



# SAR TEST REPORT

No. 2011SAR00083

For

**TCT Mobile Limited**

**GSM dual band mobile phone**

**B11Q US**

**one touch 585A**

With

**Hardware Version: PIO**

**Software Version: V200**

**FCCID: RAD178**

**Issued Date: 2011-07-11**



**No. DGA-PL-114/01-02**

**Note:**

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of TMC Beijing.

**Test Laboratory:**

TMC Beijing, Telecommunication Metrology Center of MIIT

No. 52, Huayuan Bei Road, Haidian District, Beijing, P. R. China 100191.

Tel:+86(0)10-62304633-2079, Fax:+86(0)10-62304793 Email:welcom@emcite.com. [www.emcite.com](http://www.emcite.com)

©Copyright. All rights reserved by TMC Beijing.

## TABLE OF CONTENT

<b>1 TEST LABORATORY</b> .....	<b>3</b>
1.1 TESTING LOCATION .....	3
1.2 TESTING ENVIRONMENT.....	3
1.3 PROJECT DATA .....	3
1.4 SIGNATURE.....	3
<b>2 CLIENT INFORMATION</b> .....	<b>4</b>
2.1 APPLICANT INFORMATION .....	4
2.2 MANUFACTURER INFORMATION .....	4
<b>3 EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE) .....</b>	<b>5</b>
3.1 ABOUT EUT .....	5
3.2 INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST .....	5
3.3 INTERNAL IDENTIFICATION OF AE USED DURING THE TEST.....	5
<b>4 CHARACTERISTICS OF THE TEST .....</b>	<b>5</b>
4.1 APPLICABLE LIMIT REGULATIONS .....	5
4.2 APPLICABLE MEASUREMENT STANDARDS.....	6
<b>5 OPERATIONAL CONDITIONS DURING TEST .....</b>	<b>6</b>
5.1 SCHEMATIC TEST CONFIGURATION.....	6
5.2 SAR MEASUREMENT SET-UP.....	6
5.3 DASY4 E-FIELD PROBE SYSTEM.....	7
5.4 E-FIELD PROBE CALIBRATION .....	8
5.5 OTHER TEST EQUIPMENT .....	9
5.6 EQUIVALENT TISSUES.....	10
5.7 SYSTEM SPECIFICATIONS.....	10
<b>6 CONDUCTED OUTPUT POWER MEASUREMENT.....</b>	<b>11</b>
6.1 SUMMARY .....	11
6.2 CONDUCTED POWER .....	11
<b>7 TEST RESULTS .....</b>	<b>12</b>
7.1 DIELECTRIC PERFORMANCE .....	12
7.2 SYSTEM VALIDATION.....	13
7.3 EVALUATION OF MULTI-BATTERIES.....	14
7.4 SUMMARY OF MEASUREMENT RESULTS .....	14
7.5 SUMMARY OF MEASUREMENT RESULTS (BLUETOOTH FUNCTION) .....	17
7.6 CONCLUSION.....	18
<b>8 MEASUREMENT UNCERTAINTY .....</b>	<b>18</b>
<b>9 MAIN TEST INSTRUMENTS .....</b>	<b>19</b>
<b>ANNEX A MEASUREMENT PROCESS.....</b>	<b>20</b>
<b>ANNEX B TEST LAYOUT .....</b>	<b>21</b>
<b>ANNEX C GRAPH RESULTS.....</b>	<b>26</b>
<b>ANNEX D SYSTEM VALIDATION RESULTS .....</b>	<b>72</b>
<b>ANNEX E PROBE CALIBRATION CERTIFICATE.....</b>	<b>76</b>
<b>ANNEX F DIPOLE CALIBRATION CERTIFICATE .....</b>	<b>85</b>

## 1 Test Laboratory

### 1.1 Testing Location

Company Name: TMC Beijing, Telecommunication Metrology Center of MIIT  
Address: No 52, Huayuan beilu, Haidian District, Beijing,P.R.China  
Postal Code: 100191  
Telephone: +86-10-62304633  
Fax: +86-10-62304793

### 1.2 Testing Environment

Temperature: 18°C~25 °C,  
Relative humidity: 30%~ 70%  
Ground system resistance: < 0.5 Ω

Ambient noise is checked and found very low and in compliance with requirement of standards.  
Reflection of surrounding objects is minimized and in compliance with requirement of standards.

### 1.3 Project Data

Project Leader: Qi Dianyuan  
Test Engineer: Lin Xiaojun  
Testing Start Date: June 1, 2011  
Testing End Date: June 2, 2011

### 1.4 Signature



---

Lin Xiaojun  
(Prepared this test report)



---

Qi Dianyuan  
(Reviewed this test report)



---

Xiao Li  
Deputy Director of the laboratory  
(Approved this test report)

## 2 Client Information

### 2.1 Applicant Information

Company Name: TCT Mobile Limited  
Address /Post: 5F, E building, No. 232, Liang Jing Road ZhangJiang High-Tech Park,  
Pudong Area Shanghai, P.R. China. 201203  
City: Shanghai  
Postal Code: 201203  
Country: P. R. China  
Telephone: 0086-21-61460890  
Fax: 0086-21-61460602

### 2.2 Manufacturer Information

Company Name: TCT Mobile Limited  
Address /Post: 5F, E building, No. 232, Liang Jing Road ZhangJiang High-Tech Park,  
Pudong Area Shanghai, P.R. China. 201203  
City: Shanghai  
Postal Code: 201203  
Country: P. R. China  
Telephone: 0086-21-61460890  
Fax: 0086-21-61460602

### 3 Equipment Under Test (EUT) and Ancillary Equipment (AE)

#### 3.1 About EUT

EUT Description:	GSM dual band mobile phone
Model Name:	B11Q US
Marketing Name:	one touch 585A
Frequency Band:	GSM 850 / PCS 1900
GPRS Multislot Class:	12
GPRS capability Class:	B

#### 3.2 Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	012697000220102 / 012697000220128	PIO	V200

\*EUT ID: is used to identify the test sample in the lab internally.

#### 3.3 Internal Identification of AE used during the test

AE ID*	Description	Model	SN	Manufacturer
AE1	Battery	CAB3120000C1	/	BYD
AE2	Battery	CAB3120000C2	/	Lishen
AE3	Headset	CCB3160A10C2	/	Sunda
AE4	Headset	CCB3160A10C4	/	MeiHao

\*AE ID: is used to identify the test sample in the lab internally.

## 4 CHARACTERISTICS OF THE TEST

### 4.1 Applicable Limit Regulations

**EN 50360–2001:** Product standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones.

It specifies the maximum exposure limit of **2.0 W/kg** as averaged over any 10 gram of tissue for portable devices being used within 20 cm of the user in the uncontrolled environment.

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

It specifies the maximum exposure limit of **1.6 W/kg** as averaged over any 1 gram of tissue for portable devices being used within 20 cm of the user in the uncontrolled environment.

## 4.2 Applicable Measurement Standards

**EN 62209-1-2006:** Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures –Part 1: Procedure to determine the specific absorption rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz).

**IEEE 1528-2003:** Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques.

**OET Bulletin 65 (Edition 97-01) and Supplement C(Edition 01-01):** Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits.

**IEC 62209-1:** Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures –Part 1: Procedure to determine the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)

**KDB648474 D01 SAR Handsets Multi Xmitter and Ant, v01r05:** SAR Evaluation Considerations for Handsets with Multiple Transmitters and Antennas.

## 5 OPERATIONAL CONDITIONS DURING TEST

### 5.1 Schematic Test Configuration

During SAR test, EUT is in Traffic Mode (Channel Allocated) at Normal Voltage Condition. 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 respectively in the case of GSM 850 MHz, or to 512, 661 and 810 respectively in the case of PCS 1900 MHz. The EUT is commanded to operate at maximum transmitting power.

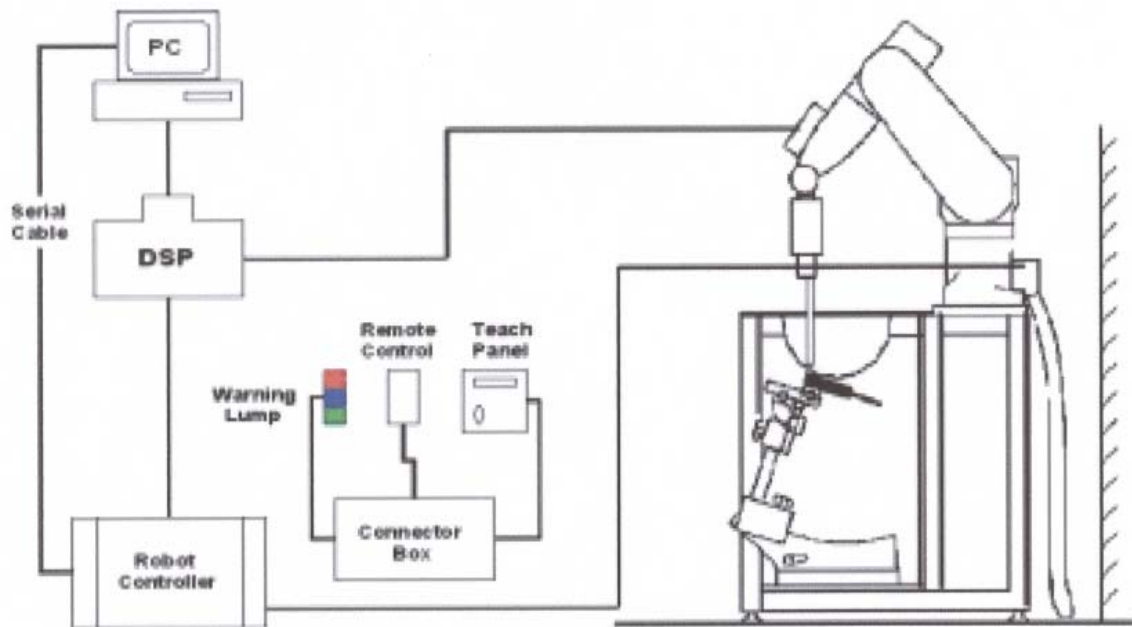
The EUT shall use its internal transmitter. The antenna(s), battery and accessories shall be those specified by the manufacturer. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output. If a wireless link is used, the antenna connected to the output of the base station simulator shall be placed at least 50 cm away from the handset. The signal transmitted by the simulator to the antenna feeding point shall be lower than the output power level of the handset by at least 30 dB.

### 5.2 SAR Measurement Set-up

These measurements were performed with the automated near-field scanning system DAS4 Professional from Schmid & Partner Engineering AG (SPEAG). The system is based on a high precision robot (working range greater than 0.9m), which positions the probes with a positional repeatability of better than  $\pm 0.02\text{mm}$ . Special E- and H-field probes have been developed for

measurements close to material discontinuity, the sensors of which are directly loaded with a Schottky diode and connected via highly resistive lines (length =300mm) to the data acquisition unit.

A cell controller system contains the power supply, robot controller, teaches pendant (Joystick), and remote control, is used to drive the robot motors. The PC consists of the Micron Pentium III 800 MHz computer with Windows 2000 system and SAR Measurement Software DASY4 Professional, A/D interface card, monitor, mouse, and keyboard. The Stäubli Robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card.



**Picture 1: SAR Lab Test Measurement Set-up**

The DAE consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer.

### 5.3 Dasy4 E-field Probe System

The SAR measurements were conducted with the dosimetric probe ES3DV3 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe has been calibrated according to the standard procedure with an accuracy of better than  $\pm 10\%$ . The spherical isotropy was evaluated and found to be better than  $\pm 0.25\text{dB}$ .

### ES3DV3 Probe Specification

Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	Basic Broad Band Calibration in air Conversion Factors (CF) for HSL 900 and HSL 1810 Additional CF for other liquids and frequencies upon request
Frequency	10 MHz to 4 GHz; Linearity: $\pm 0.2$ dB (30 MHz to 4 GHz)
Directivity	$\pm 0.2$ dB in HSL (rotation around probe axis) $\pm 0.3$ dB in tissue material (rotation normal to probe axis)
Dynamic Range	5 $\mu$ W/g to > 100 mW/g; Linearity: $\pm 0.2$ dB
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 3.9 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.0 mm
Application	General dosimetry up to 4 GHz Dosimetry in strong gradient fields Compliance tests of mobile phones



**Picture 2: ES3DV3 E-field**



**Picture3:ES3DV3 E-field probe**

### 5.4 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  $\pm 0.25$ 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.



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

Where:  $\Delta t$  = Exposure time (30 seconds),  
 $C$  = Heat capacity of tissue (brain or muscle),  
 $\Delta T$  = Temperature increase due to RF exposure.

Or

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

Where:

$\sigma$  = Simulated tissue conductivity,  
 $\rho$  = Tissue density ( $\text{kg/m}^3$ ).



**Picture 4: Device Holder**

## 5.5 Other Test Equipment

### 5.5.1 Device Holder for Transmitters

In combination with the Generic Twin Phantom V3.0, the Mounting Device (POM) enables the rotation of the mounted transmitter in spherical coordinates whereby the rotation points is the ear opening. The devices can be easily, accurately, and repeatably positioned according to the FCC and CENELEC specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).

### 5.5.2 Phantom

The Generic Twin Phantom is constructed of a fiberglass shell integrated in a wooden table. 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



**Picture 5: Generic Twin Phantom**

## 5.6 Equivalent Tissues

The liquid used for the frequency range of 800-2000 MHz consisted of water, sugar, salt, preventol, glycol monobutyl and Cellulose. The liquid has been previously proven to be suited for worst-case. The Table 1 and 2 shows the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the IEEE 1528.

**Table 1. Composition of the Head Tissue Equivalent Matter**

MIXTURE %	FREQUENCY 850MHz
Water	41.45
Sugar	56.0
Salt	1.45
Preventol	0.1
Cellulose	1.0
Dielectric Parameters Target Value	f=850MHz $\epsilon=41.5$ $\sigma=0.90$
MIXTURE %	FREQUENCY 1900MHz
Water	55.242
Glycol monobutyl	44.452
Salt	0.306
Dielectric Parameters Target Value	f=1900MHz $\epsilon=40.0$ $\sigma=1.40$

**Table 2. Composition of the Body Tissue Equivalent Matter**

MIXTURE %	FREQUENCY 850MHz
Water	52.5
Sugar	45.0
Salt	1.4
Preventol	0.1
Cellulose	1.0
Dielectric Parameters Target Value	f=850MHz $\epsilon=55.2$ $\sigma=0.97$
MIXTURE %	FREQUENCY 1900MHz
Water	69.91
Glycol monobutyl	29.96
Salt	0.13
Dielectric Parameters Target Value	f=1900MHz $\epsilon=53.3$ $\sigma=1.52$

## 5.7 System Specifications

### Specifications

**Positioner:** Stäubli Unimation Corp. Robot Model: RX90L

**Repeatability:**  $\pm 0.02$  mm

**No. of Axis:** 6

### Data Acquisition Electronic (DAE) System

#### Cell Controller

**Processor:** Pentium III

**Clock Speed:** 800 MHz

**Operating System:** Windows 2000

**Data Converter**

**Features:**Signal Amplifier, multiplexer, A/D converter, and control logic

**Software:** DASY4 software

**Connecting Lines:** Optical downlink for data and status info.  
Optical uplink for commands and clock

## 6 CONDUCTED OUTPUT POWER MEASUREMENT

### 6.1 Summary

During the process of testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication tester (CMU-200) to ensure the maximum power transmission and proper modulation. This result contains conducted output power for the EUT. In all cases, the measured output power should be greater and within 5% than EMI measurement.

### 6.2 Conducted Power

#### 6.2.1 Measurement Methods

The EUT was set up for the maximum output power. The channel power was measured with Agilent Spectrum Analyzer E4440A. These measurements were done at low, middle and high channels.

#### 6.2.2 Measurement result

**Table 3: The conducted power for GSM 850/1900**

GSM 850MHZ	Conducted Power (dBm)		
	Channel 251(848.8MHz)	Channel 190(836.6MHz)	Channel 128(824.2MHz)
	32.80	32.86	32.94
GSM 1900MHZ	Conducted Power (dBm)		
	Channel 810(1909.8MHz)	Channel 661(1880MHz)	Channel 512(1850.2MHz)
	29.61	30.02	30.11

**Table 4: The conducted power for GPRS 850/1900 and EGPRS 850/1900**

GSM 850 GPRS	Measured Power (dBm)			calculation	Averaged Power (dBm)		
	251	190	128		251	190	128
1 Txslot	32.74	32.79	32.87	-9.03dB	23.71	23.76	23.84
2 Txslots	31.59	31.67	31.75	-6.02dB	25.57	25.65	25.73
3Txslots	30.68	30.70	30.81	-4.26dB	26.42	26.44	26.55
<b>4 Txslots</b>	29.88	29.91	30.03	<b>-3.01dB</b>	<b>26.87</b>	<b>26.90</b>	<b>27.02</b>
PCS1900 GPRS	Measured Power (dBm)			calculation	Averaged Power (dBm)		
	810	661	512		810	661	512
1 Txslot	29.55	29.97	30.05	-9.03dB	20.52	20.94	21.02
2 Txslots	28.89	29.31	29.40	-6.02dB	22.87	23.29	23.38
3Txslots	27.93	28.35	28.44	-4.26dB	23.67	24.09	24.18
<b>4 Txslots</b>	27.01	27.44	27.51	<b>-3.01dB</b>	<b>24.00</b>	<b>24.43</b>	<b>24.50</b>

NOTES:

1) Division Factors

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

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

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

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

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

**According to the conducted power as above, the body measurements are performed with 4 Txslots for GSM850 and PCS1900.**

### 6.2.3 Power Drift

To control the output power stability during the SAR test, DASY4 system calculates the power drift by measuring the E-field at the same location at the beginning and at the end of the measurement for each test position. These drift values can be found in Table 11 to Table 16 labeled as: (Power Drift [dB]). This ensures that the power drift during one measurement is within 5%.

## 7 TEST RESULTS

### 7.1 Dielectric Performance

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

Measurement is made at temperature 23.0 °C and relative humidity 38%. Liquid temperature during the test: 22.5°C Measurement Date : 850 MHz <b>June 1, 2011</b> 1900 MHz <b>June 2, 2011</b>			
/	<b>Frequency</b>	<b>Permittivity <math>\epsilon</math></b>	<b>Conductivity <math>\sigma</math> (S/m)</b>
<b>Target value</b>	835 MHz	41.5	0.90
	1900 MHz	40.0	1.40
<b>Measurement value (Average of 10 tests)</b>	835 MHz	41.8	0.91
	1900 MHz	40.7	1.41

**Table 6: Dielectric Performance of Body Tissue Simulating Liquid**

Measurement is made at temperature 23.0 °C and relative humidity 38%. Liquid temperature during the test: 22.5°C Measurement Date : 850 MHz <b>June 1, 2011</b> 1900 MHz <b>June 2, 2011</b>			
/	<b>Frequency</b>	<b>Permittivity <math>\epsilon</math></b>	<b>Conductivity <math>\sigma</math> (S/m)</b>
<b>Target value</b>	835 MHz	55.2	0.97
	1900 MHz	53.3	1.52
<b>Measurement value (Average of 10 tests)</b>	835 MHz	54.8	0.96
	1900 MHz	53.5	1.53

## 7.2 System Validation

**Table 7: System Validation of Head**

Measurement is made at temperature 23.0 °C and relative humidity 38%. Liquid temperature during the test: 22.5°C Measurement Date : 850 MHz <u>June 1, 2011</u> 1900 MHz <u>June 2, 2011</u>								
<b>Liquid parameters</b>	Dipole calibration Target value	<b>Frequency</b>		<b>Permittivity <math>\epsilon</math></b>		<b>Conductivity <math>\sigma</math> (S/m)</b>		
		835 MHz		41.6		0.92		
	Actural Measurement value	1900 MHz		39.6		1.40		
		835 MHz		41.8		0.91		
<b>Verification results</b>	<b>Frequency</b>	<b>Target value (W/kg)</b>		<b>Measured value (W/kg)</b>		<b>Deviation</b>		
		<b>10 g Average</b>	<b>1 g Average</b>	<b>10 g Average</b>	<b>1 g Average</b>	<b>10 g Average</b>	<b>1 g Average</b>	
	835 MHz		6.12	9.41	5.92	9.56	-3.27%	1.59%
	1900 MHz		20.1	39.4	19.6	39.0	-2.49%	-1.02%

Note: The forward power is 250mW. Target values are the data of the dipole validation results, please check Annex F for the Dipole Calibration Certificate.

**Table 8: System Validation of Body**

Measurement is made at temperature 23.0 °C and relative humidity 38%. Liquid temperature during the test: 22.5°C Measurement Date : 850 MHz <u>June 1, 2011</u> 1900 MHz <u>June 2, 2011</u>								
<b>Liquid parameters</b>	Dipole calibration Target value	<b>Frequency</b>		<b>Permittivity <math>\epsilon</math></b>		<b>Conductivity <math>\sigma</math> (S/m)</b>		
		835 MHz		54.5		0.97		
	Actural Measurement value	1900 MHz		52.5		1.51		
		835 MHz		54.8		0.96		
<b>Verification results</b>	<b>Frequency</b>	<b>Target value (W/kg)</b>		<b>Measured value (W/kg)</b>		<b>Deviation</b>		
		<b>10 g Average</b>	<b>1 g Average</b>	<b>10 g Average</b>	<b>1 g Average</b>	<b>10 g Average</b>	<b>1 g Average</b>	
	835 MHz		6.24	9.57	6.24	9.76	0.00%	1.99%
	1900 MHz		20.9	41.4	20.8	41.2	-0.48%	-0.48%

Note: The forward power is 250mW. Target values are the data of the dipole validation results, please check Annex F for the Dipole Calibration Certificate.

### 7.3 Evaluation of Multi-Batteries

**Table 9: Pretest SAR Values (GSM 1900 MHz Band)**

Limit of SAR (W/kg)	10 g Average	1 g Average
		2.0
Test Case	Measurement Result (W/kg)	
	10 g Average	1 g Average
Right hand, Touch cheek, High frequency (CAB3120000C1)	0.604	1.14
Right hand, Touch cheek, High frequency (CAB3120000C2)	0.542	1.01

**Note:** According to the values in the above table, the battery, CAB3120000C1, is the normal battery. We'll perform the head measurement with this battery and retest on highest value point with others.

**Table 10: Pretest SAR Values (GSM 850 MHz Band-Body)**

Limit of SAR (W/kg)	10 g Average	1 g Average
		2.0
Test Case	Measurement Result (W/kg)	
	10 g Average	1 g Average
Body, Towards Ground, Low frequency (CAB3120000C1)	0.785	1.13
Body, Towards Ground, Low frequency (CAB3120000C2)	0.772	1.11

**Note:** According to the values in the above table, the battery, CAB3120000C1, is the normal battery. We'll perform the body measurement with this battery and retest on highest value point with others.

### 7.4 Summary of Measurement Results

**Table 11: SAR Values (850MHz-Head) - with battery CAB3120000C1**

Limit of SAR (W/kg)	10 g Average	1 g Average	Power Drift (dB)
		2.0	
Test Case	Measurement Result (W/kg)		
	10 g Average	1 g Average	
Left hand, Touch cheek, High frequency (See Fig.1)	0.617	0.840	-0.175
Left hand, Touch cheek, Mid frequency (See Fig.2)	0.597	0.810	0.014
Left hand, Touch cheek, Low frequency (See Fig.3)	0.598	0.808	0.001
Left hand, Tilt 15 Degree, High frequency (See Fig.4)	0.280	0.370	0.034
Left hand, Tilt 15 Degree, Mid frequency (See Fig.5)	0.286	0.378	-0.170
Left hand, Tilt 15 Degree, Low frequency (See Fig.6)	0.288	0.380	0.061
Right hand, Touch cheek, High frequency (See Fig.7)	0.683	0.962	-0.039
Right hand, Touch cheek, Mid frequency (See Fig.8)	0.637	0.896	-0.016

Right hand, Touch cheek, Low frequency (See Fig.9)	0.626	0.877	0.012
Right hand, Tilt 15 Degree, High frequency (See Fig.10)	0.284	0.379	-0.027
Right hand, Tilt 15 Degree, Mid frequency (See Fig.11)	0.290	0.384	0.051
Right hand, Tilt 15 Degree, Low frequency (See Fig.12)	0.287	0.381	-0.065

**Table 12: SAR Values (1900MHz-Head) - with battery CAB3120000C1**

Limit of SAR (W/kg)	10 g Average	1 g Average	Power Drift (dB)
	2.0	1.6	
Test Case	Measurement Result (W/kg)		
	10 g Average	1 g Average	
Left hand, Touch cheek, High frequency (See Fig.13)	0.503	0.877	0.048
Left hand, Touch cheek, Mid frequency (See Fig.14)	0.420	0.745	0.046
Left hand, Touch cheek, Low frequency (See Fig.15)	0.282	0.500	0.070
Left hand, Tilt 15 Degree, High frequency (See Fig.16)	0.140	0.254	0.008
Left hand, Tilt 15 Degree, Mid frequency (See Fig.17)	0.113	0.196	0.101
Left hand, Tilt 15 Degree, Low frequency (See Fig.18)	0.117	0.198	0.006
Right hand, Touch cheek, High frequency (See Fig.19)	0.604	1.14	0.061
Right hand, Touch cheek, Mid frequency (See Fig.20)	0.501	0.959	-0.041
Right hand, Touch cheek, Low frequency (See Fig.21)	0.355	0.674	-0.001
Right hand, Tilt 15 Degree, High frequency (See Fig.22)	0.142	0.234	-0.014
Right hand, Tilt 15 Degree, Mid frequency (See Fig.23)	0.113	0.189	-0.094
Right hand, Tilt 15 Degree, Low frequency(See Fig.24)	0.123	0.200	-0.006

**Table 13: SAR Values (1900MHz-Head) - with battery CAB3120000C2**

Limit of SAR (W/kg)	10 g Average	1 g Average	Power Drift (dB)
	2.0	1.6	
Test Case	Measurement Result (W/kg)		
	10 g Average	1 g Average	
Right hand, Touch cheek, High frequency (See Fig.25)	0.542	1.01	-0.035



**Table 14: SAR Values (850MHz-Body) - with battery CAB3120000C1**

Limit of SAR (W/kg)	10 g Average	1g Average	Power Drift (dB)
	2.0	1.6	
Test Case	Measurement Result (W/kg)		Power Drift (dB)
	10 g Average	1 g Average	
Body, Towards Ground, High frequency with GPRS (See Fig.26)	0.727	1.05	-0.092
Body, Towards Ground, Mid frequency with GPRS (See Fig.27)	0.751	1.09	-0.043
Body, Towards Ground, Low frequency with GPRS (See Fig.28)	0.785	1.13	-0.011
Body, Towards Phantom, High frequency with GPRS (See Fig.29)	0.619	0.876	-0.105
Body, Towards Phantom, Mid frequency with GPRS (See Fig.30)	0.616	0.868	-0.112
Body, Towards Phantom, Low frequency with GPRS (See Fig.31)	0.634	0.891	0.029
Body, Towards Ground, Low frequency with Headset_CCB3160A10C2 (See Fig.32)	0.323	0.465	0.059
Body, Towards Ground, Low frequency with Headset_CCB3160A10C4 (See Fig.33)	0.324	0.471	-0.025

**Table 15: SAR Values (1900MHz-Body) - with battery CAB3120000C1**

Limit of SAR (W/kg)	10 g Average	1g Average	Power Drift (dB)
	2.0	1.6	
Test Case	Measurement Result (W/kg)		Power Drift (dB)
	10 g Average	1 g Average	
Body, Towards Ground, High frequency with GPRS (See Fig.34)	0.430	0.754	0.092
Body, Towards Ground, Mid frequency with GPRS (See Fig.35)	0.458	0.820	0.086
Body, Towards Ground, Low frequency with GPRS (See Fig.36)	0.418	0.749	0.017
Body, Towards Phantom, High frequency with GPRS (See Fig.37)	0.337	0.569	0.112
Body, Towards Phantom, Mid frequency with GPRS (See Fig.38)	0.338	0.578	0.162
Body, Towards Phantom, Low frequency with GPRS (See Fig.39)	0.269	0.463	0.001
Body, Towards Ground, Mid frequency with Headset_CCB3160A10C2 (See Fig.40)	0.172	0.305	0.058
Body, Towards Ground, Mid frequency with Headset_CCB3160A10C4 (See Fig.41)	0.179	0.315	0.040

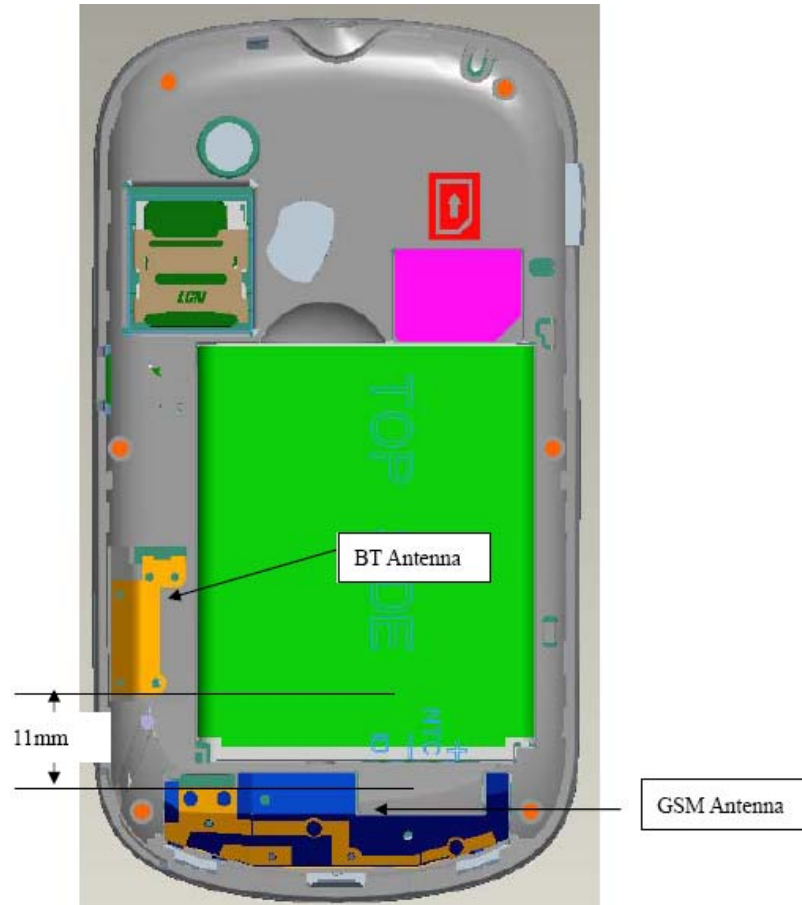


**Table 16: SAR Values (850MHz-Body) - with battery CAB3120000C2**

Limit of SAR (W/kg)	10 g Average	1g Average	Power Drift (dB)
	2.0	1.6	
Test Case	Measurement Result (W/kg)		Power Drift (dB)
	10 g Average	1 g Average	
Body, Towards Ground, Low frequency with GPRS (See Fig.42)	0.772	1.11	-0.038

### 7.5 Summary of Measurement Results (Bluetooth function)

The distance between BT antenna and GSM antenna is <math>< 2.5\text{cm}</math>. The location of the antennas inside mobile phone is shown below:



We can draw the conclusion that: stand-alone SAR and simultaneous transmission SAR are not required for BT transmitter, because The distance between BT antenna and GSM antenna is <math>< 2.5\text{cm}</math> and the 1g SAR of GSM antenna is <math>< 1.2\text{W/kg}</math>.

## 7.6 Conclusion

Localized Specific Absorption Rate (SAR) of this portable wireless device has been measured in all cases requested by the relevant standards cited in Clause 4.2 of this report. Maximum localized SAR is below exposure limits specified in the relevant standards cited in Clause 4.1 of this test report.

The maximum SAR values are obtained at the case of **GSM 1900 Head, Right hand, Touch cheek, High frequency (Table 12)**, and the value are: **0.604(10g), 1.14(1g)**.

## 8 Measurement Uncertainty

No.	Error Description	Type	Uncertainty value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
<b>Measurement system</b>										
1	Probe calibration	B	5.5	N	1	1	1	5.5	5.5	∞
2	Isotropy	B	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
4	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	N	1	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	$\sqrt{3}$	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	$\sqrt{3}$	1	1	0	0	∞
10	RF ambient conditions-reflection	B	0	R	$\sqrt{3}$	1	1	0	0	∞
11	Probe positioned mech. restrictions	B	0.4	R	$\sqrt{3}$	1	1	0.2	0.2	∞
12	Probe positioning with respect to phantom shell	B	2.9	R	$\sqrt{3}$	1	1	1.7	1.7	∞
13	Post-processing	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
<b>Test sample related</b>										
14	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	71
15	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
16	Drift of output power	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
<b>Phantom and set-up</b>										
17	Phantom uncertainty	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
18	Liquid conductivity	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞

	(target)									
19	Liquid conductivity (meas.)	A	2.06	N	1	0.64	0.43	1.32	0.89	43
20	Liquid permittivity (target)	B	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	$\infty$
21	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521
Combined standard uncertainty		$u_c = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$						9.25	9.12	257
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$						18.5	18.2	

## 9 MAIN TEST INSTRUMENTS

Table 17: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	HP 8753E	US38433212	August 4,2010	One year
02	Power meter	NRVD	102083	September 11, 2010	One year
03	Power sensor	NRV-Z5	100542		
04	Signal Generator	E4438C	MY49070393	November 13, 2010	One Year
05	Amplifier	VTL5400	0505	No Calibration Requested	
06	BTS	8960	MY48365192	November 18, 2010	One year
07	E-field Probe	SPEAG ES3DV3	3149	September 25, 2010	One year
08	DAE	SPEAG DAE4	771	November 21, 2010	One year
09	Dipole Validation Kit	SPEAG D835V2	443	February 26, 2010	Two years
10	Dipole Validation Kit	SPEAG D1900V2	541	February 26, 2010	Two years

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

## ANNEX A MEASUREMENT PROCESS

The evaluation was performed with the following procedure:

Step 1: Measurement of the SAR value at a fixed location above the reference point was measured and was used as a reference value for assessing the power drop.

Step 2: The SAR distribution at the exposed side of the phantom was measured at a distance of 3.9 mm from the inner surface of the shell. The area covered the entire dimension of the flat phantom and the horizontal grid spacing was 10 mm x 10 mm. Based on this data, the area of the maximum absorption was determined by spline interpolation.

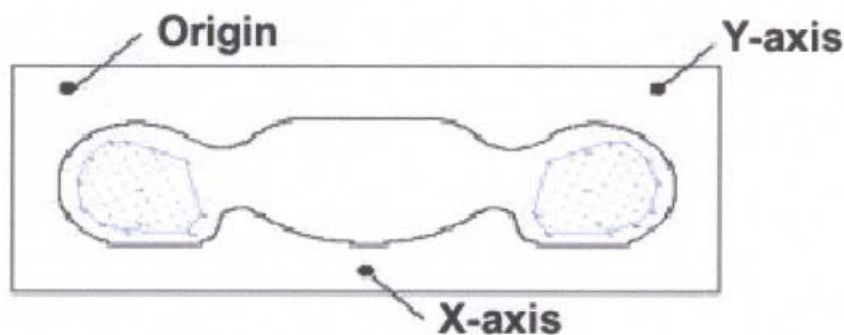
Step 3: Around this point, a volume of 30 mm x 30 mm x 30 mm was assessed by measuring 7 x 7x 7 points. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

a. The data at the surface were extrapolated, since the center of the dipoles is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2 mm. The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.

b. The maximum interpolated value was searched with a straightforward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1g or 10g) were computed using the 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the "Not a knot"-condition (in x ~ y and z-directions). The volume was integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the average.

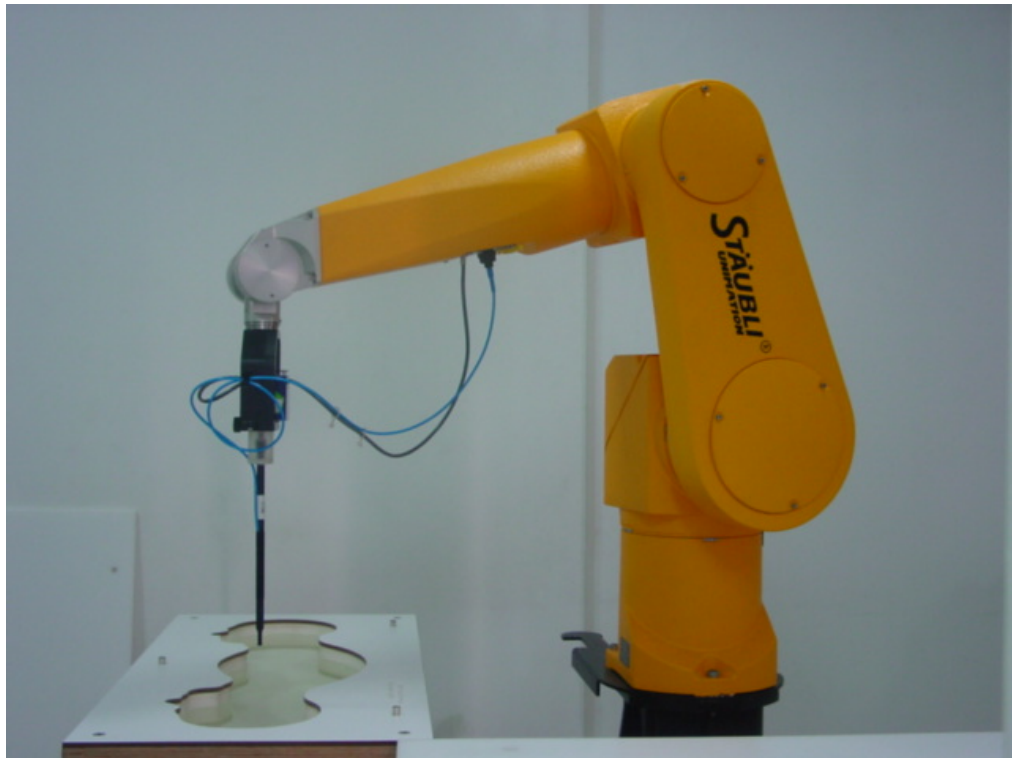
c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

Step 4: Re-measurement the SAR value at the same location as in Step 1. If the value changed by more than 5%, the evaluation is repeated.

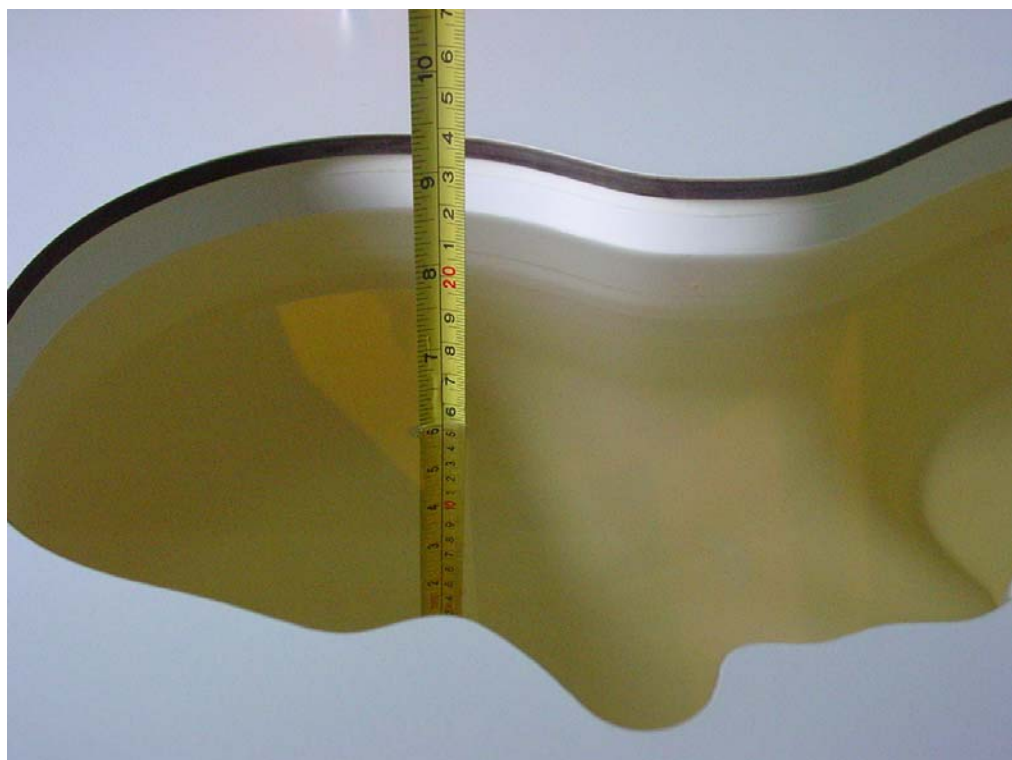


Picture A: SAR Measurement Points in Area Scan

## ANNEX B TEST LAYOUT



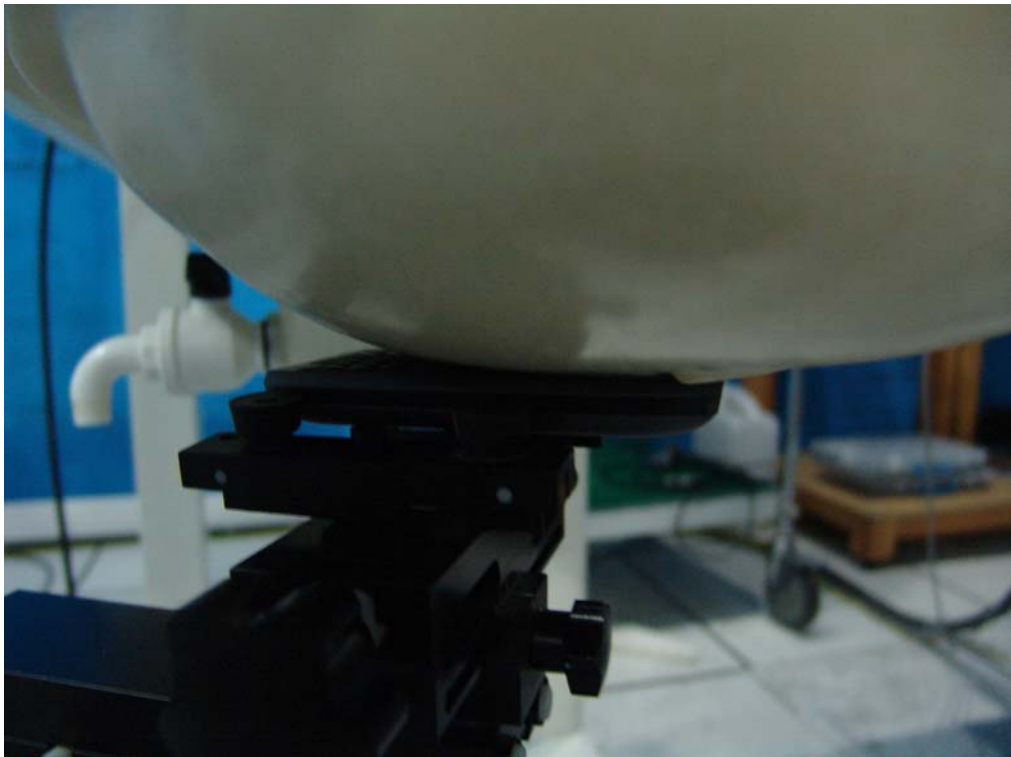
Picture B1: Specific Absorption Rate Test Layout



Picture B2: Liquid depth in the Flat Phantom (850 MHz)



**Picture B3 Liquid depth in the Flat Phantom (1900MHz)**



**Picture B4: Left Hand Touch Cheek Position**





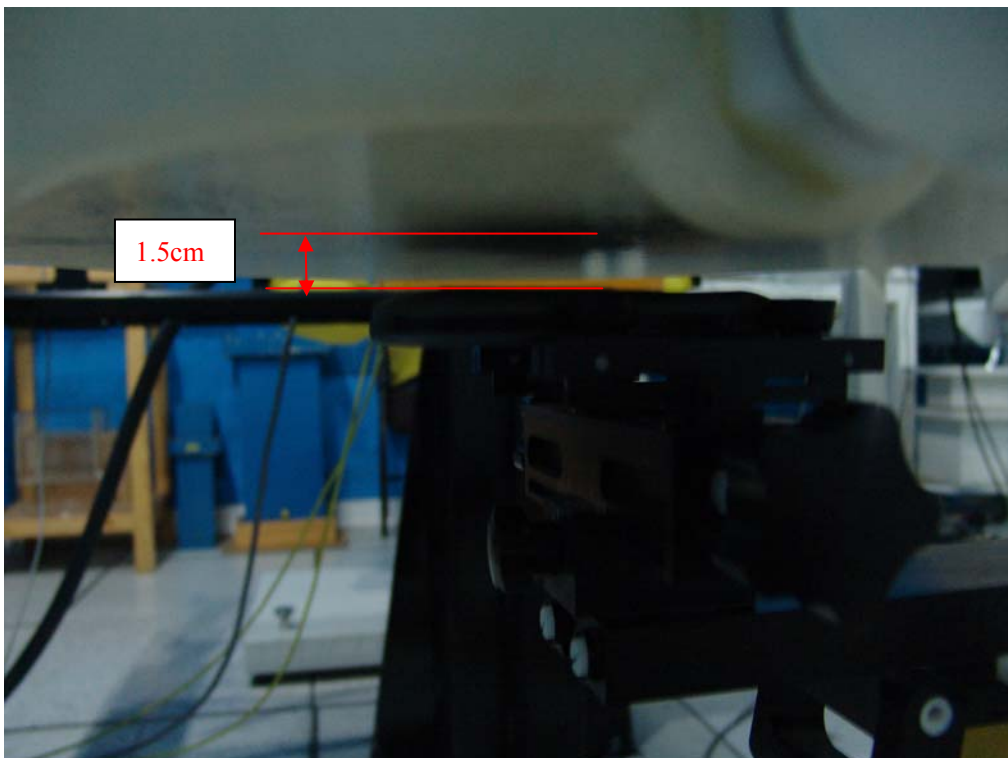
**Picture B5: Left Hand Tilt 15° Position**



**Picture B6: Right Hand Touch Cheek Position**

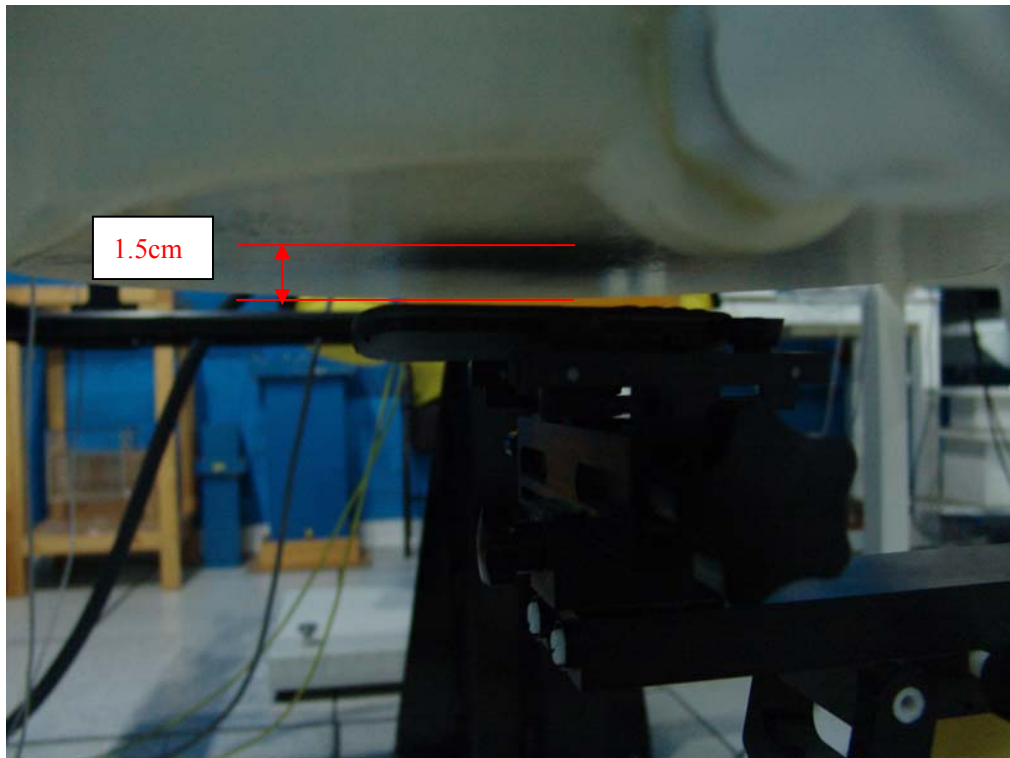


**Picture B7: Right Hand Tilt 15° Position**

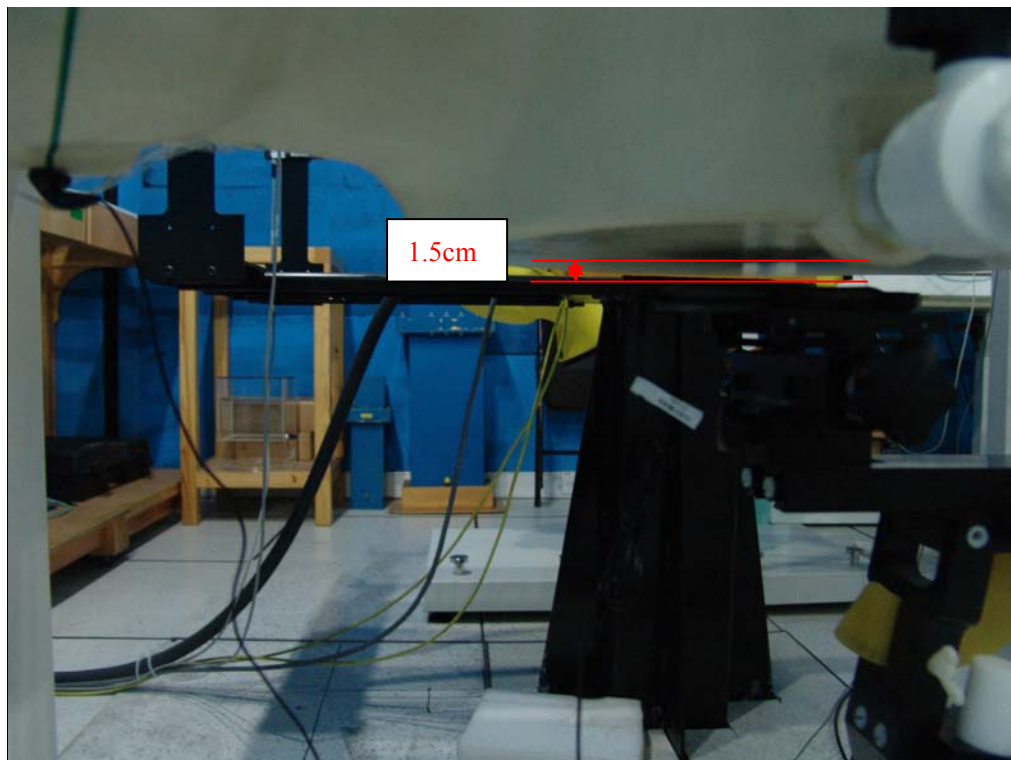


**Picture B8: Body-worn Position (towards ground, the distance from handset to the bottom of the Phantom is 1.5cm)**





**Picture B9: Body-worn Position (towards phantom, the distance from handset to the bottom of the Phantom is 1.5cm)**



**Picture B10: Body-worn Position with Headset (towards ground, the distance from handset to the bottom of the Phantom is 1.5cm)**

## ANNEX C GRAPH RESULTS

### 850 Left Cheek High

Date/Time: 2011-6-1 14:12:26

Electronics: DAE4 Sn771

Medium: Head 850 MHz

Medium parameters used (interpolated):  $f = 848.8$  MHz;  $\sigma = 0.93$  mho/m;  $\epsilon_r = 41.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

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

Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

**Cheek Middle/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

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

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

Reference Value = 10.3 V/m; Power Drift = -0.175 dB

Peak SAR (extrapolated) = 1.08 W/kg

**SAR(1 g) = 0.840 mW/g; SAR(10 g) = 0.617 mW/g**

Maximum value of SAR (measured) = 0.883 mW/g

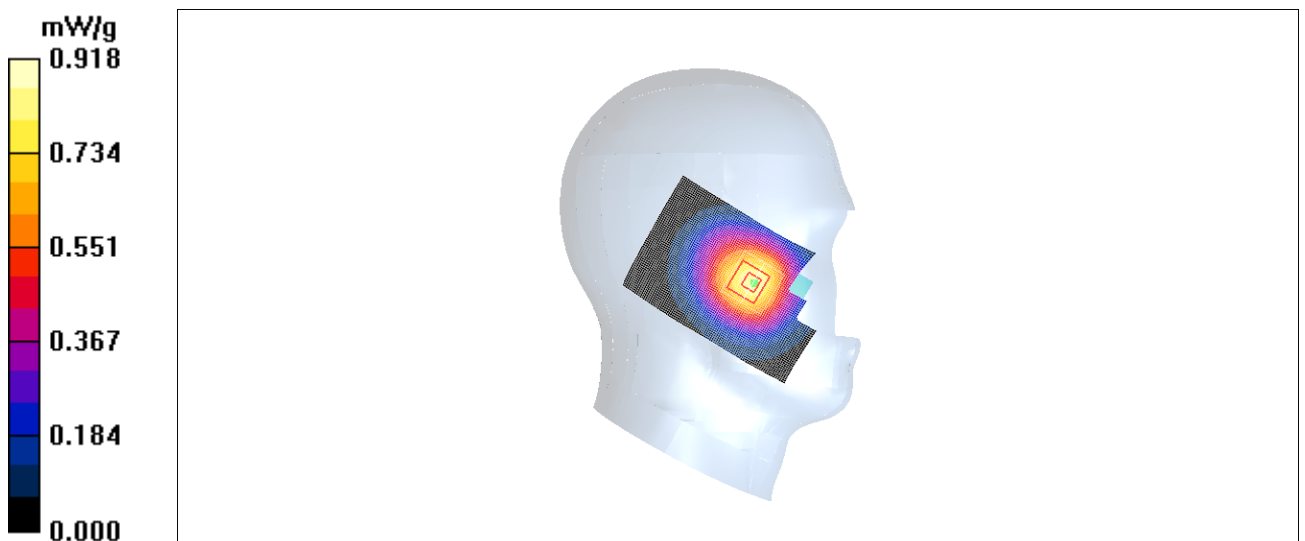


Fig. 1 850MHz CH251

**850 Left Cheek Middle**

Date/Time: 2011-6-1 14:26:47

Electronics: DAE4 Sn771

Medium: Head 850 MHz

Medium parameters used (interpolated):  $f = 836.6$  MHz;  $\sigma = 0.918$  mho/m;  $\epsilon_r = 41.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

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

Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

**Cheek Middle/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.860 mW/g

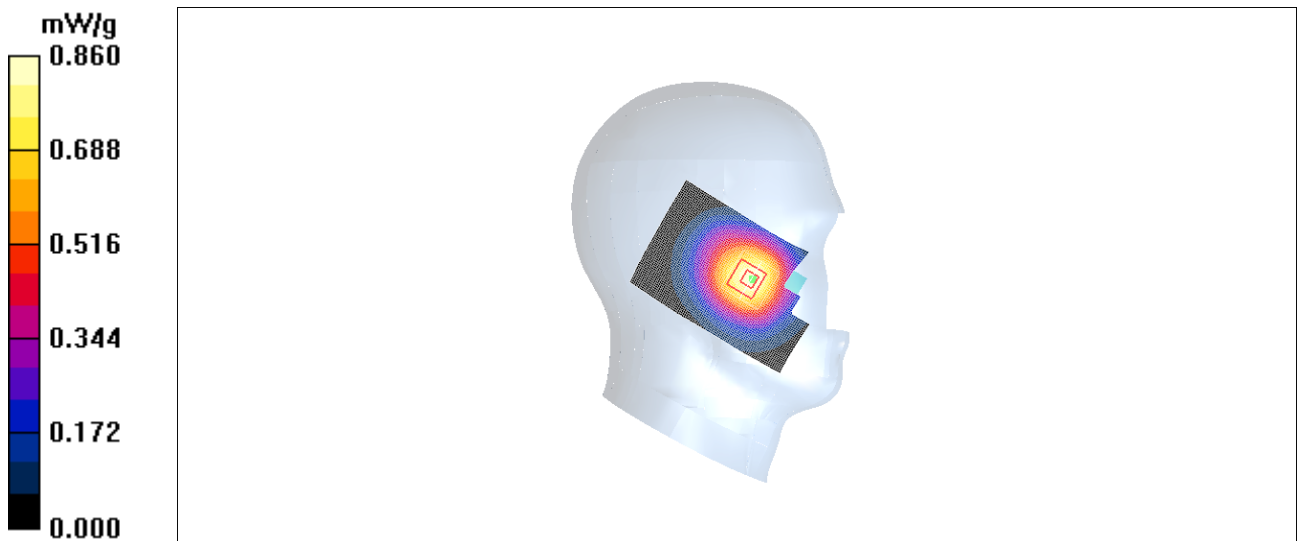
**Cheek Middle/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.0 V/m; Power Drift = 0.014 dB

Peak SAR (extrapolated) = 1.04 W/kg

**SAR(1 g) = 0.810 mW/g; SAR(10 g) = 0.597 mW/g**

Maximum value of SAR (measured) = 0.861 mW/g



**Fig. 2 850 MHz CH190**

### 850 Left Cheek Low

Date/Time: 2011-6-1 14:41:04

Electronics: DAE4 Sn771

Medium: Head 850 MHz

Medium parameters used:  $f = 825$  MHz;  $\sigma = 0.906$  mho/m;  $\epsilon_r = 41.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

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

Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

**Cheek Low/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.861 mW/g

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

Reference Value = 10.1 V/m; Power Drift = 0.001 dB

Peak SAR (extrapolated) = 1.03 W/kg

**SAR(1 g) = 0.808 mW/g; SAR(10 g) = 0.598 mW/g**

Maximum value of SAR (measured) = 0.854 mW/g

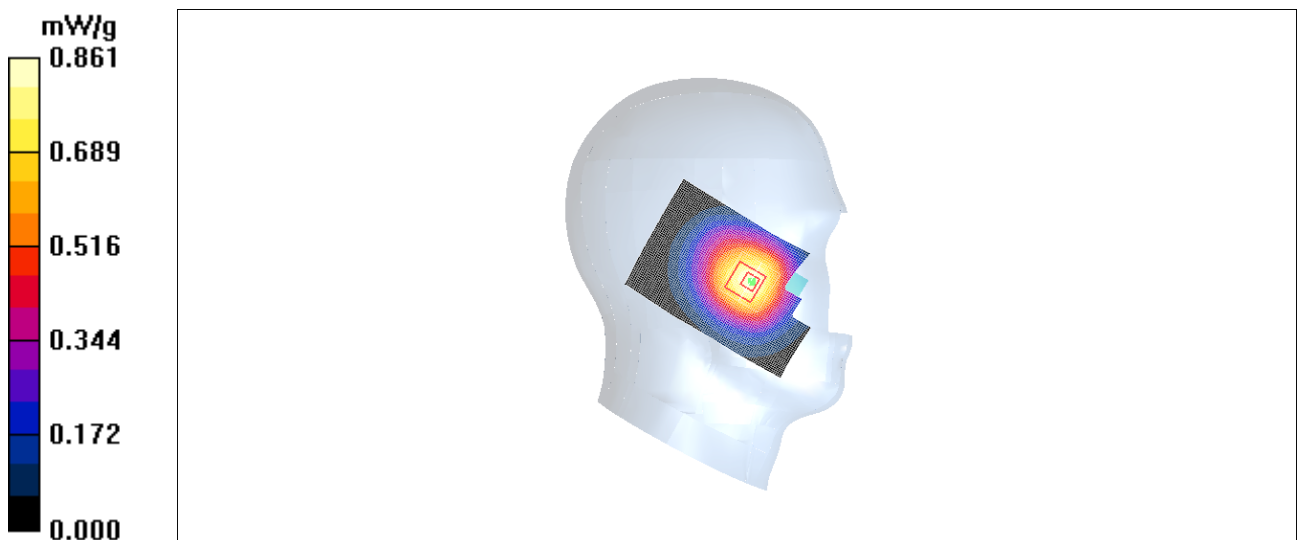


Fig. 3 850 MHz CH128

### 850 Left Tilt High

Date/Time: 2011-6-1 14:55:41

Electronics: DAE4 Sn771

Medium: Head 850 MHz

Medium parameters used (interpolated):  $f = 848.8$  MHz;  $\sigma = 0.93$  mho/m;  $\epsilon_r = 41.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

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

Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

**Tilt High/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.395 mW/g

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

Reference Value = 13.9 V/m; Power Drift = 0.034 dB

Peak SAR (extrapolated) = 0.455 W/kg

**SAR(1 g) = 0.370 mW/g; SAR(10 g) = 0.280 mW/g**

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

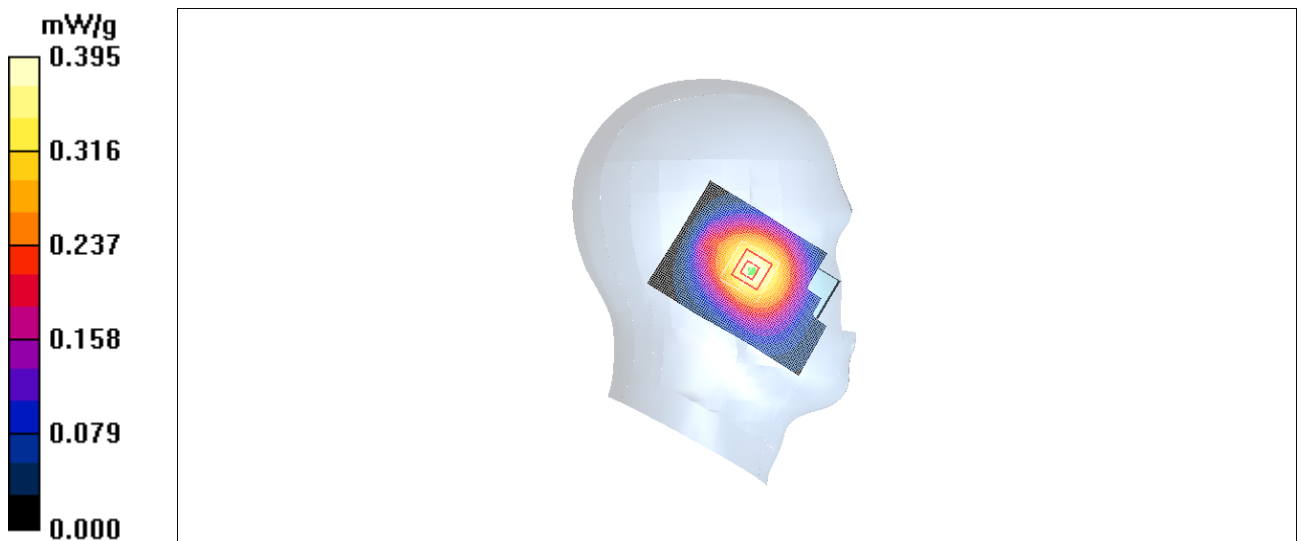


Fig.4 850 MHz CH251

**850 Left Tilt Middle**

Date/Time: 2011-6-1 15:09:58

Electronics: DAE4 Sn771

Medium: Head 850 MHz

Medium parameters used (interpolated):  $f = 836.6$  MHz;  $\sigma = 0.918$  mho/m;  $\epsilon_r = 41.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

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

Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

**Tilt Middle/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.402 mW/g

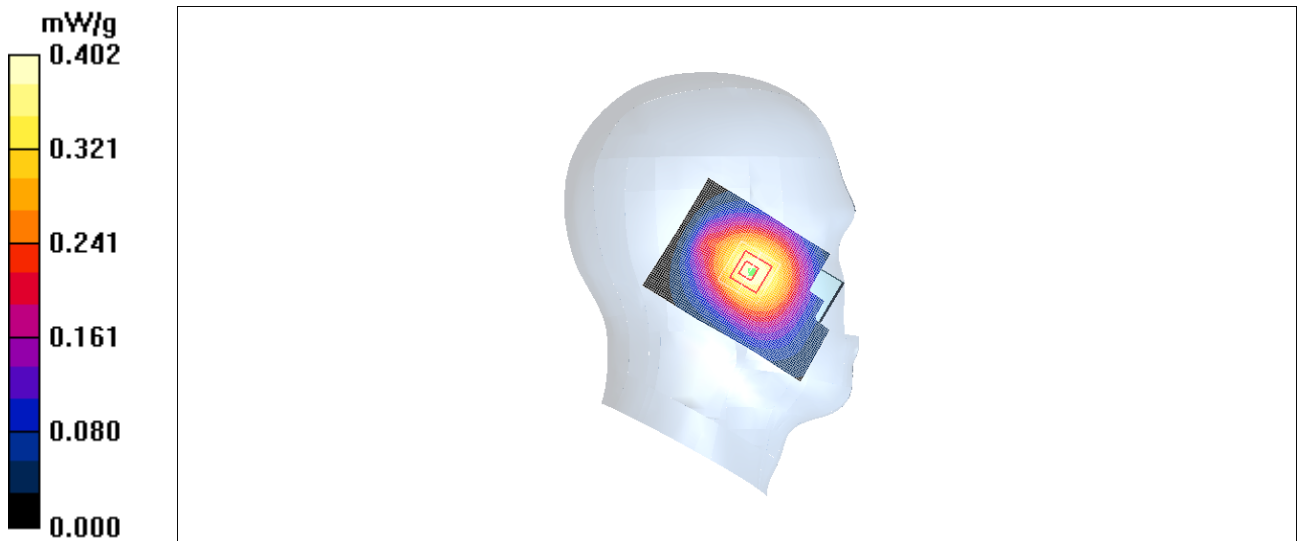
**Tilt Middle/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 14.3 V/m; Power Drift = -0.170 dB

Peak SAR (extrapolated) = 0.465 W/kg

**SAR(1 g) = 0.378 mW/g; SAR(10 g) = 0.286 mW/g**

Maximum value of SAR (measured) = 0.398 mW/g



**Fig.5 850 MHz CH190**

**850 Left Tilt Low**

Date/Time: 2011-6-1 15:24:20

Electronics: DAE4 Sn771

Medium: Head 850 MHz

Medium parameters used:  $f = 825 \text{ MHz}$ ;  $\sigma = 0.906 \text{ mho/m}$ ;  $\epsilon_r = 41.8$ ;  $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature:  $23.0^\circ\text{C}$       Liquid Temperature:  $22.5^\circ\text{C}$

Communication System: GSM 850 Frequency:  $824.2 \text{ MHz}$  Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

**Tilt Low/Area Scan (61x91x1):** Measurement grid:  $dx=10\text{mm}$ ,  $dy=10\text{mm}$

Maximum value of SAR (interpolated) =  $0.400 \text{ mW/g}$

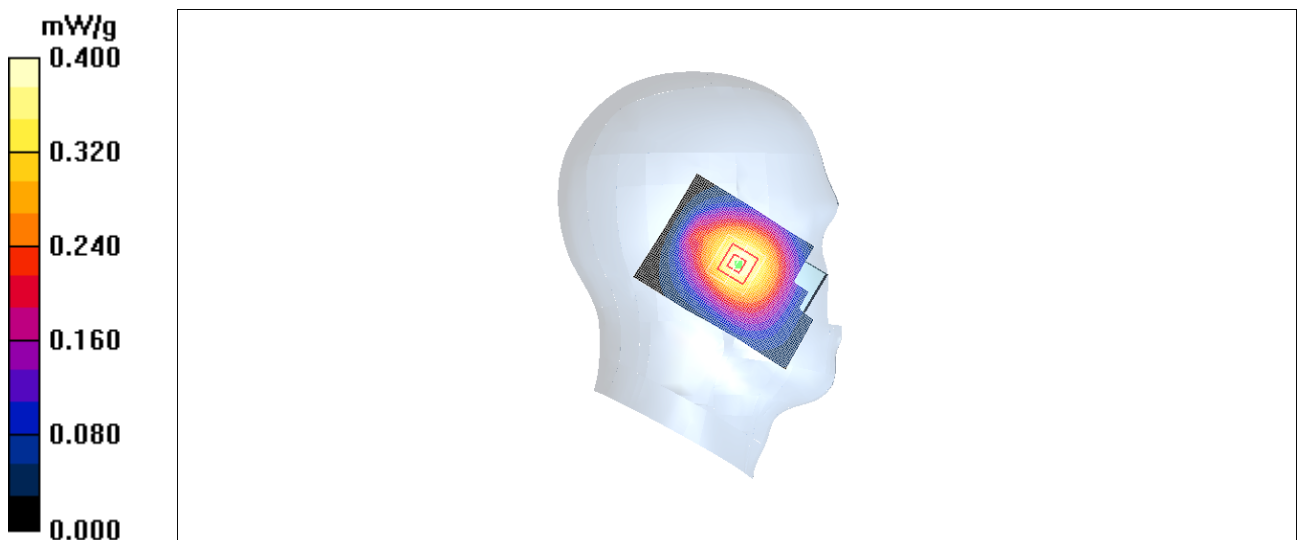
**Tilt Low/Zoom Scan (7x7x7)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value =  $14.3 \text{ V/m}$ ; Power Drift =  $0.061 \text{ dB}$

Peak SAR (extrapolated) =  $0.467 \text{ W/kg}$

**SAR(1 g) =  $0.380 \text{ mW/g}$ ; SAR(10 g) =  $0.288 \text{ mW/g}$**

Maximum value of SAR (measured) =  $0.400 \text{ mW/g}$



**Fig. 6 850 MHz CH128**

### 850 Right Cheek High

Date/Time: 2011-6-1 15:39:01

Electronics: DAE4 Sn771

Medium: Head 850 MHz

Medium parameters used (interpolated):  $f = 848.8$  MHz;  $\sigma = 0.93$  mho/m;  $\epsilon_r = 41.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

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

Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

**Cheek High/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

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

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

Reference Value = 11.2 V/m; Power Drift = -0.039 dB

Peak SAR (extrapolated) = 1.48 W/kg

**SAR(1 g) = 0.962 mW/g; SAR(10 g) = 0.683 mW/g**

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

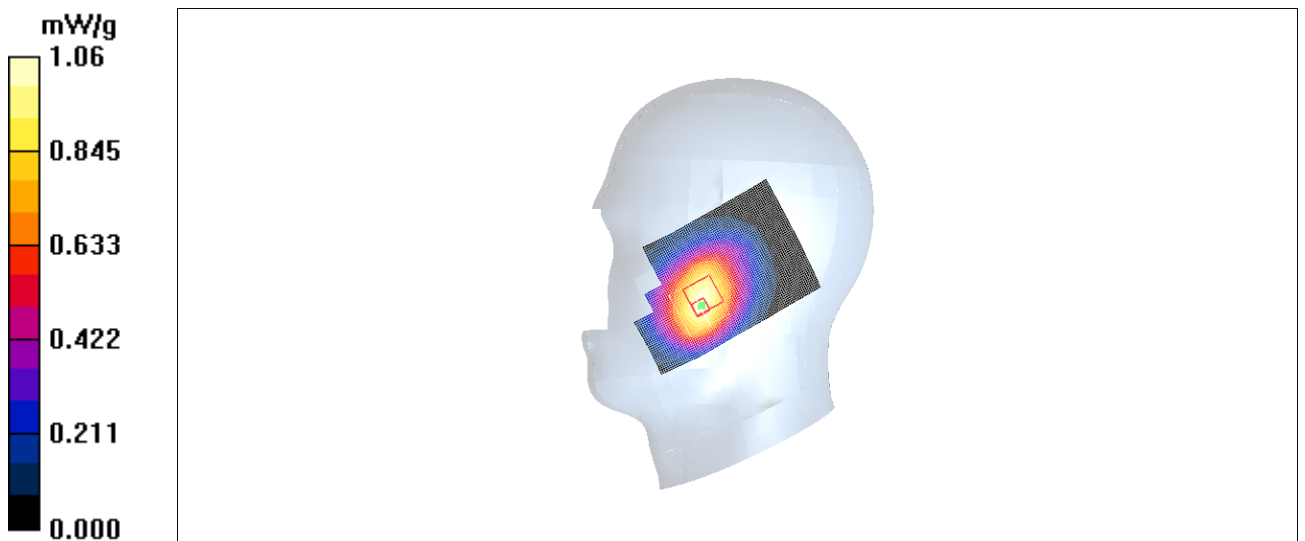
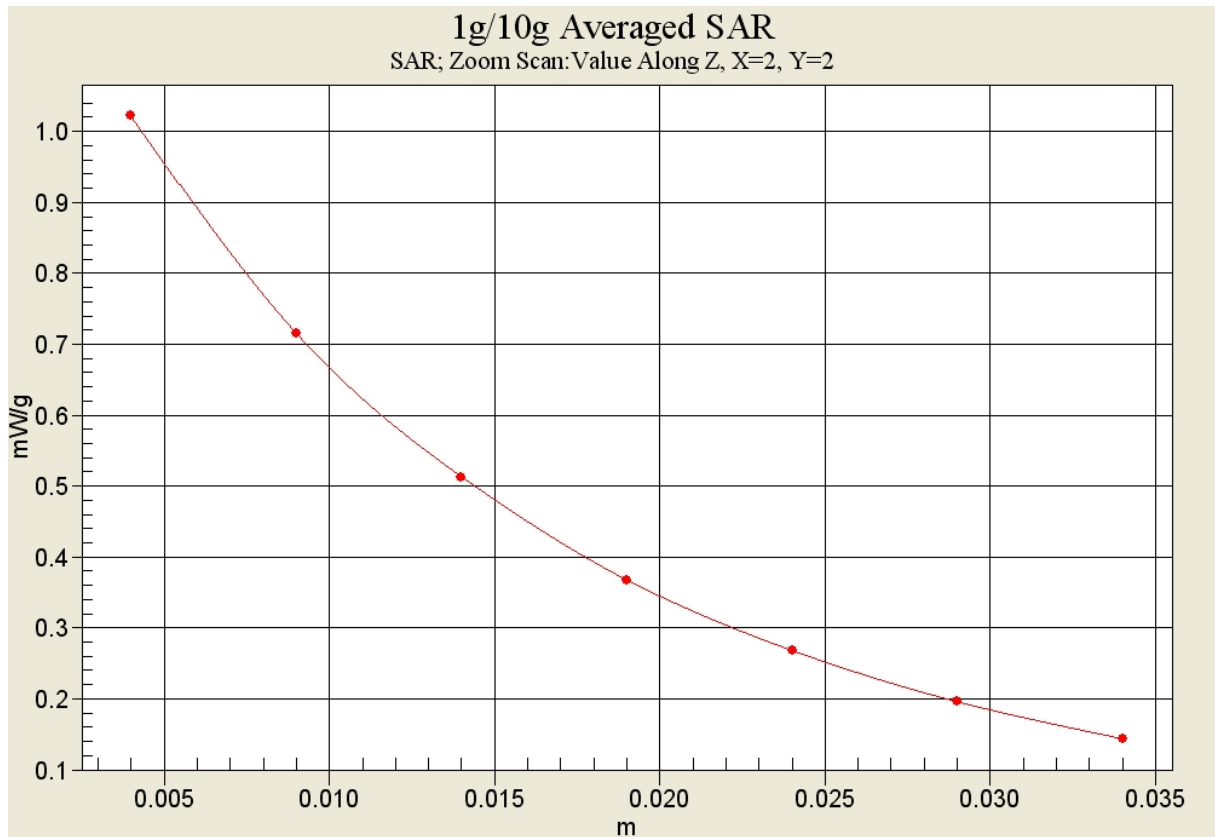


Fig. 7 850 MHz CH251





**Fig. 7-1 Z-Scan at power reference point (850 MHz CH251)**

### 850 Right Cheek Middle

Date/Time: 2011-6-1 15:53:22

Electronics: DAE4 Sn771

Medium: Head 850 MHz

Medium parameters used (interpolated):  $f = 836.6$  MHz;  $\sigma = 0.918$  mho/m;  $\epsilon_r = 41.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

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

Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

**Cheek Middle/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.976 mW/g

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

Reference Value = 9.76 V/m; Power Drift = -0.016 dB

Peak SAR (extrapolated) = 1.33 W/kg

**SAR(1 g) = 0.896 mW/g; SAR(10 g) = 0.637 mW/g**

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

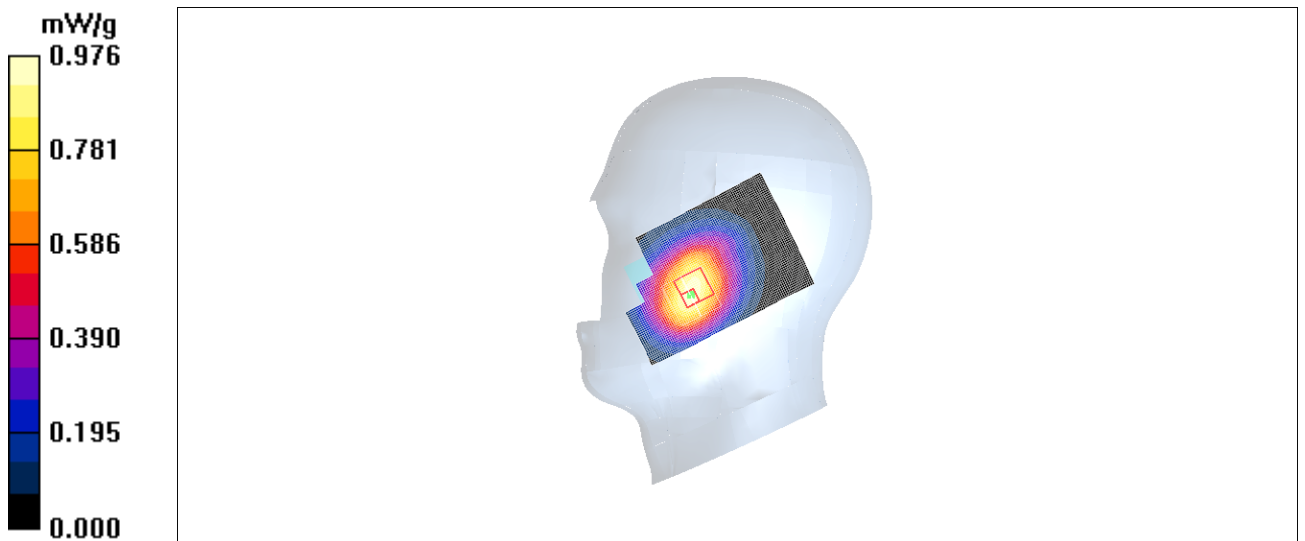


Fig. 8 850 MHz CH190

**850 Right Cheek Low**

Date/Time: 2011-6-1 16:07:43

Electronics: DAE4 Sn771

Medium: Head 850 MHz

Medium parameters used:  $f = 825 \text{ MHz}$ ;  $\sigma = 0.906 \text{ mho/m}$ ;  $\epsilon_r = 41.8$ ;  $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature:  $23.0^\circ\text{C}$       Liquid Temperature:  $22.5^\circ\text{C}$

Communication System: GSM 850 Frequency:  $824.2 \text{ MHz}$  Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

**Cheek Low/Area Scan (61x91x1):** Measurement grid:  $dx=10\text{mm}$ ,  $dy=10\text{mm}$

Maximum value of SAR (interpolated) =  $0.955 \text{ mW/g}$

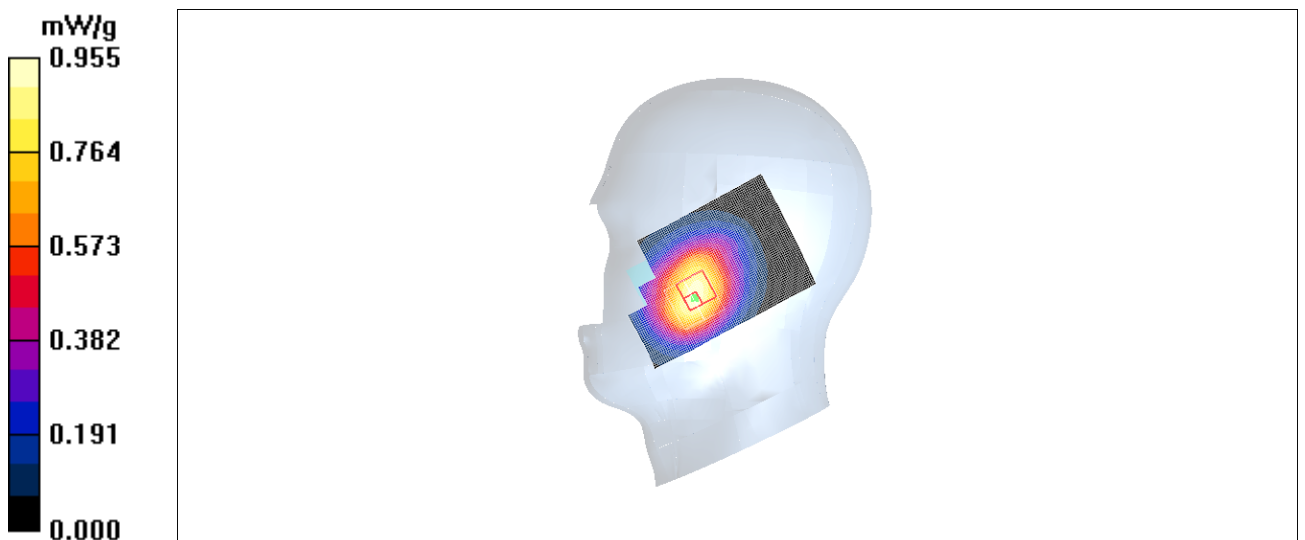
**Cheek Low/Zoom Scan (7x7x7)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value =  $9.72 \text{ V/m}$ ; Power Drift =  $0.012 \text{ dB}$

Peak SAR (extrapolated) =  $1.32 \text{ W/kg}$

**SAR(1 g) =  $0.877 \text{ mW/g}$ ; SAR(10 g) =  $0.626 \text{ mW/g}$**

Maximum value of SAR (measured) =  $0.926 \text{ mW/g}$



**Fig. 9    850 MHz CH128**

### 850 Right Tilt High

Date/Time: 2011-6-1 16:22:05

Electronics: DAE4 Sn771

Medium: Head 850 MHz

Medium parameters used (interpolated):  $f = 848.8$  MHz;  $\sigma = 0.93$  mho/m;  $\epsilon_r = 41.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

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

Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

**Tilt High/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.402 mW/g

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

Reference Value = 10.7 V/m; Power Drift = -0.027 dB

Peak SAR (extrapolated) = 0.466 W/kg

**SAR(1 g) = 0.379 mW/g; SAR(10 g) = 0.284 mW/g**

Maximum value of SAR (measured) = 0.399 mW/g

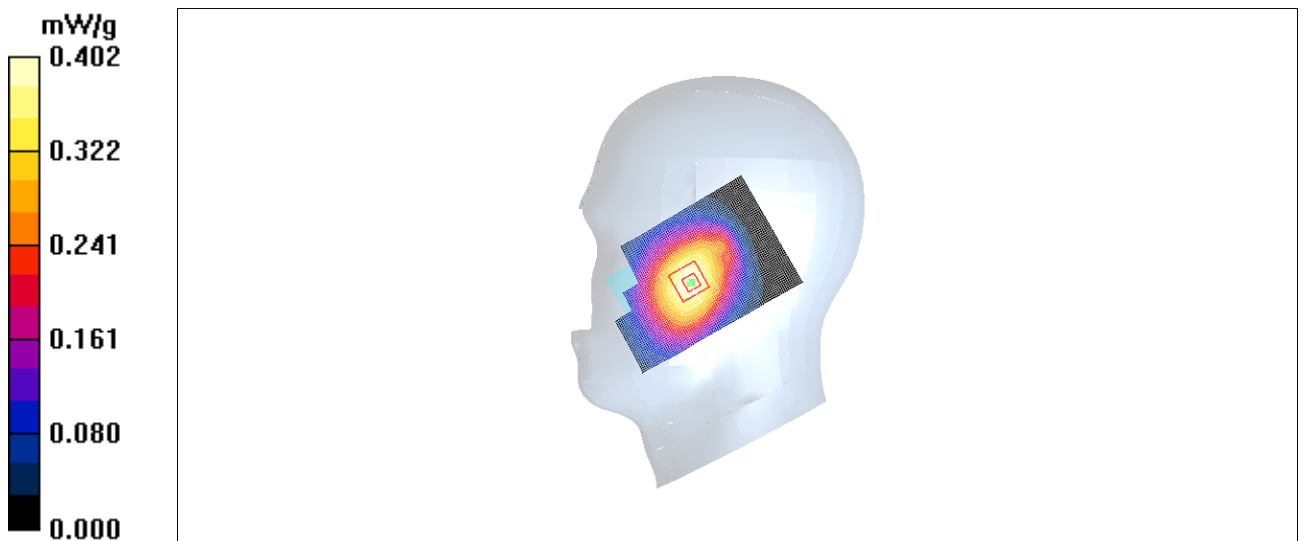


Fig.10 850 MHz CH251

### 850 Right Tilt Middle

Date/Time: 2011-6-1 16:36:23

Electronics: DAE4 Sn771

Medium: Head 850 MHz

Medium parameters used (interpolated):  $f = 836.6$  MHz;  $\sigma = 0.918$  mho/m;  $\epsilon_r = 41.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

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

Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

**Tilt Middle/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

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

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

Reference Value = 10.9 V/m; Power Drift = 0.051 dB

Peak SAR (extrapolated) = 0.469 W/kg

**SAR(1 g) = 0.384 mW/g; SAR(10 g) = 0.290 mW/g**

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

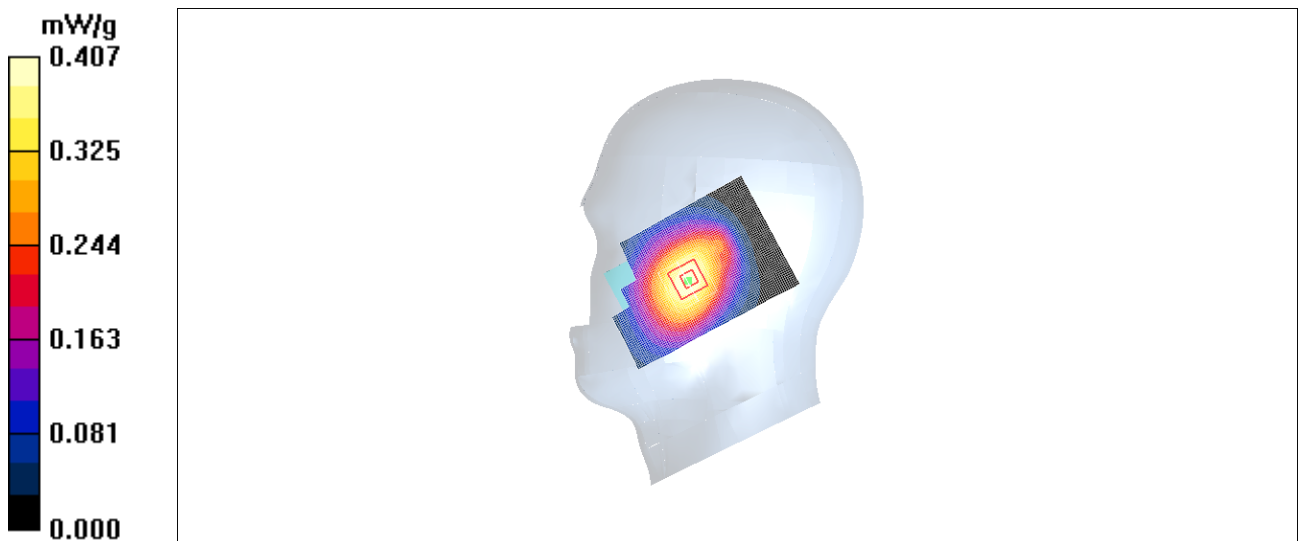


Fig.11 850 MHz CH190

### 850 Right Tilt Low

Date/Time: 2011-6-1 16:50:42

Electronics: DAE4 Sn771

Medium: Head 850 MHz

Medium parameters used:  $f = 825$  MHz;  $\sigma = 0.906$  mho/m;  $\epsilon_r = 41.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

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

Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

**Tilt Low/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.397 mW/g

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

Reference Value = 11.2 V/m; Power Drift = -0.065 dB

Peak SAR (extrapolated) = 0.474 W/kg

**SAR(1 g) = 0.381 mW/g; SAR(10 g) = 0.287 mW/g**

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

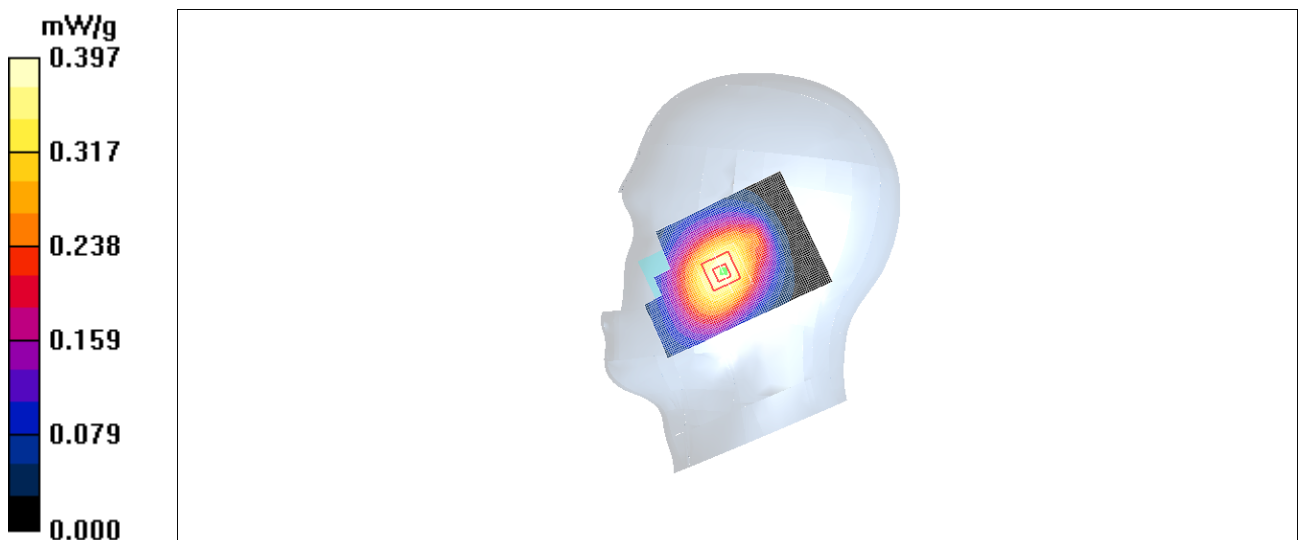


Fig. 12 850 MHz CH128

**1900 Left Cheek High**

Date/Time: 2011-6-2 14:09:23

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used:  $f = 1910$  MHz;  $\sigma = 1.43$  mho/m;  $\epsilon_r = 40.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

Communication System: GSM 1900MHz Frequency: 1909.8 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

**Cheek High/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.977 mW/g

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

Reference Value = 9.45 V/m; Power Drift = 0.048 dB

Peak SAR (extrapolated) = 1.42 W/kg

**SAR(1 g) = 0.877 mW/g; SAR(10 g) = 0.503 mW/g**

Maximum value of SAR (measured) = 0.961 mW/g

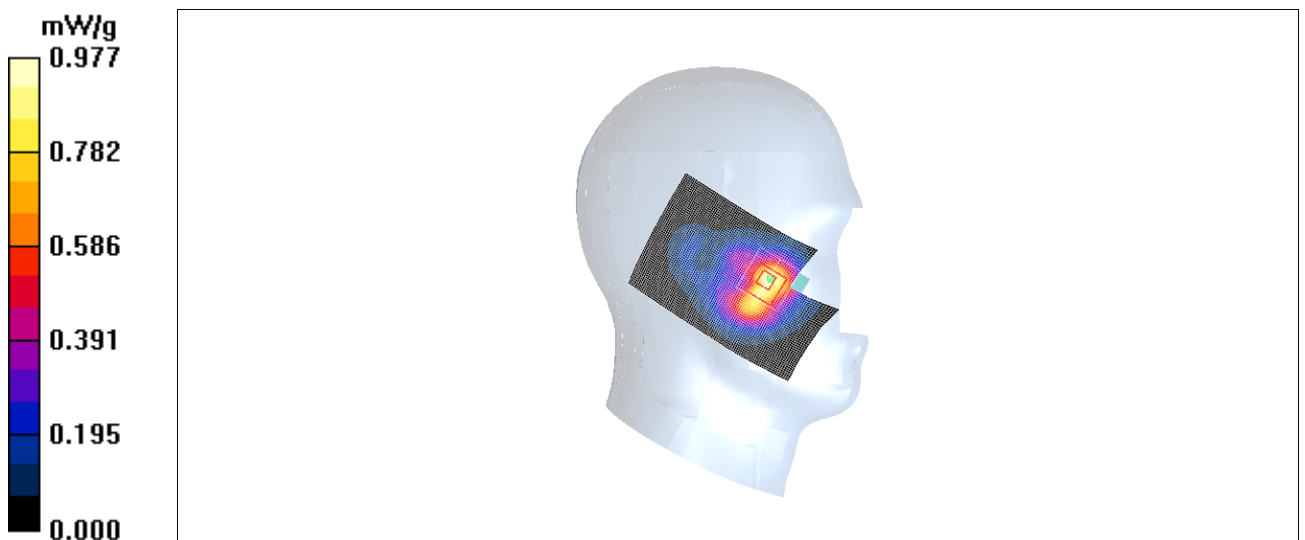


Fig. 13 1900 MHz CH810

**1900 Left Cheek Middle**

Date/Time: 2011-6-2 14:23:51

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.41$  mho/m;  $\epsilon_r = 40.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

Communication System: GSM 1900MHz Frequency: 1880 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

**Cheek Middle/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.840 mW/g

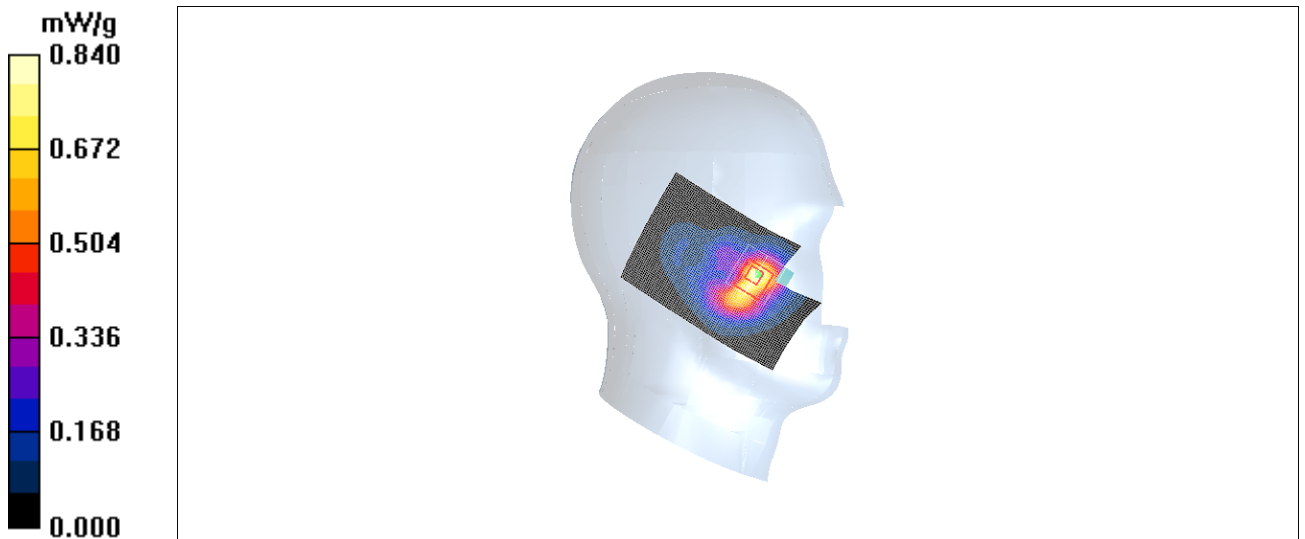
**Cheek Middle/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.13 V/m; Power Drift = 0.046 dB

Peak SAR (extrapolated) = 1.23 W/kg

**SAR(1 g) = 0.745 mW/g; SAR(10 g) = 0.420 mW/g**

Maximum value of SAR (measured) = 0.824 mW/g



**Fig. 14 1900 MHz CH661**



**1900 Left Cheek Low**

Date/Time: 2011-6-2 14:38:13

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.38$  mho/m;  $\epsilon_r = 40.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

Communication System: GSM 1900MHz Frequency: 1850.2 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

**Cheek Low/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.541 mW/g

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

Reference Value = 8.59 V/m; Power Drift = 0.070 dB

Peak SAR (extrapolated) = 0.849 W/kg

**SAR(1 g) = 0.500 mW/g; SAR(10 g) = 0.282 mW/g**

Maximum value of SAR (measured) = 0.554 mW/g

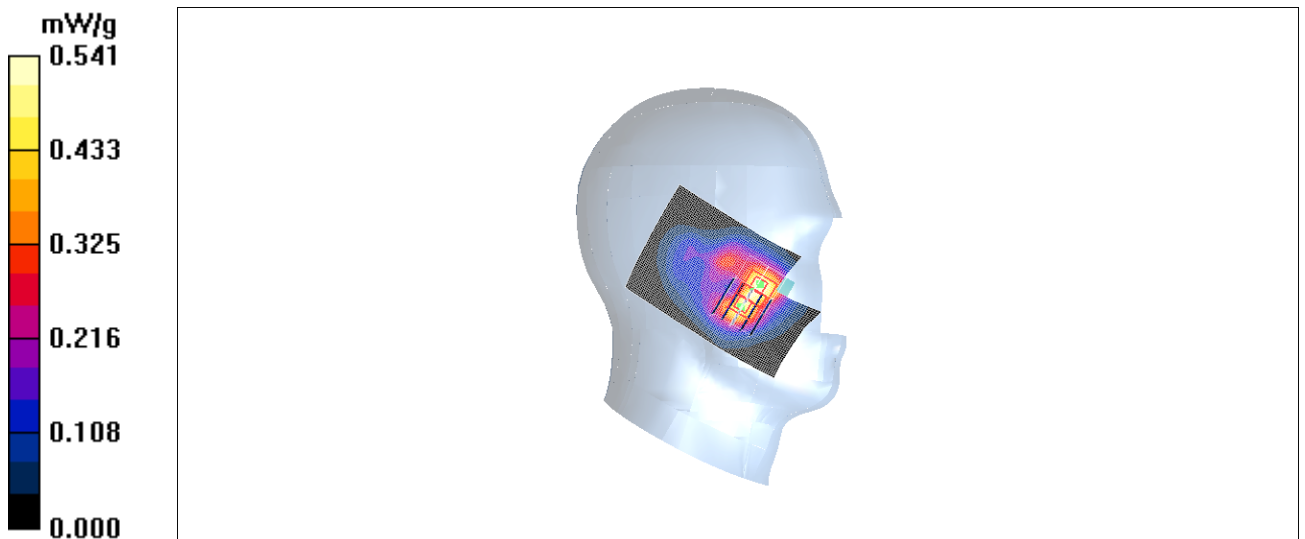
**Cheek Low/Zoom Scan (7x7x7)/Cube 1:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.59 V/m; Power Drift = 0.070 dB

Peak SAR (extrapolated) = 0.799 W/kg

**SAR(1 g) = 0.457 mW/g; SAR(10 g) = 0.274 mW/g**

Maximum value of SAR (measured) = 0.514 mW/g



**Fig. 15 1900 MHz CH512**

**1900 Left Tilt High**

Date/Time: 2011-6-2 14:52:47

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used:  $f = 1910$  MHz;  $\sigma = 1.43$  mho/m;  $\epsilon_r = 40.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

Communication System: GSM 1900MHz Frequency: 1909.8 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

**Tilt High/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.279 mW/g

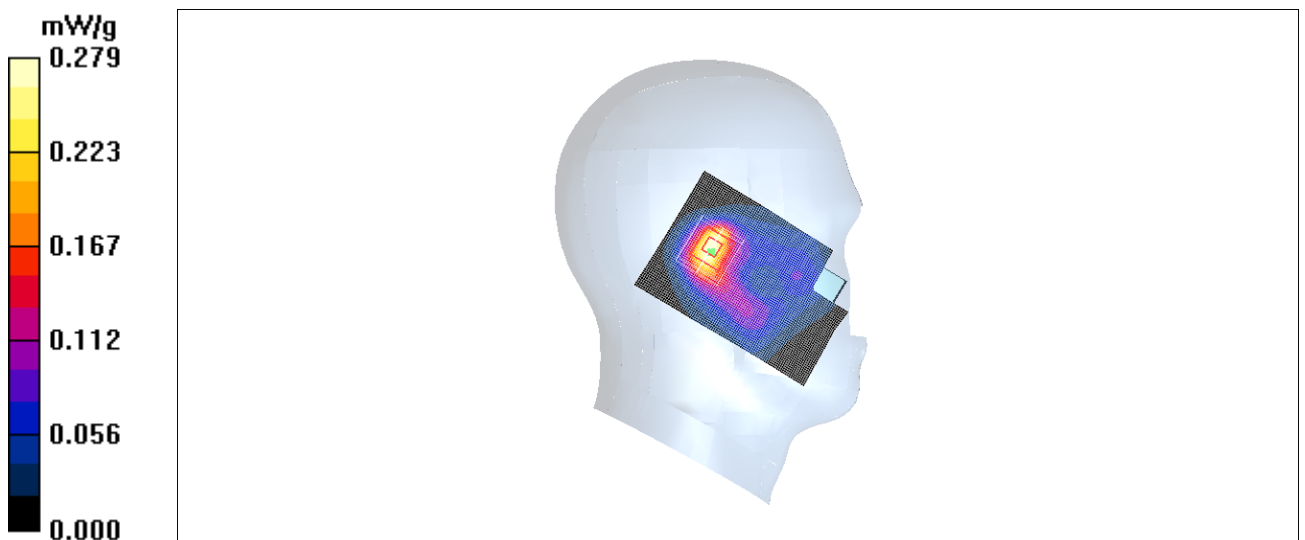
**Tilt High/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.3 V/m; Power Drift = 0.008 dB

Peak SAR (extrapolated) = 0.435 W/kg

**SAR(1 g) = 0.254 mW/g; SAR(10 g) = 0.140 mW/g**

Maximum value of SAR (measured) = 0.277 mW/g



**Fig.16 1900 MHz CH810**

**1900 Left Tilt Middle**

Date/Time: 2011-6-2 15:07:11

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.41$  mho/m;  $\epsilon_r = 40.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

Communication System: GSM 1900MHz Frequency: 1880 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

**Tilt Middle/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.225 mW/g

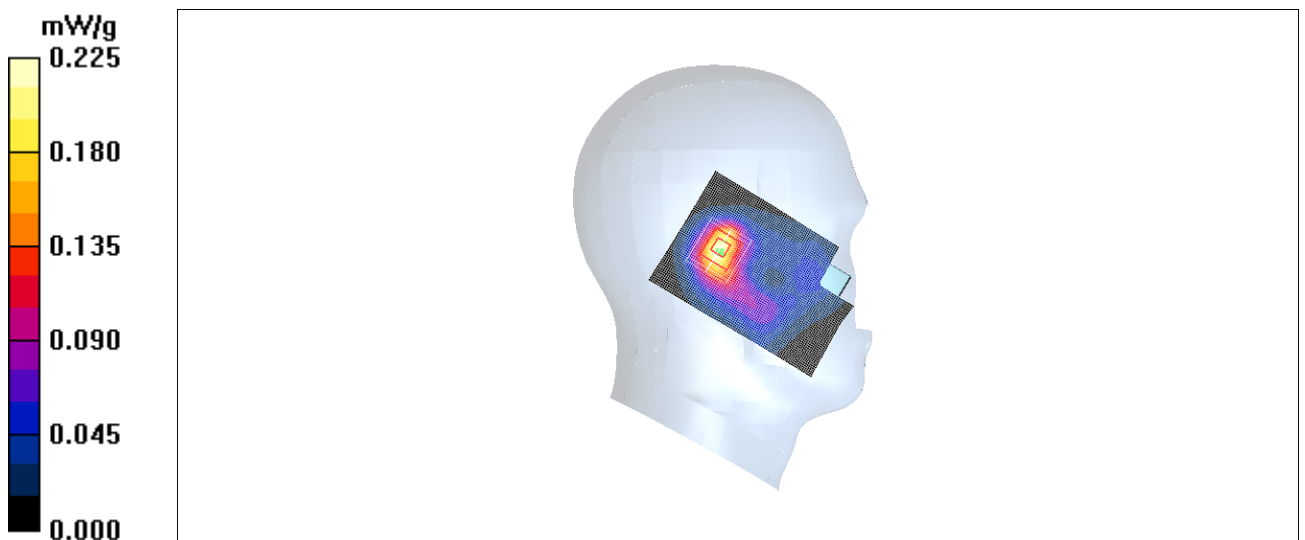
**Tilt Middle/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.66 V/m; Power Drift = 0.101 dB

Peak SAR (extrapolated) = 0.325 W/kg

**SAR(1 g) = 0.196 mW/g; SAR(10 g) = 0.113 mW/g**

Maximum value of SAR (measured) = 0.215 mW/g



**Fig. 17 1900 MHz CH661**

**1900 Left Tilt Low**

Date/Time: 2011-6-2 15:21:30

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.38$  mho/m;  $\epsilon_r = 40.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

Communication System: GSM 1900MHz Frequency: 1850.2 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

**Tilt Low/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.215 mW/g

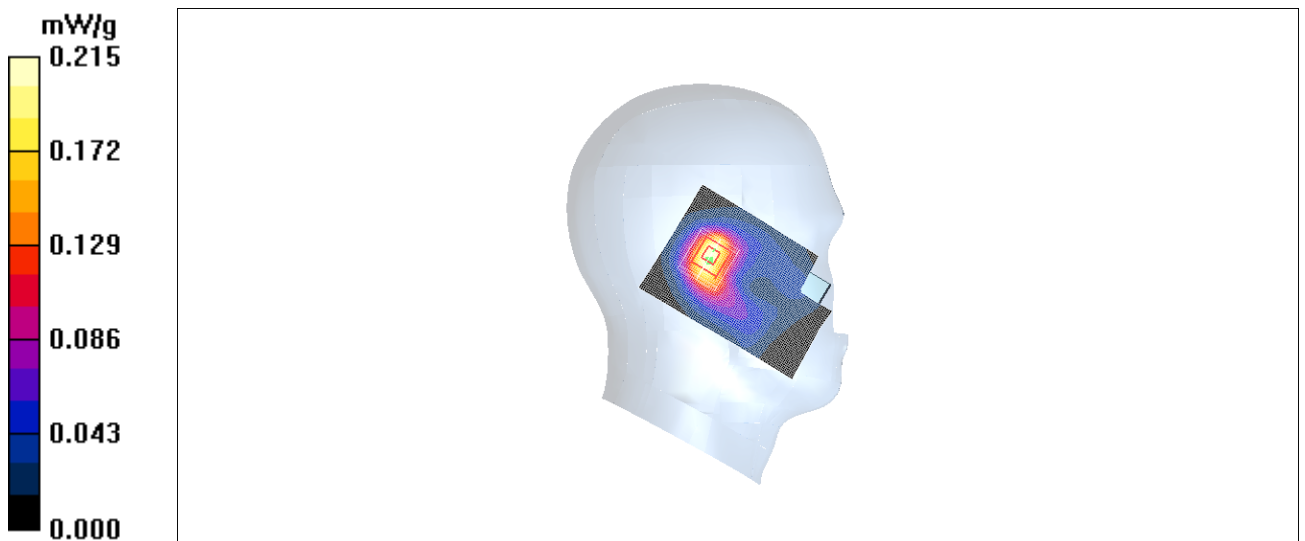
**Tilt Low/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.2 V/m; Power Drift = 0.006 dB

Peak SAR (extrapolated) = 0.319 W/kg

**SAR(1 g) = 0.198 mW/g; SAR(10 g) = 0.117 mW/g**

Maximum value of SAR (measured) = 0.216 mW/g



**Fig. 18 1900 MHz CH512**

**1900 Right Cheek High**

Date/Time: 2011-6-2 15:36:03

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used:  $f = 1910$  MHz;  $\sigma = 1.43$  mho/m;  $\epsilon_r = 40.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

Communication System: GSM 1900MHz Frequency: 1909.8 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

**Cheek High/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

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

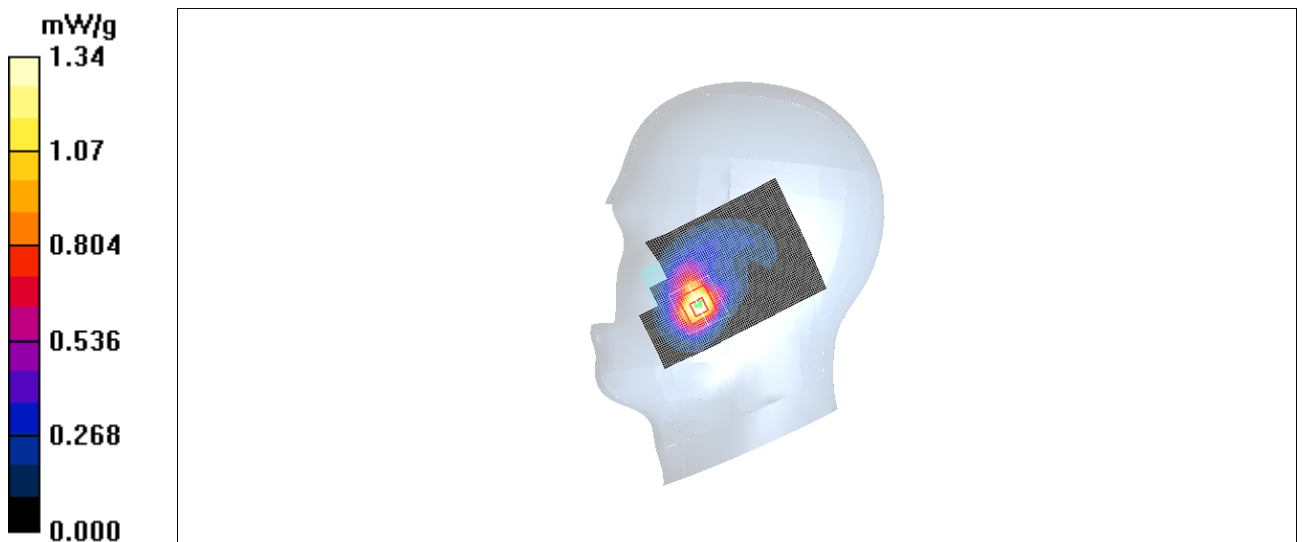
**Cheek High/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.56 V/m; Power Drift = 0.061 dB

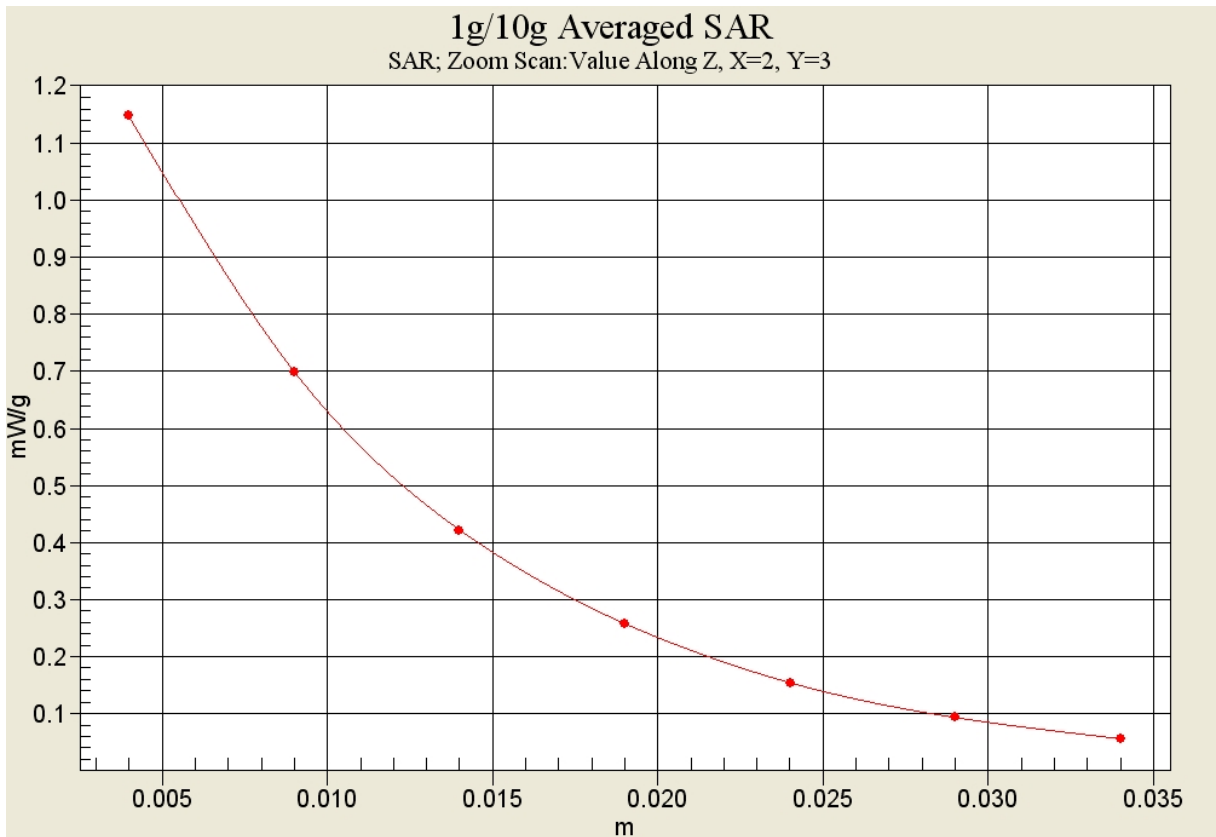
Peak SAR (extrapolated) = 2.06 W/kg

**SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.604 mW/g**

Maximum value of SAR (measured) = 1.30 mW/g



**Fig. 19 1900 MHz CH810**



**Fig. 19-1 Z-Scan at power reference point (1900 MHz CH810)**

**1900 Right Cheek Middle**

Date/Time: 2011-6-2 15:50:24

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.41$  mho/m;  $\epsilon_r = 40.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

Communication System: GSM 1900MHz Frequency: 1880 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

**Cheek Middle/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

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

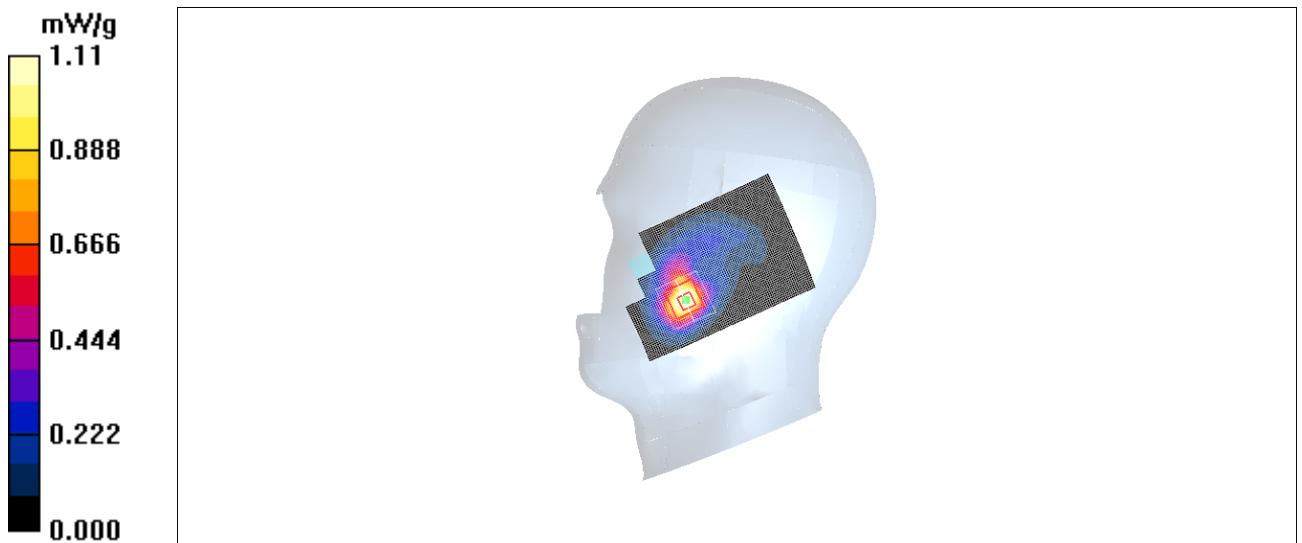
**Cheek Middle/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.50 V/m; Power Drift = -0.041 dB

Peak SAR (extrapolated) = 1.81 W/kg

**SAR(1 g) = 0.959 mW/g; SAR(10 g) = 0.501 mW/g**

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



**Fig. 20 1900 MHz CH661**



**1900 Right Cheek Low**

Date/Time: 2011-6-2 16:04:48

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.38$  mho/m;  $\epsilon_r = 40.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

Communication System: GSM 1900MHz Frequency: 1850.2 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

**Cheek Low/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.732 mW/g

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

Reference Value = 9.10 V/m; Power Drift = -0.001 dB

Peak SAR (extrapolated) = 1.38 W/kg

**SAR(1 g) = 0.674 mW/g; SAR(10 g) = 0.355 mW/g**

Maximum value of SAR (measured) = 0.783 mW/g

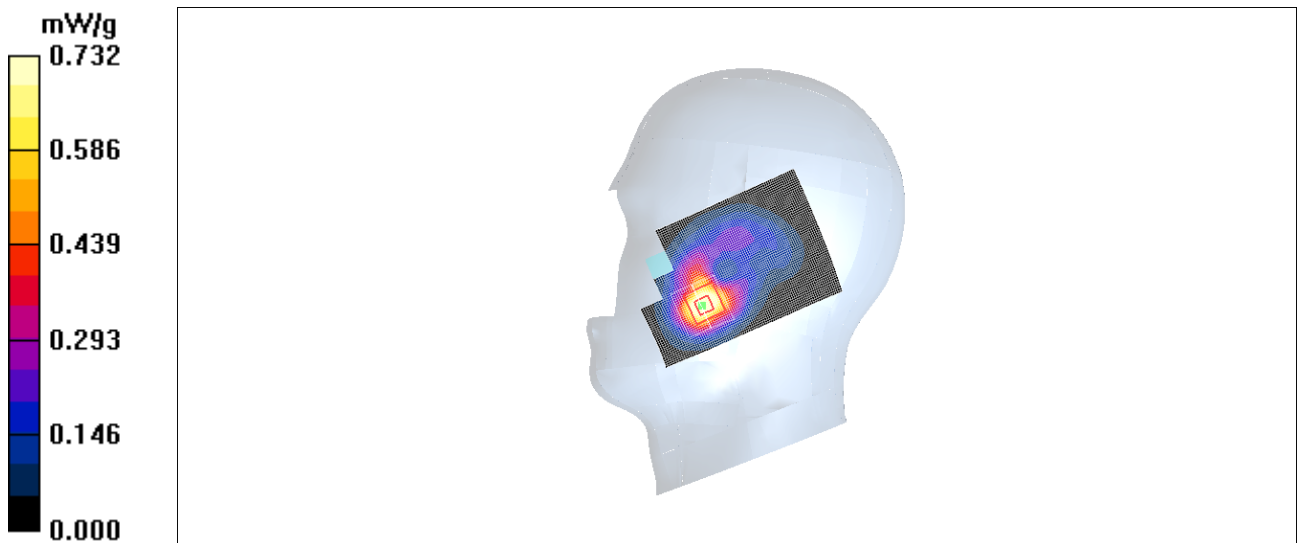


Fig. 21 1900 MHz CH512

### 1900 Right Tilt High

Date/Time: 2011-6-2 16:19:09

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used:  $f = 1910$  MHz;  $\sigma = 1.43$  mho/m;  $\epsilon_r = 40.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

Communication System: GSM 1900MHz Frequency: 1909.8 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

**Tilt High/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.286 mW/g

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

Reference Value = 13.3 V/m; Power Drift = -0.014 dB

Peak SAR (extrapolated) = 0.359 W/kg

**SAR(1 g) = 0.234 mW/g; SAR(10 g) = 0.142 mW/g**

Maximum value of SAR (measured) = 0.249 mW/g

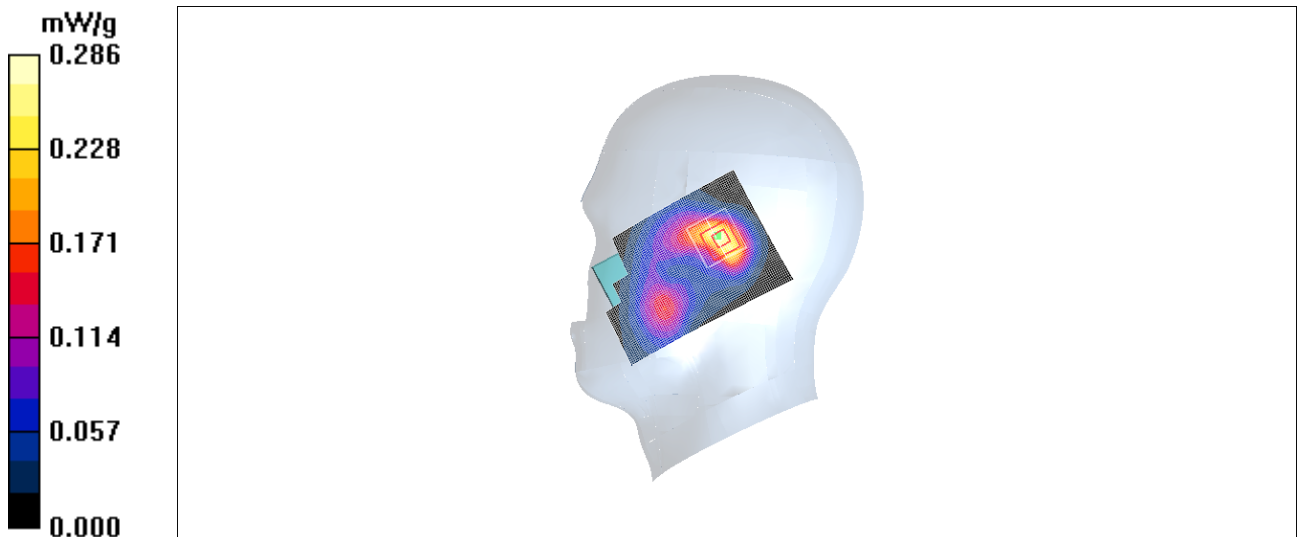


Fig. 22 1900 MHz CH810

**1900 Right Tilt Middle**

Date/Time: 2011-6-2 16:33:32

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.41$  mho/m;  $\epsilon_r = 40.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

Communication System: GSM 1900MHz Frequency: 1880 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

**Tilt Middle/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.228 mW/g

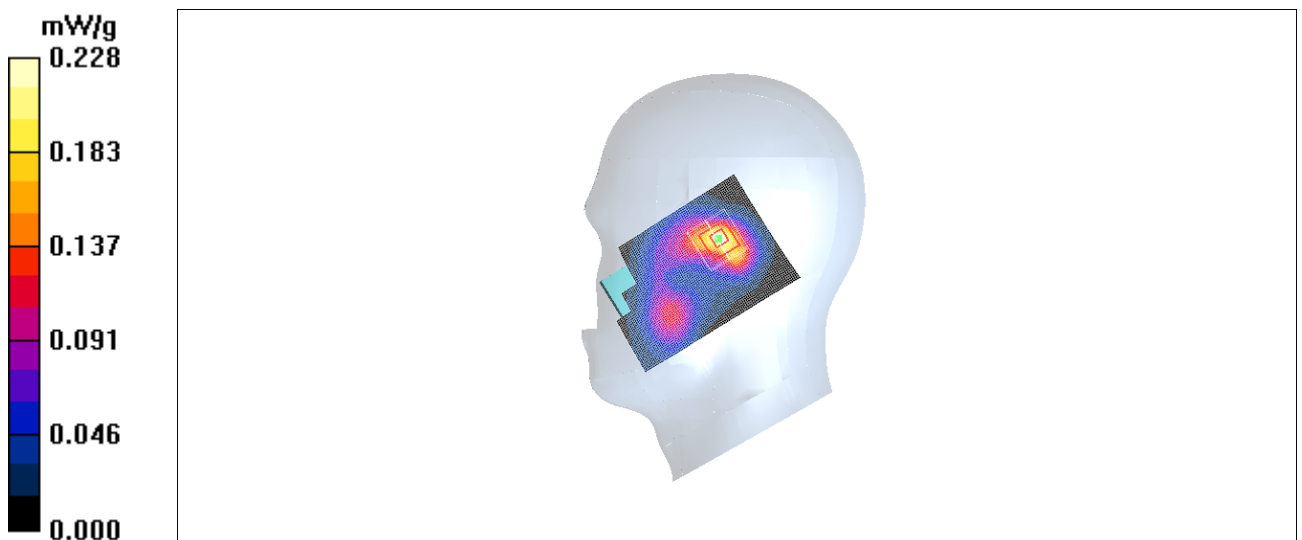
**Tilt Middle/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.3 V/m; Power Drift = -0.094 dB

Peak SAR (extrapolated) = 0.297 W/kg

**SAR(1 g) = 0.189 mW/g; SAR(10 g) = 0.113 mW/g**

Maximum value of SAR (measured) = 0.205 mW/g



**Fig.23 1900 MHz CH661**

### 1900 Right Tilt Low

Date/Time: 2011-6-2 16:47:55

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.38$  mho/m;  $\epsilon_r = 40.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

Communication System: GSM 1900MHz Frequency: 1850.2 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

**Tilt Low/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.244 mW/g

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

Reference Value = 11.6 V/m; Power Drift = -0.006 dB

Peak SAR (extrapolated) = 0.302 W/kg

**SAR(1 g) = 0.200 mW/g; SAR(10 g) = 0.123 mW/g**

Maximum value of SAR (measured) = 0.218 mW/g

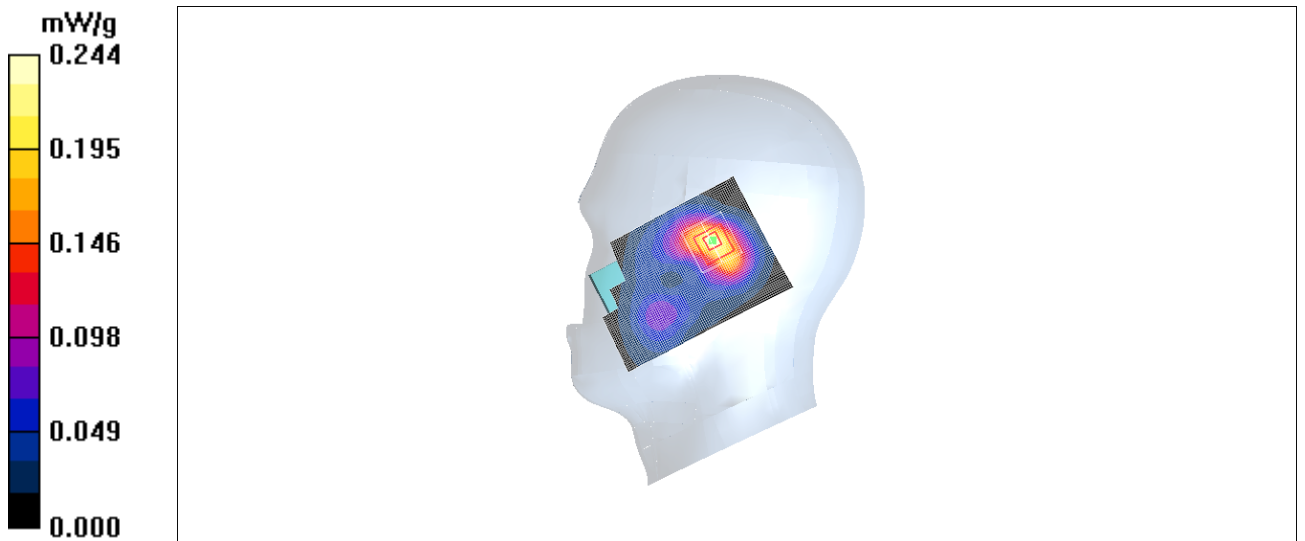


Fig.24 1900 MHz CH512

**1900 Right Cheek High with battery CAB3120000C2**

Date/Time: 2011-6-2 17:03:35

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used:  $f = 1910$  MHz;  $\sigma = 1.43$  mho/m;  $\epsilon_r = 40.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

Communication System: GSM 1900MHz Frequency: 1909.8 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

**Cheek High/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

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 = 9.76 V/m; Power Drift = -0.035 dB

Peak SAR (extrapolated) = 1.78 W/kg

**SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.542 mW/g**

Maximum value of SAR (measured) = 1.16 mW/g

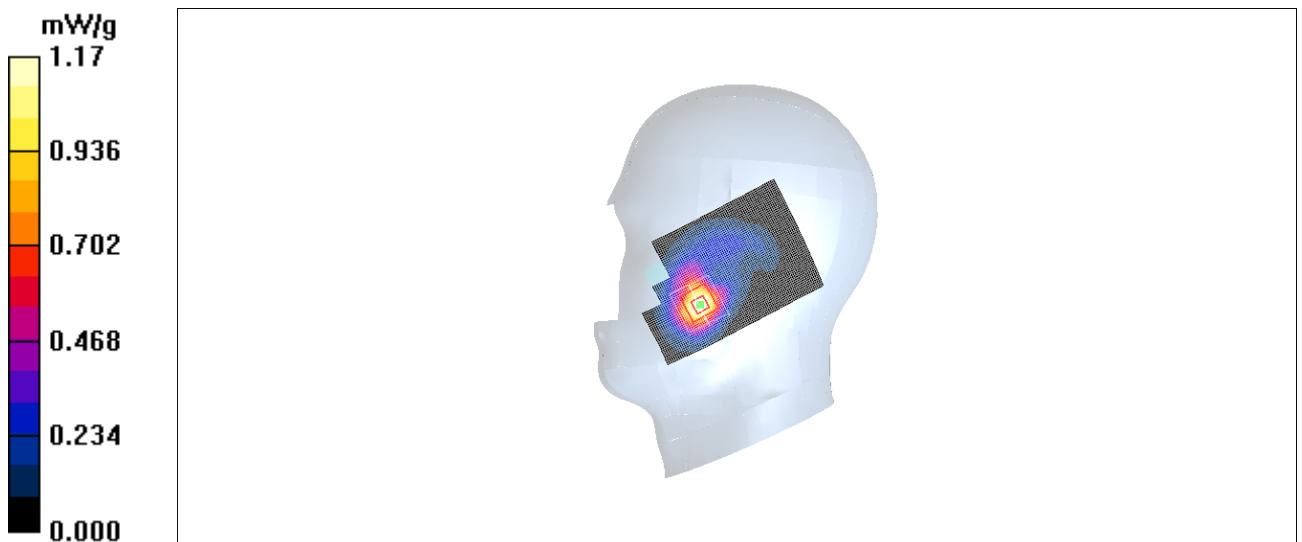


Fig. 25 1900MHz CH810

**850 Body Towards Ground High with GPRS**

Date/Time: 2011-6-1 17:18:02

Electronics: DAE4 Sn771

Medium: Body 850 MHz

Medium parameters used (interpolated):  $f = 848.8$  MHz;  $\sigma = 0.98$  mho/m;  $\epsilon_r = 54.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

Communication System: GSM 850 GPRS Frequency: 848.8 MHz Duty Cycle: 1:2

Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

**Toward Ground High/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

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

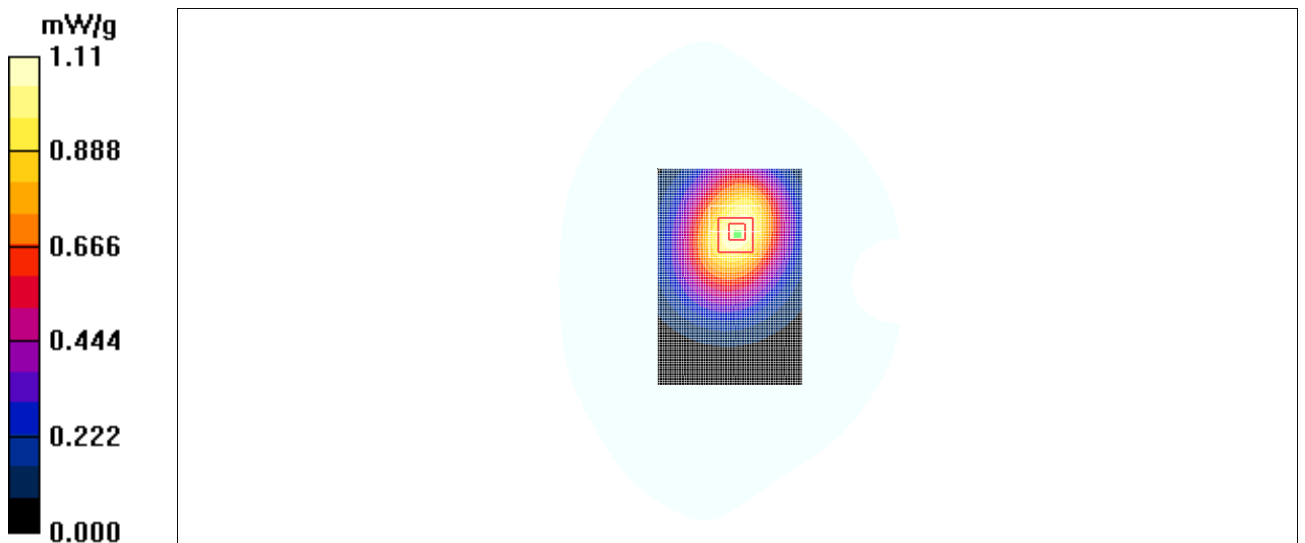
**Toward Ground High/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 25.7 V/m; Power Drift = -0.092 dB

Peak SAR (extrapolated) = 1.44 W/kg

**SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.727 mW/g**

Maximum value of SAR (measured) = 1.12 mW/g



**Fig. 26 850 MHz CH251**

### 850 Body Towards Ground Middle with GPRS

Date/Time: 2011-6-1 17:33:29

Electronics: DAE4 Sn771

Medium: Body 850 MHz

Medium parameters used (interpolated):  $f = 836.6$  MHz;  $\sigma = 0.97$  mho/m;  $\epsilon_r = 54.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

Communication System: GSM 850 GPRS Frequency: 836.6 MHz Duty Cycle: 1:2

Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

**Toward Ground Middle/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

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

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

Reference Value = 25.5 V/m; Power Drift = -0.043 dB

Peak SAR (extrapolated) = 1.49 W/kg

**SAR(1 g) = 1.09 mW/g; SAR(10 g) = 0.751 mW/g**

Maximum value of SAR (measured) = 1.16 mW/g

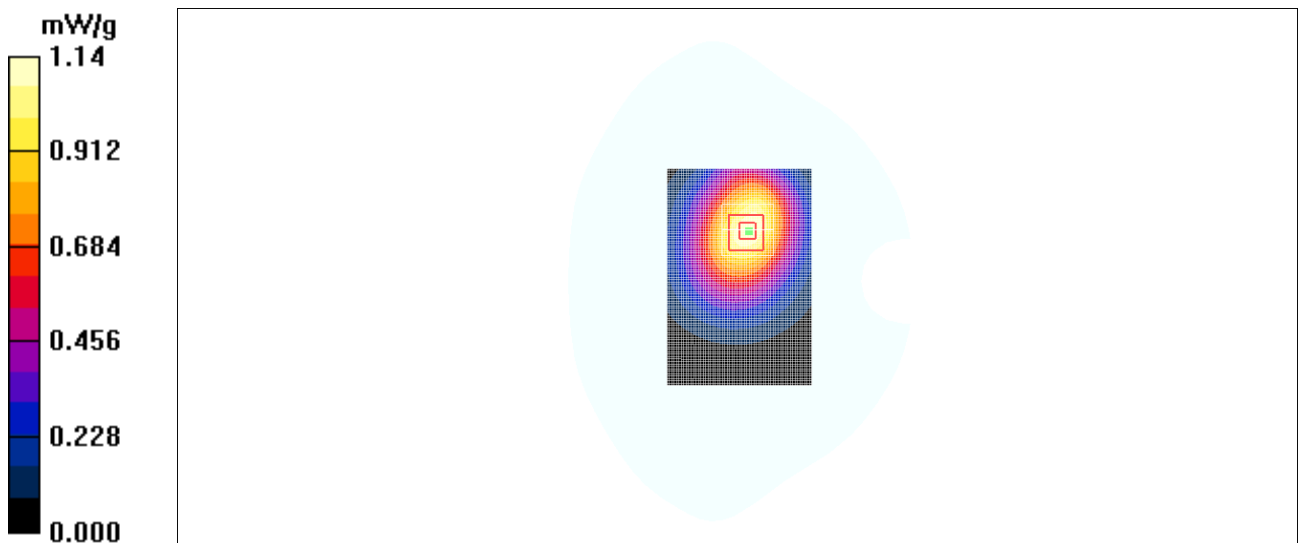


Fig. 27 850 MHz CH190

**850 Body Towards Ground Low with GPRS**

Date/Time: 2011-6-1 17:48:54

Electronics: DAE4 Sn771

Medium: Body 850 MHz

Medium parameters used:  $f = 825$  MHz;  $\sigma = 0.953$  mho/m;  $\epsilon_r = 54.9$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

Communication System: GSM 850 GPRS Frequency: 824.2 MHz Duty Cycle: 1:2

Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

**Toward Ground Low/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.19 mW/g

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

Reference Value = 25.9 V/m; Power Drift = -0.011 dB

Peak SAR (extrapolated) = 1.55 W/kg

**SAR(1 g) = 1.13 mW/g; SAR(10 g) = 0.785 mW/g**

Maximum value of SAR (measured) = 1.21 mW/g

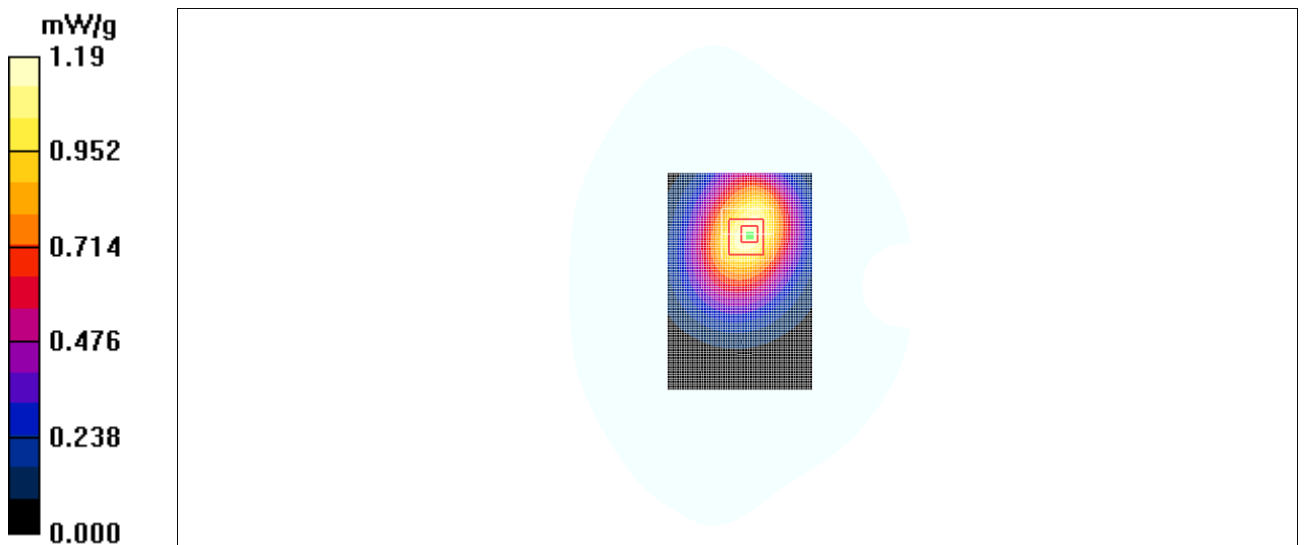
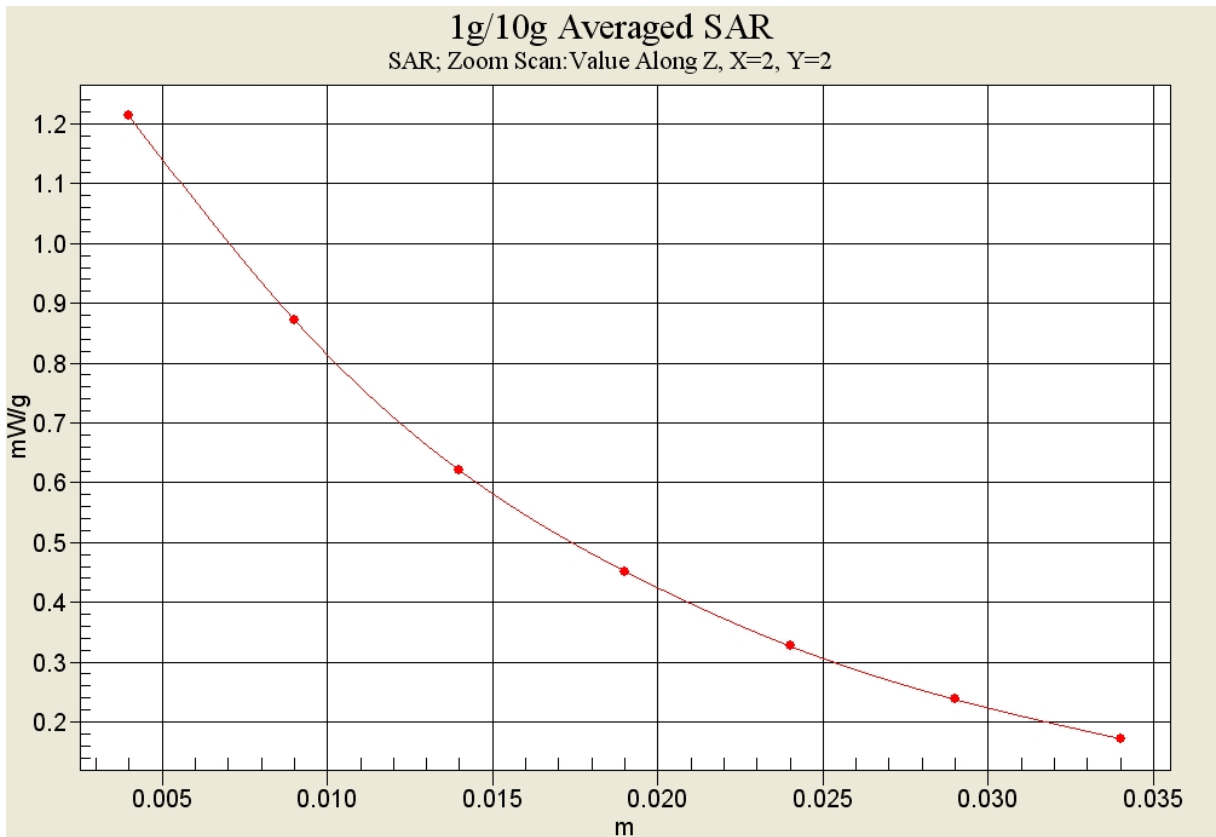


Fig. 28 850 MHz CH128





**Fig. 28-1 Z-Scan at power reference point (850 MHz CH128)**

### 850 Body Towards Phantom High with GPRS

Date/Time: 2011-6-1 18:04:36

Electronics: DAE4 Sn771

Medium: Body 850 MHz

Medium parameters used (interpolated):  $f = 848.8$  MHz;  $\sigma = 0.98$  mho/m;  $\epsilon_r = 54.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

Communication System: GSM 850 GPRS Frequency: 848.8 MHz Duty Cycle: 1:2

Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

**Toward Phantom High/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.933 mW/g

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

Reference Value = 26.6 V/m; Power Drift = -0.105 dB

Peak SAR (extrapolated) = 1.20 W/kg

**SAR(1 g) = 0.876 mW/g; SAR(10 g) = 0.619 mW/g**

Maximum value of SAR (measured) = 0.939 mW/g

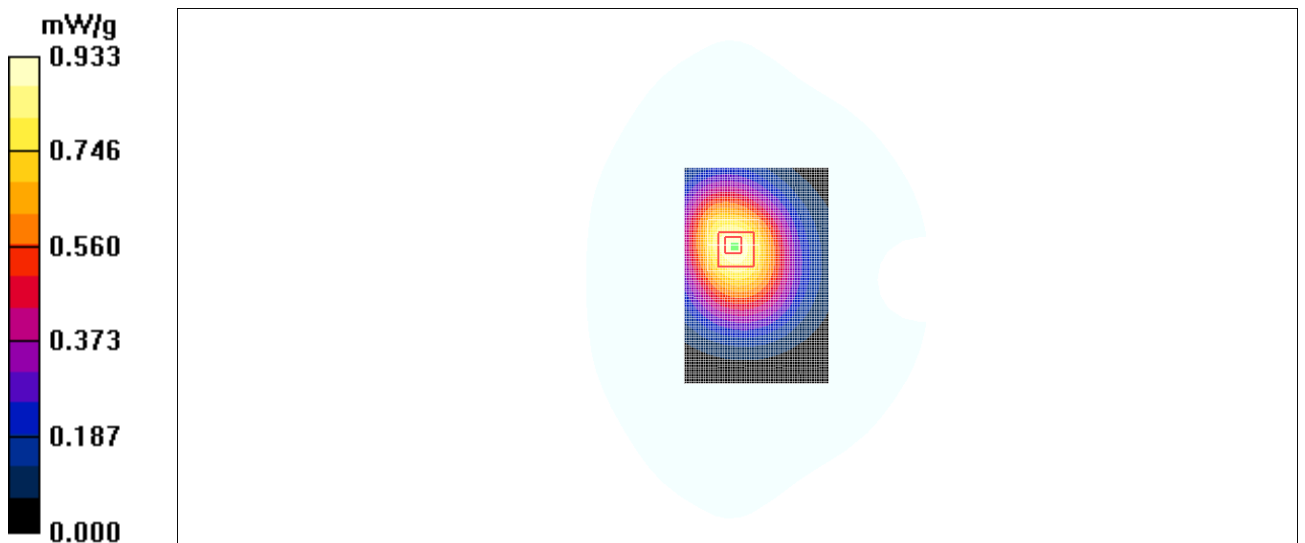


Fig. 29 850 MHz CH251

### 850 Body Towards Phantom Middle with GPRS

Date/Time: 2011-6-1 18:20:00

Electronics: DAE4 Sn771

Medium: Body 850 MHz

Medium parameters used (interpolated):  $f = 836.6$  MHz;  $\sigma = 0.97$  mho/m;  $\epsilon_r = 54.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

Communication System: GSM 850 GPRS Frequency: 836.6 MHz Duty Cycle: 1:2

Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

**Toward Phantom Middle/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.928 mW/g

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

dy=5mm, dz=5mm

Reference Value = 23.6 V/m; Power Drift = -0.112 dB

Peak SAR (extrapolated) = 1.17 W/kg

**SAR(1 g) = 0.868 mW/g; SAR(10 g) = 0.616 mW/g**

Maximum value of SAR (measured) = 0.922 mW/g

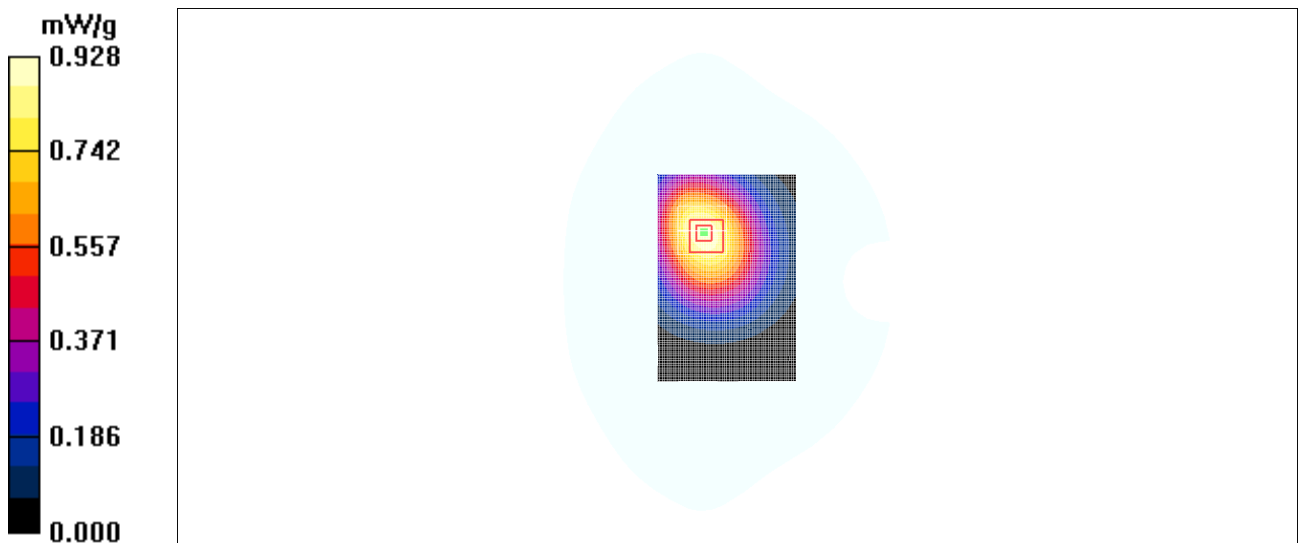


Fig. 30 850 MHz CH190

### 850 Body Towards Phantom Low with GPRS

Date/Time: 2011-6-1 18:35:24

Electronics: DAE4 Sn771

Medium: Body 850 MHz

Medium parameters used:  $f = 825$  MHz;  $\sigma = 0.953$  mho/m;  $\epsilon_r = 54.9$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

Communication System: GSM 850 GPRS Frequency: 824.2 MHz Duty Cycle: 1:2

Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

**Toward Phantom Low/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.942 mW/g

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

Reference Value = 23.5 V/m; Power Drift = 0.029 dB

Peak SAR (extrapolated) = 1.20 W/kg

**SAR(1 g) = 0.891 mW/g; SAR(10 g) = 0.634 mW/g**

Maximum value of SAR (measured) = 0.954 mW/g

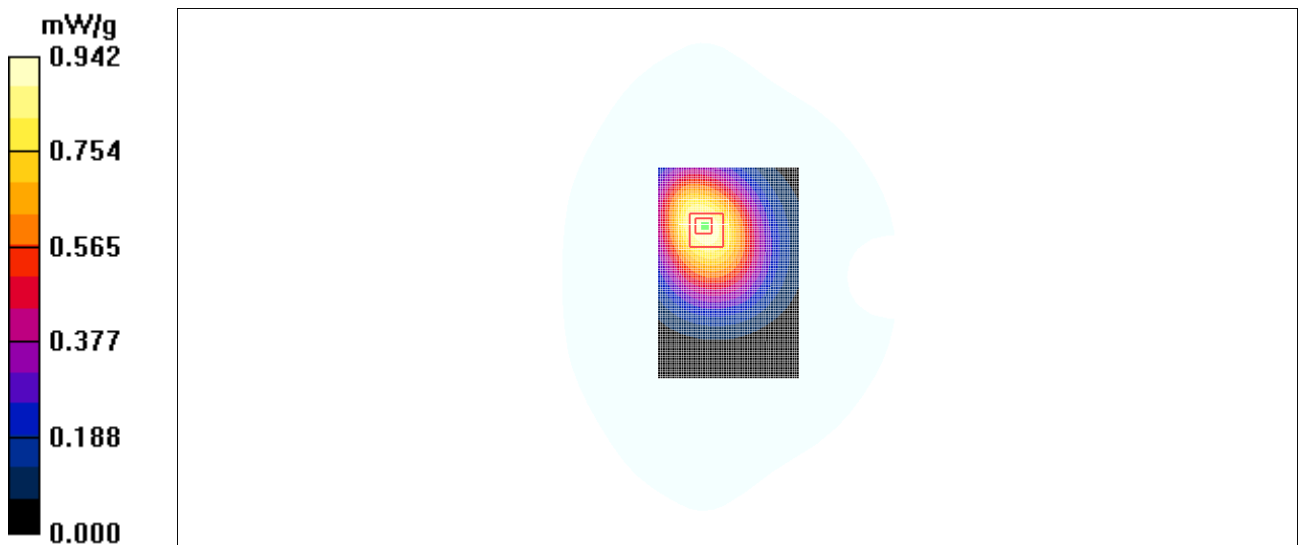


Fig. 31 850 MHz CH128

**850 Body Towards Ground Low with Headset\_CCB3160A10C2**

Date/Time: 2011-6-1 18:52:10

Electronics: DAE4 Sn771

Medium: Body 850 MHz

Medium parameters used:  $f = 825$  MHz;  $\sigma = 0.953$  mho/m;  $\epsilon_r = 54.9$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

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

Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

**Toward Ground Low/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.485 mW/g

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

Reference Value = 17.0 V/m; Power Drift = 0.059 dB

Peak SAR (extrapolated) = 0.646 W/kg

**SAR(1 g) = 0.465 mW/g; SAR(10 g) = 0.323 mW/g**

Maximum value of SAR (measured) = 0.497 mW/g

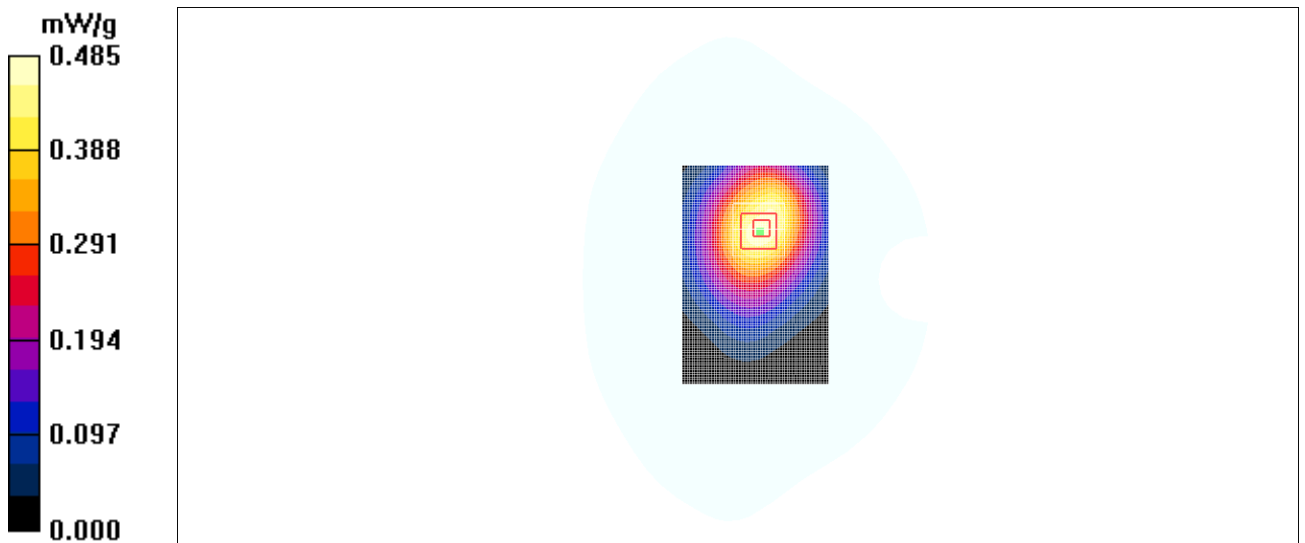


Fig. 32 850 MHz CH128

**850 Body Towards Ground Low with Headset\_CCB3160A10C4**

Date/Time: 2011-6-1 19:08:49

Electronics: DAE4 Sn771

Medium: Body 850 MHz

Medium parameters used:  $f = 825$  MHz;  $\sigma = 0.953$  mho/m;  $\epsilon_r = 54.9$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

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

Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

**Toward Ground Low/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.496 mW/g

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

Reference Value = 16.0 V/m; Power Drift = -0.025 dB

Peak SAR (extrapolated) = 0.659 W/kg

**SAR(1 g) = 0.471 mW/g; SAR(10 g) = 0.324 mW/g**

Maximum value of SAR (measured) = 0.499 mW/g

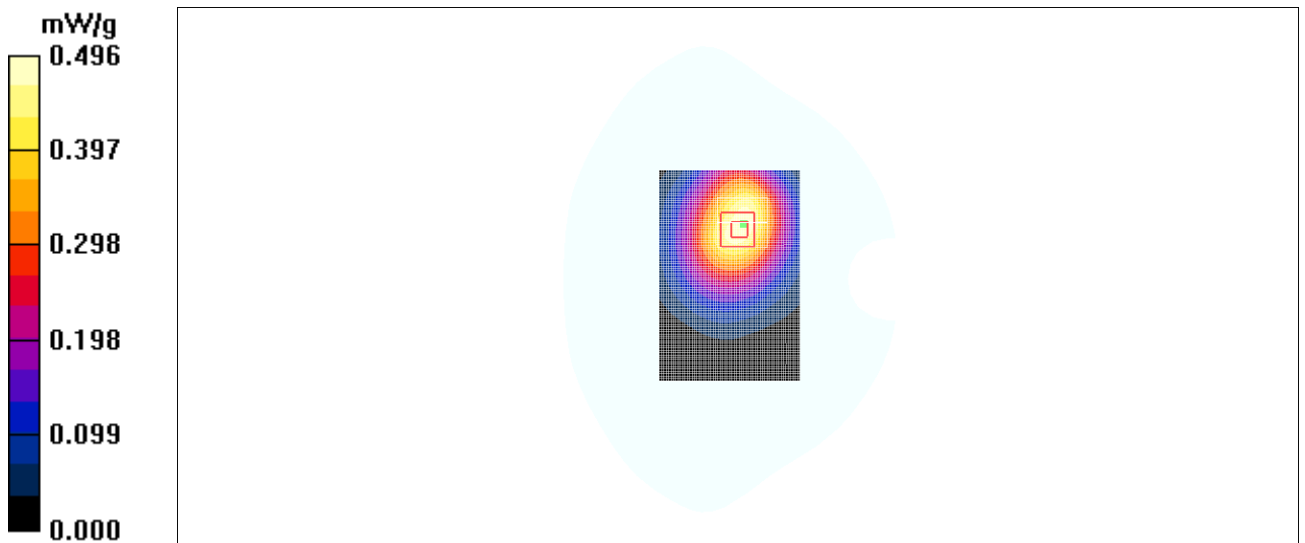


Fig. 33 850 MHz CH128

**1900 Body Towards Ground High with GPRS**

Date/Time: 2011-6-2 17:26:19

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used:  $f = 1910$  MHz;  $\sigma = 1.54$  mho/m;  $\epsilon_r = 53.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

Communication System: GSM 1900MHz GPRS Frequency: 1909.8 MHz Duty Cycle: 1:2

Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

**Toward Ground High/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.843 mW/g

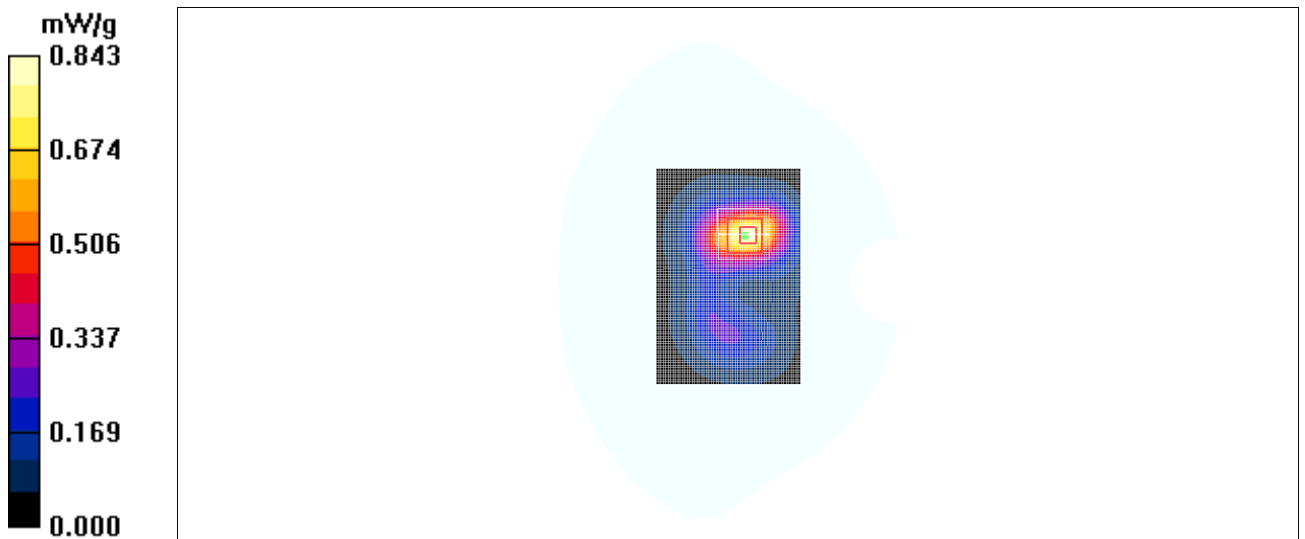
**Toward Ground High/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.1 V/m; Power Drift = 0.092 dB

Peak SAR (extrapolated) = 1.28 W/kg

**SAR(1 g) = 0.754 mW/g; SAR(10 g) = 0.430 mW/g**

Maximum value of SAR (measured) = 0.820 mW/g



**Fig. 34 1900 MHz CH810**

### 1900 Body Towards Ground Middle with GPRS

Date/Time: 2011-6-2 17:41:44

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.51$  mho/m;  $\epsilon_r = 53.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

Communication System: GSM 1900MHz GPRS Frequency: 1880 MHz Duty Cycle: 1:2

Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

**Toward Ground Middle/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.938 mW/g

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

Reference Value = 8.82 V/m; Power Drift = 0.086 dB

Peak SAR (extrapolated) = 1.41 W/kg

**SAR(1 g) = 0.820 mW/g; SAR(10 g) = 0.458 mW/g**

Maximum value of SAR (measured) = 0.879 mW/g

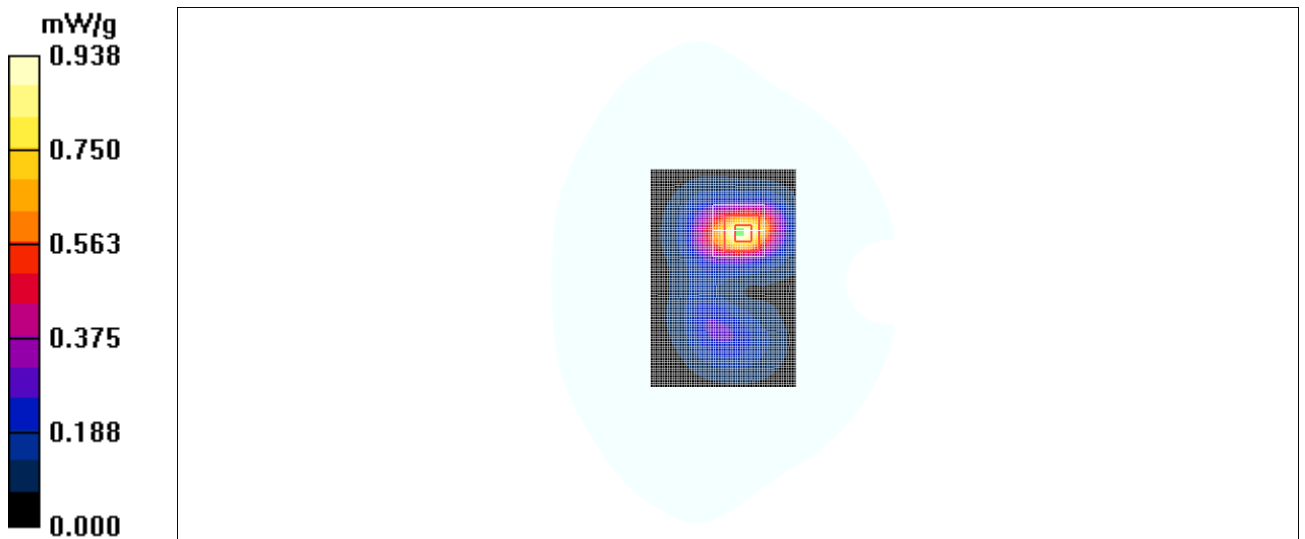
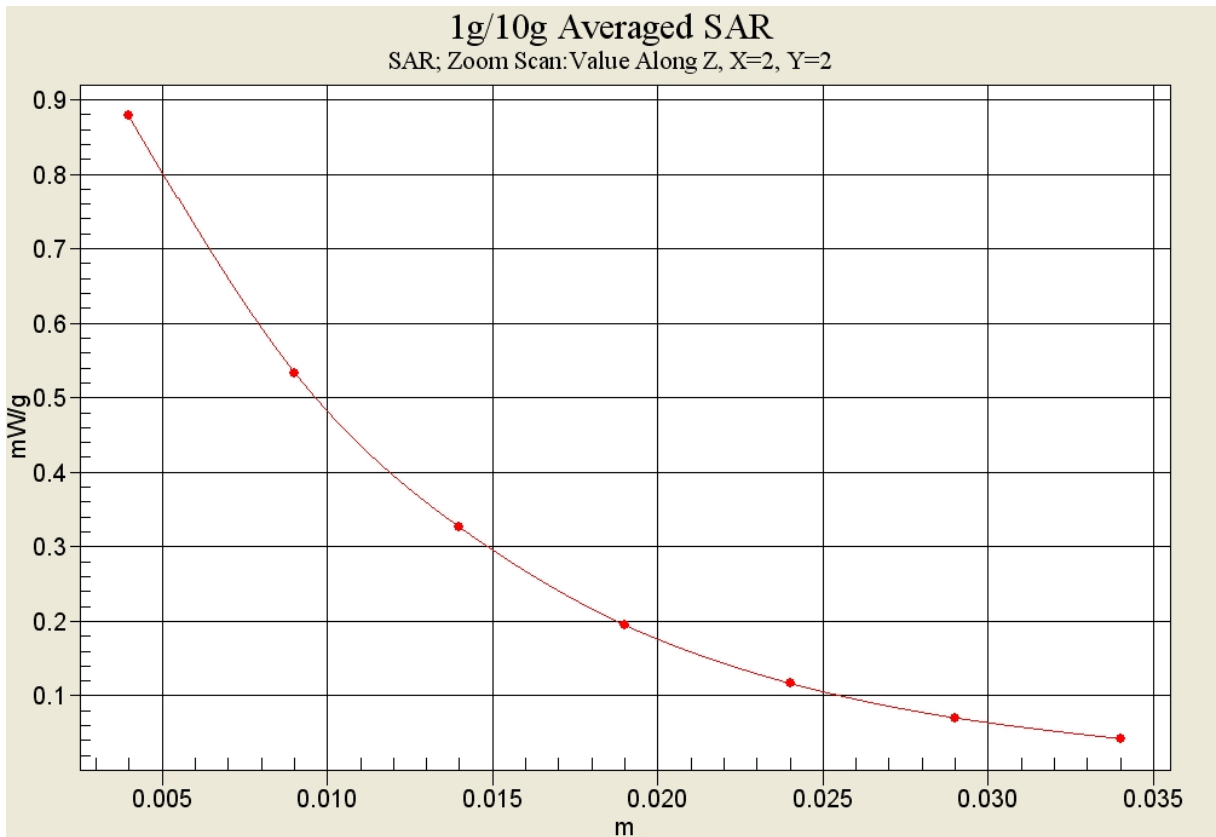


Fig. 35 1900 MHz CH661





**Fig. 35-1 Z-Scan at power reference point (1900 MHz CH661)**

**1900 Body Towards Ground Low with GPRS**

Date/Time: 2011-6-2 17:56:12

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.49$  mho/m;  $\epsilon_r = 53.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

Communication System: GSM 1900MHz GPRS Frequency: 1850.2 MHz Duty Cycle: 1:2

Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

**Toward Ground Low/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.837 mW/g

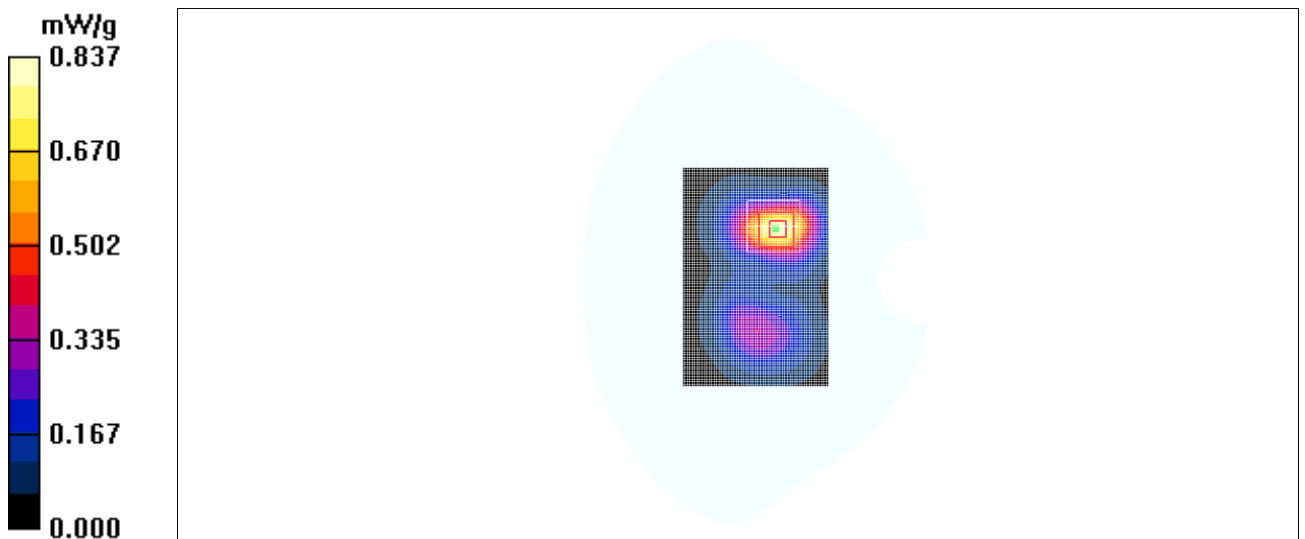
**Toward Ground Low/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.17 V/m; Power Drift = 0.017 dB

Peak SAR (extrapolated) = 1.29 W/kg

**SAR(1 g) = 0.749 mW/g; SAR(10 g) = 0.418 mW/g**

Maximum value of SAR (measured) = 0.806 mW/g



**Fig. 36 1900 MHz CH512**

**1900 Body Towards Phantom High with GPRS**

Date/Time: 2011-6-2 18:12:08

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used:  $f = 1910$  MHz;  $\sigma = 1.54$  mho/m;  $\epsilon_r = 53.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

Communication System: GSM 1900MHz GPRS Frequency: 1909.8 MHz Duty Cycle: 1:2

Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

**Toward Phantom High/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

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

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

Reference Value = 10.8 V/m; Power Drift = 0.112 dB

Peak SAR (extrapolated) = 0.950 W/kg

**SAR(1 g) = 0.569 mW/g; SAR(10 g) = 0.337 mW/g**

Maximum value of SAR (measured) = 0.619 mW/g

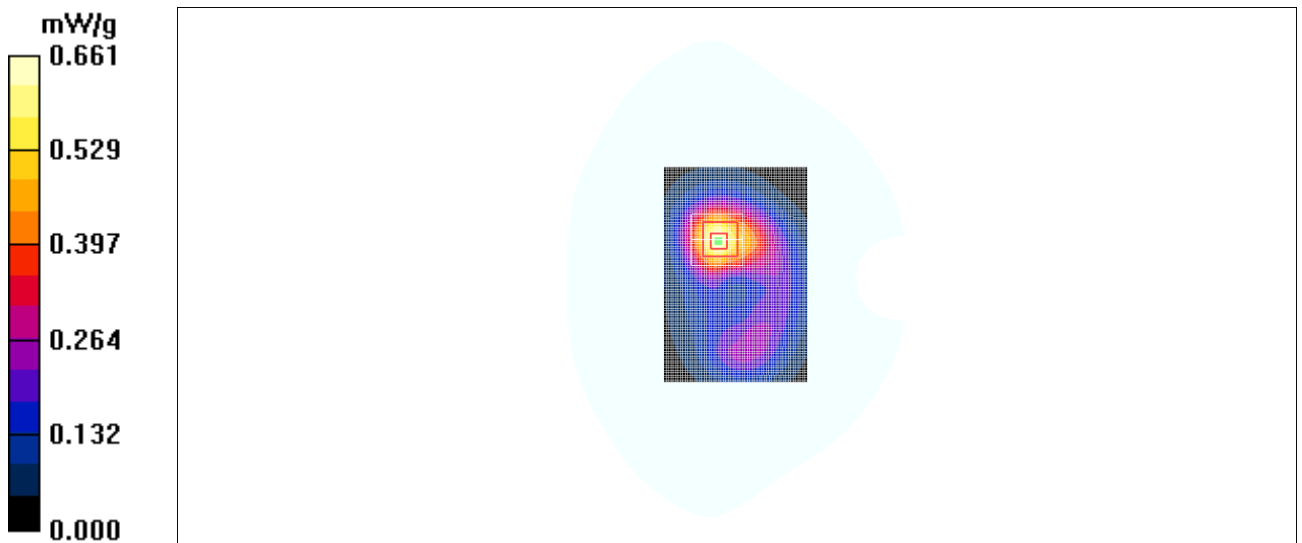


Fig. 37 1900 MHz CH810

**1900 Body Towards Phantom Middle with GPRS**

Date/Time: 2011-6-2 18:27:34

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.51$  mho/m;  $\epsilon_r = 53.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

Communication System: GSM 1900MHz GPRS Frequency: 1880 MHz Duty Cycle: 1:2

Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

**Toward Phantom Middle/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.650 mW/g

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

Reference Value = 10.0 V/m; Power Drift = 0.162 dB

Peak SAR (extrapolated) = 0.976 W/kg

**SAR(1 g) = 0.578 mW/g; SAR(10 g) = 0.338 mW/g**

Maximum value of SAR (measured) = 0.627 mW/g

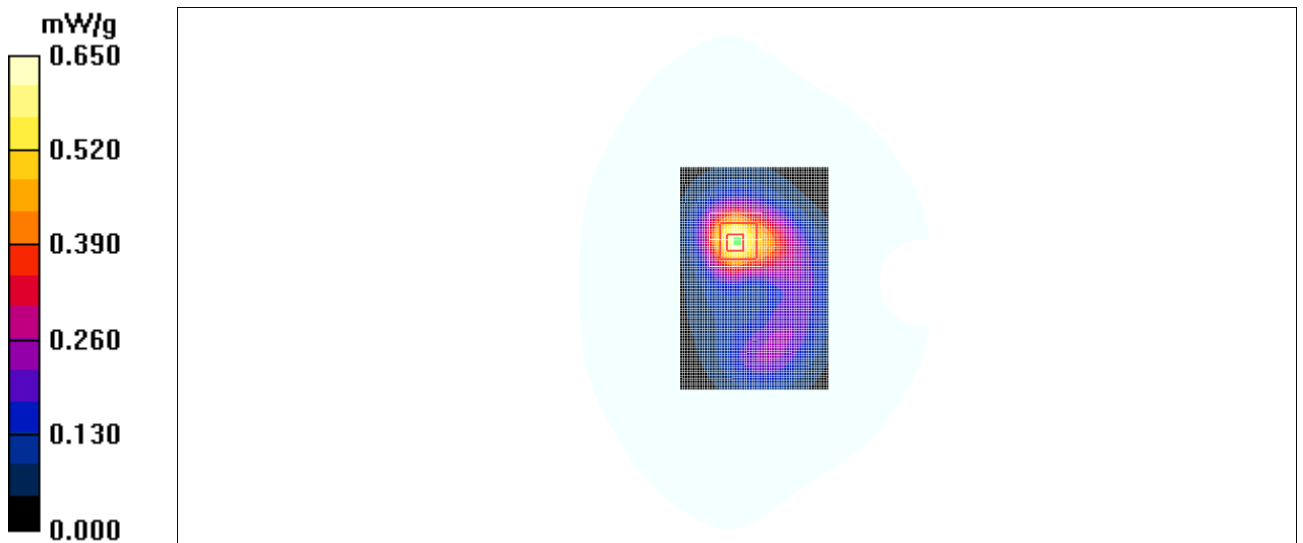


Fig. 38 1900 MHz CH661

**1900 Body Towards Phantom Low with GPRS**

Date/Time: 2011-6-2 18:42:58

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.49$  mho/m;  $\epsilon_r = 53.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

Communication System: GSM 1900MHz GPRS Frequency: 1850.2 MHz Duty Cycle: 1:2

Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

**Toward Phantom Low/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.526 mW/g

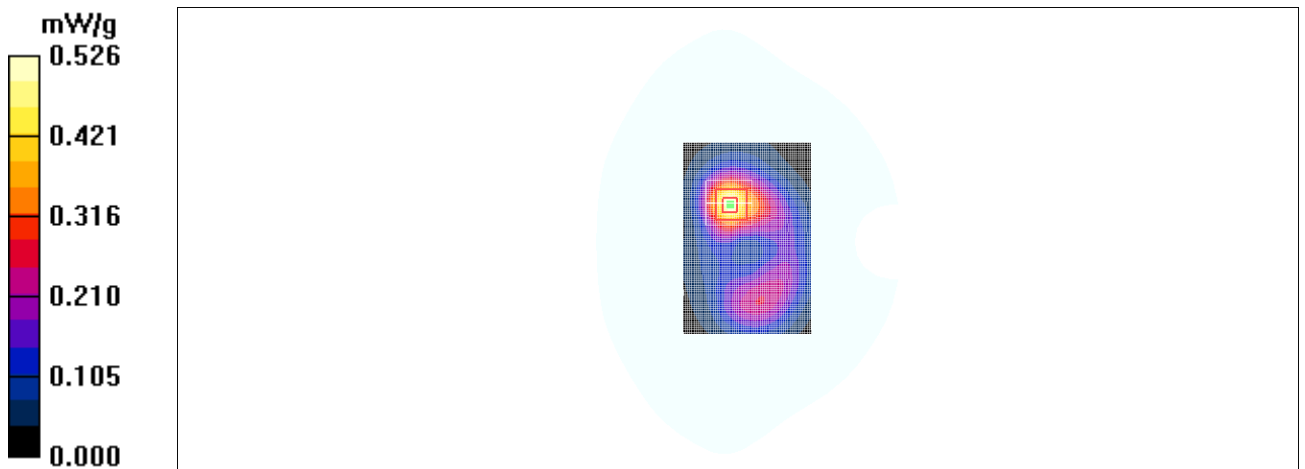
**Toward Phantom Low/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.86 V/m; Power Drift = 0.001 dB

Peak SAR (extrapolated) = 0.777 W/kg

**SAR(1 g) = 0.463 mW/g; SAR(10 g) = 0.269 mW/g**

Maximum value of SAR (measured) = 0.505 mW/g



**Fig. 39 1900 MHz CH512**

**1900 Body Towards Ground Middle with Headset\_CCB3160A10C2**

Date/Time: 2011-6-2 18:59:30

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.51$  mho/m;  $\epsilon_r = 53.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

Communication System: GSM 1900MHz Frequency: 1880 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

**Toward Ground Middle/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.335 mW/g

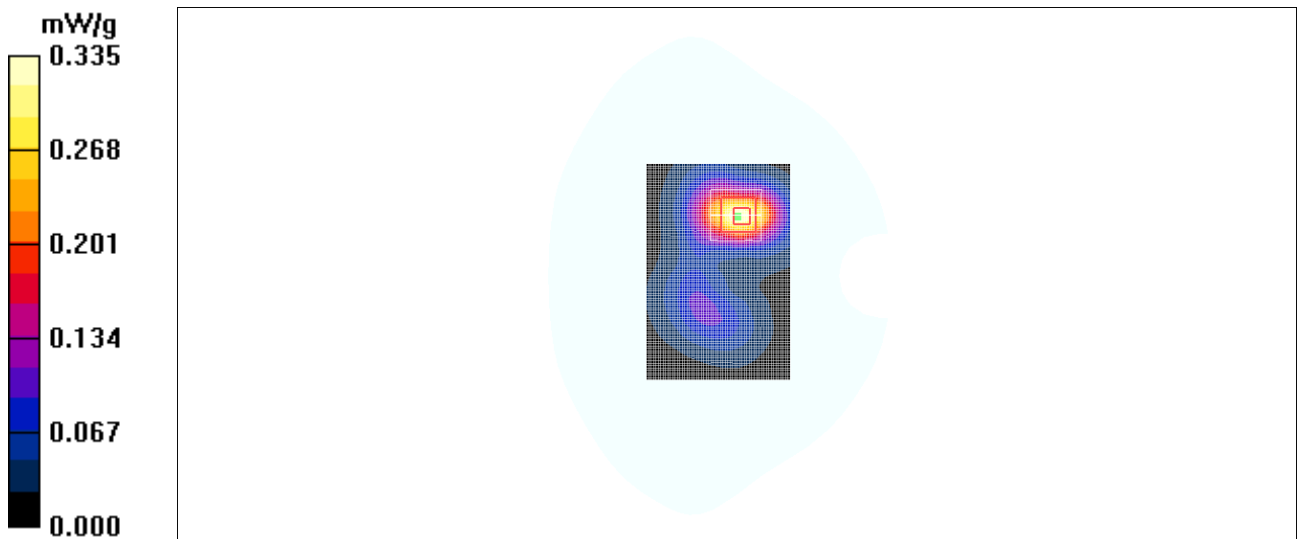
**Toward Ground Middle/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.63 V/m; Power Drift = 0.058 dB

Peak SAR (extrapolated) = 0.520 W/kg

**SAR(1 g) = 0.305 mW/g; SAR(10 g) = 0.172 mW/g**

Maximum value of SAR (measured) = 0.327 mW/g



**Fig. 40 1900 MHz CH661**

**1900 Body Towards Ground Middle with Headset\_CCB3160A10C4**

Date/Time: 2011-6-2 19:16:42

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.51$  mho/m;  $\epsilon_r = 53.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

Communication System: GSM 1900MHz Frequency: 1880 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

**Toward Ground Middle/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.350 mW/g

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

Reference Value = 5.74 V/m; Power Drift = 0.040 dB

Peak SAR (extrapolated) = 0.535 W/kg

**SAR(1 g) = 0.315 mW/g; SAR(10 g) = 0.179 mW/g**

Maximum value of SAR (measured) = 0.341 mW/g

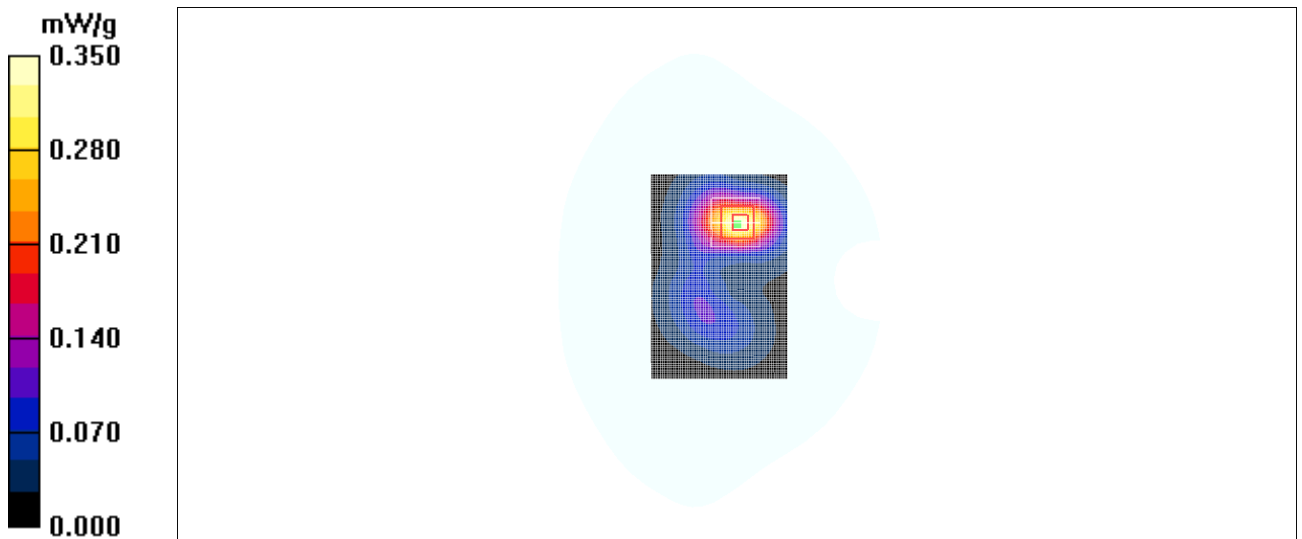


Fig. 41 1900 MHz CH661

**850 Body Towards Ground Low with GPRS with battery CAB3120000C2**

Date/Time: 2011-6-1 19:25:30

Electronics: DAE4 Sn771

Medium: Body 850 MHz

Medium parameters used:  $f = 825$  MHz;  $\sigma = 0.953$  mho/m;  $\epsilon_r = 54.9$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

Communication System: GSM 850 GPRS Frequency: 824.2 MHz Duty Cycle: 1:2

Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

**Toward Ground Low/Area Scan (61x91x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.18 mW/g

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

Reference Value = 29.7 V/m; Power Drift = -0.038 dB

Peak SAR (extrapolated) = 1.54 W/kg

**SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.772 mW/g**

Maximum value of SAR (measured) = 1.19 mW/g

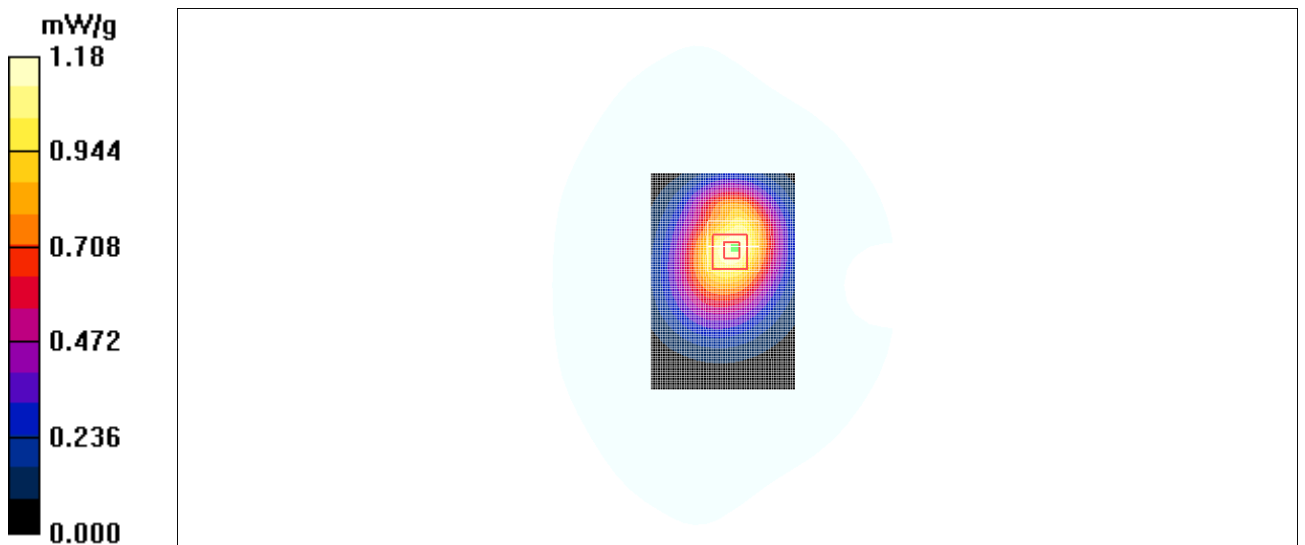


Fig. 42 850 MHz CH128



## ANNEX D SYSTEM VALIDATION RESULTS

### 835MHz

Date/Time: 2011-6-1 7:29:16

Electronics: DAE4 Sn771

Medium: Head 850 MHz

Medium parameters used:  $f = 835$  MHz;  $\sigma = 0.91$  mho/m;  $\epsilon_r = 41.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 23.0°C      Liquid Temperature: 22.5°C

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

Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

**System Validation /Area Scan (101x101x1):** Measurement grid: dx=10mm, dy=10mm  
Maximum value of SAR (interpolated) = 2.61 mW/g

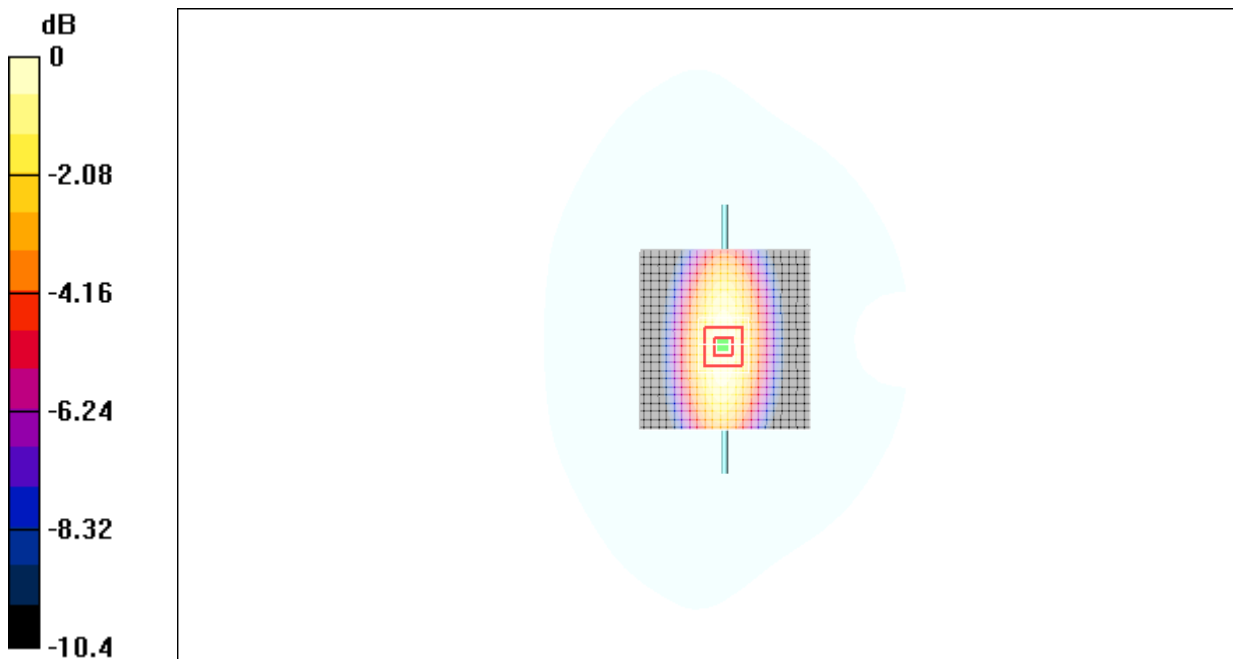
**System Validation /Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.8 V/m; Power Drift = 0.098 dB

Peak SAR (extrapolated) = 3.40 W/kg

**SAR(1 g) = 2.39 mW/g; SAR(10 g) = 1.48 mW/g**

Maximum value of SAR (measured) = 2.52 mW/g



0 dB = 2.52mW/g

**Fig.43 validation 835MHz 250mW**

## 835MHz

Date/Time: 2011-6-1 8:03:22

Electronics: DAE4 Sn771

Medium: Body 850 MHz

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.96 \text{ mho/m}$ ;  $\epsilon_r = 54.8$ ;  $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature:  $23.0^\circ\text{C}$       Liquid Temperature:  $22.5^\circ\text{C}$

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

Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

**System Validation /Area Scan (101x101x1):** Measurement grid:  $dx=10\text{mm}$ ,  $dy=10\text{mm}$   
Maximum value of SAR (interpolated) = 2.64 mW/g

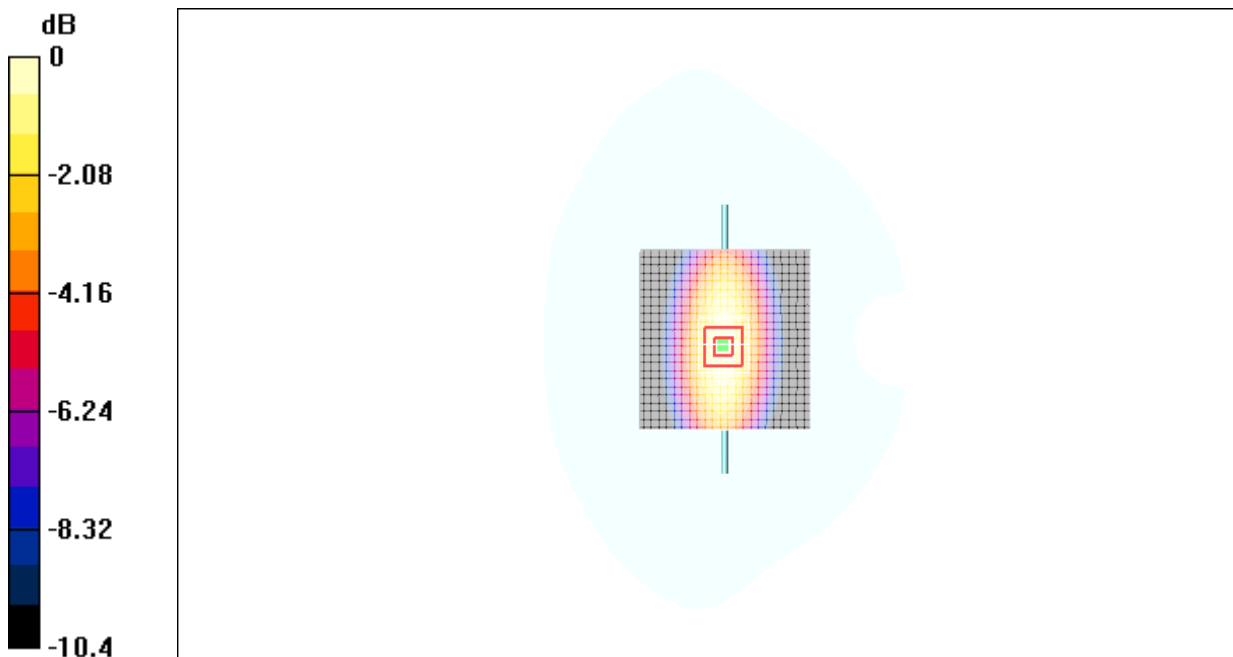
**System Validation /Zoom Scan (7x7x7)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  
 $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 51.7 V/m; Power Drift = -0.081 dB

Peak SAR (extrapolated) = 3.41 W/kg

**SAR(1 g) = 2.44 mW/g; SAR(10 g) = 1.56 mW/g**

Maximum value of SAR (measured) = 2.49 mW/g



0 dB = 2.49mW/g

**Fig.44 validation 835MHz 250mW**

## 1900MHz

Date/Time: 2011-6-2 7:30:31

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used:  $f = 1900 \text{ MHz}$ ;  $\sigma = 1.41 \text{ mho/m}$ ;  $\epsilon_r = 40.7$ ;  $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature:  $23.0^\circ\text{C}$       Liquid Temperature:  $22.5^\circ\text{C}$

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

Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

**System Validation/Area Scan (101x101x1):** Measurement grid:  $dx=10\text{mm}$ ,  $dy=10\text{mm}$   
Maximum value of SAR (interpolated) =  $11.3 \text{ mW/g}$

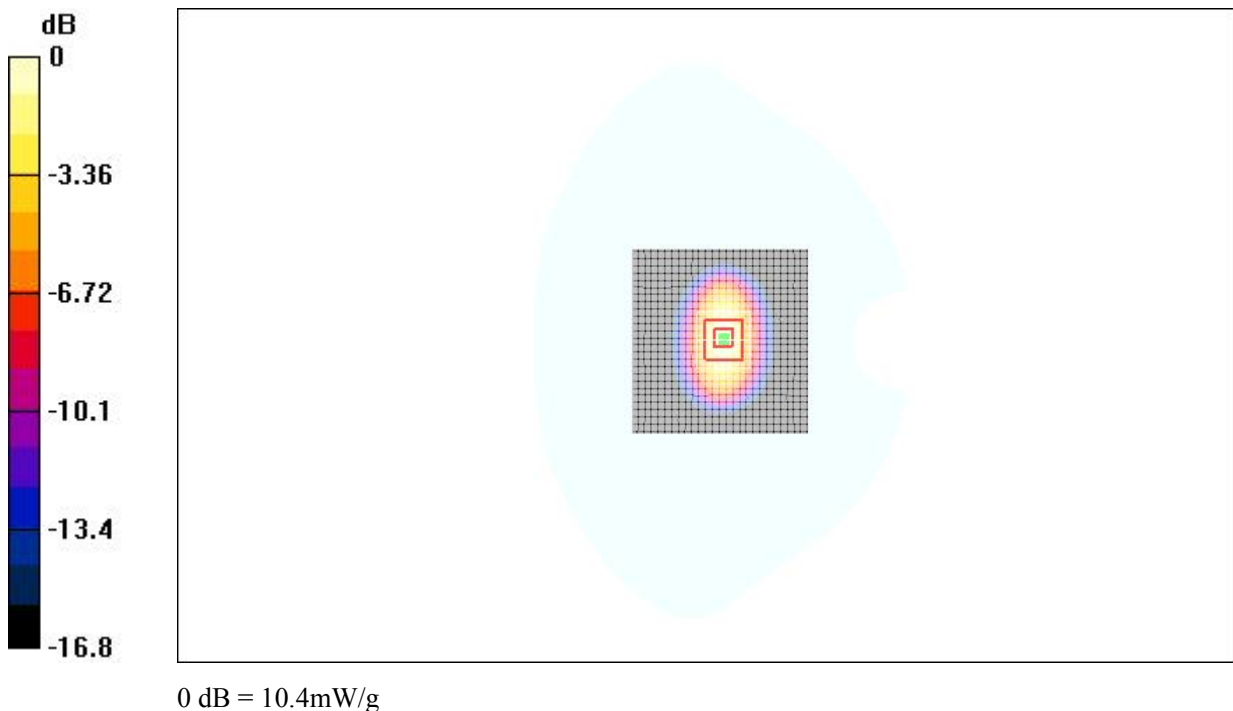
**System Validation/Zoom Scan (7x7x7)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value =  $88.9 \text{ V/m}$ ; Power Drift =  $0.063 \text{ dB}$

Peak SAR (extrapolated) =  $14.7 \text{ W/kg}$

**SAR(1 g) =  $9.75 \text{ mW/g}$ ; SAR(10 g) =  $4.90 \text{ mW/g}$**

Maximum value of SAR (measured) =  $10.4 \text{ mW/g}$



**Fig.45 validation 1900MHz 250mW**

## 1900MHz

Date/Time: 2011-6-2 8:01:27

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used:  $f = 1900 \text{ MHz}$ ;  $\sigma = 1.53 \text{ mho/m}$ ;  $\epsilon_r = 53.5$ ;  $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature:  $23.0^\circ\text{C}$       Liquid Temperature:  $22.5^\circ\text{C}$

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

Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

**System Validation/Area Scan (101x101x1):** Measurement grid:  $dx=10\text{mm}$ ,  $dy=10\text{mm}$   
Maximum value of SAR (interpolated) =  $11.5 \text{ mW/g}$

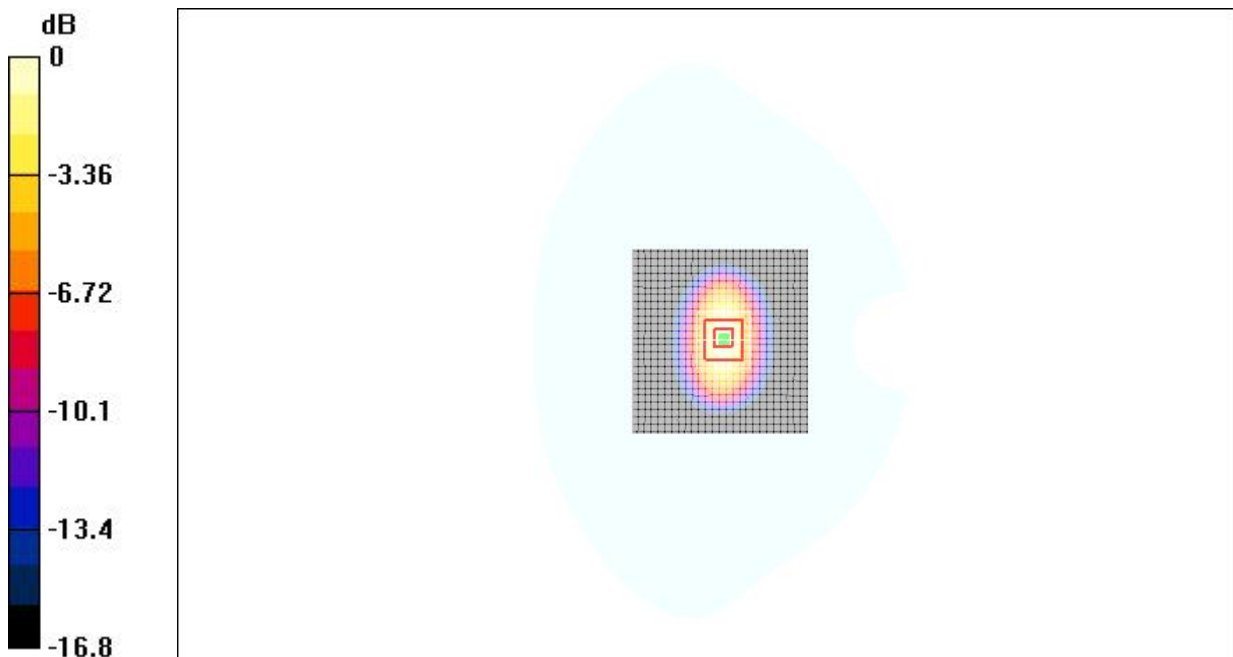
**System Validation/Zoom Scan (7x7x7)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  
 $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value =  $93.5 \text{ V/m}$ ; Power Drift =  $0.058 \text{ dB}$

Peak SAR (extrapolated) =  $15.4 \text{ W/kg}$

**SAR(1 g) =  $10.3 \text{ mW/g}$ ; SAR(10 g) =  $5.20 \text{ mW/g}$**

Maximum value of SAR (measured) =  $10.8 \text{ mW/g}$



0 dB =  $10.8\text{mW/g}$

**Fig.46 validation 1900MHz 250mW**

## ANNEX E PROBE CALIBRATION CERTIFICATE

**Calibration Laboratory of  
Schmid & Partner  
Engineering AG**  
Zeughausstrasse 43, 8004 Zurich, Switzerland



**S** Schweizerischer Kalibrierdienst  
**C** Service suisse d'étalonnage  
**S** Servizio svizzero di taratura  
**S** Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)  
The Swiss Accreditation Service is one of the signatories to the EA  
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **TMC China**

Certificate No: **ES3DV3-3149\_Sep10**

### CALIBRATION CERTIFICATE

Object	<b>ES3DV3-SN: 3149</b>
Calibration procedure(s)	<b>QA CAL-01.v6 Calibration procedure for dosimetric E-field probes</b>
Calibration date:	<b>September 25, 2010</b>
Condition of the calibrated item	<b>In Tolerance</b>

This calibration certify documents the traceability to national standards, which realize the physical units of measurements(SI).  
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.  
All calibrations have been conducted at an environment temperature (22±3)°C and humidity<70%

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID#	Cal Data (Calibrated by, Certification NO.)	Scheduled Calibration
Power meter E4419B	GB41293874	5-May-10 (METAS, NO. 251-00388)	May-11
Power sensor E4412A	MY41495277	5-May-10 (METAS, NO. 251-00388)	May-11
Reference 3 dB Attenuator	SN:S5054 (3c)	10-Aug-10 (METAS, NO. 251-00403)	Aug-11
Reference 20 dB Attenuator	SN:S5086 (20b)	3-May-10 (METAS, NO. 251-00389)	May-11
Reference 30 dB Attenuator	SN:S5129 (30b)	10-Aug-10 (METAS, NO. 251-00404)	Aug-11
DAE4	SN:617	10-Jun-10 (SPEAG, NO.DAE4-907_Jun10)	Jun-11
Reference Probe ES3DV2	SN: 3013	12-Jan-10 (SPEAG, NO. ES3-3013_Jan10)	Jan-11

Secondary Standards	ID#	Check Data (in house)	Scheduled Calibration
RF generator HP8648C	US3642U01700	4-Aug-99(SPEAG, in house check Oct-09)	In house check: Oct-10
Network Analyzer HP 8753E	US37390585	18-Oct-01(SPEAG, in house check Nov-09)	In house check: Nov-10

Name	Function	Signature
Calibrated by: Katja Pokovic	Technical Manager	

Approved by: Niels Kuster	Quality Manager	
---------------------------	-----------------	--

Issued: **September 25, 2010**

This calibration certificate shall not be reported except in full without written approval of the laboratory.

**Calibration Laboratory of**  
Schmid & Partner  
Engineering AG  
Zeughausstrasse 43, 8004 Zurich, Switzerland



**S** Schweizerischer Kalibrierdienst  
**S** Service suisse d'étalonnage  
**C** Servizio svizzero di taratura  
**S** Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)  
The Swiss Accreditation Service is one of the signatories to the EA  
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

**Glossary:**

TSL	tissue simulating liquid
NORM <sub>x,y,z</sub>	sensitivity in free space
ConF	sensitivity in TSL / NORM <sub>x,y,z</sub>
DCP	diode compression point
Polarization $\varphi$	$\varphi$ rotation around probe axis
Polarization $\vartheta$	$\vartheta$ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis

**Calibration is Performed According to the Following Standards:**

- a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

**Methods Applied and Interpretation of Parameters:**

- **NORM<sub>x,y,z</sub>**: Assessed for E-field polarization  $\vartheta = 0$  ( $f \leq 900$  MHz in TEM-cell;  $f > 1800$  MHz: R22 waveguide). NORM<sub>x,y,z</sub> are only intermediate values, i.e., the uncertainties of NORM<sub>x,y,z</sub> does not effect the  $E^2$ -field uncertainty inside TSL (see below *ConvF*).
- **NORM(f)<sub>x,y,z</sub>** = NORM<sub>x,y,z</sub> \* *frequency\_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- **DCP<sub>x,y,z</sub>**: DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- **ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for  $f \leq 800$  MHz) and inside waveguide using analytical field distributions based on power measurements for  $f > 800$  MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM<sub>x,y,z</sub> \* *ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from  $\pm 50$  MHz to  $\pm 100$  MHz.
- **Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- **Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.



ES3DV3 SN: 3149

September 25, 2010

# Probe ES3DV3

**SN: 3149**

Manufactured: June 12, 2007

Calibrated: September 25, 2010

Calibrated for DASY4 System

ES3DV3 SN: 3149

September 25, 2010

**DASY – Parameters of Probe: ES3DV3 SN:3149**

Sensitivity in Free Space<sup>A</sup>

Diode Compression<sup>B</sup>

NormX	1.14±10.1%	$\mu V/(V/m)^2$	DCP X	94mV
NormY	1.23±10.1%	$\mu V/(V/m)^2$	DCP Y	95mV
NormZ	1.29±10.1%	$\mu V/(V/m)^2$	DCP Z	91mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8

Boundary Effect

TSL                    900MHz      Typical SAR gradient: 5% per mm

Sensor Center to Phantom Surface Distance		3.0 mm	4.0 mm
SARbe[%]	Without Correction Algorithm	3.8	1.6
SARbe[%]	With Correction Algorithm	0.8	0.7

TSL                    1810MHz      Typical SAR gradient: 10% per mm

Sensor Center to Phantom Surface Distance		3.0 mm	4.0 mm
SARbe[%]	Without Correction Algorithm	6.8	3.6
SARbe[%]	With Correction Algorithm	0.4	0.2

Sensor Offset

Probe Tip to Sensor Center                    2.0 mm

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor  $k=2$ , which for a normal distribution Corresponds to a coverage probability of approximately 95%.

<sup>A</sup> The uncertainties of NormX,Y,Z do not affect the  $E^2$ -field uncertainty inside TSL (see Page 8).

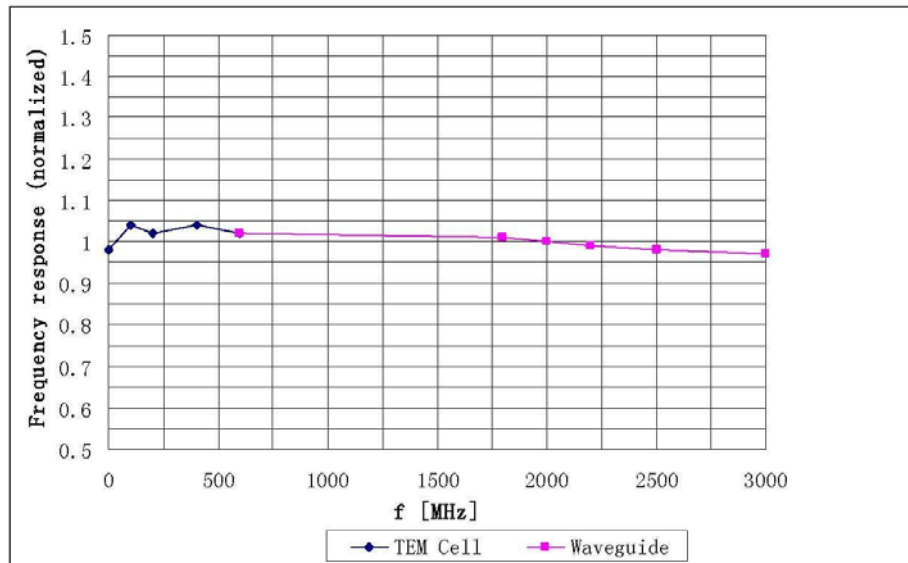
<sup>B</sup> Numerical linearization parameter: uncertainty not required.



ES3DV3 SN: 3149

September 25, 2010

## Frequency Response of E-Field



Uncertainty of Frequency Response of E-field:  $\pm 5.0\%$  ( $k=2$ )