



# OET 65

# TEST REPORT

<b>Product Name</b>	UMTS TriBand / GSM Quadband mobile phone
<b>Model</b>	Highway US
<b>Marketing Name</b>	one touch 870A
<b>FCC ID</b>	RAD245
<b>Client</b>	TCT Mobile Limited

**TA Technology (Shanghai) Co., Ltd.**

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**Test Report**

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**GENERAL SUMMARY**

<b>Product Name</b>	UMTS TriBand / GSM Quadband mobile phone	<b>Model</b>	Highway US
<b>Report No.</b>	RXA1204-0049SAR	<b>FCC ID</b>	RAD245
<b>Client</b>	TCT Mobile Limited		
<b>Manufacturer</b>	TCT Mobile Limited		
<b>Reference Standard(s)</b>	<p><b>IEEE Std C95.1, 1999:</b> IEEE Standard for Safety Levels with Respect to Human Exposure to Radiofrequency Electromagnetic Fields, 3 kHz to 300 GHz.</p> <p><b>IEEE Std 1528™-2003:</b> 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><b>SUPPLEMENT C Edition 01-01 to OET BULLETIN 65 Edition 97-01 June 2001 including DA 02-1438, published June 2002:</b> Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields Additional Information for Evaluation Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions.</p> <p><b>KDB941225 D01 SAR test for 3G devices v02:</b> SAR Measurement Procedures CDMA 20001x RTT, 1x Ev-Do, WCDMA, HSDPA/HSPA</p> <p><b>KDB 648474 D01 SAR Handsets Multi Xmitter and Ant, v01r05:</b> SAR Evaluation Considerations for Handsets with Multiple Transmitters and Antennas.</p>		
<b>Conclusion</b>	<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.</p> <p>General Judgment: <b>Pass</b></p> <p style="text-align: right;">(Stamp) Date of issue: April 17<sup>th</sup>, 2012</p>		
<b>Comment</b>	The test result only responds to the measured sample.		

Approved by 杨伟中  
Director

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Performed by 杨如蔚  
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## 1. General Information

### 1.1. Notes of the Test Report

**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.

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This report standalone dose 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 electrical report is inconsistent with the printed one, it should be subject to the latter.

### 1.2. Testing Laboratory

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### 1.3. Applicant Information

Company: TCT Mobile Limited  
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Postal Code: 201203  
Country: P.R. China  
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### 1.4. Manufacturer Information

Company: TCT Mobile Limited  
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City: Shanghai  
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### 1.5. Information of EUT

#### General Information

Device Type:	Portable Device		
Exposure Category:	Uncontrolled Environment / General Population		
State of Sample:	Prototype Unit		
Product Name:	UMTS TriBand / GSM Quadband mobile phone		
IMEI:	013083000000423		
Hardware Version:	PIO2		
Software Version:	sw622		
Antenna Type:	Internal Antenna		
Device Operating Configurations :			
Supporting Mode(s):	GSM 850/GSM 1900; (tested) WCDMA Band II /WCDMA Band V; (tested) GSM 900/GSM 1800/WCDMA Band I; (untested) Bluetooth; (untested)		
Test Modulation:	(GSM)GMSK; (WCDMA)QPSK		
Device Class:	B		
HSDPA UE Category:	8		
HSUPA UE Category:	6		
GPRS Multislot Class(12):	Max Number of Timeslots in Uplink	4	
	Max Number of Timeslots in Downlink	4	
	Max Total Timeslot	5	
EGPRS Multislot Class(12):	Max Number of Timeslots in Uplink	4	
	Max Number of Timeslots in Downlink	4	
	Max Total Timeslot	5	
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
	WCDMA Band II	1852.4 ~ 1907.6	1932.4 ~ 1987.6
	WCDMA Band V	826.4 ~ 846.6	871.4 ~ 891.6
Power Class:	GSM 850: 4, tested with power level 5		
	GSM 1900: 1, tested with power level 0		
	WCDMA Band II: 3, tested with power control all up bits		
	WCDMA Band V: 3, tested with power control all up bits		
Test Channel: (Low - Middle - High)	128 - 190 - 251	(GSM 850)	(tested)
	512 - 661 - 810	(GSM 1900)	(tested)
	9262 - 9400 - 9538	(WCDMA Band II)	(tested)
	4132 - 4183 - 4233	(WCDMA Band V)	(tested)

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**Auxiliary Equipment Details**

<b>Name</b>	<b>Model</b>	<b>Manufacturer</b>	<b>S/N</b>
Battery 1	CAB3120000C3	BAK	BAK2011110800329
Battery 2	CAB3120000C1	BYD	B08606451BA
Stereo Headset 1	CCB3160A11C1	Juwei	/
Stereo Headset 2	CCB3160A11C4	Meihao	/
Stereo Headset 3	CCB3160A15C1	Juwei	/
Stereo Headset 4	CCB3160A15C4	Meihao	/

Note: 1. Stereo Headset 1 and Stereo Headset 2 non-REACH, need test.  
2. Stereo Headset 3 and Stereo Headset 4 REACH, no need test but must be shown in report.

Equipment Under Test (EUT) is a UMTS TriBand / GSM Quadband mobile phone. The EUT has a GSM/WCDMA antenna that is used for Tx/Rx, and the other is BT/WIFI antenna that can be used for Tx/Rx. The detail about EUT and Lithium Battery is in chapter 1.5 in this report. SAR are tested for GSM 850, GSM 1900, WCDMA Band II and WCDMA Band V.

The sample under test was selected by the Client.

Components list please refer to documents of the manufacturer.

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**1.6. The Maximum SAR<sub>1g</sub> Values**

**Head SAR Configuration**

Mode	Channel	Position	SAR <sub>1g</sub> (W/kg)
GSM 850	Middle/190	Right, Cheek	<b>0.998</b>
GSM 1900	Low/512	Right, Cheek	<b>0.746</b>
WCDMA Band II	High/9538	Right, Cheek	<b>1.190</b>
WCDMA Band V	High/4233	Right, Cheek	<b>0.941</b>

**Body Worn Configuration**

Mode	Channel	Position	Separation distance	SAR <sub>1g</sub> (W/kg)
4Txslots GPRS 850	Low/128	Towards Ground	15mm	<b>1.030</b>
4Txslots GPRS 1900	High/810	Towards Ground	15mm	<b>0.532</b>
WCDMA Band II	High/9538	Towards Ground	15mm	<b>0.579</b>
WCDMA Band V	Low/4132	Towards Ground	15mm	<b>0.600</b>

**Simultaneous SAR**

SAR <sub>1g</sub> (W/kg)	WCDMA Band II	BT	MAX. ΣSAR <sub>1g</sub>
Test Position			
Right hand, Touch Cheek	1.190	0	1.190

Note: 1. Stand alone SAR for BT is not required. Its SAR is considered 0 in the 1-g SAR summing process to determine simultaneous transmission SAR evaluation requirements.

**1.7. Test Date**

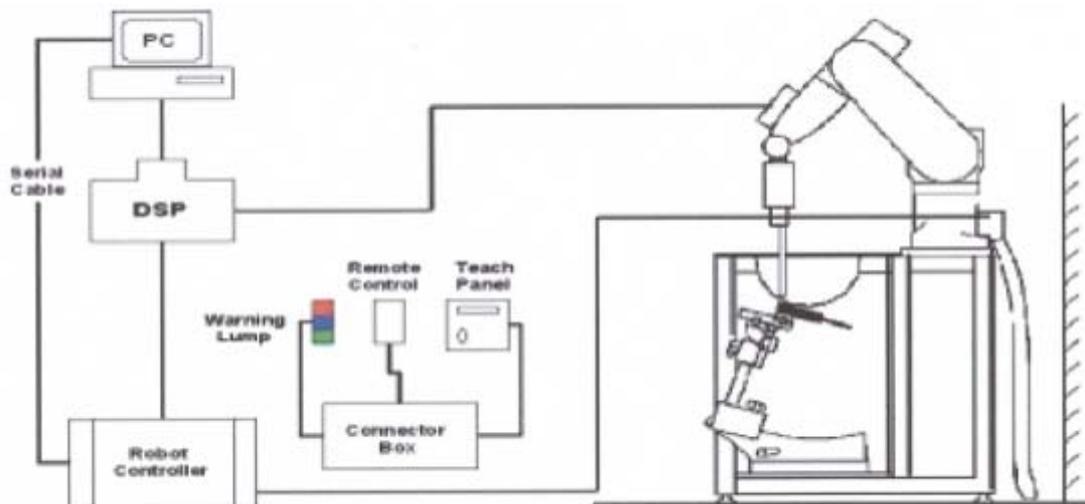
The test performed from April 15, 2012 to April 17, 2012.

## 2. SAR Measurements System Configuration

### 2.1. SAR Measurement Set-up

The DASY4 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 DASY4 measurement server.
- The DASY4 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
- DASY4 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. DASY4 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: $\pm 0.2$ dB (30 MHz to 6 GHz)
Directivity	$\pm 0.3$ dB in HSL (rotation around probe axis) $\pm 0.5$ dB in tissue material (rotation normal to probe axis)
Dynamic Range	10 $\mu$ W/g to > 100 mW/g Linearity: $\pm 0.2$ dB (noise: typically < 1 $\mu$ 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:  $\Delta t$  = Exposure time (30 seconds),  
C = Heat capacity of tissue (brain or muscle),  
 $\Delta T$  = Temperature increase due to RF exposure.  
Or

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

Where:  
 $\sigma$  = Simulated tissue conductivity,  
 $\rho$  = Tissue density (kg/m<sup>3</sup>).

## 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 DASY4 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 DASY4 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

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spacing of 15 mm x 15 mm is set. During the scan the distance of the probe to the phantom remains unchanged.

After finishing area scan, the field maxima within a range of 2 dB will be ascertained.

- Zoom Scan

Zoom Scans are used to estimate the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The default Zoom Scan is done by 5x5x7 points within a cube whose base is centered around the maxima found in the preceding area scan.

- Spatial Peak Detection

The procedure for spatial peak SAR evaluation has been implemented and can determine values of masses of 1g and 10g, as well as for user-specific masses. The DASY4 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. For a grid using 5x5x7 measurement points with 5mm resolution amounting to 175 measurement points, the uncertainty of the extrapolation routines is less than 1% for 1g and 10g cubes.

- A Z-axis scan measures the total SAR value at the x-and y-position of the maximum SAR value found during the cube 5x5x7 scan. The probe is moved away in z-direction from the bottom of the SAM phantom in 5mm steps.

## **2.5. Data Storage and Evaluation**

### **2.5.1. Data Storage**

The DASY4 software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension “.DA4”. The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated.

The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [mW/g], [mW/cm<sup>2</sup>], [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 <sub>i0</sub> , a <sub>i1</sub> , a <sub>i2</sub>
	- Conversion factor	ConvF <sub>i</sub>
	- Diode compression point	Dcp <sub>i</sub>
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 DASY4 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.

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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)<sup>2</sup>] 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

**$\sigma$**  = conductivity in [mho/m] or [Siemens/m]

**$\rho$**  = equivalent tissue density in g/cm<sup>3</sup>

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/cm<sup>2</sup>

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

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

### 3. Laboratory Environment

**Table 1: The Requirements of the Ambient Conditions**

Temperature	Min. = 18°C, Max. = 25 °C
Relative humidity	Min. = 30%, Max. = 70%
Ground system resistance	< 0.5 $\Omega$
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 2 and table 3 show the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the OET 65.

**Table 2: Composition of the Head Tissue Equivalent Matter**

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

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

**Table 3: 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 $\epsilon=53.3$ $\sigma=1.52$

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**4.2. Tissue-equivalent Liquid Properties**

**Table 4: Dielectric Performance of Head Tissue Simulating Liquid**

Frequency	Description	Dielectric Parameters		Temp °C
		$\epsilon_r$	$\sigma$ (s/m)	
<b>835MHz (head)</b>	Target value ± 5% window	41.50 39.43 — 43.58	0.90 0.86 — 0.95	22.0
	Measurement value 2012-4-16	42.3	0.888	21.5
<b>1900MHz (head)</b>	Target value ±5% window	40.00 38.00 — 42.00	1.40 1.33 — 1.47	22.0
	Measurement value 2012-4-16	40.1	1.39	21.5
	Measurement value 2012-4-17	40.1	1.39	21.5

**Table 5: Dielectric Performance of Body Tissue Simulating Liquid**

Frequency	Description	Dielectric Parameters		Temp °C
		$\epsilon_r$	$\sigma$ (s/m)	
<b>835MHz (body)</b>	Target value ±5% window	55.20 52.44 — 57.96	0.97 0.92 — 1.02	22.0
	Measurement value 2012-4-15	55.4	0.989	21.5
	Measurement value 2012-4-17	55.4	0.989	21.5
<b>1900MHz (body)</b>	Target value ±5% window	53.30 50.64 — 55.97	1.52 1.44 — 1.60	22.0
	Measurement value 2012-4-17	52.1	1.55	21.5

## 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 DASY4 system.

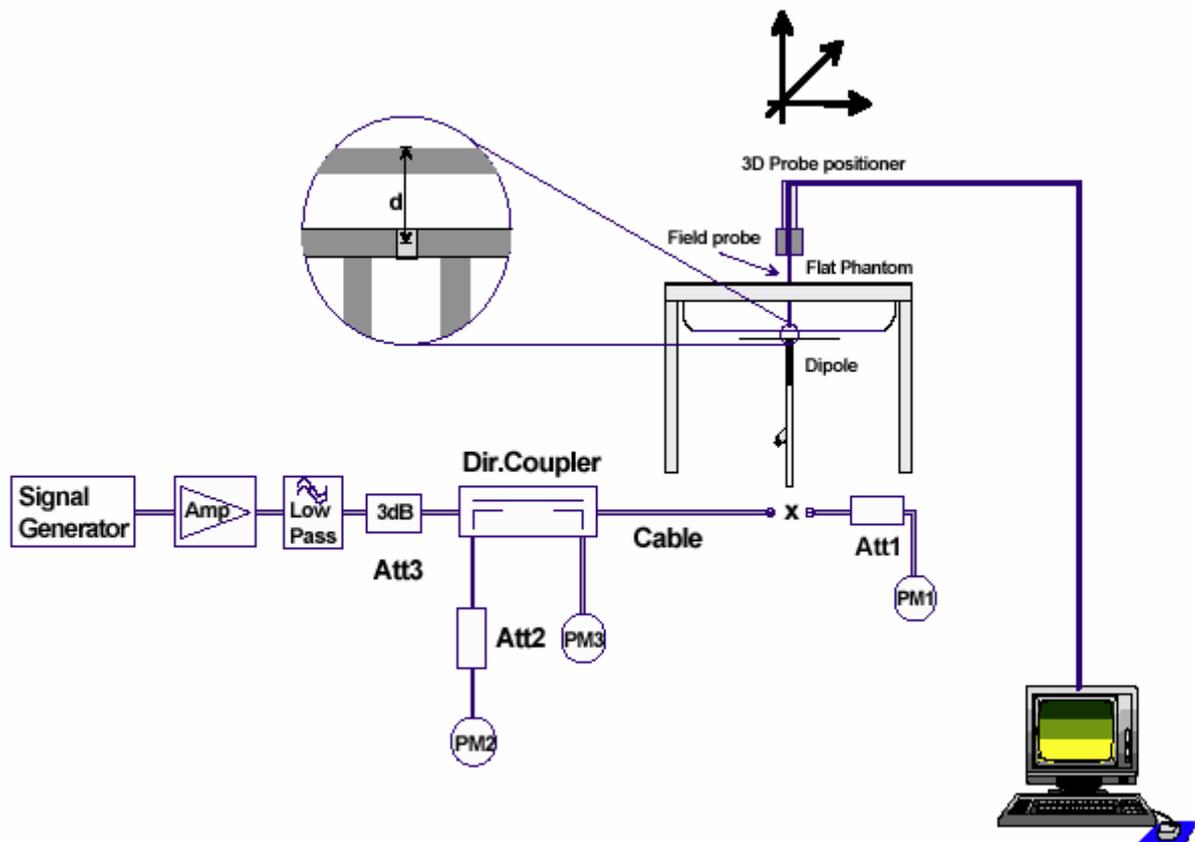


Figure 6 System Check Set-up

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### 5.2. System Check Results

**Table 6: System Check in Head Tissue Simulating Liquid**

Frequency	Test Date	Dielectric Parameters		Temp (°C)	250mW Measured SAR <sub>1g</sub>	1W Normalized SAR <sub>1g</sub>	1W Target SAR <sub>1g</sub> (±10% deviation)
		$\epsilon_r$	$\sigma$ (s/m)				
835MHz	2012-4-16	42.3	0.888	21.5	2.45	9.80	9.34 (8.41~10.27)
1900MHz	2012-4-16	40.1	1.39	21.5	9.52	38.08	40.30 (36.27~ 44.33)
1900MHz	2012-4-17	40.1	1.39	21.5	9.60	38.40	40.30 (36.27~ 44.33)

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

**Table 7: System Check in Body Tissue Simulating Liquid**

Frequency	Test Date	Dielectric Parameters		Temp (°C)	250mW Measured SAR <sub>1g</sub>	1W Normalized SAR <sub>1g</sub>	1W Target SAR <sub>1g</sub> (±10% deviation)
		$\epsilon_r$	$\sigma$ (s/m)				
835MHz	2012-4-15	55.4	0.989	21.5	2.50	10	9.46 (8.51~10.41)
835MHz	2012-4-17	55.4	0.989	21.5	2.48	9.92	9.46 (8.51~10.41)
1900MHz	2012-4-17	52.1	1.55	21.5	10.50	42	41.70 (37.53~45.87)

Note: 1. The graph results see ANNEX B.  
2. Target Values 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 Absolute Radiofrequency Channel Number (ARFCN) is allocated to 128, 190 and 251 in the case of GSM 850, to 512, 661 and 810 in the case of GSM 1900, to 9262, 9400 and 9538 in the case of WCDMA Band II, to 4132, 4183 and 4233 in the case of WCDMA Band V. 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. Devices with a headset output should be tested with a headset connected to the device. The distance between the device and the phantom was kept 15mm.

### 6.3. Test Configuration

#### 6.3.1. 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 lever is set to “5” for GSM 850, set to “0” for GSM 1900. Since the GPRS class is 12 for this EUT, it has at most 4 timeslots in uplink and at most 4 timeslots in downlink, the maximum total timeslots is 5; the EGPRS class is 12 for this EUT, it has at most 4 timeslots in uplink and at most 4 timeslots in downlink, the maximum total timeslots is 5.

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

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

**Table 8: The allowed power reduction in the multi-slot configuration**

Number of timeslots in uplink assignment	Permissible nominal reduction of maximum output power,(dB)
1	0
2	0 to 3,0
3	1,8 to 4,8
4	3,0 to 6,0

#### 6.3.2. WCDMA Test Configuration

##### 6.3.2.1. Output power Verification

Maximum output power is verified on the High, Middle and Low channel according to the procedures described in section 5.2 of 3GPP TS 34. 121, using the appropriate RMC or AMR with TPC(transmit power control) set to all up bits for WCDMA/HSDPA or applying the required inner loop power control procedures to the maximum output power while HSUPA is active. Results for all applicable physical channel configuration (DPCCH, DPDCH<sub>n</sub> and spreading codes, HSDPA, HSPA) should be tabulated in the SAR report. All configuration that are not supported by the DUT or can not be measured due to technical or equipment limitations should be clearly identified.

##### 6.3.2.2. Head SAR Measurements

SAR for head exposure configurations in voice mode is measured using a 12.2kbps RMC with TPC bits configured to all up bits. SAR in AMR configurations is not required when the maximum average output of each RF channel for 12.2kbps AMR is less than 1/4 dB higher than that measured in 12.2 kbps RMC. Otherwise, SAR is measured on the maximum output channel in 12.2kbps AMR with a 3.4 kbps SRB( Signaling radio bearer) using the exposure configuration that results in the highest SAR in 12.2kbps RMC for that RF channel.

### 6.3.2.3. Body SAR Measurements

SAR for body exposure configurations in voice and data modes is measured using 12.2kbps RMC with TPC bits configured to all up bits. SAR for other spreading codes and multiple DPDCH<sub>n</sub>, when supported by the DUT, are not required when the maximum average output of each RF channel, for each spreading code and DPDCH<sub>n</sub> configuration, are less than 1/4 dB higher than those measured in 12.2kbps RMC. Otherwise, SAR is measured on the maximum output channel with an applicable RMC configuration for the corresponding spreading code or DPDCH<sub>n</sub> using the exposure configuration that results in the highest SAR with 12.2 kbps RMC. When more than 2 DPDCH<sub>n</sub> are supported by the DUT, it may be necessary to configure additional DPDCH<sub>n</sub> for a DUT using FTM (Factory Test Mode) or other chipset based test approaches with parameters similar to those used in 384 kbps and 768 kbps RMC.

### 6.3.3. HSDPA Test Configuration

SAR for body exposure configurations is measured according to the ‘Body SAR Measurements’ procedures of that section. In addition, body SAR is also measured for HSDPA when the maximum average output of each RF channel with HSDPA active is at least ¼ dB higher than that measured without HSDPA using 12.2 kbps RMC or the maximum SAR for 12.2 kbps RMC is above 75% of the SAR limit.<sup>30</sup> Body SAR for HSDPA is measured using an FRC with H-Set 1 in Sub-test 1 and a 12.2 kbps RMC configured in Test Loop Mode 1, using the highest body SAR configuration in 12.2 kbps RMC without HSDPA.

HSDPA should be configured according to the UE category of a test device. The number of HSDSCH/ HS-PDSCHs, HARQ processes, minimum inter-TTI interval, transport block sizes and RV coding sequence are defined by the H-set. To maintain a consistent test configuration and stable transmission conditions, QPSK is used in the H-set for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 4 ms with a CQI repetition factor of 2 to maintain a constant rate of active CQI slots. DPCCH and DPDCH gain factors ( $\beta_c$ ,  $\beta_d$ ), and HS-DPCCH power offset parameters ( $\Delta_{ACK}$ ,  $\Delta_{NACK}$ ,  $\Delta_{CQI}$ ) should be set according to values indicated in the Table below.<sup>32</sup> The CQI value is determined by the UE category, transport block size, number of HS-PDSCHs and modulation used in the H-set.

**Table 9: Subtests for UMTS Release 5 HSDPA**

Sub-set	$\beta_c$	$\beta_d$	$\beta_d$ (SF)	$\beta_c/\beta_d$	$\beta_{hs}$ (note 1, note 2)	CM(dB) (note 3)	MPR(dB)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (note 4)	15/15 (note 4)	64	12/15 (note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note1:  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$

Note2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1.A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA,  $\Delta_{ACK}$  and  $\Delta_{NACK} = 8$  ( $A_{hs} = 30/15$ ) with  $\beta_{hs} = 30/15 * \beta_c$ , and  $\Delta_{CQI} =$

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7 ( $A_{HS}=24/15$ ) with  $\beta_{HS}=24/15*\beta_c$ .

Note3: CM=1 for  $\beta_c/\beta_d = 12/15$ ,  $\beta_{HS}/\beta_c=24/15$ . For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the  $\beta_c/\beta_d$  ratio of 12/15 for the TFC during the measurement period(TF1,TF0) is achieved by setting the signaled gain factors for the reference TFC (TFC1,TF1) to  $\beta_c=11/15$  and  $\beta_d=15/15$ .

**Table 10: Settings of required H-Set 1 QPSK in HSDPA mode**

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	534
Inter-TTI Distance	TTI's	3
Number of HARQ Processes	Processes	2
Information Bit Payload ( $N_{INF}$ )	Bits	3202
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	4800
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	9600
Coding Rate	/	0.67
Number of Physical Channel Codes	Codes	5
Modulation	/	QPSK

**Table 11: HSDPA UE category**

HS-DSCH Category	Maximum HS-DSCH Codes Received	Minimum Inter-TTI Interval	Maximum Transport Bits/HS-DSCH	Total Channel
1	5	3	7298	19200
2	5	3	7298	28800
3	5	2	7298	28800
4	5	2	7298	38400
5	5	1	7298	57600
6	5	1	7298	67200
7	10	1	14411	115200
8	10	1	14411	134400
9	15	1	25251	172800
10	15	1	27952	172800
11	5	2	3630	14400
12	5	1	3630	28800
13	15	1	34800	259200
14	15	1	42196	259200
15	15	1	23370	345600
16	15	1	27952	345600

**6.3.4. HSUPA Test Configuration**

Body SAR is also measured for HSPA when the maximum average output of each RF channel with HSPA active is at least ¼ dB higher than that measured without HSPA using 12.2 kbps RMC or the maximum SAR for 12.2 kbps RMC is above 75% of the SAR limit. Body SAR for HSPA is measured with E-DCH Sub-test 5, using H-Set 1 and QPSK for FRC and a 12.2 kbps RMC configured in Test Loop Mode 1 with power control algorithm 2, according to the highest body SAR configuration in 12.2 kbps RMC without HSPA.<sup>40</sup>

Due to inner loop power control requirements in HSPA, a commercial communication test set should be used for the output power and SAR tests.<sup>41</sup> The 12.2 kbps RMC, FRC H-set 1 and E-DCH configurations for HSPA should be configured according to the  $\beta$  values indicated below as well as other applicable procedures described in the 'WCDMA Handset' and 'Release 5 HSDPA Data Devices' sections of 3 G device.

**Table 12: Sub-Test 5 Setup for Release 6 HSUPA**

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

Note 1:  $\Delta_{ACK}, \Delta_{NACK}$  and  $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$ .

Note 2: CM = 1 for  $\beta_c/\beta_d = 12/15, \beta_{hs}/\beta_c = 24/15$ . For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the  $\beta_c/\beta_d$  ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to  $\beta_c = 10/15$  and  $\beta_d = 15/15$ .

Note 4: For subtest 5 the  $\beta_c/\beta_d$  ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to  $\beta_c = 14/15$  and  $\beta_d = 15/15$ .

Note 5: Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Figure 5.1g.

Note 6:  $\beta_{ed}$  can not be set directly; it is set by Absolute Grant Value.

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**Table 13: HSUPA UE category**

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

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

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### 7. Test Results

#### 7.1. Conducted Power Results

**Table 14: Conducted Power Measurement Results**

GSM 850		Burst Conducted Power(dBm)				Average power(dBm)		
		Channel 128	Channel 190	Channel 251		Channel 128	Channel 190	Channel 251
GSM		32.37	32.33	32.25	-9.03dB	23.34	23.3	23.22
GPRS (GMSK)	1Txslot	32.37	32.34	32.26	-9.03dB	23.34	23.31	23.23
	2Txslots	30.6	30.52	30.41	-6.02dB	24.58	24.5	24.39
	3Txslots	29.15	29.08	28.96	-4.26dB	24.89	24.82	24.7
	4Txslots	28.26	28.19	28.07	-3.01dB	<b>25.25</b>	<b>25.18</b>	<b>25.06</b>
EGPRS (GMSK)	1Txslot	32.35	32.32	32.24	-9.03dB	23.32	23.29	23.21
	2Txslots	30.58	30.51	30.39	-6.02dB	24.56	24.49	24.37
	3Txslots	29.14	29.06	28.95	-4.26dB	24.88	24.8	24.69
	4Txslots	28.25	28.17	28.06	-3.01dB	<b>25.24</b>	<b>25.16</b>	<b>25.05</b>
GSM 1900		Burst Conducted Power(dBm)				Average power(dBm)		
		Channel 512	Channel 661	Channel 810		Channel 512	Channel 661	Channel 810
GSM		29.64	29.40	29.22	-9.03dB	20.61	20.37	20.19
GPRS (GMSK)	1Txslot	29.66	29.42	29.23	-9.03dB	20.63	20.39	20.20
	2Txslots	28.69	28.48	28.32	-6.02dB	22.67	22.46	22.30
	3Txslots	26.8	26.66	26.57	-4.26dB	22.54	22.40	22.31
	4Txslots	25.93	25.9	25.76	-3.01dB	<b>22.92</b>	<b>22.89</b>	<b>22.75</b>
EGPRS (GMSK)	1Txslot	29.64	29.4	29.22	-9.03dB	20.61	20.37	20.19
	2Txslots	28.68	28.46	28.31	-6.02dB	22.66	22.44	22.29
	3Txslots	26.79	26.65	26.56	-4.26dB	22.53	22.39	22.3
	4Txslots	25.92	25.89	25.76	-3.01dB	<b>22.91</b>	<b>22.88</b>	<b>22.75</b>

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

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

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

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

2) Average power numbers

The maximum power numbers are marks in bold.

WCDMA Band II		Conducted Power (dBm)		
		Channel 9262	Channel 9400	Channel 9538
<b>RMC</b>		22.54	22.51	22.67
<b>HSUPA</b>	Sub - Test 1	19.27	19.45	19.63
	Sub - Test 2	18.24	18.45	18.67
	Sub - Test 3	18.76	18.94	19.15
	Sub - Test 4	19.30	19.45	19.67
	Sub - Test 5	21.24	21.42	21.63
WCDMA Band V		Conducted Power (dBm)		
		Channel 4132	Channel 4183	Channel 4233
<b>RMC</b>		23.27	23.01	23.21
<b>HSUPA</b>	Sub - Test 1	19.80	19.67	19.77
	Sub - Test 2	18.81	18.64	18.81
	Sub - Test 3	19.29	19.13	19.31
	Sub - Test 4	19.85	19.66	19.82
	Sub - Test 5	21.79	21.58	21.78

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### 7.2. SAR Test Results

#### 7.2.1. GSM 850 (GPRS/EGPRS)

**Table 15: SAR Values [GSM 850 (GPRS/EGPRS)]**

Limit of SAR		10 g Average	1 g Average	Power Drift	Graph Results
		2.0 W/kg	1.6 W/kg	± 0.21 dB	
Different Test Position	Channel	Measurement Result(W/kg)		Power Drift (dB)	
		10 g Average	1 g Average		
<b>Test Position of Head with Battery 1</b>					
Left hand, Touch Cheek	High/251	0.619	0.828	0.011	Figure 13
	Middle/190	0.694	0.926	-0.102	Figure 14
	Low/128	0.639	0.848	0.021	Figure 15
Left hand, Tilt 15 Degree	High/251	0.276	0.374	-0.022	Figure 16
	Middle/190	0.298	0.400	-0.007	Figure 17
	Low/128	0.276	0.368	-0.063	Figure 18
Right hand, Touch Cheek	High/251	0.651	0.863	0.037	Figure 19
	Middle/190	0.752	0.998	-0.184	Figure 20
	Low/128	0.716	0.945	-0.113	Figure 21
Right hand, Tilt 15 Degree	High/251	0.274	0.369	-0.012	Figure 22
	Middle/190	0.305	0.409	0.001	Figure 23
	Low/128	0.293	0.388	-0.036	Figure 24
<b>Test position of Body with Battery 1 (Distance 15mm)</b>					
Towards Ground (4Txslots)	High/251	0.449	0.619	0.025	Figure 25
	Middle/190	0.601	0.828	-0.022	Figure 26
	Low/128	0.746	1.030	0.037	Figure 27
Towards Phantom (4Txslots)	High/251	0.412	0.557	0.051	Figure 28
	Middle/190	0.546	0.736	0.036	Figure 29
	Low/128	0.679	0.913	-0.176	Figure 30
<b>Worst Case Position of Body with EGPRS (Battery 1, GMSK, Distance 15mm)</b>					
Towards Ground (4Txslots)	Low/128	0.733	1.010	0.021	Figure 31
<b>Worst Case Position of Body with Stereo Headset 1 and Battery 1 (Distance 15mm)</b>					
Towards Ground	Low/128	0.399	0.547	0.026	Figure 32
<b>Worst Case Position of Body with Stereo Headset 2 and Battery 1 (Distance 15mm)</b>					
Towards Ground	Low/128	0.373	0.511	-0.027	Figure 33

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**Worst Case Position of Body with Battery 2 (Distance 10mm)**

Towards Ground (4Txslots)	Low/128	0.722	0.991	-0.071	Figure 34
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Note: 1. The value with blue color is the maximum SAR Value of each test band.

2. The SAR test shall be performed at the high, middle and low frequency channels of each operating mode. If the SAR measured at mid-band channel for each test configuration is at least 3.0 dB lower than the SAR limit ( $< 0.8\text{W/kg}$ ), testing at the high and low channels is optional.
3. When multiple slots can be used, SAR should be tested to account for the maximum source-based time-averaged output power.
4. 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.

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### 7.2.2. GSM 1900 (GPRS/EGPRS)

**Table 16: SAR Values [GSM 1900(GPRS/EGPRS)]**

Limit of SAR		10 g Average	1 g Average	Power Drift	Graph Results
		2.0 W/kg	1.6 W/kg	± 0.21 dB	
Different Test Position	Channel	Measurement Result(W/kg)		Power Drift (dB)	
		10 g Average	1 g Average		
<b>Test Position of Head with Battery 1</b>					
Left hand, Touch Cheek	High/810	0.332	0.522	0.089	Figure 35
	Middle/661	0.367	0.580	-0.066	Figure 36
	Low/512	0.433(max.cube)	0.694(max.cube)	-0.055	Figure 37
Left hand, Tilt 15 Degree	High/810	0.141	0.232	-0.030	Figure 38
	Middle/661	0.150	0.240	-0.005	Figure 39
	Low/512	0.176	0.275	-0.032	Figure 40
Right hand, Touch Cheek	High/810	0.360	0.609	0.170	Figure 41
	Middle/661	0.392	0.661	-0.157	Figure 42
	Low/512	0.442	0.746	0.050	Figure 43
Right hand, Tilt 15 Degree	High/810	0.136	0.236	-0.003	Figure 44
	Middle/661	0.142	0.246	0.050	Figure 45
	Low/512	0.173	0.295	-0.061	Figure 46
<b>Test position of Body with Battery 1 (Distance 15mm)</b>					
Towards Ground (4Txslots)	High/810	0.321	0.532	0.014	Figure 47
	Middle/661	0.289	0.481	0.082	Figure 48
	Low/512	0.271	0.456	-0.002	Figure 49
Towards Phantom (4Txslots)	High/810	0.232	0.386	-0.063	Figure 50
	Middle/661	0.203	0.340	-0.075	Figure 51
	Low/512	0.183	0.308	0.020	Figure 52
<b>Worst Case Position of Body with EGPRS (Battery 1, GMSK, Distance 15mm)</b>					
Towards Ground (4Txslots)	High/810	0.287	0.481	-0.069	Figure 53
<b>Worst Case Position of Body with Stereo Headset 1 and Battery 1 (Distance 15mm)</b>					
Towards Ground	High/810	0.166	0.275	0.102	Figure 54
<b>Worst Case Position of Body with Stereo Headset 2 and Battery 1 (Distance 15mm)</b>					
Towards Ground	High/810	0.159	0.260	0.067	Figure 55

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

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2. The SAR test shall be performed at the high, middle and low frequency channels of each operating mode. If the SAR measured at mid-band channel for each test configuration is at least 3.0 dB lower than the SAR limit ( $< 0.8\text{W/kg}$ ), testing at the high and low channels is optional.
3. When multiple slots can be used, SAR should be tested to account for the maximum source-based time-averaged output power.
4. 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.
5. The (max.cube) labeling indicates that during the grid scanning an additional peak was found which was within 2.0dB of the highest peak. The value of the highest cube is given in the table above.

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### 7.2.3. WCDMA Band II (WCDMA)

**Table 17: SAR Values [WCDMA Band II (WCDMA)]**

Limit of SAR		10 g Average	1 g Average	Power Drift	Graph Results
		2.0 W/kg	1.6 W/kg	± 0.21 dB	
Different Test Position	Channel	Measurement Result(W/kg)		Power Drift (dB)	
		10 g Average	1 g Average		
<b>Test Position of Head with Battery 1</b>					
Left hand, Touch Cheek	High/9538	0.644(max.cube)	1.010(max.cube)	-0.041	Figure 56
	Middle/9400	0.635(max.cube)	1.000(max.cube)	0.105	Figure 57
	Low/9262	0.643(max.cube)	1.030(max.cube)	0.120	Figure 58
Left hand, Tilt 15 Degree	High/9538	0.267	0.437	0.011	Figure 59
	Middle/9400	0.262	0.420	-0.018	Figure 60
	Low/9262	0.278	0.435	0.040	Figure 61
Right hand, Touch Cheek	High/9538	0.708	1.190	0.181	Figure 62
	Middle/9400	0.676	1.140	0.031	Figure 63
	Low/9262	0.665	1.120	-0.096	Figure 64
Right hand, Tilt 15 Degree	High/9538	0.254	0.439	-0.031	Figure 65
	Middle/9400	0.249	0.429	0.031	Figure 66
	Low/9262	0.265	0.451	0.001	Figure 67
<b>Test Position of Head with Battery 2</b>					
Right hand, Touch Cheek	High/9538	0.664	1.120	0.014	Figure 68
<b>Test position of Body with Battery 1 (Distance 15mm)</b>					
Towards Ground	High/9538	0.348	0.579	0.054	Figure 69
	Middle/9400	0.313	0.523	0.029	Figure 70
	Low/9262	0.298	0.499	0.033	Figure 71
Towards Phantom	High/9538	0.241	0.400	0.002	Figure 72
	Middle/9400	0.209	0.348	-0.012	Figure 73
	Low/9262	0.195	0.327	-0.014	Figure 74
<b>Worst Case Position of Body with Stereo Headset 1 and Battery 1 (Distance 15mm)</b>					
Towards Ground	High/9538	0.309	0.512	-0.055	Figure 75
<b>Worst Case Position of Body with Stereo Headset 2 and Battery 1 (Distance 15mm)</b>					
Towards Ground	High/9538	0.295	0.484	0.012	Figure 76

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

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2. The SAR test shall be performed at the high, middle and low frequency channels of each operating mode. If the SAR measured at mid-band channel for each test configuration is at least 3.0 dB lower than the SAR limit ( $< 0.8\text{W/kg}$ ), testing at the high and low channels is optional.
3. WCDMA mode were tested under RMC 12.2kbps with HSPA (HSDPA/HSUPA) inactive per KDB Publication 941225 D01. HSPA (HSDPA/HSUPA) SAR for body was not required since the average output power of the HSPA (HSDPA/HSUPA) subtests was not more than 0.25 dB higher than the RMC level and the maximum SAR for 12.2kbps RMC was less than 75% SAR limit.
4. The (max.cube) labeling indicates that during the grid scanning an additional peak was found which was within 2.0dB of the highest peak. The value of the highest cube is given in the table above.

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### 7.2.4. WCDMA Band V (WCDMA/HSDPA)

**Table 18: SAR Values [WCDMA Band V (WCDMA/HSDPA)]**

Limit of SAR		10 g Average	1 g Average	Power Drift	Graph Results
		2.0 W/kg	1.6 W/kg	± 0.21 dB	
Different Test Position	Channel	Measurement Result(W/kg)		Power Drift (dB)	
		10 g Average	1 g Average		
<b>Test Position of Head with Battery 1</b>					
Left hand, Touch Cheek	High/4233	0.669	0.892	-0.076	Figure 77
	Middle/4183	0.606	0.807	0.109	Figure 78
	Low/4132	0.612	0.812	0.105	Figure 79
Left hand, Tilt 15 Degree	High/4233	0.312	0.423	0.024	Figure 80
	Middle/4183	0.279	0.376	0.056	Figure 81
	Low/4132	0.275	0.369	0.147	Figure 82
Right hand, Touch Cheek	High/4233	0.710	0.941	0.101	Figure 83
	Middle/4183	0.652	0.864	-0.070	Figure 84
	Low/4132	0.661	0.875	-0.013	Figure 85
Right hand, Tilt 15 Degree	High/4233	0.302	0.406	0.067	Figure 86
	Middle/4183	0.270	0.361	-0.059	Figure 87
	Low/4132	0.266	0.355	0.047	Figure 88
<b>Test position of Body with Battery 1 (Distance 15mm)</b>					
Towards Ground	High/4233	0.409	0.564	-0.009	Figure 89
	Middle/4183	0.413	0.569	0.014	Figure 90
	Low/4132	0.437	0.600	0.015	Figure 91
Towards Phantom	High/4233	0.366	0.497	0.016	Figure 92
	Middle/4183	0.353	0.480	-0.014	Figure 93
	Low/4132	0.372	0.504	0.027	Figure 94
<b>Worst Case Position of Body with Stereo Headset 1 and Battery 1 (Distance 15mm)</b>					
Towards Ground	Low/4132	0.295	0.407	0.074	Figure 95
<b>Worst Case Position of Body with Stereo Headset 2 and Battery 1 (Distance 15mm)</b>					
Towards Ground	Low/4132	0.362	0.497	-0.023	Figure 96

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

2. The SAR test shall be performed at the high, middle and low frequency channels of each operating mode. If the SAR measured at mid-band channel for each test configuration is at least 3.0 dB lower than the SAR limit (< 0.8W/kg), testing at the high and low channels is optional.

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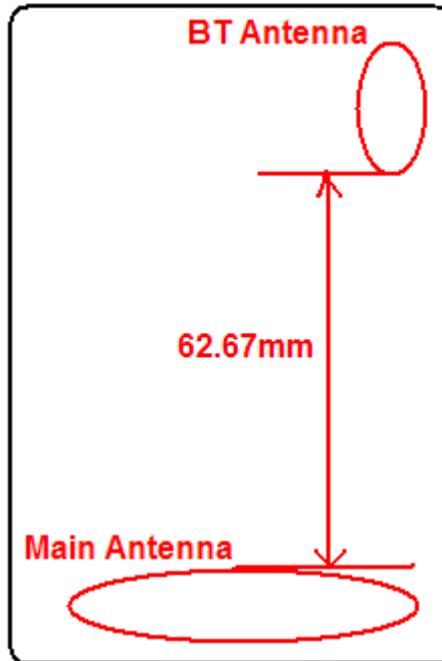
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3. WCDMA mode were tested under RMC 12.2kbps with HSPA (HSDPA/HSUPA) inactive per KDB Publication 941225 D01. HSPA (HSDPA/HSUPA) SAR for body was not required since the average output power of the HSPA (HSDPA/HSUPA) subtests was not more than 0.25 dB higher than the RMC level and the maximum SAR for 12.2kbps RMC was less than 75% SAR limit.

**7.2.5. Bluetooth Function**

The distance between BT antenna and GSM/WCDMA antenna is >5cm. The location of the antennas inside EUT is shown in Annex H:



The output power of BT antenna is as following:

Channel	Ch 0 2402 MHz	Ch 39 2441 MHz	Ch 78 2480 MHz
GFSK(dBm)	6.92	6.83	8.60
EDR2M-4_DQPSK(dBm)	6.20	6.44	8.19
EDR3M-8DPSK(dBm)	6.45	6.69	8.45

**Output Power Thresholds for Unlicensed Transmitters**

	2.45	5.15 - 5.35	5.47 - 5.85	GHz
<b>P<sub>Ref</sub></b>	12	6	5	<b>mW</b>
Device output power should be rounded to the nearest mW to compare with values specified in this table.				

**Stand-alone SAR**

According to the output power measurement result and the distance between BT antenna and GSM/WCDMA antenna we can draw the conclusion that:

BT antenna is >5cm from GSM/WCDMA antenna, stand-alone SAR are not required for BT, because the output power of BT transmitter is  $\leq 2P_{Ref} = 13.8\text{dBm}$ .

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### Simultaneous SAR

About BT and GSM/WCDMA Antenna,

SAR <sub>1g</sub> (W/kg) Test Position	GSM 850	GSM 1900	WCDMA Band II	WCDMA Band V	BT	MAX. ΣSAR <sub>1g</sub>
Left hand, Touch cheek	0.926	0.694	<b>1.030</b>	0.892	0	1.030
Left hand, Tilt 15 Degree	0.400	0.275	<b>0.437</b>	0.423	0	0.437
Right hand, Touch cheek	0.998	0.746	<b>1.190</b>	0.941	0	<b>1.190</b>
Right hand, Tilt 15 Degree	0.409	0.295	<b>0.451</b>	0.406	0	0.451
Body, Towards Ground	<b>1.030</b>	0.532	0.579	0.600	0	1.030
Body, Towards Phantom	<b>0.913</b>	0.386	0.400	0.504	0	0.913

Note: 1. The value with blue color is the maximum ΣSAR<sub>1g</sub> Value.

2. MAX. ΣSAR<sub>1g</sub> = Unlicensed SAR<sub>MAX</sub> + Licensed SAR<sub>MAX</sub>

3. Stand alone SAR for BT is not required. Its SAR is considered 0 in the 1-g SAR summing process to determine simultaneous transmission SAR evaluation requirements.

BT antenna is >5cm from GSM/WCDMA Antenna. (GSM/WCDMA Antenna SAR<sub>MAX</sub>)1.190 +(BT Antenna SAR<sub>MAX</sub>)0 =1.190 < 1.6, So the Simultaneous SAR are not required for BT and GSM/WCDMA antenna.

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**8. Measurement Uncertainty**

No.	source	Type	Uncertainty Value (%)	Probability Distribution	k	c <sub>i</sub>	Standard uncertainty u <sub>i</sub> (%)	Degree of freedom V <sub>eff</sub> or V <sub>i</sub>
1	System repetivity	A	0.5	N	1	1	0.5	9
Measurement system								
2	-probe calibration	B	6.0	N	1	1	6.0	∞
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	∞
6	-boundary effect	B	1.9	R	$\sqrt{3}$	1	1.1	∞
7	-probe linearity	B	4.7	R	$\sqrt{3}$	1	2.7	∞
8	- System detection limits	B	1.0	R	$\sqrt{3}$	1	0.6	∞
9	-readout Electronics	B	1.0	N	1	1	1.0	∞
10	-response time	B	0	R	$\sqrt{3}$	1	0	∞
11	-integration time	B	4.32	R	$\sqrt{3}$	1	2.5	∞
12	-noise	B	0	R	$\sqrt{3}$	1	0	∞
13	-RF Ambient Conditions	B	3	R	$\sqrt{3}$	1	1.73	∞
14	-Probe Positioner Mechanical Tolerance	B	0.4	R	$\sqrt{3}$	1	0.2	∞
15	-Probe Positioning with respect to Phantom Shell	B	2.9	R	$\sqrt{3}$	1	1.7	∞
16	-Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	B	3.9	R	$\sqrt{3}$	1	2.3	∞
Test sample Related								
17	-Test Sample Positioning	A	2.9	N	1	1	2.9	71
18	-Device Holder Uncertainty	A	4.1	N	1	1	4.1	5
19	-Output Power Variation - SAR drift measurement	B	5.0	R	$\sqrt{3}$	1	2.9	∞
Physical parameter								
20	-phantom	B	4.0	R	$\sqrt{3}$	1	2.3	∞

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21	-liquid conductivity (deviation from target)	B	5.0	R	$\sqrt{3}$	0.64	1.8	$\infty$
22	-liquid conductivity (measurement uncertainty)	B	2.5	N	1	0.64	1.6	9
23	-liquid permittivity (deviation from target)	B	5.0	R	$\sqrt{3}$	0.6	1.7	$\infty$
24	-liquid permittivity (measurement uncertainty)	B	2.5	N	1	0.6	1.5	9
Combined standard uncertainty		$u_c = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$					12.16	
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$		N	k=2	23.00		

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**9. Main Test Instruments**

**Table 19: List of Main Instruments**

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	Agilent 8753E	US37390326	September 12, 2011	One year
02	Dielectric Probe Kit	Agilent 85070E	US44020115	No Calibration Requested	
03	Power meter	Agilent E4417A	GB41291714	March 11, 2012	One year
04	Power sensor	Agilent N8481H	MY50350004	September 25, 2011	One year
05	Power sensor	E9327A	US40441622	September 24, 2011	One year
06	Signal Generator	HP 8341B	2730A00804	September 12, 2011	One year
07	Dual directional coupler	778D-012	5051P	August 21, 2011	One year
08	Dual directional coupler	777D	50146	August 21, 2011	One year
09	Amplifier	IXA-020	0401	No Calibration Requested	
10	BTS	E5515C	MY48360988	December 2, 2011	One year
11	E-field Probe	EX3DV4	3816	October 3, 2011	One year
12	DAE	DAE4	1317	January 23, 2012	One year
13	Validation Kit 835MHz	D835V2	4d020	August 26, 2011	One year
14	Validation Kit 1900MHz	D1900V2	5d060	August 31, 2011	One year
15	Temperature Probe	JM222	AA1009129	March 15, 2012	One year
16	Hygrothermograph	WS-1	64591	September 28, 2011	One year

\*\*\*\*\*END OF REPORT BODY\*\*\*\*\*

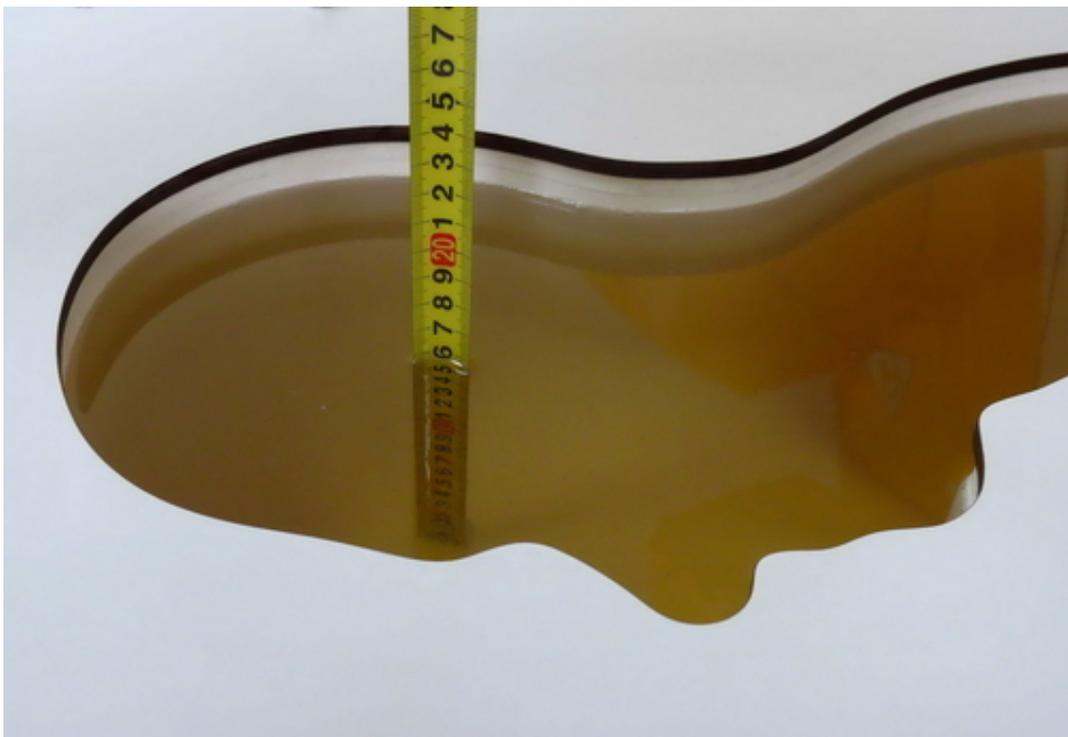
## ANNEX A: Test Layout



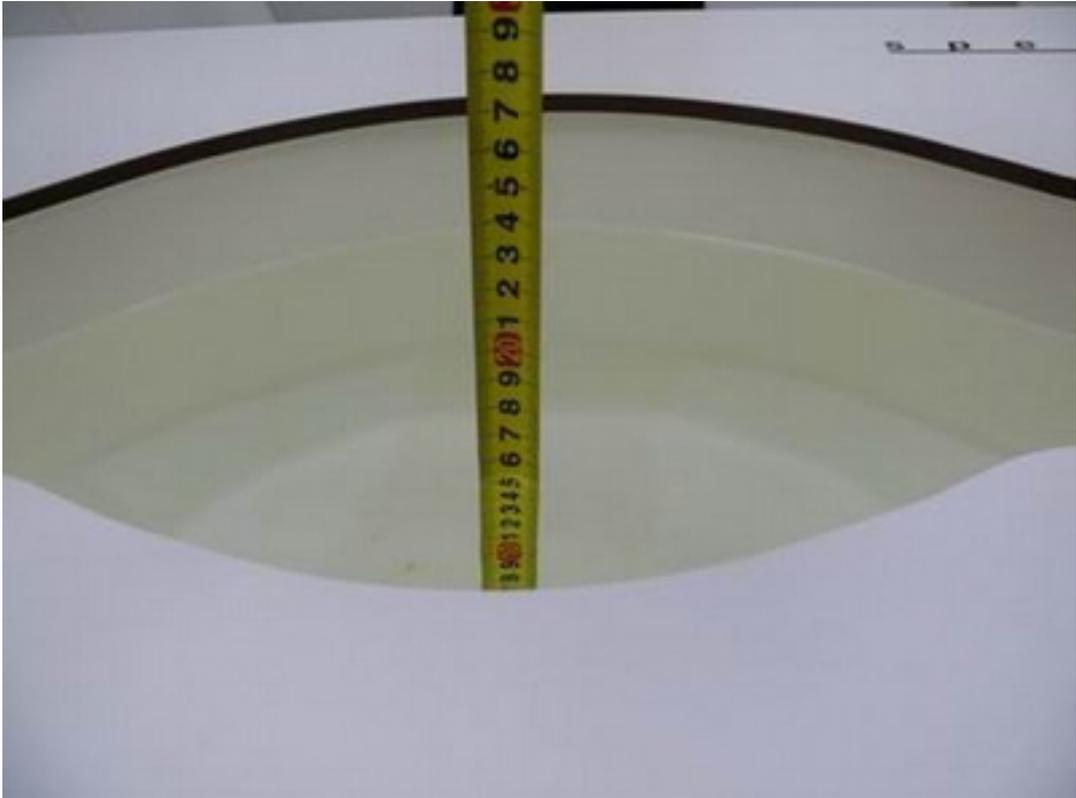
Picture 1: Specific Absorption Rate Test Layout



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)

## 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: 4/16/2012 5:19:00 AM

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

Medium parameters used:  $f = 835$  MHz;  $\sigma = 0.888$  mho/m;  $\epsilon_r = 42.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(9.22, 9.22, 9.22); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**d=15mm, Pin=250mW/Area Scan (101x121x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 2.63 mW/g

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

Reference Value = 54.7 V/m; Power Drift = -0.046 dB

Peak SAR (extrapolated) = 3.68 W/kg

**SAR(1 g) = 2.45 mW/g; SAR(10 g) = 1.61 mW/g**

Maximum value of SAR (measured) = 2.63 mW/g

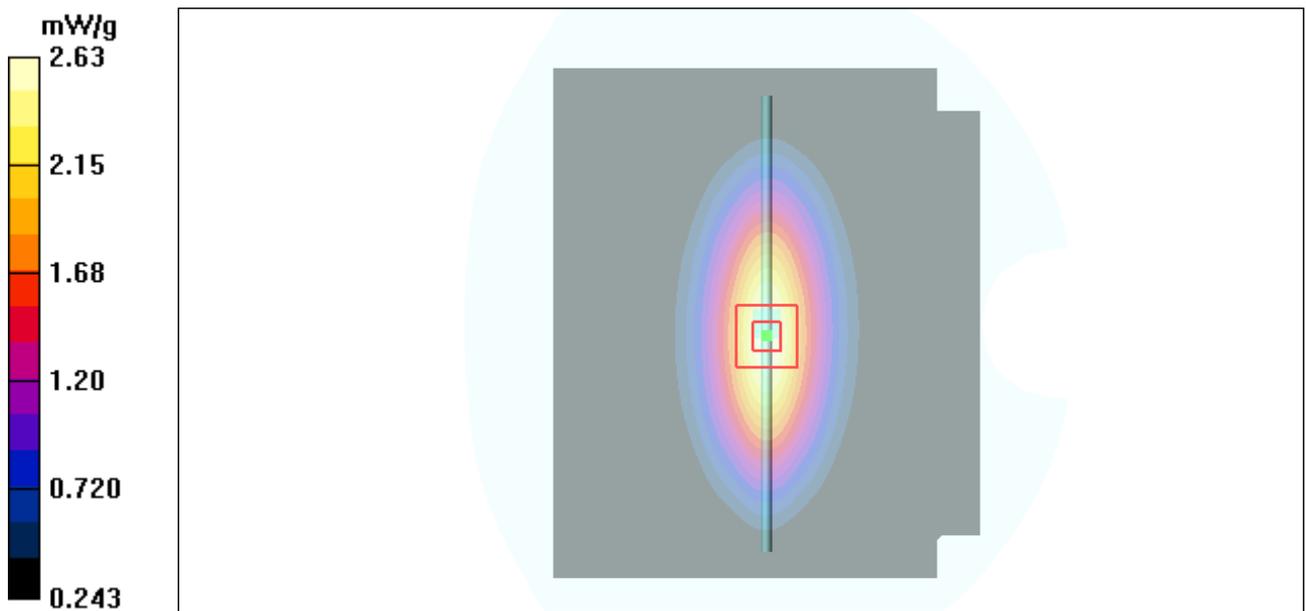


Figure 7 System Performance Check 835MHz 250mW

### System Performance Check at 835 MHz Body TSL

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

Date/Time: 4/15/2012 7:14:41 PM

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

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.989 \text{ mho/m}$ ;  $\epsilon_r = 55.4$ ;  $\rho = 1000 \text{ kg/m}^3$

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(9.38, 9.38, 9.38); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**d=15mm, Pin=250mW/Area Scan (51x121x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) =  $2.69 \text{ mW/g}$

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

Reference Value =  $52.6 \text{ V/m}$ ; Power Drift =  $-0.053 \text{ dB}$

Peak SAR (extrapolated) =  $3.72 \text{ W/kg}$

**SAR(1 g) =  $2.5 \text{ mW/g}$ ; SAR(10 g) =  $1.65 \text{ mW/g}$**

Maximum value of SAR (measured) =  $2.69 \text{ mW/g}$

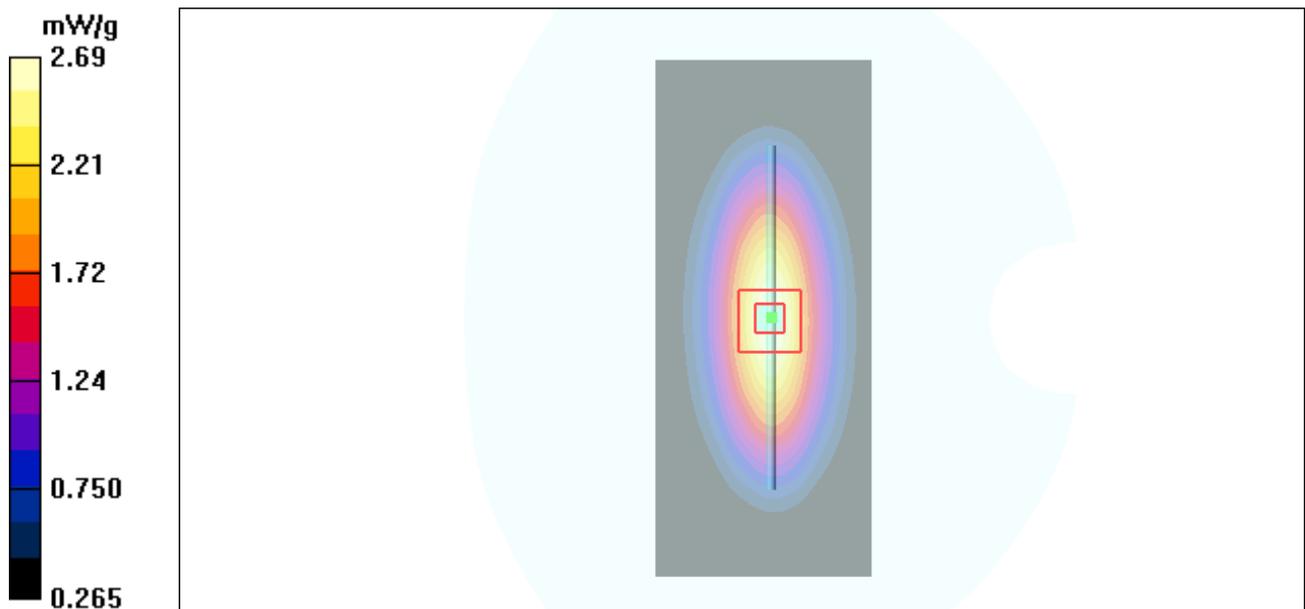


Figure 8 System Performance Check 835MHz 250mW

### System Performance Check at 835 MHz Body TSL

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

Date/Time: 4/17/2012 12:36:53 AM

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

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.989 \text{ mho/m}$ ;  $\epsilon_r = 55.4$ ;  $\rho = 1000 \text{ kg/m}^3$

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(9.38, 9.38, 9.38); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**d=15mm, Pin=250mW/Area Scan (101x121x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 2.71 mW/g

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

Reference Value = 52.8 V/m; Power Drift = -0.124 dB

Peak SAR (extrapolated) = 3.69 W/kg

**SAR(1 g) = 2.48 mW/g; SAR(10 g) = 1.64 mW/g**

Maximum value of SAR (measured) = 2.68 mW/g

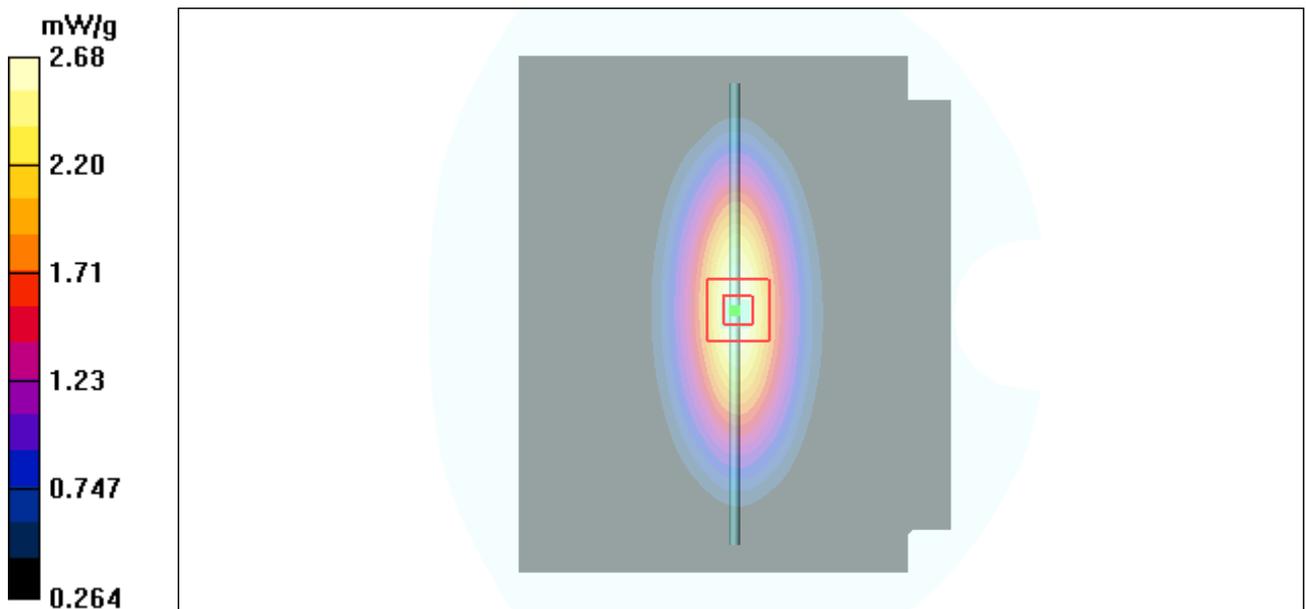


Figure 9 System Performance Check 835MHz 250mW

### System Performance Check at 1900 MHz Head TSL

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

Date/Time: 4/16/2012 12:11:10 AM

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

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.39$  mho/m;  $\epsilon_r = 40.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.9, 7.9, 7.9); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**d=10mm, Pin=250mW/Area Scan (61x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 11.6 mW/g

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

Reference Value = 88.5 V/m; Power Drift = -0.173 dB

Peak SAR (extrapolated) = 17.9 W/kg

**SAR(1 g) = 9.52 mW/g; SAR(10 g) = 4.93 mW/g**

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

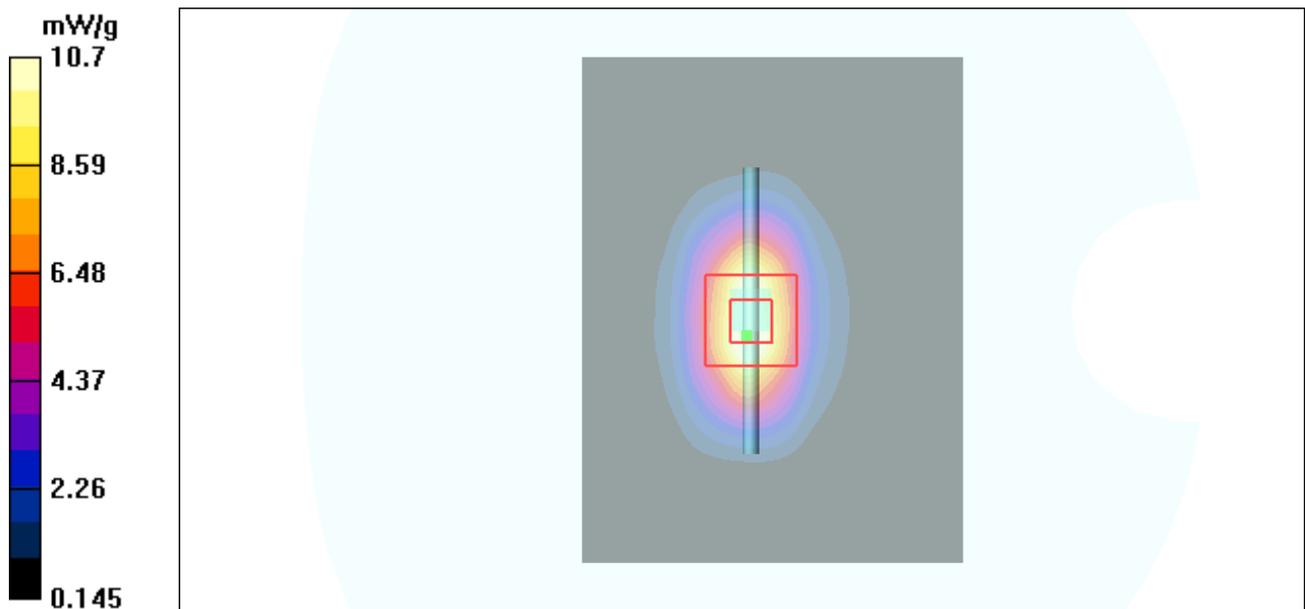


Figure 10 System Performance Check 1900MHz 250mW

### System Performance Check at 1900 MHz Head TSL

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

Date/Time: 4/17/2012 10:11:54 AM

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

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.39$  mho/m;  $\epsilon_r = 40.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.9, 7.9, 7.9); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**d=10mm, Pin=250mW/Area Scan (61x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 11.5 mW/g

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

Reference Value = 87.1 V/m; Power Drift = -0.066 dB

Peak SAR (extrapolated) = 18.0 W/kg

**SAR(1 g) = 9.6 mW/g; SAR(10 g) = 4.98 mW/g**

Maximum value of SAR (measured) = 10.8 mW/g

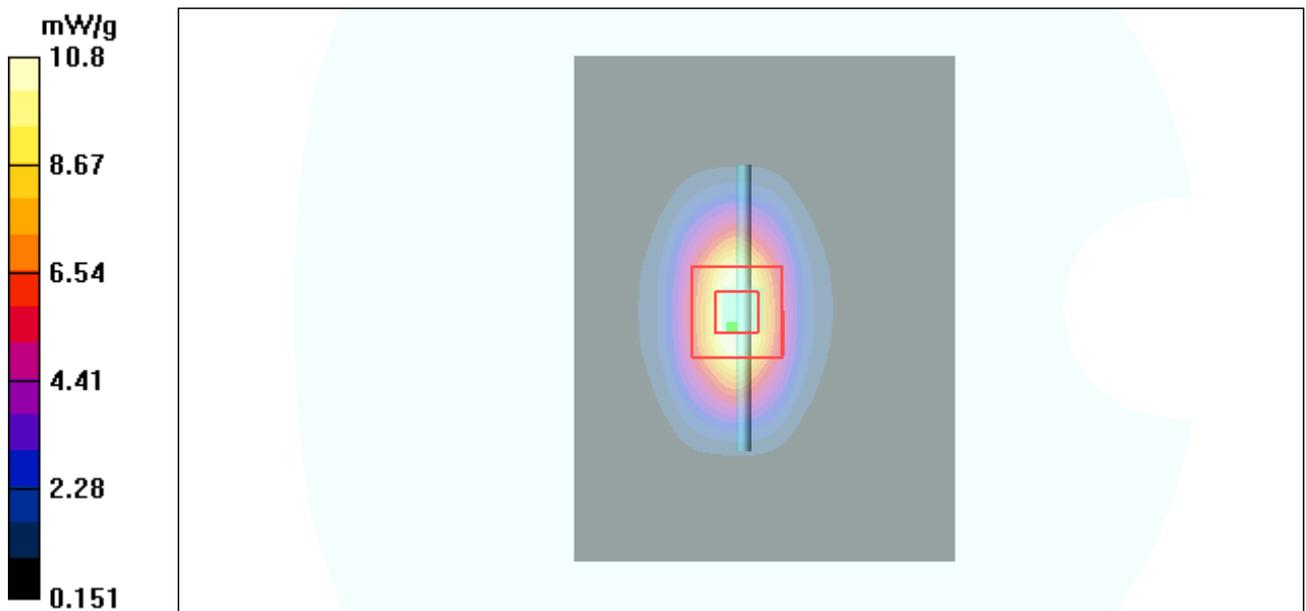


Figure 11 System Performance Check 1900MHz 250mW

**System Performance Check at 1900 MHz Body TSL**

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

Date/Time: 4/17/2012 4:37:48 AM

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

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.55$  mho/m;  $\epsilon_r = 52.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.51, 7.51, 7.51); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**d=10mm, Pin=250mW/Area Scan (61x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 12.8 mW/g

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

Reference Value = 87.0 V/m; Power Drift = -0.014 dB

Peak SAR (extrapolated) = 19.2 W/kg

**SAR(1 g) = 10.5 mW/g; SAR(10 g) = 5.48 mW/g**

Maximum value of SAR (measured) = 11.8 mW/g

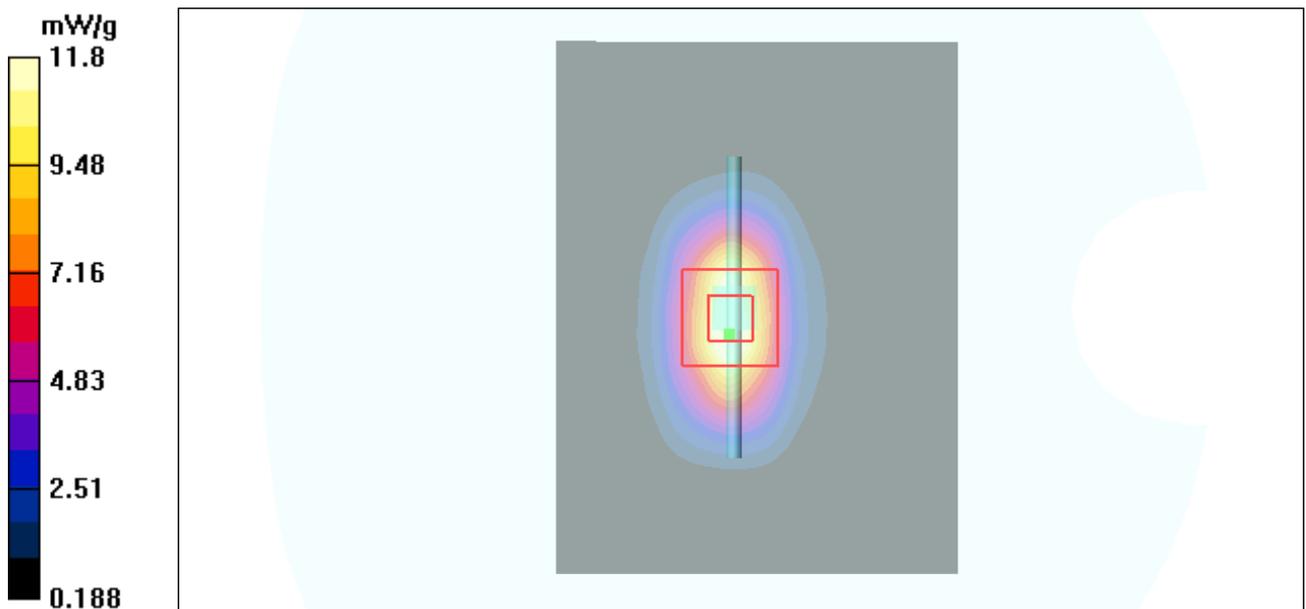


Figure 12 System Performance Check 1900MHz 250mW

## ANNEX C: Graph Results

### GSM 850 Left Cheek High (Battery 1)

Date/Time: 4/16/2012 11:32:26 AM

Communication System: GSM 850; Frequency: 848.8 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 849$  MHz;  $\sigma = 0.901$  mho/m;  $\epsilon_r = 42.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Left Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(9.22, 9.22, 9.22); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Cheek High/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.880 mW/g

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

Reference Value = 10.6 V/m; Power Drift = 0.011 dB

Peak SAR (extrapolated) = 1.03 W/kg

**SAR(1 g) = 0.828 mW/g; SAR(10 g) = 0.619 mW/g**

Maximum value of SAR (measured) = 0.865 mW/g

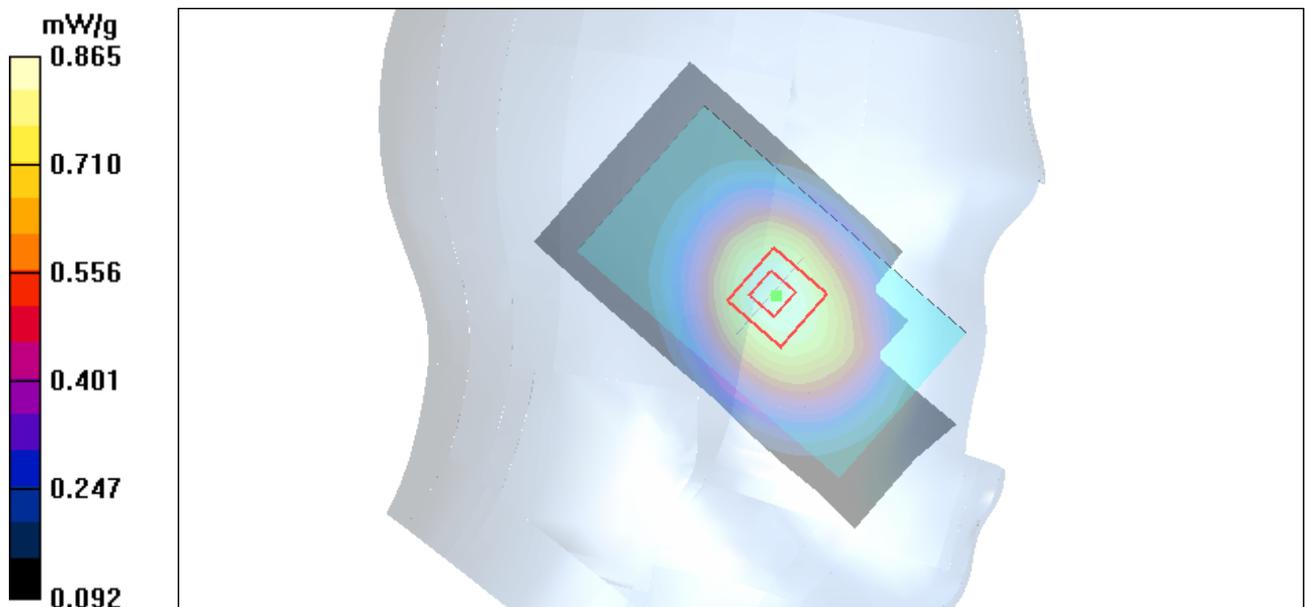


Figure 13 Left Hand Touch Cheek GSM 850 Channel 251

**GSM 850 Left Cheek Middle (Battery 1)**

Date/Time: 4/16/2012 11:06:12 AM

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.89$  mho/m;  $\epsilon_r = 42.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Left Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(9.22, 9.22, 9.22); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Cheek Middle/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.998 mW/g

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

Reference Value = 11.4 V/m; Power Drift = -0.102 dB

Peak SAR (extrapolated) = 1.13 W/kg

**SAR(1 g) = 0.926 mW/g; SAR(10 g) = 0.694 mW/g**

Maximum value of SAR (measured) = 0.967 mW/g

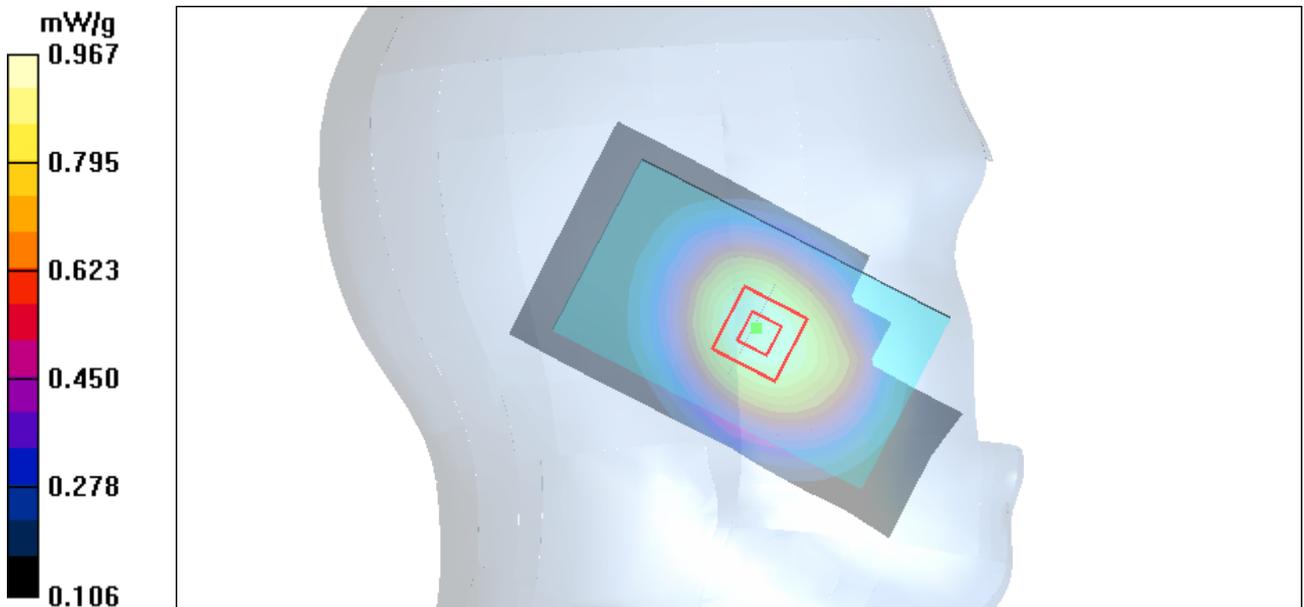


Figure 14 Left Hand Touch Cheek GSM 850 Channel 190

**GSM 850 Left Cheek Low (Battery 1)**

Date/Time: 4/16/2012 11:19:02 AM

Communication System: GSM 850; Frequency: 824.2 MHz; Duty Cycle: 1:8.3

Medium parameters used (interpolated):  $f = 824.2$  MHz;  $\sigma = 0.878$  mho/m;  $\epsilon_r = 42.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Left Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(9.22, 9.22, 9.22); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Cheek Low/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.900 mW/g

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

Reference Value = 10.9 V/m; Power Drift = 0.021 dB

Peak SAR (extrapolated) = 1.03 W/kg

**SAR(1 g) = 0.848 mW/g; SAR(10 g) = 0.639 mW/g**

Maximum value of SAR (measured) = 0.886 mW/g

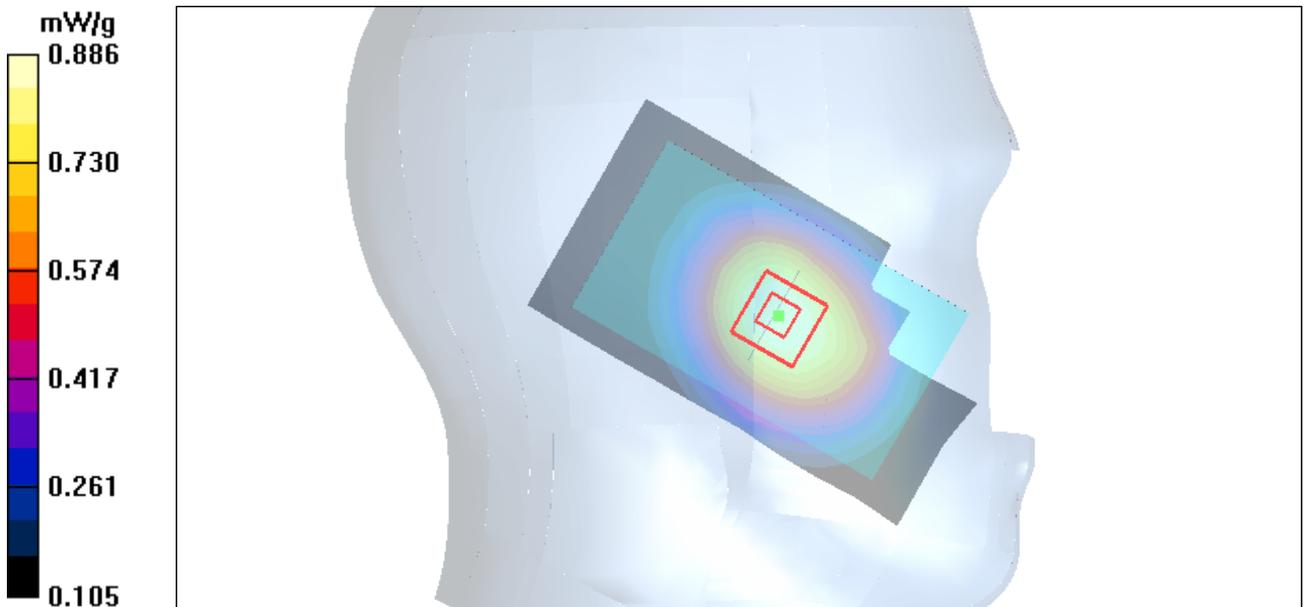


Figure 15 Left Hand Touch Cheek GSM 850 Channel 128

**GSM 850 Left Tilt High (Battery 1)**

Date/Time: 4/16/2012 11:45:37 AM

Communication System: GSM 850; Frequency: 848.8 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 849$  MHz;  $\sigma = 0.901$  mho/m;  $\epsilon_r = 42.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Left Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(9.22, 9.22, 9.22); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Tilt High/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.393 mW/g

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

Reference Value = 11.7 V/m; Power Drift = -0.022 dB

Peak SAR (extrapolated) = 0.484 W/kg

**SAR(1 g) = 0.374 mW/g; SAR(10 g) = 0.276 mW/g**

Maximum value of SAR (measured) = 0.392 mW/g

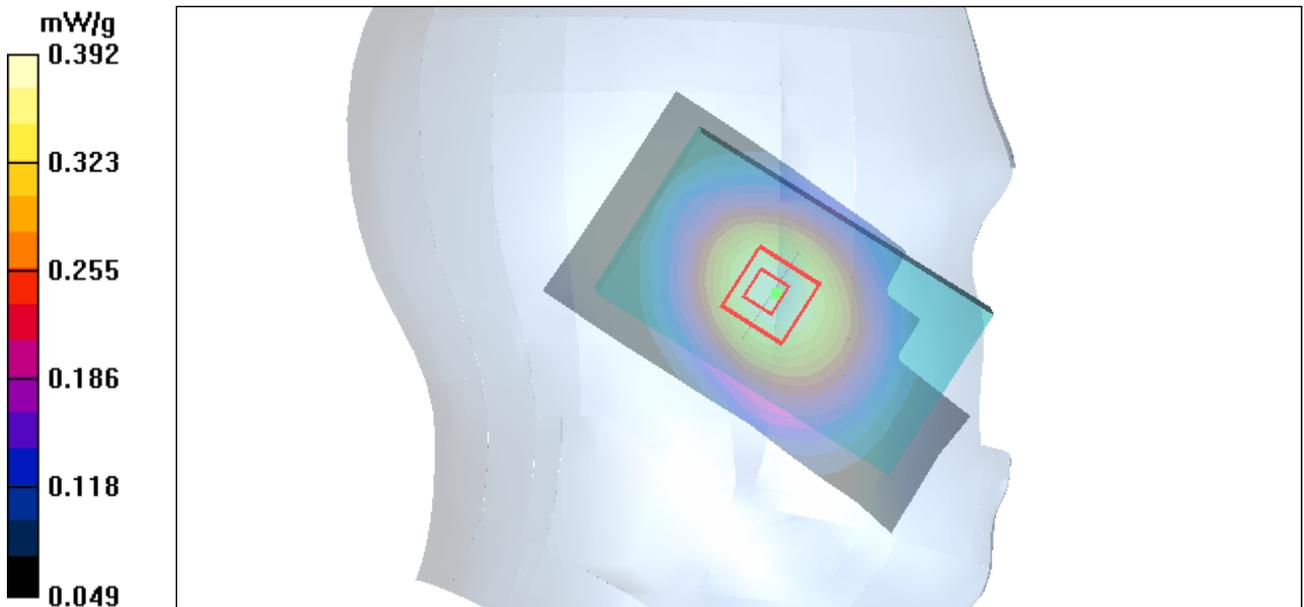


Figure 16 Left Hand Tilt 15° GSM 850 Channel 251

### GSM 850 Left Tilt Middle (Battery 1)

Date/Time: 4/16/2012 12:11:34 PM

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.89$  mho/m;  $\epsilon_r = 42.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Left Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(9.22, 9.22, 9.22); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Tilt Middle/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.421 mW/g

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

Reference Value = 12.3 V/m; Power Drift = -0.007 dB

Peak SAR (extrapolated) = 0.510 W/kg

**SAR(1 g) = 0.400 mW/g; SAR(10 g) = 0.298 mW/g**

Maximum value of SAR (measured) = 0.420 mW/g

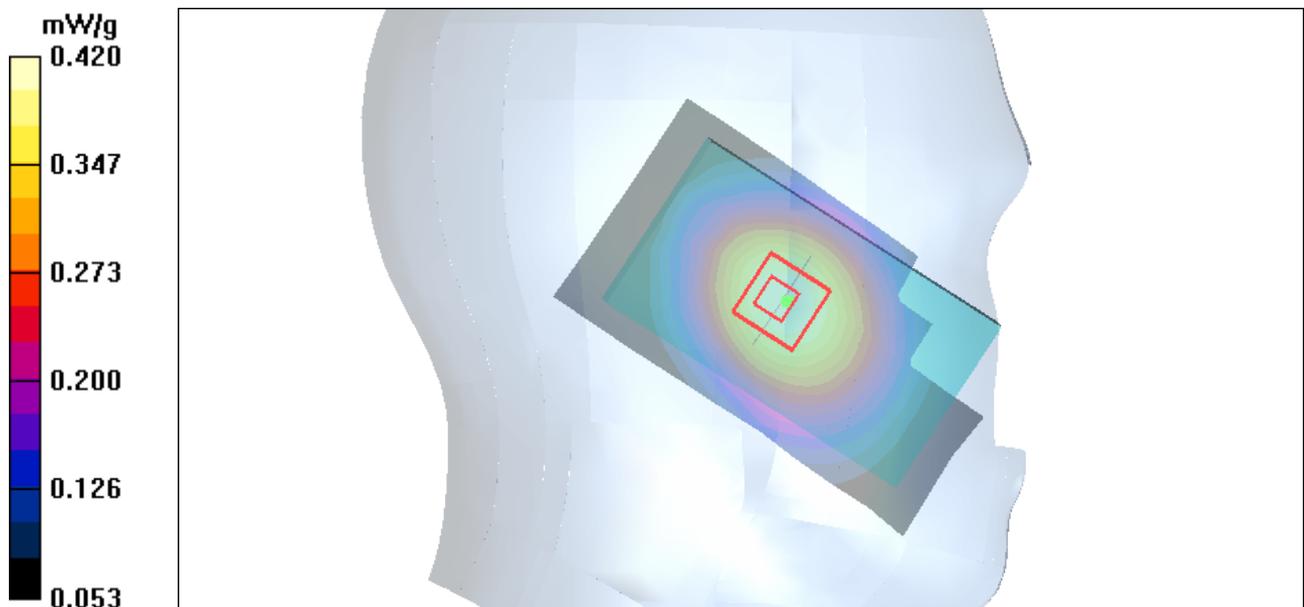


Figure 17 Left Hand Tilt 15° GSM 850 Channel 190

**GSM 850 Left Tilt Low (Battery 1)**

Date/Time: 4/16/2012 11:58:42 AM

Communication System: GSM 850; Frequency: 824.2 MHz; Duty Cycle: 1:8.3

Medium parameters used (interpolated):  $f = 824.2$  MHz;  $\sigma = 0.878$  mho/m;  $\epsilon_r = 42.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Left Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(9.22, 9.22, 9.22); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Tilt Low/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.390 mW/g

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

Reference Value = 12.0 V/m; Power Drift = -0.063 dB

Peak SAR (extrapolated) = 0.464 W/kg

**SAR(1 g) = 0.368 mW/g; SAR(10 g) = 0.276 mW/g**

Maximum value of SAR (measured) = 0.387 mW/g

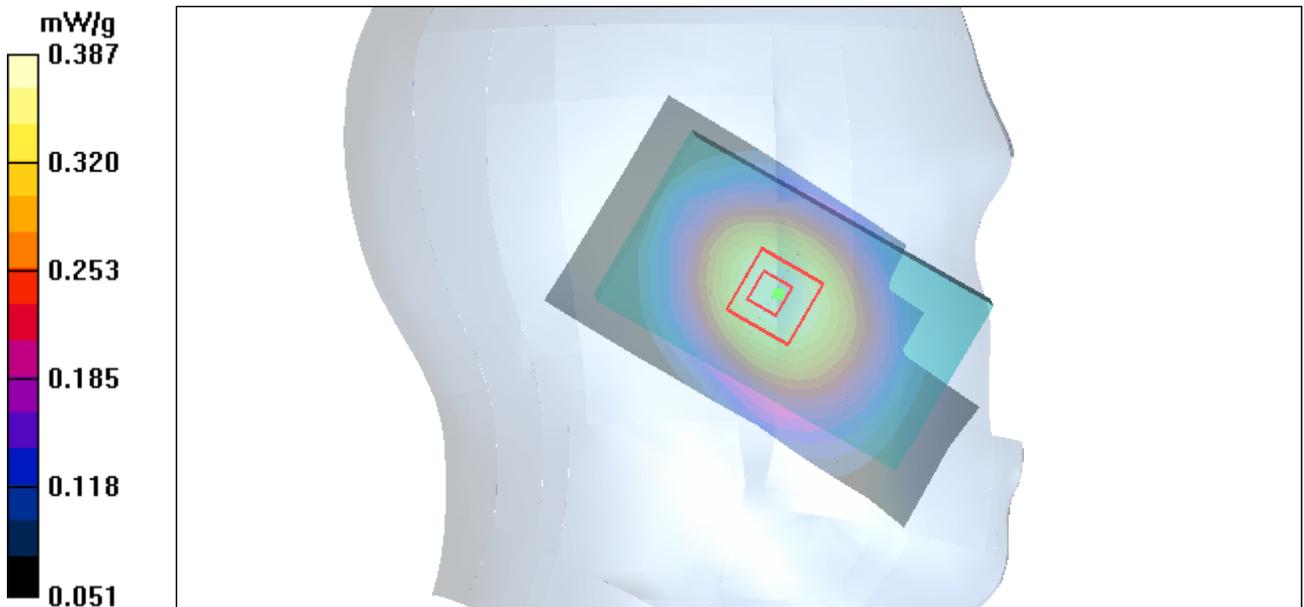


Figure 18 Left Hand Tilt 15° GSM 850 Channel 128

### GSM 850 Right Cheek High (Battery 1)

Date/Time: 4/16/2012 9:20:28 AM

Communication System: GSM 850; Frequency: 848.8 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 849$  MHz;  $\sigma = 0.901$  mho/m;  $\epsilon_r = 42.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Right Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(9.22, 9.22, 9.22); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Cheek High/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.924 mW/g

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

Reference Value = 10.8 V/m; Power Drift = 0.037 dB

Peak SAR (extrapolated) = 1.06 W/kg

**SAR(1 g) = 0.863 mW/g; SAR(10 g) = 0.651 mW/g**

Maximum value of SAR (measured) = 0.901 mW/g

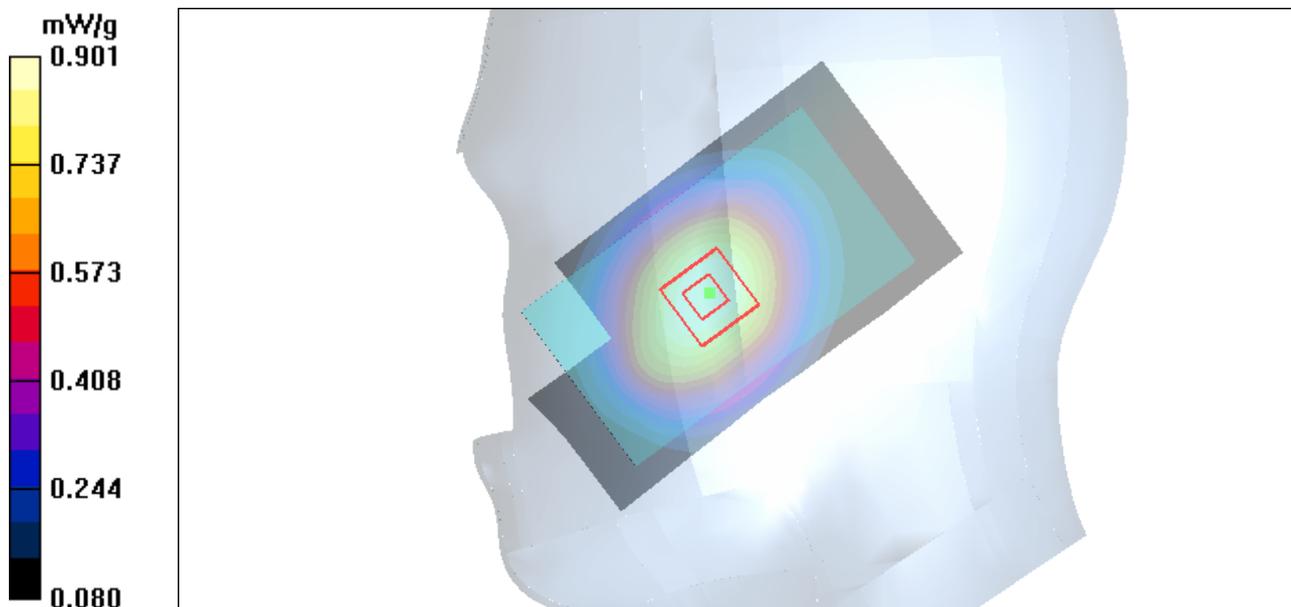


Figure 19 Right Hand Touch Cheek GSM 850 Channel 251

### GSM 850 Right Cheek Middle (Battery 1)

Date/Time: 4/16/2012 9:07:52 AM

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.89$  mho/m;  $\epsilon_r = 42.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Right Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(9.22, 9.22, 9.22); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Cheek Middle/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.07 mW/g

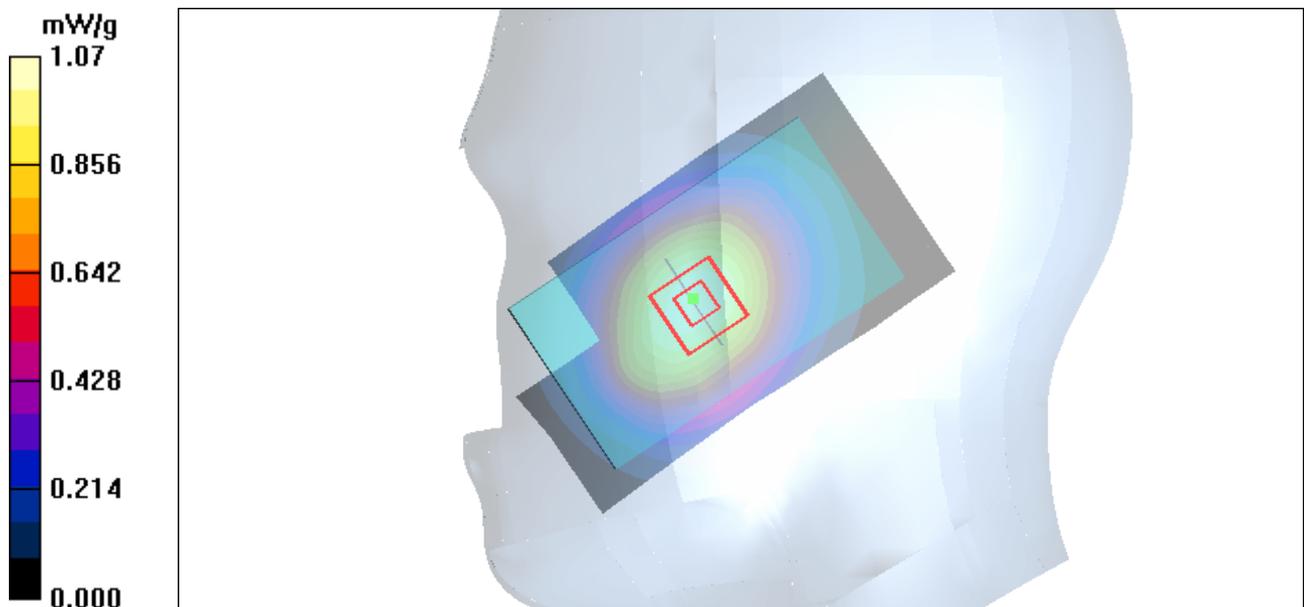
**Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 12.0 V/m; Power Drift = -0.184 dB

Peak SAR (extrapolated) = 1.21 W/kg

**SAR(1 g) = 0.998 mW/g; SAR(10 g) = 0.752 mW/g**

Maximum value of SAR (measured) = 1.05 mW/g



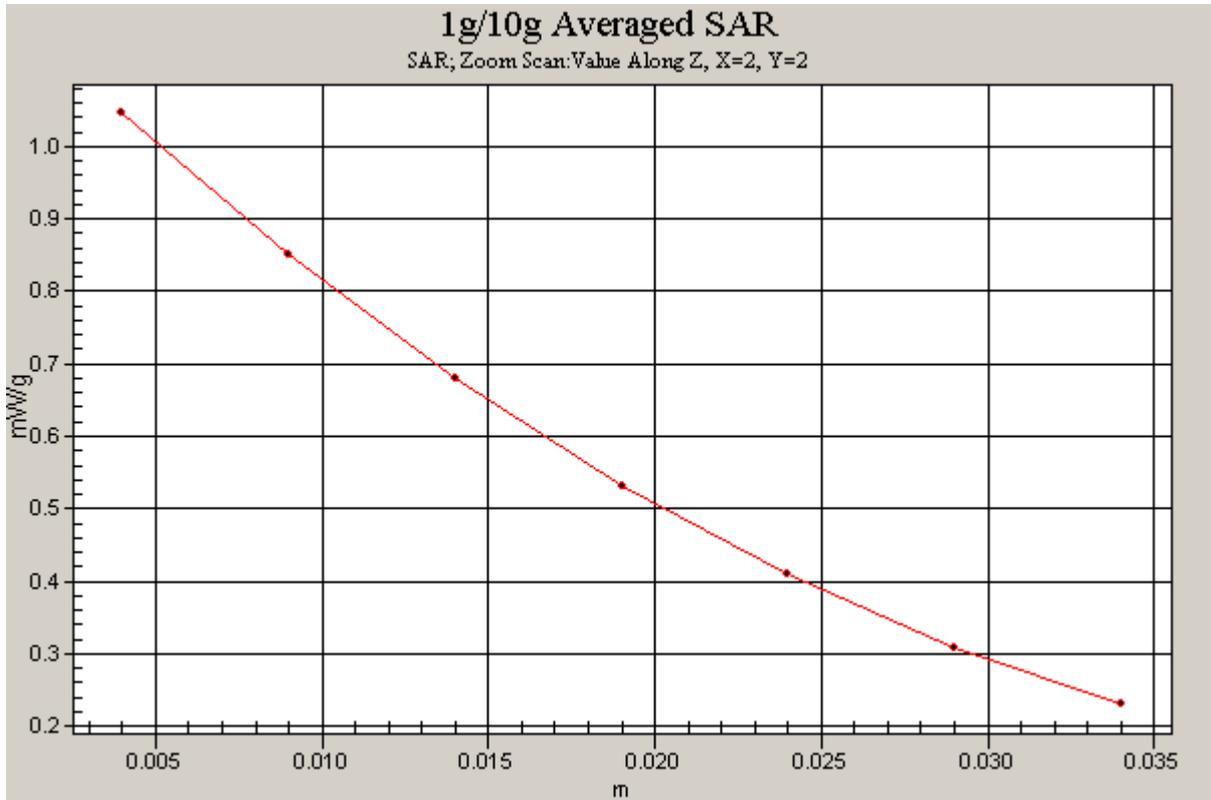


Figure 20 Right Hand Touch Cheek GSM 850 Channel 190

**GSM 850 Right Cheek Low (Battery 1)**

Date/Time: 4/16/2012 9:32:58 AM

Communication System: GSM 850; Frequency: 824.2 MHz; Duty Cycle: 1:8.3

Medium parameters used (interpolated):  $f = 824.2$  MHz;  $\sigma = 0.878$  mho/m;  $\epsilon_r = 42.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Right Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(9.22, 9.22, 9.22); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Cheek Low/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.01 mW/g

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

Reference Value = 11.7 V/m; Power Drift = -0.113 dB

Peak SAR (extrapolated) = 1.14 W/kg

**SAR(1 g) = 0.945 mW/g; SAR(10 g) = 0.716 mW/g**

Maximum value of SAR (measured) = 0.990 mW/g

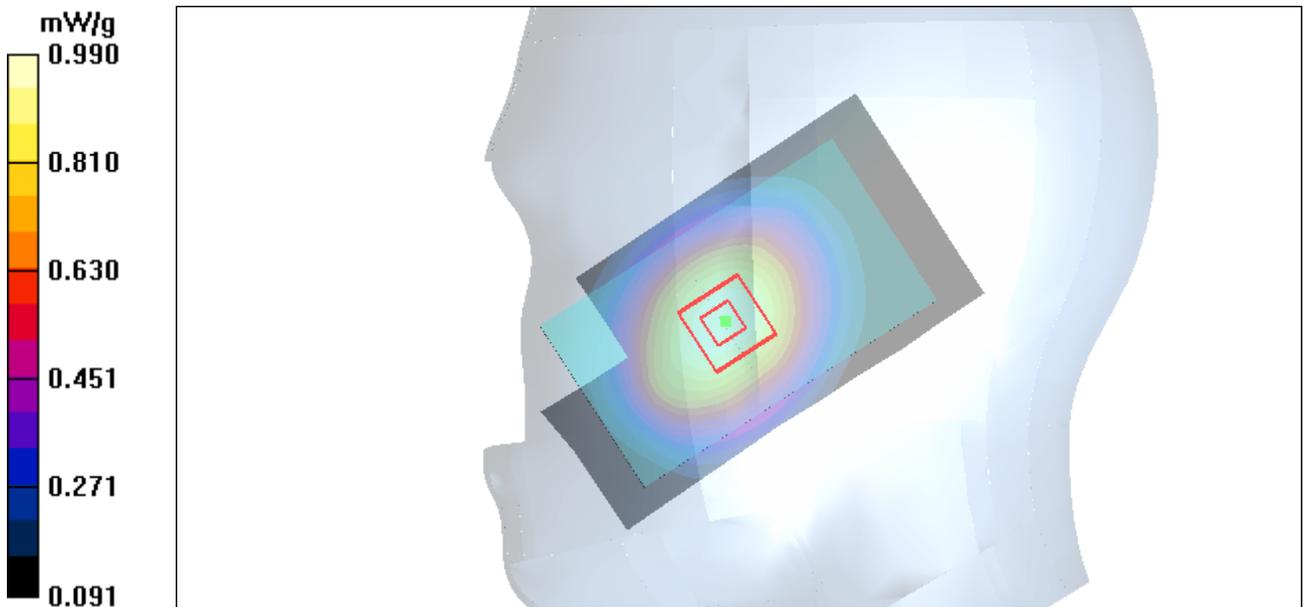


Figure 21 Right Hand Touch Cheek GSM 850 Channel 128

**GSM 850 Right Tilt High (Battery 1)**

Date/Time: 4/16/2012 10:13:37 AM

Communication System: GSM 850; Frequency: 848.8 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 849$  MHz;  $\sigma = 0.901$  mho/m;  $\epsilon_r = 42.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Right Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(9.22, 9.22, 9.22); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Tilt High/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.390 mW/g

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

Reference Value = 11.7 V/m; Power Drift = -0.012 dB

Peak SAR (extrapolated) = 0.470 W/kg

**SAR(1 g) = 0.369 mW/g; SAR(10 g) = 0.274 mW/g**

Maximum value of SAR (measured) = 0.389 mW/g

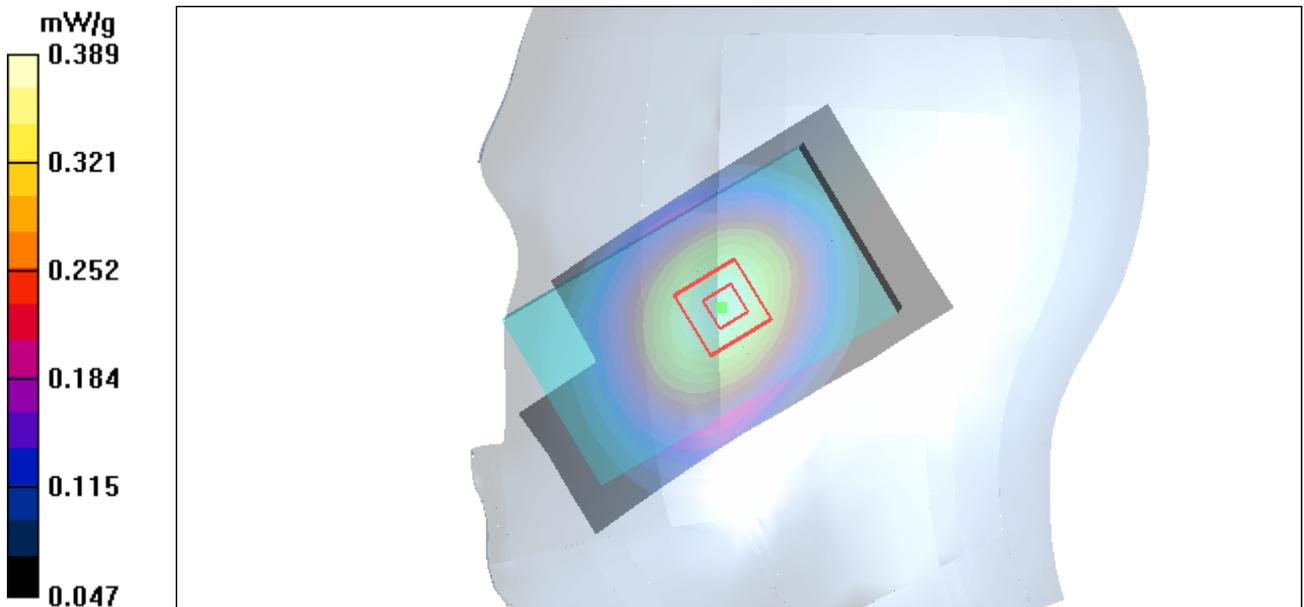


Figure 22 Right Hand Tilt 15° GSM 850 Channel 251

### GSM 850 Right Tilt Middle (Battery 1)

Date/Time: 4/16/2012 9:46:13 AM

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.89$  mho/m;  $\epsilon_r = 42.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Right Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(9.22, 9.22, 9.22); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Tilt Middle/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.430 mW/g

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

Reference Value = 12.4 V/m; Power Drift = 0.001 dB

Peak SAR (extrapolated) = 0.527 W/kg

**SAR(1 g) = 0.409 mW/g; SAR(10 g) = 0.305 mW/g**

Maximum value of SAR (measured) = 0.425 mW/g

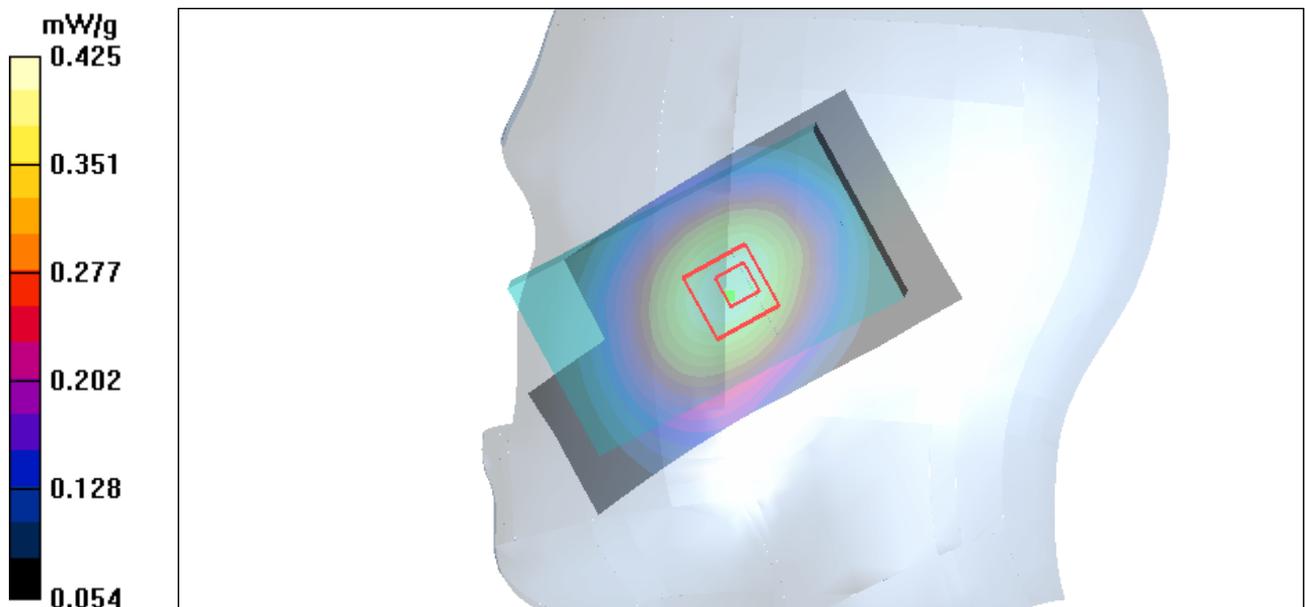


Figure 23 Right Hand Tilt 15° GSM 850 Channel 190

**GSM 850 Right Tilt Low (Battery 1)**

Date/Time: 4/16/2012 10:00:27 AM

Communication System: GSM 850; Frequency: 824.2 MHz; Duty Cycle: 1:8.3

Medium parameters used (interpolated):  $f = 824.2$  MHz;  $\sigma = 0.878$  mho/m;  $\epsilon_r = 42.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Right Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(9.22, 9.22, 9.22); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Tilt Low/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.412 mW/g

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

Reference Value = 12.5 V/m; Power Drift = -0.036 dB

Peak SAR (extrapolated) = 0.488 W/kg

**SAR(1 g) = 0.388 mW/g; SAR(10 g) = 0.293 mW/g**

Maximum value of SAR (measured) = 0.407 mW/g

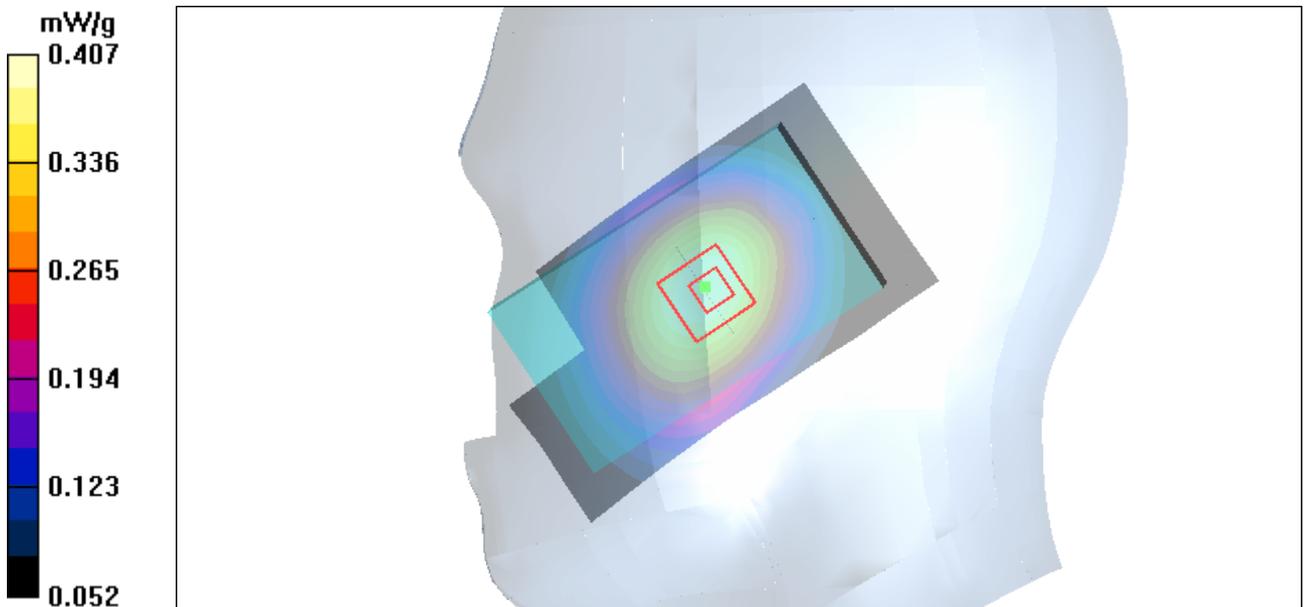


Figure 24 Right Hand Tilt 15° GSM 850 Channel 128

### GSM 850 GPRS (4Txslots) Towards Ground High (Battery 1)

Date/Time: 4/15/2012 10:04:52 PM

Communication System: GSM850 + GPRS(4Up); Frequency: 848.8 MHz; Duty Cycle: 1:2.075

Medium parameters used:  $f = 849$  MHz;  $\sigma = 1$  mho/m;  $\epsilon_r = 55.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(9.38, 9.38, 9.38); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Towards Ground High/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.655 mW/g

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

Reference Value = 24.2 V/m; Power Drift = 0.025 dB

Peak SAR (extrapolated) = 0.830 W/kg

**SAR(1 g) = 0.619 mW/g; SAR(10 g) = 0.449 mW/g**

Maximum value of SAR (measured) = 0.653 mW/g

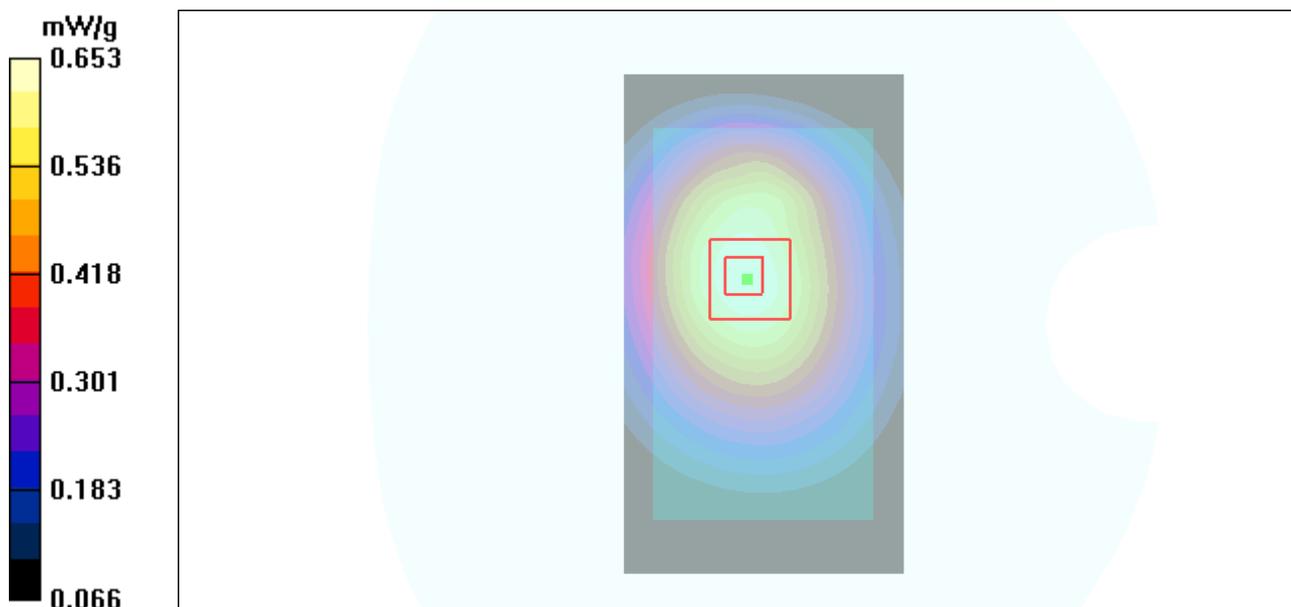


Figure 25 Body, Towards Ground, GSM 850 GPRS (4Txslots) Channel 251

**GSM 850 GPRS (4Txslots) Towards Ground Middle (Battery 1)**

Date/Time: 4/15/2012 9:52:37 PM

Communication System: GSM850 + GPRS(4Up); Frequency: 836.6 MHz; Duty Cycle: 1:2.075

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.991$  mho/m;  $\epsilon_r = 55.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(9.38, 9.38, 9.38); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Towards Ground Middle/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.872 mW/g

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

Reference Value = 28.0 V/m; Power Drift = -0.022 dB

Peak SAR (extrapolated) = 1.11 W/kg

**SAR(1 g) = 0.828 mW/g; SAR(10 g) = 0.601 mW/g**

Maximum value of SAR (measured) = 0.875 mW/g

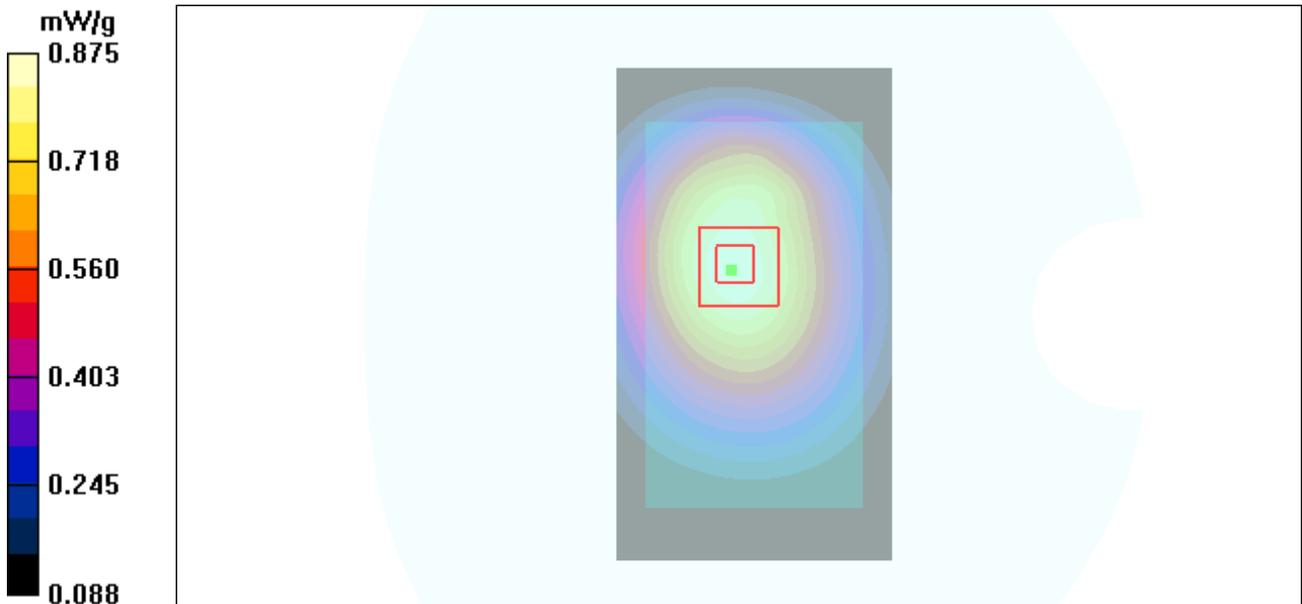


Figure 26 Body, Towards Ground, GSM 850 GPRS (4Txslots) Channel 190

### GSM 850 GPRS (4Txslots) Towards Ground Low (Battery 1)

Date/Time: 4/15/2012 9:40:17 PM

Communication System: GSM850 + GPRS(4Up); Frequency: 824.2 MHz; Duty Cycle: 1:2.075

Medium parameters used (interpolated):  $f = 824.2$  MHz;  $\sigma = 0.98$  mho/m;  $\epsilon_r = 55.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(9.38, 9.38, 9.38); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Towards Ground Low/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.07 mW/g

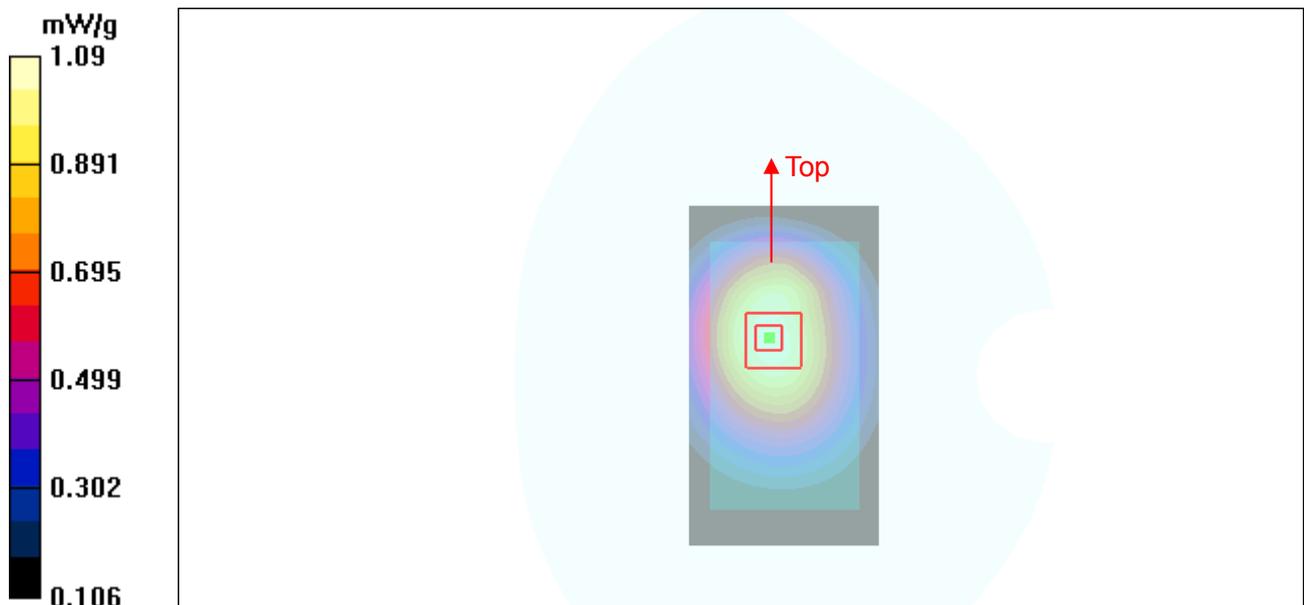
**Towards Ground Low/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 31.1 V/m; Power Drift = 0.037 dB

Peak SAR (extrapolated) = 1.36 W/kg

**SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.746 mW/g**

Maximum value of SAR (measured) = 1.09 mW/g



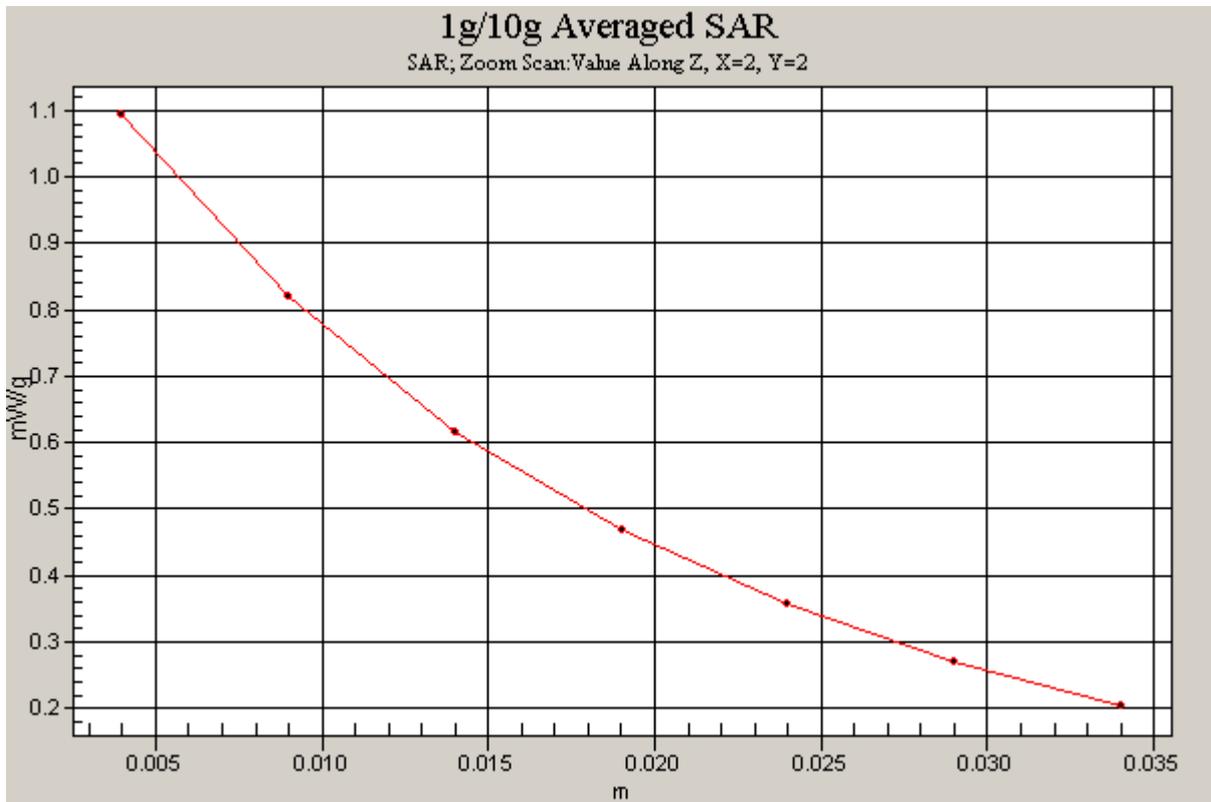


Figure 27 Body, Towards Ground, GSM 850 GPRS (4Txslots) Channel 128

**GSM 850 GPRS (4Txslots) Towards Phantom High (Battery 1)**

Date/Time: 4/15/2012 9:11:31 PM

Communication System: GSM850 + GPRS(4Up); Frequency: 848.8 MHz; Duty Cycle: 1:2.075

Medium parameters used:  $f = 849$  MHz;  $\sigma = 1$  mho/m;  $\epsilon_r = 55.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(9.38, 9.38, 9.38); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Towards Phantom High/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.597 mW/g

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

Reference Value = 23.3 V/m; Power Drift = 0.051 dB

Peak SAR (extrapolated) = 0.717 W/kg

**SAR(1 g) = 0.557 mW/g; SAR(10 g) = 0.412 mW/g**

Maximum value of SAR (measured) = 0.589 mW/g

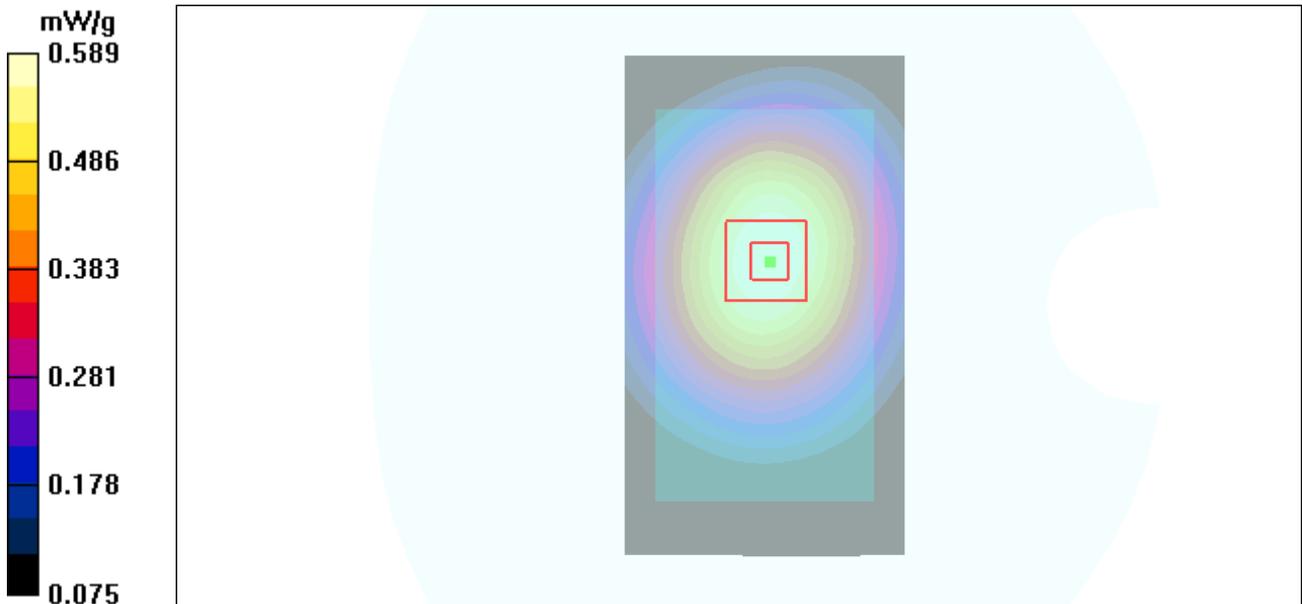


Figure 28 Body, Towards Phantom, GSM 850 GPRS (4Txslots) Channel 251

**GSM 850 GPRS (4Txslots) Towards Phantom Middle (Battery 1)**

Date/Time: 4/15/2012 9:26:07 PM

Communication System: GSM850 + GPRS(4Up); Frequency: 836.6 MHz; Duty Cycle: 1:2.075

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.991$  mho/m;  $\epsilon_r = 55.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(9.38, 9.38, 9.38); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Towards Phantom Middle/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.775 mW/g

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

Reference Value = 26.8 V/m; Power Drift = 0.036 dB

Peak SAR (extrapolated) = 0.945 W/kg

**SAR(1 g) = 0.736 mW/g; SAR(10 g) = 0.546 mW/g**

Maximum value of SAR (measured) = 0.775 mW/g

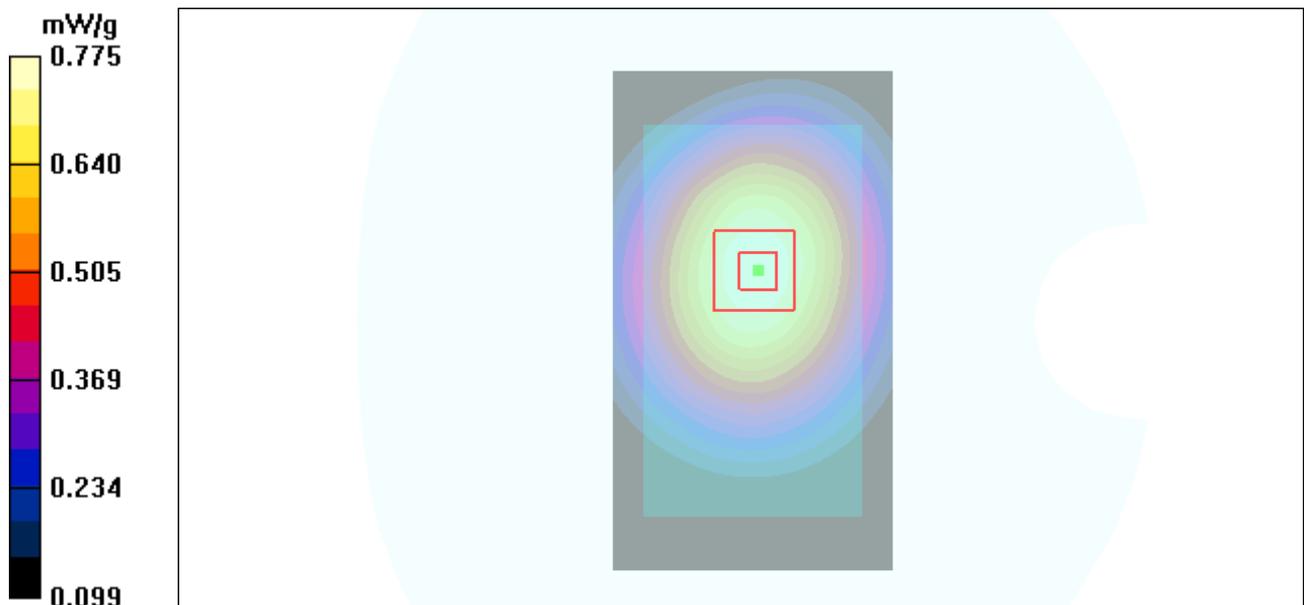


Figure 29 Body, Towards Phantom, GSM 850 GPRS (4Txslots) Channel 190

**GSM 850 GPRS (4Txslots) Towards Phantom Low (Battery 1)**

Date/Time: 4/15/2012 8:59:33 PM

Communication System: GSM850 + GPRS(4Up); Frequency: 824.2 MHz; Duty Cycle: 1:2.075

Medium parameters used (interpolated):  $f = 824.2$  MHz;  $\sigma = 0.98$  mho/m;  $\epsilon_r = 55.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(9.38, 9.38, 9.38); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Towards Phantom Low/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.969 mW/g

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

Reference Value = 30.4 V/m; Power Drift = -0.176 dB

Peak SAR (extrapolated) = 1.17 W/kg

**SAR(1 g) = 0.913 mW/g; SAR(10 g) = 0.679 mW/g**

Maximum value of SAR (measured) = 0.960 mW/g

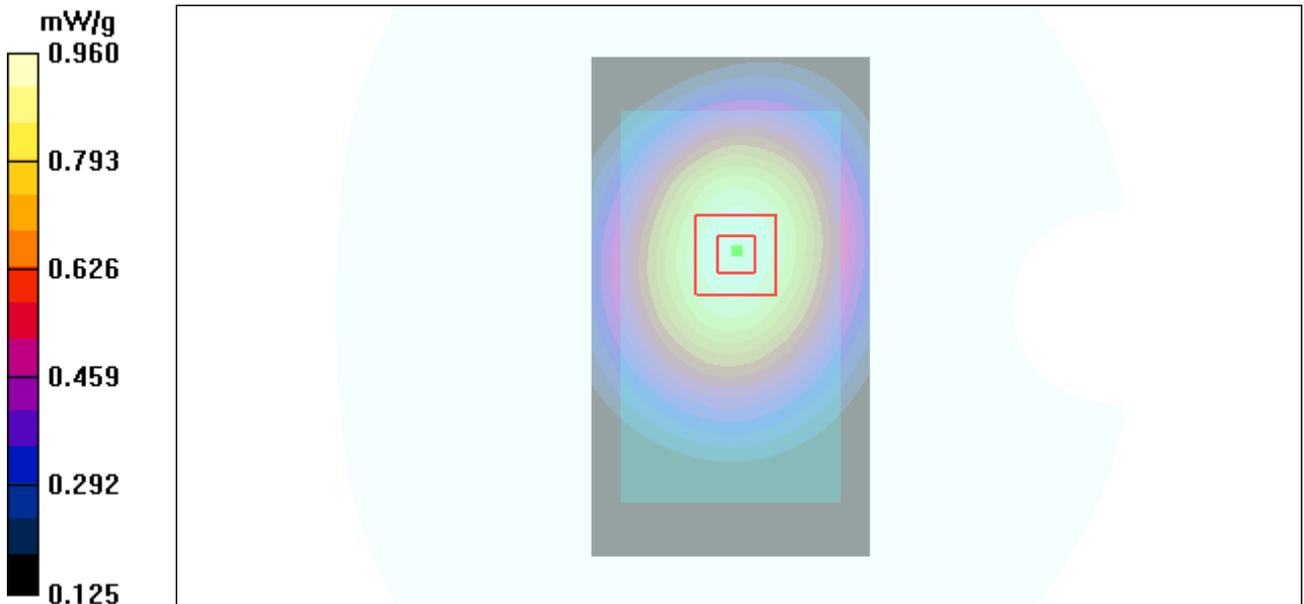


Figure 30 Body, Towards Phantom, GSM 850 GPRS (4Txslots) Channel 128

### GSM 850 EGPRS (4Txslots) Towards Ground Low (Battery 1)

Date/Time: 4/15/2012 10:19:15 PM

Communication System: GSM850 + EGPRS(4Up); Frequency: 824.2 MHz; Duty Cycle: 1:2.075

Medium parameters used (interpolated):  $f = 824.2$  MHz;  $\sigma = 0.98$  mho/m;  $\epsilon_r = 55.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(9.38, 9.38, 9.38); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Towards Ground Low/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.06 mW/g

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

Reference Value = 30.8 V/m; Power Drift = 0.021 dB

Peak SAR (extrapolated) = 1.34 W/kg

**SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.733 mW/g**

Maximum value of SAR (measured) = 1.06 mW/g

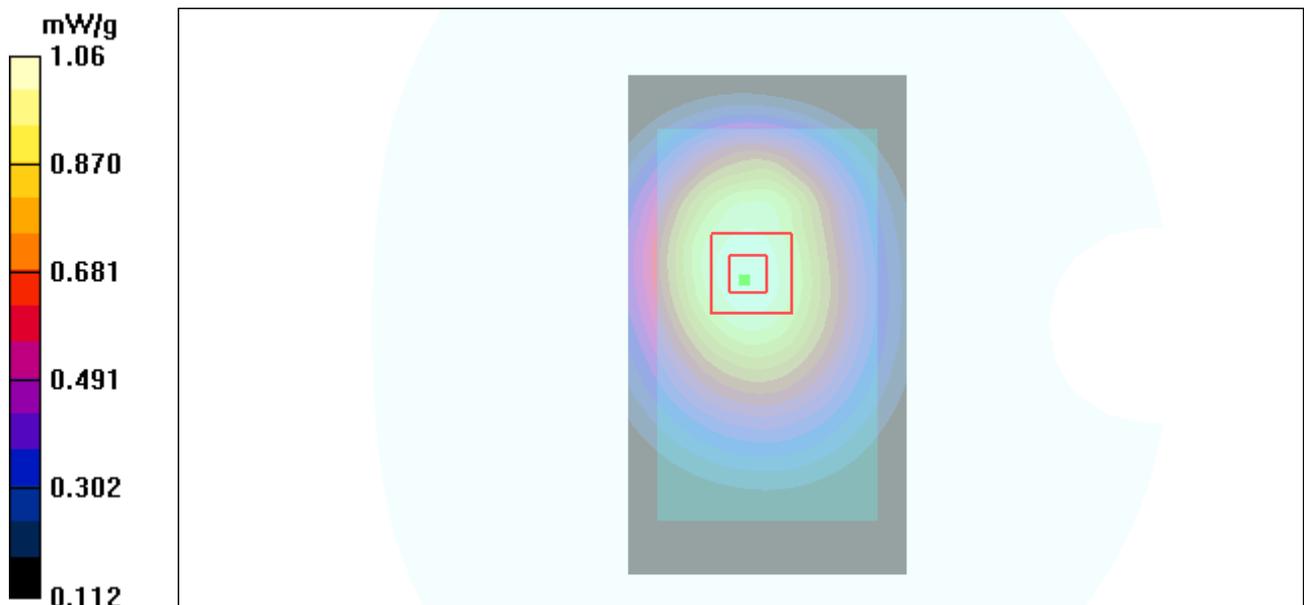


Figure 31 Body, Towards Ground, GSM 850 EGPRS (4Txslots) Channel 128

**GSM 850 with Stereo Headset 1 Towards Ground Low (Battery 1)**

Date/Time: 4/15/2012 10:55:03 PM

Communication System: GSM 850; Frequency: 824.2 MHz; Duty Cycle: 1:8.3

Medium parameters used (interpolated):  $f = 824.2$  MHz;  $\sigma = 0.98$  mho/m;  $\epsilon_r = 55.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(9.38, 9.38, 9.38); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Towards Ground Low/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.584 mW/g

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

Reference Value = 22.9 V/m; Power Drift = 0.026 dB

Peak SAR (extrapolated) = 0.718 W/kg

**SAR(1 g) = 0.547 mW/g; SAR(10 g) = 0.399 mW/g**

Maximum value of SAR (measured) = 0.577 mW/g

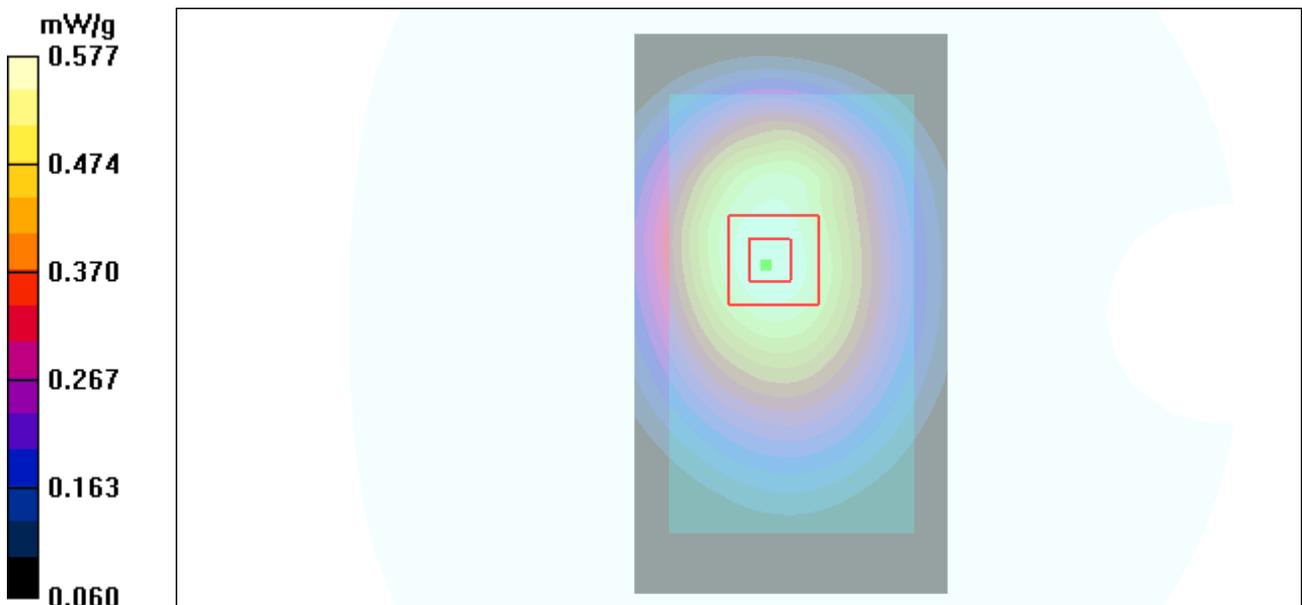


Figure 32 Body with Stereo Headset 1, Towards Ground, GSM 850 Channel 128

**GSM 850 with Stereo Headset 2 Towards Ground Low (Battery 1)**

Date/Time: 4/17/2012 3:28:19 AM

Communication System: GSM 850; Frequency: 824.2 MHz; Duty Cycle: 1:8.3

Medium parameters used (interpolated):  $f = 824.2$  MHz;  $\sigma = 0.98$  mho/m;  $\epsilon_r = 55.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(9.38, 9.38, 9.38); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Towards Ground Low/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.536 mW/g

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

Reference Value = 22.2 V/m; Power Drift = -0.027 dB

Peak SAR (extrapolated) = 0.672 W/kg

**SAR(1 g) = 0.511 mW/g; SAR(10 g) = 0.373 mW/g**

Maximum value of SAR (measured) = 0.540 mW/g

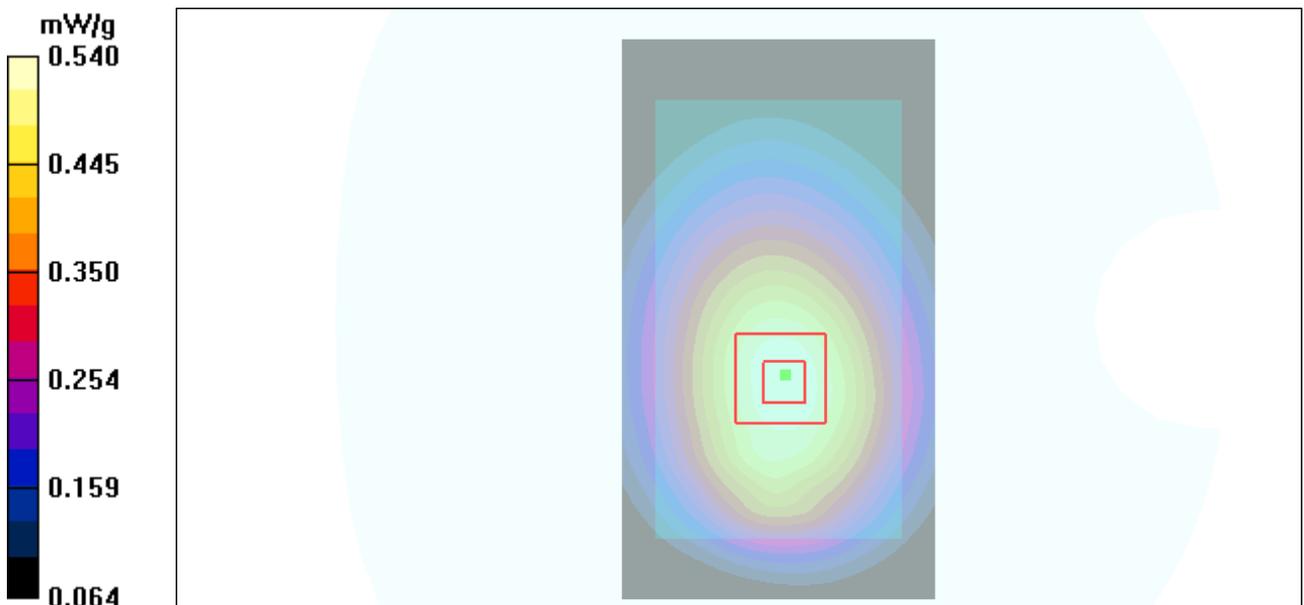


Figure 33 Body with Stereo Headset 2, Towards Ground, GSM 850 Channel 128

**GSM 850 GPRS (4Txslots) Towards Ground Low (Battery 2)**

Date/Time: 4/17/2012 11:15:19 AM

Communication System: GSM850 + GPRS(4Up); Frequency: 824.2 MHz;Duty Cycle: 1:2.075

Medium parameters used (interpolated):  $f = 824.2$  MHz;  $\sigma = 0.98$  mho/m;  $\epsilon_r = 55.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(9.38, 9.38, 9.38); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Towards Ground Low/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.04 mW/g

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

Reference Value = 31.0 V/m; Power Drift = -0.071 dB

Peak SAR (extrapolated) = 1.30 W/kg

**SAR(1 g) = 0.991 mW/g; SAR(10 g) = 0.722 mW/g**

Maximum value of SAR (measured) = 1.04 mW/g

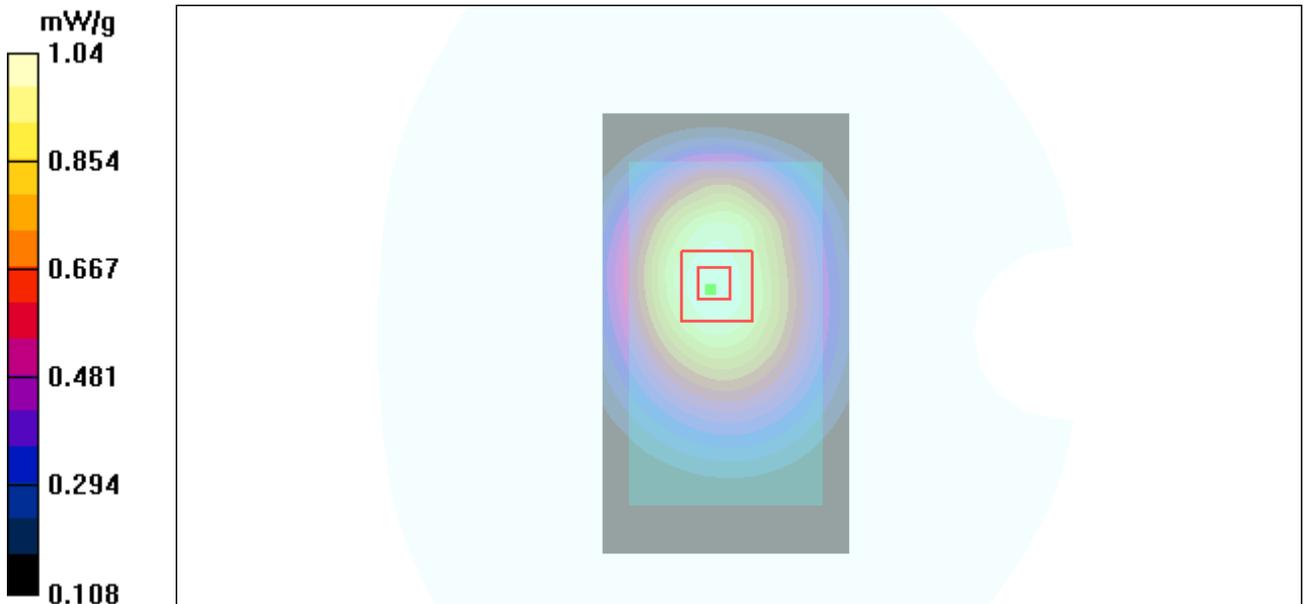


Figure 34 Body, Towards Ground, GSM 850 GPRS (4Txslots) Channel 128

### GSM 1900 Left Cheek High (Battery 1)

Date/Time: 4/16/2012 5:58:40 PM

Communication System: PCS 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 1910$  MHz;  $\sigma = 1.4$  mho/m;  $\epsilon_r = 40.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Left Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.9, 7.9, 7.9); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Cheek High/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.580 mW/g

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

Reference Value = 8.28 V/m; Power Drift = 0.089 dB

Peak SAR (extrapolated) = 0.794 W/kg

**SAR(1 g) = 0.522 mW/g; SAR(10 g) = 0.332 mW/g**

Maximum value of SAR (measured) = 0.564 mW/g

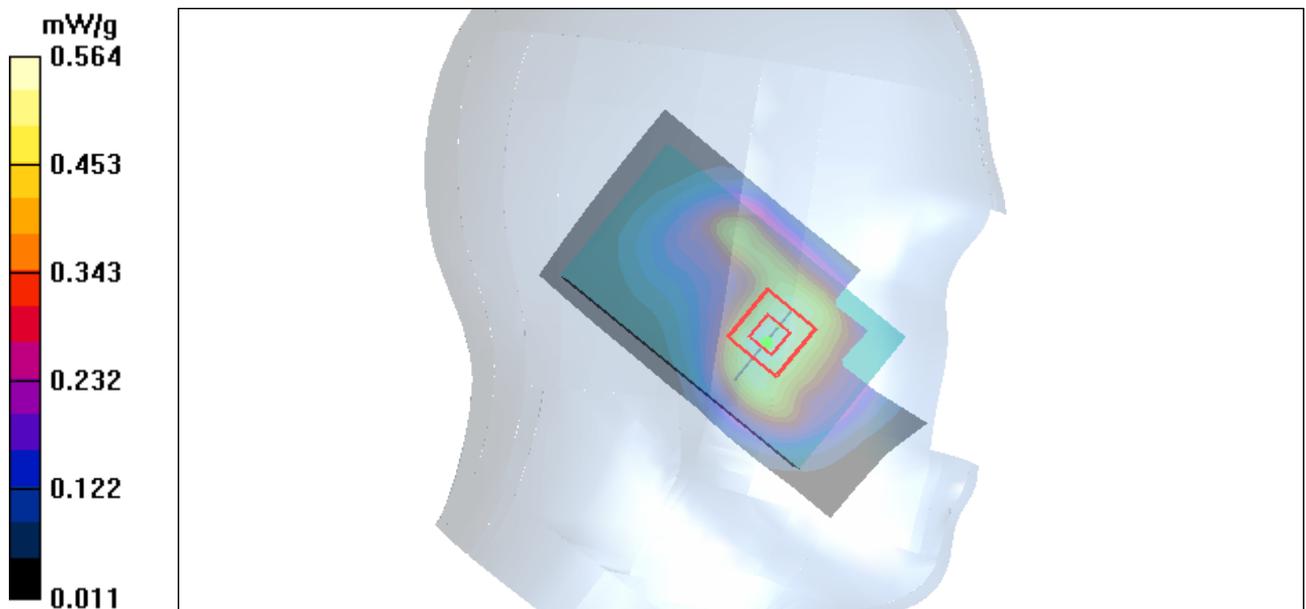


Figure 35 Left Hand Touch Cheek GSM 1900 Channel 810

**GSM 1900 Left Cheek Middle (Battery 1)**

Date/Time: 4/16/2012 5:43:41 PM

Communication System: PCS 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.38$  mho/m;  $\epsilon_r = 40.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Left Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.9, 7.9, 7.9); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Cheek Middle/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.653 mW/g

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

Reference Value = 8.38 V/m; Power Drift = -0.066 dB

Peak SAR (extrapolated) = 0.895 W/kg

**SAR(1 g) = 0.580 mW/g; SAR(10 g) = 0.367 mW/g**

Maximum value of SAR (measured) = 0.623 mW/g

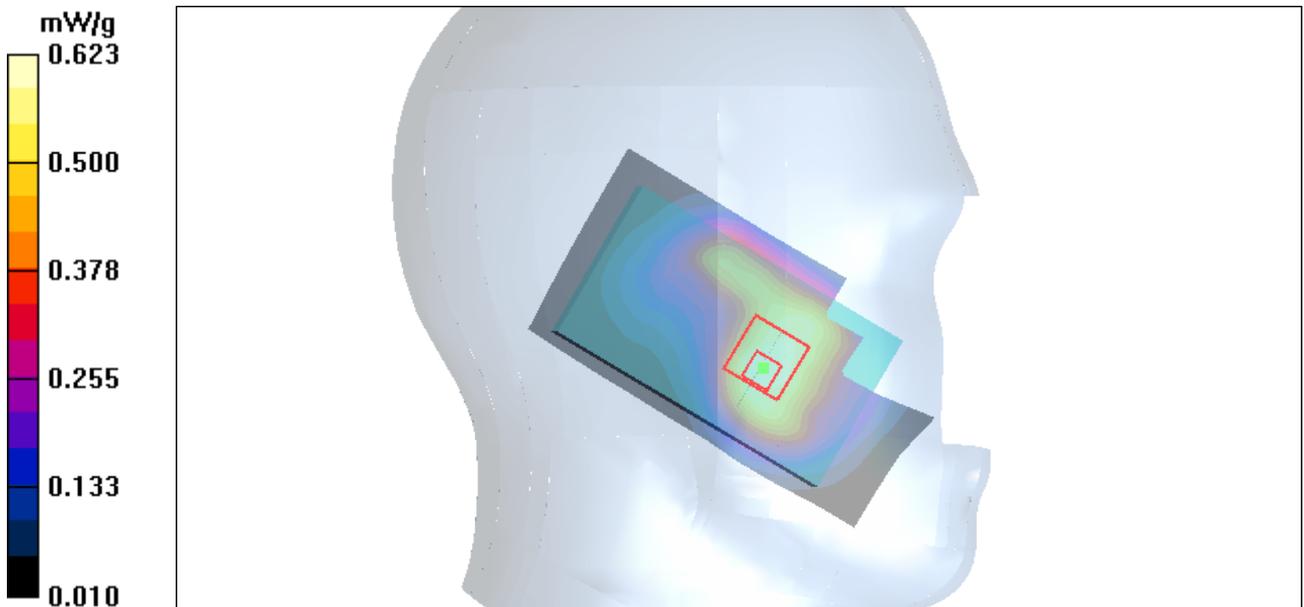


Figure 36 Left Hand Touch Cheek GSM 1900 Channel 661

### GSM 1900 Left Cheek Low (Battery 1)

Date/Time: 4/16/2012 6:22:02 PM

Communication System: PCS 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3

Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.35$  mho/m;  $\epsilon_r = 40.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Left Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.9, 7.9, 7.9); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Cheek Low/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.769 mW/g

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

Reference Value = 9.63 V/m; Power Drift = -0.055 dB

Peak SAR (extrapolated) = 0.888 W/kg

**SAR(1 g) = 0.520 mW/g; SAR(10 g) = 0.328 mW/g**

Maximum value of SAR (measured) = 0.678 mW/g

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

Reference Value = 9.63 V/m; Power Drift = -0.055 dB

Peak SAR (extrapolated) = 1.08 W/kg

**SAR(1 g) = 0.694 mW/g; SAR(10 g) = 0.433 mW/g**

Maximum value of SAR (measured) = 0.740 mW/g

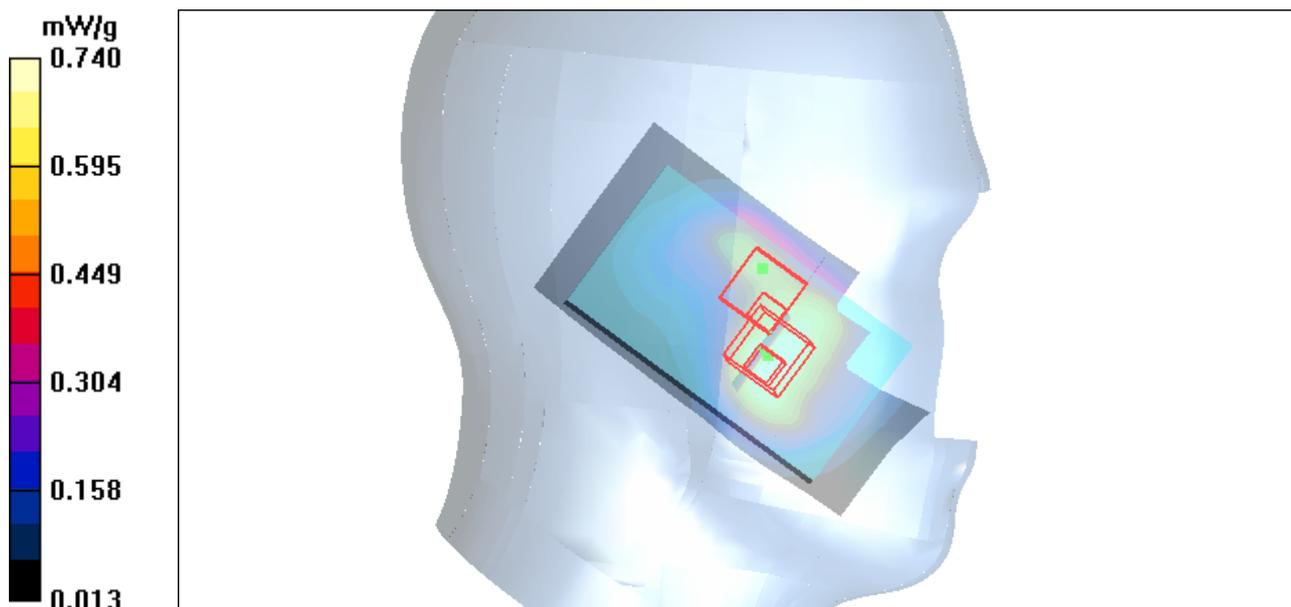


Figure 37 Left Hand Touch Cheek GSM 1900 Channel 512

### GSM 1900 Left Tilt High (Battery 1)

Date/Time: 4/16/2012 7:09:52 PM

Communication System: PCS 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 1910$  MHz;  $\sigma = 1.4$  mho/m;  $\epsilon_r = 40.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Left Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.9, 7.9, 7.9); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Tilt High/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.265 mW/g

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

Reference Value = 12.1 V/m; Power Drift = -0.030 dB

Peak SAR (extrapolated) = 0.367 W/kg

**SAR(1 g) = 0.232 mW/g; SAR(10 g) = 0.141 mW/g**

Maximum value of SAR (measured) = 0.250 mW/g

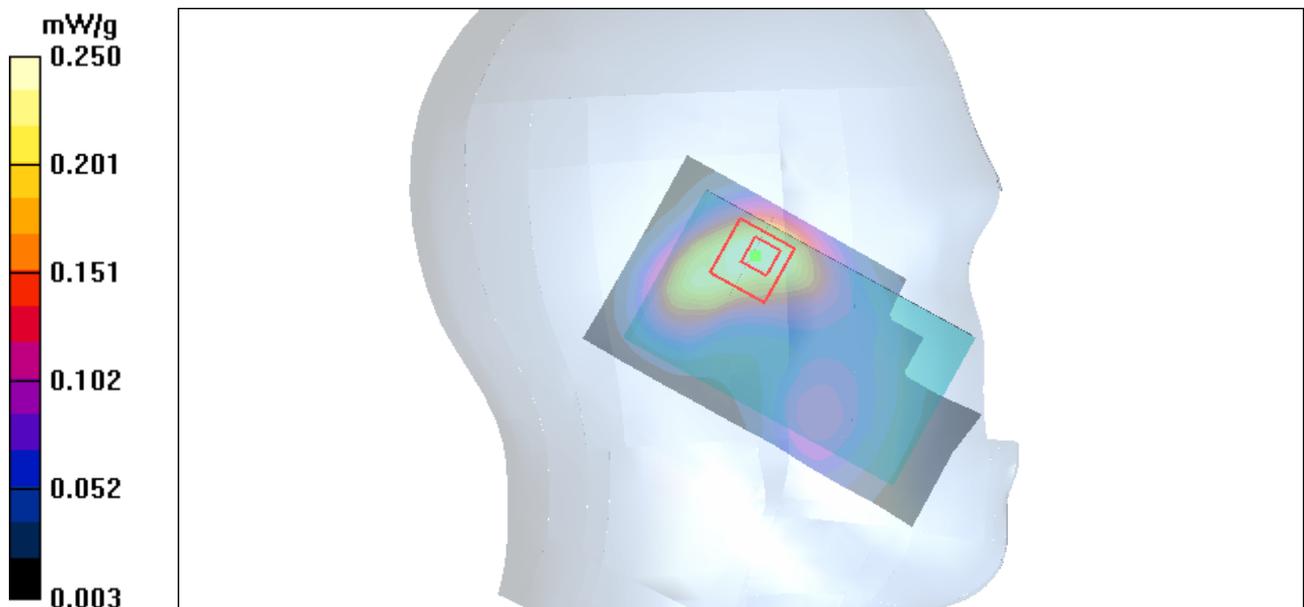


Figure 38 Left Hand Tilt 15° GSM 1900 Channel 810

**GSM 1900 Left Tilt Middle (Battery 1)**

Date/Time: 4/16/2012 6:56:00 PM

Communication System: PCS 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.38$  mho/m;  $\epsilon_r = 40.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Left Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.9, 7.9, 7.9); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Tilt Middle/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.280 mW/g

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

Reference Value = 12.8 V/m; Power Drift = -0.005 dB

Peak SAR (extrapolated) = 0.374 W/kg

**SAR(1 g) = 0.240 mW/g; SAR(10 g) = 0.150 mW/g**

Maximum value of SAR (measured) = 0.256 mW/g

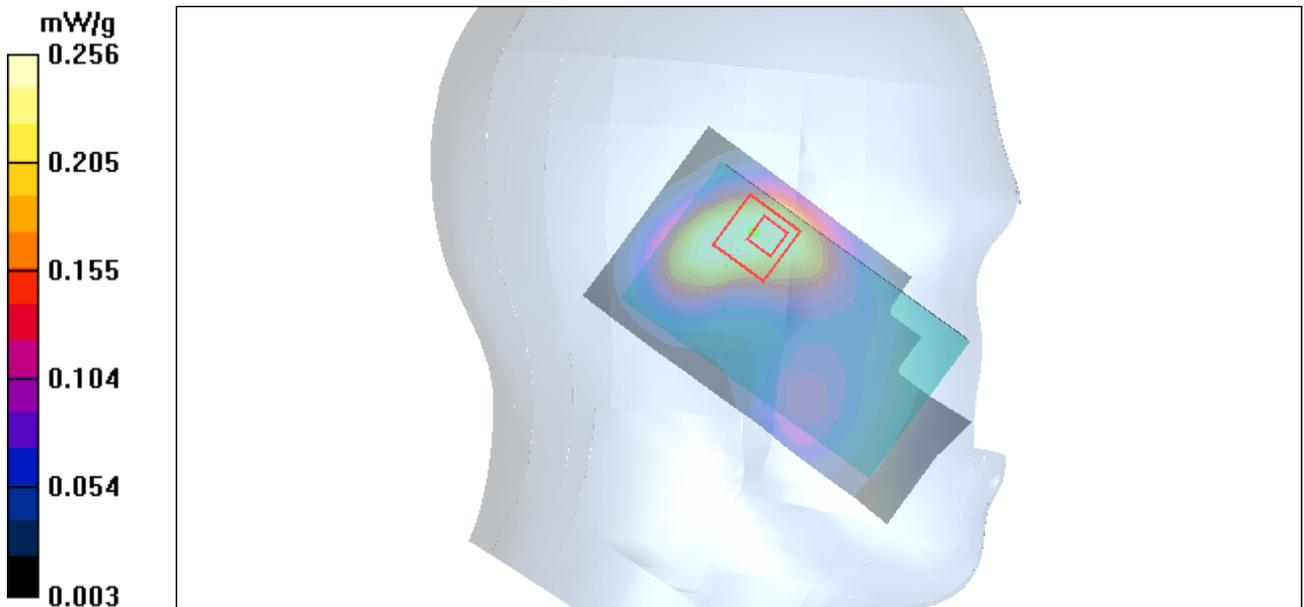


Figure 39 Left Hand Tilt 15° GSM 1900 Channel 661

**GSM 1900 Left Tilt Low (Battery 1)**

Date/Time: 4/16/2012 6:43:02 PM

Communication System: PCS 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3

Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.35$  mho/m;  $\epsilon_r = 40.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Left Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.9, 7.9, 7.9); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Tilt Low/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.321 mW/g

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

Reference Value = 14.1 V/m; Power Drift = -0.032 dB

Peak SAR (extrapolated) = 0.418 W/kg

**SAR(1 g) = 0.275 mW/g; SAR(10 g) = 0.176 mW/g**

Maximum value of SAR (measured) = 0.296 mW/g

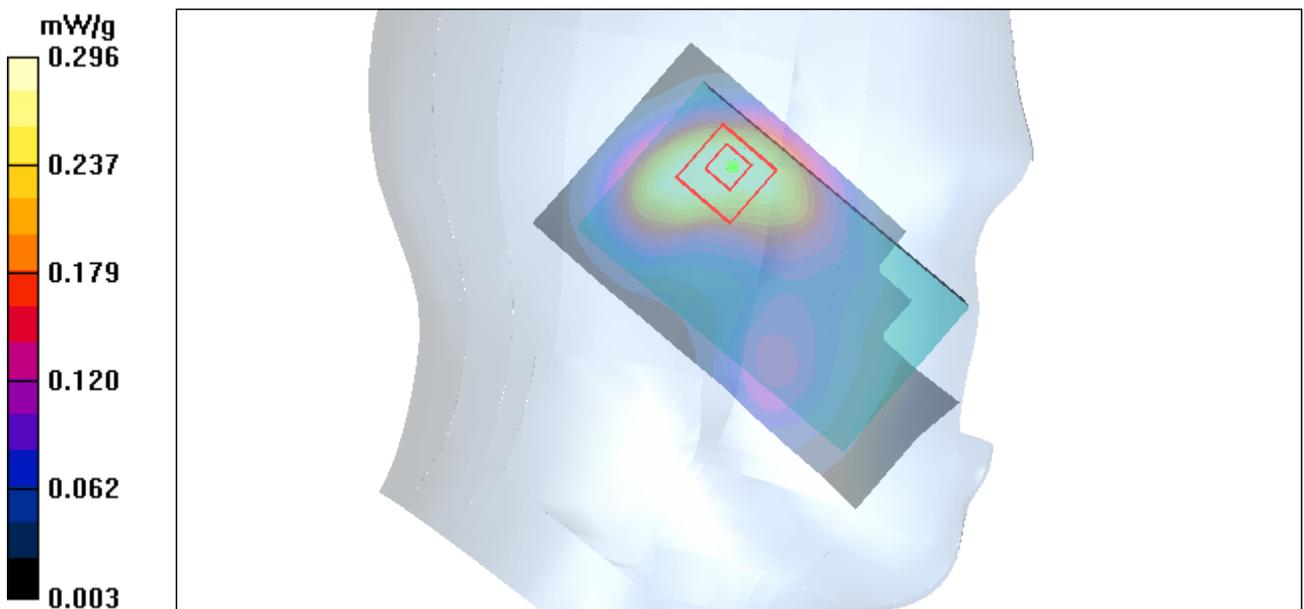


Figure 40 Left Hand Tilt 15° GSM 1900 Channel 512

**GSM 1900 Right Cheek High (Battery 1)**

Date/Time: 4/16/2012 4:33:47 PM

Communication System: PCS 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 1910$  MHz;  $\sigma = 1.4$  mho/m;  $\epsilon_r = 40.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Right Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.9, 7.9, 7.9); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Cheek High/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.654 mW/g

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

Reference Value = 9.15 V/m; Power Drift = 0.170 dB

Peak SAR (extrapolated) = 0.934 W/kg

**SAR(1 g) = 0.609 mW/g; SAR(10 g) = 0.360 mW/g**

Maximum value of SAR (measured) = 0.641 mW/g

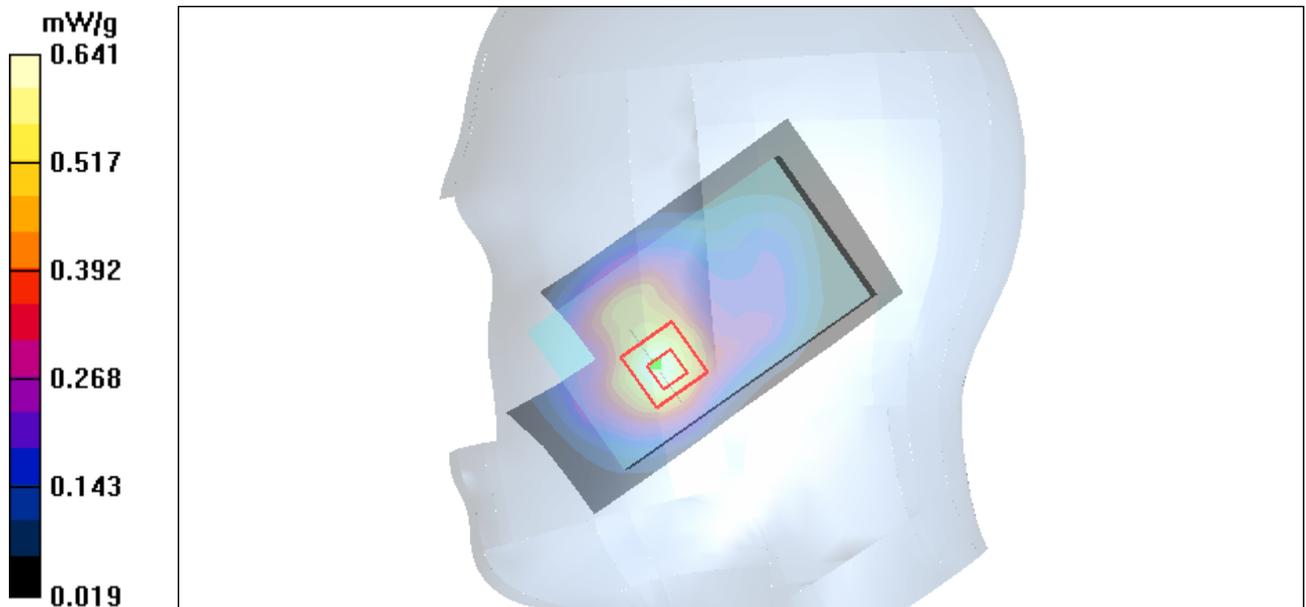


Figure 41 Right Hand Touch Cheek GSM 1900 Channel 810

### GSM 1900 Right Cheek Middle (Battery 1)

Date/Time: 4/16/2012 4:20:39 PM

Communication System: PCS 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.38$  mho/m;  $\epsilon_r = 40.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Right Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.9, 7.9, 7.9); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Cheek Middle/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.713 mW/g

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

Reference Value = 9.99 V/m; Power Drift = -0.157 dB

Peak SAR (extrapolated) = 1.01 W/kg

**SAR(1 g) = 0.661 mW/g; SAR(10 g) = 0.392 mW/g**

Maximum value of SAR (measured) = 0.698 mW/g

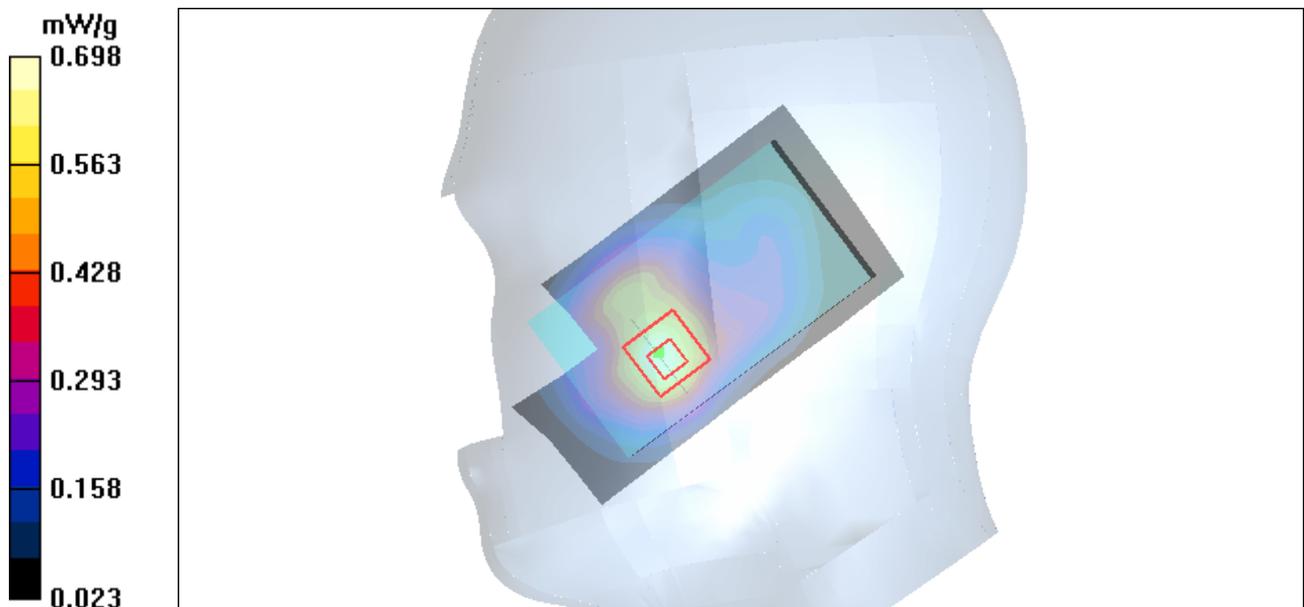


Figure 42 Right Hand Touch Cheek GSM 1900 Channel 661

### GSM 1900 Right Cheek Low (Battery 1)

Date/Time: 4/16/2012 4:47:27 PM

Communication System: PCS 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3

Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.35$  mho/m;  $\epsilon_r = 40.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Right Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.9, 7.9, 7.9); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Cheek Low/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.808 mW/g

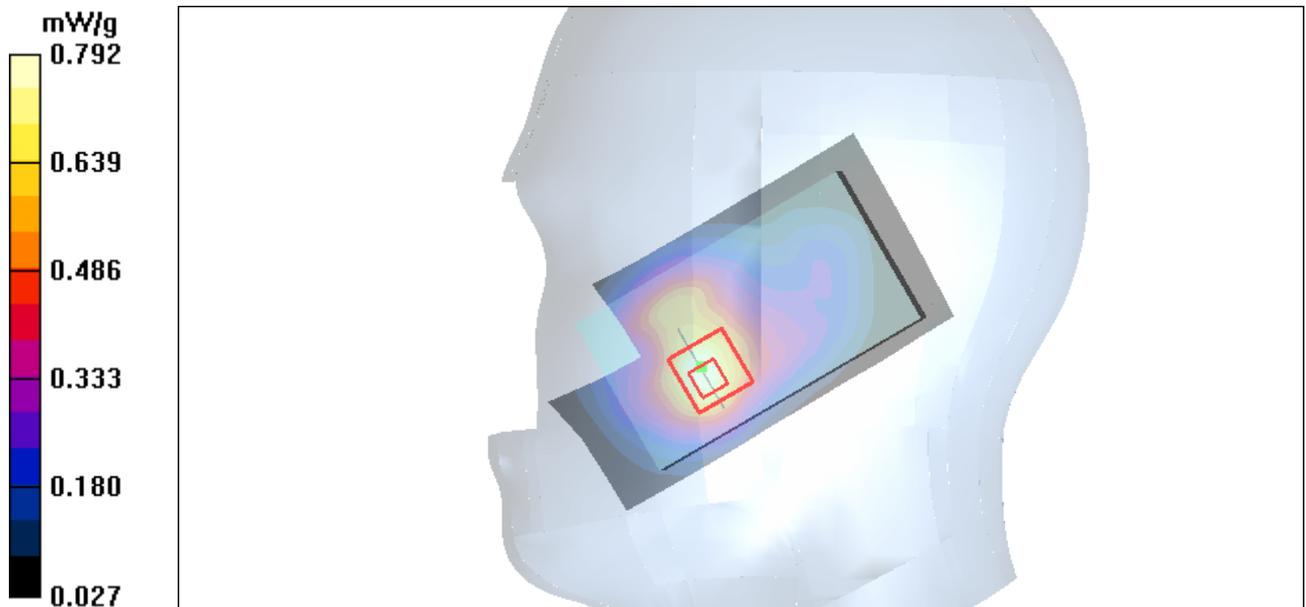
**Cheek Low/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.7 V/m; Power Drift = 0.050 dB

Peak SAR (extrapolated) = 1.16 W/kg

**SAR(1 g) = 0.746 mW/g; SAR(10 g) = 0.442 mW/g**

Maximum value of SAR (measured) = 0.792 mW/g



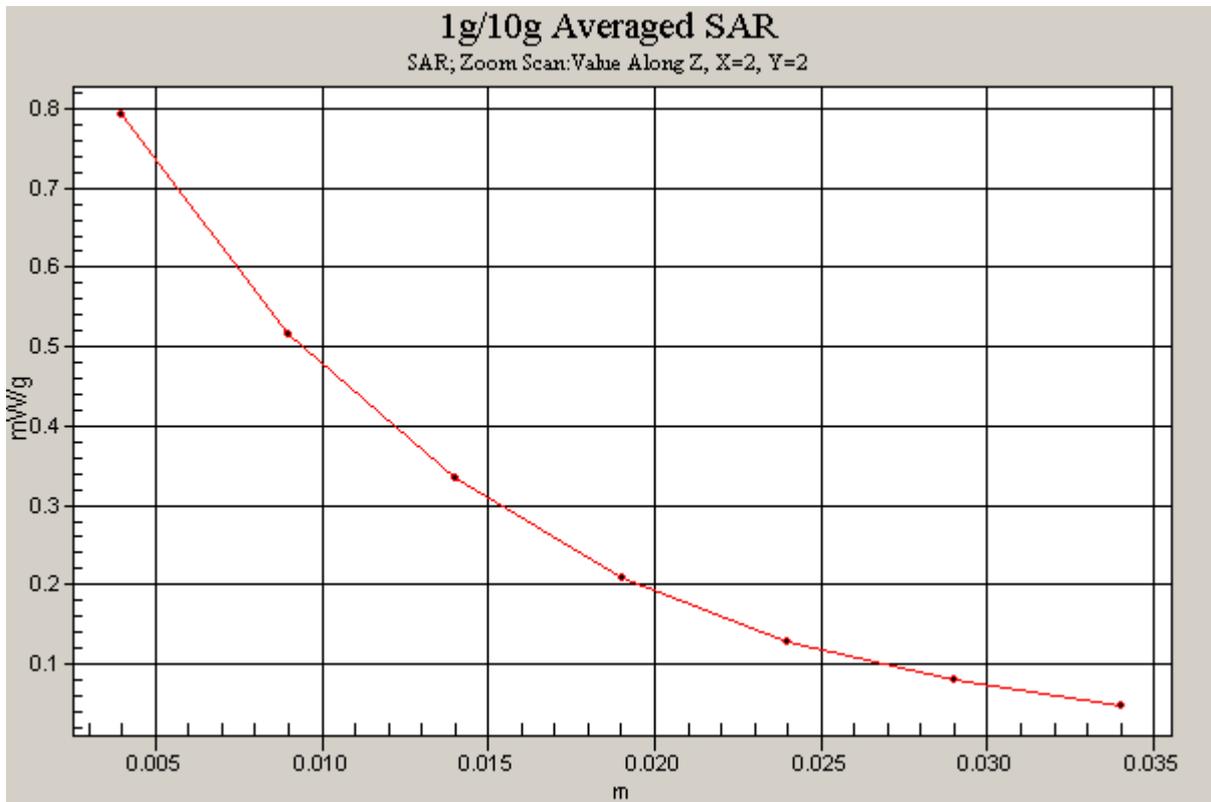


Figure 43 Right Hand Touch Cheek GSM 1900 Channel 512

### GSM 1900 Right Tilt High (Battery 1)

Date/Time: 4/16/2012 5:14:42 PM

Communication System: PCS 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 1910$  MHz;  $\sigma = 1.4$  mho/m;  $\epsilon_r = 40.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Right Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.9, 7.9, 7.9); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Tilt High/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.268 mW/g

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

Reference Value = 12.9 V/m; Power Drift = -0.003 dB

Peak SAR (extrapolated) = 0.382 W/kg

**SAR(1 g) = 0.236 mW/g; SAR(10 g) = 0.136 mW/g**

Maximum value of SAR (measured) = 0.262 mW/g

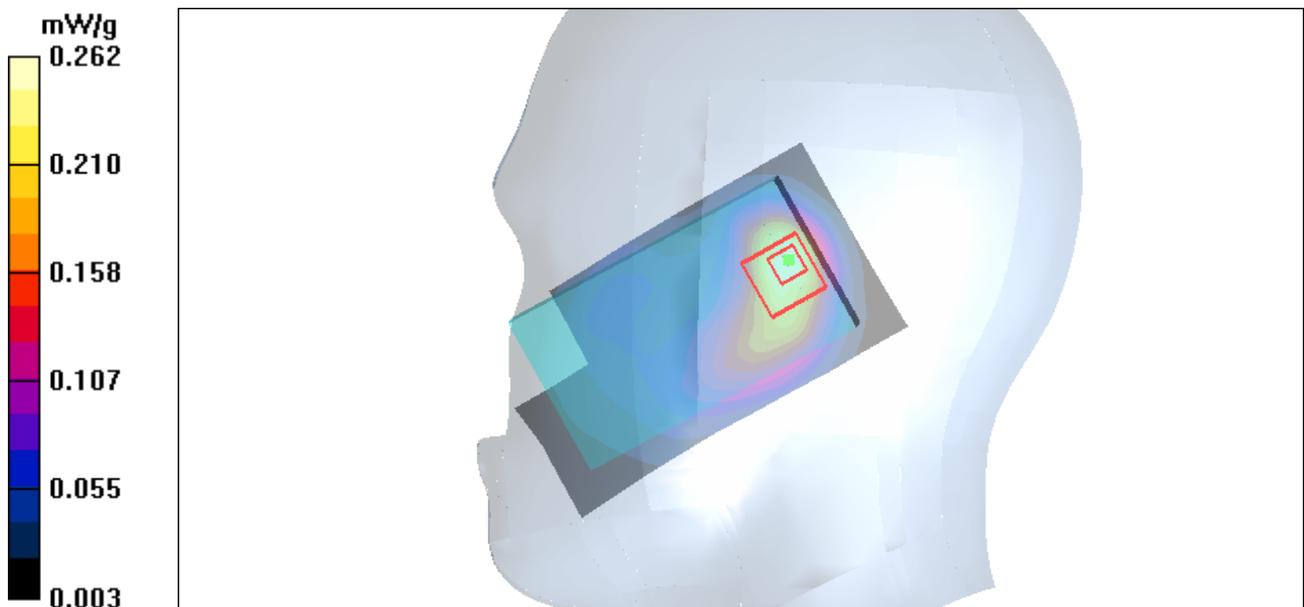


Figure 44 Right Hand Tilt 15° GSM 1900 Channel 810

### GSM 1900 Right Tilt Middle (Battery 1)

Date/Time: 4/16/2012 5:27:31 PM

Communication System: PCS 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.38$  mho/m;  $\epsilon_r = 40.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Right Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.9, 7.9, 7.9); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Tilt Middle/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.280 mW/g

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

Reference Value = 13.2 V/m; Power Drift = 0.050 dB

Peak SAR (extrapolated) = 0.400 W/kg

**SAR(1 g) = 0.246 mW/g; SAR(10 g) = 0.142 mW/g**

Maximum value of SAR (measured) = 0.271 mW/g

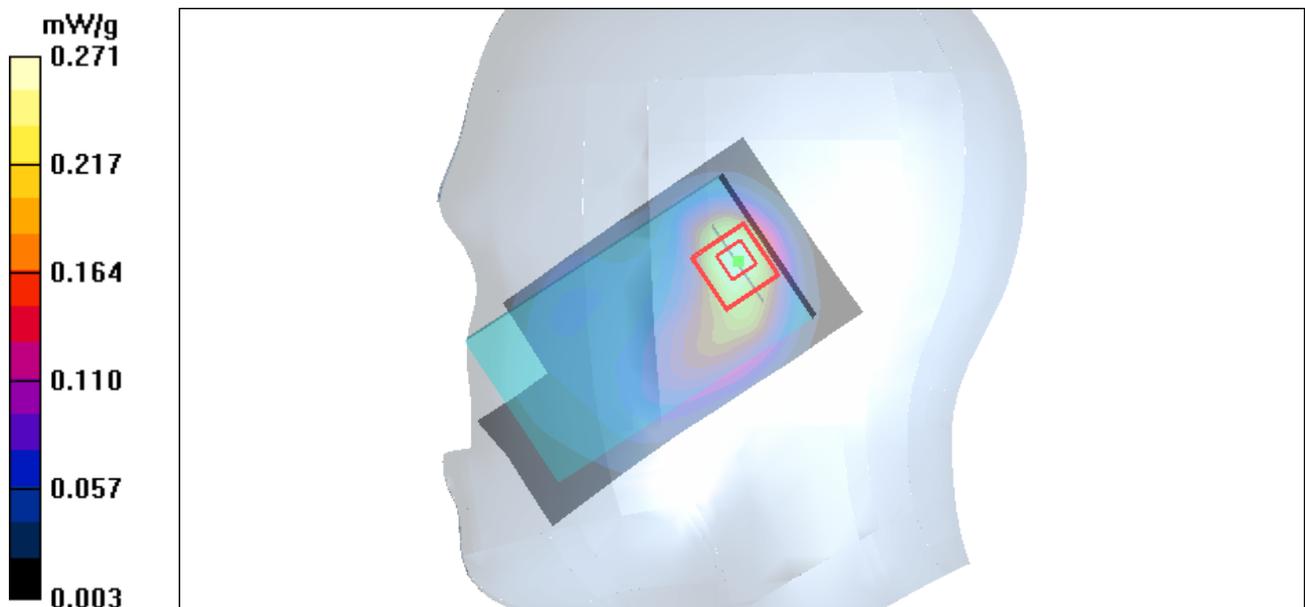


Figure 45 Right Hand Tilt 15° GSM 1900 Channel 661

### GSM 1900 Right Tilt Low (Battery 1)

Date/Time: 4/16/2012 5:01:14 PM

Communication System: PCS 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3

Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.35$  mho/m;  $\epsilon_r = 40.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Right Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.9, 7.9, 7.9); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Tilt Low/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.332 mW/g

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

Reference Value = 14.7 V/m; Power Drift = -0.061 dB

Peak SAR (extrapolated) = 0.479 W/kg

**SAR(1 g) = 0.295 mW/g; SAR(10 g) = 0.173 mW/g**

Maximum value of SAR (measured) = 0.325 mW/g

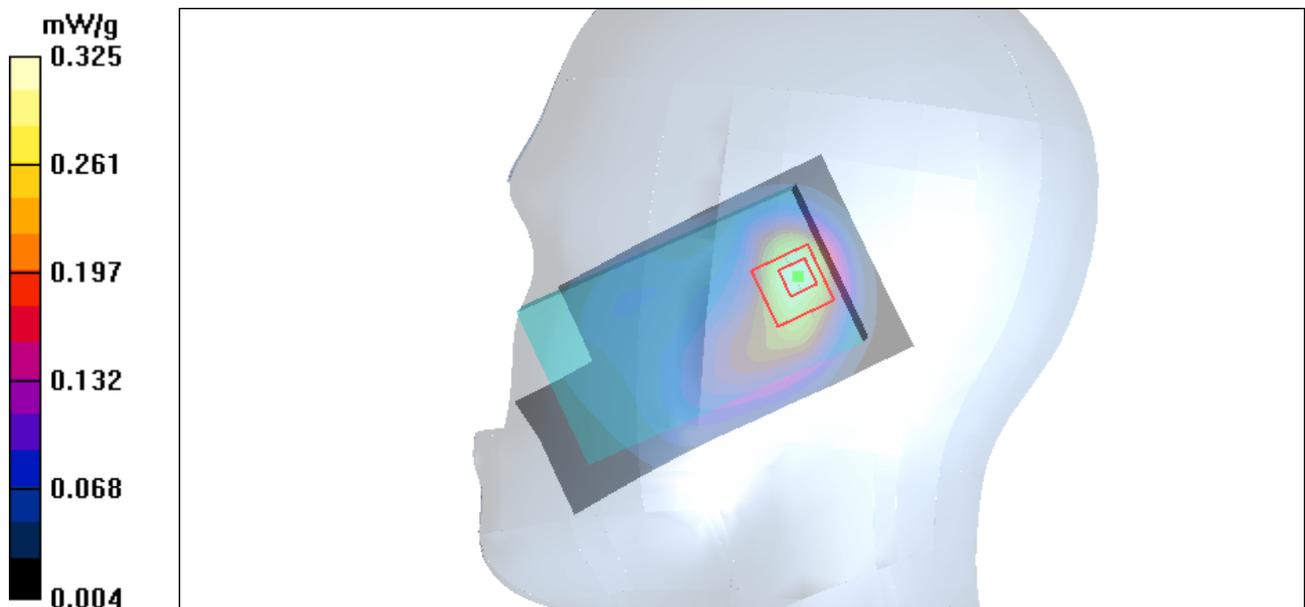


Figure 46 Right Hand Tilt 15° GSM 1900 Channel 512

**GSM 1900 GPRS (4Txslots) Towards Ground High (Battery 1)**

Date/Time: 4/17/2012 6:09:07 AM

Communication System: PCS 1900+GPRS(4Up); Frequency: 1909.8 MHz; Duty Cycle: 1:2.075

Medium parameters used:  $f = 1910$  MHz;  $\sigma = 1.56$  mho/m;  $\epsilon_r = 52.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.51, 7.51, 7.51); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Towards Ground High/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.589 mW/g

**Towards Ground High/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm,

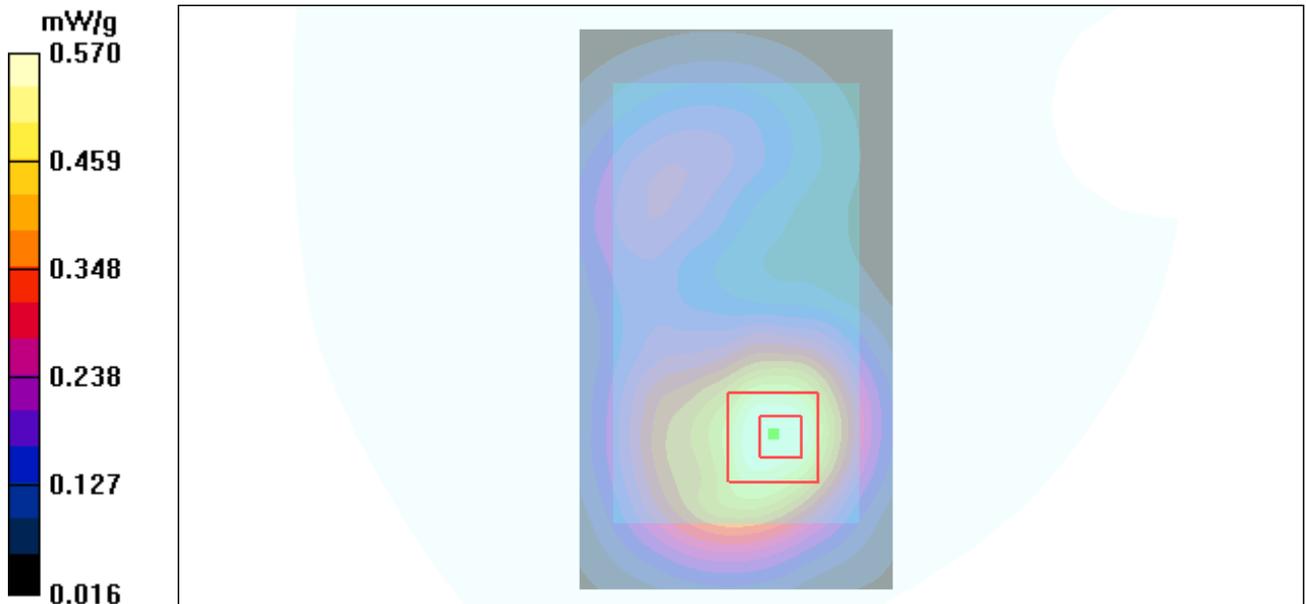
dz=5mm

Reference Value = 10.1 V/m; Power Drift = 0.014 dB

Peak SAR (extrapolated) = 0.855 W/kg

**SAR(1 g) = 0.532 mW/g; SAR(10 g) = 0.321 mW/g**

Maximum value of SAR (measured) = 0.570 mW/g



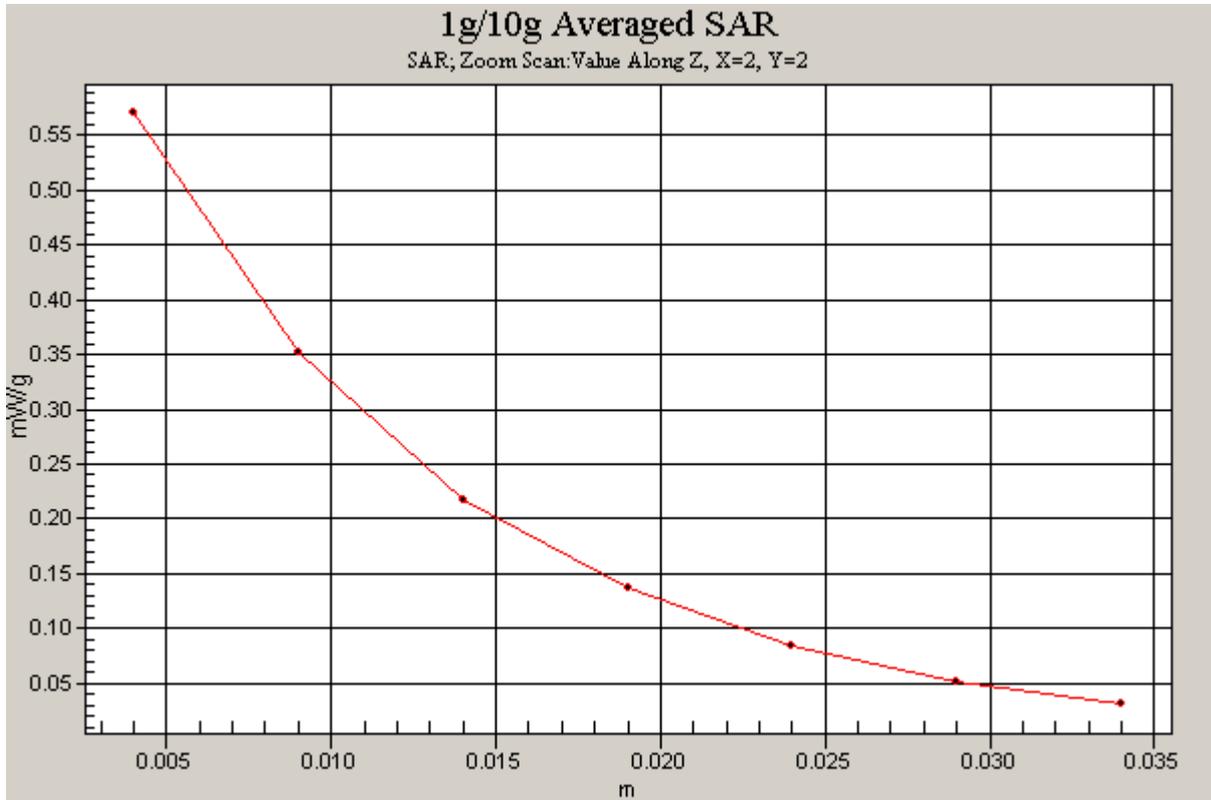


Figure 47 Body, Towards Ground, GSM 1900 GPRS (4Txslots) Channel 810

**GSM 1900 GPRS (4Txslots) Towards Ground Middle (Battery 1)**

Date/Time: 4/17/2012 5:56:16 AM

Communication System: PCS 1900+GPRS(4Up); Frequency: 1880 MHz;Duty Cycle: 1:2.075

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.54$  mho/m;  $\epsilon_r = 52.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.51, 7.51, 7.51); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Towards Ground Middle/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.535 mW/g

**Towards Ground Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm,

dz=5mm

Reference Value = 10.5 V/m; Power Drift = 0.082 dB

Peak SAR (extrapolated) = 0.773 W/kg

**SAR(1 g) = 0.481 mW/g; SAR(10 g) = 0.289 mW/g**

Maximum value of SAR (measured) = 0.519 mW/g

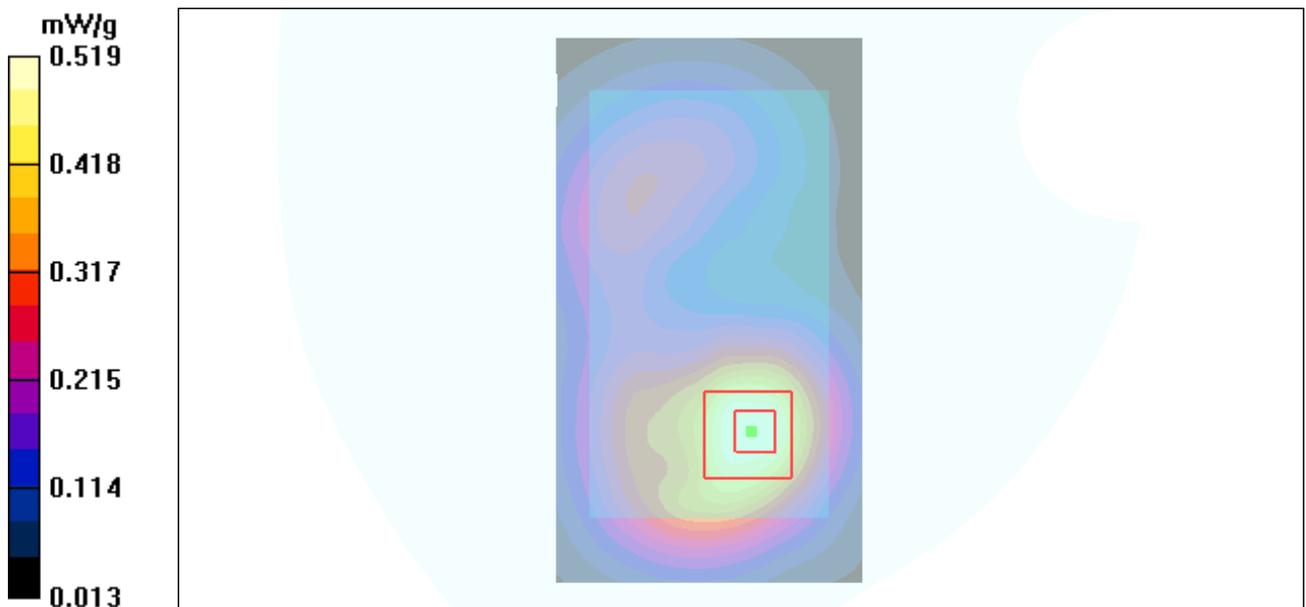


Figure 48 Body, Towards Ground, GSM 1900 GPRS (4Txslots) Channel 661

### GSM 1900 GPRS (4Txslots) Towards Ground Low (Battery 1)

Date/Time: 4/17/2012 6:21:45 AM

Communication System: PCS 1900+GPRS(4Up); Frequency: 1850.2 MHz; Duty Cycle: 1:2.075

Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.51$  mho/m;  $\epsilon_r = 52.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.51, 7.51, 7.51); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Towards Ground Low/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.498 mW/g

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

Reference Value = 10.7 V/m; Power Drift = -0.002 dB

Peak SAR (extrapolated) = 0.741 W/kg

**SAR(1 g) = 0.456 mW/g; SAR(10 g) = 0.271 mW/g**

Maximum value of SAR (measured) = 0.495 mW/g

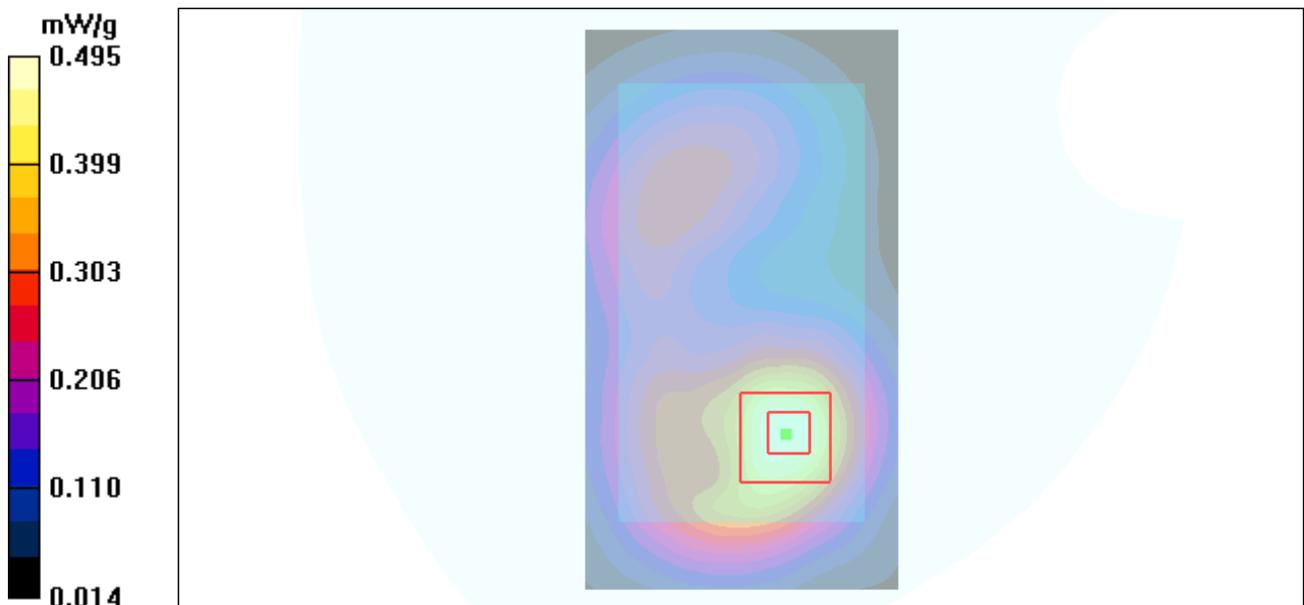


Figure 49 Body, Towards Ground, GSM 1900 GPRS (4Txslots) Channel 512

**GSM 1900 GPRS (4Txslots) Towards Phantom High (Battery 1)**

Date/Time: 4/17/2012 5:13:24 AM

Communication System: PCS 1900+GPRS(4Up); Frequency: 1909.8 MHz; Duty Cycle: 1:2.075

Medium parameters used:  $f = 1910$  MHz;  $\sigma = 1.56$  mho/m;  $\epsilon_r = 52.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.51, 7.51, 7.51); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Towards Phantom High/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.428 mW/g

**Towards Phantom High/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm,

dz=5mm

Reference Value = 10.3 V/m; Power Drift = -0.063 dB

Peak SAR (extrapolated) = 0.640 W/kg

**SAR(1 g) = 0.386 mW/g; SAR(10 g) = 0.232 mW/g**

Maximum value of SAR (measured) = 0.415 mW/g

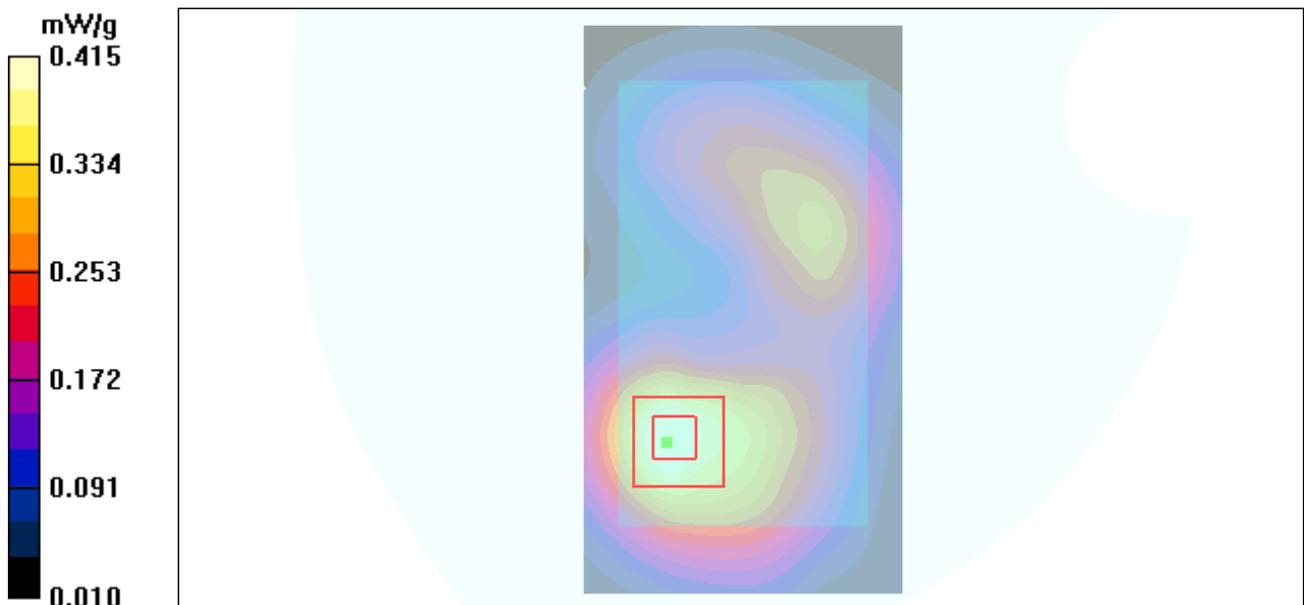


Figure 50 Body, Towards Phantom, GSM 1900 GPRS (4Txslots) Channel 810

**GSM 1900 GPRS (4Txslots) Towards Phantom Middle (Battery 1)**

Date/Time: 4/17/2012 5:00:54 AM

Communication System: PCS 1900+GPRS(4Up); Frequency: 1880 MHz;Duty Cycle: 1:2.075

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.54$  mho/m;  $\epsilon_r = 52.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.51, 7.51, 7.51); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Towards Phantom Middle/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.373 mW/g

**Towards Phantom Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm,

dz=5mm

Reference Value = 10.4 V/m; Power Drift = -0.075 dB

Peak SAR (extrapolated) = 0.562 W/kg

**SAR(1 g) = 0.340 mW/g; SAR(10 g) = 0.203 mW/g**

Maximum value of SAR (measured) = 0.370 mW/g

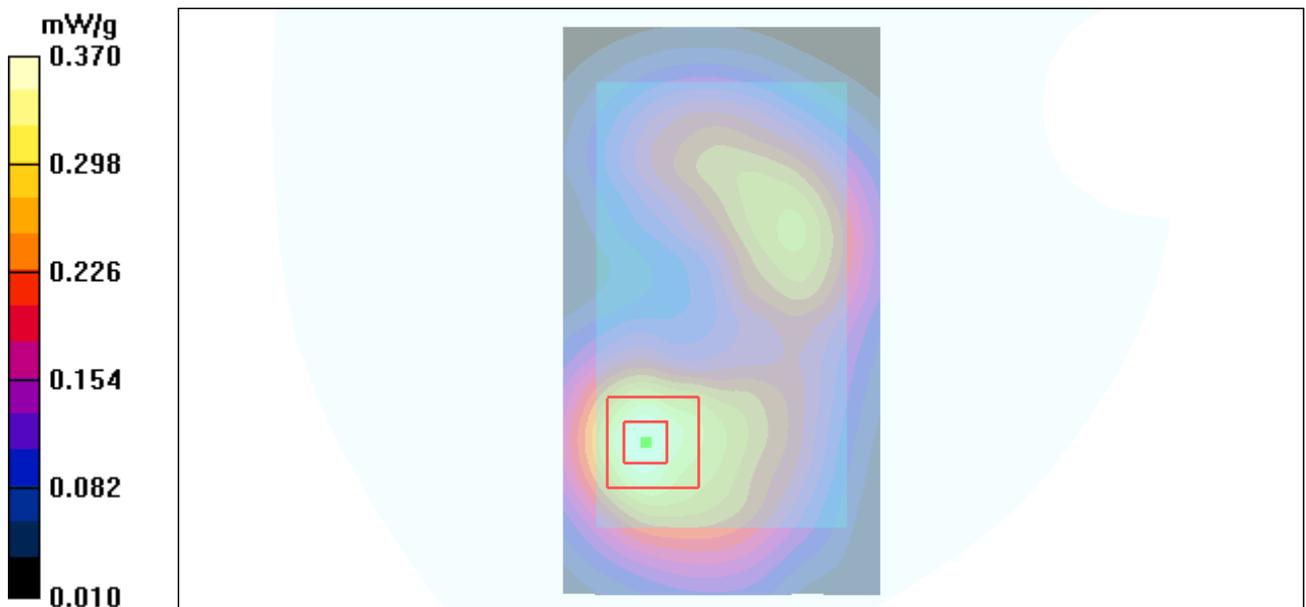


Figure 51 Body, Towards Phantom, GSM 1900 GPRS (4Txslots) Channel 661

**GSM 1900 GPRS (4Txslots) Towards Phantom Low (Battery 1)**

Date/Time: 4/17/2012 5:42:05 AM

Communication System: PCS 1900+GPRS(4Up); Frequency: 1850.2 MHz; Duty Cycle: 1:2.075

Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.51$  mho/m;  $\epsilon_r = 52.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.51, 7.51, 7.51); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Towards Phantom Low/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.339 mW/g

**Towards Phantom Low/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm,

dz=5mm

Reference Value = 10.5 V/m; Power Drift = 0.020 dB

Peak SAR (extrapolated) = 0.500 W/kg

**SAR(1 g) = 0.308 mW/g; SAR(10 g) = 0.183 mW/g**

Maximum value of SAR (measured) = 0.335 mW/g

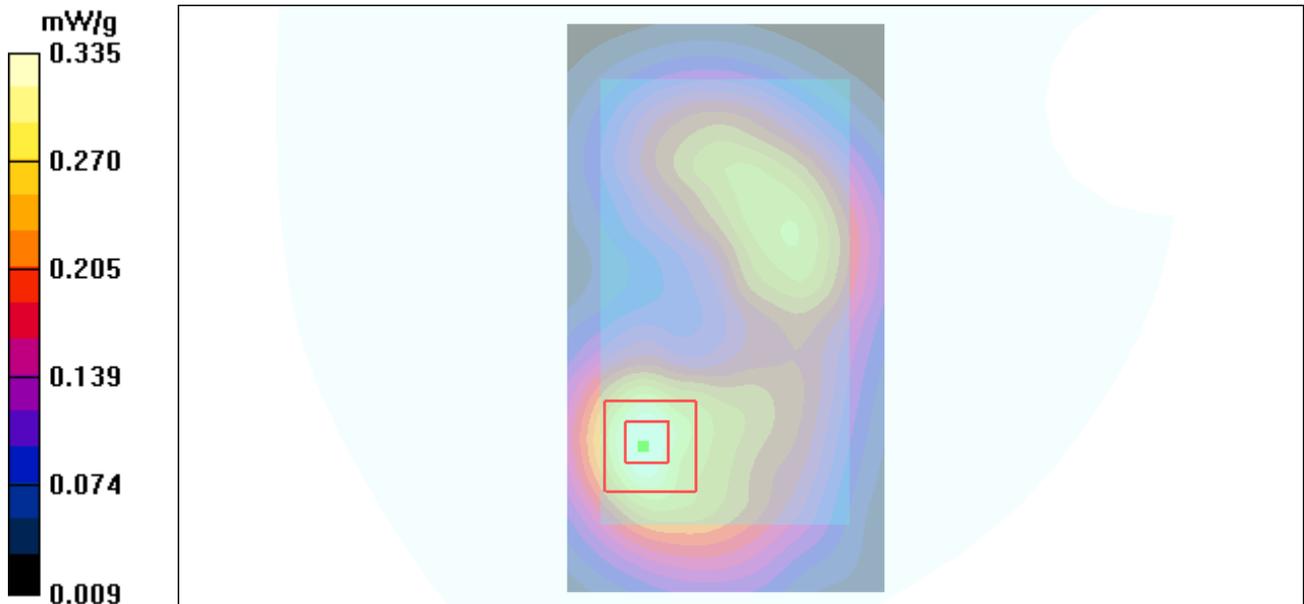


Figure 52 Body, Towards Phantom, GSM 1900 GPRS (4Txslots) Channel 512

**GSM 1900 EGPRS (4Txslots) Towards Ground High (Battery 1)**

Date/Time: 4/17/2012 6:37:23 AM

Communication System: PCS 1900+EGPRS(4Up); Frequency: 1909.8 MHz;Duty Cycle: 1:2.075

Medium parameters used:  $f = 1910$  MHz;  $\sigma = 1.56$  mho/m;  $\epsilon_r = 52.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.51, 7.51, 7.51); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Towards Ground High/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.527 mW/g

**Towards Ground High/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm,

dz=5mm

Reference Value = 10.9 V/m; Power Drift = -0.069 dB

Peak SAR (extrapolated) = 0.785 W/kg

**SAR(1 g) = 0.481 mW/g; SAR(10 g) = 0.287 mW/g**

Maximum value of SAR (measured) = 0.524 mW/g

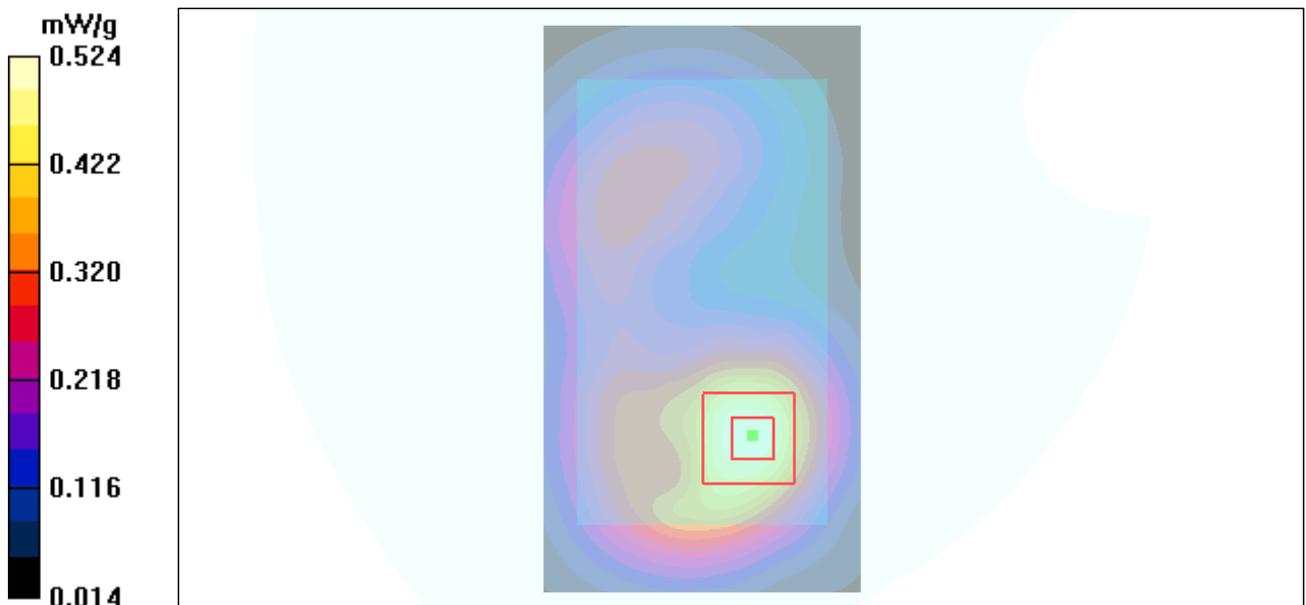


Figure 53 Body, Towards Ground, GSM 1900 EGPRS (4Txslots) Channel 810

**GSM 1900 with Stereo Headset 1 Towards Ground High (Battery 1)**

Date/Time: 4/17/2012 6:51:55 AM

Communication System: PCS 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 1910$  MHz;  $\sigma = 1.56$  mho/m;  $\epsilon_r = 52.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.51, 7.51, 7.51); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Towards Ground High/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.304 mW/g

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

Reference Value = 7.10 V/m; Power Drift = 0.102 dB

Peak SAR (extrapolated) = 0.447 W/kg

**SAR(1 g) = 0.275 mW/g; SAR(10 g) = 0.166 mW/g**

Maximum value of SAR (measured) = 0.294 mW/g

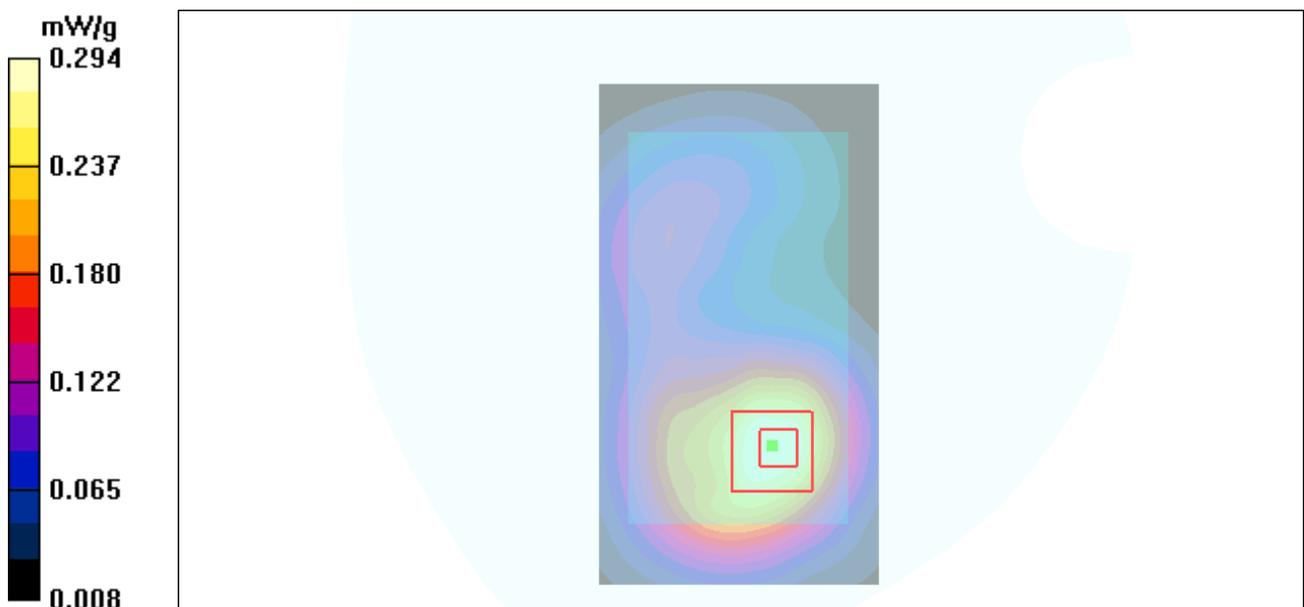


Figure 54 Body with Stereo Headset 1, Towards Ground, GSM 1900 Channel 810

**GSM 1900 with Stereo Headset 2 Towards Ground High (Battery 1)**

Date/Time: 4/17/2012 7:04:48 AM

Communication System: PCS 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 1910$  MHz;  $\sigma = 1.56$  mho/m;  $\epsilon_r = 52.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.51, 7.51, 7.51); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Towards Ground High/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.287 mW/g

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

Reference Value = 6.76 V/m; Power Drift = 0.067 dB

Peak SAR (extrapolated) = 0.422 W/kg

**SAR(1 g) = 0.260 mW/g; SAR(10 g) = 0.159 mW/g**

Maximum value of SAR (measured) = 0.273 mW/g

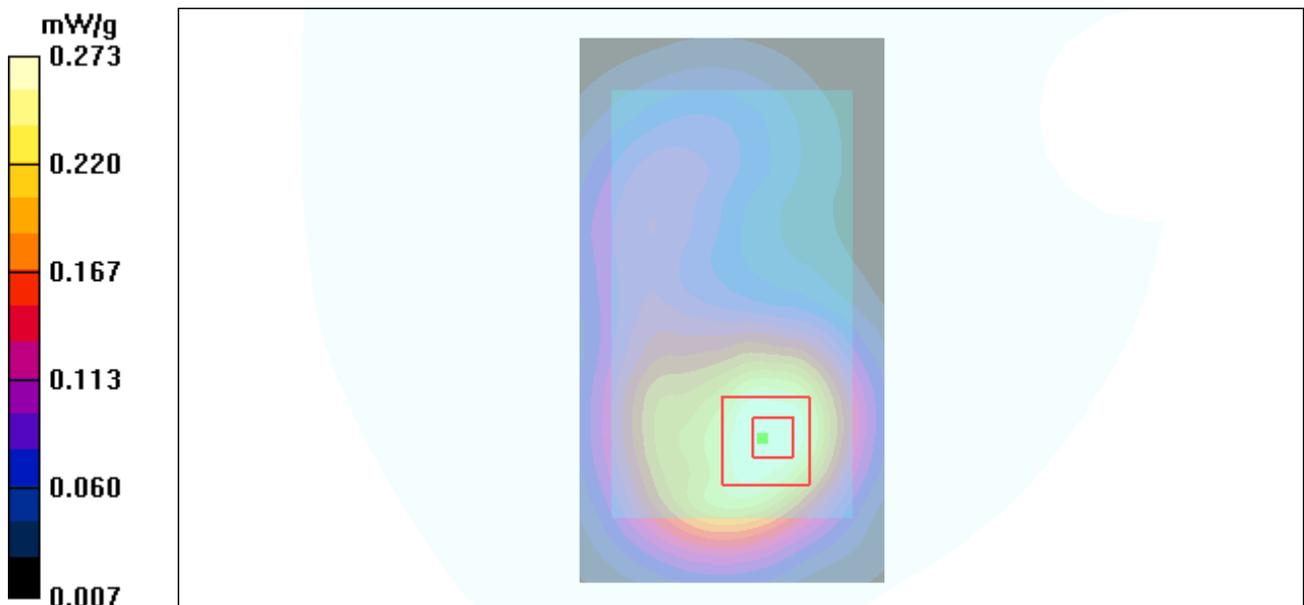


Figure 55 Body with Stereo Headset 2, Towards Ground, GSM 1900 Channel 810

### WCDMA Band II Left Cheek High (Battery 1)

Date/Time: 4/16/2012 7:51:23 PM

Communication System: WCDMA Band II; Frequency: 1907.6 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1908$  MHz;  $\sigma = 1.4$  mho/m;  $\epsilon_r = 40.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Left Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.9, 7.9, 7.9); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Cheek High/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.11 mW/g

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

Reference Value = 10.5 V/m; Power Drift = -0.041 dB

Peak SAR (extrapolated) = 1.34 W/kg

**SAR(1 g) = 0.795 mW/g; SAR(10 g) = 0.474 mW/g**

Maximum value of SAR (measured) = 0.865 mW/g

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

Reference Value = 10.5 V/m; Power Drift = -0.041 dB

Peak SAR (extrapolated) = 1.52 W/kg

**SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.644 mW/g**

Maximum value of SAR (measured) = 1.08 mW/g

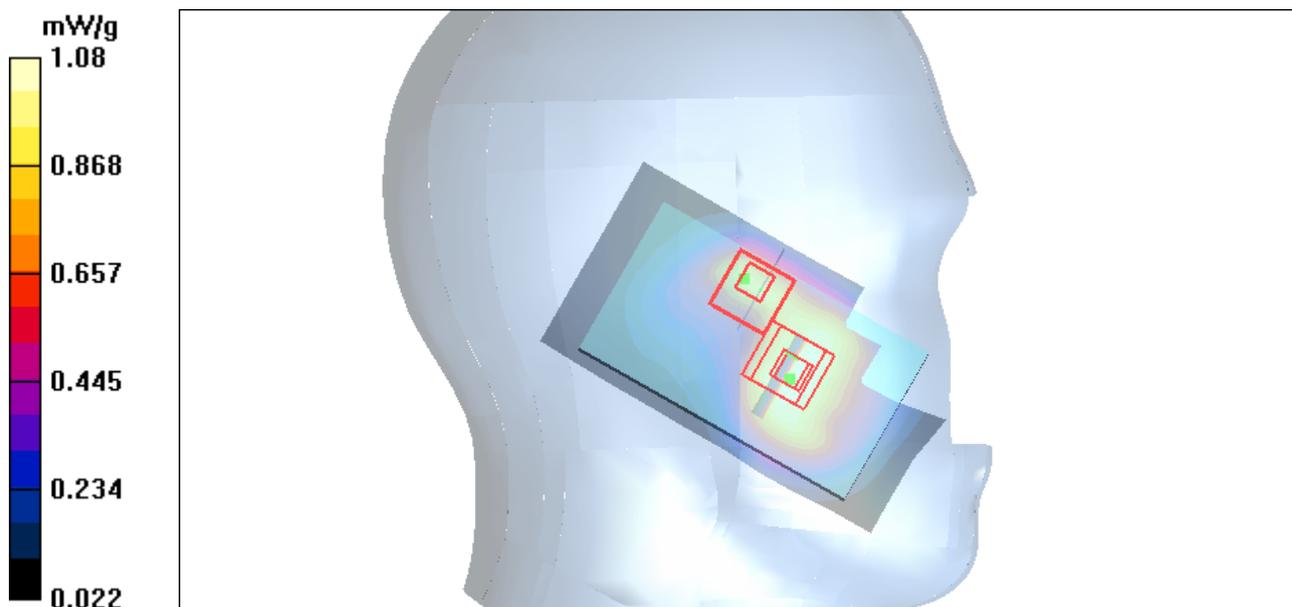


Figure 56 Left Hand Touch Cheek WCDMA Band II Channel 9538

### WCDMA Band II Left Cheek Middle (Battery 1)

Date/Time: 4/16/2012 8:13:13 PM

Communication System: WCDMA Band II; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.38$  mho/m;  $\epsilon_r = 40.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Left Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.9, 7.9, 7.9); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Cheek Middle/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.12 mW/g

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

Reference Value = 11.3 V/m; Power Drift = 0.105 dB

Peak SAR (extrapolated) = 1.28 W/kg

**SAR(1 g) = 0.758 mW/g; SAR(10 g) = 0.454 mW/g**

Maximum value of SAR (measured) = 0.832 mW/g

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

Reference Value = 11.3 V/m; Power Drift = 0.105 dB

Peak SAR (extrapolated) = 1.54 W/kg

**SAR(1 g) = 1 mW/g; SAR(10 g) = 0.635 mW/g**

Maximum value of SAR (measured) = 1.07 mW/g

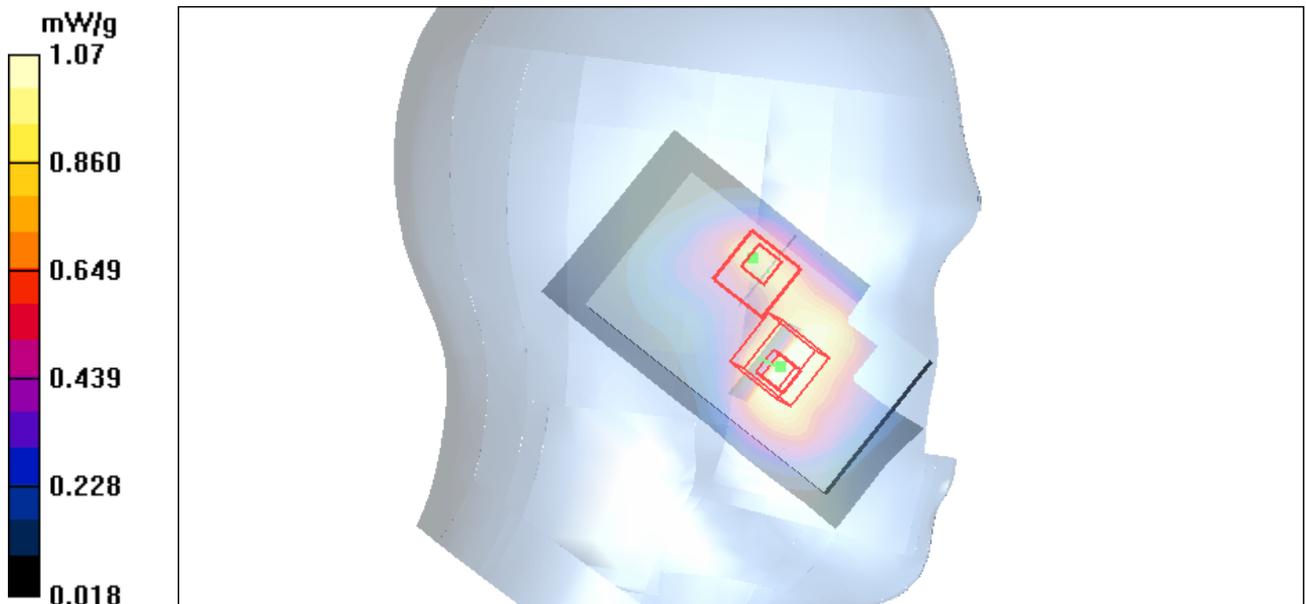


Figure 57 Left Hand Touch Cheek WCDMA Band II Channel 9400

**WCDMA Band II Left Cheek Low (Battery 1)**

Date/Time: 4/16/2012 8:39:12 PM

Communication System: WCDMA Band II; Frequency: 1852.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 1852.4$  MHz;  $\sigma = 1.36$  mho/m;  $\epsilon_r = 40.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Left Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.9, 7.9, 7.9); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Cheek Low/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.14 mW/g

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

Reference Value = 11.4 V/m; Power Drift = 0.120 dB

Peak SAR (extrapolated) = 1.25 W/kg

**SAR(1 g) = 0.760 mW/g; SAR(10 g) = 0.485 mW/g**

Maximum value of SAR (measured) = 0.948 mW/g

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

Reference Value = 11.4 V/m; Power Drift = 0.120 dB

Peak SAR (extrapolated) = 1.58 W/kg

**SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.643 mW/g**

Maximum value of SAR (measured) = 1.10 mW/g

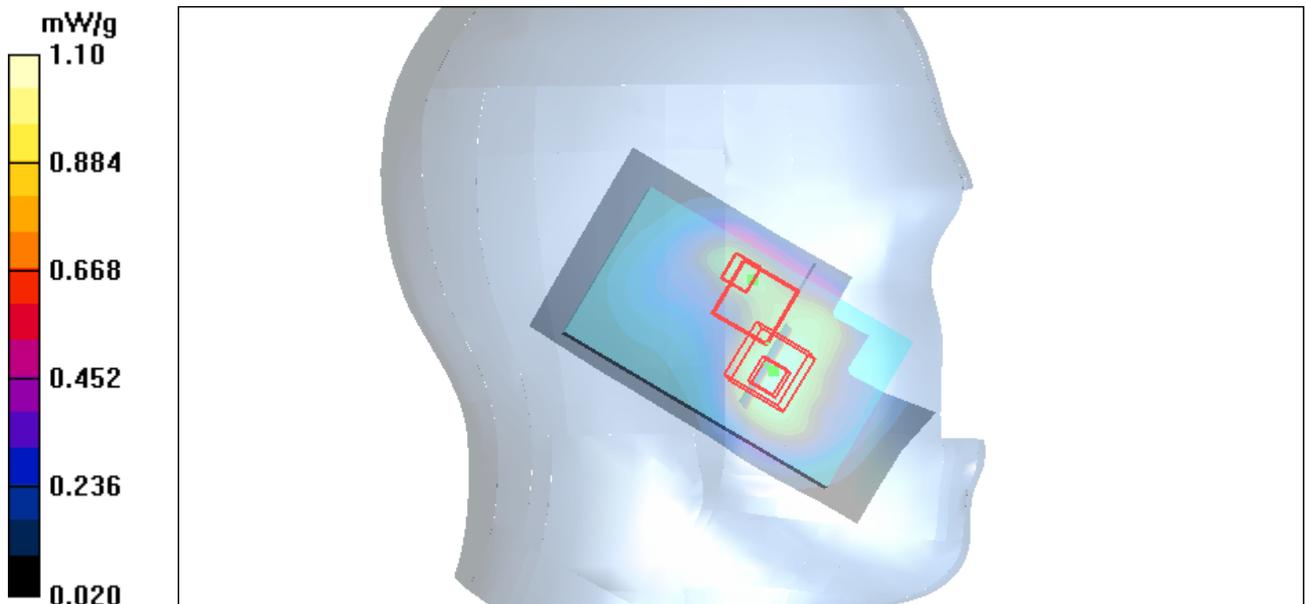


Figure 58 Left Hand Touch Cheek WCDMA Band II Channel 9262

**WCDMA Band II Left Tilt High (Battery 1)**

Date/Time: 4/16/2012 9:43:18 PM

Communication System: WCDMA Band II; Frequency: 1907.6 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1908$  MHz;  $\sigma = 1.4$  mho/m;  $\epsilon_r = 40.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Left Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.9, 7.9, 7.9); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Tilt High/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.497 mW/g

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

Reference Value = 15.8 V/m; Power Drift = 0.011 dB

Peak SAR (extrapolated) = 0.697 W/kg

**SAR(1 g) = 0.437 mW/g; SAR(10 g) = 0.267 mW/g**

Maximum value of SAR (measured) = 0.473 mW/g

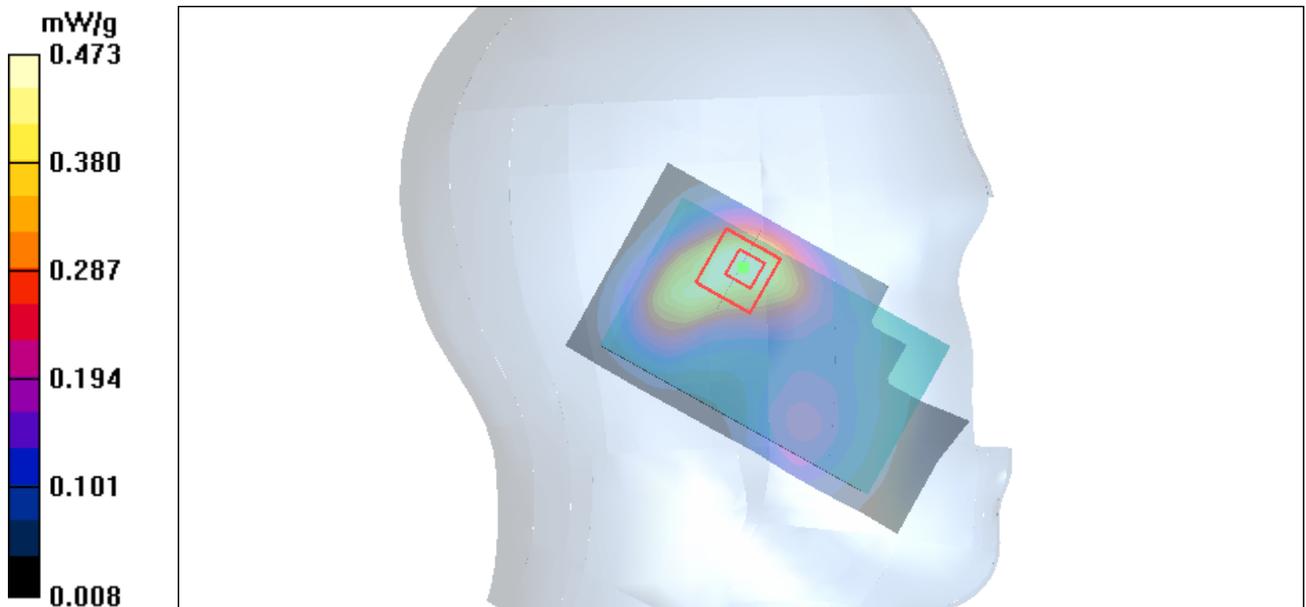


Figure 59 Left Hand Tilt 15° WCDMA Band II Channel 9538

**WCDMA Band II Left Tilt Middle (Battery 1)**

Date/Time: 4/16/2012 9:17:01 PM

Communication System: WCDMA Band II; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.38$  mho/m;  $\epsilon_r = 40.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Left Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.9, 7.9, 7.9); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Tilt Middle/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.485 mW/g

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

Reference Value = 16.2 V/m; Power Drift = -0.018 dB

Peak SAR (extrapolated) = 0.649 W/kg

**SAR(1 g) = 0.420 mW/g; SAR(10 g) = 0.262 mW/g**

Maximum value of SAR (measured) = 0.446 mW/g

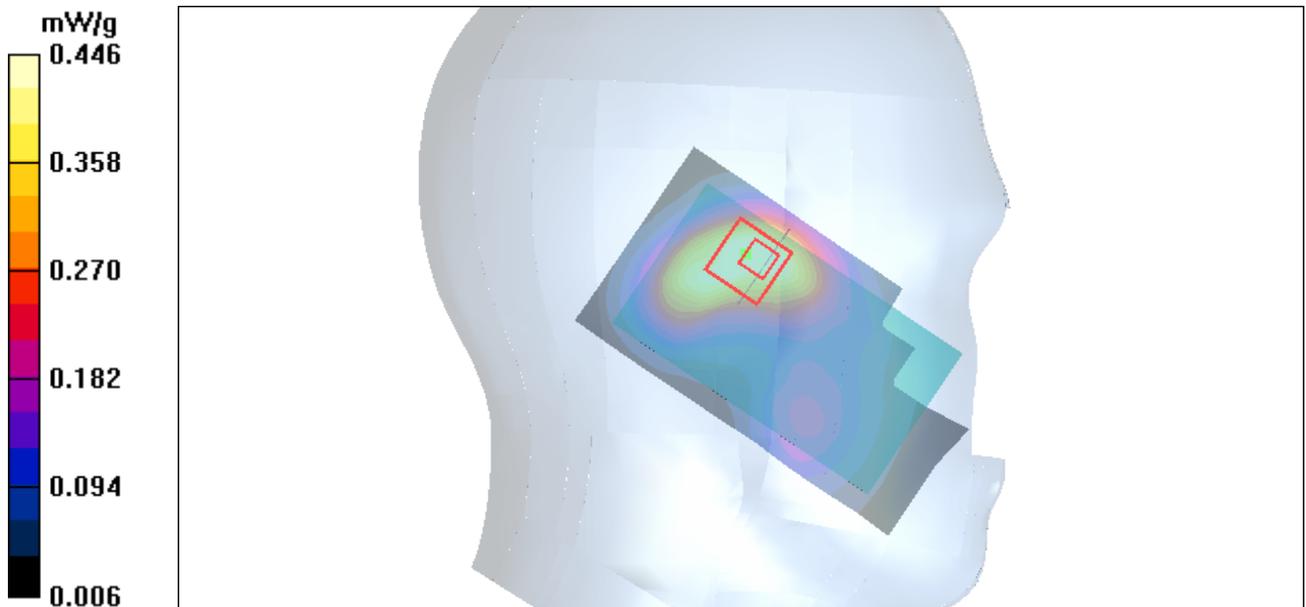


Figure 60 Left Hand Tilt 15° WCDMA Band II Channel 9400

### WCDMA Band II Left Tilt Low (Battery 1)

Date/Time: 4/16/2012 9:30:06 PM

Communication System: WCDMA Band II; Frequency: 1852.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 1852.4$  MHz;  $\sigma = 1.36$  mho/m;  $\epsilon_r = 40.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Left Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.9, 7.9, 7.9); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Tilt Low/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.507 mW/g

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

Reference Value = 16.8 V/m; Power Drift = 0.040 dB

Peak SAR (extrapolated) = 0.662 W/kg

**SAR(1 g) = 0.435 mW/g; SAR(10 g) = 0.278 mW/g**

Maximum value of SAR (measured) = 0.465 mW/g

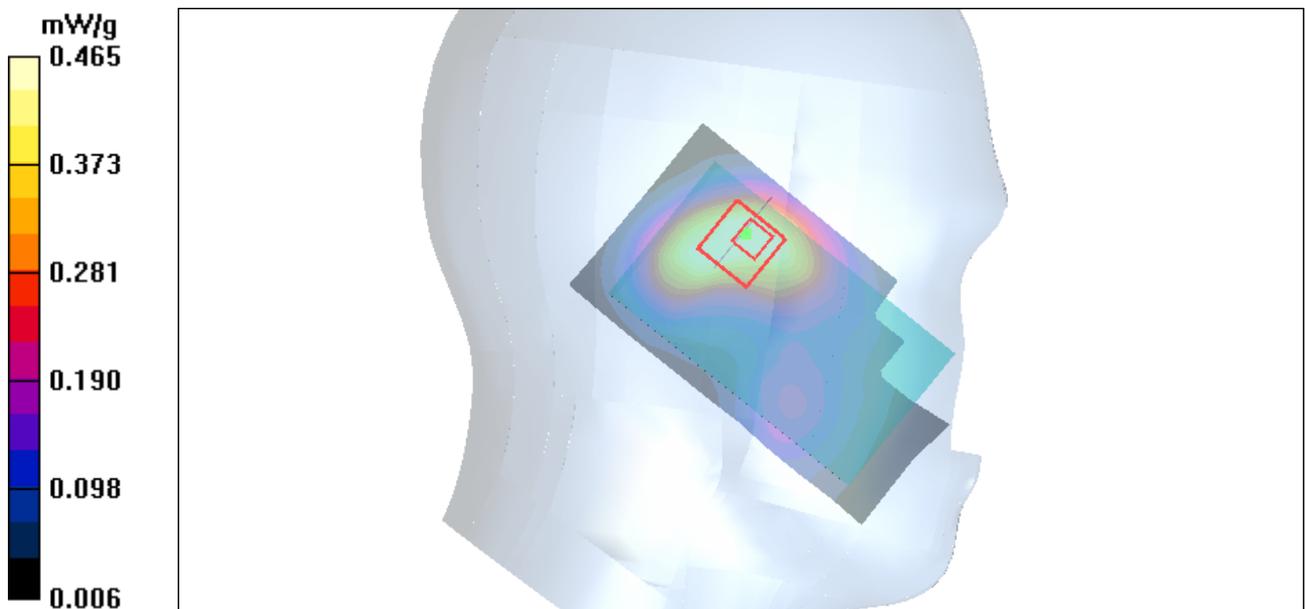


Figure 61 Left Hand Tilt 15° WCDMA Band II Channel 9262

**WCDMA Band II Right Cheek High (Battery 1)**

Date/Time: 4/16/2012 11:24:58 PM

Communication System: WCDMA Band II; Frequency: 1907.6 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1908 \text{ MHz}$ ;  $\sigma = 1.4 \text{ mho/m}$ ;  $\epsilon_r = 40.1$ ;  $\rho = 1000 \text{ kg/m}^3$

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

Phantom section: Right Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.9, 7.9, 7.9); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Cheek High/Area Scan (51x91x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) =  $1.26 \text{ mW/g}$

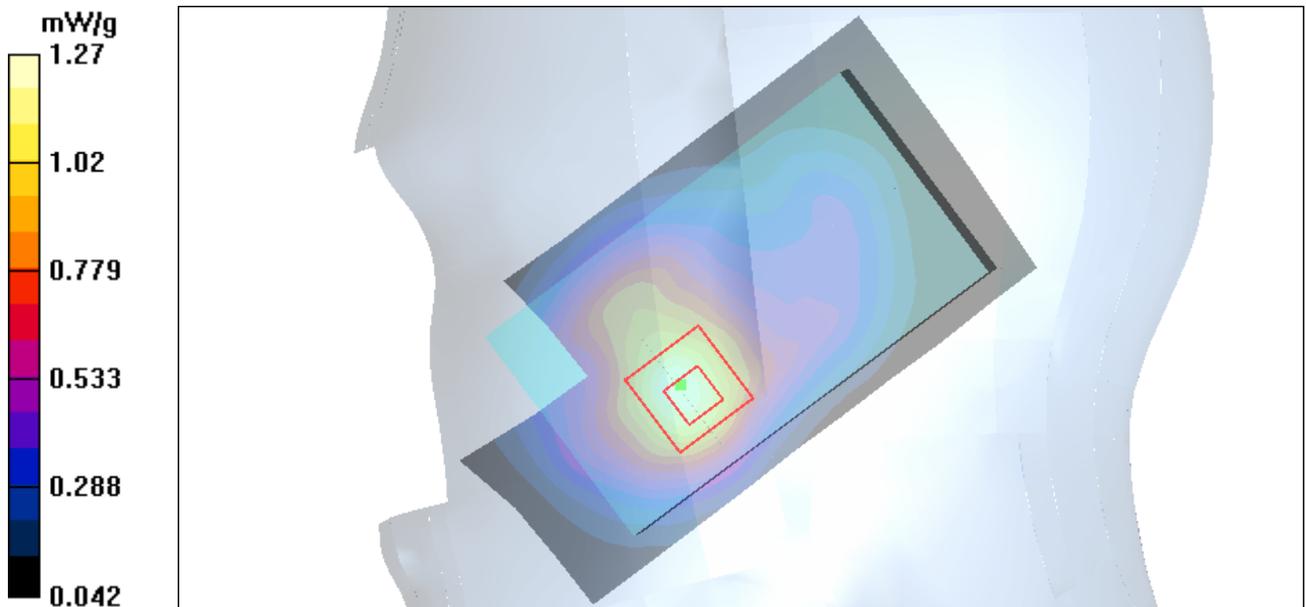
**Cheek High/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value =  $12.2 \text{ V/m}$ ; Power Drift =  $0.181 \text{ dB}$

Peak SAR (extrapolated) =  $1.82 \text{ W/kg}$

**SAR(1 g) =  $1.19 \text{ mW/g}$ ; SAR(10 g) =  $0.708 \text{ mW/g}$**

Maximum value of SAR (measured) =  $1.27 \text{ mW/g}$



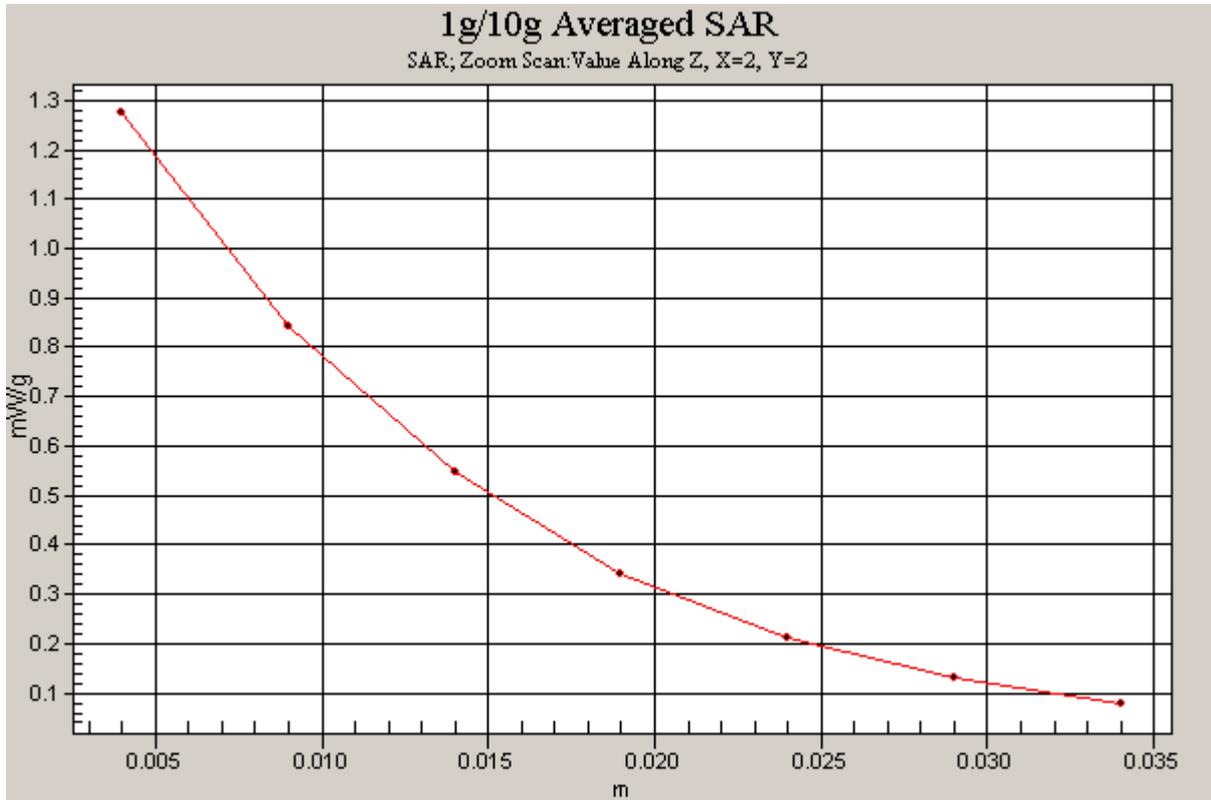


Figure 62 Right Hand Touch Cheek WCDMA Band II Channel 9538

**WCDMA Band II Right Cheek Middle (Battery 1)**

Date/Time: 4/16/2012 10:27:40 PM

Communication System: WCDMA Band II; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.38$  mho/m;  $\epsilon_r = 40.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Right Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.9, 7.9, 7.9); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Cheek Middle/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.18 mW/g

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

Reference Value = 11.8 V/m; Power Drift = 0.031 dB

Peak SAR (extrapolated) = 1.74 W/kg

**SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.676 mW/g**

Maximum value of SAR (measured) = 1.20 mW/g

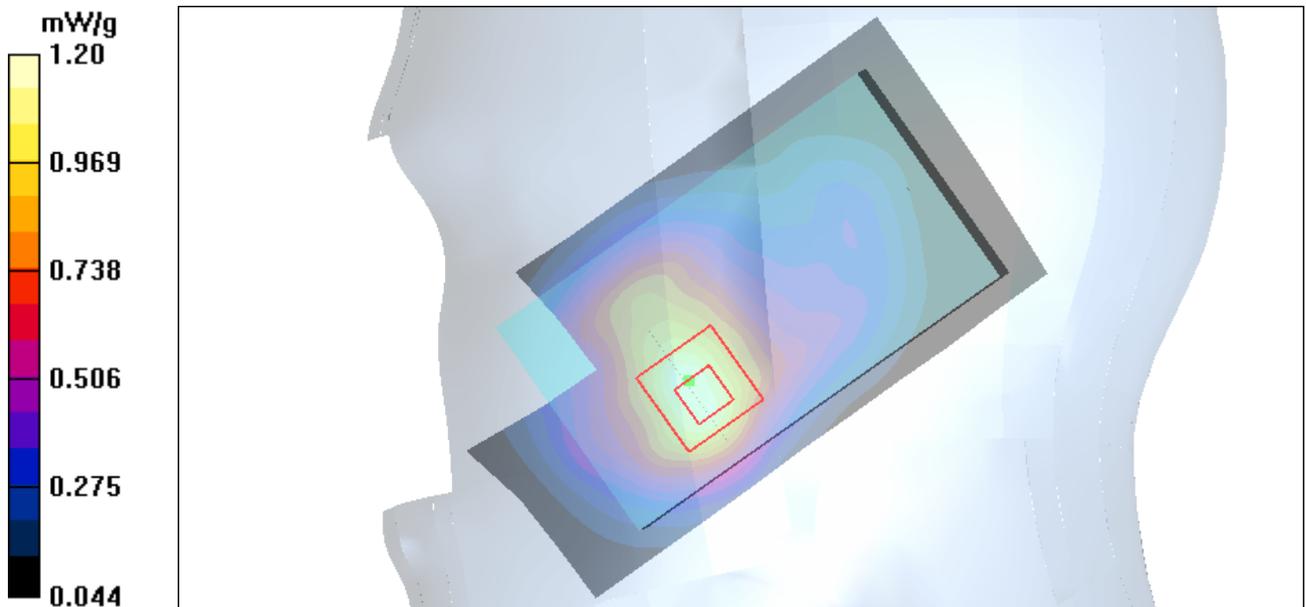


Figure 63 Right Hand Touch Cheek WCDMA Band II Channel 9400

**WCDMA Band II Right Cheek Low (Battery 1)**

Date/Time: 4/16/2012 10:14:05 PM

Communication System: WCDMA Band II; Frequency: 1852.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 1852.4$  MHz;  $\sigma = 1.36$  mho/m;  $\epsilon_r = 40.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Right Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.9, 7.9, 7.9); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Cheek Low/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.16 mW/g

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

Reference Value = 12.0 V/m; Power Drift = -0.096 dB

Peak SAR (extrapolated) = 1.73 W/kg

**SAR(1 g) = 1.12 mW/g; SAR(10 g) = 0.665 mW/g**

Maximum value of SAR (measured) = 1.19 mW/g

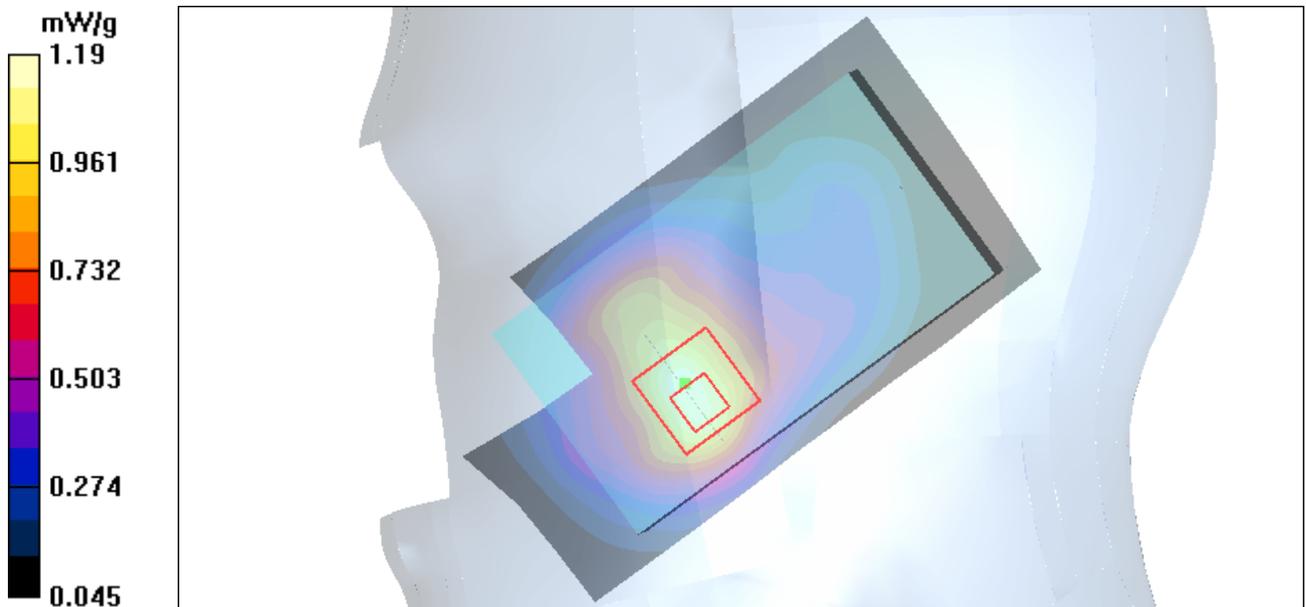


Figure 64 Right Hand Touch Cheek WCDMA Band II Channel 9262

**WCDMA Band II Right Tilt High (Battery 1)**

Date/Time: 4/16/2012 11:43:14 PM

Communication System: WCDMA Band II; Frequency: 1907.6 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1908$  MHz;  $\sigma = 1.4$  mho/m;  $\epsilon_r = 40.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Right Section

DASY4 Configuration:

Probe: EX3DV4 - SN3816; ConvF(7.9, 7.9, 7.9); Calibrated: 10/3/2011

Electronics: DAE4 Sn1317; Calibrated: 1/23/2012

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Tilt High/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.494 mW/g

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

Reference Value = 17.0 V/m; Power Drift = -0.031 dB

Peak SAR (extrapolated) = 0.716 W/kg

**SAR(1 g) = 0.439 mW/g; SAR(10 g) = 0.254 mW/g**

Maximum value of SAR (measured) = 0.464 mW/g

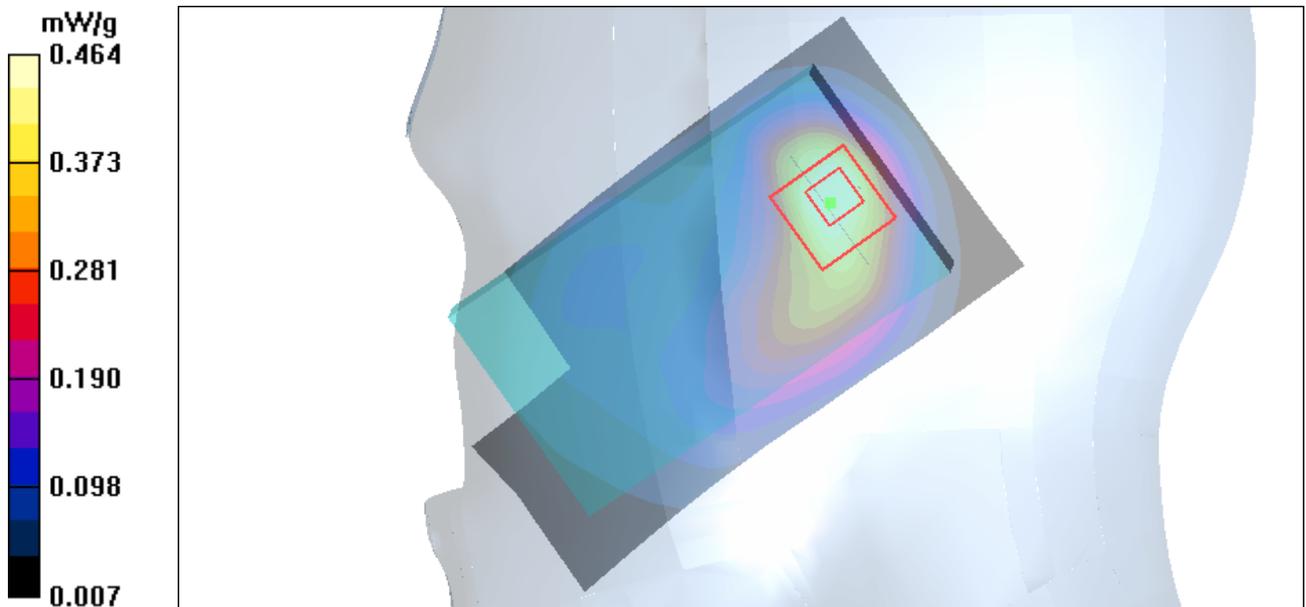


Figure 65 Right Hand Tilt 15° WCDMA Band II Channel 9538