



SAR TEST REPORT

Product Name	HUAWEI MediaPad X1 7.0
Model Name	7D-501g
FCC ID	QIS7D-501G
Client	Huawei Technologies Co., Ltd.
Manufacturer	Huawei Technologies Co., Ltd.
Date of issue	March 25, 2014

TA Technology (Shanghai) Co., Ltd.

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No. RHA1403-0023SAR

Page 2 of 165

GENERAL SUMMARY

Reference Standard(s)	<p>FCC 47CFR §2.1093 Radiofrequency Radiation Exposure Evaluation: Portable Devices</p> <p>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)</p> <p>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.</p> <p>RSS-102 Issue 4 March 2010: Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands).</p> <p>KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r03: SAR Measurement Requirements for 100 MHz to 6 GHz</p> <p>KDB 447498 D01 General RF Exposure Guidance v05r02: Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies</p> <p>KDB 941225 D03 SAR Test Reduction GSM/GPRS/EDGE v01: Recommended SAR Test Reduction Procedures for GSM/GPRS/EDGE</p> <p>KDB 616217 D04 SAR for laptop and tablets v01r01: SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers</p> <p>KDB 648474 D04 Handset SAR v01r02 SAR Evaluation Considerations for Wireless Handsets</p>
Conclusion	<p>This portable wireless equipment has been measured in all cases requested by the relevant standards. Test results in Chapter 7 of this test report are below limits specified in the relevant standards for the tested bands only.</p> <p>General Judgment: Pass</p>
Comment	<p>The test result only responds to the measured sample.</p>

Approved by Weizhong Yang
Weizhong Yang
Director

Revised by Minbao Ling
Minbao Ling
SAR Manager

Performed by Yi Zhang
Yi Zhang
SAR Engineer

TABLE OF CONTENT

1. General Information	5
1.1. Notes of the Test Report.....	5
1.2. Testing Laboratory.....	5
1.3. Applicant Information	6
1.4. Manufacturer Information.....	6
1.5. Information of EUT.....	7
1.6. The Maximum Reported SAR _{1g}	8
1.7. Maximum Conducted Power of Each Tested Mode.....	9
1.8. Test Date	9
2. SAR Measurements System Configuration.....	10
2.1. SAR Measurement Set-up.....	10
2.2. DASY5 E-field Probe System	11
2.2.1. EX3DV4 Probe Specification	11
2.2.2. E-field Probe Calibration.....	12
2.3. Other Test Equipment	12
2.3.1. Device Holder for Transmitters	12
2.3.2. Phantom	13
2.4. Scanning Procedure	13
2.5. Data Storage and Evaluation	15
2.5.1. Data Storage.....	15
2.5.2. Data Evaluation by SEMCAD	15
3. Laboratory Environment.....	17
4. Tissue-equivalent Liquid	18
4.1. Tissue-equivalent Liquid Ingredients.....	18
4.2. Tissue-equivalent Liquid Properties	20
5. System Check.....	21
5.1. Description of System Check.....	21
5.2. System Check Results.....	24
6. Operational Conditions during Test.....	25
6.1. General Description of Test Procedures	25
6.2. Test Configuration.....	25
6.2.1. GSM Test Configuration.....	25
6.2.2. WIFI Test Configuration	27
6.3. Measurement Variability.....	27
6.4. Test Positions.....	28
6.4.1. Against Phantom Head.....	28
6.4.2. Body Configuration	28
6.4.3. SAR test reduction and exclusion guidance.....	28
7. Test Results	31
7.1. Conducted Power Results	31
7.2. SAR Test Results	36
7.2.1. GSM 850 (GSM/GPRS/EGPRS)	36
7.2.2. GSM 1900 (GSM/GPRS/EGPRS)	38

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No. RHA1403-0023SAR

Page 4 of 165

7.2.3. WIFI (802.11b, WIFI)	41
7.2.4. BT	43
7.3. Simultaneous Transmission Conditions	44
8. Measurement Uncertainty	49
9. Main Test Instruments	50
ANNEX A: Test Layout	51
ANNEX B: System Check Results	55
ANNEX C: Graph Results(Original).....	61
ANNEX D: Graph Results (Variant).....	104
ANNEX E: Probe Calibration Certificate.....	117
ANNEX F: D835V2 Dipole Calibration Certificate	128
ANNEX G: D1900V2 Dipole Calibration Certificate.....	136
ANNEX H: D2450V2 Dipole Calibration Certificate	144
ANNEX I: DAE4 Calibration Certificate	152
ANNEX J: The EUT Appearances and Test Configuration	157
ANNEX K Product Change Description.....	165

1. General Information

1.1. Notes of the Test Report

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS), and accreditation number: L2264.

TA Technology (Shanghai) Co., Ltd. guarantees the reliability of the data presented in this test report, which is the results of measurements and tests performed for the items under test on the date and under the conditions stated in this test report and is based on the knowledge and technical facilities available at TA Technology (Shanghai) Co., Ltd. at the time of execution of the test.

TA Technology (Shanghai) Co., Ltd. is liable to the client for the maintenance by its personnel of the confidentiality of all information related to the items under test and the results of the test. This report only refers to the item that has undergone the test.

This report alone does not constitute or imply by its own an approval of the product by the certification Bodies or competent Authorities. This report cannot be used partially or in full for publicity and/or promotional purposes without previous written approval of **TA Technology (Shanghai) Co., Ltd.** and the Accreditation Bodies, if it applies.

If the electronic report is inconsistent with the printed one, it should be subject to the latter.

1.2. Testing Laboratory

Company: TA Technology (Shanghai) Co., Ltd.
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China
City: Shanghai
Post code: 201201
Country: P. R. China
Contact: Yang Weizhong
Telephone: +86-021-50791141/2/3
Fax: +86-021-50791141/2/3-8000
Website: <http://www.ta-shanghai.com>
E-mail: yangweizhong@ta-shanghai.com

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No. RHA1403-0023SAR

Page 6 of 165

1.3. Applicant Information

Company: Huawei Technologies Co., Ltd.
Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian,
Longgang District
Address: Shenzhen
518129
P.R.China

1.4. Manufacturer Information

Company: Huawei Technologies Co., Ltd.
Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian,
Longgang District
Address: Shenzhen
518129
P.R.China

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No. RHA1403-0023SAR

Page 7 of 165

1.5. Information of EUT

General Information

Device Type:	Portable Device		
Exposure Category:	Uncontrolled Environment / General Population		
State of Sample:	Prototype Unit		
IMEI:	869077010010724		
Hardware Version:	SH1S7501LM		
Software Version:	7D-501gV100R001C001		
Antenna Type:	Internal Antenna		
Device Operating Configurations:			
Tested Mode(s):	GSM 850/ GSM 1900; Bluetooth ; WiFi(802.11b/g/n HT20/ n HT40);		
Test Modulation:	(GSM)GMSK; (WIFI)BPSK		
Device Class:	B		
GPRS Multislot Class(12):	Max Number of Timeslots in Uplink	4	
	Max Number of Timeslots in Downlink	4	
	Max Total Timeslot	5	
EGPRS Multislot Class(12):	Max Number of Timeslots in Uplink	4	
	Max Number of Timeslots in Downlink	4	
	Max Total Timeslot	5	
Power Class:	GSM 850: 4		
	GSM 1900: 1		
Power Level:	GSM 850: tested with power level 5		
	GSM 1900: tested with power level 0		
Test Channel: (Low - Middle - High)	128 -190 - 251	(GSM 850)	
	512 - 661 - 810	(GSM 1900)	
	0-39-78	(Bluetooth)	
	1-6-11	(802.11b/g/n HT20)	
	3-6-9	(802.11n HT40)	
Test Frequency Range(s):	Mode	Tx (MHz)	Rx (MHz)
	GSM 850	824.2 ~ 848.8	869.2 ~ 893.8
	GSM 1900	1850.2 ~ 1909.8	1930.2 ~ 1989.8
	Bluetooth	2402 ~ 2480	2402 ~ 2480
	WIFI	2412 ~ 2462	2412 ~ 2462

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No. RHA1403-0023SAR

Page 8 of 165

Equipment Under Test (EUT) has a GSM antenna that is used for Tx/Rx, the second is BT/WIFI antenna that can be used for Tx/Rx.

7D-501g is a variant model of 7D-501u. SAR values duplicated from 7D-501u for 7D-501g, the report number of 7D-501u is RHA1403-0022SAR. The detailed product change description please refers to the ANNEX K.

The sample undergoing test was selected by the Client.

Components list please refer to documents of the manufacturer.

1.6. The Maximum Reported SAR_{1g}

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	Right, cheek	190/836.6	0.214	0.286
GSM 1900	Right, cheek	810/1909.8	0.840	1.149
WiFi(802.11b)	Right, cheek	6/2437	0.056	0.057

Body 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)
2Txslots GPRS 850	Test Position 1/ Back side	190/836.6	0.499	0.673
2Txslots GPRS 1900	Test Position 1/ Back side	661/1880	1.290	1.464
WiFi(802.11b)	Test Position 1/ Back side	6/2437	0.564	0.573

TA Technology (Shanghai) Co., Ltd.
Test Report

1.7. Maximum Conducted Power of Each Tested Mode

Mode		Maximum Burst Conducted Power (dBm)	Maximum Average Power (dBm)
GSM 850 (Original)	GSM	32.91	23.88
	GPRS(GMSK), 2 Txslots	30.74	24.72
	EGPRS(GMSK), 2 Txslots	30.74	24.72
GSM 1900 (Original)	GSM	29.71	20.68
	GPRS(GMSK), 2 Txslots	28.45	22.43
	EGPRS(GMSK), 2 Txslots	28.45	22.43

Mode		Maximum Burst Conducted Power (dBm)	Maximum Average Power (dBm)
GSM 850 (Variant)	GSM	32.91	23.88
	GPRS(GMSK), 2 Txslots	30.70	24.68
	EGPRS(GMSK), 2 Txslots	30.70	24.68
GSM 1900 (Variant)	GSM	29.71	20.68
	GPRS(GMSK), 2 Txslots	28.45	22.43
	EGPRS(GMSK), 2 Txslots	28.45	22.43

Mode	Maximum Conducted Power (dBm)
WiFi(802.11b)	14.93

Note: The detail Power refers to Table 14 (Conducted Power Measurement Results).

1.8. Test Date

The test performed from March 14, 2014 to March 19, 2014.

2. SAR Measurements System Configuration

2.1. 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.

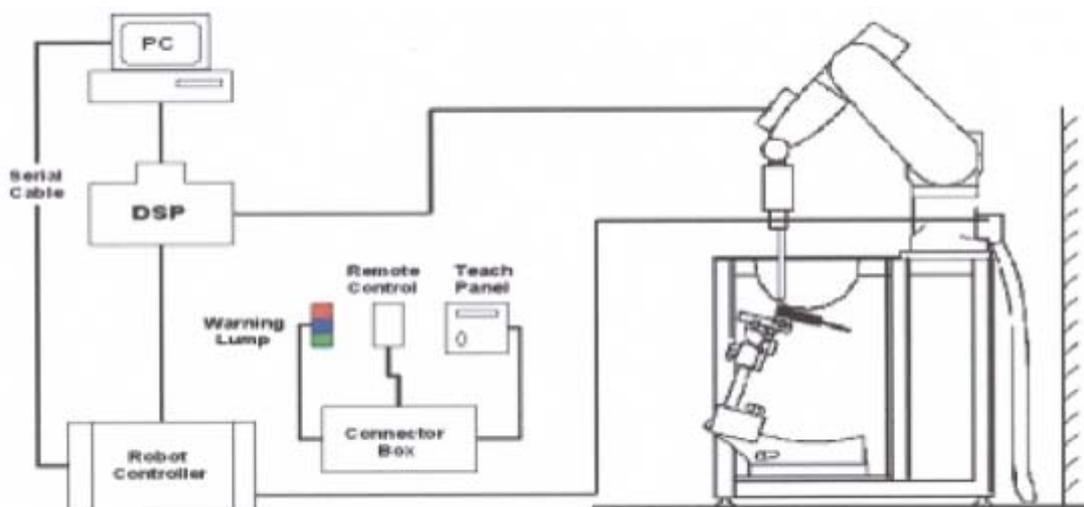


Figure 1. SAR Lab Test Measurement Set-up

2.2. DASY5 E-field Probe System

The SAR measurements were conducted with the dosimetric probe EX3DV4 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation.

2.2.1. EX3DV4 Probe Specification

Construction	Symmetrical design with triangular core 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 > 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	10 μ W/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μ W/g)
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.



Figure 2. EX3DV4 E-field Probe



Figure 3. EX3DV4 E-field probe

2.2.2. E-field Probe Calibration

Each probe is calibrated according to a dosimetric assessment procedure with accuracy better than $\pm 10\%$. The spherical isotropy was evaluated and found to be better than $\pm 0.25\text{dB}$. The sensitivity parameters (NormX, NormY, NormZ), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe are tested.

The free space E-field from amplified probe outputs is determined in a test chamber. This is performed in a TEM cell for frequencies below 1 GHz, and in a wave guide above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees.

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The measured free space E-field in the medium correlates to temperature rise in a dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

$$\text{SAR} = C \frac{\Delta T}{\Delta t}$$

Where: Δt = Exposure time (30 seconds),
C = Heat capacity of tissue (brain or muscle),
 ΔT = Temperature increase due to RF exposure.
Or

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

Where:
 σ = Simulated tissue conductivity,
 ρ = Tissue density (kg/m³).

2.3. Other Test Equipment

2.3.1. Device Holder for Transmitters

Construction: Simple but effective and easy-to-use extension for Mounting Device that facilitates the testing of larger devices according to IEC 62209-2 (e.g., laptops, cameras, etc.) It is lightweight and fits easily on the upper part of the Mounting Device in place of the phone positioner. The extension is fully compatible with the Twin SAM, ELI4 and SAM v6.0 Phantoms.

Material: POM, Acrylic glass, Foam

2.3.2. Phantom

Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI is fully compatible with the IEC 62209-2 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all SPEAG do symmetric probes and dipoles.

Shell Thickness	2±0.2 mm
Filling Volume	Approx. 30 liters
Dimensions	190×600×0 mm (H x L x W)



Figure 4.ELI4 Phantom

2.4. 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°.)

TA Technology (Shanghai) Co., Ltd.

Test Report

- **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.

- **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 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.

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

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

Frequency	Maximum Area Scan Resolution (mm) ($\Delta x_{area}, \Delta y_{area}$)	Maximum Zoom Scan Resolution (mm) ($\Delta x_{zoom}, \Delta y_{zoom}$)	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

2.5. Data Storage and Evaluation

2.5.1. 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 “.DAE4”. 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.

2.5.2. Data Evaluation by SEMCAD

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, a _{i0} , a _{i1} , a _{i2}
	- Conversion factor	ConvF _i
	- Diode compression point	Dcp _i
Device parameters:	- Frequency	f
	- Crest factor	cf
Media parameters:	- Conductivity	
	- Density	

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.

TA Technology (Shanghai) Co., Ltd.
Test Report

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:

$$V_i = U_i + U_i^2 \cdot c f / d c p_i$$

With V_i = compensated signal of channel i (i = x, y, z)

U_i = input signal of channel i (i = x, y, z)

cf = crest factor of exciting field (DASY parameter)

dcp_i = diode compression point (DASY parameter)

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

E-field probes: $E_i = (V_i / Norm_i \cdot ConvF)^{1/2}$

H-field probes: $H_i = (V_i)^{1/2} \cdot (a_{i0} + a_{i1} f + a_{i2} f^2) / f$

With V_i = compensated signal of channel i (i = x, y, z)

$Norm_i$ = sensor sensitivity of channel i (i = x, y, z)
[mV/(V/m)²] for E-field Probes

$ConvF$ = sensitivity enhancement in solution

a_{ij} = sensor sensitivity factors for H-field probes

f = carrier frequency [GHz]

E_i = electric field strength of channel i in V/m

H_i = magnetic field strength of channel i in A/m

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

$$E_{tot} = (E_x^2 + E_y^2 + E_z^2)^{1/2}$$

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

$$SAR = (E_{tot})^2 \cdot \sigma / (\rho \cdot 1000)$$

with SAR = local specific absorption rate in mW/g

E_{tot} = 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. The power flow density is calculated assuming the excitation field to be a free space field.

$$P_{pwe} = E_{tot}^2 / 3770 \quad \text{or} \quad P_{pwe} = H_{tot}^2 \cdot 37.7$$

with P_{pwe} = equivalent power density of a plane wave in mW/cm²

E_{tot} = total electric field strength in V/m

H_{tot} = total magnetic field strength in A/m

3. Laboratory Environment

Table 2: The Requirements of the Ambient Conditions

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.	

4. Tissue-equivalent Liquid

4.1. Tissue-equivalent Liquid Ingredients

The liquid is consisted of water, salt, Glycol, Sugar, Preventol and Cellulose. The liquid has previously been proven to be suited for worst-case. The table 3 and table 4 show the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the KDB 865664 D01.

Table 3: Composition of the Head Tissue Equivalent Matter

MIXTURE%	FREQUENCY(Brain) 835MHz
Water	41.45
Sugar	56
Salt	1.45
Preventol	0.1
Cellulose	1.0
Dielectric Parameters Target Value	f=835MHz $\epsilon=41.5$ $\sigma=0.9$

MIXTURE%	FREQUENCY(Brain) 1900MHz
Water	55.242
Glycol monobutyl	44.452
Salt	0.306
Dielectric Parameters Target Value	f=1900MHz $\epsilon=40.0$ $\sigma=1.40$

MIXTURE%	FREQUENCY(Brain) 2450MHz
Water	62.7
Glycol	36.8
Salt	0.5
Dielectric Parameters Target Value	f=2450MHz $\epsilon=39.20$ $\sigma=1.80$

TA Technology (Shanghai) Co., Ltd.
Test Report

Table 4: Composition of the Body Tissue Equivalent Matter

MIXTURE%	FREQUENCY(Body) 835MHz
Water	52.5
Sugar	45
Salt	1.4
Preventol	0.1
Cellulose	1.0
Dielectric Parameters Target Value	f=835MHz $\epsilon=55.2$ $\sigma=0.97$

MIXTURE%	FREQUENCY (Body) 1900MHz
Water	69.91
Glycol monobutyl	29.96
Salt	0.13
Dielectric Parameters Target Value	f=1900MHz $\epsilon=53.3$ $\sigma=1.52$

MIXTURE%	FREQUENCY(Body) 2450MHz
Water	73.2
Glycol	26.7
Salt	0.1
Dielectric Parameters Target Value	f=2450MHz $\epsilon=52.70$ $\sigma=1.95$

TA Technology (Shanghai) Co., Ltd.
Test Report

4.2. Tissue-equivalent Liquid Properties

Table 5: Dielectric Performance of Tissue Simulating Liquid

Frequency	Test Date	Temp °C	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)	2014-3-15	21.5	41.4	0.93	41.50	0.90	-0.24	3.33
1900MHz (head)	2014-3-17	21.5	39.6	1.43	40.00	1.40	-1.00	2.14
2450MHz (head)	2014-3-19	21.5	39.1	1.80	39.20	1.80	-0.26	0.00
835MHz (body)	2014-3-14	21.5	55.9	0.99	55.20	0.97	1.27	2.06
1900MHz (body)	2014-3-17	21.5	52.6	1.52	53.30	1.52	-1.31	0.00
2450MHz (body)	2014-3-18	21.5	52.1	1.99	52.70	1.95	-1.14	2.05

5. System Check

5.1. Description of System Check

The manufacturer calibrates the probes annually. Dielectric parameters of the tissue simulants were measured every day using the dielectric probe kit and the network analyzer. A system check measurement was made following the determination of the dielectric parameters of the simulant, using the dipole validation kit. A power level of 250 mW was supplied to the dipole antenna, which was placed under the flat section of the twin SAM phantom. The system check results (dielectric parameters and SAR values) are given in the table 5.

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

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

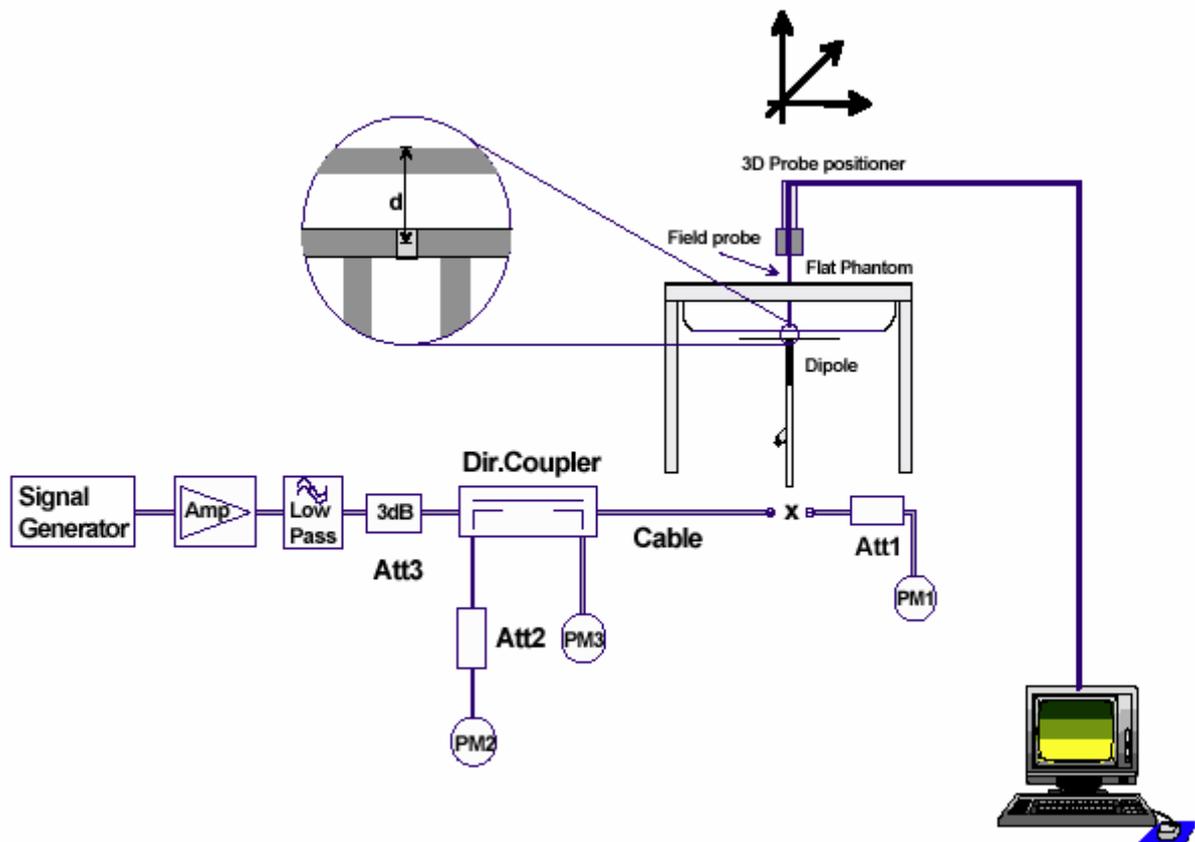


Figure 5. System Check Set-up

TA Technology (Shanghai) Co., Ltd. Test Report

Justification for Extended SAR Dipole Calibrations

Usage of SAR dipoles calibrated less than 3 years ago but more than 1 year ago were confirmed in maintaining return loss (< - 20 dB, within 20% of prior calibration) and impedance (within 5 ohm from prior calibration) requirements per extended calibrations in KDB 865664 D01:

Dipole D835V2 SN: 4d020				
Head Liquid				
Date of Measurement	Return Loss(dB)	Δ %	Impedance (Ω)	$\Delta\Omega$
8/26/2011	-27.7	/	52.9	/
8/25/2012	-29.1	5.0%	55.0	2.1 Ω
8/24/2013	-26.6	4.1%	55.3	2.4 Ω
Body Liquid				
Date of Measurement	Return Loss(dB)	Δ %	Impedance (Ω)	$\Delta\Omega$
8/26/2011	-25.1	/	48.7	/
8/25/2012	-24.3	3.2 %	50.6	1.9 Ω
8/24/2013	-24.7	1.6%	51.1	2.4 Ω

Dipole D1900V2 SN: 5d060				
Head Liquid				
Date of Measurement	Return Loss(dB)	Δ %	Impedance (Ω)	$\Delta\Omega$
8/31/2011	-22.3	/	52.6	/
8/30/2012	-21.7	2.7%	51.4	1.2 Ω
8/29/2013	-21.4	4.2%	50.5	2.1 Ω
Body Liquid				
Date of Measurement	Return Loss(dB)	Δ %	Impedance (Ω)	$\Delta\Omega$
8/31/2011	-21.3	/	47.3	/
8/30/2012	-20.9	1.9%	45.9	1.4 Ω
8/29/2013	-20.4	4.4%	44.8	2.5 Ω

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No. RHA1403-0023SAR

Page 23 of 165

Dipole D2450V2 SN: 786				
Head Liquid				
Date of Measurement	Return Loss(dB)	Δ %	Impedance (Ω)	$\Delta\Omega$
8/29/2011	-25.5	/	55.0	/
8/28/2012	-26.8	5.1%	56.5	1.5 Ω
8/27/2013	-26.4	3.5%	56.9	1.9 Ω
Body Liquid				
Date of Measurement	Return Loss(dB)	Δ %	Impedance (Ω)	$\Delta\Omega$
8/29/2011	-29.0	/	50.4	/
8/28/2012	-29.9	3.1%	52.1	1.7 Ω
8/27/2013	-28.2	2.8%	52.7	2.3 Ω

TA Technology (Shanghai) Co., Ltd.
Test Report

5.2. System Check Results

Table 6: System Check in Head Tissue Simulating Liquid

Frequency	Test Date	Dielectric Parameters		Temp (°C)	250mW Measured SAR _{1g}	1W Normalized SAR _{1g}	1W Target SAR _{1g}	Limit (±10% Deviation)
		ε _r	σ(s/m)		(W/kg)			
835MHz	2014-3-15	41.4	0.93	21.5	2.44	9.76	9.34	4.50
1900MHz	2014-3-17	39.6	1.43	21.5	9.48	37.92	40.30	-5.91
2450MHz	2014-3-19	39.1	1.80	21.5	13.70	54.8	53.80	1.86

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

Table 7: System Check in Body Tissue Simulating Liquid

Frequency	Test Date	Dielectric Parameters		Temp (°C)	250mW Measured SAR _{1g}	1W Normalized SAR _{1g}	1W Target SAR _{1g}	Limit (±10% Deviation)
		ε _r	σ(s/m)		(W/kg)			
835MHz	2014-3-14	55.9	0.99	21.5	2.52	10.08	9.46	6.55
1900MHz	2014-3-17	52.6	1.52	21.5	9.82	39.28	41.70	-5.80
2450MHz	2014-3-18	52.1	1.99	21.5	13.20	52.80	51.70	2.13

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

6. Operational Conditions during Test

6.1. General Description of Test Procedures

A communication link is set up with a System Simulator (SS) by air link, and a call is established. The EUT is commanded to operate at maximum transmitting power.

Connection to the EUT is established via air interface with E5515C, and the EUT is set to maximum output power by E5515C. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output. The antenna connected to the output of the base station simulator shall be placed at least 50 cm away from the EUT. The signal transmitted by the simulator to the antenna feeding point shall be lower than the output power level of the EUT by at least 30 dB.

6.2. Test Configuration

6.2.1. 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 timeslot is 5. Since 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 timeslot 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:

GSM 850

GPRS (GMSK) :

Number of timeslots in uplink assignment	reduction of maximum output power, (dB)
1	0
2	2
3	4
4	6

EGPRS(8PSK):

TA Technology (Shanghai) Co., Ltd.
Test Report

Number of timeslots in uplink assignment	reduction of maximum output power, (dB)
1	0
2	2
3	4
4	6

EGPRS(GMSK):

Number of timeslots in uplink assignment	reduction of maximum output power, (dB)
1	0
2	2
3	4
4	6

GSM 1900

GPRS (GMSK) :

Number of timeslots in uplink assignment	reduction of maximum output power, (dB)
1	0
2	2
3	4
4	6

EGPRS(8PSK):

Number of timeslots in uplink assignment	reduction of maximum output power, (dB)
1	0
2	2
3	4
4	6

EGPRS(GMSK):

Number of timeslots in uplink assignment	reduction of maximum output power, (dB)
1	0
2	2
3	4
4	6

6.2.2. 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 9 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.

6.3. Measurement Variability

Per FCC KDB Publication 865664 D01, SAR measurement variability was assessed for each frequency band, which was determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media were required for SAR measurements in a frequency band, the variability measurement procedures were applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. These additional measurements were repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device was returned to ambient conditions (normal room temperature) with the battery fully charged before it was re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

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

- 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.
- 2) A second repeated measurement was performed 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

6.4. Test Positions

6.4.1. Against Phantom Head

Measurements were made in “cheek” and “tilt” positions on both the left hand and right hand sides of the phantom.

The positions used in the measurements for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”.

6.4.2. Body Configuration

The overall diagonal dimension of the display section of a tablet is 23 cm > 20 cm, Per FCC KDB 616217, the back surface and edges of the tablet should be tested for SAR compliance with the tablet touching the phantom. SAR evaluation for the front surface of tablet display screens are generally not necessary. The SAR Exclusion Threshold in KDB 447498 D01 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 required for the adjacent edges, with the adjacent edge positioned against the phantom and the edge containing the antenna positioned perpendicular to the phantom.

6.4.3. SAR test reduction and exclusion guidance

(1) The SAR exclusion threshold for distances <50mm is defined by the following equation:

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

(2) The SAR exclusion threshold for distances >50mm is defined by the following equation, as illustrated in KDB 447498 D01 Appendix B:

a) at 100 MHz to 1500 MHz

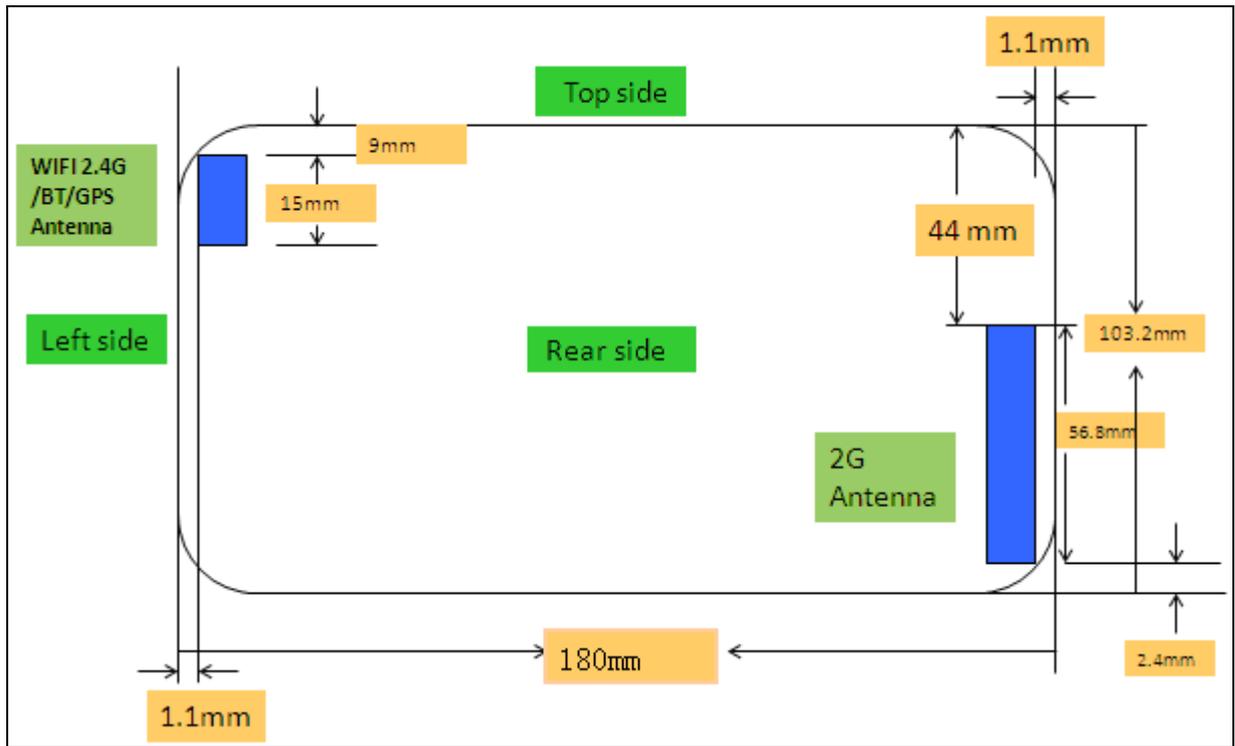
$$[\text{Power allowed at numeric Threshold at 50 mm in step 1} + (\text{test separation distance} - 50 \text{ mm}) \cdot (f_{\text{(MHz)}}/150)] \text{ mW}$$

b) at > 1500 MHz and ≤ 6 GHz

$$[\text{Power allowed at numeric Threshold at 50 mm in step 1} + (\text{test separation distance} - 50 \text{ mm}) \cdot 10] \text{ mW}$$

TA Technology (Shanghai) Co., Ltd. Test Report

The location of the antennas inside EUT is shown in ANNEX J:



- Test Position 1: The back surface of the EUT towards to the bottom of the flat phantom.(ANNEX J).
SAR is required for GSM/WiFi antenna in this position.
SAR is not required for BT antenna in this position.
Test Position 1 Evaluation $_{(GSM\ 850)} = [10^{((32-6.02)/10)}/5] * (0.8488^{1/2}) = 71.9 > 3.0$
Test Position 1 Evaluation $_{(GSM\ 1900)} = [10^{((29-6.02)/10)}/5] * (1.9098^{1/2}) = 54 > 3.0$
Test Position 1 Evaluation $_{(WiFi)} = [10^{(15/10)}/5] * (2.462^{1/2}) = 9.9 > 3.0$
Test Position 1 Evaluation $_{(BT)} = [10^{(1/10)}/5] * (2.480^{1/2}) = 0.40 < 3.0$

- Test Position 2: The left edge of the EUT towards the bottom of the flat phantom. (ANNEX J).
SAR is required for WIFI antenna in this position.
SAR is not required for GSM/BT antenna in this position.
Test Position 2 evaluation $_{(GSM\ 850)} = 164 + (178.9-50)*(848.8/150) = 893.4mW = 29.51\ dBm > (32-6.02)\ dBm = 25.98\ dBm\ (max.power)$
Test Position 2 evaluation $_{(GSM\ 1900)} = 109 + (178.9-50)*10 = 1398mW = 31.45\ dBm > (29-6.02)\ dBm = 22.98(max.power)$
Test Position 2 Evaluation $_{(WiFi)} = [10^{(15/10)}/5] * (2.462^{1/2}) = 9.9 > 3.0$
Test Position 2 Evaluation $_{(BT)} = [10^{(1/10)}/5] * (2.480^{1/2}) = 0.40 < 3.0$

TA Technology (Shanghai) Co., Ltd.

Test Report

- Test Position 3: The right edge of the EUT towards the bottom of the flat phantom. (ANNEX J).
SAR is required for GSM antenna in this position.
SAR is not required for BT/WIFI antenna in this position.
Test Position 3 Evaluation $_{(GSM\ 850)} = [10^{((32-6.02)/10)}/5] * (0.8488^{1/2}) = 71.9 > 3.0$
Test Position 3 Evaluation $_{(GSM\ 1900)} = [10^{((29-6.02)/10)}/5] * (1.9098^{1/2}) = 54 > 3.0$
Test Position 3 Evaluation $_{(WIFI)} = 96 + (178.9-50)*10 = 1385mW = 31.41\ dBm > 15\ dBm$ (max.power)
Test Position 3 Evaluation $_{(BT)} = 96 + (178.9-50)*10 = 1385mW = 31.41\ dBm > 1\ dBm$ (max.power)

- Test Position 4: The top edge of the EUT towards the bottom of the flat phantom. (ANNEX J).
SAR is required for GSM/WIFI antenna in this position.
SAR is not required for BT antenna in this position.
Test Position 4 Evaluation $_{(GSM\ 850)} = [10^{((32-6.02)/10)}/44] * (0.8488^{1/2}) = 8.2 > 3.0$
Test Position 4 Evaluation $_{(GSM\ 1900)} = [10^{((29-6.02)/10)}/44] * (1.9098^{1/2}) = 6.1 > 3.0$
Test Position 4 Evaluation $_{(WIFI)} = [10^{(15/10)}/9] * (2.462^{1/2}) = 5.5 > 3.0$
Test Position 4 Evaluation $_{(BT)} = [10^{(1/10)}/9] * (2.480^{1/2}) = 0.2 < 3.0$

- Test Position 5: The bottom edge of the EUT towards the bottom of the flat phantom. . (ANNEX J).
SAR is required for GSM antenna in this position.
SAR is not required for BT/WIFI antenna in this position.
Test Position 5 Evaluation $_{(GSM\ 850)} = [10^{((32-6.02)/10)}/5] * (0.8488^{1/2}) = 71.9 > 3.0$
Test Position 5 Evaluation $_{(GSM\ 1900)} = [10^{((29-6.02)/10)}/5] * (1.9098^{1/2}) = 54 > 3.0$
Test Position 5 Evaluation $_{(WIFI)} = 96 + (79.2-50)*10 = 388mW = 25.89\ dBm > 15\ dBm$ (max.power)
Test Position 5 Evaluation $_{(BT)} = 96 + (79.2-50)*10 = 388mW = 25.89\ dBm > 1\ dBm$ (max.power)

TA Technology (Shanghai) Co., Ltd.
Test Report

7. Test Results

7.1. Conducted Power Results

Table 8: Conducted Power Measurement Results (Original)

GSM 850		Burst Conducted Power(dBm)			/	Average power(dBm)		
		Channel 128	Channel 190	Channel 251		Channel 128	Channel 190	Channel 251
GSM		32.91	32.74	32.62	-9.03dB	23.88	23.71	23.59
GPRS (GMSK)	1Txslot	29.69	29.71	29.64	-9.03dB	20.66	20.68	20.61
	2Txslots	30.58	30.74	30.61	-6.02dB	24.56	24.72	24.59
	3Txslots	28.52	28.69	28.73	-4.26dB	24.26	24.43	24.47
	4Txslots	26.23	26.57	26.59	-3.01dB	23.22	23.56	23.58
EGPRS (GMSK)	1Txslot	32.94	32.78	32.61	-9.03dB	23.91	23.75	23.58
	2Txslots	30.58	30.74	30.61	-6.02dB	24.56	24.72	24.59
	3Txslots	28.52	28.69	28.73	-4.26dB	24.26	24.43	24.47
	4Txslots	26.23	26.57	26.59	-3.01dB	23.22	23.56	23.58
EGPRS (8PSK)	1Txslot	26.61	26.91	27.22	-9.03dB	17.58	17.88	18.19
	2Txslots	24.47	27.51	24.49	-6.02dB	18.45	21.49	18.47
	3Txslots	22.46	22.47	22.45	-4.26dB	18.2	18.21	18.19
	4Txslots	20.27	20.18	20.18	-3.01dB	17.26	17.17	17.17
GSM 1900		Burst Conducted Power(dBm)			/	Average power(dBm)		
		Channel 512	Channel 661	Channel 810		Channel 512	Channel 661	Channel 810
GSM		29.69	29.71	29.64	-9.03dB	20.66	20.68	20.61
GPRS (GMSK)	1Txslot	29.59	29.6	29.61	-9.03dB	20.56	20.57	20.58
	2Txslots	28.41	28.45	28.42	-6.02dB	22.39	22.43	22.4
	3Txslots	25.36	25.4	25.29	-4.26dB	21.1	21.14	21.03
	4Txslots	23.39	23.41	23.29	-3.01dB	20.38	20.4	20.28
EGPRS (GMSK)	1Txslot	29.59	29.6	29.61	-9.03dB	20.56	20.57	20.58
	2Txslots	28.41	28.45	28.42	-6.02dB	22.39	22.43	22.4
	3Txslots	25.36	25.4	25.29	-4.26dB	21.1	21.14	21.03
	4Txslots	23.39	23.41	23.29	-3.01dB	20.38	20.4	20.28
EGPRS (8PSK)	1Txslot	25.55	25.47	25.48	-9.03dB	16.52	16.44	16.45
	2Txslots	23.39	23.24	23.26	-6.02dB	17.37	17.22	17.24
	3Txslots	21.59	21.37	21.06	-4.26dB	17.33	17.11	16.8
	4Txslots	19.56	19.25	19.04	-3.01dB	16.55	16.24	16.03

TA Technology (Shanghai) Co., Ltd.

Test Report

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 (Variant)

GSM 850		Burst Conducted Power(dBm)			/	Average power(dBm)		
		Channel 128	Channel 190	Channel 251		Channel 128	Channel 190	Channel 251
GSM		32.91	32.74	32.62	-9.03dB	23.88	23.71	23.59
GPRS (GMSK)	1Txslot	32.92	32.74	32.59	-9.03dB	23.89	23.71	23.56
	2Txslots	30.56	30.7	30.66	-6.02dB	24.54	24.68	24.64
	3Txslots	28.48	28.71	28.75	-4.26dB	24.22	24.45	24.49
	4Txslots	26.19	26.51	26.56	-3.01dB	23.18	23.5	23.55
EGPRS (GMSK)	1Txslot	32.92	32.74	32.59	-9.03dB	23.89	23.71	23.56
	2Txslots	30.56	30.7	30.66	-6.02dB	24.54	24.68	24.64
	3Txslots	28.48	28.71	28.75	-4.26dB	24.22	24.45	24.49
	4Txslots	26.19	26.51	26.56	-3.01dB	23.18	23.5	23.55
EGPRS (8PSK)	1Txslot	26.61	26.91	27.22	-9.03dB	17.58	17.88	18.19
	2Txslots	24.47	24.51	24.49	-6.02dB	18.45	18.49	18.47
	3Txslots	22.46	22.47	22.45	-4.26dB	18.2	18.21	18.19
	4Txslots	20.27	20.18	20.18	-3.01dB	17.26	17.17	17.17
GSM 1900		Burst Conducted Power(dBm)			/	Average power(dBm)		
		Channel 512	Channel 661	Channel 810		Channel 512	Channel 661	Channel 810
GSM		29.69	29.71	29.64	-9.03dB	20.66	20.68	20.61
GPRS (GMSK)	1Txslot	29.61	29.59	29.58	-9.03dB	20.58	20.56	20.55
	2Txslots	28.41	28.45	28.42	-6.02dB	22.39	22.43	22.4
	3Txslots	25.33	25.39	25.22	-4.26dB	21.07	21.13	20.96
	4Txslots	23.37	23.38	23.24	-3.01dB	20.36	20.37	20.23

TA Technology (Shanghai) Co., Ltd. Test Report

Report No. RHA1403-0023SAR

Page 33 of 165

EGPRS (GMSK)	1Txslot	29.61	29.59	29.58	-9.03dB	20.58	20.56	20.55
	2Txslots	28.41	28.45	28.42	-6.02dB	22.39	22.43	22.4
	3Txslots	25.33	25.39	25.22	-4.26dB	21.07	21.13	20.96
	4Txslots	23.37	23.38	23.24	-3.01dB	20.36	20.37	20.23
EGPRS (8PSK)	1Txslot	25.55	25.47	25.48	-9.03dB	16.52	16.44	16.45
	2Txslots	23.39	23.24	23.26	-6.02dB	17.37	17.22	17.24
	3Txslots	21.59	21.37	21.06	-4.26dB	17.33	17.11	16.8
	4Txslots	19.56	19.25	19.04	-3.01dB	16.55	16.24	16.03

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.

The average output power of BT antenna is as following:

Channel	Ch 0 2402 MHz	Ch 39 2441 MHz	Ch 78 2480 MHz
2450MHz	0.08	0.07	0.09

TA Technology (Shanghai) Co., Ltd. Test Report

The average output power of WIFI antenna is as following:
WIFI Antenna

Mode	Channel	Data rate (Mbps)	AV Power (dBm)
802.11b	1	1	14.88
		2	14.60
		5.5	14.53
		11	14.51
	6	1	14.93
		2	14.75
		5.5	14.71
		11	14.67
	11	1	14.81
		2	14.46
		5.5	14.68
		11	14.57
802.11g	1	6	11.75
		9	11.37
		12	11.26
		18	11.17
		24	11.54
		36	11.43
		48	11.45
		54	11.33
	6	6	11.86
		9	11.68
		12	11.67
		18	11.52
		24	11.39
		36	11.65
		48	11.56
		54	11.57
	11	6	11.93
		9	11.71
		12	11.61
		18	11.56
		24	11.38
		36	11.05
		48	11.69
		54	11.65
802.11n HT20	1	MCS0	11.74
		MCS1	11.26
		MCS2	11.05
		MCS3	11.69

TA Technology (Shanghai) Co., Ltd. Test Report

		MCS4	11.65
		MCS5	11.33
		MCS6	11.22
		MCS7	11.06
	6	MCS0	11.94
		MCS1	11.64
		MCS2	11.68
		MCS3	11.61
		MCS4	11.63
		MCS5	11.68
		MCS6	11.71
	11	MCS7	11.72
		MCS0	11.81
		MCS1	11.67
		MCS2	11.33
		MCS3	11.27
		MCS4	11.58
MCS5		11.46	
802.11n HT40	3	MCS6	11.34
		MCS7	11.36
		MCS0	11.82
		MCS1	11.34
		MCS2	11.14
		MCS3	11.34
		MCS4	11.38
	6	MCS5	11.08
		MCS6	11.71
		MCS7	11.59
		MCS0	11.68
		MCS1	11.15
		MCS2	11.61
		MCS3	11.54
9	MCS4	11.78	
	MCS5	11.79	
	MCS6	11.57	
	MCS7	11.51	
	MCS0	11.67	
	MCS1	11.58	
	MCS2	11.69	
	MCS3	11.24	
	MCS4	11.67	
	MCS5	11.48	
	MCS6	11.35	
		MCS7	11.21

TA Technology (Shanghai) Co., Ltd.

Test Report

7.2. SAR Test Results

7.2.1. GSM 850 (GSM/GPRS/EGPRS)

Table 10: SAR Values [GSM/GSM 850 (GPRS/EGPRS)] (Original)

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	34	32.78	-0.07	0.095	1.32	0.126	Figure 12
Left/Tilt	190/836.6	GSM	1:8.3	34	32.78	0.02	0.102	1.32	0.135	Figure 13
Right/Cheek	190/836.6	GSM	1:8.3	34	32.78	0.058	0.169	1.32	0.224	Figure 14
Right/Tilt	190/836.6	GSM	1:8.3	34	32.78	0.03	0.148	1.32	0.196	Figure 15
Test Position of Body (Distance 0mm)										
Test Position 1	190/836.6	2Txslots	1:4.14	32	30.74	0.053	0.466	1.34	0.623	Figure 16
Test Position 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Test Position 3	190/836.6	2Txslots	1:4.14	32	30.74	-0.100	0.399	1.34	0.533	Figure 17
Test Position 4	190/836.6	2Txslots	1:4.14	32	30.74	-0.16	0.019	1.34	0.097	Figure18
Test Position 5	190/836.6	2Txslots	1:4.14	32	30.74	-0.079	0.073	1.34	0.025	Figure19
Worst Case Position of Body with EGPRS(Distance 0mm)										
Test Position 1	190/836.6	2Txslots	1:4.14	32	30.74	-0.021	0.406	1.34	0.543	Figure20
<p>Note: 1. The value with blue color is the maximum SAR Value of each test band.</p> <p>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 not required for such test configuration(s).</p> <p>3. 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.</p> <p>4. When multiple slots are used, SAR should be tested to account for the maximum source-based time-averaged output power.</p> <p>5. 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.</p>										

TA Technology (Shanghai) Co., Ltd.
Test Report

Table 11: SAR Values [GSM/GSM 850 (GPRS/EGPRS)] (Variant)

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										
Right/Cheek	190/836.6	GSM	1:8.3	34	32.74	-0.010	0.214	1.34	0.286	Figure 49
Test Position of Body (Distance 0mm)										
Test Position 1	190/836.6	2Txslots	1:4.14	32	30.7	-0.040	0.499	1.35	0.673	Figure 50
<p>Note: 1. The value with blue color is the maximum SAR Value of each test band.</p> <p>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 not required for such test configuration(s).</p> <p>3. When multiple slots are used, SAR should be tested to account for the maximum source-based time-averaged output power.</p> <p>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.</p>										

TA Technology (Shanghai) Co., Ltd.

Test Report

7.2.2. GSM 1900 (GSM/GPRS/EGPRS)

Table 12: SAR Values [GSM 1900 (GSM/GPRS/EGPRS)] (Original)

Test Position	Channel/Frequency (MHz)	Time slot	Duty Cycle	Maximum Allowed Power (dBm)	Conducted Power (dBm)	Drift ± 0.21 dB	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	31	29.71	-0.020	0.323	1.35	0.435	Figure 21
Left/Tilt	661/1880	GSM	1:8.3	31	29.71	-0.030	0.256	1.35	0.345	Figure 22
Right/Cheek	810/1909.8	GSM	1:8.3	31	29.64	-0.020	0.840	1.37	1.149	Figure 23
	661/1880	GSM	1:8.3	31	29.71	0.150	0.842	1.35	1.133	Figure 24
	512/1850.2	GSM	1:8.3	31	29.69	0.050	0.787	1.35	1.064	Figure 25
Right/Tilt	810/1909.8	GSM	1:8.3	31	29.64	-0.050	0.716	1.37	0.979	Figure 26
	661/1880	GSM	1:8.3	31	29.71	0.050	0.697	1.35	0.938	Figure 27
	512/1850.2	GSM	1:8.3	31	29.69	0.010	0.668	1.35	0.903	Figure 28
Test Position of Body (Distance 0mm)										
Test Position 1	810/1909.8	2Txslots	1:4.14	29	28.41	-0.047	1.220	1.15	1.398	Figure 29
	661/1880	2Txslots	1:4.14	29	28.45	0.032	1.290	1.14	1.464	Figure 30
	512/1850.2	2Txslots	1:4.14	29	28.42	0.137	1.180	1.14	1.349	Figure 31
Test Position 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Test Position 3	810/1909.8	2Txslots	1:4.14	29	28.41	-0.050	1.250	1.15	1.432	Figure 32
	661/1880	2Txslots	1:4.14	29	28.45	-0.080	1.250	1.14	1.419	Figure 33
	512/1850.2	2Txslots	1:4.14	29	28.42	-0.130	1.190	1.14	1.360	Figure 34
Test Position 4	661/1880	2Txslots	1:4.14	29	28.41	0.090	0.055	1.15	0.062	Figure 35
Test Position 5	661/1880	2Txslots	1:4.14	29	28.45	-0.126	0.212	1.14	0.241	Figure 36
Worst Test Position of Body with EGPRS(Distance 0mm)										
Test Position 1	661/1880	2Txslots	1:4.14	29	28.45	0.099	1.220	1.14	1.385	Figure 37
Worst Test Position of Body with Earphone (Distance 0mm)										
Test Position 1	661/1880	2Txslots	1:8.3	30.5	29.71	0.095	0.891	1.20	1.069	Figure 38
Worst Case Position of Body (1st Repeated SAR, Distance 0mm)										
Test Position 1	661/1880	2Txslots	1:4.14	29	28.45	-0.046	1.200	1.14	1.362	Figure 39

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 not required for such test configuration(s).

3. 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.

4. When multiple slots are used, SAR should be tested to account for the maximum source-based time-averaged output power.

TA Technology (Shanghai) Co., Ltd.
Test Report

Table 13: SAR Measurement Variability Results [GSM 1900 (GPRS/EGPRS)] (Original)

Test Position	Timeslots	Channel/ Frequency (MHz)	Measured SAR (1g)	1 st Repeated SAR (1g)	Ratio	2 nd Repeated SAR (1g)	3 rd Repeated SAR (1g)
Test Position 1	2Txslots	661/1880	1.290	1.200	1.08	NA	NA

Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.
 2) A second repeated measurement was performed 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

TA Technology (Shanghai) Co., Ltd.

Test Report

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

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										
Right/Cheek	661/1880	GSM	1:8.3	31	29.71	0.170	0.840	1.35	1.131	Figure 51
Test Position of Body (Distance 0mm)										
Test Position 1	661/1880	2Txslots	1:4.14	29	28.41	0.049	1.250	1.15	1.432	Figure 52
Worst Case Position of Body (1st Repeated SAR, Distance 0mm)										
Test Position 1	661/1880	2Txslots	1:4.14	29	28.41	0.079	1.250	1.15	1.432	Figure 53
<p>Note: 1. The value with blue color is the maximum SAR Value of each test band.</p> <p>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 not required for such test configuration(s).</p> <p>3. When multiple slots are used, SAR should be tested to account for the maximum source-based time-averaged output power.</p>										

Table 15: SAR Measurement Variability Results [GSM 1900 (GPRS/EGPRS)] (Variant)

Test Position	Timeslots	Channel/Frequency (MHz)	Measured SAR (1g)	1 st Repeated SAR (1g)	Ratio	2 nd Repeated SAR (1g)	3 rd Repeated SAR (1g)
Test Position 1	2Txslots	661/1880	1.25	1.25	1.00	NA	NA
<p>Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.</p> <p>2) A second repeated measurement was performed 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).</p> <p>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.</p> <p>4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg</p>							

TA Technology (Shanghai) Co., Ltd.

Test Report

7.2.3. WIFI (802.11b, WIFI)

Table 16: SAR Values (802.11b) (Original)

Test Position	Channel/ Frequency (MHz)	Mode	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	6/2437	DSSS	1:1	15	14.93	-0.115	0.013	1.02	0.013	Figure 40
Left/Tilt	6/2437	DSSS	1:1	15	14.93	-0.024	0.013	1.02	0.013	Figure 41
Right/Cheek	6/2437	DSSS	1:1	15	14.93	-0.160	0.017	1.02	0.017	Figure 42
Right/Tilt	6/2437	DSSS	1:1	15	14.93	0.040	0.010	1.02	0.010	Figure 43
Test Position of Body (0mm)										
Test Position 1	6/2437	DSSS	1:1	15	14.93	0.009	0.564	1.02	0.573	Figure 44
Test Position 2	6/2437	DSSS	1:1	15	14.93	-0.01	0.28	1.02	0.285	Figure 45
Test Position 3	6/2437	DSSS	1:1	15	14.93	-0.07	0.003	1.02	0.003	Figure 46
Test Position 4	6/2437	DSSS	1:1	15	14.93	0.029	0.22	1.02	0.224	Figure 47
Test Position 5	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 not required 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. For Test Position 3 where the estimated SAR is overly conservative for certain conditions, we choose to perform SAR measurements and use the measured SAR to determine simultaneous transmission SAR test exclusion.

TA Technology (Shanghai) Co., Ltd.

Test Report

Table 17: SAR Values (802.11b) (Variant)

Test Position	Channel/ Frequency (MHz)	Mode	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										
Right/Cheek	6/2437	DSSS	1:1	15	14.93	-0.057	0.056	1.02	0.057	Figure 54
Test Position of Body (0mm)										
Test Position 1	6/2437	DSSS	1:1	15	14.93	-0.090	0.529	1.02	0.538	Figure 55
<p>Note: 1. The value with blue color is the maximum SAR Value of each test band.</p> <p>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 not required for such test configuration(s).</p> <p>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.</p>										

TA Technology (Shanghai) Co., Ltd. Test Report

7.2.4. BT

Table 18: SAR Values (BT) (Original)

Test Position	Channel/Frequency (MHz)	Mode	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 Body (0mm)										
Test Position 3	78/2480	DSSS	1:1	1	0.09	-0.04	0.001	1.23	0.001	Figure 48
<p>Note: For conditions where the estimated SAR is overly conservative for certain conditions, the test lab may choose to perform standalone SAR measurements and use the measured SAR to determine simultaneous transmission SAR test exclusion.</p>										

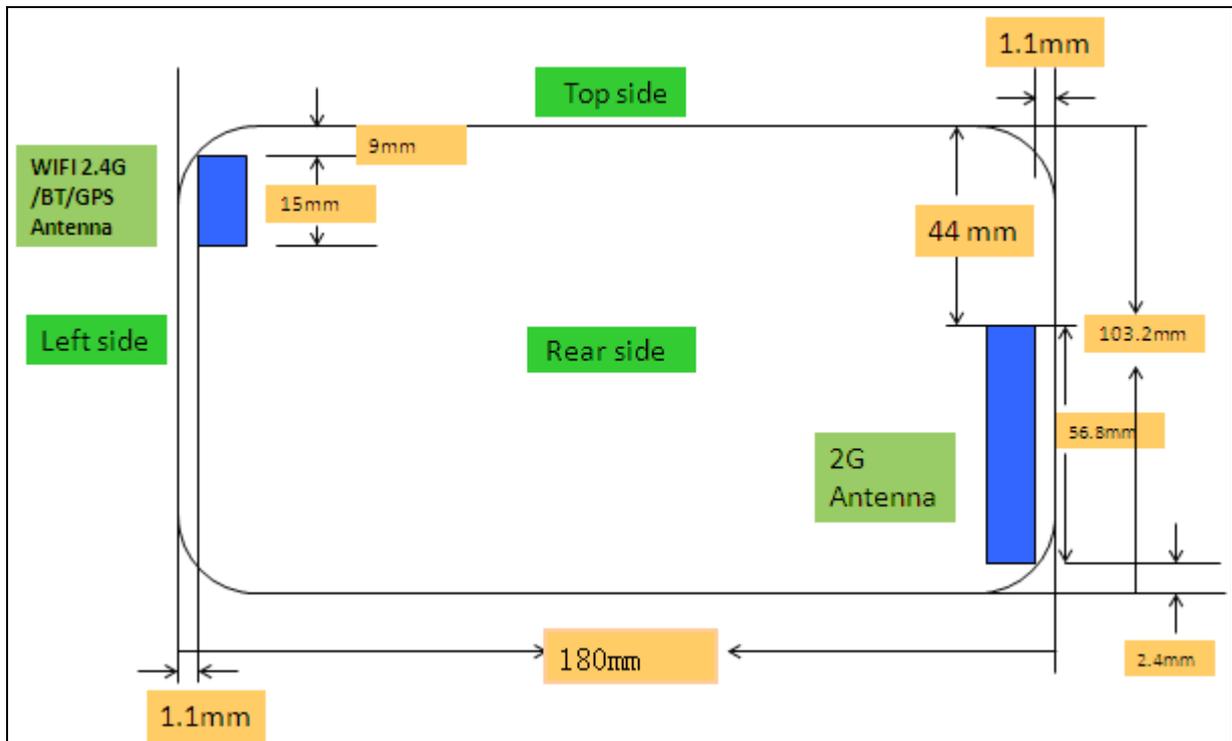
TA Technology (Shanghai) Co., Ltd. Test Report

7.3. Simultaneous Transmission Conditions

Air-Interface	Band (MHz)	Type	Simultaneous Transmissions	Voice Over Digital Transport (Data)
GSM	850	VO	Yes WIFI or BT	NA
	1900	VO	Yes WIFI or BT	NA
	GPRS /EGPRS	DT	Yes WIFI or BT	NA
WIFI	2450	DT	Yes GSM,GPRS,EGPRS,	Yes
Bluetooth (BT)	2400	DT	Yes GSM,GPRS,EGPRS	NA

Note: VO Voice Service only
DT Digital Transport

The location of the antennas inside EUT is shown in ANNEX J:



Estimated SAR

(1) for test separation distances ≤ 50 mm

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 for test separation distances ≤ 50 mm.

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

(2) for test separation distances >50 mm

0.4 W/kg for 1-g SAR

$$\text{Head Estimated SAR}_{\text{Max.BT. Test Position 1}} = [10^{(1/10)}/5] * (2.48^{0.5}/7.5) = 0.053 \text{ W/kg}$$

$$\text{Head Estimated SAR}_{\text{Max.BT. Test Position 2}} = [10^{(1/10)}/5] * (2.48^{0.5}/7.5) = 0.053 \text{ W/kg}$$

$$\text{Head Estimated SAR}_{\text{Max.BT. Test Position 3}} = [10^{(1/10)}/5] * (2.48^{0.5}/7.5) = 0.053 \text{ W/kg}$$

$$\text{Head Estimated SAR}_{\text{Max.BT. Test Position 4}} = [10^{(1/10)}/5] * (2.48^{0.5}/7.5) = 0.053 \text{ W/kg}$$

$$\text{Head Estimated SAR}_{\text{Max.BT. Test Position 5}} = [10^{(1/10)}/5] * (2.48^{0.5}/7.5) = 0.053 \text{ W/kg}$$

$$\text{Body Estimated SAR}_{\text{Max.BT. Test Position 1}} = [10^{(1/10)}/5] * (2.48^{0.5}/7.5) = 0.053 \text{ W/kg}$$

$$\text{Body Estimated SAR}_{\text{Max.BT. Test Position 2}} = [10^{(1/10)}/5] * (2.48^{0.5}/7.5) = 0.053 \text{ W/kg}$$

$$\text{Body Estimated SAR}_{\text{Max.BT. Test Position 4}} = [10^{(1/10)}/5] * (2.48^{0.5}/7.5) = 0.053 \text{ W/kg}$$

$$\text{Body Estimated SAR}_{\text{Max. BT. Test Position 5}} \leq 0.4 \text{ W/kg}$$

Note:

For conditions where the estimated SAR is overly conservative for certain conditions, the test lab may choose to perform standalone SAR measurements and use the measured SAR to determine simultaneous transmission SAR test exclusion.

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.

$$\text{Ratio} = \frac{(\text{SAR}_1 + \text{SAR}_2)^{1.5}}{(\text{min. test separation distance, mm})} < 0.04$$

TA Technology (Shanghai) Co., Ltd.

Test Report

GSM&WIFI Mode

Test Position \ Reported SAR _{1g} (W/kg)	GSM 850	GSM 1900	WIFI	MAX. Σ SAR _{1g}	peak location separation ratio
Left hand, Touch cheek	0.126	0.435	0.013	0.448	No
Left hand, Tilt 15 Degree	0.135	0.345	0.013	0.358	No
Right hand, Touch cheek	0.286	1.149	0.057	1.206	No
Right hand, Tilt 15 Degree	0.196	0.979	0.010	0.989	No
Test Position 1	0.673	1.464	0.573	2.037	Yes
Test Position 2	0.400	0.400	0.224	0.624	No
Test Position 3	0.533	1.432	0.003	1.435	No
Test Position 4	0.025	0.062	0.285	0.347	No
Test Position 5	0.097	0.241	0.4	0.641	No
Note: 1.The value with blue color is the maximum ΣSAR _{1g} Value. 2. MAX. ΣSAR _{1g} = Reported SAR _{Max,WIFI} + Reported SAR _{Max,GSM}					

MAX. ΣSAR_{1g} = 2.037W/kg > 1.6 W/kg, so the SAR to peak location separation ratio should be considered

Test Position \ Reported SAR _{1g} (W/kg)	GSM 850	GSM 1900	WIFI	MAX. Σ SAR _{1g}
Test Position 1	0.673	/	0.573	1.246
	/	1.464	0.573	2.037
Note: 1.The value with red color is the SAR _{1g} > 1.6 W/kg. 2. when the MAX. Σ SAR _{1g} potio > 1.6 W/kg in a position, simultaneous transmission conditions of other bands also need consideration in this position.				

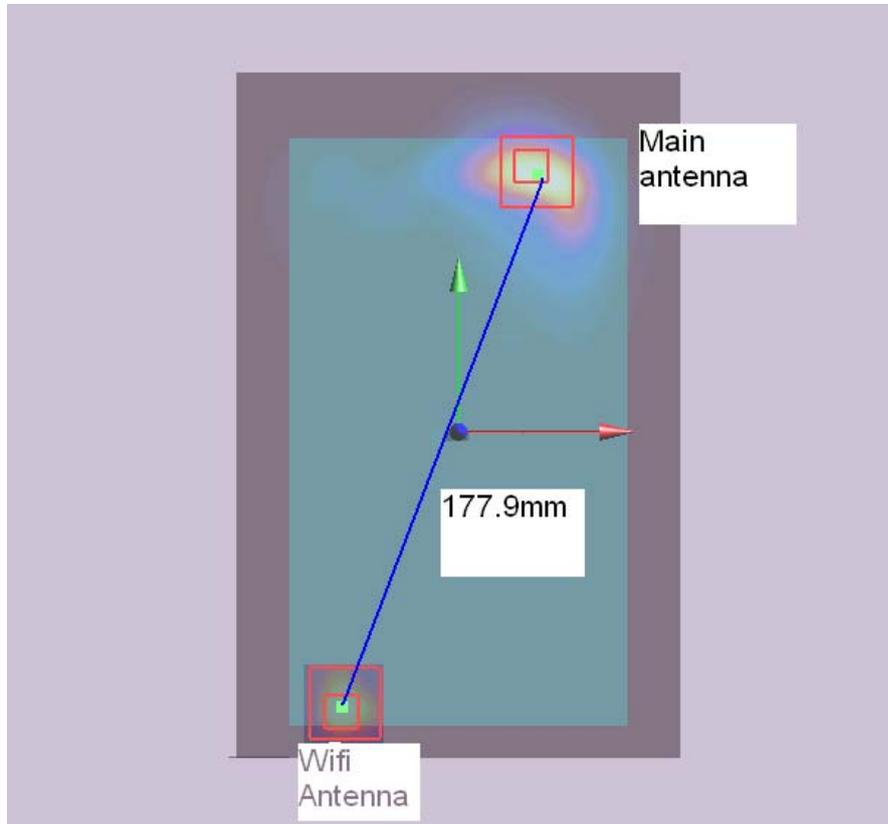
TA Technology (Shanghai) Co., Ltd. Test Report

($SAR_{Max}=2.037W/Kg$)

The position $SAR_{GSM\ 1900}$ is ($x_1= 31.5, y_1= 81, z_1= -178.6$),

The position $SAR_{Max.WIFI}$ is ($x_2= -35.5, y_2=-84, z_2= -178.6$)

so the distance between the $SAR_{Max.GSM\ 1900}$ and $SAR_{Max.WIFI}$ is 177.90mm.



Ratio= $[(\text{Reported } SAR_{Max.GSM}) 1.464W/kg + (\text{Reported } SAR_{Max.WIFI}) 0.573W/kg]^{3/2} / \text{Peak SAR Location Separation} = 2.037^{3/2} / 177.90 = 0.02 < 0.04$

So the Simultaneous SAR are not required for WIFI and GSM antenna.

TA Technology (Shanghai) Co., Ltd. Test Report

GSM & BT Mode

Test Position \ Reported SAR _{1g} (W/kg)	GSM 850	GSM 1900	BT	MAX. Σ SAR _{1g}	peak location separation ratio
Left hand, Touch cheek	0.126	0.435	0.053	0.488	No
Left hand, Tilt 15 Degree	0.135	0.345	0.053	0.398	No
Right hand, Touch cheek	0.286	1.149	0.053	1.202	No
Right hand, Tilt 15 Degree	0.196	0.979	0.053	1.032	No
Test Position 1	0.673	1.464	0.053	1.517	No
Test Position 2	0.4	0.4	0.053	0.453	No
Test Position 3	0.533	1.432	0.001	1.433	No
Test Position 4	0.025	0.062	0.053	0.115	No
Test Position 5	0.097	0.241	0.4	0.641	No
Note: 1.The value with blue color is the maximum ΣSAR _{1g} Value. 2. MAX. ΣSAR _{1g} = Reported SAR _{Max.WIFI} + Reported SAR _{Max.GSM}					

MAX. ΣSAR_{1g} = 1.517W/kg < 1.6 W/kg, so the Simultaneous SAR are not required for BT and GSM antenna.

WIFI antenna and BT antenna cannot transmit simultaneously.

8. Measurement Uncertainty

The measured SAR were <1.5 W/kg for all frequency bands, therefore per KDB Publication 865664 D01v01r03, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2003 is not required in SAR reports

*****END OF REPORT *****

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No. RHA1403-0023SAR

Page 50 of 165

9. Main Test Instruments

Table 19: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	Agilent 8753E	US37390326	September 10, 2013	One year
02	Dielectric Probe Kit	Agilent 85070E	US44020115	No Calibration Requested	
03	Power meter	Agilent E4417A	GB41291714	March 9, 2014	One year
04	Power sensor	Agilent N8481H	MY50350004	September 23, 2013	One year
05	Power sensor	E9327A	US40441622	January 1, 2014	One year
06	Signal Generator	HP 8341B	2730A00804	September 9, 2013	One year
07	Dual directional coupler	778D-012	50519	March 25, 2013	One year
08	Dual directional coupler	777D	50146	March 25, 2013	One year
09	Amplifier	IXA-020	0401	No Calibration Requested	
10	BTS	E5515C	MY48360988	November 26, 2013	One year
11	E-field Probe	EX3DV4	3677	November 28, 2013	One year
12	DAE	DAE4	1317	January 16, 2014	One year
13	Validation Kit 835MHz	D835V2	4d020	August 26, 2011	Three years
14	Validation Kit 1900MHz	D1900V2	5d060	August 31, 2011	Three years
15	Validation Kit 2450MHz	D2450V2	786	August 29, 2011	Three years
16	Temperature Probe	JM222	AA1009129	March 12, 2014	One year
17	Hygrothermograph	WS-1	64591	September 26, 2013	One year

***END OF REPORT ***

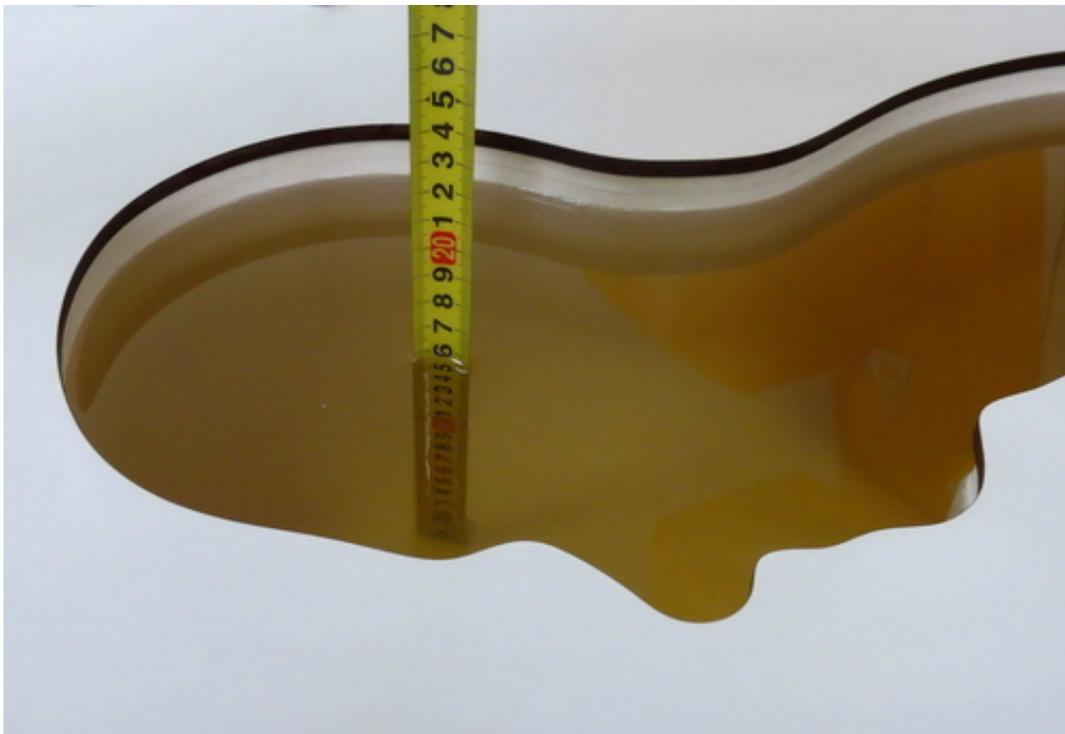
ANNEX A: Test Layout



Picture 1: Specific Absorption Rate Test Layout



Picture 2: Liquid depth in the Flat Phantom (835 MHz, 15.4cm depth)



Picture 3: Liquid depth in the head Phantom (835MHz, 15.3cm depth)



Picture 4: Liquid depth in the Flat Phantom (1900 MHz, 15.1cm depth)



Picture 5: liquid depth in the head Phantom (1900 MHz, 15.3cm depth)



Picture 6: Liquid depth in the Flat Phantom (2450 MHz, 15.3cm depth)



Picture 7: Liquid depth in the head Phantom (2450 MHz, 15.4cm depth)

ANNEX B: System Check Results

System Performance Check at 835 MHz Head TSL

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d020

Date/Time: 3/15/2014 2:45:17 AM

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

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.93 \text{ mho/m}$; $\epsilon_r = 41.4$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: $22.3 \text{ }^\circ\text{C}$ Liquid Temperature: 21.5°C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.41, 9.41, 9.41); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

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

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

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

d=15mm, Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, 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

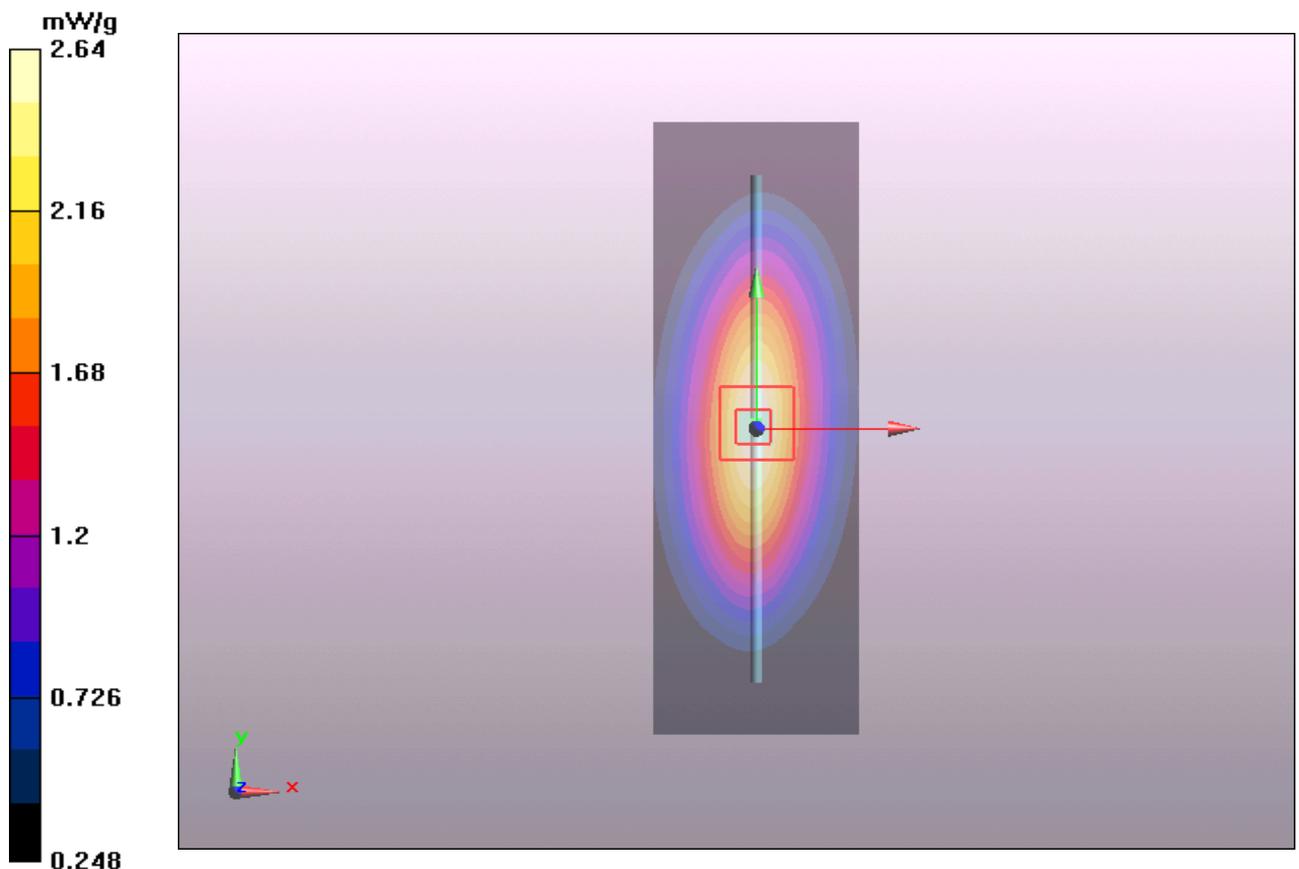


Figure 6 System Performance Check 835MHz 250mW

System Performance Check at 835 MHz Body TSL

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d020

Date/Time: 3/14/2014 5:21:34 PM

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

Medium parameters used: $f = 835$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 55.9$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 – SN3677; ConvF(9.51, 9.51, 9.51); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Sensor-Surface: 4mm (Mechanical Surface Detection)

Phantom: ELI 4.0; Type: QDOVA001BA;

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

d=15mm, Pin=250mW/Area Scan (61x121x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 2.72 mW/g

d=15mm, Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 50.9 V/m; Power Drift = 0.023 dB

Peak SAR (extrapolated) = 3.63 W/kg

SAR(1 g) = 2.52 mW/g; SAR(10 g) = 1.65 mW/g

Maximum value of SAR (measured) = 2.73 mW/g

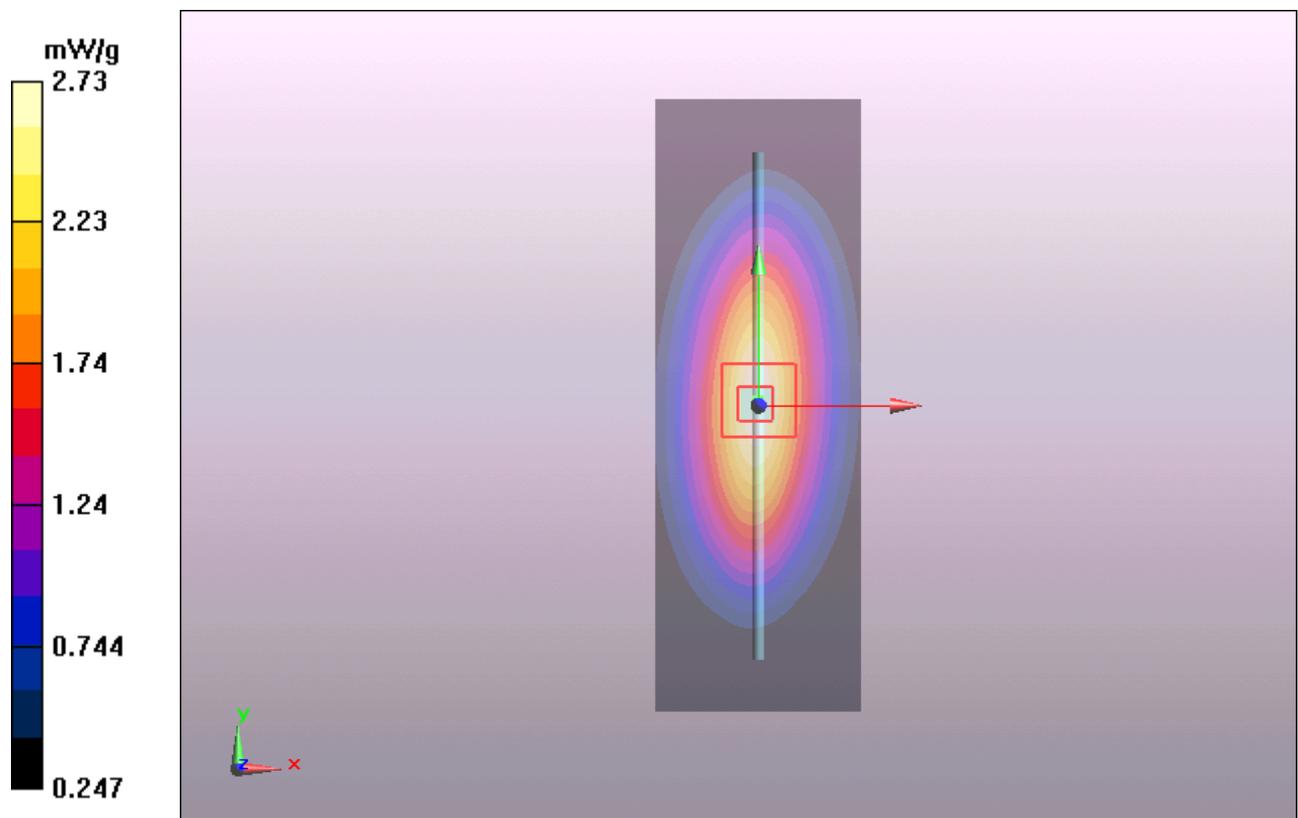


Figure 7 System Performance Check 835MHz 250mW

TA Technology (Shanghai) Co., Ltd. Test Report

Report No. RHA1403-0023SAR

Page 57 of 165

System Performance Check at 1900 MHz Head TSL

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d060

Date/Time: 3/18/2014 23:13:45 PM

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

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.43$ mho/m; $\epsilon_r = 39.6$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(8.15, 8.15, 8.15); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

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=15mm, dy=15mm

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

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

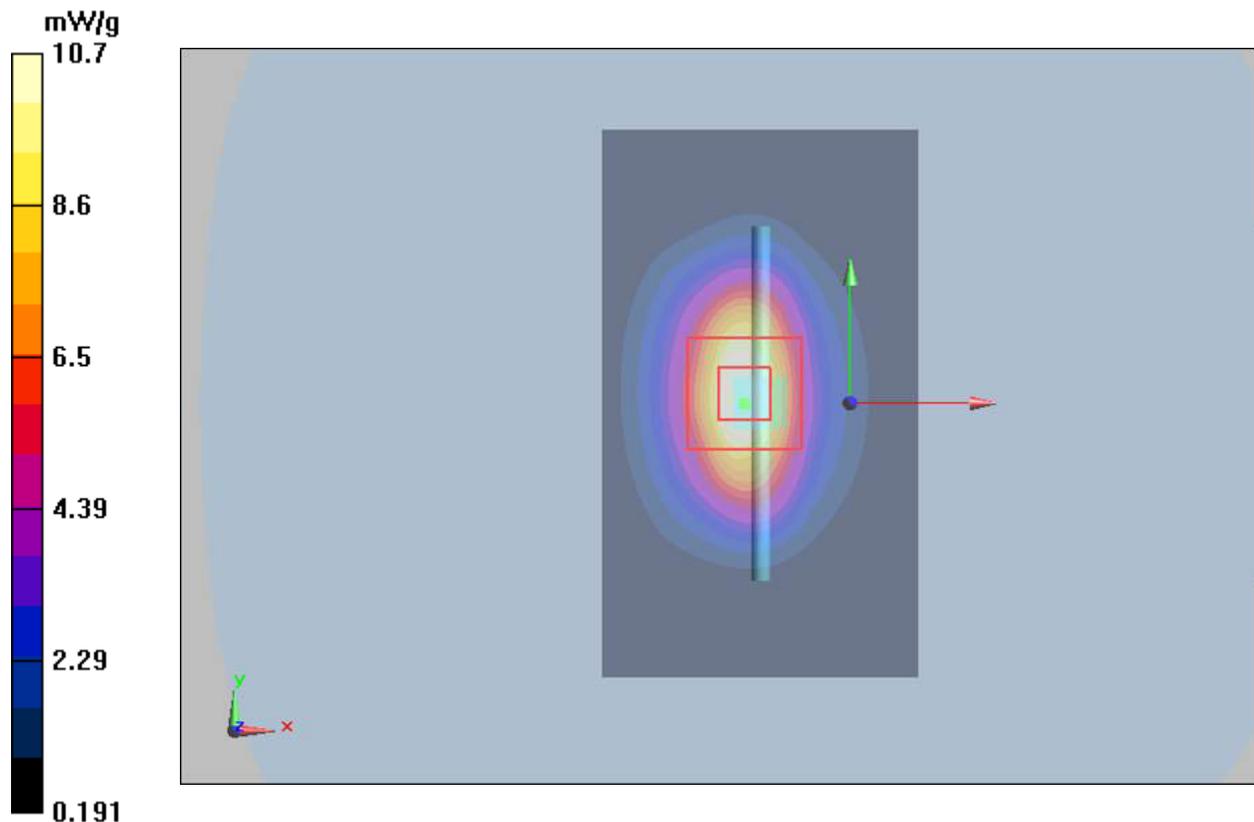


Figure 8 System Performance Check 1900MHz 250mW

System Performance Check at 1900 MHz Body TSL

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d060

Date/Time: 3/17/2014 11:45:37 AM

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

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.6$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: ELI 4.0; Type: QDOVA001BA;

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

d=10mm, Pin=250mW/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 11.9 mW/g

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

Reference Value = 80.8 V/m; Power Drift = -0.063 dB

Peak SAR (extrapolated) = 17.6 W/kg

SAR(1 g) = 9.82 mW/g; SAR(10 g) = 5.2 mW/g

Maximum value of SAR (measured) = 11 mW/g

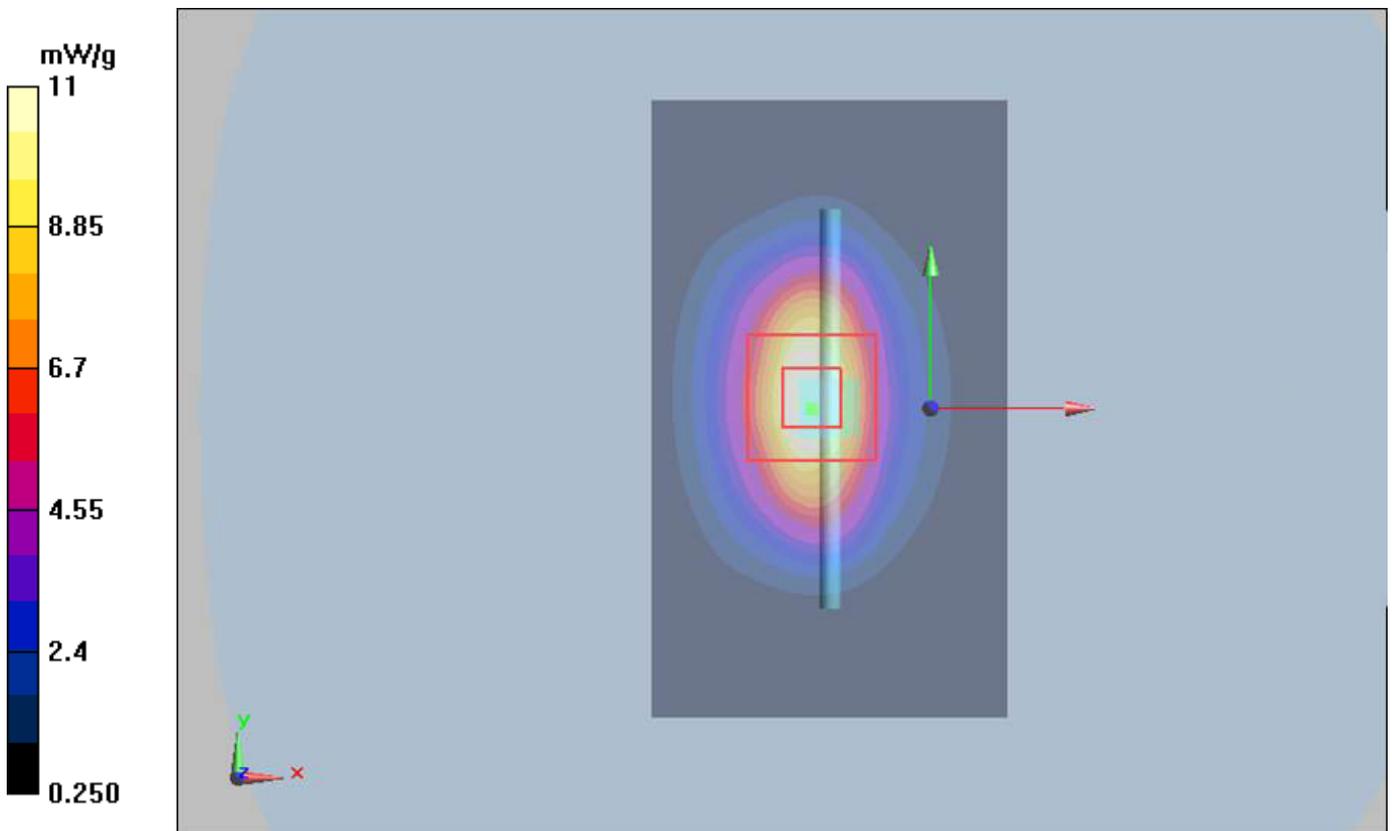


Figure 9 System Performance Check 1900MHz 250mW

TA Technology (Shanghai) Co., Ltd. Test Report

Report No. RHA1403-0023SAR

Page 59 of 165

System Performance Check at 2450 MHz Head TSL

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 786

Date/Time: 3/19/2014 5:41:12 AM

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

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.80$ mho/m; $\epsilon_r = 39.1$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.64, 7.64, 7.64); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

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=12mm, dy=12mm

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) = 13.7 mW/g; SAR(10 g) = 6.22 mW/g

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

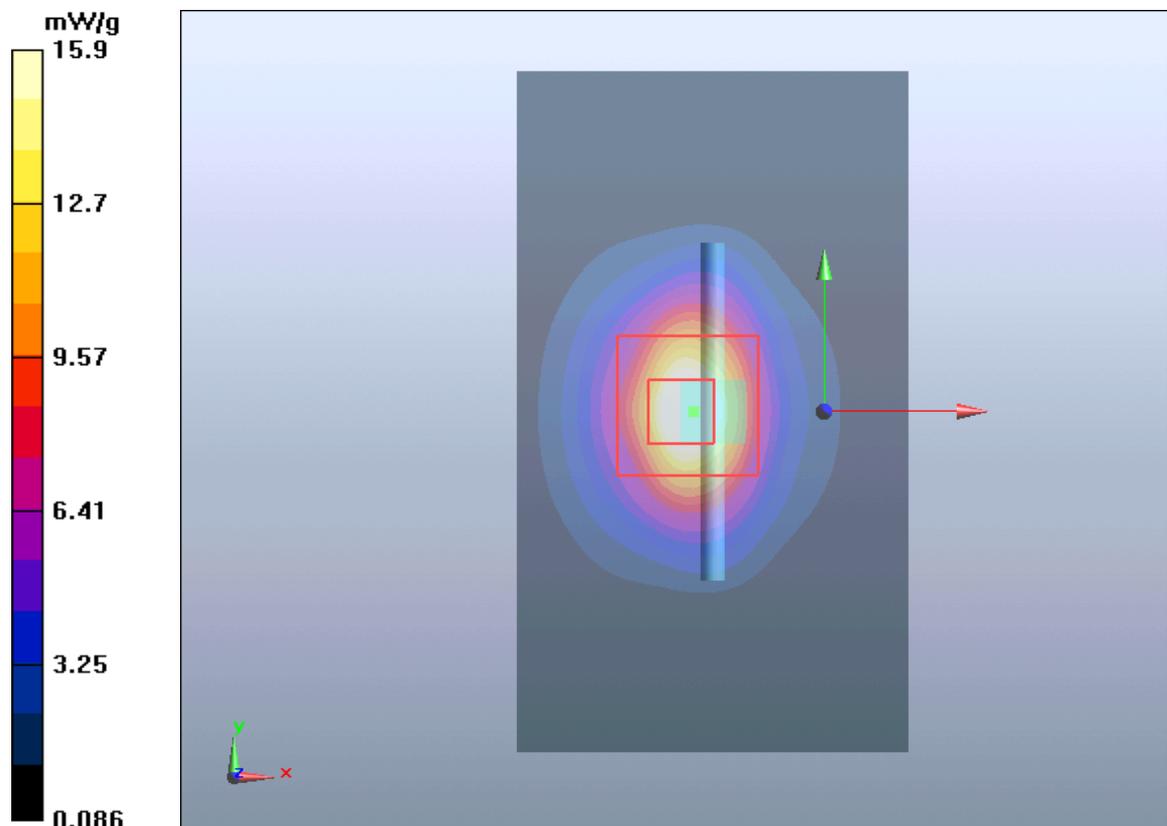


Figure 10 System Performance Check 2450MHz 250mW

System Performance Check at 2450 MHz Body TSL

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 786

Date/Time: 3/18/2014 22:30:37 PM

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

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.99$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.61, 7.61, 7.61); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: ELI v4.0; Type: QDOVA001BB;

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

d=10mm, Pin=250mW/Area Scan (41x71x1): Measurement grid: dx=12mm, dy=12mm

Maximum value of SAR (interpolated) = 17.3 mW/g

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

Reference Value = 90.4 V/m; Power Drift = -0.093 dB

Peak SAR (extrapolated) = 26.1 W/kg

SAR(1 g) = 13.2 mW/g; SAR(10 g) = 6.27 mW/g

Maximum value of SAR (measured) = 15 mW/g

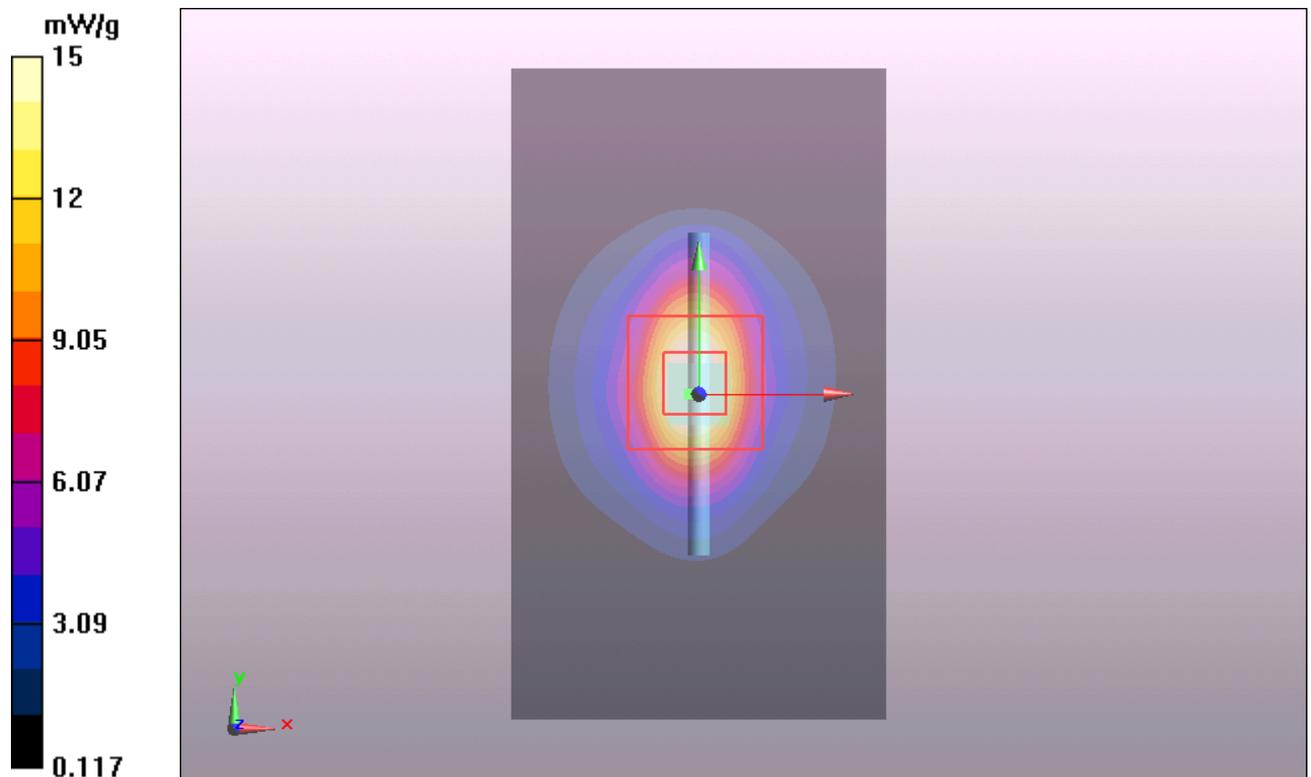


Figure 11 System Performance Check 2450MHz 250mW

ANNEX C: Graph Results(Original)

GSM 850 Left Cheek Middle

Date/Time: 3/15/2014 4:23:38 AM

Communication System: GSM ; Frequency: 836.6 MHz;Duty Cycle: 1:8.30042

Medium parameters used: $f = 837$ MHz; $\sigma = 0.932$ S/m; $\epsilon_r = 41.357$; $\rho = 1000$ kg/m³

Ambient Temperature:22.3 °C Liquid Temperature: 21.5°C

Phantom section: Left Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.41, 9.41, 9.41); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

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 (81x131x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.104 W/kg

Left Cheek Middle /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.300 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 0.160 W/kg

SAR(1 g) = 0.095 W/kg; SAR(10 g) = 0.062 W/kg

Maximum value of SAR (measured) = 0.106 W/kg

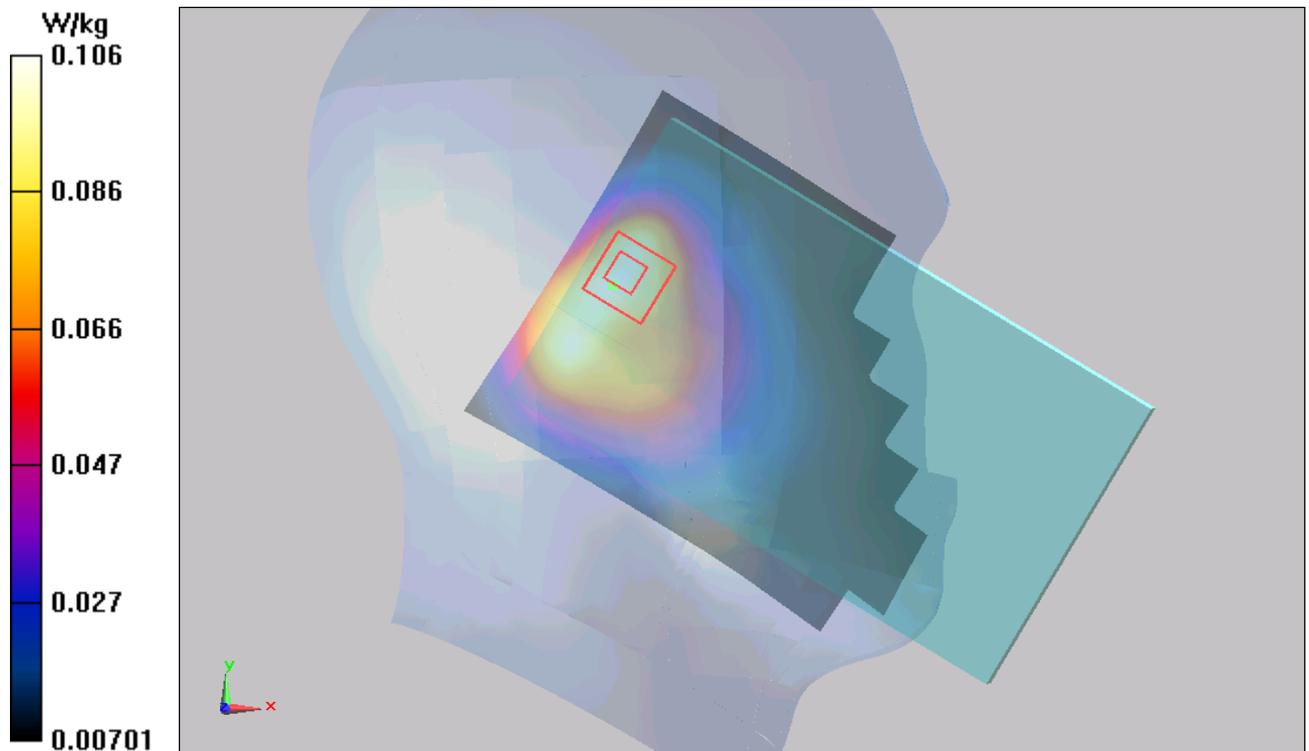


Figure 12 Left Hand Touch Cheek GSM 850 Channel 190

GSM 850 Left Tilt Middle

Date/Time: 3/15/2014 4:40:18 AM

Communication System: GSM ; Frequency: 836.6 MHz;Duty Cycle: 1:8.30042

Medium parameters used: $f = 837$ MHz; $\sigma = 0.932$ S/m; $\epsilon_r = 41.357$; $\rho = 1000$ kg/m³

Ambient Temperature:22.3 °C Liquid Temperature: 21.5°C

Phantom section: Left Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.41, 9.41, 9.41); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

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

Left Tilt Middle /Area Scan (81x131x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.111 W/kg

Left Tilt Middle /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.821 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.151 W/kg

SAR(1 g) = 0.102 W/kg; SAR(10 g) = 0.066 W/kg

Maximum value of SAR (measured) = 0.109 W/kg

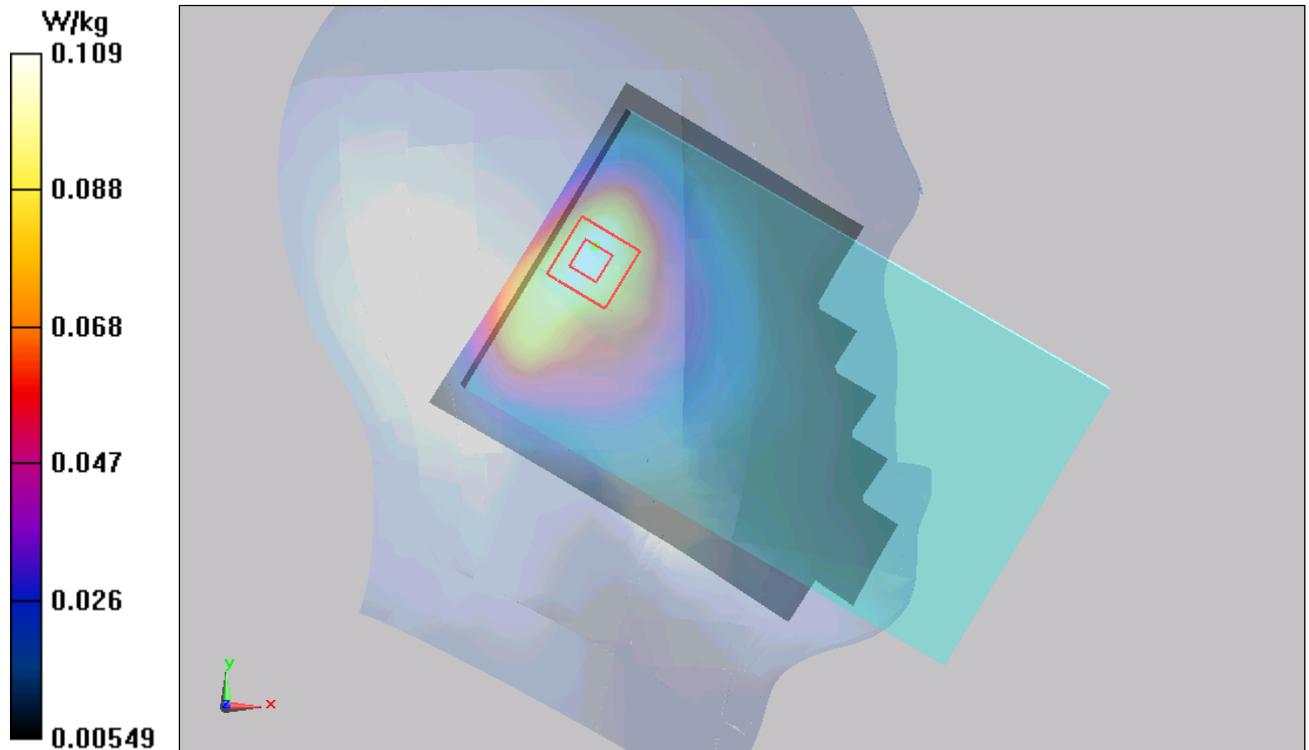


Figure 13 Left Hand Tilt 15° GSM 850 Channel 190

GSM 850 Right Cheek Middle

Date/Time: 3/15/2014 4:59:30 AM

Communication System: GSM ; Frequency: 836.6 MHz; Duty Cycle: 1:8.30042

Medium parameters used: $f = 837$ MHz; $\sigma = 0.932$ S/m; $\epsilon_r = 41.357$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Right Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.41, 9.41, 9.41); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

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 (81x131x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.181 W/kg

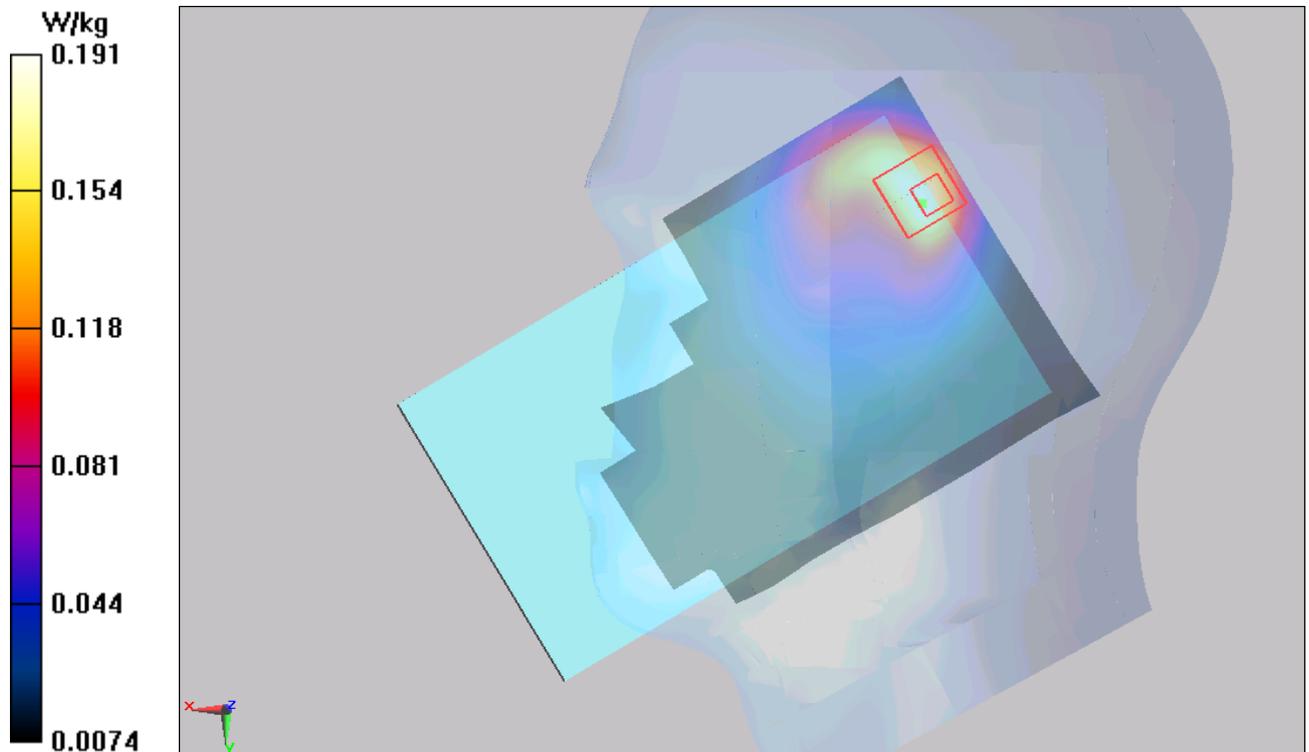
Right Cheek Middle /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.348 V/m; Power Drift = 0.058 dB

Peak SAR (extrapolated) = 0.325 W/kg

SAR(1 g) = 0.169 W/kg; SAR(10 g) = 0.091 W/kg

Maximum value of SAR (measured) = 0.191 W/kg



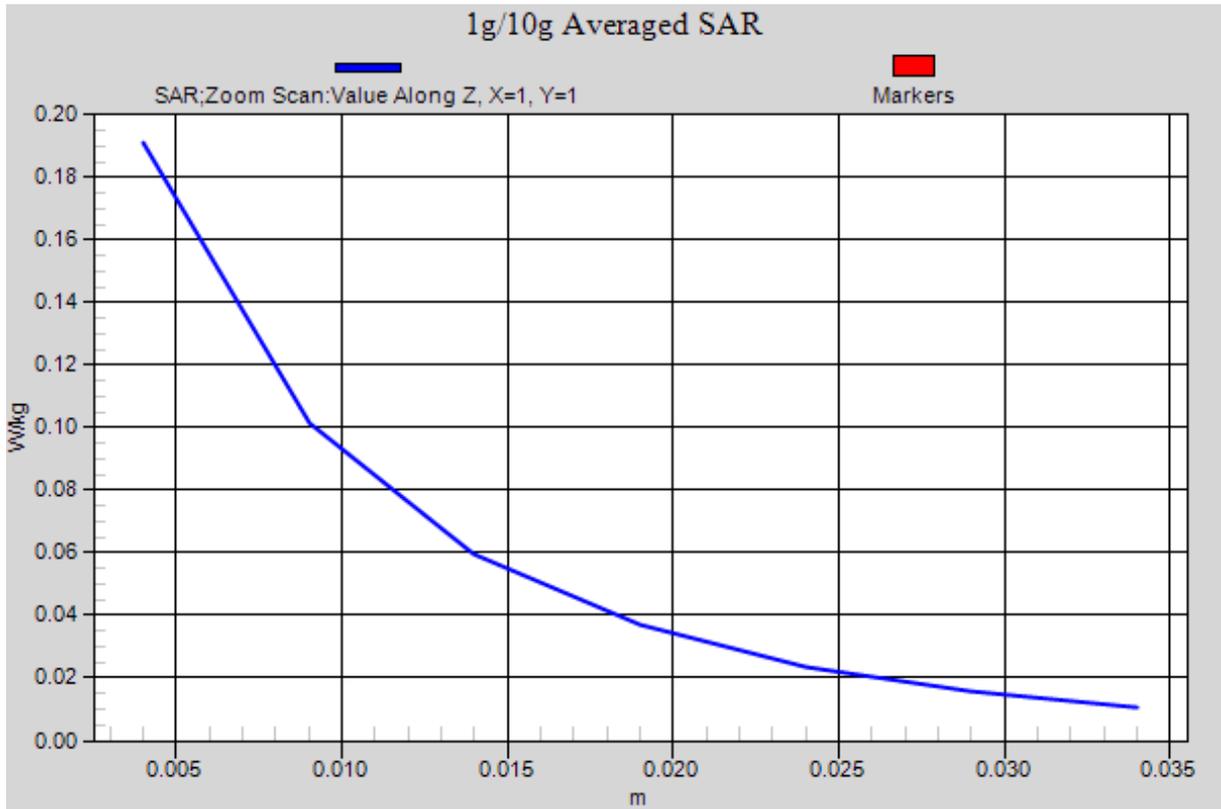


Figure 14 Right Hand Touch Cheek GSM 850 Channel 190

GSM 850 Right Tilt Middle

Date/Time: 3/15/2014 5:15:54 AM

Communication System: GSM ; Frequency: 836.6 MHz; Duty Cycle: 1:8.30042

Medium parameters used: $f = 837$ MHz; $\sigma = 0.932$ S/m; $\epsilon_r = 41.357$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Right Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.41, 9.41, 9.41); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

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

Right Tilt Middle /Area Scan (81x131x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.152 W/kg

Right Tilt Middle /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.457 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.277 W/kg

SAR(1 g) = 0.148 W/kg; SAR(10 g) = 0.079 W/kg

Maximum value of SAR (measured) = 0.172 W/kg

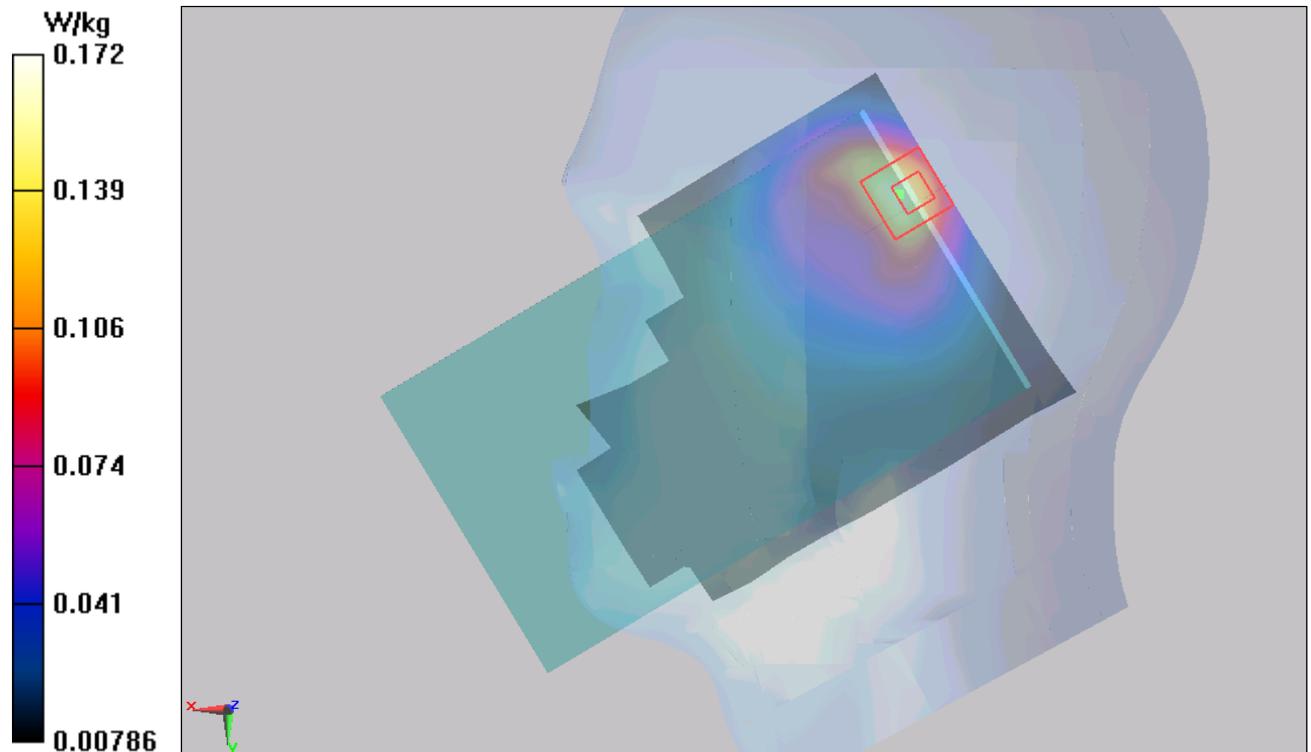


Figure 15 Right Hand Tilt 15° GSM 850 Channel 190

GSM 850 GPRS (2TXslots) with Test Position 1 Middle

Date/Time: 3/14/2014 7:05:19 PM

Communication System: GPRS 2TX ; Frequency: 836.6 MHz; Duty Cycle: 1:4.14954

Medium parameters used: $f = 837$ MHz; $\sigma = 0.992$ S/m; $\epsilon_r = 55.882$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.51, 9.51, 9.51); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: ELI 4.0; Type: QDOVA001BA;

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

Test Position 1 Middle /Area Scan (71x131x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.566 W/kg

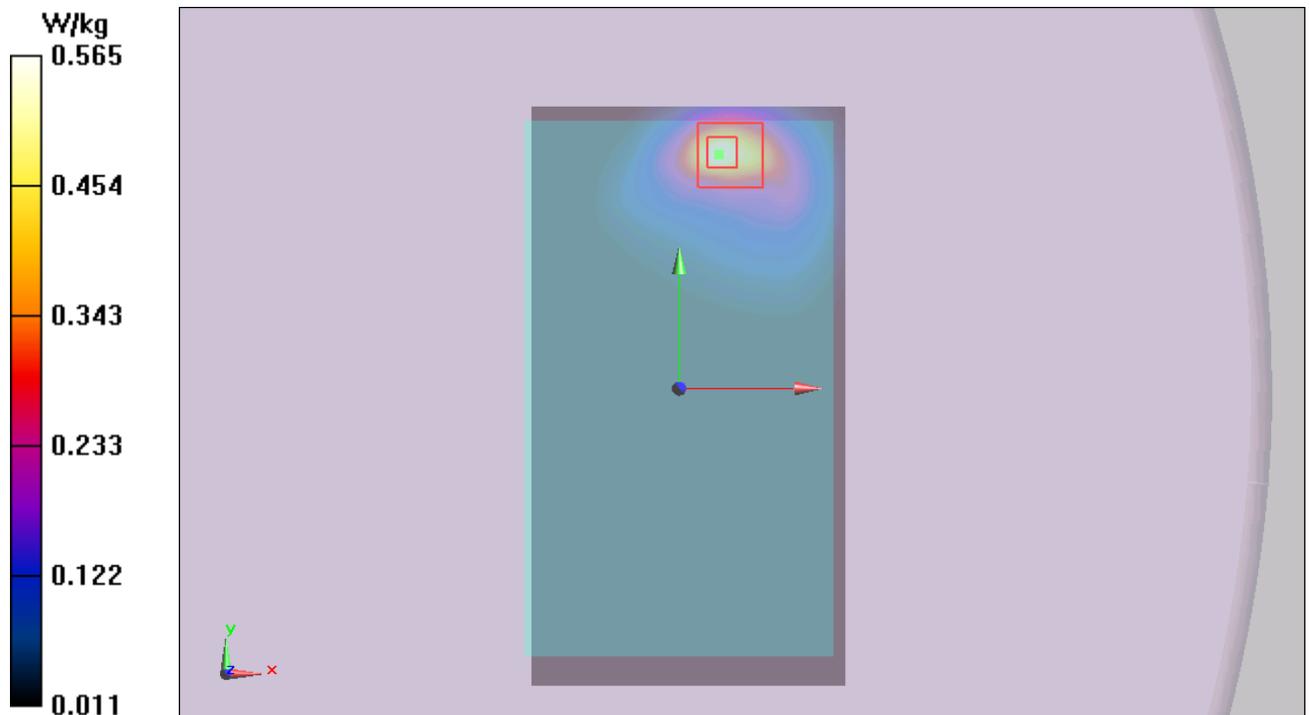
Test Position 1 Middle /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 2.114 V/m; Power Drift = 0.053 dB

Peak SAR (extrapolated) = 1.19 W/kg

SAR(1 g) = 0.466 W/kg; SAR(10 g) = 0.215 W/kg

Maximum value of SAR (measured) = 0.565 W/kg



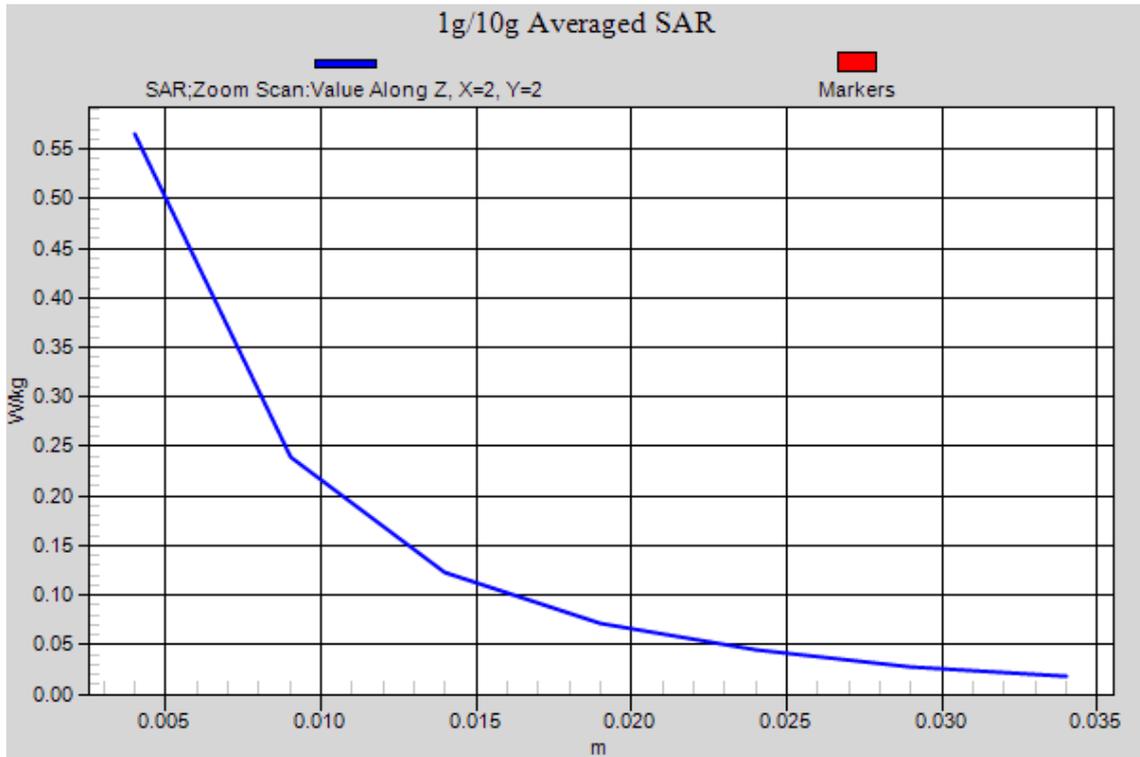


Figure 16 GSM 850 GPRS (2TXslots) with Test Position 1 Channel 190

GSM 850 GPRS (2TXslots) with Test Position 3 Middle

Date/Time: 3/14/2014 8:27:37 PM

Communication System: GPRS 2TX ; Frequency: 836.6 MHz; Duty Cycle: 1:4.14954

Medium parameters used: $f = 837$ MHz; $\sigma = 0.992$ S/m; $\epsilon_r = 55.882$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.51, 9.51, 9.51); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: ELI 4.0; Type: QDOVA001BA;

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

Test Position 3 Middle /Area Scan (31x91x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.348 W/kg

Test Position 3 Middle /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 20.235 V/m; Power Drift = -0.10 dB

Peak SAR (extrapolated) = 0.806 W/kg

SAR(1 g) = 0.399 W/kg; SAR(10 g) = 0.199 W/kg

Maximum value of SAR (measured) = 0.502 W/kg

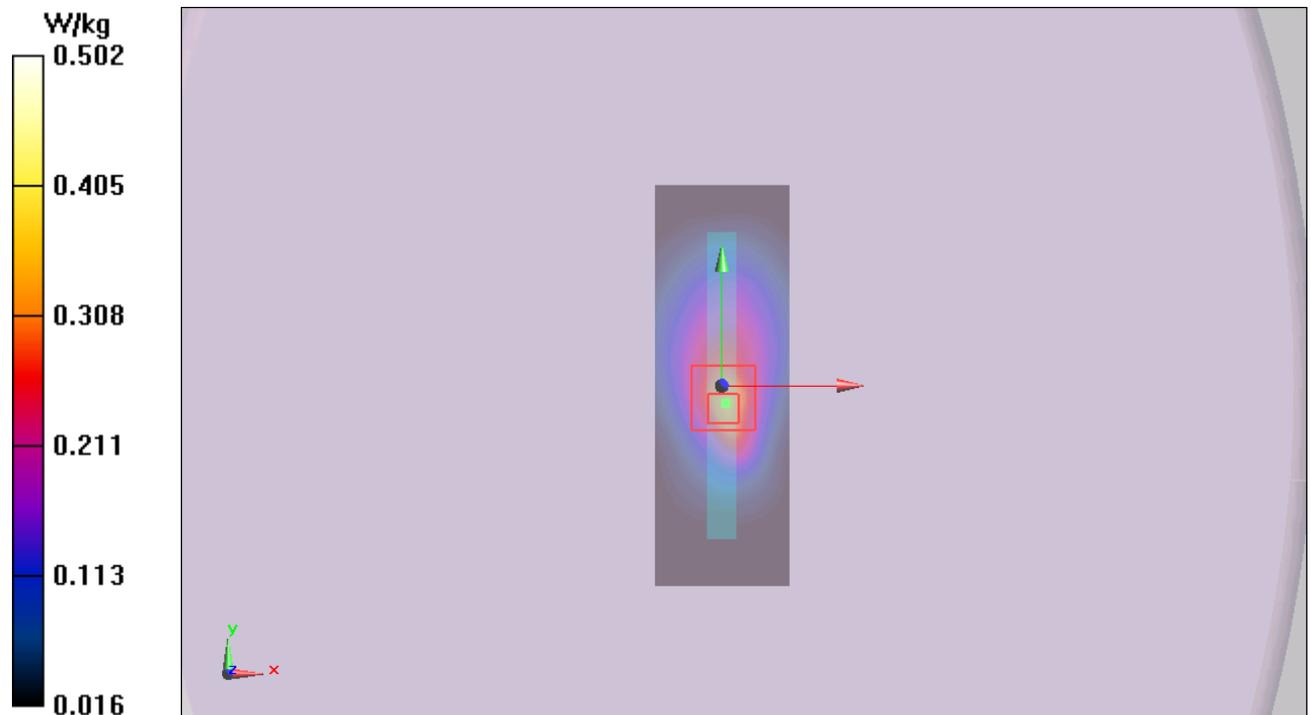


Figure 17 GSM 850 GPRS (2TXslots) with Test Position 3 Channel 190

TA Technology (Shanghai) Co., Ltd.
Test Report

GSM 850 GPRS (2TXslots) with Test Position 4 Middle

Date/Time: 3/21/2014 3:12:49 PM

Communication System: GPRS 2TX ; Frequency: 836.6 MHz; Duty Cycle: 1:4.14954

Medium parameters used: $f = 837$ MHz; $\sigma = 0.992$ S/m; $\epsilon_r = 55.882$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.51, 9.51, 9.51); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

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

Test Position 4 Middle /Area Scan (31x141x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.0228 W/kg

Test Position 4 Middle /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 3.628 V/m; Power Drift = -0.16 dB

Peak SAR (extrapolated) = 0.0340 W/kg

SAR(1 g) = 0.019 W/kg; SAR(10 g) = 0.011 W/kg

Maximum value of SAR (measured) = 0.0233 W/kg



Figure 18 GSM 850 GPRS (2TXslots) with Test Position 4 Channel 190

GSM 850 GPRS (2TXslots) with Test Position 5 Middle

Date/Time: 3/14/2014 7:45:34 PM

Communication System: GPRS 2TX ; Frequency: 836.6 MHz; Duty Cycle: 1:4.14954

Medium parameters used: $f = 837$ MHz; $\sigma = 0.992$ S/m; $\epsilon_r = 55.882$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.51, 9.51, 9.51); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: ELI 4.0; Type: QDOVA001BA;

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

Test Position 5 Middle /Area Scan (31x131x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.0716 W/kg

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

Reference Value = 3.676 V/m; Power Drift = -0.079 dB

Peak SAR (extrapolated) = 0.150 W/kg

SAR(1 g) = 0.073 W/kg; SAR(10 g) = 0.037 W/kg

Maximum value of SAR (measured) = 0.0837 W/kg

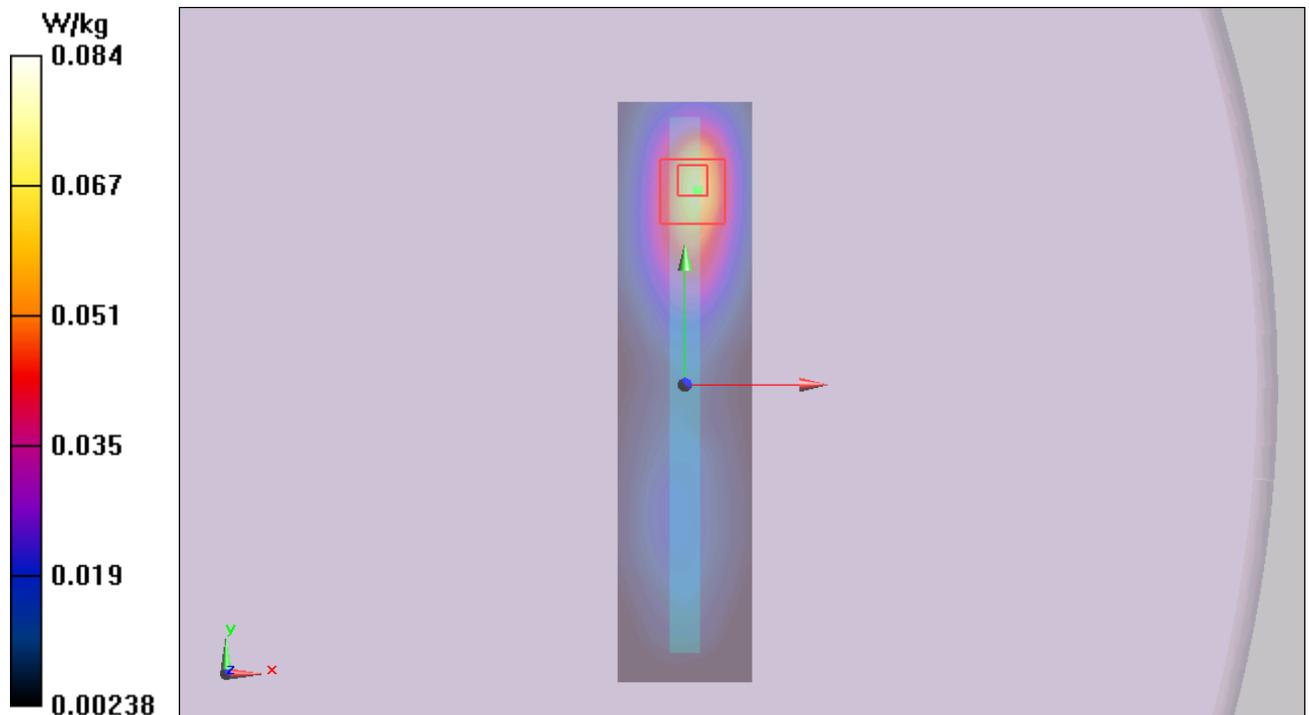


Figure 19 GSM 850 GPRS (2TXslots) with Test Position 5 Channel 190

GSM 850 EGPRS (2TXslots) with Test Position 1 Middle

Date/Time: 3/14/2014 7:27:38 PM

Communication System: EGPRS 2TX ; Frequency: 836.6 MHz;Duty Cycle: 1:4.14954

Medium parameters used: $f = 837$ MHz; $\sigma = 0.992$ S/m; $\epsilon_r = 55.882$; $\rho = 1000$ kg/m³

Ambient Temperature:22.3 °C Liquid Temperature: 21.5°C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.51, 9.51, 9.51); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: ELI 4.0; Type: QDOVA001BA;

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

Test Position 1 Middle /Area Scan (71x131x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.489 W/kg

Test Position 1 Middle /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 2.267 V/m; Power Drift = -0.021 dB

Peak SAR (extrapolated) = 0.994 W/kg

SAR(1 g) = 0.406 W/kg; SAR(10 g) = 0.193 W/kg

Maximum value of SAR (measured) = 0.479 W/kg

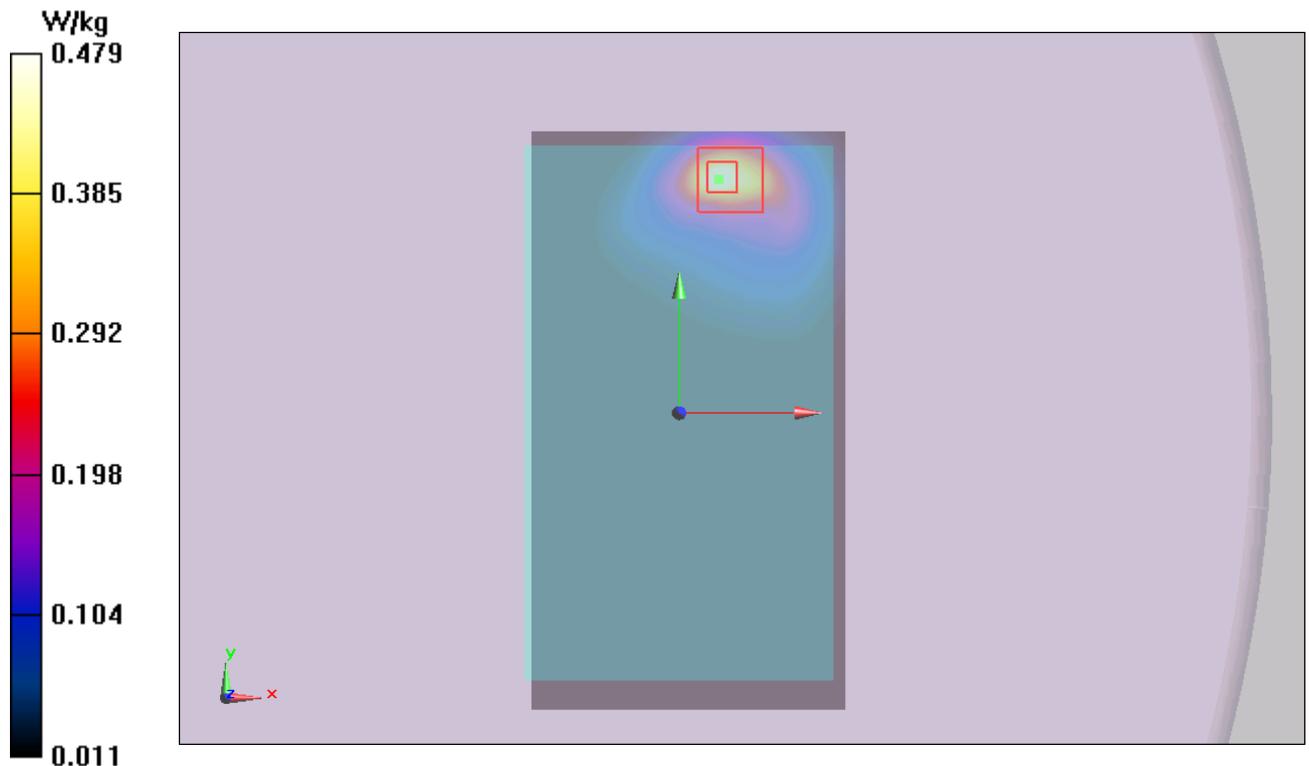


Figure 20 GSM 850 EGPRS (2TXslots) with Test Position 1 Channel 190

GSM 1900 Left Cheek Middle

Date/Time: 3/18/2014 2:09:30 AM

Communication System: GSM ; Frequency: 1880 MHz;Duty Cycle: 1:8.30042

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.413$ S/m; $\epsilon_r = 39.689$; $\rho = 1000$ kg/m³

Ambient Temperature:22.3 °C Liquid Temperature: 21.5°C

Phantom section: Left Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(8.15, 8.15, 8.15); Calibrated: 11/28/2013

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

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

Left Cheek Middle /Area Scan (101x141x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.373 W/kg

Left Cheek Middle /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 11.065 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.526 W/kg

SAR(1 g) = 0.323 W/kg; SAR(10 g) = 0.173 W/kg

Maximum value of SAR (measured) = 0.331 W/kg

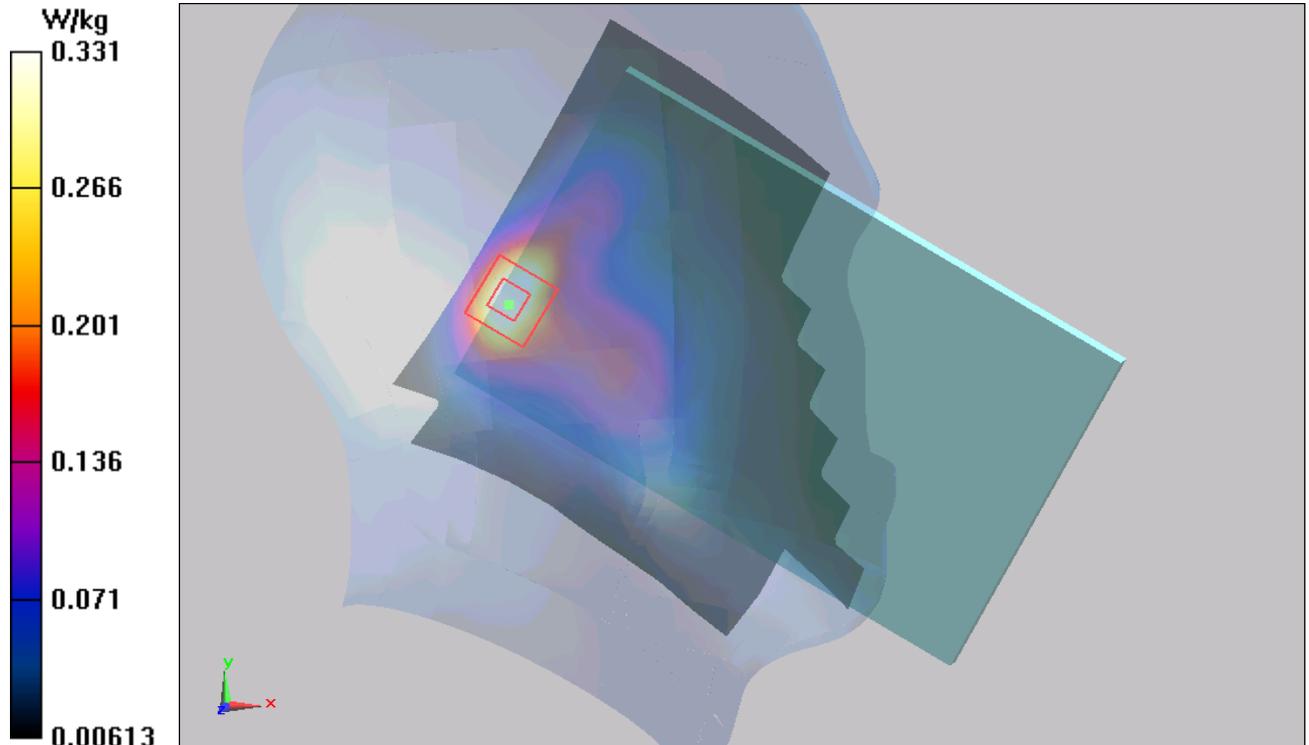


Figure 21 Left Hand Touch Cheek GSM 1900 Channel 661

GSM 1900 Left Tilt Middle

Date/Time: 3/18/2014 3:01:58 AM

Communication System: GSM ; Frequency: 1880 MHz; Duty Cycle: 1:8.30042

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.413$ S/m; $\epsilon_r = 39.689$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Left Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(8.15, 8.15, 8.15); Calibrated: 11/28/2013

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

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

Left Tilt Middle /Area Scan (101x141x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.284 W/kg

Left Tilt Middle /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 11.838 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.423 W/kg

SAR(1 g) = 0.256 W/kg; SAR(10 g) = 0.135 W/kg

Maximum value of SAR (measured) = 0.251 W/kg

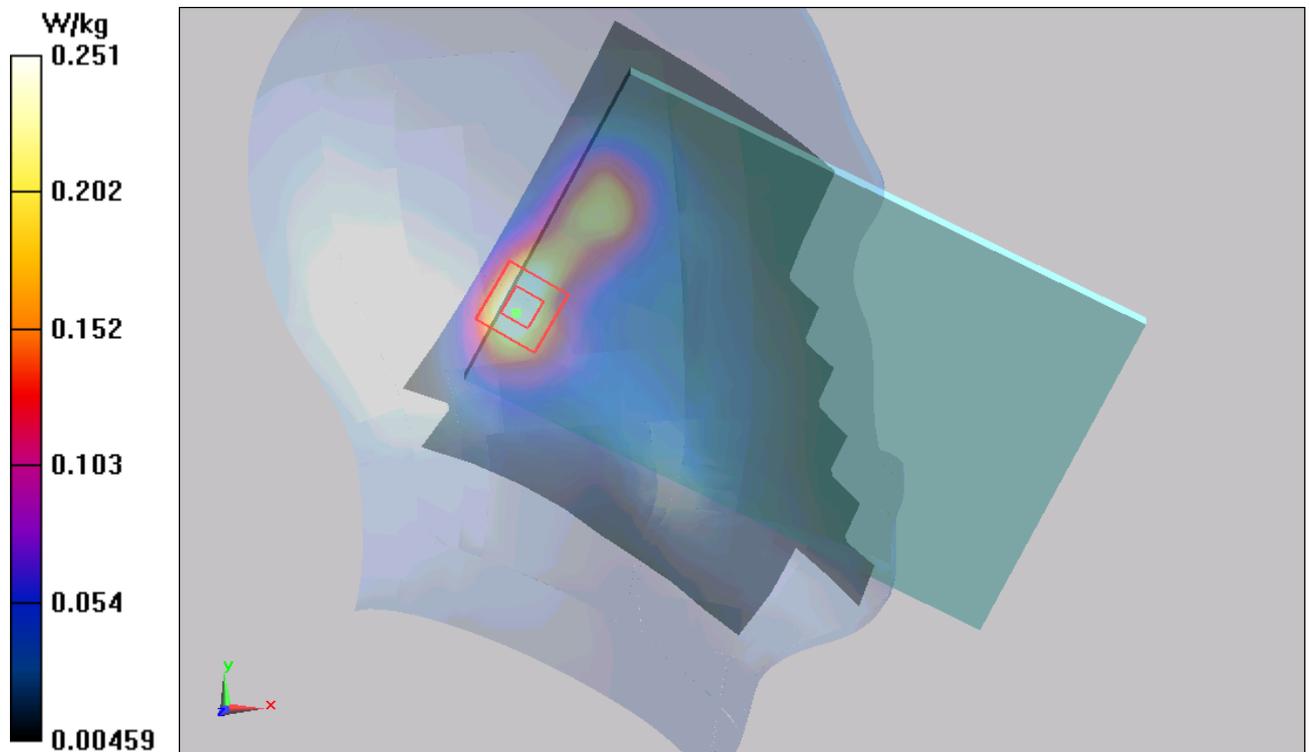


Figure 22 Left Hand Tilt 15° GSM 1900 Channel 661

GSM 1900 Right Cheek High

Date/Time: 3/18/2014 6:14:33 AM

Communication System: GSM ; Frequency: 1909.8 MHz; Duty Cycle: 1:8.30042

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.44$ S/m; $\epsilon_r = 39.607$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Right Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(8.15, 8.15, 8.15); Calibrated: 11/28/2013

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

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

Right Cheek High /Area Scan (91x141x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 1.02 W/kg

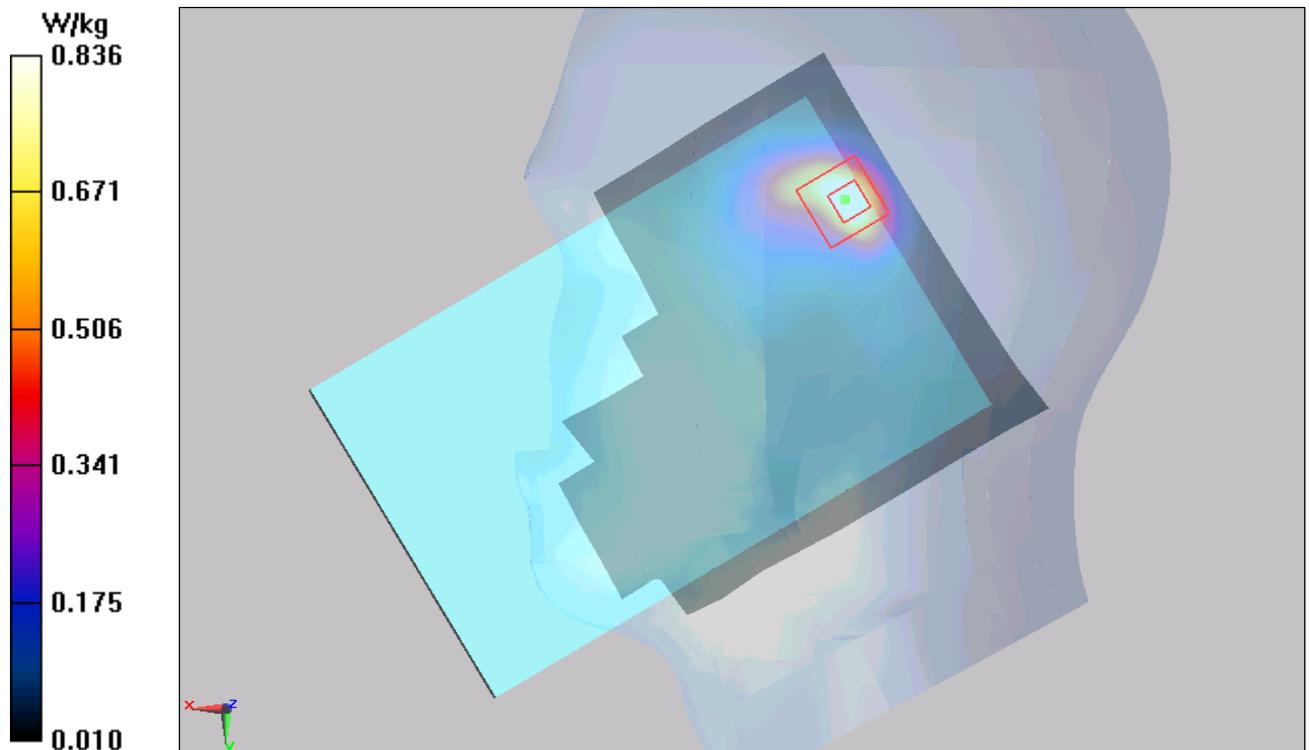
Right Cheek High /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 14.176 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 1.56 W/kg

SAR(1 g) = 0.840 W/kg; SAR(10 g) = 0.396 W/kg

Maximum value of SAR (measured) = 0.836 W/kg



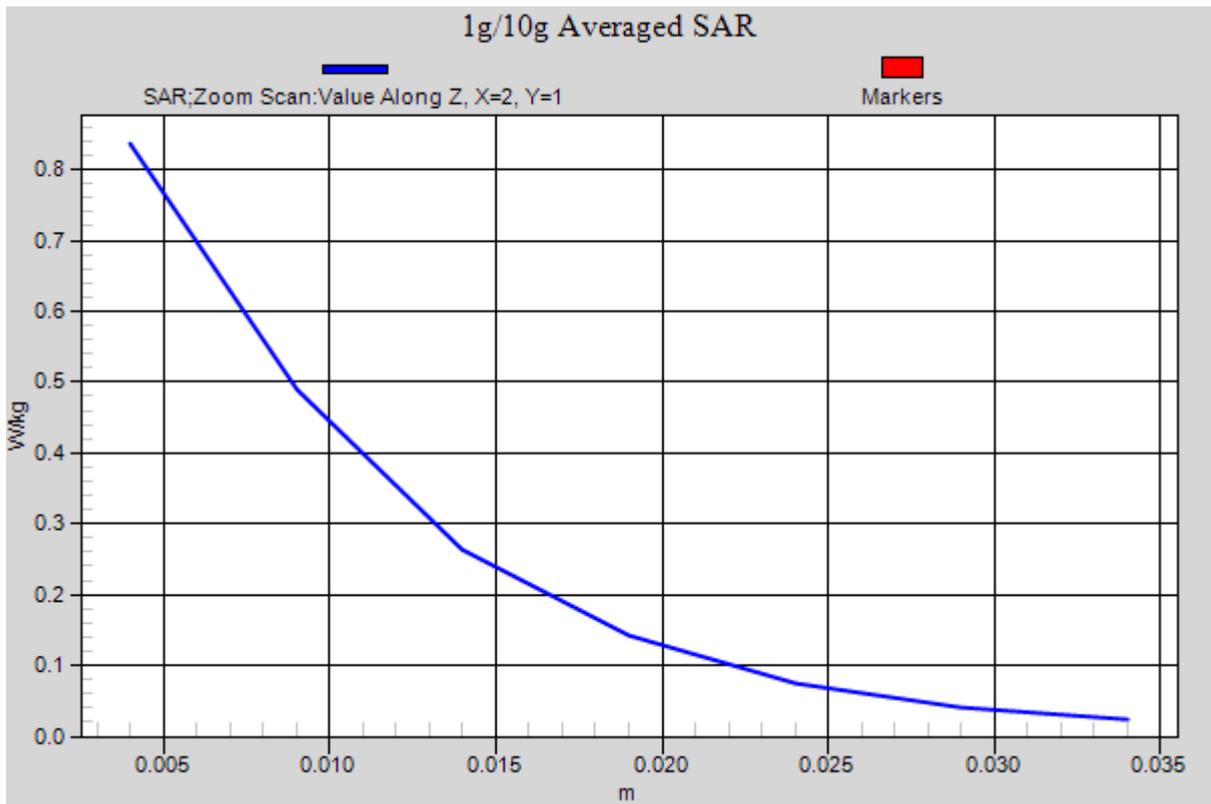


Figure 23 Right Hand Touch Cheek GSM 1900 Channel 810

GSM 1900 Right Cheek Middle

Date/Time: 3/18/2014 3:41:58 AM

Communication System: GSM ; Frequency: 1880 MHz;Duty Cycle: 1:8.30042

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.413$ S/m; $\epsilon_r = 39.689$; $\rho = 1000$ kg/m³

Ambient Temperature:22.3 °C Liquid Temperature: 21.5°C

Phantom section: Right Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(8.15, 8.15, 8.15); Calibrated: 11/28/2013

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

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

Right Cheek Middle /Area Scan (91x141x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 1.04 W/kg

Right Cheek Middle /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 14.261 V/m; Power Drift = 0.15 dB

Peak SAR (extrapolated) = 1.55 W/kg

SAR(1 g) = 0.842 W/kg; SAR(10 g) = 0.399 W/kg

Maximum value of SAR (measured) = 0.858 W/kg

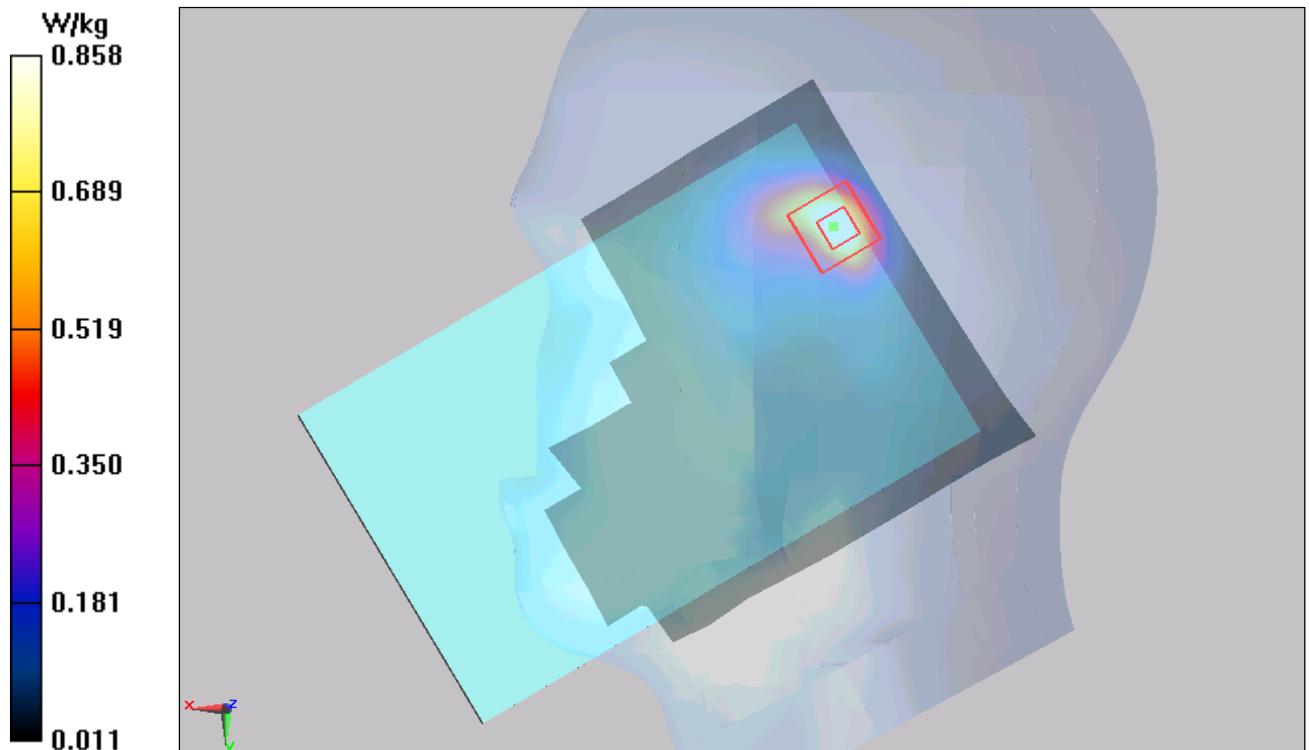


Figure 24 Right Hand Touch Cheek GSM 1900 Channel 661

GSM 1900 Right Cheek Low

Date/Time: 3/18/2014 5:57:11 AM

Communication System: GSM ; Frequency: 1850.2 MHz;Duty Cycle: 1:8.30042

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.386$ S/m; $\epsilon_r = 39.813$; $\rho = 1000$ kg/m³

Ambient Temperature:22.3 °C Liquid Temperature: 21.5°C

Phantom section: Right Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(8.15, 8.15, 8.15); Calibrated: 11/28/2013

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

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

Right Cheek Low /Area Scan (91x141x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.980 W/kg

Right Cheek Low /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 14.173 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 1.41 W/kg

SAR(1 g) = 0.787 W/kg; SAR(10 g) = 0.380 W/kg

Maximum value of SAR (measured) = 0.793 W/kg

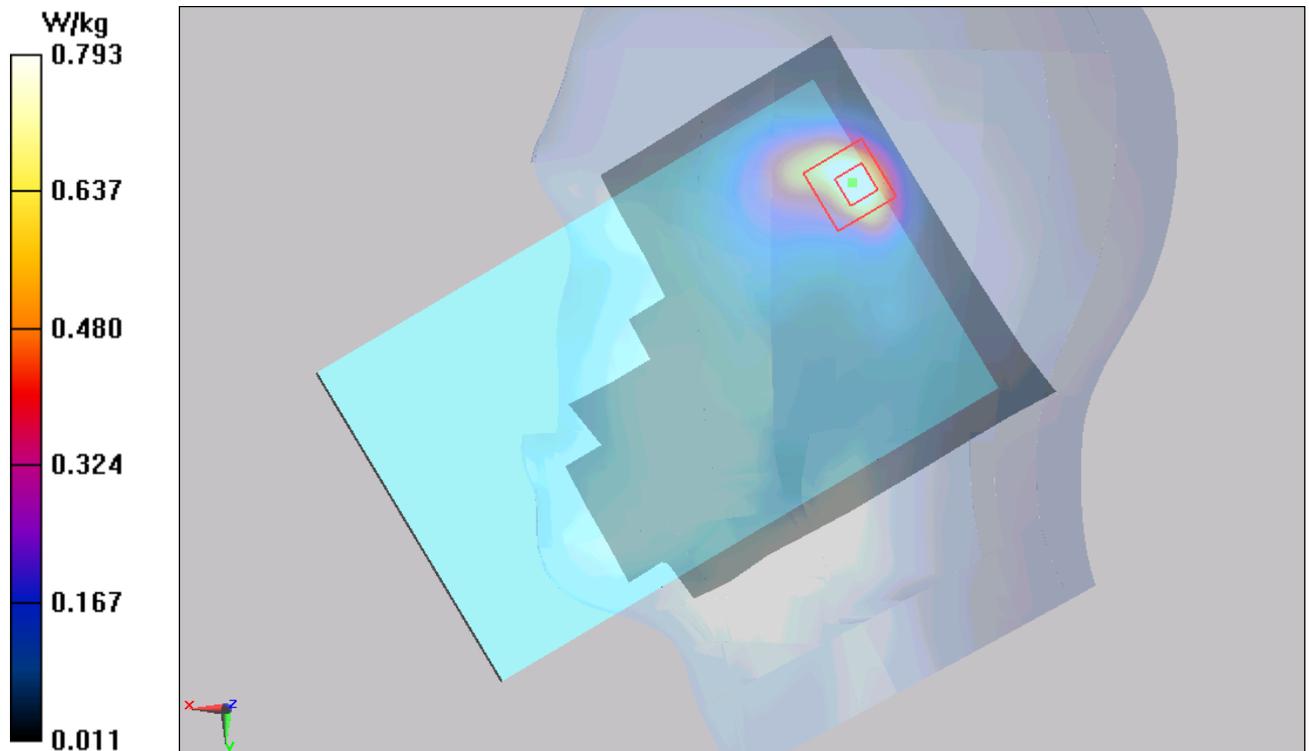


Figure 25 Right Hand Touch Cheek GSM 1900 Channel 512

GSM 1900 Right Tilt High

Date/Time: 3/18/2014 5:22:17 AM

Communication System: GSM ; Frequency: 1909.8 MHz;Duty Cycle: 1:8.30042

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.44$ S/m; $\epsilon_r = 39.607$; $\rho = 1000$ kg/m³

Ambient Temperature:22.3 °C Liquid Temperature: 21.5°C

Phantom section: Right Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(8.15, 8.15, 8.15); Calibrated: 11/28/2013

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

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

Right Tilt High /Area Scan (91x141x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.859 W/kg

Right Tilt High /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 14.530 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 1.34 W/kg

SAR(1 g) = 0.716 W/kg; SAR(10 g) = 0.330 W/kg

Maximum value of SAR (measured) = 0.751 W/kg

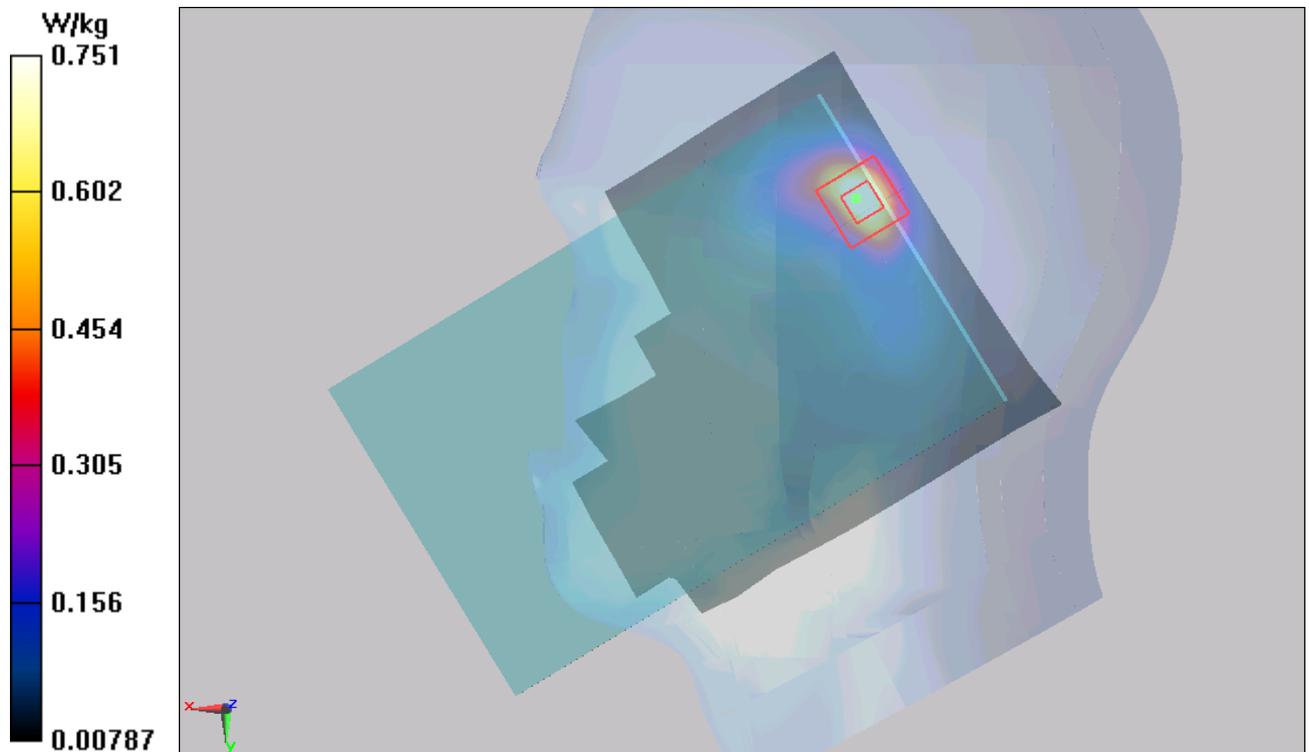


Figure 26 Right Hand Tilt 15° GSM 1900 Channel 810

GSM 1900 Right Tilt Middle

Date/Time: 3/18/2014 4:00:03 AM

Communication System: GSM ; Frequency: 1880 MHz;Duty Cycle: 1:8.30042

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.413$ S/m; $\epsilon_r = 39.689$; $\rho = 1000$ kg/m³

Ambient Temperature:22.3 °C Liquid Temperature: 21.5°C

Phantom section: Right Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(8.15, 8.15, 8.15); Calibrated: 11/28/2013

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

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

Right Tilt Middle /Area Scan (91x141x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.838 W/kg

Right Tilt Middle /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 14.504 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 1.29 W/kg

SAR(1 g) = 0.697 W/kg; SAR(10 g) = 0.324 W/kg

Maximum value of SAR (measured) = 0.741 W/kg

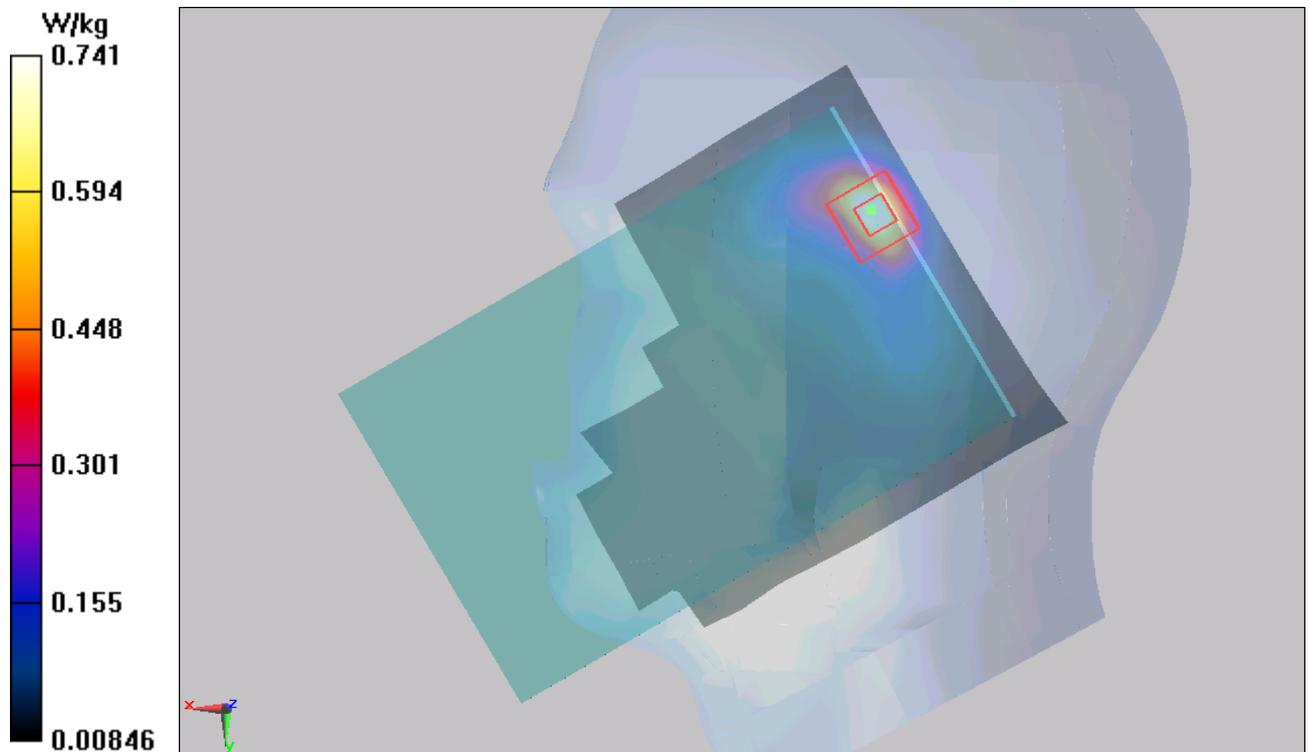


Figure 27 Right Hand Tilt 15° GSM 1900 Channel 661

GSM 1900 Right Tilt Low

Date/Time: 3/18/2014 5:39:14 AM

Communication System: GSM ; Frequency: 1850.2 MHz;Duty Cycle: 1:8.30042

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.386$ S/m; $\epsilon_r = 39.813$; $\rho = 1000$ kg/m³

Ambient Temperature:22.3 °C Liquid Temperature: 21.5°C

Phantom section: Right Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(8.15, 8.15, 8.15); Calibrated: 11/28/2013

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

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

Right Tilt Low /Area Scan (91x141x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.800 W/kg

Right Tilt Low /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 14.647 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 1.23 W/kg

SAR(1 g) = 0.668 W/kg; SAR(10 g) = 0.314 W/kg

Maximum value of SAR (measured) = 0.710 W/kg

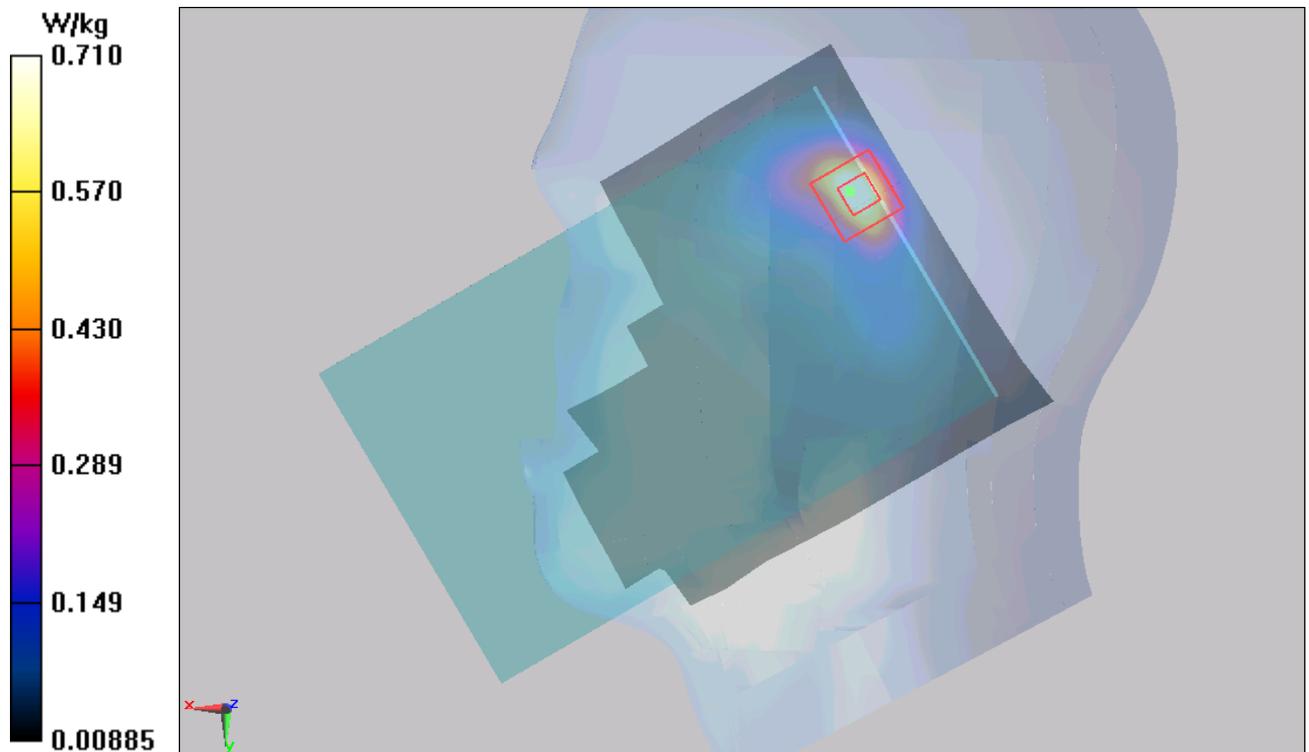


Figure 28 Right Hand Tilt 15° GSM 1900 Channel 512

GSM 1900 GPRS (2TXslots) with Test Position 1 High

Date/Time: 3/17/2014 4:09:54 PM

Communication System: GPRS 2TX ; Frequency: 1909.8 MHz;Duty Cycle: 1:4.14954

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.531$ S/m; $\epsilon_r = 52.629$; $\rho = 1000$ kg/m³

Ambient Temperature:22.3 °C Liquid Temperature: 21.5°C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: ELI 4.0; Type: QDOVA001BA;

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

Test Position 1 High /Area Scan (91x141x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 1.51 W/kg

Test Position 1 High /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.608 V/m; Power Drift = -0.047 dB

Peak SAR (extrapolated) = 2.81 W/kg

SAR(1 g) = 1.22 W/kg; SAR(10 g) = 0.536 W/kg

Maximum value of SAR (measured) = 1.42 W/kg

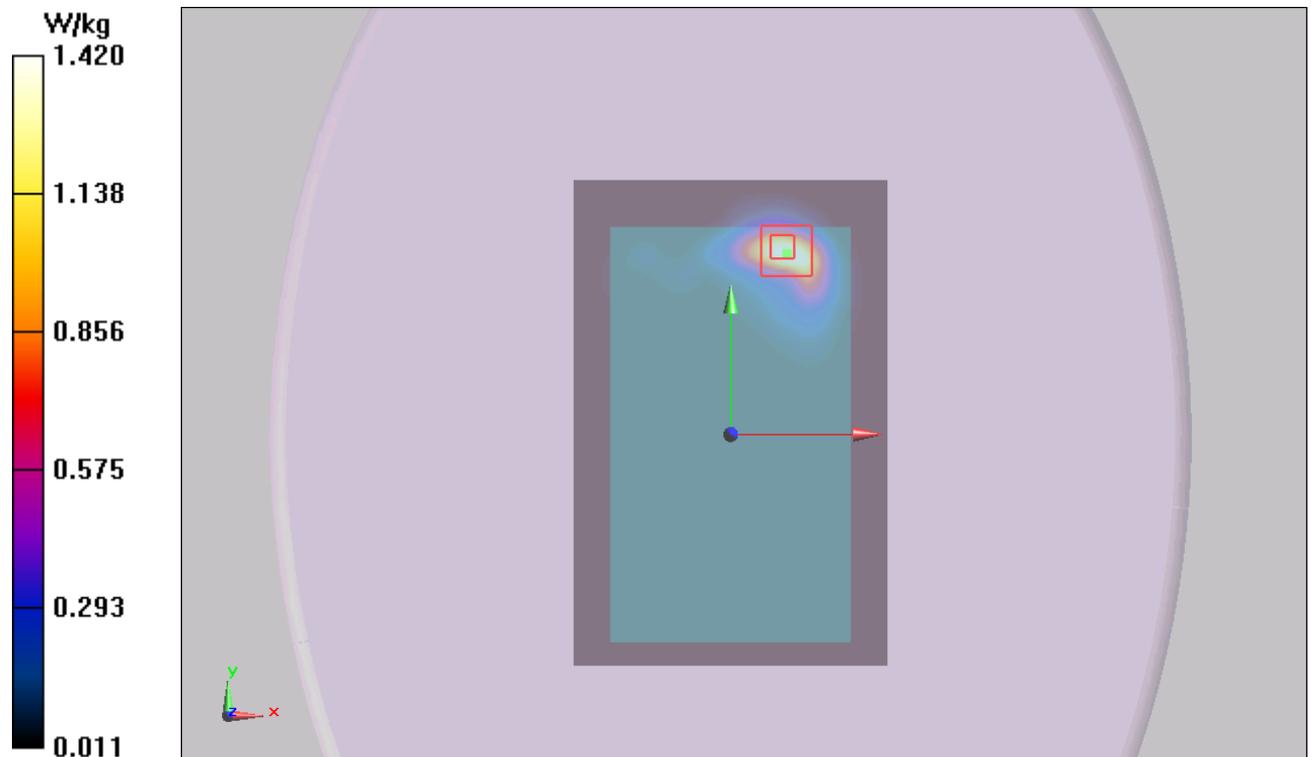


Figure 29 GSM 1900 GPRS (2TXslots) with Test Position 1 Channel 810

TA Technology (Shanghai) Co., Ltd. Test Report

Report No. RHA1403-0023SAR

Page 82 of 165

GSM 1900 GPRS (2TXslots) with Test Position 1 Middle

Date/Time: 3/17/2014 3:51:21 PM

Communication System: GPRS 2TX ; Frequency: 1880 MHz; Duty Cycle: 1:4.14954

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.493$ S/m; $\epsilon_r = 52.676$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: ELI 4.0; Type: QDOVA001BA;

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

Test Position 1 Middle /Area Scan (91x141x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 1.56 W/kg

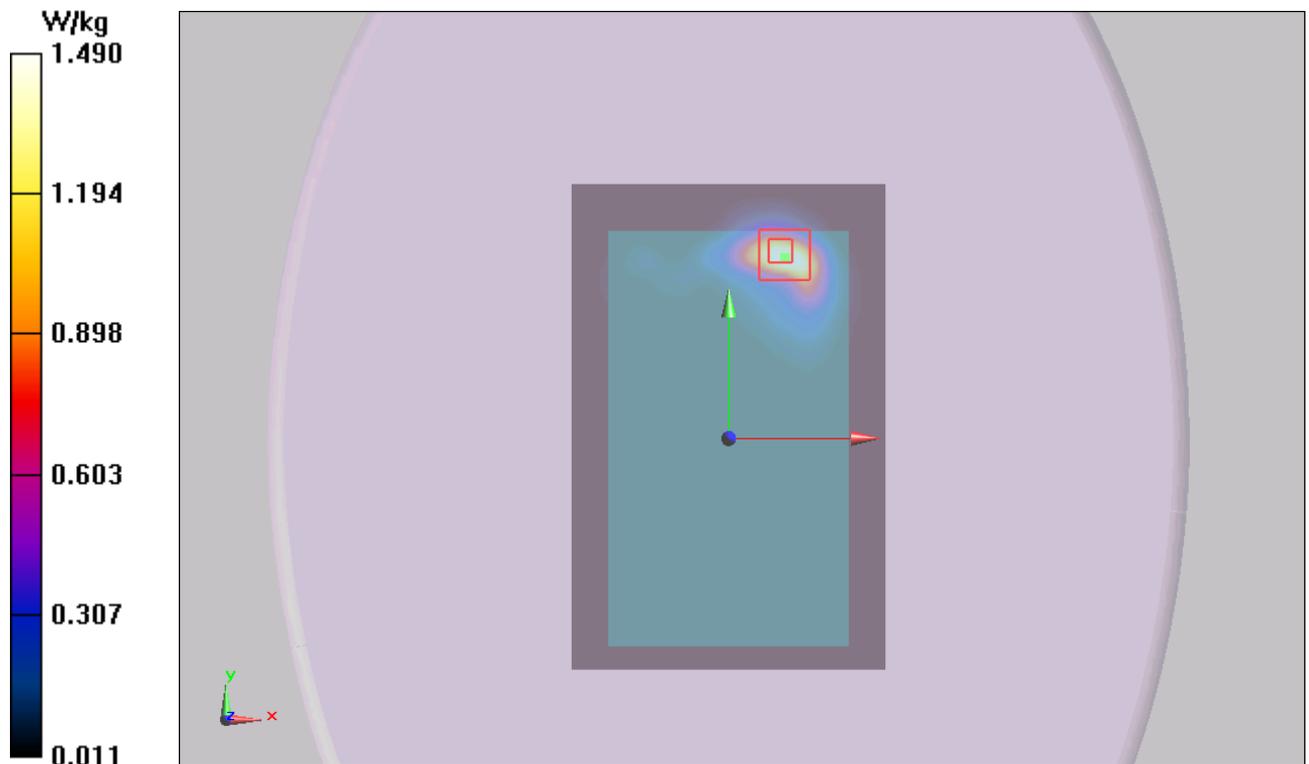
Test Position 1 Middle /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.249 V/m; Power Drift = 0.032 dB

Peak SAR (extrapolated) = 2.99 W/kg

SAR(1 g) = 1.29 W/kg; SAR(10 g) = 0.556 W/kg

Maximum value of SAR (measured) = 1.49 W/kg



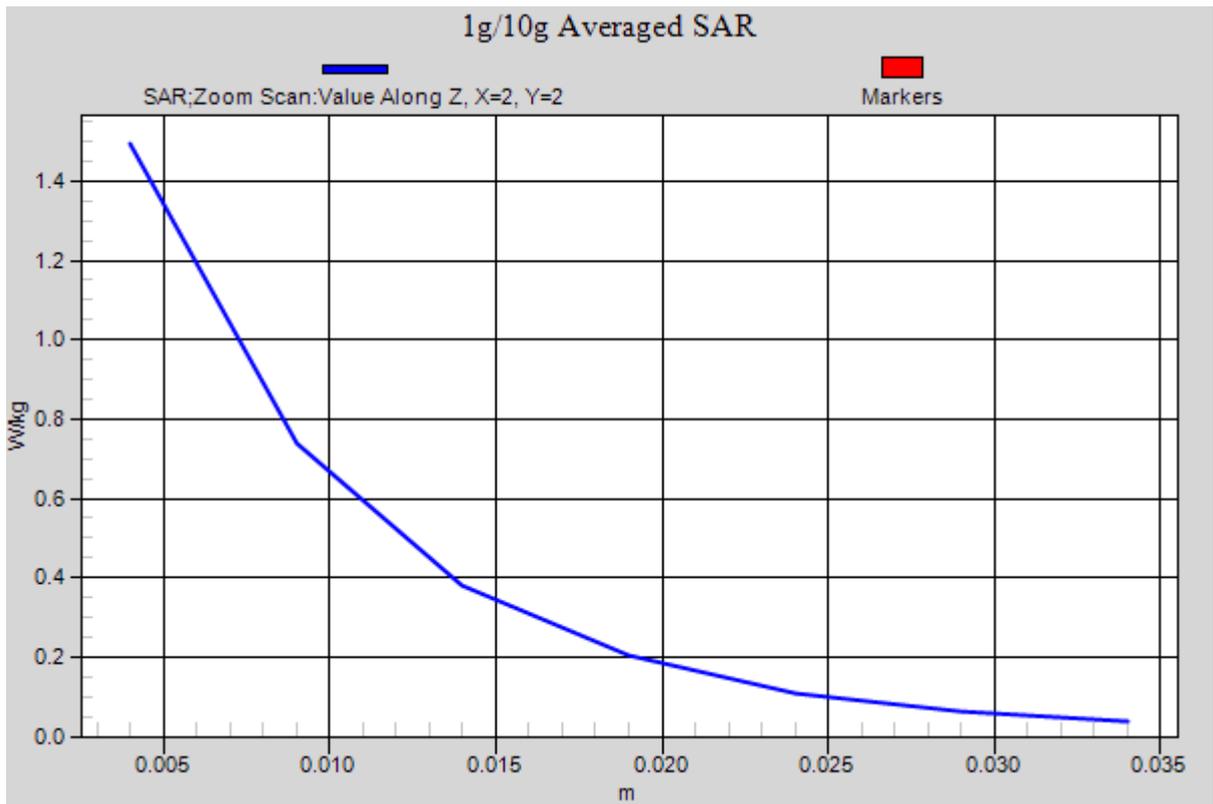


Figure 30 GSM 1900 GPRS (2TXslots) with Test Position 1 Channel 661

GSM 1900 GPRS (2TXslots) with Test Position 1 Low

Date/Time: 3/17/2014 4:37:07 PM

Communication System: GPRS 2TX ; Frequency: 1850.2 MHz; Duty Cycle: 1:4.14954

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.462$ S/m; $\epsilon_r = 52.753$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: ELI 4.0; Type: QDOVA001BA;

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

Test Position 1 Low /Area Scan (91x141x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 1.50 W/kg

Test Position 1 Low /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.307 V/m; Power Drift = 0.137 dB

Peak SAR (extrapolated) = 2.75 W/kg

SAR(1 g) = 1.18 W/kg; SAR(10 g) = 0.529 W/kg

Maximum value of SAR (measured) = 1.37 W/kg

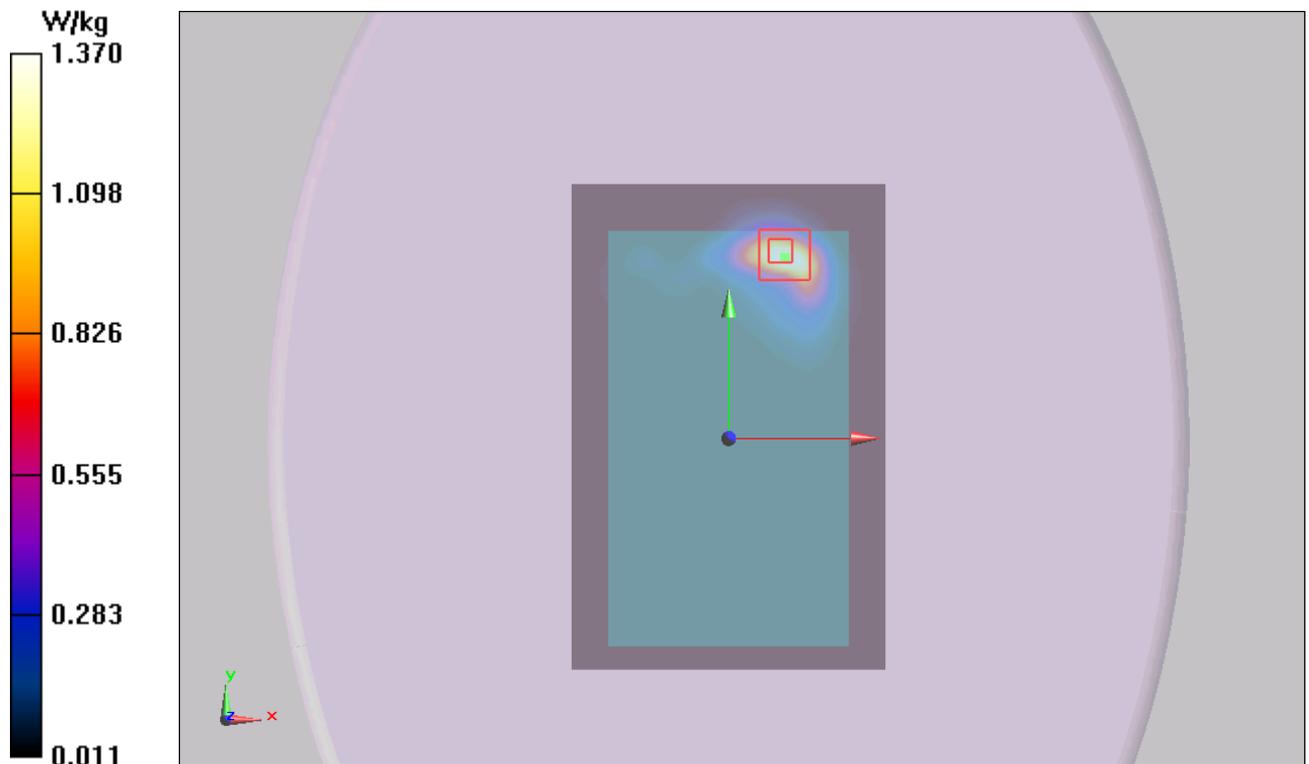


Figure 31 GSM 1900 GPRS (2TXslots) with Test Position 1 Channel 512

GSM 1900 GPRS (2TXslots) with Test Position 3 High

Date/Time: 3/17/2014 7:33:46 PM

Communication System: GPRS 2TX ; Frequency: 1909.8 MHz; Duty Cycle: 1:4.14954

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.531$ S/m; $\epsilon_r = 52.629$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: ELI 4.0; Type: QDOVA001BA;

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

Test Position 3 High /Area Scan (31x91x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 1.13 W/kg

Test Position 3 High /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.003 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 2.99 W/kg

SAR(1 g) = 1.25 W/kg; SAR(10 g) = 0.461 W/kg

Maximum value of SAR (measured) = 1.17 W/kg

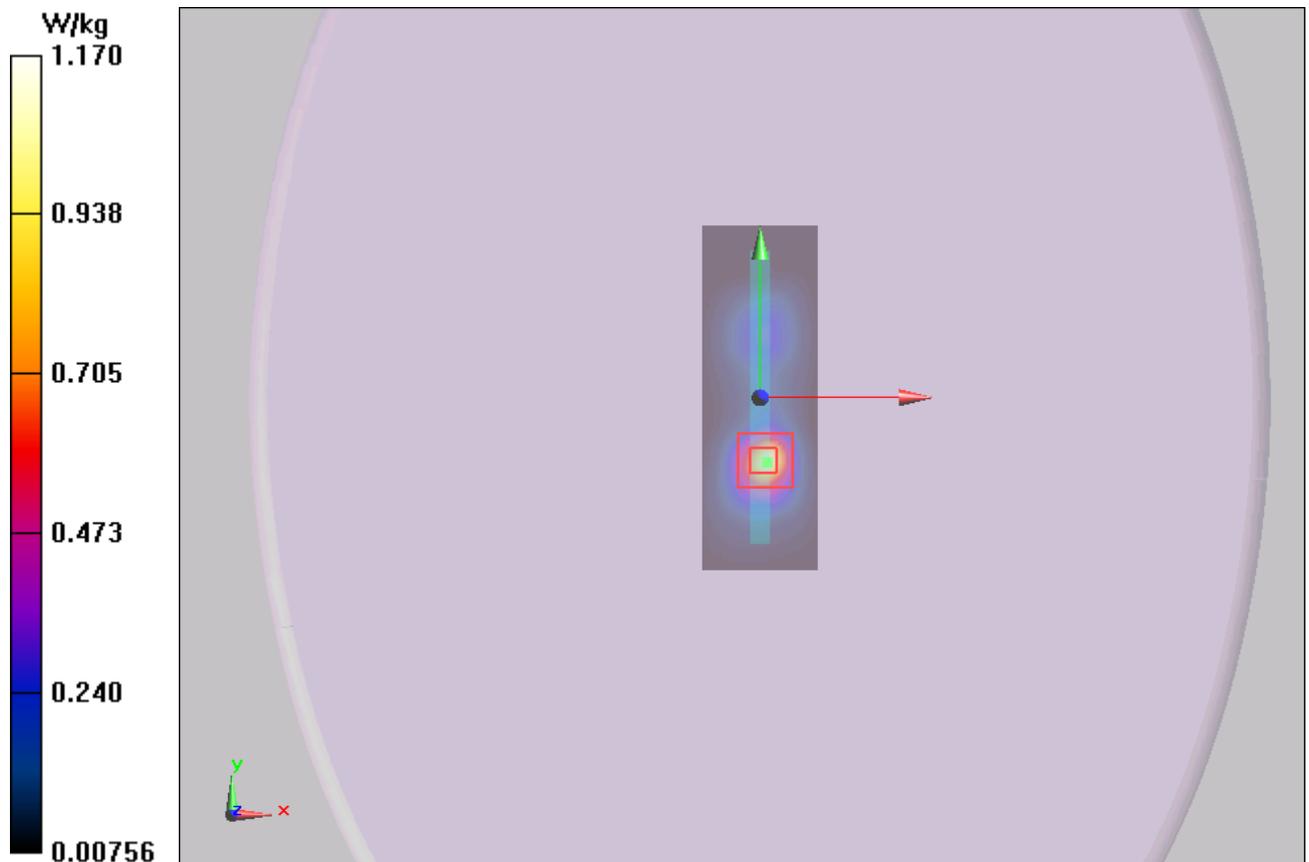


Figure 32 GSM 1900 GPRS (2TXslots) with Test Position 3 Channel 810

GSM 1900 GPRS (2TXslots) with Test Position 3 Middle

Date/Time: 3/17/2014 7:15:57 PM

Communication System: GPRS 2TX ; Frequency: 1880 MHz; Duty Cycle: 1:4.14954

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.493$ S/m; $\epsilon_r = 52.676$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: ELI 4.0; Type: QDOVA001BA;

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

Test Position 3 Middle /Area Scan (31x91x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 1.17 W/kg

Test Position 3 Middle /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.725 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 2.95 W/kg

SAR(1 g) = 1.25 W/kg; SAR(10 g) = 0.461 W/kg

Maximum value of SAR (measured) = 0.981 W/kg

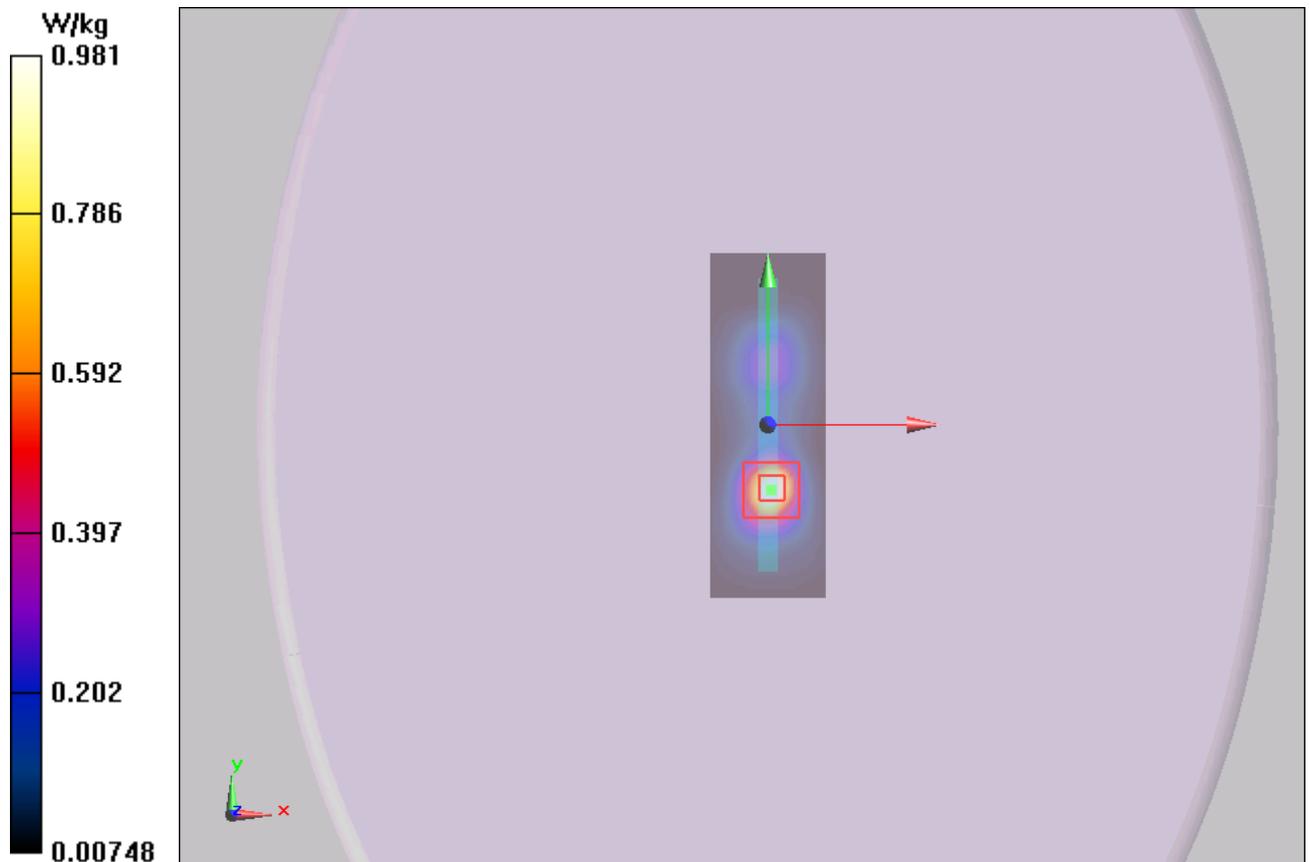


Figure 33 GSM 1900 GPRS (2TXslots) with Test Position 3 Channel 661

GSM 1900 GPRS (2TXslots) with Test Position 3 Low

Date/Time: 3/17/2014 7:44:13 PM

Communication System: GPRS 2TX ; Frequency: 1850.2 MHz;Duty Cycle: 1:4.14954

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.462$ S/m; $\epsilon_r = 52.753$; $\rho = 1000$ kg/m³

Ambient Temperature:22.3 °C Liquid Temperature: 21.5°C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: ELI 4.0; Type: QDOVA001BA;

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

Test Position 3 Low /Area Scan (31x91x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 1.15 W/kg

Test Position 3 Low /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.173 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 2.83 W/kg

SAR(1 g) = 1.19 W/kg; SAR(10 g) = 0.445 W/kg

Maximum value of SAR (measured) = 1.10 W/kg

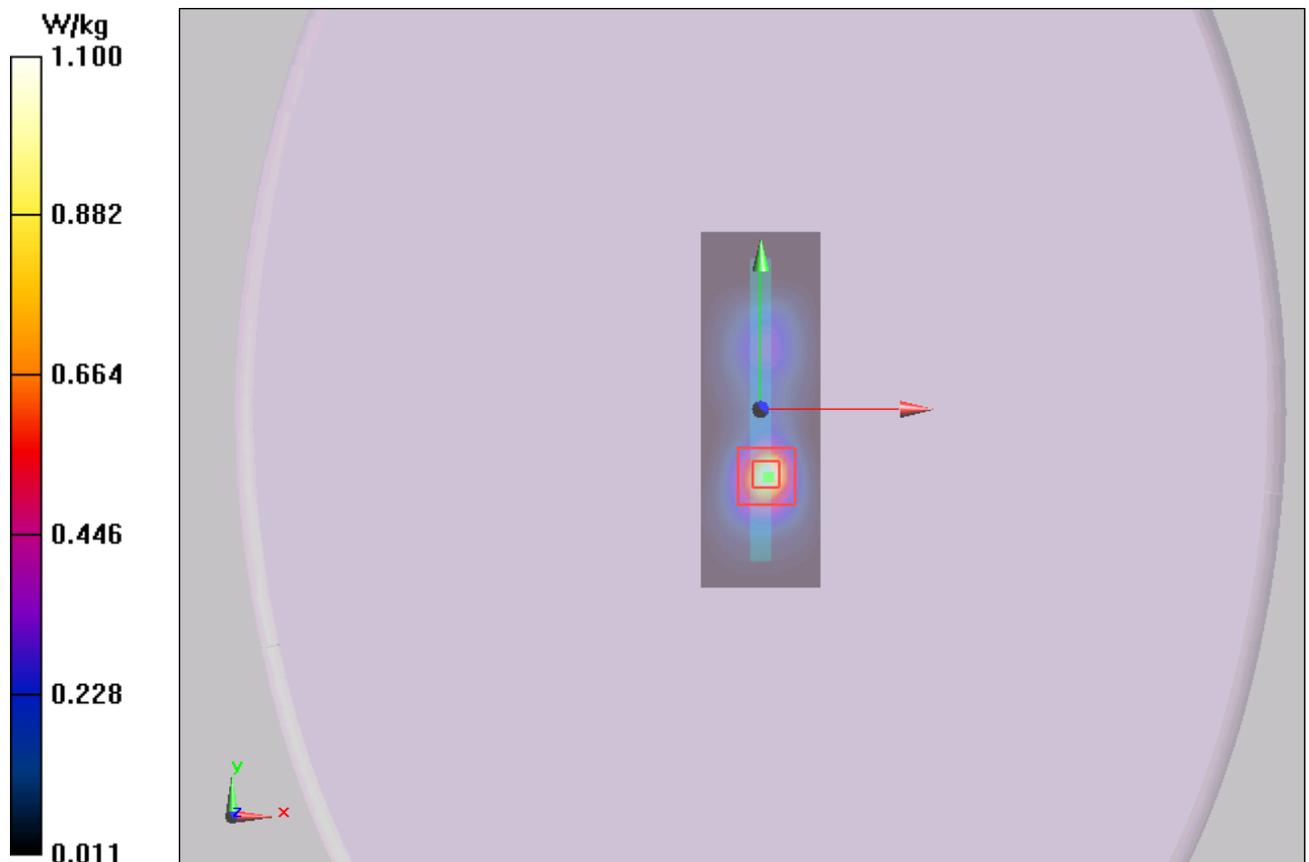


Figure 34 GSM 1900 GPRS (2TXslots) with Test Position 3 Channel 512

GSM 1900 GPRS (2TXslots) with Test Position 4 Middle

Date/Time: 3/18/2014 6:34:09 AM

Communication System: GPRS 2TX ; Frequency: 1880 MHz; Duty Cycle: 1:4.14954

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.493$ S/m; $\epsilon_r = 52.676$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: ELI 4.0; Type: QDOVA001BA;

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

Test Position 4 Middle /Area Scan (31x131x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.0585 W/kg

Test Position 4 Middle /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 3.290 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.113 W/kg

SAR(1 g) = 0.055 W/kg; SAR(10 g) = 0.027 W/kg

Maximum value of SAR (measured) = 0.059 W/kg

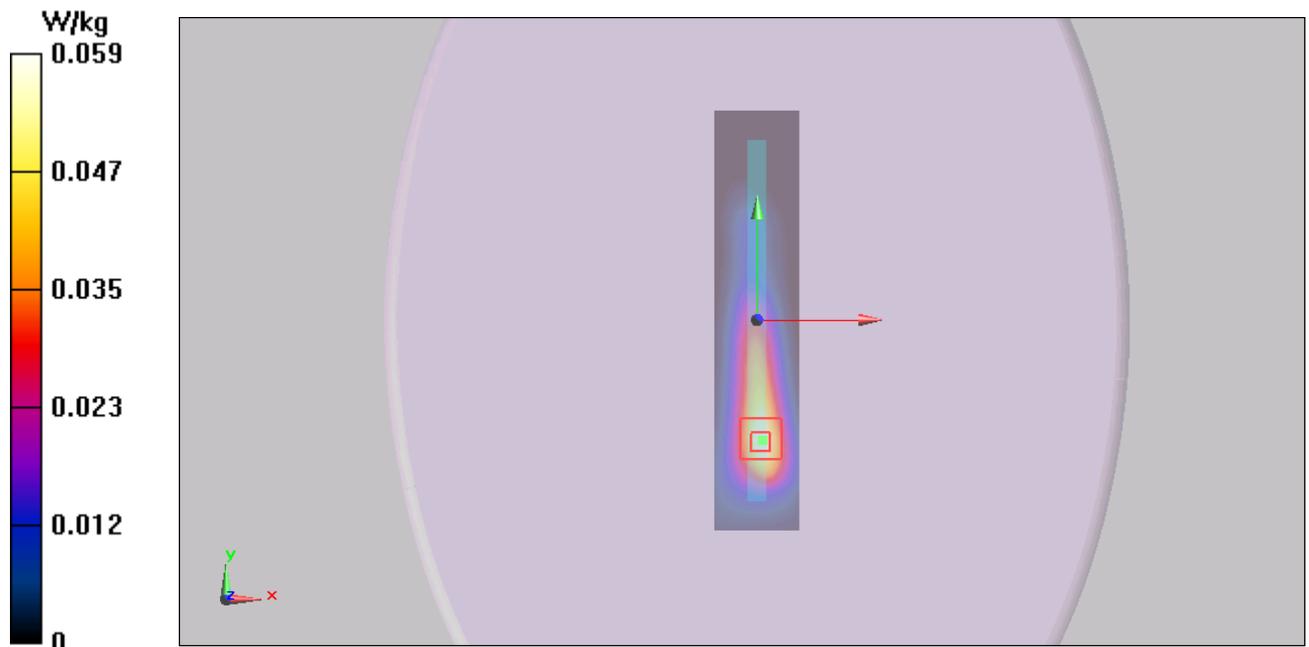


Figure 35 GSM 1900 GPRS (2TXslots) with Test Position 4 Channel 661

TA Technology (Shanghai) Co., Ltd. Test Report

Report No. RHA1403-0023SAR

Page 89 of 165

GSM 1900 GPRS (2TXslots) with Test Position 5 Middle

Date/Time: 3/17/2014 9:38:47 PM

Communication System: GPRS 2TX ; Frequency: 1880 MHz; Duty Cycle: 1:4.14954

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.493$ S/m; $\epsilon_r = 52.676$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: ELI 4.0; Type: QDOVA001BA;

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

Test Position 5 Middle /Area Scan (31x141x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.216 W/kg

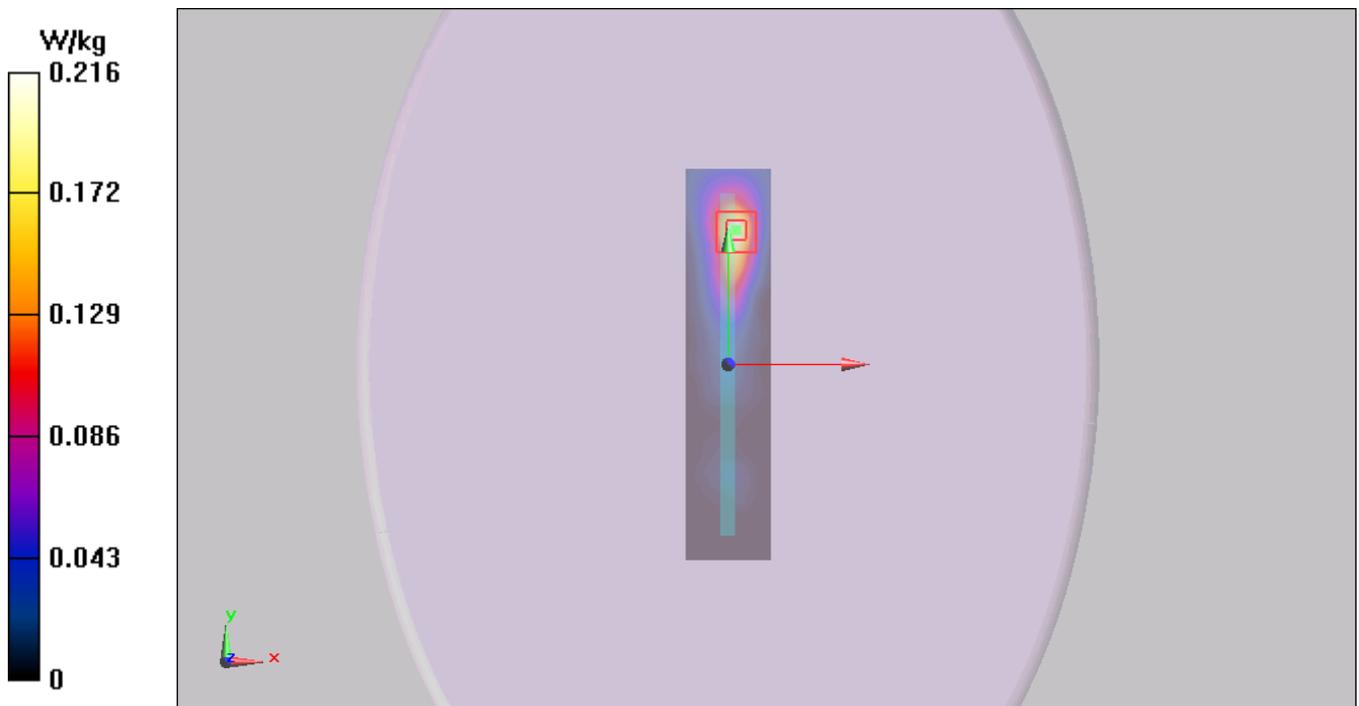
Test Position 5 Middle /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.841 V/m; Power Drift = -0.126 dB

Peak SAR (extrapolated) = 0.440 W/kg

SAR(1 g) = 0.212 W/kg; SAR(10 g) = 0.098 W/kg

Maximum value of SAR (measured) = 0.216 W/kg



0 dB = 0.216 W/kg = -6.66 dBW/kg

Figure 36 GSM 1900 GPRS (2TXslots) with Test Position 5 Channel 661

GSM 1900 EGPRS (2TXslots) with Test Position 1 Middle

Date/Time: 3/17/2014 8:04:36 PM

Communication System: EGPRS 2TX ; Frequency: 1880 MHz; Duty Cycle: 1:4.14954

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.493$ S/m; $\epsilon_r = 52.676$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: ELI 4.0; Type: QDOVA001BA;

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

Test Position 1 Middle /Area Scan (91x141x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 1.18 W/kg

Test Position 1 Middle /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 0 V/m; Power Drift = 0.099 dB

Peak SAR (extrapolated) = 2.68 W/kg

SAR(1 g) = 1.22 W/kg; SAR(10 g) = 0.529 W/kg

Maximum value of SAR (measured) = 1.48 W/kg

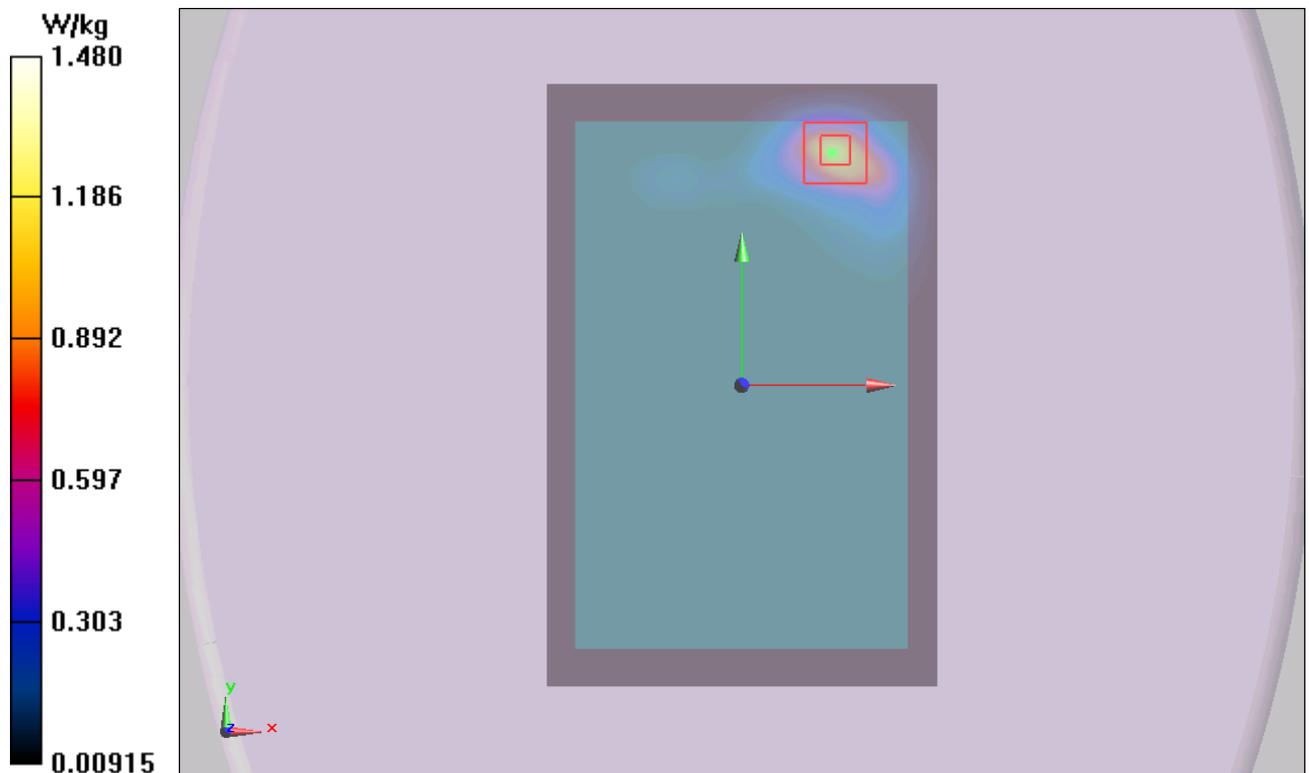


Figure 37 GSM 1900 EGPRS (2TXslots) with Test Position 1 Channel 661

GSM 1900 Test Position 1 Middle (Earphone)

Date/Time: 3/17/2014 9:02:29 PM

Communication System: GSM ; Frequency: 1880 MHz; Duty Cycle: 1:8.30042

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.493$ S/m; $\epsilon_r = 52.676$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: ELI 4.0; Type: QDOVA001BA;

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

Test Position 1 Middle /Area Scan (91x141x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.910 W/kg

Test Position 1 Middle /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 0.989 V/m; Power Drift = 0.095 dB

Peak SAR (extrapolated) = 1.92 W/kg

SAR(1 g) = 0.891 W/kg; SAR(10 g) = 0.399 W/kg

Maximum value of SAR (measured) = 1.08 W/kg

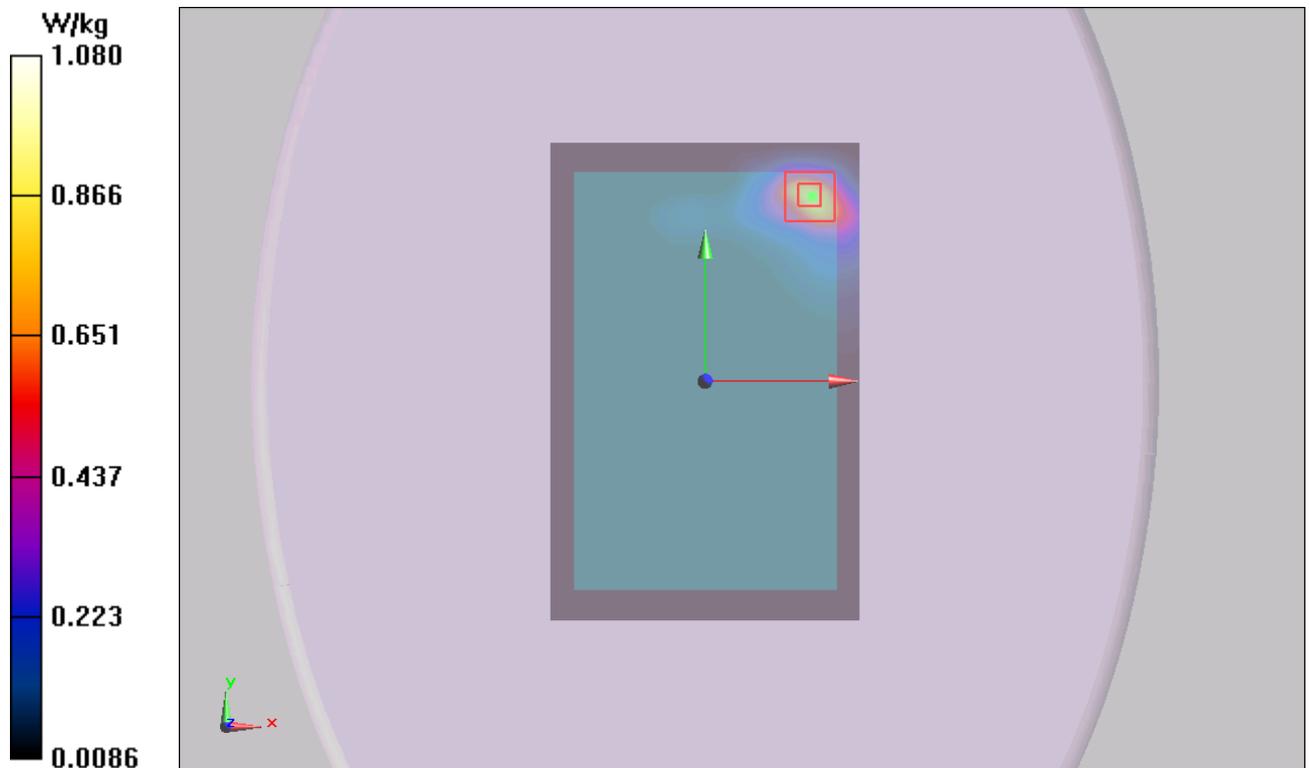


Figure 38 GSM 1900 Test Position 1 Channel 661

TA Technology (Shanghai) Co., Ltd. Test Report

Report No. RHA1403-0023SAR

Page 92 of 165

GSM 1900 GPRS (2TXslots) with Test Position 1 Middle (1st Repeated SAR)

Date/Time: 3/17/2014 8:30:21 PM

Communication System: GPRS 2TX ; Frequency: 1880 MHz; Duty Cycle: 1:4.14954

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.493$ S/m; $\epsilon_r = 52.676$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: ELI 4.0; Type: QDOVA001BA;

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

Test Position 1 Middle /Area Scan (91x141x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 1.20 W/kg

Test Position 1 Middle /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.173 V/m; Power Drift = -0.046 dB

Peak SAR (extrapolated) = 2.65 W/kg

SAR(1 g) = 1.2 W/kg; SAR(10 g) = 0.523 W/kg

Maximum value of SAR (measured) = 1.47 W/kg

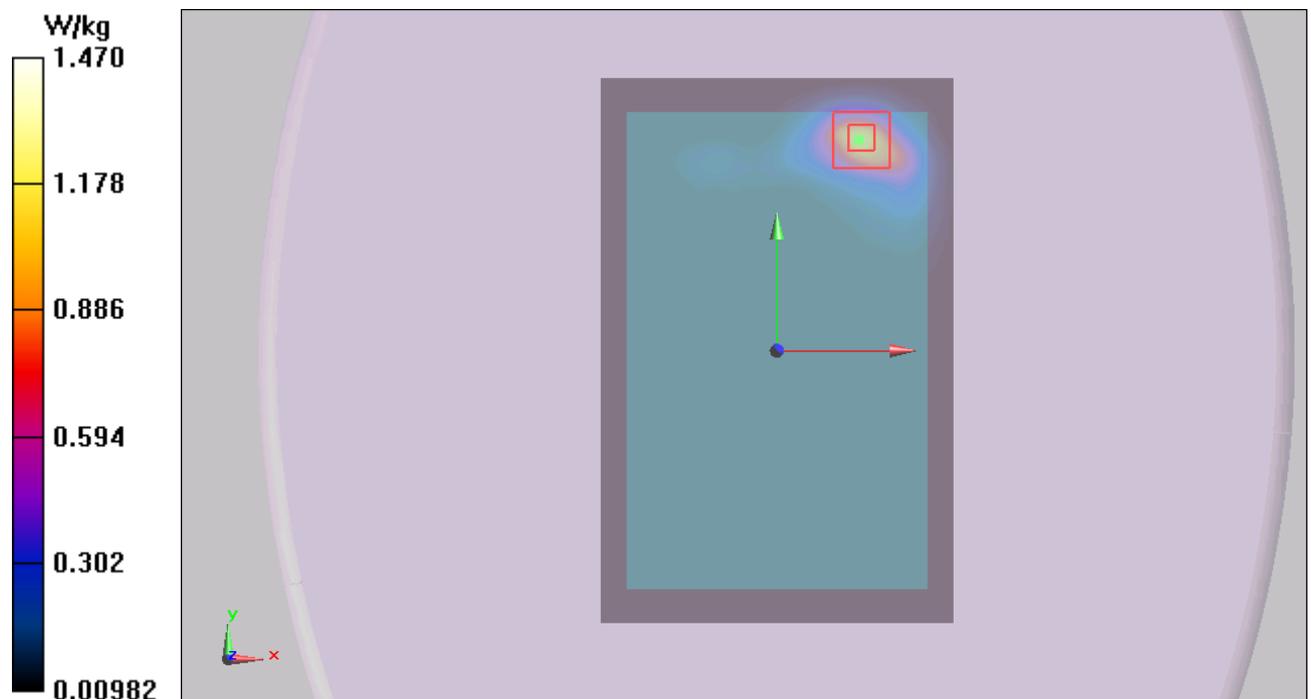


Figure 39 GSM 1900 GPRS (2TXslots) with Test Position 1 Channel 661

802.11b Left Cheek Middle

Date/Time: 3/19/2014 6:51:49 AM

Communication System: 802.11b ; Frequency: 2437 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2437$ MHz; $\sigma = 1.787$ S/m; $\epsilon_r = 39.199$; $\rho = 1000$ kg/m³

Ambient Temperature:22.3 °C Liquid Temperature: 21.5°C

Phantom section: Left Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.64, 7.64, 7.64); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

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

Left Cheek Middle /Area Scan (101x161x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.0196 W/kg

Left Cheek Middle /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx5mm, dy=5mm, dz=5mm

Reference Value = 1.065 V/m; Power Drift = -0.115 dB

Peak SAR (extrapolated) = 0.0230 W/kg

SAR(1 g) = 0.013 W/kg; SAR(10 g) = 0.00687 W/kg

Maximum value of SAR (measured) = 0.0131 W/kg

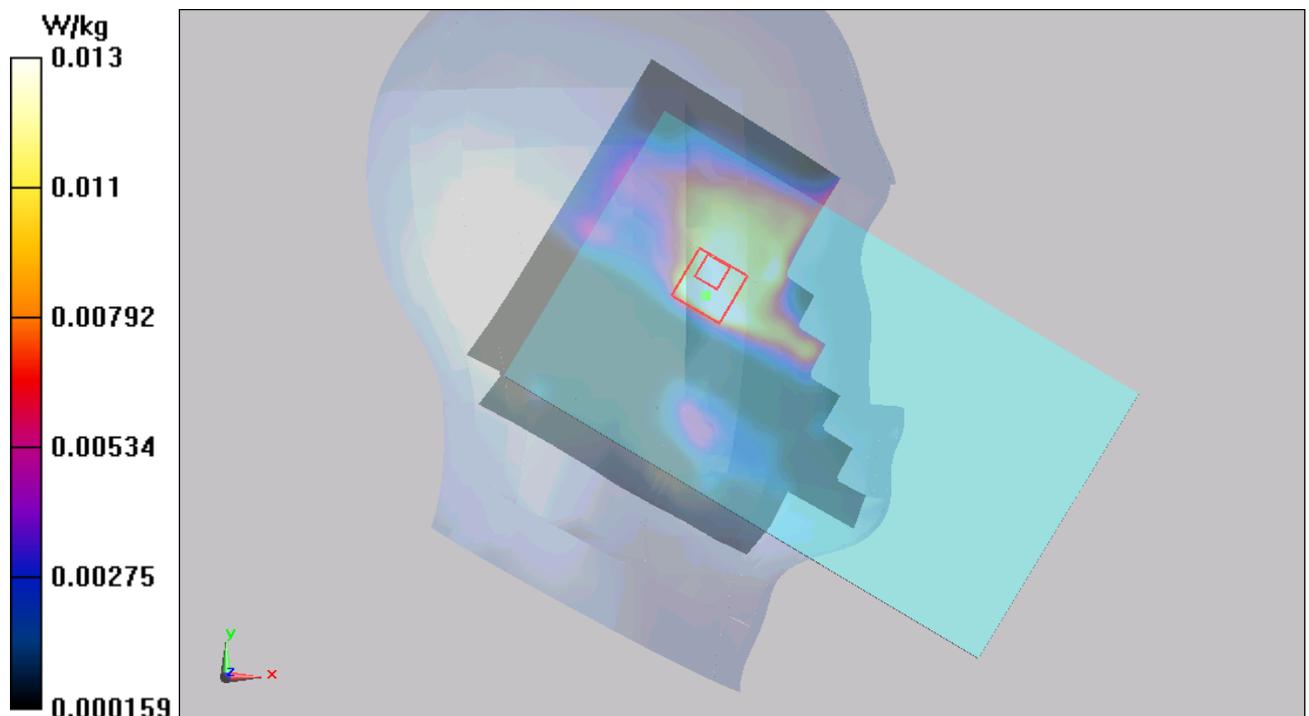


Figure 40 Left Hand Touch Cheek 802.11b Channel 6

802.11b Left Tilt Middle

Date/Time: 3/19/2014 7:11:21 AM

Communication System: 802.11b ; Frequency: 2437 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2437$ MHz; $\sigma = 1.787$ S/m; $\epsilon_r = 39.199$; $\rho = 1000$ kg/m³

Ambient Temperature:22.3 °C Liquid Temperature: 21.5°C

Phantom section: Left Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.64, 7.64, 7.64); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

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

Left Tilt Middle /Area Scan (101x161x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.0144 W/kg

Left Tilt Middle /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx5mm, dy=5mm, dz=5mm

Reference Value = 1.679 V/m; Power Drift = -0.024 dB

Peak SAR (extrapolated) = 0.0230 W/kg

SAR(1 g) = 0.013 W/kg; SAR(10 g) = 0.0073 W/kg

Maximum value of SAR (measured) = 0.0135 W/kg

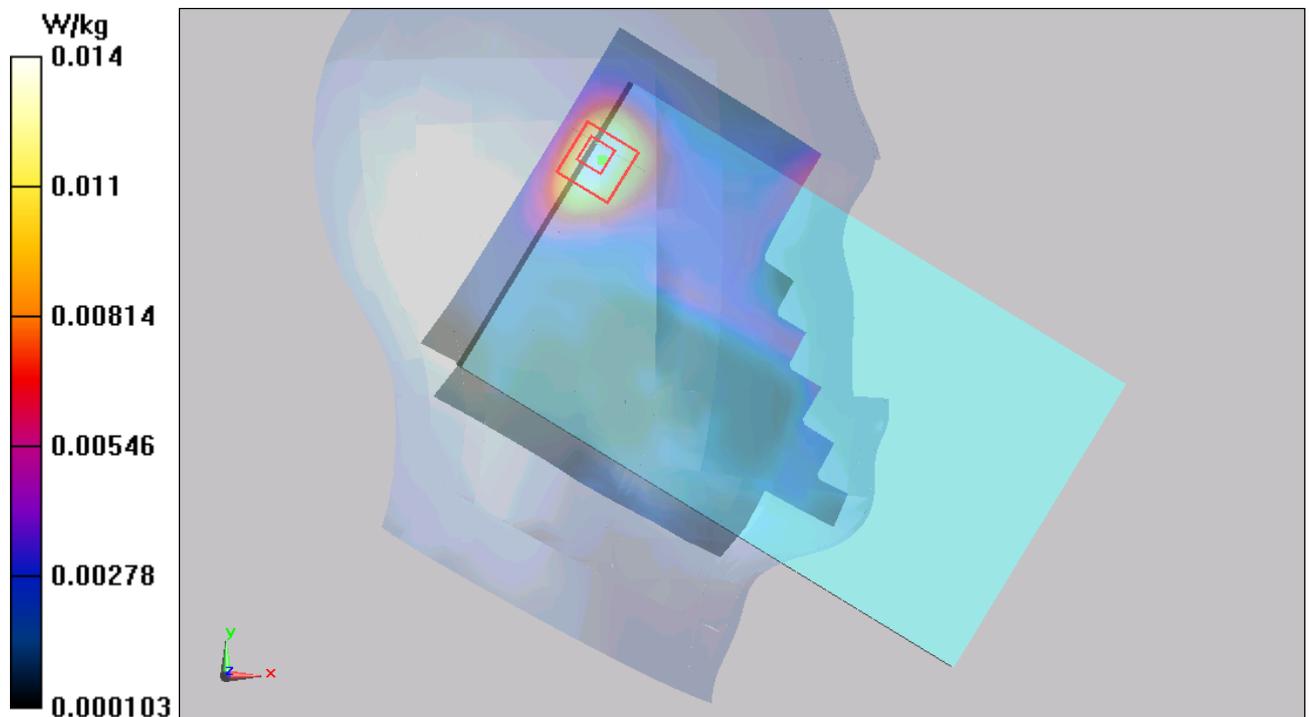


Figure 41 Left Hand Tilt 15° 802.11b Channel 6

802.11b Right Cheek Middle

Date/Time: 3/19/2014 8:02:31 AM

Communication System: 802.11b ; Frequency: 2437 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2437$ MHz; $\sigma = 1.787$ S/m; $\epsilon_r = 39.199$; $\rho = 1000$ kg/m³

Ambient Temperature:22.3 °C Liquid Temperature: 21.5°C

Phantom section: Right Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.64, 7.64, 7.64); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

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

Right Cheek Middle /Area Scan (91x161x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.0423 W/kg

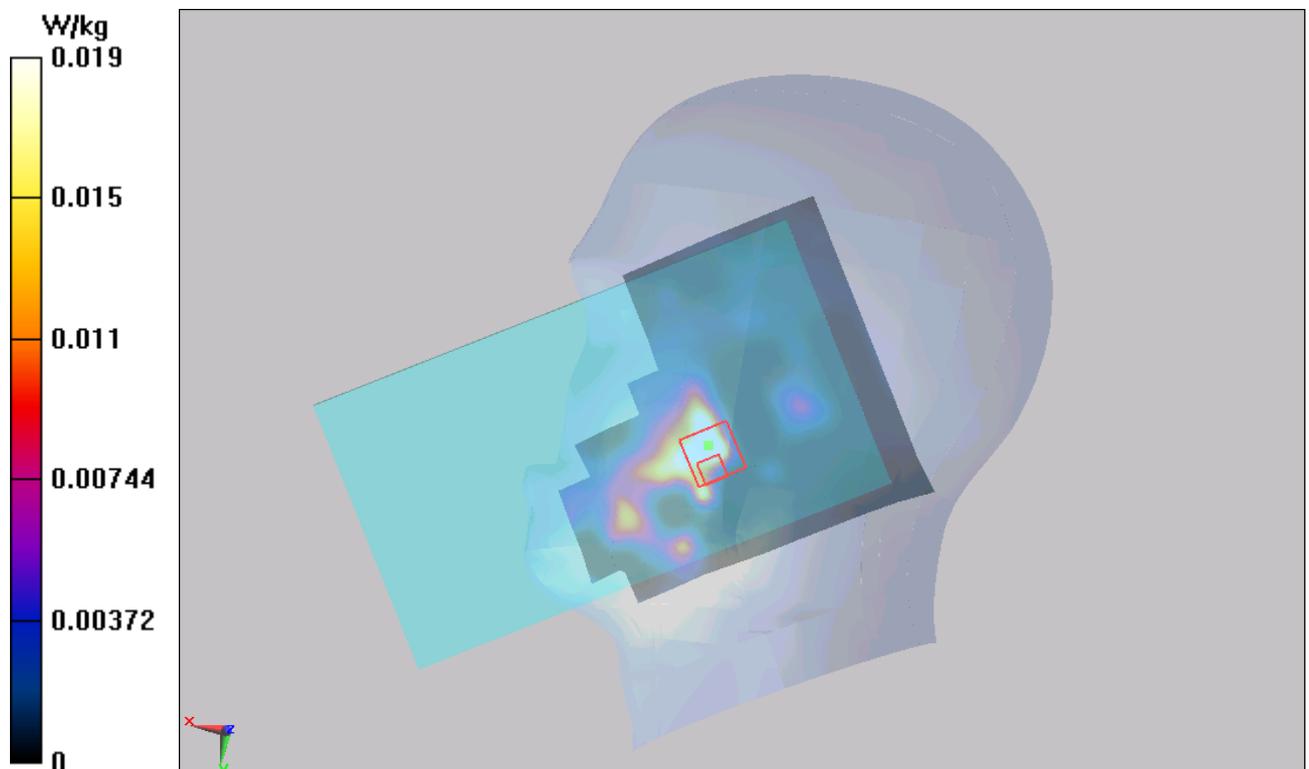
Right Cheek Middle /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx5mm, dy=5mm, dz=5mm

Reference Value = 1.305 V/m; Power Drift = -0.16 dB

Peak SAR (extrapolated) = 0.0300 W/kg

SAR(1 g) = 0.017 W/kg; SAR(10 g) = 0.00939 W/kg

Maximum value of SAR (measured) = 0.0186 W/kg



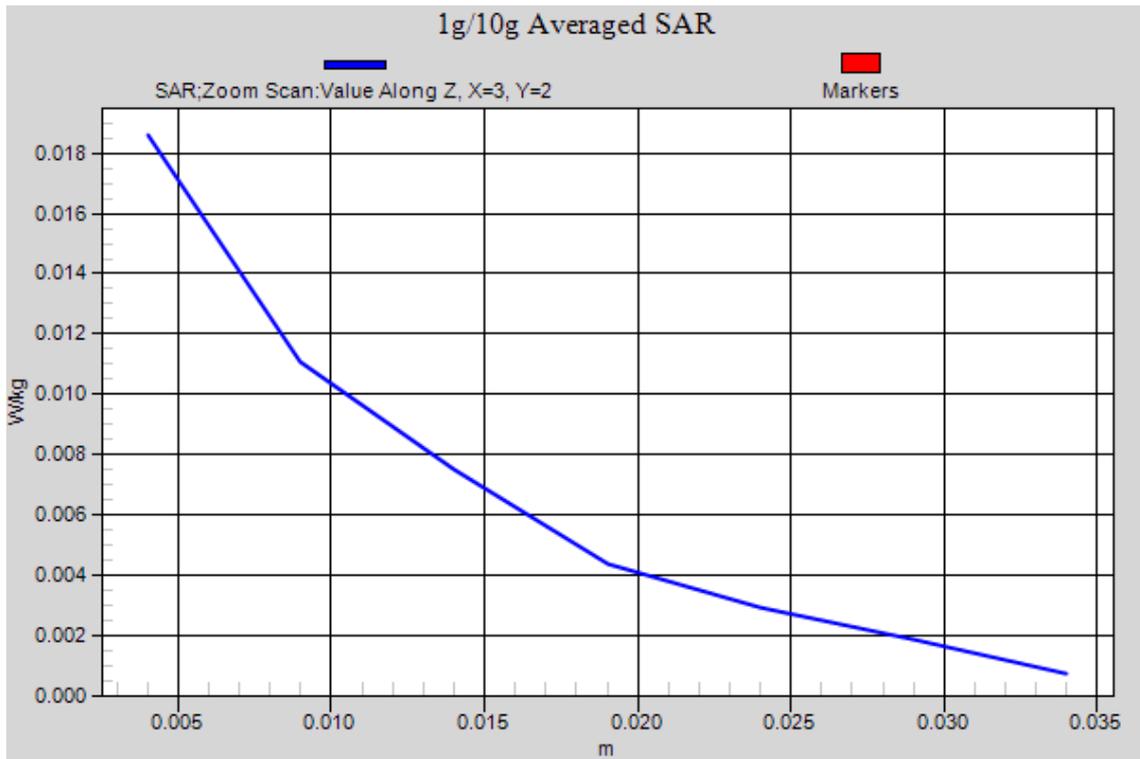


Figure 42 Right Hand Touch Cheek 802.11b Channel 6

802.11b Right Tilt Middle

Date/Time: 3/19/2014 8:20:58 AM

Communication System: 802.11b ; Frequency: 2437 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2437$ MHz; $\sigma = 1.787$ S/m; $\epsilon_r = 39.199$; $\rho = 1000$ kg/m³

Ambient Temperature:22.3 °C Liquid Temperature: 21.5°C

Phantom section: Right Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.64, 7.64, 7.64); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

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

Right Tilt Middle /Area Scan (91x161x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.0144 W/kg

Right Tilt Middle /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx5mm, dy=5mm, dz=5mm

Reference Value = 2.112 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.0160 W/kg

SAR(1 g) = 0.010 W/kg; SAR(10 g) = 0.00499 W/kg

Maximum value of SAR (measured) = 0.0111 W/kg

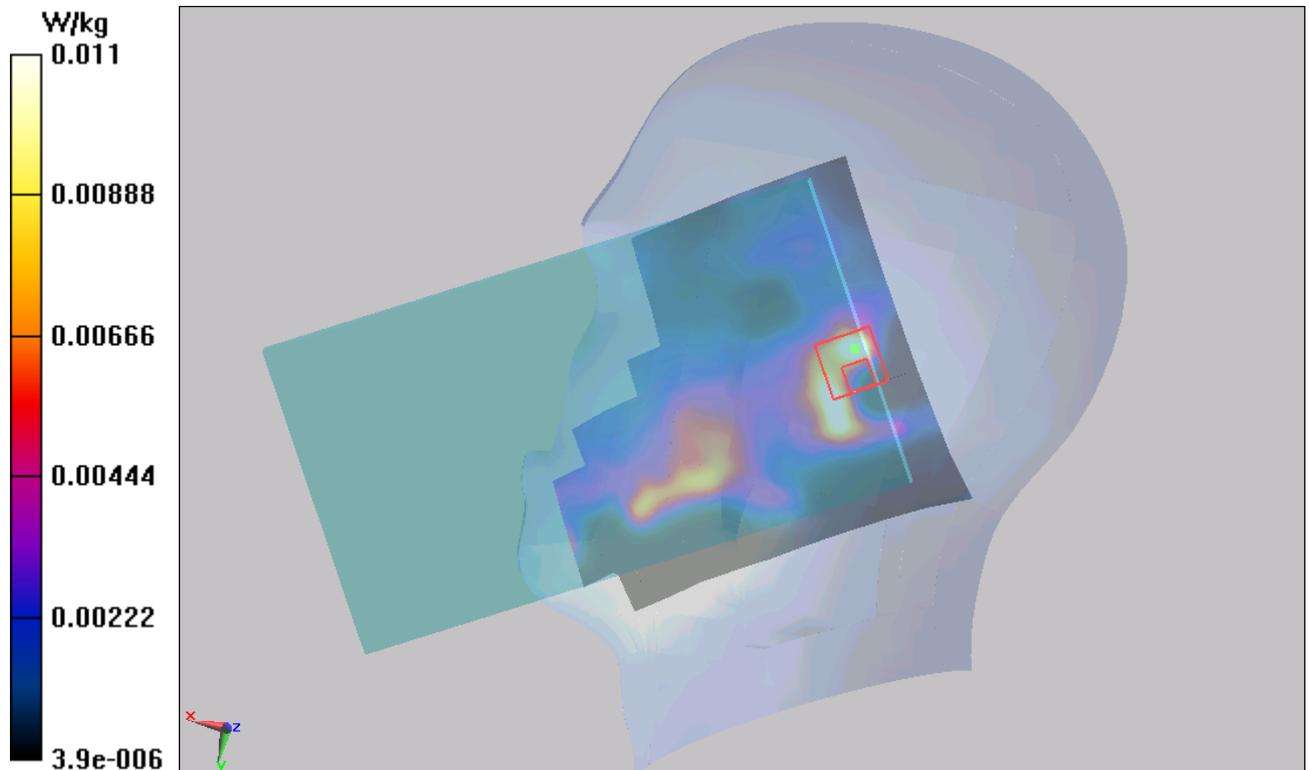


Figure 43 Right Hand Tilt 15° 802.11b Channel 6

TA Technology (Shanghai) Co., Ltd. Test Report

Report No. RHA1403-0023SAR

Page 98 of 165

802.11b Test Position 1 Middle

Date/Time: 3/19/2014 12:17:59 AM

Communication System: 802.11b ; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 2437$ MHz; $\sigma = 1.977$ S/m; $\epsilon_r = 52.177$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.61, 7.61, 7.61); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: ELI 4.0; Type: QDOVA001BA;

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

Test Position 1 Middle /Area Scan (91x141x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.665 W/kg

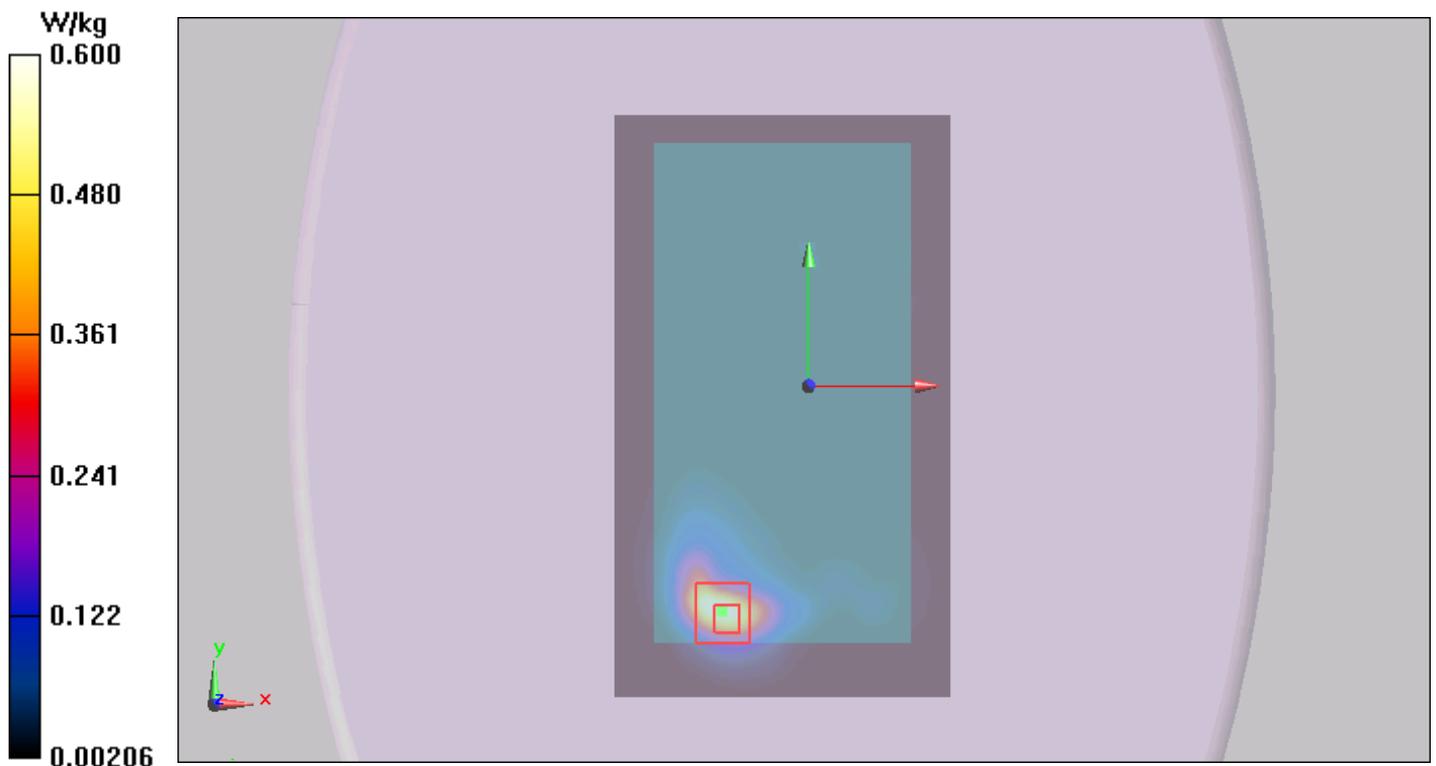
Test Position 1 Middle /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 0 V/m; Power Drift = 0.009 dB

Peak SAR (extrapolated) = 1.67 W/kg

SAR(1 g) = 0.564 W/kg; SAR(10 g) = 0.215 W/kg

Maximum value of SAR (measured) = 0.600 W/kg



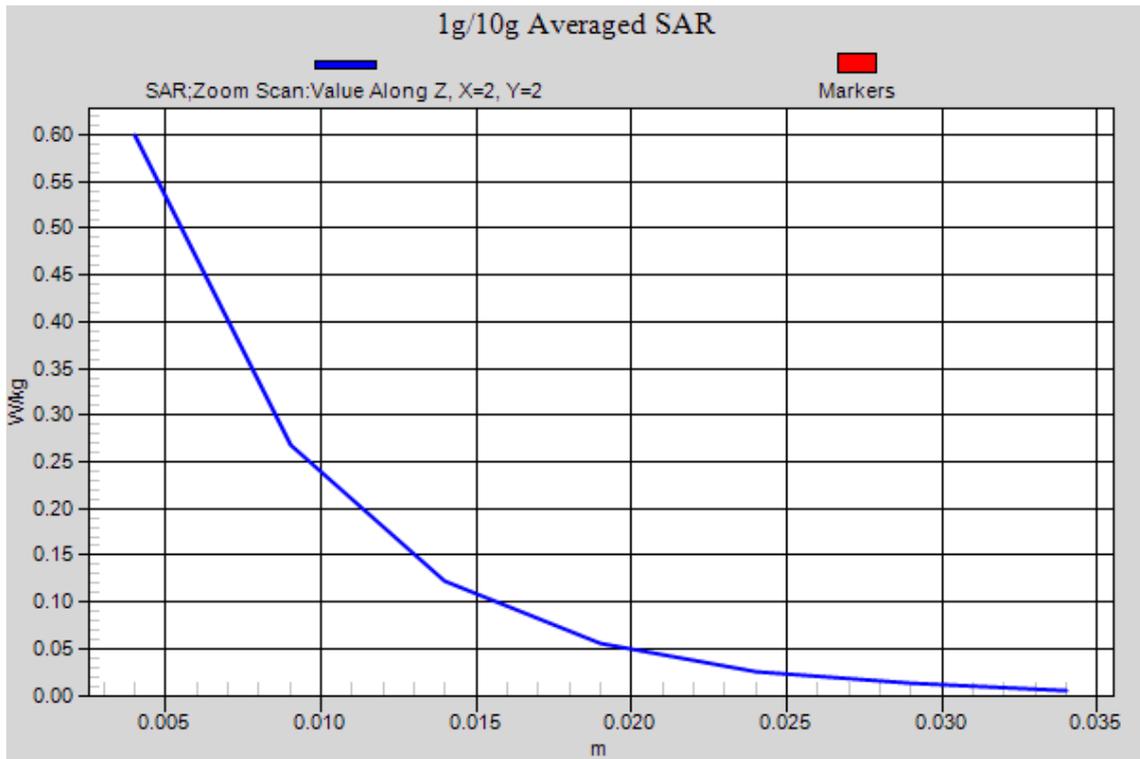


Figure 44 802.11b Test Position 1 Channel 6

802.11b Test Position 2 Middle

Date/Time: 3/19/2014 1:07:48 AM

Communication System: 802.11b ; Frequency: 2437 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2437$ MHz; $\sigma = 1.977$ S/m; $\epsilon_r = 52.177$; $\rho = 1000$ kg/m³

Ambient Temperature:22.3 °C Liquid Temperature: 21.5°C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.61, 7.61, 7.61); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: ELI 4.0; Type: QDOVA001BA;

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

Test Position 2 Middle /Area Scan (31x91x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.316 W/kg

Test Position 2 Middle /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx5mm, dy=5mm, dz=5mm

Reference Value = 9.652 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.893 W/kg

SAR(1 g) = 0.280 W/kg; SAR(10 g) = 0.100 W/kg

Maximum value of SAR (measured) = 0.315 W/kg



Figure 45 802.11b Test Position 2 Channel 6

802.11b Test Position 3 Middle

Date/Time: 3/19/2014 4:45:10 AM

Communication System: 802.11b ; Frequency: 2437 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2437$ MHz; $\sigma = 1.977$ S/m; $\epsilon_r = 52.177$; $\rho = 1000$ kg/m³

Ambient Temperature:22.3 °C Liquid Temperature: 21.5°C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.61, 7.61, 7.61); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: ELI 4.0; Type: QDOVA001BA;

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

Test Position 3 Middle /Area Scan (31x141x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (measured) = 0.0393 W/kg

Test Position 3 Middle /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx5mm, dy=5mm, dz=5mm

Reference Value = 10.817 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 0.675 mW/g

SAR(1 g) = 0.003 mW/g; SAR(10 g) = 0.002 mW/g

Maximum value of SAR (measured) = 0.076 W/kg

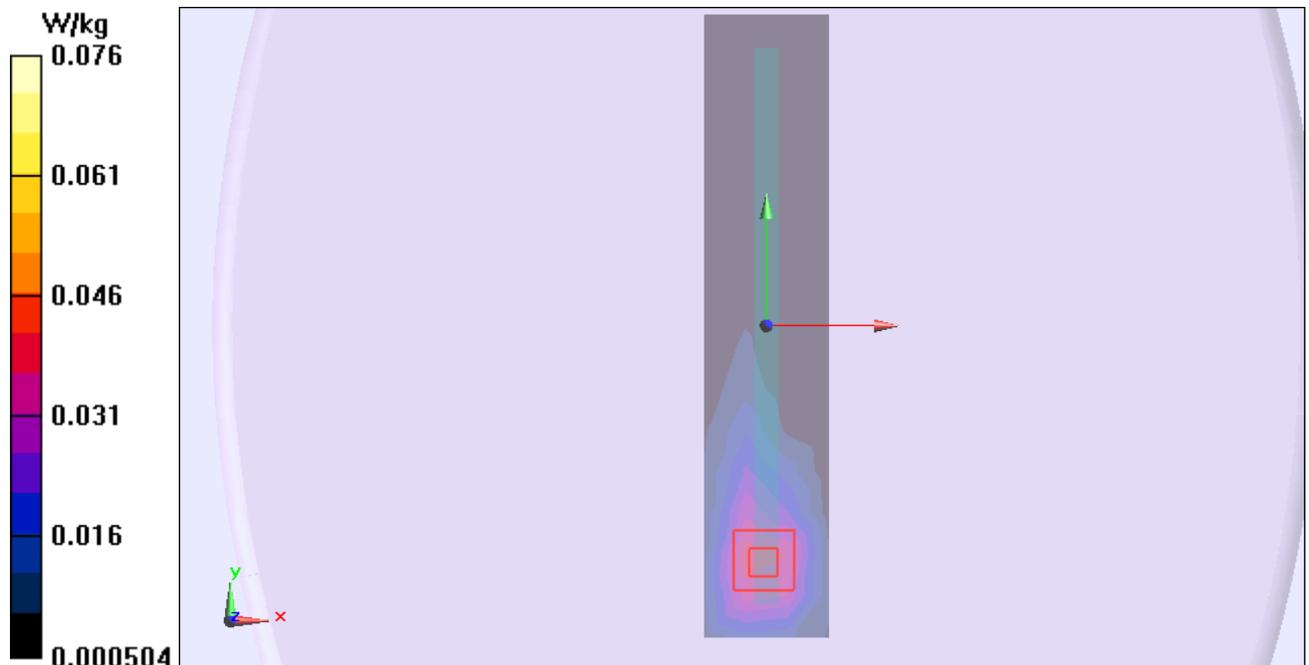


Figure 46 802.11b Test Position 3 Channel 6

802.11b Test Position 4 Middle

Date/Time: 3/19/2014 12:47:10 AM

Communication System: 802.11b ; Frequency: 2437 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2437$ MHz; $\sigma = 1.977$ S/m; $\epsilon_r = 52.177$; $\rho = 1000$ kg/m³

Ambient Temperature:22.3 °C Liquid Temperature: 21.5°C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.61, 7.61, 7.61); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: ELI 4.0; Type: QDOVA001BA;

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

Test Position 4 Middle /Area Scan (31x141x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.244 W/kg

Test Position 4 Middle /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx5mm, dy=5mm, dz=5mm

Reference Value = 5.311 V/m; Power Drift = 0.029 dB

Peak SAR (extrapolated) = 0.482 W/kg

SAR(1 g) = 0.220 W/kg; SAR(10 g) = 0.097 W/kg

Maximum value of SAR (measured) = 0.255 W/kg

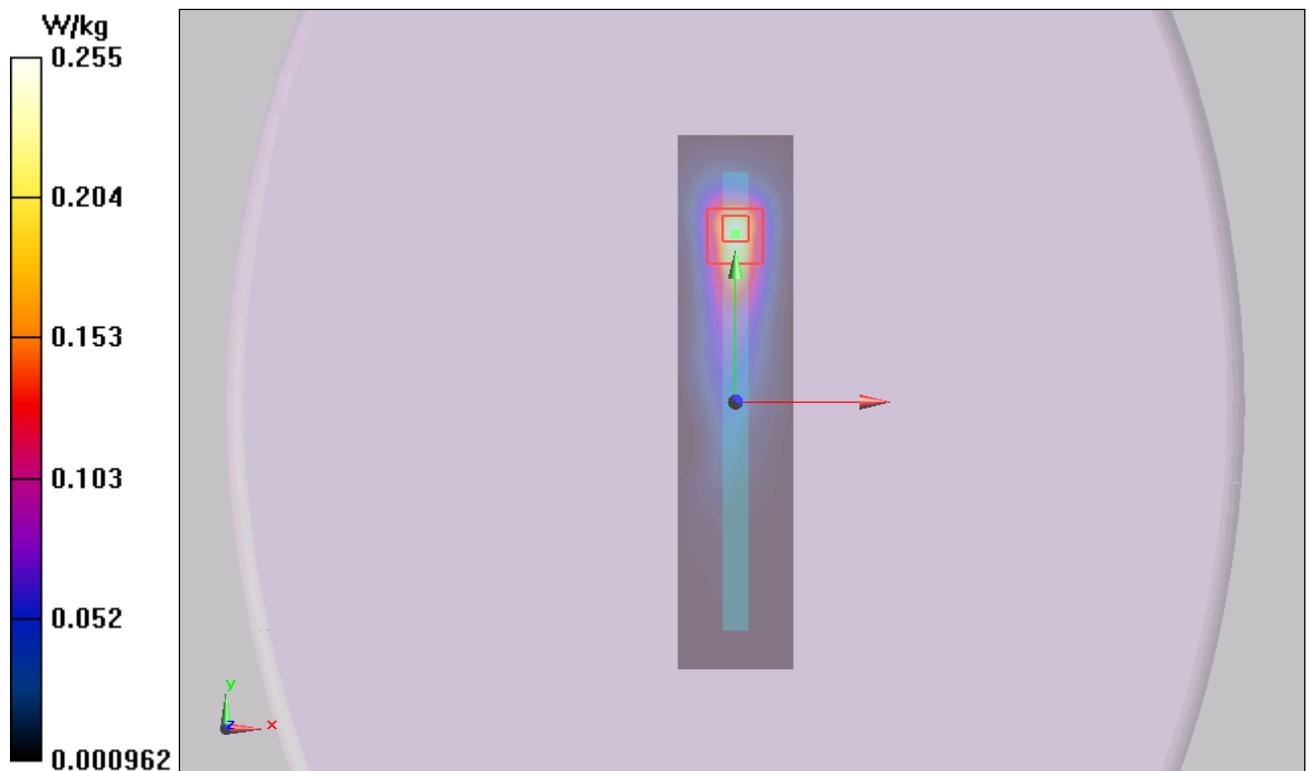


Figure 47 802.11b Test Position 4 Channel 6

BT Test Position 3 High

Date/Time: 3/19/2014 5:15:17 AM

Communication System: BT; Frequency: 2480 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2480$ MHz; $\sigma = 1.99$ S/m; $\epsilon_r = 52.011$; $\rho = 1000$ kg/m³

Ambient Temperature:22.3 °C Liquid Temperature: 21.5°C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.61, 7.61, 7.61); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: ELI 4.0; Type: QDOVA001BA;

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

Test Position 3 High /Area Scan (31x141x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (measured) = 0.0271 W/kg

Test Position 3 High /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx5mm, dy=5mm, dz=5mm

Reference Value = 7.412 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.451 mW/g

SAR(1 g) = 0.001 mW/g; SAR(10 g) = 0.001 mW/g

Maximum value of SAR (measured) = 0.061 W/kg

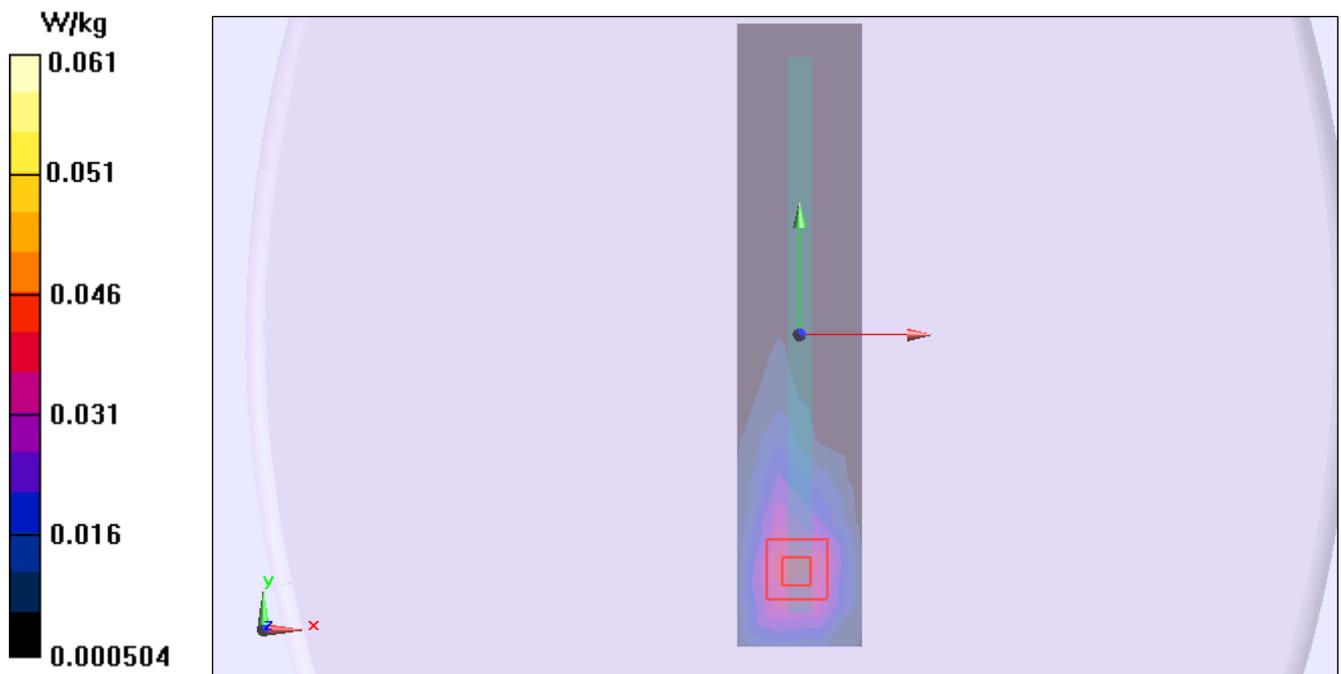


Figure 48 BT Test Position 3 Channel 78

ANNEX D: Graph Results (Variant)

GSM 850 Right Cheek Middle

Date/Time: 3/15/2014 6:41:36 AM

Communication System: GSM ; Frequency: 836.6 MHz; Duty Cycle: 1:8.30042

Medium parameters used: $f = 837$ MHz; $\sigma = 0.932$ S/m; $\epsilon_r = 41.357$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Right Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.41, 9.41, 9.41); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

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 (81x131x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.254 W/kg

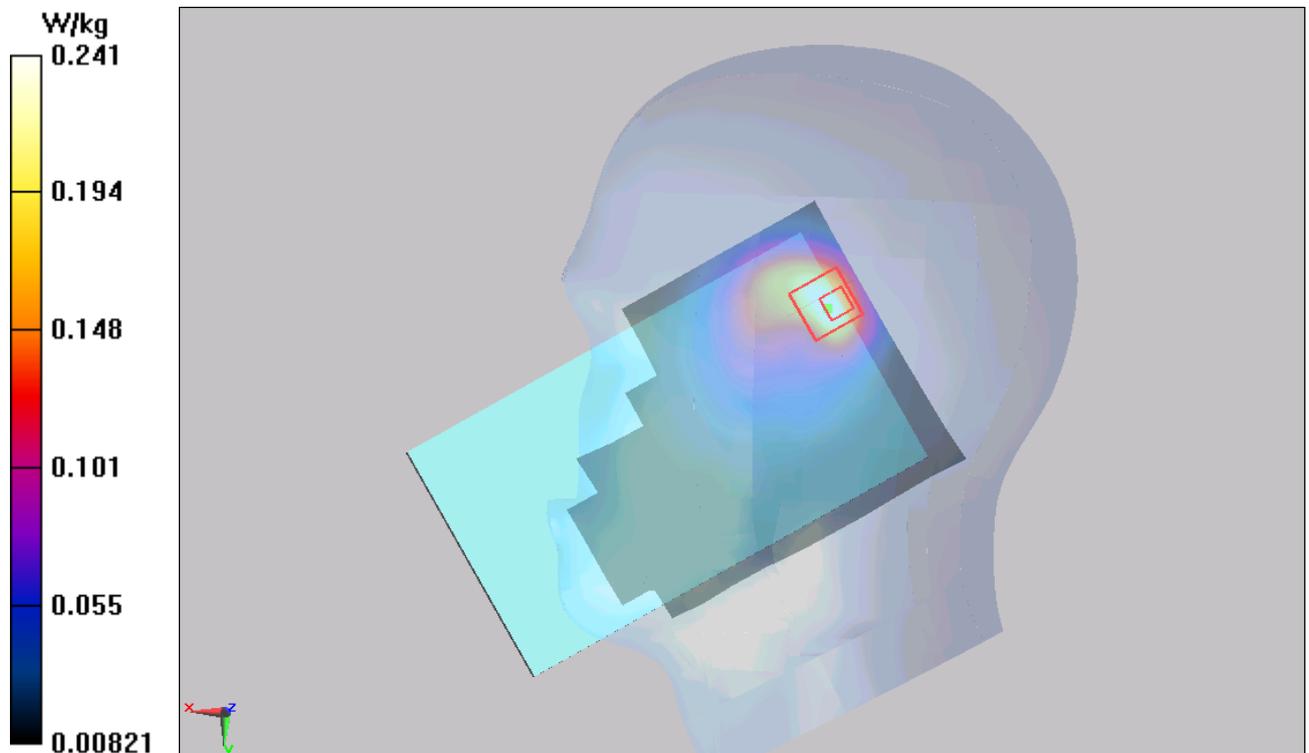
Right Cheek Middle /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 11.422 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.436 W/kg

SAR(1 g) = 0.214 W/kg; SAR(10 g) = 0.113 W/kg

Maximum value of SAR (measured) = 0.241 W/kg



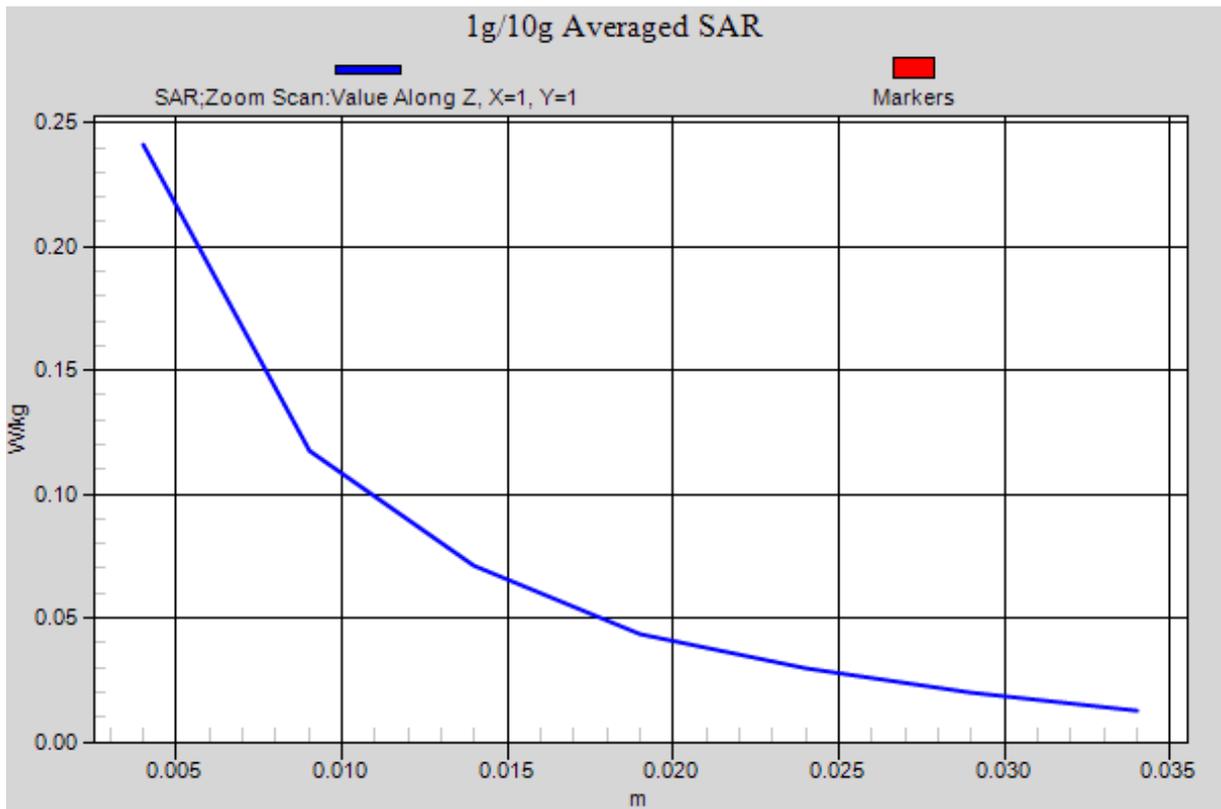


Figure 49 Right Hand Touch Cheek GSM 850 Channel 190

TA Technology (Shanghai) Co., Ltd. Test Report

Report No. RHA1403-0023SAR

Page 106 of 165

GSM 850 GPRS (2TXslots) with Test Position 1 Middle

Date/Time: 3/14/2014 8:07:14 PM

Communication System:GPRS 2TX ; Frequency: 836.6 MHz;Duty Cycle: 1:4.14954

Medium parameters used: $f = 837$ MHz; $\sigma = 0.992$ S/m; $\epsilon_r = 55.882$; $\rho = 1000$ kg/m³

Ambient Temperature:22.3 °C Liquid Temperature: 21.5°C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.51, 9.51, 9.51); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

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

Test Position 1 Middle /Area Scan (81x141x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.475 W/kg

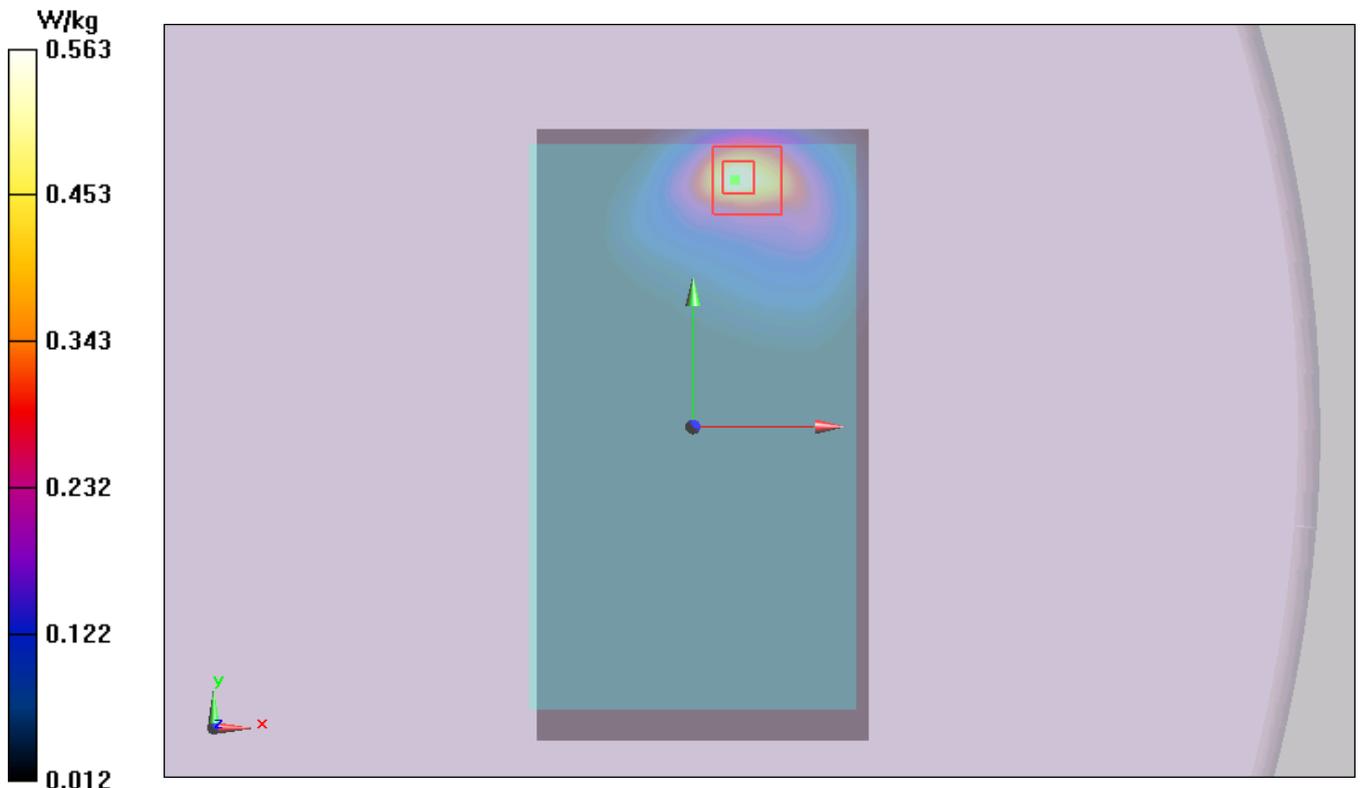
Test Position 1 Middle /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.035 V/m; Power Drift = -0.040 dB

Peak SAR (extrapolated) = 1.22 W/kg

SAR(1 g) = 0.499 W/kg; SAR(10 g) = 0.241 W/kg

Maximum value of SAR (measured) = 0.563 W/kg



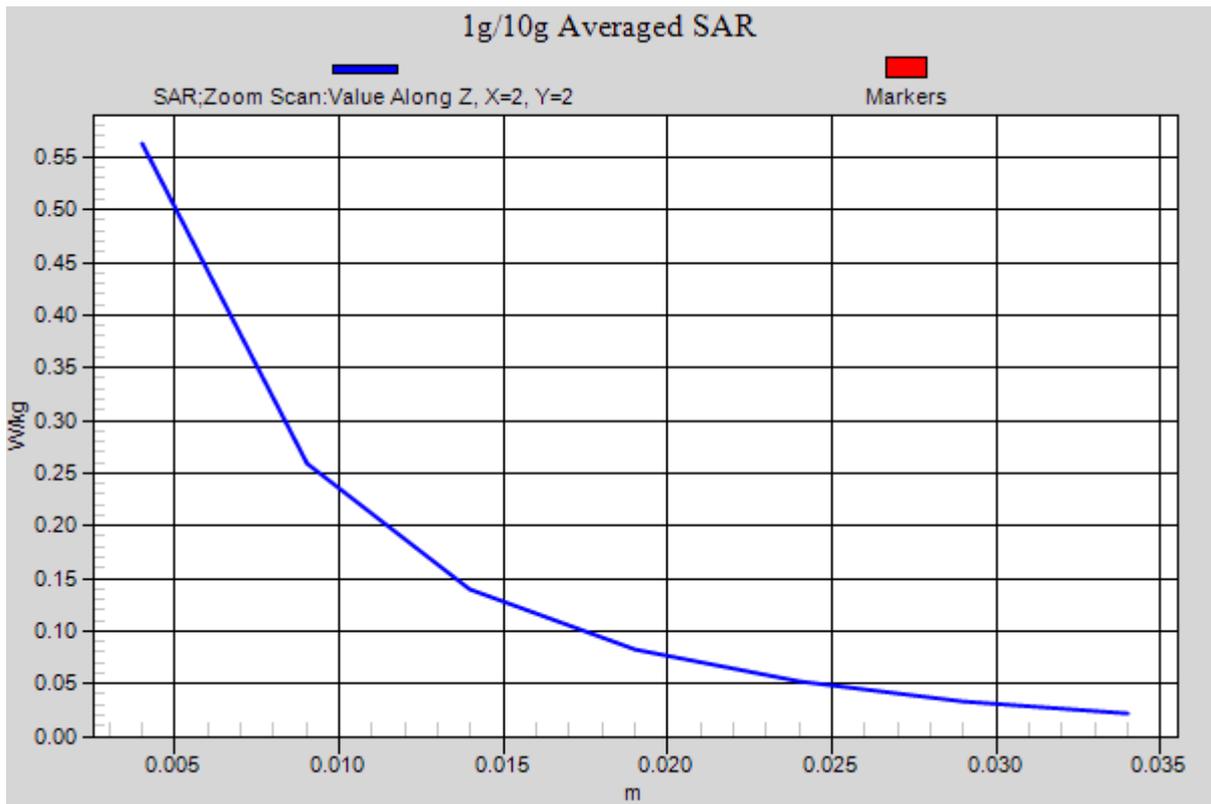


Figure 50 GSM 850 GPRS (2TXslots) with Test Position 1 Channel 190

GSM 1900 Right Cheek Middle

Date/Time: 3/18/2014 6:55:45 AM

Communication System: GSM ; Frequency: 1880 MHz; Duty Cycle: 1:8.30042

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.413$ S/m; $\epsilon_r = 39.689$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Right Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(8.15, 8.15, 8.15); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

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

Right Cheek Middle /Area Scan (91x141x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.956 W/kg

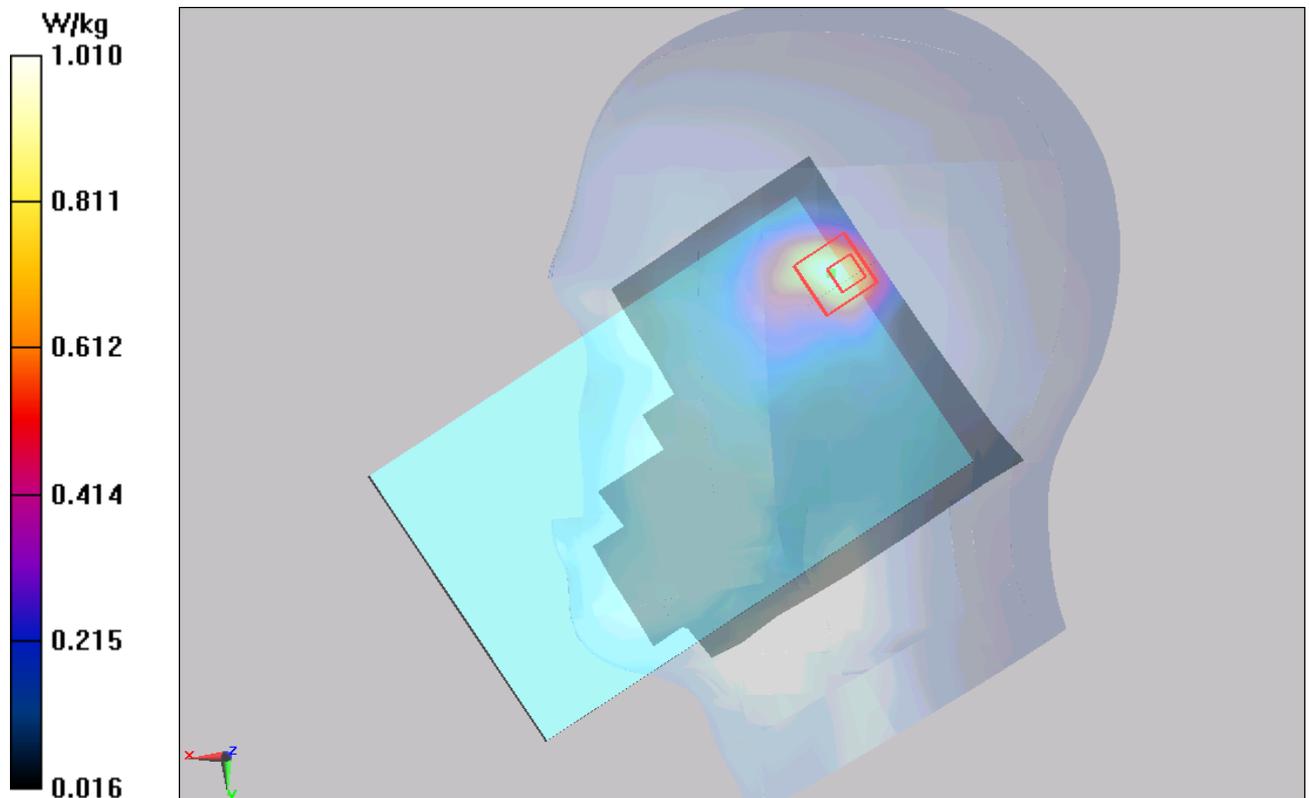
Right Cheek Middle /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 11.245 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 1.55 W/kg

SAR(1 g) = 0.840 W/kg; SAR(10 g) = 0.414 W/kg

Maximum value of SAR (measured) = 1.01 W/kg



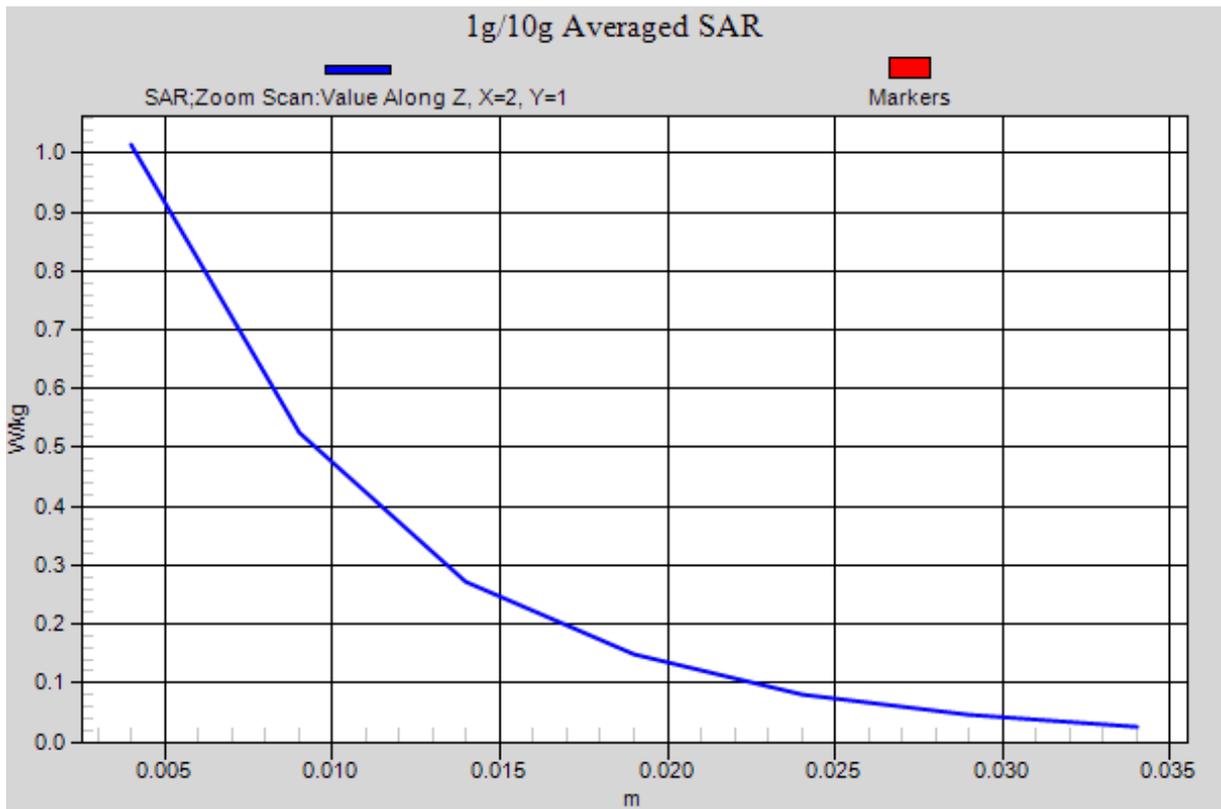


Figure 51 Right Hand Touch Cheek GSM 1900 Channel 661

GSM 1900 GPRS (2TXslots) with Test Position 1 Middle

Date/Time: 3/17/2014 9:56:40 PM

Communication System:GPRS 2TX ; Frequency: 1880 MHz;Duty Cycle: 1:4.14954

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.493$ S/m; $\epsilon_r = 52.676$; $\rho = 1000$ kg/m³

Ambient Temperature:22.3 °C Liquid Temperature: 21.5°C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: ELI 4.0; Type: QDOVA001BA;

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

Test Position 1 Middle /Area Scan (91x141x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 1.57 W/kg

Test Position 1 Middle /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 0.993 V/m; Power Drift = 0.049 dB

Peak SAR (extrapolated) = 3.01 W/kg

SAR(1 g) = 1.25 W/kg; SAR(10 g) = 0.568 W/kg

Maximum value of SAR (measured) = 1.34 W/kg

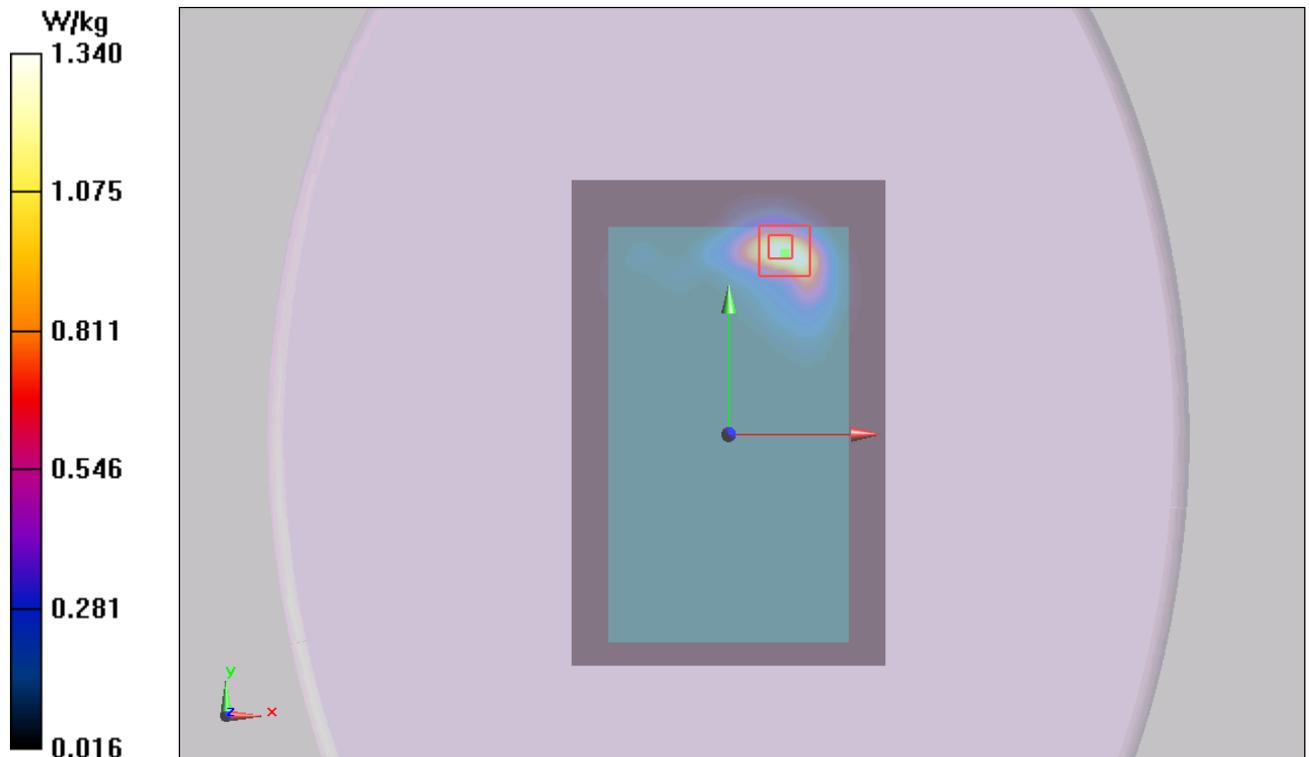


Figure 52 GSM 1900 GPRS (2TXslots) with Test Position 1 Channel 661

TA Technology (Shanghai) Co., Ltd. Test Report

Report No. RHA1403-0023SAR

Page 111 of 165

GSM 1900 GPRS (2TXslots) with Test Position 1 Middle (1st Repeated SAR)

Date/Time: 3/17/2014 10:27:20 PM

Communication System:GPRS 2TX ; Frequency: 1880 MHz;Duty Cycle: 1:4.14954

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.493$ S/m; $\epsilon_r = 52.676$; $\rho = 1000$ kg/m³

Ambient Temperature:22.3 °C Liquid Temperature: 21.5°C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: ELI 4.0; Type: QDOVA001BA;

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

Test Position 1 Middle /Area Scan (91x141x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 1.58 W/kg

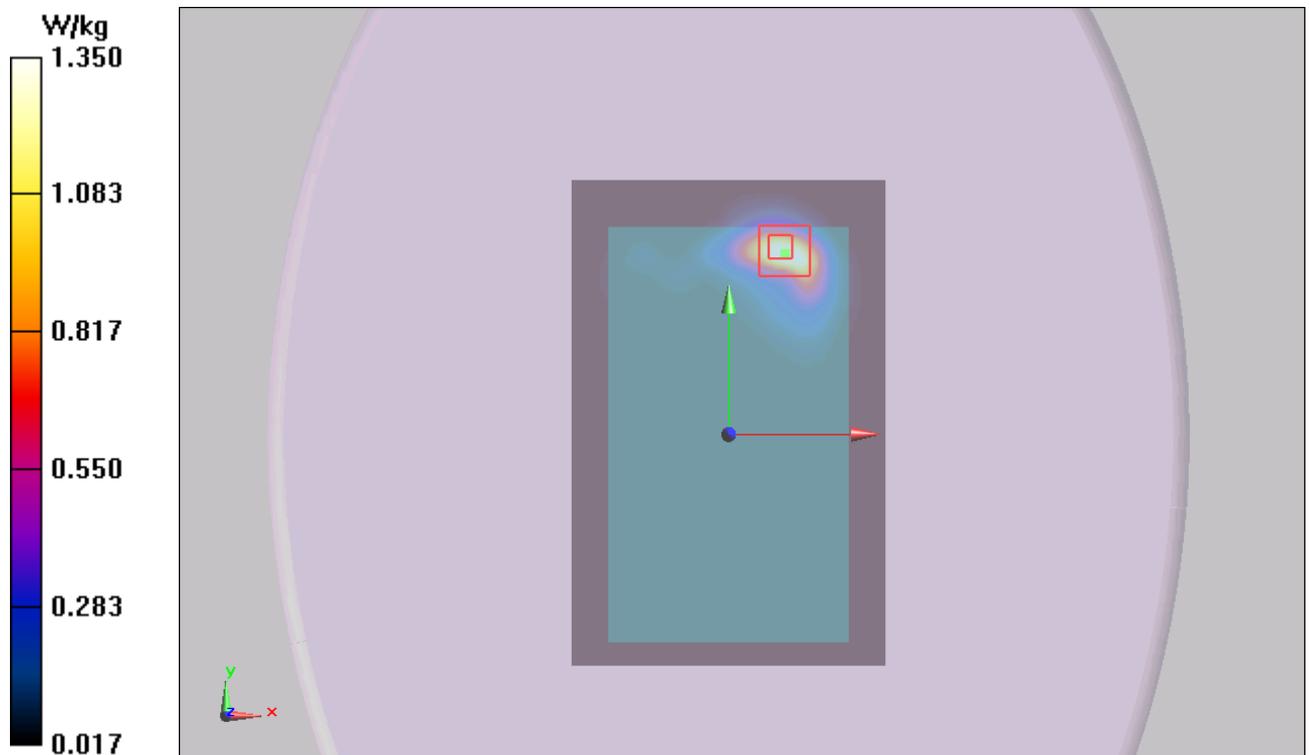
Test Position 1 Middle /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.581 V/m; Power Drift = 0.079 dB

Peak SAR (extrapolated) = 2.99 W/kg

SAR(1 g) = 1.25 W/kg; SAR(10 g) = 0.567 W/kg

Maximum value of SAR (measured) = 1.35 W/kg



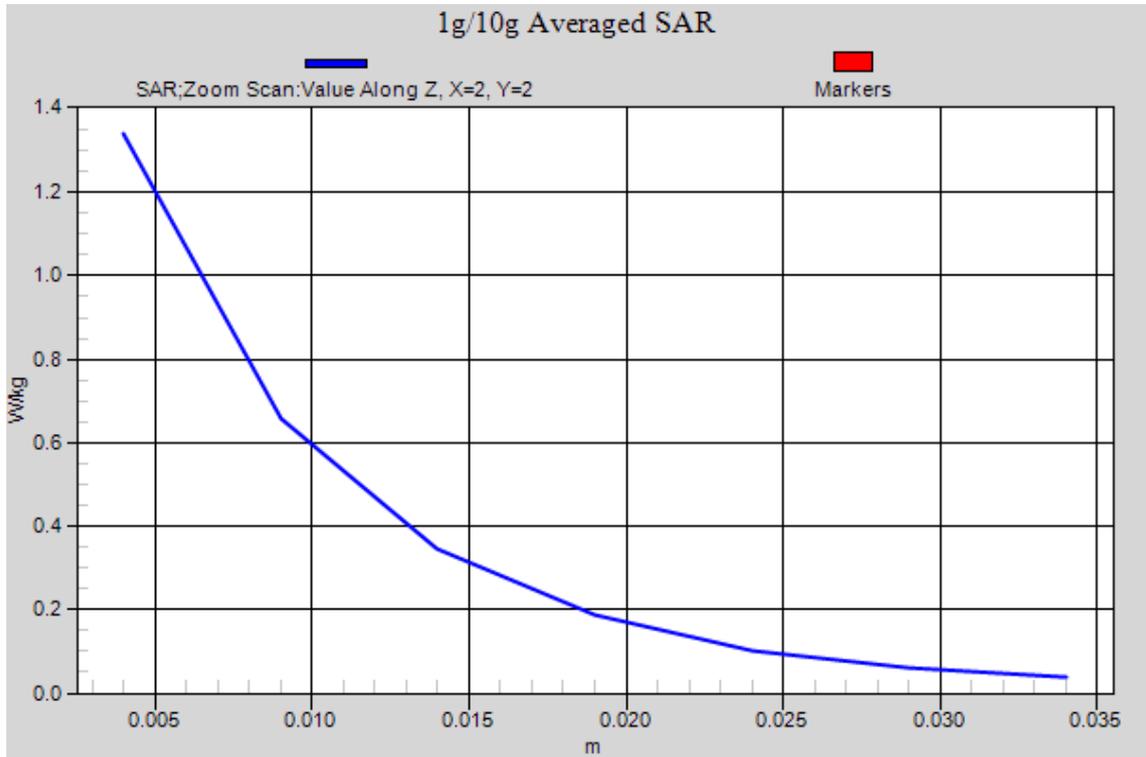


Figure 53 GSM 1900 GPRS (2TXslots) with Test Position 1 Channel 661

802.11b Right Cheek Middle

Date/Time: 3/19/2014 8:35:10 PM

Communication System:802.11b ; Frequency: 2437 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2437$ MHz; $\sigma = 1.787$ S/m; $\epsilon_r = 39.199$; $\rho = 1000$ kg/m³

Ambient Temperature:22.3 °C Liquid Temperature: 21.5°C

Phantom section: Right Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.64, 7.64, 7.64); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

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

Right Cheek Middle /Area Scan (91x161x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.0742 W/kg

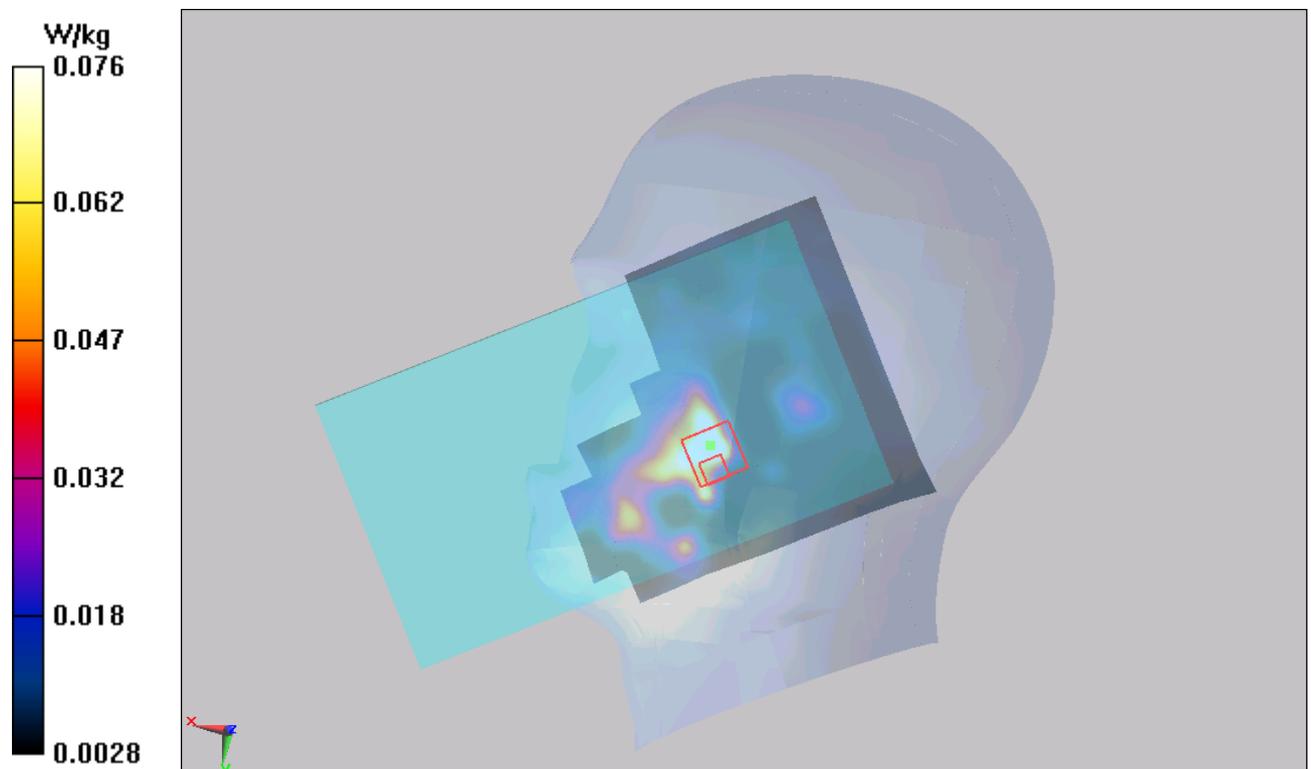
Right Cheek Middle /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.649 V/m; Power Drift = -0.057 dB

Peak SAR (extrapolated) = 0.102 W/kg

SAR(1 g) = 0.056 W/kg; SAR(10 g) = 0.023 W/kg

Maximum value of SAR (measured) = 0.0765 W/kg



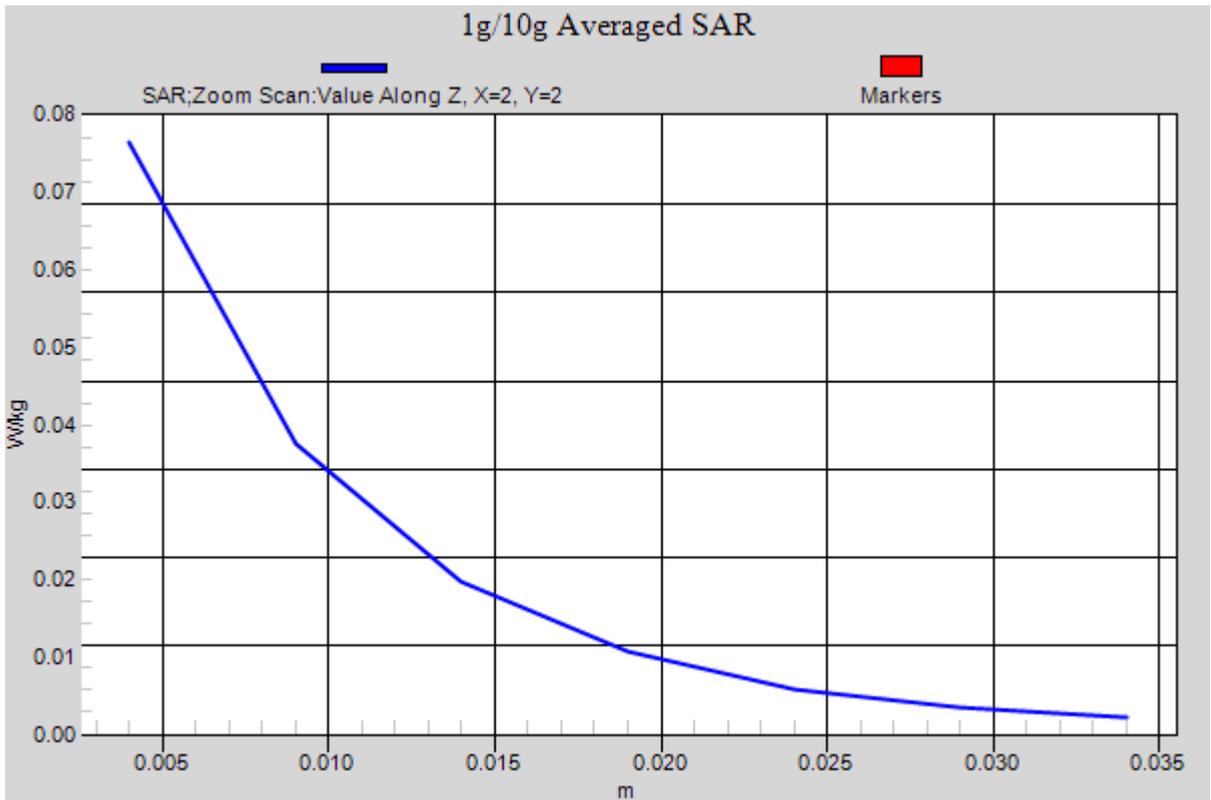


Figure 54 Right Hand Touch Cheek 802.11b Channel 6

TA Technology (Shanghai) Co., Ltd. Test Report

Report No. RHA1403-0023SAR

Page 115 of 165

802.11b Test Position 1 Middle

Date/Time: 3/19/2014 1:26:46 AM

Communication System:802.11b ; Frequency: 2437 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2437$ MHz; $\sigma = 1.977$ S/m; $\epsilon_r = 52.177$; $\rho = 1000$ kg/m³

Ambient Temperature:22.3 °C Liquid Temperature: 21.5°C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.61, 7.61, 7.61); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: ELI 4.0; Type: QDOVA001BA;

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

Test Position 1 Middle/Area Scan (91x141x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.596 W/kg

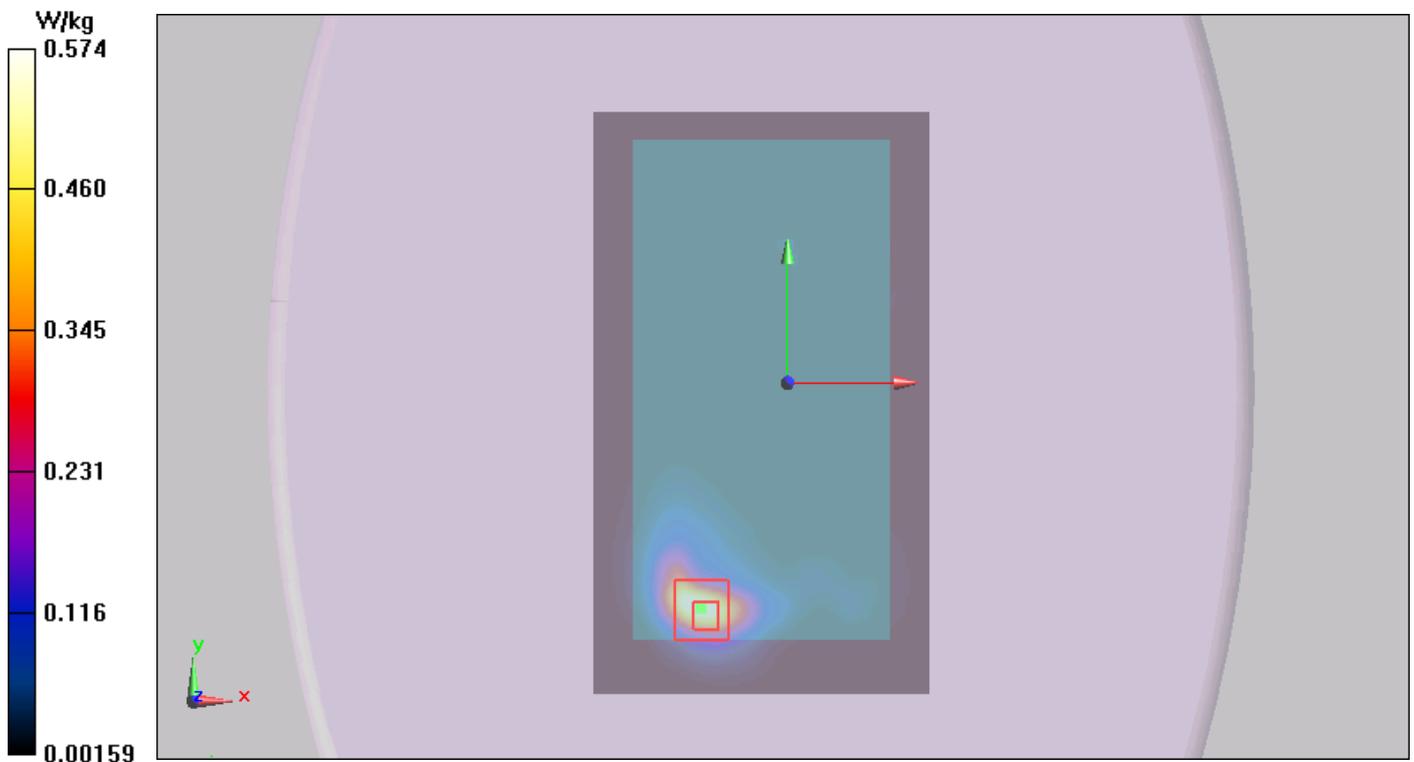
Test Position 1 Middle /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 0.854 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 1.53 W/kg

SAR(1 g) = 0.529 W/kg; SAR(10 g) = 0.203 W/kg

Maximum value of SAR (measured) = 0.574 W/kg



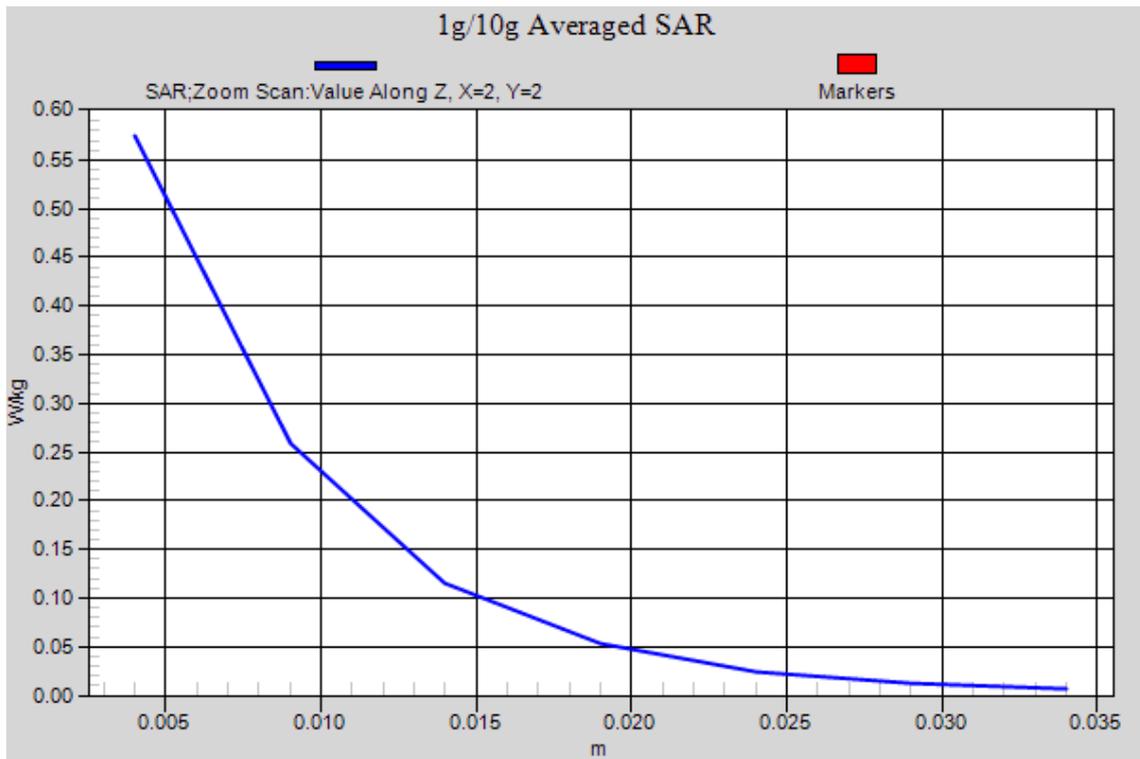


Figure 55 802.11b Test Position 1 Channel 6

TA Technology (Shanghai) Co., Ltd. Test Report

Report No. RHA1403-0023SAR

Page 117 of 165

ANNEX E: Probe Calibration Certificate



In Collaboration with
s p e a g
CALIBRATION LABORATORY



Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

Client **TA-ShangHai**

Certificate No: **J13-2-2971**

CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:3677**

Calibration Procedure(s) **TMC-OS-E-02-195
Calibration Procedures for Dosimetric E-field Probes**

Calibration date: **November 28, 2013**

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements(SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)°C and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	101919	01-Jul-13 (TMC, No.JW13-044)	Jun-14
Power sensor NRP-Z91	101547	01-Jul-13 (TMC, No.JW13-044)	Jun-14
Power sensor NRP-Z91	101548	01-Jul-13 (TMC, No.JW13-044)	Jun-14
Reference10dBAttenuator	BT0520	12-Dec-12(TMC,No.JZ12-867)	Dec-14
Reference20dBAttenuator	BT0267	12-Dec-12(TMC,No.JZ12-866)	Dec-14
Reference Probe EX3DV4	SN 3846	03-Sep-13(SPEAG.No.EX3-3846_Sep13)	Sep-14
DAE4	SN 777	22-Feb-13 (SPEAG, DAE4-777_Feb13)	Feb -14
Secondary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
SignalGeneratorMG3700A	6201052605	01-Jul-13 (TMC, No.JW13-045)	Jun-14
Network Analyzer E5071C	MY46110673	15-Feb-13 (TMC, No.JZ13-781)	Feb-14

	Name	Function	Signature
Calibrated by:	Yu Zongying	SAR Test Engineer	
Reviewed by:	Qi Dianyuan	SAR Project Leader	
Approved by:	Lu Bingsong	Deputy Director of the Laboratory	

Issued: November 29, 2013

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConvF	sensitivity in TSL / NORM _{x,y,z}
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A,B,C,D	modulation dependent linearization parameters
Polarization Φ	Φ rotation around probe axis
Polarization θ	θ rotation around an axis that is in the plane normal to probe axis (at measurement center), i $\theta=0$ is normal to probe axis

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300MHz to 3GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}**: Assessed for E-field polarization $\theta=0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not effect the E^2 -field uncertainty inside TSL (see below ConvF).
- NORM(f)_{x,y,z} = NORM_{x,y,z} * frequency_response** (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCP_{x,y,z}**: DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- PAR**: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics.
- A_{x,y,z}; B_{x,y,z}; C_{x,y,z}; VR_{x,y,z}; A,B,C** are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty valued are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM_{x,y,z} ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- Connector Angle**: The angle is assessed using the information gained by determining the NORM_x (no uncertainty required).



Add: No 52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

Probe EX3DV4

SN: 3677

Calibrated: November 28, 2013

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)



Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

DASY – Parameters of Probe: EX3DV4 - SN: 3677

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm($\mu\text{V}/(\text{V}/\text{m})^2$) ^A	0.38	0.44	0.38	±10.8%
DCP(mV) ^B	99.8	100.9	101.9	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB, μV	C	D dB	VR mV	Unc ^E (k=2)
0	CW	X	0.0	0.0	1.0	0.00	93.3	±2.6%
		Y	0.0	0.0	1.0		101.7	
		Z	0.0	0.0	1.0		92.1	

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

^A The uncertainties of Norm X, Y, Z do not affect the E²-field uncertainty inside TSL (see Page 5 and Page 6).

^B Numerical linearization parameter; uncertainty not required.

^E Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.



Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
 Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
 E-mail: Info@emcite.com Http://www.emcite.com

DASY – Parameters of Probe: EX3DV4 - SN: 3677

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz] ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	41.9	0.89	9.94	9.94	9.94	0.16	1.13	± 12%
850	41.5	0.92	9.41	9.41	9.41	0.11	1.47	± 12%
1750	40.1	1.37	8.22	8.22	8.22	0.14	2.11	± 12%
1900	40.0	1.40	8.15	8.15	8.15	0.14	2.34	± 12%
2100	39.8	1.49	7.87	7.87	7.87	0.13	3.21	± 12%
2450	39.2	1.80	7.64	7.64	7.64	0.39	0.95	± 12%
5200	36.0	4.66	5.73	5.73	5.73	0.95	0.62	± 13%
5300	35.9	4.76	5.68	5.68	5.68	0.87	0.67	± 13%
5500	35.6	4.96	5.62	5.62	5.62	0.97	0.62	± 13%
5600	35.5	5.07	5.29	5.29	5.29	0.89	0.63	± 13%
5800	35.3	5.27	5.29	5.29	5.29	1.02	0.61	± 13%

^C Frequency validity of ±100MHz only applies for DASY v4.4 and higher (Page 2), else it is restricted to ±50MHz. The uncertainty is the RSS of ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

^F At frequency below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ±5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.



Add: No 52 Huayuanbei Road, Haidian District, Beijing, 100191, China
 Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
 E-mail: Info@emcite.com Http://www.emcite.com

DASY – Parameters of Probe: EX3DV4 - SN: 3677

Calibration Parameter Determined in Body Tissue Simulating Media

f [MHz] ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	55.5	0.96	9.72	9.72	9.72	0.11	1.97	± 12%
850	55.2	0.99	9.51	9.51	9.51	0.15	1.55	± 12%
1750	53.4	1.49	7.77	7.77	7.77	0.14	3.23	± 12%
1900	53.3	1.52	7.63	7.63	7.63	0.15	2.81	± 12%
2100	53.2	1.62	7.97	7.97	7.97	0.16	4.09	± 12%
2450	52.7	1.95	7.61	7.61	7.61	0.45	0.92	± 12%
5200	49.0	5.30	4.72	4.72	4.72	0.66	1.10	± 13%
5300	48.9	5.42	4.67	4.67	4.67	0.64	1.19	± 13%
5500	48.6	5.65	4.34	4.34	4.34	0.73	0.80	± 13%
5600	48.5	5.77	4.29	4.29	4.29	0.74	0.81	± 13%
5800	48.2	6.00	4.46	4.46	4.46	0.78	0.80	± 13%

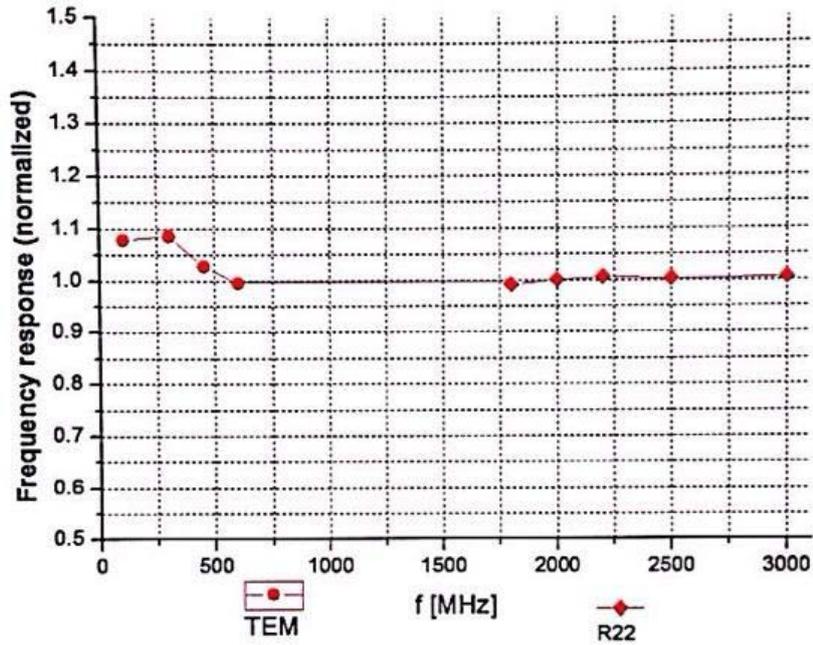
^C Frequency validity of ±100MHz only applies for DASY v4.4 and higher (Page 2), else it is restricted to ±50MHz. The uncertainty is the RSS of ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

^F At frequency below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ±5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.



Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

Frequency Response of E-Field (TEM-Cell: ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field: $\pm 7.5\%$ (k=2)

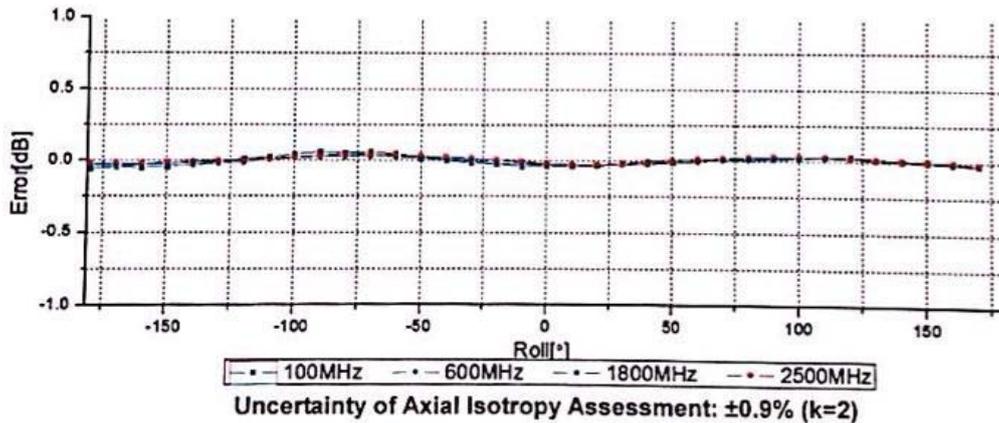
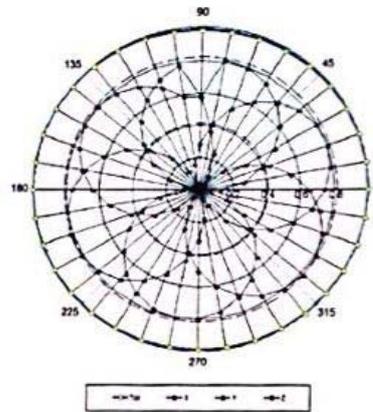
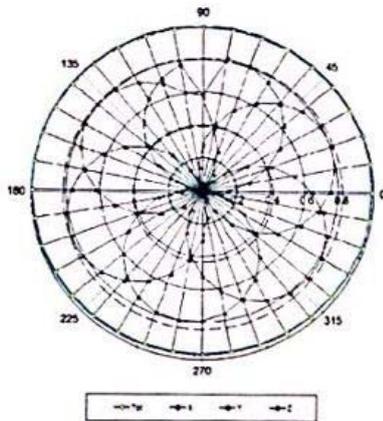


Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

Receiving Pattern (Φ), $\theta=0^\circ$

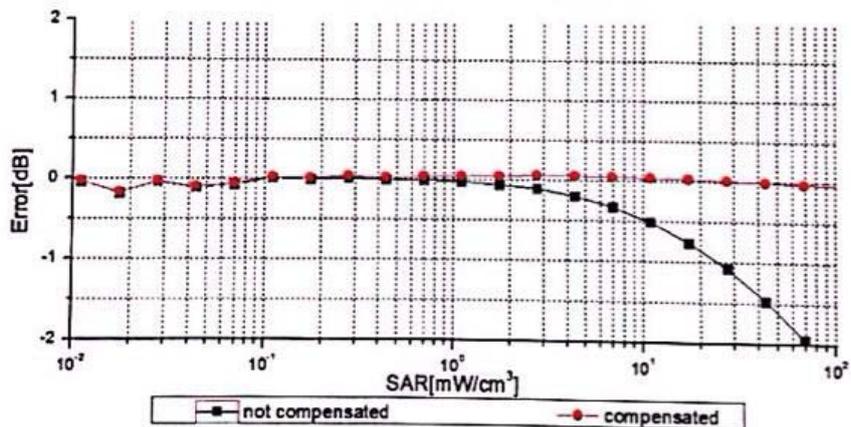
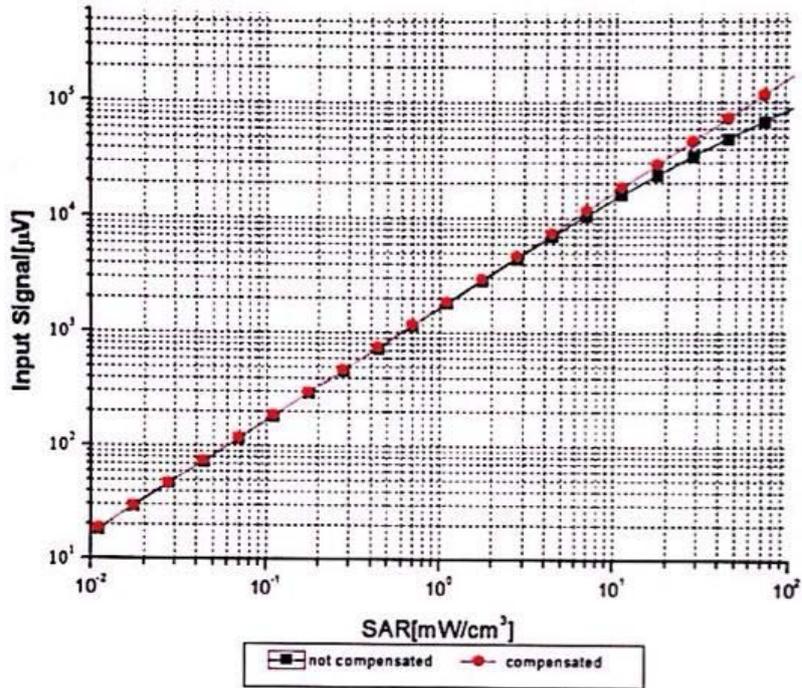
f=600 MHz, TEM

f=1800 MHz, R22





**Dynamic Range f(SAR_{head})
 (TEM cell, f = 900 MHz)**



Uncertainty of Linearity Assessment: ±0.9% (k=2)

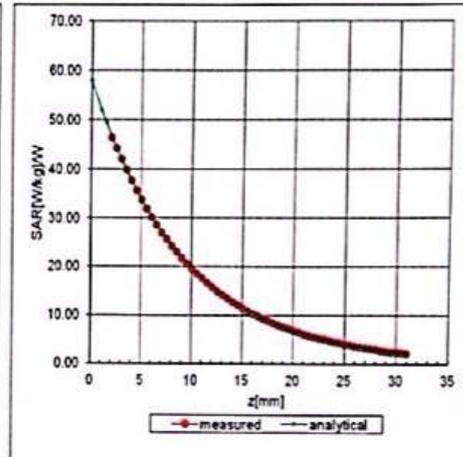
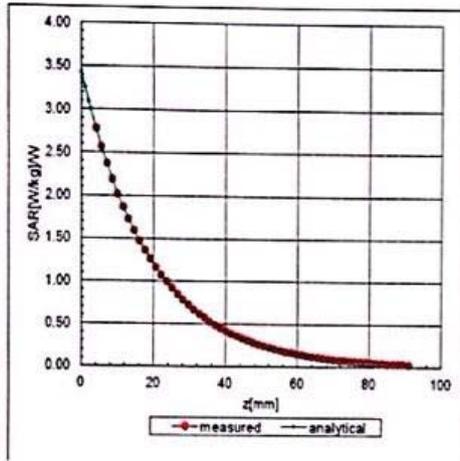


Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
 Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
 E-mail: Info@emcite.com Http://www.emcite.com

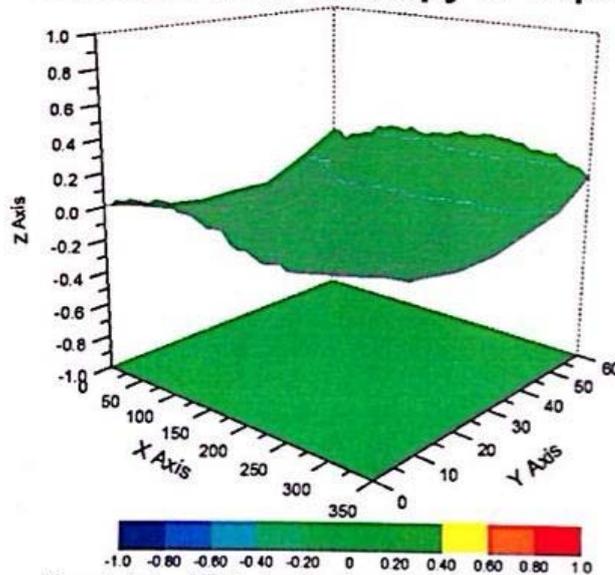
Conversion Factor Assessment

f=850 MHz, WGLS R9(H_convF)

f=2450 MHz, WGLS R26(H_convF)



Deviation from Isotropy in Liquid



Uncertainty of Spherical Isotropy Assessment: $\pm 2.8\%$ (K=2)



Add: No. 52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

DASY - Parameters of Probe: EX3DV4 - SN: 3677

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	117
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disable
Probe Overall Length	337mm
Probe Body Diameter	10mm
Tip Length	9mm
Tip Diameter	2.5mm
Probe Tip to Sensor X Calibration Point	1mm
Probe Tip to Sensor Y Calibration Point	1mm
Probe Tip to Sensor Z Calibration Point	1mm
Recommended Measurement Distance from Surface	2mm

TA Technology (Shanghai) Co., Ltd. Test Report

Report No. RHA1403-0023SAR

Page 128 of 165

ANNEX F: D835V2 Dipole Calibration Certificate

**Calibration Laboratory of
Schmid & Partner
Engineering AG**
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **TA-Shanghai (Auden)**

Certificate No: **D835V2-4d020_Aug11**

CALIBRATION CERTIFICATE

Object: **D835V2 - SN: 4d020**

Calibration procedure(s): **QA CAL-05.v8
Calibration procedure for dipole validation kits above 700 MHz**

Calibration date: **August 26, 2011**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe ES3DV3	SN: 3205	29-Apr-11 (No. ES3-3205_Apr11)	Apr-12
DAE4	SN: 601	04-Jul-11 (No. DAE4-601_Jul11)	Jul-12

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: August 26, 2011

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No. RHA1403-0023SAR

Page 129 of 165

**Calibration Laboratory of
Schmid & Partner
Engineering AG**
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

TA Technology (Shanghai) Co., Ltd. Test Report

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.6.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.1 ± 6 %	0.89 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.32 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	9.34 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.52 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	6.11 mW / g ± 16.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	53.4 ± 6 %	0.99 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.42 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	9.46 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.59 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	6.26 mW / g ± 16.5 % (k=2)

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.9 Ω - 3.1 $j\Omega$
Return Loss	- 27.7 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.7 Ω - 5.4 $j\Omega$
Return Loss	- 25.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.391 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	April 22, 2004

DASY5 Validation Report for Head TSL

Date: 25.08.2011

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d020

Communication System: CW; Frequency: 835 MHz

Medium parameters used: $f = 835$ MHz; $\sigma = 0.89$ mho/m; $\epsilon_r = 41.1$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.07, 6.07, 6.07); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

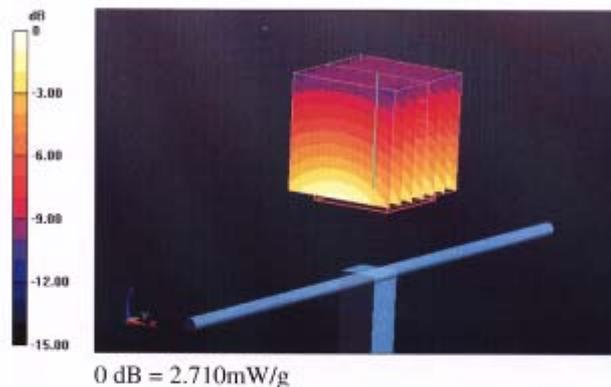
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 56.930 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 3.421 W/kg

SAR(1 g) = 2.32 mW/g; SAR(10 g) = 1.52 mW/g

Maximum value of SAR (measured) = 2.708 mW/g

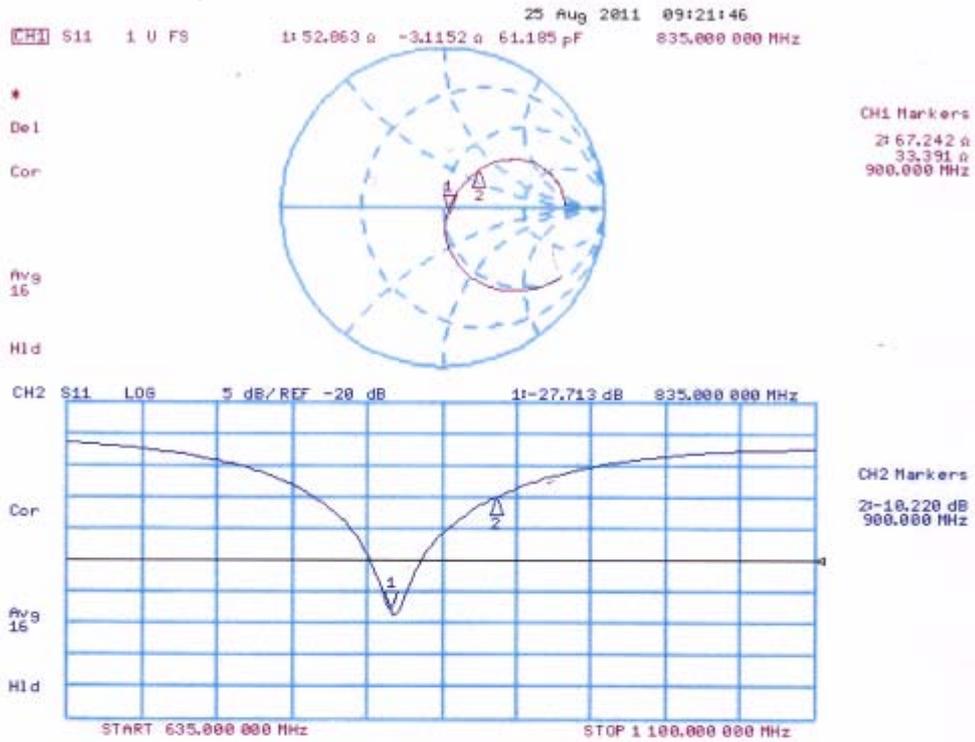


TA Technology (Shanghai) Co., Ltd. Test Report

Report No. RHA1403-0023SAR

Page 133 of 165

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 26.08.2011

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d020

Communication System: CW; Frequency: 835 MHz

Medium parameters used: $f = 835$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 53.4$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.02, 6.02, 6.02); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

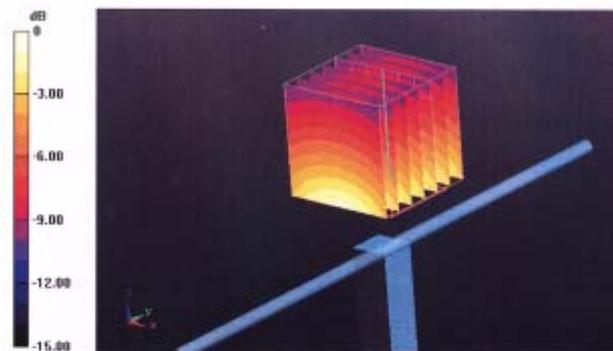
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.406 V/m; Power Drift = 0.02 dB

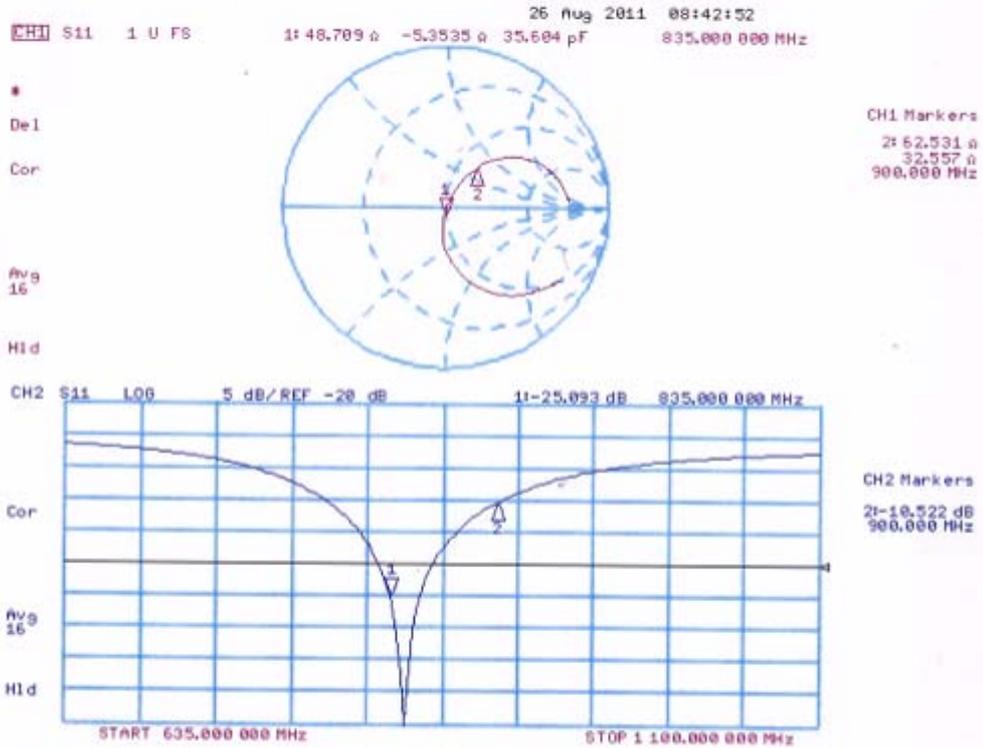
Peak SAR (extrapolated) = 3.509 W/kg

SAR(1 g) = 2.42 mW/g; SAR(10 g) = 1.59 mW/g

Maximum value of SAR (measured) = 2.827 mW/g



Impedance Measurement Plot for Body TSL



TA Technology (Shanghai) Co., Ltd. Test Report

Report No. RHA1403-0023SAR

Page 136 of 165

ANNEX G: D1900V2 Dipole Calibration Certificate

**Calibration Laboratory of
Schmid & Partner
Engineering AG**
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **TA-Shanghai (Auden)**

Certificate No: **D1900V2-5d060_Aug11**

CALIBRATION CERTIFICATE

Object **D1900V2 - SN: 5d060**

Calibration procedure(s) **QA CAL-05.v8
Calibration procedure for dipole validation kits above 700 MHz**

Calibration date: **August 31, 2011**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe ES3DV3	SN: 3205	29-Apr-11 (No. ES3-3205_Apr11)	Apr-12
DAE4	SN: 601	04-Jul-11 (No. DAE4-601_Jul11)	Jul-12
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Dimce Iliev	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: August 31, 2011

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

**Calibration Laboratory of
Schmid & Partner
Engineering AG**
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
S Service suisse d'étalonnage
C Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

TA Technology (Shanghai) Co., Ltd.

Test Report

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.6.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz \pm 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 \pm 0.2) °C	39.5 \pm 6 %	1.42 mho/m \pm 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	10.2 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	40.3 mW / g \pm 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.30 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	21.1 mW / g \pm 16.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 \pm 0.2) °C	53.9 \pm 6 %	1.57 mho/m \pm 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	10.6 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	41.7 mW / g \pm 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.55 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	22.0 mW / g \pm 16.5 % (k=2)

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.6 Ω + 7.5 j Ω
Return Loss	- 22.3 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.3 Ω + 7.9 j Ω
Return Loss	- 21.3 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.194 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	December 10, 2004

DASY5 Validation Report for Head TSL

Date: 30.08.2011

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d060

Communication System: CW; Frequency: 1900 MHz

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.42$ mho/m; $\epsilon_r = 39.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.01, 5.01, 5.01); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

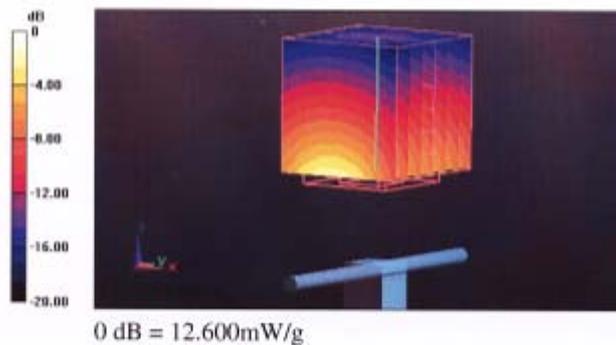
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 97.636 V/m; Power Drift = 0.07 dB

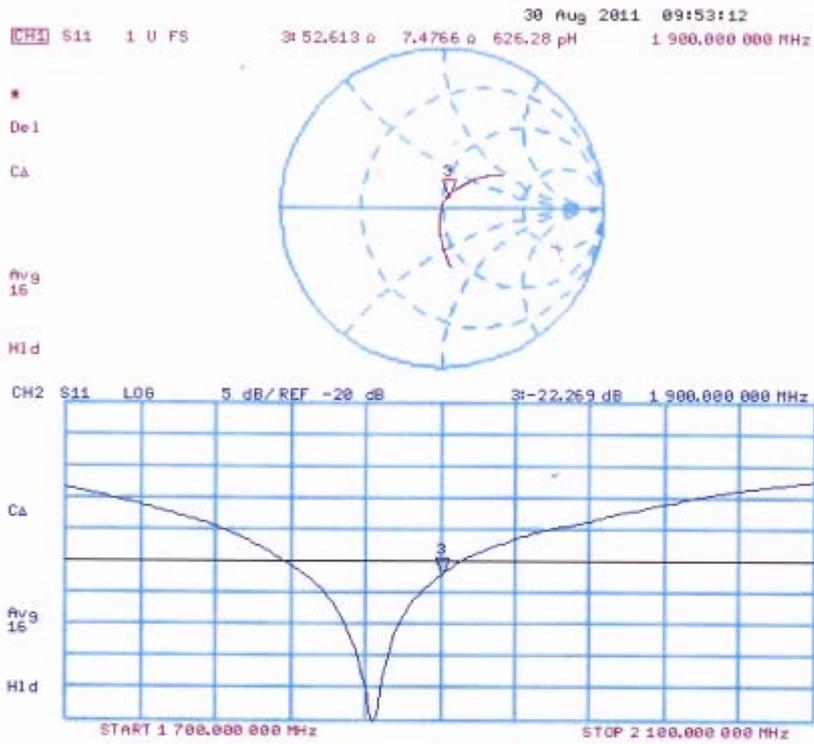
Peak SAR (extrapolated) = 18.535 W/kg

SAR(1 g) = 10.2 mW/g; SAR(10 g) = 5.3 mW/g

Maximum value of SAR (measured) = 12.600 mW/g



Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 31.08.2011

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d060

Communication System: CW; Frequency: 1900 MHz

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.57$ mho/m; $\epsilon_r = 53.9$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.62, 4.62, 4.62); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

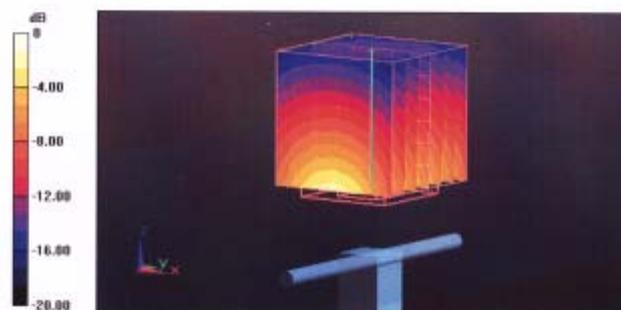
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 96.435 V/m; Power Drift = -0.0099 dB

Peak SAR (extrapolated) = 18.663 W/kg

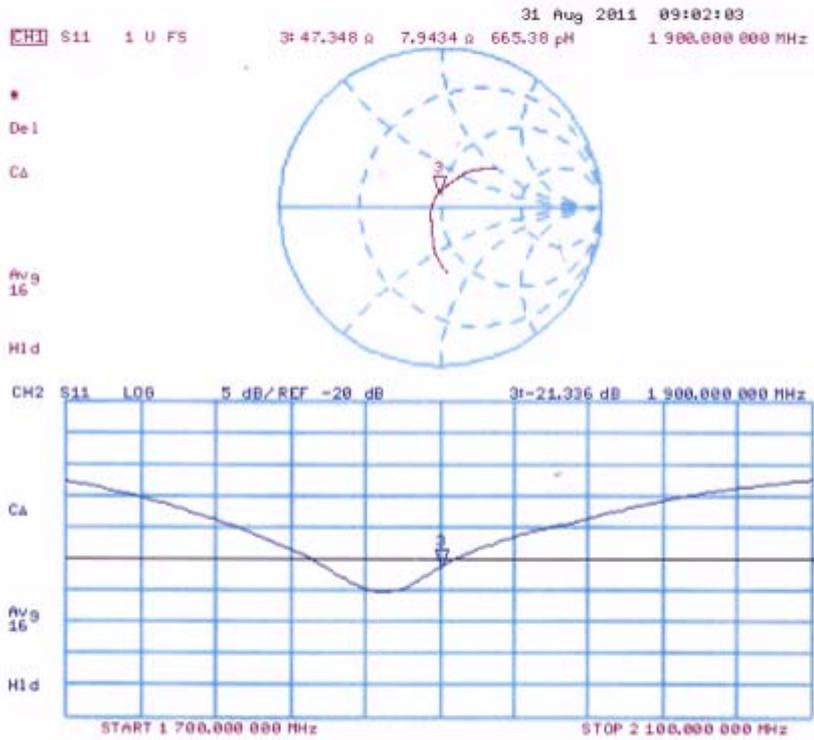
SAR(1 g) = 10.6 mW/g; SAR(10 g) = 5.55 mW/g

Maximum value of SAR (measured) = 13.397 mW/g



0 dB = 13.400mW/g

Impedance Measurement Plot for Body TSL



TA Technology (Shanghai) Co., Ltd. Test Report

Report No. RHA1403-0023SAR

Page 144 of 165

ANNEX H: D2450V2 Dipole Calibration Certificate

**Calibration Laboratory of
Schmid & Partner
Engineering AG**
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **TA-Shanghai (Auden)**

Certificate No: **D2450V2-786_Aug11**

CALIBRATION CERTIFICATE

Object: **D2450V2 - SN: 786**

Calibration procedure(s): **QA CAL-05.v8
Calibration procedure for dipole validation kits above 700 MHz**

Calibration date: **August 29, 2011**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe ES3DV3	SN: 3205	29-Apr-11 (No. ES3-3205_Apr11)	Apr-12
DAE4	SN: 601	04-Jul-11 (No. DAE4-601_Jul11)	Jul-12
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

Calibrated by:	Name Dimce Iliev	Function Laboratory Technician	Signature
Approved by:	Name Katja Pokovic	Technical Manager Technical Manager	

Issued: August 29, 2011

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No. RHA1403-0023SAR

Page 145 of 165

**Calibration Laboratory of
Schmid & Partner
Engineering AG**
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

TA Technology (Shanghai) Co., Ltd. Test Report

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.6.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.4 ± 6 %	1.85 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.7 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	53.8 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.41 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	25.4 mW / g ± 16.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	51.8 ± 6 %	2.02 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	13.2 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	51.7 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.10 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	24.2 mW / g ± 16.5 % (k=2)

TA Technology (Shanghai) Co., Ltd.

Test Report

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	$55.0 \Omega + 2.4 j\Omega$
Return Loss	- 25.5 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	$50.4 \Omega + 3.5 j\Omega$
Return Loss	- 29.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.154 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	May 06, 2005

DASY5 Validation Report for Head TSL

Date: 29.08.2011

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 786

Communication System: CW; Frequency: 2450 MHz

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.85$ mho/m; $\epsilon_r = 38.4$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.45, 4.45, 4.45); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

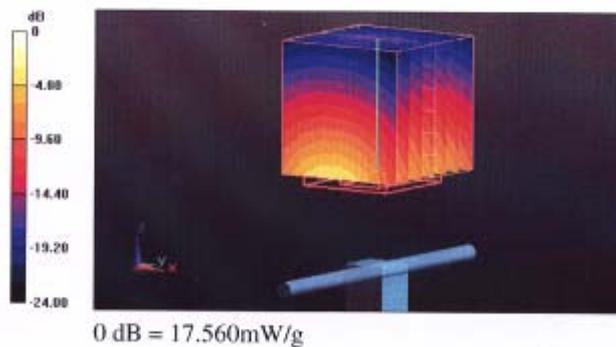
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 101.5 V/m; Power Drift = 0.06 dB

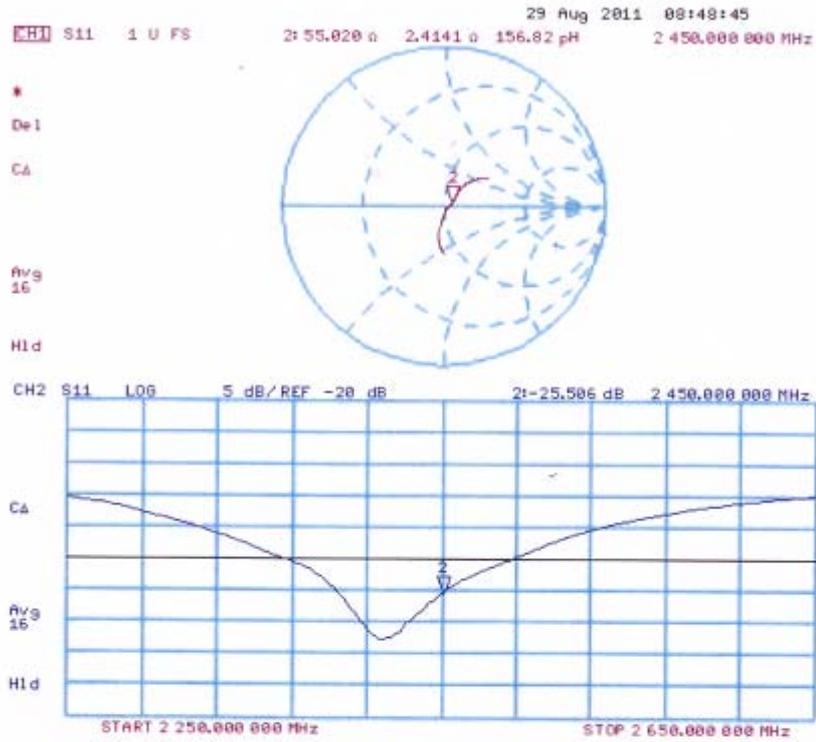
Peak SAR (extrapolated) = 28.303 W/kg

SAR(1 g) = 13.7 mW/g; SAR(10 g) = 6.41 mW/g

Maximum value of SAR (measured) = 17.561 mW/g



Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 29.08.2011

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 786

Communication System: CW; Frequency: 2450 MHz

Medium parameters used: $f = 2450$ MHz; $\sigma = 2.02$ mho/m; $\epsilon_r = 51.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.26, 4.26, 4.26); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

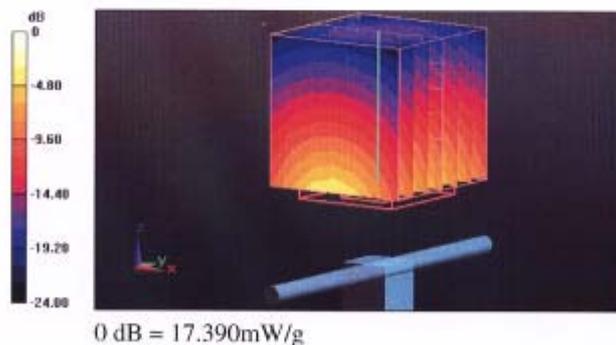
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 96.118 V/m; Power Drift = 0.0072 dB

Peak SAR (extrapolated) = 27.129 W/kg

SAR(1 g) = 13.2 mW/g; SAR(10 g) = 6.1 mW/g

Maximum value of SAR (measured) = 17.387 mW/g

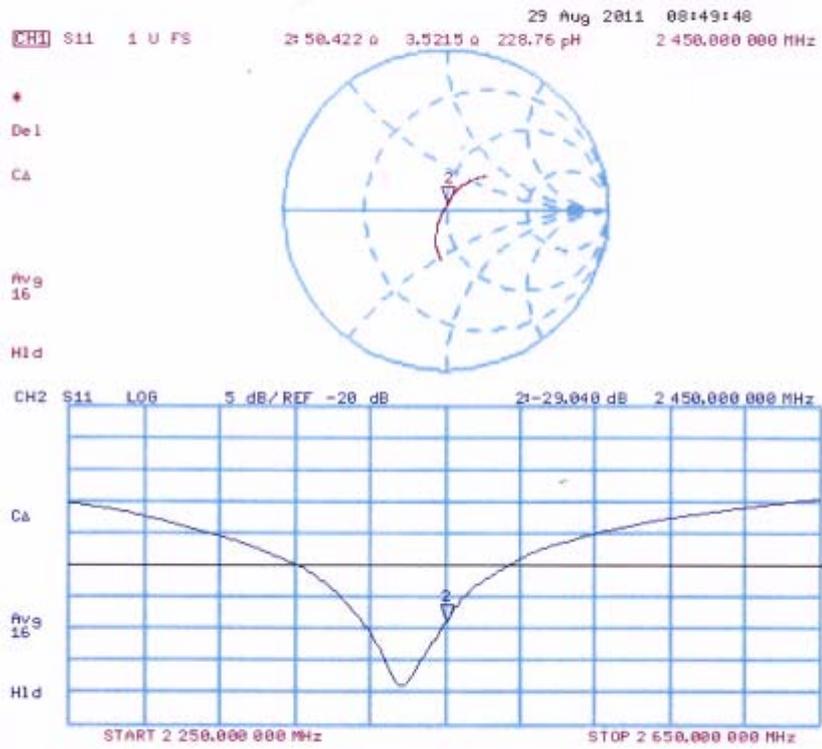


TA Technology (Shanghai) Co., Ltd. Test Report

Report No. RHA1403-0023SAR

Page 151 of 165

Impedance Measurement Plot for Body TSL



TA Technology (Shanghai) Co., Ltd. Test Report

Report No. RHA1403-0023SAR

Page 152 of 165

ANNEX I: DAE4 Calibration Certificate



In Collaboration with
s p e a g
CALIBRATION LABORATORY

Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: info@emcite.com Http://www.emcite.com



Client : **TA(Shanghai)**

Certificate No: **J14-2-0052**

CALIBRATION CERTIFICATE			
Object	DAE4 - SN: 1317		
Calibration Procedure(s)	TMC-OS-E-01-198 Calibration Procedure for the Data Acquisition Electronics (DAEx)		
Calibration date:	January 16, 2014		
<p>This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements(SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.</p> <p>All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)°C and humidity<70%.</p> <p>Calibration Equipment used (M&TE critical for calibration)</p>			
Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Documenting Process Calibrator 753	1971018	01-July-13 (TMC, No:JW13-049)	July-14
Calibrated by:	Name Yu Zongying	Function SAR Test Engineer	Signature
Reviewed by:	Qi Dianyuan	SAR Project Leader	
Approved by:	Lu Bingsong	Deputy Director of the laboratory	
<p>Issued: January 16, 2014</p> <p>This calibration certificate shall not be reproduced except in full without written approval of the laboratory.</p>			



Glossary:

DAE data acquisition electronics
Connector angle information used in DASY system to align probe sensor X to the robot coordinate system.

Methods Applied and Interpretation of Parameters:

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle:* The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The report provide only calibration results for DAE, it does not contain other performance test results.

TA Technology (Shanghai) Co., Ltd. Test Report

Report No. RHA1403-0023SAR

Page 154 of 165



In Collaboration with
s p e a g
CALIBRATION LABORATORY

Add: No 52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1μV, full range = -100...+300 mV

Low Range: 1LSB = 61nV, full range = -1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec, Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	404.058 ± 0.15% (k=2)	404.060 ± 0.15% (k=2)	403.954 ± 0.15% (k=2)
Low Range	3.99002 ± 0.7% (k=2)	3.99910 ± 0.7% (k=2)	3.98303 ± 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	119° ± 1°
---	-----------

TA Technology (Shanghai) Co., Ltd.

Test Report

Appendix

1. DC Voltage Linearity

High Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	199996.94	-1.27	-0.00
Channel X	+ Input	20000.14	-0.07	-0.00
Channel X	- Input	-19997.83	3.06	-0.02
Channel Y	+ Input	199996.34	-1.76	-0.00
Channel Y	+ Input	19997.45	-2.66	-0.01
Channel Y	- Input	-20000.85	0.11	-0.00
Channel Z	+ Input	199999.43	1.31	0.00
Channel Z	+ Input	19998.09	-2.03	-0.01
Channel Z	- Input	-20000.38	0.66	-0.00

Low Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	2000.20	-0.38	-0.02
Channel X	+ Input	201.23	0.09	0.04
Channel X	- Input	-197.80	0.90	-0.45
Channel Y	+ Input	2000.37	-0.14	-0.01
Channel Y	+ Input	200.23	-0.93	-0.46
Channel Y	- Input	-199.71	-0.91	0.46
Channel Z	+ Input	2000.07	-0.47	-0.02
Channel Z	+ Input	200.24	-0.94	-0.47
Channel Z	- Input	-199.53	-0.70	0.35

2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Common mode Input Voltage (mV)	High Range Average Reading (μV)	Low Range Average Reading (μV)
Channel X	200	10.10	8.39
	- 200	-6.31	-7.87
Channel Y	200	7.67	7.42
	- 200	-9.57	-9.68
Channel Z	200	2.03	1.67
	- 200	-2.67	-3.15

3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Input Voltage (mV)	Channel X (μV)	Channel Y (μV)	Channel Z (μV)
Channel X	200	-	5.61	-1.03
Channel Y	200	9.77	-	7.17
Channel Z	200	9.96	6.56	-

TA Technology (Shanghai) Co., Ltd.

Test Report

4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	High Range (LSB)	Low Range (LSB)
Channel X	15897	16637
Channel Y	16146	15425
Channel Z	16377	16752

5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Input 10M Ω

	Average (μ V)	min. Offset (μ V)	max. Offset (μ V)	Std. Deviation (μ V)
Channel X	0.62	-0.20	1.36	0.34
Channel Y	-0.89	-1.83	-0.02	0.33
Channel Z	-0.59	-2.34	1.15	0.60

6. Input Offset Current

Nominal input circuitry offset current on all channels: <25fA

7. Input Resistance (Typical values for information)

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

8. Low Battery Alarm Voltage (Typical values for information)

Typical values	Alarm Level (VDC)
Supply (+ Vcc)	+7.9
Supply (- Vcc)	-7.6

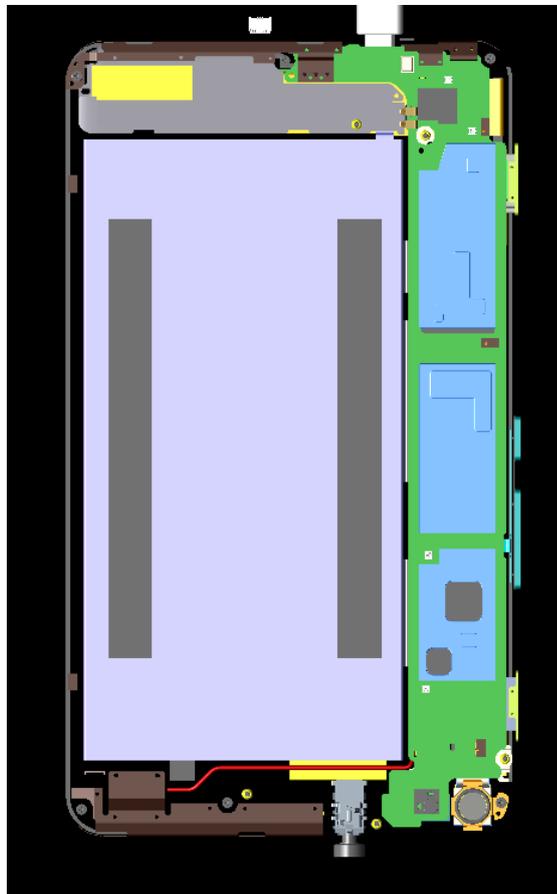
9. Power Consumption (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	+6	+14
Supply (- Vcc)	-0.01	-8	-9

ANNEX J: The EUT Appearances and Test Configuration



a.EUT

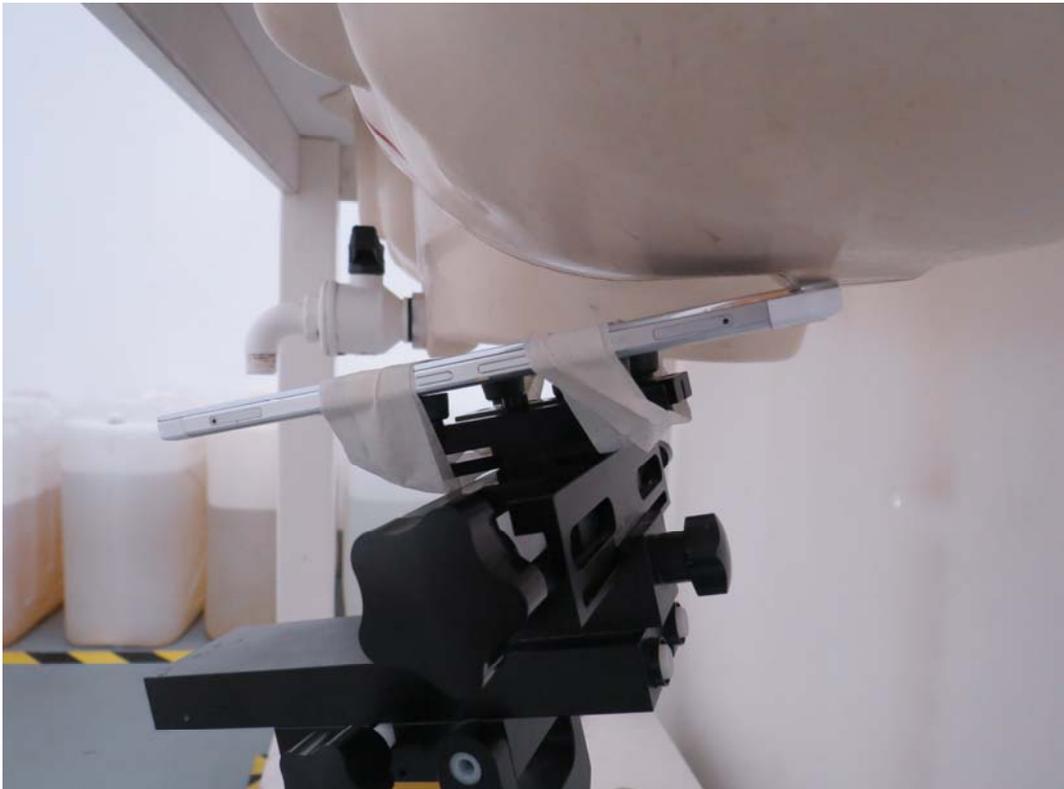


b.Antenna

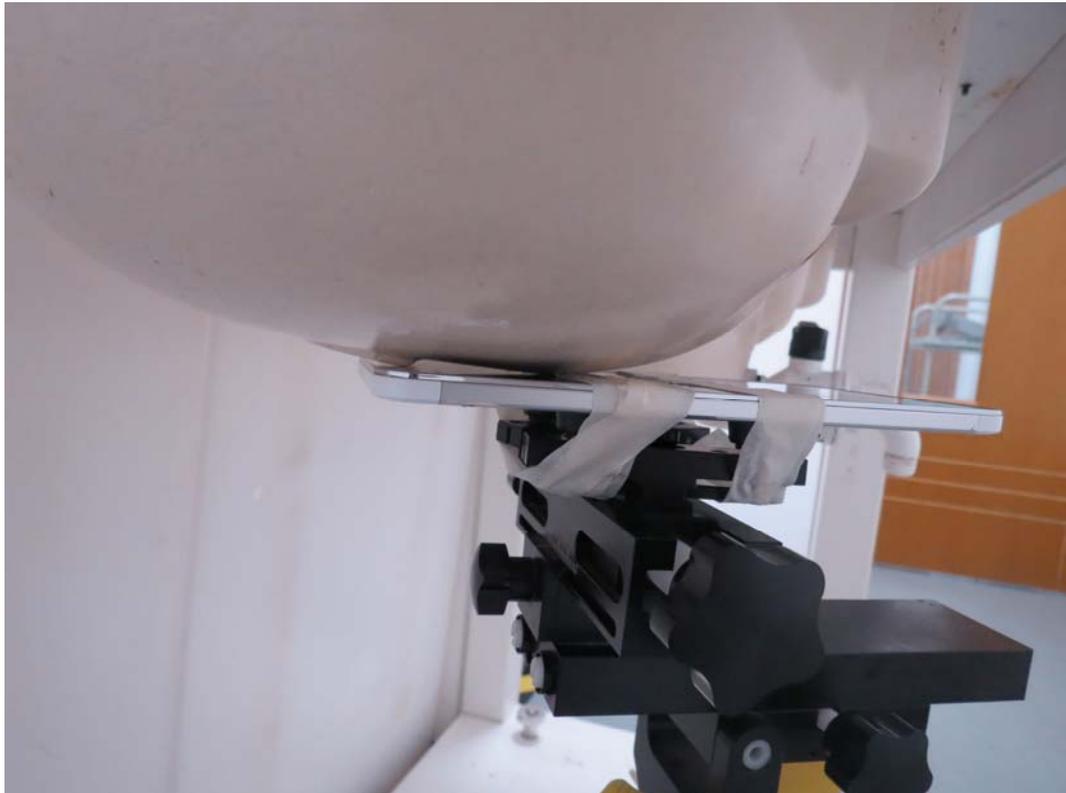
Picture 8: Constituents of the EUT(Original)



Picture 9: Left Hand Touch Cheek Position(Original)



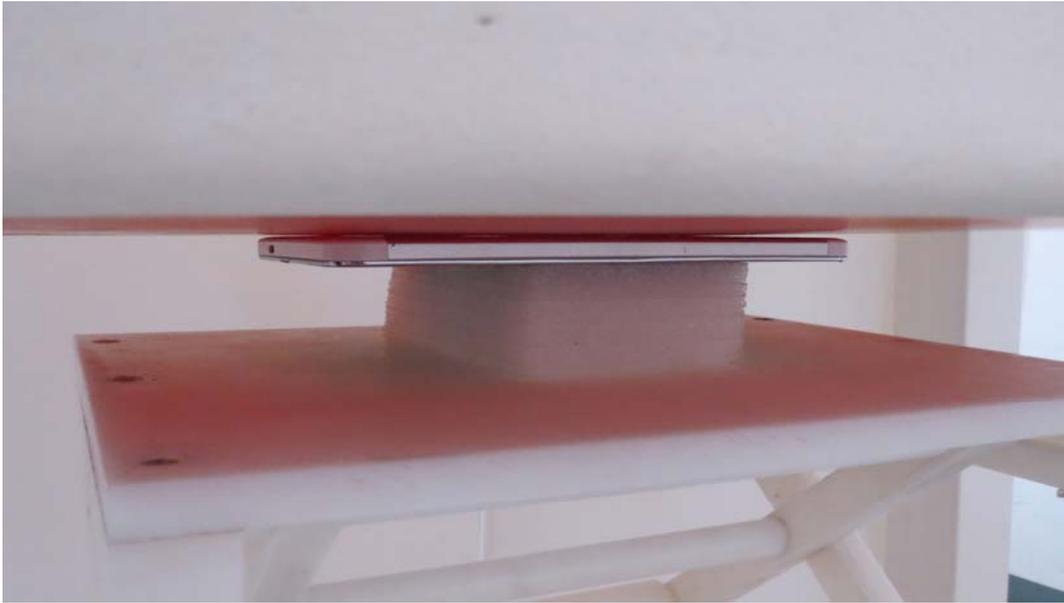
Picture 10: Left Hand Tilt 15 Degree Position(Original)



Picture 11: Right Hand Touch Cheek Position(Original)



Picture 12: Right Hand Tilt 15 Degree Position(Original)



Picture 13: Test position 1 (Original)



Picture 14: Test position 2(Original)



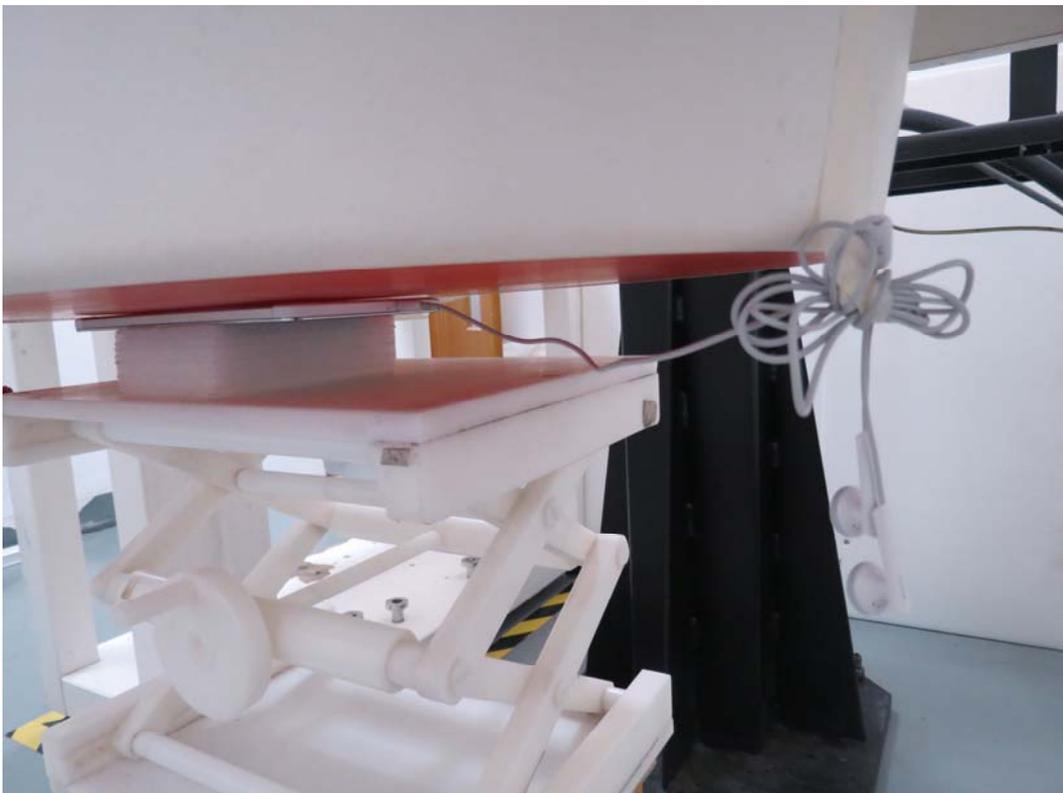
Picture 15: Test Position 3(Original)



Picture 16: Test Position 4 (Original)



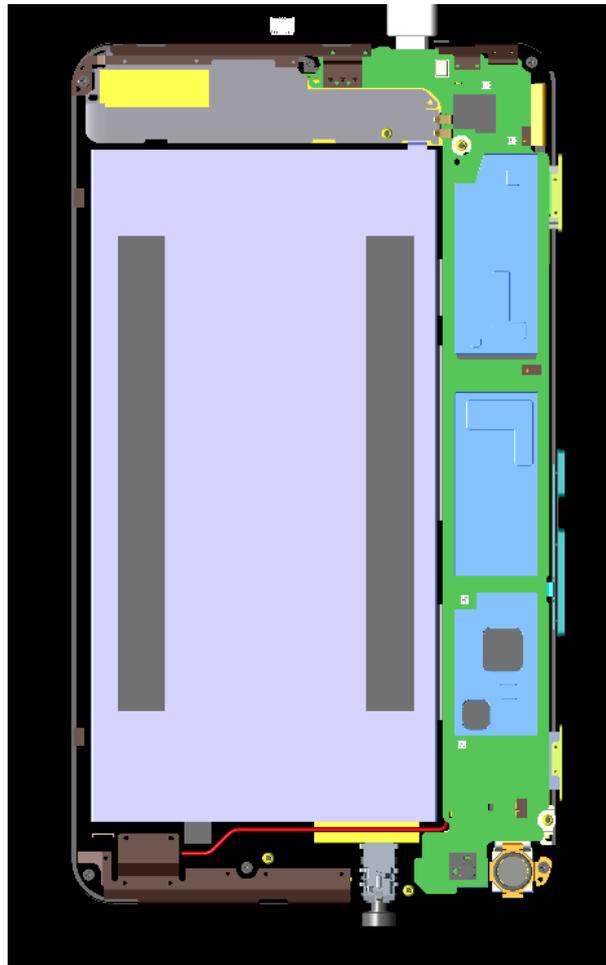
Picture 17: Test Position 5(Original)



Picture 18: Test position 1 with Earphone(Original)



a.EUT

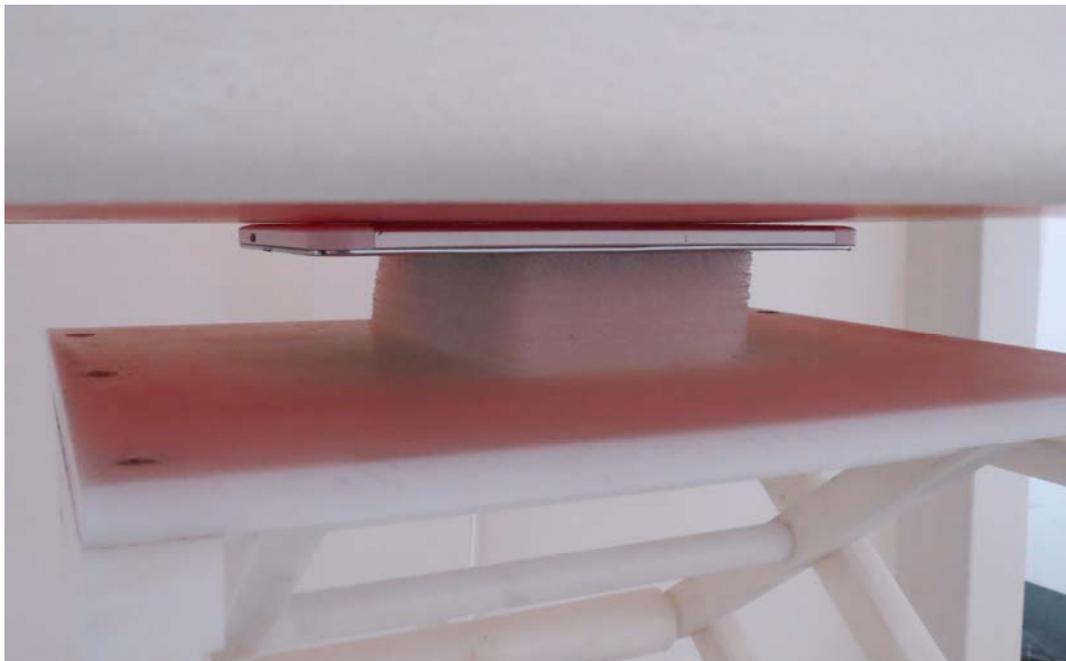


b.Antenna

Picture 19: Constituents of the EUT (Variant)

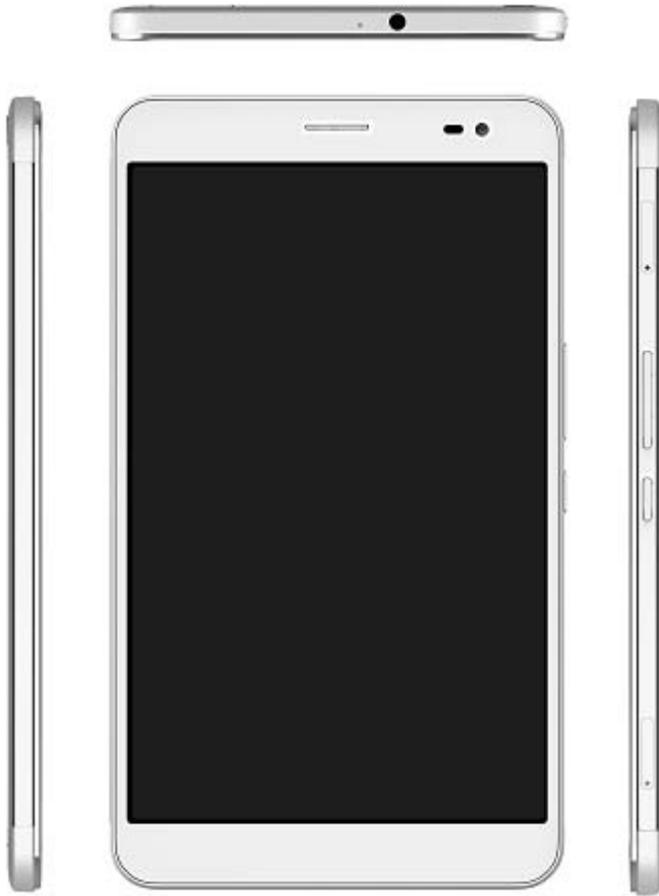


Picture 20: Right Hand Touch Cheek Position (Variant)



Picture 21: Test position 1 (Variant)

ANNEX K Product Change Description



The differences between 7D-501u ,7D-501g is :

	7D-501u	7D-501g
PCB	the same	the same
WIFI/BT 2.4G	the same	the same
GSM850/1900	the same	the same
WCDMA1900/850	support	Not support by software