



Report No.: RZA2010-1340FCC-R2



# OET 65

# TEST REPORT

<b>Product Name</b>	HSDPA/UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth
<b>Model</b>	HUAWEI U8150-A/U8150-A/Comet
<b>FCC ID</b>	QISU8150-A
<b>IC</b>	6369A-U8150A
<b>Client</b>	Huawei Technologies Co., Ltd.

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## GENERAL SUMMARY

<b>Product Name</b>	HSDPA/UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth	<b>Model</b>	HUAWEI U8150-A/U8150-A/Comet
<b>FCC ID</b>	QISU8150-A	<b>Report No.</b>	RZA2010-1340FCC-R2
<b>Client</b>	Huawei Technologies Co., Ltd.		
<b>Manufacturer</b>	Huawei Technologies Co., Ltd.		
<b>Reference Standard(s)</b>	<p><b>IEEE Std C95.1, 1999:</b> IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency 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 Radio frequency Electromagnetic Fields Additional Information for Evaluation Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radio frequency Emissions.</p> <p><b>RSS-102 Issue 4 March 2010:</b> Radio Frequency (RF) Exposure Compliance of Radio communication Apparatus (All Frequency Bands)</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: <b>September 21<sup>st</sup>, 2010</b></p>		
<b>Comment</b>	The test result only responds to the measured sample.		

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**Revision History**

<b>Report No.</b>	<b>Revisions</b>	<b>Issue Date</b>
RZA2010-1340FCC	Initial Issue	September 9,2010
RZA2010-1340FCC-R1	-Added IC ID	September 9,2010
RZA2010-1340FCC-R2	<ul style="list-style-type: none"><li>- Added devise class</li><li>- Added maximum number of downlink, uplink and total timeslots per frame for GPRS and EGPRS</li><li>- Added conducted power of EGPRS in 8-PSK mode</li><li>- Added extrapolated SAR values</li><li>- Added antenna separation distances</li></ul>	September 21,2010

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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.

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

This report 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.

### 1.2. Testing Laboratory

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## 1.3. Applicant Information

Company: Huawei Technologies Co., Ltd.  
Address: Bantian, Longgang District  
City: Shenzhen  
Postal Code: 518129  
Country: P.R. China  
Contact: Wang Wei  
Telephone: 0755-28780808  
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## 1.4. Manufacturer Information

Company: Huawei Technologies Co., Ltd.  
Address: Bantian, Longgang District  
City: Shenzhen  
Postal Code: 518129  
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### 1.5. Information of EUT

#### General Information

Device Type :	Portable Device		
Exposure Category:	Uncontrolled Environment / General Population		
Product Name:	HSDPA/UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth		
IMEI or SN:	352607040016509		
Device Operating Configurations:			
Operating Mode(s):	GSM 850; (tested) GSM 1900; (tested) WCDMA Band IV; (tested) BT/WIFI;		
Test Modulation:	(GSM)GMSK; (WCDMA)QPSK		
Device Class:	B		
GPRS Multislot Class(10):	Maximum Number of Timeslots in Uplink	Maximum Number of Timeslots in Downlink	Maximum Total Timeslot
	2	4	5
EGPRS Multislot Class(10):	Maximum Number of Timeslots in Uplink	Maximum Number of Timeslots in Downlink	Maximum Total Timeslot
	2	4	5
HSDPA UE Category:	8		
Operating Frequency Range(s):	Band	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 IV	1712.4 ~ 1752.6	2112.4 ~ 2152.2
Power Class:	GSM 850: 4, tested with power level 5		
	GSM 1900: 1, tested with power level 0		
	WCDMA Band IV: 3, tested with power control all up bits		
Test Channel: (Low - Middle - High)	128 - 190 - 251 512 - 661 - 810 1312 - 1413 - 1513	(GSM 850) (GSM 1900) (WCDMA Band IV)	(tested) (tested) (tested)
Hardware Version:	HD1U815M		
Software Version:	HUAWEI U8150 V100R001C197B821SP03		
Antenna Type:	Internal Antenna		

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### Auxiliary Equipment Details

#### AE1:Battery

Model: HB4J1H  
Manufacturer: Huawei Technologies Co., Ltd.  
SN: UNHA601XA2201056

#### AE2:Travel Adapter

Model: HW-050100U1W  
Manufacturer: Huawei Technologies Co., Ltd.  
SN: HKAA50924648

Equipment Under Test (EUT) is a model of HSDPA/UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth with internal antenna. The detail about Mobile phone, Lithium Battery and AC/DC Adapter is in chapter 1.5 in this report. SAR is tested for GSM 850, GSM 1900 and WCDMA Band IV. The EUT has GPRS (class 10), EGPRS (class 10), WCDMA and HSDPA functions. The device class of the EUT is class B, not has DTM function. The EUT has a main antenna which is used for Tx/Rx, and the other is BT/WIFI antenna which can be used for Tx/Rx.

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 and Conducted Power of each tested band**

The Maximum SAR<sub>1g</sub> Values

Band	SAR <sub>1g</sub> (W/kg)	
	Head	Body
GSM 850	<b>0.337</b>	<b>1.240</b>
GSM 1900	<b>0.365</b>	<b>0.542</b>
WCDMA Band IV	<b>1.270</b>	<b>0.922</b>

The Maximum Power

Band		Maximum Conducted Power (dBm)	Maximum Average Power (dBm)
GSM 850	GSM,GPRS/EGPRS,1 time-slot	<b>33.63</b>	<b>24.60</b>
	GPRS,2 time-slots	<b>31.18</b>	<b>25.16</b>
	EGPRS,2 time-slots	<b>31.17</b>	<b>25.15</b>
GSM 1900	GSM,GPRS/EGPRS,1 time-slot	<b>30.73</b>	<b>21.70</b>
	GPRS,2 time-slots	<b>30.68</b>	<b>24.66</b>
	EGPRS,2 time-slots	<b>30.67</b>	<b>24.65</b>
WCDMA Band IV		<b>24.04</b>	<b>/</b>

Note: The detail Power refer to Table 8 (Power Measurement Results).

**1.7. Test Date**

The test is performed from August 31, 2010 to September 4, 2010.

## 2. Operational Conditions during Test

### 2.1. 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 Radio Frequency 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 1312, 1413 and 1513 in the case of WCDMA Band IV. 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. Using E5515C the power lever is set to “5” in SAR of GSM 850, set to “0” in SAR of GSM 1900, power control is set “All Up Bits” of WCDMA. 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.

### 2.2. 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” in SAR of GSM 850, set to “0” in SAR of GSM 1900. The test in the band of GSM 850 and GSM 1900 are performed in the mode of speech transfer function and GPRS/EGPRS function. Since the GPRS class is 10 for this EUT, it has at most 2 timeslots in uplink and at most 4 timeslots in downlink, the maximum total timeslots is 5. The EGPRS class is 10 for this EUT; it has at most 2 timeslots in uplink and at most 4 timeslots in downlink, the maximum total timeslots is 5.

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

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

Output power of reductions:

#### **GSM 850**

GPRS (GMSK):

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

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EGPRS (8PSK):

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

EGPRS (GMSK):

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

**GAM 1900**

GPRS (GMSK):

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

EGPRS (8PSK):

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

EGPRS (GMSK):

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

## **2.3. WCDMA Test Configuration**

### **2.3.1. 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 "1's" 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.

### **2.3.2. Head SAR Measurements**

SAR for head exposure configurations in voice mode is measured using a 12.2kbps RMC with TPC bits configured to all "1's". 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.

### **2.3.3. 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 "1's". 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.

## **2.4. 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 1/4 dB higher than that measured without HSDPA using 12.2kbps RMC or the maximum SAR 12.2kbps RMC is above 75% of the SAR limit. Body SAR for HSDPA is measured using an FRC with H-Set 1 in Sub-test 1 and a 12.2kbps RMC configured in Test Loop Mode 1, using the highest body SAR configuration in 12.2 kbps RMC without HSDPA.

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HSDPA should be configured according to the UE category of a test device. The number of HS-DSCH/HS-PDSCHs, HARQ processes, minimum inter-TTI interval, transport block sizes and RV coding sequence are defined by the H-set f. To maintain a consistent test configuration and stable transmission condition, 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. The CQI value is determined by the UE category, transport block size, number of HS-PDSCHs and modulation used in the H-set.

**Table 1: Subtests for UMTS Release 5 HSDPA**

Sub-set	$\beta_c$	$\beta_d$	$\beta_d$ (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  $\Delta_{CQI} = 7$  ( $A_{hs} = 24/15$ ) 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 2: 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

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**Table 3: 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

**Table 4: UE maximum output powers with HS-DPCCH (Release 5 Only)**

Ratio of $\beta_c$ to $\beta_d$ for all values of $\beta_{hs}$	Power Class 3		Power Class 4	
	Power (dBm)	Tolerance (dB)	Power (dBm)	Tolerance (dB)
$1/15 \leq \beta_c/\beta_d \leq 12/15$	+24	+1/-3	+21	+2/-2
$13/15 \leq \beta_c/\beta_d \leq 15/8$	+23	+2/-3	+20	+3/-2
$15/7 \leq \beta_c/\beta_d \leq 15/0$	+22	+3/-3	+19	+4/-2

### 3. SAR Measurements System Configuration

#### 3.1. 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.

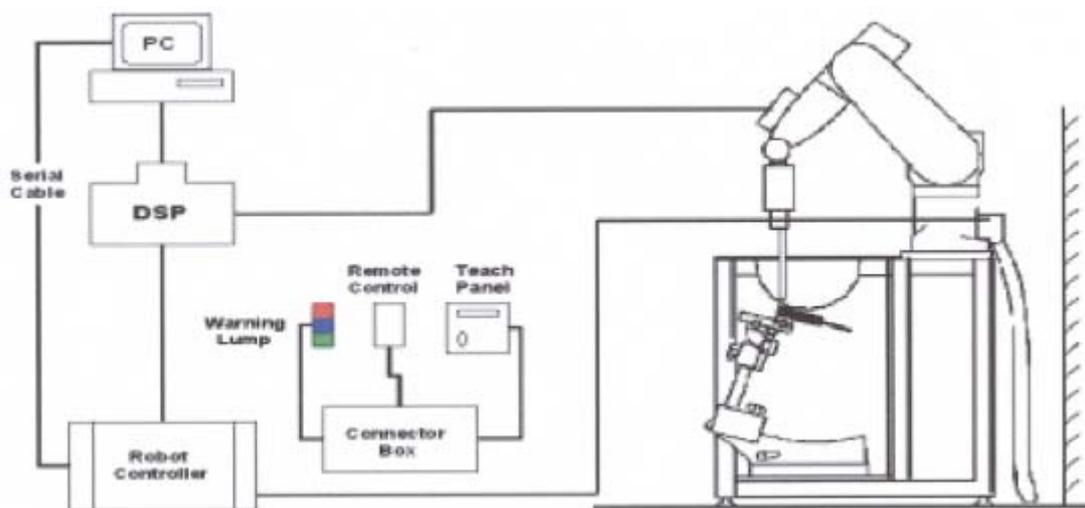


Figure 1 SAR Lab Test Measurement Set-up

### 3.2. 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.

#### 3.2.1. 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

### 3.2.2. 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>).

### 3.3. Other Test Equipment

#### 3.3.1. Device Holder for Transmitters

The DASY device holder is designed to cope with the die rent 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 inference of the clamp on the test results could thus be lowered.



**Figure 4 Device Holder**

### 3.3.2. 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

### 3.4. 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 7x7x7 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 7x7x7 measurement points with 5mm resolution amounting to 343 measurement points, the uncertainty of the extrapolation routines is less than 1% for 1g and 10g cubes.

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

### **3.5. Data Storage and Evaluation**

#### **3.5.1. 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.

#### **3.5.2. 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, ai <sub>0</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.

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

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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

### 3.6. 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 11 and table 12.

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.

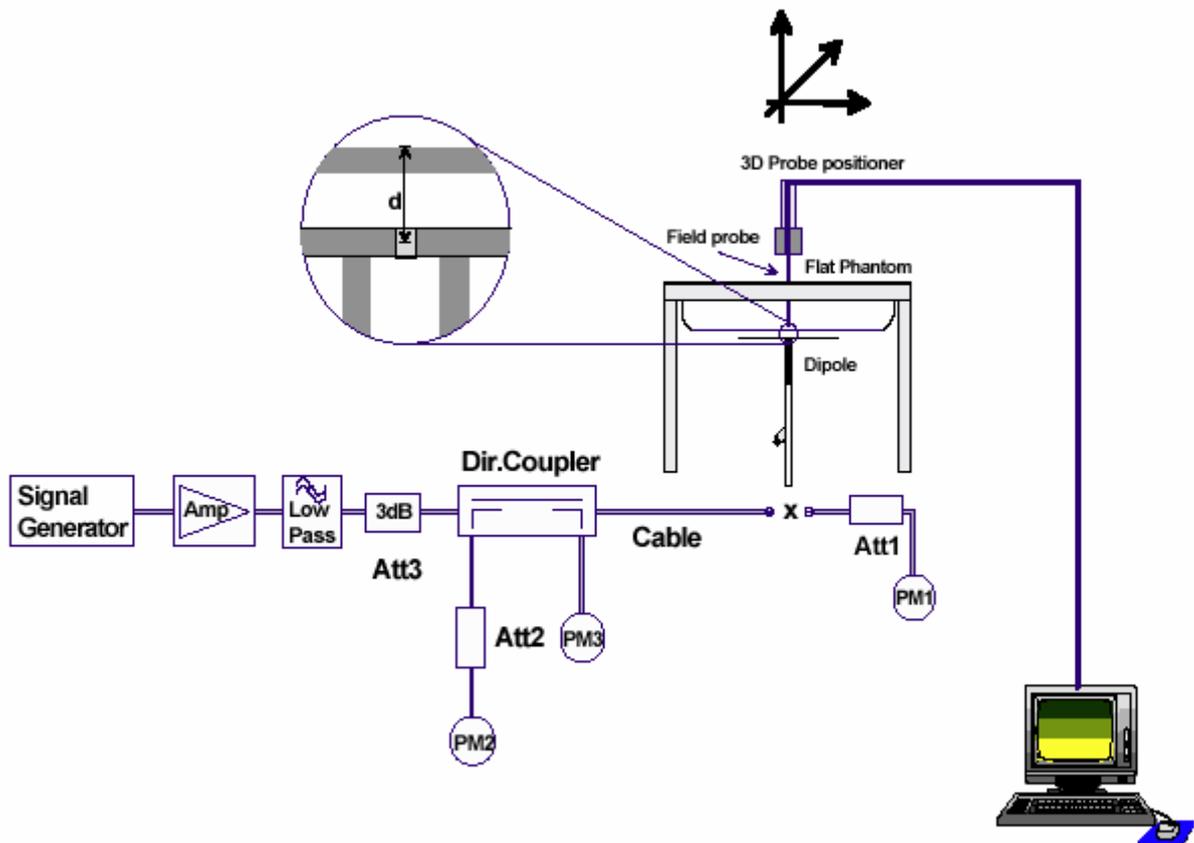


Figure 6 System Check Set-up

### 3.7. Equivalent Tissues

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 5 and table 6 show the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the OET 65.

**Table 5: 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) 1750MHz
Water	55.24
Glycol	44.45
Salt	0.31
Dielectric Parameters Target Value	f=1750MHz $\epsilon=40.1$ $\sigma=1.37$

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

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**Table 6: 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) 1750MHz
Water	69.91
Glycol	29.97
Salt	0.12
Dielectric Parameters Target Value	f=1750MHz $\epsilon=53.4$ $\sigma=1.49$

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

#### 4. Laboratory Environment

**Table 7: The Ambient Conditions during Test**

Temperature	Min. = 20°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.	

## **5. Characteristics of the Test**

### **5.1. Applicable Limit Regulations**

**IEEE Std C95.1, 1999:** IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

### **5.2. Applicable Measurement Standards**

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

**SUPPLEMENT C Edition 01-01 to OET BULLETIN 65 Edition 97-01 June 2001 including DA 02-1438, published June 2002:** Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields Additional Information for Evaluation Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radio frequency Emissions

**RSS-102 Issue 4 March 2010:** Radio Frequency (RF) Exposure Compliance of Radio communication Apparatus (All Frequency Bands)

## 6. Conducted Output Power Measurement

### 6.1. Summary

The DUT is tested using an E5515C communications tester as controller unit to set test channels and maximum output power to the DUT, as well as for measuring the conducted power.

Conducted output power was measured using an integrated RF connector and attached RF cable.

This result contains conducted output power for the EUT.

### 6.2. Conducted Power Results

**Table 8: Conducted Power Measurement Results**

WCDMA Band IV		Conducted Power (dBm)		
		Channel 1312	Channel 1413	Channel 1513
12.2kbps RMC	Before	23.73	23.87	24.04
	After	23.72	23.85	24.03
64kbps RMC	Before	23.72	23.84	24.01
	After	23.71	23.83	24.02
144kbps RMC	Before	23.75	23.83	24.03
	After	23.73	23.84	24.01
384kbps RMC	Before	23.74	23.82	24.02
	After	23.75	23.83	24.00
WCDMA Band IV HSDPA		Conducted Power (dBm)		
		Channel 1312	Channel 1413	Channel 1513
Sub - Test 1	Before	23.71	23.85	24.04
	After	23.70	23.83	24.02
Sub - Test 2	Before	23.54	23.76	23.97
	After	23.55	23.77	23.96
Sub - Test 3	Before	23.51	23.72	23.91
	After	23.52	23.73	23.90
Sub - Test 4	Before	23.26	23.54	23.65
	After	23.24	23.55	23.66

**Average power**

GSM 850	Conducted Power(dBm)						
	Channel 128	Channel 190	Channel 251		Channel 128	Channel 190	Channel 251
Before Test	33.55	33.62	33.53	-9.03dB	24.52	24.59	24.50
After Test	33.53	33.61	33.52	-9.03dB	24.50	24.58	24.49

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GSM 850 GPRS (GMSK)		Conducted Power(dBm)						
		Channel 128	Channel 190	Channel 251		Channel 128	Channel 190	Channel 251
1TXslot	Before Test	33.52	33.61	33.52	-9.03dB	24.49	24.58	24.49
	After Test	33.53	33.63	33.51	-9.03dB	24.50	24.6	24.48
2TXslots	Before Test	31.09	31.18	31.14	-6.02dB	<b>25.07</b>	<b>25.16</b>	<b>25.12</b>
	After Test	31.08	31.16	31.12	-6.02dB	25.06	25.14	25.10
GSM 850 EGPRS (GMSK)		Conducted Power(dBm)						
		Channel 128	Channel 190	Channel 251		Channel 128	Channel 190	Channel 251
1TXslot	Before Test	33.54	33.62	33.53	-9.03dB	24.51	24.59	24.50
	After Test	33.55	33.61	33.52	-9.03dB	24.52	24.58	24.49
2TXslots	Before Test	31.02	31.17	31.12	-6.02dB	<b>25.00</b>	<b>25.15</b>	<b>25.10</b>
	After Test	31.01	31.15	31.11	-6.02dB	24.99	25.13	25.09
GSM 850 EGPRS (8PSK)		Conducted Power(dBm)						
		Channel 128	Channel 190	Channel 251		Channel 128	Channel 190	Channel 251
1TXslot	Before Test	27.24	27.08	27.43	-9.03dB	18.21	18.05	18.40
	After Test	27.22	27.09	27.42	-9.03dB	18.19	18.06	18.39
2TXslots	Before Test	26.93	27.21	27.38	-6.02dB	<b>20.91</b>	<b>21.19</b>	<b>21.36</b>
	After Test	26.91	27.20	27.36	-6.02dB	20.89	21.18	21.34
GSM 1900		Conducted Power(dBm)						
		Channel 512	Channel 661	Channel 810		Channel 512	Channel 661	Channel 810
Before Test		30.67	30.71	30.34	-9.03dB	21.64	21.68	21.31
After Test		30.65	30.70	30.32	-9.03dB	21.62	21.67	21.29
GSM 1900 GPRS (GMSK)		Conducted Power(dBm)						
		Channel 512	Channel 661	Channel 810		Channel 512	Channel 661	Channel 810
1TXslot	Before Test	30.71	30.73	30.32	-9.03dB	21.68	21.70	21.29
	After Test	30.70	30.71	30.33	-9.03dB	21.67	21.68	21.30
2TXslots	Before Test	30.66	30.68	30.31	-6.02dB	<b>24.64</b>	<b>24.66</b>	<b>24.29</b>
	After Test	30.64	30.67	30.29	-6.02dB	24.62	24.65	24.27
GSM 1900 EGPRS (GMSK)		Conducted Power(dBm)						
		Channel 512	Channel 661	Channel 810		Channel 512	Channel 661	Channel 810
1TXslot	Before Test	30.68	30.72	30.41	-9.03dB	21.65	21.69	21.38
	After Test	30.69	30.71	30.42	-9.03dB	21.66	21.68	21.39
2TXslots	Before Test	30.67	30.65	30.37	-6.02dB	<b>24.65</b>	<b>24.63</b>	<b>24.35</b>
	After Test	30.65	30.63	30.36	-6.02dB	24.63	24.61	24.34
GSM 1900 EGPRS		Conducted Power(dBm)						

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<b>(8PSK)</b>		Channel 512	Channel 661	Channel 810		Channel 512	Channel 661	Channel 810
1TXslot	Before Test	26.24	26.43	25.87	-9.03dB	17.21	17.40	16.84
	After Test	26.25	26.42	25.86	-9.03dB	17.22	17.39	16.83
2TXslots	Before Test	26.18	26.37	25.90	-6.02dB	<b>20.16</b>	<b>20.35</b>	<b>19.88</b>
	After Test	26.16	26.35	25.89	-6.02dB	20.14	20.33	19.87

Note:

1) Division Factors

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

1 TX- slot = 1 transmit time slot out of 8 time slots

=> conducted power divided by (8/1) => -9.03 dB

2 TX- slot = 2 transmit time slots out of 8 time slots

=> conducted power divided by (8/2) => -6.02 dB

2) Average power numbers

The maximum power numbers are marks in bold.

3) For SAR testing the EUT was set to multislot class based on the maximum averaged conducted power.

## 7. Test Results

### 7.1. Dielectric Performance

**Table 9: Dielectric Performance of Head Tissue Simulating Liquid**

Frequency	Description	Dielectric Parameters		Temp ℃
		$\epsilon_r$	$\sigma$ (s/m)	
<b>835MHz (head)</b>	Target value ± 5% window	41.50 39.43 — 43.58	0.90 0.86 — 0.95	/
	Measurement value 2010-8-31	42.46	0.90	21.8
<b>1750MHz (head)</b>	Target value ±5% window	40.1 38.10 — 42.11	1.37 1.30 — 1.44	/
	Measurement value 2010-9-4	39.98	1.37	21.9
<b>1900MHz (head)</b>	Target value ±5% window	40.00 38.00 — 42.00	1.40 1.33 — 1.47	/
	Measurement value 2010-9-2	40.20	1.41	21.9

**Table 10: Dielectric Performance of Body Tissue Simulating Liquid**

Frequency	Description	Dielectric Parameters		Temp ℃
		$\epsilon_r$	$\sigma$ (s/m)	
<b>835MHz (body)</b>	Target value ±5% window	55.20 52.44 — 57.96	0.97 0.92 — 1.02	/
	Measurement value 2010-9-2	54.82	1.00	21.9
<b>1750MHz (body)</b>	Target value ±5% window	53.4 50.73 — 56.07	1.49 1.42 — 1.56	/
	Measurement value 2010-9-3	52.22	1.48	21.8
<b>1900MHz (body)</b>	Target value ±5% window	53.30 50.64 — 55.97	1.52 1.44 — 1.60	/
	Measurement value 2010-9-3	53.01	1.56	21.7

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**7.2. System Check Results**

**Table 11: System Check for Head tissue simulation liquid**

Frequency	Description	SAR(W/kg)		Dielectric Parameters		Temp
		10g	1g	$\epsilon_r$	$\sigma$ (s/m)	°C
835MHz	Recommended result ±10% window	1.56 1.40 — 1.72	2.39 2.15 — 2.63	41.2	0.89	/
	Measurement value 2010-8-31	1.6	2.42	42.46	0.90	21.8
1750 MHz	Recommended result ±10% window	4.74 4.27 — 5.21	8.86 7.97 — 9.75	39.8	1.33	/
	Measurement value 2010-9-4	4.59	8.78	39.98	1.37	21.9
1900MHz	Recommended result ±10% window	5.22 4.70 — 5.74	10 9.00 — 11.00	39.5	1.44	/
	Measurement value 2010-9-2	5.34	10.3	40.20	1.41	21.9

Note: 1. the graph results see ANNEX B.

2. Recommended Values used derive from the calibration certificate and 250 mW is used as feeding power to the calibrated dipole.

**Table 12: System Check for Body tissue simulation liquid**

Frequency	Description	SAR(W/kg)		Dielectric Parameters		Temp
		10g	1g	$\epsilon_r$	$\sigma$ (s/m)	°C
835MHz	Recommended result ±10% window	1.63 1.47 — 1.79	2.49 2.24 — 2.74	54.6	0.98	/
	Measurement value 2010-9-2	1.65	2.52	54.82	1.00	21.9
1750MHz	Recommended result ±10% window	5.11 4.60 — 5.62	9.37 8.43 — 10.31	54.1	1.43	/
	Measurement value 2010-9-3	4.98	9.31	52.22	1.48	21.8
1900 MHz	Recommended result ±10% window	5.52 4.97 — 6.07	10.3 9.27 — 11.33	53.5	1.54	/
	Measurement value 2010-9-3	5.34	10.18	53.01	1.56	21.7

Note: 1. The graph results see ANNEX B.

2. Target Values used derive from the calibration certificate and 250 mW is used as feeding power to the Calibrated dipole.

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### 7.3. Summary of Measurement Results

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

**Table 13: 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	
Test Case		Measurement Result(W/kg)		Power Drift	
Different Test Position	Channel	10 g Average	1 g Average	(dB)	
<b>Test Position of Head</b>					
Left Hand, Touch Cheek	Middle	0.169	0.224	-0.006	Figure 13
Left Hand, Tilt 15 Degree	Middle	0.103	0.146	-0.011	Figure 14
Right Hand, Touch Cheek	High	0.211	0.337	-0.059	Figure 15
	Middle	0.158	0.251	-0.076	Figure 16
	Low	0.148	0.233	0.009	Figure 17
Right Hand, Tilt 15 Degree	Middle	0.130	0.204	-0.069	Figure 18
<b>Test Position of Body (Distance 15mm)</b>					
Towards Ground	High	0.592	0.968	-0.026	Figure 19
	Middle	0.565	0.919	-0.014	Figure 20
	Low	0.507(max.cube)	0.819(max.cube)	0.040	Figure 21
Towards Phantom	Middle	0.096	0.131	0.018	Figure 22
<b>Worst Case Position of Body with Earphone</b>					
Towards Ground	High	0.310	0.529	-0.097	Figure 23
<b>Test Position of Body with GPRS (2Up, Distance 15mm)</b>					
Towards Ground	High	0.721(max.cube)	1.160(max.cube)	-0.010	Figure 24
	Middle	0.610(max.cube)	0.998(max.cube)	-0.098	Figure 25
	Low	0.557(max.cube)	0.903(max.cube)	-0.058	Figure 26
Towards Phantom	Middle	0.103	0.140	-0.053	Figure 27
<b>Worst Case Position of Body with EGPRS (GMSK, 2Up, Distance 15mm)</b>					
Towards Ground	High	0.752(max.cube)	1.240(max.cube)	-0.179	Figure 28

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

2. Upper and lower frequencies were measured at the worst position.
3. 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.
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; the value from the second assessed cube is given in the SAR distribution plots (See ANNEX C).
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.

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**Table 14: Extrapolated SAR Values of highest measured SAR [GSM 850 (GPRS/EGPRS)]**

Limit of SAR		Conducted Power	1g Average		Tune-up procedures Power(dBm)	1g Average
			1.6 W/kg			1.6
Test Case		Measurement Result (dBm)	Measurement Result (W/kg)	Extrapolated Result (W/kg)		
Test Position	Channel					
<b>GSM</b>						
Towards Ground	High	33.53	0.968	33.9	1.054	
<b>GPRS (2Up)</b>						
Towards Ground	High	31.14	1.160	31.9	1.382	
<b>EGPRS (GMSK, 2Up)</b>						
Towards Ground	High	31.12	1.240	31.9	1.484	

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

**Table 15: 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	
Test Case		Measurement Result(W/kg)		Power Drift	
Different Test Position	Channel	10 g Average	1 g Average	(dB)	
<b>Test Position of Head</b>					
Left Hand, Touch Cheek	Middle	0.125	0.205	-0.194	Figure 29
Left Hand, Tilt 15 Degree	Middle	0.159	0.277	-0.077	Figure 30
Right Hand, Touch Cheek	Middle	0.160	0.301	-0.083	Figure 31
Right Hand, Tilt 15 Degree	High	0.166	0.309	0.004	Figure 32
	Middle	0.189	0.347	-0.018	Figure 33
	Low	0.200	0.365	-0.049	Figure 34
<b>Test Position of Body (Distance 15mm)</b>					
Towards Ground	High	0.164	0.282	0.072	Figure 35
	Middle	0.179	0.305	-0.035	Figure 36
	Low	0.163	0.280	-0.092	Figure 37
Towards Phantom	Middle	0.048	0.081	0.103	Figure 38
<b>Worst Case Position of Body with Earphone</b>					
Towards Ground	Middle	0.243	0.433	0.137	Figure 39
<b>Test Position of Body with GPRS (2Up, Distance 15mm)</b>					
Towards Ground	High	0.307	0.530	0.042	Figure 40
	Middle	0.317	0.541	-0.000	Figure 41
	Low	0.285	0.485	-0.114	Figure 42
Towards Phantom	Middle	0.084	0.142	-0.120	Figure 43
<b>Worst Case Position of Body with EGPRS (GMSK, 2Up, Distance 15mm)</b>					
Towards Ground	Middle	0.310	0.542	-0.036	Figure 44

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

2. Upper and lower frequencies were measured at the worst position.
3. 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.
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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**Table 16: Extrapolated SAR Values of highest measured SAR [GSM 1900 (GPRS/EGPRS)]**

Limit of SAR		Conducted Power	1g Average		Tune-up procedures Power(dBm)	1g Average	
			1.6 W/kg			1.6	
Test Case		Measurement Result (dBm)	Measurement Result (W/kg)				
Test Position	Channel						
<b>GSM</b>							
Towards Ground	Middle	30.71	0.433	31.2	0.485		
<b>GPRS (2Up)</b>							
Towards Ground	Middle	30.68	0.541	31.2	0.610		
<b>EGPRS (GMSK, 2Up)</b>							
Towards Ground	Middle	30.65	0.542	31.2	0.615		

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**7.3.3. WCDMA Band IV (WCDMA/HSDPA)**

**Table 17: SAR Values [WCDMA Band IV (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	
Test Case		Measurement Result(W/kg)		Power Drift (dB)	
Different Test Position	Channel	10 g Average	1 g Average		
<b>Test Position of Head</b>					
Left Hand, Touch Cheek	Middle	0.521	0.788	-0.023	Figure 45
Left Hand, Tilt 15 Degree	High	0.572	0.954	0.011	Figure 46
	Middle	0.527	0.878	-0.110	Figure 47
	Low	0.593	0.977	0.078	Figure 48
Right Hand, Touch Cheek	High	0.598	1.040	0.037	Figure 49
	Middle	0.570	0.962	0.052	Figure 50
	Low	0.686	1.160	-0.024	Figure 51
Right Hand, Tilt 15 Degree	High	0.711	1.210	0.064	Figure 52
	Middle	0.659	1.110	-0.015	Figure 53
	Low	0.757	1.270	0.064	Figure 54
<b>Test Position of Body (Distance 15mm)</b>					
Towards Ground	High	0.489	0.858	-0.009	Figure 55
	Middle	0.438	0.771	-0.003	Figure 56
	Low	0.521	0.922	0.073	Figure 57
Towards Phantom	Middle	0.151	0.231	-0.019	Figure 58
<b>Worst Case Position of Body with Earphone</b>					
Towards Ground	Low	0.449	0.796	0.142	Figure 59
<b>Worst Case Position of Body with HSDPA (Distance 15mm)</b>					
Towards Ground	Low	0.495	0.878	0.101	Figure 60

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

2. Upper and lower frequencies were measured at the worst position.
3. 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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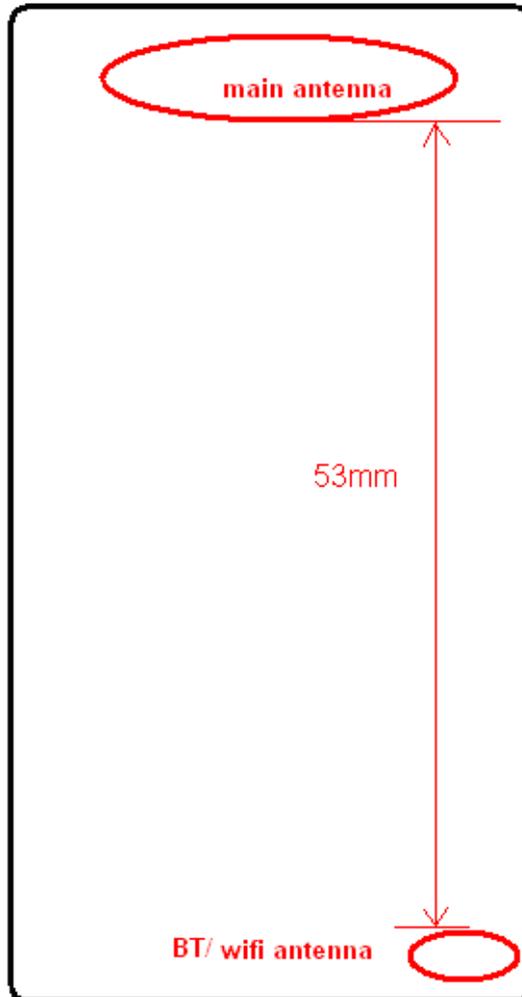
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**Table 18: Extrapolated SAR Values of highest measured SAR [WCDMA Band IV (WCDMA/HSDPA)]**

Limit of SAR		Conducted Power	1g Average	Tune-up procedures Power(dBm)	1g Average
			1.6 W/kg		1.6
Test Case		Measurement Result (dBm)	Measurement Result (W/kg)		
Different Test Position	Channel				
Right Hand, Tilt 15 Degree	Low	23.73	1.270	24.6	1.552

7.3.4. Bluetooth/WIFI Function

The distance between BT/WIFI antenna and main antenna is >5cm. The location of the antennas inside mobile phone is shown below (refer to Annex J):



The output power of BT antenna is as following:

Channel	Ch 0	Ch 39	Ch 78
Bluetooth (dBm)	7.49	8.24	9.16

The output power of WIFI antenna is as following:

Channel	Channel 1	Channel 6	Channel 11
802.11b	13.25	13.35	13.14
802.11g	8.84	8.71	8.76
802.11n	8.36	7.14	8.19

**Stand-alone SAR**

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

stand-alone SAR are not required for BT, because the output power of BT transmitter is  $\leq 2P_{Ref}$  and its antenna is  $\geq 5\text{cm}$  from other antenna.

stand-alone SAR are not required for wifi, because the output power of BT transmitter is  $\leq 2P_{Ref}$  and its antenna is  $\geq 5\text{cm}$  from other antenna.

**Simultaneous SAR**

About BT and GSM, because stand-alone SAR are not required for BT and its antenna is  $\geq 5\text{cm}$  from other antenna, so Simultaneous SAR are not required for BT and GSM.

About wifi and GSM, because stand-alone SAR are not required for wifi and its antenna is  $\geq 5\text{cm}$  from other antenna, so Simultaneous SAR are not required for wifi and GSM.

About BT and WiFi can't simultaneous transmit.

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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	5.9	N	1	1	5.9	∞
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	5
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								

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20	-phantom	B	4.0	R	$\sqrt{3}$	1	2.3	$\infty$	
21	-liquid conductivity (deviation from target)	B	5.0	R	$\sqrt{3}$	$\frac{0.6}{4}$	1.8	$\infty$	
22	-liquid conductivity (measurement uncertainty)	B	5.0	N	1	$\frac{0.6}{4}$	3.2	$\infty$	
23	-liquid permittivity (deviation from target)	B	5.0	R	$\sqrt{3}$	0.6	1.7	$\infty$	
24	-liquid permittivity (measurement uncertainty )	B	5.0	N	1	0.6	3.0	$\infty$	
Combined standard uncertainty		$u_c' = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$						12.0	
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$		N	k=2		24.0		

## 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 13, 2009	One year
02	Dielectric Probe Kit	Agilent 85070E	US44020115	No Calibration Requested	
03	Power meter	Agilent E4417A	GB41291714	March 13, 2010	One year
04	Power sensor	Agilent 8481H	MY41091316	March 26, 2010	One year
05	Signal Generator	HP 8341B	2730A00804	September 13, 2009	One year
06	Amplifier	IXA-020	0401	No Calibration Requested	
07	Validation Kit 835MHz	D835V2	4d092	January 14, 2010	One year
08	Validation Kit 1750MHz	D1750V2	1033	May 17, 2010	One year
09	Validation Kit 1900MHz	D1900V2	5d018	June 15, 2010	One year
10	BTS	E5515C	MY48360988	December 4, 2009	One year
11	E-field Probe	EX3DV4	3677	September 23, 2009	One year
12	DAE	DAE4	871	November 11, 2009	One year

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

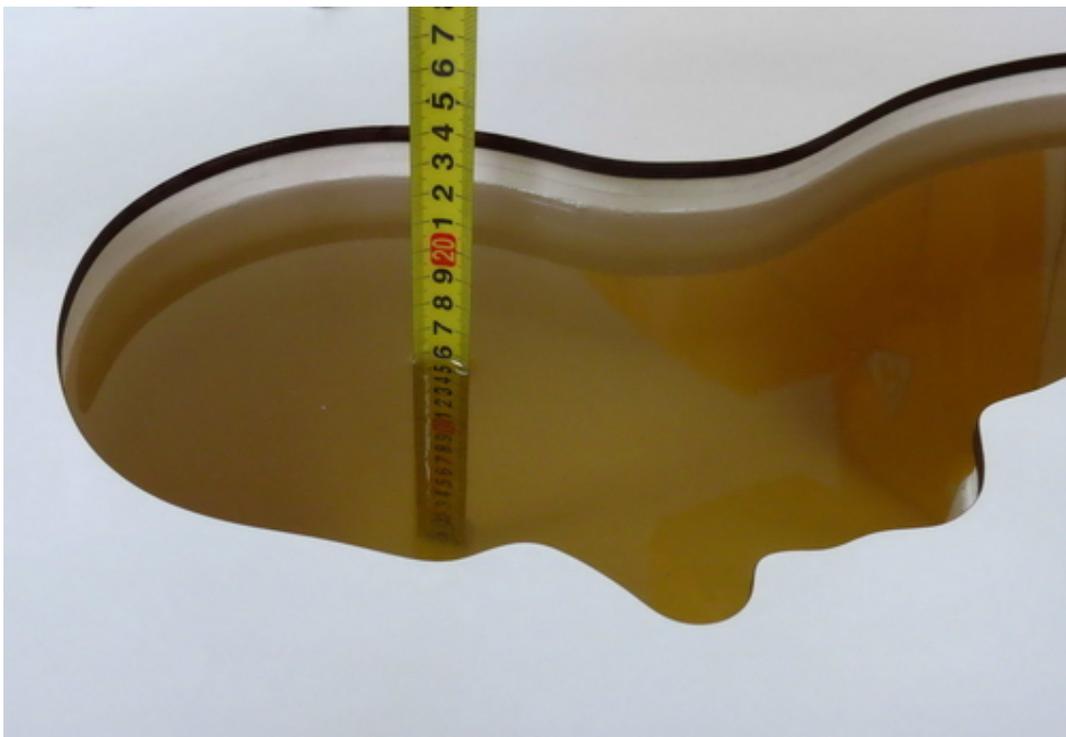
## ANNEX A: Test Layout



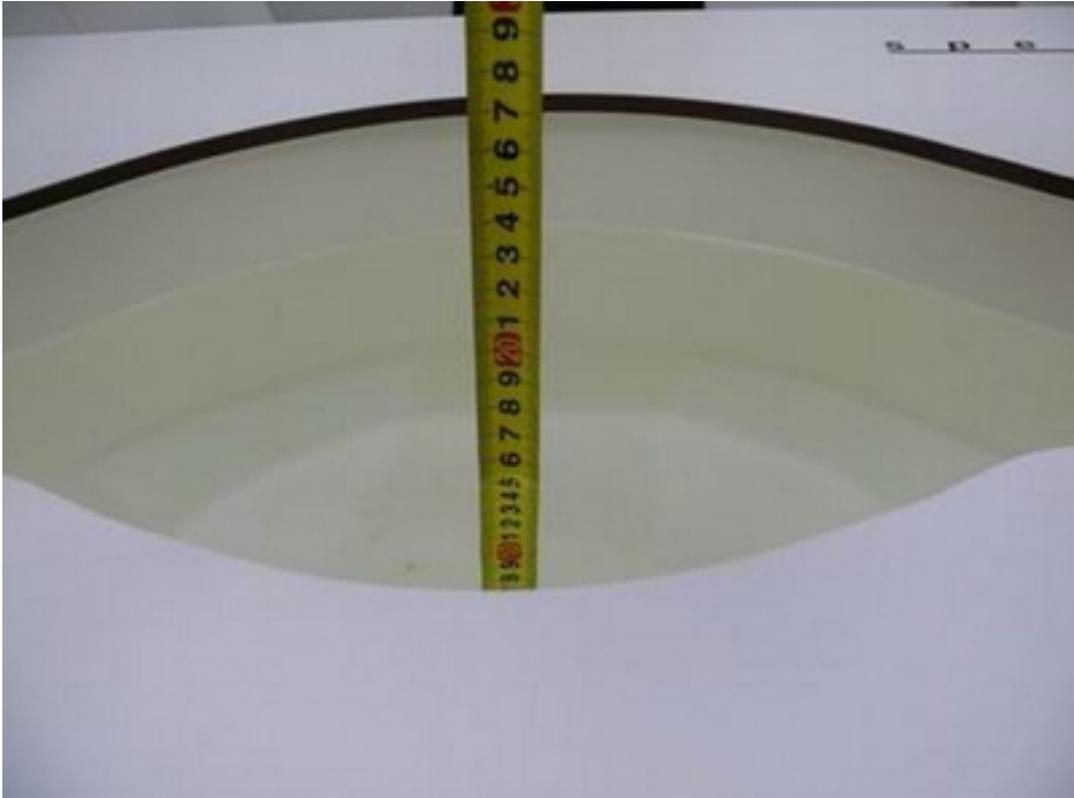
Picture 1: Specific Absorption Rate Test Layout



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



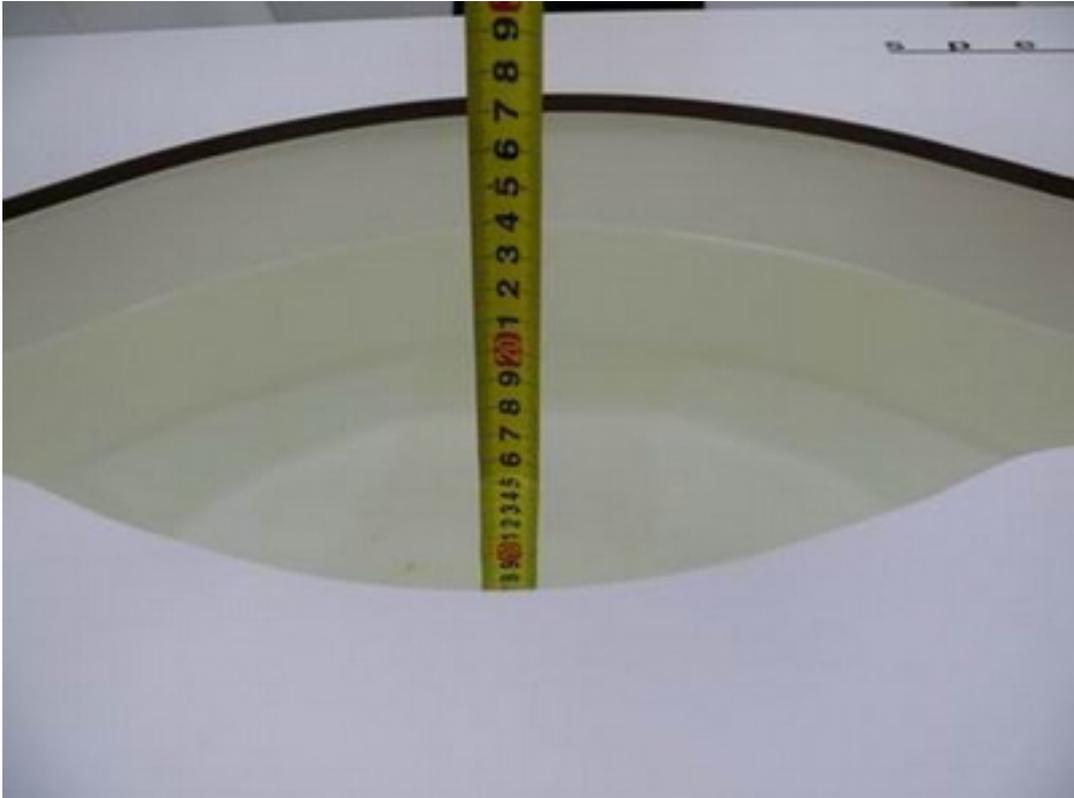
Picture 3: Liquid depth in the head Phantom (835MHz, 15.4cm depth)



Picture 5: Liquid depth in the Flat Phantom (1750 MHz, 15.2cm depth)



Picture 4: liquid depth in the head Phantom (1750 MHz, 15.1cm depth)



Picture 4: Liquid depth in the flat Phantom (1900 MHz, 15.2cm depth)



Picture 5: liquid depth in the head Phantom (1900 MHz, 15.2cm depth)

## ANNEX B: System Check Results

### System Performance Check at 835 MHz Head TSL

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d092

Date/Time: 8/31/2010 10:12:13 AM

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

Medium parameters used:  $f = 835$  MHz;  $\sigma = 0.90$  mho/m;  $\epsilon_r = 42.46$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(9.2, 9.2, 9.2); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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) = 2.56 mW/g

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

Reference Value = 51.1 V/m; Power Drift = -0.037 dB

Peak SAR (extrapolated) = 3.54 W/kg

**SAR(1 g) = 2.42 mW/g; SAR(10 g) = 1.6 mW/g**

Maximum value of SAR (measured) = 2.61 mW/g

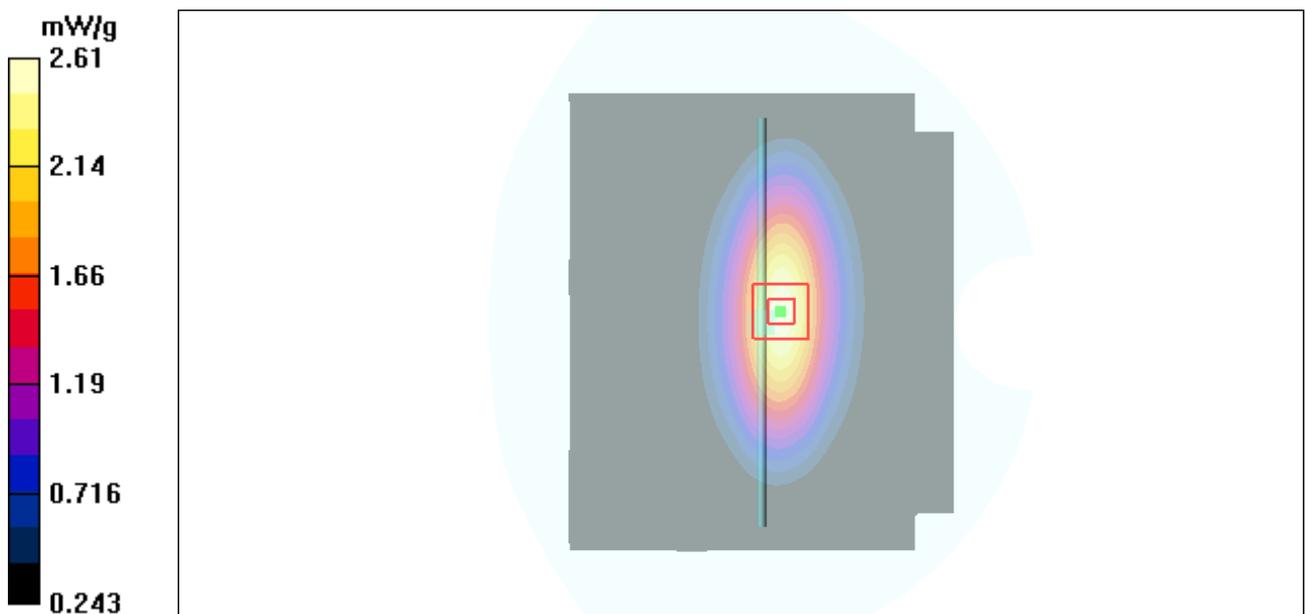


Figure 7 System Performance Check 835MHz 250mW

### System Performance Check at 835 MHz Body TSL

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d092**

Date/Time: 9/2/2010 7:56:20 AM

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

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 1.00 \text{ mho/m}$ ;  $\epsilon_r = 54.82$ ;  $\rho = 1000 \text{ kg/m}^3$

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

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(9.11, 9.11, 9.11); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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 (61x121x1):** Measurement grid: dx=15mm, dy=15mm

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

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

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

Peak SAR (extrapolated) = 3.63 W/kg

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

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

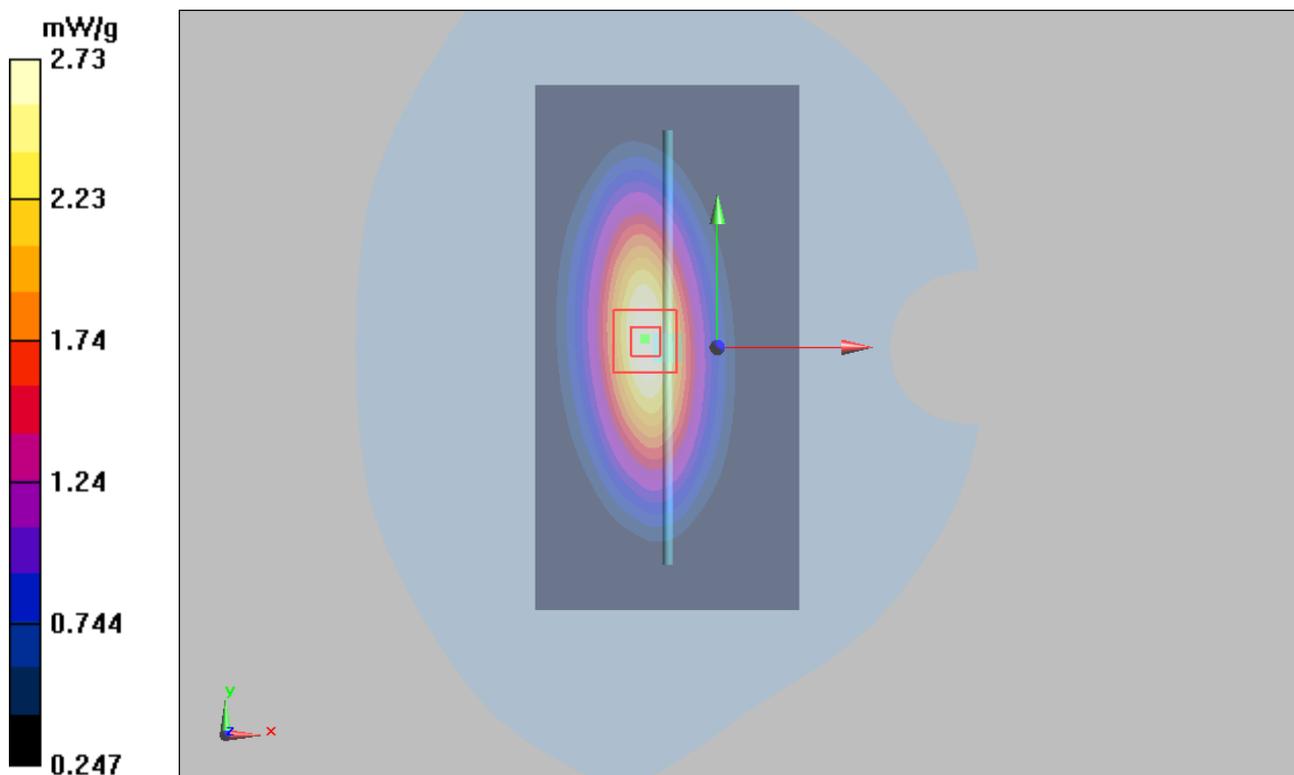


Figure 8 System Performance Check 835MHz 250mW

### System Performance Check at 1750 MHz Head TSL

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

Date/Time: 9/4/2010 9:32:30 AM

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

Medium parameters used:  $f = 1750$  MHz;  $\sigma = 1.37$  mho/m;  $\epsilon_r = 39.98$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(8.04, 8.04, 8.04); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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 (51x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 9.96 mW/g

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

Reference Value = 78.7 V/m; Power Drift = 0.084 dB

Peak SAR (extrapolated) = 16.6 W/kg

**SAR(1 g) = 8.78 mW/g; SAR(10 g) = 4.59 mW/g**

Maximum value of SAR (measured) = 9.83 mW/g

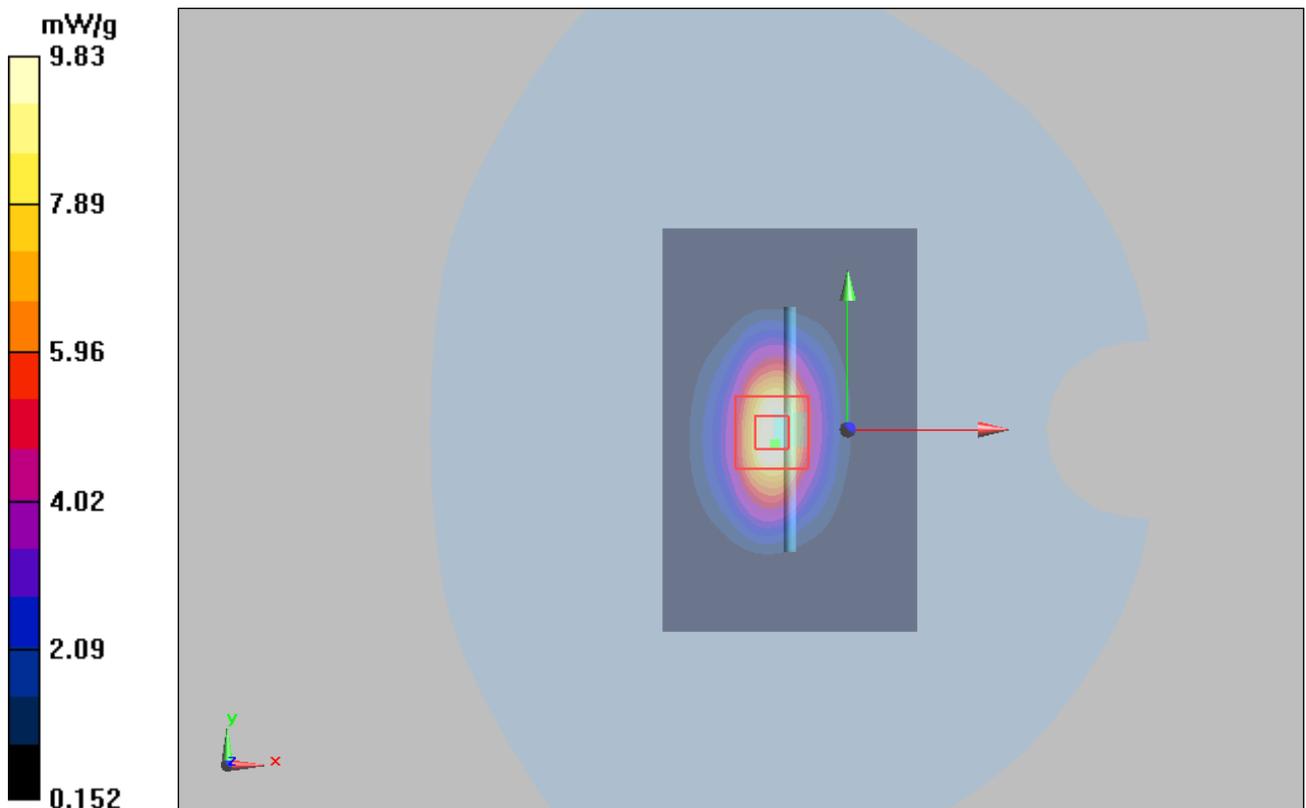


Figure 9 System Performance Check 1750MHz 250mW

**System Performance Check at 1750 MHz Body TSL**

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

Date/Time: 9/3/2010 11:45:41 AM

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

Medium parameters used:  $f = 1750$  MHz;  $\sigma = 1.48$  mho/m;  $\epsilon_r = 52.22$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.7, 7.7, 7.7); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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 (51x81x1):** Measurement grid: dx=15mm, dy=15mm

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

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

Reference Value = 76.7 V/m; Power Drift = 0.102 dB

Peak SAR (extrapolated) = 16.7 W/kg

**SAR(1 g) = 9.31 mW/g; SAR(10 g) = 4.98 mW/g**

Maximum value of SAR (measured) = 10.5 mW/g

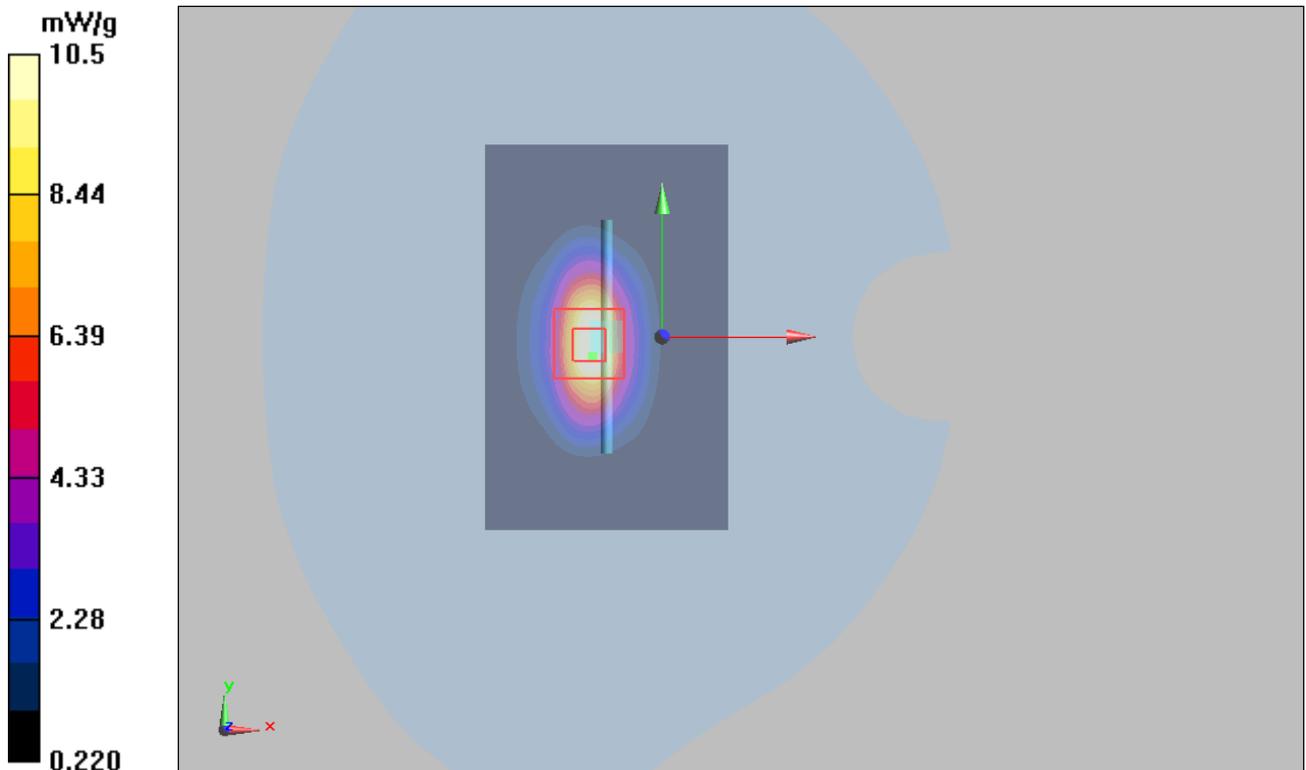


Figure 10 System Performance Check 1750MHz 250mW

### System Performance Check at 1900 MHz Head TSL

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d018**

Date/Time: 9/4/2010 4:58:34 PM

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

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.41$  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: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.53, 7.53, 7.53); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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 (51x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 12.7 mW/g

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

Reference Value = 81.0 V/m; Power Drift = -0.068 dB

Peak SAR (extrapolated) = 18.9 W/kg

**SAR(1 g) = 10.3 mW/g; SAR(10 g) = 5.34 mW/g**

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

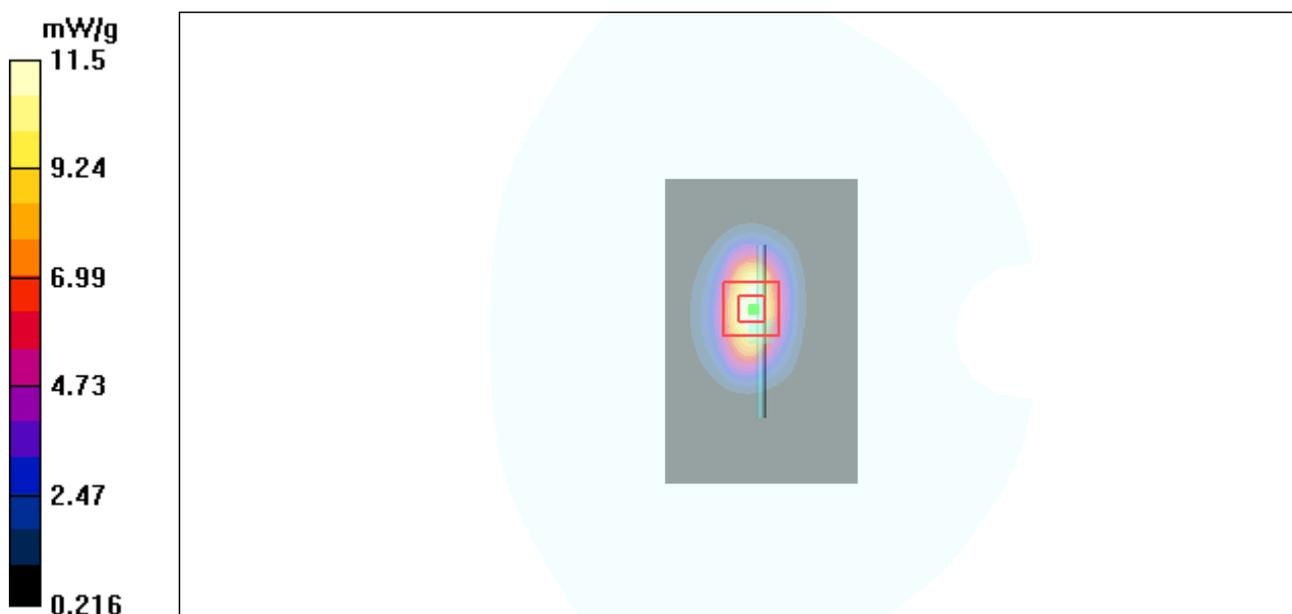


Figure 11 System Performance Check 1900MHz 250mW

### System Performance Check at 1900 MHz Body TSL

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d018**

Date/Time: 9/3/2010 9:39:19 AM

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

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.56$  mho/m;  $\epsilon_r = 53.01$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.62, 7.62, 7.62); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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 (41x71x1):** Measurement grid: dx=15mm, dy=15mm

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

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

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

Peak SAR (extrapolated) = 17.6 W/kg

**SAR(1 g) = 10.18 mW/g; SAR(10 g) = 5.34 mW/g**

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

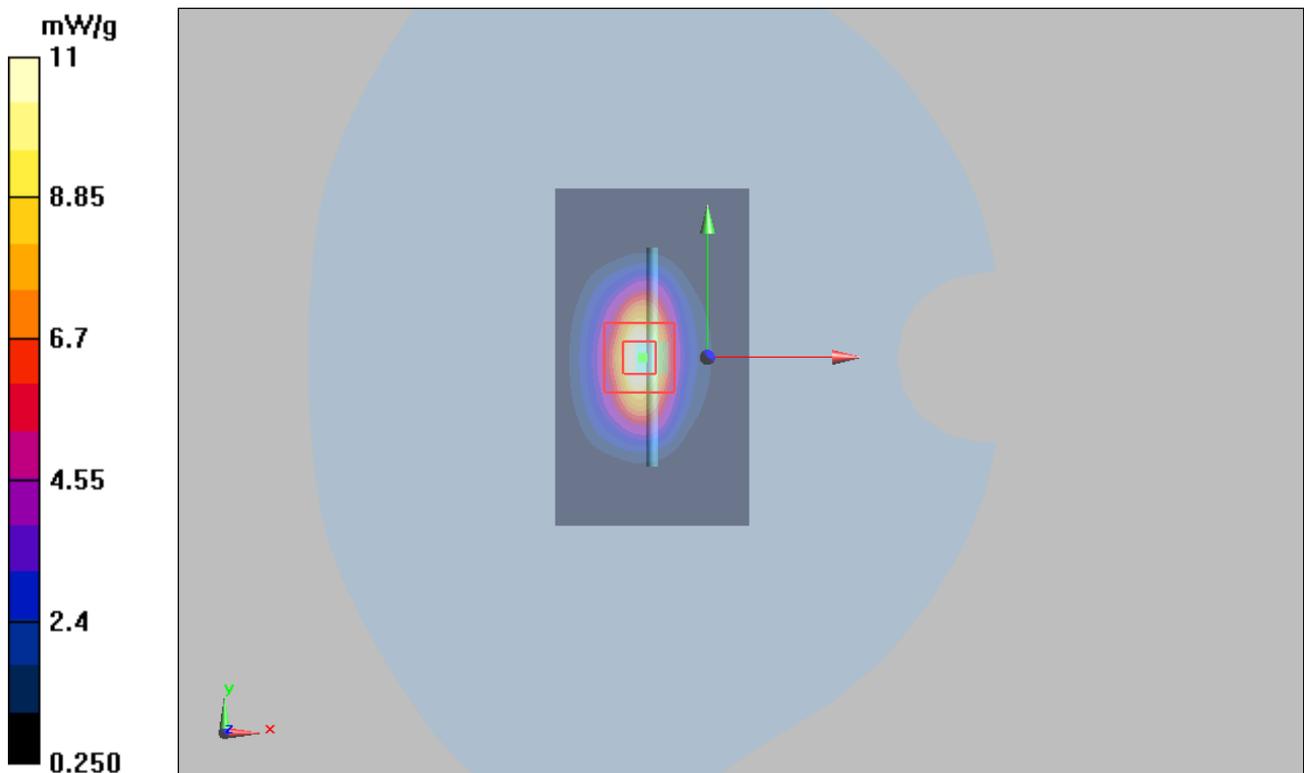


Figure 12 System Performance Check 1900MHz 250mW

## ANNEX C: Graph Results

### GSM 850 Left Cheek Middle

Date/Time: 8/31/2010 1:16:04 PM

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

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.9$  mho/m;  $\epsilon_r = 42.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Left Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(9.2, 9.2, 9.2); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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 (51x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.236 mW/g

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

Reference Value = 15.0 V/m; Power Drift = -0.006 dB

Peak SAR (extrapolated) = 0.271 W/kg

**SAR(1 g) = 0.224 mW/g; SAR(10 g) = 0.169 mW/g**

Maximum value of SAR (measured) = 0.236 mW/g

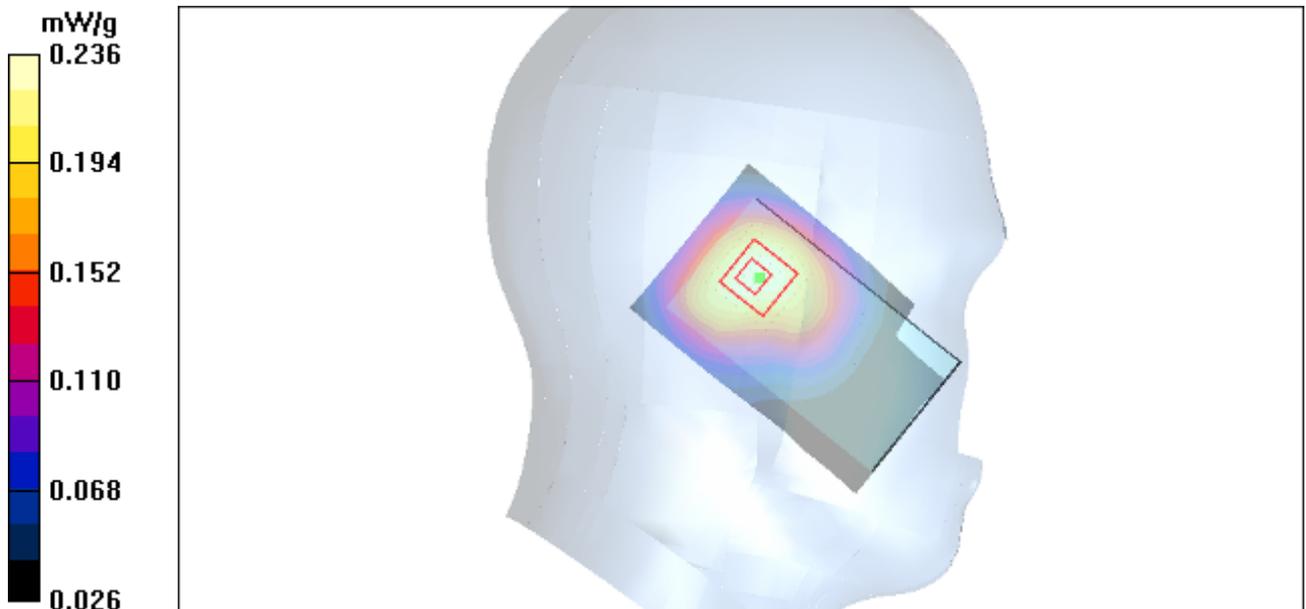


Figure 13 Left Hand Touch Cheek GSM 850 Channel 190

**GSM 850 Left Tilt Middle**

Date/Time: 8/31/2010 12:57:12 PM

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

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.9$  mho/m;  $\epsilon_r = 42.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Left Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(9.2, 9.2, 9.2); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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 (51x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.156 mW/g

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

Reference Value = 12.7 V/m; Power Drift = -0.011 dB

Peak SAR (extrapolated) = 0.197 W/kg

**SAR(1 g) = 0.146 mW/g; SAR(10 g) = 0.103 mW/g**

Maximum value of SAR (measured) = 0.155 mW/g

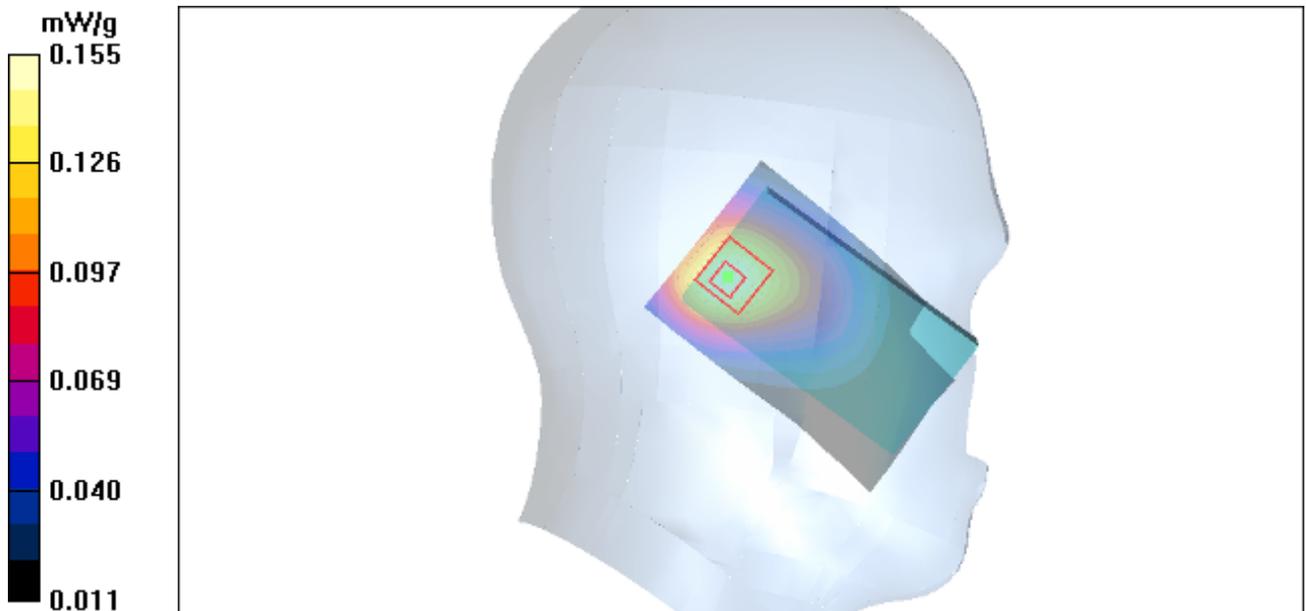


Figure 14 Left Hand Tilt 15° GSM 850 Channel 190

### GSM 850 Right Cheek High

Date/Time: 8/31/2010 1:37:46 PM

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

Medium parameters used:  $f = 849$  MHz;  $\sigma = 0.911$  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 - SN3677; ConvF(9.2, 9.2, 9.2); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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) = 0.352 mW/g

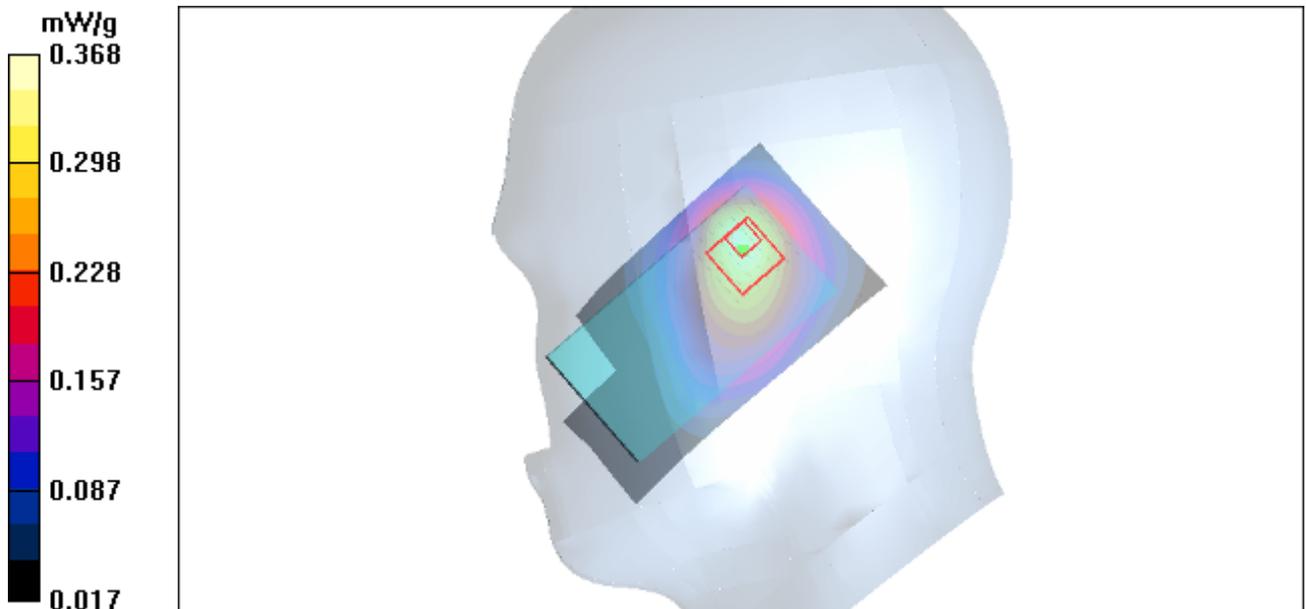
**Cheek High/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 16.4 V/m; Power Drift = -0.059 dB

Peak SAR (extrapolated) = 0.567 W/kg

**SAR(1 g) = 0.337 mW/g; SAR(10 g) = 0.211 mW/g**

Maximum value of SAR (measured) = 0.368 mW/g



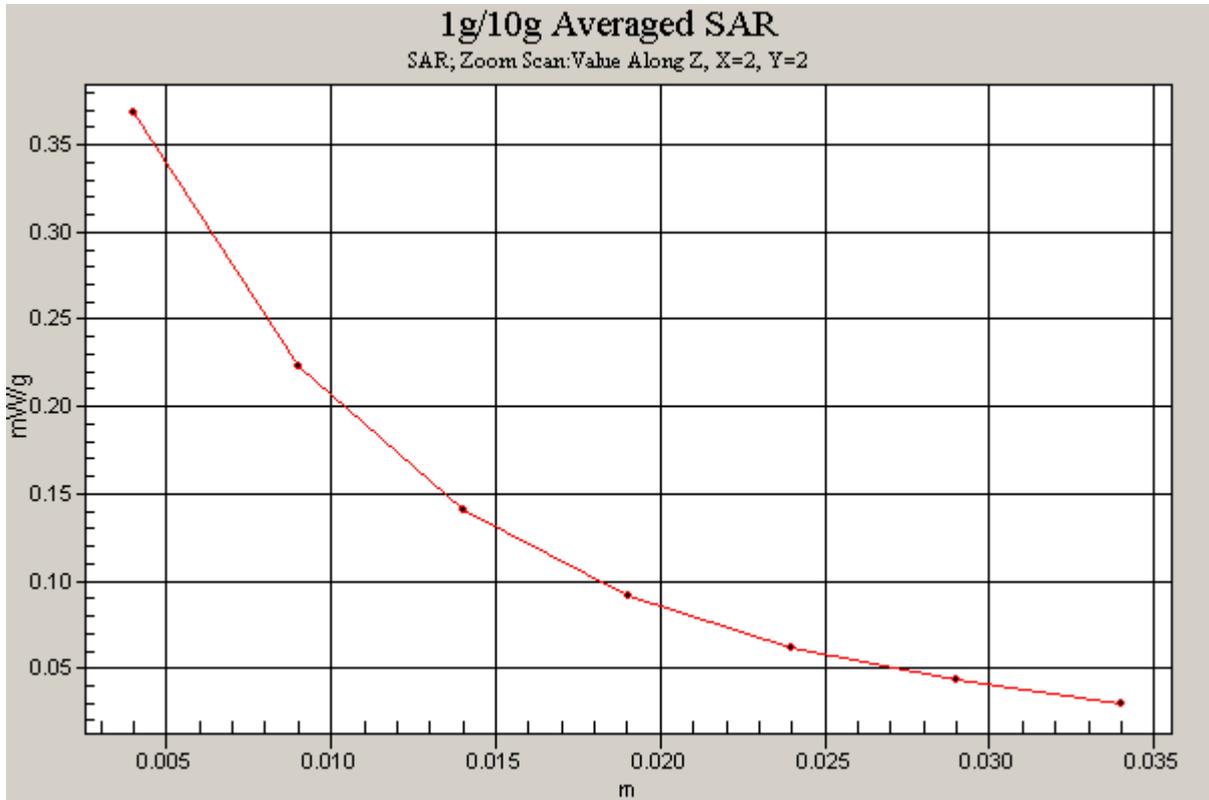


Figure 15 Right Hand Touch Cheek GSM 850 Channel 251

### GSM 850 Right Cheek Middle

Date/Time: 8/31/2010 11:41:48 AM

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

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.9$  mho/m;  $\epsilon_r = 42.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Right Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(9.2, 9.2, 9.2); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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) = 0.263 mW/g

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

Reference Value = 14.9 V/m; Power Drift = -0.076 dB

Peak SAR (extrapolated) = 0.421 W/kg

**SAR(1 g) = 0.251 mW/g; SAR(10 g) = 0.158 mW/g**

Maximum value of SAR (measured) = 0.273 mW/g

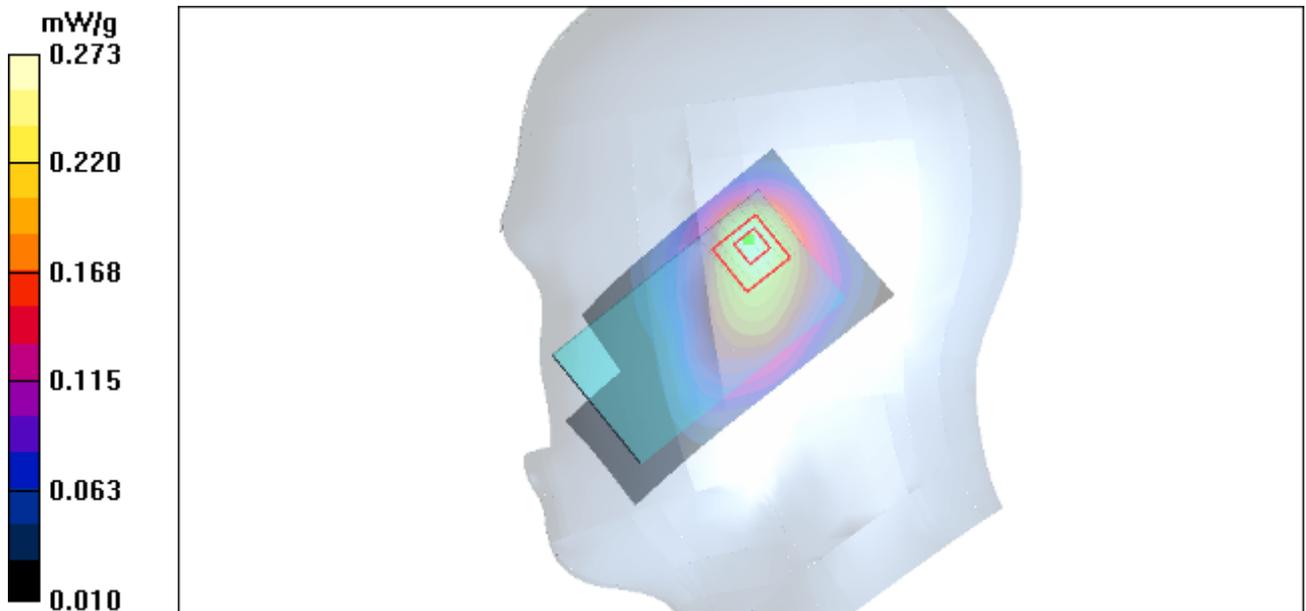


Figure 16 Right Hand Touch Cheek GSM 850 Channel 190

### GSM 850 Right Cheek Low

Date/Time: 8/31/2010 1:56:24 PM

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

Medium parameters used (interpolated):  $f = 824.2$  MHz;  $\sigma = 0.89$  mho/m;  $\epsilon_r = 42.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Right Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(9.2, 9.2, 9.2); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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) = 0.244 mW/g

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

Reference Value = 13.6 V/m; Power Drift = 0.009 dB

Peak SAR (extrapolated) = 0.383 W/kg

**SAR(1 g) = 0.233 mW/g; SAR(10 g) = 0.148 mW/g**

Maximum value of SAR (measured) = 0.253 mW/g

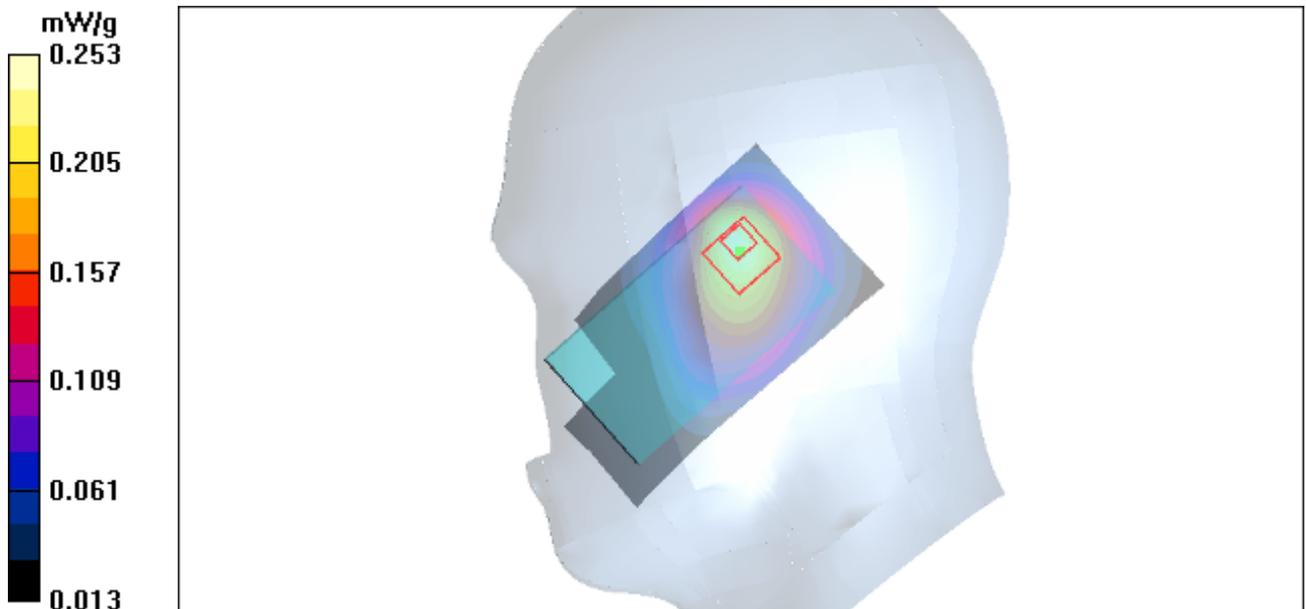


Figure 17 Right Hand Touch Cheek GSM 850 Channel 128

**GSM 850 Right Tilt Middle**

Date/Time: 8/31/2010 12:02:57 PM

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

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.9$  mho/m;  $\epsilon_r = 42.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Right Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(9.2, 9.2, 9.2); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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) = 0.217 mW/g

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

Reference Value = 13.4 V/m; Power Drift = -0.069 dB

Peak SAR (extrapolated) = 0.319 W/kg

**SAR(1 g) = 0.204 mW/g; SAR(10 g) = 0.130 mW/g**

Maximum value of SAR (measured) = 0.221 mW/g

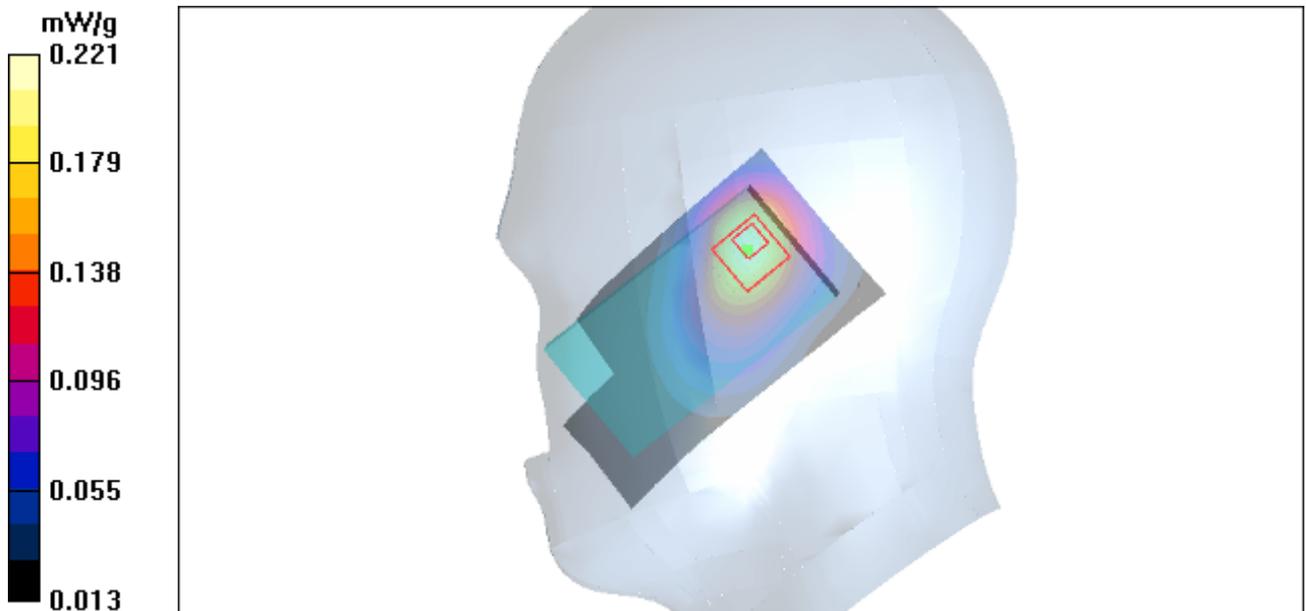


Figure 18 Right Hand Tilt 15° GSM 850 Channel 190

### GSM 850 Towards Ground High

Date/Time: 9/2/2010 10:15:23 AM

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

Medium parameters used:  $f = 849$  MHz;  $\sigma = 1.01$  mho/m;  $\epsilon_r = 54.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(9.11, 9.11, 9.11); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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 (51x81x1):** Measurement grid: dx=15mm, dy=15mm

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

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

Reference Value = 29.9 V/m; Power Drift = -0.026 dB

Peak SAR (extrapolated) = 1.51 W/kg

**SAR(1 g) = 0.968 mW/g; SAR(10 g) = 0.592 mW/g**

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

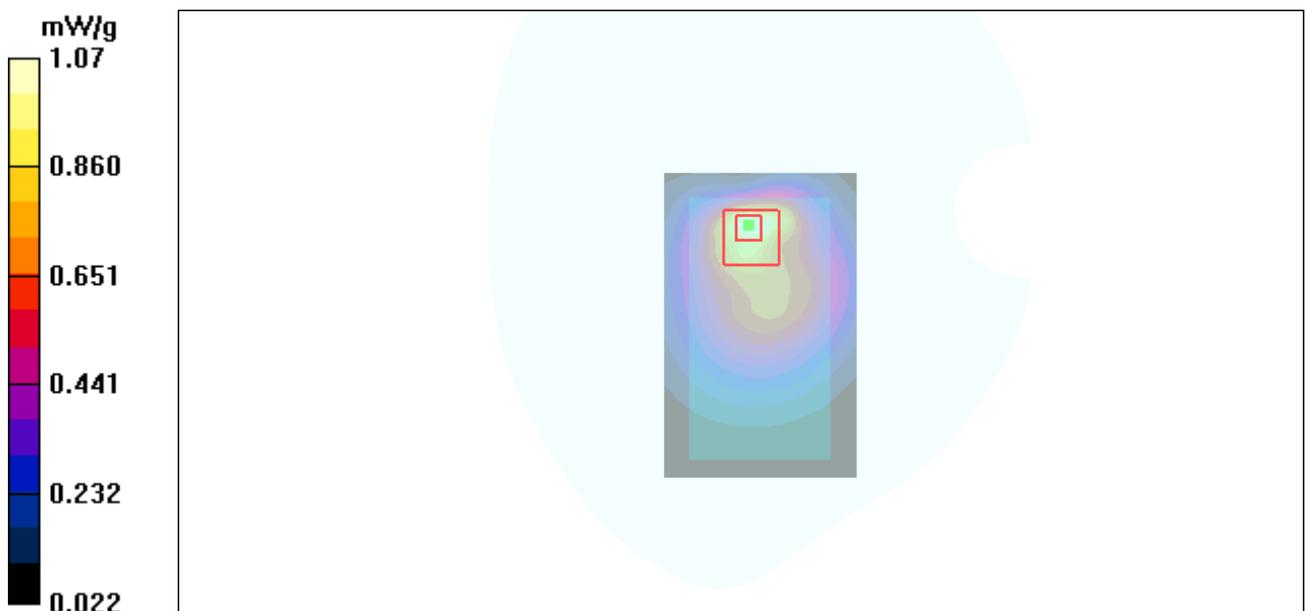


Figure 19 Body, Towards Ground, GSM 850 Channel 251

### GSM 850 Towards Ground Middle

Date/Time: 9/2/2010 9:57:44 AM

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

Medium parameters used:  $f = 837$  MHz;  $\sigma = 1$  mho/m;  $\epsilon_r = 54.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(9.11, 9.11, 9.11); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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 (51x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.03 mW/g

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

Reference Value = 29.2 V/m; Power Drift = -0.014 dB

Peak SAR (extrapolated) = 1.45 W/kg

**SAR(1 g) = 0.919 mW/g; SAR(10 g) = 0.565 mW/g**

Maximum value of SAR (measured) = 1.02 mW/g

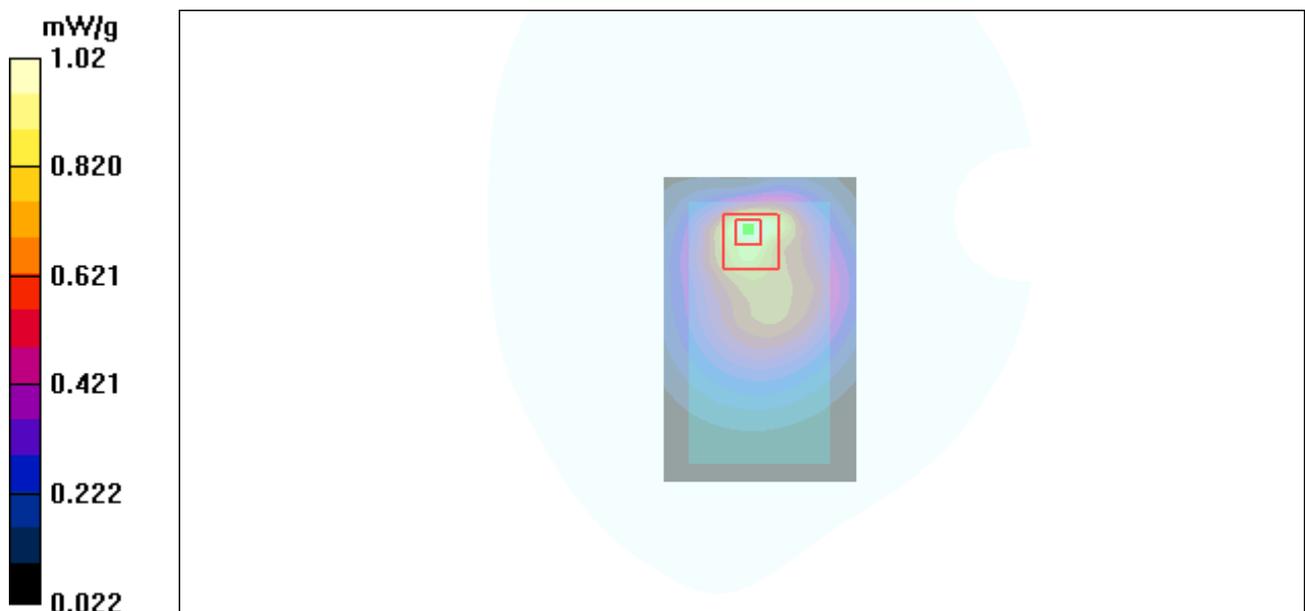


Figure 20 Body, Towards Ground, GSM 850 Channel 190

### GSM 850 Towards Ground Low

Date/Time: 9/2/2010 10:32:33 AM

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

Medium parameters used (interpolated):  $f = 824.2$  MHz;  $\sigma = 0.99$  mho/m;  $\epsilon_r = 55$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(9.11, 9.11, 9.11); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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 (51x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.911 mW/g

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

Reference Value = 27.5 V/m; Power Drift = 0.040 dB

Peak SAR (extrapolated) = 1.27 W/kg

**SAR(1 g) = 0.819 mW/g; SAR(10 g) = 0.507 mW/g**

Maximum value of SAR (measured) = 0.905 mW/g

**Towards Ground Low/Zoom Scan (7x7x7)/Cube 1:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 27.5 V/m; Power Drift = 0.040 dB

Peak SAR (extrapolated) = 1.05 W/kg

**SAR(1 g) = 0.660 mW/g; SAR(10 g) = 0.446 mW/g**

Maximum value of SAR (measured) = 0.832 mW/g

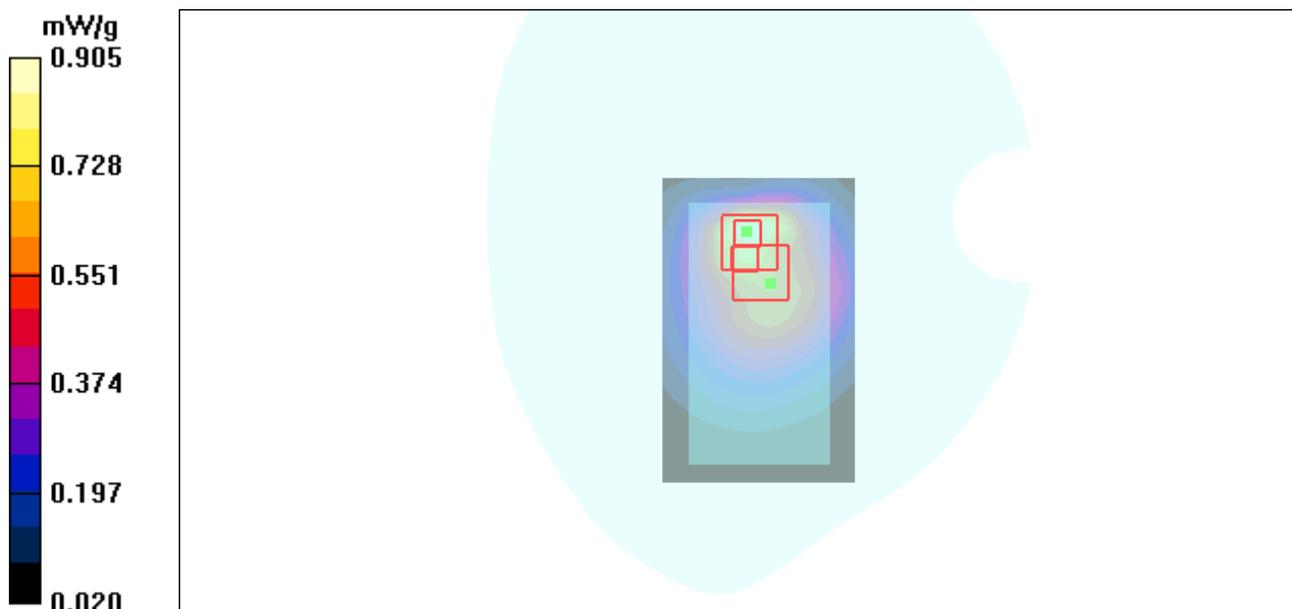


Figure 21 Body, Towards Ground, GSM 850 Channel 128

### GSM 850 Towards Phantom Middle

Date/Time: 9/2/2010 9:37:53 AM

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

Medium parameters used:  $f = 837$  MHz;  $\sigma = 1$  mho/m;  $\epsilon_r = 54.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(9.11, 9.11, 9.11); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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 (51x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.139 mW/g

**Towards Phantom Middle/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm,

dz=5mm

Reference Value = 9.84 V/m; Power Drift = 0.018 dB

Peak SAR (extrapolated) = 0.172 W/kg

**SAR(1 g) = 0.131 mW/g; SAR(10 g) = 0.096 mW/g**

Maximum value of SAR (measured) = 0.138 mW/g

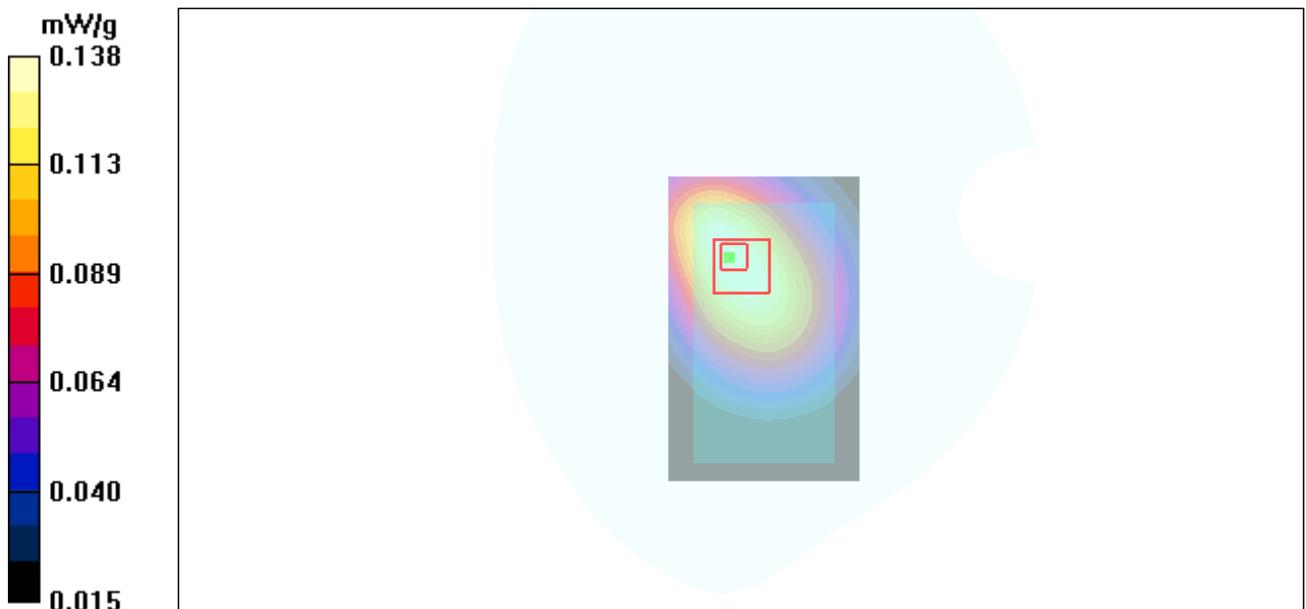


Figure 22 Body, Towards Phantom, GSM 850 Channel 190

### GSM 850 with Earphone Towards Ground High

Date/Time: 9/2/2010 9:24:26 PM

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

Medium parameters used:  $f = 849$  MHz;  $\sigma = 1.01$  mho/m;  $\epsilon_r = 54.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(9.11, 9.11, 9.11); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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 (51x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.544 mW/g

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

Reference Value = 18.9 V/m; Power Drift = -0.097 dB

Peak SAR (extrapolated) = 0.855 W/kg

**SAR(1 g) = 0.529 mW/g; SAR(10 g) = 0.310 mW/g**

Maximum value of SAR (measured) = 0.588 mW/g

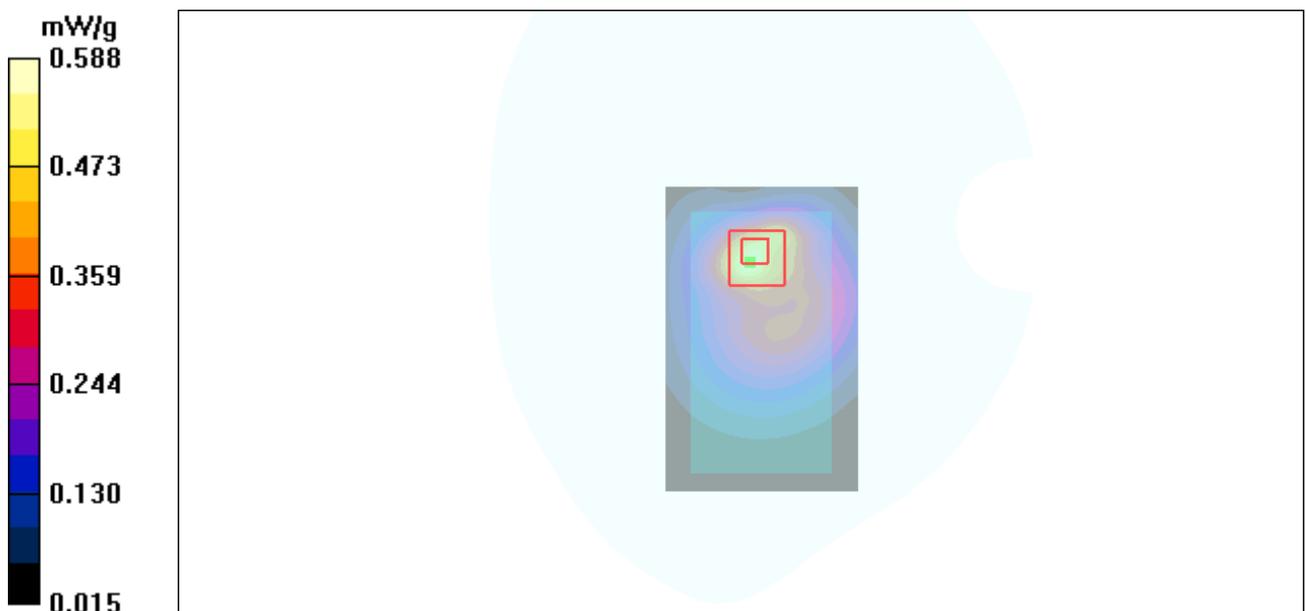


Figure 23 Body with Earphone, Towards Ground, GSM 850 Channel 251

### GSM 850 GPRS (2Up) Towards Ground High

Date/Time: 9/2/2010 10:13:18 PM

Communication System: GSM850 + GPRS(2Up); Frequency: 848.8 MHz; Duty Cycle: 1:4.15

Medium parameters used:  $f = 849$  MHz;  $\sigma = 1.01$  mho/m;  $\epsilon_r = 54.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(9.11, 9.11, 9.11); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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 (51x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.32 mW/g

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

Reference Value = 28.6 V/m; Power Drift = -0.010 dB

Peak SAR (extrapolated) = 1.60 W/kg

**SAR(1 g) = 1.16 mW/g; SAR(10 g) = 0.721 mW/g**

Maximum value of SAR (measured) = 1.36 mW/g

**Towards Ground High/Zoom Scan (7x7x7)/Cube 1:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 28.6 V/m; Power Drift = -0.010 dB

Peak SAR (extrapolated) = 1.07 W/kg

**SAR(1 g) = 0.797 mW/g; SAR(10 g) = 0.584 mW/g**

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

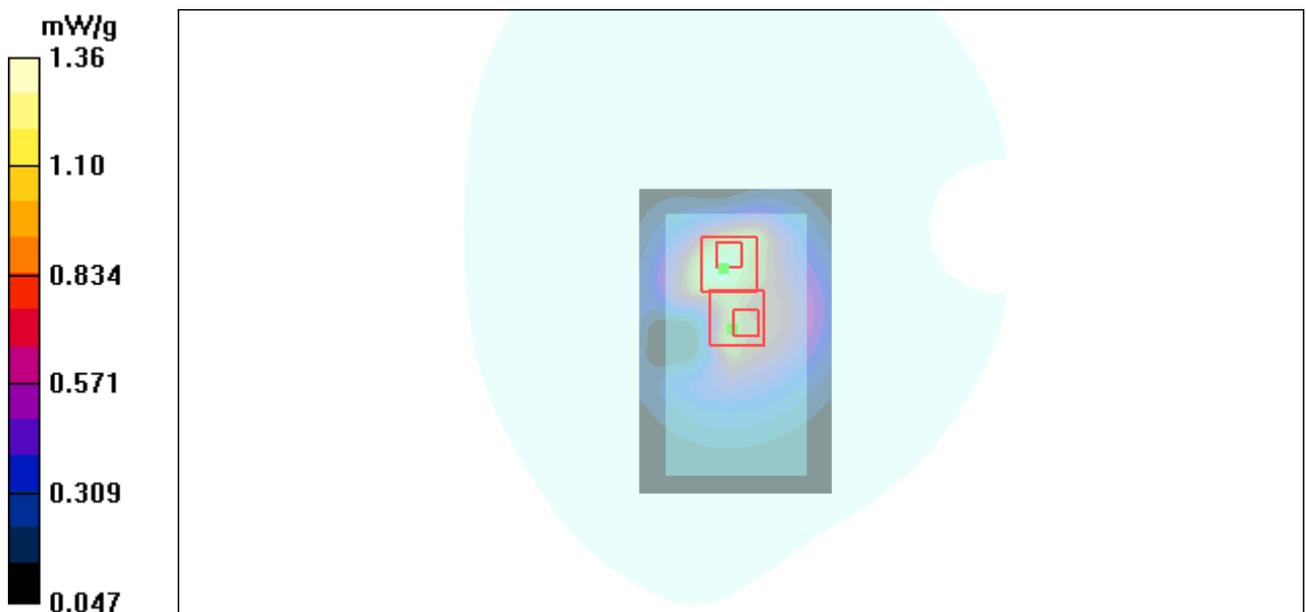


Figure 24 Body, Towards Ground, GSM 850 GPRS (2Up) Channel 251

### GSM 850 GPRS (2Up) Towards Ground Middle

Date/Time: 9/2/2010 9:44:34 PM

Communication System: GSM850 + GPRS(2Up); Frequency: 836.6 MHz;Duty Cycle: 1:4.15

Medium parameters used:  $f = 837$  MHz;  $\sigma = 1$  mho/m;  $\epsilon_r = 54.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(9.11, 9.11, 9.11); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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 (51x81x1):** Measurement grid: dx=15mm, dy=15mm

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

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

Reference Value = 25.9 V/m; Power Drift = -0.098 dB

Peak SAR (extrapolated) = 1.56 W/kg

**SAR(1 g) = 0.998 mW/g; SAR(10 g) = 0.610 mW/g**

Maximum value of SAR (measured) = 1.11 mW/g

**Towards Ground Middle/Zoom Scan (7x7x7)/Cube 1:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 25.9 V/m; Power Drift = -0.098 dB

Peak SAR (extrapolated) = 1.35 W/kg

**SAR(1 g) = 0.677 mW/g; SAR(10 g) = 0.494 mW/g**

Maximum value of SAR (measured) = 0.726 mW/g

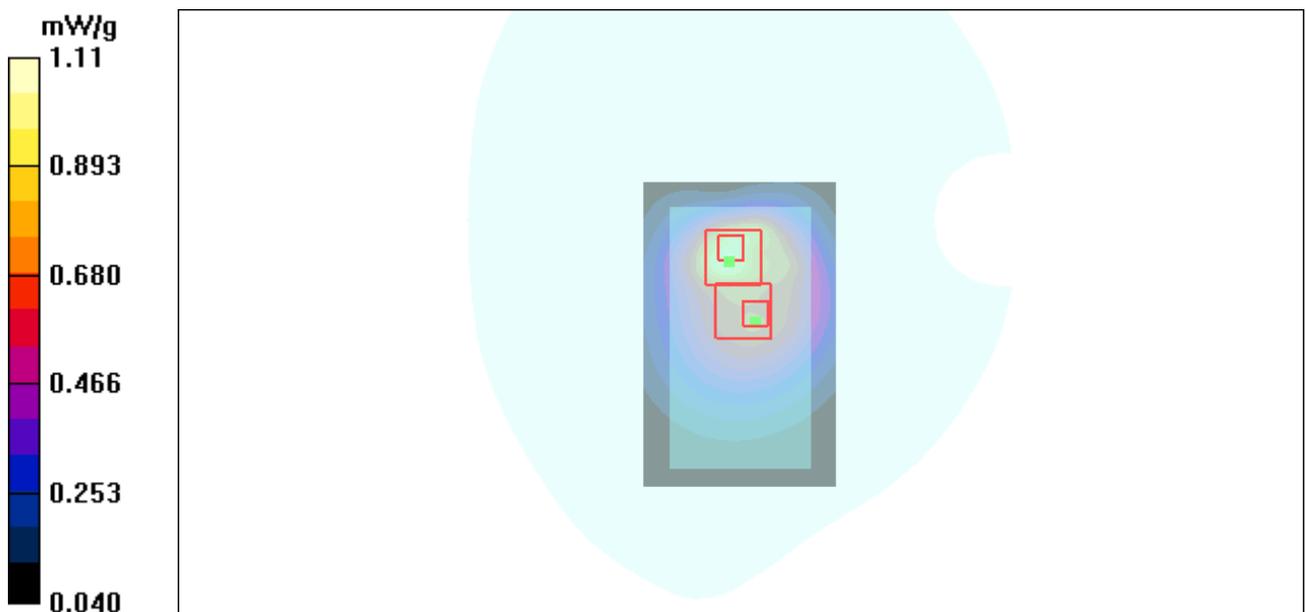


Figure 25 Body, Towards Ground, GSM 850 GPRS (2Up) Channel 190

### GSM 850 GPRS (2Up) Towards Ground Low

Date/Time: 9/2/2010 11:06:39 PM

Communication System: GSM850 + GPRS(2Up); Frequency: 824.2 MHz;Duty Cycle: 1:4.15

Medium parameters used (interpolated):  $f = 824.2$  MHz;  $\sigma = 0.99$  mho/m;  $\epsilon_r = 55$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(9.11, 9.11, 9.11); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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 (51x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.986 mW/g

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

Reference Value = 24.3 V/m; Power Drift = -0.058 dB

Peak SAR (extrapolated) = 1.39 W/kg

**SAR(1 g) = 0.903 mW/g; SAR(10 g) = 0.557 mW/g.**

Maximum value of SAR (measured) = 1.00 mW/g

**Towards Ground Low/Zoom Scan (7x7x7)/Cube 1:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 24.3 V/m; Power Drift = -0.058 dB

Peak SAR (extrapolated) = 0.891 W/kg

**SAR(1 g) = 0.616 mW/g; SAR(10 g) = 0.452 mW/g**

Maximum value of SAR (measured) = 0.661 mW/g

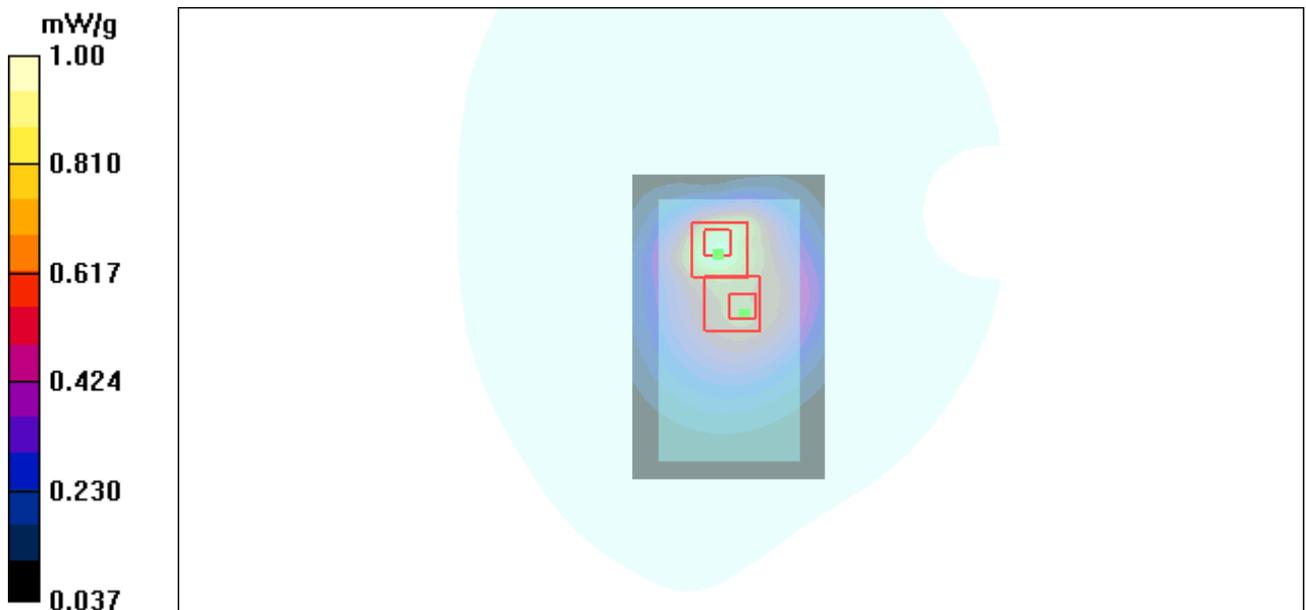


Figure 26 Body, Towards Ground, GSM 850 GPRS (2Up) Channel 128

### GSM 850 GPRS (2Up) Towards Phantom Middle

Date/Time: 9/2/2010 9:19:40 AM

Communication System: GSM850 + GPRS(2Up); Frequency: 836.6 MHz; Duty Cycle: 1:4.15

Medium parameters used:  $f = 837$  MHz;  $\sigma = 1$  mho/m;  $\epsilon_r = 54.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(9.11, 9.11, 9.11); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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 (51x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.148 mW/g

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

Reference Value = 10.3 V/m; Power Drift = -0.053 dB

Peak SAR (extrapolated) = 0.184 W/kg

**SAR(1 g) = 0.140 mW/g; SAR(10 g) = 0.103 mW/g**

Maximum value of SAR (measured) = 0.148 mW/g

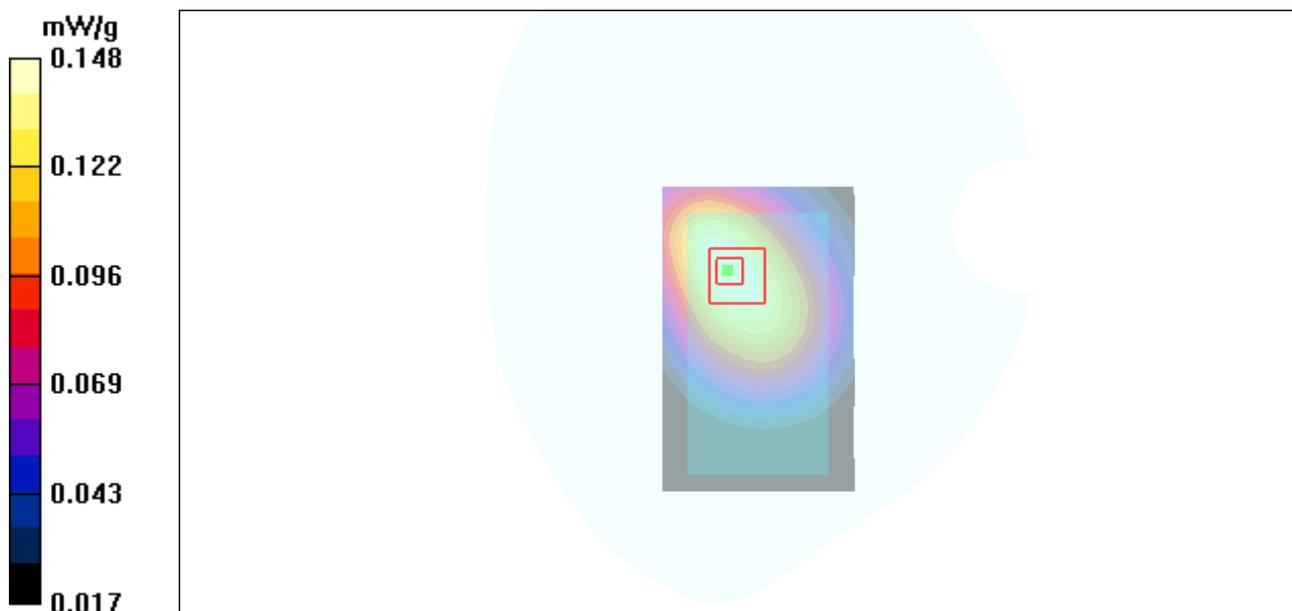


Figure 27 Body, Towards Phantom, GSM 850 GPRS (2Up) Channel 190

### GSM 850 EGPRS (2Up) Towards Ground High

Date/Time: 9/2/2010 11:36:27 PM

Communication System: GSM850 + EGPRS(2Up); Frequency: 848.8 MHz; Duty Cycle: 1:4.15

Medium parameters used:  $f = 849$  MHz;  $\sigma = 1.01$  mho/m;  $\epsilon_r = 54.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(9.11, 9.11, 9.11); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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 (51x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.34 mW/g

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

Reference Value = 28.2 V/m; Power Drift = -0.179 dB

Peak SAR (extrapolated) = 1.96 W/kg

**SAR(1 g) = 1.24 mW/g; SAR(10 g) = 0.752 mW/g**

Maximum value of SAR (measured) = 1.39 mW/g

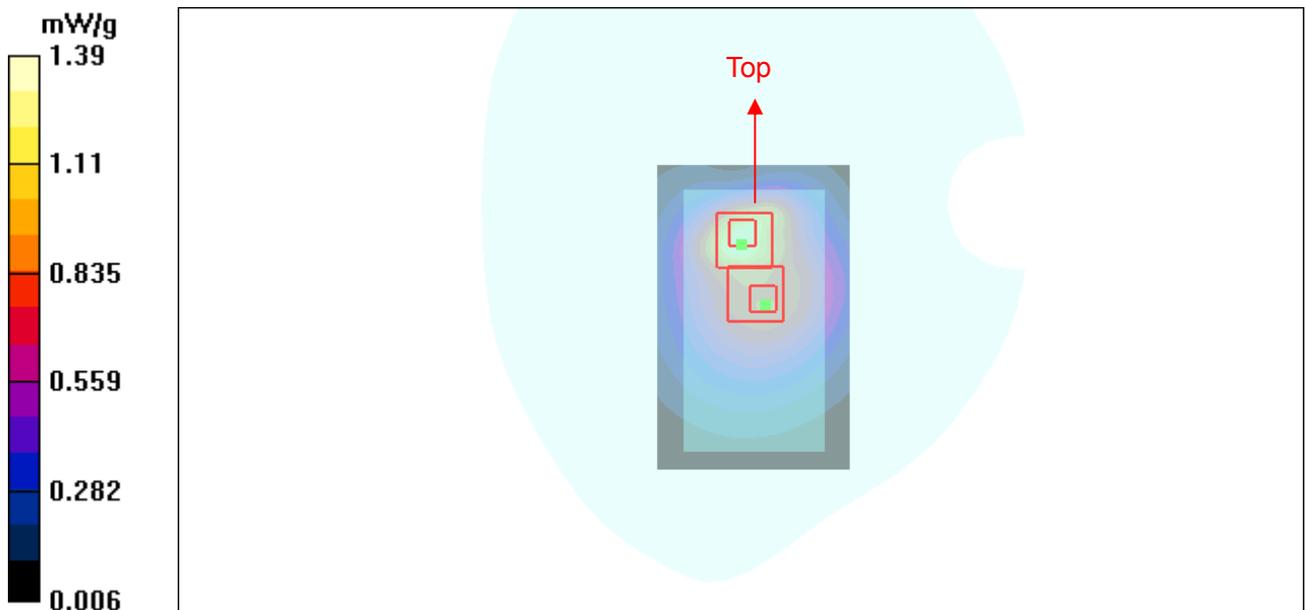
**Towards Ground High/Zoom Scan (7x7x7)/Cube 1:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 28.2 V/m; Power Drift = -0.179 dB

Peak SAR (extrapolated) = 1.09 W/kg

**SAR(1 g) = 0.807 mW/g; SAR(10 g) = 0.594 mW/g**

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



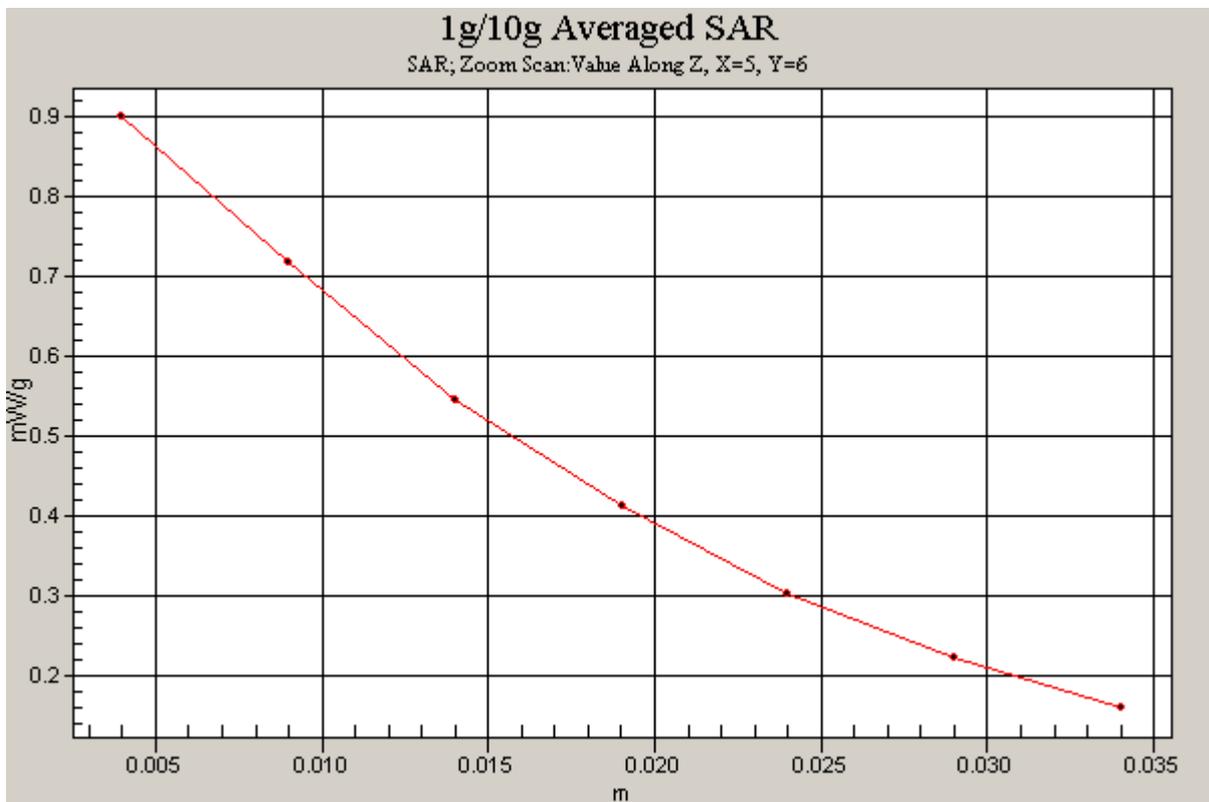
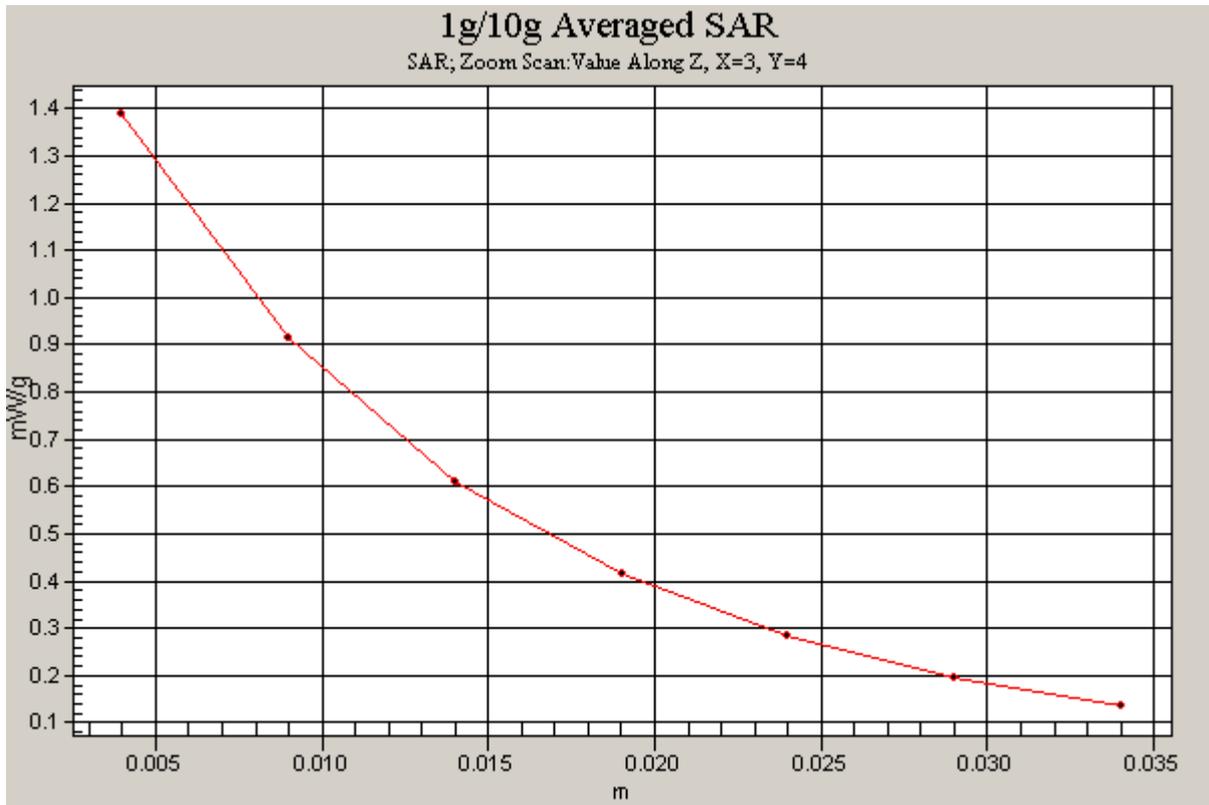


Figure 28 Body, Towards Ground, GSM 850 EGPRS (2Up) Channel 251

### GSM 1900 Left Cheek Middle

Date/Time: 9/2/2010 6:21:53 PM

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

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.4$  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 - SN3677; ConvF(7.53, 7.53, 7.53); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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 (51x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.223 mW/g

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

Reference Value = 12.5 V/m; Power Drift = -0.194 dB

Peak SAR (extrapolated) = 0.338 W/kg

**SAR(1 g) = 0.205 mW/g; SAR(10 g) = 0.125 mW/g**

Maximum value of SAR (measured) = 0.224 mW/g

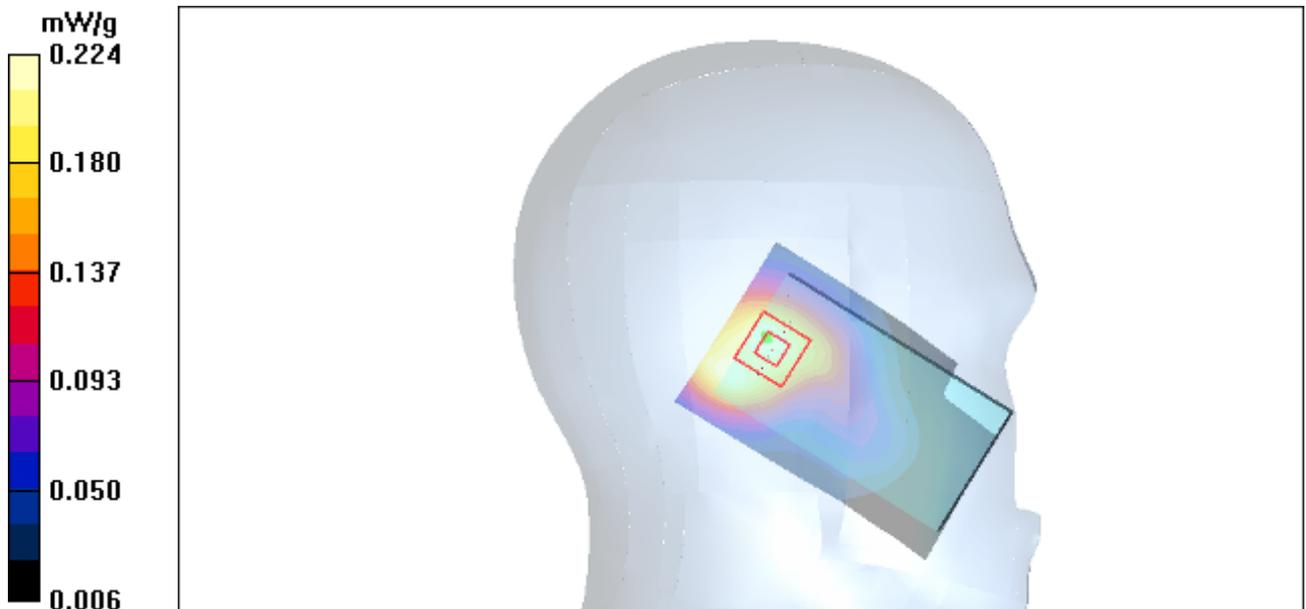


Figure 29 Left Hand Touch Cheek GSM 1900 Channel 661

**GSM 1900 Left Tilt Middle**

Date/Time: 9/2/2010 6:43:24 PM

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

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.4$  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 - SN3677; ConvF(7.53, 7.53, 7.53); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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 (51x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.316 mW/g

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

Reference Value = 14.0 V/m; Power Drift = -0.077 dB

Peak SAR (extrapolated) = 0.491 W/kg

**SAR(1 g) = 0.277 mW/g; SAR(10 g) = 0.159 mW/g**

Maximum value of SAR (measured) = 0.302 mW/g

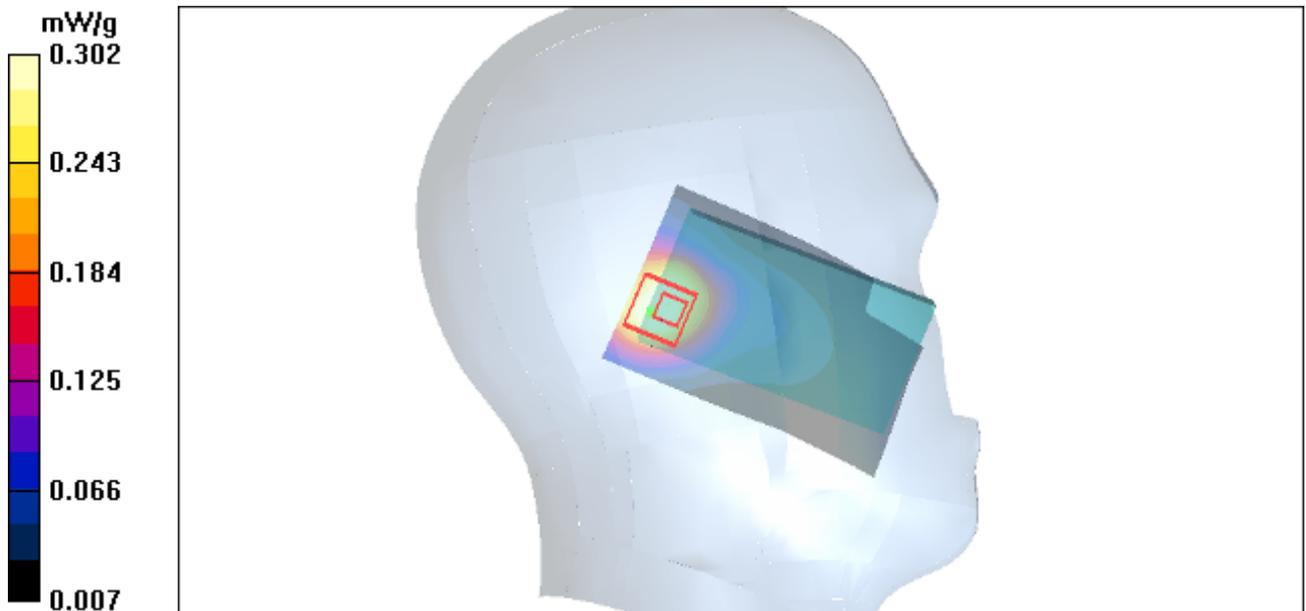


Figure 30 Left Hand Tilt 15° GSM 1900 Channel 661

### GSM 1900 Right Cheek Middle

Date/Time: 9/2/2010 7:02:23 PM

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

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.4$  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 - SN3677; ConvF(7.53, 7.53, 7.53); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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) = 0.332 mW/g

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

Reference Value = 13.1 V/m; Power Drift = -0.083 dB

Peak SAR (extrapolated) = 0.550 W/kg

**SAR(1 g) = 0.301 mW/g; SAR(10 g) = 0.160 mW/g**

Maximum value of SAR (measured) = 0.338 mW/g

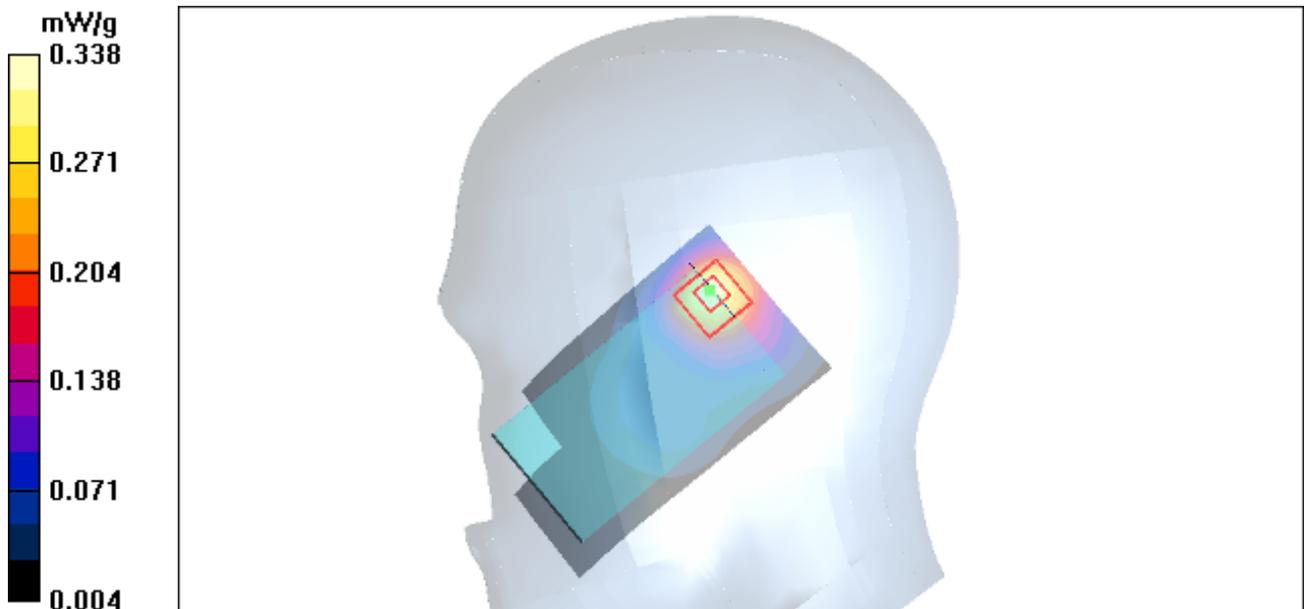


Figure 31 Right Hand Touch Cheek GSM 1900 Channel 661

### GSM 1900 Right Tilt High

Date/Time: 9/2/2010 8:40:16 PM

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

Medium parameters used:  $f = 1910$  MHz;  $\sigma = 1.42$  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 - SN3677; ConvF(7.53, 7.53, 7.53); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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) = 0.333 mW/g

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

Reference Value = 14.8 V/m; Power Drift = 0.004 dB

Peak SAR (extrapolated) = 0.544 W/kg

**SAR(1 g) = 0.309 mW/g; SAR(10 g) = 0.166 mW/g**

Maximum value of SAR (measured) = 0.343 mW/g

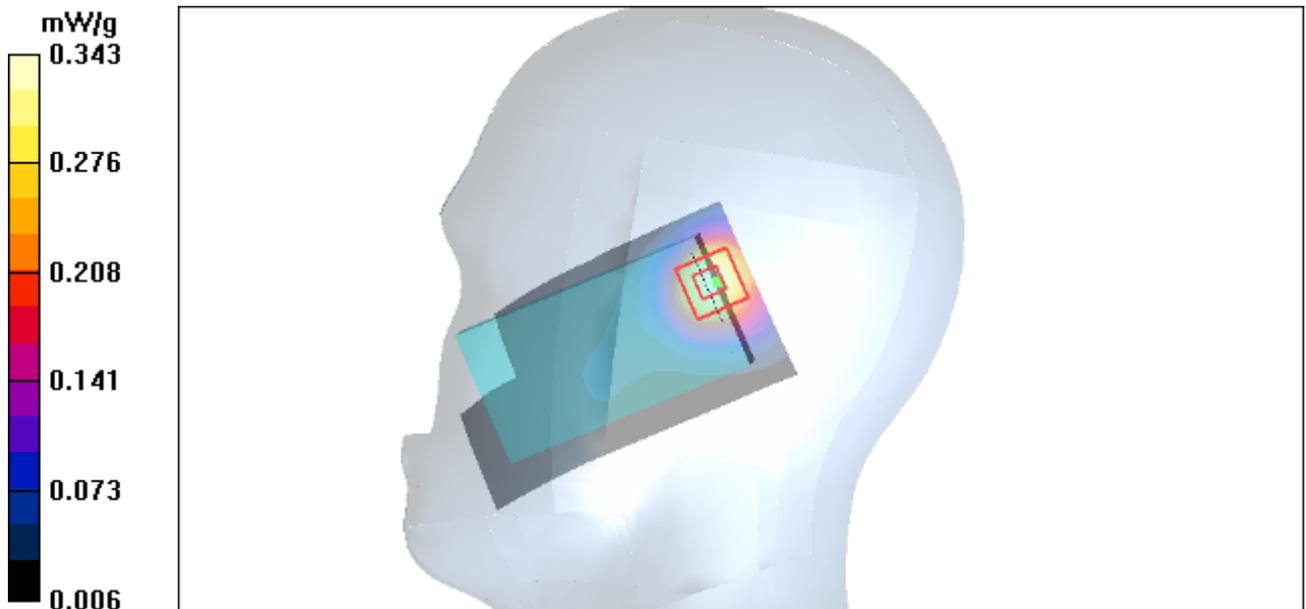


Figure 32 Right Hand Tilt 15° GSM 1900 Channel 810

### GSM 1900 Right Tilt Middle

Date/Time: 9/2/2010 8:21:29 PM

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

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.4$  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 - SN3677; ConvF(7.53, 7.53, 7.53); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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) = 0.379 mW/g

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

Reference Value = 16.0 V/m; Power Drift = -0.018 dB

Peak SAR (extrapolated) = 0.605 W/kg

**SAR(1 g) = 0.347 mW/g; SAR(10 g) = 0.189 mW/g**

Maximum value of SAR (measured) = 0.384 mW/g

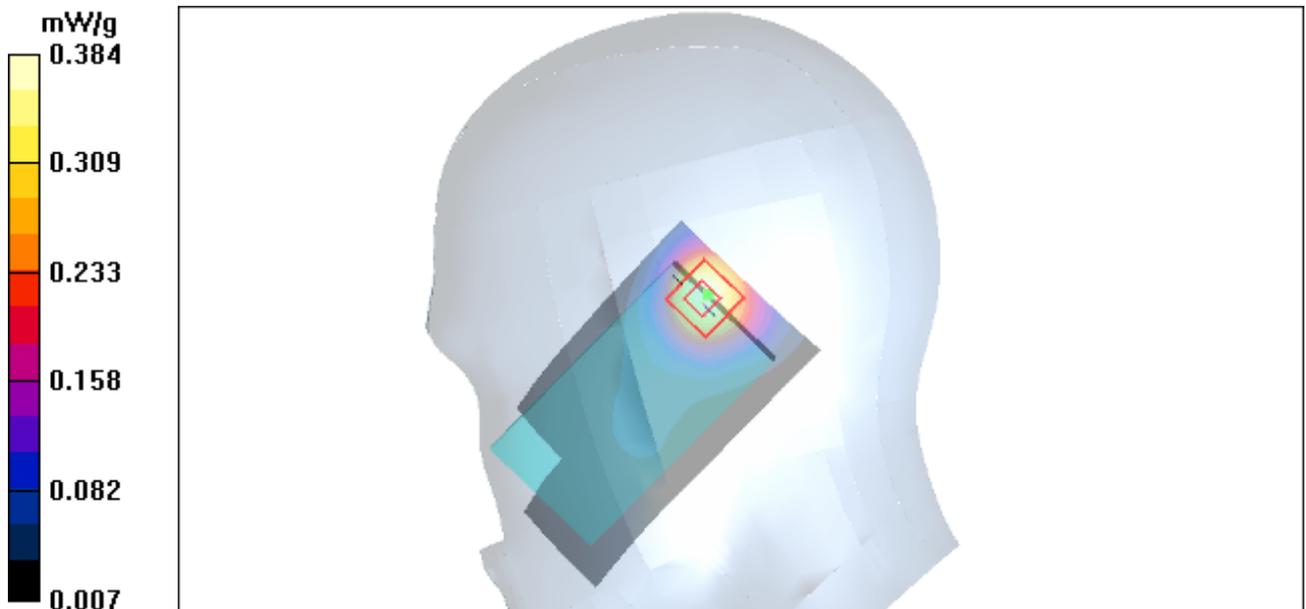


Figure 33 Right Hand Tilt 15° GSM 1900 Channel 661

### GSM 1900 Right Tilt Low

Date/Time: 9/2/2010 8:58:16 PM

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

Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.37$  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 - SN3677; ConvF(7.53, 7.53, 7.53); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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) = 0.394 mW/g

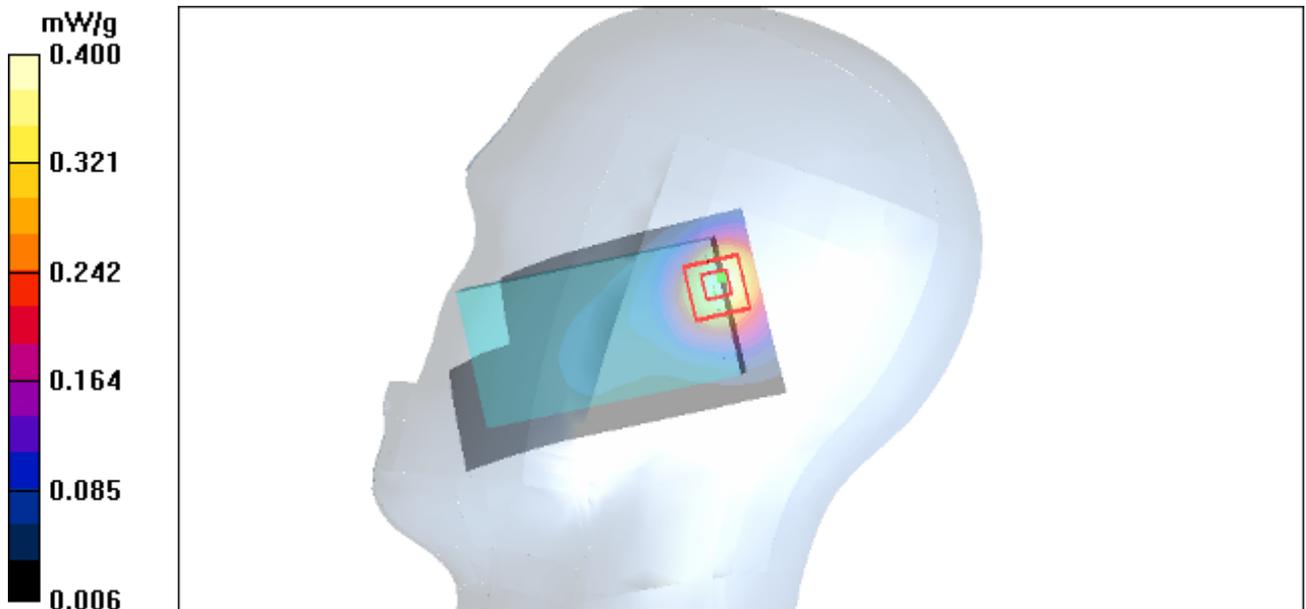
**Tilt Low/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 16.5 V/m; Power Drift = -0.049 dB

Peak SAR (extrapolated) = 0.636 W/kg

**SAR(1 g) = 0.365 mW/g; SAR(10 g) = 0.200 mW/g**

Maximum value of SAR (measured) = 0.400 mW/g



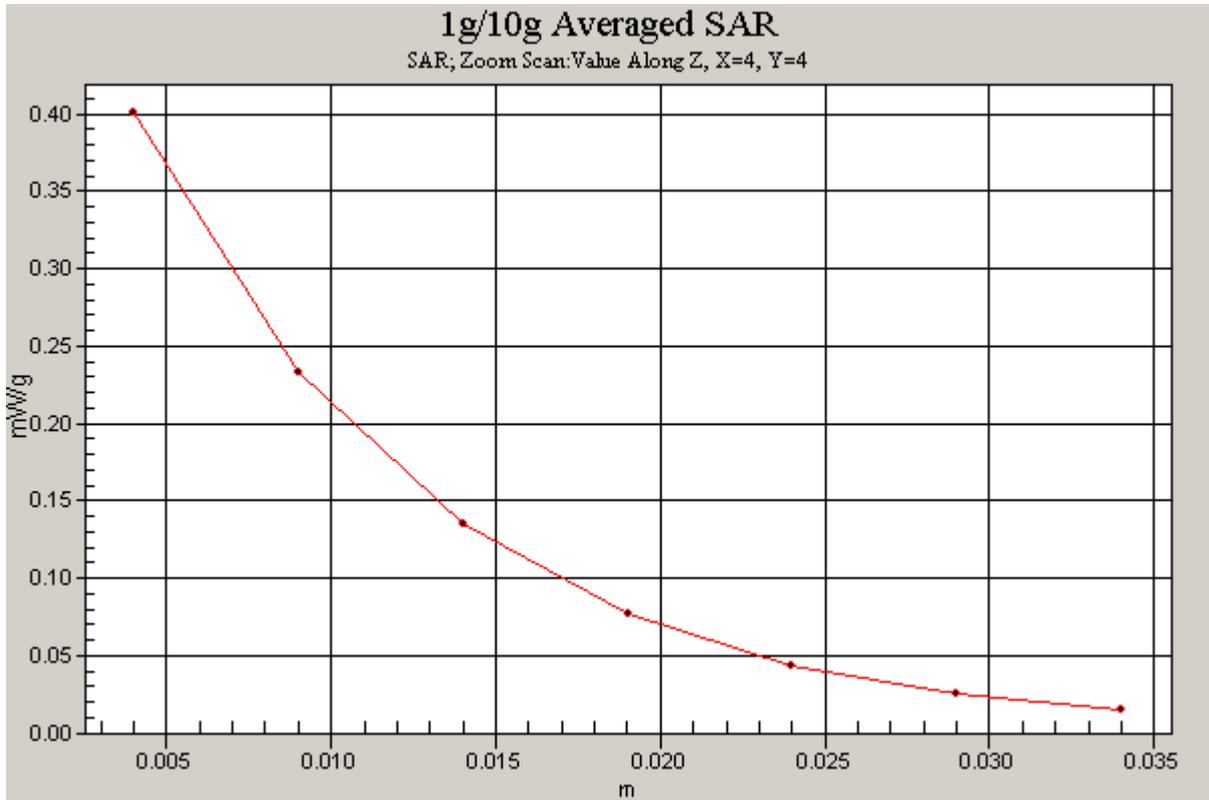


Figure 34 Right Hand Tilt 15° GSM 1900 Channel 512

### GSM 1900 Towards Ground High

Date/Time: 9/3/2010 2:18:53 PM

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

Medium parameters used:  $f = 1910$  MHz;  $\sigma = 1.58$  mho/m;  $\epsilon_r = 53$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.62, 7.62, 7.62); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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 (51x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.312 mW/g

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

Reference Value = 13.4 V/m; Power Drift = 0.072 dB

Peak SAR (extrapolated) = 0.460 W/kg

**SAR(1 g) = 0.282 mW/g; SAR(10 g) = 0.164 mW/g**

Maximum value of SAR (measured) = 0.312 mW/g

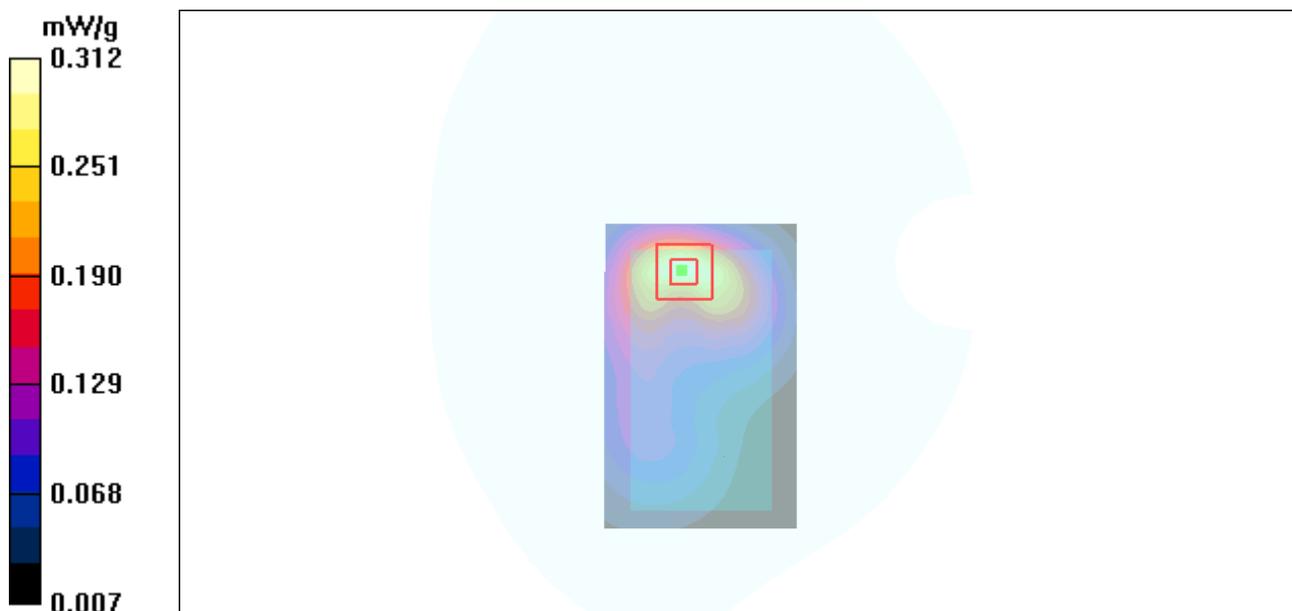


Figure 35 Body, Towards Ground, GSM 1900 Channel 810

### GSM 1900 Towards Ground Middle

Date/Time: 9/3/2010 1:25:12 PM

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

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.54$  mho/m;  $\epsilon_r = 53.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.62, 7.62, 7.62); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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 (51x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.344 mW/g

**Towards Ground Middle/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm,

dz=5mm

Reference Value = 14.2 V/m; Power Drift = -0.035 dB

Peak SAR (extrapolated) = 0.495 W/kg

**SAR(1 g) = 0.305 mW/g; SAR(10 g) = 0.179 mW/g**

Maximum value of SAR (measured) = 0.337 mW/g

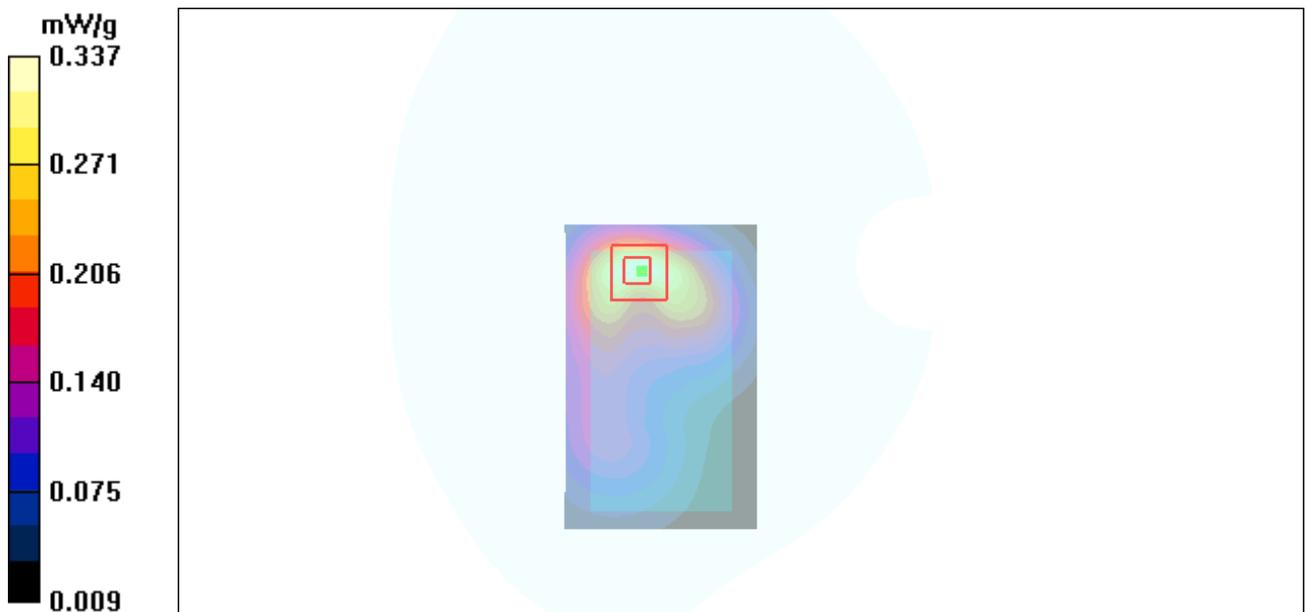


Figure 36 Body, Towards Ground, GSM 1900 Channel 661

**GSM 1900 Towards Ground Low**

Date/Time: 9/3/2010 2:36:20 PM

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

Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.51$  mho/m;  $\epsilon_r = 53.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.62, 7.62, 7.62); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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 (51x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.308 mW/g

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

Reference Value = 13.4 V/m; Power Drift = -0.092 dB

Peak SAR (extrapolated) = 0.457 W/kg

**SAR(1 g) = 0.280 mW/g; SAR(10 g) = 0.163 mW/g**

Maximum value of SAR (measured) = 0.310 mW/g

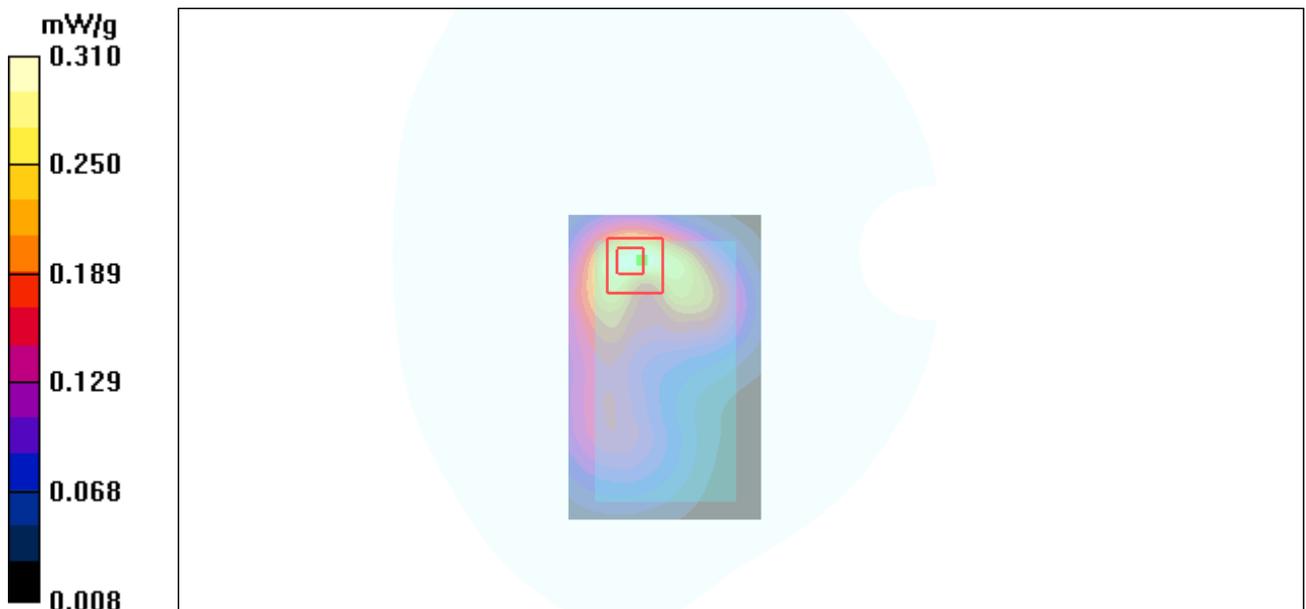


Figure 37 Body, Towards Ground, GSM 1900 Channel 512

### GSM 1900 Towards Phantom Middle

Date/Time: 9/3/2010 11:08:06 AM

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

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.54$  mho/m;  $\epsilon_r = 53.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature:22.3 °C      Liqjud Temperature: 21.5°C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.62, 7.62, 7.62); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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 (51x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.089 mW/g

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

Reference Value = 5.23 V/m; Power Drift = 0.103 dB

Peak SAR (extrapolated) = 0.136 W/kg

**SAR(1 g) = 0.081 mW/g; SAR(10 g) = 0.048 mW/g**

Maximum value of SAR (measured) = 0.088 mW/g

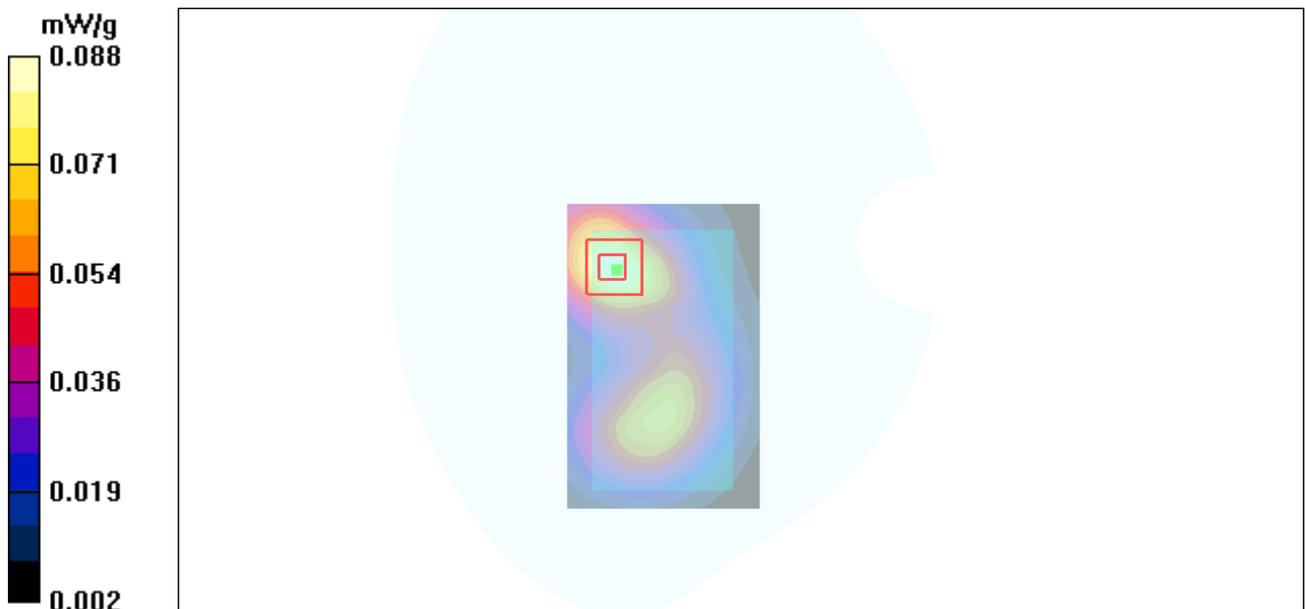


Figure 38 Body, Towards Phantom, GSM 1900 Channel 661

### GSM 1900 with Earphone Towards Ground Middle

Date/Time: 9/3/2010 4:27:25 PM

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

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.54$  mho/m;  $\epsilon_r = 53.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.62, 7.62, 7.62); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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 (51x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.468 mW/g

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

Reference Value = 16.5 V/m; Power Drift = 0.137 dB

Peak SAR (extrapolated) = 0.735 W/kg

**SAR(1 g) = 0.433 mW/g; SAR(10 g) = 0.243 mW/g**

Maximum value of SAR (measured) = 0.478 mW/g

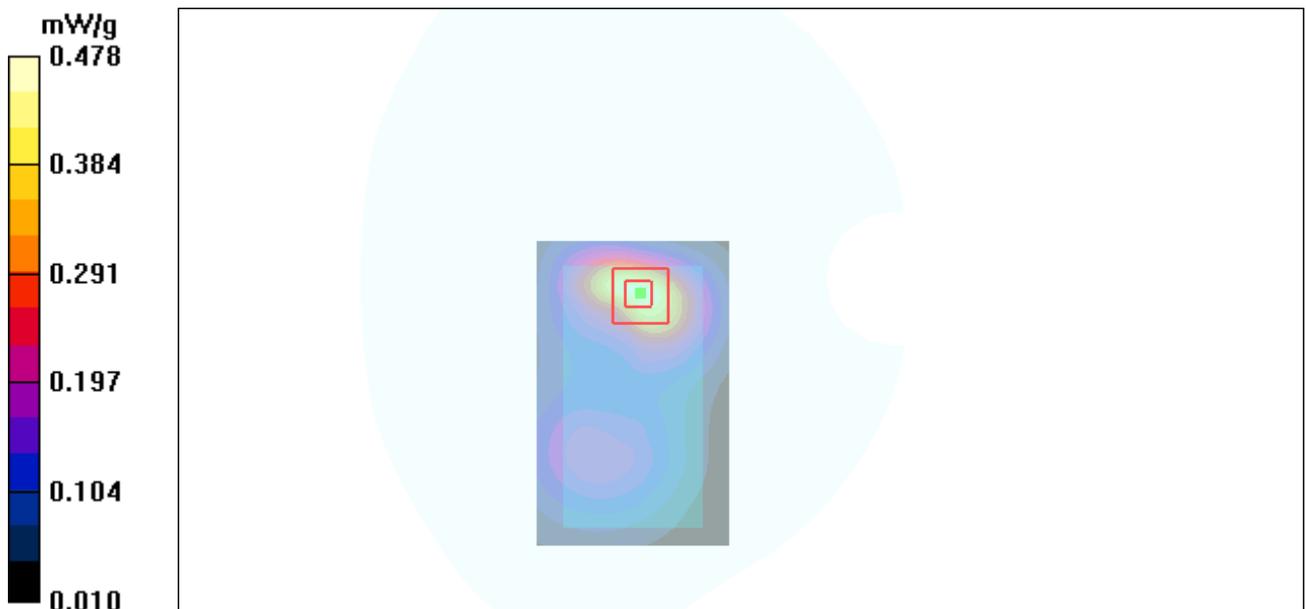


Figure 39 Body with Earphone, Towards Ground, GSM 1900 Channel 661

### GSM 1900 GPRS (2Up) Towards Ground High

Date/Time: 9/3/2010 3:47:36 PM

Communication System: PCS 1900+GPRS(2Up); Frequency: 1909.8 MHz; Duty Cycle: 1:4.15

Medium parameters used:  $f = 1910$  MHz;  $\sigma = 1.58$  mho/m;  $\epsilon_r = 53$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.62, 7.62, 7.62); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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 (51x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.582 mW/g

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

Reference Value = 18.3 V/m; Power Drift = 0.042 dB

Peak SAR (extrapolated) = 0.880 W/kg

**SAR(1 g) = 0.530 mW/g; SAR(10 g) = 0.307 mW/g**

Maximum value of SAR (measured) = 0.583 mW/g

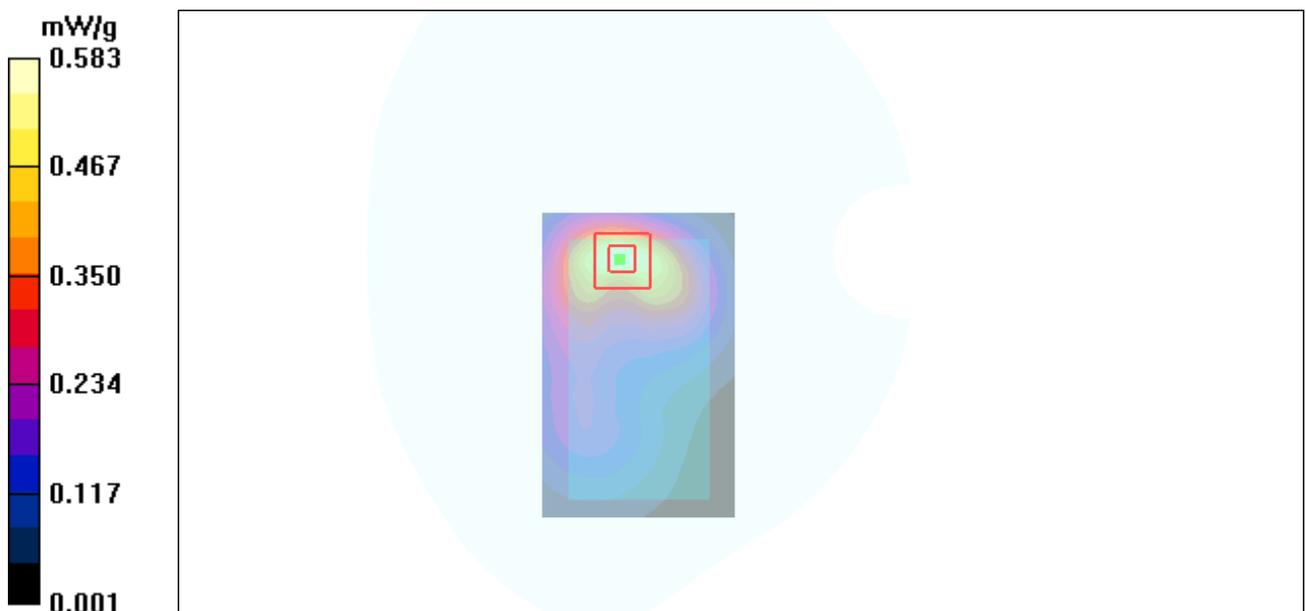


Figure 40 Body, Towards Ground, GSM 1900 GPRS (2Up) Channel 810

### GSM 1900 GPRS (2Up) Towards Ground Middle

Date/Time: 9/3/2010 2:54:55 PM

Communication System: PCS 1900+GPRS(2Up); Frequency: 1880 MHz;Duty Cycle: 1:4.15

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.54$  mho/m;  $\epsilon_r = 53.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.62, 7.62, 7.62); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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 (51x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.605 mW/g

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

Reference Value = 18.9 V/m; Power Drift = -0.000 dB

Peak SAR (extrapolated) = 0.881 W/kg

**SAR(1 g) = 0.541 mW/g; SAR(10 g) = 0.317 mW/g**

Maximum value of SAR (measured) = 0.594 mW/g

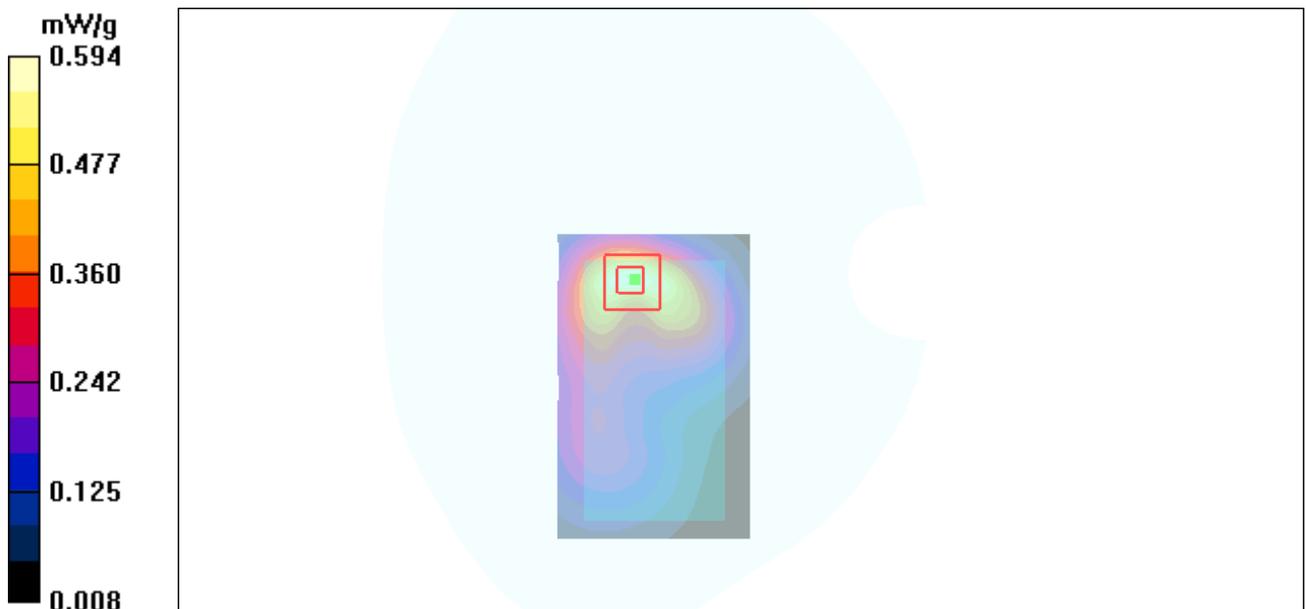


Figure 41 Body, Towards Ground, GSM 1900 GPRS (2Up) Channel 661

### GSM 1900 GPRS (2Up) Towards Ground Low

Date/Time: 9/3/2010 3:29:59 PM

Communication System: PCS 1900+GPRS(2Up); Frequency: 1850.2 MHz; Duty Cycle: 1:4.15

Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.51$  mho/m;  $\epsilon_r = 53.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.62, 7.62, 7.62); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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 (51x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.531 mW/g

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

Reference Value = 17.8 V/m; Power Drift = -0.114 dB

Peak SAR (extrapolated) = 0.823 W/kg

**SAR(1 g) = 0.485 mW/g; SAR(10 g) = 0.285 mW/g**

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

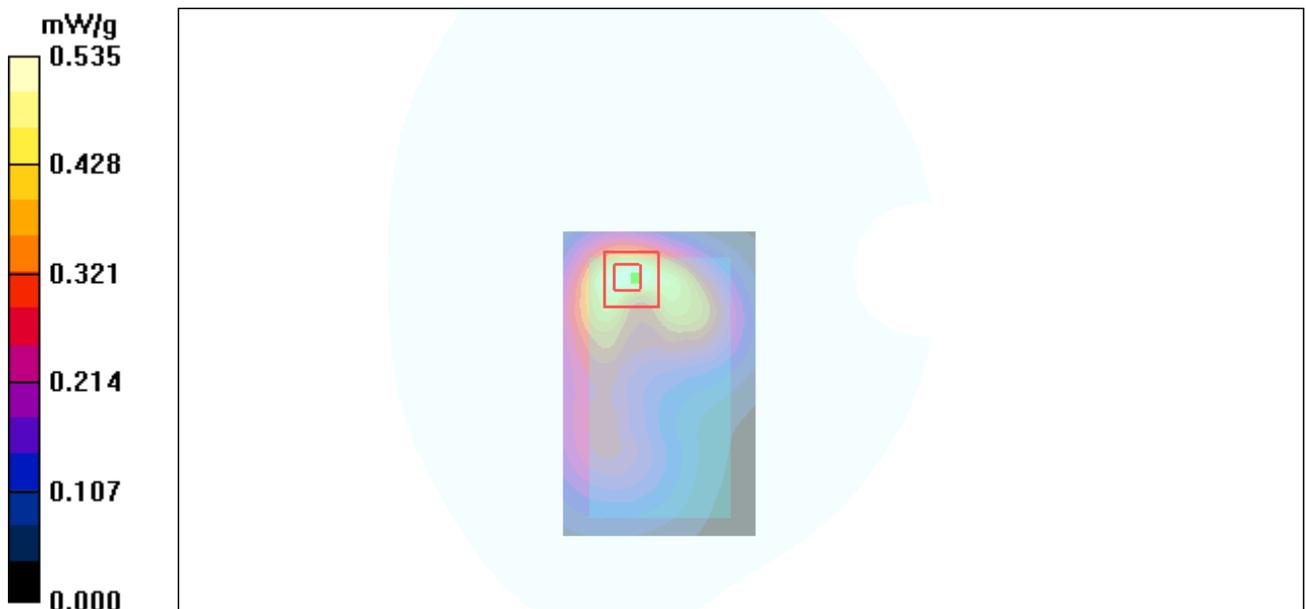


Figure 42 Body, Towards Ground, GSM 1900 GPRS (2Up) Channel 512

### GSM 1900 GPRS (2Up) Towards Phantom Middle

Date/Time: 9/3/2010 11:27:05 AM

Communication System: PCS 1900+GPRS(2Up); Frequency: 1880 MHz;Duty Cycle: 1:4.15

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.54$  mho/m;  $\epsilon_r = 53.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature:22.3 °C      Liqiud Temperature: 21.5°C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.62, 7.62, 7.62); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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 (51x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.158 mW/g

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

Reference Value = 7.09 V/m; Power Drift = -0.120 dB

Peak SAR (extrapolated) = 0.232 W/kg

**SAR(1 g) = 0.142 mW/g; SAR(10 g) = 0.084 mW/g**

Maximum value of SAR (measured) = 0.154 mW/g

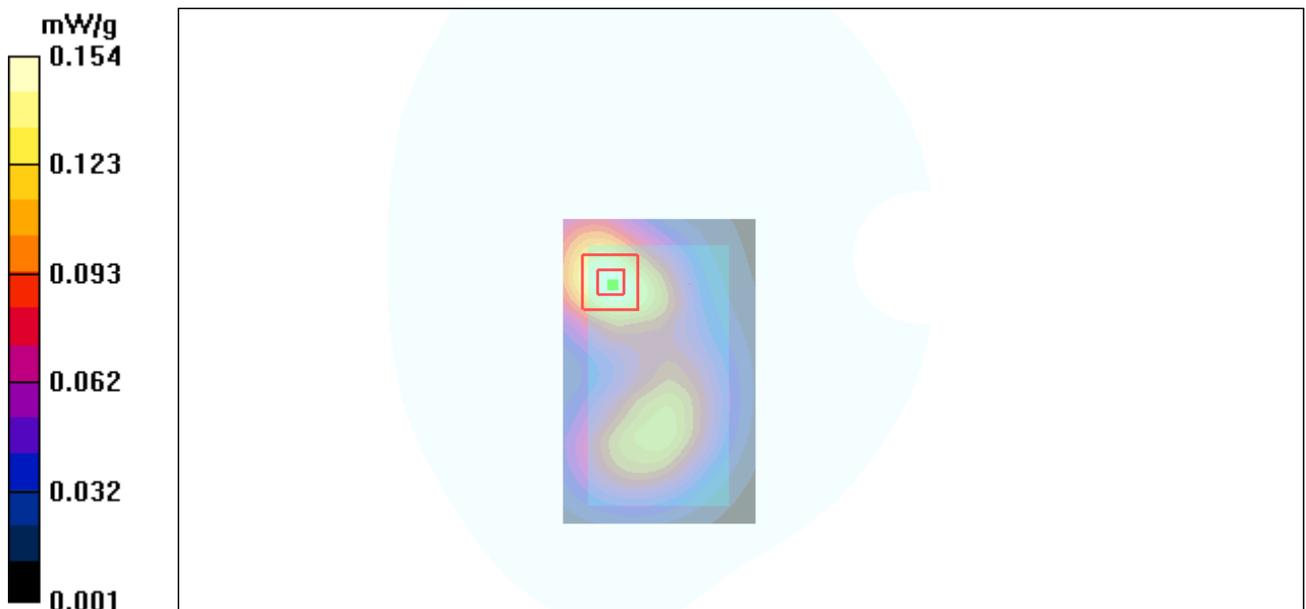


Figure 43 Body, Towards Phantom, GSM 1900 GPRS (2Up) Channel 661

### GSM 1900 EGPRS (2Up) Towards Ground Middle

Date/Time: 9/3/2010 4:08:33 PM

Communication System: PCS 1900+EGPRS(2Up); Frequency: 1880 MHz;Duty Cycle: 1:4.15

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.54$  mho/m;  $\epsilon_r = 53.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.62, 7.62, 7.62); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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 (51x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.598 mW/g

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

Reference Value = 18.7 V/m; Power Drift = -0.036 dB

Peak SAR (extrapolated) = 0.896 W/kg

**SAR(1 g) = 0.542 mW/g; SAR(10 g) = 0.310 mW/g**

Maximum value of SAR (measured) = 0.600 mW/g



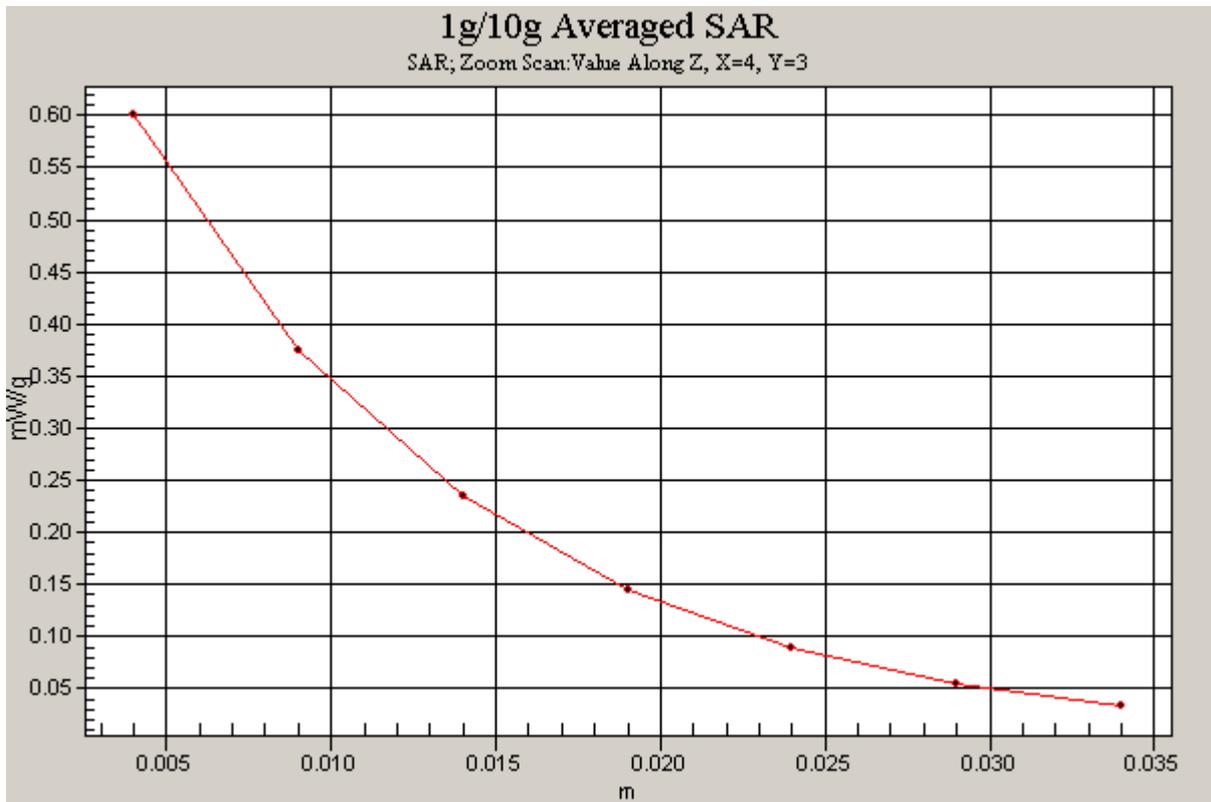


Figure 44 Body, Towards Ground, GSM 1900 EGPRS (2Up) Channel 661

### WCDMA Band IV Left Cheek Middle

Date/Time: 9/4/2010 10:50:13 AM

Communication System: WCDMA Band IV; Frequency: 1732.6 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1733$  MHz;  $\sigma = 1.35$  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 - SN3677; ConvF(8.04, 8.04, 8.04); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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) = 0.851 mW/g

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

Reference Value = 23.6 V/m; Power Drift = -0.023 dB

Peak SAR (extrapolated) = 1.10 W/kg

**SAR(1 g) = 0.788 mW/g; SAR(10 g) = 0.521 mW/g**

Maximum value of SAR (measured) = 0.855 mW/g

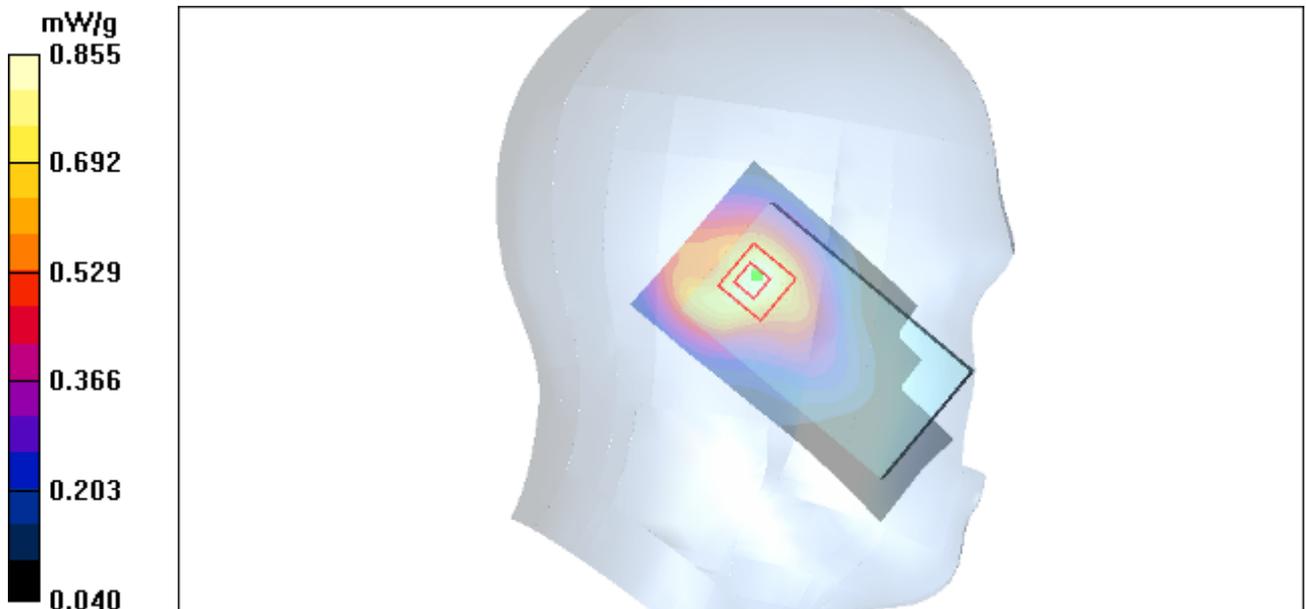


Figure 45 Left Hand Touch Cheek WCDMA Band IV Channel 1413

### WCDMA Band IV Left Tilt High

Date/Time: 9/4/2010 11:27:03 AM

Communication System: WCDMA Band IV; Frequency: 1752.6 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1753$  MHz;  $\sigma = 1.37$  mho/m;  $\epsilon_r = 39.9$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Left Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(8.04, 8.04, 8.04); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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) = 1.05 mW/g

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

Reference Value = 25.3 V/m; Power Drift = 0.011 dB

Peak SAR (extrapolated) = 1.52 W/kg

**SAR(1 g) = 0.954 mW/g; SAR(10 g) = 0.572 mW/g**

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

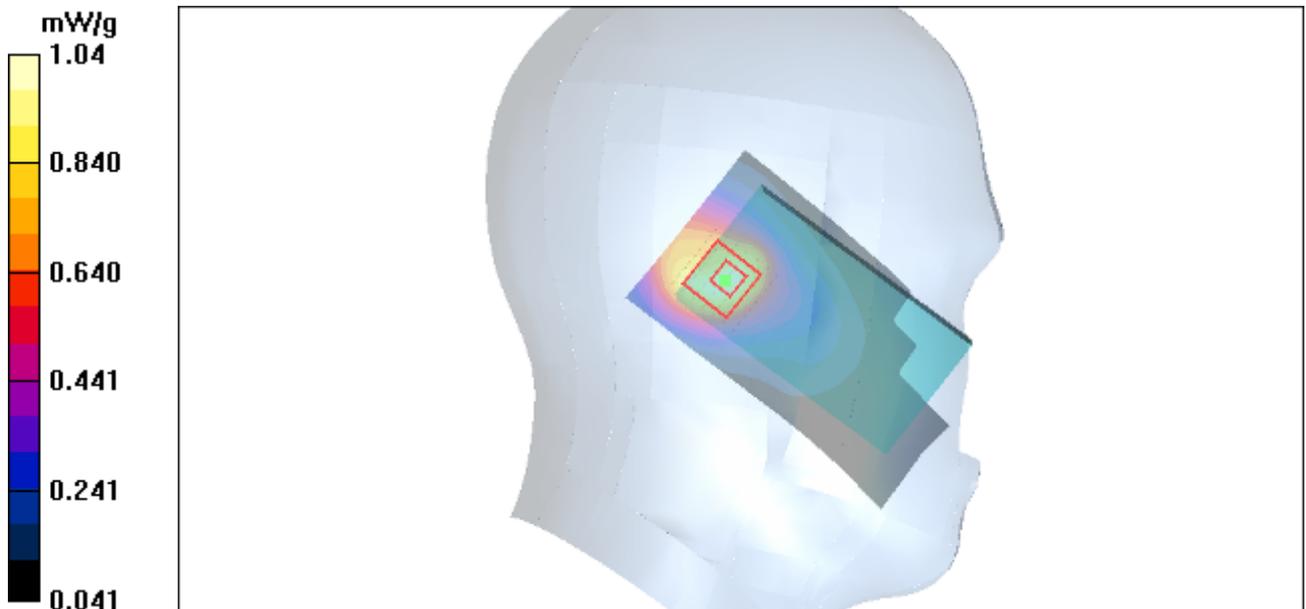


Figure 46 Left Hand Tilt 15° WCDMA Band IV Channel 1513

### WCDMA Band IV Left Tilt Middle

Date/Time: 9/4/2010 11:08:46 AM

Communication System: WCDMA Band IV; Frequency: 1732.6 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1733$  MHz;  $\sigma = 1.35$  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 - SN3677; ConvF(8.04, 8.04, 8.04); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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) = 0.965 mW/g

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

Reference Value = 24.5 V/m; Power Drift = -0.110 dB

Peak SAR (extrapolated) = 1.40 W/kg

**SAR(1 g) = 0.878 mW/g; SAR(10 g) = 0.527 mW/g**

Maximum value of SAR (measured) = 0.983 mW/g

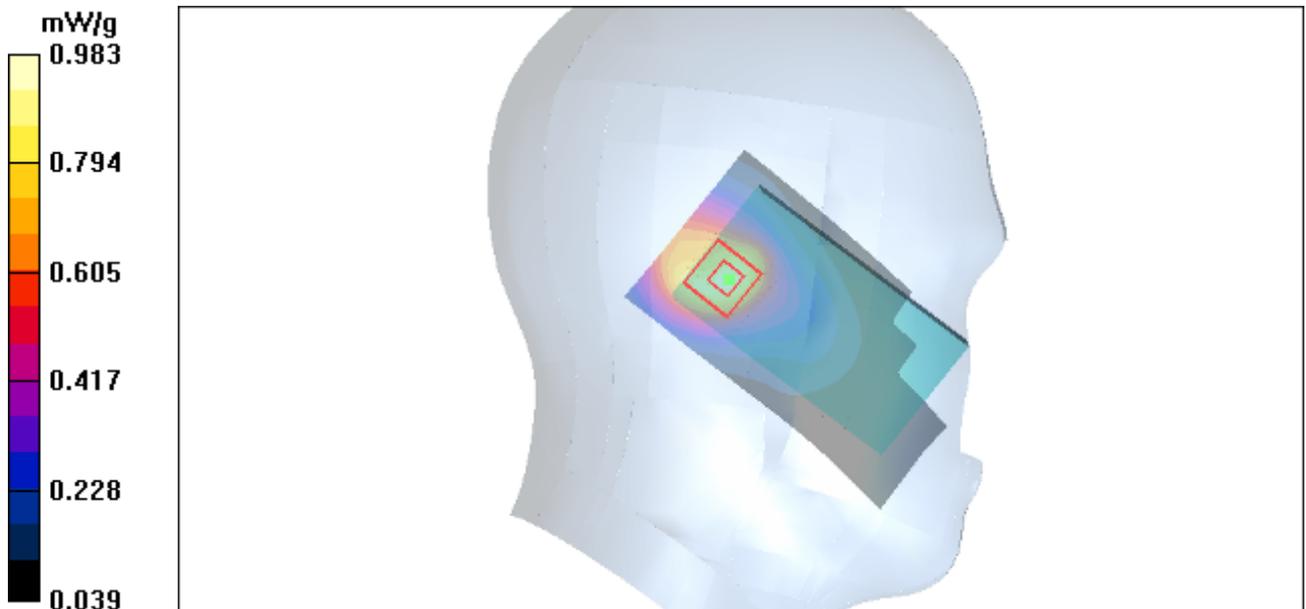


Figure 47 Left Hand Tilt 15° WCDMA Band IV Channel 1413

### WCDMA Band IV Left Tilt Low

Date/Time: 9/4/2010 11:45:43 AM

Communication System: WCDMA Band IV; Frequency: 1712.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 1712.4$  MHz;  $\sigma = 1.34$  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 - SN3677; ConvF(8.04, 8.04, 8.04); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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) = 1.09 mW/g

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

Reference Value = 25.5 V/m; Power Drift = 0.078 dB

Peak SAR (extrapolated) = 1.53 W/kg

**SAR(1 g) = 0.977 mW/g; SAR(10 g) = 0.593 mW/g**

Maximum value of SAR (measured) = 1.08 mW/g

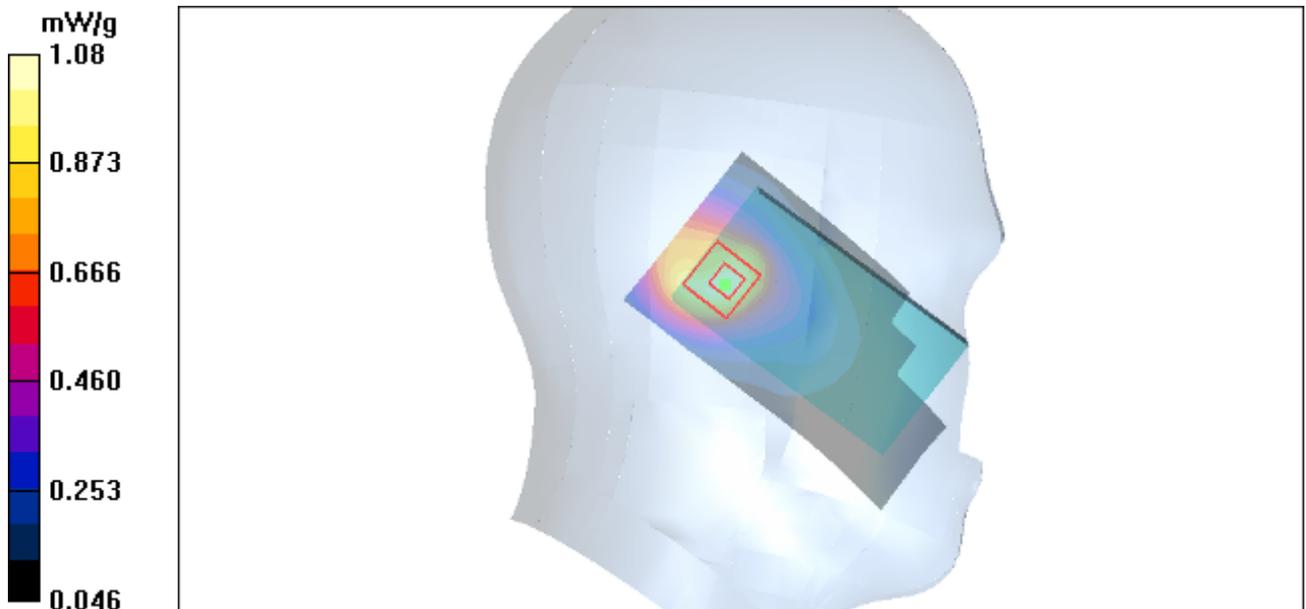


Figure 48 Left Hand Tilt 15° WCDMA Band IV Channel 1312

### WCDMA Band IV Right Cheek High

Date/Time: 9/4/2010 11:47:20 PM

Communication System: WCDMA Band IV; Frequency: 1752.6 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1753$  MHz;  $\sigma = 1.37$  mho/m;  $\epsilon_r = 39.9$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Right Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(8.04, 8.04, 8.04); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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) = 1.17 mW/g

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

Reference Value = 25.4 V/m; Power Drift = 0.037 dB

Peak SAR (extrapolated) = 1.72 W/kg

**SAR(1 g) = 1.04 mW/g; SAR(10 g) = 0.598 mW/g**

Maximum value of SAR (measured) = 1.14 mW/g

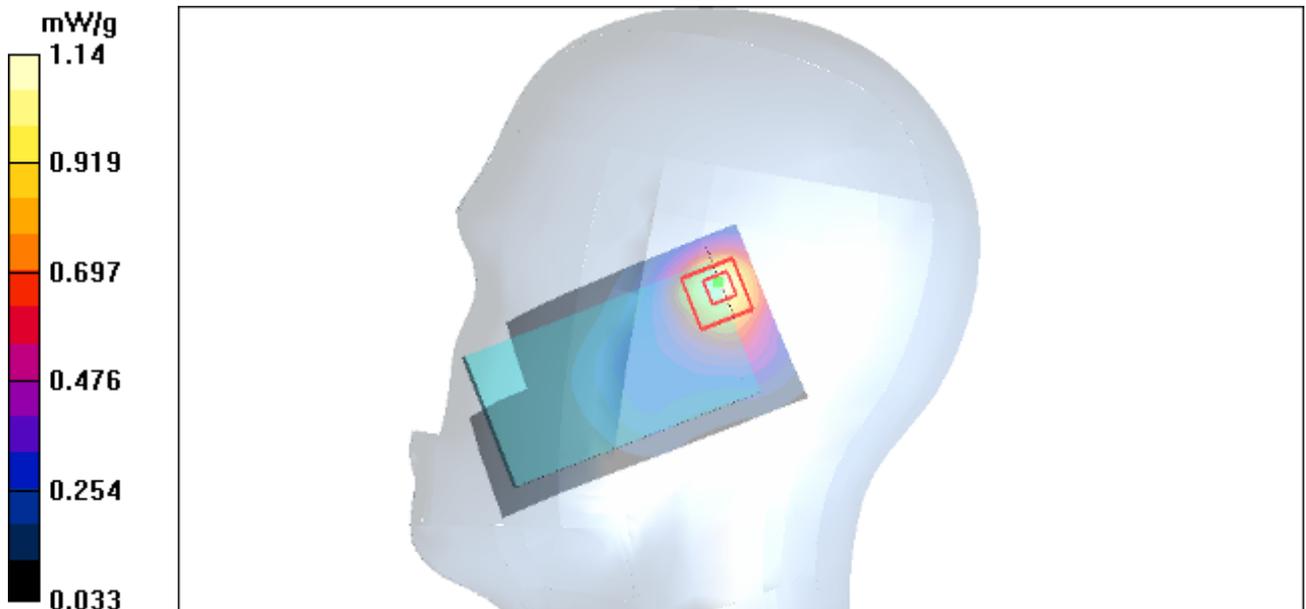


Figure 49 Right Hand Touch Cheek WCDMA Band IV Channel 1513

### WCDMA Band IV Right Cheek Middle

Date/Time: 9/4/2010 10:06:37 PM

Communication System: WCDMA Band IV; Frequency: 1732.6 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1733$  MHz;  $\sigma = 1.35$  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 - SN3677; ConvF(8.04, 8.04, 8.04); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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) = 1.08 mW/g

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

Reference Value = 23.8 V/m; Power Drift = 0.052 dB

Peak SAR (extrapolated) = 1.55 W/kg

**SAR(1 g) = 0.962 mW/g; SAR(10 g) = 0.570 mW/g**

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

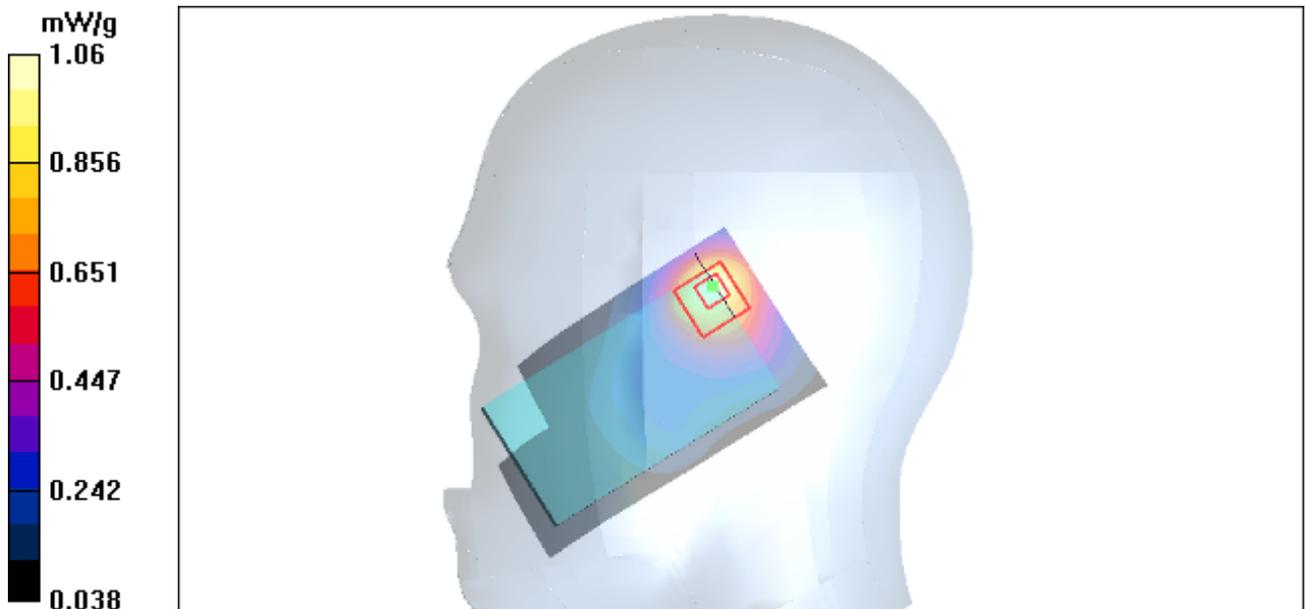


Figure 50 Right Hand Touch Cheek WCDMA Band IV Channel 1413

### WCDMA Band IV Right Cheek Low

Date/Time: 9/4/2010 11:29:29 PM

Communication System: WCDMA Band IV; Frequency: 1712.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 1712.4$  MHz;  $\sigma = 1.34$  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 - SN3677; ConvF(8.04, 8.04, 8.04); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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) = 1.28 mW/g

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

Reference Value = 25.8 V/m; Power Drift = -0.024 dB

Peak SAR (extrapolated) = 1.86 W/kg

**SAR(1 g) = 1.16 mW/g; SAR(10 g) = 0.686 mW/g**

Maximum value of SAR (measured) = 1.28 mW/g

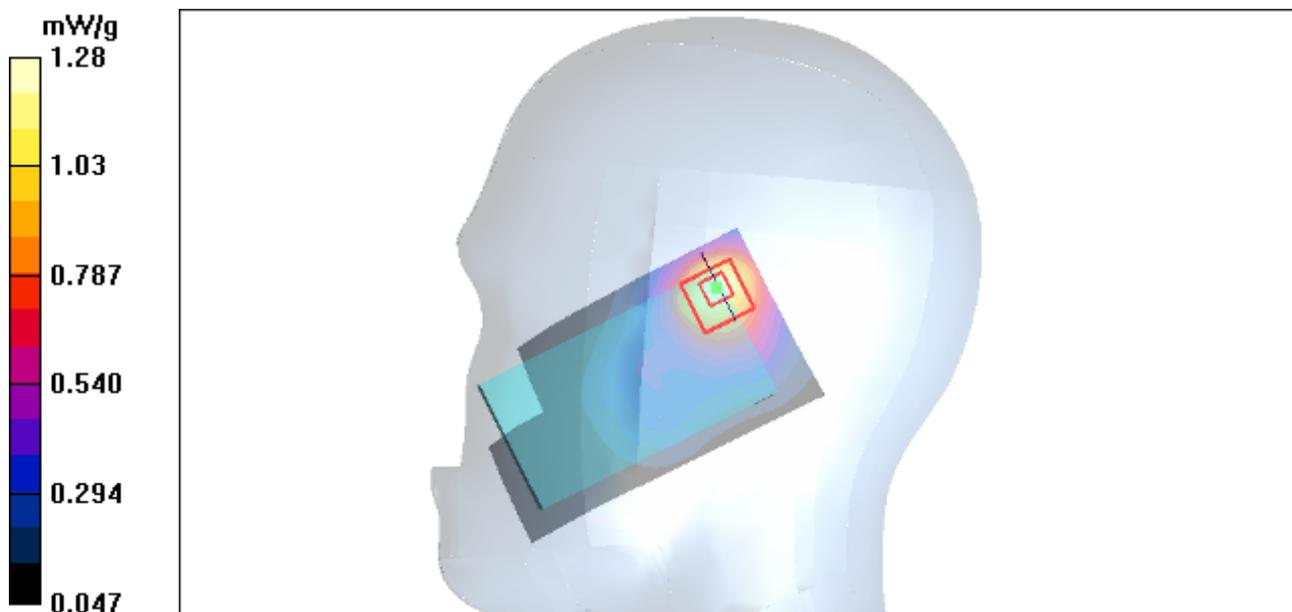


Figure 51 Right Hand Touch Cheek WCDMA Band IV Channel 1312

### WCDMA Band IV Right Tilt High

Date/Time: 9/4/2010 10:48:29 PM

Communication System: WCDMA Band IV; Frequency: 1752.6 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1753$  MHz;  $\sigma = 1.37$  mho/m;  $\epsilon_r = 39.9$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Phantom section: Right Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(8.04, 8.04, 8.04); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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) = 1.32 mW/g

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

Reference Value = 29.2 V/m; Power Drift = 0.064 dB

Peak SAR (extrapolated) = 1.90 W/kg

**SAR(1 g) = 1.21 mW/g; SAR(10 g) = 0.711 mW/g**

Maximum value of SAR (measured) = 1.35 mW/g

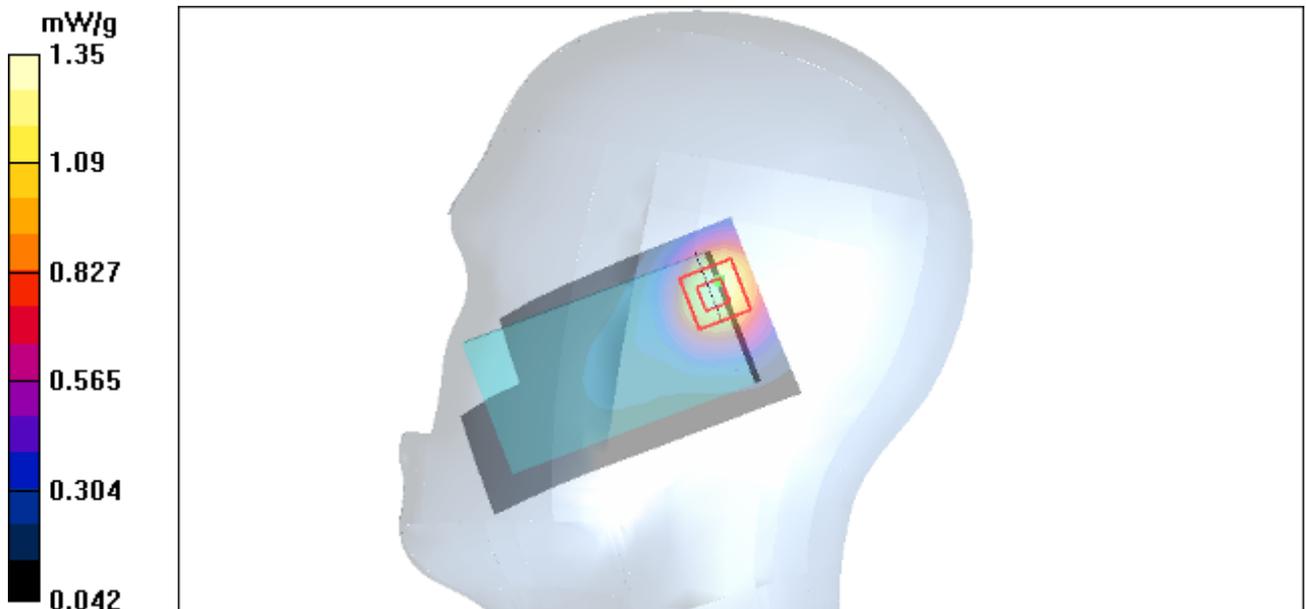


Figure 52 Right Hand Tilt 15° WCDMA Band IV Channel 1513

### WCDMA Band IV Right Tilt Middle

Date/Time: 9/4/2010 10:26:21 PM

Communication System: WCDMA Band IV; Frequency: 1732.6 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1733$  MHz;  $\sigma = 1.35$  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 - SN3677; ConvF(8.04, 8.04, 8.04); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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) = 1.21 mW/g

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

Reference Value = 28.4 V/m; Power Drift = -0.015 dB

Peak SAR (extrapolated) = 1.73 W/kg

**SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.659 mW/g**

Maximum value of SAR (measured) = 1.23 mW/g

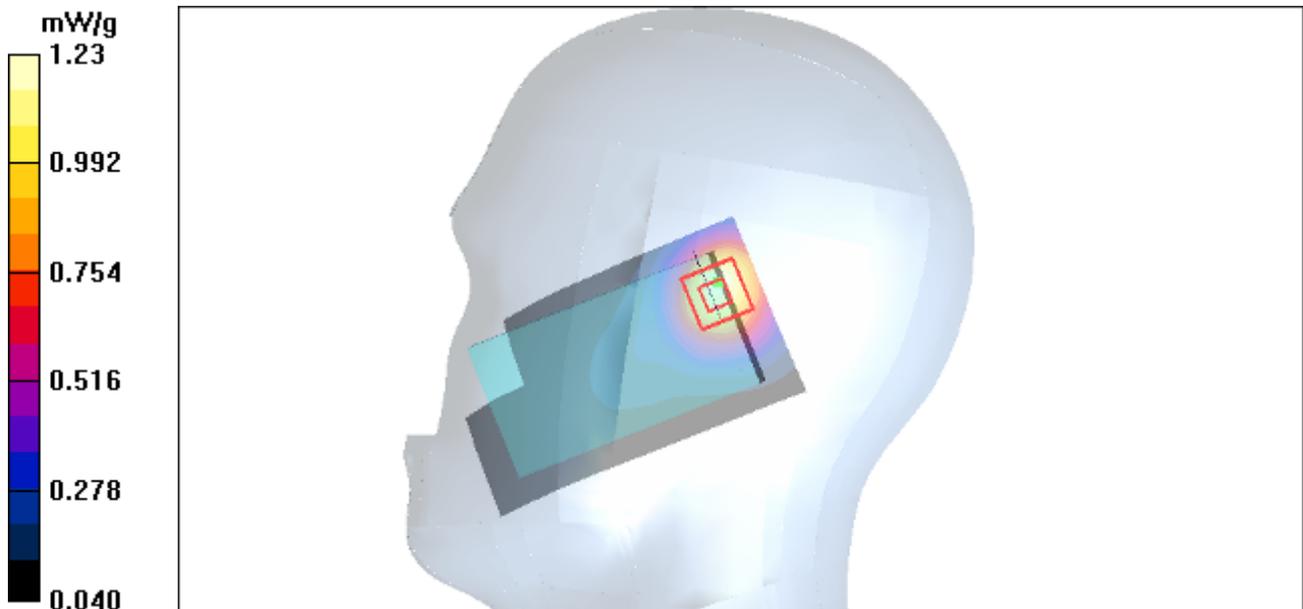


Figure 53 Right Hand Tilt 15° WCDMA Band IV Channel 1413

### WCDMA Band IV Right Tilt Low

Date/Time: 9/4/2010 11:09:32 PM

Communication System: WCDMA Band IV; Frequency: 1712.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 1712.4$  MHz;  $\sigma = 1.34$  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 - SN3677; ConvF(8.04, 8.04, 8.04); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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) = 1.38 mW/g

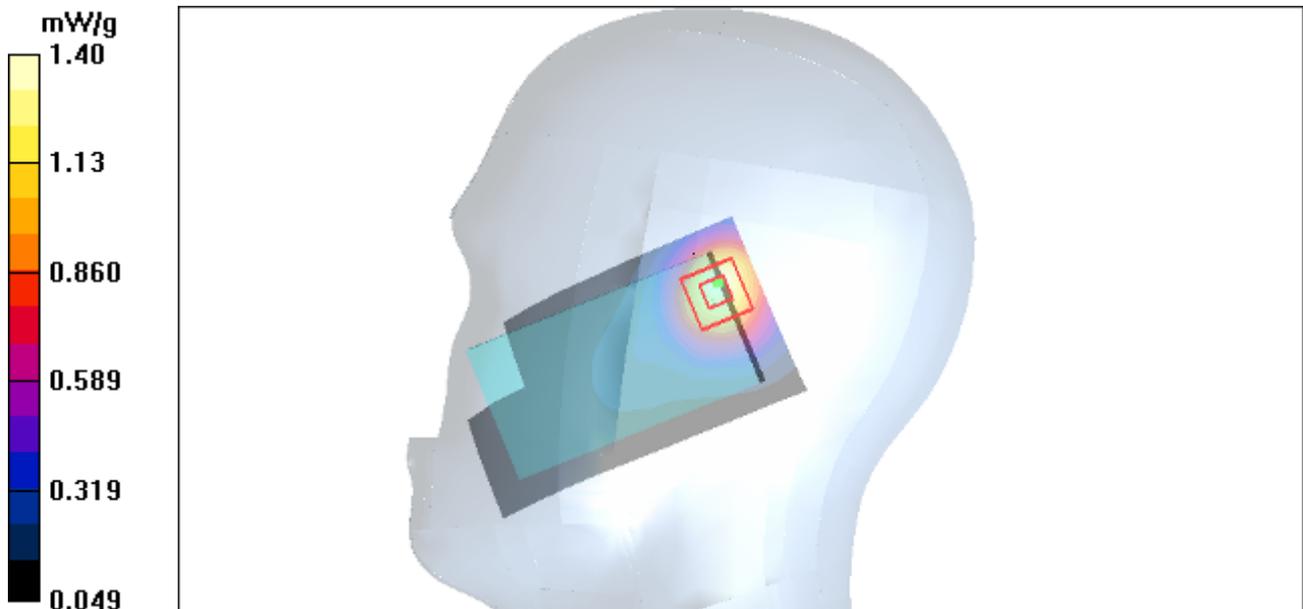
**Tilt Low/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 30.1 V/m; Power Drift = 0.064 dB

Peak SAR (extrapolated) = 1.96 W/kg

**SAR(1 g) = 1.27 mW/g; SAR(10 g) = 0.757 mW/g**

Maximum value of SAR (measured) = 1.40 mW/g



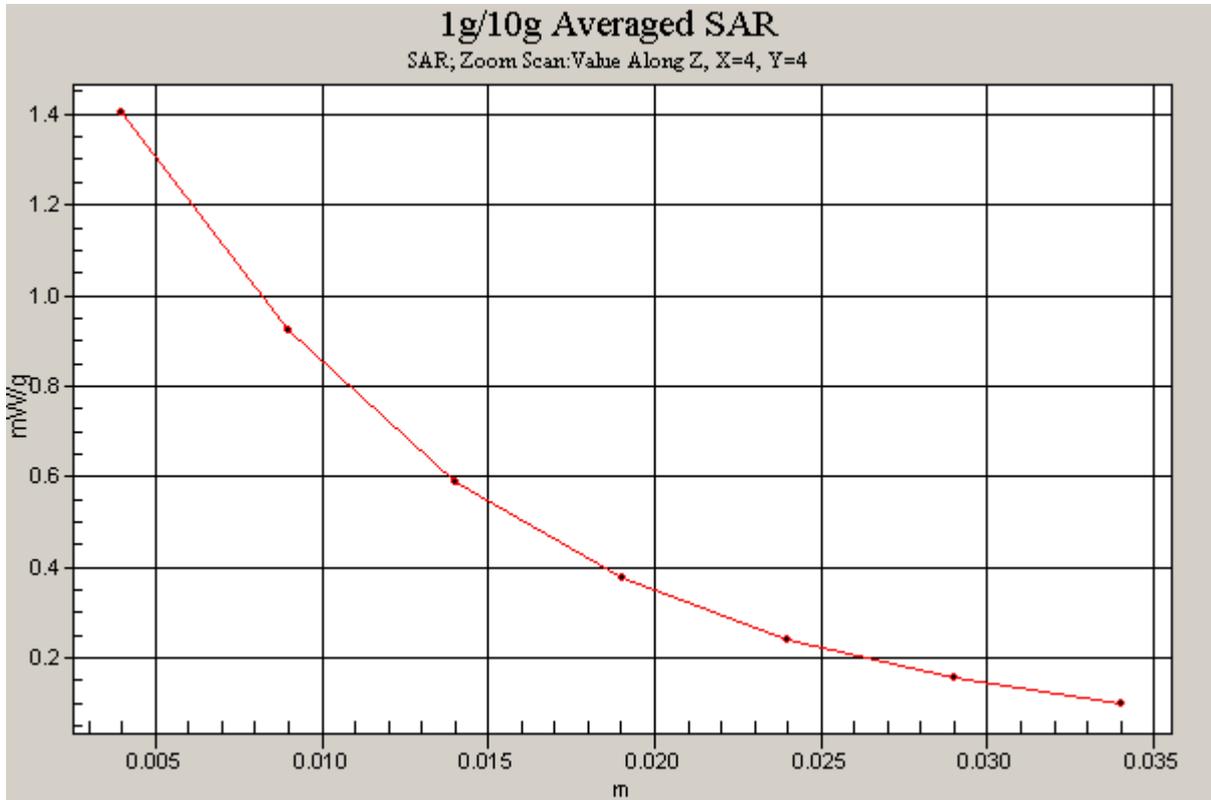


Figure 54 Right Hand Tilt 15° WCDMA Band IV Channel 1312

### WCDMA Band IV Towards Ground High

Date/Time: 9/3/2010 5:44:34 PM

Communication System: WCDMA Band IV; Frequency: 1752.6 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 1752.6$  MHz;  $\sigma = 1.48$  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 - SN3677; ConvF(7.7, 7.7, 7.7); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

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 (51x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.918 mW/g

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

Reference Value = 20.9 V/m; Power Drift = -0.009 dB

Peak SAR (extrapolated) = 1.45 W/kg

**SAR(1 g) = 0.858 mW/g; SAR(10 g) = 0.489 mW/g**

Maximum value of SAR (measured) = 0.951 mW/g

**Towards Ground High/Zoom Scan (7x7x7)/Cube 1:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 20.9 V/m; Power Drift = -0.009 dB

Peak SAR (extrapolated) = 1.24 W/kg

**SAR(1 g) = 0.736 mW/g; SAR(10 g) = 0.421 mW/g**

Maximum value of SAR (measured) = 0.839 mW/g

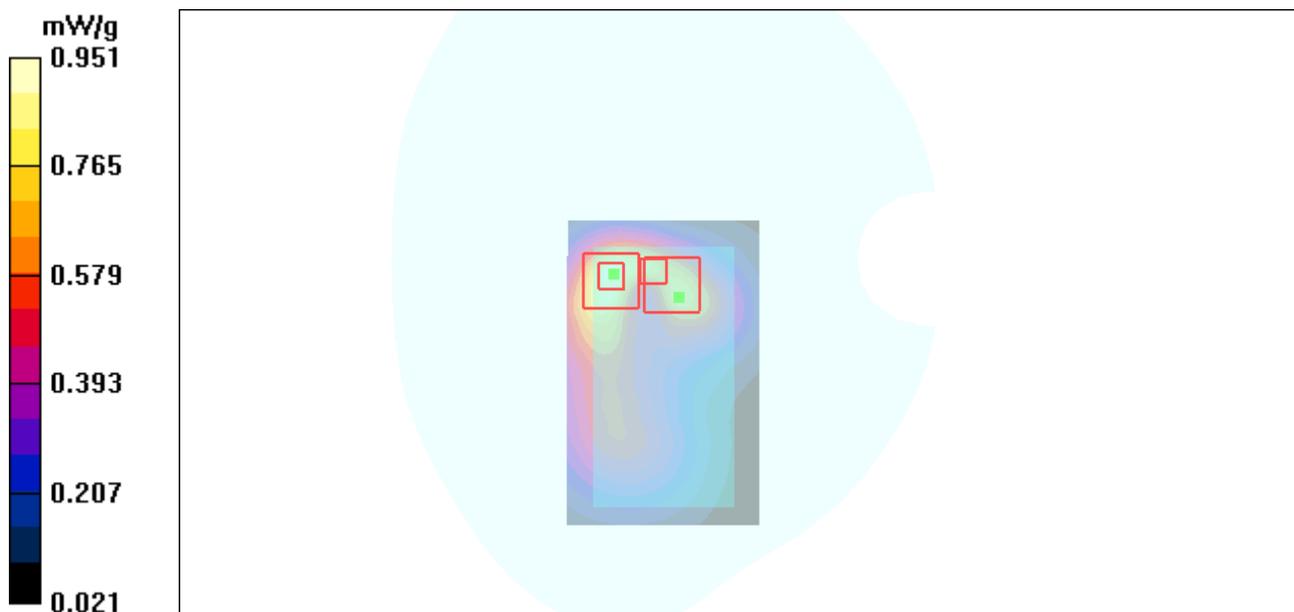


Figure 55 Body, Towards Ground, WCDMA Band IV Channel 1513