



SAR TEST REPORT

Product Name	HSPA+/UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth; HUAWEI Ascend Y530
Model Name	HUAWEI Y530-U00, Y530-U00
FCC ID	QISY530-U00
Client	Huawei Technologies Co., Ltd.
Manufacturer	Huawei Technologies Co., Ltd.
Date of issue	December 16, 2013

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

Report No.: RHA1311-0086SAR01R2

Page 2 of 166

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™-2013: 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 v01r01: SAR Measurement Requirements for 100 MHz to 6 GHz</p> <p>KDB 447498 D01 Mobile Portable RF Exposure v05r01: Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies</p> <p>KDB 648474 D04 Handset SAR v01r01: SAR Evaluation Considerations for Wireless Handsets.</p> <p>KDB 941225 D03 Test Reduction GSM_GPRS_EDGE v01:Recommended SAR Test Reduction Procedures for GSM/GPRS/EDGEs</p> <p>KDB 941225 D06 Hotspot Mode SAR v01r01: SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities</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 杨伟冲
Director

Revised by 凌敏宝
SAR Manager

Performed by 沈辰
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}	9
1.7. Maximum Conducted Power of each tested Mode.....	10
1.8. Test Date	10
2. SAR Measurements System Configuration	11
2.1. SAR Measurement Set-up	11
2.2. DASY5 E-field Probe System	12
2.2.1. EX3DV4 Probe Specification	12
2.2.2. E-field Probe Calibration.....	13
2.3. Other Test Equipment	13
2.3.1. Device Holder for Transmitters	13
2.3.2. Phantom	14
2.4. Scanning Procedure	14
2.5. Data Storage and Evaluation	16
2.5.1. Data Storage.....	16
2.5.2. Data Evaluation by SEMCAD	16
3. Laboratory Environment.....	18
4. Tissue-equivalent Liquid	19
4.1. Tissue-equivalent Liquid Ingredients.....	19
4.2. Tissue-equivalent Liquid Properties	21
5. System Check.....	22
5.1. Description of System Check.....	22
5.2. System Check Results.....	24
6. Operational Conditions during Test	25
6.1. General Description of Test Procedures	25
6.2. Test Positions.....	25
6.2.1. Against Phantom Head.....	25
6.2.2. Body Worn Configuration.....	25
6.3. Measurement Variability.....	27
6.4. Test Configuration	28
6.4.1. GSM Test Configuration.....	28
6.4.2. WIFI Test Configuration	30
7. Test Results	31
7.1. Conducted Power Results	31
7.2. Standalone SAR Test Exclusion Considerations	34

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

Report No.: RHA1311-0086SAR01R2

Page 4 of 166

7.3.	SAR Test Results	35
7.3.1.	GSM 850 (GSM/GPRS/EGPRS)	35
7.3.2.	GSM 1900 (GSM/GPRS/EGPRS)	37
7.3.3.	WIFI (802.11b, WIFI)	39
7.4.	Simultaneous Transmission Conditions	41
8.	700MHz to 3GHz Measurement Uncertainty	44
9.	Main Test Instruments	46
ANNEX A:	Test Layout	47
ANNEX B:	System Check Results	51
ANNEX C:	Graph Results	57
ANNEX D:	Probe Calibration Certificate	119
ANNEX E:	D835V2 Dipole Calibration Certificate	130
ANNEX F:	D1900V2 Dipole Calibration Certificate	138
ANNEX G:	D2450V2 Dipole Calibration Certificate	146
ANNEX H:	DAE4 Calibration Certificate	154
ANNEX I:	The EUT Appearances and Test Configuration	159

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

Report No.: RHA1311-0086SAR01R2

Page 5 of 166

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.: RHA1311-0086SAR01R2

Page 6 of 166

1.3. Applicant Information

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

1.4. Manufacturer Information

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

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RHA1311-0086SAR01R2

Page 7 of 166

1.5. Information of EUT

General Information

Device Type:	Portable Device		
Exposure Category:	Uncontrolled Environment / General Population		
State of Sample:	Prototype Unit		
Product IMEI:	353059020005525		
Hardware Version:	HD1Y530M		
Software Version:	Y530-U00V100R001C00B162		
Antenna Type:	Internal Antenna		
Device Operating Configurations :			
Supporting Mode(s):	GSM 850/GSM 1900; (tested) WiFi (802.11b); (tested) WiFi (802.11g/n HT20); (untested) GSM 900/GSM 1800; (untested) UMTS Band I/UMTS Band VIII; (untested) Bluetooth; (untested)		
Test Modulation:	(GSM)GMSK		
Support Hotspot	Yes		
Device Class:	B		
HSDPA UE Category:	14		
HSUPA UE Category:	6		
GPRS Multislot Class(10):	Max Number of Timeslots in Uplink	2	
	Max Number of Timeslots in Downlink	4	
	Max Total Timeslot	5	
EGPRS Multislot Class(10):	Max Number of Timeslots in Uplink	2	
	Max Number of Timeslots in Downlink	4	
	Max Total Timeslot	5	
Operating 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
	WIFI(2.4G)	2412 ~ 2462	2412 ~ 2462
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 - 192 - 251	(GSM 850)	(tested)
	512 - 661 - 810	(GSM 1900)	(tested)
	1-6-11	(802.11b)	(tested)

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RHA1311-0086SAR01R2

Page 8 of 166

Auxiliary Equipment Details

AE:Battery 1

Model: HB4W1H
Manufacturer: Huawei Technologies Co., Ltd.
S/N: MAID909X19107911

AE:Battery 2

Model: HB4W1
Manufacturer: Huawei Technologies Co., Ltd.
S/N: GAGCA10Z18000172

AE:Battery 3

Model: HB4W1H
Manufacturer: Huawei Technologies Co., Ltd.
S/N: MPCD9089191H0558

AE:Battery 4

Model: HB4W1H
Manufacturer: Huawei Technologies Co., Ltd.
S/N: BAAD918K18002624

AE:Battery 5

Model: HB4W1H
Manufacturer: Huawei Technologies Co., Ltd.
S/N: CABCC10I18013350

Equipment under Test (EUT) has a GSM/UMTS antenna that is used for Tx/Rx, the second is BT/WIFI antenna that can be used for Tx/Rx. It consists of EUT and battery and the detail about these is in chapter 1.5 in this report.

The sample under test was selected by the Client.

Components list please refer to documents of the manufacturer.

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

Report No.: RHA1311-0086SAR01R2

Page 9 of 166

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	Left, cheek	192/837	0.283	0.318
GSM 1900	Left, cheek	661/1880	0.382	0.447
WiFi(802.11b)	Left, cheek	11/2462	0.097	0.110

Body Worn Configuration

Mode	Test Position	Channel /Frequency(MHz)	Limit SAR _{1g} 1.6 W/kg	
			Measured SAR _{1g} (W/kg)	Reported SAR _{1g} (W/kg)
2Txslots EGPRS 850	Back side	251/848.8	0.813	0.927
2Txslots GPRS 1900	Bottom side	661/1880	0.631	0.713
WiFi(802.11b)	Back side	11/2462	0.105	0.119

Hotspot SAR Configuration

Mode	Test Position	Channel /Frequency(MHz)	Limit SAR _{1g} 1.6 W/kg	
			Measured SAR _{1g} (W/kg)	Reported SAR _{1g} (W/kg)
2Txslots EGPRS 850	Back side	251/848.8	0.813	0.927
2Txslots GPRS 1900	Bottom Edge	661/1880	0.631	0.713
WiFi(802.11b)	Back side	11/2462	0.105	0.119

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

Report No.: RHA1311-0086SAR01R2

Page 10 of 166

1.7. Maximum Conducted Power of each tested Mode

Mode		Max Burst Conducted Power (dBm)	Max Average Power (dBm)
GSM 850	GSM	33.54	24.51
	GPRS, 2Txslots	31.63	25.61
	EGPRS, 2Txslots	31.61	25.59
GSM 1900	GSM	30.47	21.44
	GPRS, 2Txslots	27.47	21.45
	EGPRS, 2Txslots	27.45	21.43

Mode	Maximum Conducted Power (dBm)
WiFi(802.11b)	18.15

Note: The detail Power refer to Table 13 (Power Measurement Results).

1.8. Test Date

The test performed from November 13, 2013 to November 23, 2013.

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.

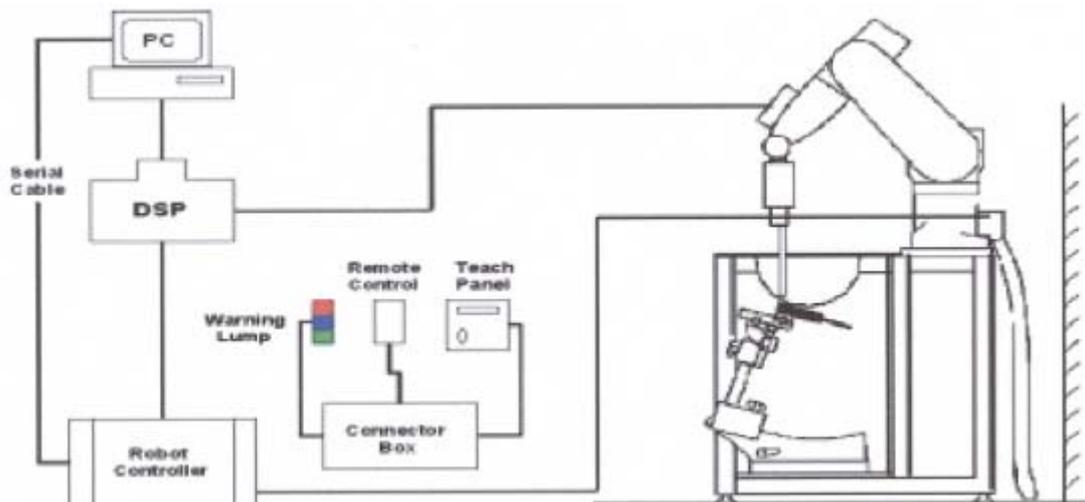


Figure 1 SAR Lab Test Measurement Set-up

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

The DASY device holder is designed to cope with the different positions given in the standard.

It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.

The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.



Figure 4 Device Holder

2.3.2. Phantom

The Generic Twin Phantom is constructed of a fiberglass shell integrated in a wooden Figure. The shape of the shell is based on data from an anatomical study designed to determine the maximum exposure in at least 90% of all users. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents the evaporation of the liquid. Reference markings on the Phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot.

Shell Thickness	2±0.1 mm
Filling Volume	Approx. 20 liters
Dimensions	810 x 1000 x 500 mm (H x L x W) Available Special



Figure 5 Generic Twin 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°.)
- 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

TA Technology (Shanghai) Co., Ltd.

Test Report

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

Report No.: RHA1311-0086SAR01R2

Page 17 of 166

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 $\epsilon=41.5$ $\sigma=0.90$

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 $\epsilon=39.2$ $\sigma=1.80$

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

Report No.: RHA1311-0086SAR01R2

Page 20 of 166

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 $\epsilon=52.7$ $\sigma=1.95$

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

Report No.: RHA1311-0086SAR01R2

Page 21 of 166

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)	2013-11-16	21.5	42.3	0.94	41.5	0.90	1.83	4.00
1900MHz (head)	2013-11-17	21.5	39.6	1.43	40.0	1.40	-1.00	2.14
2450MHz (head)	2013-11-23	21.5	39.1	1.80	39.2	1.80	-0.20	0.17
835MHz (body)	2013-11-18	21.5	55.1	0.99	55.2	0.97	-0.18	2.37
1900MHz (body)	2013-11-13	21.5	53.1	1.52	53.3	1.52	-0.41	0.26
2450MHz (body)	2013-11-22	21.5	52.1	1.99	52.7	1.95	-1.06	2.26

5. System Check

5.1. Description of System Check

The manufacturer calibrates the probes annually. Dielectric parameters of the tissue simulates 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 simulates, 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 6 and table 7.

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.

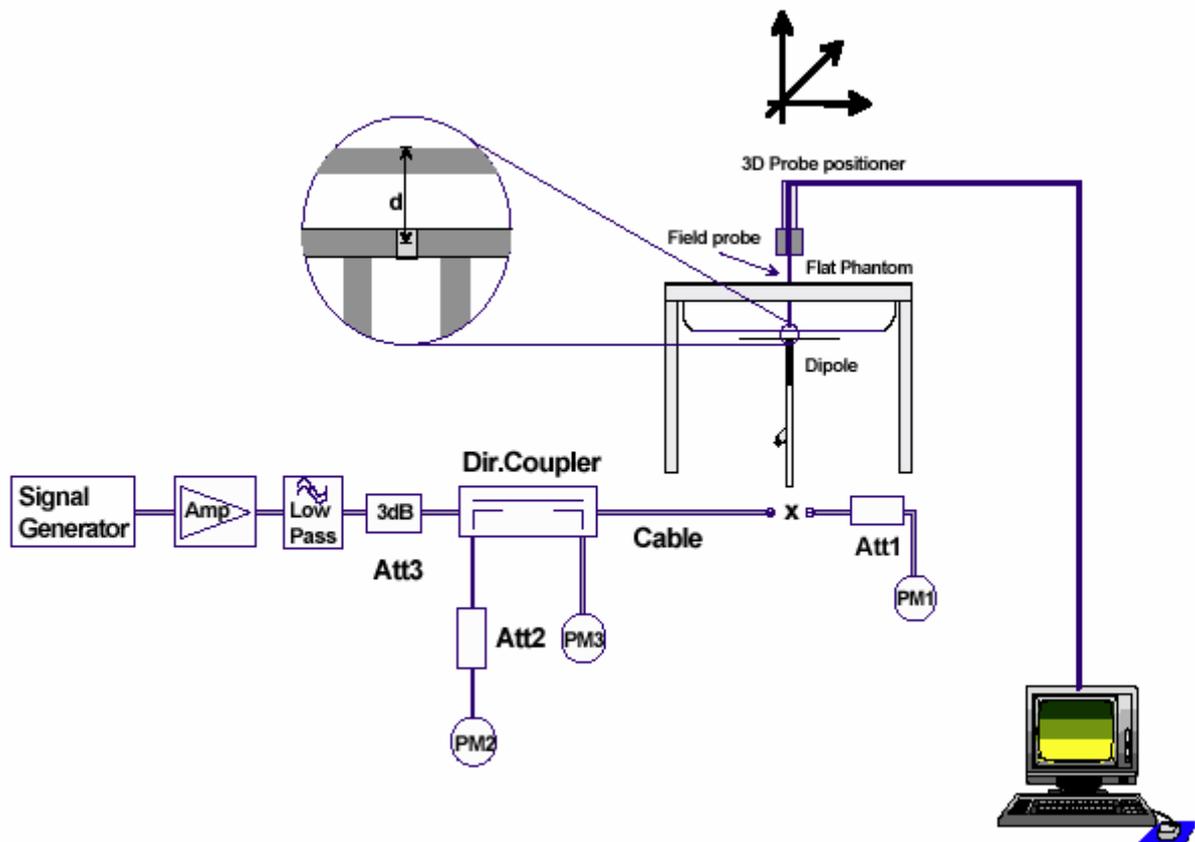


Figure 6 System Check Set-up

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RHA1311-0086SAR01R2

Page 23 of 166

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

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

Report No.: RHA1311-0086SAR01R2

Page 24 of 166

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	2013-11-16	42.3	0.94	21.5	2.44	9.76	9.34	4.50
1900MHz	2013-11-17	39.6	1.43	21.5	9.48	37.92	40.30	-5.91
2450MHz	2013-11-23	39.1	1.80	21.5	13.70	54.80	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	2013-11-18	55.1	0.99	21.5	2.41	9.64	9.46	1.90
1900MHz	2013-11-13	53.1	1.52	21.5	9.93	39.72	41.70	-4.75
2450MHz	2013-11-22	52.1	1.99	21.5	12.50	50.00	51.70	-3.29

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 Positions

6.2.1. 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 were according to IEEE 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".

6.2.2. Body Worn Configuration

Body-worn operating configurations should be tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in normal use configurations.

Based upon KDB941225 D06 with a form factor > 9 cm x 5 cm, when the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested. The distance between the device and the phantom was kept 10mm of wireless routers,

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration. Per FCC KDB Publication 648474 D04, Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB Publication 447498 D01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple

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

Report No.: RHA1311-0086SAR01R2

Page 26 of 166

accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are tested with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

Body-worn accessories may not always be supplied or available as options for some devices intended to be authorized for body-worn use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used. Test position spacing was documented. Transmitters that are designed to operate in front of a person's face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom in head fluid. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessories, including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.

6.3. 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

The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.

6.4. Test Configuration

6.4.1. 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 10 for this EUT, it has at most 2 timeslots in uplink and at most 4 timeslots in downlink, the maximum total timeslots is 5; the EGPRS class is 10 for this EUT, it has at most 2 timeslots in uplink and at most 4 timeslots in downlink, the maximum total timeslots is 5.

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

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

Output power of reductions:

GSM 850

GPRS (GMSK) :

Number of timeslots in uplink assignment	reduction of maximum output power, (dB)
1	0
2	2.5

EGPRS(8PSK):

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

EGPRS(GMSK):

Number of timeslots in uplink assignment	reduction of maximum output power, (dB)
1	0
2	2.5

GSM 1900

GPRS (GMSK) :

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

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

Report No.: RHA1311-0086SAR01R2

Page 29 of 166

EGPRS(8PSK):

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

EGPRS(GMSK):

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

6.4.2. WIFI Test Configuration

For WLAN SAR testing, WLAN engineering testing software installed on the DUT can provide continuous transmitting RF signal. 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.

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

7. Test Results

7.1. Conducted Power Results

Table 8: Conducted Power Measurement Results

GSM 850		Burst Conducted Power(dBm)			/	Average power(dBm)		
		Channel 128	Channel 192	Channel 251		Channel 128	Channel 192	Channel 251
GSM		33.54	33.49	33.47	-9.03dB	24.51	24.46	24.44
GPRS (GMSK)	1Txslot	33.42	33.34	33.29	-9.03dB	24.39	24.31	24.26
	2Txslots	31.51	31.63	31.47	-6.02dB	25.49	25.61	25.45
EGPRS (GMSK)	1Txslot	33.38	33.31	33.27	-9.03dB	24.35	24.28	24.24
	2Txslots	31.49	31.61	31.43	-6.02dB	25.47	25.59	25.41
EGPRS (8PSK)	1Txslot	27.59	27.51	27.38	-9.03dB	18.56	18.48	18.35
	2Txslots	27.29	27.21	27.15	-6.02dB	21.27	21.19	21.13
GSM 1900		Burst Conducted Power(dBm)			/	Average power(dBm)		
		Channel 512	Channel 661	Channel 810		Channel 512	Channel 661	Channel 810
GSM		30.47	30.32	30.07	-9.03dB	21.44	21.29	21.04
GPRS (GMSK)	1Txslot	29.75	29.51	29.19	-9.03dB	20.72	20.48	20.16
	2Txslots	27.39	27.47	27.32	-6.02dB	21.37	21.45	21.30
EGPRS (GMSK)	1Txslot	29.73	29.45	29.15	-9.03dB	20.70	20.42	20.12
	2Txslots	27.35	27.45	27.30	-6.02dB	21.33	21.43	21.28
EGPRS (8PSK)	1Txslot	26.38	26.30	26.08	-9.03dB	17.35	17.27	17.05
	2Txslots	26.22	26.11	25.94	-6.02dB	20.20	20.09	19.92

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

2) Average power numbers

The maximum power numbers are marks in bold.

TA Technology (Shanghai) Co., Ltd.

Test Report

The average output power of BT antenna is as following:

Channel	Ch 0 2402 MHz	Ch 39 2441 MHz	Ch 78 2480 MHz
Test Result	6.03	6.51	6.37

The output power of WIFI antenna is as following:

WIFI Antenna

Mode	Channel	Data rate (Mbps)	AV Power (dBm)
802.11b	1	1	16.83
		2	16.99
		5.5	17.31
		11	16.72
	6	1	17.79
		2	17.84
		5.5	18.15
		11	17.63
	11	1	17.95
		2	18.14
		5.5	18.02
		11	17.61
802.11g	1	6	11.75
		9	11.72
		12	11.73
		18	11.71
		24	11.72
		36	11.74
		48	11.75
		54	11.68
	6	6	11.96
		9	11.97
		12	11.94
		18	11.93
		24	11.92
		36	11.93
		48	11.92
		54	11.91
	11	6	12.55
		9	12.57

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

Report No.: RHA1311-0086SAR01R2

Page 33 of 166

		12	12.53
		18	12.55
		24	12.53
		36	12.53
		48	12.51
		54	12.52
802.11n HT20	1	MCS0	8.32
		MCS1	8.26
		MCS2	8.24
		MCS3	8.24
		MCS4	8.26
		MCS5	8.25
		MCS6	8.23
		MCS7	8.22
	6	MCS0	8.33
		MCS1	8.35
		MCS2	8.29
		MCS3	8.28
		MCS4	8.28
		MCS5	8.26
		MCS6	8.24
		MCS7	8.24
	11	MCS0	9.01
		MCS1	9.02
		MCS2	9.02
		MCS3	9.06
		MCS4	9.03
		MCS5	9.04
		MCS6	9.02
		MCS7	9.02

7.2. Standalone SAR Test Exclusion Considerations

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

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

Based on the above equation, Bluetooth SAR was not required;

$$\text{Head Evaluation} = [10^{(7/10)}/5] * (2.480^{1/2}) = 1.58 < 3.0$$

$$\text{Body Evaluation} = [10^{(7/10)}/10] * (2.480^{1/2}) = 0.79 < 3.0$$

Based on the above equation, WIFI SAR was required;

$$\text{Head Evaluation} = [10^{(18.5/10)}/5] * (2.462^{1/2}) = 22.22 > 3.0$$

$$\text{Body Evaluation} = [10^{(18.5/10)}/10] * (2.462^{1/2}) = 11.11 > 3.0$$

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RHA1311-0086SAR01R2

Page 35 of 166

7.3. SAR Test Results

7.3.1. GSM 850 (GSM/GPRS/EGPRS)

Table 9: SAR Values [GSM 850 (GSM/GPRS/EGPRS)]

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 with Battery 1										
Left Cheek	192/837	GSM	1:8.3	34	33.49	-0.02	0.283	1.12	0.318	Figure13
Left Tilt	192/837	GSM	1:8.3	34	33.49	0.07	0.175	1.12	0.197	Figure14
Right Cheek	192/837	GSM	1:8.3	34	33.49	-0.14	0.208	1.12	0.234	Figure15
Right Tilt	192/837	GSM	1:8.3	34	33.49	0.17	0.167	1.12	0.188	Figure16
Worst Case Position of Head with Battery 2										
Left Cheek	192/837	GSM	1:8.3	34	33.49	-0.02	0.272	1.12	0.306	Figure17
Worst Case Position of Head with Battery 3										
Left Cheek	192/837	GSM	1:8.3	34	33.49	0.01	0.268	1.12	0.301	Figure18
Worst Case Position of Head with Battery 4										
Left Cheek	192/837	GSM	1:8.3	34	33.49	-0.04	0.265	1.12	0.298	Figure19
Worst Case Position of Head with Battery 5										
Left Cheek	192/837	GSM	1:8.3	34	33.49	0.01	0.263	1.12	0.296	Figure20
Test position of Body with Battery 1 (Distance 10mm)										
Back Side	192/837	2Txslots	1:4.15	32	31.63	-0.03	0.734	1.09	0.799	Figure21
Front Side	192/837	2Txslots	1:4.15	32	31.63	-0.03	0.452	1.09	0.492	Figure22
Left Edge	192/837	2Txslots	1:4.15	32	31.63	-0.08	0.270	1.09	0.294	Figure23
Right Edge	192/837	2Txslots	1:4.15	32	31.63	-0.01	0.275	1.09	0.299	Figure24
Top Edge	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bottom Edge	192/837	2Txslots	1:4.15	32	31.63	-0.01	0.122	1.09	0.133	Figure25
Worst Case Position of Body with EGPRS (Battery 1, GMSK, Distance 10mm)										
Back Side	251/848.8	2Txslots	1:4.15	32	31.43	-0.16	0.813	1.14	0.927	Figure26
	192/837	2Txslots	1:4.15	32	31.61	-0.10	0.805	1.09	0.881	Figure27
	128/824.2	2Txslots	1:4.15	32	31.49	0.027	0.690	1.12	0.776	Figure28

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RHA1311-0086SAR01R2

Page 36 of 166

Worst Case Position of Body with Battery 2 (Distance 10mm)										
Back Side	251/848.8	2Txslots	1:4.15	32	31.43	-0.06	0.789	1.14	0.900	Figure29
Worst Case Position of Body with Battery 3 (Distance 10mm)										
Back Side	251/848.8	2Txslots	1:4.15	32	31.43	-0.06	0.788	1.14	0.899	Figure30
Worst Case Position of Body with Battery 4 (Distance 10mm)										
Back Side	251/848.8	2Txslots	1:4.15	32	31.43	-0.13	0.787	1.14	0.897	Figure31
Worst Case Position of Body with Battery 5 (Distance 10mm)										
Back Side	251/848.8	2Txslots	1:4.15	32	31.43	-0.08	0.789	1.14	0.900	Figure32
Worst Case Position of Body with EGPRS (1 st Repeated SAR, Battery 1, GMSK, Distance 10mm)										
Back Side	251/848.8	2Txslots	1:4.15	32	31.43	0.01	0.781	1.14	0.891	Figure33

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. WWAN antenna is located at bottom edge; antenna-to-top edge distance is more than 2.5 cm (see ANNEX I). Based upon KDB941225 D06, when the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested.
4. When multiple slots are used, SAR should be tested to account for the maximum source-based time-averaged output power.
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.
6. Per FCC KDB Publication 648474 D04, SAR was evaluated without a headset connected to the device. Since the reported SAR was ≤ 1.2 W/kg, no additional SAR evaluations using a headset cable were required

Table 10: SAR Measurement Variability Results [GSM 850(GSM/GPRS/EGPRS)]

Test Position	Channel/ Frequency (MHz)	Measured SAR (1g)	1 st Repeated SAR (1g)	Ratio	2 nd Repeated SAR (1g)	3 rd Repeated SAR (1g)
Back Side	251/848.8	0.813	0.781	1.04	N/A	N/A

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

Report No.: RHA1311-0086SAR01R2

Page 37 of 166

7.3.2. GSM 1900 (GSM/GPRS/EGPRS)

Table 11: SAR Values [GSM 1900(GSM/GPRS/EGPRS)]

Test Position	Channel/ Frequency (MHz)	Time slot	Duty Cycle	Maximum Allowed Power (dBm)	Conducted Power (dBm)	Drift	Limit SAR _{1g} 1.6 W/kg			
						± 0.21dB	Measured SAR _{1g} (W/kg)	Scaling Factor	Reported SAR _{1g} (W/kg)	Graph Results
Test Position of Head with Battery 1										
Left Cheek	661/1880	GSM	1:8.3	31	30.32	0.1	0.382	1.17	0.447	Figure34
Left Tilt	661/1880	GSM	1:8.3	31	30.32	0.1	0.124	1.17	0.145	Figure35
Right Cheek	661/1880	GSM	1:8.3	31	30.32	0.143	0.24	1.17	0.281	Figure36
Right Tilt	661/1880	GSM	1:8.3	31	30.32	-0.04	0.169	1.17	0.198	Figure37
Worst Case Position of Head with Battery 2										
Left Cheek	661/1880	GSM	1:8.3	31	30.32	0.17	0.328	1.17	0.384	Figure38
Worst Case Position of Head with Battery 3										
Left Cheek	661/1880	GSM	1:8.3	31	30.32	0.14	0.334	1.17	0.391	Figure39
Worst Case Position of Head with Battery 4										
Left Cheek	661/1880	GSM	1:8.3	31	30.32	0.09	0.364	1.17	0.426	Figure40
Worst Case Position of Head with Battery 5										
Left Cheek	661/1880	GSM	1:8.3	31	30.32	0.02	0.336	1.17	0.393	Figure41
Test position of Body with Battery 1 (Distance 10mm)										
Back Side	661/1880	2Txslots	1:4.15	28	27.47	-0.01	0.463	1.13	0.523	Figure42
Front Side	661/1880	2Txslots	1:4.15	28	27.47	-0.174	0.561	1.13	0.634	Figure43
Left Edge	661/1880	2Txslots	1:4.15	28	27.47	0.13	0.13	1.13	0.147	Figure44
Right Edge	661/1880	2Txslots	1:4.15	28	27.47	-0.06	0.142	1.13	0.160	Figure45
Top Edge	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bottom Edge	661/1880	2Txslots	1:4.15	28	27.47	0.13	0.596	1.13	0.673	Figure46
Worst Case Position of Body with EGPRS (Battery 1, GMSK, Distance 10mm)										
Bottom Edge	661/1880	2Txslots	1:4.15	28	27.45	0.03	0.612	1.14	0.695	Figure47
Worst Case Position of Body with Battery 2 (Distance 10mm)										
Bottom Edge	661/1880	2Txslots	1:4.15	28	27.47	0.05	0.631	1.13	0.713	Figure48
Worst Case Position of Body with Battery 3 (Distance 10mm)										

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

Report No.: RHA1311-0086SAR01R2

Page 38 of 166

Bottom Edge	661/1880	2Txslots	1:4.15	28	27.47	0.11	0.618	1.13	0.698	Figure49
Worst Case Position of Body with Battery 4 (Distance 10mm)										
Bottom Edge	661/1880	2Txslots	1:4.15	28	27.47	-0.04	0.617	1.13	0.697	Figure50
Worst Case Position of Body with Battery 5 (Distance 10mm)										
Bottom Edge	661/1880	2Txslots	1:4.15	28	27.47	-0.13	0.602	1.13	0.680	Figure51

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. WWAN antenna is located at bottom edge; antenna-to-top edge distance is more than 2.5 cm (see ANNEX I). Based upon KDB941225 D06, when the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested.
4. When multiple slots are used, SAR should be tested to account for the maximum source-based time-averaged output power.
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.
6. 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.

TA Technology (Shanghai) Co., Ltd.

Test Report

7.3.3. WIFI (802.11b, WIFI)

Table 12: SAR Values (802.11b)

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 with Battery 1											
Left Cheek	11/2462	DSSS	1:1	18.5	17.95	0.038	0.097	1.14	0.107	Figure52	
Left Tilt	11/2462	DSSS	1:1	18.5	17.95	0.11	0.043	1.14	0.049	Figure53	
Right Cheek	11/2462	DSSS	1:1	18.5	17.95	0.02	0.077	1.14	0.087	Figure54	
Right Tilt	11/2462	DSSS	1:1	18.5	17.95	0.023	0.046	1.14	0.052	Figure55	
Worst Case Position of Head with Battery 2											
Left Cheek	11/2462	DSSS	1:1	18.5	17.95	0.08	0.096	1.14	0.109	Figure56	
Worst Case Position of Head with Battery 3											
Left Cheek	11/2462	DSSS	1:1	18.5	17.95	0.04	0.096	1.14	0.109	Figure57	
Worst Case Position of Head with Battery 4											
Left Cheek	11/2462	DSSS	1:1	18.5	17.95	0.02	0.097	1.14	0.110	Figure58	
Worst Case Position of Head with Battery 5											
Left Cheek	11/2462	DSSS	1:1	18.5	17.95	0.13	0.096	1.14	0.109	Figure59	
Test position of Body with Battery 1 (Distance 10mm)											
Back Side	11/2462	DSSS	1:1	18.5	17.95	0.033	0.105	1.14	0.119	Figure60	
Front Side	11/2462	DSSS	1:1	18.5	17.95	0.034	0.026	1.14	0.029	Figure61	
Left Edge	11/2462	DSSS	1:1	18.5	17.95	0.116	0.008	1.14	0.009	Figure62	
Right Edge	11/2462	DSSS	1:1	18.5	17.95	0.18	0.019	1.14	0.021	Figure63	
Top Edge	11/2462	DSSS	1:1	18.5	17.95	0.01	0.092	1.14	0.105	Figure64	
Bottom Edge	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Worst Case Position of Body with Battery 2 (Distance 10mm)											
Back Side	11/2462	DSSS	1:1	18.5	17.95	-0.066	0.104	1.14	0.118	Figure65	
Worst Case Position of Body with Battery 3 (Distance 10mm)											
Back Side	11/2462	DSSS	1:1	18.5	17.95	0.044	0.104	1.14	0.118	Figure66	
Worst Case Position of Body with Battery 4 (Distance 10mm)											

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

Report No.: RHA1311-0086SAR01R2

Page 40 of 166

Back Side	11/2462	DSSS	1:1	18.5	17.95	0.041	0.100	1.14	0.114	Figure67
Worst Case Position of Body with Battery 5 (Distance 10mm)										
Back Side	11/2462	DSSS	1:1	18.5	17.95	0.021	0.101	1.14	0.115	Figure68

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. WLAN antenna is located at top edge, near to left edge ; antenna-to- Bottom/Right edge distance is more than 2.5 cm (see ANNEX I). Based upon KDB941225 D06, when the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested.

4. KDB 248227-SAR is not required for 802.11g/n channels when the maximum average output power is less than $\frac{1}{4}$ dB higher than measured on the corresponding 802.11b channels.

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.

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

Report No.: RHA1311-0086SAR01R2

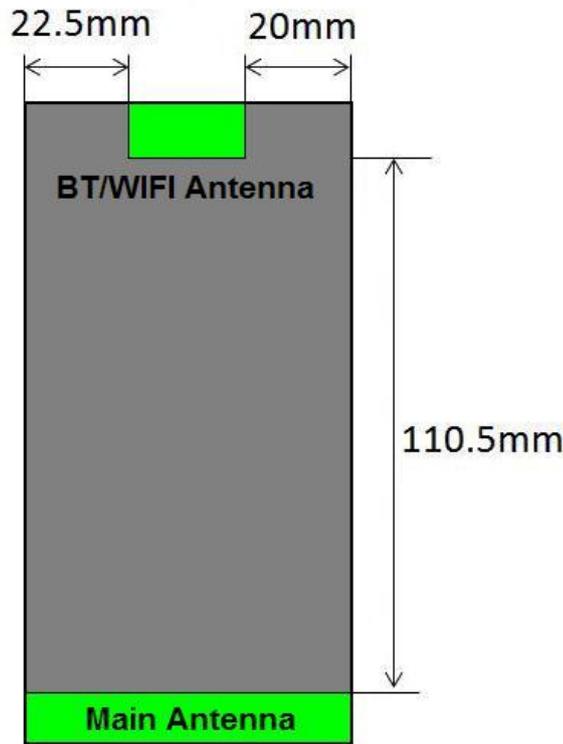
Page 41 of 166

7.4. Simultaneous Transmission Conditions

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

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

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



Back Side

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.

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

So, Head Estimated SAR_{Max.BT} = [10^(7/10)/5] * (2.480^{1/2}/7.5) = 0.210W/kg

Body hotspots Estimated SAR_{Max.BT} = [10^(7/10)/10] * (2.480^{1/2}/7.5) = 0.105 W/kg

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.

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

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

Report No.: RHA1311-0086SAR01R2

Page 43 of 166

GSM&WIFI&BT Mode

Reported SAR_{1g} (W/kg)	GSM 850	GSM 1900	WIFI	BT	MAX. ΣSAR_{1g}
Test Position					
Left hand, Touch cheek	0.318	0.447	0.110	0.210	0.767
Left hand, Tilt 15 Degree	0.197	0.145	0.049	0.210	0.456
Right hand, Touch cheek	0.234	0.281	0.087	0.210	0.578
Right hand, Tilt 15 Degree	0.188	0.198	0.052	0.210	0.460
Body, Back Side	0.927	0.523	0.119	0.105	1.151
Body, Front Side	0.492	0.634	0.029	0.105	0.768
Body, Left Edge	0.294	0.147	0.009	0.105	0.408
Body, Right Edge	0.299	0.160	0.021	0.105	0.425
Body, Top Edge	NA	NA	0.105	0.105	NA
Body, Bottom Edge	0.133	0.713	NA	0.105	NA

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} = 1.151 W/kg < 1.6 W/kg, So the Simultaneous SAR are not required for BT, WIFI and GSM antenna.

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

Report No.: RHA1311-0086SAR01R2

Page 44 of 166

8. 700MHz to 3GHz Measurement Uncertainty

No.	source	Type	Uncertainty Value (%)	Probability Distribution	k	c _i	Standard uncertainty u _i (%)	Degree of freedom V _{eff} or V _i
1	System repetivity	A	0.5	N	1	1	0.5	9
Measurement system								
2	-probe calibration	B	6	N	1	1	6	∞
3	-axial isotropy of the probe	B	4.7	R	$\sqrt{3}$	$\sqrt{0.5}$	1.9	∞
4	- Hemispherical isotropy of the probe	B	9.4	R	$\sqrt{3}$	$\sqrt{0.5}$	3.9	∞
5	-boundary effect	B	1.9	R	$\sqrt{3}$	1	1.1	∞
6	-probe linearity	B	4.7	R	$\sqrt{3}$	1	2.7	∞
7	- System detection limits	B	1.0	R	$\sqrt{3}$	1	0.6	∞
8	-readout Electronics	B	1.0	N	1	1	1.0	∞
9	-response time	B	0.8	R	$\sqrt{3}$	1	0.5	∞
10	-integration time	B	4.3	R	$\sqrt{3}$	1	2.5	∞
11	-RF Ambient noise	B	3.0	R	$\sqrt{3}$	1	1.7	∞
12	-RF Ambient Conditions	B	3.0	R	$\sqrt{3}$	1	1.7	∞
13	-Probe Positioner Mechanical Tolerance	B	0.4	R	$\sqrt{3}$	1	0.2	∞
14	-Probe Positioning with respect to Phantom Shell	B	2.9	R	$\sqrt{3}$	1	1.7	∞
15	-Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	B	3.9	R	$\sqrt{3}$	1	2.3	∞
Test sample Related								
16	-Test Sample Positioning	A	2.9	N	1	1	2.9	71
17	-Device Holder Uncertainty	A	4.1	N	1	1	4.1	5
18	- Power drift	B	5.0	R	$\sqrt{3}$	1	2.9	∞
Physical parameter								
19	-phantom Uncertainty	B	4.0	R	$\sqrt{3}$	1	2.3	∞

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

Report No.: RHA1311-0086SAR01R2

Page 45 of 166

20	Algorithm for correcting SAR for deviations in permittivity and conductivity	B	1.9	N	1	1	1.9	∞
21	-Liquid conductivity (measurement uncertainty)	B	2.5	N	1	0.78	2.0	9
22	-Liquid permittivity (measurement uncertainty)	B	2.5	N	1	0.23	0.6	9
23	-Liquid conductivity -temperature uncertainty	B	1.7	R	$\sqrt{3}$	0.78	0.8	∞
24	-Liquid permittivity -temperature uncertainty	B	0.3	R	$\sqrt{3}$	0.23	0.04	∞
Combined standard uncertainty		$u_c = \sqrt{\sum_{i=1}^{24} c_i^2 u_i^2}$					11.53	
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$		N	k=2		23.06	

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

Report No.: RHA1311-0086SAR01R2

Page 46 of 166

9. Main Test Instruments

Table 13: 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 10, 2013	One year
04	Power sensor	Agilent N8481H	MY50350004	September 23, 2013	One year
05	Power sensor	E9327A	US40441622	January 2, 2013	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	December 1, 2012	One year
11	E-field Probe	EX3DV4	3753	January 17, 2013	One year
12	DAE	DAE4	1317	January 25, 2013	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 14, 2013	One year
17	Hygrothermograph	WS-1	64591	September 26, 2013	One year

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

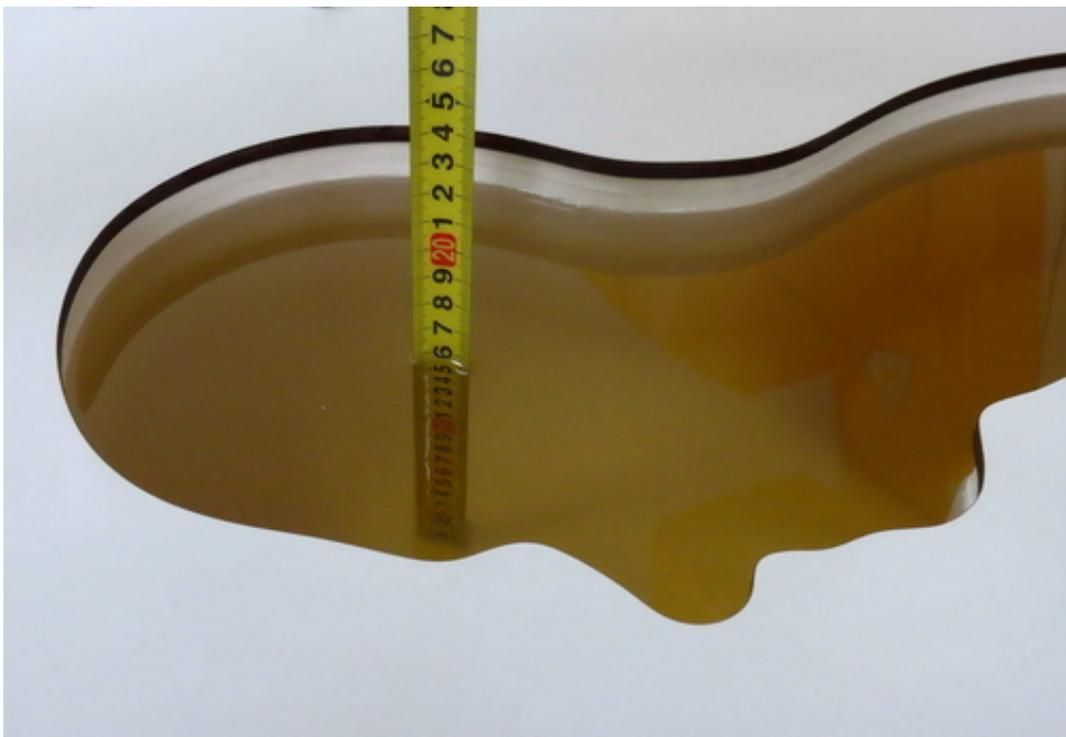
ANNEX A: Test Layout



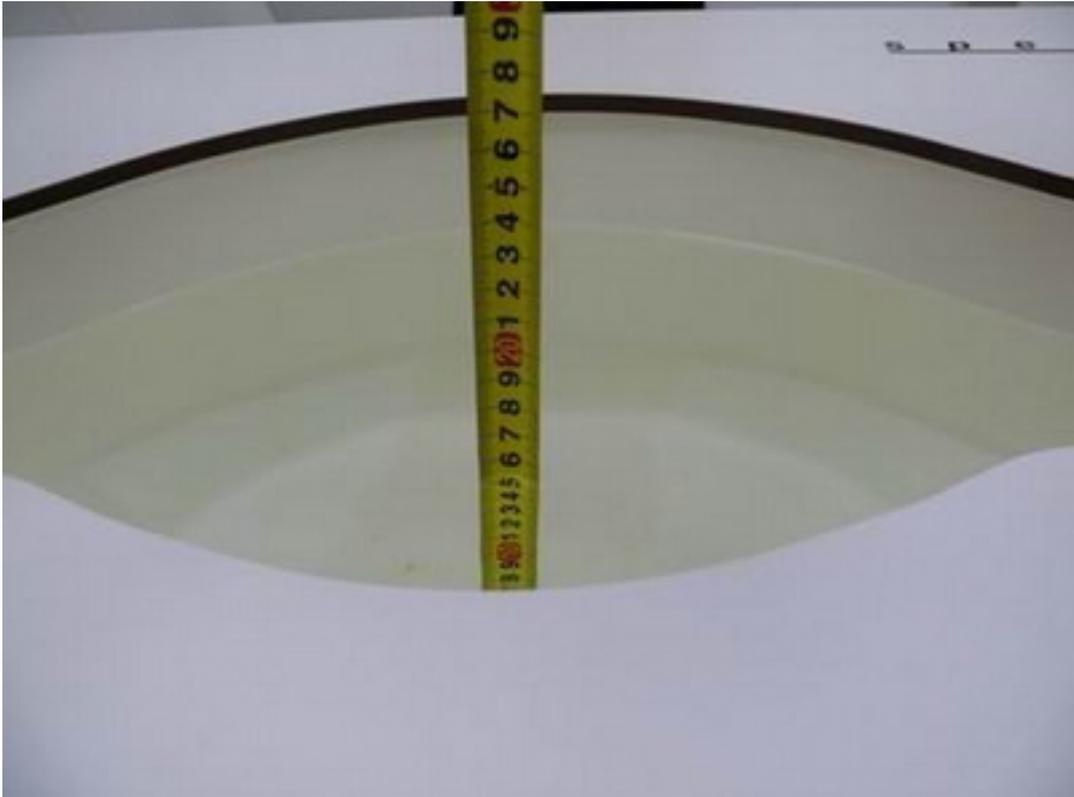
Picture 1: Specific Absorption Rate Test Layout



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



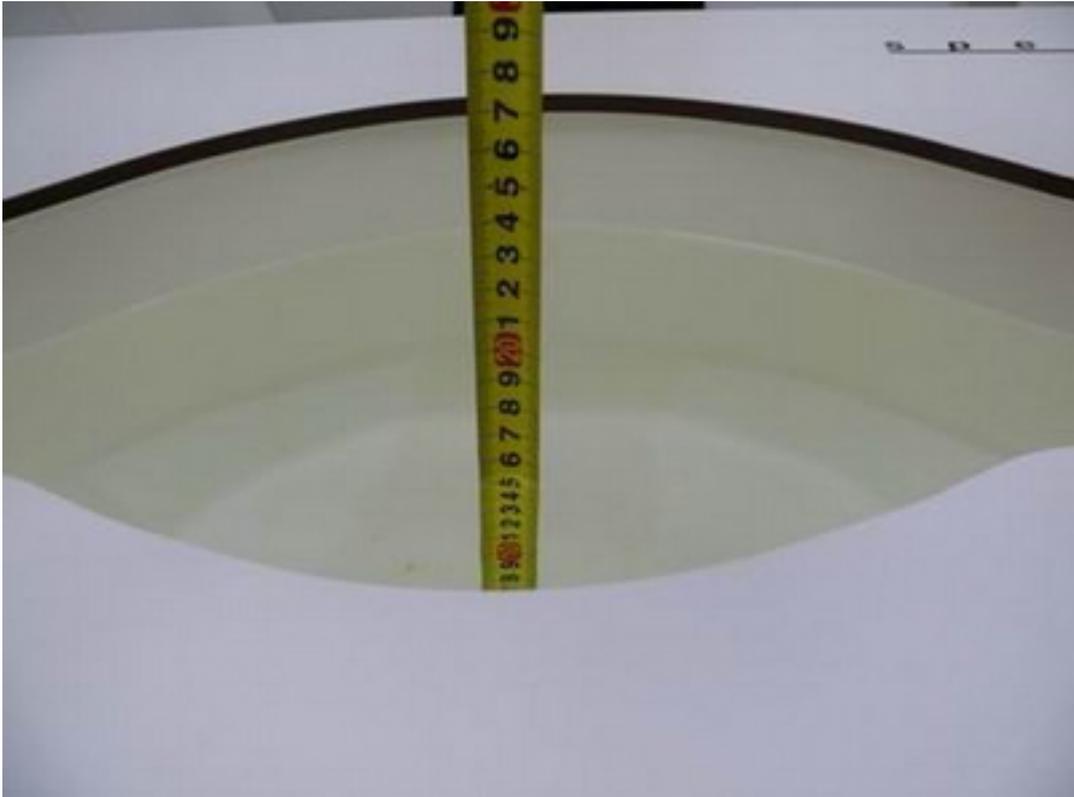
Picture 3: Liquid depth in the head Phantom (835MHz, 15.3cm depth)



Picture 4: Liquid depth in the flat Phantom (1900 MHz, 15.2cm 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: 11/16/2013 12:45:38 PM

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

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.94 \text{ mho/m}$; $\epsilon_r = 42.3$; $\rho = 1000 \text{ kg/m}^3$

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

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3753; ConvF(8.95, 8.95, 8.95); Calibrated: 1/17/2013

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

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

Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

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

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

Peak SAR (extrapolated) = 3.67 W/kg

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

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

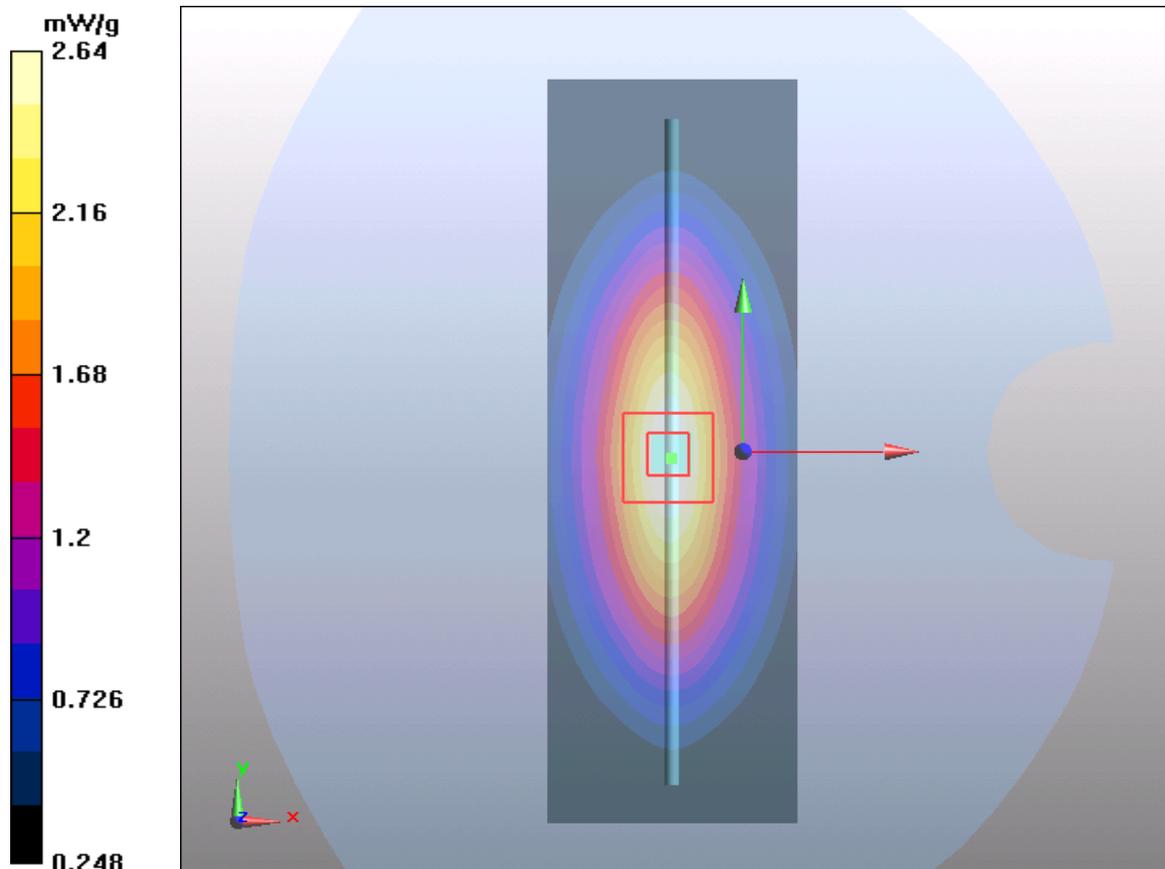


Figure 7 System Performance Check 835MHz 250mW

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

Report No.: RHA1311-0086SAR01R2

Page 52 of 166

System Performance Check at 835 MHz Body TSL

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

Date/Time: 11/18/2013 11:29:37 AM

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

Medium parameters used: $f = 835$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 55.1$; $\rho = 1000$ 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 - SN3753; ConvF(9.05, 9.05, 9.05); Calibrated: 1/17/2013

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

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

Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

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

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

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

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

Peak SAR (extrapolated) = 3.5 W/kg

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

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

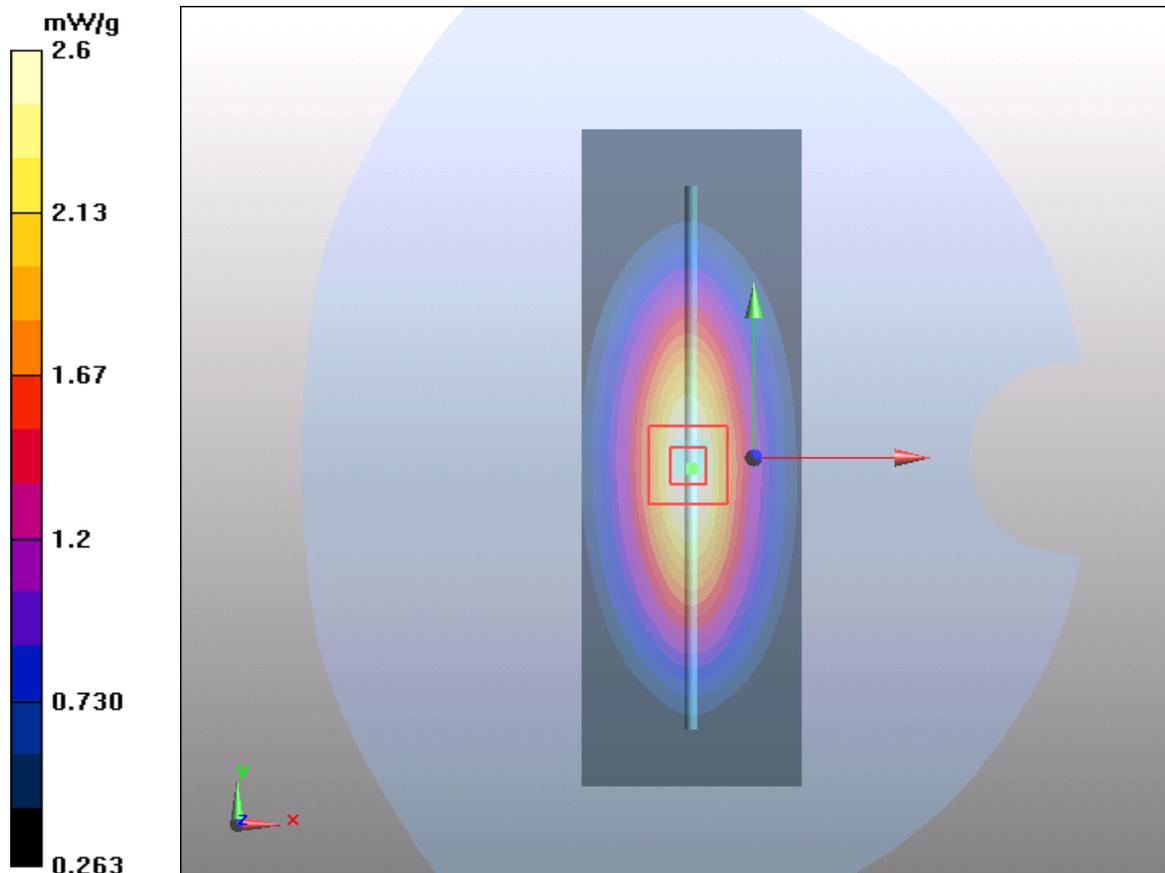


Figure 8 System Performance Check 835MHz 250mW

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

Report No.: RHA1311-0086SAR01R2

Page 53 of 166

System Performance Check at 1900 MHz Head TSL

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

Date/Time: 11/17/2013 8:40:55 AM

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 - SN3753; ConvF(7.63, 7.63, 7.63); Calibrated: 1/17/2013

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

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

Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

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

dz=5mm

Reference Value = 85.5 V/m; Power Drift = 0.028 dB

Peak SAR (extrapolated) = 17.8 W/kg

SAR(1 g) = 9.48 mW/g; SAR(10 g) = 4.9 mW/g

Maximum value of SAR (measured) = 10.7 mW/g

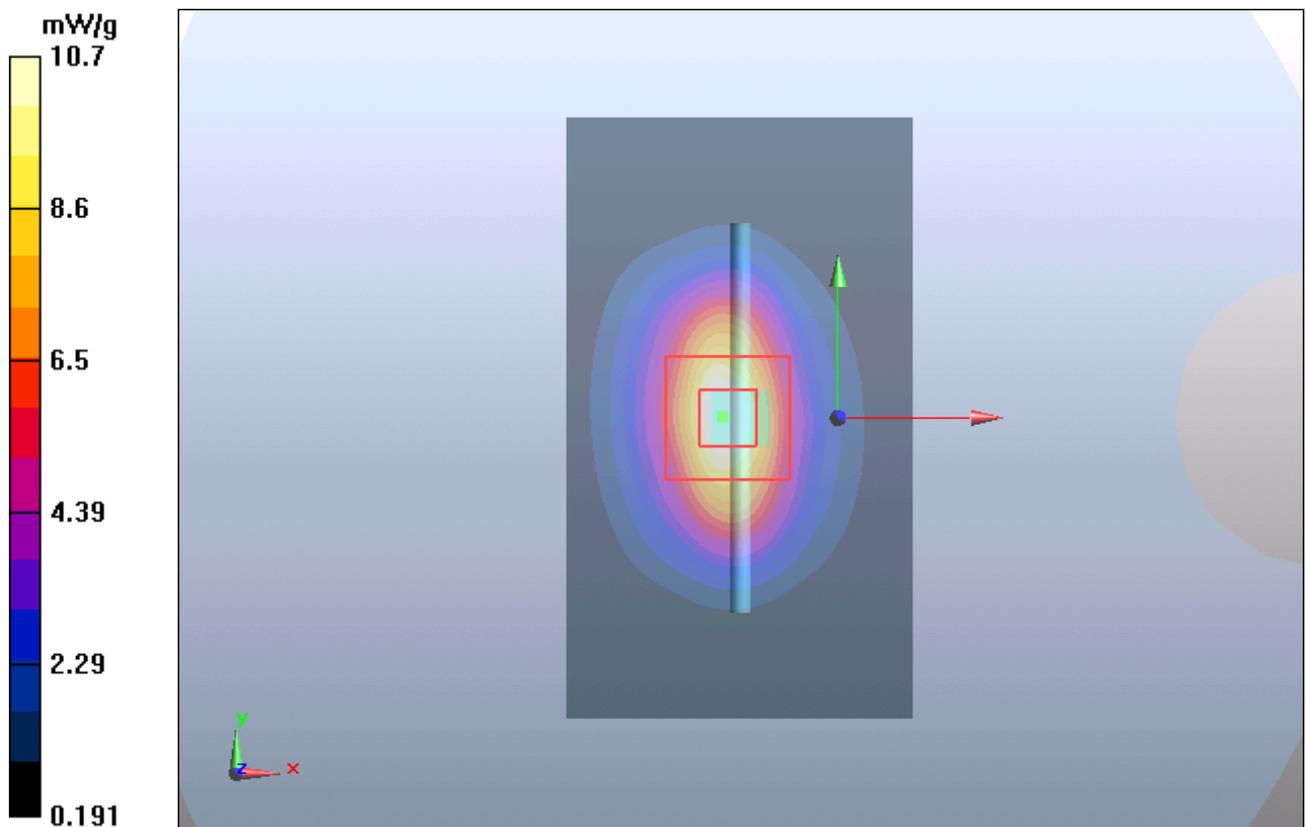


Figure 9 System Performance Check 1900MHz 250mW

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

Report No.: RHA1311-0086SAR01R2

Page 54 of 166

System Performance Check at 1900 MHz Body TSL

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

Date/Time: 11/13/2013 5:30:25 PM

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

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 53.1$; $\rho = 1000$ 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 - SN3753; ConvF(7.33, 7.33, 7.33); Calibrated: 1/17/2013

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

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

Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

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

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

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

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

Peak SAR (extrapolated) = 17.8 W/kg

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

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

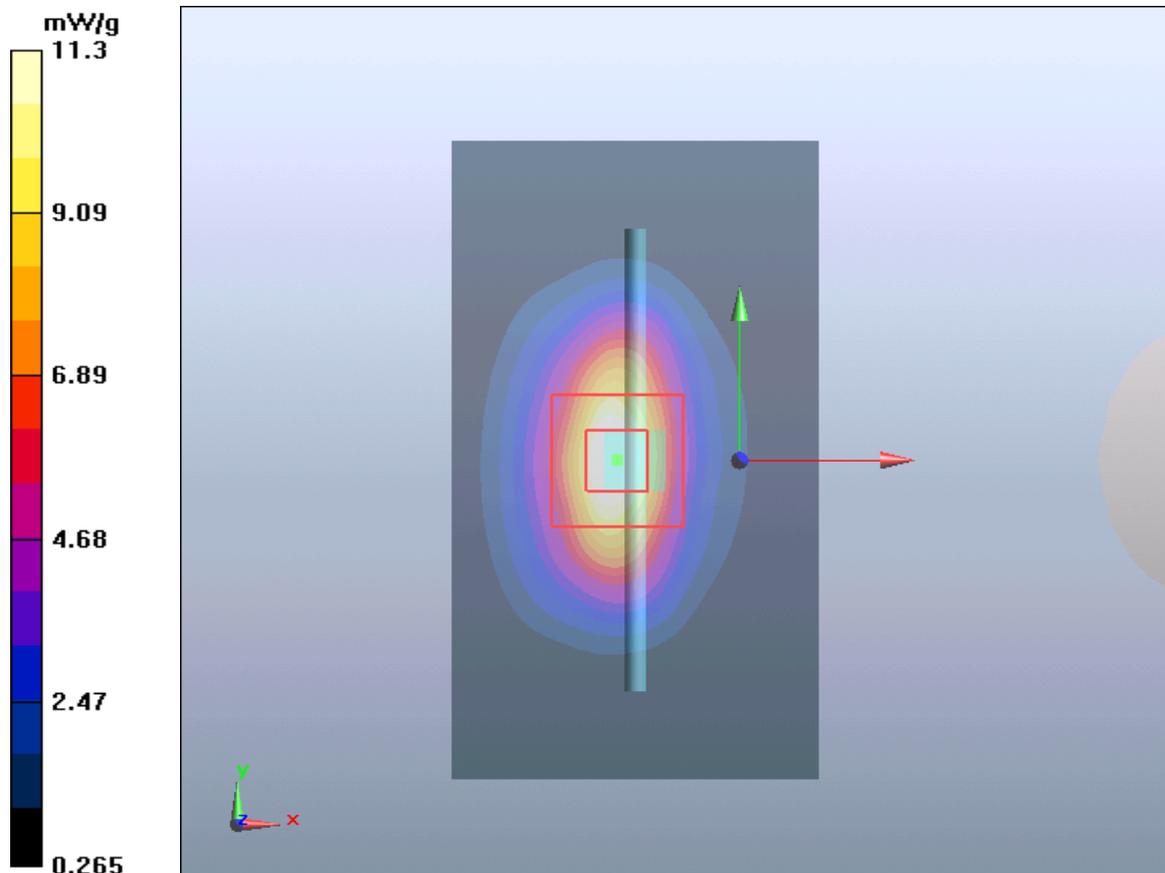


Figure 10 System Performance Check 1900MHz 250mW

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

Report No.: RHA1311-0086SAR01R2

Page 55 of 166

System Performance Check at 2450 MHz Head TSL

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

Date/Time: 11/23/2013 12:02:12 PM

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 - SN3753; ConvF(6.86, 6.86, 6.86); Calibrated: 1/17/2013

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

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

Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

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

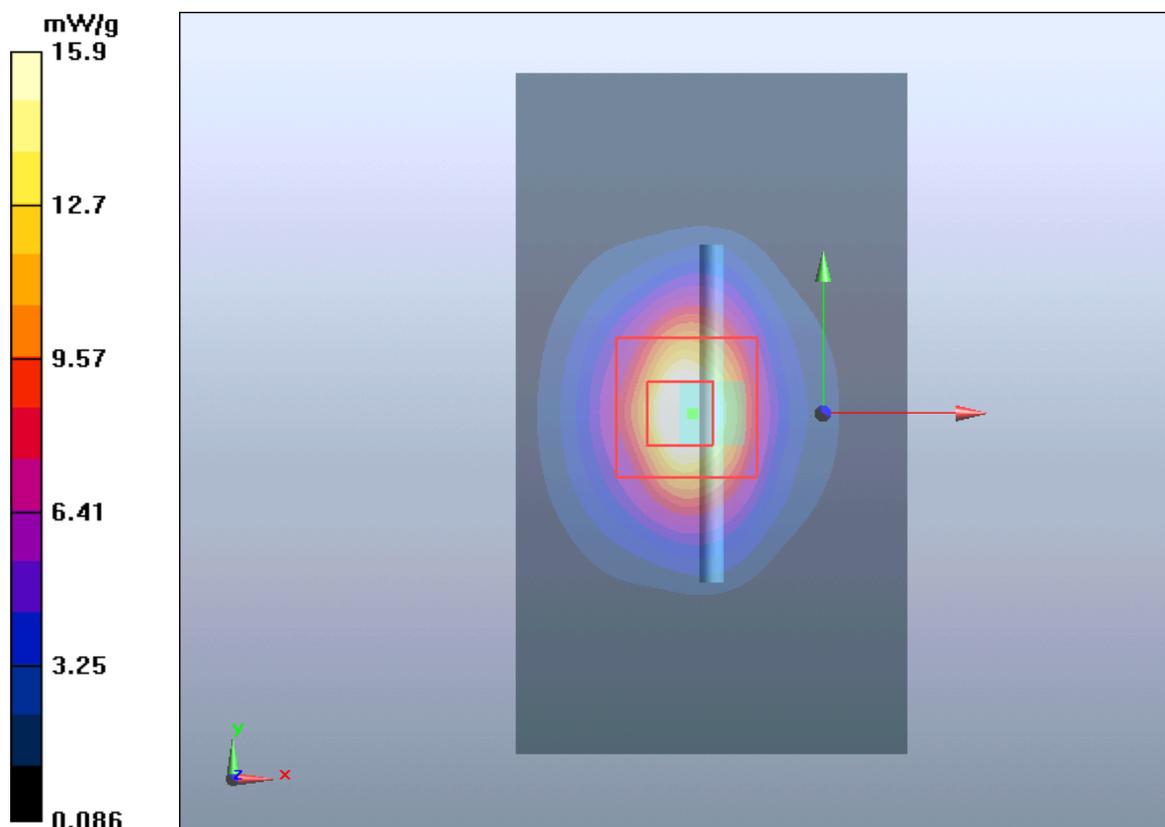


Figure 11 System Performance Check 2450MHz 250mW

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

Report No.: RHA1311-0086SAR01R2

Page 56 of 166

System Performance Check at 2450 MHz Body TSL

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

Date/Time: 11/22/2013 1:05:59 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 - SN3753; ConvF(6.90, 6.90, 6.90); Calibrated: 1/17/2013

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

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

Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

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

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

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

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

Peak SAR (extrapolated) = 25.4 W/kg

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

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

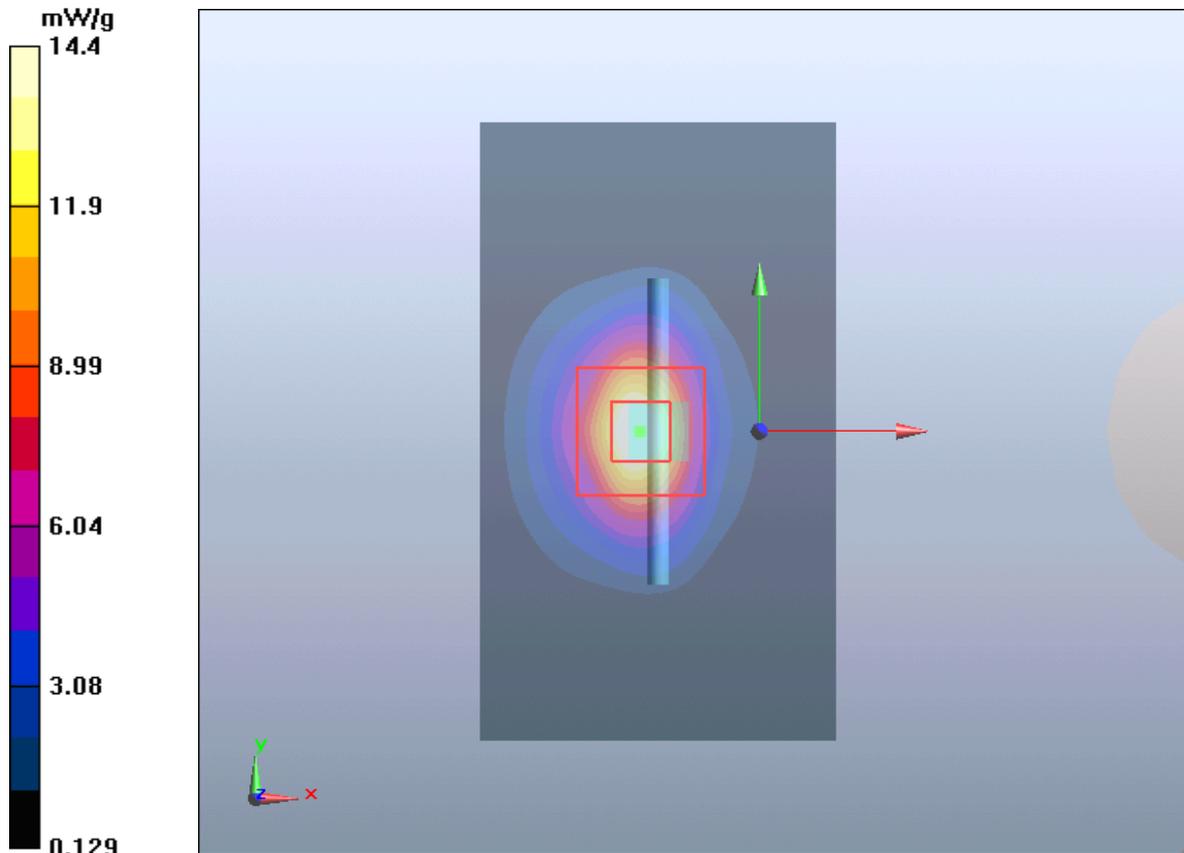


Figure 12 System Performance Check 2450MHz 250mW

ANNEX C: Graph Results

GSM 850 Left Cheek Middle (Battery 1)

Date/Time: 11/16/2013 2:28:54 PM

Communication System: GSM; Frequency: 837 MHz; Duty Cycle: 1:8.30042

Medium parameters used: $f = 837$ MHz; $\sigma = 0.937$ mho/m; $\epsilon_r = 42.233$; $\rho = 1000$ 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 - SN3753; ConvF(8.95, 8.95, 8.95); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

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

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

Left Cheek Middle/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.307 W/kg

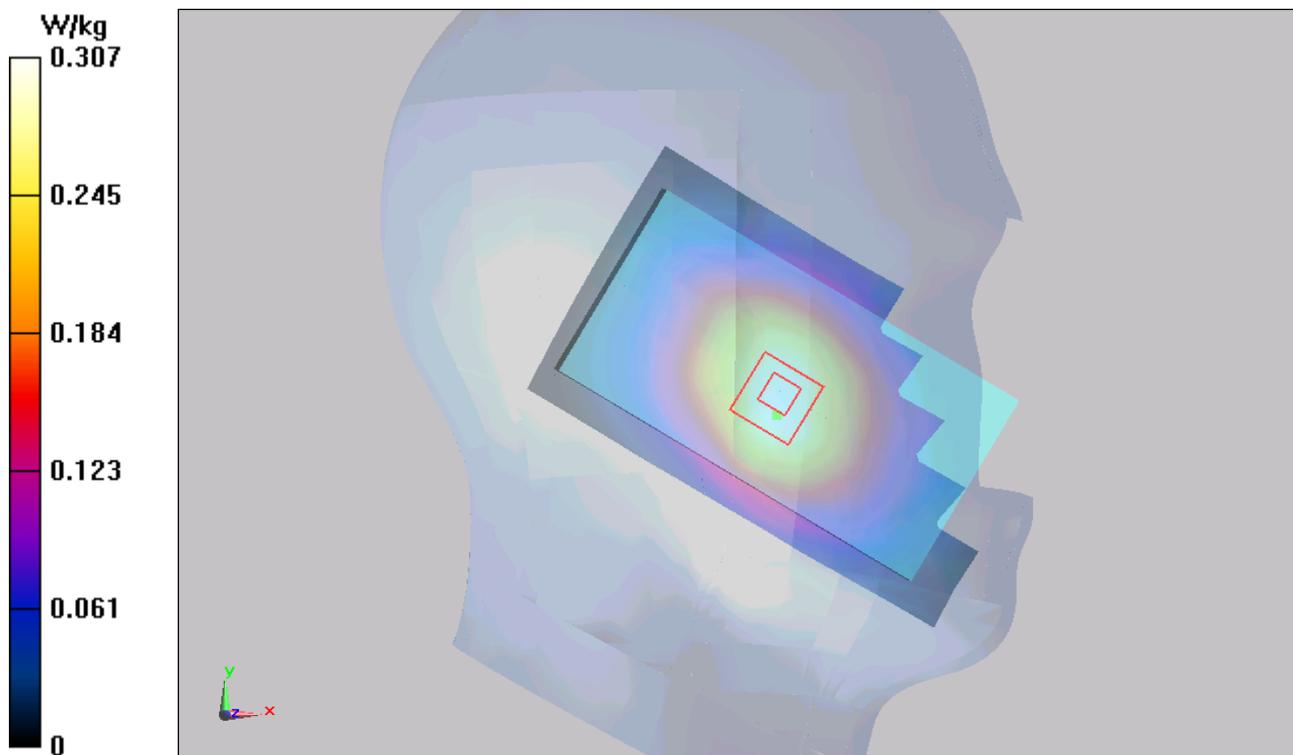
Left Cheek Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.973 V/m; Power Drift = -0.020 dB

Peak SAR (extrapolated) = 0.355 mW/g

SAR(1 g) = 0.283 mW/g; SAR(10 g) = 0.212 mW/g

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



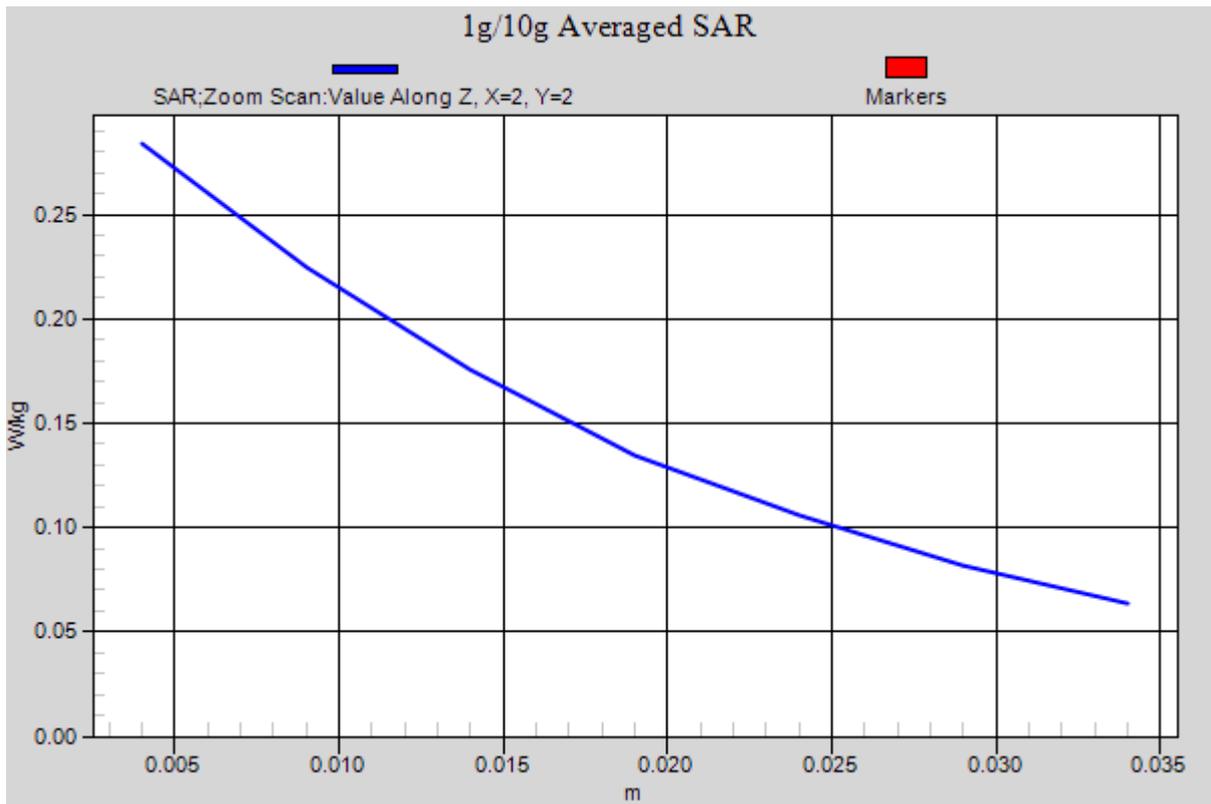


Figure 13 Left Hand Touch Cheek GSM 850 Channel 192

GSM 850 Left Tilt Middle (Battery 1)

Date/Time: 11/16/2013 4:32:37 PM

Communication System: GSM; Frequency: 837 MHz; Duty Cycle: 1:8.30042

Medium parameters used: $f = 837$ MHz; $\sigma = 0.937$ mho/m; $\epsilon_r = 42.233$; $\rho = 1000$ 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 - SN3753; ConvF(8.95, 8.95, 8.95); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

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

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

Left Tilt Middle/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

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

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

Reference Value = 9.398 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.216 mW/g

SAR(1 g) = 0.175 mW/g; SAR(10 g) = 0.134 mW/g

Maximum value of SAR (measured) = 0.185 W/kg

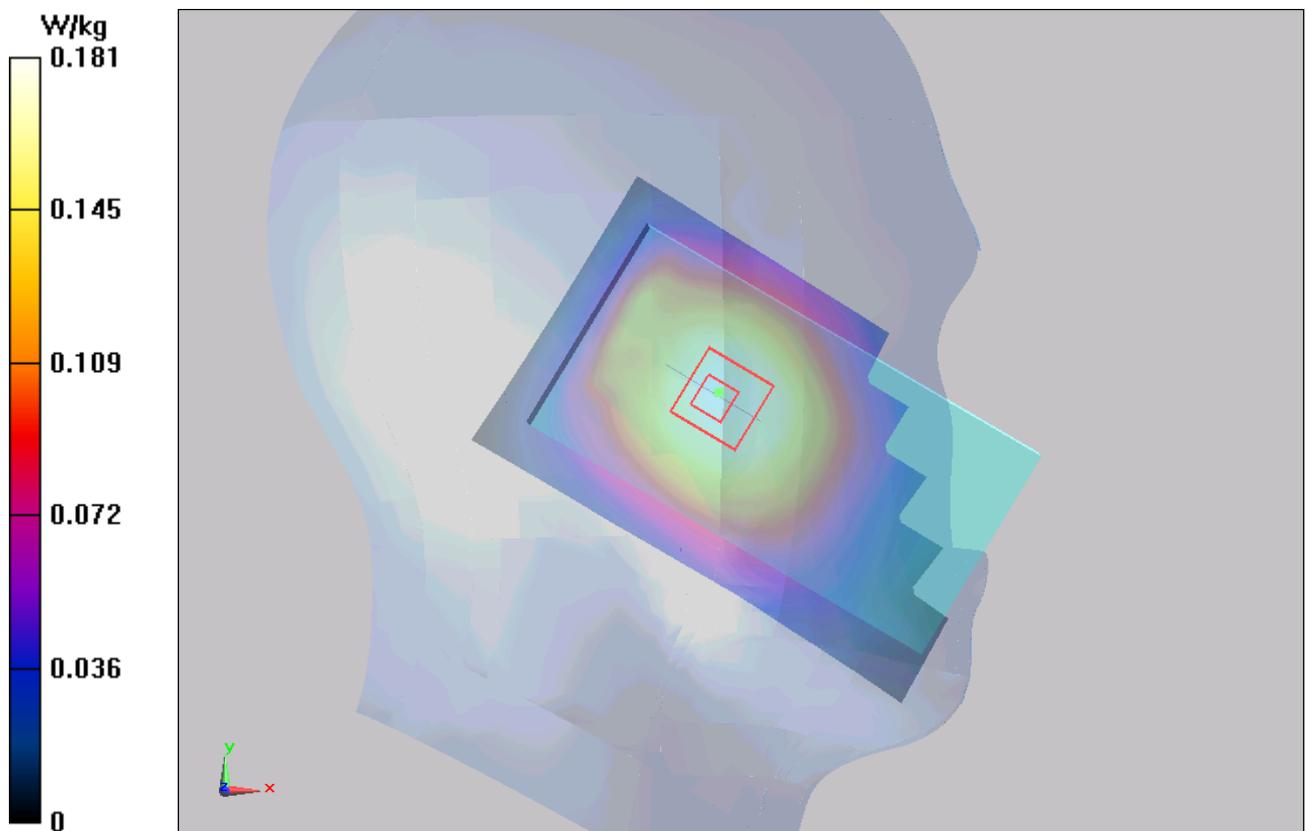


Figure 14 Left Hand Tilt 15° GSM 850 Channel 192

GSM 850 Right Cheek Middle (Battery 1)

Date/Time: 11/16/2013 4:59:49 PM

Communication System: GSM; Frequency: 837 MHz; Duty Cycle: 1:8.30042

Medium parameters used: $f = 837$ MHz; $\sigma = 0.937$ mho/m; $\epsilon_r = 42.233$; $\rho = 1000$ 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 - SN3753; ConvF(8.95, 8.95, 8.95); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

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

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

Right Cheek Middle/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.222 W/kg

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

Reference Value = 6.882 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 0.258 mW/g

SAR(1 g) = 0.208 mW/g; SAR(10 g) = 0.157 mW/g

Maximum value of SAR (measured) = 0.219 W/kg

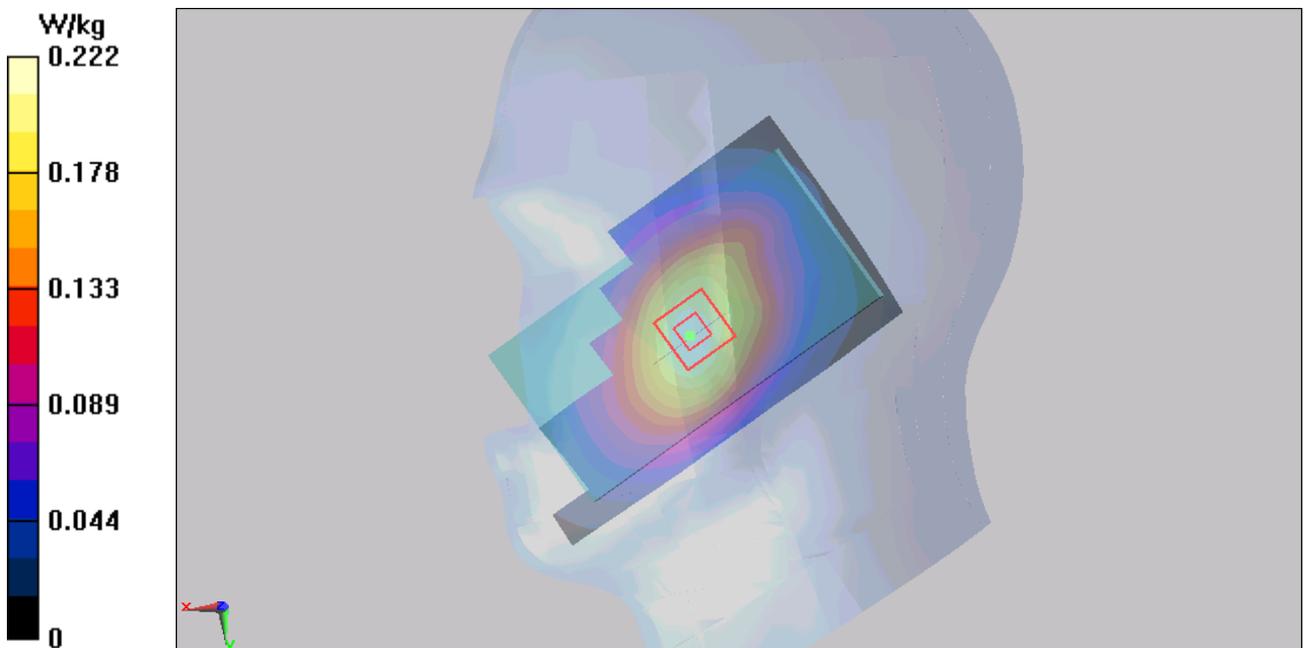


Figure 15 Right Hand Touch Cheek GSM 850 Channel 192

GSM 850 Right Tilt Middle (Battery 1)

Date/Time: 11/16/2013 2:09:08 PM

Communication System: GSM; Frequency: 837 MHz; Duty Cycle: 1:8.30042

Medium parameters used: $f = 837$ MHz; $\sigma = 0.937$ mho/m; $\epsilon_r = 42.233$; $\rho = 1000$ 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 - SN3753; ConvF(8.95, 8.95, 8.95); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

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

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

Right Tilt Middle/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.179 W/kg

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

Reference Value = 9.805 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 0.203 mW/g

SAR(1 g) = 0.167 mW/g; SAR(10 g) = 0.128 mW/g

Maximum value of SAR (measured) = 0.175 W/kg

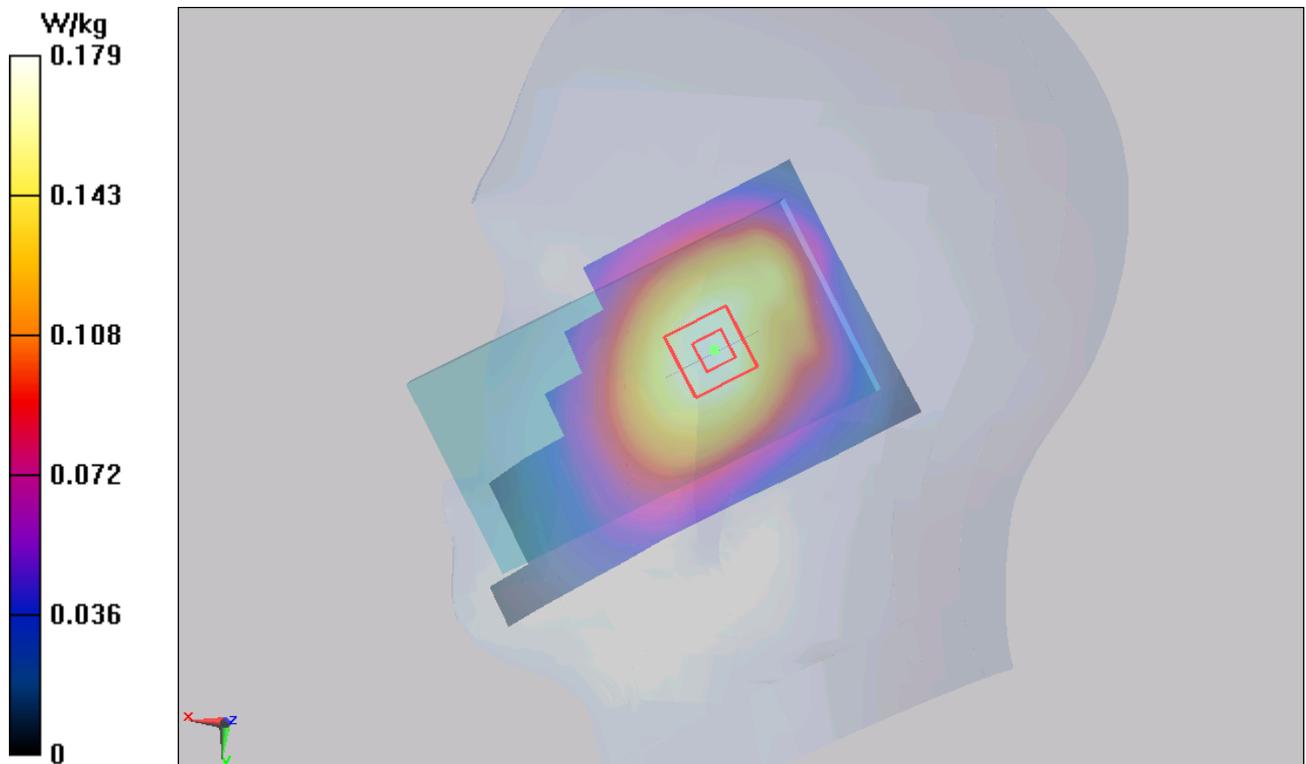


Figure 16 Right Hand Tilt 15° GSM 850 Channel 192

GSM 850 Left Cheek Middle (Battery 2)

Date/Time: 11/16/2013 3:20:23 PM

Communication System: GSM; Frequency: 837 MHz; Duty Cycle: 1:8.30042

Medium parameters used: $f = 837$ MHz; $\sigma = 0.937$ mho/m; $\epsilon_r = 42.233$; $\rho = 1000$ 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 - SN3753; ConvF(8.95, 8.95, 8.95); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

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

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

Left Cheek Middle/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.293 W/kg

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

Reference Value = 6.700 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.342 mW/g

SAR(1 g) = 0.272 mW/g; SAR(10 g) = 0.203 mW/g

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

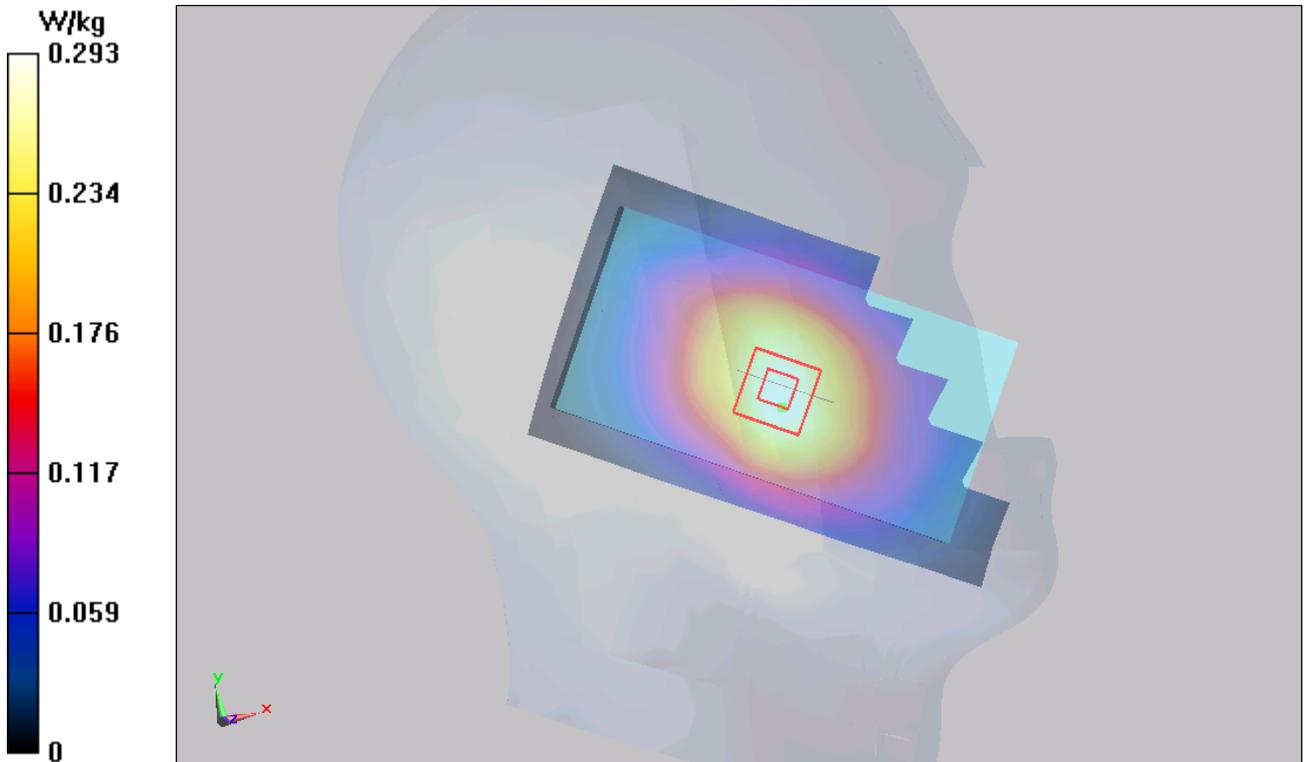


Figure 17 Left Hand Touch Cheek GSM 850 Channel 192

GSM 850 Left Cheek Middle (Battery 3)

Date/Time: 11/16/2013 3:37:55 PM

Communication System: GSM; Frequency: 837 MHz; Duty Cycle: 1:8.30042

Medium parameters used: $f = 837$ MHz; $\sigma = 0.937$ mho/m; $\epsilon_r = 42.233$; $\rho = 1000$ 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 - SN3753; ConvF(8.95, 8.95, 8.95); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

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

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

Left Cheek Middle/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.288 W/kg

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

Reference Value = 6.626 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.337 mW/g

SAR(1 g) = 0.268 mW/g; SAR(10 g) = 0.201 mW/g

Maximum value of SAR (measured) = 0.280 W/kg

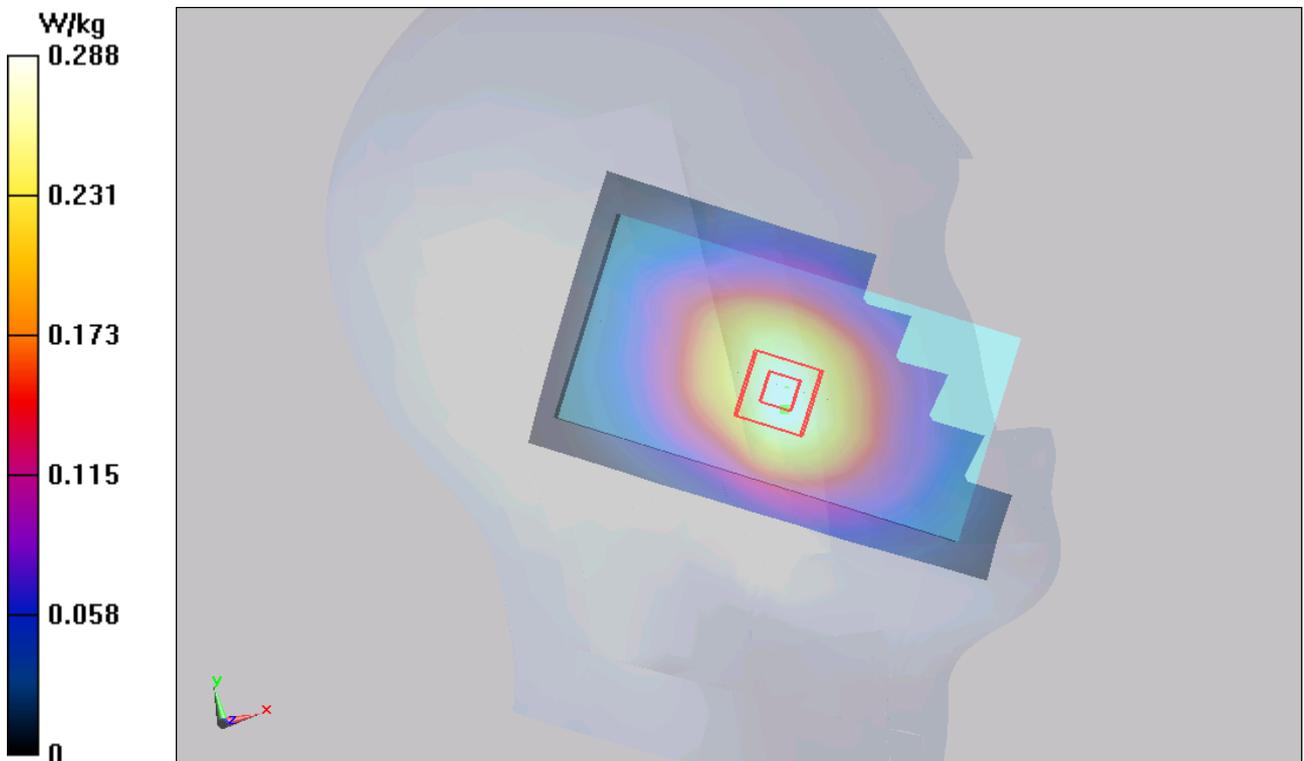


Figure 18 Left Hand Touch Cheek GSM 850 Channel 192

GSM 850 Left Cheek Middle (Battery 4)

Date/Time: 11/16/2013 3:55:08 PM

Communication System: GSM; Frequency: 837 MHz; Duty Cycle: 1:8.30042

Medium parameters used: $f = 837$ MHz; $\sigma = 0.937$ mho/m; $\epsilon_r = 42.233$; $\rho = 1000$ 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 - SN3753; ConvF(8.95, 8.95, 8.95); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

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

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

Left Cheek Middle/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.286 W/kg

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

Reference Value = 6.590 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.333 mW/g

SAR(1 g) = 0.265 mW/g; SAR(10 g) = 0.199 mW/g

Maximum value of SAR (measured) = 0.277 W/kg

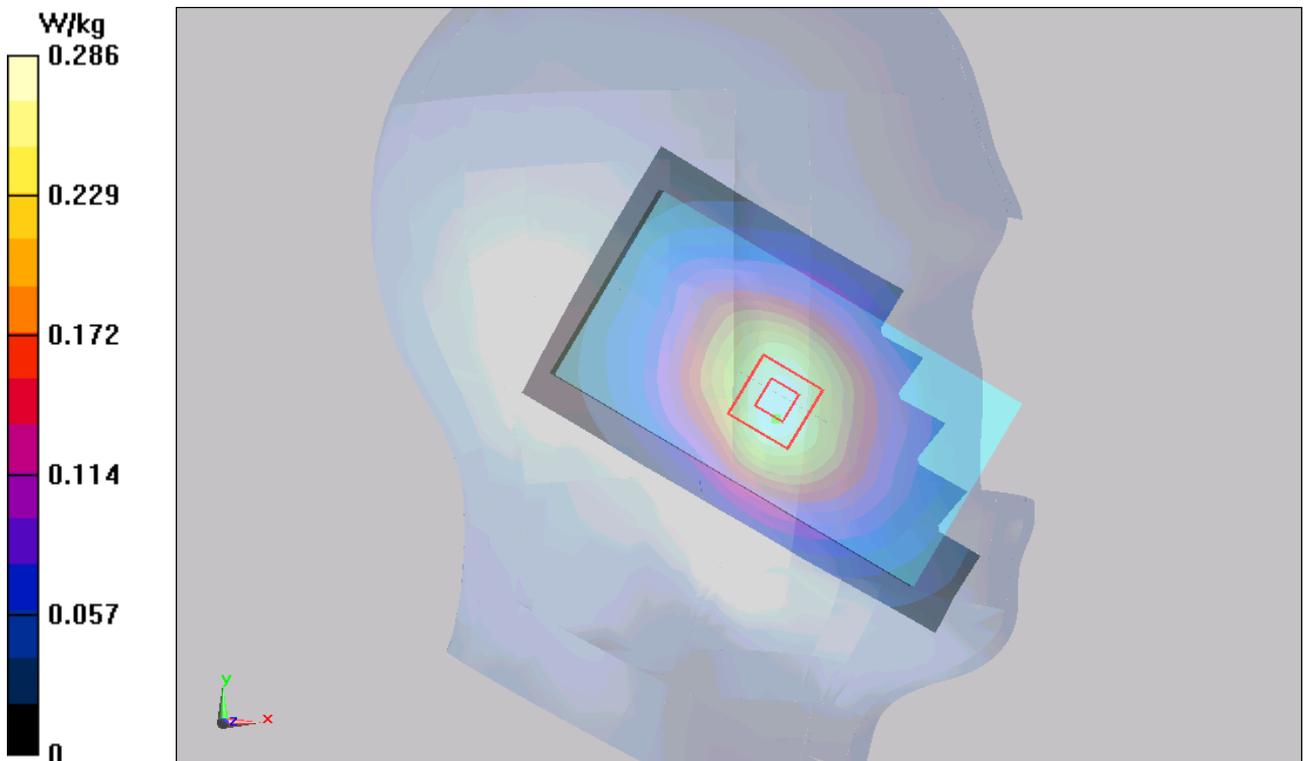


Figure 19 Left Hand Touch Cheek GSM 850 Channel 192

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

Report No.: RHA1311-0086SAR01R2

Page 65 of 166

GSM 850 Left Cheek Middle (Battery 5)

Date/Time: 11/16/2013 4:11:59 PM

Communication System: GSM; Frequency: 837 MHz; Duty Cycle: 1:8.30042

Medium parameters used: $f = 837$ MHz; $\sigma = 0.937$ mho/m; $\epsilon_r = 42.233$; $\rho = 1000$ 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 - SN3753; ConvF(8.95, 8.95, 8.95); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

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

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

Left Cheek Middle/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.283 W/kg

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

Reference Value = 6.581 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.334 mW/g

SAR(1 g) = 0.263 mW/g; SAR(10 g) = 0.197 mW/g

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

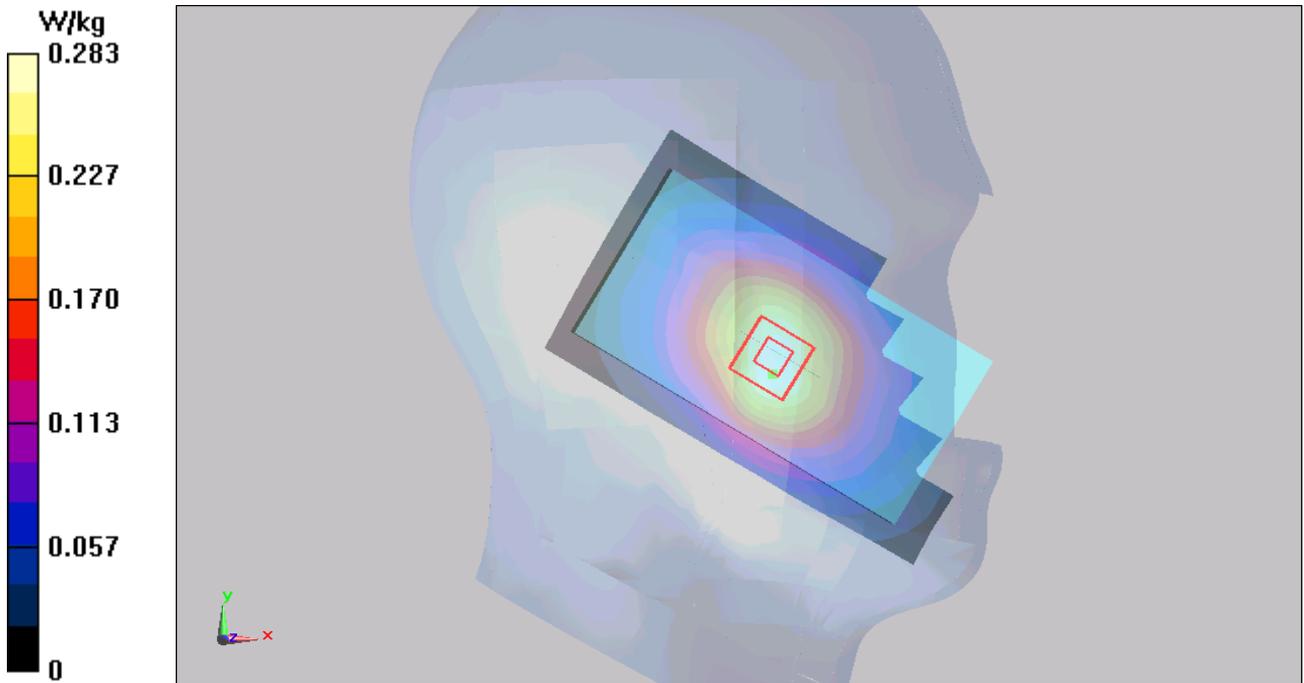


Figure 20 Left Hand Touch Cheek GSM 850 Channel 192

GSM 850 GPRS (2Txslots)Front Side Middle (Battery 1, Distance 10mm)

Date/Time: 11/18/2013 3:29:50 PM

Communication System: GPRS 2TX; Frequency: 837 MHz;Duty Cycle: 1:4.14954

Medium parameters used: $f = 837$ MHz; $\sigma = 0.995$ mho/m; $\epsilon_r = 55.073$; $\rho = 1000$ 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 - SN3753; ConvF(9.05, 9.05, 9.05); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

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

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

Front Side Middle/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.472 W/kg

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

Reference Value = 21.947 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.556 mW/g

SAR(1 g) = 0.452 mW/g; SAR(10 g) = 0.348 mW/g

Maximum value of SAR (measured) = 0.470 W/kg

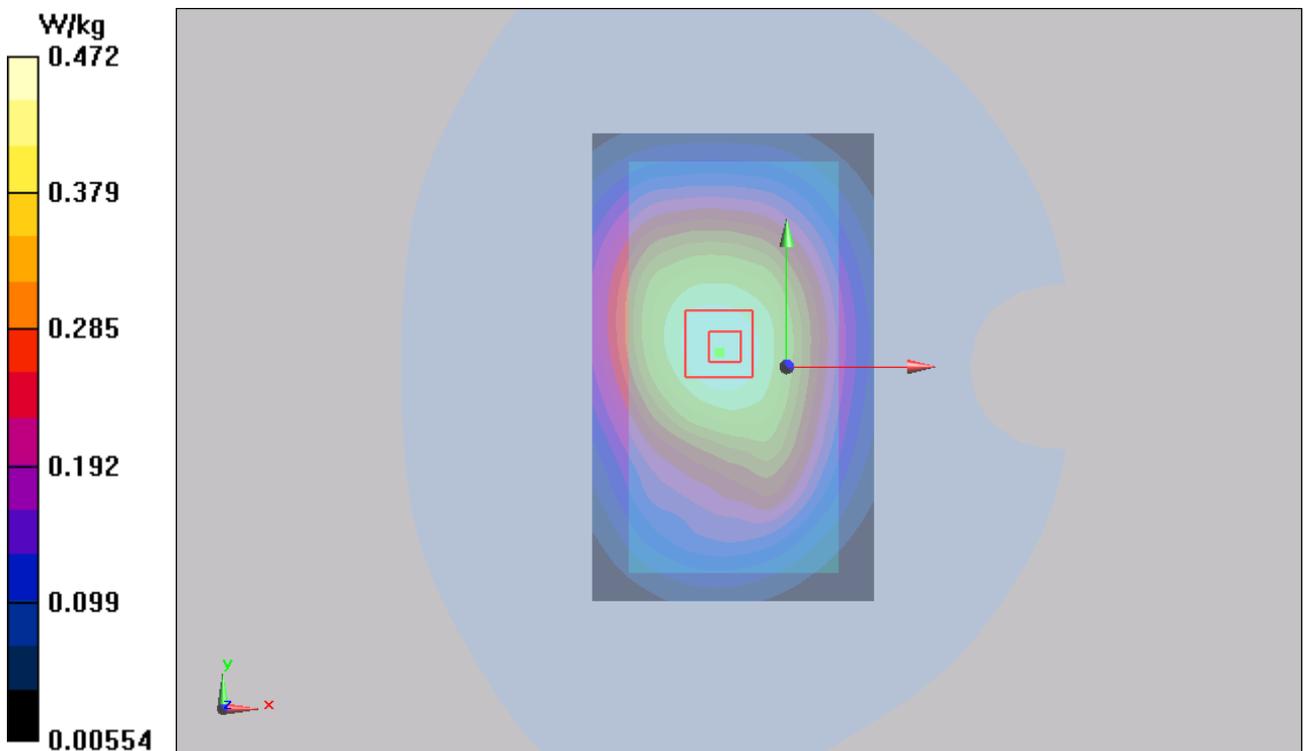


Figure 22 Body, Front Side, GSM 850 GPRS (2Txslots)Channel 192

GSM 850 GPRS (2Txslots)Left Edge Middle (Battery 1, Distance 10mm)

Date/Time: 11/18/2013 2:56:14 PM

Communication System: GPRS 2TX; Frequency: 837 MHz;Duty Cycle: 1:4.14954

Medium parameters used: $f = 837$ MHz; $\sigma = 0.995$ mho/m; $\epsilon_r = 55.073$; $\rho = 1000$ 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 - SN3753; ConvF(9.05, 9.05, 9.05); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

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

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

Left Edge Middle/Area Scan (31x101x1): Interpolated grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.290 W/kg

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

Reference Value = 17.325 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 0.371 mW/g

SAR(1 g) = 0.270 mW/g; SAR(10 g) = 0.187 mW/g

Maximum value of SAR (measured) = 0.286 W/kg

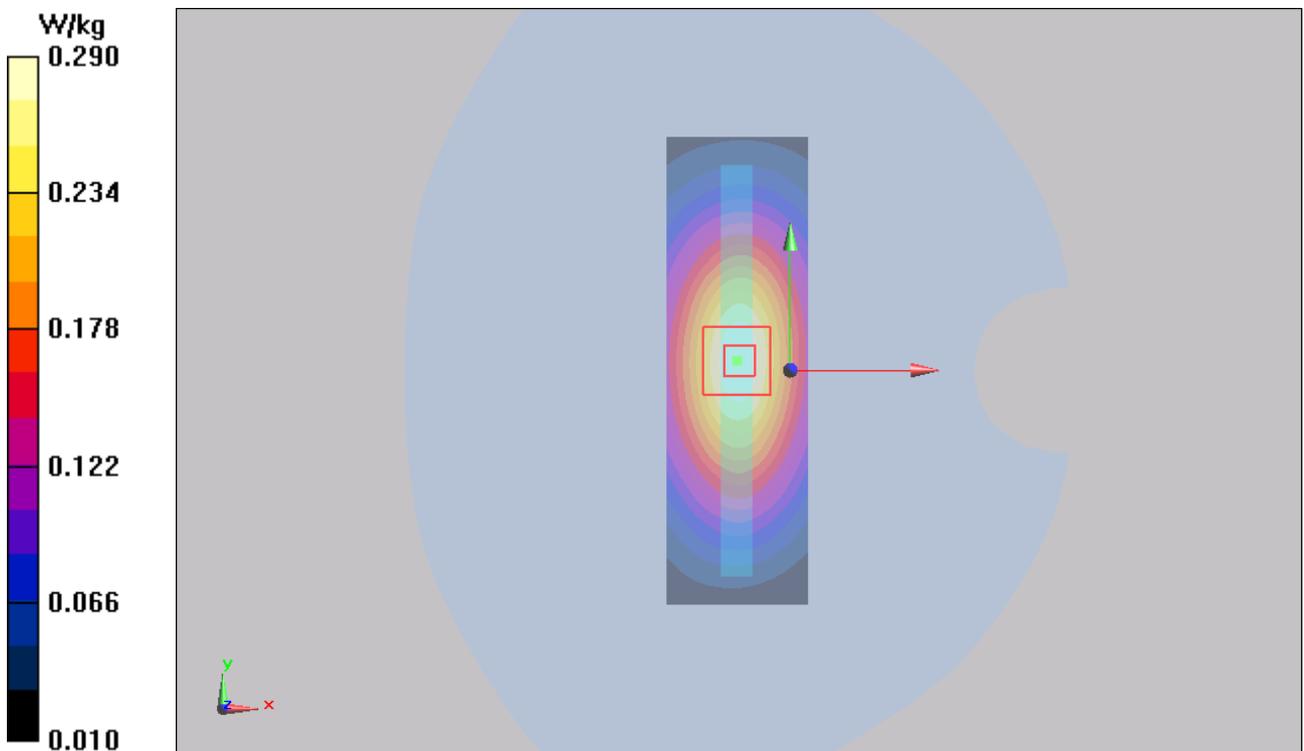


Figure 23 Body, Left Edge, GSM 850 GPRS (2Txslots)Channel 192

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

GSM 850 GPRS (2Txslots)Right Edge Middle (Battery 1, Distance 10mm)

Date/Time: 11/18/2013 3:14:09 PM

Communication System: GPRS 2TX; Frequency: 837 MHz;Duty Cycle: 1:4.14954

Medium parameters used: $f = 837$ MHz; $\sigma = 0.995$ mho/m; $\epsilon_r = 55.073$; $\rho = 1000$ 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 - SN3753; ConvF(9.05, 9.05, 9.05); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

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

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

Right Edge Middle/Area Scan (31x101x1): Interpolated grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.292 W/kg

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

Reference Value = 17.425 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.383 mW/g

SAR(1 g) = 0.275 mW/g; SAR(10 g) = 0.190 mW/g

Maximum value of SAR (measured) = 0.295 W/kg

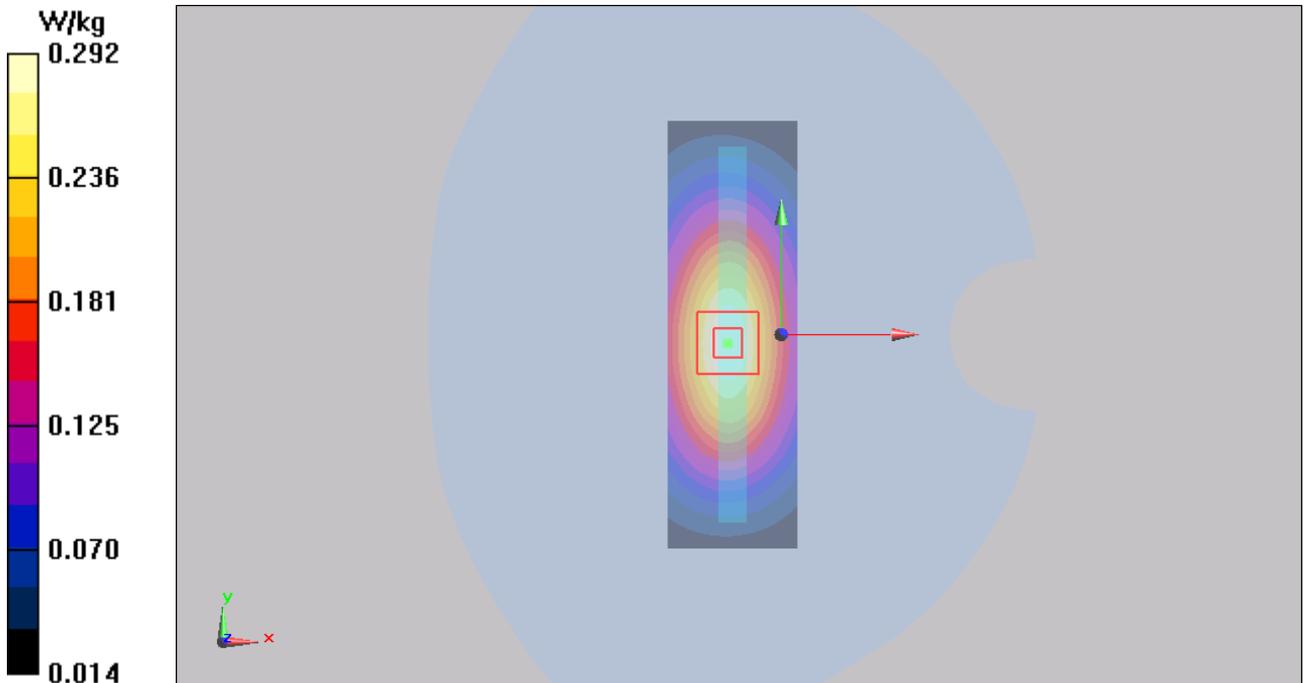


Figure 24 Body, Right Edge, GSM 850 GPRS (2Txslots)Channel 192

GSM 850 GPRS (2Txslots)Bottom Edge Middle (Battery 1, Distance 10mm)

Date/Time: 11/18/2013 4:10:28 PM

Communication System: GPRS 2TX; Frequency: 837 MHz;Duty Cycle: 1:4.14954

Medium parameters used: $f = 837$ MHz; $\sigma = 0.995$ mho/m; $\epsilon_r = 55.073$; $\rho = 1000$ 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 - SN3753; ConvF(9.05, 9.05, 9.05); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

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

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

Bottom Edge Middle/Area Scan (31x61x1): Interpolated grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.144 W/kg

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

Reference Value = 11.650 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.214 mW/g

SAR(1 g) = 0.122 mW/g; SAR(10 g) = 0.072 mW/g

Maximum value of SAR (measured) = 0.133 W/kg

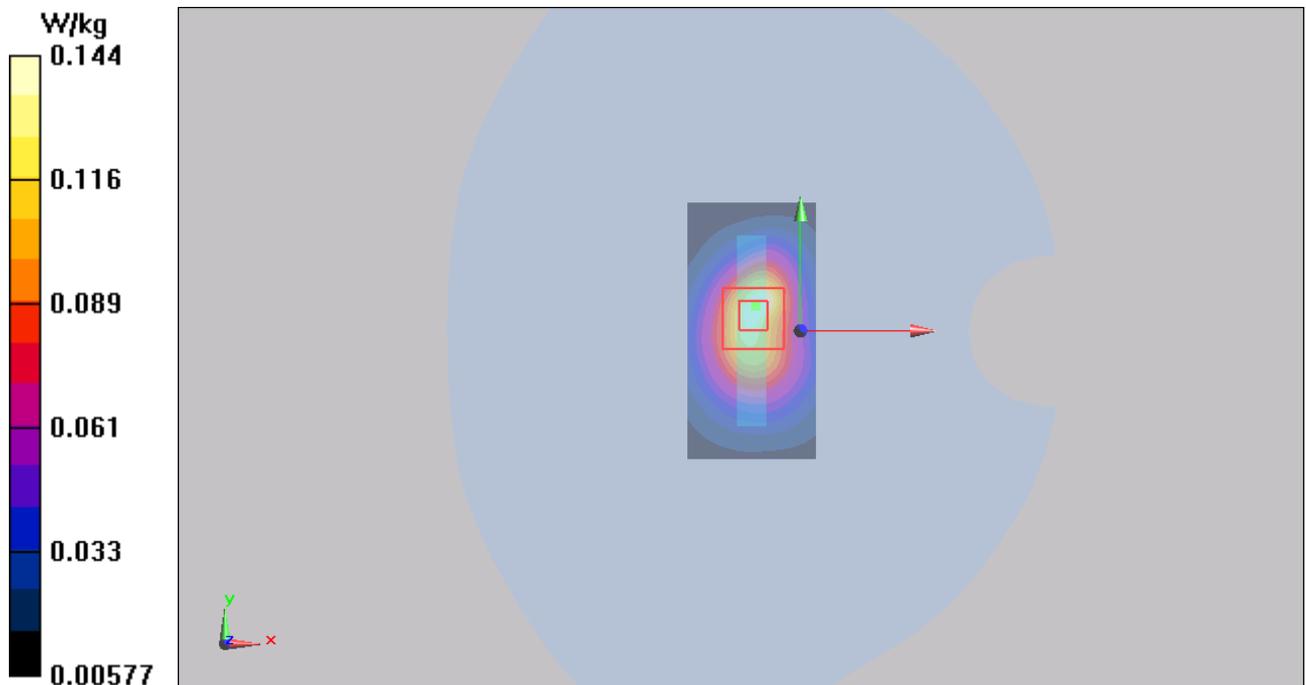


Figure 25 Body, Bottom Edge, GSM 850 GPRS (2Txslots)annel 192

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

Report No.: RHA1311-0086SAR01R2

Page 71 of 166

GSM 850 EGPRS (2Txslots) Back Side High (Battery 1, Distance 10mm)

Date/Time: 11/18/2013 4:47:06 PM

Communication System: EGPRS 2TX; Frequency: 848.8 MHz; Duty Cycle: 1:4.14954

Medium parameters used: $f = 849$ MHz; $\sigma = 1.007$ mho/m; $\epsilon_r = 54.952$; $\rho = 1000$ 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 - SN3753; ConvF(9.05, 9.05, 9.05); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

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

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

Back Side High/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.873 W/kg

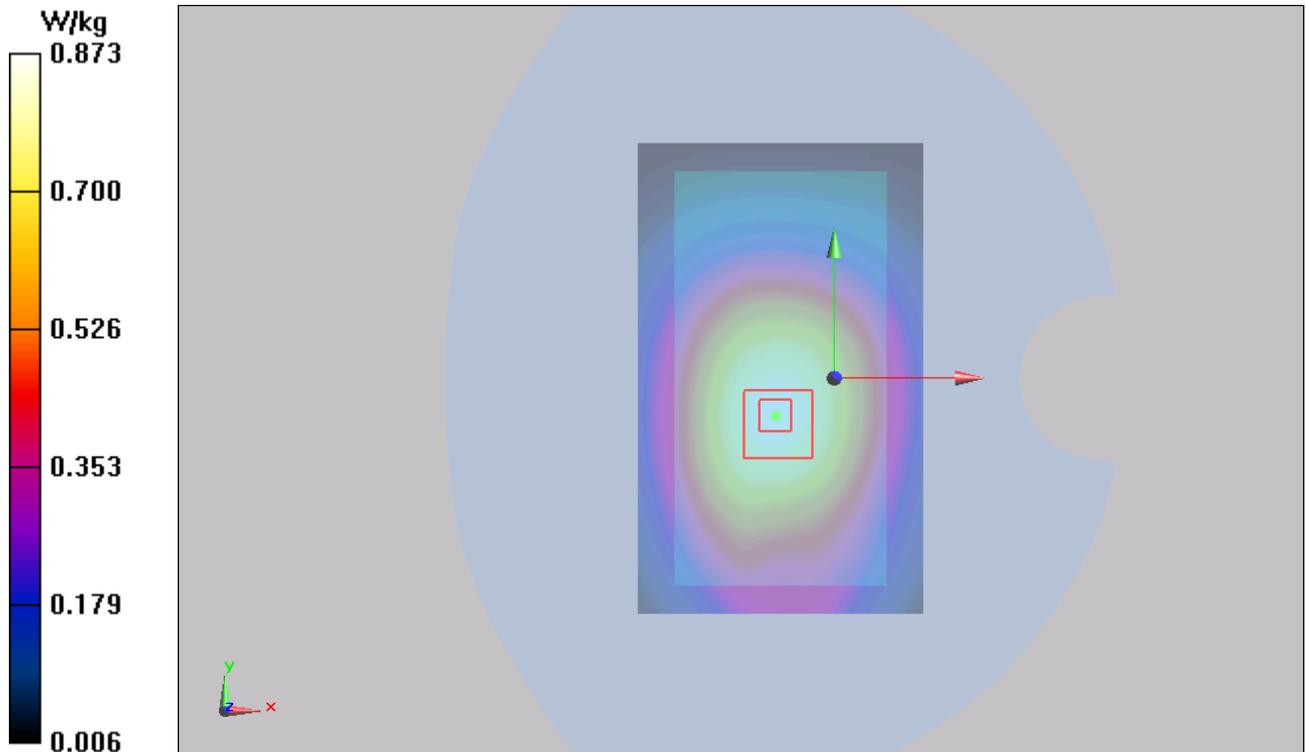
Back Side High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 29.369 V/m; Power Drift = -0.16 dB

Peak SAR (extrapolated) = 1.008 mW/g

SAR(1 g) = 0.813 mW/g; SAR(10 g) = 0.604 mW/g

Maximum value of SAR (measured) = 0.850 W/kg



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

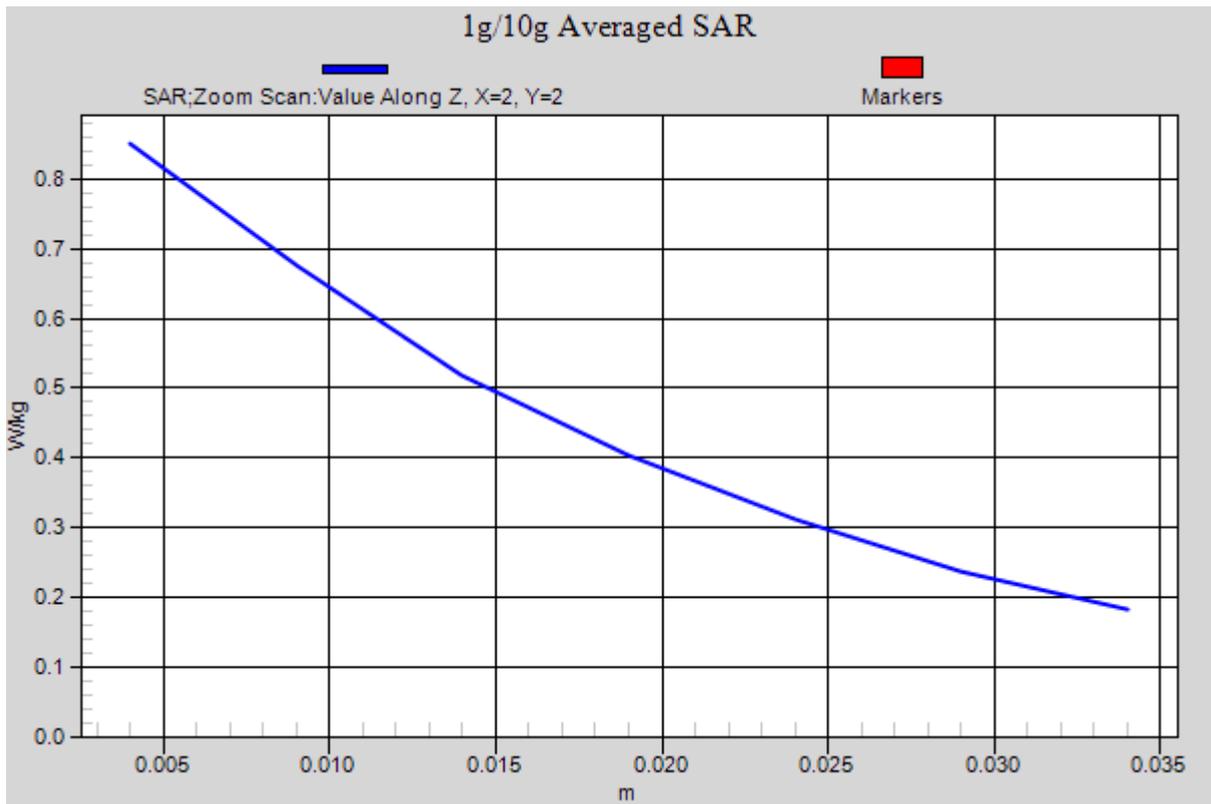


Figure 26 Body, Back Side, GSM 850 EGPRS (2Txslots) Channel 251

GSM 850 EGPRS (2Txslots) Back Side Middle (Battery 1, Distance 10mm)

Date/Time: 11/18/2013 1:02:07 PM

Communication System: EGPRS 2TX; Frequency: 837 MHz; Duty Cycle: 1:4.14954

Medium parameters used: $f = 837$ MHz; $\sigma = 0.995$ mho/m; $\epsilon_r = 55.073$; $\rho = 1000$ 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 - SN3753; ConvF(9.05, 9.05, 9.05); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

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

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

Back Side Middle/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.921 W/kg

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

Reference Value = 29.531 V/m; Power Drift = -0.10 dB

Peak SAR (extrapolated) = 1.003 mW/g

SAR(1 g) = 0.805 mW/g; SAR(10 g) = 0.609 mW/g

Maximum value of SAR (measured) = 0.846 W/kg

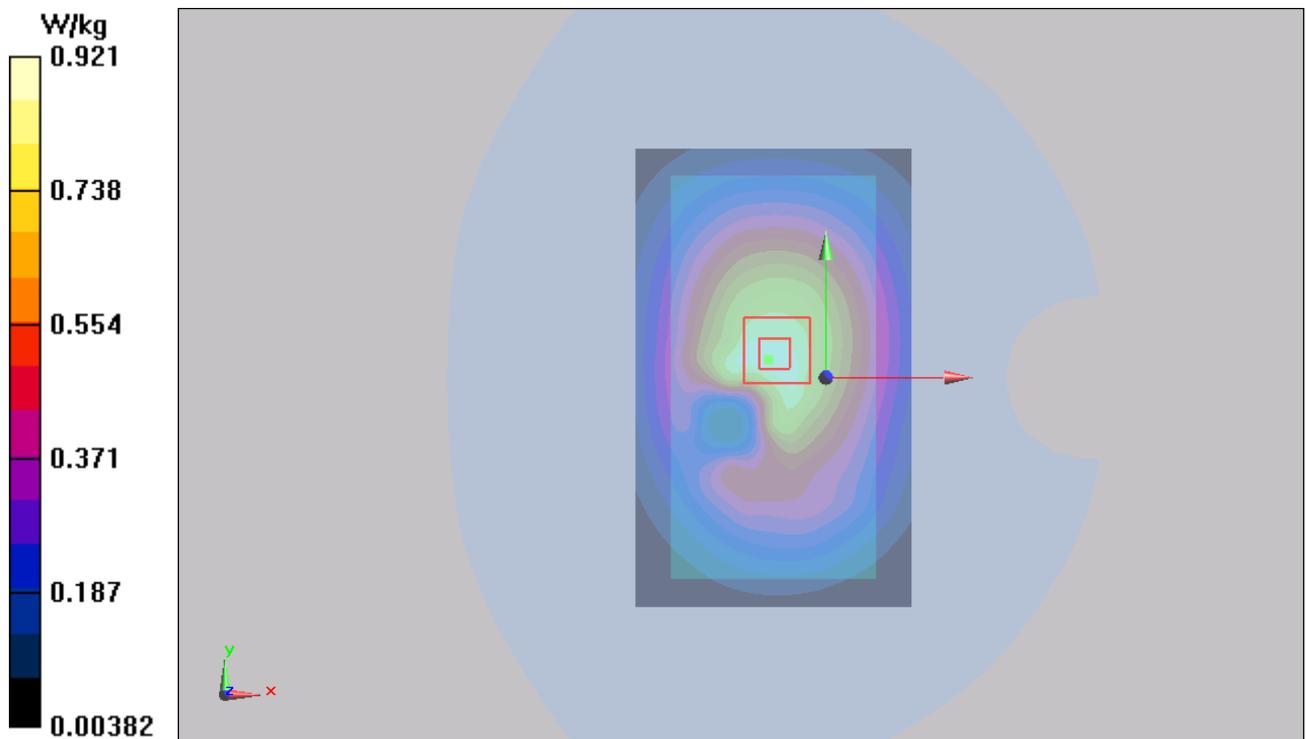


Figure 27 Body, Back Side, GSM 850 EGPRS (2Txslots) Channel 192

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

Report No.: RHA1311-0086SAR01R2

Page 74 of 166

GSM 850 EGPRS (2Txslots) Back Side Low (Battery 1, Distance 10mm)

Date/Time: 11/18/2013 3:56:17 PM

Communication System: EGPRS 2TX; Frequency: 824.2 MHz; Duty Cycle: 1:4.14954

Medium parameters used (interpolated): $f = 824.2$ MHz; $\sigma = 0.982$ mho/m; $\epsilon_r = 55.199$; $\rho = 1000$ 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 - SN3753; ConvF(9.05, 9.05, 9.05); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

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

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

Back Side Low/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.717 W/kg

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

Reference Value = 26.073 V/m; Power Drift = 0.027 dB

Peak SAR (extrapolated) = 1.570 mW/g

SAR(1 g) = 0.690 mW/g; SAR(10 g) = 0.521 mW/g

Maximum value of SAR (measured) = 0.714 W/kg

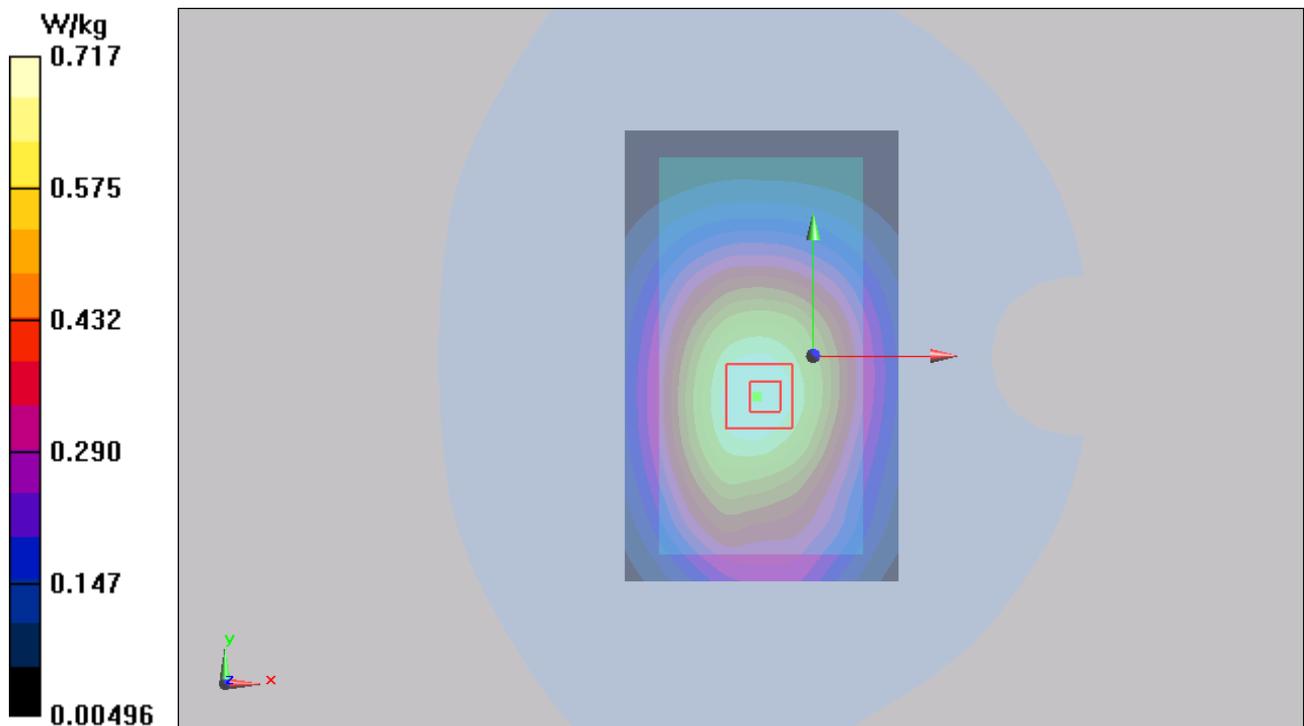


Figure 28 Body, Back Side, GSM 850 EGPRS (2Txslots) Channel 128

GSM 850 EGPRS (2Txslots) Back Side High (Battery 2, Distance 10mm)

Date/Time: 11/18/2013 2:46:19 PM

Communication System: EGPRS 2TX; Frequency: 848.8 MHz; Duty Cycle: 1:4.14954

Medium parameters used: $f = 849$ MHz; $\sigma = 1.007$ mho/m; $\epsilon_r = 54.952$; $\rho = 1000$ 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 - SN3753; ConvF(9.05, 9.05, 9.05); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

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

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

Back Side High/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.864 W/kg

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

Reference Value = 28.892 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 0.994 mW/g

SAR(1 g) = 0.789 mW/g; SAR(10 g) = 0.593 mW/g

Maximum value of SAR (measured) = 0.827 W/kg

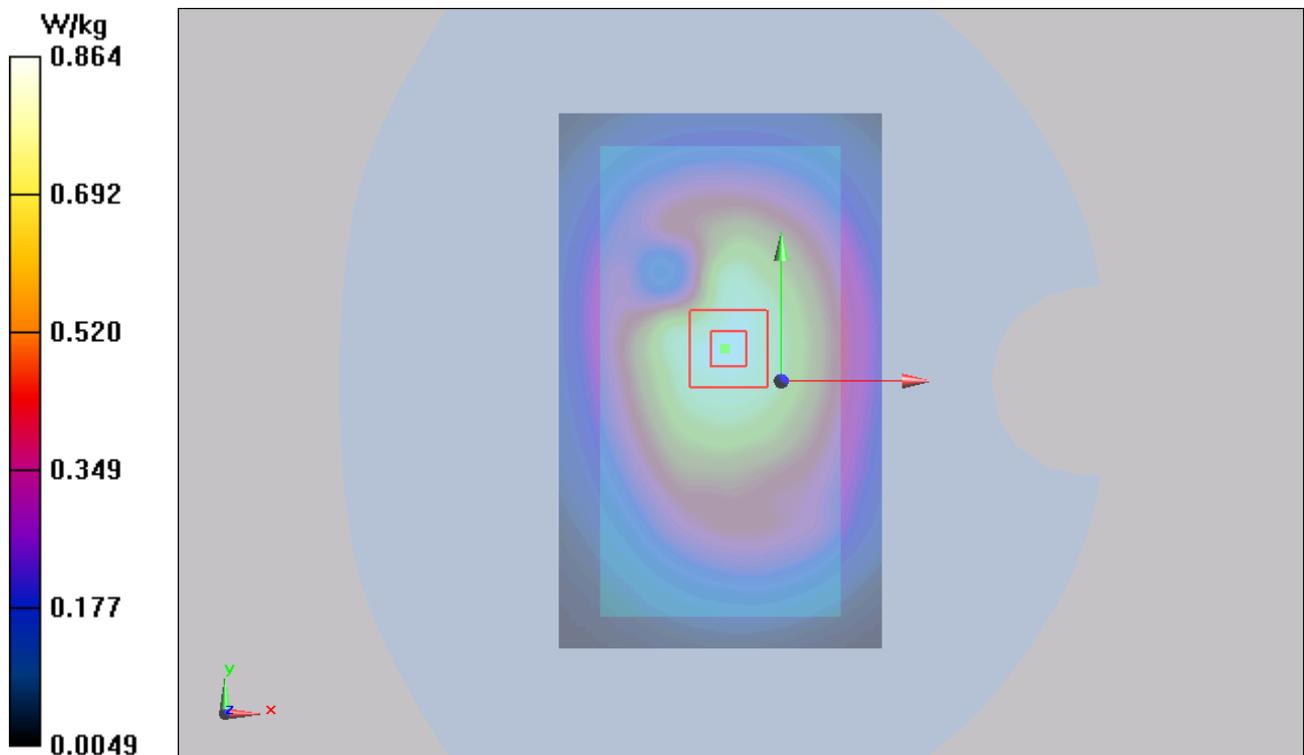


Figure 29 Body, Back Side, GSM 850 EGPRS (2Txslots) Channel 251

GSM 850 EGPRS (2Txslots) Back Side High (Battery 3, Distance 10mm)

Date/Time: 11/18/2013 1:42:24 PM

Communication System: EGPRS 2TX; Frequency: 848.8 MHz; Duty Cycle: 1:4.14954

Medium parameters used: $f = 849$ MHz; $\sigma = 1.007$ mho/m; $\epsilon_r = 54.952$; $\rho = 1000$ 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 - SN3753; ConvF(9.05, 9.05, 9.05); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

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

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

Back Side High/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.835 W/kg

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

Reference Value = 28.910 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 1.243 mW/g

SAR(1 g) = 0.788 mW/g; SAR(10 g) = 0.595 mW/g

Maximum value of SAR (measured) = 0.828 W/kg

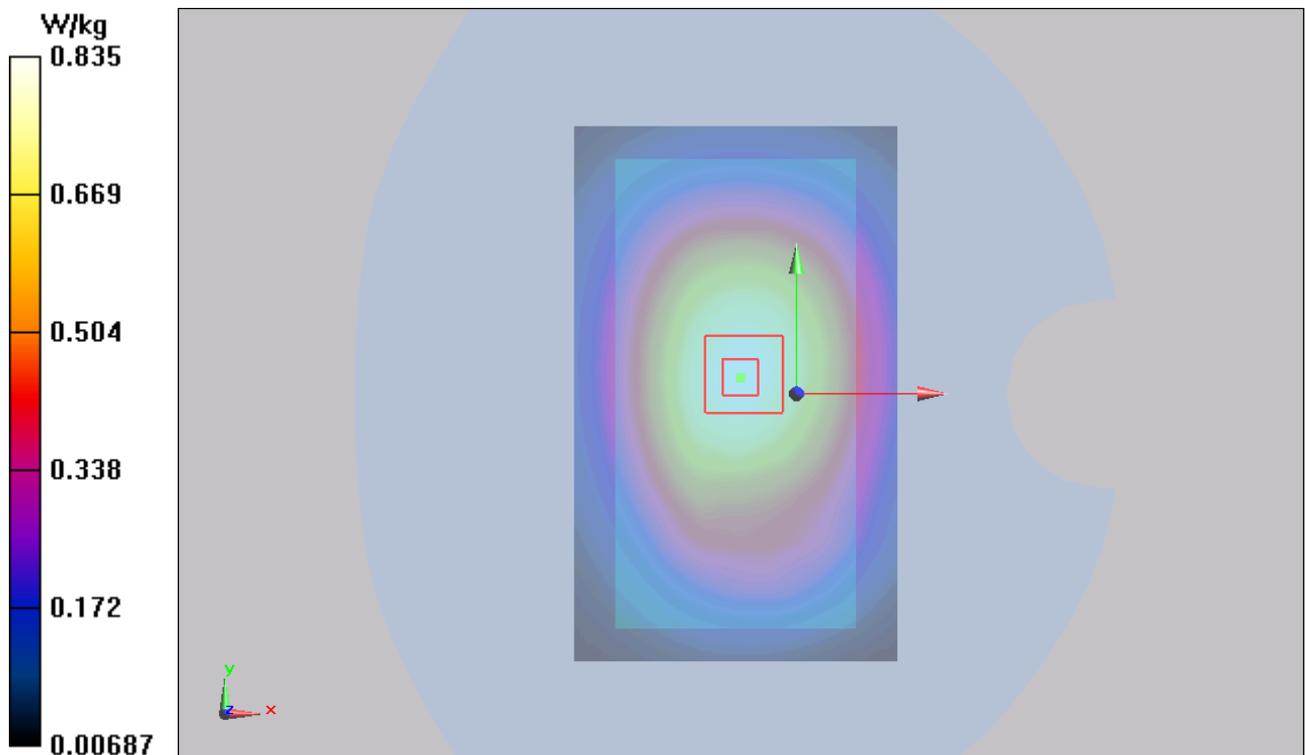


Figure 30 Body, Back Side, GSM 850 EGPRS (2Txslots) Channel 251

GSM 850 EGPRS (2Txslots) Back Side High (Battery 4, Distance 10mm)

Date/Time: 11/18/2013 2:23:01 PM

Communication System: EGPRS 2TX; Frequency: 848.8 MHz; Duty Cycle: 1:4.14954

Medium parameters used: $f = 849$ MHz; $\sigma = 1.007$ mho/m; $\epsilon_r = 54.952$; $\rho = 1000$ 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 - SN3753; ConvF(9.05, 9.05, 9.05); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

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

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

Back Side High/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.841 W/kg

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

Reference Value = 29.201 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 0.987 mW/g

SAR(1 g) = 0.787 mW/g; SAR(10 g) = 0.595 mW/g

Maximum value of SAR (measured) = 0.827 W/kg

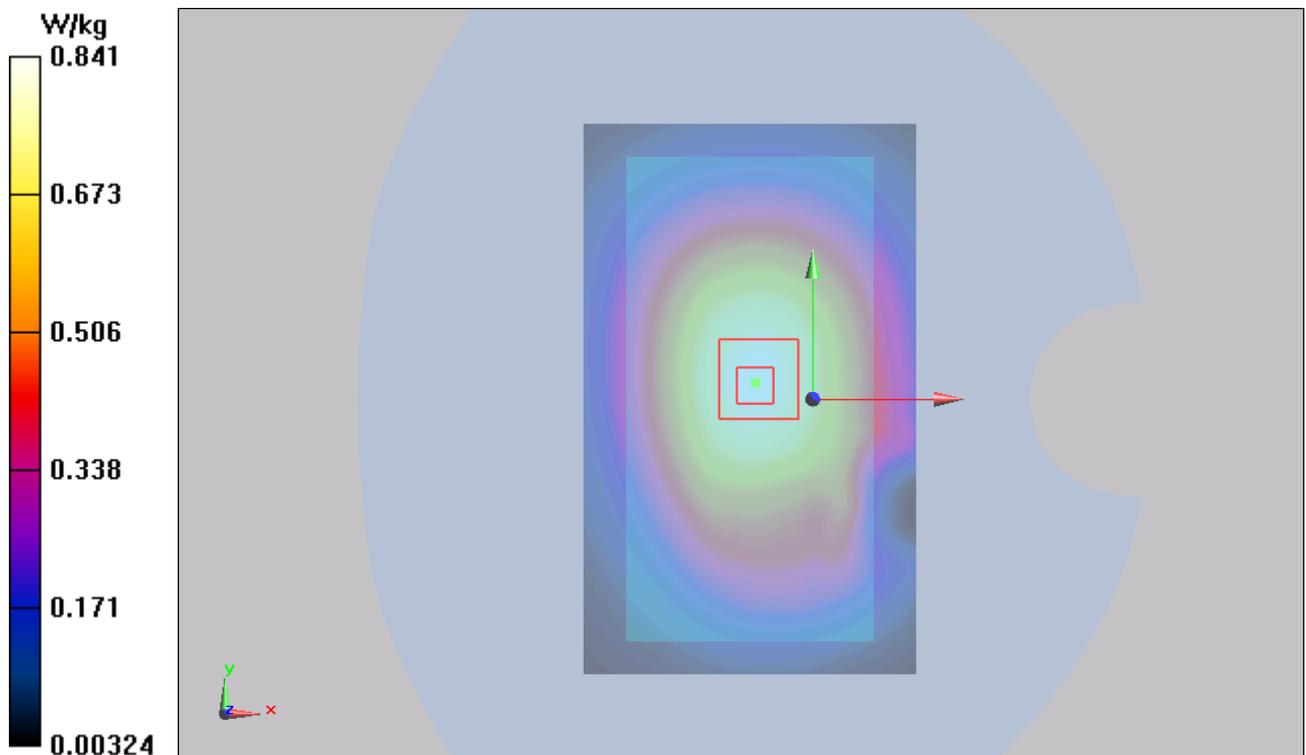


Figure 31 Body, Back Side, GSM 850 EGPRS (2Txslots) Channel 251

GSM 850 EGPRS (2Txslots) Back Side High (Battery 5, Distance 10mm)

Date/Time: 11/18/2013 1:25:02 PM

Communication System: EGPRS 2TX; Frequency: 848.8 MHz; Duty Cycle: 1:4.14954

Medium parameters used: $f = 849$ MHz; $\sigma = 1.007$ mho/m; $\epsilon_r = 54.952$; $\rho = 1000$ 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 - SN3753; ConvF(9.05, 9.05, 9.05); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

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

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

Back Side High/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.841 W/kg

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

Reference Value = 29.219 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 1.474 mW/g

SAR(1 g) = 0.789 mW/g; SAR(10 g) = 0.596 mW/g

Maximum value of SAR (measured) = 0.840 W/kg

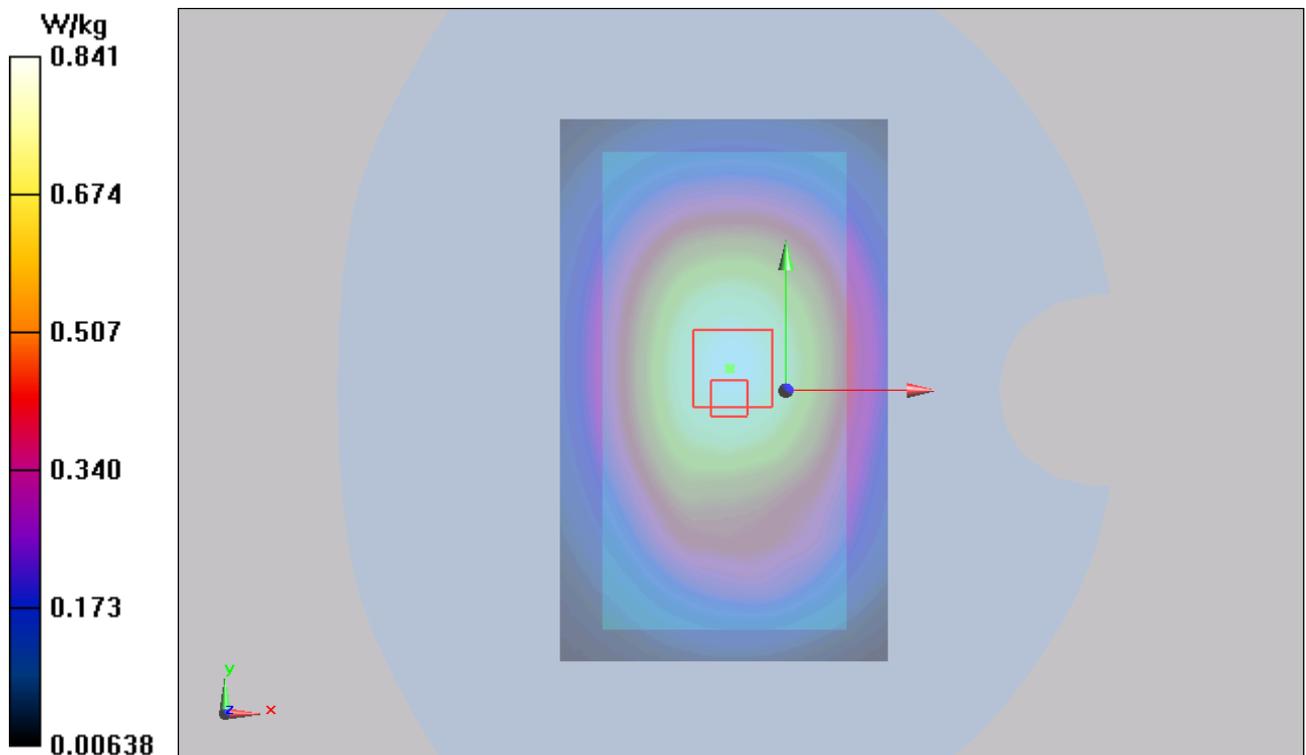


Figure 32 Body, Back Side, GSM 850 EGPRS (2Txslots) Channel 251

GSM 850 EGPRS (2Txslots) Back Side High (1st repeated SAR, Battery 1, Distance 10mm)

Date/Time: 11/18/2013 4:26:00 PM

Communication System: EGPRS 2TX; Frequency: 848.8 MHz; Duty Cycle: 1:4.14954

Medium parameters used: $f = 849$ MHz; $\sigma = 1.007$ mho/m; $\epsilon_r = 54.952$; $\rho = 1000$ 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 - SN3753; ConvF(9.05, 9.05, 9.05); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

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

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

Back Side High/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.830 W/kg

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

Reference Value = 28.515 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.978 mW/g

SAR(1 g) = 0.781 mW/g; SAR(10 g) = 0.588 mW/g

Maximum value of SAR (measured) = 0.821 W/kg

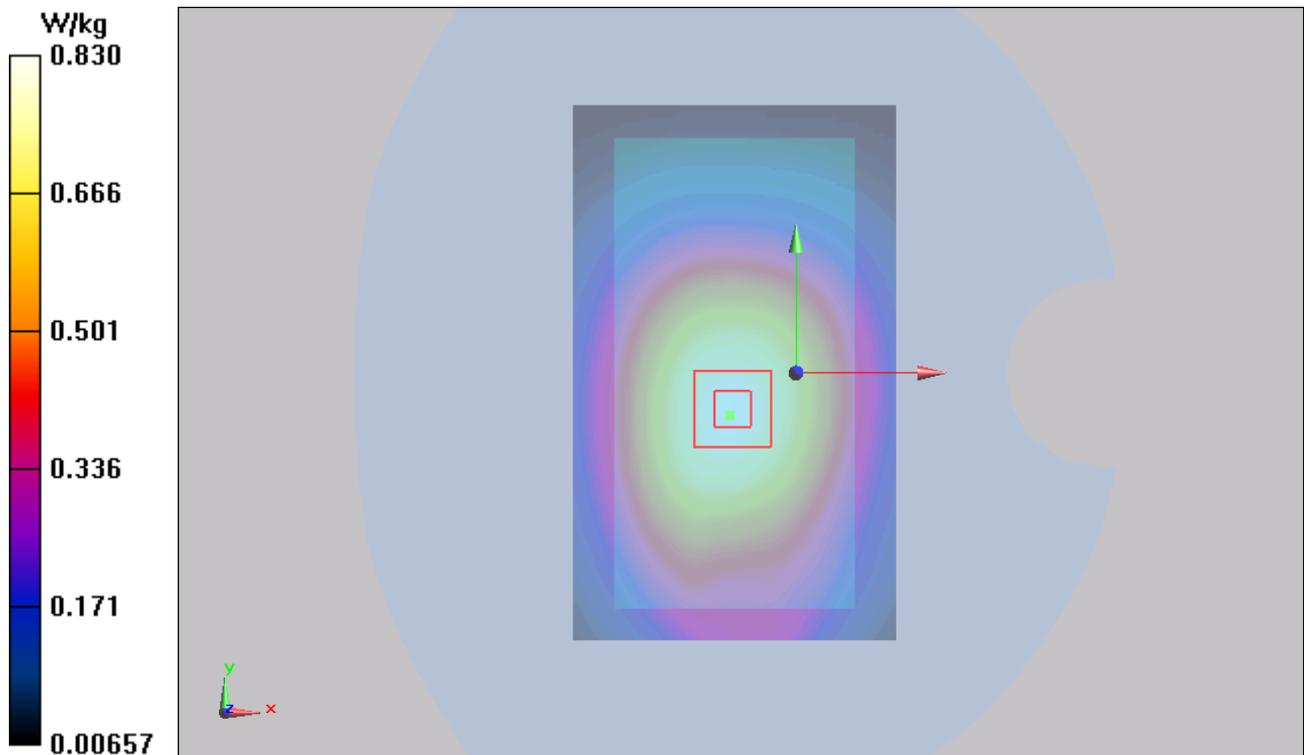


Figure 33 Body, Back Side, GSM 850 EGPRS (2Txslots) Channel 251

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

Report No.: RHA1311-0086SAR01R2

Page 80 of 166

GSM 1900 Left Cheek Middle (Battery 1)

Date/Time: 11/17/2013 1:13:06 PM

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.413$ mho/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 - SN3753; ConvF(7.63, 7.63, 7.63); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Left Cheek Middle/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.437 W/kg

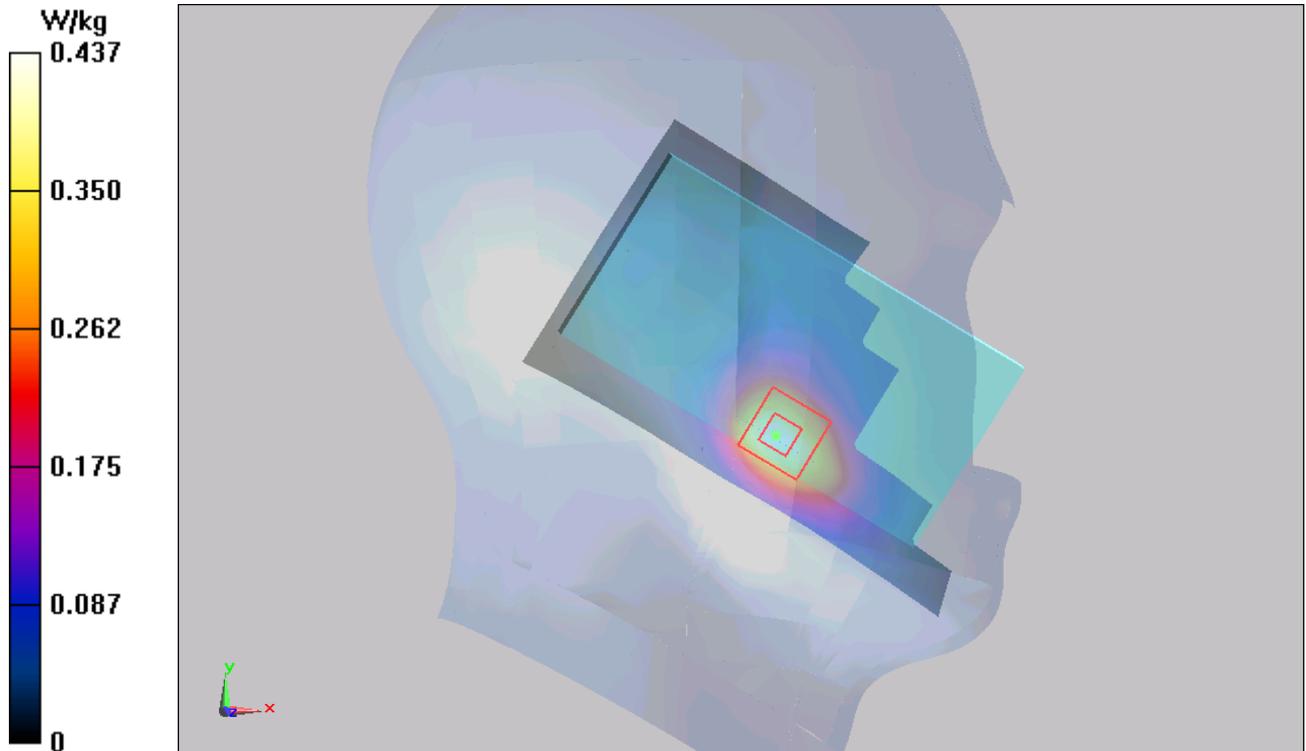
Left Cheek Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.572 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 0.631 mW/g

SAR(1 g) = 0.382 mW/g; SAR(10 g) = 0.220 mW/g

Maximum value of SAR (measured) = 0.417 W/kg



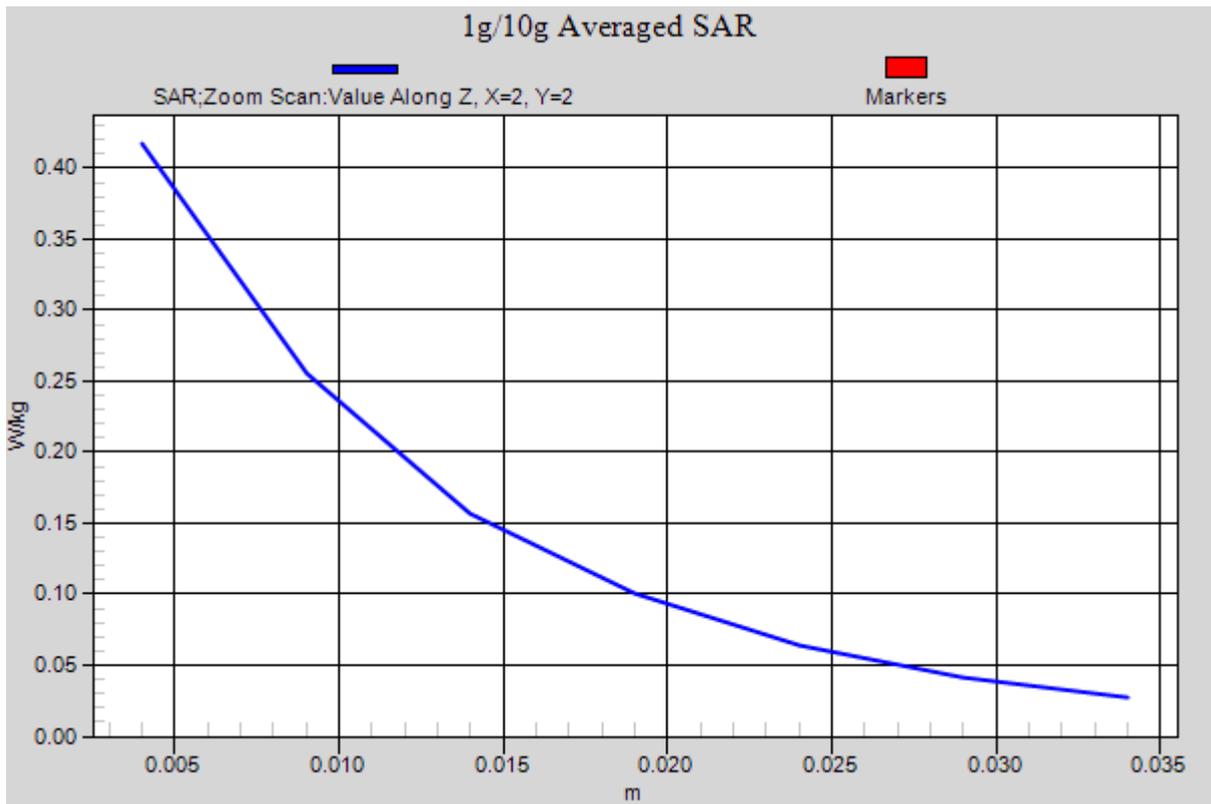


Figure 34 Left Hand Touch Cheek GSM 1900 Channel 661

GSM 1900 Left Tilt Middle (Battery 1)

Date/Time: 11/17/2013 1:30:15 PM

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.413$ mho/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 - SN3753; ConvF(7.63, 7.63, 7.63); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Left Tilt Middle/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.147 W/kg

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

Reference Value = 7.987 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 0.207 mW/g

SAR(1 g) = 0.124 mW/g; SAR(10 g) = 0.072 mW/g

Maximum value of SAR (measured) = 0.137 W/kg

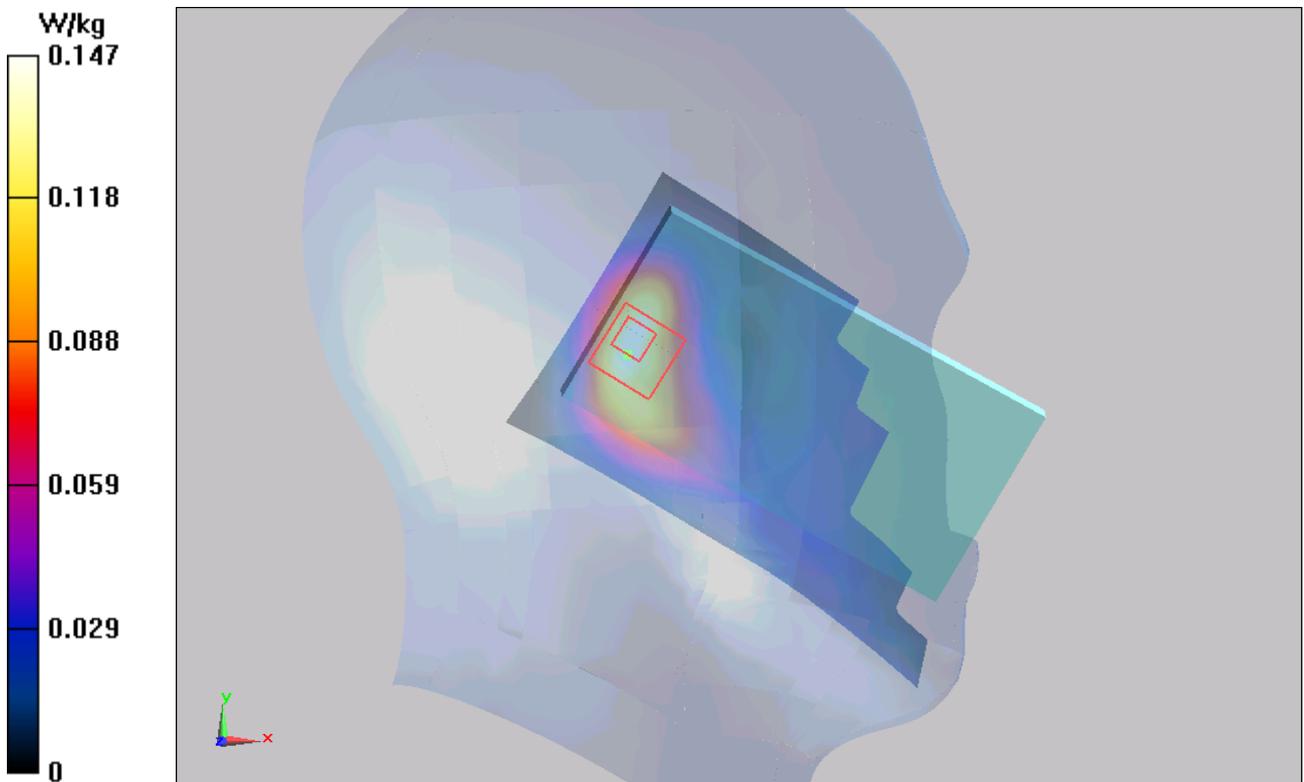


Figure 35 Left Hand Tilt 15° GSM 1900 Channel 661

GSM 1900 Right Cheek Middle (Battery 1)

Date/Time: 11/17/2013 10:11:30 AM

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.413$ mho/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 - SN3753; ConvF(7.63, 7.63, 7.63); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Right Cheek Middle/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.268 W/kg

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

Reference Value = 5.597 V/m; Power Drift = 0.143 dB

Peak SAR (extrapolated) = 0.377 mW/g

SAR(1 g) = 0.240 mW/g; SAR(10 g) = 0.149 mW/g

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

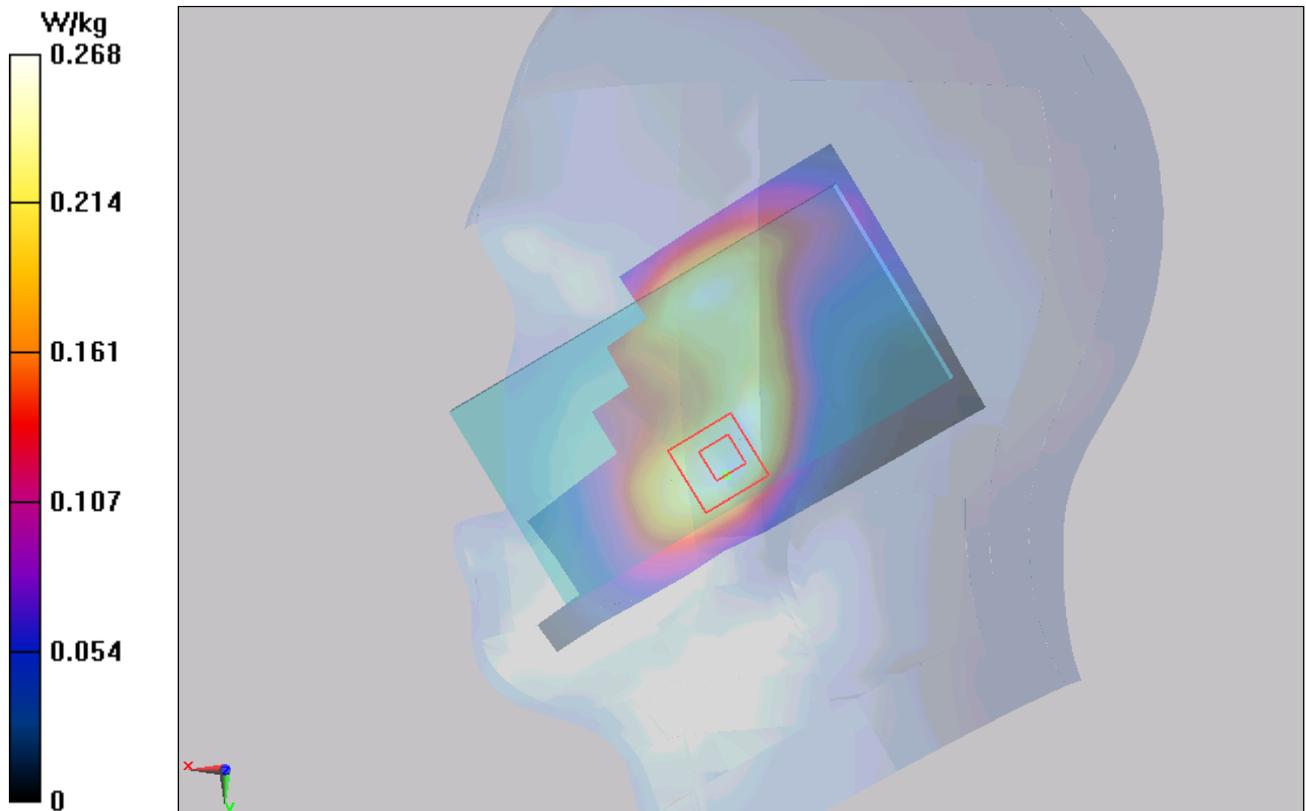


Figure 36 Right Hand Touch Cheek GSM 1900 Channel 661

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

Report No.: RHA1311-0086SAR01R2

Page 84 of 166

GSM 1900 Right Tilt Middle (Battery 1)

Date/Time: 11/17/2013 10:29:05 AM

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.413$ mho/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 - SN3753; ConvF(7.63, 7.63, 7.63); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Right Tilt Middle/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

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

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

Reference Value = 9.256 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.261 mW/g

SAR(1 g) = 0.169 mW/g; SAR(10 g) = 0.104 mW/g

Maximum value of SAR (measured) = 0.176 W/kg

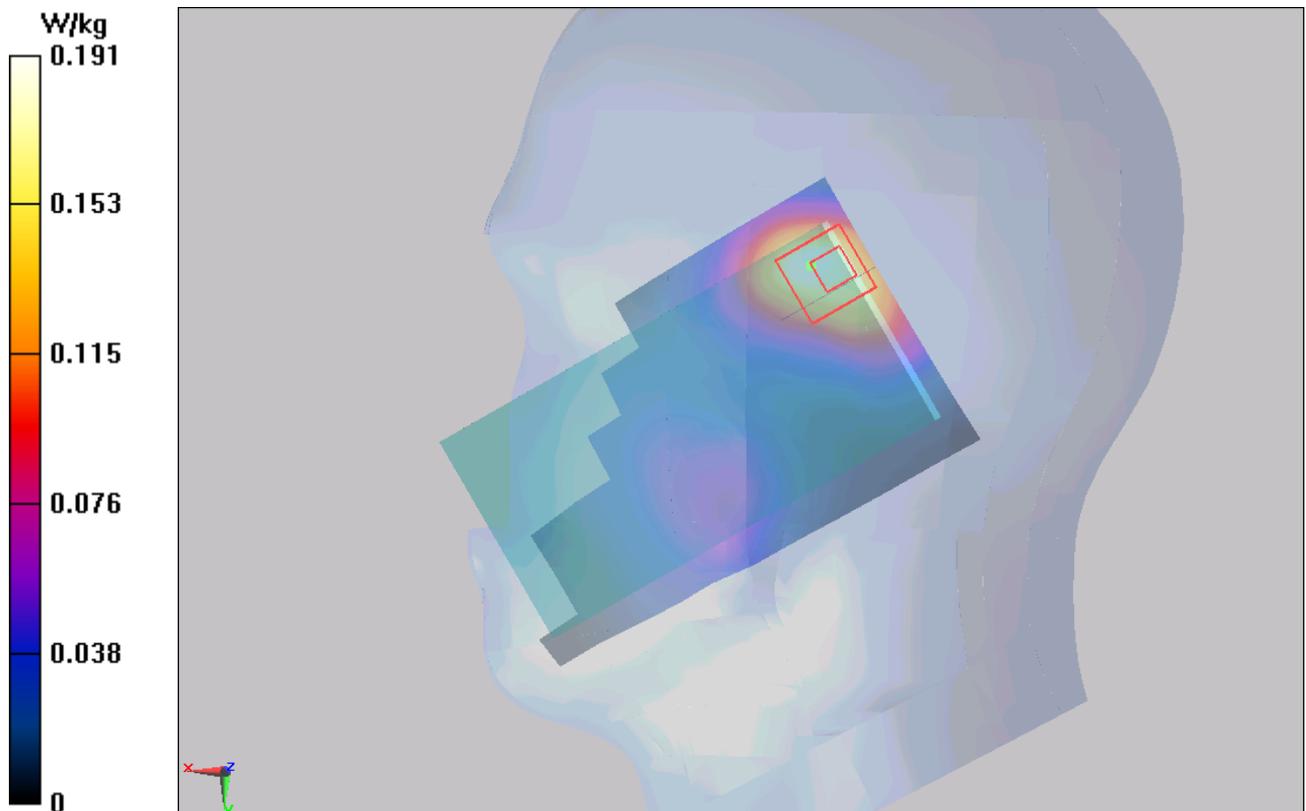


Figure 37 Right Hand Tilt 15° GSM 1900 Channel 661

GSM 1900 Left Cheek Middle (Battery 2)

Date/Time: 11/17/2013 11:45:40 AM

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.413$ mho/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 - SN3753; ConvF(7.63, 7.63, 7.63); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Left Cheek Middle/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.375 W/kg

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

Reference Value = 5.354 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 0.542 mW/g

SAR(1 g) = 0.328 mW/g; SAR(10 g) = 0.191 mW/g

Maximum value of SAR (measured) = 0.353 W/kg

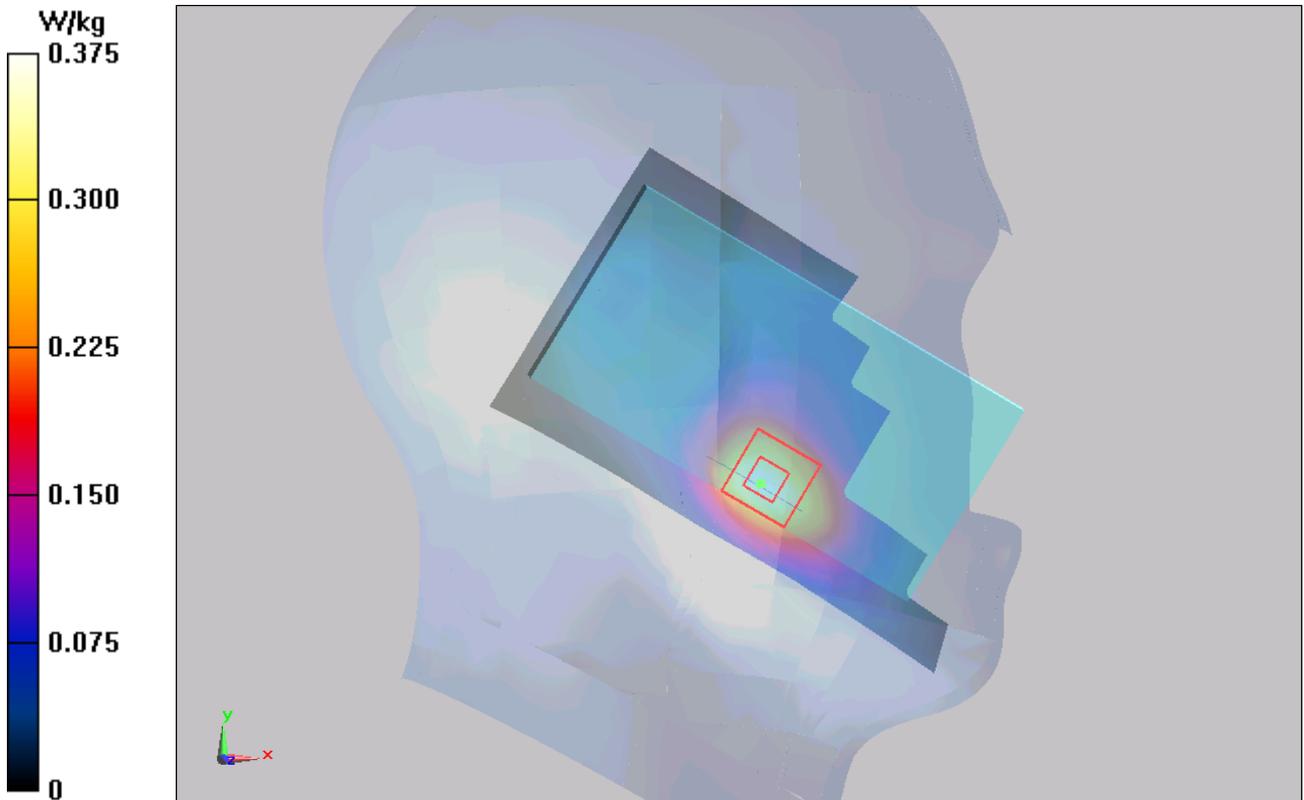


Figure 38 Left Hand Touch Cheek GSM 1900 Channel 661

GSM 1900 Left Cheek Middle (Battery 3)

Date/Time: 11/17/2013 12:14:55 PM

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.413$ mho/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 - SN3753; ConvF(7.63, 7.63, 7.63); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Left Cheek Middle/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.383 W/kg

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

Reference Value = 5.379 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 0.550 mW/g

SAR(1 g) = 0.334 mW/g; SAR(10 g) = 0.193 mW/g

Maximum value of SAR (measured) = 0.359 W/kg

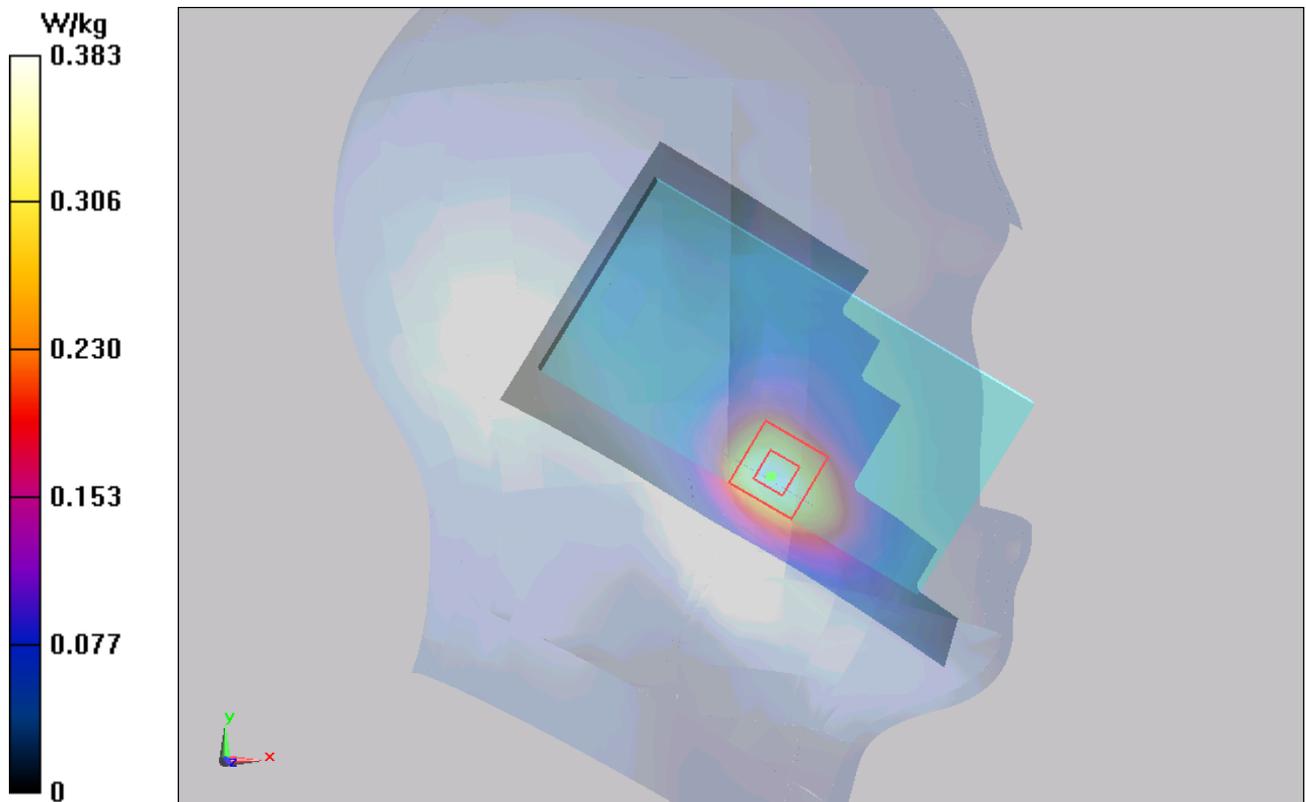


Figure 39 Left Hand Touch Cheek GSM 1900 Channel 661

GSM 1900 Left Cheek Middle (Battery 4)

Date/Time: 11/17/2013 12:34:57 PM

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.413$ mho/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 - SN3753; ConvF(7.63, 7.63, 7.63); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Left Cheek Middle/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.415 W/kg

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

Reference Value = 5.762 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.597 mW/g

SAR(1 g) = 0.364 mW/g; SAR(10 g) = 0.210 mW/g

Maximum value of SAR (measured) = 0.392 W/kg

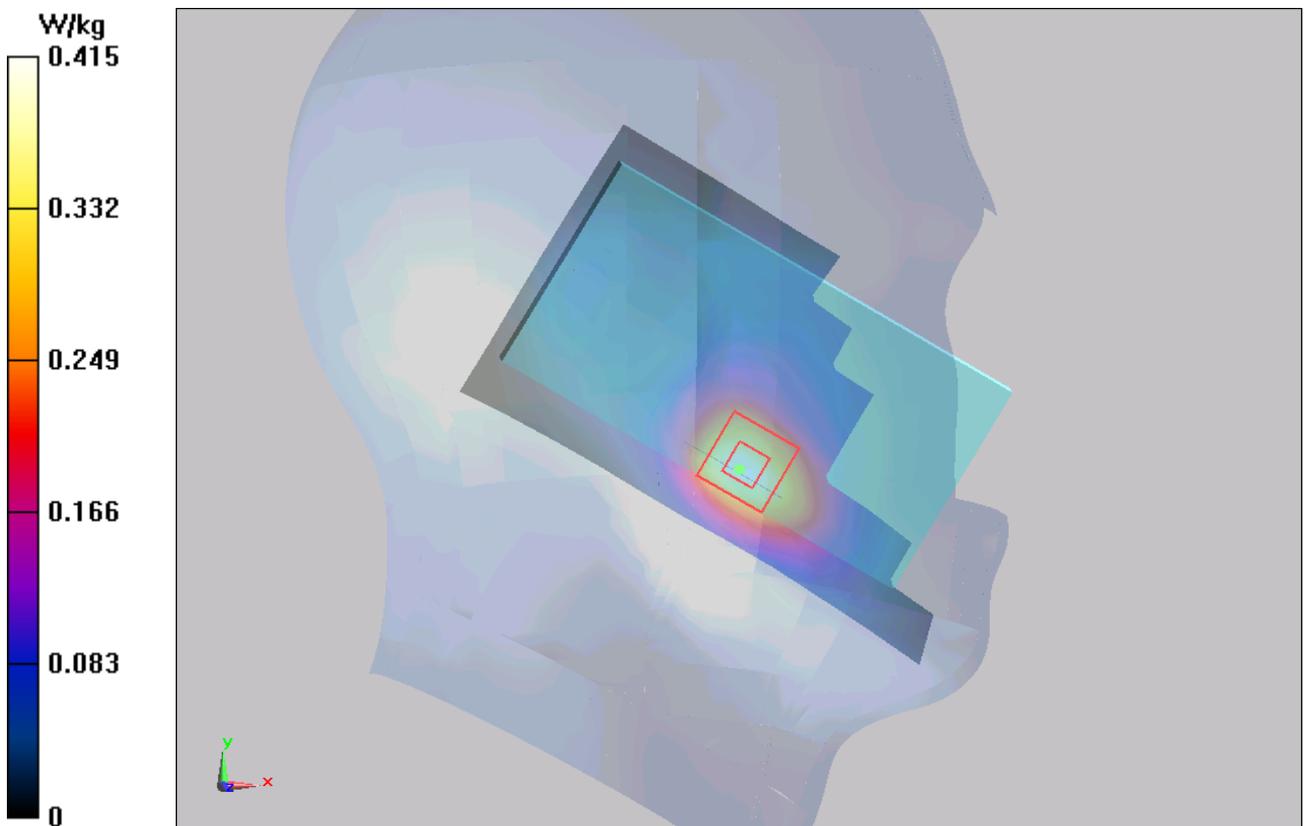


Figure 40 Left Hand Touch Cheek GSM 1900 Channel 661

GSM 1900 Left Cheek Middle (Battery 5)

Date/Time: 11/17/2013 12:54:13 PM

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.413$ mho/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 - SN3753; ConvF(7.63, 7.63, 7.63); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Left Cheek Middle/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.383 W/kg

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

Reference Value = 5.393 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.551 mW/g

SAR(1 g) = 0.336 mW/g; SAR(10 g) = 0.195 mW/g

Maximum value of SAR (measured) = 0.365 W/kg

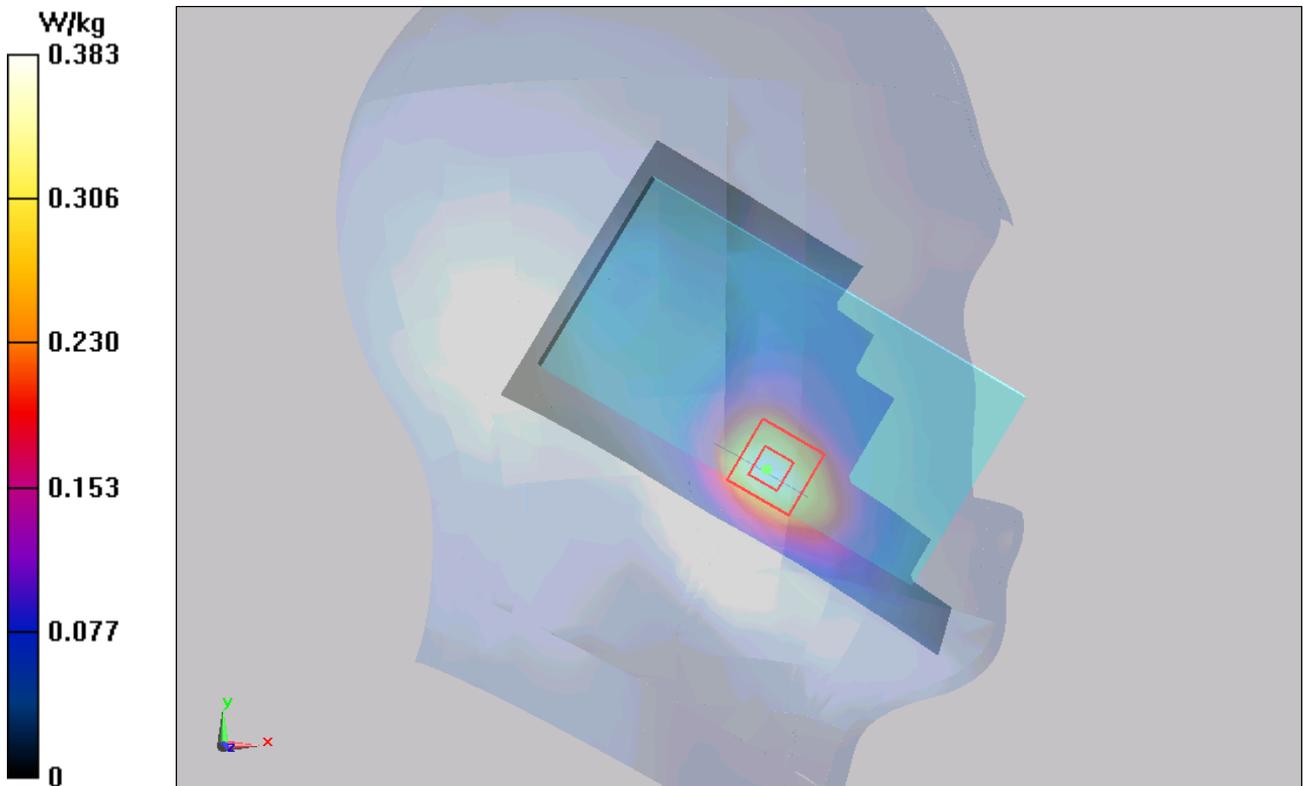


Figure 41 Left Hand Touch Cheek GSM 1900 Channel 661

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

Report No.: RHA1311-0086SAR01R2

Page 89 of 166

GSM 1900 GPRS (2Txslots) Back Side Middle (Battery 1, Distance 10mm)

Date/Time: 11/13/2013 10:46:48 PM

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.504$ mho/m; $\epsilon_r = 53.137$; $\rho = 1000$ 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 - SN3753; ConvF(7.33, 7.33, 7.33); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Back Side Middle/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.514 W/kg

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

Reference Value = 8.129 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.758 mW/g

SAR(1 g) = 0.463 mW/g; SAR(10 g) = 0.277 mW/g

Maximum value of SAR (measured) = 0.507 W/kg

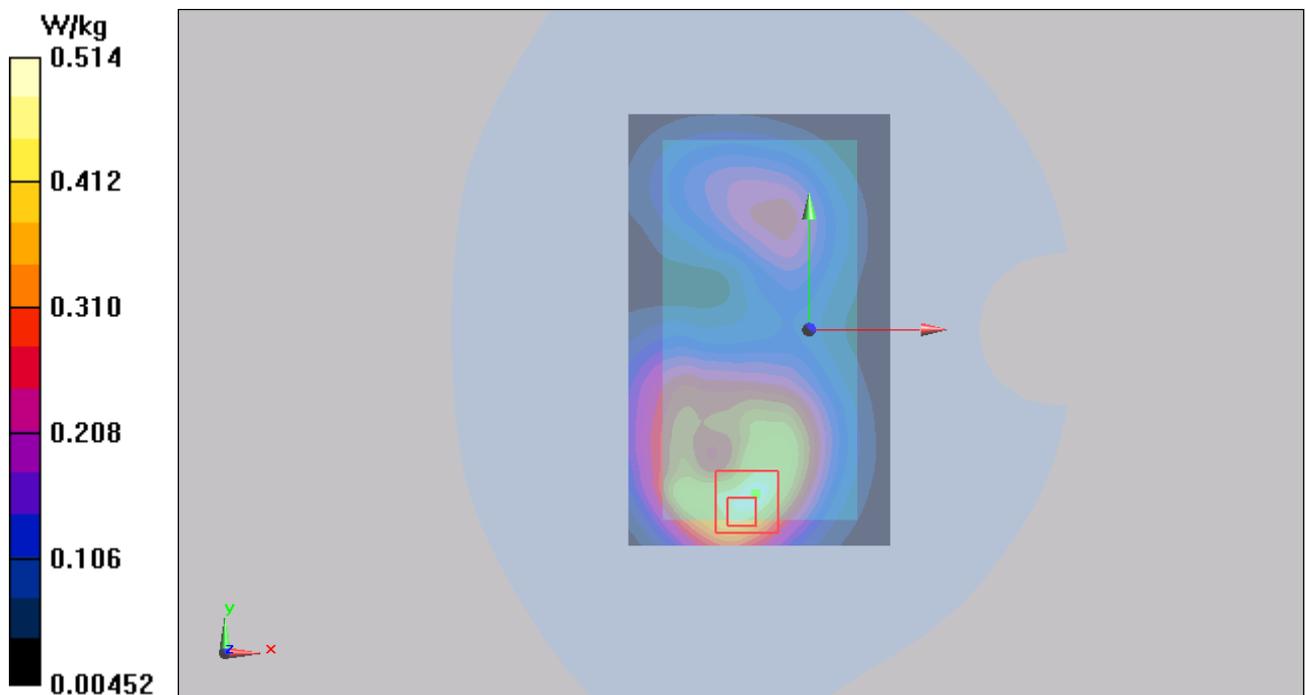


Figure 42 Body, Back Side, GSM 1900 GPRS (2Txslots) Channel 661

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

Report No.: RHA1311-0086SAR01R2

Page 90 of 166

GSM 1900 GPRS (2Txslot) Front Side Middle (Battery 1, Distance 10mm)

Date/Time: 11/13/2013 7:56:42 PM

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.504$ mho/m; $\epsilon_r = 53.137$; $\rho = 1000$ 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 - SN3753; ConvF(7.33, 7.33, 7.33); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Back Side Middle/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.480 W/kg

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

Reference Value = 7.606 V/m; Power Drift = -0.174 dB

Peak SAR (extrapolated) = 1.273 mW/g

SAR(1 g) = 0.561 mW/g; SAR(10 g) = 0.299 mW/g

Maximum value of SAR (measured) = 0.458 W/kg

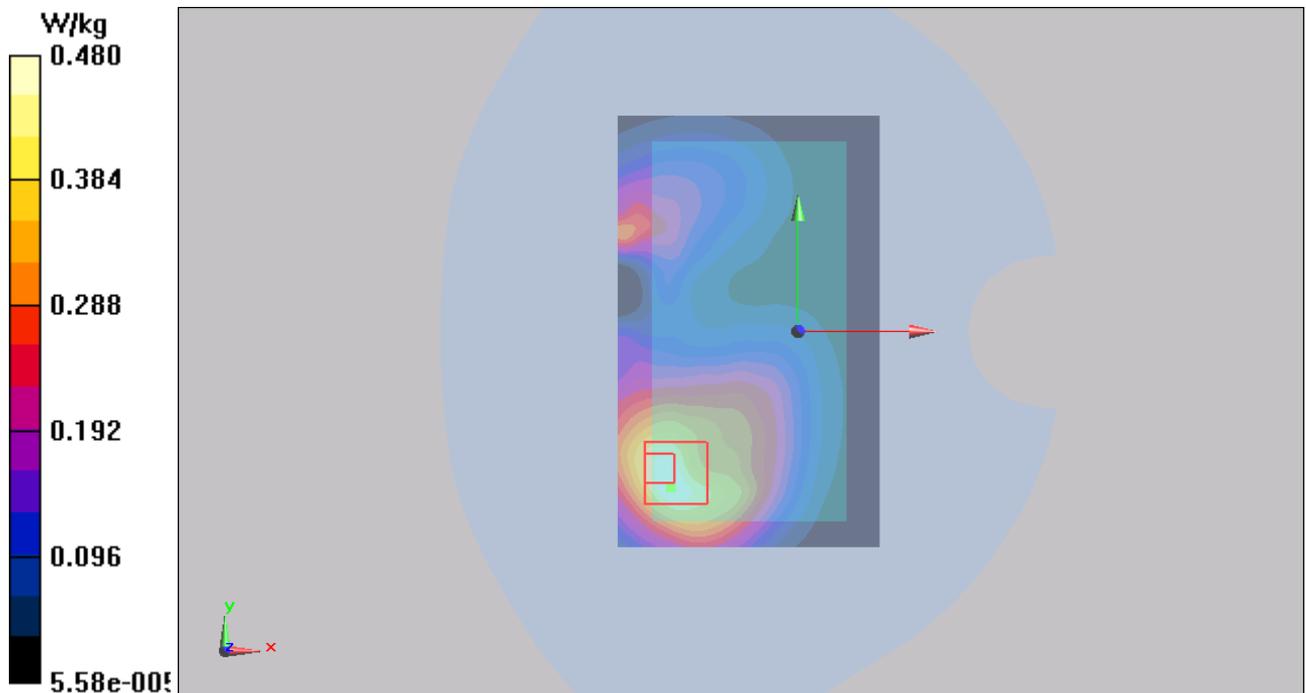


Figure 43 Body, Front Side, GSM 1900 GPRS (2Txslots) Channel 661

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

Report No.: RHA1311-0086SAR01R2

Page 91 of 166

GSM 1900 GPRS (2Txslots) Left Edge Middle (Battery 1, Distance 10mm)

Date/Time: 11/13/2013 7:15:58 PM

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.504$ mho/m; $\epsilon_r = 53.137$; $\rho = 1000$ 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 - SN3753; ConvF(7.33, 7.33, 7.33); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Left Edge Middle/Area Scan (31x101x1): Interpolated grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.143 W/kg

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

Reference Value = 5.291 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 0.207 mW/g

SAR(1 g) = 0.130 mW/g; SAR(10 g) = 0.077 mW/g

Maximum value of SAR (measured) = 0.143 W/kg

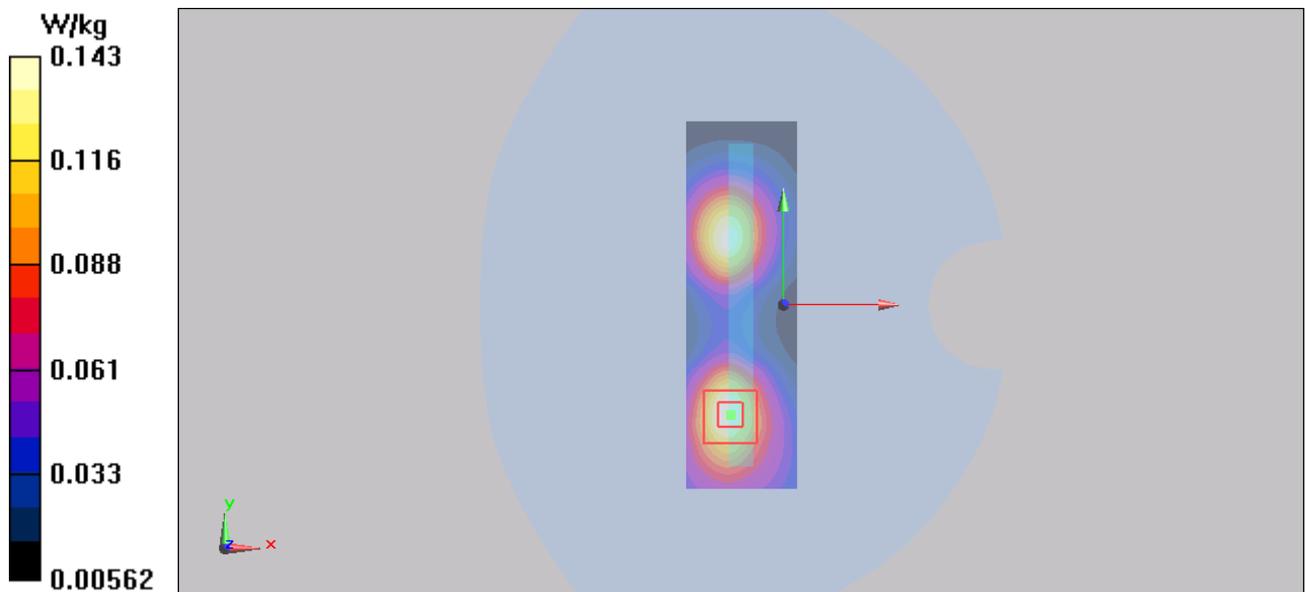


Figure 44 Body, Left Edge, GSM 1900 GPRS (2Txslots) Channel 661

GSM 1900 GPRS (2Txslots) Right Edge Middle (Battery 1, Distance 10mm)

Date/Time: 11/13/2013 7:39:21 PM

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.504$ mho/m; $\epsilon_r = 53.137$; $\rho = 1000$ 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 - SN3753; ConvF(7.33, 7.33, 7.33); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Right Edge Middle/Area Scan (31x101x1): Interpolated grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.163 W/kg

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

Reference Value = 9.652 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 0.227 mW/g

SAR(1 g) = 0.142 mW/g; SAR(10 g) = 0.085 mW/g

Maximum value of SAR (measured) = 0.151 W/kg

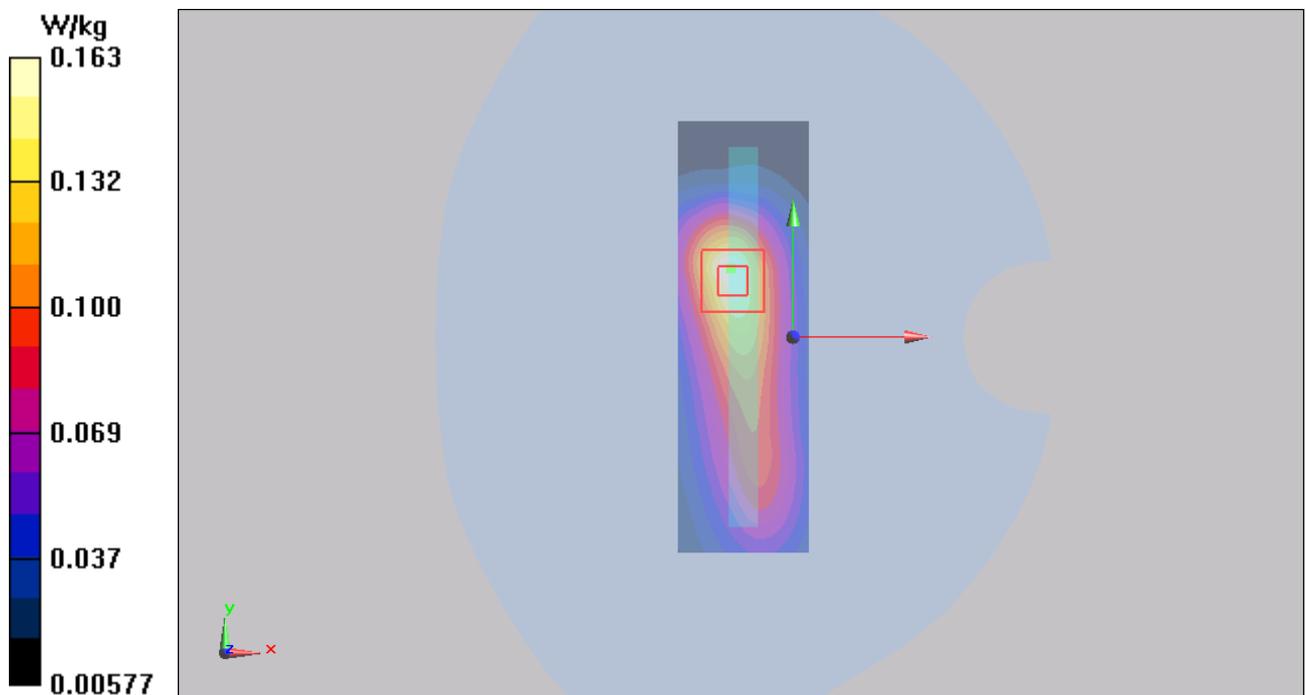


Figure 45 Body, Right Edge, GSM 1900 GPRS (2Txslots) Channel 661

GSM 1900 GPRS (2Txslots) Bottom Edge Middle (Battery 1, Distance 10mm)

Date/Time: 11/13/2013 6:51:44 PM

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.504$ mho/m; $\epsilon_r = 53.137$; $\rho = 1000$ 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 - SN3753; ConvF(7.33, 7.33, 7.33); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Bottom Edge Middle/Area Scan (31x61x1): Interpolated grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.671 W/kg

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

Reference Value = 19.528 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 1.024 mW/g

SAR(1 g) = 0.596 mW/g; SAR(10 g) = 0.320 mW/g

Maximum value of SAR (measured) = 0.674 W/kg

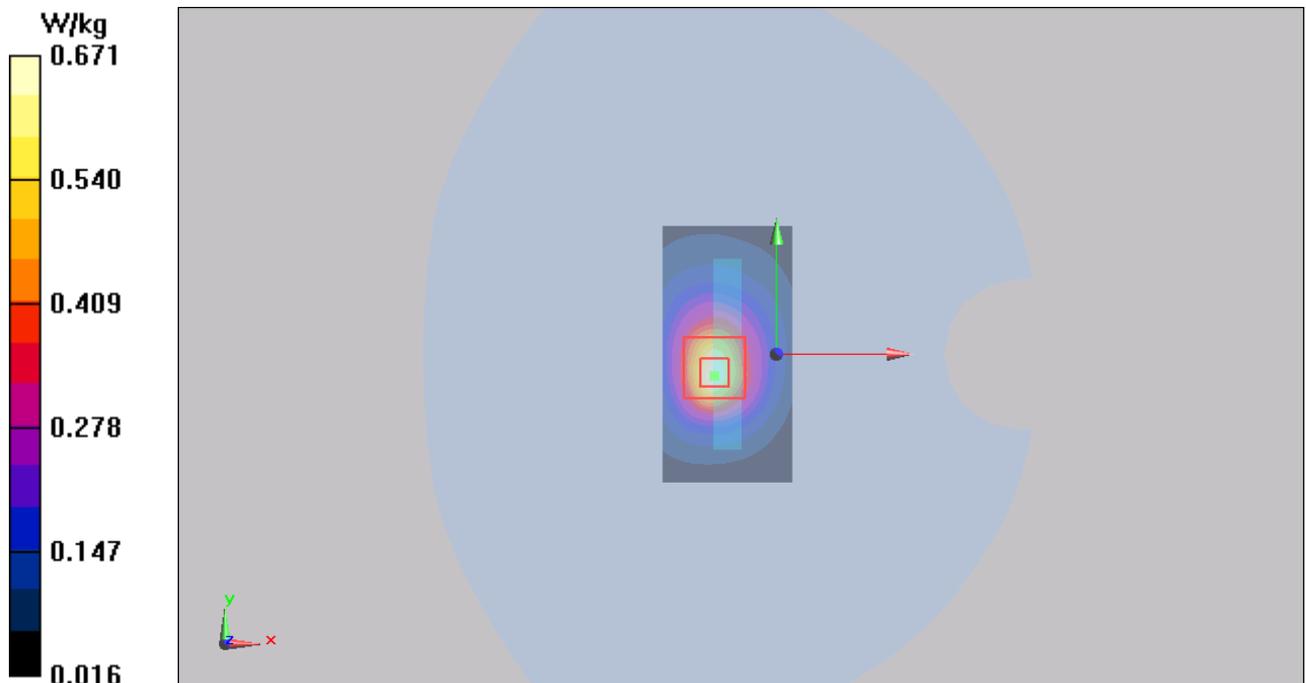


Figure 46 Body, Bottom Edge, GSM 1900 GPRS (2Txslots) Channel 661

GSM 1900 EGPRS (2Txslots) Bottom Edge Middle (Battery 1, Distance 10mm)

Date/Time: 11/13/2013 11:40:56 PM

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.504$ mho/m; $\epsilon_r = 53.137$; $\rho = 1000$ 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 - SN3753; ConvF(7.33, 7.33, 7.33); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Bottom Edge Middle/Area Scan (31x61x1): Interpolated grid: dx=10mm, dy=10mm

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

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

Reference Value = 19.391 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 1.537 mW/g

SAR(1 g) = 0.612 mW/g; SAR(10 g) = 0.325 mW/g

Maximum value of SAR (measured) = 0.677 W/kg

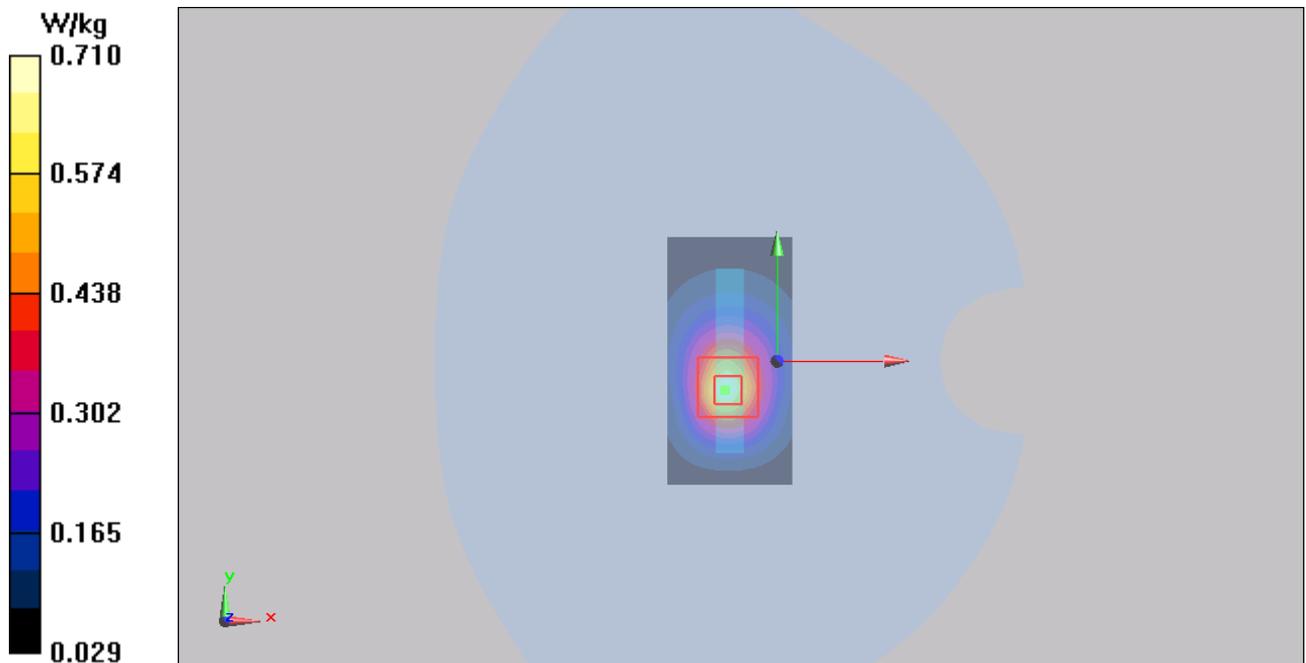


Figure 47 Body, Bottom Edge, GSM 1900 EGPRS (2Txslots) Channel 661

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RHA1311-0086SAR01R2

Page 95 of 166

GSM 1900 GPRS (2Txslots) Bottom Edge Middle (Battery 2, Distance 10mm)

Date/Time: 11/13/2013 11:28:56 PM

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.504$ mho/m; $\epsilon_r = 53.137$; $\rho = 1000$ 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 - SN3753; ConvF(7.33, 7.33, 7.33); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Bottom Edge Middle/Area Scan (31x61x1): Interpolated grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.708 W/kg

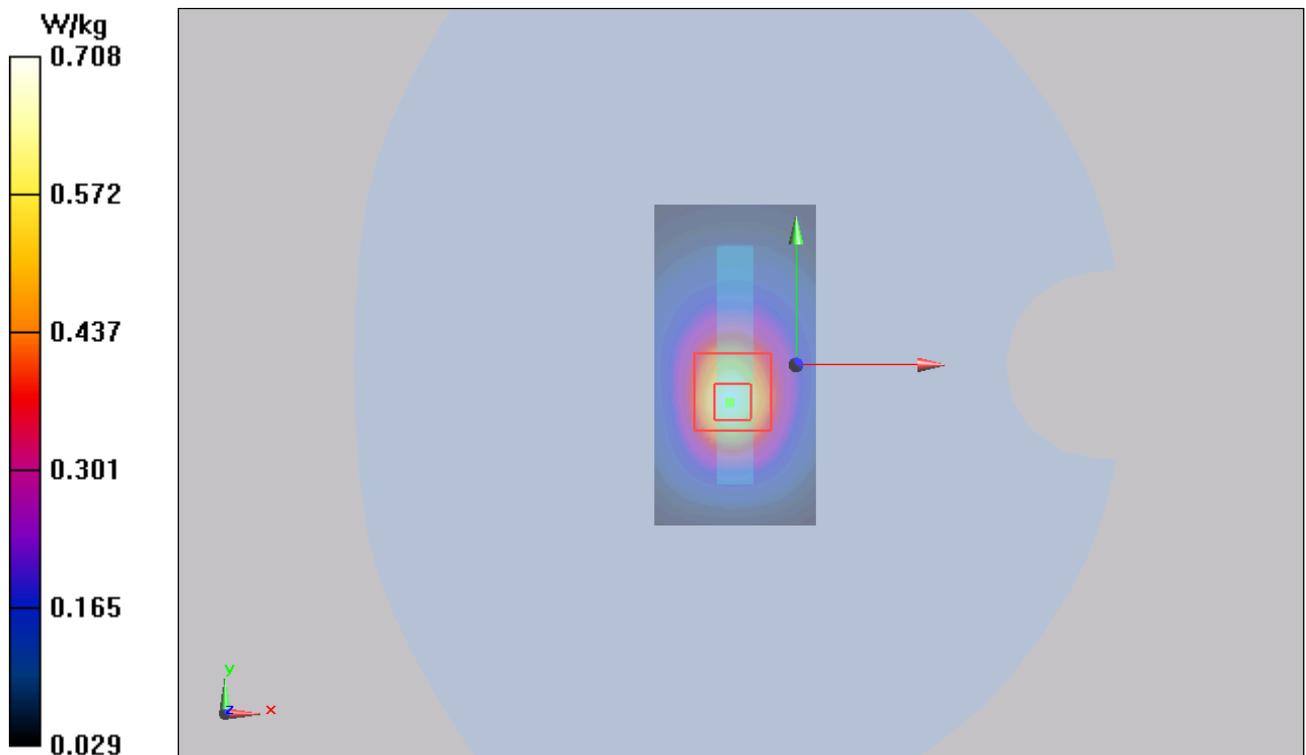
Bottom Edge Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 19.390 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 1.094 mW/g

SAR(1 g) = 0.631 mW/g; SAR(10 g) = 0.332 mW/g

Maximum value of SAR (measured) = 0.688 W/kg



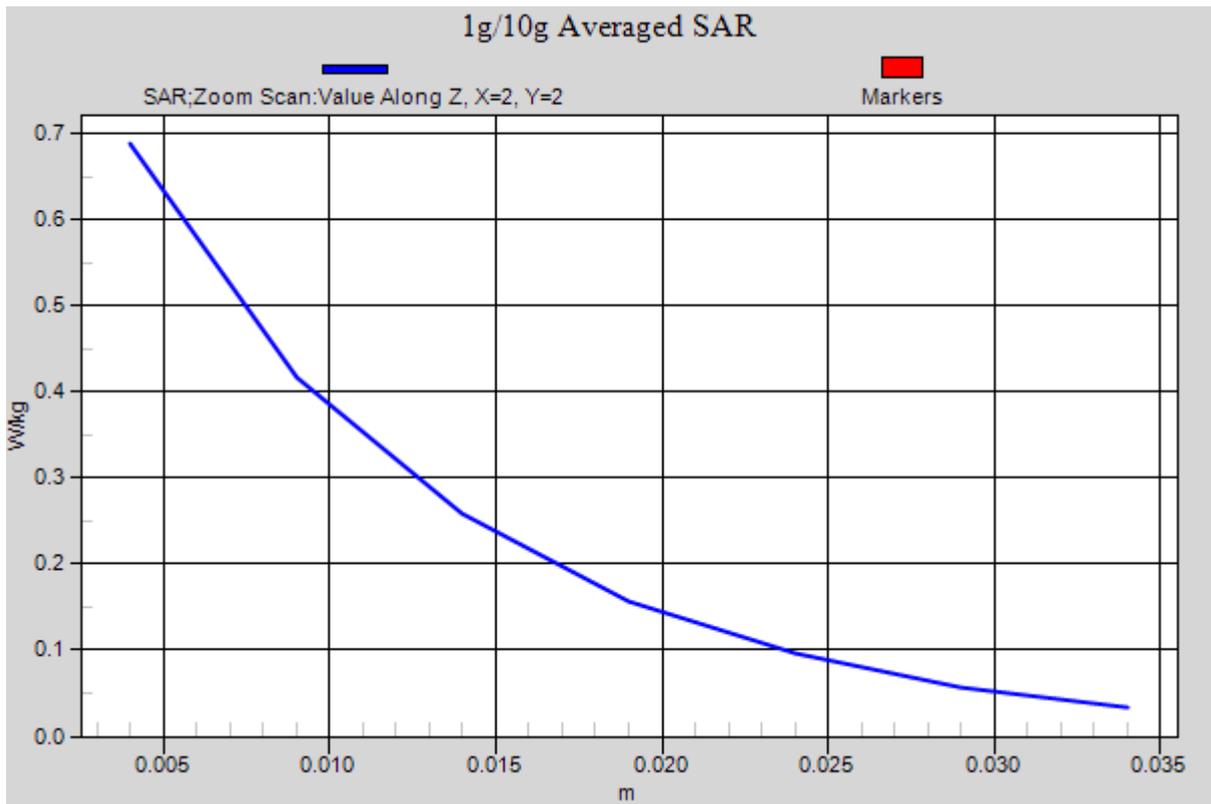


Figure 48 Body, Bottom Edge, GSM 1900 Channel 661

GSM 1900 GPRS (2Txslots) Bottom Edge Middle (Battery 3, Distance 10mm)

Date/Time: 11/14/2013 12:12:39 AM

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.504$ mho/m; $\epsilon_r = 53.137$; $\rho = 1000$ 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 - SN3753; ConvF(7.33, 7.33, 7.33); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Bottom Edge Middle/Area Scan (31x61x1): Interpolated grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.716 W/kg

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

Reference Value = 18.261 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 1.072 mW/g

SAR(1 g) = 0.618 mW/g; SAR(10 g) = 0.333 mW/g

Maximum value of SAR (measured) = 0.687 W/kg

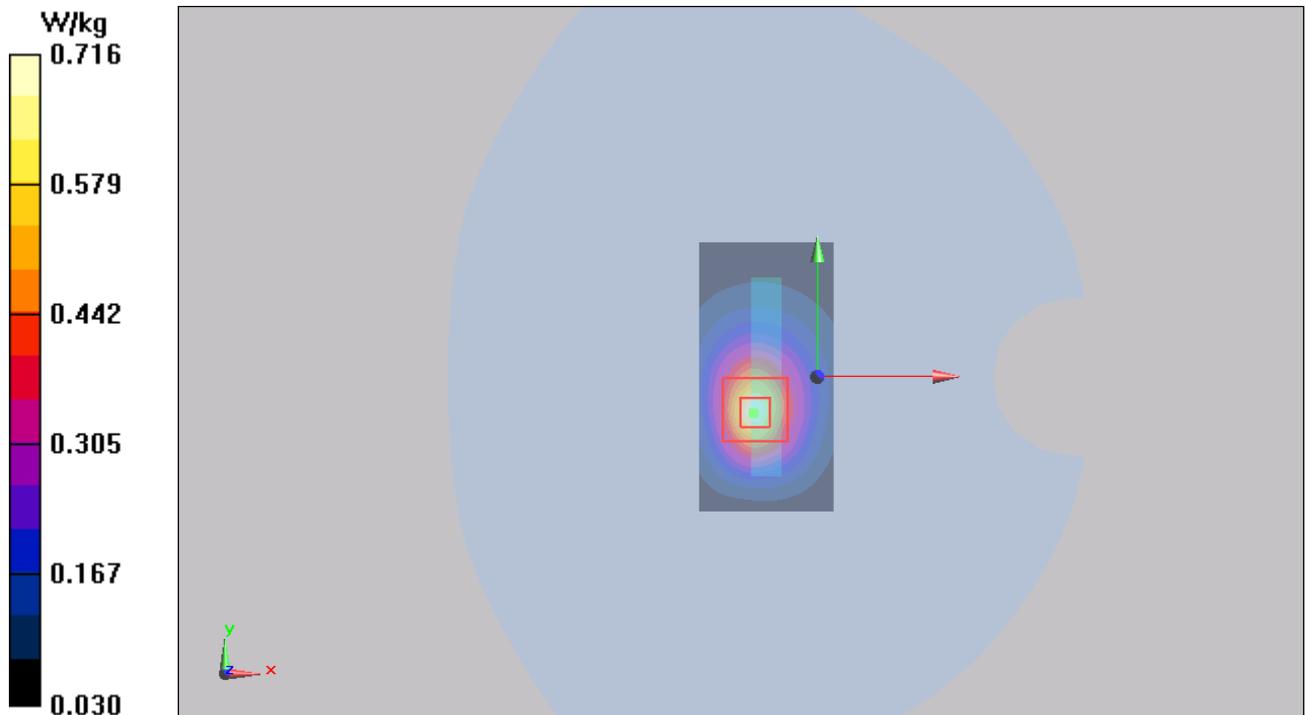


Figure 49 Body, Bottom Edge, GSM 1900 Channel 661

GSM 1900 GPRS (2Txslots) Bottom Edge Middle (Battery 4, Distance 10mm)

Date/Time: 11/14/2013 12:28:37 AM

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.504$ mho/m; $\epsilon_r = 53.137$; $\rho = 1000$ 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 - SN3753; ConvF(7.33, 7.33, 7.33); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Bottom Edge Middle/Area Scan (31x61x1): Interpolated grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.681 W/kg

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

Reference Value = 18.389 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 1.058 mW/g

SAR(1 g) = 0.617 mW/g; SAR(10 g) = 0.332 mW/g

Maximum value of SAR (measured) = 0.673 W/kg

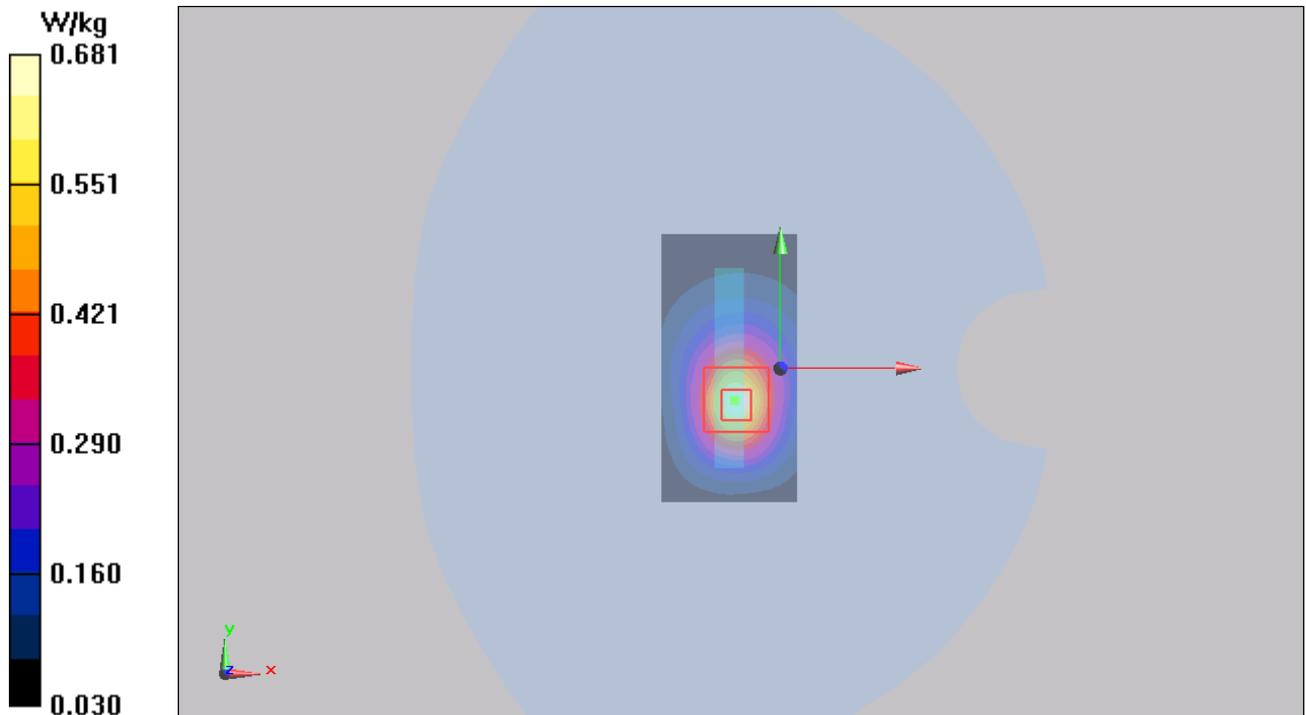


Figure 50 Body, Bottom Edge, GSM 1900 Channel 661

GSM 1900 GPRS (2Txslots) Bottom Edge Middle (Battery 5, Distance 10mm)

Date/Time: 11/14/2013 12:42:52 AM

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.504$ mho/m; $\epsilon_r = 53.137$; $\rho = 1000$ 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 - SN3753; ConvF(7.33, 7.33, 7.33); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Bottom Edge Middle/Area Scan (31x61x1): Interpolated grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.714 W/kg

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

Reference Value = 19.423 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 0.929 mW/g

SAR(1 g) = 0.602 mW/g; SAR(10 g) = 0.319 mW/g

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

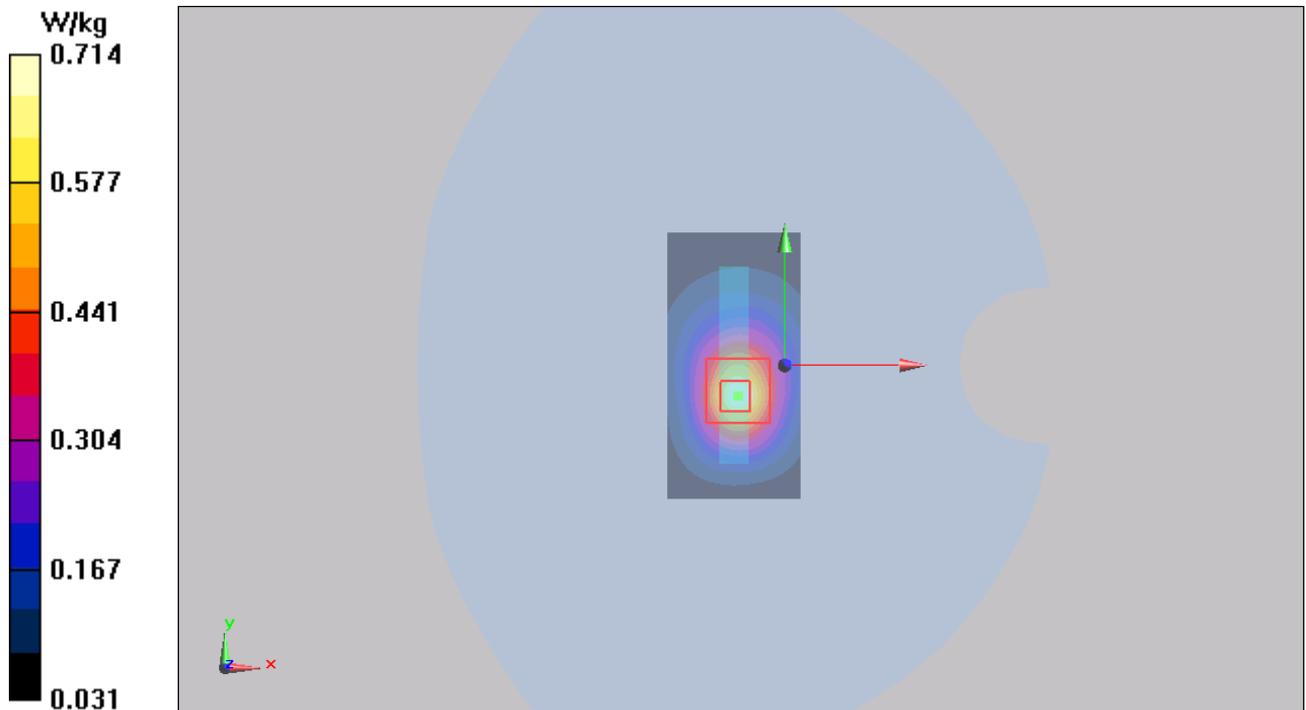


Figure 51 Body, Bottom Edge, GSM 1900 Channel 661

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

Report No.: RHA1311-0086SAR01R2

Page 100 of 166

802.11b Left Cheek High(Battery 1)

Date/Time: 11/23/2013 1:26:40 PM

Communication System: 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2462$ MHz; $\sigma = 1.818$ mho/m; $\epsilon_r = 39.076$; $\rho = 1000$ 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 - SN3753; ConvF(6.86, 6.86, 6.86); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Left Cheek High/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.118 W/kg

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

Reference Value = 4.394 V/m; Power Drift = 0.038 dB

Peak SAR (extrapolated) = 0.226 mW/g

SAR(1 g) = 0.097 mW/g; SAR(10 g) = 0.044 mW/g

Maximum value of SAR (measured) = 0.114 W/kg

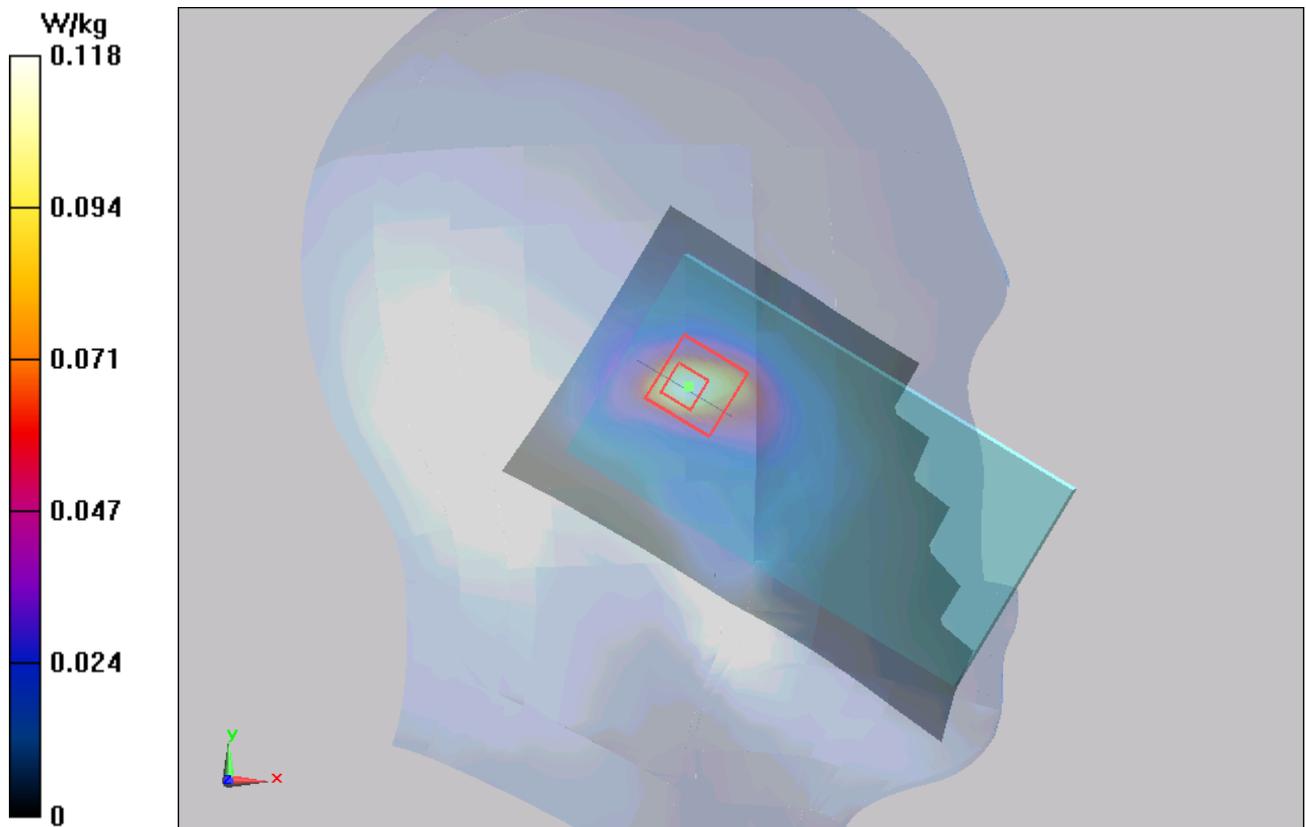


Figure 52 Left Hand Touch Cheek 802.11b Channel 11

802.11b Left Tilt High(Battery 1)

Date/Time: 11/23/2013 1:44:00 PM

Communication System: 802.11b; Frequency: 2462 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 2462$ MHz; $\sigma = 1.818$ mho/m; $\epsilon_r = 39.076$; $\rho = 1000$ 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 - SN3753; ConvF(6.86, 6.86, 6.86); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Left Tilt High/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.0482 W/kg

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

Reference Value = 3.961 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.089 mW/g

SAR(1 g) = 0.043 mW/g; SAR(10 g) = 0.022 mW/g

Maximum value of SAR (measured) = 0.0479 W/kg

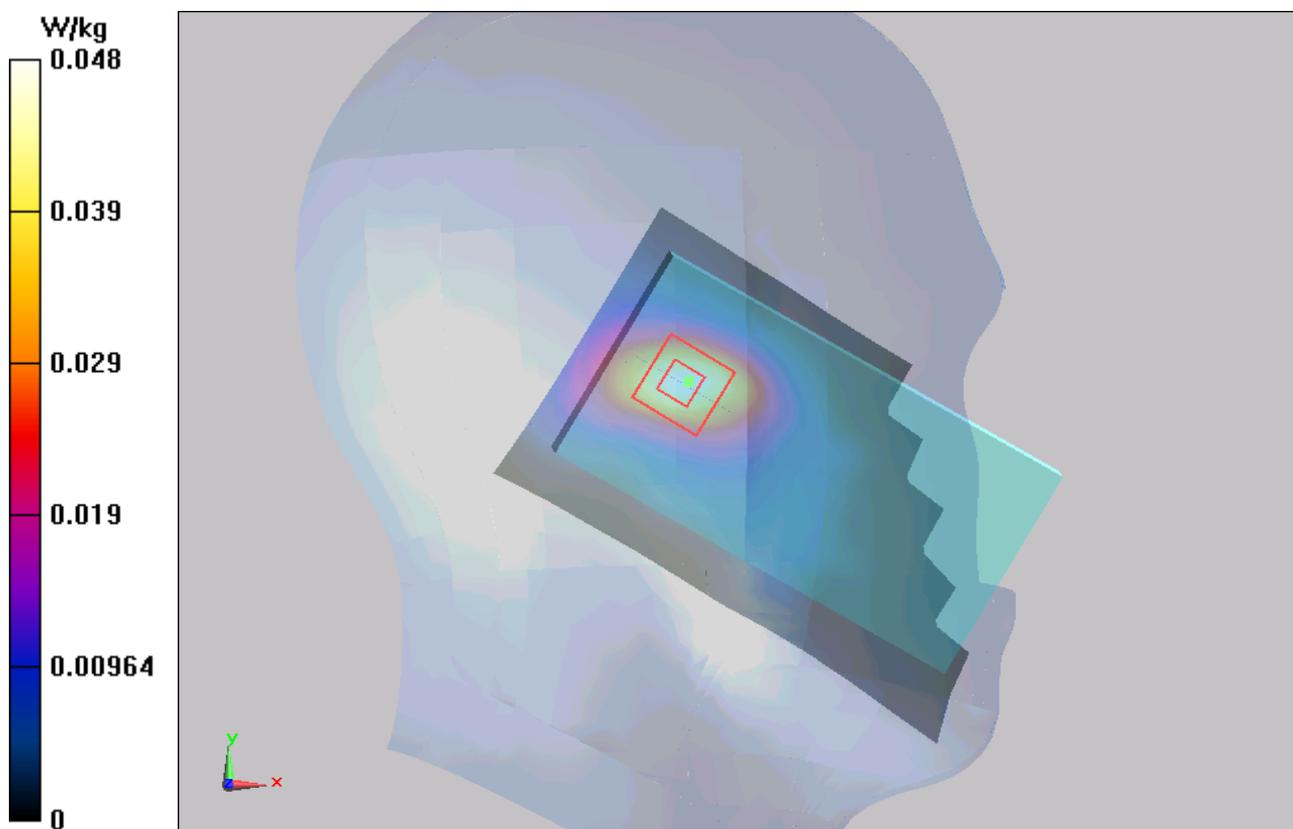


Figure 53 Left Hand Tilt 15° 802.11b Channel 11

802.11b Right Cheek High(Battery 1)

Date/Time: 11/23/2013 2:11:29 PM

Communication System: 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2462$ MHz; $\sigma = 1.818$ mho/m; $\epsilon_r = 39.076$; $\rho = 1000$ 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 - SN3753; ConvF(6.86, 6.86, 6.86); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Right Cheek High/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.0893 W/kg

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

Reference Value = 6.426 V/m; Power Drift = 0.020 dB

Peak SAR (extrapolated) = 0.176 mW/g

SAR(1 g) = 0.077 mW/g; SAR(10 g) = 0.035 mW/g

Maximum value of SAR (measured) = 0.0858 W/kg

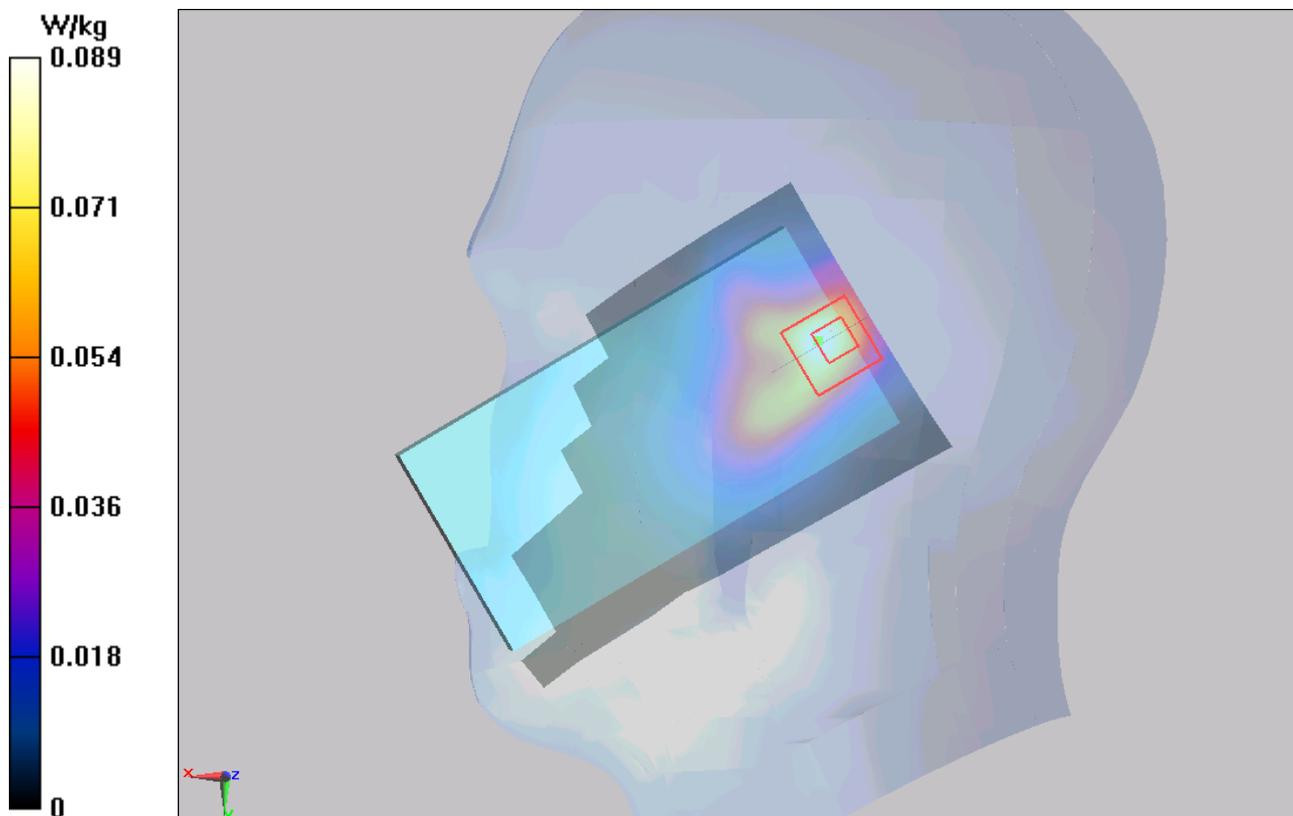


Figure 54 Right Hand Touch Cheek 802.11b Channel 11

802.11b Right Tilt High(Battery 1)

Date/Time: 11/23/2013 2:28:12 PM

Communication System: 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2462$ MHz; $\sigma = 1.818$ mho/m; $\epsilon_r = 39.076$; $\rho = 1000$ 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 - SN3753; ConvF(6.86, 6.86, 6.86); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Right Tilt High/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.0493 W/kg

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

Reference Value = 4.820 V/m; Power Drift = 0.023 dB

Peak SAR (extrapolated) = 0.096 mW/g

SAR(1 g) = 0.046 mW/g; SAR(10 g) = 0.023 mW/g

Maximum value of SAR (measured) = 0.0512 W/kg

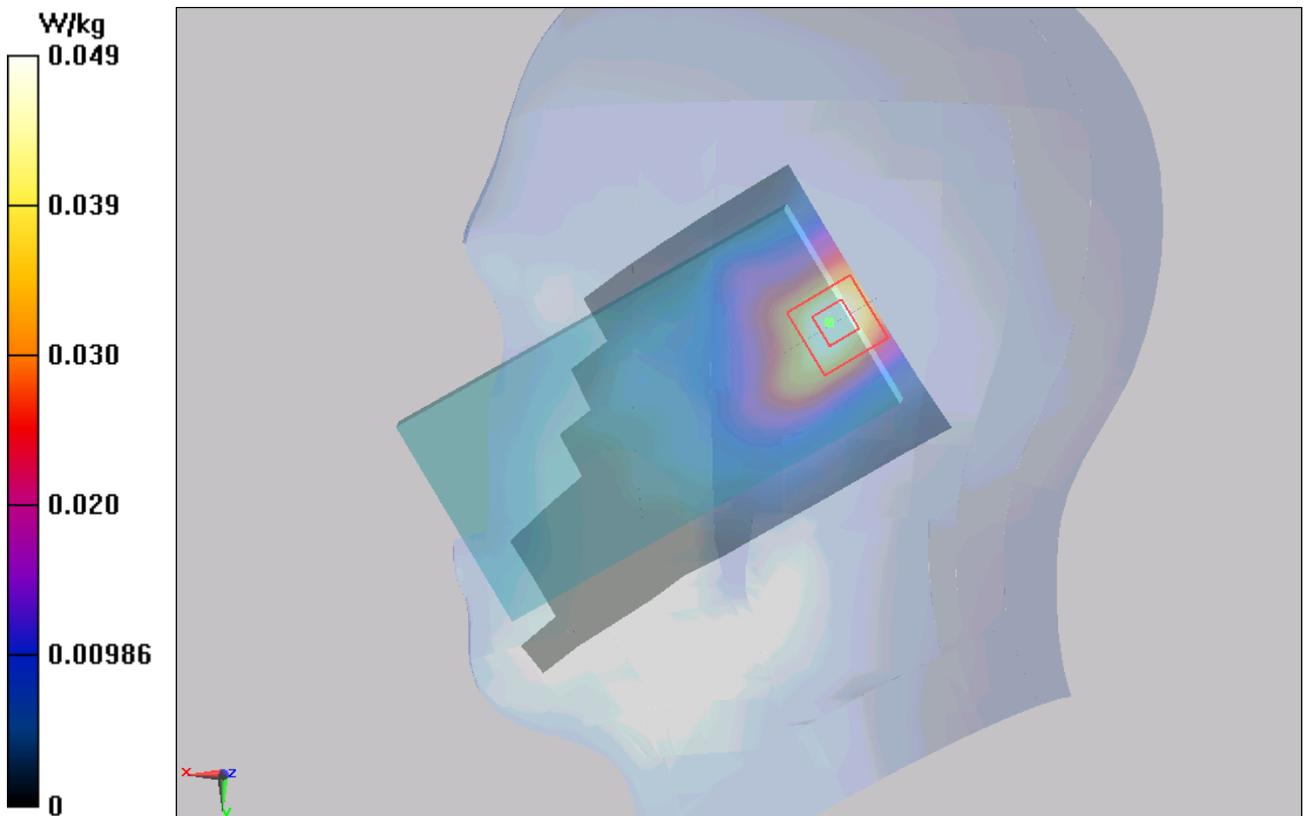


Figure 55 Right Hand Tilt 15° 802.11b Channel 11

802.11b Left Cheek High(Battery 2)

Date/Time: 11/23/2013 2:47:21 PM

Communication System: 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2462$ MHz; $\sigma = 1.818$ mho/m; $\epsilon_r = 39.076$; $\rho = 1000$ 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 - SN3753; ConvF(6.86, 6.86, 6.86); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Left Cheek High/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.102 W/kg

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

Reference Value = 5.872 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 0.221 mW/g

SAR(1 g) = 0.096 mW/g; SAR(10 g) = 0.043 mW/g

Maximum value of SAR (measured) = 0.107 W/kg

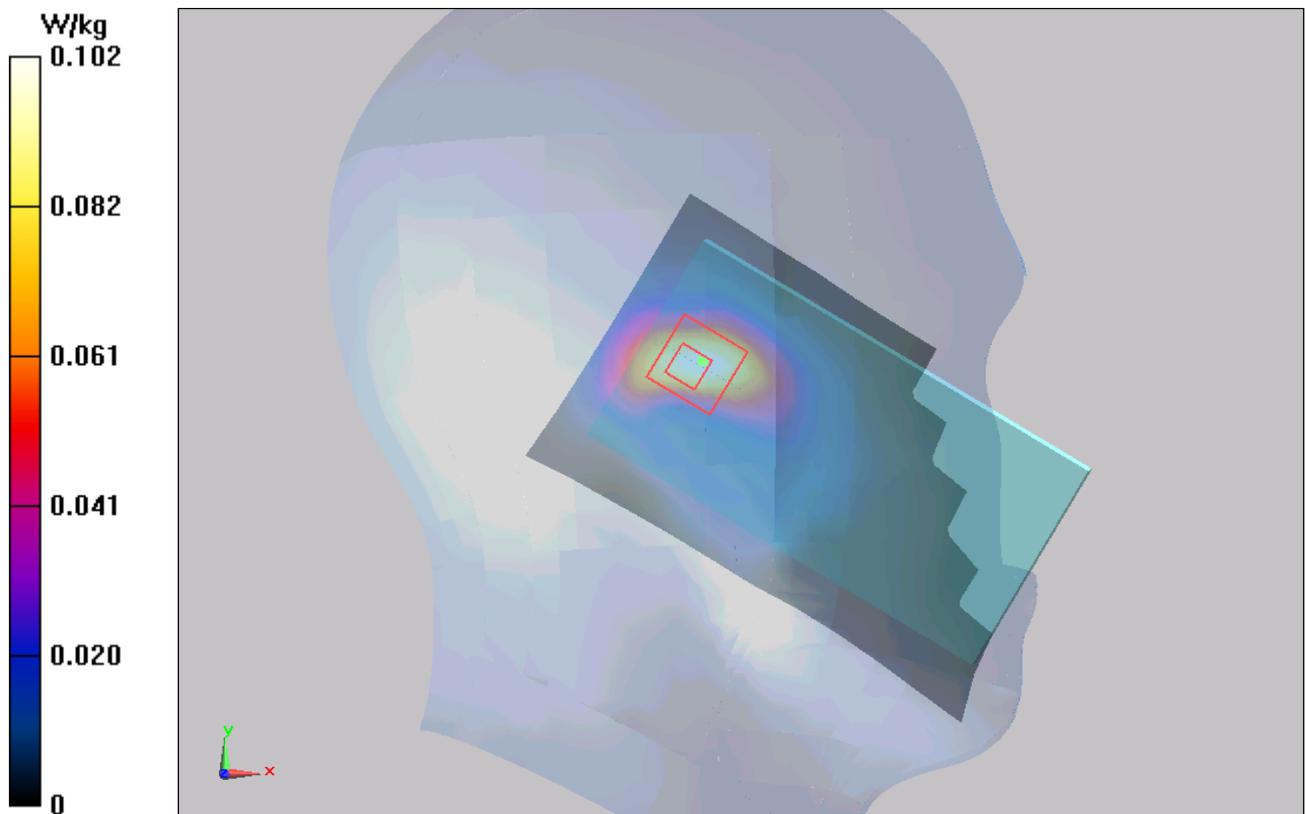


Figure 56 Left Hand Touch Cheek 802.11b Channel 11

802.11b Left Cheek High(Battery 3)

Date/Time: 11/23/2013 3:22:20 PM

Communication System: 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2462$ MHz; $\sigma = 1.818$ mho/m; $\epsilon_r = 39.076$; $\rho = 1000$ 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 - SN3753; ConvF(6.86, 6.86, 6.86); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Left Cheek High/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.105 W/kg

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

Reference Value = 5.876 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.226 mW/g

SAR(1 g) = 0.096 mW/g; SAR(10 g) = 0.043 mW/g

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

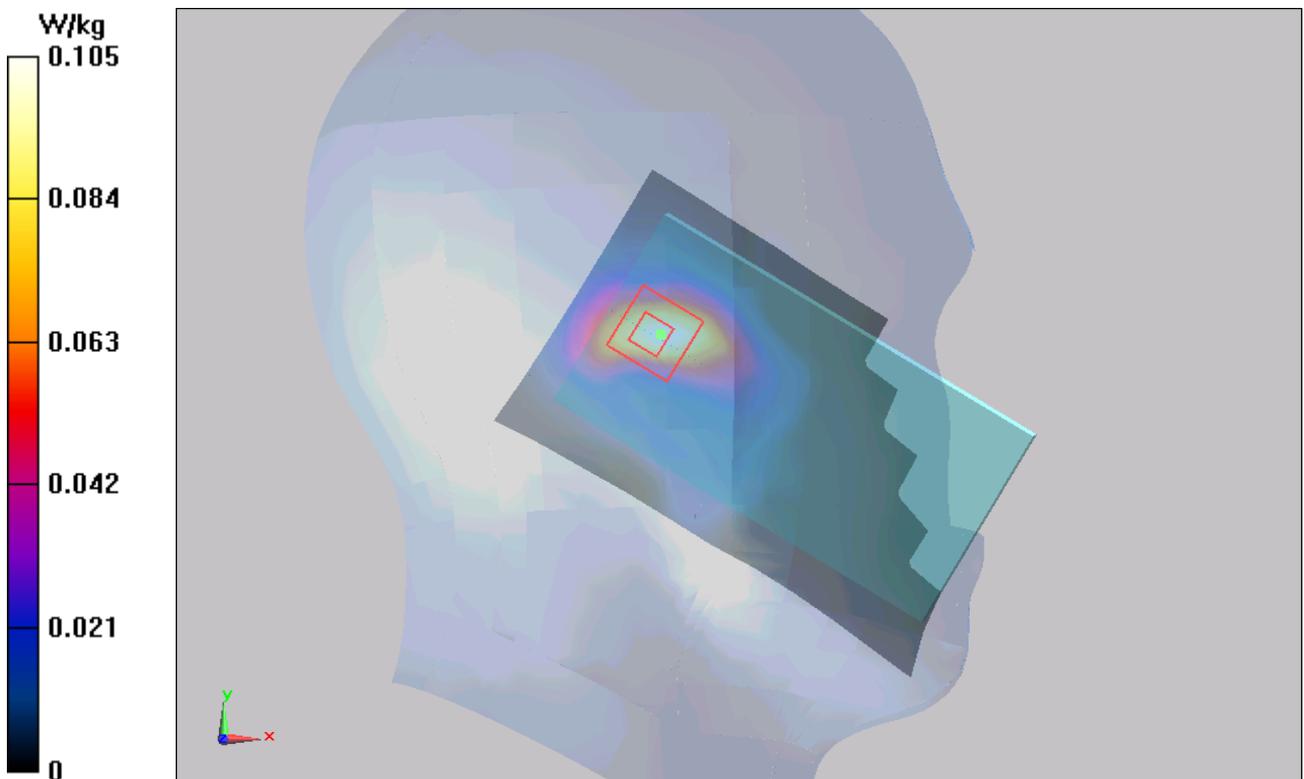


Figure 57 Left Hand Touch Cheek 802.11b Channel 11

802.11b Left Cheek High(Battery 4)

Date/Time: 11/23/2013 3:04:44 PM

Communication System: 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2462$ MHz; $\sigma = 1.818$ mho/m; $\epsilon_r = 39.076$; $\rho = 1000$ 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 - SN3753; ConvF(6.86, 6.86, 6.86); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Left Cheek High/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.105 W/kg

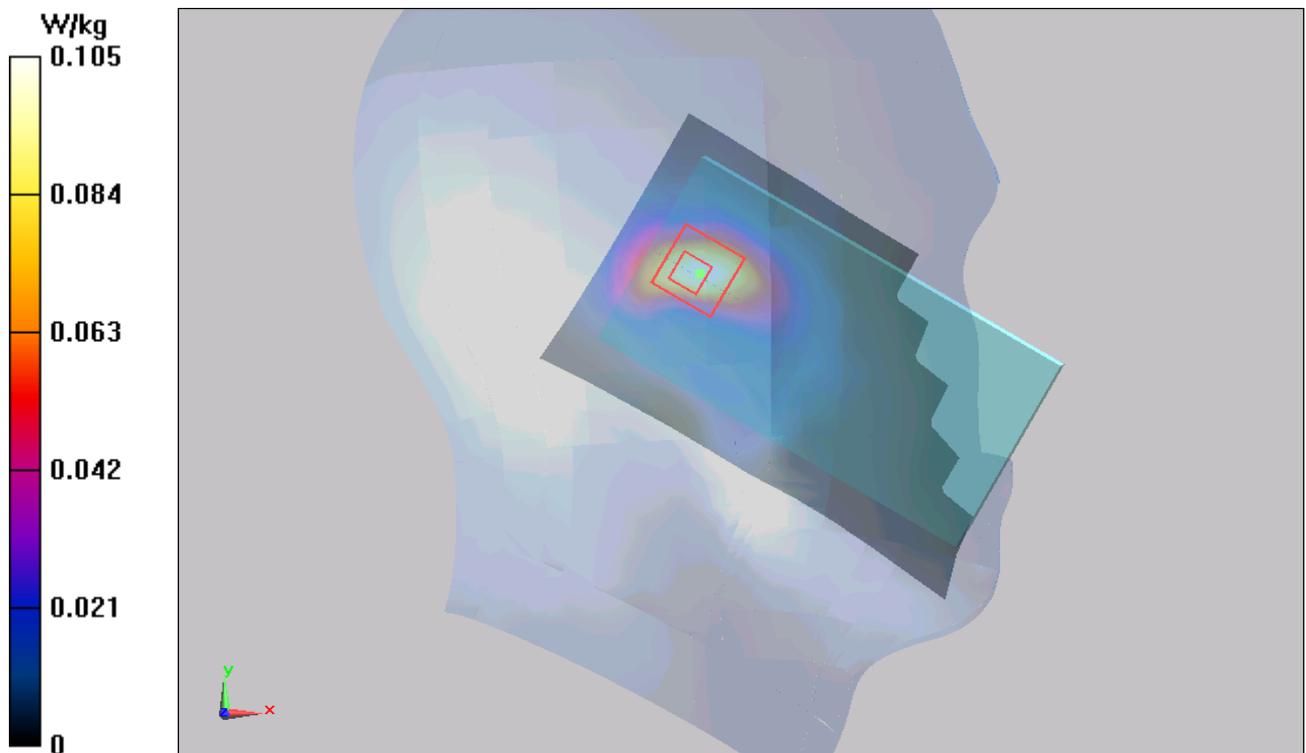
Left Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.894 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.231 mW/g

SAR(1 g) = 0.097 mW/g; SAR(10 g) = 0.043 mW/g

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



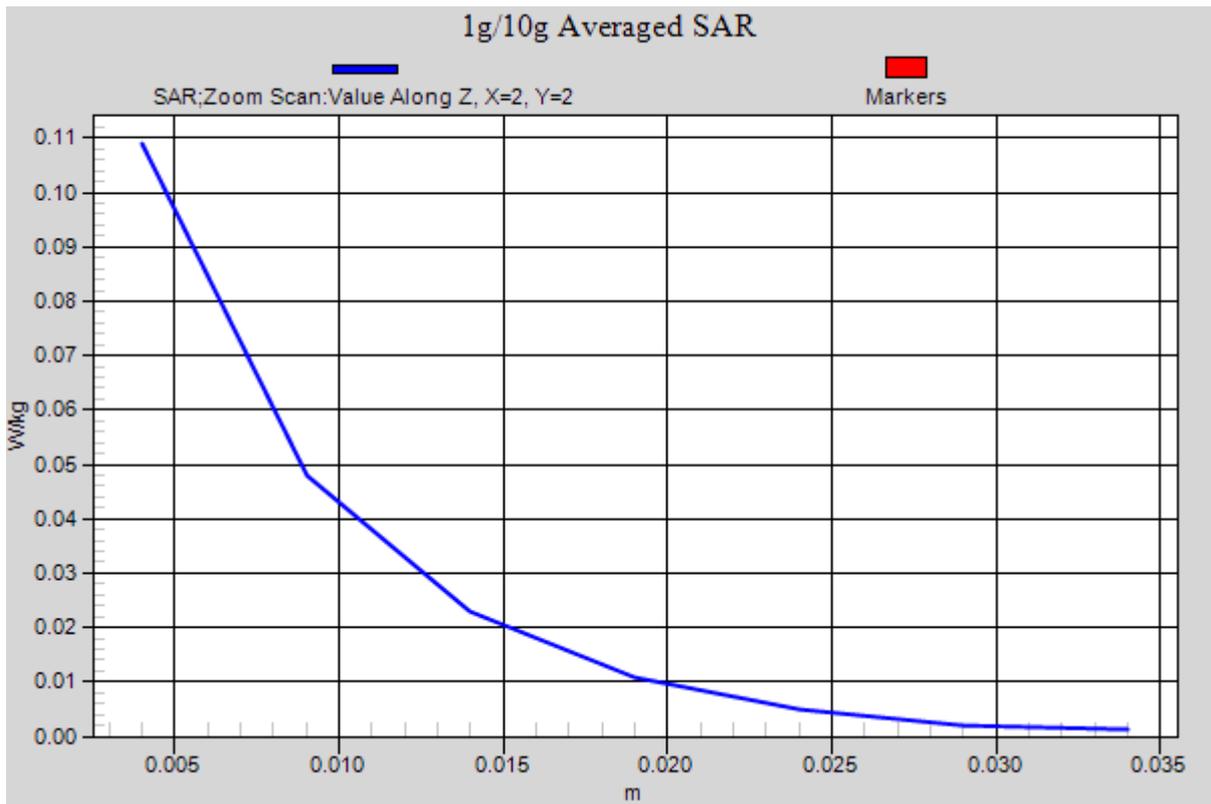


Figure 58 Left Hand Touch Cheek 802.11b Channel 11

802.11b Left Cheek High(Battery 5)

Date/Time: 11/23/2013 3:39:31 PM

Communication System: 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2462$ MHz; $\sigma = 1.818$ mho/m; $\epsilon_r = 39.076$; $\rho = 1000$ 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 - SN3753; ConvF(6.86, 6.86, 6.86); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Left Cheek High/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

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

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

Reference Value = 5.827 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 0.219 mW/g

SAR(1 g) = 0.096 mW/g; SAR(10 g) = 0.043 mW/g

Maximum value of SAR (measured) = 0.110 W/kg

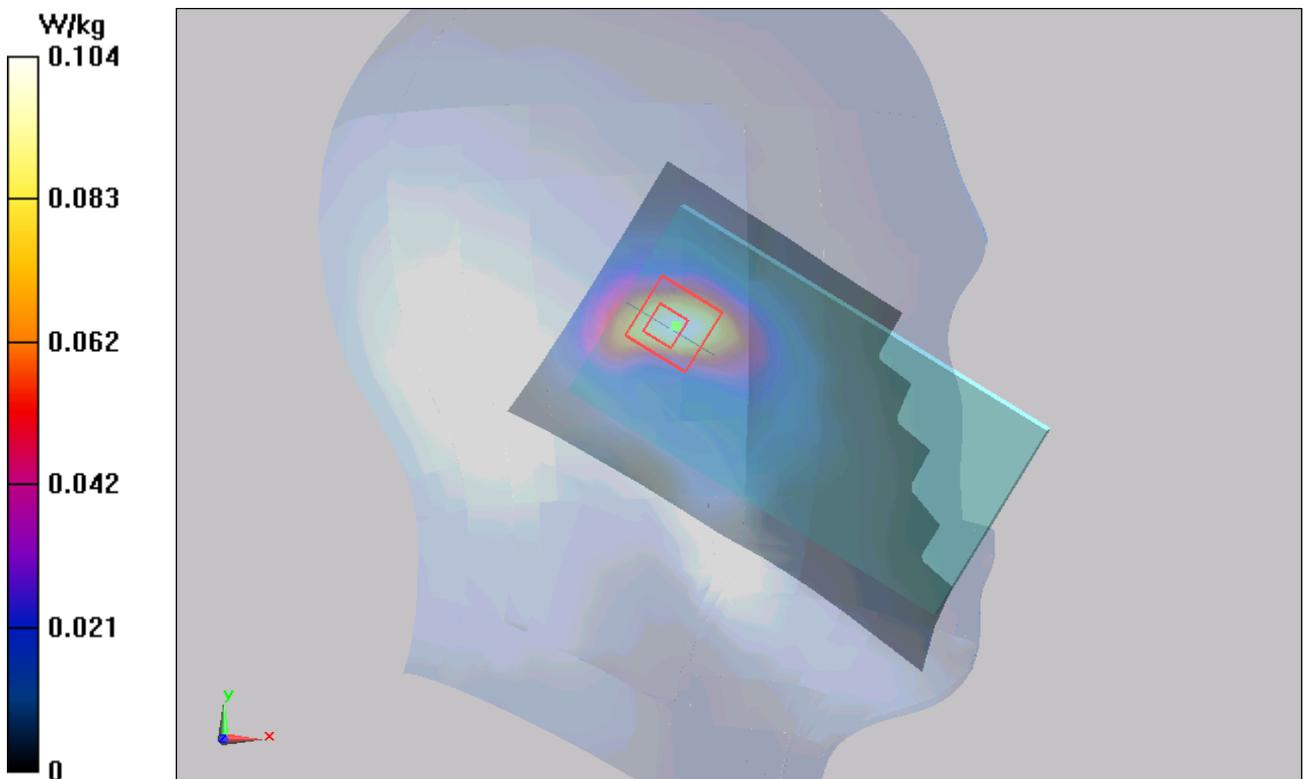


Figure 59 Left Hand Touch Cheek 802.11b Channel 11

802.11b Back Side High(Battery 1, Distance 10mm)

Date/Time: 11/22/2013 2:41:43 PM

Communication System: 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2462$ MHz; $\sigma = 2.009$ mho/m; $\epsilon_r = 52.109$; $\rho = 1000$ 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 - SN3753; ConvF(6.90, 6.90, 6.90); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Back Side High/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.107 W/kg

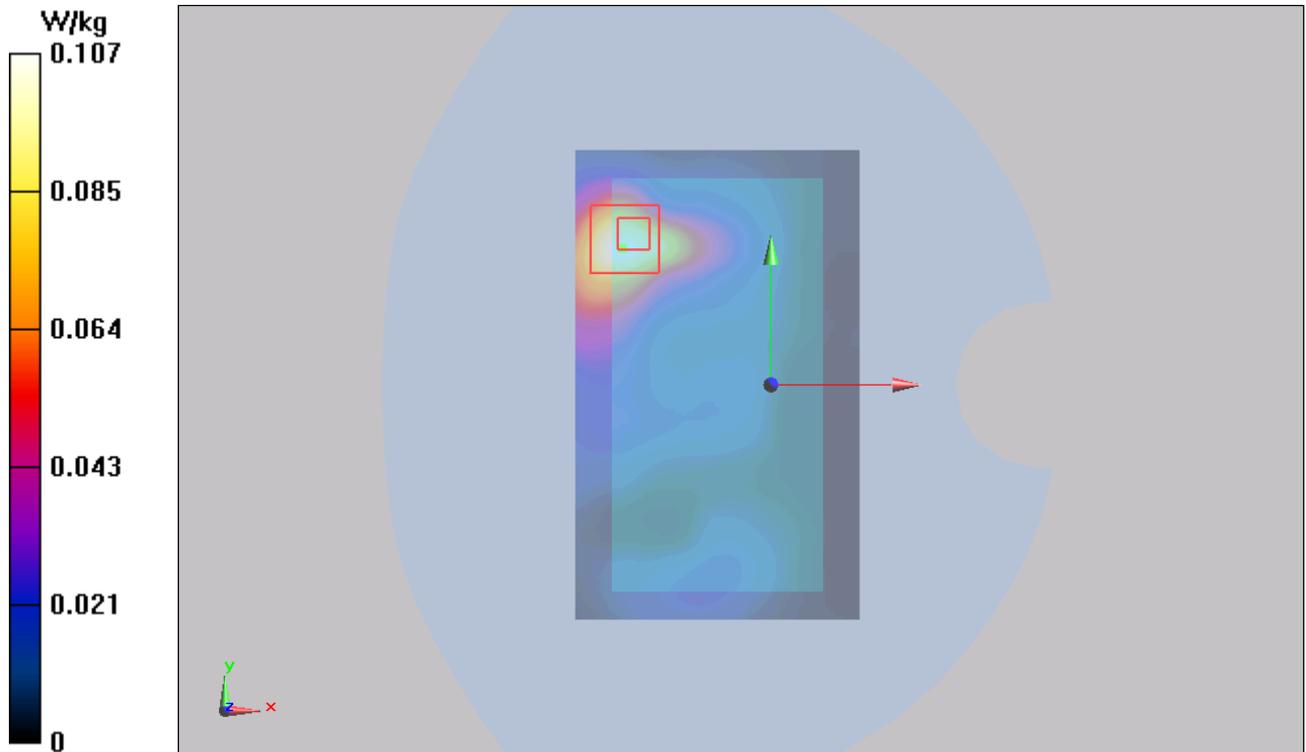
Back Side High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.916 V/m; Power Drift = 0.033 dB

Peak SAR (extrapolated) = 0.210 mW/g

SAR(1 g) = 0.105 mW/g; SAR(10 g) = 0.053 mW/g

Maximum value of SAR (measured) = 0.108 W/kg



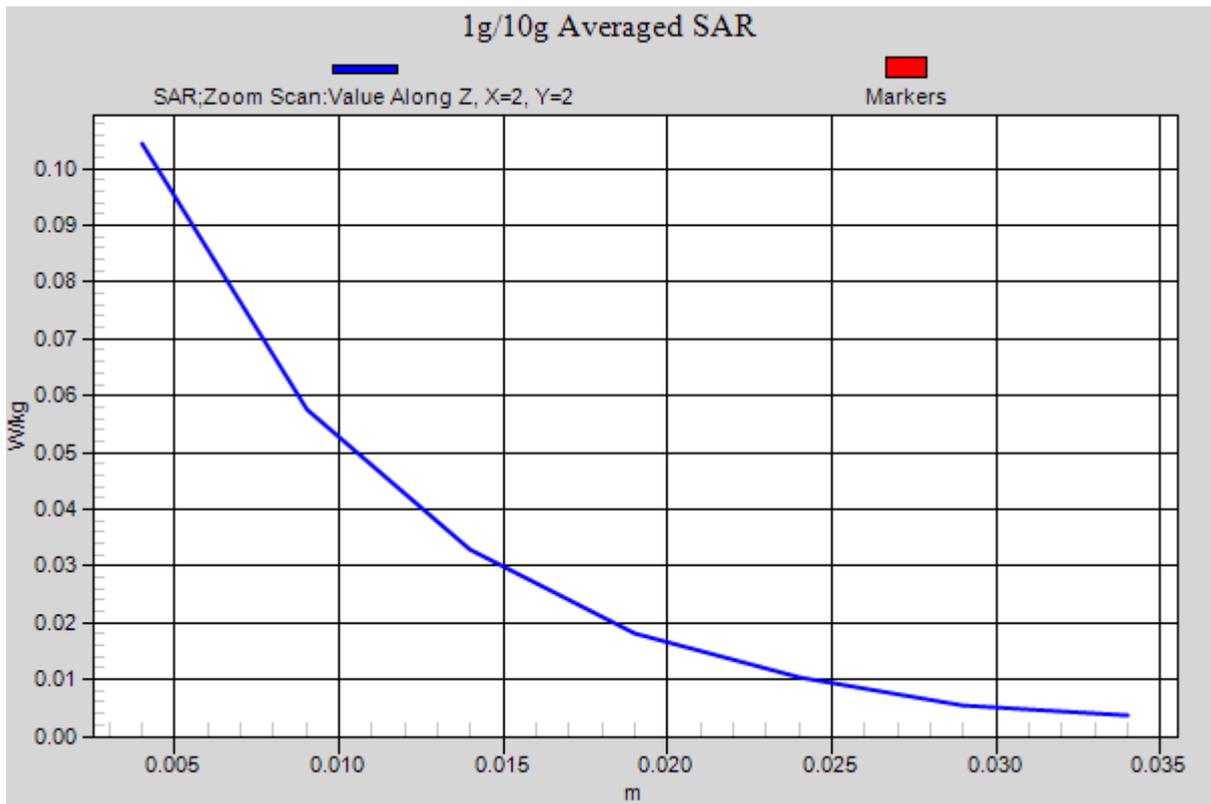


Figure 60 Body, Back Side, 802.11b Channel 11

802.11b Front Side High(Battery 1, Distance 10mm)

Date/Time: 11/22/2013 2:19:59 PM

Communication System: 802.11b; Frequency: 2462 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 2462$ MHz; $\sigma = 2.009$ mho/m; $\epsilon_r = 52.109$; $\rho = 1000$ 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 - SN3753; ConvF(6.90, 6.90, 6.90); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Front Side High/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.0301 W/kg

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

Reference Value = 2.299 V/m; Power Drift = 0.034 dB

Peak SAR (extrapolated) = 0.047 mW/g

SAR(1 g) = 0.026 mW/g; SAR(10 g) = 0.013 mW/g

Maximum value of SAR (measured) = 0.0282 W/kg

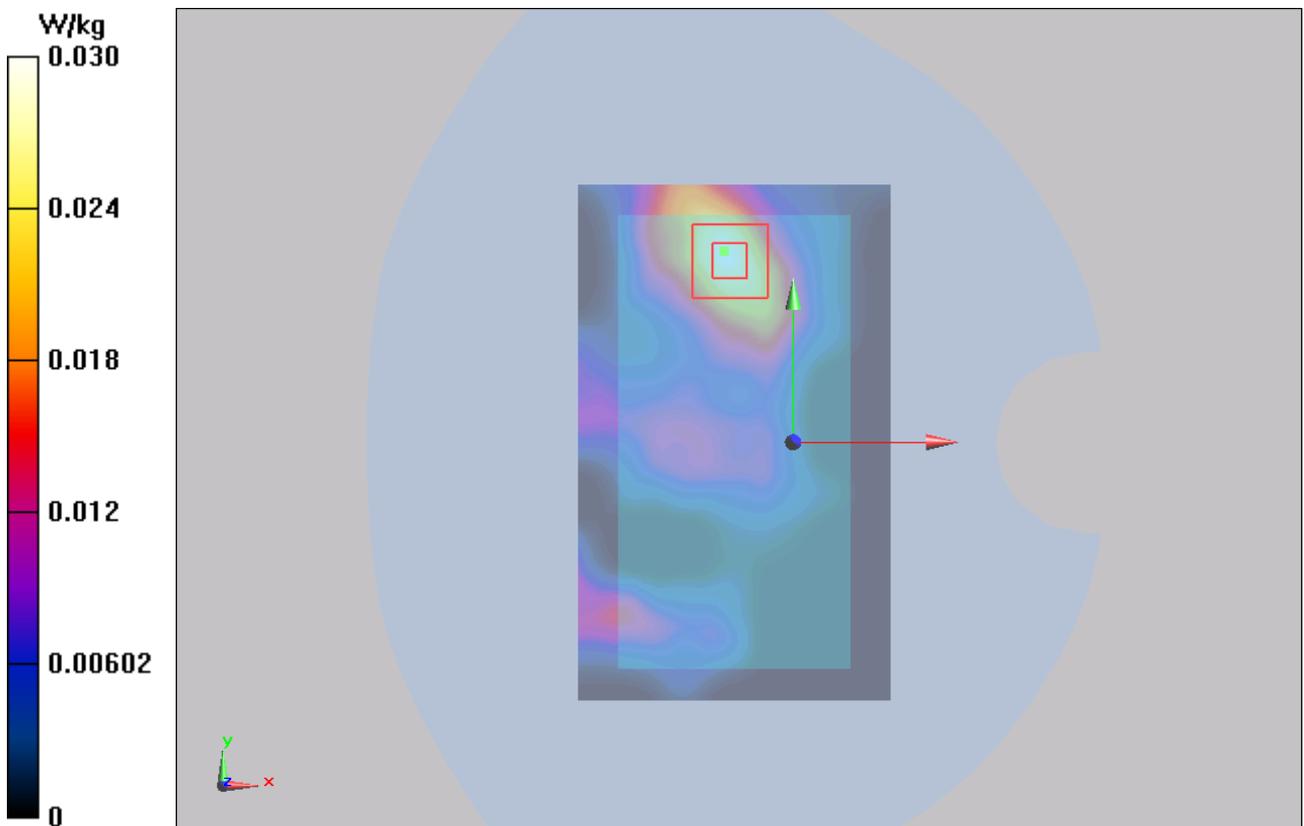


Figure 61 Body, Front Side, 802.11b Channel 11

802.11b Left Edge High(Battery 1, Distance 10mm)

Date/Time: 11/22/2013 3:09:28 PM

Communication System: 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2462$ MHz; $\sigma = 2.009$ mho/m; $\epsilon_r = 52.109$; $\rho = 1000$ 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 - SN3753; ConvF(6.90, 6.90, 6.90); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Left Edge High/Area Scan (31x101x1): Interpolated grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.0123 W/kg

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

Reference Value = 1.952 V/m; Power Drift = 0.116 dB

Peak SAR (extrapolated) = 0.028 mW/g

SAR(1 g) = 0.008 mW/g; SAR(10 g) = 0.003 mW/g

Maximum value of SAR (measured) = 0.00842 W/kg

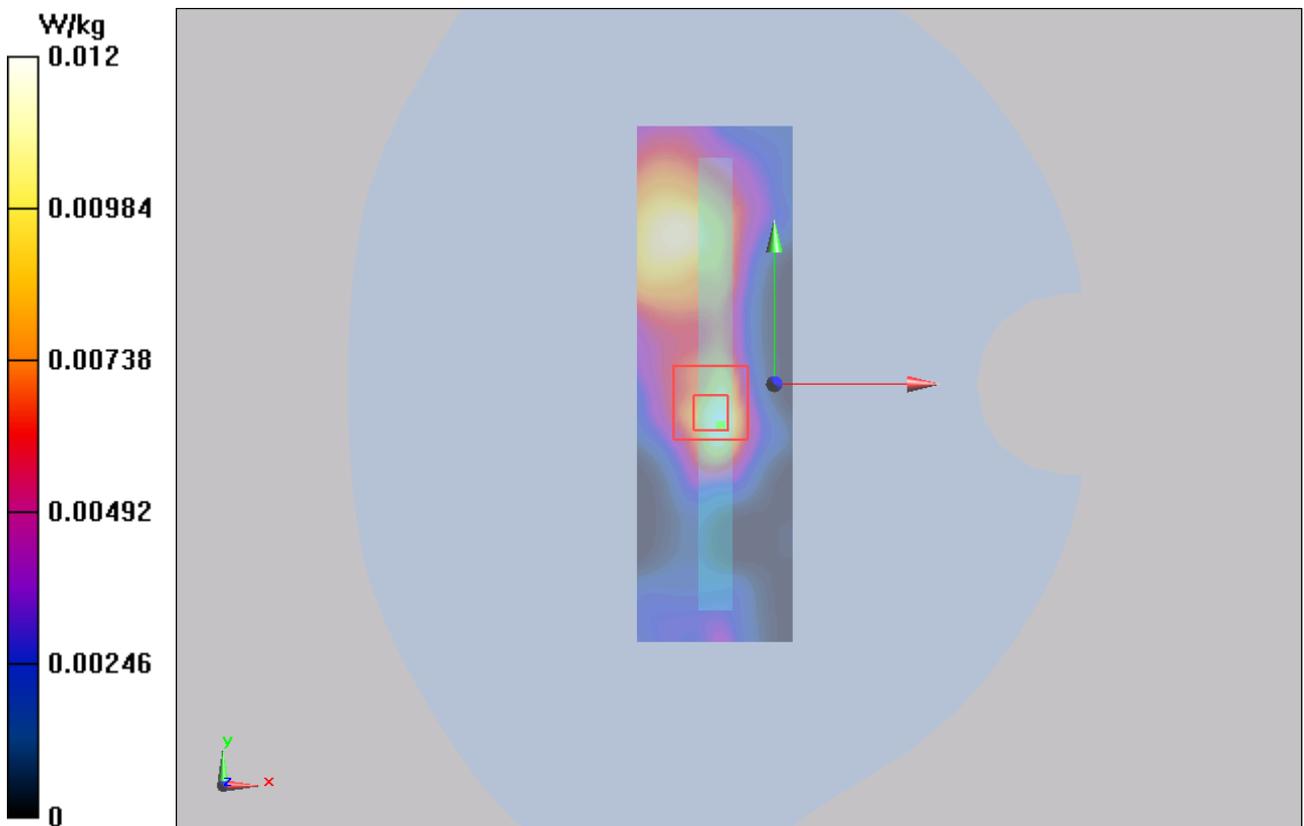


Figure 62 Body, Left Edge, 802.11b Channel 11

802.11b Right Edge High(Battery 1, Distance 10mm)

Date/Time: 11/22/2013 3:27:59 PM

Communication System: 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2462$ MHz; $\sigma = 2.009$ mho/m; $\epsilon_r = 52.109$; $\rho = 1000$ 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 - SN3753; ConvF(6.90, 6.90, 6.90); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Right Edge High/Area Scan (31x101x1): Interpolated grid: dx=10mm, dy=10mm

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

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

Reference Value = 2.087 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 0.042 mW/g

SAR(1 g) = 0.019 mW/g; SAR(10 g) = 0.010 mW/g

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

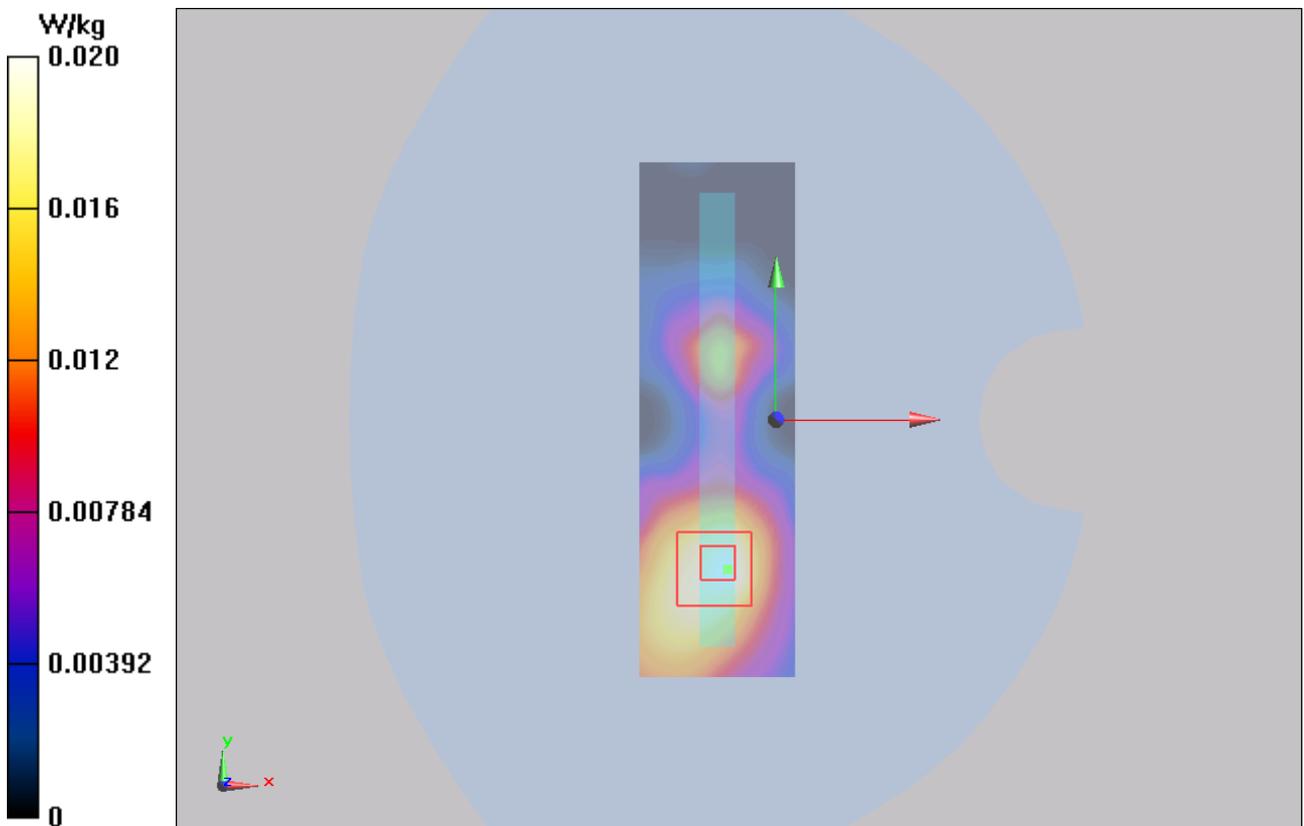


Figure 63 Body, Right Edge, 802.11b Channel 11

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

802.11b Top Edge High(Battery 1, Distance 10mm)

Date/Time: 11/22/2013 3:51:19 PM

Communication System: 802.11b; Frequency: 2462 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 2462$ MHz; $\sigma = 2.009$ mho/m; $\epsilon_r = 52.109$; $\rho = 1000$ 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 - SN3753; ConvF(6.90, 6.90, 6.90); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Top Edge High/Area Scan (31x61x1): Interpolated grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.0972 W/kg

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

Reference Value = 7.336 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.192 mW/g

SAR(1 g) = 0.092 mW/g; SAR(10 g) = 0.043 mW/g

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

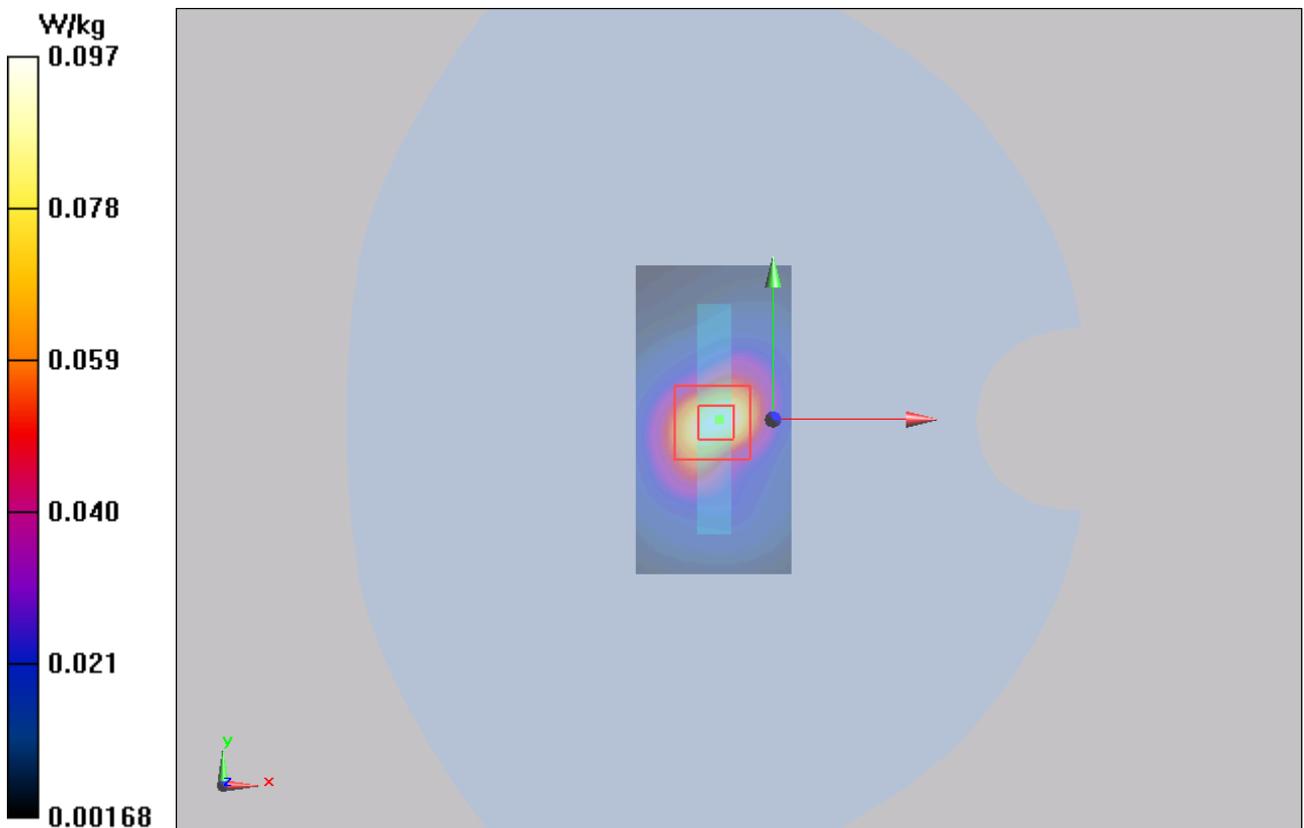


Figure 64 Body, Top Edge, 802.11b Channel 11

802.11b Back Side High(Battery 2, Distance 10mm)

Date/Time: 11/22/2013 4:15:02 PM

Communication System: 802.11b; Frequency: 2462 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 2462$ MHz; $\sigma = 2.009$ mho/m; $\epsilon_r = 52.109$; $\rho = 1000$ 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 - SN3753; ConvF(6.90, 6.90, 6.90); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Back Side High/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.115 W/kg

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

Reference Value = 2.560 V/m; Power Drift = -0.066 dB

Peak SAR (extrapolated) = 0.199 mW/g

SAR(1 g) = 0.104 mW/g; SAR(10 g) = 0.053 mW/g

Maximum value of SAR (measured) = 0.114 W/kg

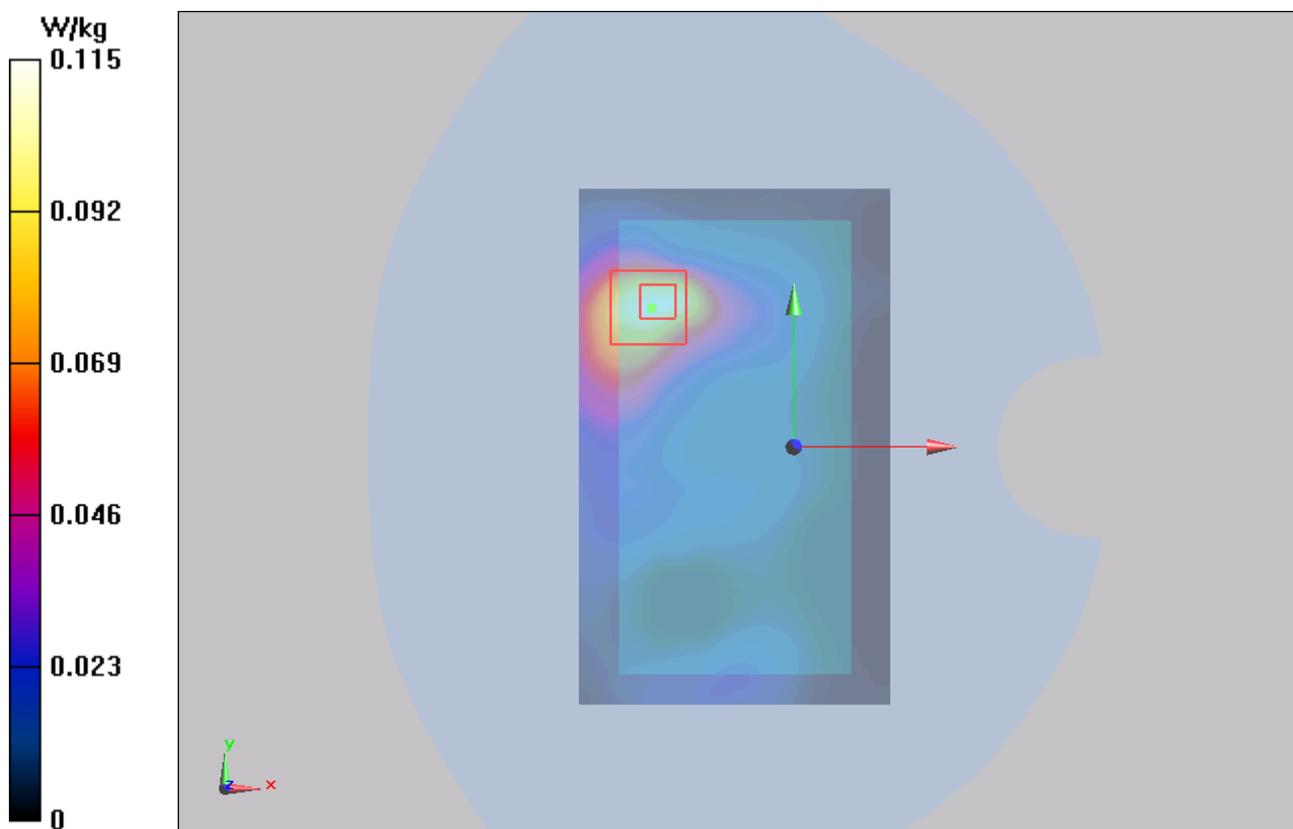


Figure 65 Body, Back Side, 802.11b Channel 11

802.11b Back Side High(Battery 3, Distance 10mm)

Date/Time: 11/22/2013 4:33:50 PM

Communication System: 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2462$ MHz; $\sigma = 2.009$ mho/m; $\epsilon_r = 52.109$; $\rho = 1000$ 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 - SN3753; ConvF(6.90, 6.90, 6.90); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Back Side High/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.116 W/kg

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

Reference Value = 2.326 V/m; Power Drift = 0.044 dB

Peak SAR (extrapolated) = 0.204 mW/g

SAR(1 g) = 0.104 mW/g; SAR(10 g) = 0.053 mW/g

Maximum value of SAR (measured) = 0.115 W/kg

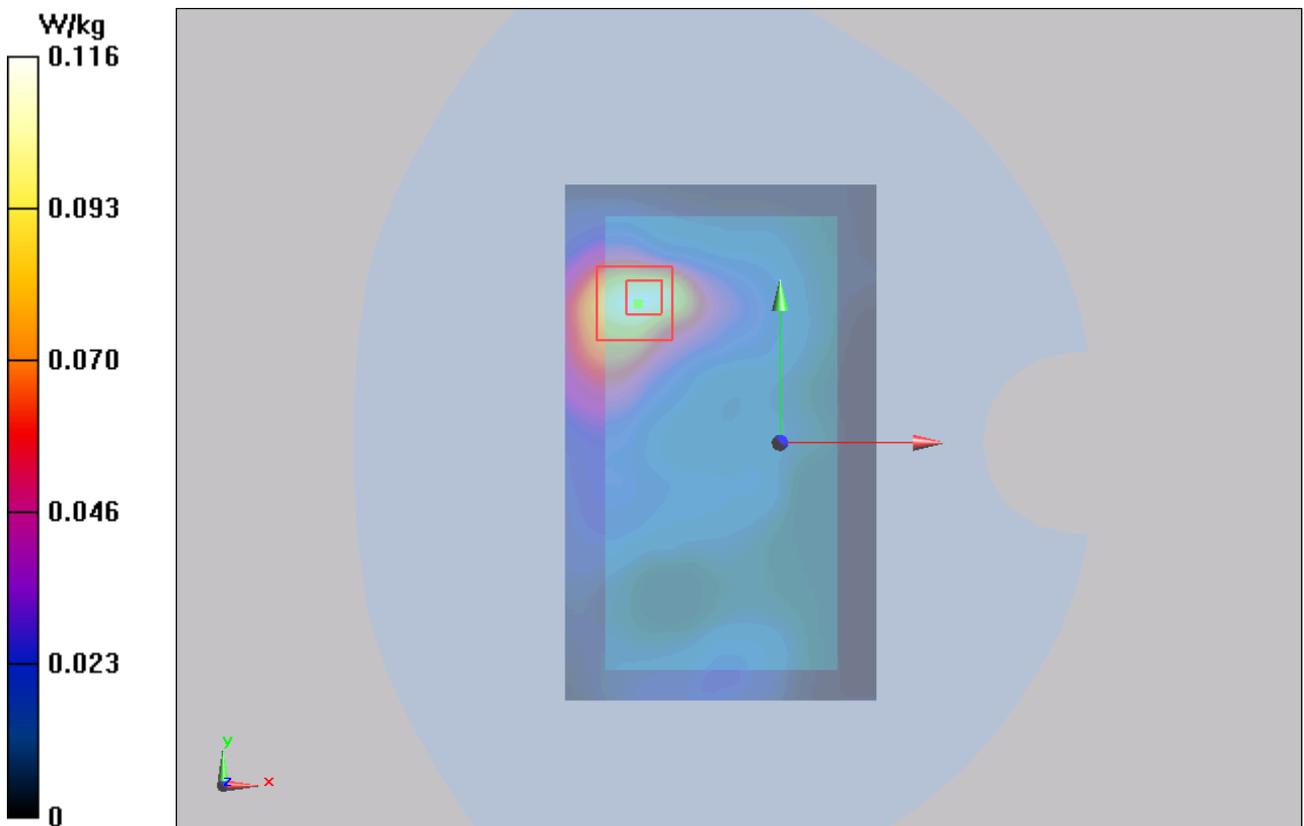


Figure 66 Body, Back Side, 802.11b Channel 11

802.11b Back Side High(Battery 4, Distance 10mm)

Date/Time: 11/22/2013 4:54:39 PM

Communication System: 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2462$ MHz; $\sigma = 2.009$ mho/m; $\epsilon_r = 52.109$; $\rho = 1000$ 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 - SN3753; ConvF(6.90, 6.90, 6.90); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Back Side High/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.116 W/kg

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

Reference Value = 2.325 V/m; Power Drift = 0.041 dB

Peak SAR (extrapolated) = 0.192 mW/g

SAR(1 g) = 0.100 mW/g; SAR(10 g) = 0.051 mW/g

Maximum value of SAR (measured) = 0.114 W/kg

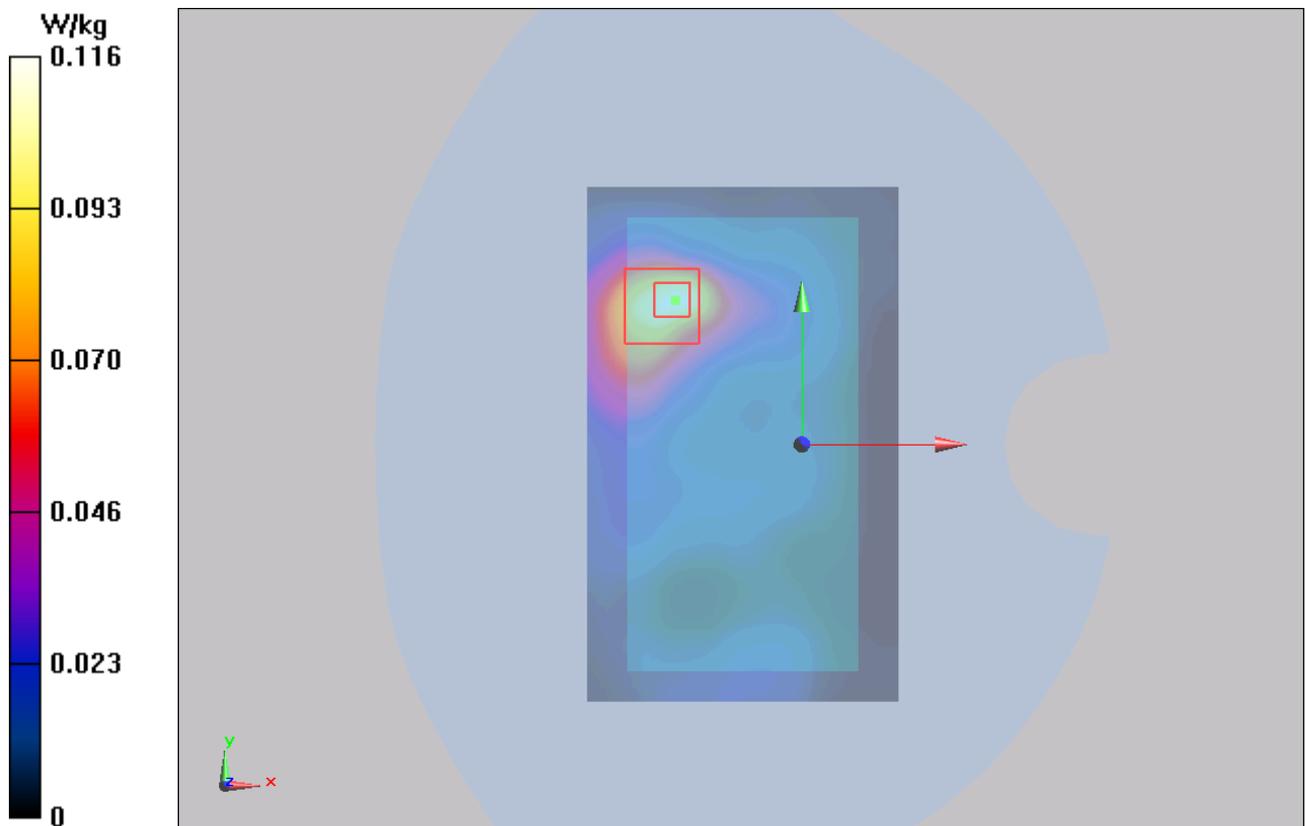


Figure 67 Body, Back Side, 802.11b Channel 11

802.11b Back Side High(Battery 5, Distance 10mm)

Date/Time: 11/22/2013 5:45:52 PM

Communication System: 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2462$ MHz; $\sigma = 2.009$ mho/m; $\epsilon_r = 52.109$; $\rho = 1000$ 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 - SN3753; ConvF(6.90, 6.90, 6.90); Calibrated: 1/17/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/25/2013

Phantom: SAM 2; Type: SAM;

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

Back Side High/Area Scan (61x101x1): Interpolated grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.119 W/kg

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

Reference Value = 2.375 V/m; Power Drift = 0.021 dB

Peak SAR (extrapolated) = 0.193 mW/g

SAR(1 g) = 0.101 mW/g; SAR(10 g) = 0.052 mW/g

Maximum value of SAR (measured) = 0.115 W/kg

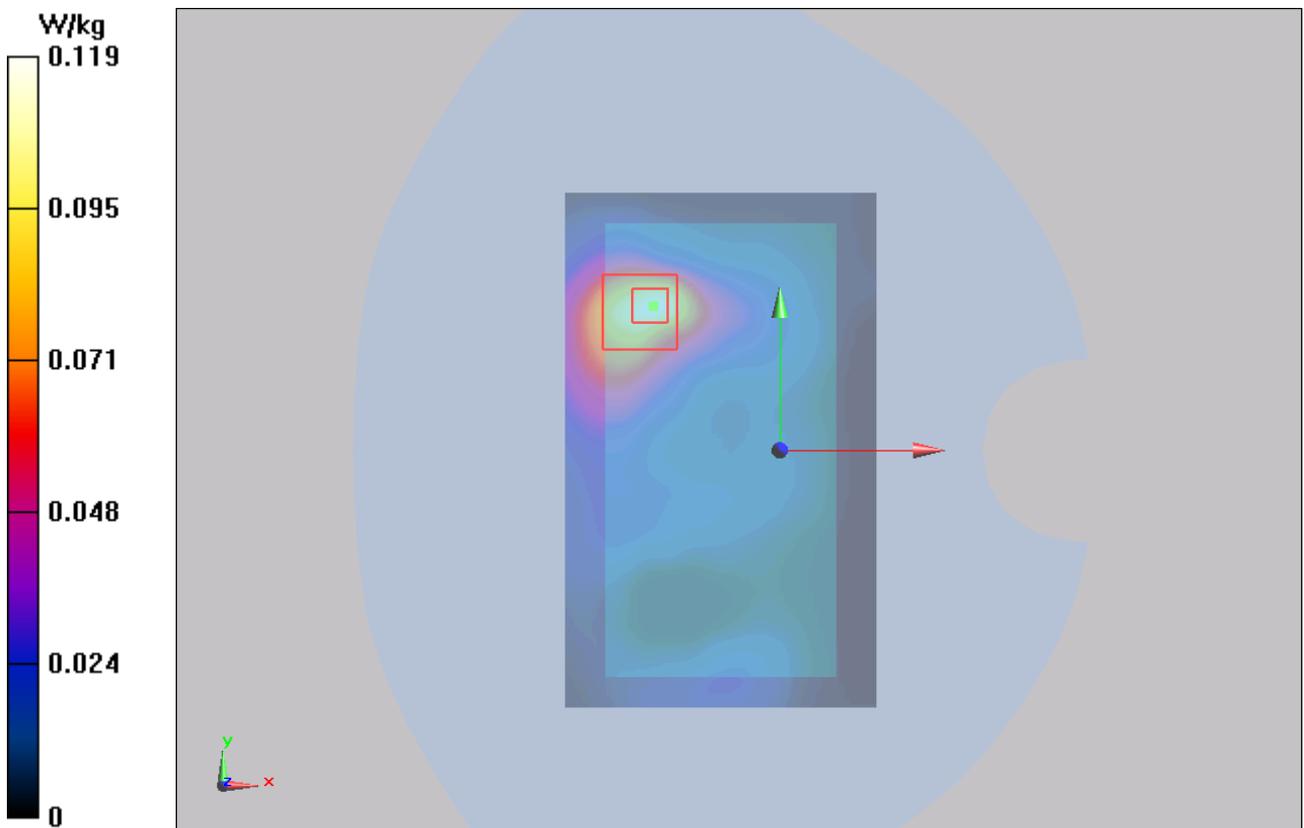


Figure 68 Body, Back Side, 802.11b Channel 11

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RHA1311-0086SAR01R2

Page 119 of 166

ANNEX D: Probe 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
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 **Auden**

Certificate No: **EX3-3753_Jan13**

CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:3753**

Calibration procedure(s) **QA CAL-01.v8, QA CAL-14.v3, QA CAL-23.v4, QA CAL-25.v4
Calibration procedure for dosimetric E-field probes**

Calibration date: **January 17, 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 (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	29-Mar-12 (No. 217-01508)	Apr-13
Power sensor E4412A	MY41498087	29-Mar-12 (No. 217-01508)	Apr-13
Reference 3 dB Attenuator	SN: S5054 (3c)	27-Mar-12 (No. 217-01531)	Apr-13
Reference 20 dB Attenuator	SN: S5086 (20b)	27-Mar-12 (No. 217-01529)	Apr-13
Reference 30 dB Attenuator	SN: S5129 (30b)	27-Mar-12 (No. 217-01532)	Apr-13
Reference Probe ES3DV2	SN: 3013	28-Dec-12 (No. ES3-3013 Dec12)	Dec-13
DAE4	SN: 660	20-Jun-12 (No. DAE4-660_Jun12)	Jun-13
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-11)	In house check: Apr-13
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-12)	In house check: Oct-13

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: January 17, 2013

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.: RHA1311-0086SAR01R2

Page 120 of 166

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
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S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 108**

The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

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.e., $\vartheta = 0$ 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 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}**: Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not affect the E²-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 with CW signal (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}; D_{x,y,z}; VR_{x,y,z}**: A, B, C, D 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 values 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.

EX3DV4 – SN:3753

January 17, 2013

Probe EX3DV4

SN:3753

Manufactured: March 16, 2010
Calibrated: January 17, 2013

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

TA Technology (Shanghai) Co., Ltd.

Test Report

EX3DV4- SN:3753

January 17, 2013

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3753

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu\text{V}/(\text{V}/\text{m})^2$) ^A	0.47	0.31	0.45	$\pm 10.1\%$
DCP (mV) ^B	101.8	102.3	102.3	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB $\sqrt{\mu\text{V}}$	C	D dB	VR mV	Unc ^E (k=2)
0	CW	X	0.0	0.0	1.0	0.00	163.7	$\pm 3.5\%$
		Y	0.0	0.0	1.0		168.5	
		Z	0.0	0.0	1.0		159.9	

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 NormX,Y,Z do not affect the E²-field uncertainty inside TSL (see Pages 5 and 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.

TA Technology (Shanghai) Co., Ltd.

Test Report

EX3DV4– SN:3753

January 17, 2013

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3753

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	9.46	9.46	9.46	0.45	0.83	± 12.0 %
835	41.5	0.90	8.95	8.95	8.95	0.26	1.19	± 12.0 %
1750	40.1	1.37	7.86	7.86	7.86	0.52	0.79	± 12.0 %
1900	40.0	1.40	7.63	7.63	7.63	0.54	0.73	± 12.0 %
2000	40.0	1.40	7.50	7.50	7.50	0.53	0.77	± 12.0 %
2450	39.2	1.80	6.86	6.86	6.86	0.44	0.80	± 12.0 %
5200	36.0	4.66	4.65	4.65	4.65	0.40	1.80	± 13.1 %
5300	35.9	4.76	4.48	4.48	4.48	0.40	1.80	± 13.1 %
5500	35.6	4.96	4.46	4.46	4.46	0.40	1.80	± 13.1 %
5600	35.5	5.07	4.51	4.51	4.51	0.35	1.80	± 13.1 %
5800	35.3	5.27	4.36	4.36	4.36	0.45	1.80	± 13.1 %

^C Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

^F At frequencies 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.

TA Technology (Shanghai) Co., Ltd.

Test Report

EX3DV4- SN:3753

January 17, 2013

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3753

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	9.25	9.25	9.25	0.54	0.75	± 12.0 %
835	55.2	0.97	9.05	9.05	9.05	0.68	0.68	± 12.0 %
1750	53.4	1.49	7.82	7.82	7.82	0.50	0.84	± 12.0 %
1900	53.3	1.52	7.33	7.33	7.33	0.31	1.01	± 12.0 %
2000	53.3	1.52	7.43	7.43	7.43	0.57	0.73	± 12.0 %
2300	52.9	1.81	7.07	7.07	7.07	0.74	0.64	± 12.0 %
2450	52.7	1.95	6.90	6.90	6.90	0.80	0.50	± 12.0 %
2600	52.5	2.16	6.66	6.66	6.66	0.80	0.50	± 12.0 %
3500	51.3	3.31	6.30	6.30	6.30	0.38	1.11	± 13.1 %
5200	49.0	5.30	4.38	4.38	4.38	0.50	1.90	± 13.1 %
5300	48.9	5.42	4.13	4.13	4.13	0.50	1.90	± 13.1 %
5500	48.6	5.65	4.09	4.09	4.09	0.50	1.90	± 13.1 %
5600	48.5	5.77	4.10	4.10	4.10	0.45	1.90	± 13.1 %
5800	48.2	6.00	4.02	4.02	4.02	0.55	1.90	± 13.1 %

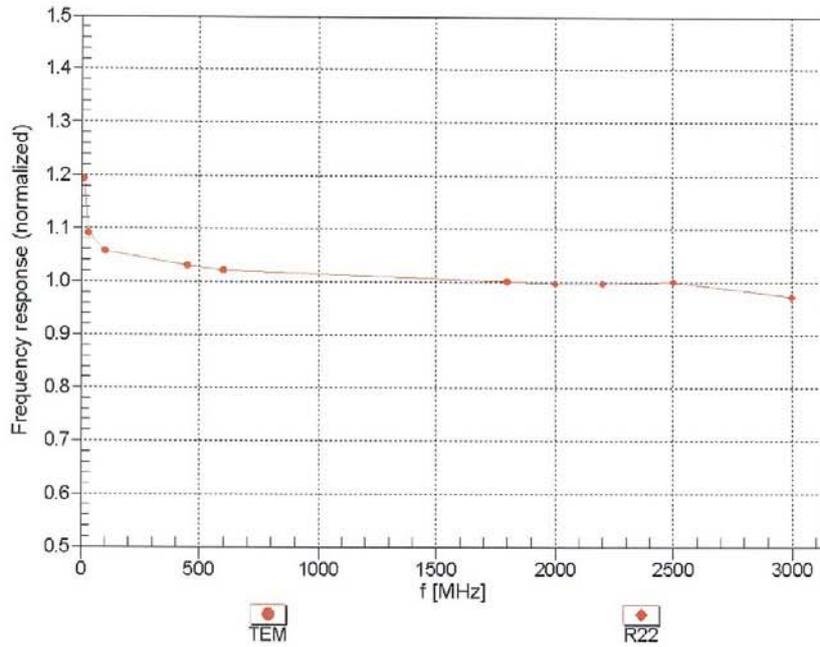
^C Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

^F At frequencies 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.

EX3DV4- SN:3753

January 17, 2013

Frequency Response of E-Field
(TEM-Cell:ifi110 EXX, Waveguide: R22)

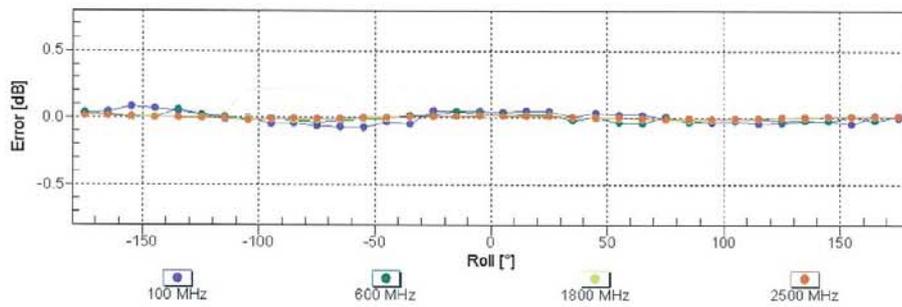
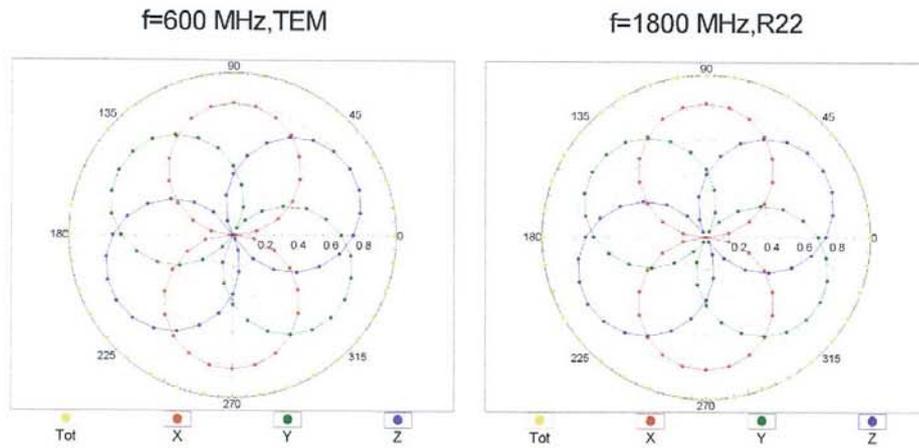


Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ (k=2)

EX3DV4-SN:3753

January 17, 2013

Receiving Pattern (ϕ), $\vartheta = 0^\circ$

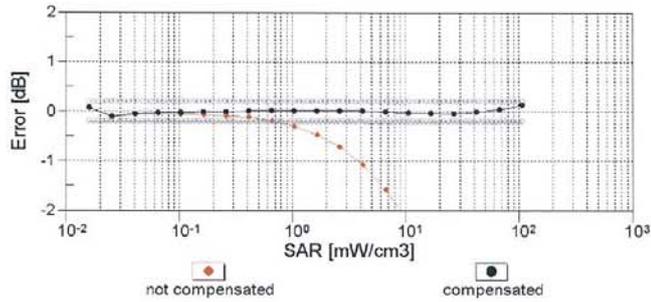
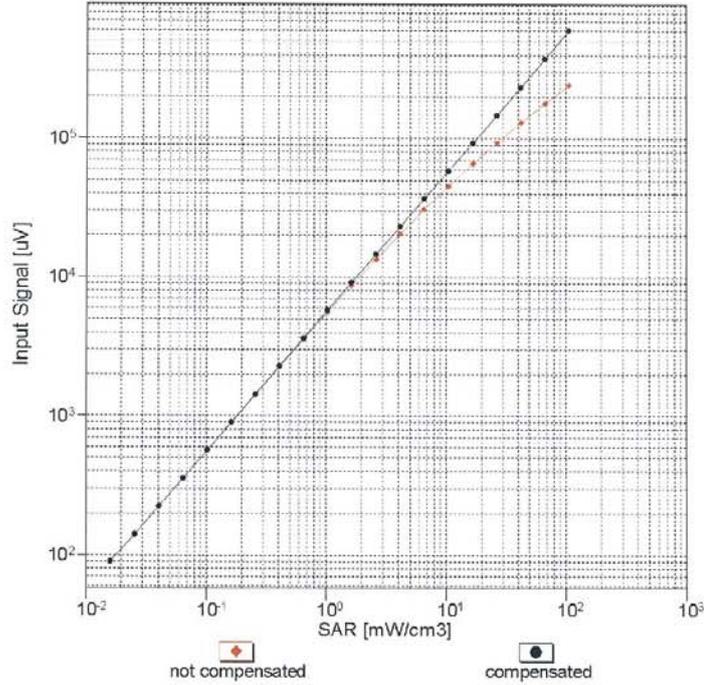


Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

EX3DV4- SN:3753

January 17, 2013

Dynamic Range $f(SAR_{head})$
(TEM cell , $f = 900$ MHz)

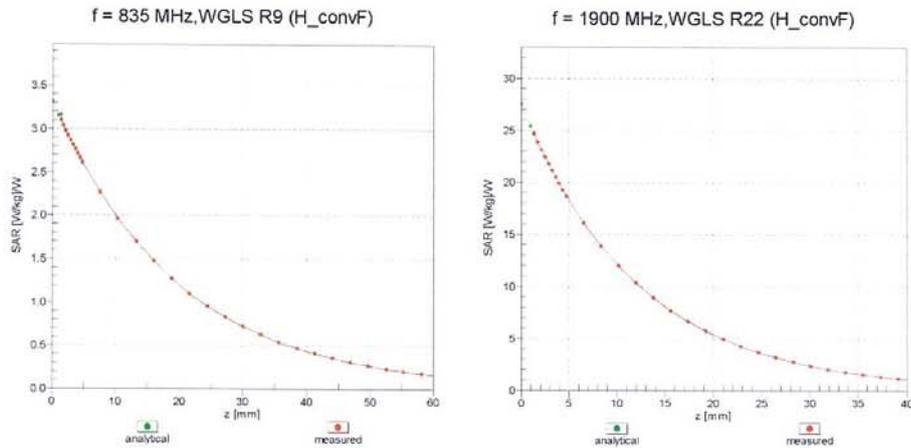


Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

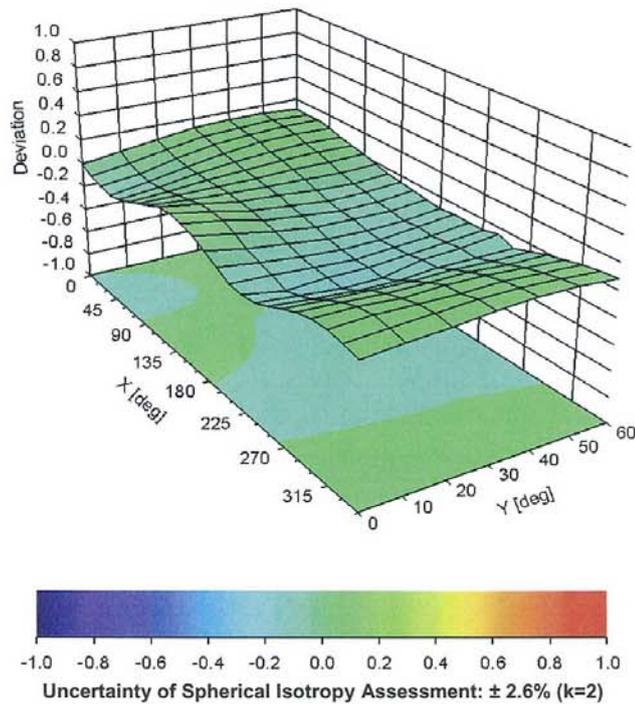
EX3DV4- SN:3753

January 17, 2013

Conversion Factor Assessment



Deviation from Isotropy in Liquid Error (ϕ, ϑ), f = 900 MHz



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

Report No.: RHA1311-0086SAR01R2

Page 129 of 166

EX3DV4- SN:3753

January 17, 2013

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3753

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	55.2
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	2 mm

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RHA1311-0086SAR01R2

Page 130 of 166

ANNEX E: D835V2 Dipole Calibration Certificate

**Calibration Laboratory of
Schmid & Partner
Engineering AG**
Zeughausstrasse 43, 8004 Zurich, Switzerland



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S Servizio svizzero di taratura
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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	100006	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.: RHA1311-0086SAR01R2

Page 131 of 166

**Calibration Laboratory of
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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

Report No.: RHA1311-0086SAR01R2

Page 132 of 166

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)

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RHA1311-0086SAR01R2

Page 133 of 166

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:

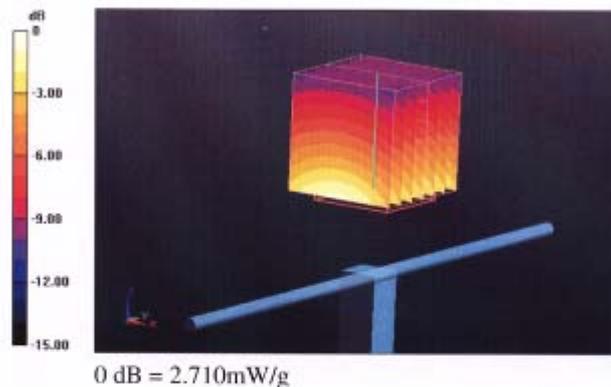
Measurement grid: dx=5mm, dy=5mm, dz=5mm

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

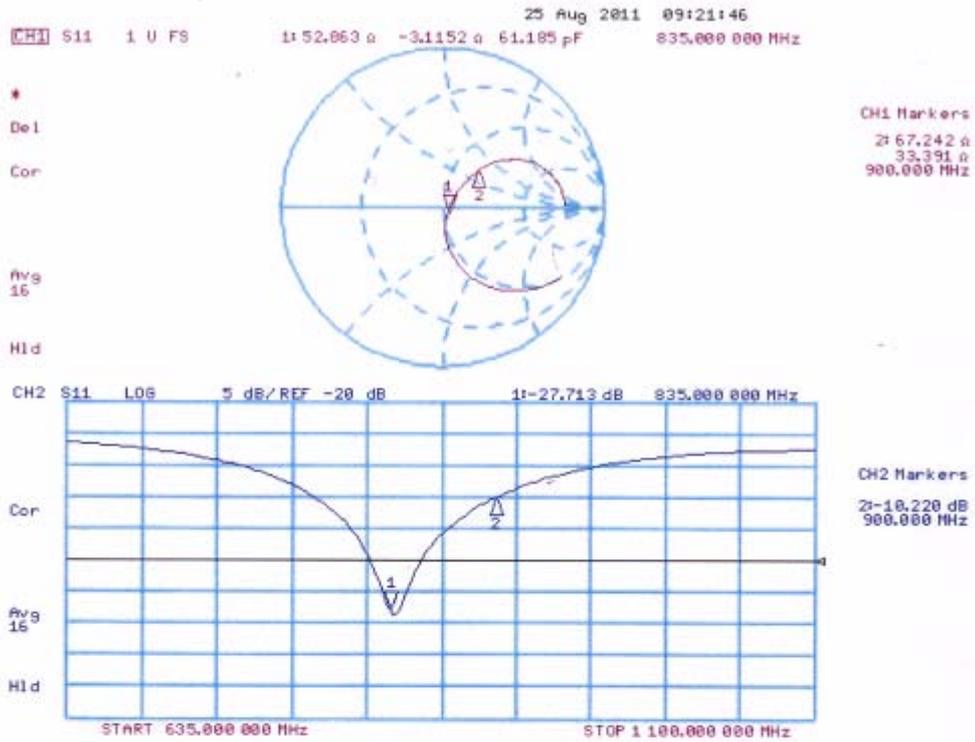


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Test Report

Report No.: RHA1311-0086SAR01R2

Page 135 of 166

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: $f = 835 \text{ MHz}$; $\sigma = 0.99 \text{ mho/m}$; $\epsilon_r = 53.4$; $\rho = 1000 \text{ kg/m}^3$

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:

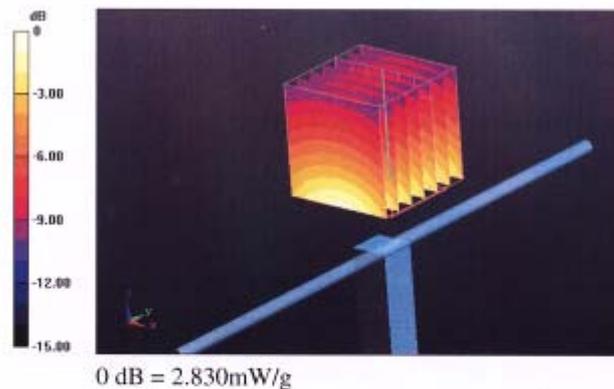
Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 55.406 V/m; Power Drift = 0.02 dB

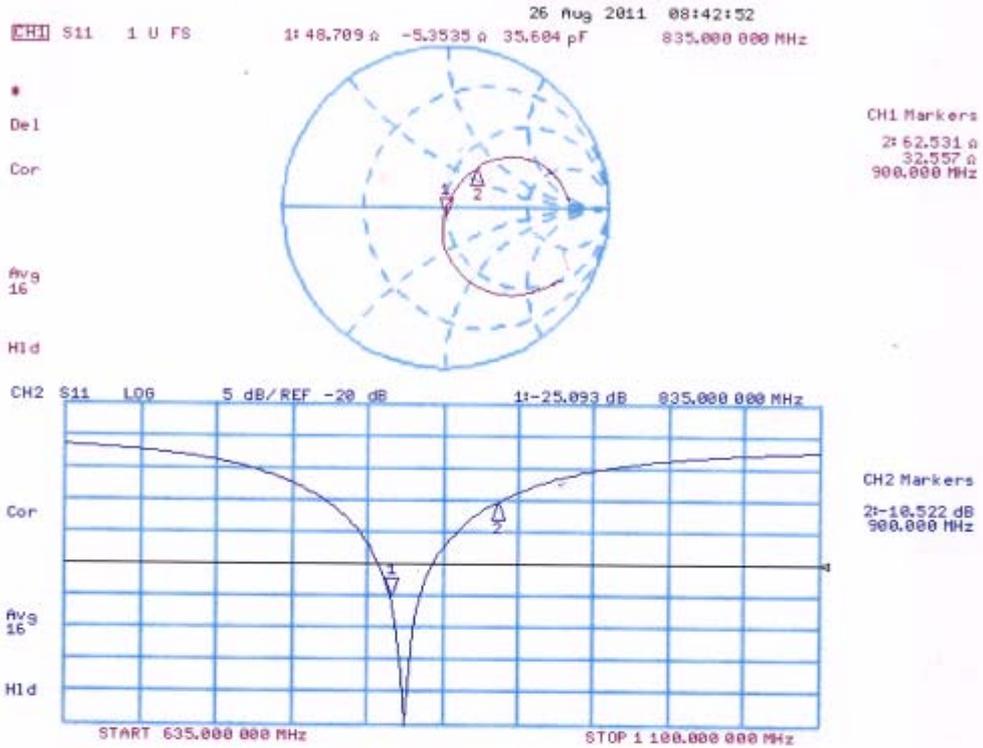
Peak SAR (extrapolated) = 3.509 W/kg

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.: RHA1311-0086SAR01R2

Page 138 of 166

ANNEX F: D1900V2 Dipole Calibration Certificate

**Calibration Laboratory of
Schmid & Partner
Engineering AG**
Zeughausstrasse 43, 8004 Zurich, Switzerland



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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																																														
<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> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Primary Standards</th> <th style="width: 15%;">ID #</th> <th style="width: 30%;">Cal Date (Certificate No.)</th> <th style="width: 25%;">Scheduled Calibration</th> </tr> </thead> <tbody> <tr> <td>Power meter EPM-442A</td> <td>GB37480704</td> <td>06-Oct-10 (No. 217-01266)</td> <td>Oct-11</td> </tr> <tr> <td>Power sensor HP 8481A</td> <td>US37292783</td> <td>06-Oct-10 (No. 217-01266)</td> <td>Oct-11</td> </tr> <tr> <td>Reference 20 dB Attenuator</td> <td>SN: S5086 (20b)</td> <td>29-Mar-11 (No. 217-01367)</td> <td>Apr-12</td> </tr> <tr> <td>Type-N mismatch combination</td> <td>SN: 5047.2 / 06327</td> <td>29-Mar-11 (No. 217-01371)</td> <td>Apr-12</td> </tr> <tr> <td>Reference Probe ES3DV3</td> <td>SN: 3205</td> <td>29-Apr-11 (No. ES3-3205_Apr11)</td> <td>Apr-12</td> </tr> <tr> <td>DAE4</td> <td>SN: 601</td> <td>04-Jul-11 (No. DAE4-601_Jul11)</td> <td>Jul-12</td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Secondary Standards</th> <th style="width: 15%;">ID #</th> <th style="width: 30%;">Check Date (in house)</th> <th style="width: 25%;">Scheduled Check</th> </tr> </thead> <tbody> <tr> <td>Power sensor HP 8481A</td> <td>MY41092317</td> <td>18-Oct-02 (in house check Oct-09)</td> <td>In house check: Oct-11</td> </tr> <tr> <td>RF generator R&S SMT-06</td> <td>100005</td> <td>04-Aug-99 (in house check Oct-09)</td> <td>In house check: Oct-11</td> </tr> <tr> <td>Network Analyzer HP 8753E</td> <td>US37390585 S4206</td> <td>18-Oct-01 (in house check Oct-10)</td> <td>In house check: Oct-11</td> </tr> </tbody> </table>				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
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Calibrated by:	Name Dimce Iliev	Function Laboratory Technician	Signature 																																												
Approved by:	Name Katja Pokovic	Technical Manager																																													
			Issued: August 31, 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.: RHA1311-0086SAR01R2

Page 139 of 166

**Calibration Laboratory of
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Engineering AG**
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
S Service suisse d'étalonnage
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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 ± 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 ± 0.2) °C	39.5 ± 6 %	1.42 mho/m ± 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 ± 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 ± 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 ± 0.2) °C	53.9 ± 6 %	1.57 mho/m ± 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 ± 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 ± 16.5 % (k=2)

TA Technology (Shanghai) Co., Ltd.

Test Report

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:

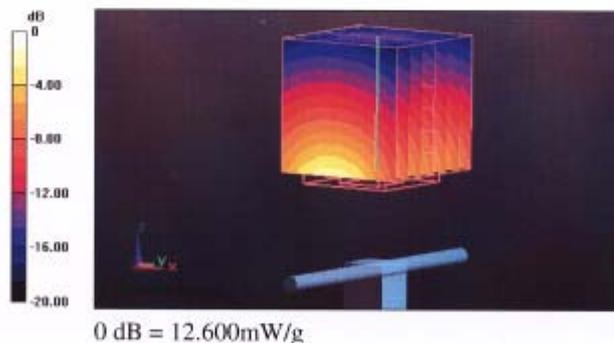
Measurement grid: dx=5mm, dy=5mm, dz=5mm

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

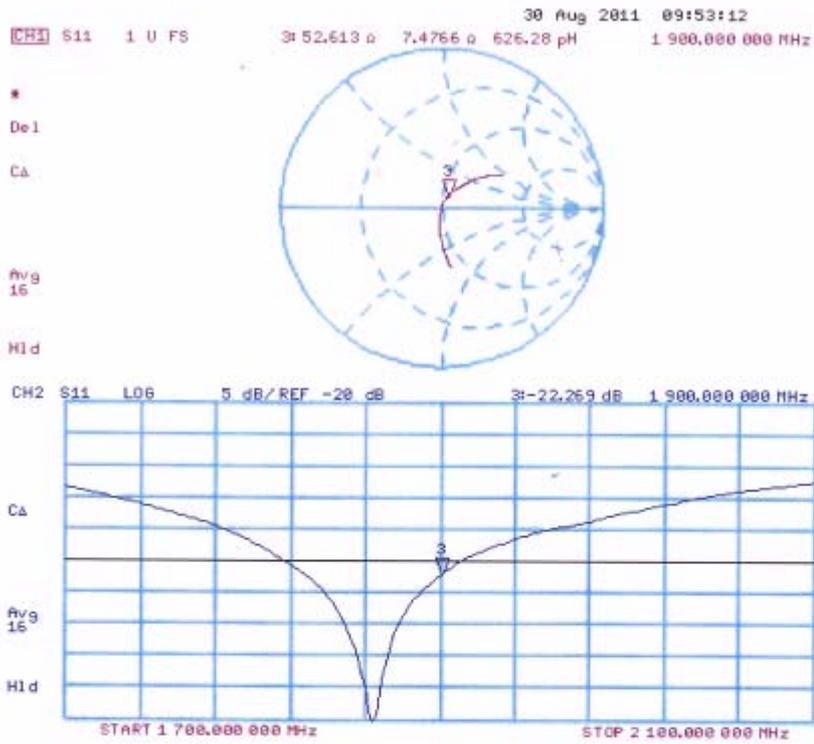


TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RHA1311-0086SAR01R2

Page 143 of 166

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:

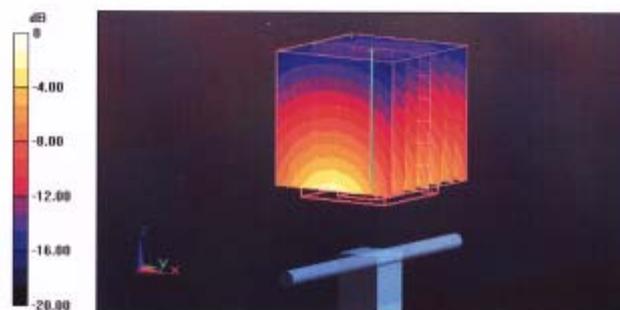
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 96.435 V/m; Power Drift = -0.0099 dB

Peak SAR (extrapolated) = 18.663 W/kg

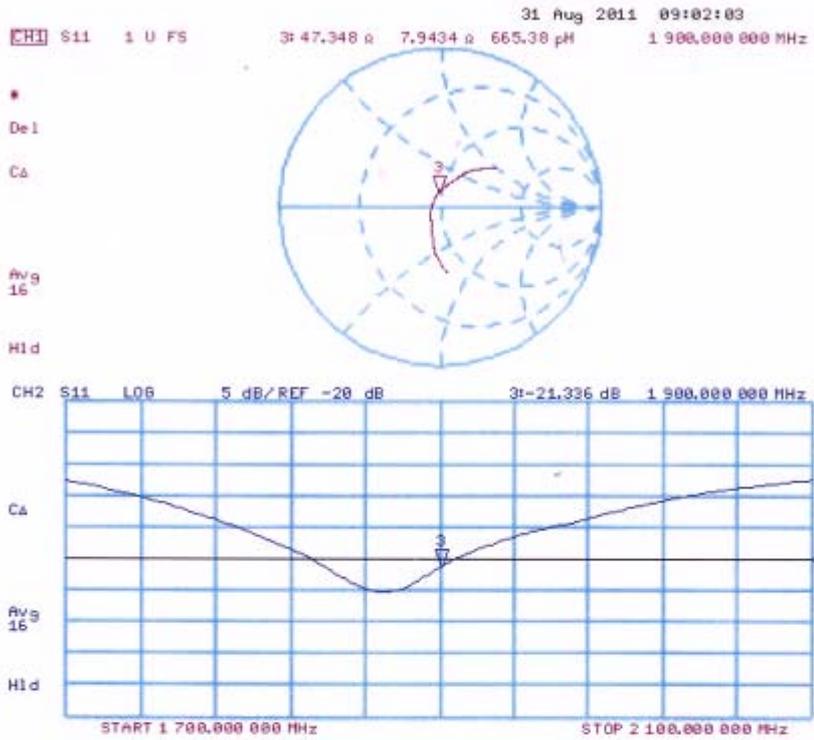
SAR(1 g) = 10.6 mW/g; SAR(10 g) = 5.55 mW/g

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.: RHA1311-0086SAR01R2

Page 146 of 166

ANNEX G: D2450V2 Dipole Calibration Certificate

**Calibration Laboratory of
Schmid & Partner
Engineering AG**
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
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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

	Name	Function	Signature
Calibrated by:	Dirce Iliev	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: August 29, 2011

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TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RHA1311-0086SAR01R2

Page 147 of 166

**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
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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 cm ³ (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 cm ³ (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 cm ³ (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 cm ³ (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 Ω + 2.4 $j\Omega$
Return Loss	- 25.5 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	50.4 Ω + 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:

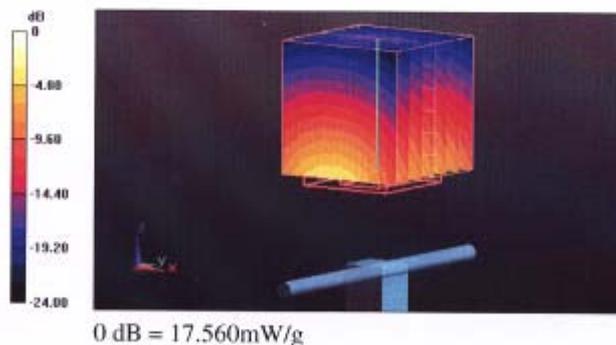
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 101.5 V/m; Power Drift = 0.06 dB

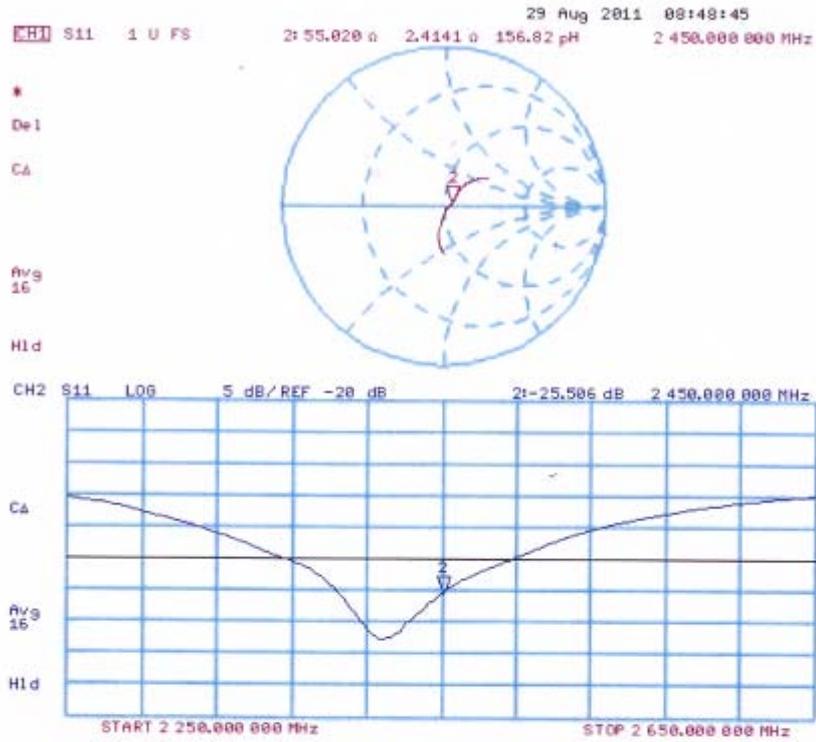
Peak SAR (extrapolated) = 28.303 W/kg

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:

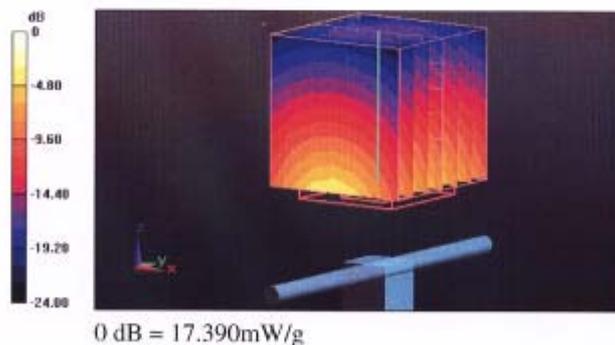
Measurement grid: dx=5mm, dy=5mm, dz=5mm

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

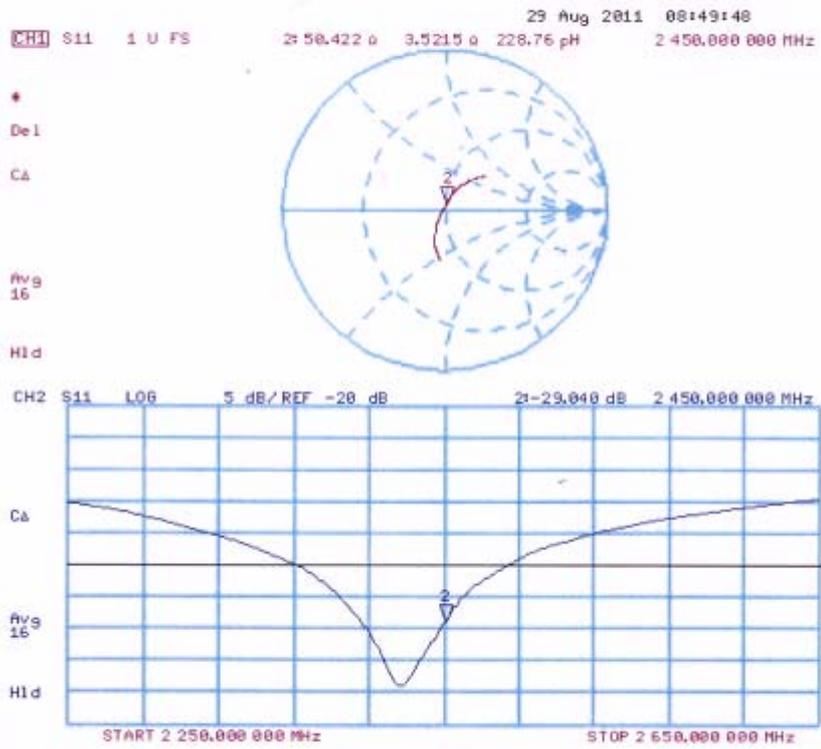


TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RHA1311-0086SAR01R2

Page 153 of 166

Impedance Measurement Plot for Body TSL



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

ANNEX H: DAE4 Calibration Certificate

**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**

Client **TA Shanghai (Auden)**

Certificate No: **DAE4-1317_Jan13**

CALIBRATION CERTIFICATE

Object **DAE4 - SD 000 D04 BJ - SN: 1317**

Calibration procedure(s) **QA CAL-06.v25
Calibration procedure for the data acquisition electronics (DAE)**

Calibration date: **January 25, 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 (Certificate No.)	Scheduled Calibration
Keithley Multimeter Type 2001	SN: 0810278	02-Oct-12 (No:12728)	Oct-13
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Auto DAE Calibration Unit	SE UWS 053 AA 1001	07-Jan-13 (in house check)	In house check: Jan-14
Calibrator Box V2.1	SE UMS 006 AA 1002	07-Jan-13 (in house check)	In house check: Jan-14

	Name	Function	Signature
Calibrated by:	R.Mayoraz	Technician	<i>R. Mayoraz</i>
Approved by:	Fin Bomholt	Deputy Technical Manager	<i>Fin Bomholt</i>

Issued: January 25, 2013

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



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Accreditation No.: SCS 108

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 following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
 - *DC Voltage Measurement Linearity:* Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
 - *Common mode sensitivity:* Influence of a positive or negative common mode voltage on the differential measurement.
 - *Channel separation:* Influence of a voltage on the neighbor channels not subject to an input voltage.
 - *AD Converter Values with inputs shorted:* Values on the internal AD converter corresponding to zero input voltage
 - *Input Offset Measurement:* Output voltage and statistical results over a large number of zero voltage measurements.
 - *Input Offset Current:* Typical value for information; Maximum channel input offset current, not considering the input resistance.
 - *Input resistance:* Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
 - *Low Battery Alarm Voltage:* Typical value for information. Below this voltage, a battery alarm signal is generated.
 - *Power consumption:* Typical value for information. Supply currents in various operating modes.

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

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1 μ V, 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	404.011 \pm 0.02% (k=2)	404.006 \pm 0.02% (k=2)	403.901 \pm 0.02% (k=2)
Low Range	3.98819 \pm 1.55% (k=2)	3.99805 \pm 1.55% (k=2)	3.98192 \pm 1.55% (k=2)

Connector Angle

Connector Angle to be used in DASY system	117 $^{\circ}$ \pm 1 $^{\circ}$
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TA Technology (Shanghai) Co., Ltd.

Test Report

Appendix

1. DC Voltage Linearity

High Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	199994.16	-0.78	-0.00
Channel X	+ Input	20000.75	0.37	0.00
Channel X	- Input	-19997.98	2.89	-0.01
Channel Y	+ Input	199995.20	0.02	0.00
Channel Y	+ Input	19999.08	-1.15	-0.01
Channel Y	- Input	-20002.66	-1.68	0.01
Channel Z	+ Input	199994.67	-0.43	-0.00
Channel Z	+ Input	19997.92	-2.31	-0.01
Channel Z	- Input	-20000.66	0.26	-0.00

Low Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	2001.23	0.59	0.03
Channel X	+ Input	201.53	0.55	0.28
Channel X	- Input	-198.20	0.62	-0.31
Channel Y	+ Input	2000.33	-0.29	-0.01
Channel Y	+ Input	200.43	-0.68	-0.34
Channel Y	- Input	-199.64	-0.69	0.35
Channel Z	+ Input	2000.78	0.22	0.01
Channel Z	+ Input	200.32	-0.69	-0.34
Channel Z	- Input	-199.27	-0.35	0.18

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	-23.69	-25.75
	- 200	28.59	26.45
Channel Y	200	-1.44	-1.70
	- 200	-0.06	-0.16
Channel Z	200	-10.76	-11.18
	- 200	9.82	9.91

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	-	1.52	-4.72
Channel Y	200	8.54	-	4.31
Channel Z	200	10.79	5.34	-

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	16104	15986
Channel Y	16111	15993
Channel Z	16217	16069

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	1.28	0.53	2.45	0.33
Channel Y	-1.29	-2.89	0.51	0.58
Channel Z	-0.39	-1.47	1.06	0.37

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