/kg; SAR(10 g) = 0.138 W/kg
Maximum value of SAR (measured) = 0.294 W/kg

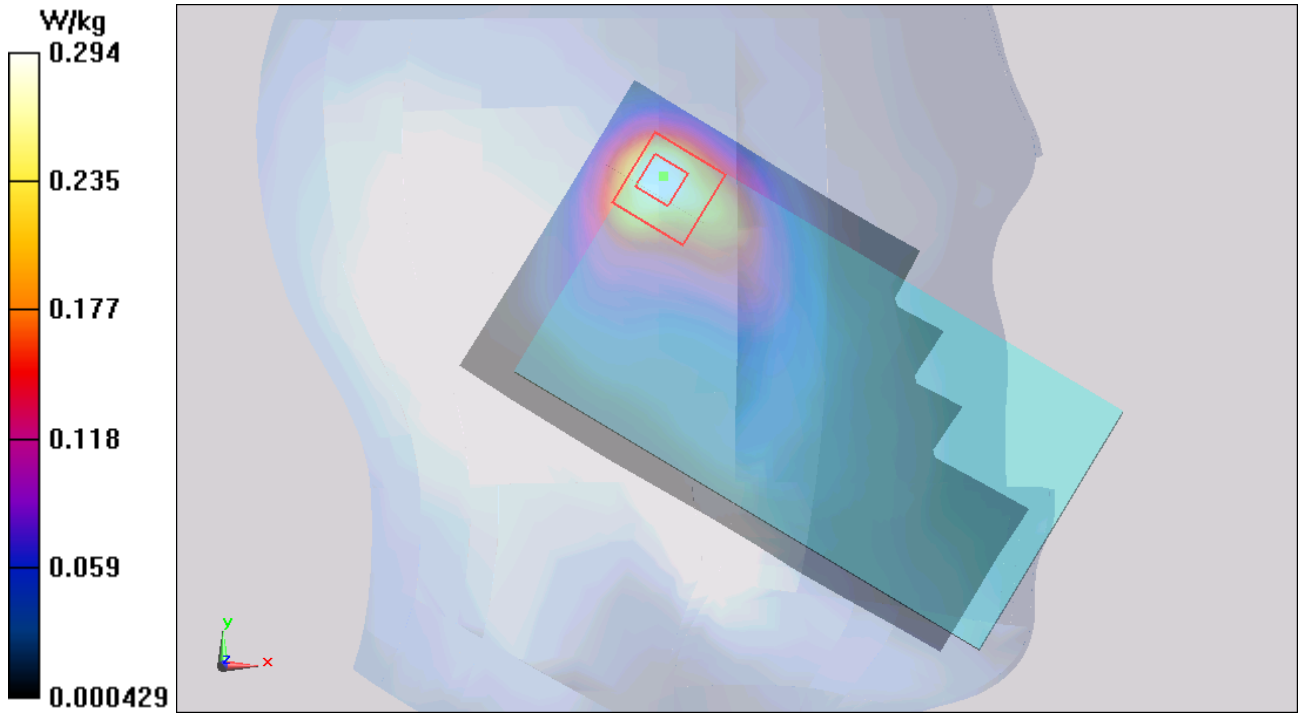


Figure 13: Left Hand Touch Cheek 802.11b Channel 11

802.11b Back Side High
Date: 11/4/2014
Communication System: UID 0, 802.11b (0); Frequency: 2462 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2462 MHz; σ = 2.009 S/m; ε_r = 52.109; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 - SN3842; ConvF(6.93, 6.93, 6.93); Calibrated: 06/06/2014;
Electronics: DAE4 Sn1315; Calibrated: 11/25/2013
Phantom: SAM 2; Type: SAM;
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Back Side High/Area Scan (81x141x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.117 W/kg

Back Side High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.797 V/m; Power Drift = 0.066 dB
Peak SAR (extrapolated) = 0.175 W/kg
SAR(1 g) = 0.093 W/kg; SAR(10 g) = 0.046 W/kg
Maximum value of SAR (measured) = 0.105 W/kg

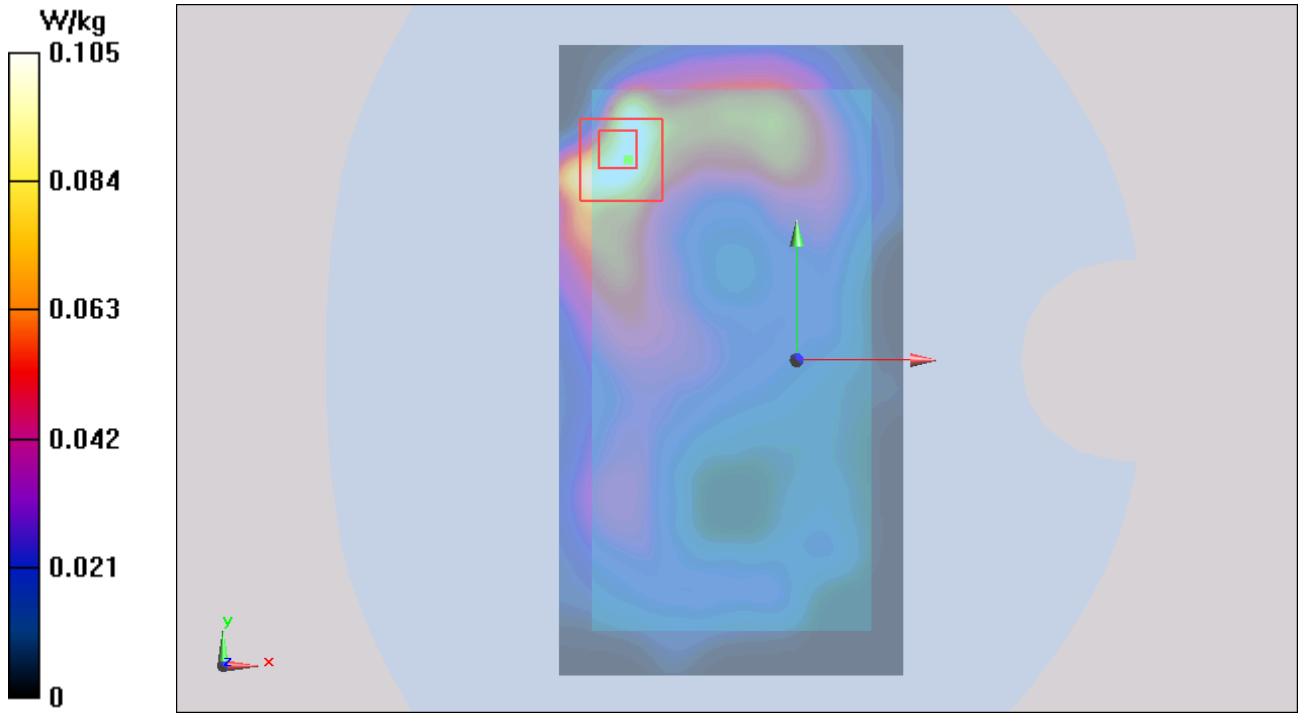


Figure 14: Body, Back Side, 802.11b Channel 11