Shenzhen GTI Technology Co., Ltd.

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TEST REPORT

Product Name ....: Tablet PC

Trademark ....: /

Model/Type reference ....: PAD702

Listed Model(s) ....: PAD706

FCC ID..: **2ACZDPAD702**

Test Standards ....: **ANSI C95.1–1999**
47CFR §2.1093
KDB 447498

Applicant ....: Haier Information Technology(Shenzhen) CO., Ltd

Address of applicant ....: Room B4 of Floor 21 ,No.3 Tower Building , Chinese Technology Research Park, China Technology Exploitation Institute; Gaoxin South first street No.009, Nanshan District, Shenzhen City, Guangdong Province.

Date of Receipt ....: Nov.01, 2014

Date of Test Date.......................: Nov.01, 2014 - Nov.24, 2014

Data of issue. ....: Nov.28, 2014

Test result	**Pass ***

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

GENERAL DESCRIPTION OF EUT	
Equipment:	Tablet PC
Model Name:	PAD702
Manufacturer:	Haier Information Technology(Shenzhen) CO., Ltd
Manufacturer Address:	Room B4 of Floor 21 ,No.3 Tower Building , Chinese Technology Research Park, China Technology Exploitation Institute; Gaoxin South first street No.009, Nanshan District, Shenzhen City, Guangdong Province.
Power Rating:	DC 3.7V from battery or DC 5.0V form adapter: Input: 100-240V~ 50/60Hz 0.3A Max Output: 5V⎓1.5A

Compiled By: Allen Wang

(Allen Wang)

Reviewed By: Tony Wang

(Tony Wang)

Approved By: Walter Chen

(Walter Chen)

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1. SUMMARY

1.1. Test Standards

IEEE Std C95.1, 1999: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 KHz to 300 GHz. It specifies the maximum exposure limit of 1.6 W/kg as averaged over any 1 gram of tissue for portable devices being used within 20 cm of the user in the uncontrolled environment.

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.

FCC Part 2.1093 Radiofrequency Radiation Exposure Evaluation: Portable Devices

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

KDB 616217 D04 SAR for laptop and tablets v01r01: SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers

KDB865664 D01 SAR measurement 100 MHz to 6 GHz v01r03: SAR Measurement Requirements for 100 MHz to 6 GHz

KDB865664 D02 SAR Reporting v01r01: RF Exposure Compliance Reporting and Documentation Considerations

KDB248227 01 v01r02: SAR measurement procedures for 802.112abg transmitters

KDB648474 D04 SAR Handsets Multi Xmiter and Ant v01r02: SAR Evaluation Considerations for Wireless Handsets.

KDB941225 D06 Hot Spot SAR v02: SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities

KDB941225 D01 3G SAR Procedures v03: 3G SAR MEAUREMENT PROCEDURES

1.2. Summary of Maximum SAR Value

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

Highest tested and scaled SAR Summary

Exposure Position	Frequency Band	Highest Tested 1g-SAR(W/Kg)	Highest Scaled Maximum SAR(W/Kg)
Head	GSM 850	0.123	0.141
	PCS 1900	0.259	0.293
	WCDMA Band II	0.515	0.557
	WCDMA Band V	0.395	0.446
	WLAN2450	0.748	0.778
Body- worn	GSM 850	0.567	0.629
	PCS 1900	0.665	0.734
	WCDMA Band II	0.616	0.666
	WCDMA Band V	0.479	0.541
	WLAN2450	0.494	0.514

Highest Simultaneous transmission SAR Summary

Exposure Position	Transmission Combination	Highest Simultaneous Maximum SAR(W/Kg)
Head	GSM 835+WLAN	0.910
	PCS 1900+WLAN	1.048
	WCDMA Band II+WLAN	1.317
	WCDMA Band V+WLAN	1.205
Body- worn	GSM 835+WLAN	1.143
	PCS 1900+WLAN	1.248
	WCDMA Band II+WLAN	1.180
	WCDMA Band V+WLAN	1.055

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.
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-reflec tion	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:

Normal Temperature:	15°C -35°C
Relative Humidity:	35%-55 %
Air Pressure:	101 kPa

2.2. General Description of EUT

Product Name:	Tablet PC
Model/Type reference:	PAD702
Test device:	Prototype
Power supply:	DC 3.8V from Li-ion battery
Adapter information:	Model: JY-05150 Input: 100-240V~ 50/60Hz 0.3A MAX Output: 5V⎓1.5A
Hardware version:	A081-MB-V0.2
Software version:	CP-706-MB-V3.0-153
2G	
Operation Band:	GSM850, PCS1900
Supported Type:	GSM/GPRS/EGPRS
Power Class:	GSM850:Power Class 4 DCS1900:Power Class 1
Modulation Type:	GMSK for GSM/GPRS/EGPRS
GSM Release Version	R99
GPRS/EGPRS Class	Class B
GPRS Multislot Class	12
EGPRS Multislot Class	12
WCDMA	
Operation Band:	FDD Band II & Band V
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
DC-HSUPA Release Version:	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:	2.0dBi
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:	2.0dBi
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:	2.0dBi

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	Manufacturer	Type/Model	Serial Number	Calibrated until
Data Acquisition Electronics DAEx	SPEAG	DAE4	1315	Nov 24,2015
E-field Probe	SPEAG	EX3DV4	3842	Jun 05,2015
System Validation Dipole 835V2	SPEAG	D835V2	4d134	Dec 12,2014
System Validation Dipole D900V2	SPEAG	D900V2	1d129	Dec 12,2014
System Validation Dipole D1750V2	SPEAG	D1750V2	1062	Dec 11,2014
System Validation Dipole 1900V2	SPEAG	D1900V2	5d150	Dec 11,2014
System Validation Dipole 2450V2	SPEAG	D2450V2	884	Dec 10,2014
Dielectric Probe Kit	Agilent	85070E	US44020288	/
Power meter	Agilent	E4417A	GB41292254	Nov 25,2014
Power sensor	Agilent	8481H	MY41095360	Nov 25,2014
Network analyzer	Agilent	8753E	US37390562	Nov 24,2014
Universal Radio Communication Tester	ROHDE & SCHWARZ	CMU200	112012	Oct 22,2015

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.

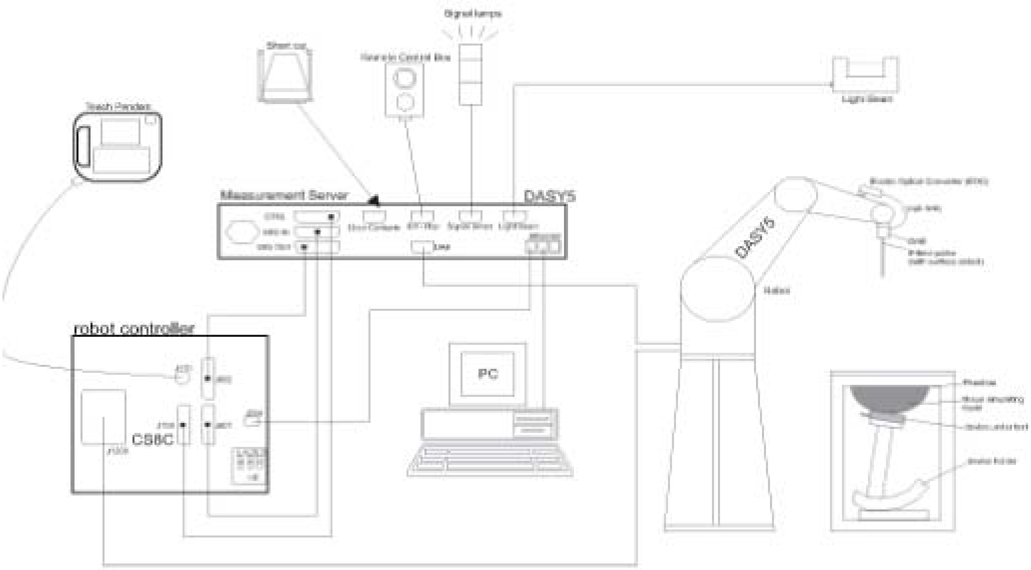
Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.

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.

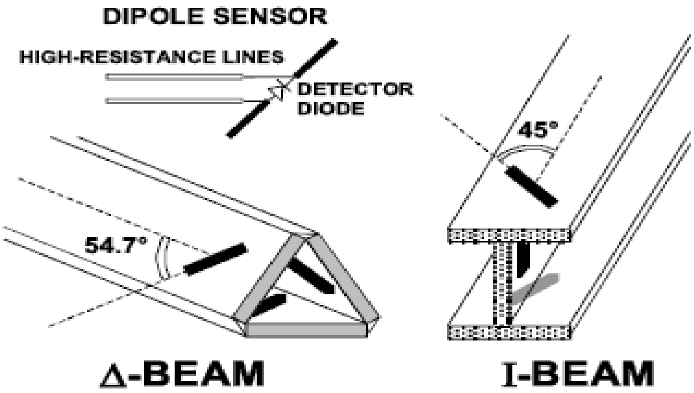
Probe Specification:

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 of 15 mm x 15 mm is set. During the 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

Zoom Scans are used to estimate the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The default Zoom Scan is done by 7x7x7 points within a cube whose base is centred around the maxima found in the preceding area scan.

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-D after 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 Sheppard'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 Sheppard's method for extrapolation. For a grid using 7x7x7 measurement points with 5mm resolution amounting to 343 measurement points, the uncertainty of the extrapolation routines is less than 1% for 1g and 10g cubes.

A Z-axis scan measures the total SAR value at the x-and y-position of the maximum SAR value found during the cube 7x7x7 scan. The probe is moved away in z-direction from the bottom of the SAM phantom in 5mm steps.

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		2450MHz	
(% Weight)	Head	Body	Head	Body	Head	Body
Water	41.45	52.5	55.242	69.91	62.7	73.2
Salt	1.45	1.40	0.306	0.13	0.50	0.10
Sugar	56	45.0	0.00	0.00	0.00	0.00
Preventol	0.10	0.10	0.00	0.00	0.00	0.00
HEC	1.00	1.00	0.00	0.00	0.00	0.00
DGBE	0.00	0.00	44.452	29.96	36.8	26.7

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.

Fr. (MHz)	Dielectric Parameters (±5%)				Tissue Temp [^{o} C]	Test time
	head		body			
	εr 39.425-43.575	δ[s/m] 0.855-0.945	εr 52.44-57-96	δ[s/m] 0.9215-1.0185		
835	41.45	0.91	54.65	0.98	21	Nov.,20,2014

Fr. (MHz)	Dielectric Parameters (±5%)				Tissue Temp [^{o} C]	Test time
	head		body			
	εr 38.00-42.00	δ[s/m] 1.33-1.47	εr 50.635-55.965	δ[s/m] 1.444-1.596		
1900	39.78	1.46	55.33	1.45	21	Nov.,20,2014

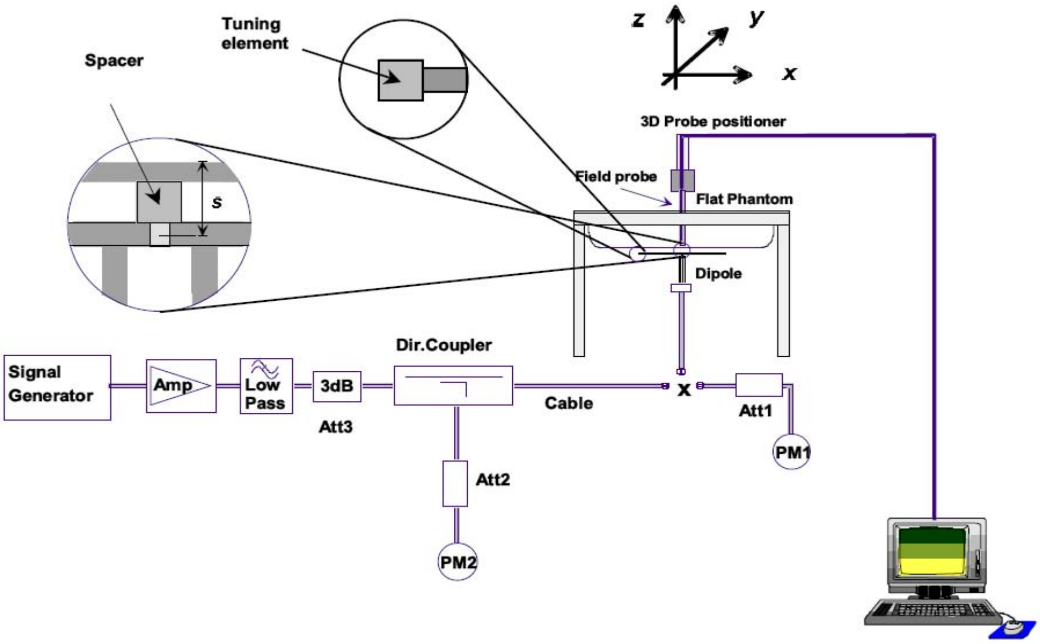
Fr. (MHz)	Dielectric Parameters (±5%)				Tissue Temp [^{o} C]	Test time
			body			
	εr 37.24-41.16	δ[s/m] 1.71-1.89	εr 50.065-55.335	δ[s/m] 1.8525-2.047 5		
2450	39.28	1.78	54.42	1.98	21	Nov.,20,2014

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.

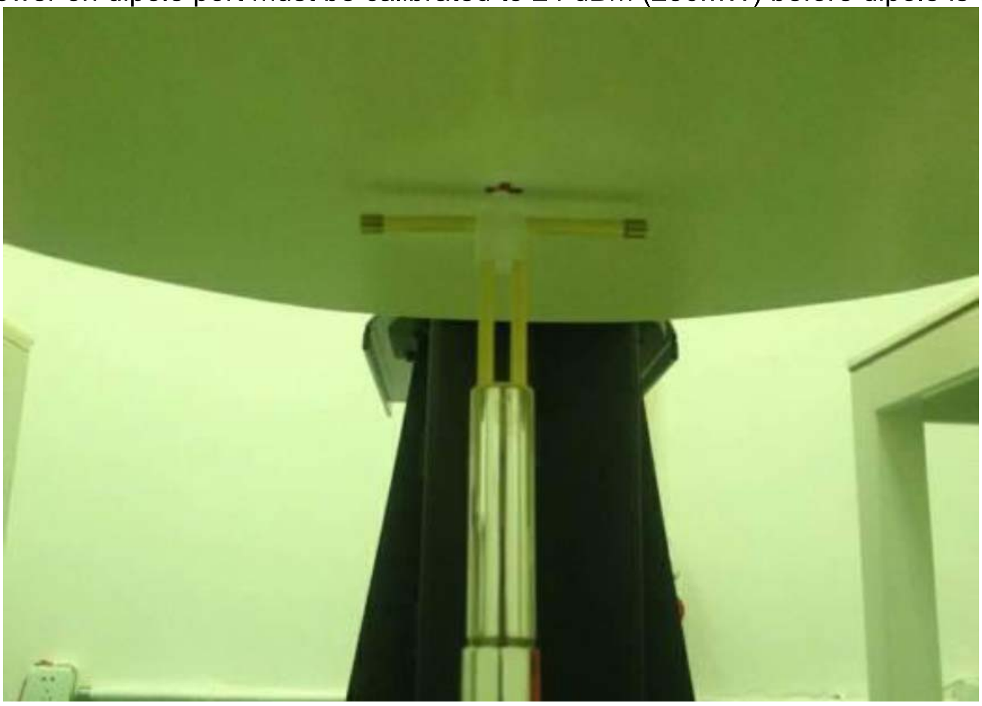


Photo of Dipole Setup

System Validation of Head 1g Average

Measurement is made at temperature 22.0 ℃ and relative humidity 55%.						Measurement Date
Verification results	Frequency (MHz)	Target value (W/kg)	Measured 250mW value (W/kg)	Normalized 1W value (W/kg)	Deviation	
	835	9.66	2.32	9.28	-3.93%	Nov.,20th,2014
	1900	38.30	9.60	38.40	0.26%	Nov.,20th,2014
	2450	51.70	12.47	49.88	-3.52%	Nov.,20th,2014

System Validation of Body 1g Average

Measurement is made at temperature 22.0 ℃ and relative humidity 55%.						Measurement Date
Verification results	Frequency (MHz)	Target value (W/kg)	Measured 250mW value (W/kg)	Normalized 1W value (W/kg)	Deviation	
	835	9.36	2.27	9.08	-2.99%	Nov.,20th,2014
	1900	39.90	9.51	38.04	-4.66%	Nov.,20th,2014
	2450	51.80	12.53	50.12	-3.24%	Nov.,20th,2014

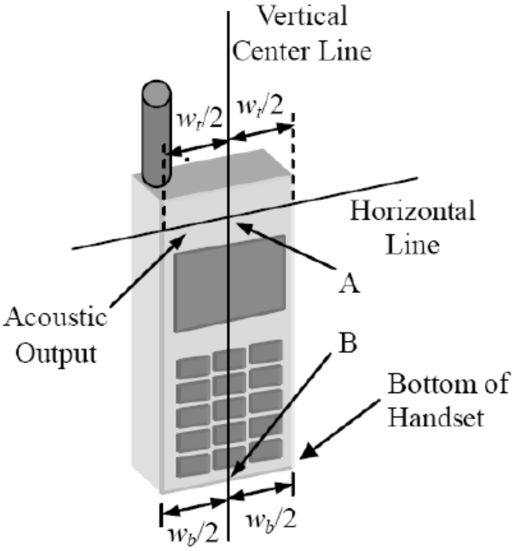
6. EUT TEST POSITION

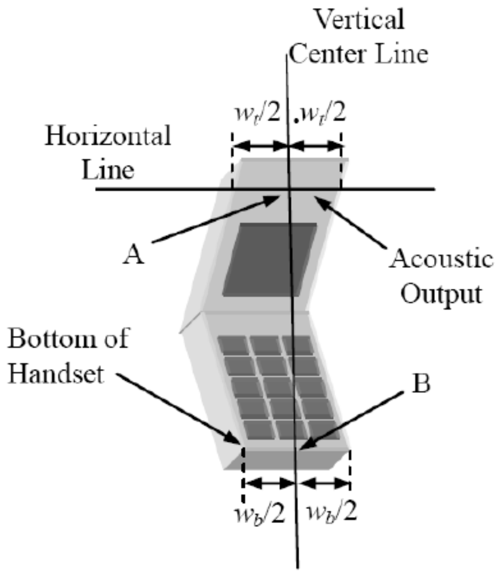
6.1. Define Two Imaginary Lines on the Handset

(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.

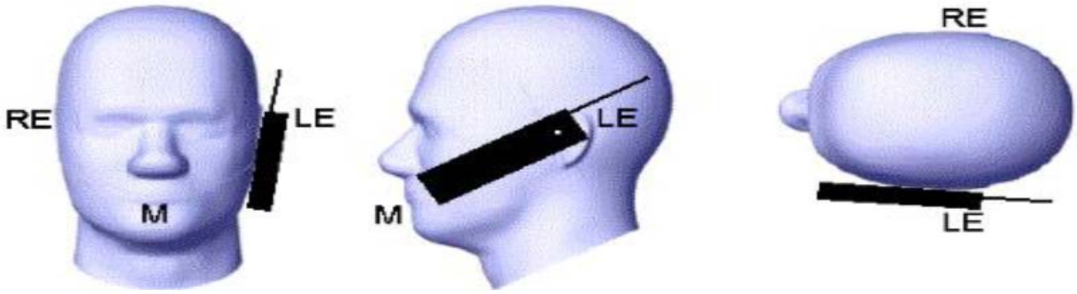




6.2. Cheek Position

(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.

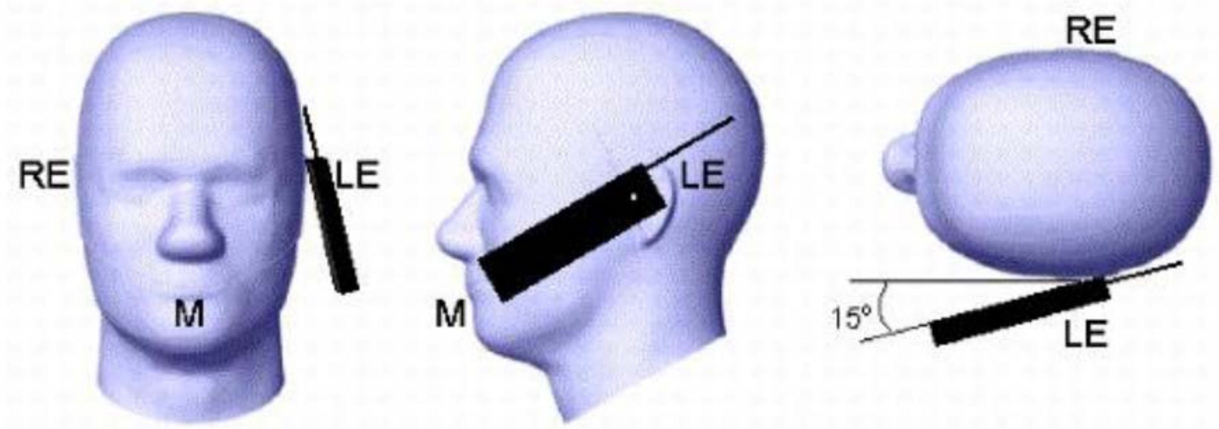
(2) To move the device towards the phantom with the ear piece aligned with the line LE-RE until the phone touched the ear. While maintaining the device in the reference plane and maintaining the phone contact with ear, move the bottom of the phone until any point on the front side is in contact with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

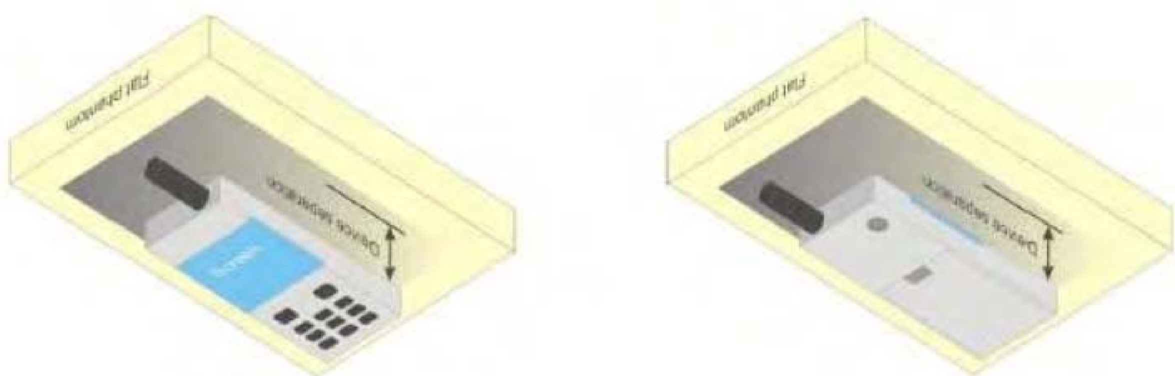


6.4. Body Worn Position

(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 5mm. (Hotspot mode the distance of 10mm).



6.5. SAR Testing for Tablet

This device can be used also in full sized tablet exposure conditions, due to its size. Per FCC KDB 616217, the back surface and edges of the tablet should be tested for SAR compliance with the tablet touching the phantom. The SAR exclusion threshold in KDB 447498 D01v05r02 can be applied to determine SAR test exclusion for adjacent edge configurations. The closest distance from the antenna to an adjacent tablet edge is used to determine if SAR testing is requires for the adjacent edges, with the adjacent edge positioned against the phantom and the edge containing the antenna positioned perpendicular to the phantom.

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. 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 1: 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 2：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 ⇔ $A_{hs} = \beta_{hs}/\beta_c$ = 30/15 ⇔ 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 3: 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)

7.2.2.7 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 4: 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 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:

Conducted power measurement results (GSM850/1900)

Mode	Txslot	Measured Power (dBm)			Calculation (dB)	Frame-Averaged Power (dBm)		
		251	190	128		251	190	128
GSM850	/	32.39	32.41	32.57	/	/	/	/
GPRS 850 (GMSK)	1 Txslot	32.25	32.29	32.54	-9.03	23.22	23.26	23.51
	2 Txslot	**30.79**	**30.55**	**30.63**	**-6.02**	**24.77**	**24.53**	**24.61**
	3 Txslot	28.45	28.47	28.35	-4.26	24.19	24.21	24.09
	4 Txslot	27.45	27.32	27.44	-3.01	24.44	24.31	24.43
EGPRS 850 (GMSK)	1 Txslot	32.57	32.47	32.36	-9.03	23.54	23.44	23.33
	2 Txslot	**30.44**	**30.50**	**30.56**	**-6.02**	**24.42**	**24.48**	**24.54**
	3 Txslot	28.23	28.47	28.53	-4.26	23.97	24.21	24.27
	4 Txslot	27.37	27.36	27.55	-3.01	24.36	24.35	24.54
Mode	**Txslot**	**Measured Power (dBm)**			**Calculation (dB)**	**Frame-Averaged Power (dBm)**		
		810	**661**	**512**		**810**	**661**	**512**
DCS1900	/	30.55	30.47	30.23	/	/	/	/
GPRS 1900 (GMSK)	1 Txslot	30.03	29.76	29.64	-9.03	21.00	20.73	20.61
	2 Txslot	28.04	28.25	27.95	-6.02	22.02	22.23	21.93
	3 Txslot	25.90	25.53	25.82	-4.26	21.64	21.27	21.56
	4 Txslot	25.18	24.46	24.93	-3.01	22.17	21.45	21.92
EGPRS 1900 (GMSK)	1 Txslot	30.25	30.78	30.14	-9.03	21.22	21.75	21.11
	2 Txslot	**28.50**	**28.66**	**28.95**	**-6.02**	**22.48**	**22.64**	**22.93**
	3 Txslot	26.36	26.55	26.23	-4.26	22.10	22.29	21.97
	4 Txslot	25.22	25.13	25.34	-3.01	22.21	22.12	22.33

NOTES:

1) Division Factors

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

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

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

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

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

2) According to the conducted power as above, the body measurements are performed with 2Txslots for GPRS850 and GPRS1900.

Conducted power measurement results (UMTS Band II/V)

Item	Band	FDD Band V result (dBm)			FDD Band II result (dBm)		
		Test Channel			Test Channel		
	ARFCN	4132	4183	4233	9262	9400	9538
RMC	12.2kbps RMC	23.23	23.47	23.78	23.54	23.66	23.24
HSDPA	Sub - Test 1	22.66	22.22	22.19	22.41	22.24	22.20
	Sub - Test 2	22.59	22.17	22.11	22.25	22.14	22.15
	Sub - Test 3	21.78	21.79	21.77	21.56	21.63	21.64
	Sub - Test 4	21.03	21.64	21.60	21.02	21.12	21.45
HSUPA	Sub - Test 1	22.69	22.27	22.95	22.63	22.54	22.86
	Sub - Test 2	22.13	22.78	22.46	22.31	22.26	22.50
	Sub - Test 3	21.06	21.60	21.13	21.25	21.53	21.23
	Sub - Test 4	21.18	21.83	21.52	21.33	21.41	21.46
	Sub - Test 5	22.72	22.29	22.33	22.65	22.32	22.29

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

Mode	Channel	Frequency (MHz)	Worst case Data rate of worst case	Conducted Output Power (dBm)	
				Peak	Average
802.11b	1	2412	1Mbps	16.87	14.72
	6	2437	1Mbps	16.68	14.83
	11	2462	1Mbps	16.42	14.80
802.11g	1	2412	6Mbps	18.47	13.25
	6	2437	6Mbps	18.36	13.33
	11	2462	6Mbps	18.47	13.29
802.11n(20MHz)	1	2412	6.5 Mbps	18.15	13.63
	6	2437	6.5 Mbps	18.20	13.47
	11	2462	6.5 Mbps	18.17	13.66
802.11n(40MHz)	3	2422	13.5 Mbps	17.14	12.87
	6	2437	13.5 Mbps	17.24	12.94
	9	2452	13.5 Mbps	17.18	12.91

Conducted Power Measurement Results (Bluetooth)

Mode	Channel	Frequency (MHz)	Conducted Peak Output Power (dBm)
LBE	00	2402	-0.09
	19	2440	0.49
	39	2480	0.03
GFSK	00	2402	3.76
	39	2441	3.18
	78	2480	2.75
π/4DQPSK	00	2402	2.78
	39	2441	2.14
	78	2480	2.08
8DPSK	00	2402	2.93
	39	2441	2.32
	78	2480	1.81

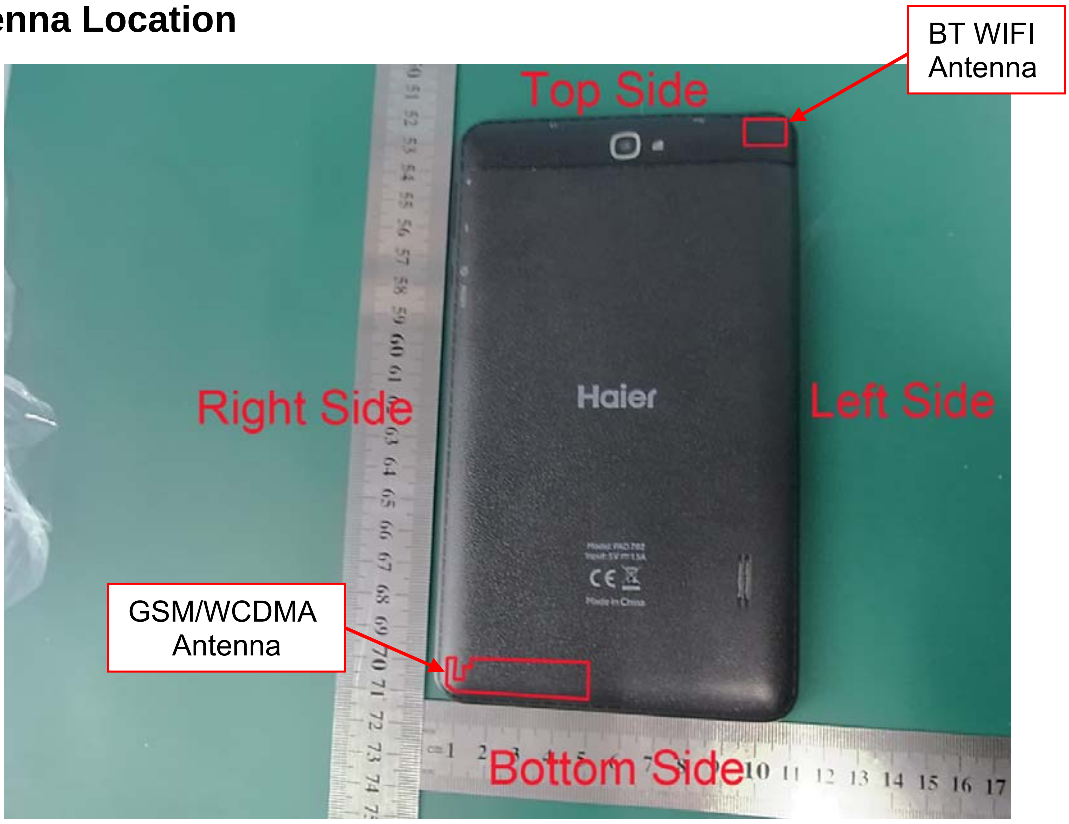
Note:
Per KDB 447498 D01v05r02, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances≤50 mm are determined by:
[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] . [$\sqrt{f(GHz)}$] ≤ 3 for 1-g SAR and] ≤ 7.5 for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

Bluetooth Max Power Allowed (dBm)	Bluetooth Max Power Allowed (mW)	Calculated Value	Separation Distance (mm)	Frequency (GHz)	Exclusion thresholds
4	3	0.8	0	2402	3

Note:
Per KDB 447498 D01v05r02, when the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion. The test exclusion threshold is 0.8 which is ≤ 3, SAR testing is not required.

8.2. Antenna Location



SAR Measurement Positions

According to the KDB941225 D06 Hot Spot SAR v02, 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)	Yes	Yes	No	Yes	No	Yes
WLAN	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 v01r03,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 v01r02,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 v02, 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 248227 D01 v01r02, 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

SAR Values (GSM850-Head)

Test Frequency Ch	Test Frequency MHz	Side	Test Position	Maximum Allowed Power (dBm)	Conducted Power (dBm)	Measurement SAR over 1g(W/kg)	Power drift	Scaling Factor	Reported SAR over 1g(W/kg)	SAR limit 1g (W/kg)	Ref. Plot #
190	836.60	Left	Touch	33.00	32.41	0.115	-0.10	1.15	0.132	1.60	--
190	836.60	Left	Tilt	33.00	32.41	0.101	-0.08	1.15	0.116	1.60	--
190	836.60	Right	Touch	33.00	32.41	0.123	-0.07	1.15	0.141	1.60	1
190	836.60	Right	Tilt	33.00	32.41	0.119	-0.11	1.15	0.136	1.60	--

SAR Values (GSM850-Body)

Test Frequency Ch	Test Frequency MHz	Mode (number of timeslots)	Test Position	Maximum Allowed Power (dBm)	Conducted Power (dBm)	Measurement SAR over 1g(W/kg)	Power drift	Scaling Factor	Reported SAR over 1g(W/kg)	SAR limit 1g (W/kg)	Ref. Plot #
190	836.60	GPRS (2)	Front	31.00	30.55	0.465	-0.11	1.11	0.516	1.60	--
190	836.60	GPRS (2)	Rear	31.00	30.55	0.567	-0.09	1.11	0.629	1.60	2
190	836.60	GPRS (2)	Right	31.00	30.55	0.435	-0.07	1.11	0.482	1.60	--
190	836.60	GPRS (2)	Bottom	31.00	30.55	0.398	-0.05	1.11	0.441	1.60	--
190	836.60	EGPRS(2)	Rear	31.00	30.50	0.513	-0.04	1.12	0.576	1.60	--

Note:
1) The distance between the EUT and the phantom bottom is 0mm.
2) According to KDB447498 D01v05r02, when the 1-g SAR for the mid-band channel or the channel with highest output power satisfies the following conditions, testing of the other channels in the band is not required.
≤0.8W/Kg and transmission band ≤100MHz;
≤0.6W/Kg and 100MHz ≤transmission band ≤200MHz;
≤ 0.4W/Kg and transmission band >200MHz

SAR Values (GSM1900-Head)

Test Frequency Ch	Test Frequency MHz	Side	Test Position	Maximum Allowed Power (dBm)	Conducted Power (dBm)	Measurement SAR over 1g(W/kg)	Power drift	Scaling Factor	Reported SAR over 1g(W/kg)	SAR limit 1g (W/kg)	Ref. Plot #
661	1880.0	Left	Touch	31.00	30.47	0.234	-0.11	1.13	0.264	1.60	--
661	1880.0	Left	Tilt	31.00	30.47	0.102	-0.06	1.13	0.115	1.60	--
661	1880.0	Right	Touch	31.00	30.47	0.259	-0.12	1.13	0.293	1.60	3
661	1880.0	Right	Tilt	31.00	30.47	0.110	-0.09	1.13	0.124	1.60	--

SAR Values (GSM1900-Body)

Test Frequency Ch	Test Frequency MHz	Mode (number of timeslots)	Test Position	Maximum Allowed Power (dBm)	Conducted Power (dBm)	Measurement SAR over 1g(W/kg)	Power drift	Scaling Factor	Reported SAR over 1g(W/kg)	SAR limit 1g (W/kg)	Ref. Plot #
661	1880.0	GPRS (2)	Front	29.00	28.57	0.526	-0.09	1.10	0.581	1.60	--
661	1880.0	GPRS (2)	Rear	29.00	28.57	0.665	-0.07	1.10	0.734	1.60	4
661	1880.0	GPRS (2)	Right	29.00	28.57	0.554	-0.05	1.10	0.612	1.60	--
661	1880.0	GPRS (2)	Bottom	29.00	28.57	0.526	-0.03	1.10	0.581	1.60	--
661	1880.0	EGPRS (2)	Rear	29.00	28.66	0.625	-0.07	1.08	0.676	1.60	

Note:
1) The distance between the EUT and the phantom bottom is 0mm.
2) According to KDB447498 D01v05r02, when the 1-g SAR for the mid-band channel or the channel with highest output power satisfies the following conditions, testing of the other channels in the band is not required.
≤0.8W/Kg and transmission band ≤100MHz;
≤0.6W/Kg and 100MHz ≤transmission band ≤200MHz;
≤ 0.4W/Kg and transmission band >200MHz

SAR Values (WCDMA Band II-Head)

Test Frequency Ch	Test Frequency MHz	Side	Test Position	Maximum Allowed Power (dBm)	Conducted Power (dBm)	Measurement SAR over 1g(W/kg)	Power drift	Scaling Factor	Reported SAR over 1g(W/kg)	SAR limit 1g (W/kg)	Ref. Plot #
9400	1880.0	Left	Touch	24.00	23.66	0.498	-0.05	1.08	0.539	1.60	--
9400	1880.0	Left	Tilt	24.00	23.66	0.214	-0.06	1.08	0.231	1.60	--
9400	1880.0	Right	Touch	24.00	23.66	0.515	-0.10	1.08	0.557	1.60	5
9400	1880.0	Right	Tilt	24.00	23.66	0.235	0.11	1.08	0.254	1.60	--

SAR Values (WCDMA Band II-Body)

Test Frequency Ch	Test Frequency MHz	Mode (number of timeslots)	Test Position	Maximum Allowed Power (dBm)	Conducted Power (dBm)	Measurement SAR over 1g(W/kg)	Power drift	Scaling Factor	Reported SAR over 1g(W/kg)	SAR limit 1g (W/kg)	Ref. Plot #
9400	1880.0	RMC	Front	24.00	23.66	0.589	-0.11	1.08	0.637	1.60	--
9400	1880.0	RMC	Rear	24.00	23.66	0.616	-0.12	1.08	0.666	1.60	6
9400	1880.0	RMC	Right	24.00	23.66	0.574	-0.08	1.08	0.621	1.60	--
9400	1880.0	RMC	Bottom	24.00	23.66	0.541	-0.09	1.08	0.585	1.60	--

Note:
1) *The distance between the EUT and the phantom bottom is 0mm.*
2) *According to KDB447498 D01v05r02, when the 1-g SAR for the mid-band channel or the channel with highest output power satisfies the following conditions, testing of the other channels in the band is not required.*
≤0.8W/Kg and transmission band ≤100MHz;
≤0.6W/Kg and 100MHz ≤transmission band ≤200MHz;
≤ 0.4W/Kg and transmission band >200MHz

SAR Values (WCDMA Band V-Head)

Test Frequency Ch	Test Frequency MHz	Side	Test Position	Maximum Allowed Power (dBm)	Conducted Power (dBm)	Measurement SAR over 1g(W/kg)	Power drift	Scaling Factor	Reported SAR over 1g(W/kg)	SAR limit 1g (W/kg)	Ref. Plot #
4183	836.60	Left	Touch	24.00	23.47	0.378	-0.05	1.13	0.427	1.60	--
4183	836.60	Left	Tilt	24.00	23.47	0.198	-0.06	1.13	0.224	1.60	--
4183	836.60	Right	Touch	24.00	23.47	0.395	-0.10	1.13	0.446	1.60	7
4183	836.60	Right	Tilt	24.00	23.47	0.211	0.11	1.13	0.238	1.60	--

SAR Values (WCDMA Band V-Body)

Test Frequency Ch	Test Frequency MHz	Mode (number of timeslots)	Test Position	Maximum Allowed Power (dBm)	Conducted Power (dBm)	Measurement SAR over 1g(W/kg)	Power drift	Scaling Factor	Reported SAR over 1g(W/kg)	SAR limit 1g (W/kg)	Ref. Plot #
4183	836.60	RMC	Front	24.00	23.47	0.410	-0.11	1.13	0.463	1.60	--
4183	836.60	RMC	Rear	24.00	23.47	0.479	-0.12	1.13	0.541	1.60	8
4183	836.60	RMC	Right	24.00	23.47	0.439	-0.08	1.13	0.496	1.60	--
4183	836.60	RMC	Bottom	24.00	23.47	0.451	-0.09	1.13	0.510	1.60	--

Note:
3) *The distance between the EUT and the phantom bottom is 0mm.*
4) *According to KDB447498 D01v05r02, when the 1-g SAR for the mid-band channel or the channel with highest output power satisfies the following conditions, testing of the other channels in the band is not required.*
≤0.8W/Kg and transmission band ≤100MHz;
≤0.6W/Kg and 100MHz ≤transmission band ≤200MHz;
≤ 0.4W/Kg and transmission band >200MHz

SAR Values (WLAN2450-Head)

Test Frequency		Side	Test Position	Maximum Allowed Power (dBm)	Conducted Power (dBm)	Measurement SAR over 1g(W/kg)	Power drift	Scaling Factor	Reported SAR over1g (W/kg)	SAR limit 1g (W/kg)	Ref. Plot #
Ch	MHz										
6	2437	Left	Touch	15.00	14.83	0.748	-0.08	1.04	0.778	1.60	9
6	2437	Left	Tilt	15.00	14.83	0.679	-0.11	1.04	0.706	1.60	---
6	2437	Right	Touch	15.00	14.83	0.726	-0.05	1.04	0.755	1.60	--
6	2437	Right	Tilt	15.00	14.83	0.685	-0.15	1.04	0.712	1.60	--

SAR Values (WLAN2450-Body)

Test Frequency		Test Position	Maximum Allowed Power (dBm)	Conducted Power (dBm)	Measurement SAR over 1g(W/kg)	Power drift	Scaling Factor	Reported SAR over1g (W/kg)	SAR limit 1g (W/kg)	Ref. Plot #
Ch	MHz									
6	2437	Front	15.00	14.83	0.336	-0.06	1.04	0.349	1.60	--
6	2437	Rear	15.00	14.83	0.494	-0.08	1.04	0.514	1.60	10
6	2437	Left	15.00	14.83	0.456	-0.09	1.04	0.474	1.60	--
6	2437	Top	15.00	14.83	0.471	-0.09	1.04	0.490	1.60	--

Note:
1) *The distance between the EUT and the phantom bottom is 0mm.*
2) *According to KDB447498 D01v05r02, when the 1-g SAR for the mid-band channel or the channel with highest output power satisfies the following conditions, testing of the other channels in the band is not required.*
   ≤0.8W/Kg and transmission band ≤100MHz;
   ≤0.6W/Kg and 100MHz ≤transmission band ≤200MHz;
   ≤ 0.4W/Kg and transmission band >200MHz

8.3.2 Simultaneous SAR Evaluation

Application Simultaneous Transmission information:

NO.	Simultaneous Transmission Configurations	Tablet		Note
		Head	Body	
1	GSM(Voice) + WLAN2.4GHz(data)	Yes	-	-
2	WCDMA(Voice) + WLAN2.4GHz(data)	Yes	-	-
3	GSM(Voice) + Bluetooth(data)	Yes	-	-
4	WCDMA((Voice) + Bluetooth(data)	Yes	-	-
5	GPRS/EDGE(Data) + WLAN2.4GHz(data)	-	Yes	2.4GHz Hotspot
6	WCDMA(Data) + WLAN2.4GHz(data)	-	Yes	2.4GHz Hotspot
7	GPRS/EDGE(Data) + Bluetooth(data)	-	Yes	Bluetooth Tethering
8	WCDMA(Data) + Bluetooth(data)	-	Yes	Bluetooth Tethering

NOTE:

1) WLAN2.4GHz and Bluetooth share the same antenna, and cannot transmit simultaneously.
2) The Reported SAR summation is calculated based on the same configuration and test position.
3) Per KDB 447498 D01v05r02, simultaneous transmission SAR is compliant if,
   a) Scalar SAR summation < 1.6W/kg.
   b) SPLSR = (SAR1 + SAR2) $^{1.5}$ / (min. separation distance, mm), and the peak separation distance is determined from the square root of \[(x1-x2) ^{2} + (y1-y2) ^{2} + (z1-z2) ^{2}], where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan
   c) If SPLSR≦ 0.04, simultaneously transmission SAR measurement is not necessary
   d) Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg
4) For simultaneous transmission analysis, Bluetooth SAR is estimated per KDB 447498 D01v05r02 based on the formula below.
   a) (max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] .[√f(GHz)/ x] W/kg for test separation distances≦50 mm; where x = 7.5 for 1-g SAR, and x = 18.75 for 10-g SAR.
   b) When the minimum separation distance is < 5mm, the distance is used 5mm to determine SAR test exclusion.
   c) 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the test separation distances is > 50 mm.
   d) Bluetooth estimated SAR is conservatively determined by 5mm separation, for all applicable exposure positions.

Bluetooth Max Power Allowed (dBm)	Bluetooth Max Power Allowed(mW)	Exposure Position	Estimated SAR (W/kg)
4	3	All Positions	0.104

GSM/WCDMA & WLAN Mode

Position	Max.WWAN SAR (W/Kg)	Max. WLAN SAR W/Kg)	SAR Summation	Limit (W/kg)	SPLSR≦0.04 (Yes/No)
GSM850+WLAN 2.4G-DTS					
Left Cheek	0.132	0.778	0.910	1.60	N/A
Left Tilt	0.116	0.706	0.822		N/A
Right Cheek	0.141	0.755	0.896		N/A
Right Tilt	0.136	0.712	0.848		N/A
Body front	0.516	0.349	0.865		N/A
Body Rear	0.629	0.514	1.143		N/A
Body Left		0.474	0.474		N/A
Body Right	0.482		0.482		N/A
Body top		0.490	0.490		N/A
Body Bottom	0.441		0.441		N/A
PCS1900+WLAN 2.4G-DTS					
Left Cheek	0.264	0.778	1.042	1.60	N/A
Left Tilt	0.115	0.706	0.821		N/A
Right Cheek	0.293	0.755	1.048		N/A
Right Tilt	0.124	0.712	0.836		N/A
Body front	0.581	0.349	0.930		N/A
Body Rear	0.734	0.514	1.248		N/A
Body Left		0.474	0.474		N/A
Body Right	0.612		0.612		N/A
Body top		0.490	0.490		N/A
Body Bottom	0.581		0.581		N/A
WCDMA Band V+WLAN 2.4G-DTS					
Left Cheek	0.539	0.778	1.317	1.60	N/A
Left Tilt	0.231	0.706	0.937		N/A
Right Cheek	0.557	0.755	1.312		N/A
Right Tilt	0.254	0.712	0.966		N/A
Body front	0.637	0.349	0.986		N/A
Body Rear	0.666	0.514	1.180		N/A
Body Left		0.474	0.474		N/A
Body Right	0.621		0.621		N/A
Body top		0.490	0.490		N/A
Body Bottom	0.585		0.585		N/A
WCDMA Band V+WLAN 2.4G-DTS					
Left Cheek	0.427	0.778	1.205	1.60	N/A
Left Tilt	0.224	0.706	0.930		N/A
Right Cheek	0.446	0.755	1.201		N/A
Right Tilt	0.238	0.712	0.950		N/A
Body front	0.463	0.349	0.812		N/A
Body Rear	0.541	0.514	1.055		N/A
Body Left		0.474	0.474		N/A
Body Right	0.496		0.496		N/A
Body top		0.490	0.490		N/A
Body Bottom	0.510		0.510		N/A

Note:

1) According to KDB 447498 D01 General RF Exposure Guidance v05r2, when the simultaneous transmission SAR is less than1.6 W/Kg, SPLSR assessment is not required.
2) SPLSR mean is “The SAR to Peak Location Separation Ratio”.

GSM/WCDMA & BT Mode

Position	Max.WWAN SAR (W/Kg)	Max. BT SAR W/Kg)	SAR Summation	Limit (W/kg)	SPLSR≦0.04 (Yes/No)
GSM850+BT 2.4G-DSS					
Left Cheek	0.132	0.104	0.236	1.60	N/A
Left Tilt	0.116	0.104	0.220		N/A
Right Cheek	0.141	0.104	0.245		N/A
Right Tilt	0.136	0.104	0.240		N/A
Body front	0.516	0.104	0.620		N/A
Body Rear	0.629	0.104	0.733		N/A
Body Left		0.104	0.104		N/A
Body Right	0.482	0.104	0.586		N/A
Body top		0.104	0.104		N/A
Body Bottom	0.441	0.104	0.545		N/A
PCS1900+ BT 2.4G-DSS					
Left Cheek	0.264	0.104	0.368	1.60	N/A
Left Tilt	0.115	0.104	0.219		N/A
Right Cheek	0.293	0.104	0.397		N/A
Right Tilt	0.124	0.104	0.228		N/A
Body front	0.581	0.104	0.685		N/A
Body Rear	0.734	0.104	0.838		N/A
Body Left		0.104	0.104		N/A
Body Right	0.612	0.104	0.716		N/A
Body top		0.104	0.104		N/A
Body Bottom	0.581	0.104	0.685		N/A
WCDMA Band V+ BT 2.4G-DSS					
Left Cheek	0.539	0.104	0.643	1.60	N/A
Left Tilt	0.231	0.104	0.335		N/A
Right Cheek	0.557	0.104	0.661		N/A
Right Tilt	0.254	0.104	0.358		N/A
Body front	0.637	0.104	0.741		N/A
Body Rear	0.666	0.104	0.770		N/A
Body Left		0.104	0.104		N/A
Body Right	0.621	0.104	0.725		N/A
Body top		0.104	0.104		N/A
Body Bottom	0.585	0.104	0.689		N/A
WCDMA Band V+ BT 2.4G-DSS					
Left Cheek	0.427	0.104	0.531	1.60	N/A
Left Tilt	0.224	0.104	0.328		N/A
Right Cheek	0.446	0.104	0.550		N/A
Right Tilt	0.238	0.104	0.342		N/A
Body front	0.463	0.104	0.567		N/A
Body Rear	0.541	0.104	0.645		N/A
Body Left		0.104	0.104		N/A
Body Right	0.496	0.104	0.600		N/A
Body top		0.104	0.104		N/A
Body Bottom	0.510	0.104	0.614		N/A

Note:

1) According to KDB 447498 D01 General RF Exposure Guidance v05r2, when the simultaneous transmission SAR is less than1.6 W/Kg, SPLSR assessment is not required.
2) SPLSR mean is “The SAR to Peak Location Separation Ratio”.

9. System Check Results

System Performance Check at 835 MHz Head

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

Date/Time: 11/20/2014

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

Medium parameters used (interpolated): f = 835 MHz; σ = 0.91 S/m; εr = 41.45; ρ = 1000 kg/m3

Phantom section: Flat Section

DASY5 Configuration:

Probe: ES3DV4 - SN3842; ConvF (8.83, 8.83, and 8.83); Calibrated: 06/06/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

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

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.5 (6469)

Area Scan (61x91x1): Measurement grid: dx=15.00 mm, dy=15.00 mm

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

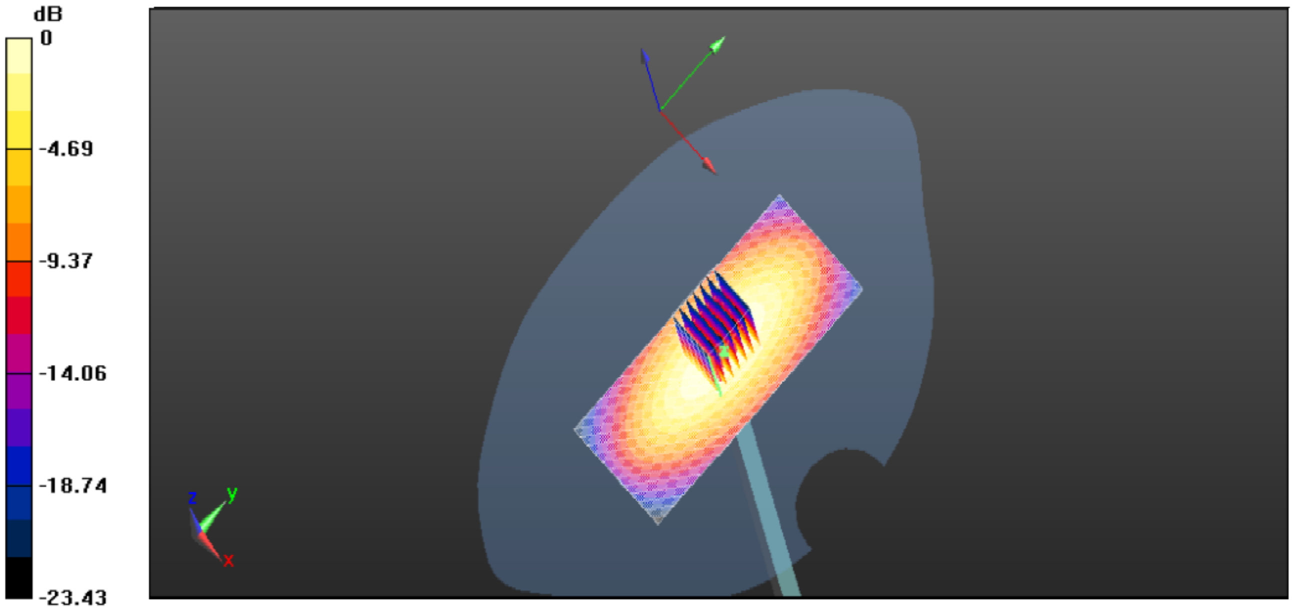
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 52.994 V/m; Power Drift = 0.082 dB

Peak SAR (extrapolated) = 3.542 W/kg

SAR(1 g) = 2.32 mW/g; SAR(10 g) = 1.49 mW/g

Maximum value of SAR (measured) = 2.59 mW/g



0 dB = 2.58mW/g=8.23dB mW/g

System Performance Check 835MHz Head 250mW

System Performance Check at 835 MHz Body

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

Date/Time: 11/20/2014

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

Medium parameters used (interpolated): f = 835 MHz; σ = 0.98 S/m; ε_r = 54.65; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

Probe: ES3DV4 - SN3842; ConvF (9.09, 9.09, and 9.09); Calibrated: 06/06/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

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

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.5 (6469)

Area Scan (61x91x1): Measurement grid: dx=15.00 mm, dy=15.00 mm

Maximum value of SAR (interpolated) = 2.15 mW/g

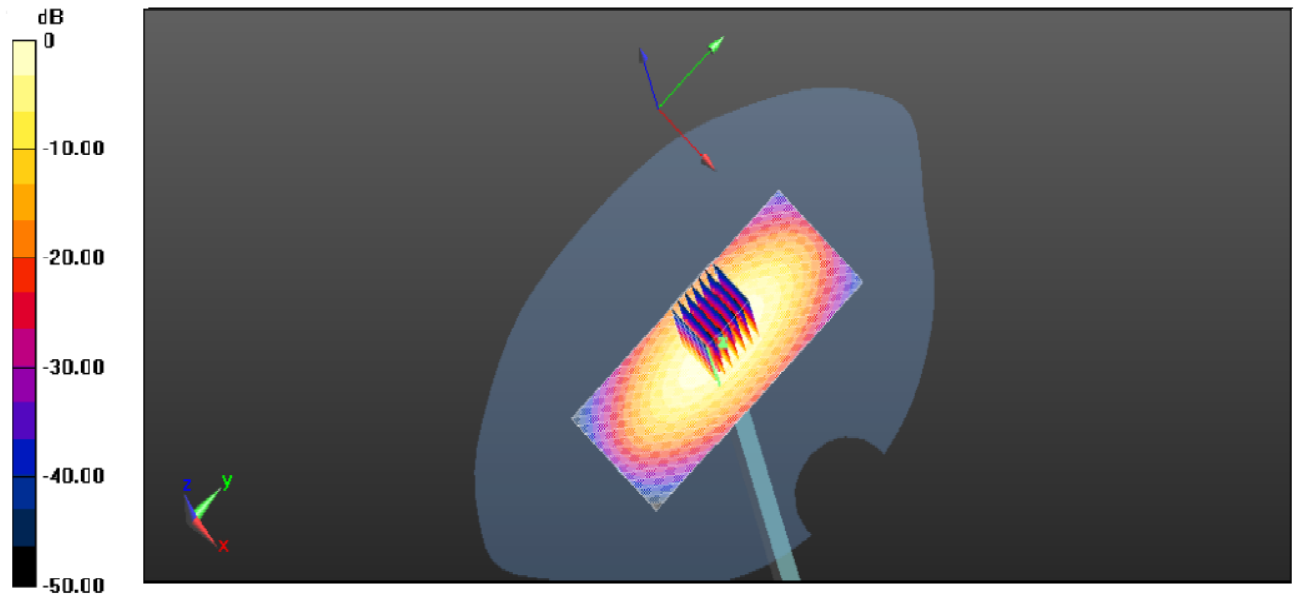
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 46.528 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 3.262 W/kg

SAR(1 g) = 2.27 mW/g; SAR(10 g) = 1.50 mW/g

Maximum value of SAR (measured) = 3.24 mW/g



0 dB = 3.24 mW/g = 11.24 dB mW/g

System Performance Check 835MHz Body 250mW

System Performance Check at 1900 MHz Head

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

Date/Time: 11/20/2014

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

Medium parameters used (interpolated): f = 1900 MHz; σ = 1.46 S/m; εr = 39.78; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

Probe: ES3DV4 - SN3842; ConvF (7.55, 7.55, 7.55); Calibrated: 06/06/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

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

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Area Scan (61x91x1): Measurement grid: dx=15.00 mm, dy=15.00 mm

Maximum value of SAR (interpolated) = 10.65 W/kg

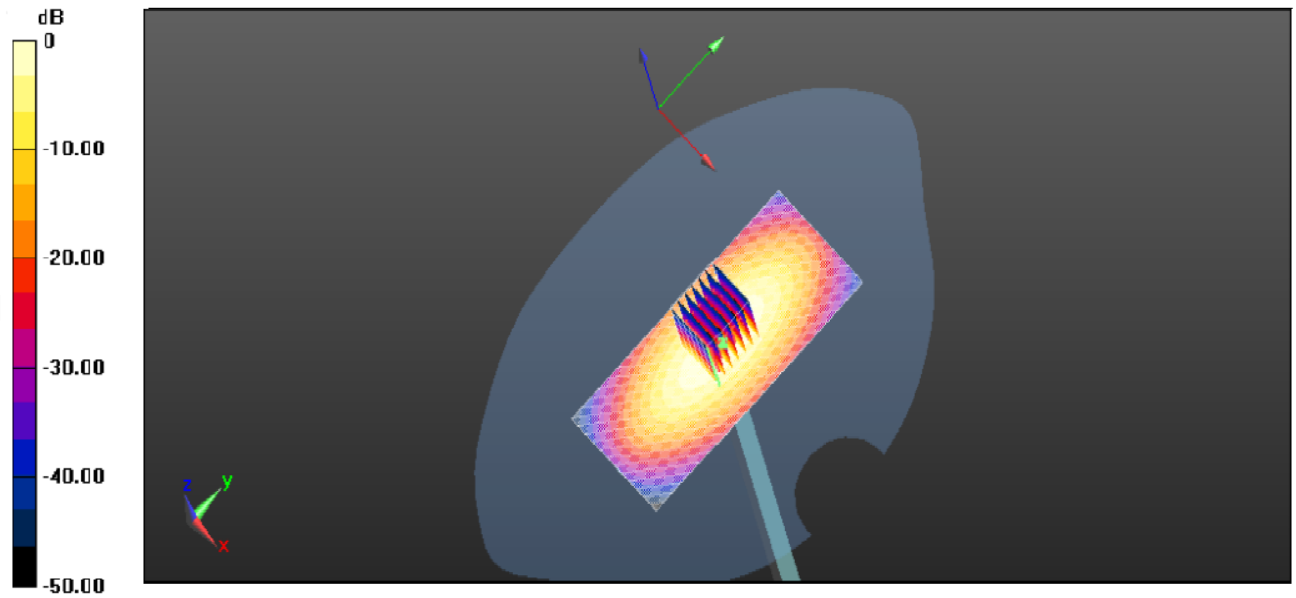
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 94.818 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 12.352 W/kg

SAR(1 g) = 9.60 W/kg; SAR(10 g) = 4.99 W/kg

Maximum value of SAR (measured) = 12.43 W/kg



0 dB = 12.43 W/kg = 20.55 dB W/kg

System Performance Check 1900MHz Head 250mW

System Performance Check at 1900 MHz Body

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

Date/Time: 11/20/2014

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

Medium parameters used (interpolated): f = 1900 MHz; σ = 1.45 S/m; εr =55.33; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

Probe: ES3DV4 - SN3842; ConvF (7.43, 7.43, 7.43); Calibrated: 06/06/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

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

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Area Scan (61x91x1): Measurement grid: dx=15.00 mm, dy=15.00 mm

Maximum value of SAR (interpolated) = 11.46 mW/g

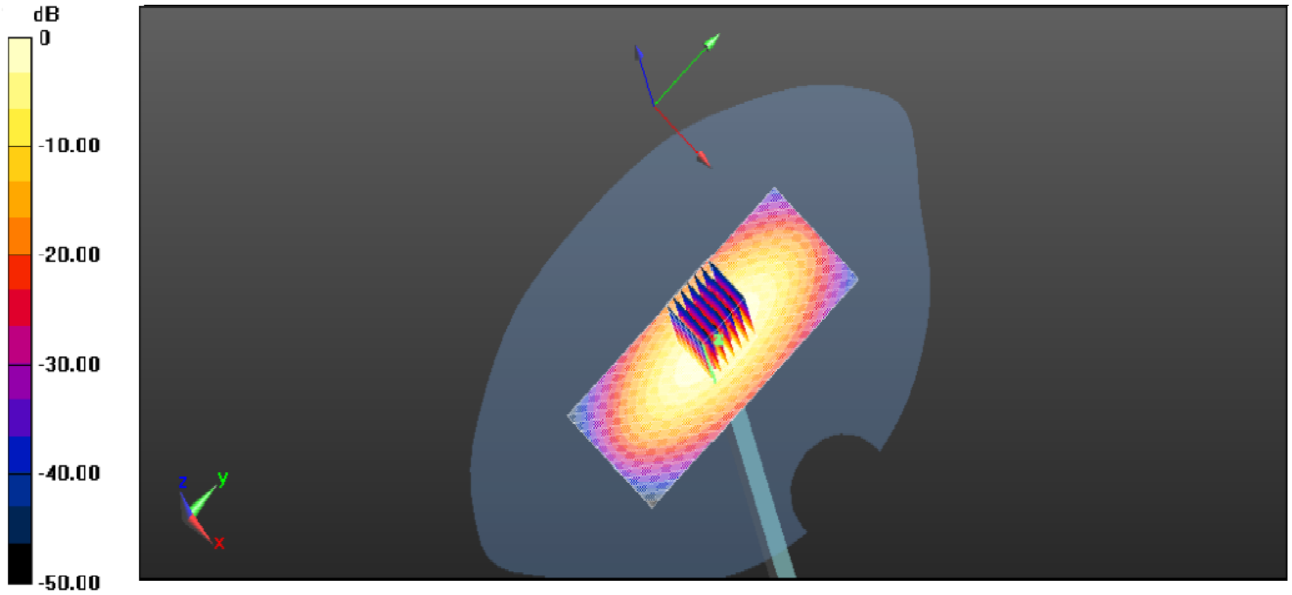
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 83.816 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 16.826 W/kg

SAR (1 g) = 9.51 mW/g; SAR (10 g) = 5.15 mW/g

Maximum value of SAR (measured) = 16.34 mW/g



0 dB = 16.34 mW/g = 24.35 dB mW/g

System Performance Check 1900MHz Body 250mW

System Performance Check at 2450 MHz Head

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

Date/Time: 11/20/2014

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

Medium parameters used (interpolated): f = 2450 MHz; σ = 1.78 S/m; ε_r = 39.28; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

Probe: ES3DV4 - SN3842; ConvF (7.26, 7.26, and 7.26); Calibrated: 06/06/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

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

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Area Scan (61x91x1): Measurement grid: dx=15.00 mm, dy=15.00 mm

Maximum value of SAR (interpolated) = 14.9 mW/g

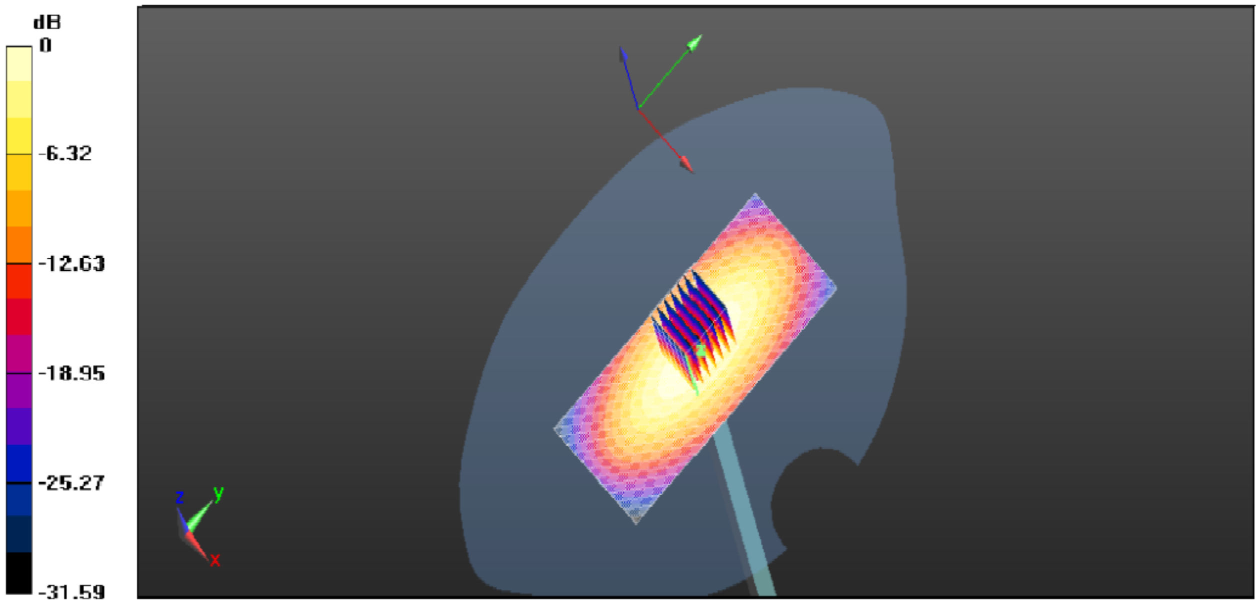
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 97.714 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 26.08 mW/g

SAR (1 g) = 12.47 mW/g; SAR (10 g) = 5.75 mW/g

Maximum value of SAR (measured) = 14.8 mW/g



0 dB = 14.9 mW/g = 23.46 dB mW/g

System Performance Check 2450MHz Head 250mW

System Performance Check at 2450 MHz Body

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

Date/Time: 11/20/2014

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

Medium parameters used (interpolated): f = 2450 MHz; σ = 1.98 S/m; ε_r = 54.42; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

Probe: ES3DV4 - SN3842; ConvF (6.93, 6.93, and 6.93); Calibrated: 06/06/2013;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1315; Calibrated: 25/11/2014

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Area Scan (61x91x1): Measurement grid: dx=15.00 mm, dy=15.00 mm

Maximum value of SAR (interpolated) = 13.15 mW/g

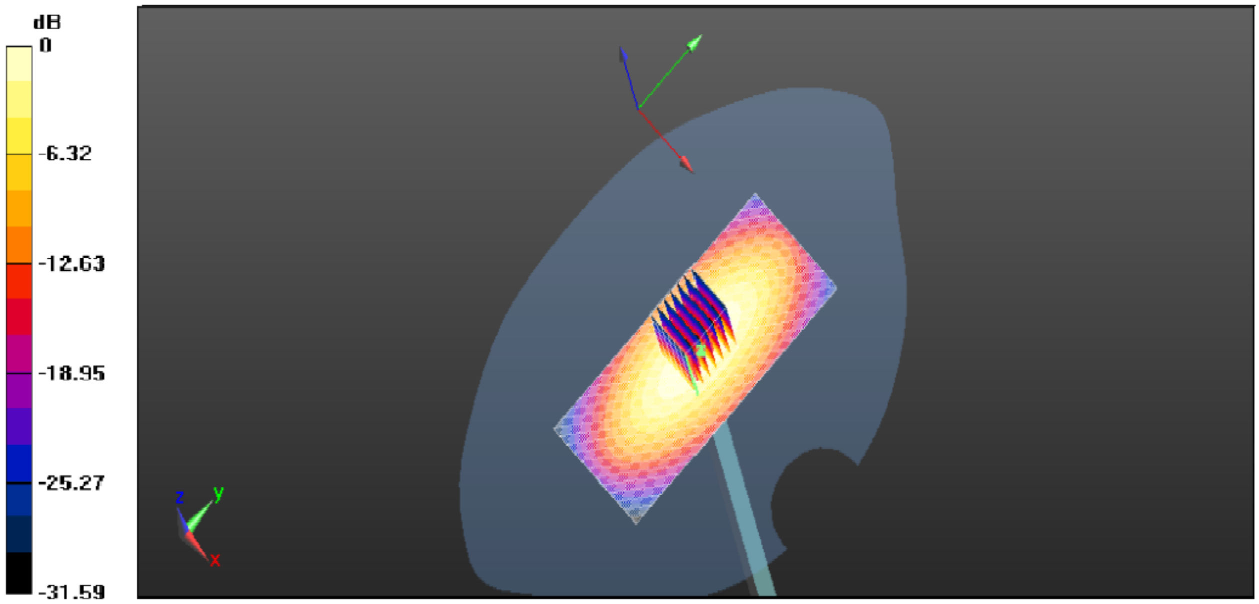
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 97.986 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 16.08 mW/g

SAR (1 g) = 12.53 mW/g; SAR (10 g) = 5.64 mW/g

Maximum value of SAR (measured) = 16.08 mW/g



0 dB = 16.08 mW/g = 24.67 dB mW/g

System Performance Check 2450MHz Body 250mW

10. SAR Test Graph Results

GSM850 Right Head Cheek Middle Channel

Date/Time: 11/20/2014

Communication System: Customer System; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.93 S/m; ε_r = 42.55; ρ = 1000 kg/m^3

Phantom section: Right Head Section

Probe: ES3DV4 - SN3842; ConvF (8.83, 8.83, and 8.83); Calibrated: 06/06/2014;

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

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (200x115x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.126 W/kg

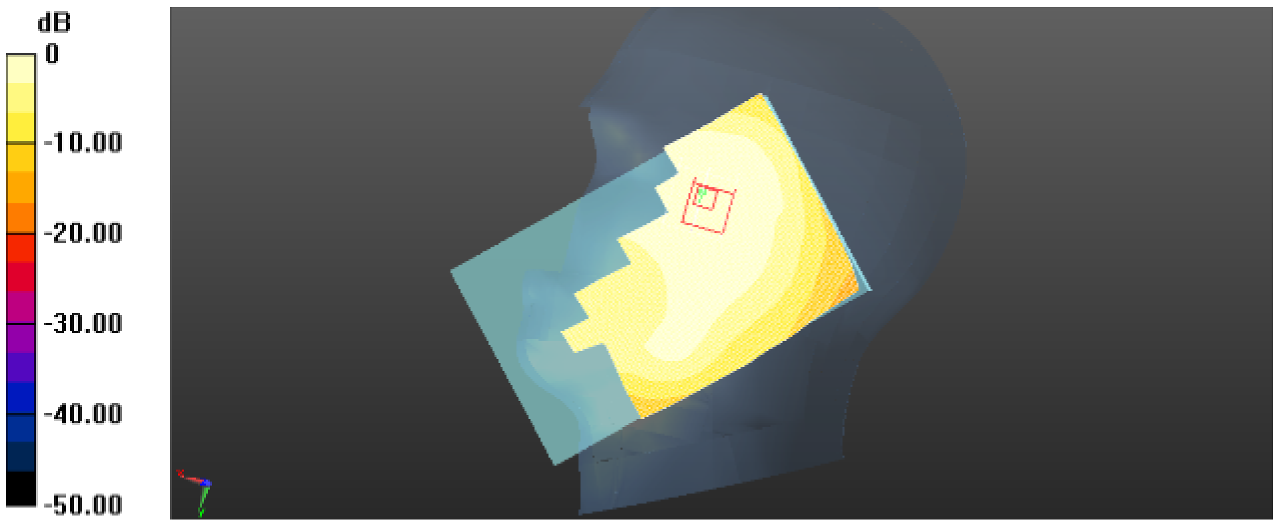
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.615 V/m; Power Drift = -0.15 dB

Peak SAR (extrapolated) = 0.147 W/kg

SAR (1 g) = 0.123 W/kg; SAR (10 g) = 0.097 W/kg

Maximum value of SAR (measured) = 0.128 W/kg



0 dB = 0.126 W/kg = -17.99 dB W/kg

Plot 1: Right Head Cheek (GSM850 Middle Channel)

GSM850 GPRS 2TS Body Rear Side Middle Channel

Date/Time: 11/20/2014

Communication System: Customer System; Frequency: 836.6 MHz; Duty Cycle: 1:4

Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.94 S/m; ε_r = 55.13; ρ = 1000 kg/m^3

Phantom section: Body- worn

Probe: ES3DV4 - SN3842; ConvF (9.09, 9.09, and 9.09); Calibrated: 06/06/2014;

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

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (200x115x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.743 W/kg

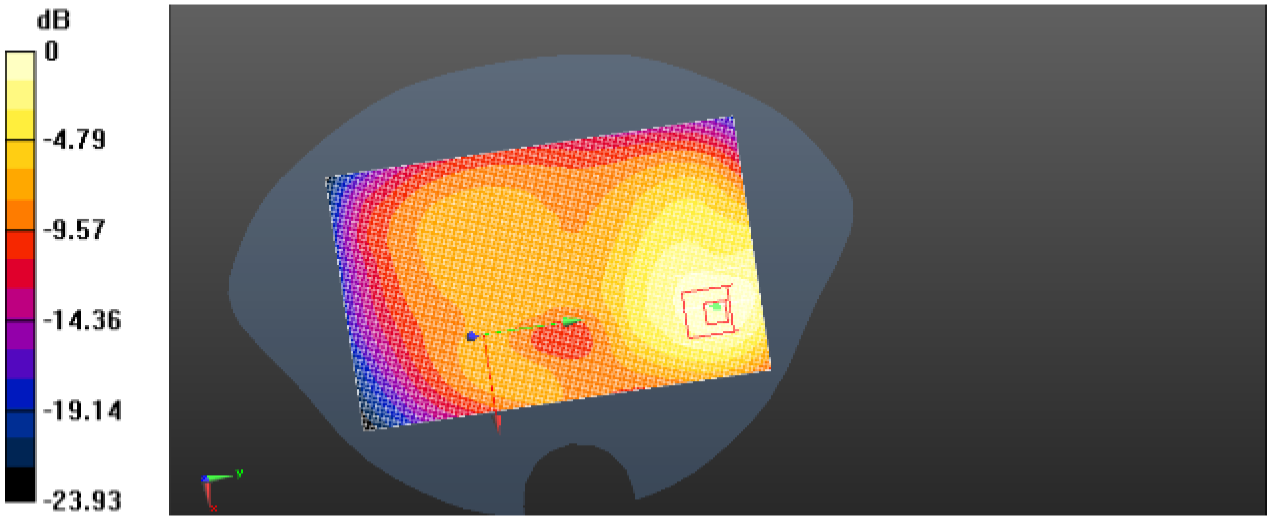
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.828 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.849 W/kg

SAR(1 g) = 0.567 W/kg; SAR(10 g) = 0.371 W/kg

Maximum value of SAR (measured) = 0.595 W/kg



0 dB = 0.743 W/kg = -2.58 dB W/kg

Plot 2: Body Rear Side (GSM850 GPRS 2TS Middle Channel)

GSM1900 Right Head Cheek Middle Channel

Date/Time: 11/20/2014

Communication System: Customer System; Frequency: 1880.0 MHz;Duty Cycle:1:8.3

Medium parameters used (interpolated): f = 1880.0 MHz; σ = 1.38 S/m; ε_r = 40.90; ρ = 1000 kg/m^3

Phantom section : Right Head Section

Probe: ES3DV4 - SN3842; ConvF (7.55, 7.55, 7.55); Calibrated: 06/06/2014;

Sensor-Surface: 4mm (Mechanical Surface Detection)

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

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (200x115x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.298 W/kg

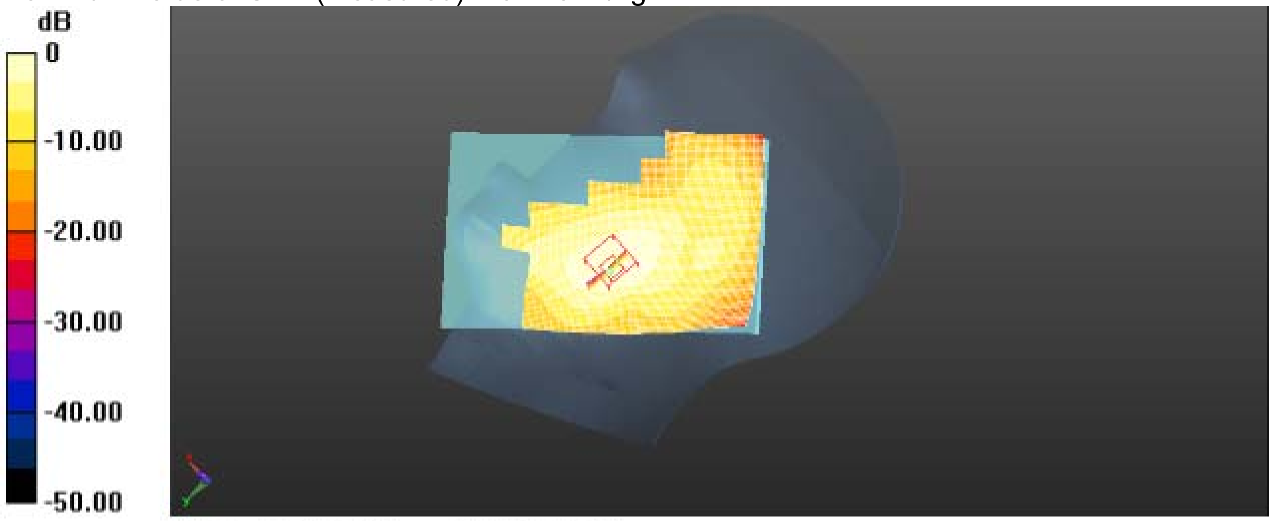
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.866 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.352 W/kg

SAR (1 g) = 0.259 W/kg; SAR (10 g) = 0.169 W/kg

Maximum value of SAR (measured) = 0.275 W/kg



0 dB = 0.298 W/kg = -10.52 dB W/kg

Plot 3: Right Head Cheek (GSM1900 Middle Channel)

GSM1900 GPRS 2TS Body Rear Side Middle Channel

Date/Time: 11/20/2014

Communication System: Customer System; Frequency: 1880.0 MHz;Duty Cycle:1:4

Medium parameters used (interpolated): f = 1880.0 MHz; σ = 1.53 S/m; ε_r = 53.53; ρ = 1000 kg/m^3

Phantom section: Body- worn

Probe: ES3DV4 - SN3842; ConvF (7.43, 7.43, 7.43); Calibrated: 06/06/2014;

Sensor-Surface: 4mm (Mechanical Surface Detection)

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

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (200x115x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.740 W/kg

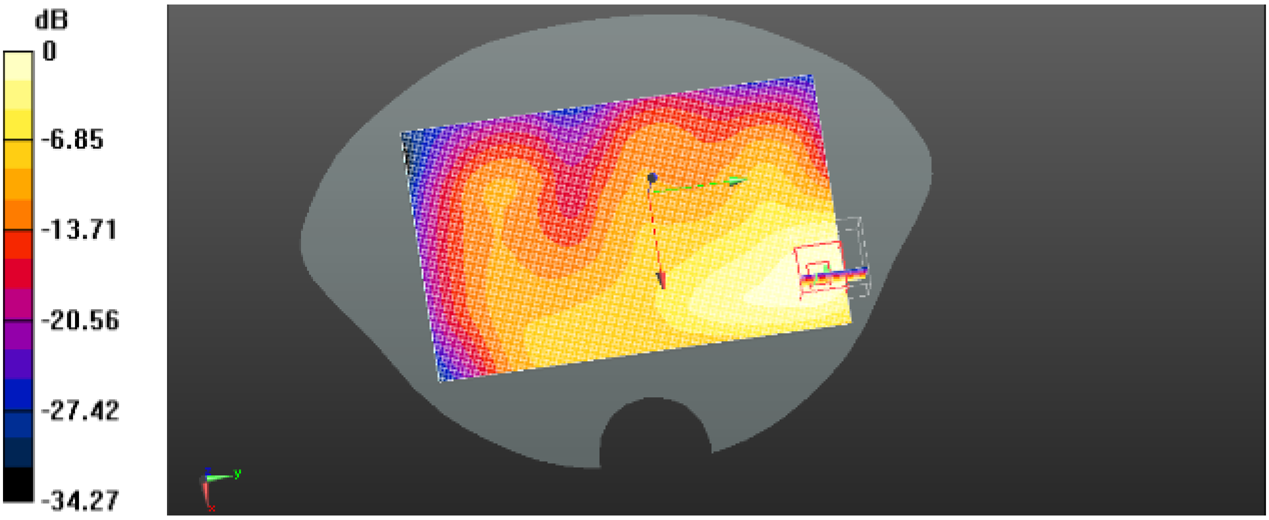
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.012 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 1.188 W/kg

SAR (1 g) = 0.665 W/kg; SAR (10 g) = 0.390 W/kg

Maximum value of SAR (measured) = 0.700 W/kg



0 dB = 0.740 W/kg = -2.62 dB W/kg

Plot 4: Body Rear Side (GSM1900 GPRS 2TS Middle Channel)

WCDMA Band II Right Head Cheek Middle Channel

Date/Time: 11/20/2014

Communication System: Customer System; Frequency: 1880.0 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): f = 1880.0 MHz; σ = 1.37 S/m; ε_r = 40.12; ρ = 1000 kg/m^3

Phantom section: Right Head Section

Probe: ES3DV4 - SN3842; ConvF (7.55, 7.55, and 7.55); Calibrated: 06/06/2014;

Sensor-Surface: 4mm (Mechanical Surface Detection)

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

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (200x115x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.595 W/kg

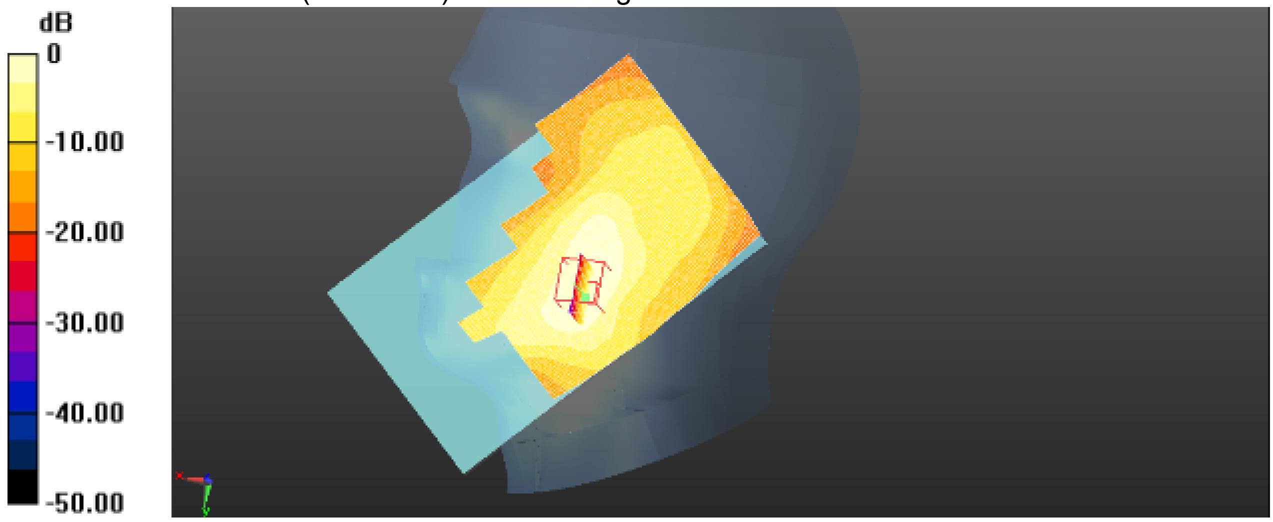
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.536 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 0.739 W/kg

SAR(1 g) = 0.515 W/kg; SAR(10 g) = 0.321 W/kg

Maximum value of SAR (measured) = 0.564 W/kg



0 dB = 0.595 W/kg = -4.51 dB W/kg

Plot 5: Right Head Cheek (WCDMA Band II Middle Channel)

WCDMA Band II RMC Body Rear Side Middle Channel

Date/Time: 11/20/2014

Communication System: Customer System; Frequency: 1880.0 MHz;Duty Cycle:1:1

Medium parameters used (interpolated): f = 1880.0 MHz; σ = 1.54 S/m; ε_r = 53.27; ρ = 1000 kg/m^3

Phantom section: Body- worn

Probe: ES3DV4 - SN3842; ConvF(7.43, 7.43, 7.43); Calibrated: 06/06/2014;

Sensor-Surface: 4mm (Mechanical Surface Detection)

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

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (200x115x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0. 674 W/kg

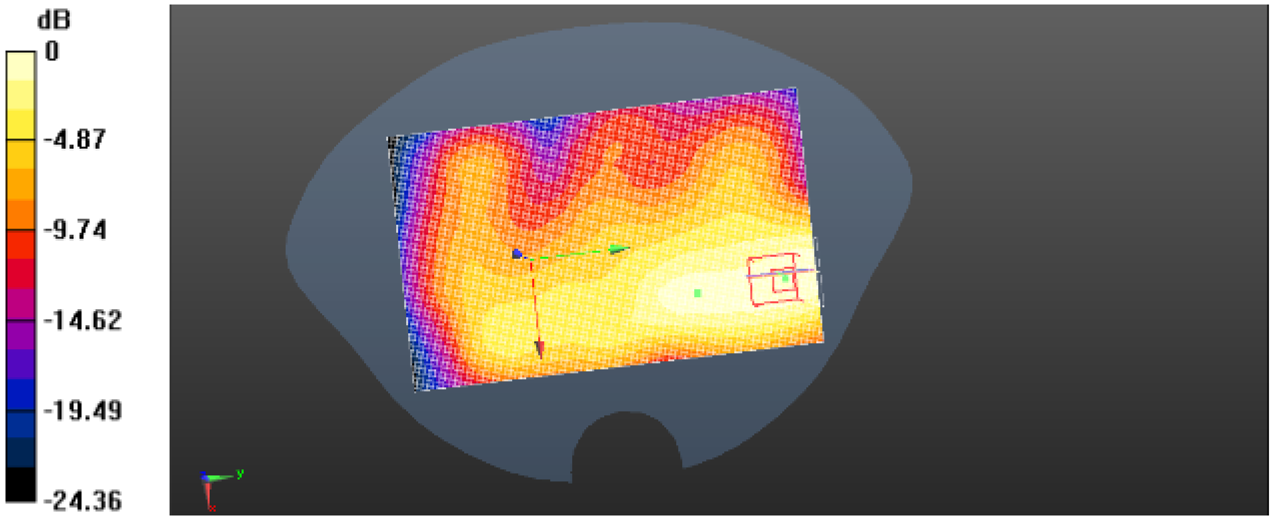
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.507 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 1.048 W/kg

SAR(1 g) = 0.616 W/kg; SAR(10 g) = 0.364 W/kg

Maximum value of SAR (measured) = 0.667 W/kg



0 dB = 0.674 W/kg = -3.43 dB W/kg

Plot 6: Body Rear Side (WCDMA Band II RMC Middle Channel)

WCDMA Band V Right Head Cheek Middle Channel

Date/Time: 11/20/2014

Communication System: Customer System; Frequency: 836.4 MHz;Duty Cycle:1:1

Medium parameters used (interpolated): f = 836.4 MHz; σ = 0.90 S/m; ε_r = 42.02; ρ = 1000 kg/m^3

Phantom section: Right Head Section

Probe: ES3DV4 - SN3842; ConvF (8.83, 8.83, and 8.83); Calibrated: 06/06/2014;

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

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (200x115x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.495 W/kg

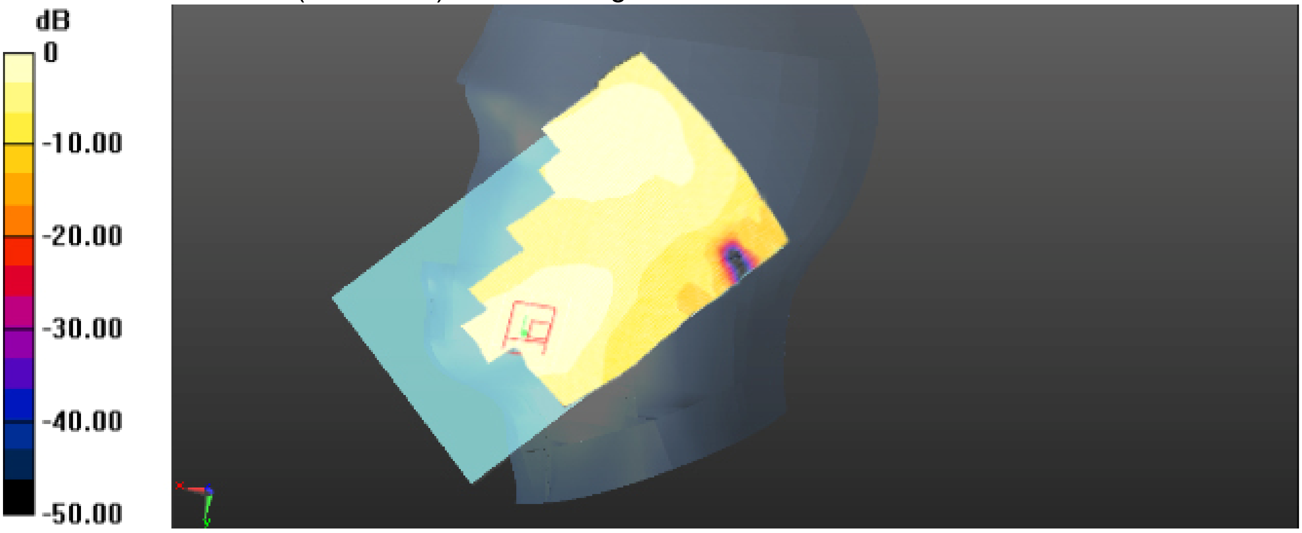
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.192 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 0.684 W/kg

SAR (1 g) = 0.395 W/kg; SAR (10 g) = 0.191 W/kg

Maximum value of SAR (measured) = 0.464 W/kg



0 dB = 0.495 W/kg = -6.11 dB W/kg

Plot 7: Right Head Cheek (WCDMA Band V Middle Channel)

WCDMA Band V RMC Body Rear Side Middle Channel

Date/Time: 11/20/2014

Communication System: Customer System; Frequency: 836.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): f = 836.4 MHz; σ = 0.95 S/m; ε_r = 55.52; ρ = 1000 kg/m^3

Phantom section: Body- worn

Probe: ES3DV4 - SN3842; ConvF (9.09, 9.09, and 9.09); Calibrated: 06/06/2014;

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

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (200x115x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0. 546 W/kg

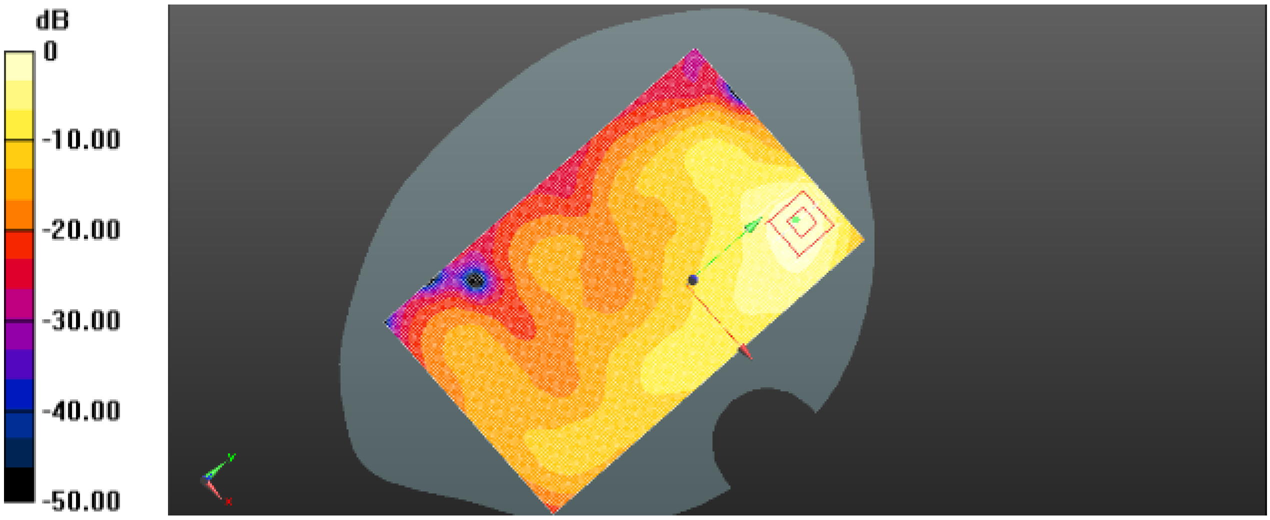
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.513 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 1.017 W/kg

SAR(1 g) = 0.479 W/kg; SAR(10 g) = 0.232 W/kg

Maximum value of SAR (measured) = 0.519 W/kg



0 dB = 0.546 W/kg = -5.26 dB W/kg

Plot 8: Body Rear Side (WCDMA Band V RMC Middle Channel)

Left Head Cheek (WLAN2450 Middle Channel-Channel 6-2437MHz (1Mbps))

Date/Time: 11/20/2014

Communication System: Customer System; Frequency: 2437.0 MHz;Duty Cycle:1:1

Medium parameters used (interpolated): f = 2437.0 MHz; σ = 1.79 S/m; ε_r = 39.12; ρ = 1000 kg/m^3

Phantom section: Left Head Section:

Probe: ES3DV4 - SN3842; ConvF (7.26, 7.26, and 7.26); Calibrated: 06/06/2014;

Sensor-Surface: 4mm (Mechanical Surface Detection)

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

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (200x115x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.807W/kg

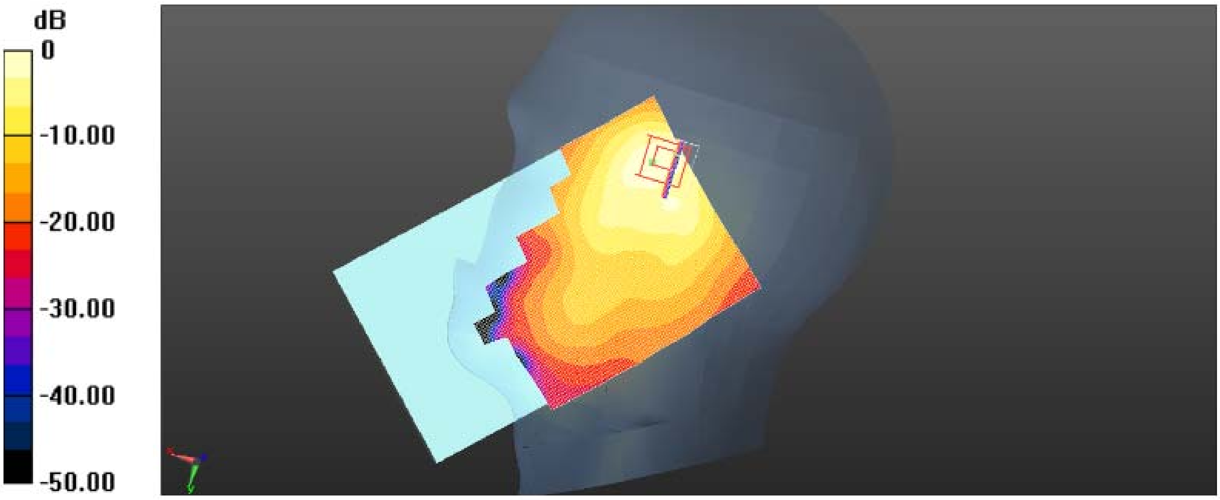
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.262 V/m; Power Drift =-0.11 dB

Peak SAR (extrapolated) = 1.857 W/kg

SAR (1 g) = 0.748 W/kg; SAR (10 g) = 0.324 W/kg

Maximum value of SAR (measured) = 0.798 W/kg



0 dB = 0.807 W/kg = -1.86 dB W/kg

Plot 9: Left Head Cheek (WLAN2450 Middle Channel-Channel 6-2437MHz (1Mbps))

Body- worn Rear Side (WLAN2450 Middle Channel-Channel 6-2437MHz (1Mbps))

Date/Time: 11/20/2014

Communication System: Customer System; Frequency: 2437.0 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): f = 2437.0 MHz; σ = 1.96 S/m; ε_r = 52.65; ρ = 1000 kg/m^3

Phantom section: Body- worn

Probe: ES3DV4 - SN3842; ConvF (6.93, 6.93, and 6.93); Calibrated: 06/06/2014;

Sensor-Surface: 4mm (Mechanical Surface Detection)

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

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (200x115x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.493 W/kg

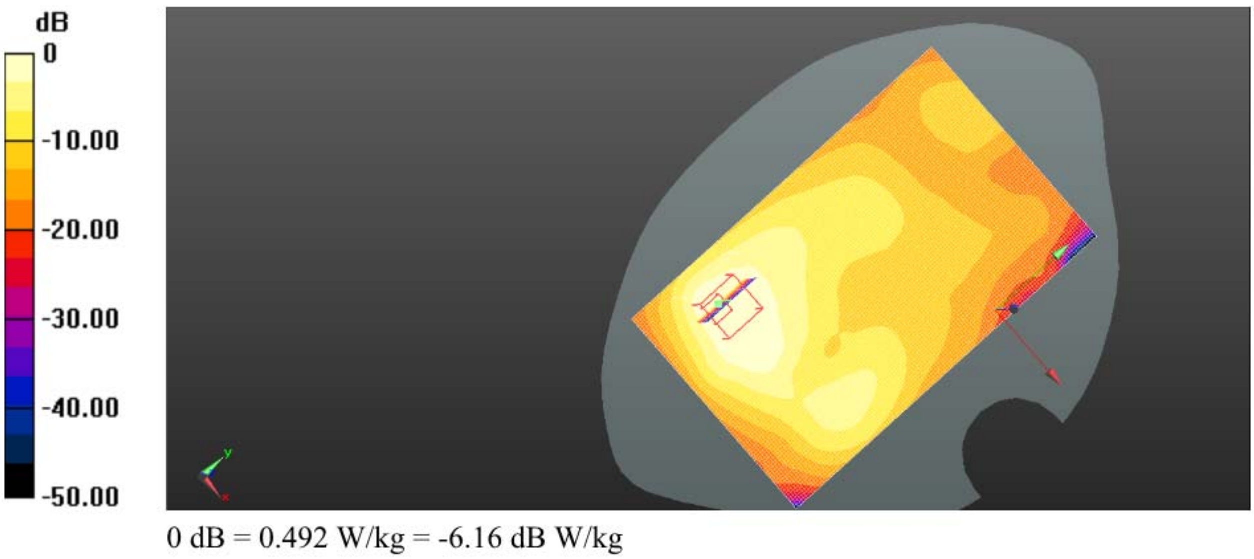
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 3.762 V/m; Power Drift = -0.09dB

Peak SAR (extrapolated) = 1.151 W/kg

SAR (1 g) = 0.494 W/kg; SAR (10 g) = 0.234 W/kg

Maximum value of SAR (measured) = 0.518 W/kg



Plot 10: Body- worn Rear Side (WLAN2450 Middle Channel-Channel 6-2437MHz (1Mbps))