



No.: RZC2008-1581



OET 65

TEST REPORT

Test name	Electromagnetic Field (Specific Absorption Rate)
Product	GSM Dual-Band Digital Mobile Phone
Model	ZTE A36G+
FCC ID	Q78-ZTEA36GPLUS
Client	ZTE CORPORATION

TA Technology (Shanghai) Co., Ltd.



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GENERAL SUMMARY

Product	GSM Dual-Band Digital Mobile Phone	Model	ZTE A36G+
Client	ZTE CORPORATION	Type of test	Entrusted
Manufacturer	ZTE CORPORATION	Arrival Date of sample	December 11 th , 2008
Place of sampling	(Blank)	Carrier of the samples	Min Zhang
Quantity of the samples	One	Date of product	(Blank)
Base of the samples	(Blank)	Items of test	SAR
Series number	353052020719641		
Standard(s)	<p>ANSI C95.1-2005: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.</p> <p>IEEE 1528-2003: Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head Due to Wireless Communications Devices: Experimental Techniques.</p> <p>OET Bulletin 65 supplement C, published June 2001 including DA 02-1438, published June 2002: Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits. Transition Period for the Phantom Requirements of Supplement C to OET Bulletin 65.</p> <p>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).</p> <p>IEC 62209-2(draft): Human exposure to radio frequency fields from handheld and body-mounted wireless communication devices – Human models, instrumentation, and procedures –Part 2: Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body. (frequency rang of 30MHz to 6GHz)</p>		
Conclusion	<p>Localized Specific Absorption Rate (SAR) of this portable wireless equipment has been measured in all cases requested by the relevant standards cited in Clause 7.2 of this test report. Maximum localized SAR is below exposure limits specified in the relevant standards cited in Clause 7.1 of this test report.</p> <p>General Judgment: Pass</p> <p style="text-align: right;">(Stamp)</p> <p style="text-align: right;">Date of issue: December 24th, 2008</p>		
Comment	The test result only responds to the measured sample.		

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1. COMPETENCE AND WARRANTIES

TA Technology (Shanghai) Co., Ltd. is a test laboratory competent to carry out the tests described in this test report.

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

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3. DESCRIPTION OF EUT

3.1. Addressing Information Related to EUT

Table 1: Applicant (The Client)

Name or Company	ZTE CORPORATION
Address/Post	ZTE Plaza, Keji Road South, Hi-Tech Industrial Park,Nanshan District,Shenzhen, Guangdong, 518057, P.R.China
City	Shenzhen
Postal Code	518057
Country	P.R.China
Telephone	021-68897541
Fax	021-50801070

Table 2: Manufacturer

Name or Company	ZTE CORPORATION
Address/Post	ZTE Plaza, Keji Road South, Hi-Tech Industrial Park,Nanshan District,Shenzhen, Guangdong, 518057, P.R.China
City	Shenzhen
Postal Code	518057
Country	P.R.China
Telephone	021-68897541
Fax	021-50801070

3.2. Constituents of EUT

Table 3: Constituents of Samples

Description	Model	Serial Number	Manufacturer
Handset	ZTE A36G+	353052020719641	ZTE CORPORATION
Lithium Battery	Li3706T42P3h383857	40040710280275921	ZTE CORPORATION
AC/DC Adapter	STC-A22O50U8-C	10080323047408 0	ZTE CORPORATION

Note:

The EUT appearances see ANNEX H.

3.3. General Description

Equipment Under Test (EUT) is a model of GSM Dual-Band Digital Mobile Phone with internal antenna. It consists of Handset, Lithium Battery and AC/DC Adapter. The detail about Mobile phone, Lithium Battery and AC/DC Adapter is in Table 3. SAR is tested for GSM 850 and GSM 1900. The EUT has GPRS(Class 10) function.

The sample under test was selected by the Client.

Components list please refer to documents of the manufacturer.

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3.4. Test item

Table 4: Test item of EUT

Device type :	portable device	
Exposure category:	uncontrolled environment / general population	
Device operating configurations :		
Operating mode(s):	GSM850; (tested) GSM1900; (tested)	
GPRS mobile station class :	A	
GPRS multislots class :	10	
Modulation:	GMSK,	
Standard output power	(33dBm,2W)GSM850; (tested) (30dBm,1W)GSM1900; (tested)	
Operating frequency range(s)	transmitter frequency range	receiver frequency range
GSM850: (tested)	824.2 MHz ~ 848.8 MHz	869.2 MHz ~ 893.8 MHz
GSM1900: (tested)	1850.2 MHz ~ 1909.8 MHz	1930.2 MHz ~ 1989.8 MHz
Power class	GSM 850: 4, tested with power level 5	
	GSM 1900: 1, tested with power level 0	
Test channel (Low –Middle –High)	128 -190 - 251 (GSM850) (tested) 512 - 661 – 810 (GSM1900) (tested)	
Hardware version:	g3dB	
Software version:	VDF-P108A2FM(VBR)(G)(U)B07-FrEs-DG01\\ng3dBV2.0	
Antenna type:	integrated antenna	

4. OPERATIONAL CONDITIONS DURING TEST

4.1. General description of test procedures

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

4.2. GSM Test Configuration

SAR tests for GSM 850 and GSM 1900, a communication link is set up with a System Simulator (SS) by air link. Using E5515C the power level is set to "5" in head SAR and body SAR of GSM850, set to "0" in head SAR and body SAR of GSM1900.

The tests in the band of GSM 850 and GSM 1900 are performed in the mode of speech transfer function and GPRS. And since the GPRS class is 10 for this EUT, it has at most 2 timeslots in uplink.

5. SAR MEASUREMENTS SYSTEM CONFIGURATION

5.1. SAR Measurement Set-up

The DASY4 system for performing compliance tests consists of the following items:

- A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating the data acquisition electronics (DAE).
- A dosimetric probe, i.e. an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- A data acquisition electronic (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- A unit to operate the optical surface detector which is connected to the EOC.
- The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY4 measurement server.
- The DASY4 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation. A computer operating Windows 2003
- DASY4 software and SEMCAD data evaluation software.
- Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.
- The generic twin phantom enabling the testing of left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- System validation dipoles allowing to validate the proper functioning of the system.

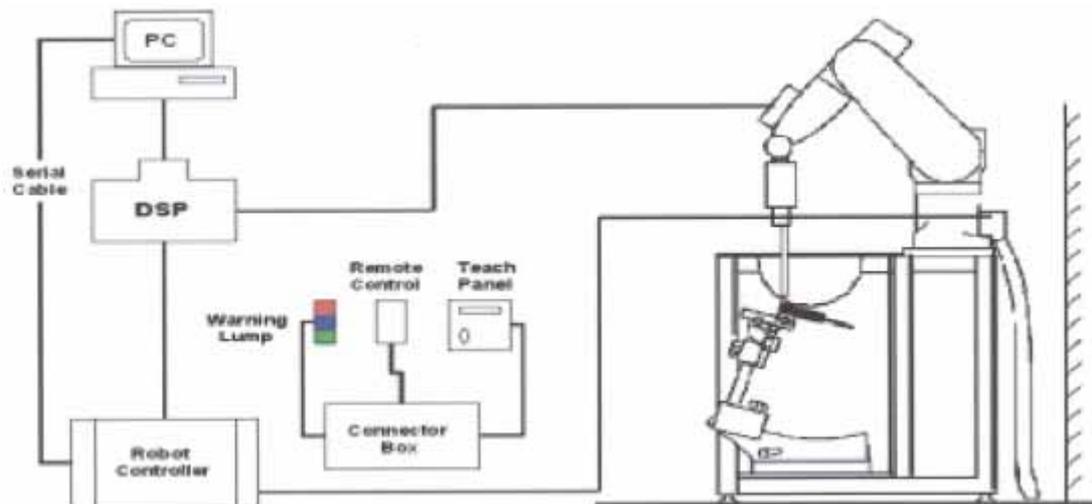


Figure 1. SAR Lab Test Measurement Set-up

5.2. Dasy4 E-field Probe System

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

5.2.1. EX3DV4 Probe Specification

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	Basic Broad Band Calibration in air Conversion Factors (CF) for HSL 900 and HSL 1750 Additional CF for other liquids and frequencies upon request
Frequency	10 MHz to > 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	10 μ W/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μ W/g)
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.



Figure 2. EX3DV4 E-field Probe



Figure 3. EX3DV4 E-field probe

5.2.2. E-field Probe Calibration

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

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

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

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

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

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

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

5.3. Other Test Equipment

5.3.1. Device Holder for Transmitters

The DASY device holder is designed to cope with the die rent positions given in the standard. It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.

The DASY device holder is constructed of low-loss POM material having the following dielectric parameters: relative permittivity $\epsilon=3$ and loss tangent $\tan \delta=0.02$. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the inference of the clamp on the test results could thus be lowered.



Figure 4. Device Holder

5.3.2. Phantom

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

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



Figure 5. Generic Twin Phantom

5.4. Scanning procedure

The DASY4 installation includes predefined files with recommended procedures for measurements and validation. They are read-only document files and destined as fully defined but unmeasured masks. All test positions (head or body-worn) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.

- The "reference" and "drift" measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure. The indicated drift is mainly the variation of the DUT's output power and should vary max. ± 5 %.
- The "surface check" measurement tests the optical surface detection system of the DASY4 system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above ± 0.1mm). To prevent wrong results tests are only executed when the liquid is free of air bubbles. The difference between the optical surface detection and the actual surface depends on the probe and is specified with each probe. (It does not depend on the surface reflectivity or the probe angle to the surface within ± 30°.)
- Area Scan
The Area Scan is used as a fast scan in two dimensions to find the area of high field values

before running a detailed measurement around the hot spot. Before starting the area scan a grid spacing of 15 mm x 15 mm is set. During the scan the distance of the probe to the phantom remains unchanged.

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

- **Zoom Scan**

Zoom Scans are used to estimate the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The default Zoom Scan is done by 7x7x7 points within a cube whose base is centered around the maxima found in the preceding area scan.

- **Spatial Peak Detection**

The procedure for spatial peak SAR evaluation has been implemented according to the IEEE1529 standard and can determine values of masses of 1g and 10g, as well as for user-specific masses. The DASY4 system allows evaluations that combine measured data and robot positions, such as:

- maximum search
- extrapolation
- boundary correction
- peak search for averaged SAR

During a maximum search, global and local maxima searches are automatically performed in 2-D after each Area Scan measurement with at least 6 measurement points. It is based on the evaluation of the local SAR gradient calculated by the Quadratic Shepard's method. The algorithm will find the global maximum and all local maxima within -2 dB of the global maxima for all SAR distributions.

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. Several measurements at different distances are necessary for the extrapolation. Extrapolation routines require at least 10 measurement points in 3-D space. They are used in the Zoom Scan to obtain SAR values between the lowest measurement points and the inner phantom surface. The routine uses the modified Quadratic Shepard's method for extrapolation. For a grid using 7x7x7 measurement points with 5mm resolution amounting to 343 measurement points, the uncertainty of the extrapolation routines is less than 1% for 1g and 10g cubes.

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

5.5. Data Storage and Evaluation

5.5.1. Data Storage

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

The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [mW/g], [mW/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

5.5.2. Data Evaluation by SEMCAD

The SEMCAD software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

Probe parameters:	- Sensitivity	Normi, ai ₀ , a _{i1} , a _{i2}
	- Conversion factor	ConvF _i
	- Diode compression point	Dcp _i
Device parameters:	- Frequency	f
	- Crest factor	cf
Media parameters:	- Conductivity	σ
	- Density	ρ

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY4 components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics.

If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

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

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

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

cf = crest factor of exciting field (DASY parameter)

dcp_i = diode compression point (DASY parameter)

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

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

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

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

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

$ConvF$ = sensitivity enhancement in solution

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

f = carrier frequency [GHz]

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

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

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

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

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

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

with **SAR** = local specific absorption rate in mW/g

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

σ = conductivity in [mho/m] or [Siemens/m]

ρ = equivalent tissue density in g/cm³

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid. The power flow density is calculated assuming the excitation field to be a free space field.

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

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

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

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

5.6. System validation

System validation is performed by using a validation dipole which is positioned parallel to the planar part of the SAM phantom at the reference point. The distance of the dipole to the SAM phantom is determined by a plexiglass spacer. The dipole is connected to the signal source consisting of signal generator and amplifier via a directional coupler, N-connector cable and adaptation to SMA. It is fed with a power of 1000 mW. To adjust this power a power meter is used. The power sensor is connected to the cable before the validation to measure the power at this point and do adjustments at the signal generator. At the outputs of the directional coupler both return loss as well as forward power are controlled during the validation to make sure that emitted power at the dipole is kept constant. This can also be checked by the power drift measurement after the test.

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

System validation is performed regularly on all frequency bands where tests are performed with the DASY 4 system.

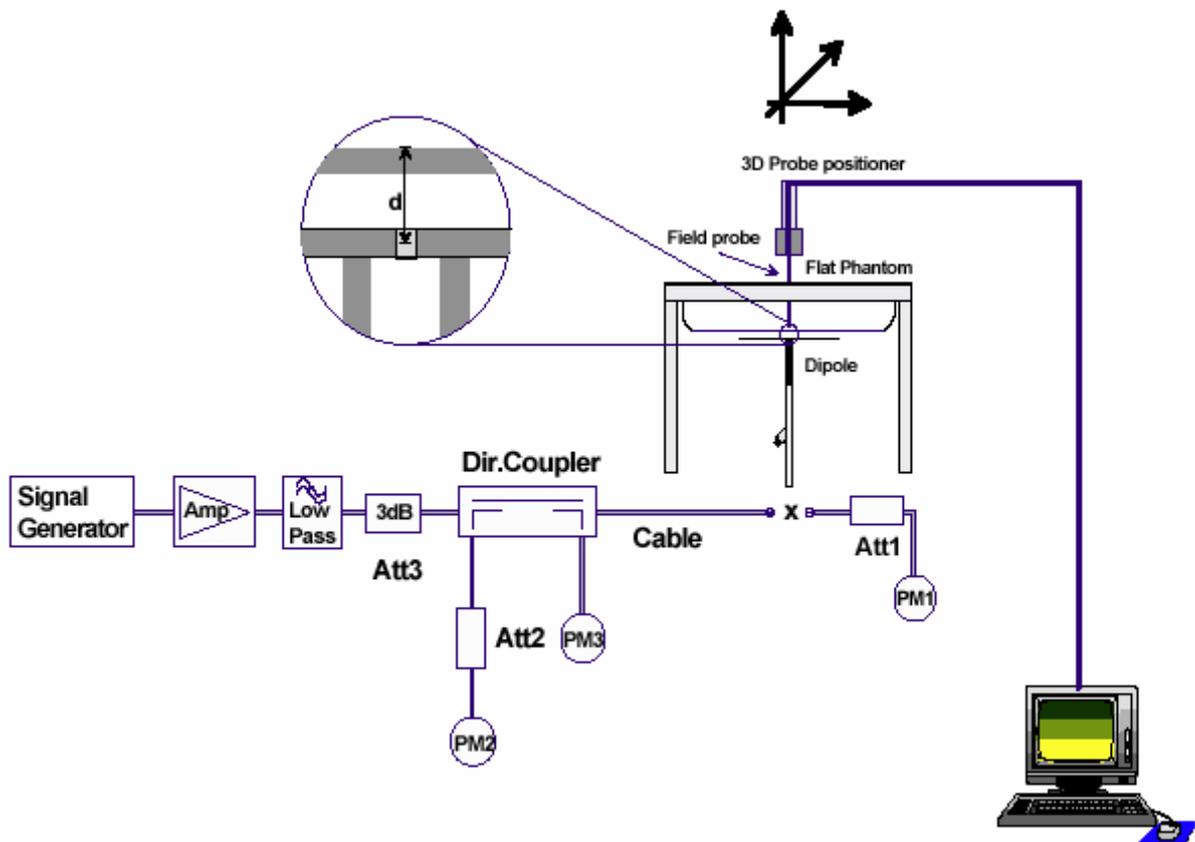


Figure 6. System validation Set-up

5.7. Equivalent Tissues

The liquid is consisted of water, salt, Glycol, Sugar, Preventol and Cellulose. The liquid has previously been proven to be suited for worst-case. The Table 5 and Table 6 show the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the OET 65.

Table 5: Composition of the Head Tissue Equivalent Matter

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

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

Table 6: Composition of the Body Tissue Equivalent Matter

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

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

6. LABORATORY ENVIRONMENT

Table 7: The Ambient Conditions during Test

Temperature	Min. = 20°C, Max. = 25 °C
Relative humidity	Min. = 30%, Max. = 70%
Ground system resistance	< 0.5 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.	

7. CHARACTERISTICS OF THE TEST

7.1. Applicable Limit Regulations

ANSI C95.1–2005: 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.

7.2. Applicable Measurement Standards

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

OET Bulletin 65 supplement C, published June 2001 including DA 02-1438, published June 2002: Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits. Transition Period for the Phantom Requirements of Supplement C to OET Bulletin 65.

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8. CONDUCTED OUTPUT POWER MEASUREMENT

8.1. Summary

The DUT is tested using an E5515C communications tester as controller unit to set test channels and maximum output power to the DUT, as well as for measuring the conducted peak power. Conducted output power was measured using an integrated RF connector and attached RF cable. This result contains conducted output power for the EUT.

8.2. Conducted Power Results

Table 8: Conducted Power Measurement Results

GSM 850	Conducted Power		
	Channel 128	Channel 190	Channel 251
	(824.2MHz)	(836.6MHz)	(848.8MHz)
Result (dBm)	31.24	31.07	30.92
GSM 850+GPRS	Conducted Power		
	Channel 128	Channel 128	Channel 128
	(824.2MHz)	(824.2MHz)	(824.2MHz)
Result (dBm)	31.37	31.24	31.12
GSM 1900	Conducted Power		
	Channel 512	Channel 661	Channel 810
	(1850.2MHz)	(1880MHz)	(1909.8MHz)
Result (dBm)	28.10	26.50	26.18
GSM 1900+GPRS	Conducted Power		
	Channel 512	Channel 661	Channel 810
	(1850.2MHz)	(1880MHz)	(1909.8MHz)
Result (dBm)	20.11	19.99	20.12

9. TEST RESULTS

9.1. Dielectric Performance

Table 9: Dielectric Performance of Head Tissue Simulating Liquid

Measurement is made at temperature 22.5 °C and relative humidity 51%. Liquid temperature during the test: 22.3°C					
Frequency (MHz)		Target value	Measurement value	Difference percentage	
835 (Brain)	Permittivity ϵ_r	41.5	41.21	-0.70	%
	Conductivity σ	0.9	0.89	-1.11	%
1900 (Brain)	Permittivity ϵ_r	40	39.98	-0.05	%
	Conductivity σ	1.4	1.41	0.71	%

Table 10: Dielectric Performance of Body Tissue Simulating Liquid

Measurement is made at temperature 22.5 °C and relative humidity 51%. Liquid temperature during the test: 22.3°C					
Frequency (MHz)		Target value	Measurement value	Difference percentage	
835 (Body)	Permittivity ϵ_r	55.2	54.06	-2.07	%
	Conductivity σ	0.97	0.98	1.03	%
1900 (Body)	Permittivity ϵ_r	53.3	51.59	-3.21	%
	Conductivity σ	1.52	1.56	2.63	%

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9.2. System Validation Results

Table 11: System Validation for Head tissue simulant

Measurement is made at temperature 23.2 °C, relative humidity 50%, and input power 250 mW. Liquid temperature during the test: 22.3°C					
	Frequency	Description	Dielectric Parameters		Temp
			Permittivity ϵ	Conductivity σ (S/m)	
Liquid parameters	835MHz	Recommended result $\pm 5\%$ window	40.9 38.85---42.94	0.89 0.85---0.93	/
		Measurement value	41.21	0.89	22.3
	1900MHz	Recommended result $\pm 5\%$ window	38.8 36.86---40.74	1.47 1.40---1.54	/
		Measurement value	39.98	1.41	22.3
	Frequency	Description	SAR(W/kg)		Input Power
			10 g Average	1 g Average	
Validation results	835MHz	Recommended result $\pm 10\%$ window	1.52 1.37--1.67	2.30 2.07--2.53	250mW
		Measurement value	1.50	2.30	250mW
	1900MHz	Recommended result $\pm 10\%$ window	5.06 4.55---5.57	9.84 8.86--10.82	250mW
		Measurement value	5.09	9.74	250mW

- Note: 1. Target Values used derive from the SPEAG calibration certificate and 250 mW is used as feeding power to the validation dipole (SPEAG using).
 2. The graph results see ANNEX B.
 3. Target values are the data of the dipole calibration results; please check ANNEX E/F for the Dipole Calibration Certificate.

9.3. Summary of Measurement Results

Table 12: SAR Values (GSM850, Head)

Liquid Temperature: 22.5					
Limit of SAR (W/kg)		10 g Average	1 g Average	Power Drift (dB)	Graph Results
		2.0	1.6	± 0.21	
Test Case Of Head		Measurement Result(W/kg)		Power Drift (dB)	
		10 g Average	1 g Average		
Different Test Position	Channel				
Left hand, Touch cheek	High	0.728	1.050	0.075	Figure 11
	Middle	0.725	1.040	-0.050	Figure 13
	Low	0.711	1.020	0.036	Figure 15
Left hand, Tilt 15 Degree	Middle	0.419	0.605	0.066	Figure 17
Right hand, Touch cheek	High	0.661	0.944	-0.070	Figure 19
	Middle	0.655	0.933	0.007	Figure 21
	Low	0.613	0.871	0.043	Figure 23
Right hand, Tilt 15 Degree	Middle	0.347	0.498	-0.089	Figure 25

- Note: 1. The value with blue color is the maximum SAR Value of test case of head in each test band
2. Upper and lower frequencies were measured at the worst position of head.
 3. The SAR test shall be performed at the high, middle and low frequency channels of each operating mode. If the SAR measured at mid-band channel for each test configuration is at least 3.0 dB lower than the SAR limit (< 0.8W/kg), testing at the high and low channels is optional.

Table 13: SAR Values (GSM850, Body, Distance 15mm)

Liquid Temperature: 22.5°C					
Limit of SAR (W/kg)		10 g Average	1 g Average	Power Drift (dB)	Graph Results
		2.0	1.6	± 0.21	
Test Case Of Body		Measurement Result (W/kg)		Power Drift (dB)	
		10 g Average	1 g Average		
Different Test Position	Channel				
Towards Ground	High	0.290	0.401	-0.051	Figure 27
	Middle	0.314	0.436	0.017	Figure 29
	Low	0.331	0.460	-0.115	Figure 31
Towards Phantom	Middle	0.281	0.389	0.069	Figure 33
Worst case position of Body in speech transfer mode with Earphone					
Towards Ground	Low	0.333	0.460	-0.017	Figure 35
Test position of Body with GPRS					
Towards Ground	High	0.525	0.727	0.009	Figure 37
	Middle	0.507	0.702	-0.049	Figure 39
	Low	0.518	0.714	0.030	Figure 41
Towards Phantom	Middle	0.476	0.660	0.057	Figure 43

- Note: 1. the value with blue color is the maximum SAR Value of test case of body in each test band.
2. Tests in body position were performed with 15 mm air gap between DUT and Phantom to simulate the use of a non-metallic belt-clip or holster.
 3. Upper and lower frequencies were measured at the worst position of body.
 4. The SAR test shall be performed at the high, middle and low frequency channels of each operating mode. If the SAR measured at mid-band channel for each test configuration is at least 3.0 dB lower than the SAR limit (< 0.8W/kg), testing at the high and low channels is optional.

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Table 14: SAR Values (GSM1900, Head)

Liquid Temperature: 22.5°C					
Limit of SAR (W/kg)		10 g Average	1 g Average	Power Drift (dB)	Graph Results
		2.0	1.6	± 0.21	
Test Case Of Head		Measurement Result(W/kg)		Power Drift (dB)	
		10 g Average	1 g Average		
Different Test Position	Channel				
Left hand, Touch cheek	High	0.489	0.864	0.013	Figure 45
	Middle	0.546	0.934	0.144	Figure 47
	Low	0.587	0.992	-0.012	Figure 49
Left hand, Tilt 15 Degree	Middle	0.434	0.747	0.004	Figure 51
Right hand, Touch cheek	High	0.480	0.822	0.104	Figure 53
	Middle	0.558	0.948	-0.119	Figure 55
	Low	0.580	0.977	-0.008	Figure 57
Right hand, Tilt 15 Degree	Middle	0.428	0.735	-0.028	Figure 59

- Note: 1. The value with blue color is the maximum SAR Value of test case of head in each test band
2. Upper and lower frequencies were measured at the worst position of head.
 3. The SAR test shall be performed at the high, middle and low frequency channels of each operating mode. If the SAR measured at mid-band channel for each test configuration is at least 3.0 dB lower than the SAR limit (< 0.8W/kg), testing at the high and low channels is optional.

Table 15: SAR Values (GSM1900, Body, Distance 15mm)

Liquid Temperature: 22.5°C					
Limit of SAR (W/kg)		10 g Average	1 g Average	Power Drift (dB)	Graph Results
		2.0	1.6	± 0.21	
Test Case Of Body		Measurement Result (W/kg)		Power Drift (dB)	
		10 g Average	1 g Average		
Different Test Position	Channel				
Towards Ground	High	0.199	0.344	-0.007	Figure 61
	Middle	0.264	0.454	-0.043	Figure 63
	Low	0.266	0.458	-0.172	Figure 65
Towards Phantom	Middle	0.157	0.257	-0.106	Figure 67
Worst case position of Body in speech transfer mode with Earphone					
Towards Ground	Low	0.312	0.538	0.007	Figure 69
Test position of Body with GPRS					
Towards Ground	High	0.323	0.557	0.007	Figure 71
	Middle	0.420	0.724	0.021	Figure 73
	Low	0.428	0.741	-0.150	Figure 75
Towards Phantom	Middle	0.237	0.462	-0.092	Figure 77

- Note: 1. the value with blue color is the maximum SAR Value of test case of body in each test band.
 2. Tests in body position were performed with 15 mm air gap between DUT and Phantom to simulate the use of a non-metallic belt-clip or holster.
 3. Upper and lower frequencies were measured at the worst position of body.
 4. The SAR test shall be performed at the high, middle and low frequency channels of each operating mode. If the SAR measured at mid-band channel for each test configuration is at least 3.0 dB lower than the SAR limit (< 0.8W/kg), testing at the high and low channels is optional.

9.4. 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 7.2 of this report. Maximum localized SAR are 1.05 W/kg (head) and 0.741 W/kg (body) that are below exposure limits specified in the relevant standards cited in Clause 7.1 of this test report.

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10. MEASUREMENT UNCERTAINTY

No.	a	Type	c	d	e=f(d, k)	f	h=cxf / e	k
	Uncertainty Component		Tol. (±%)	Prob. Dist	Div.	c ₁ (1g)	1g u (± %)	v ₁
1	System repetivity	A	0.5	N	1	1	0.5	9
Measurement system								
2	Probe Calibration	B	5	N	2	1	2.5	∞
3	Axial isotropy	B	4.7	R	$\sqrt{3}$	$(1-cp)_{1/2}$	4.3	∞
4	Hemisphere Isotropy	B	9.4	R	$\sqrt{3}$	$\sqrt{C_P}$		∞
5	Boundary Effect	B	0.4	R	$\sqrt{3}$	1	0.23	∞
6	Linearity	B	4.7	R	$\sqrt{3}$	1	2.7	∞
7	System Detection Limits	B	1.0	R	$\sqrt{3}$	1	0.6	∞
8	Readout Electronics	B	1.0	N	1	1	1.0	∞
9	RF Ambient Conditions	B	3.0	R	$\sqrt{3}$	1	1.73	∞
10	Probe Positioner Mechanical Tolerance	B	0.4	R	$\sqrt{3}$	1	0.2	∞
11	Probe Positioning with respect to Phantom Shell	B	2.9	R	$\sqrt{3}$	1	1.7	∞
12	Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	B	3.9	R	$\sqrt{3}$	1	2.3	∞
Test Sample Related								
13	Test Sample Positioning	A	4.9	N	1	1	4.9	N-1
14	Device Holder Uncertainty	A	6.1	N	1	1	6.1	N-1
15	Output Power Variation-SAR drift measurement	B	5.0	R	$\sqrt{3}$	1	2.9	∞
Phantom and Tissue Parameters								
16	Phantom Uncertainty(shape and thickness tolerances)	B	1.0	R	$\sqrt{3}$	1	0.6	∞
17	Liquid Conductivity-deviation from target values	B	5.0	R	$\sqrt{3}$	0.64	1.7	∞
18	Liquid Conductivity-measurement uncertainty	B	5.0	N	1	0.64	1.7	M
19	Liquid Permittivity-deviation from target values	B	5.0	R	$\sqrt{3}$	0.6	1.7	∞
20	Liquid Permittivity- measurement uncertainty	B	5.0	N	1	0.6	1.7	M
Combined Standard Uncertainty							11.25	
Expanded Uncertainty (95 % CONFIDENCE INTERVAL)							22.5	

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11. MAIN TEST INSTRUMENTS

Table 16: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	Agilent 8753E	US37390326	September 14, 2008	One year
02	Dielectric Probe Kit	Agilent 85070E	US44020115	No Calibration Requested	
03	Power meter	Agilent E4417A	GB41291714	March 14, 2008	One year
04	Power sensor	Agilent 8481H	MY41091316	March 14, 2008	One year
05	Signal Generator	HP 8341B	2730A00804	September 14, 2008	One year
06	Amplifier	IXA-020	0401	No Calibration Requested	
07	BTS	E5515C	GB46490218	September 14, 2008	One year
08	E-field Probe	EX3DV4	3660	September 3, 2008	One year
09	DAE	DAE3	536	August 28, 2008	One year
10	Validation Kit 835MHz	D835V2	4d020	July 21, 2008	One year
11	Validation Kit 1900MHz	D1900V2	5d060	July 22, 2008	One year

12. TEST PERIOD

The test is performed from December 12, 2008 to December 14, 2008.

13. TEST LOCATION

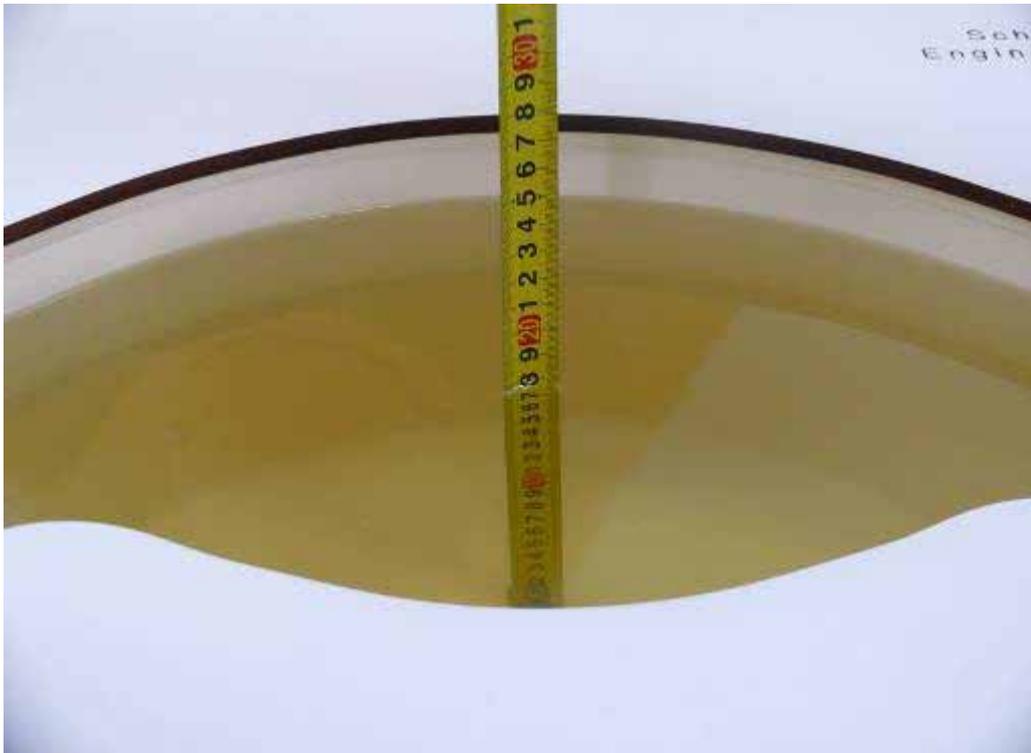
The test is performed at TA Technology (Shanghai) Co., Ltd.

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

ANNEX A: TEST LAYOUT



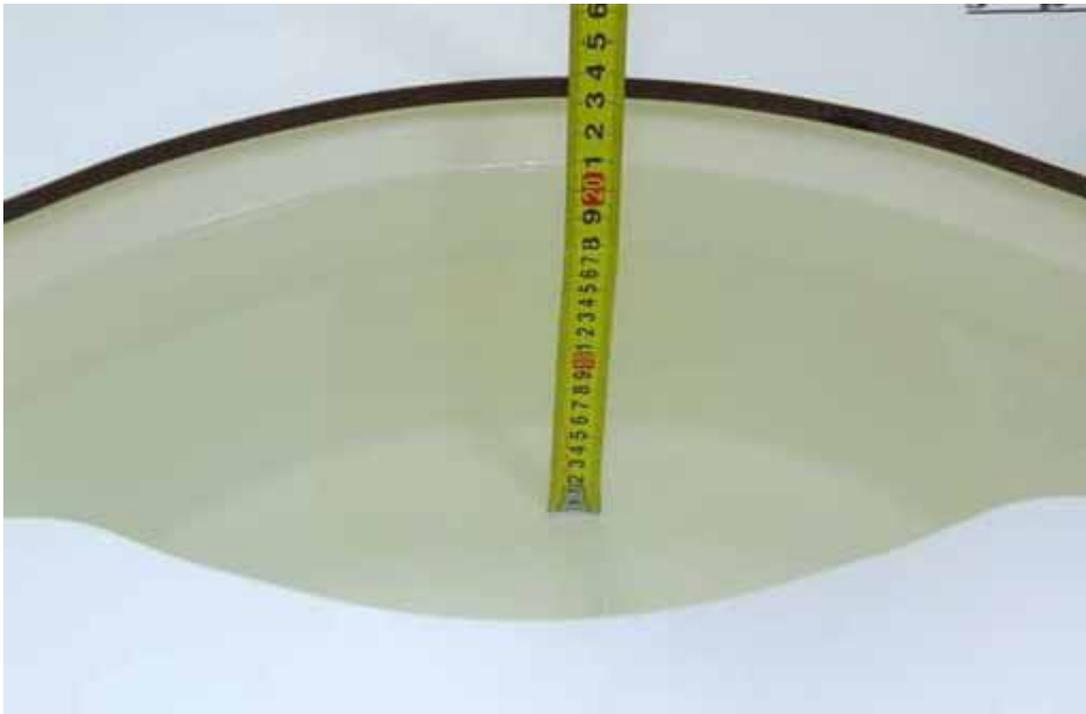
Picture 1: Specific Absorption Rate Test Layout



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



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



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



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

ANNEX B: SYSTEM VALIDATION RESULTS

System Performance Check at 835 MHz

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

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

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.89 \text{ mho/m}$; $\epsilon_r = 41.21$; $\rho = 1000 \text{ kg/m}^3$

Probe: EX3DV4 - SN3660; ConvF(9.19, 9.19, 9.19);

Electronics: DAE3 Sn536;

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

Maximum value of SAR (interpolated) = 2.81 mW/g

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

Reference Value = 55.8 V/m; Power Drift = -0.060 dB

Peak SAR (extrapolated) = 3.50 W/kg

SAR(1 g) = 2.3 mW/g; SAR(10 g) = 1.5 mW/g

Maximum value of SAR (measured) = 2.83 mW/g

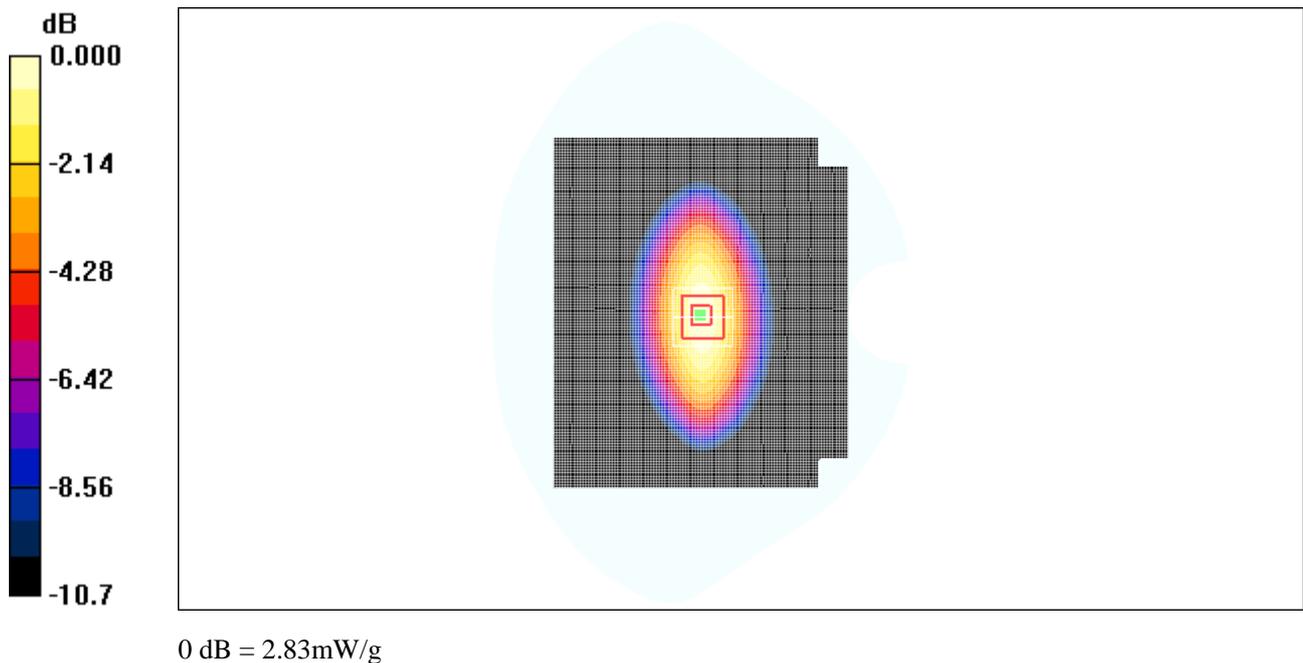


Figure 7 System Performance Check 835MHz 250mW

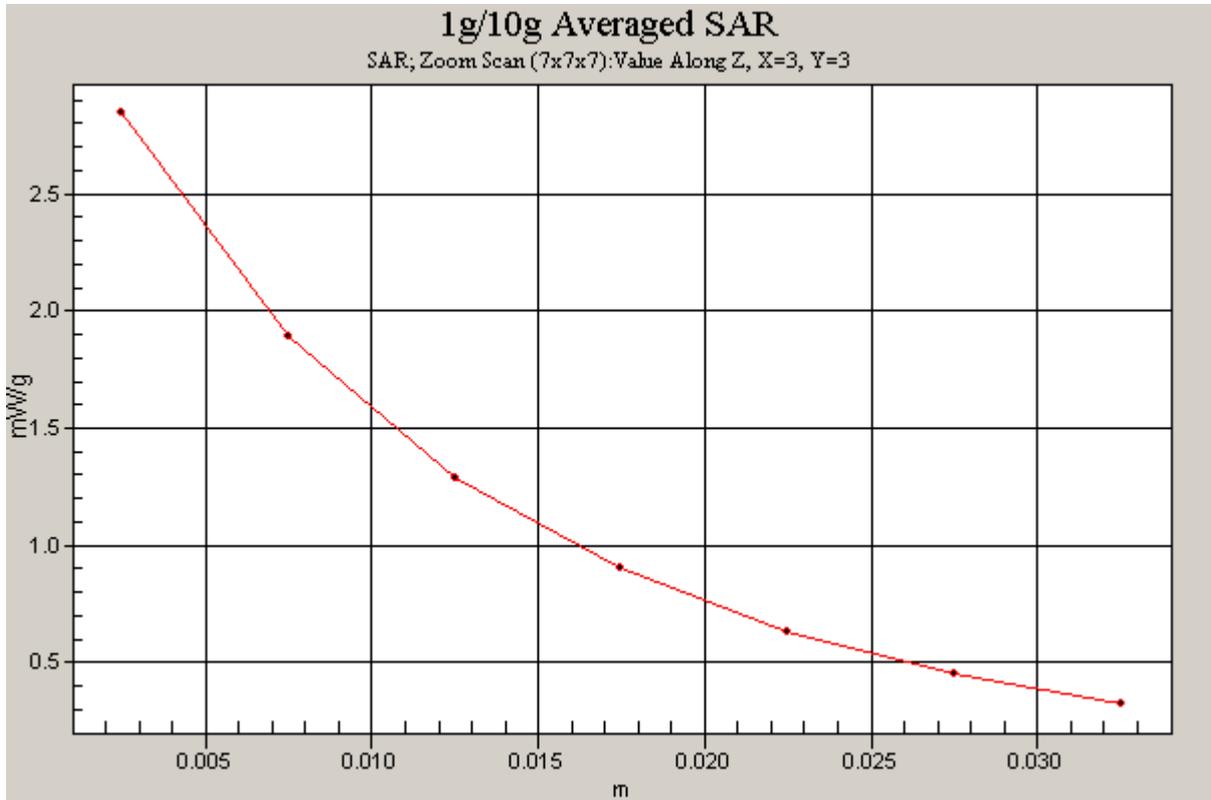


Figure 8 Z-Scan at power reference point (system validation at 835 MHz dipole)

System Performance Check at 1900 MHz

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

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

Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.406 \text{ mho/m}$; $\epsilon_r = 39.98$; $\rho = 1000 \text{ kg/m}^3$

Probe: EX3DV4 - SN3660; ConvF(7.35, 7.35, 7.35);

Electronics: DAE3 Sn536;

d=10mm, Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 11.4 mW/g

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

Reference Value = 93.1 V/m; Power Drift = -0.006 dB

Peak SAR (extrapolated) = 16.9 W/kg

SAR(1 g) = 9.74 mW/g; SAR(10 g) = 5.09 mW/g

Maximum value of SAR (measured) = 11.1 mW/g

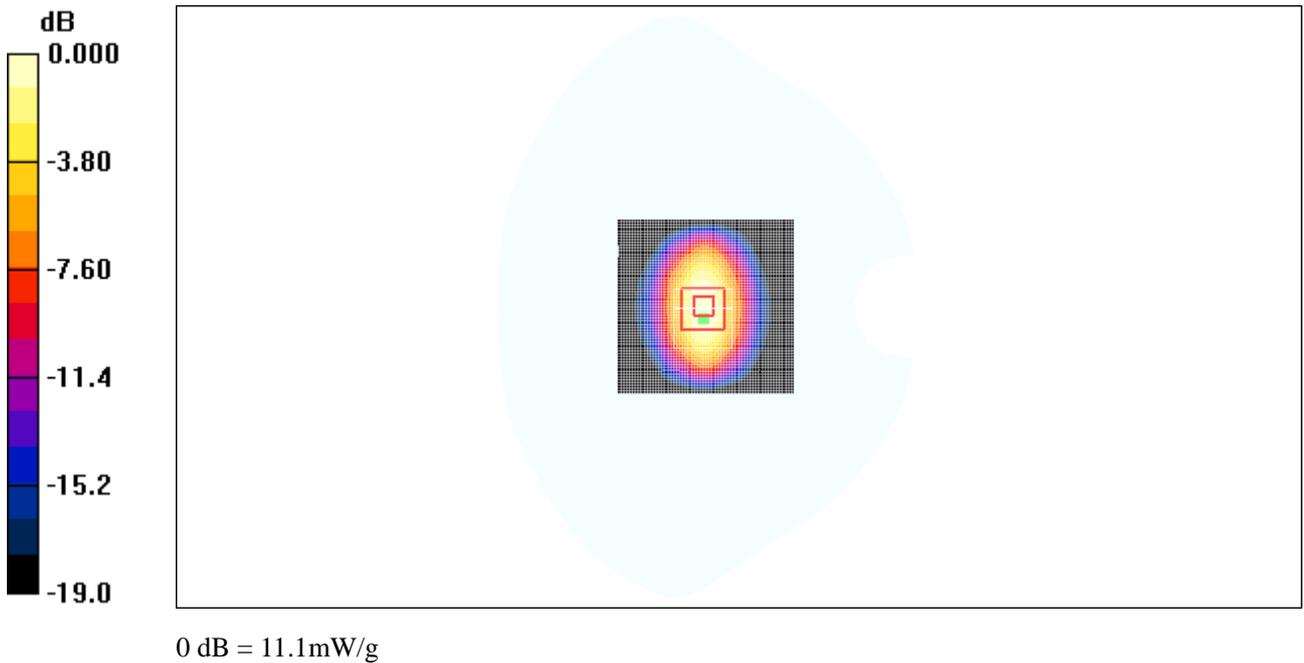


Figure 9 System Performance Check 1900MHz 250mW

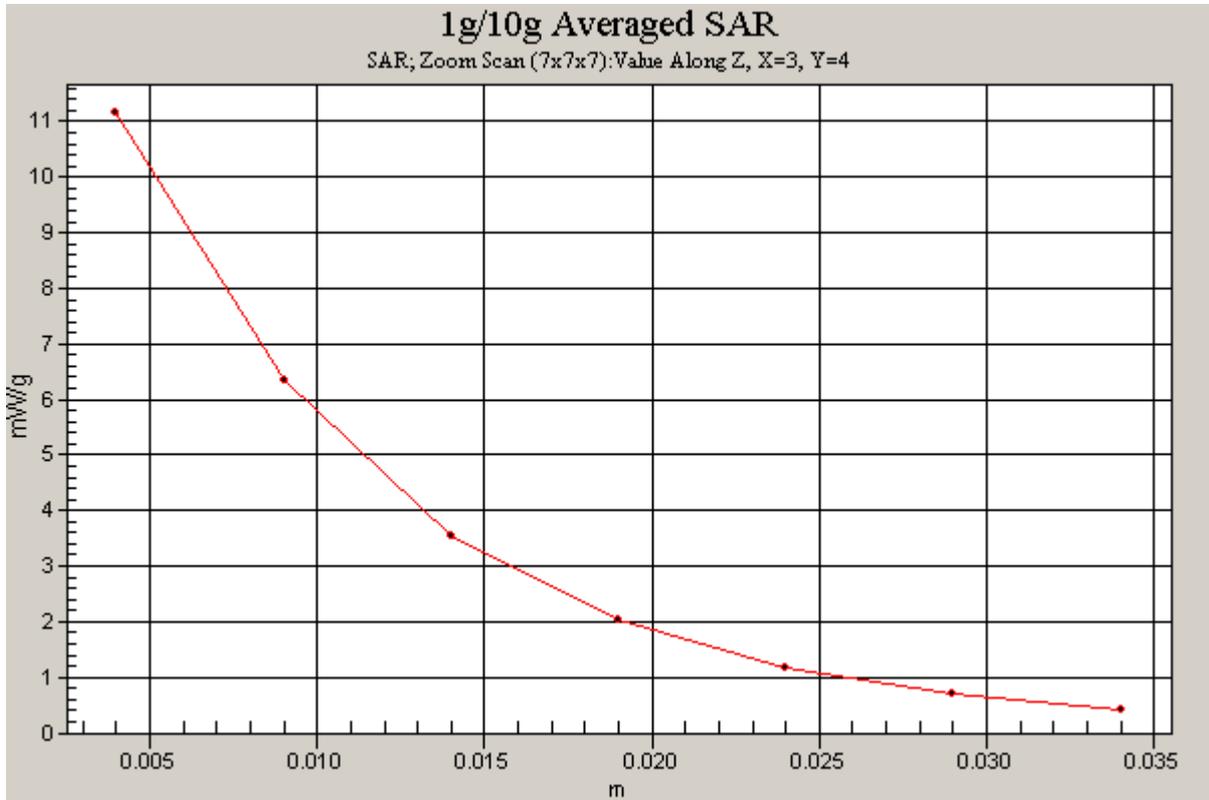


Figure 10 Z-Scan at power reference point (system validation at 1900 MHz dipole)

ANNEX C: GRAPH RESULTS

Date/Time: 12/14/2008 5:46:47 PM

GSM 850 Left Cheek High

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

Medium parameters used: $f = 849$ MHz; $\sigma = 0.9$ mho/m; $\epsilon_r = 41$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(9.19, 9.19, 9.19);
- Electronics: DAE3 Sn536;

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

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

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

Reference Value = 29.4 V/m; Power Drift = 0.075 dB

Peak SAR (extrapolated) = 1.43 W/kg

SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.728 mW/g

Maximum value of SAR (measured) = 1.22 mW/g

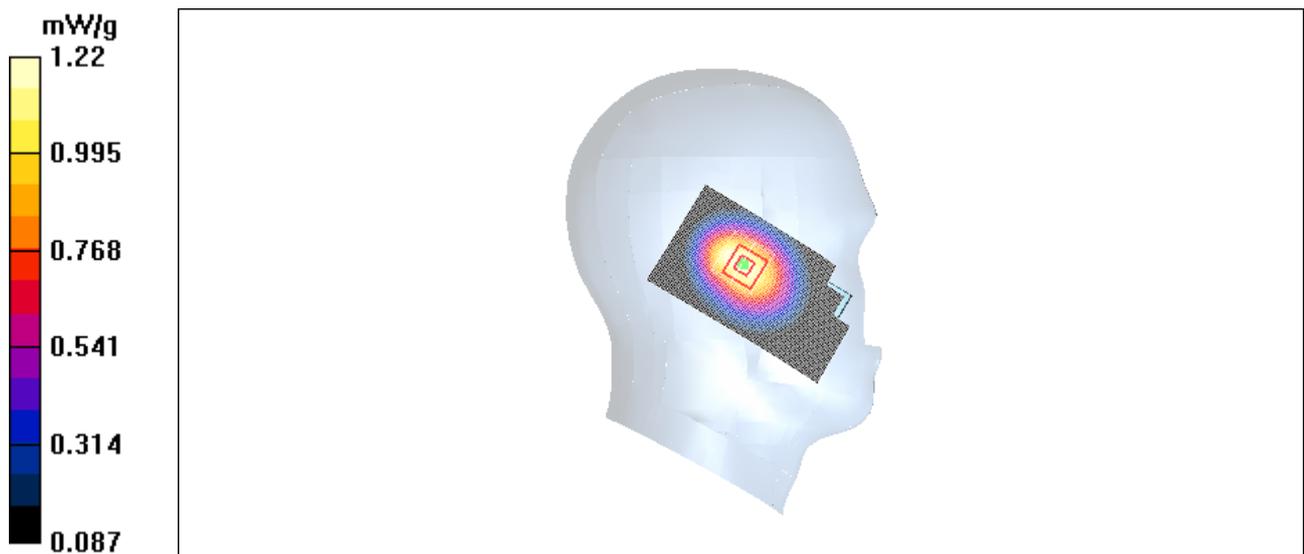


Figure 11 Left Hand Touch Cheek GSM 850 Channel 251

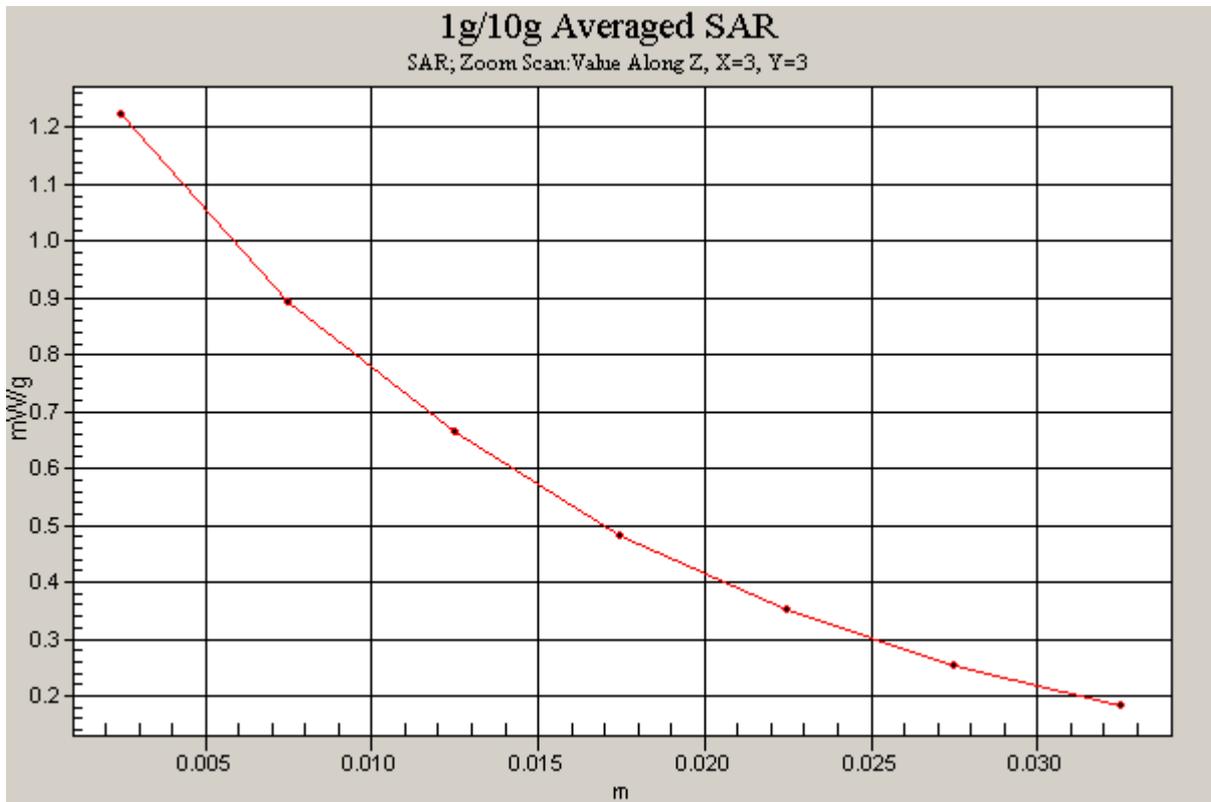


Figure 12 Z-Scan at power reference point (Left Hand Touch Cheek GSM 850 Channel 251)

Date/Time: 12/14/2008 5:28:31 PM

GSM 850 Left Cheek Middle

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

Medium parameters used: $f = 837$ MHz; $\sigma = 0.889$ mho/m; $\epsilon_r = 41.2$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(9.19, 9.19, 9.19);
- Electronics: DAE3 Sn536;

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

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

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

Reference Value = 30.3 V/m; Power Drift = -0.050 dB

Peak SAR (extrapolated) = 1.41 W/kg

SAR(1 g) = 1.04 mW/g; SAR(10 g) = 0.725 mW/g

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

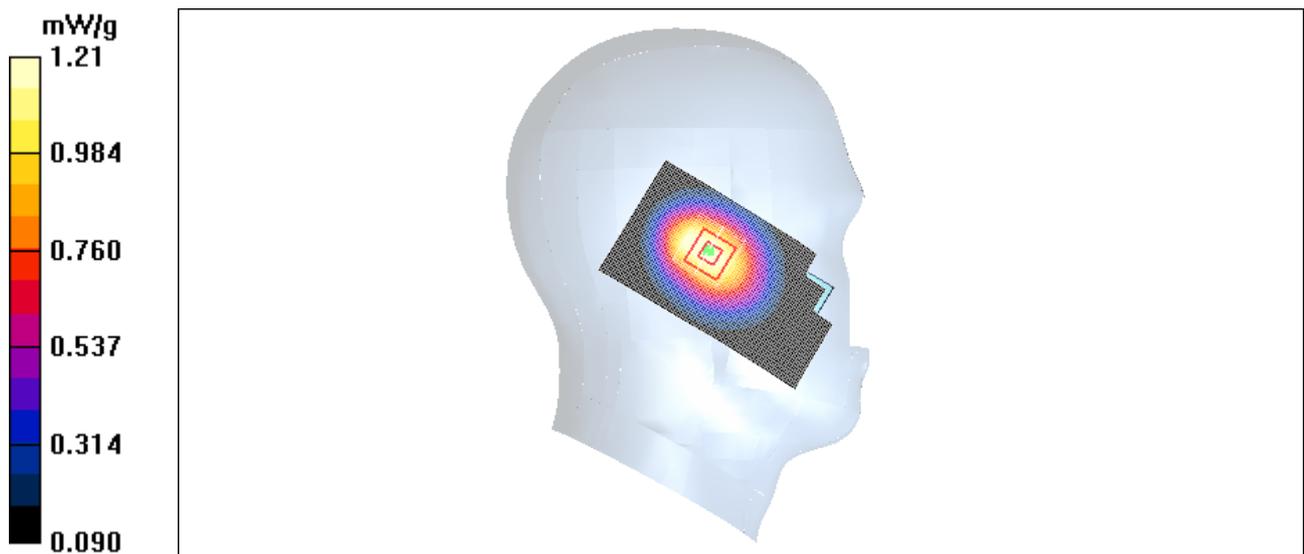


Figure 13 Left Hand Touch Cheek GSM 850 Channel 190

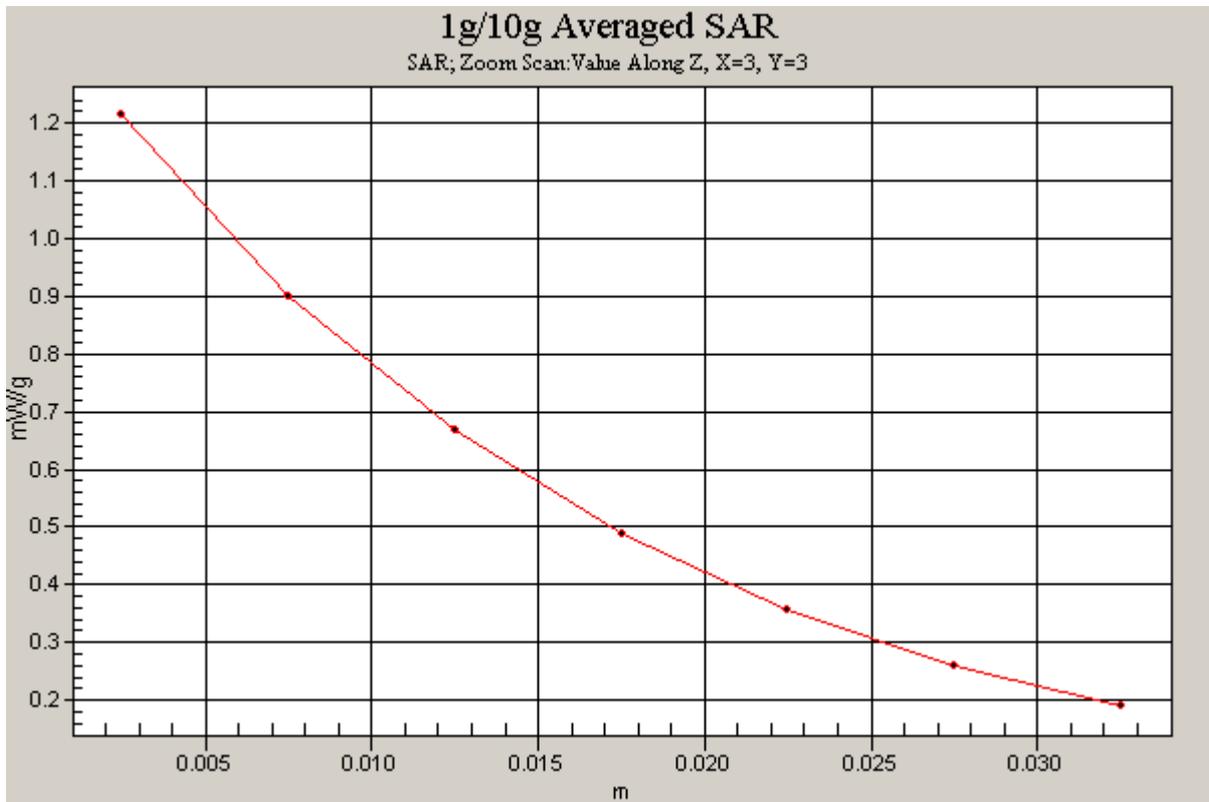


Figure 14 Z-Scan at power reference point (Left Hand Touch Cheek GSM 850 Channel 190)

Date/Time: 12/14/2008 6:04:46 PM

GSM 850 Left Cheek Low

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

Medium parameters used (interpolated): $f = 824.2$ MHz; $\sigma = 0.878$ mho/m; $\epsilon_r = 41.3$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(9.19, 9.19, 9.19);
- Electronics: DAE3 Sn536;

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

Maximum value of SAR (interpolated) = 1.20 mW/g

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

Reference Value = 30.1 V/m; Power Drift = 0.036 dB

Peak SAR (extrapolated) = 1.37 W/kg

SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.711 mW/g

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

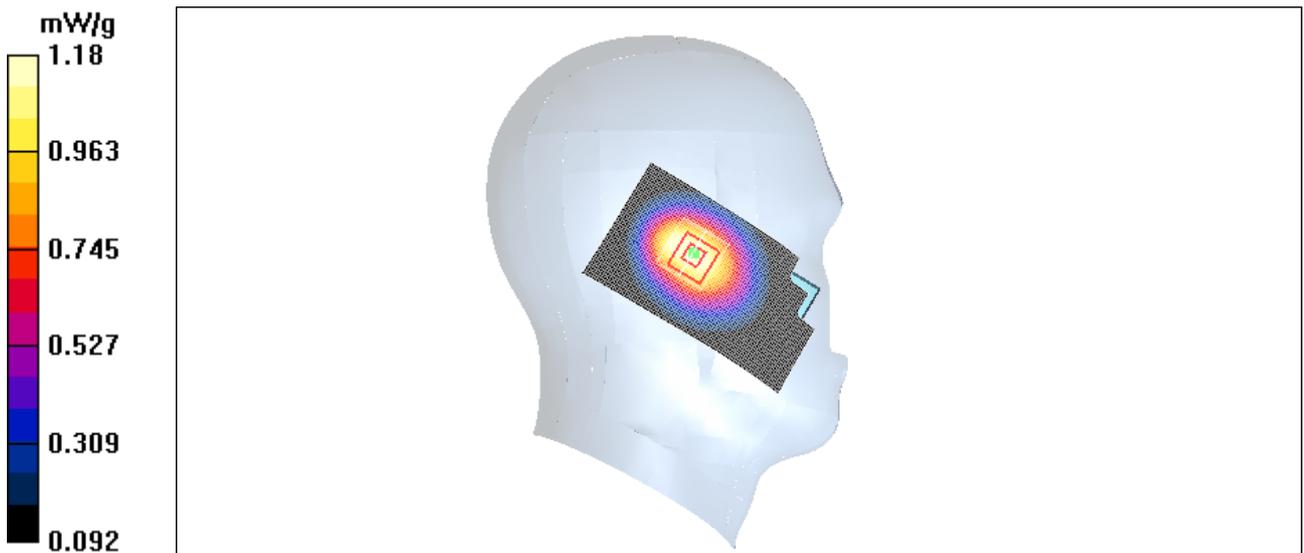


Figure 15 Left Hand Touch Cheek GSM 850 Channel 128

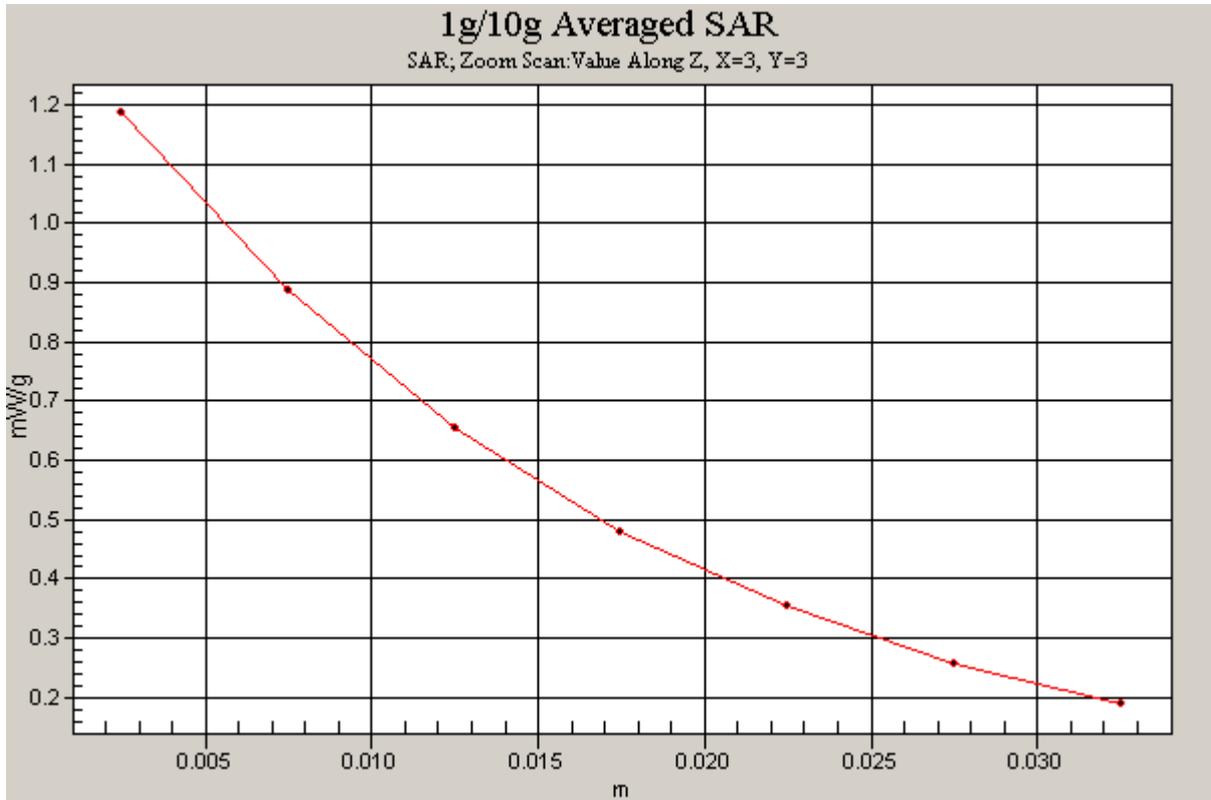


Figure 16 Z-Scan at power reference point (Left Hand Touch Cheek GSM 850 Channel 128)

Date/Time: 12/14/2008 6:23:24 PM

GSM 850 Left Tilt Middle

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

Medium parameters used: $f = 837$ MHz; $\sigma = 0.889$ mho/m; $\epsilon_r = 41.2$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(9.19, 9.19, 9.19);
- Electronics: DAE3 Sn536;76

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

Maximum value of SAR (interpolated) = 0.739 mW/g

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

Reference Value = 26.4 V/m; Power Drift = 0.066 dB

Peak SAR (extrapolated) = 0.809 W/kg

SAR(1 g) = 0.605 mW/g; SAR(10 g) = 0.419 mW/g

Maximum value of SAR (measured) = 0.702 mW/g

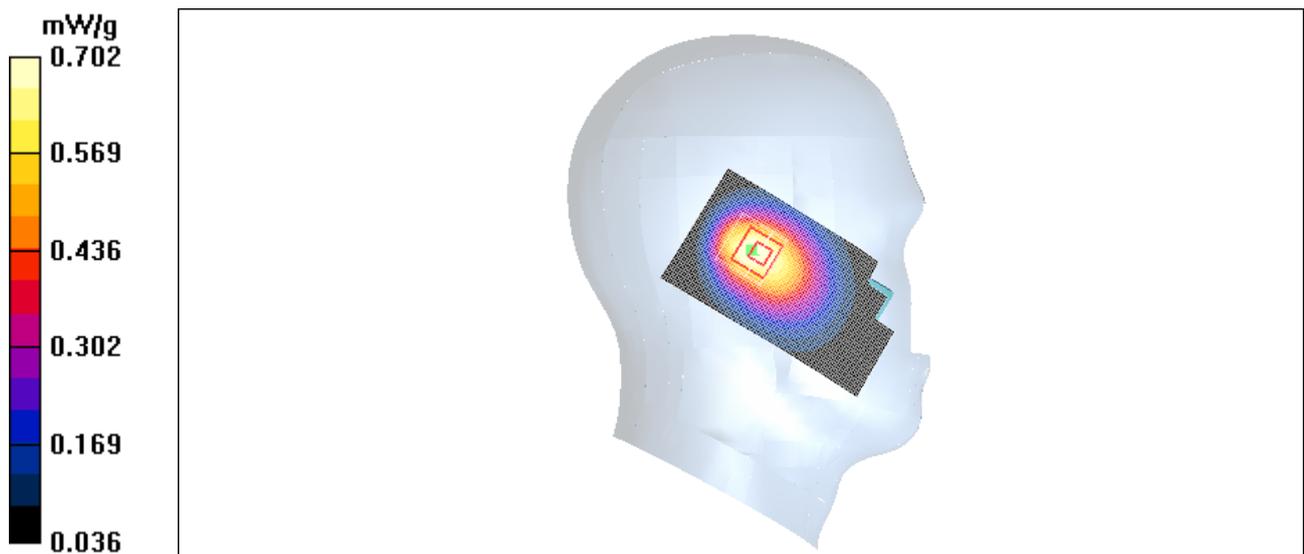


Figure 17 Left Hand Tilt 15° GSM 850 Channel 190

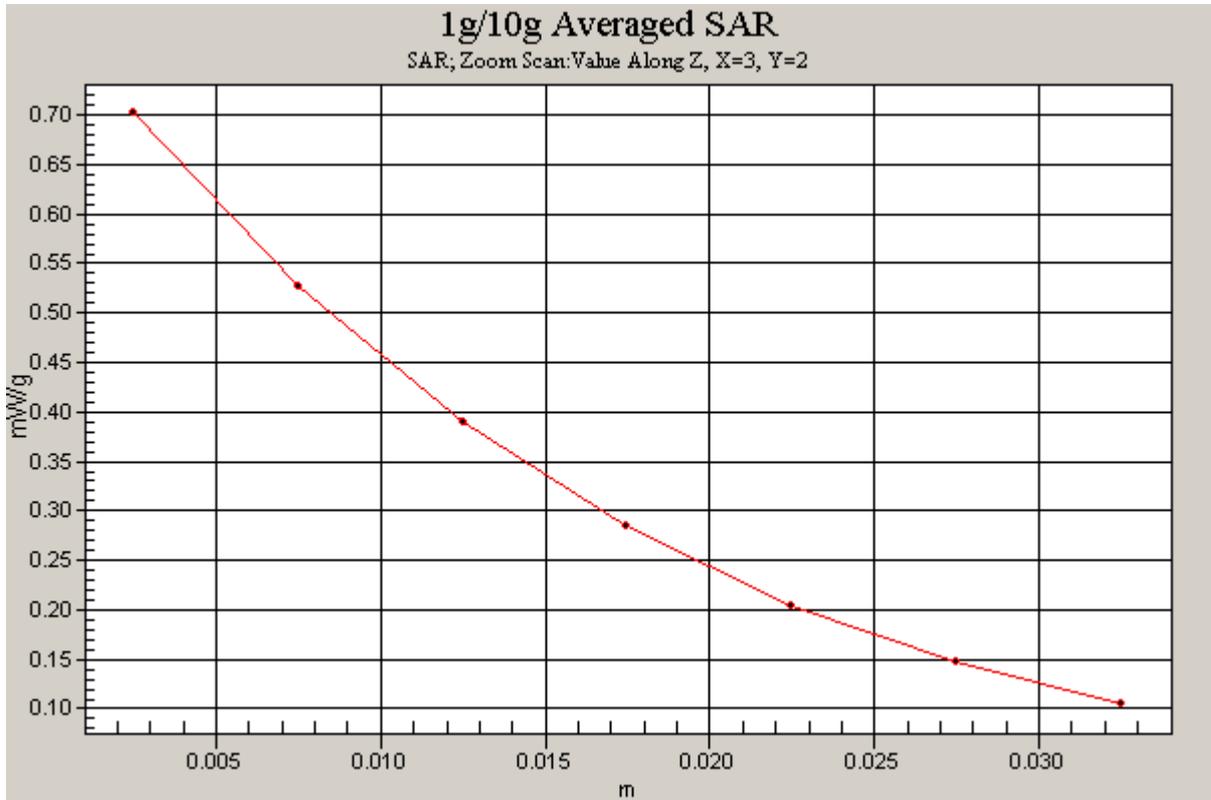


Figure 18 Z-Scan at power reference point (Left Hand Tilt 15° GSM 850 Channel 190)

Date/Time: 12/14/2008 4:05:22 PM

GSM 850 Right Cheek High

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

Medium parameters used: $f = 849$ MHz; $\sigma = 0.9$ mho/m; $\epsilon_r = 41$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(9.19, 9.19, 9.19);
- Electronics: DAE3 Sn536;

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

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

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

Reference Value = 28.2 V/m; Power Drift = -0.070 dB

Peak SAR (extrapolated) = 1.25 W/kg

SAR(1 g) = 0.944 mW/g; SAR(10 g) = 0.661 mW/g

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

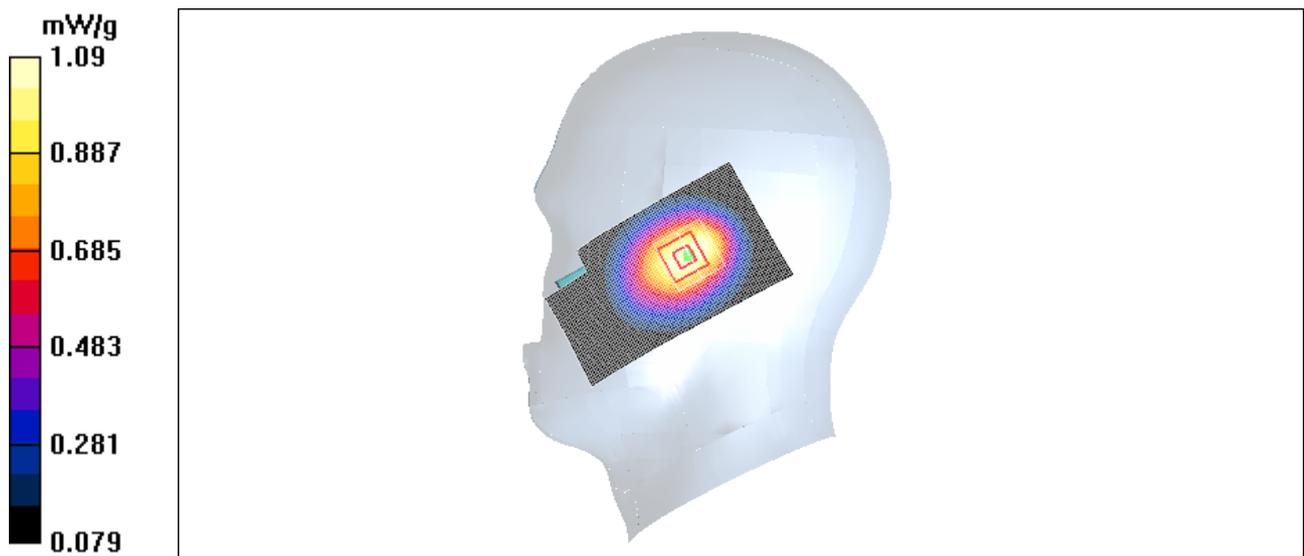


Figure 19 Right Hand Touch Cheek GSM 850 Channel 251

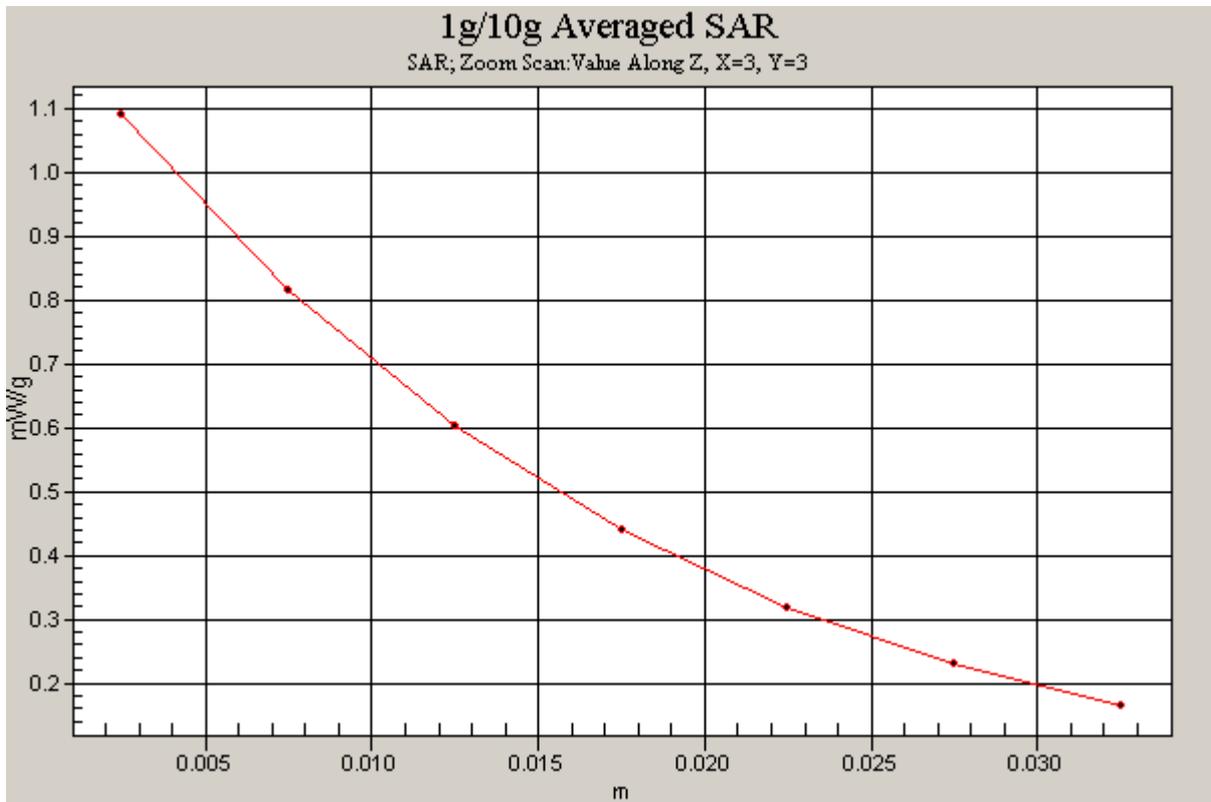


Figure 20 Z-Scan at power reference point (Right Hand Touch Cheek GSM 850 Channel 251)

Date/Time: 12/14/2008 3:41:17 PM

GSM 850 Right Cheek Middle

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

Medium parameters used: $f = 837$ MHz; $\sigma = 0.889$ mho/m; $\epsilon_r = 41.2$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(9.19, 9.19, 9.19);
- Electronics: DAE3 Sn536;

Cheek Middle/Area Scan (71x131x1): Measurement grid: dx=10mm, dy=10mm

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

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

Reference Value = 28.5 V/m; Power Drift = 0.007 dB

Peak SAR (extrapolated) = 1.24 W/kg

SAR(1 g) = 0.933 mW/g; SAR(10 g) = 0.655 mW/g

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

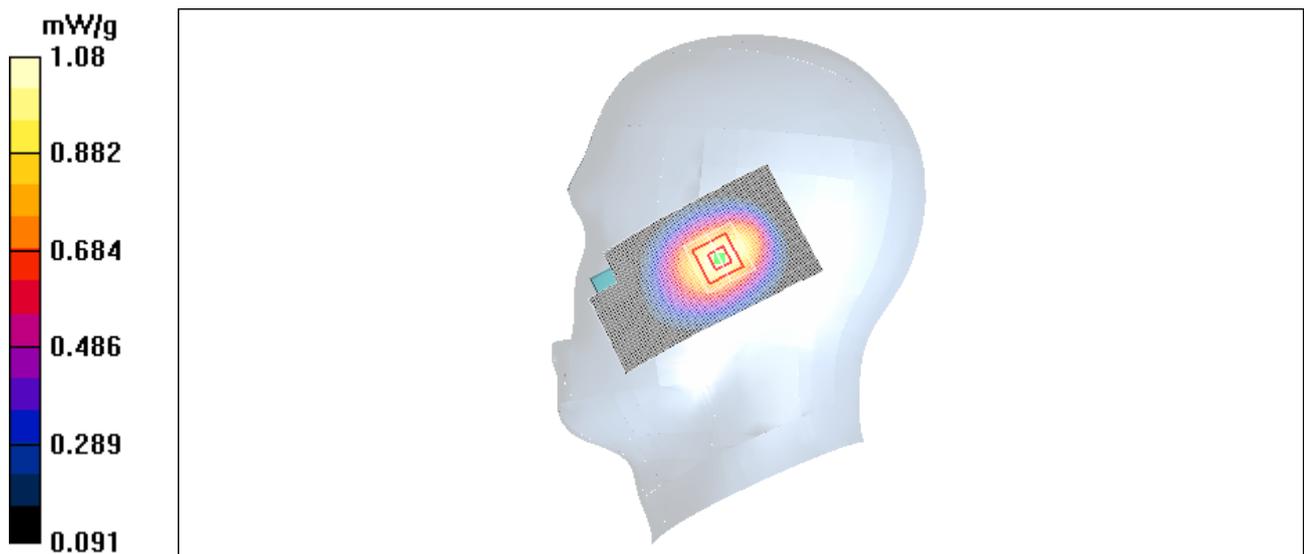


Figure 21 Right Hand Touch Cheek GSM 850 Channel 190

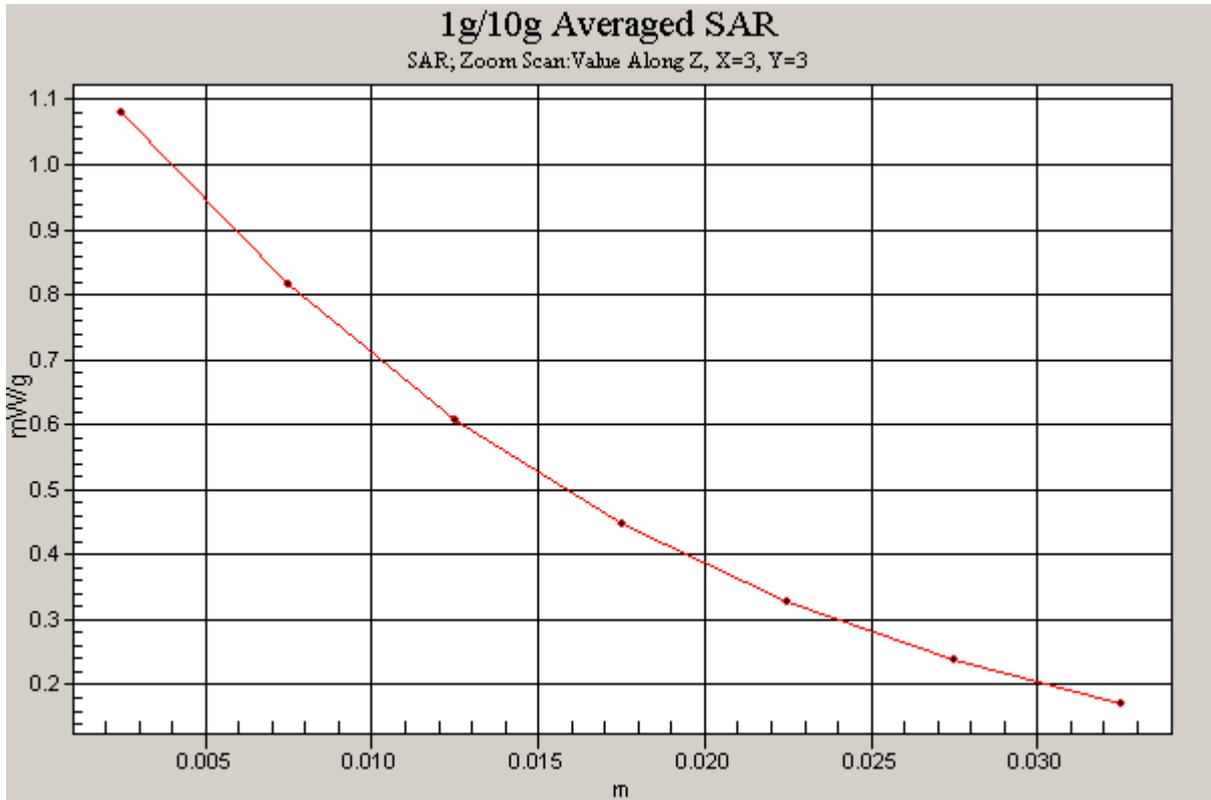


Figure 22 Z-Scan at power reference point (Right Hand Touch Cheek GSM 850 Channel 190)

Date/Time: 12/14/2008 4:42:18 PM

GSM 850 Right Cheek Low

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

Medium parameters used (interpolated): $f = 824.2$ MHz; $\sigma = 0.878$ mho/m; $\epsilon_r = 41.3$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(9.19, 9.19, 9.19);
- Electronics: DAE3 Sn536;

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

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

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

Reference Value = 27.9 V/m; Power Drift = 0.043 dB

Peak SAR (extrapolated) = 1.16 W/kg

SAR(1 g) = 0.871 mW/g; SAR(10 g) = 0.613 mW/g

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

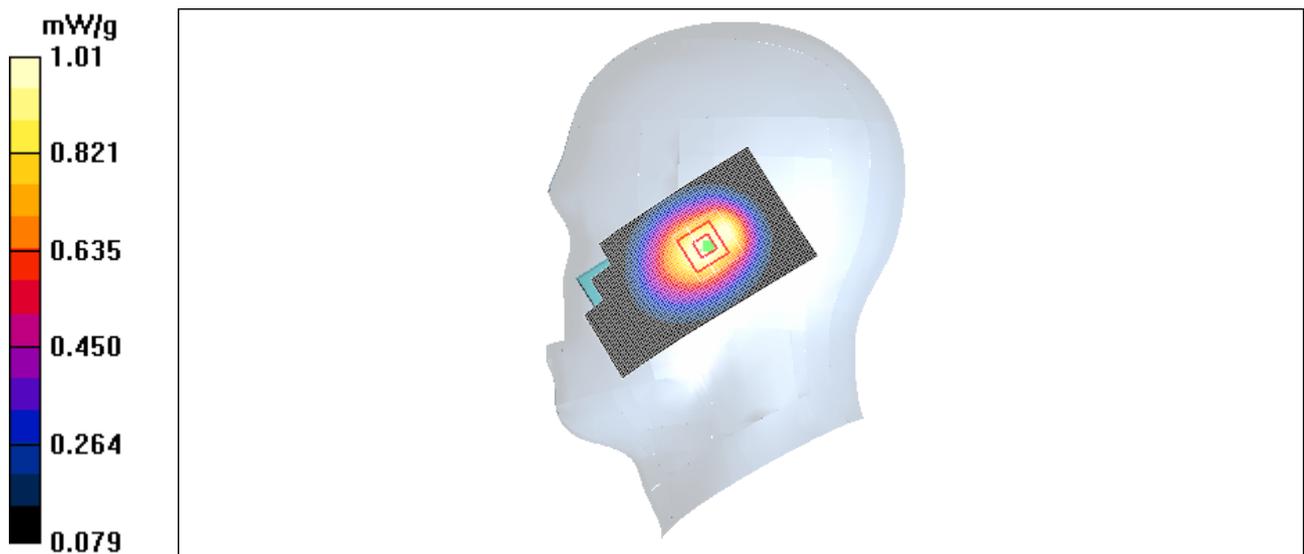


Figure 23 Right Hand Touch Cheek GSM 850 Channel 128

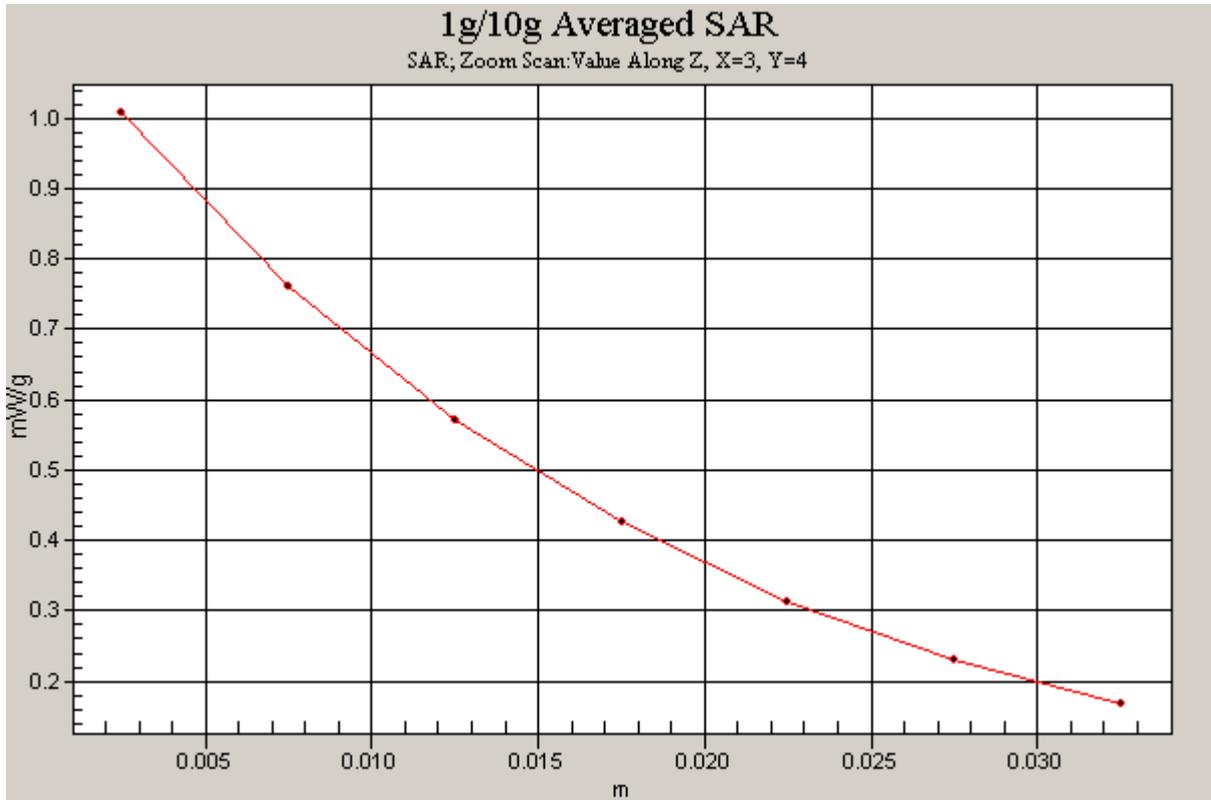


Figure 24 Z-Scan at power reference point (Right Hand Touch Cheek GSM 850 Channel 128)

Date/Time: 12/14/2008 5:01:21 PM

GSM 850 Right Tilt Middle

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

Medium parameters used: $f = 837$ MHz; $\sigma = 0.889$ mho/m; $\epsilon_r = 41.2$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(9.19, 9.19, 9.19);
- Electronics: DAE3 Sn536;

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

Maximum value of SAR (interpolated) = 0.642 mW/g

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

Reference Value = 24.7 V/m; Power Drift = -0.089 dB

Peak SAR (extrapolated) = 0.684 W/kg

SAR(1 g) = 0.498 mW/g; SAR(10 g) = 0.347 mW/g

Maximum value of SAR (measured) = 0.576 mW/g

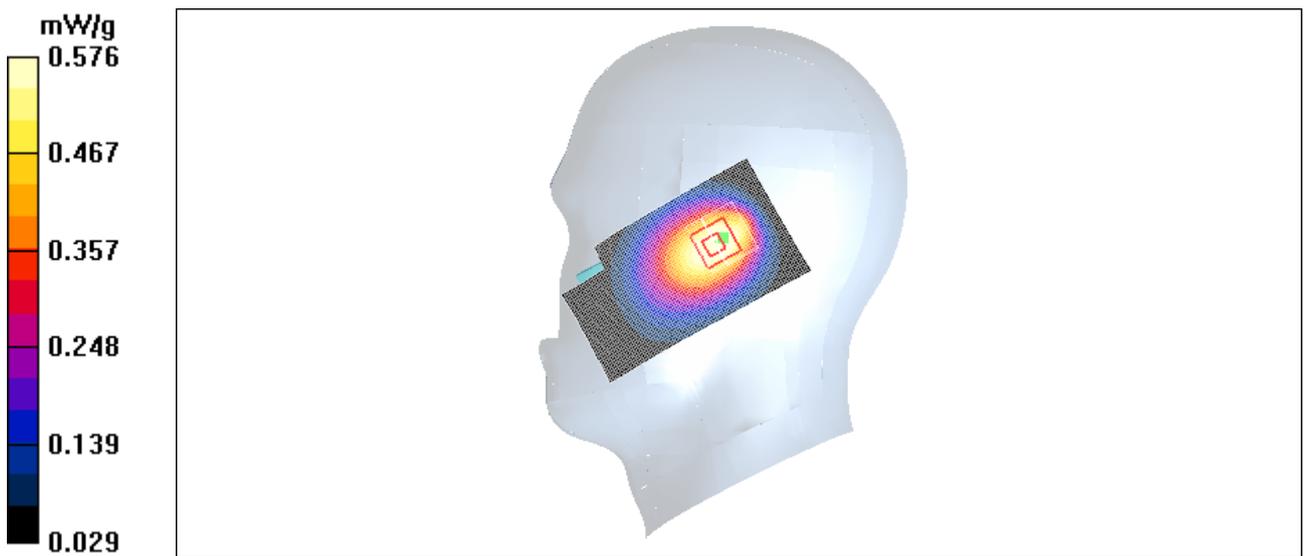


Figure 25 Right Hand Tilt 15° GSM 850 Channel 190

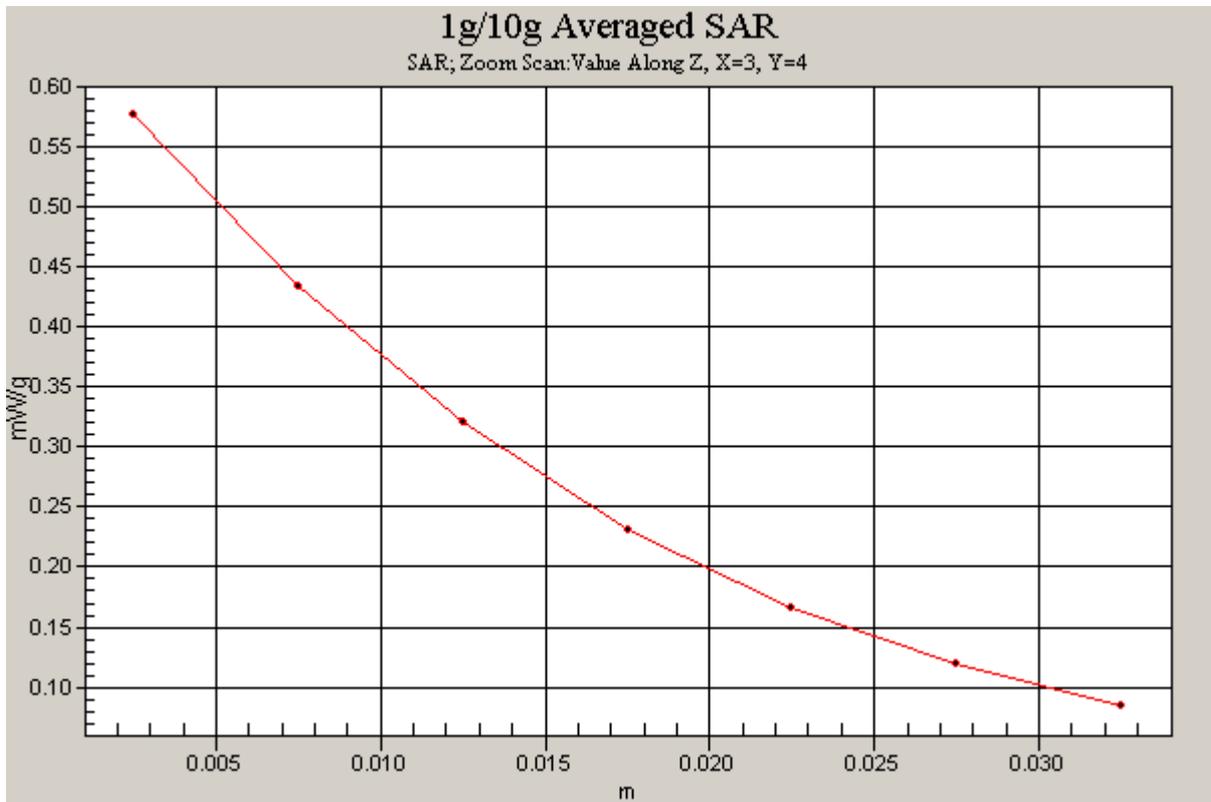


Figure 26 Z-Scan at power reference point (Right Hand Tilt 15° GSM 850 Channel 190)

Date/Time: 12/12/2008 5:36:18 PM

GSM 850 Towards Ground High

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

Medium parameters used: $f = 849$ MHz; $\sigma = 0.997$ mho/m; $\epsilon_r = 53.9$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(9.1, 9.1, 9.1);
- Electronics: DAE3 Sn536;

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

Maximum value of SAR (interpolated) = 0.434 mW/g

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

Reference Value = 16.7 V/m; Power Drift = -0.051 dB

Peak SAR (extrapolated) = 0.539 W/kg

SAR(1 g) = 0.401 mW/g; SAR(10 g) = 0.290 mW/g

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

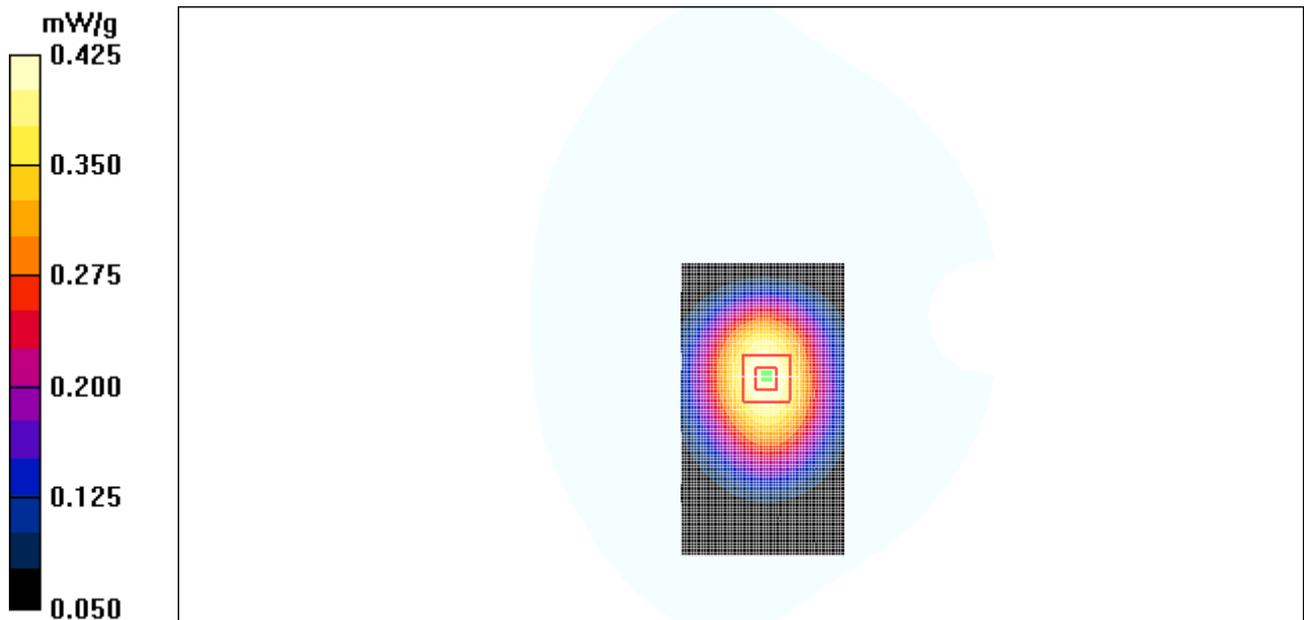


Figure 27 Body, Towards Ground, GSM 850 Channel 251

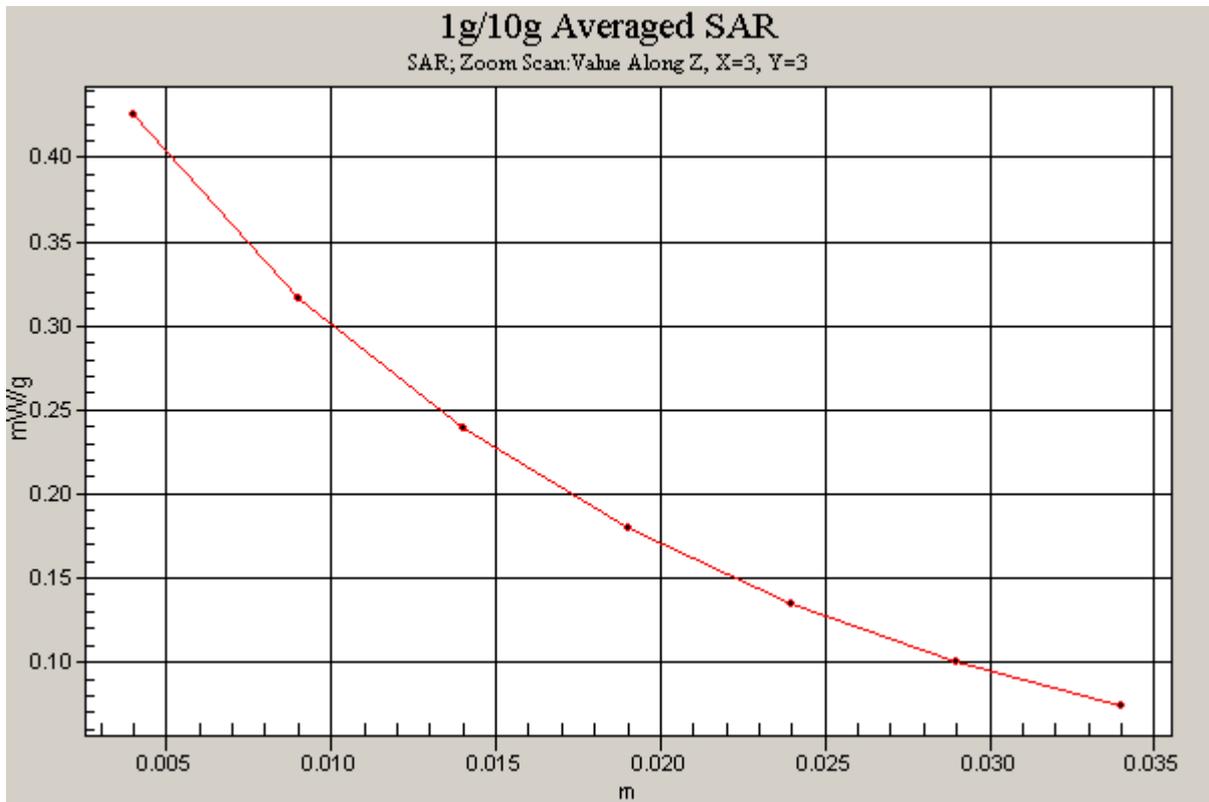


Figure 28 Z-Scan at power reference point (Body, Towards Ground, GSM 850 Channel 251)

Date/Time: 12/12/2008 1:31:10 PM

GSM 850 Towards Ground Middle

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

Medium parameters used: $f = 837$ MHz; $\sigma = 0.984$ mho/m; $\epsilon_r = 54$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(9.1, 9.1, 9.1);
- Electronics: DAE3 Sn536;

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

Maximum value of SAR (interpolated) = 0.461 mW/g

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

Reference Value = 15.8 V/m; Power Drift = 0.017 dB

Peak SAR (extrapolated) = 0.571 W/kg

SAR(1 g) = 0.436 mW/g; SAR(10 g) = 0.314 mW/g

Maximum value of SAR (measured) = 0.459 mW/g

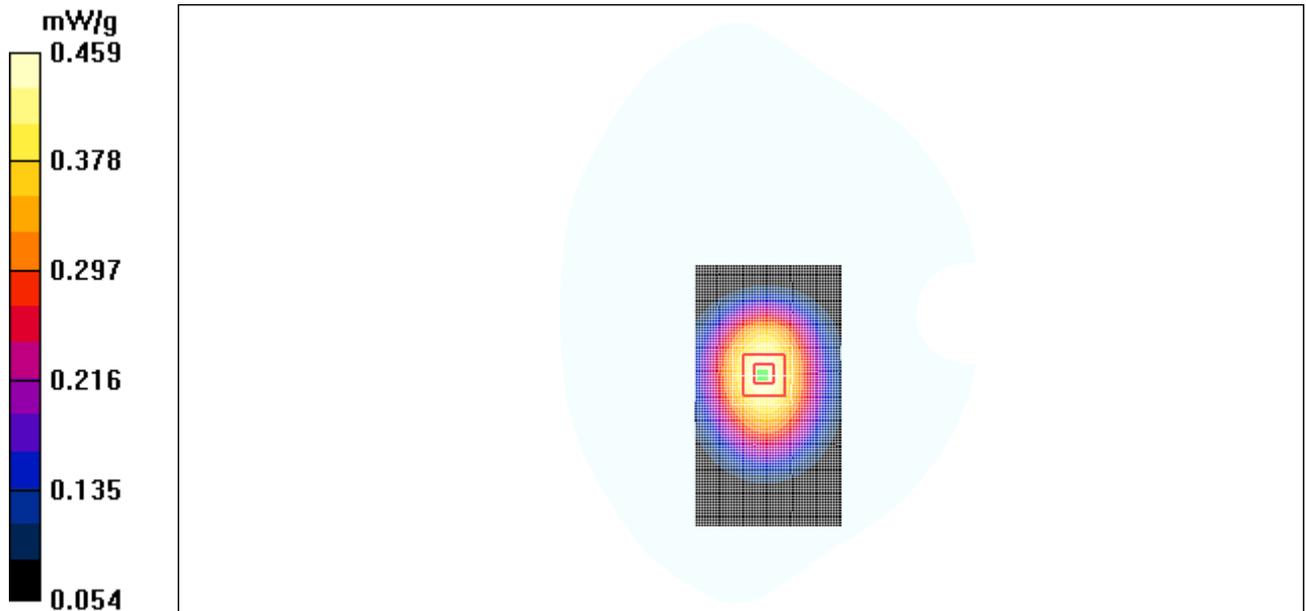


Figure 29 Body, Towards Ground, GSM 850 Channel 190

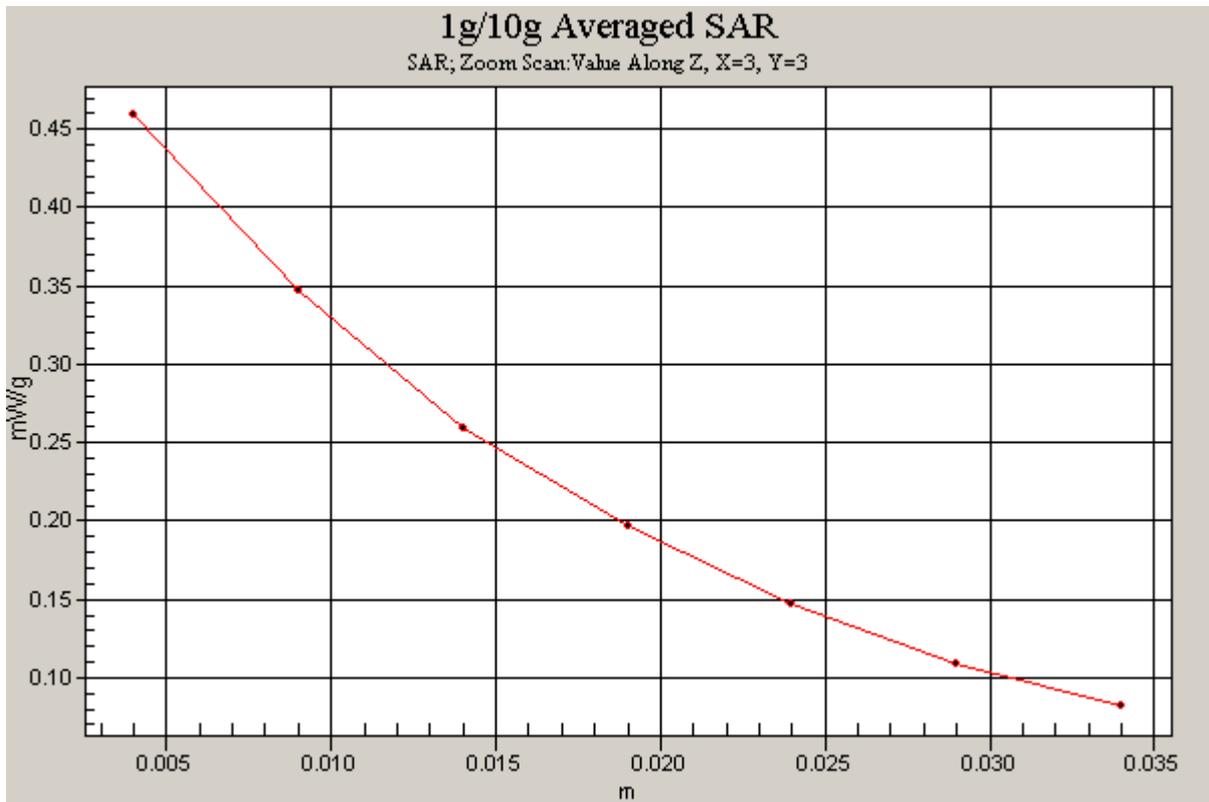


Figure 30 Z-Scan at power reference point (Body, Towards Ground, GSM 850 Channel 190)

Date/Time: 12/12/2008 1:12:01 PM

GSM 850 Towards Ground Low

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

Medium parameters used (interpolated): $f = 824.2$ MHz; $\sigma = 0.968$ mho/m; $\epsilon_r = 54.2$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(9.1, 9.1, 9.1);
- Electronics: DAE3 Sn536;

Towards Ground Low/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.489 mW/g

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

Reference Value = 16.4 V/m; Power Drift = -0.115 dB

Peak SAR (extrapolated) = 0.614 W/kg

SAR(1 g) = 0.460 mW/g; SAR(10 g) = 0.331 mW/g

Maximum value of SAR (measured) = 0.489 mW/g

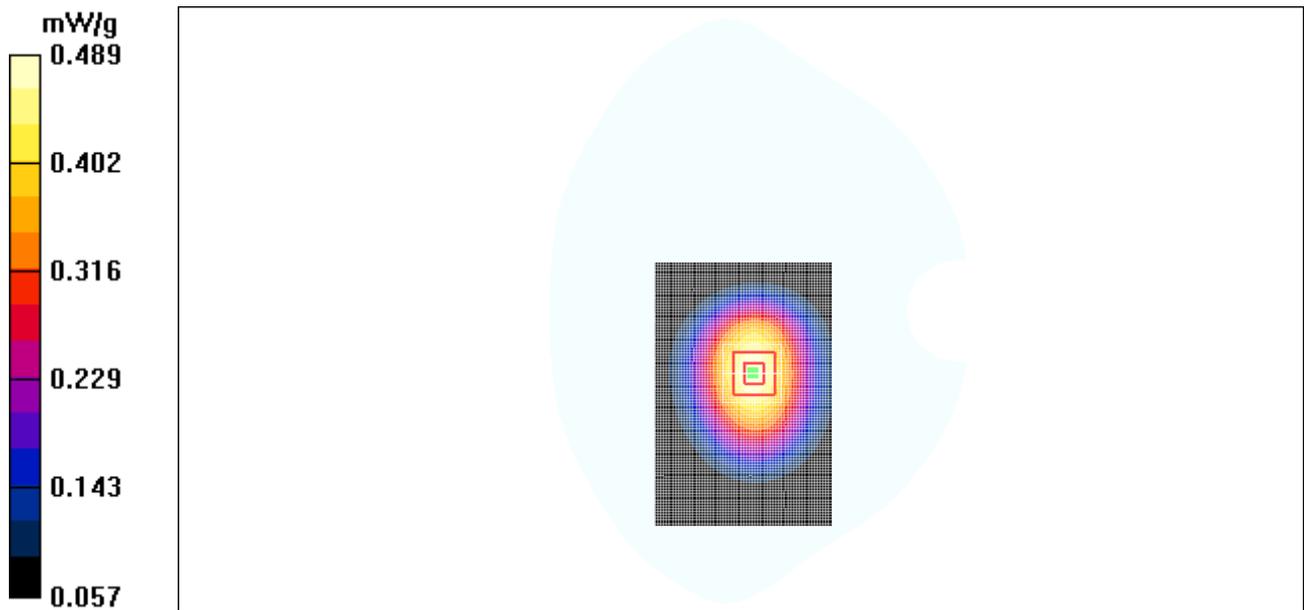


Figure 31 Body, Towards Ground, GSM 850 Channel 128

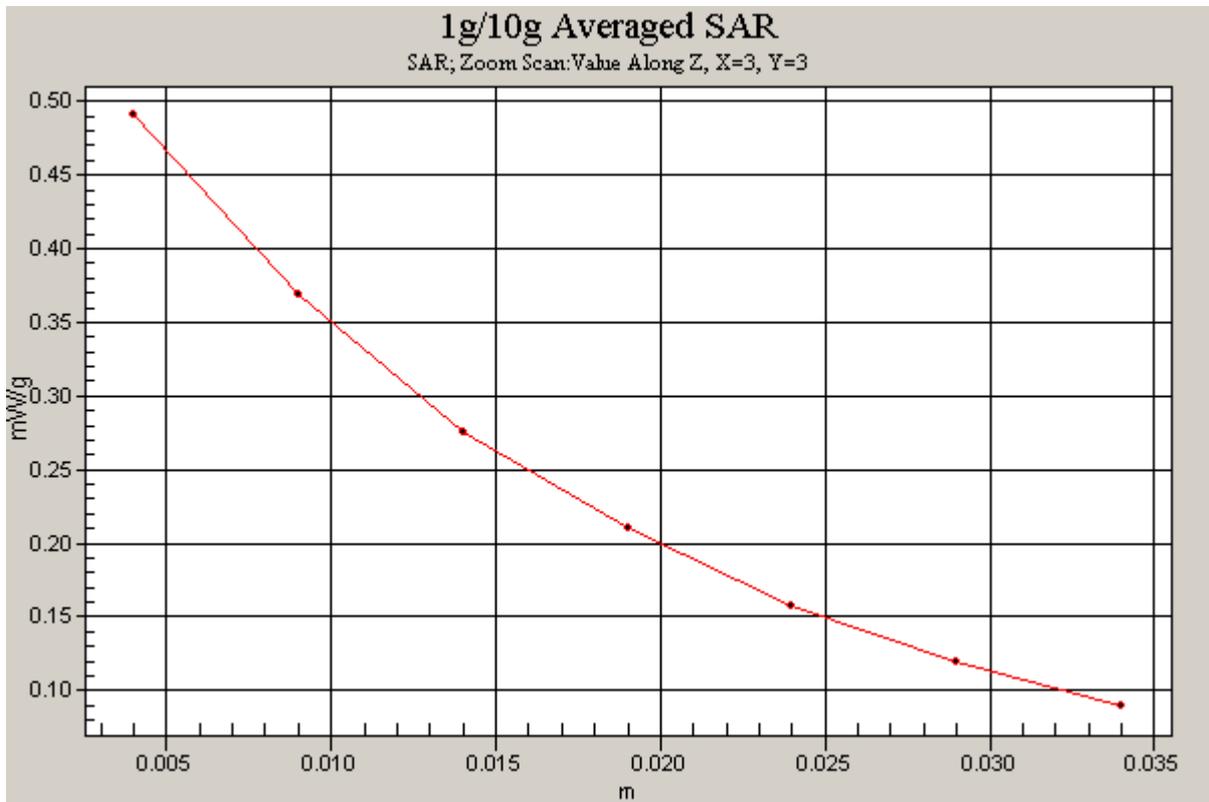


Figure 32 Z-Scan at power reference point (Body, Towards Ground, GSM 850 Channel 128)

Date/Time: 12/12/2008 1:50:06 PM

GSM 850 Towards Phantom Middle

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

Medium parameters used: $f = 837$ MHz; $\sigma = 0.984$ mho/m; $\epsilon_r = 54$; $\rho = 1000$ kg/m³

Probe: EX3DV4 - SN3660; ConvF(9.1, 9.1, 9.1);

Electronics: DAE3 Sn536;

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

Maximum value of SAR (interpolated) = 0.408 mW/g

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

Reference Value = 15.8 V/m; Power Drift = 0.069 dB

Peak SAR (extrapolated) = 0.520 W/kg

SAR(1 g) = 0.389 mW/g; SAR(10 g) = 0.281 mW/g

Maximum value of SAR (measured) = 0.413 mW/g

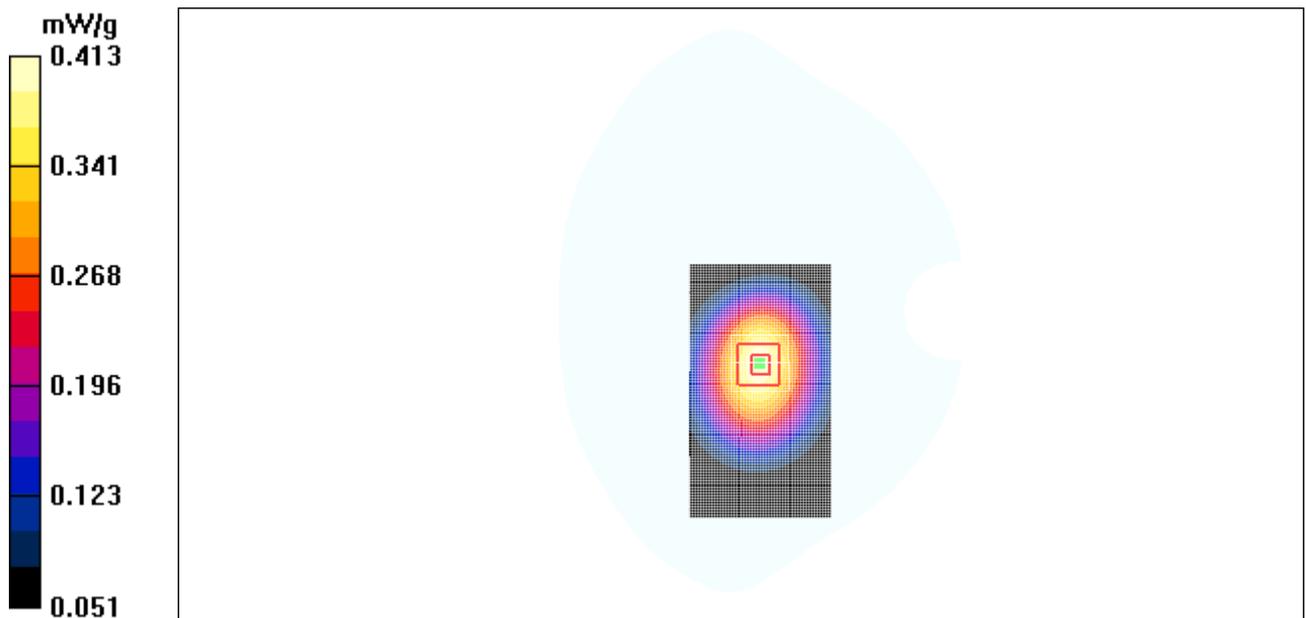


Figure 33 Body, Towards Phantom, GSM 850 Channel 190

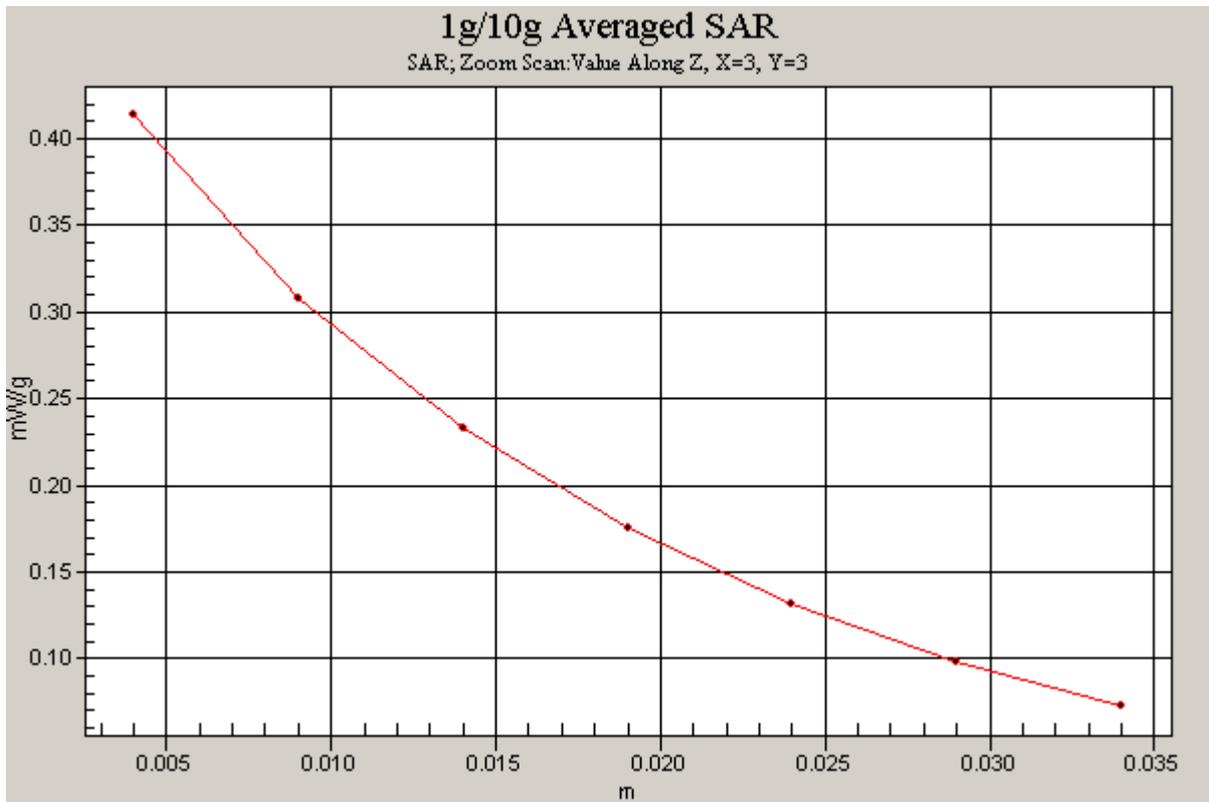


Figure 34 Z-Scan at power reference point (Body, Towards Phantom, GSM 850 Channel 190)

Date/Time: 12/14/2008 4:40:37 AM

GSM 850 Earphone Towards Ground Low

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

Medium parameters used (interpolated): $f = 824.2$ MHz; $\sigma = 0.968$ mho/m; $\epsilon_r = 54.2$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(9.1, 9.1, 9.1);
- Electronics: DAE3 Sn536;

Towards Ground Low/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.492 mW/g

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

Reference Value = 17.9 V/m; Power Drift = -0.017 dB

Peak SAR (extrapolated) = 0.612 W/kg

SAR(1 g) = 0.460 mW/g; SAR(10 g) = 0.333 mW/g

Maximum value of SAR (measured) = 0.484 mW/g

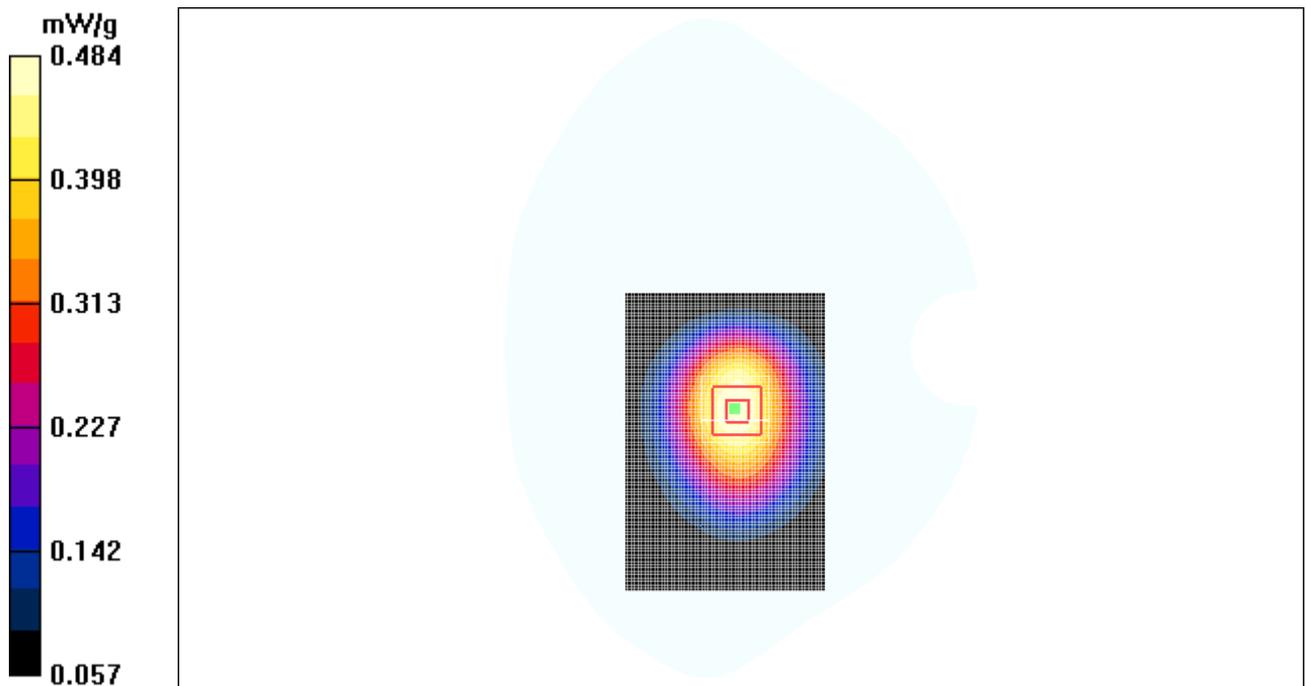


Figure 35 Body with Earphone, Towards Ground, GSM 850, Channel 128

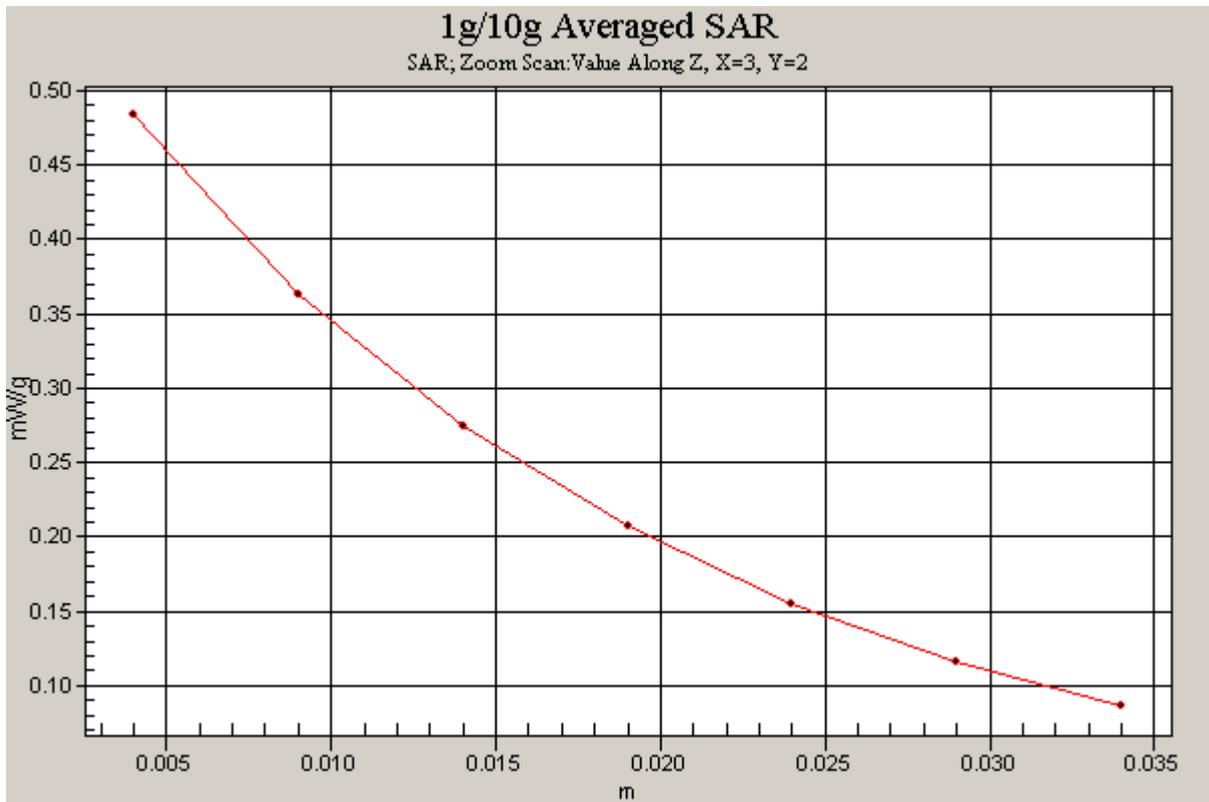


Figure 36 Z-Scan at power reference point (Body with Earphone, Towards Ground, GSM 850, Channel 128)

Date/Time: 12/12/2008 2:13:16 PM

GSM 850 GPRS Towards Ground High

Communication System: GSM850 + GPRS(2Up); Frequency: 848.8 MHz; Duty Cycle: 1:4

Medium parameters used: $f = 849$ MHz; $\sigma = 0.997$ mho/m; $\epsilon_r = 53.9$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(9.1, 9.1, 9.1);
- Electronics: DAE3 Sn536;

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

Maximum value of SAR (interpolated) = 0.766 mW/g

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

Reference Value = 26.1 V/m; Power Drift = 0.009 dB

Peak SAR (extrapolated) = 0.963 W/kg

SAR(1 g) = 0.727 mW/g; SAR(10 g) = 0.525 mW/g

Maximum value of SAR (measured) = 0.770 mW/g

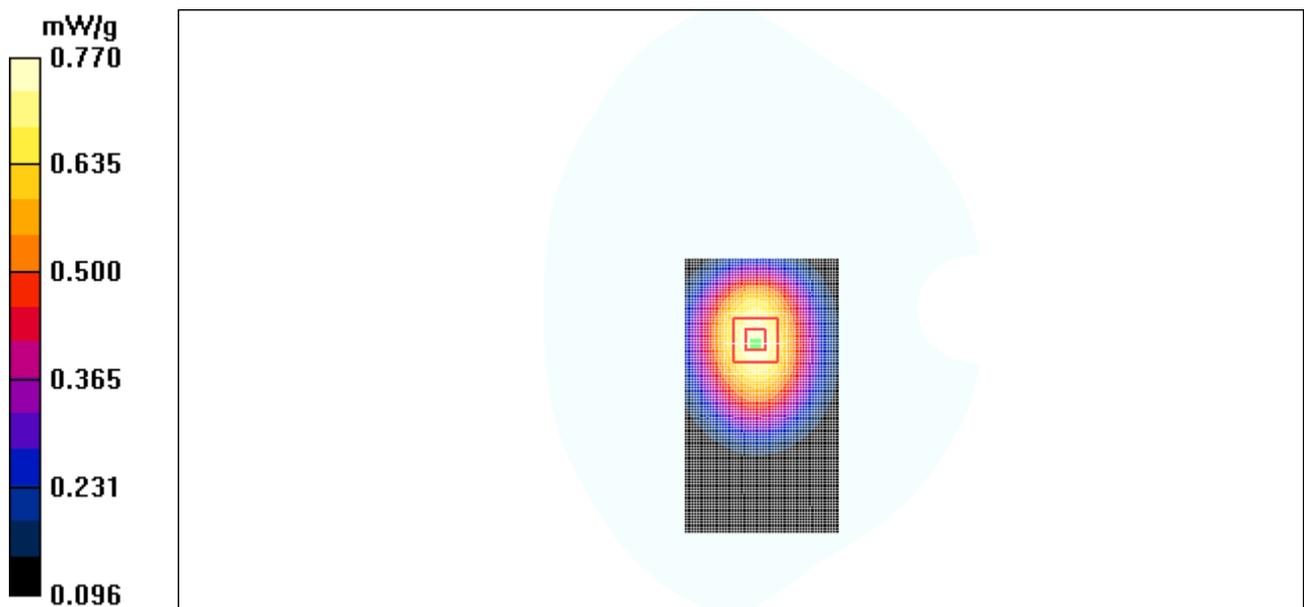


Figure 37 Body, Towards Ground, GSM 850 GPRS, Channel 251

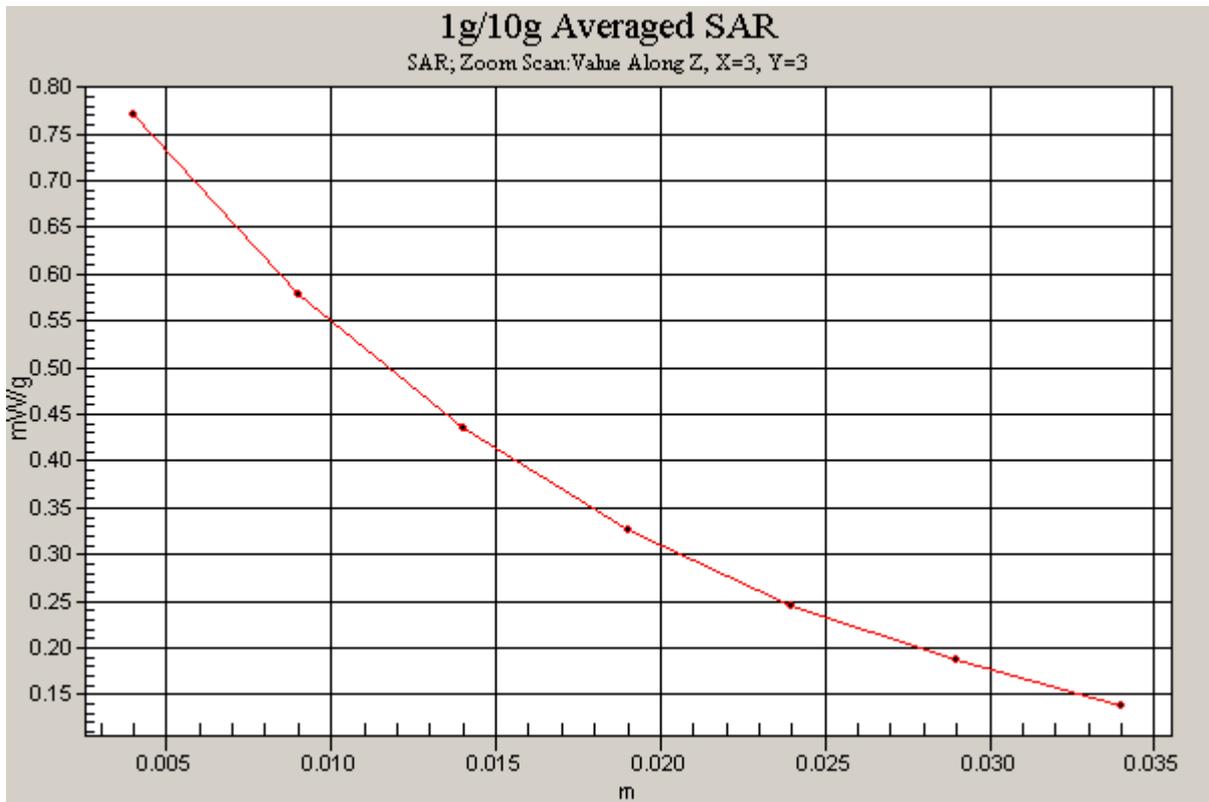


Figure 38 Z-Scan at power reference point (Body, Towards Ground, GSM 850 GPRS, Channel 251)

Date/Time: 12/12/2008 7:02:27 PM

GSM 850 GPRS Towards Ground Middle

Communication System: GSM850 + GPRS(2Up); Frequency: 836.6 MHz; Duty Cycle: 1:4

Medium parameters used: $f = 837$ MHz; $\sigma = 0.984$ mho/m; $\epsilon_r = 54$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(9.1, 9.1, 9.1);
- Electronics: DAE3 Sn536;

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

Maximum value of SAR (interpolated) = 0.746 mW/g

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

Reference Value = 22.1 V/m; Power Drift = -0.049 dB

Peak SAR (extrapolated) = 0.932 W/kg

SAR(1 g) = 0.702 mW/g; SAR(10 g) = 0.507 mW/g

Maximum value of SAR (measured) = 0.743 mW/g

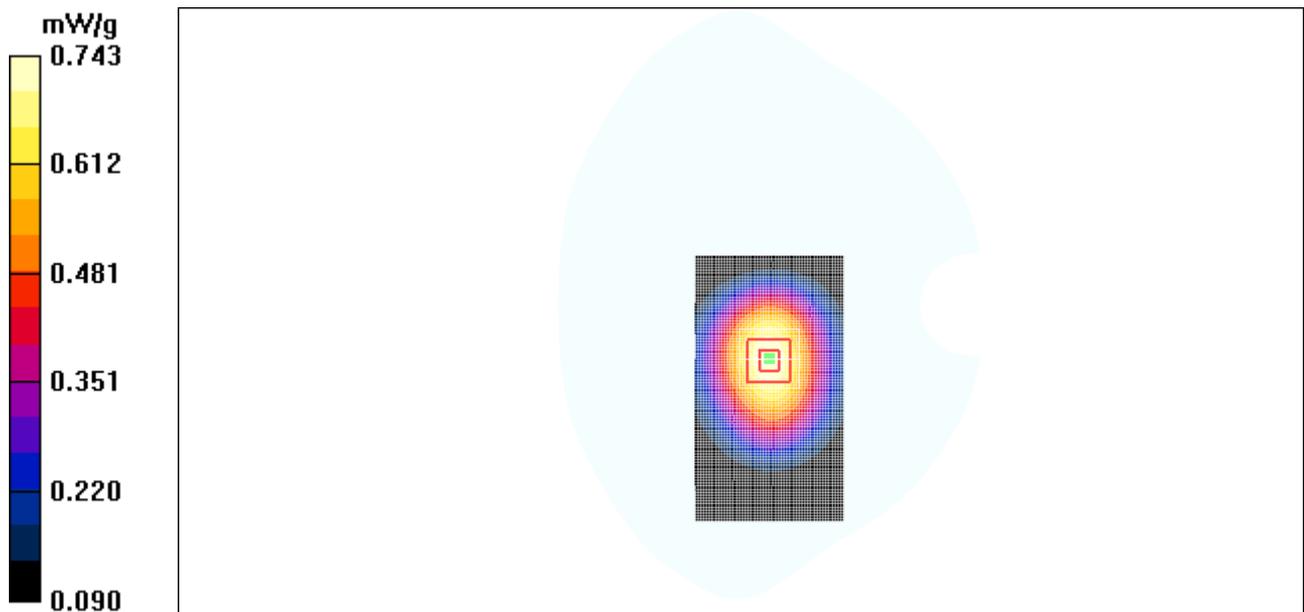


Figure 39 Body, Towards Ground, GSM 850 GPRS, Channel 190

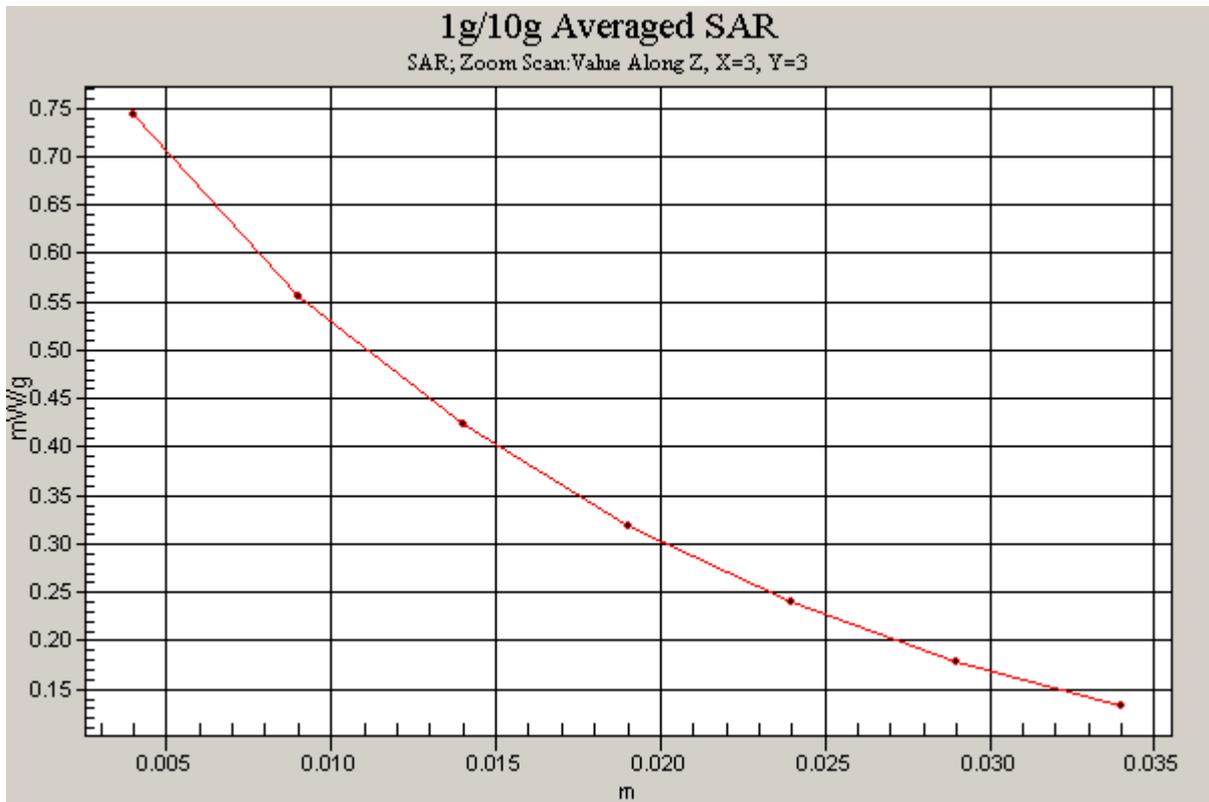


Figure 40 Z-Scan at power reference point (Body, Towards Ground, GSM 850 GPRS, Channel 190)

Date/Time: 12/12/2008 7:20:19 PM

GSM 850 GPRS Towards Ground Low

Communication System: GSM850 + GPRS(2Up); Frequency: 824.2 MHz; Duty Cycle: 1:4

Medium parameters used (interpolated): $f = 824.2$ MHz; $\sigma = 0.968$ mho/m; $\epsilon_r = 54.2$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(9.1, 9.1, 9.1);
- Electronics: DAE3 Sn536;

Towards Ground Low/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.762 mW/g

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

Reference Value = 22.3 V/m; Power Drift = 0.030 dB

Peak SAR (extrapolated) = 0.932 W/kg

SAR(1 g) = 0.714 mW/g; SAR(10 g) = 0.518 mW/g

Maximum value of SAR (measured) = 0.752 mW/g

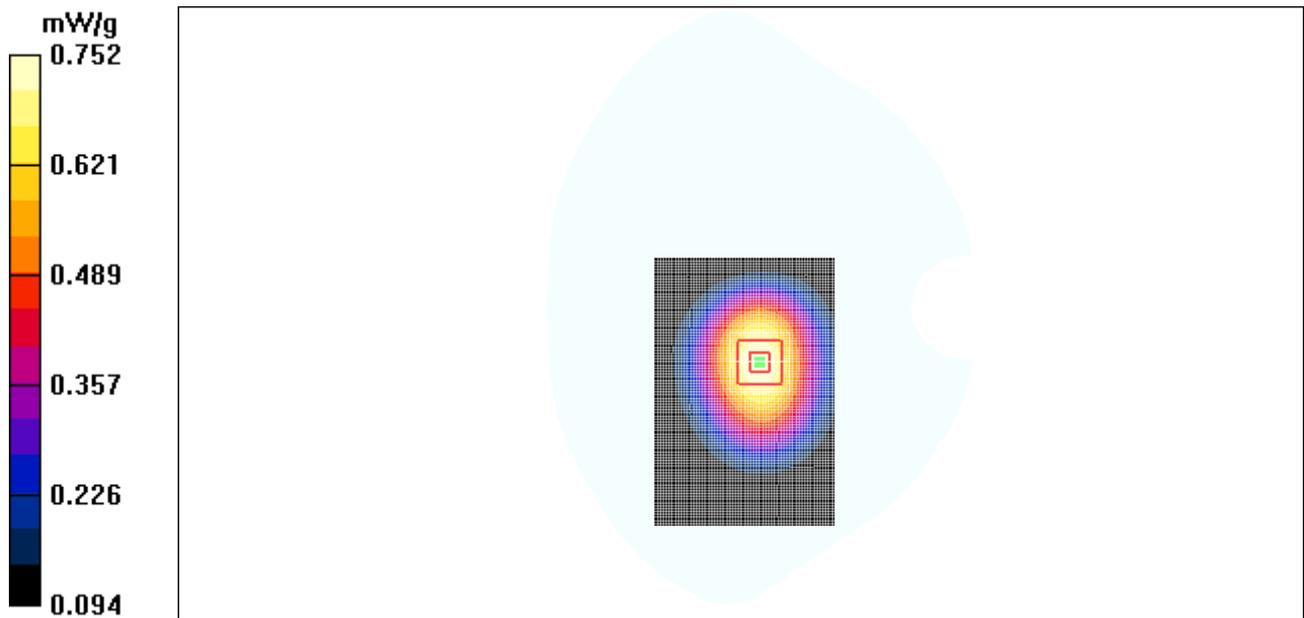


Figure 41 Body, Towards Ground, GSM 850 GPRS, Channel 128

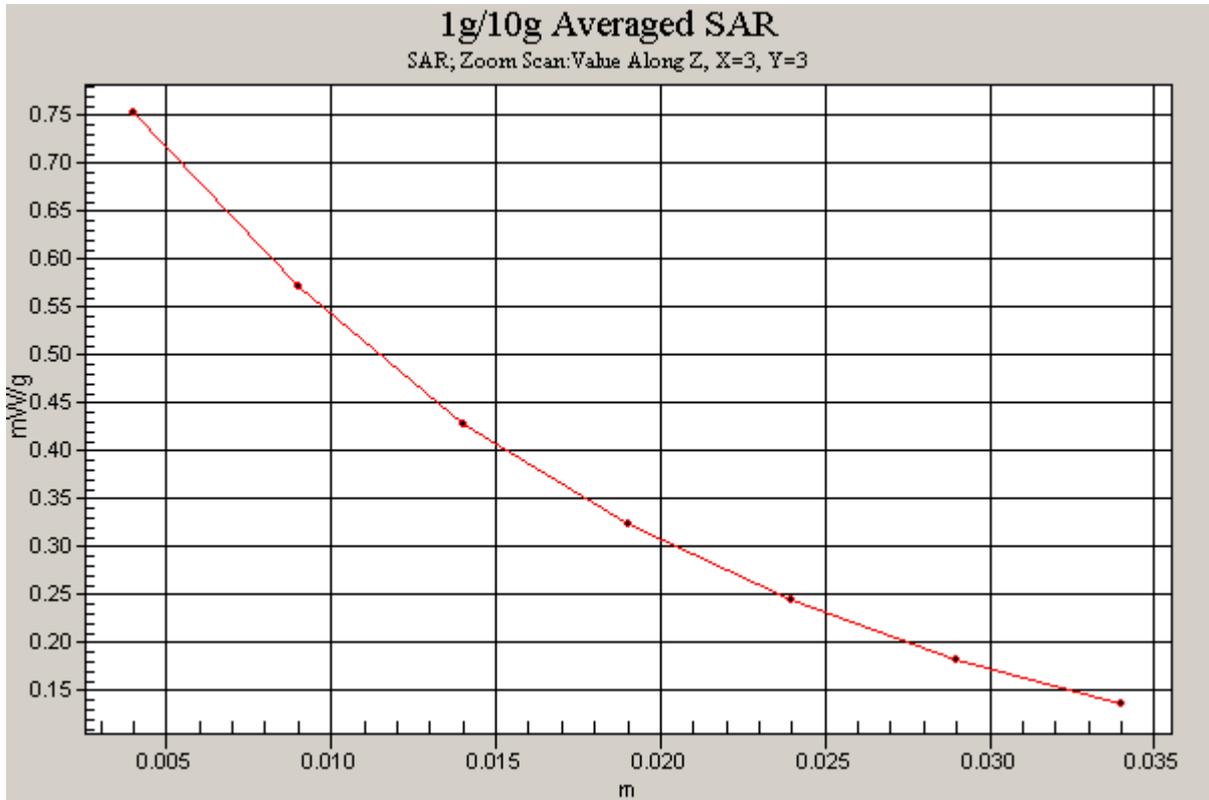


Figure 42 Z-Scan at power reference point (Body, Towards Ground, GSM 850 GPRS, Channel 128)

Date/Time: 12/12/2008 7:53:30 PM

GSM 850 GPRS Towards Phantom Middle

Communication System: GSM850 + GPRS(2Up); Frequency: 836.6 MHz; Duty Cycle: 1:4
Medium parameters used: $f = 837$ MHz; $\sigma = 0.984$ mho/m; $\epsilon_r = 54$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(9.1, 9.1, 9.1);
- Electronics: DAE3 Sn536;

Towards Phantom Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.698 mW/g

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

Reference Value = 20.4 V/m; Power Drift = 0.057 dB

Peak SAR (extrapolated) = 0.885 W/kg

SAR(1 g) = 0.660 mW/g; SAR(10 g) = 0.476 mW/g

Maximum value of SAR (measured) = 0.697 mW/g

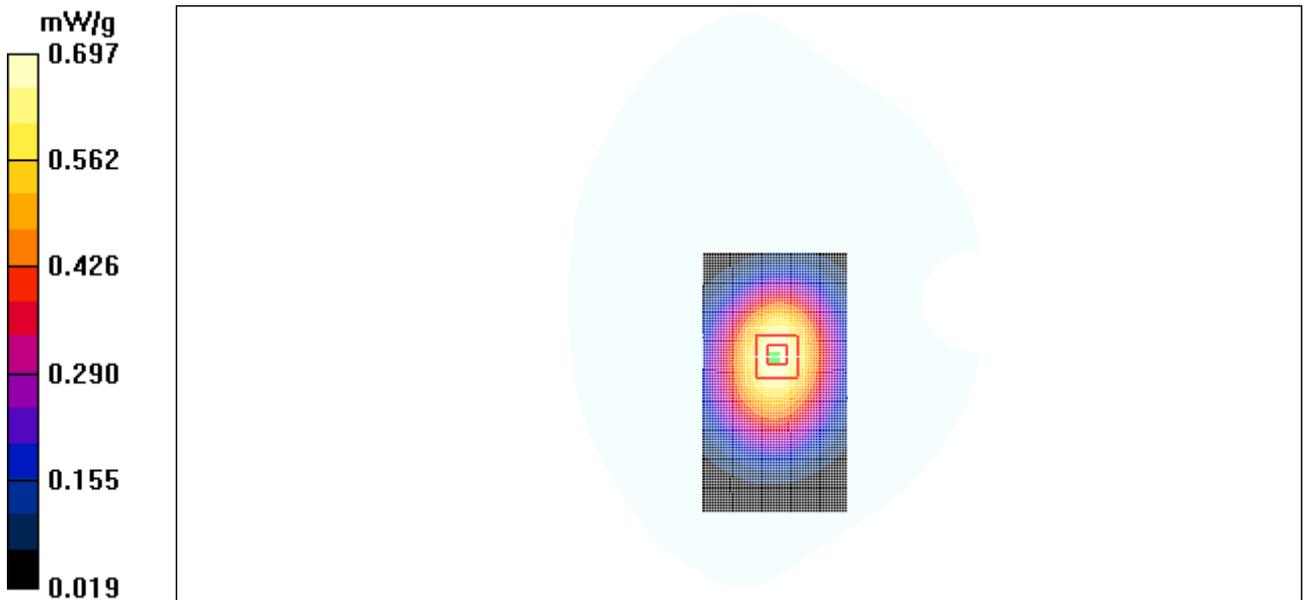


Figure 43 Body, Towards Phantom, GSM 850 GPRS, Channel 190

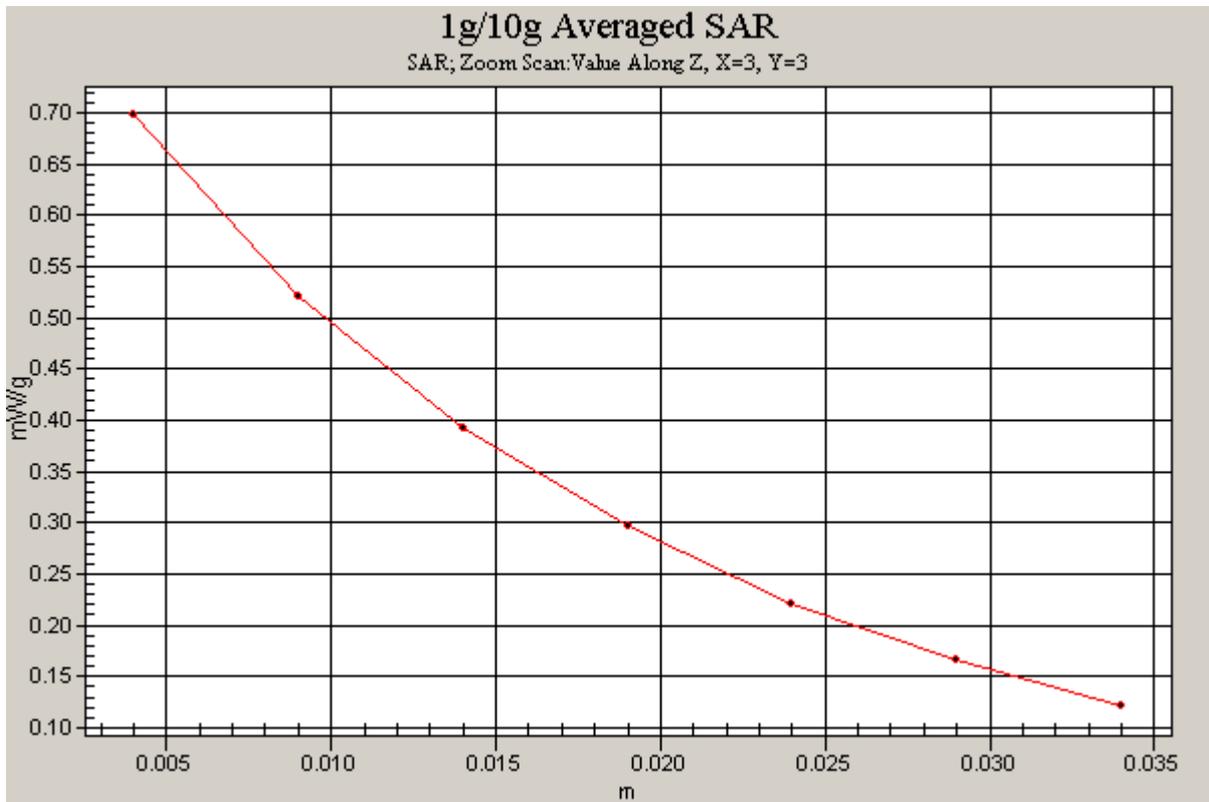


Figure 44 Z-Scan at power reference point (Body, Towards Phantom, GSM 850 GPRS, Channel 190)

Date/Time: 12/13/2008 2:51:48 PM

GSM 1900 Left Cheek High

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

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.42$ mho/m; $\epsilon_r = 40$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(7.35, 7.35, 7.35);
- Electronics: DAE3 Sn536;

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

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

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

Reference Value = 17.2 V/m; Power Drift = 0.013 dB

Peak SAR (extrapolated) = 1.48 W/kg

SAR(1 g) = 0.864 mW/g; SAR(10 g) = 0.489 mW/g

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

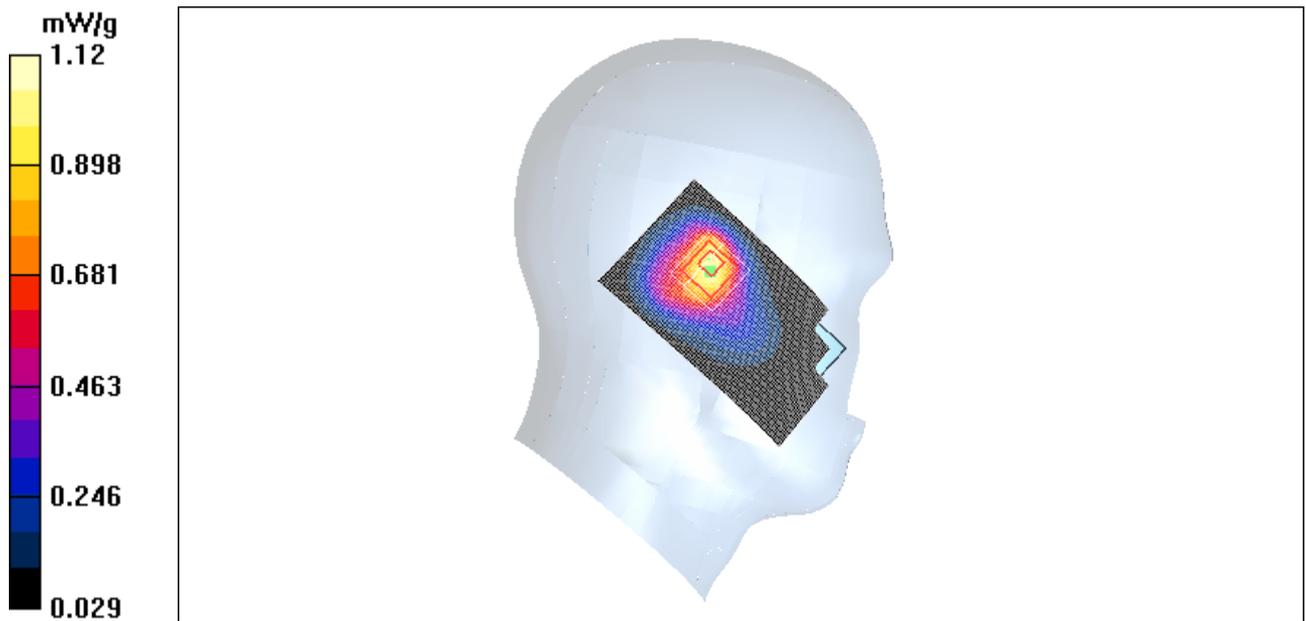


Figure 45 Left Hand Touch Cheek GSM 1900 Channel 810

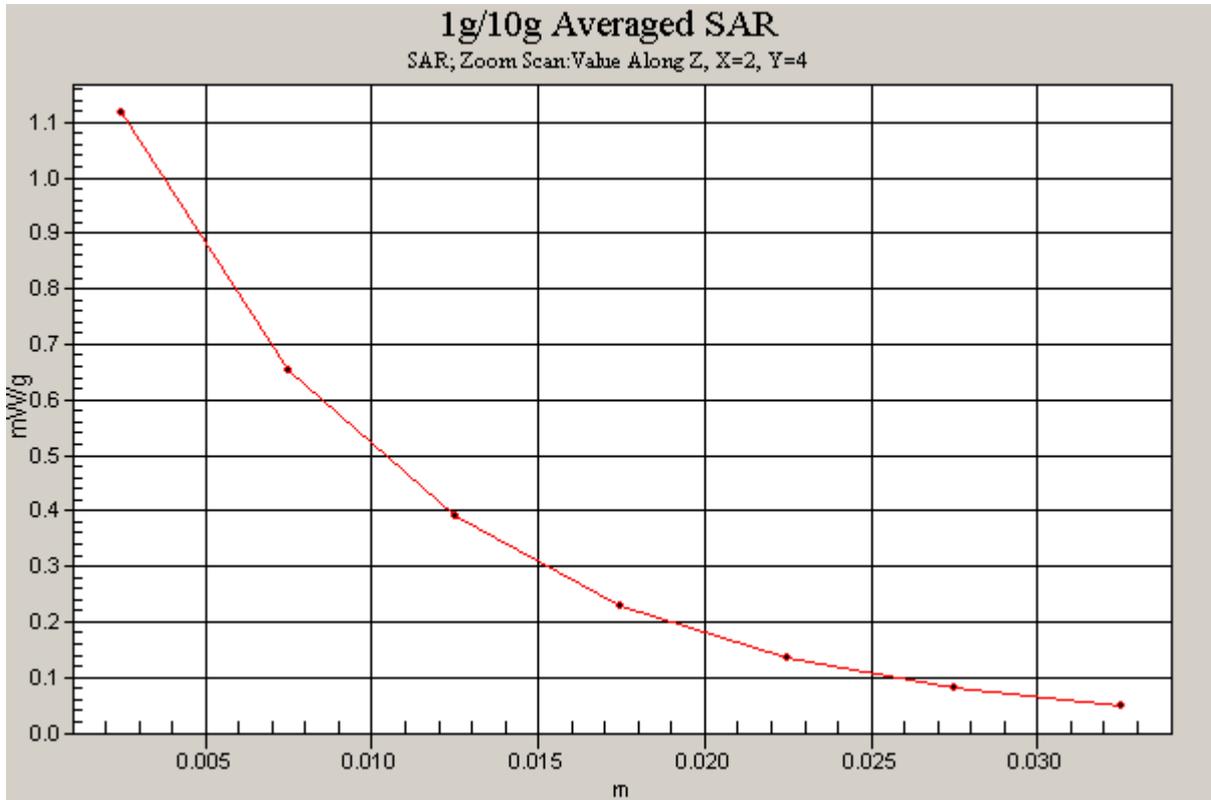


Figure 46 Z-Scan at power reference point (Left Hand Touch Cheek GSM 1900 Channel 810)

Date/Time: 12/13/2008 2:32:06 PM

GSM 1900 Left Cheek Middle

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 40.1$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(7.35, 7.35, 7.35);
- Electronics: DAE3 Sn536;

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

Maximum value of SAR (interpolated) = 1.15 mW/g

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

Reference Value = 19.1 V/m; Power Drift = 0.144 dB

Peak SAR (extrapolated) = 1.57 W/kg

SAR(1 g) = 0.934 mW/g; SAR(10 g) = 0.546 mW/g

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

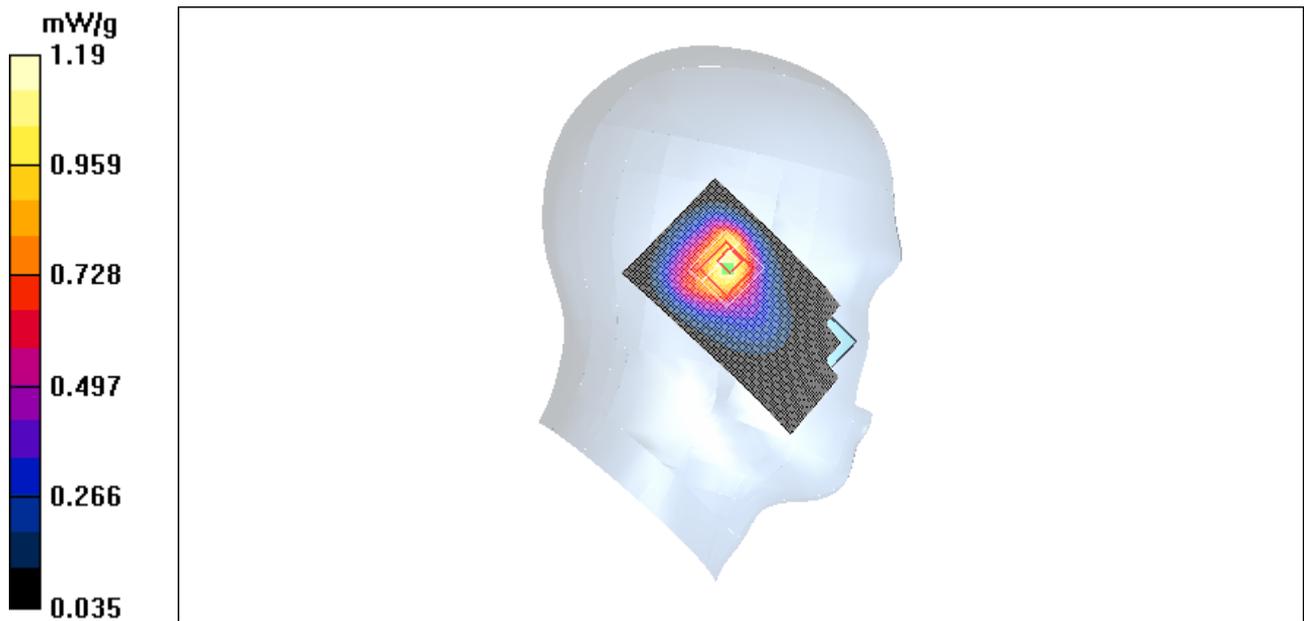


Figure 47 Left Hand Touch Cheek GSM 1900 Channel 661

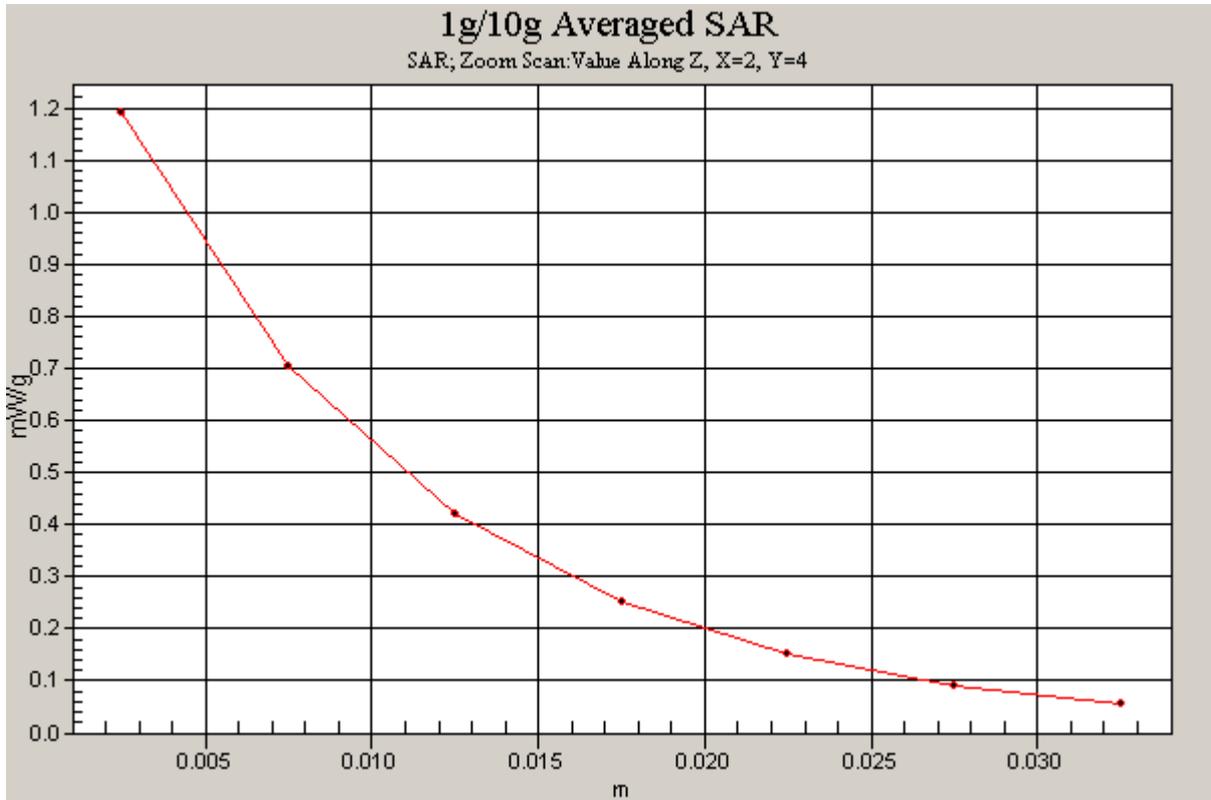


Figure 48 Z-Scan at power reference point (Left Hand Touch Cheek GSM 1900 Channel 661)

Date/Time: 12/13/2008 3:16:19 PM

GSM 1900 Left Cheek Low

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

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.37$ mho/m; $\epsilon_r = 40.2$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(7.35, 7.35, 7.35);
- Electronics: DAE3 Sn536;

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

Maximum value of SAR (interpolated) = 1.29 mW/g

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

Reference Value = 20.6 V/m; Power Drift = -0.012 dB

Peak SAR (extrapolated) = 1.65 W/kg

SAR(1 g) = 0.992 mW/g; SAR(10 g) = 0.587 mW/g

Maximum value of SAR (measured) = 1.25 mW/g

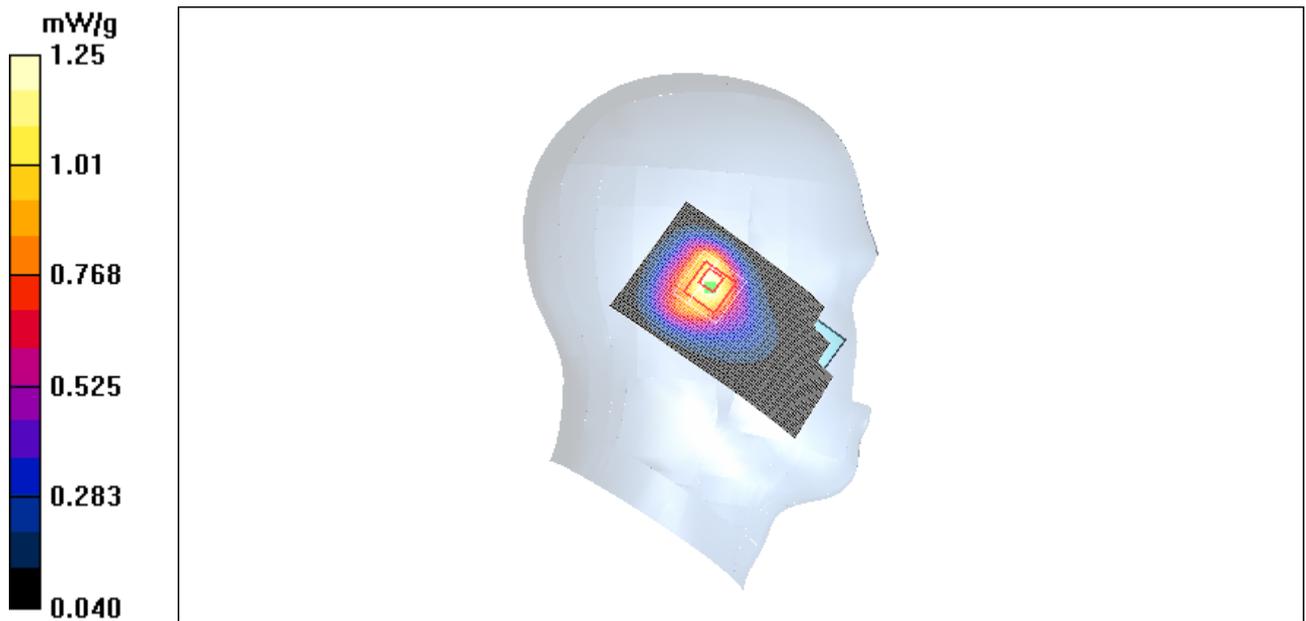


Figure 49 Left Hand Touch Cheek GSM 1900 Channel 512

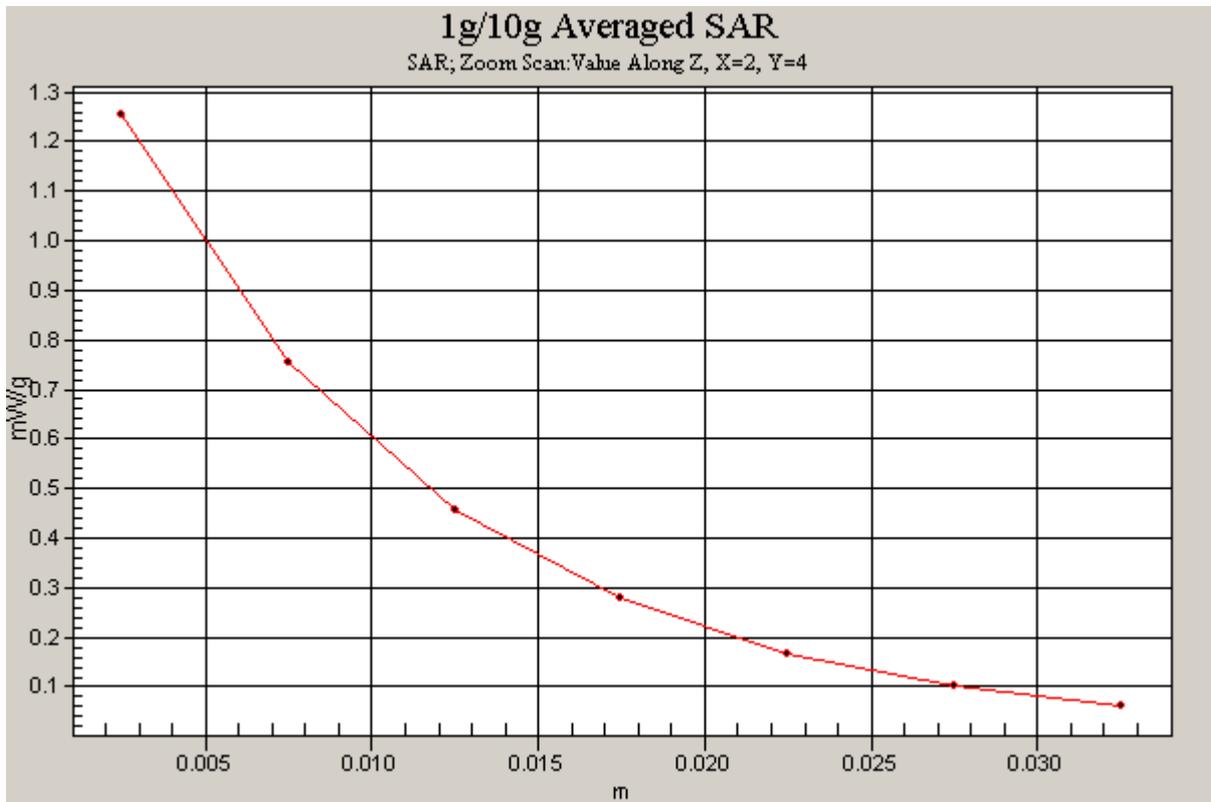


Figure 50 Z-Scan at power reference point (Left Hand Touch Cheek GSM 1900 Channel 512)

Date/Time: 12/13/2008 3:38:20 PM

GSM 1900 Left Tilt Middle

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 40.1$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(7.35, 7.35, 7.35);
- Electronics: DAE3 Sn536;

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

Maximum value of SAR (interpolated) = 0.997 mW/g

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

Reference Value = 22.8 V/m; Power Drift = 0.004 dB

Peak SAR (extrapolated) = 1.25 W/kg

SAR(1 g) = 0.747 mW/g; SAR(10 g) = 0.434 mW/g

Maximum value of SAR (measured) = 0.949 mW/g

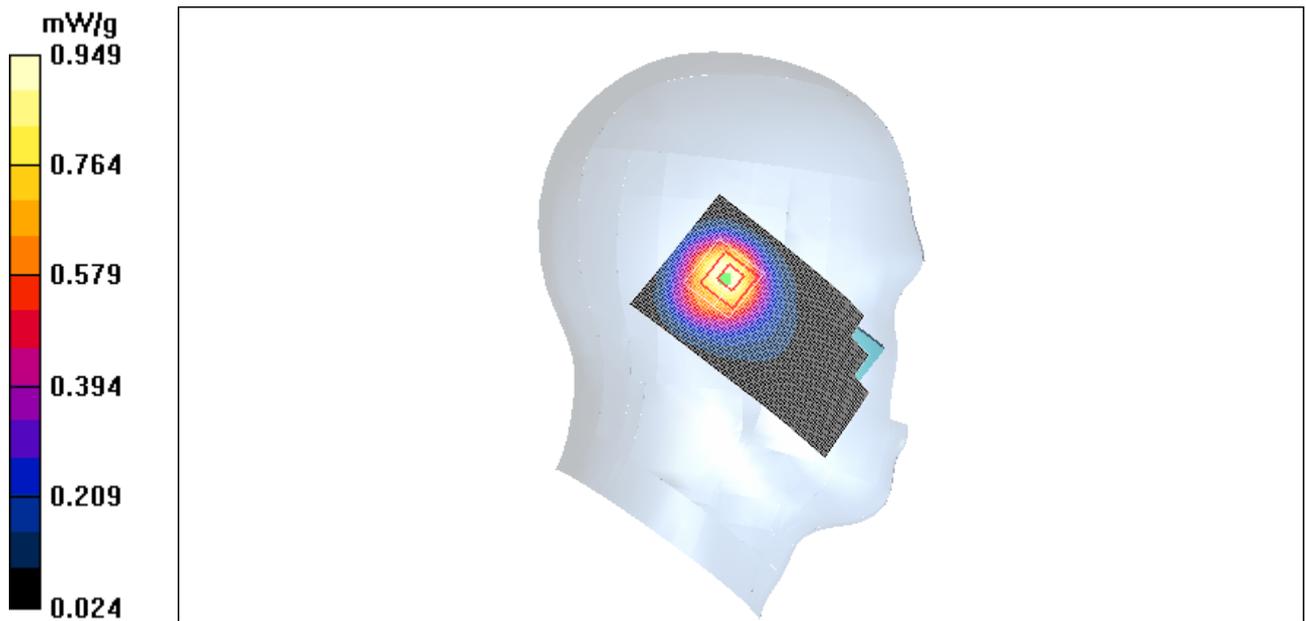


Figure 51 Left Hand Tilt 15° GSM 1900 Channel 661

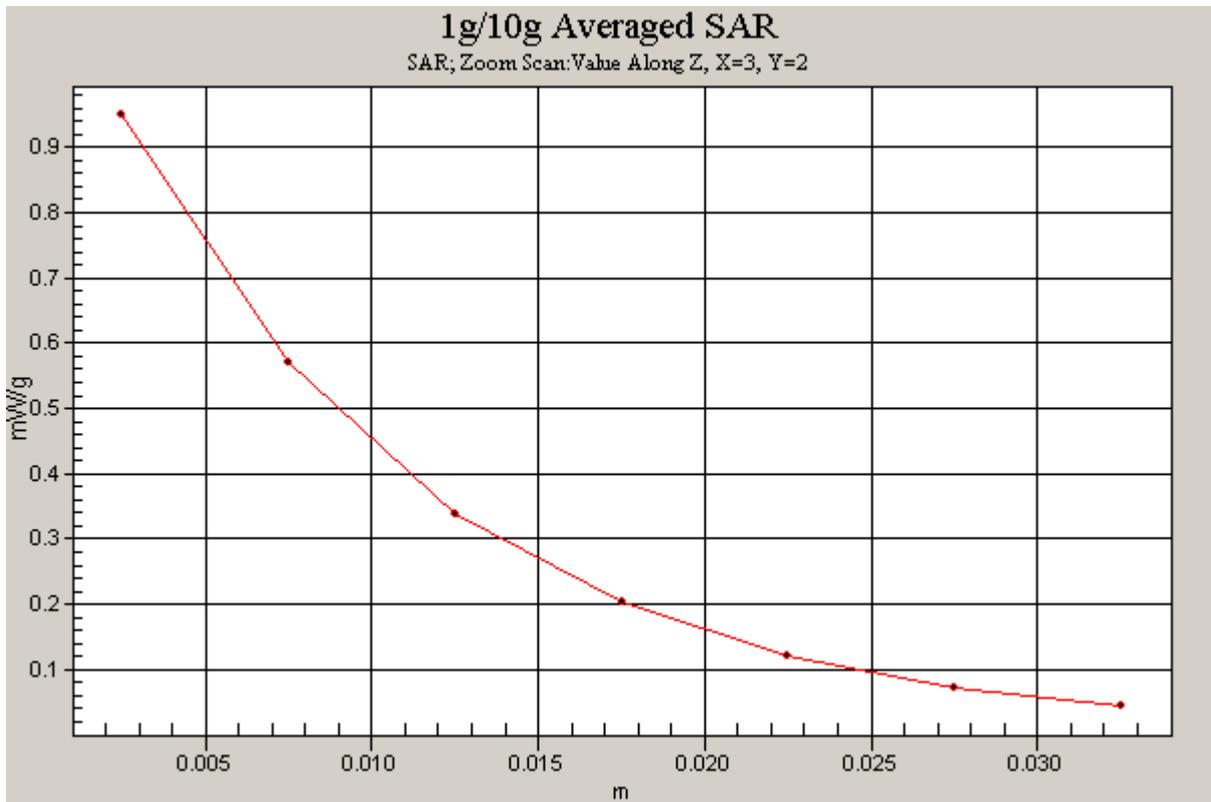


Figure 52 Z-Scan at power reference point (Left Hand Tilt 15° GSM 1900 Channel 661)

Date/Time: 12/13/2008 1:10:20 PM

GSM 1900 Right Cheek High

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

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.42$ mho/m; $\epsilon_r = 40$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(7.35, 7.35, 7.35);
- Electronics: DAE3 Sn536;

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

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

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

Reference Value = 22.7 V/m; Power Drift = 0.104 dB

Peak SAR (extrapolated) = 1.33 W/kg

SAR(1 g) = 0.822 mW/g; SAR(10 g) = 0.480 mW/g

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

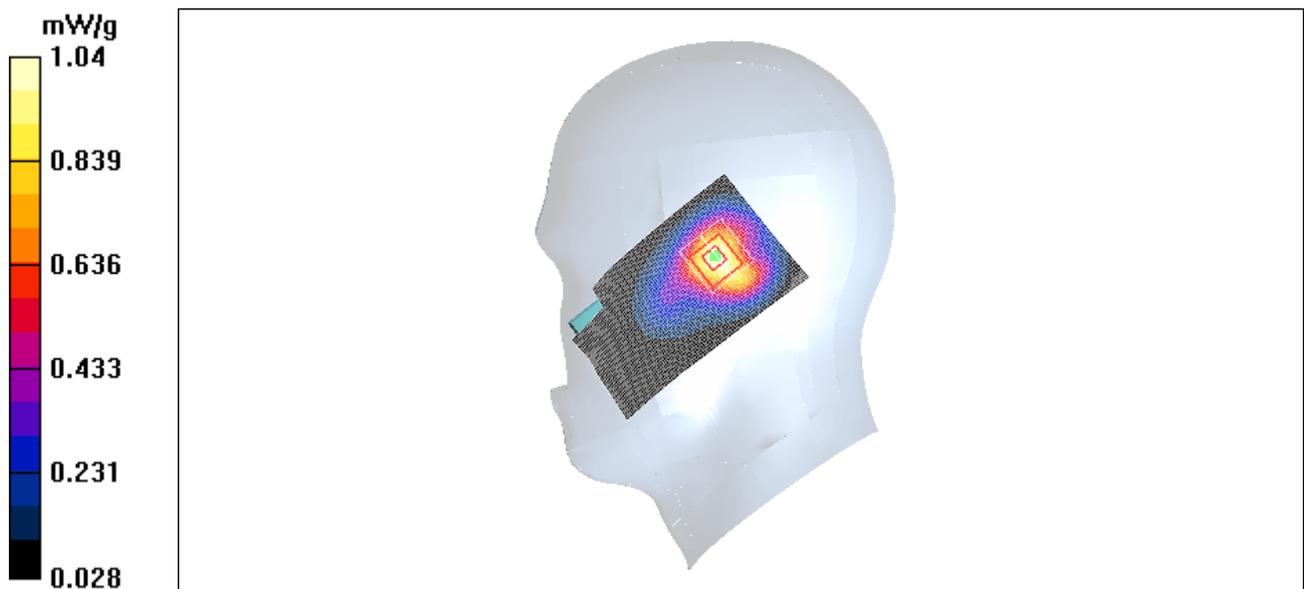


Figure 53 Right Hand Touch Cheek GSM 1900 Channel 810

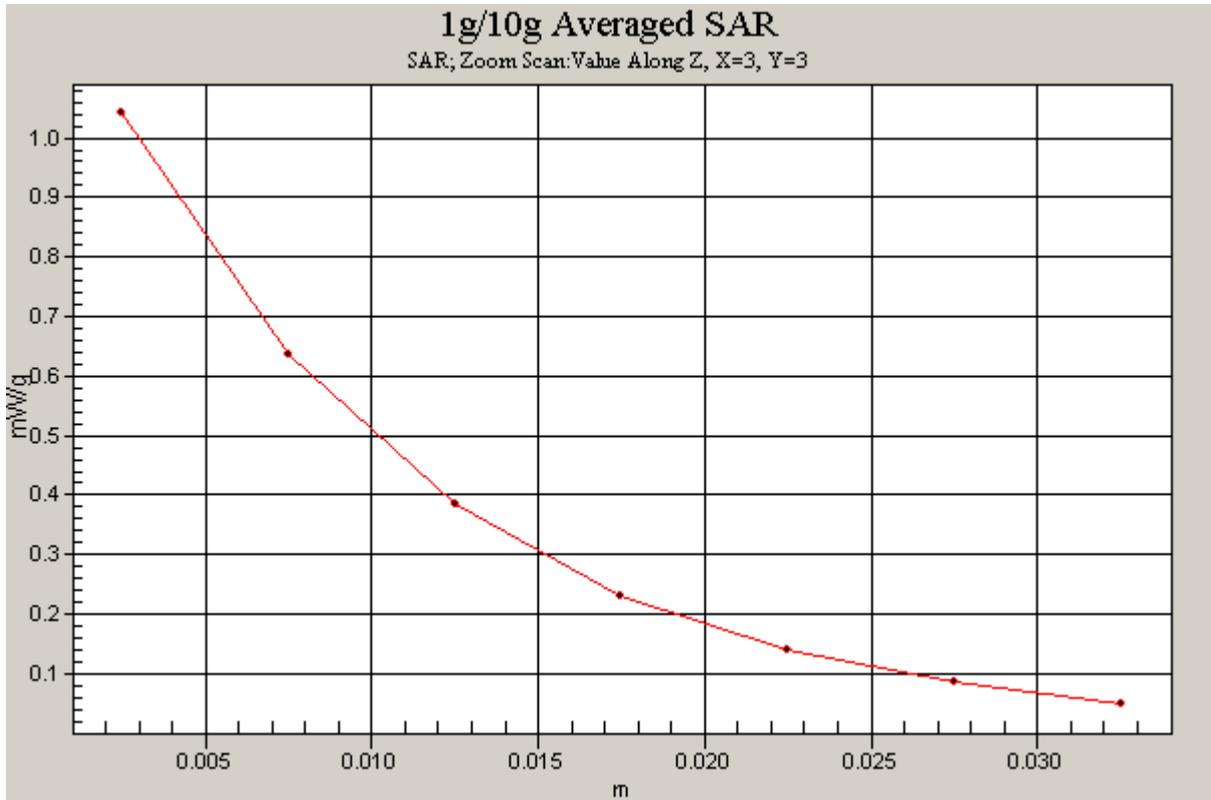


Figure 54 Z-Scan at power reference point (Right Hand Touch Cheek GSM 1900 Channel 810)

Date/Time: 12/13/2008 12:46:21 PM

GSM 1900 Right Cheek Middle

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 40.1$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(7.35, 7.35, 7.35);
- Electronics: DAE3 Sn536;

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

Maximum value of SAR (interpolated) = 1.25 mW/g

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

Reference Value = 25.9 V/m; Power Drift = -0.119 dB

Peak SAR (extrapolated) = 1.53 W/kg

SAR(1 g) = 0.948 mW/g; SAR(10 g) = 0.558 mW/g

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

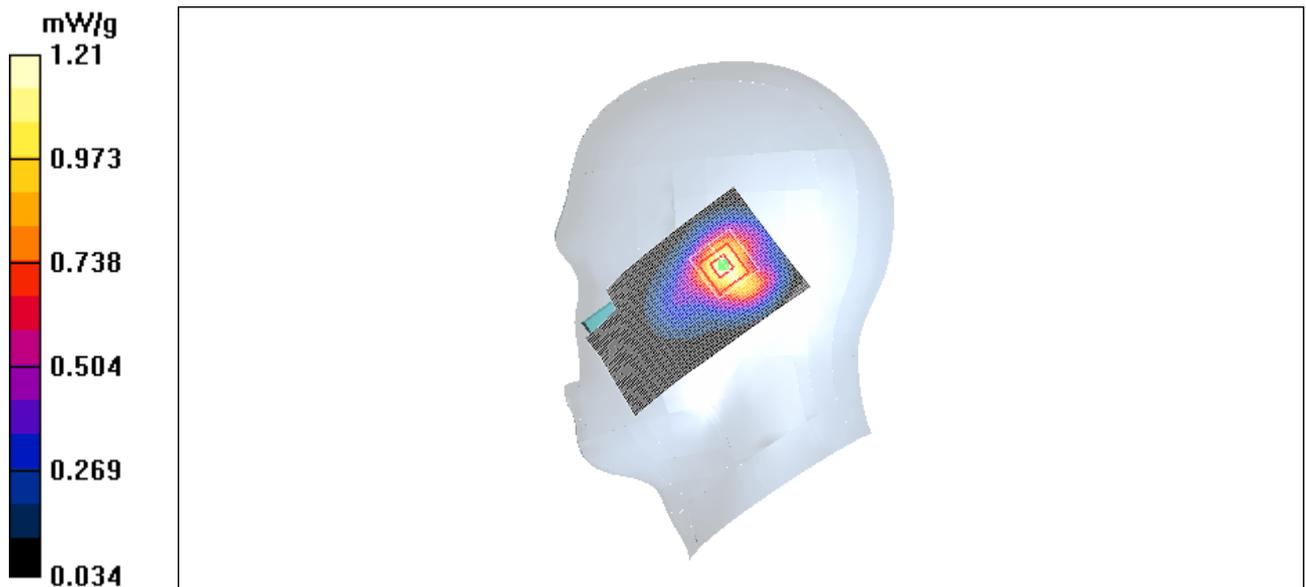


Figure 55 Right Hand Touch Cheek GSM 1900 Channel 661

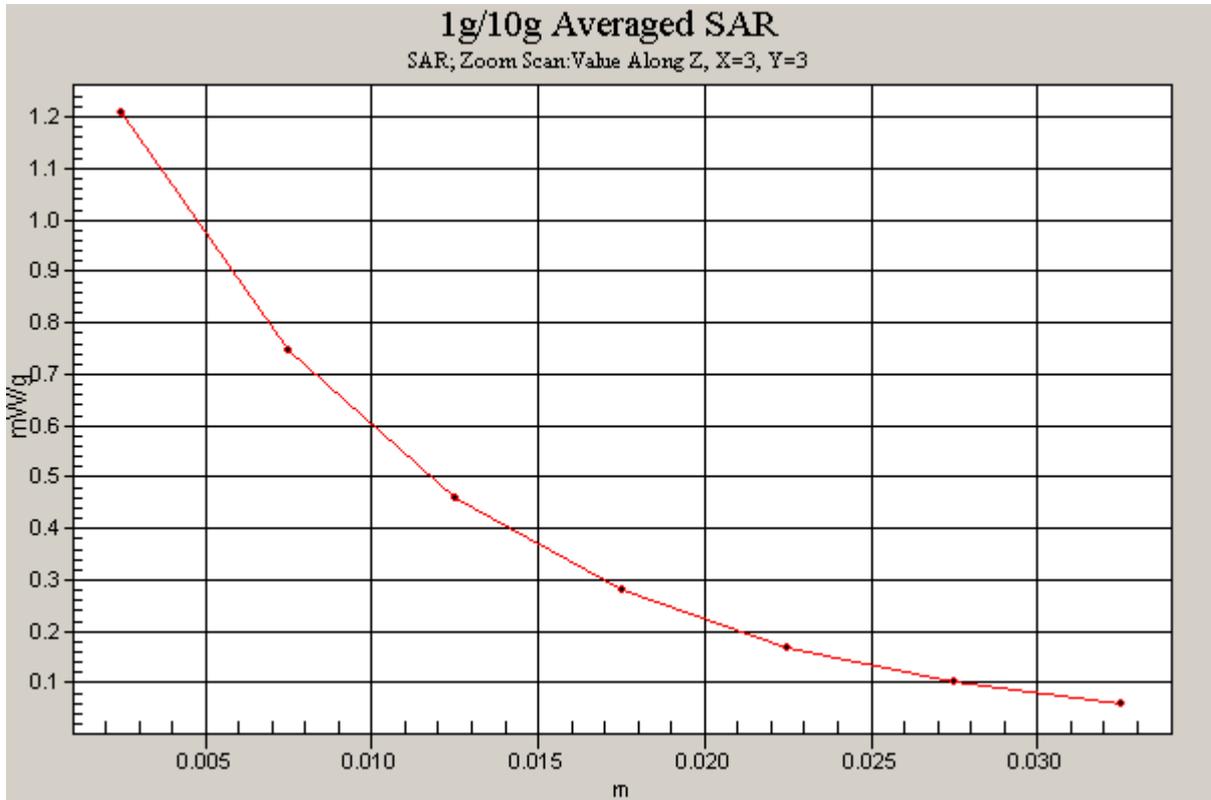


Figure 56 Z-Scan at power reference point (Right Hand Touch Cheek GSM 1900 Channel 661)

Date/Time: 12/13/2008 1:30:28 PM

GSM 1900 Right Cheek Low

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

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.37$ mho/m; $\epsilon_r = 40.2$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(7.35, 7.35, 7.35);
- Electronics: DAE3 Sn536;

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

Maximum value of SAR (interpolated) = 1.27 mW/g

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

Reference Value = 26.1 V/m; Power Drift = -0.008 dB

Peak SAR (extrapolated) = 1.55 W/kg

SAR(1 g) = 0.977 mW/g; SAR(10 g) = 0.580 mW/g

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

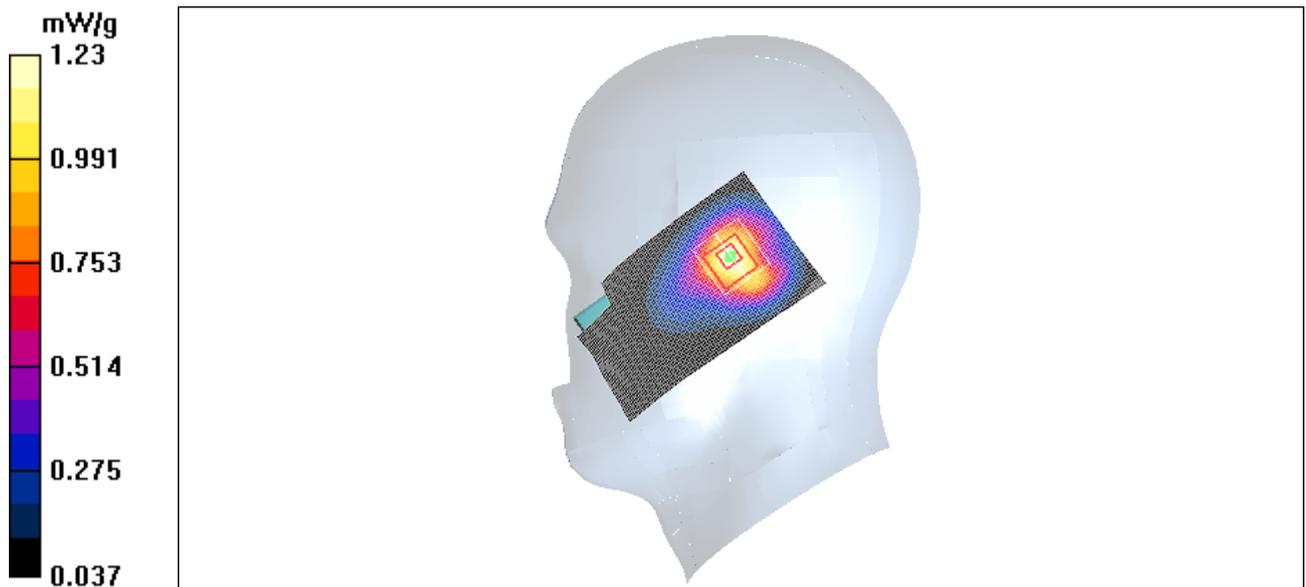


Figure 57 Right Hand Touch Cheek GSM 1900 Channel 512

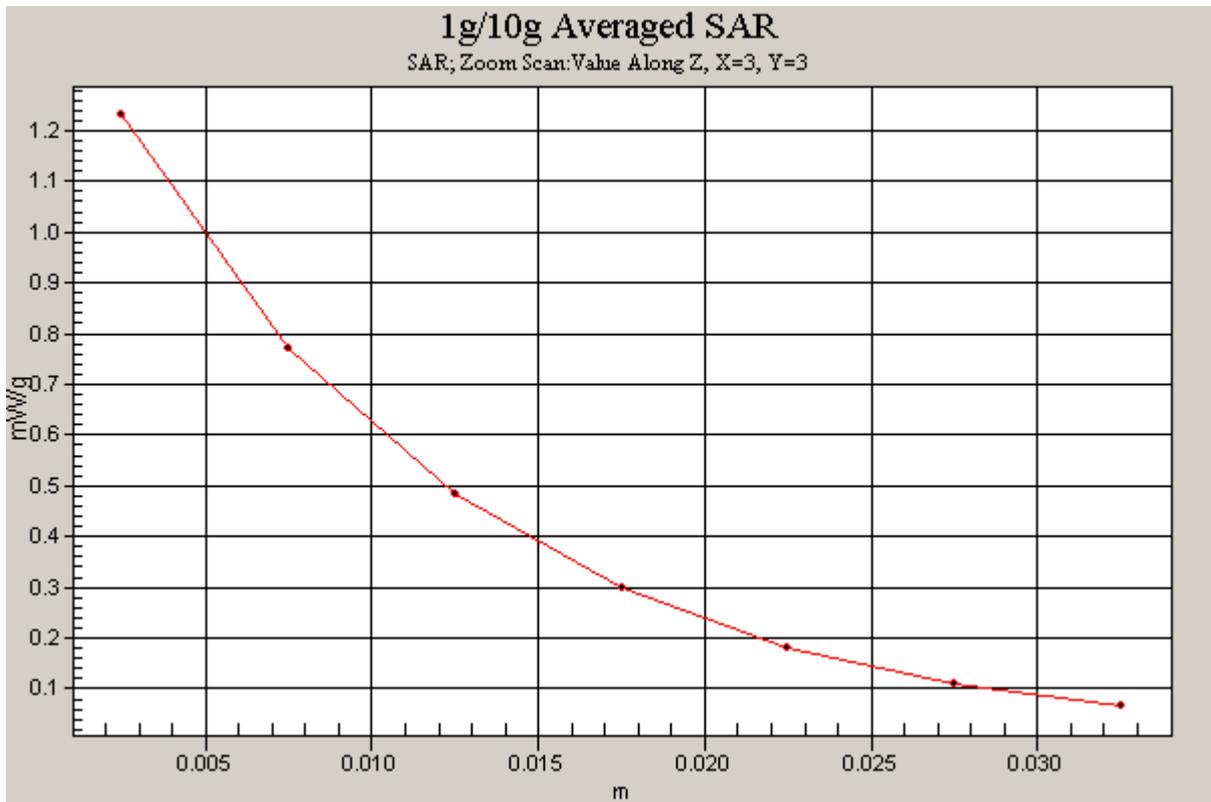


Figure 58 Z-Scan at power reference point (Right Hand Touch Cheek GSM 1900 Channel 512)

Date/Time: 12/13/2008 1:52:59 PM

GSM 1900 Right Tilt Middle

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 40.1$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(7.35, 7.35, 7.35);
- Electronics: DAE3 Sn536;

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

Maximum value of SAR (interpolated) = 0.965 mW/g

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

Reference Value = 24.2 V/m; Power Drift = -0.028 dB

Peak SAR (extrapolated) = 1.23 W/kg

SAR(1 g) = 0.735 mW/g; SAR(10 g) = 0.428 mW/g

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

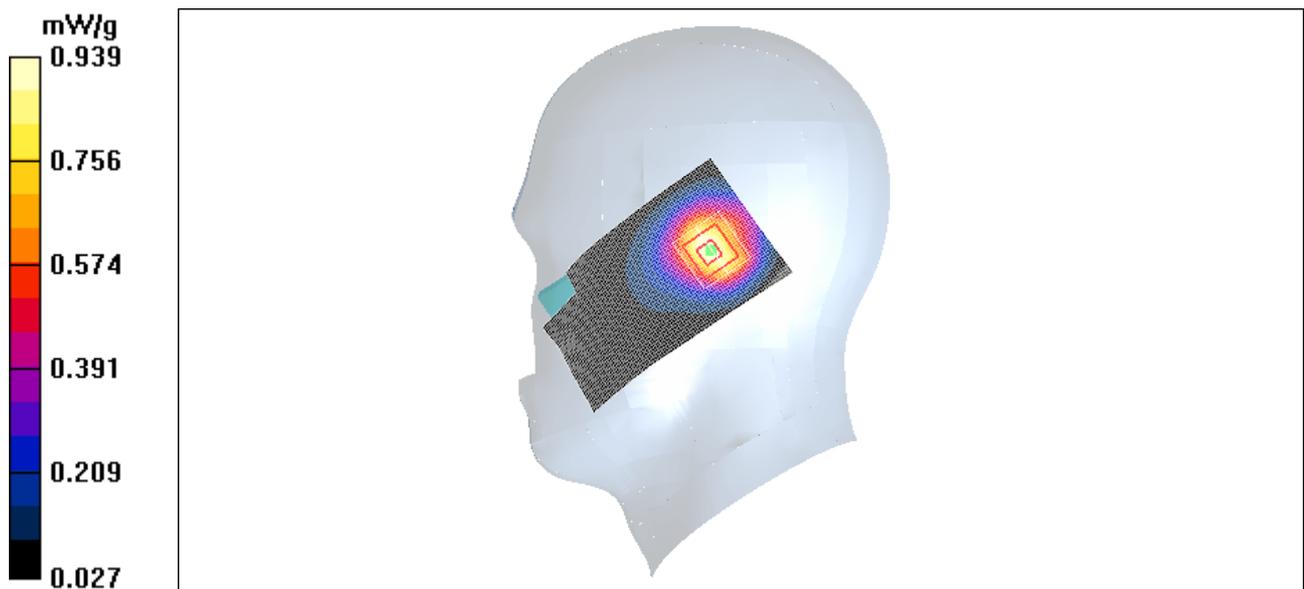


Figure 59 Right Hand Tilt 15° GSM 1900 Channel 661

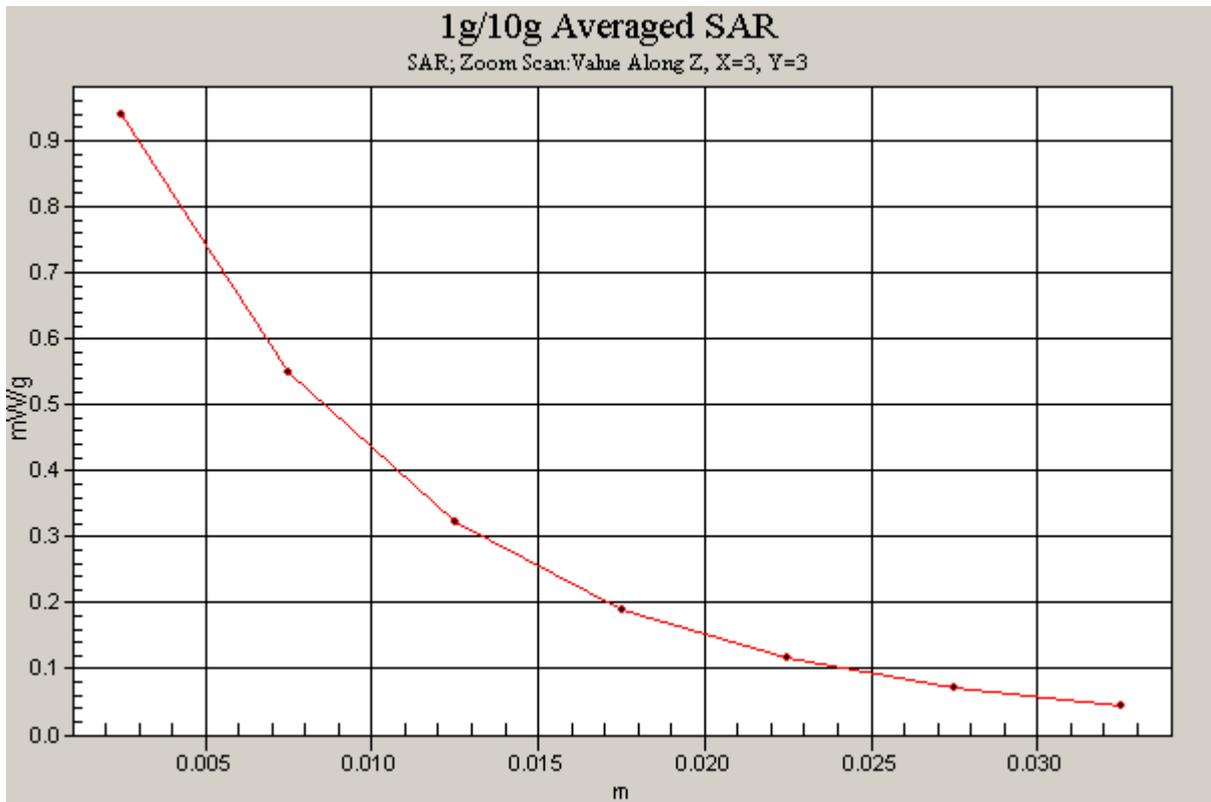


Figure 60 Z-Scan at power reference point (Right Hand Tilt 15° GSM 1900 Channel 661)

Date/Time: 12/14/2008 12:01:35 PM

GSM 1900 Towards Ground High

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

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.58$ mho/m; $\epsilon_r = 51.5$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(7.45, 7.45, 7.45);
- Electronics: DAE3 Sn536;

Towards Ground High/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.457 mW/g

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

Reference Value = 14.1 V/m; Power Drift = -0.007 dB

Peak SAR (extrapolated) = 0.576 W/kg

SAR(1 g) = 0.344 mW/g; SAR(10 g) = 0.199 mW/g

Maximum value of SAR (measured) = 0.440 mW/g

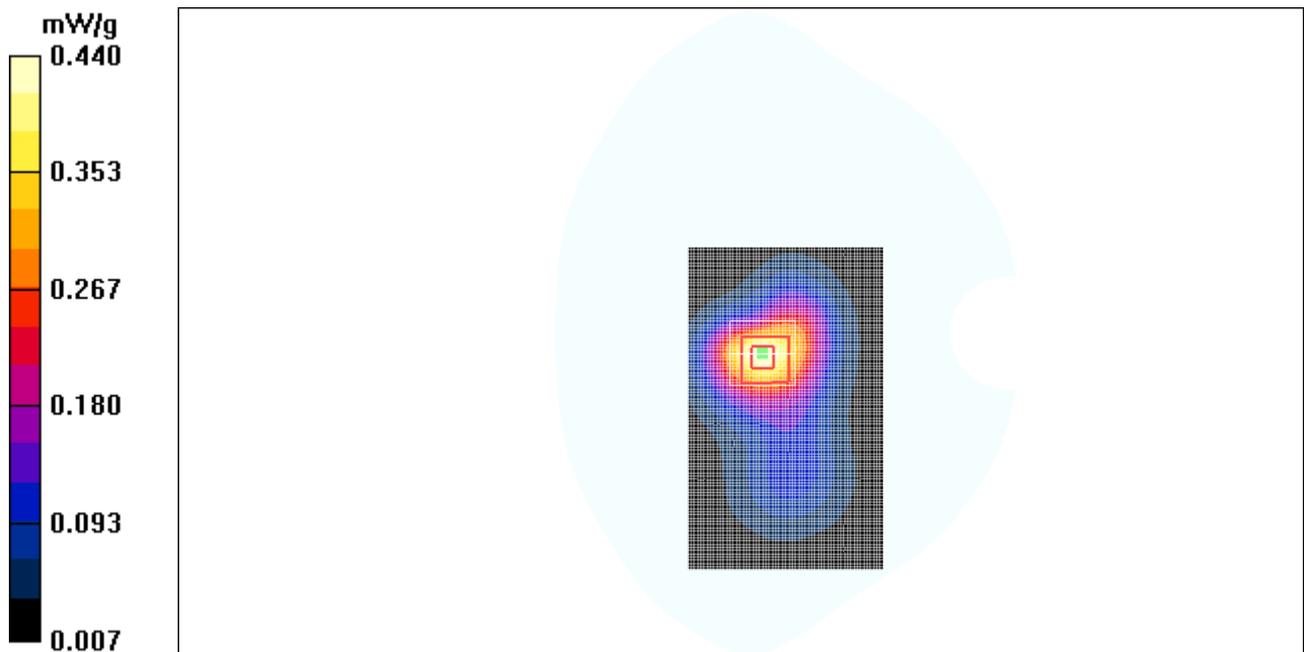


Figure 61 Body, Towards Ground, GSM 1900 Channel 810

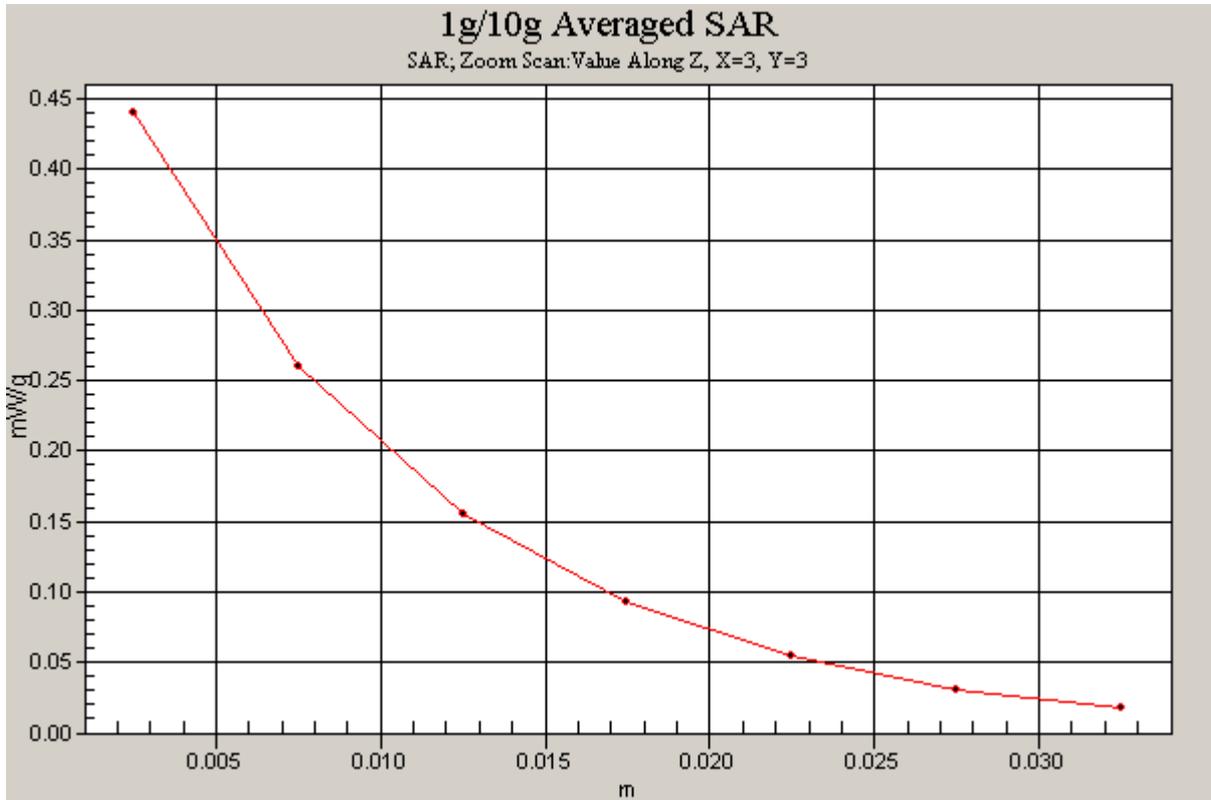


Figure 62 Z-Scan at power reference point (Body, Towards Ground, GSM 1900 Channel 810)

Date/Time: 12/14/2008 11:40:54 AM

GSM 1900 Towards Ground Middle

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.54$ mho/m; $\epsilon_r = 51.7$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(7.45, 7.45, 7.45);
- Electronics: DAE3 Sn536;

Towards Ground Middle/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.613 mW/g

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

Reference Value = 17.1 V/m; Power Drift = -0.043 dB

Peak SAR (extrapolated) = 0.760 W/kg

SAR(1 g) = 0.454 mW/g; SAR(10 g) = 0.264 mW/g

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

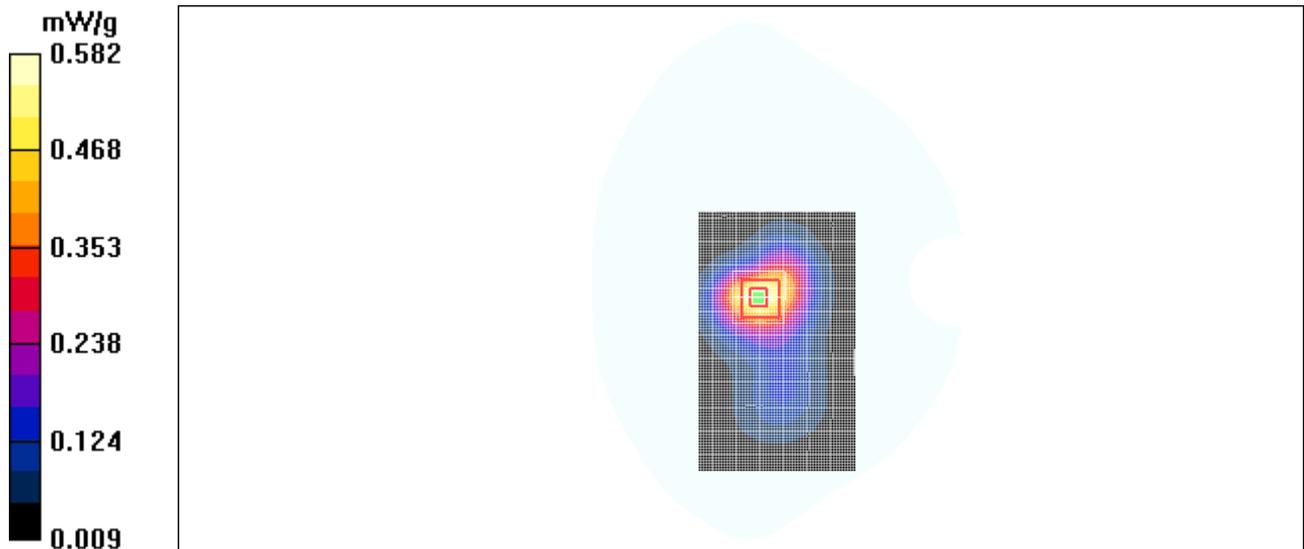


Figure 63 Body, Towards Ground, GSM 1900 Channel 661

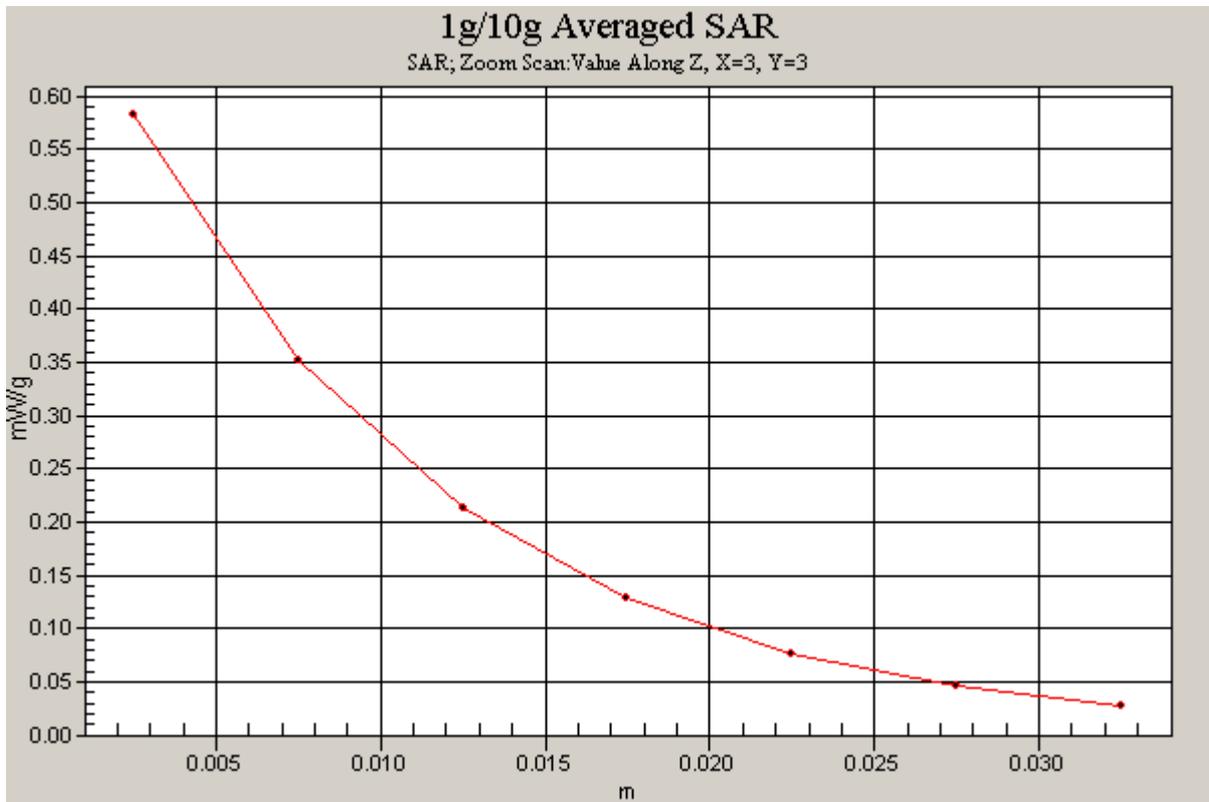


Figure 64 Z-Scan at power reference point (Body, Towards Ground, GSM 1900 Channel 661)

Date/Time: 12/14/2008 12:21:53 PM

GSM 1900 Towards Ground Low

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

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.55$ mho/m; $\epsilon_r = 51.8$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(7.45, 7.45, 7.45);
- Electronics: DAE3 Sn536;

Towards Ground Low/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.652 mW/g

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

Reference Value = 18.1 V/m; Power Drift = -0.172 dB

Peak SAR (extrapolated) = 0.768 W/kg

SAR(1 g) = 0.458 mW/g; SAR(10 g) = 0.266 mW/g

Maximum value of SAR (measured) = 0.590 mW/g

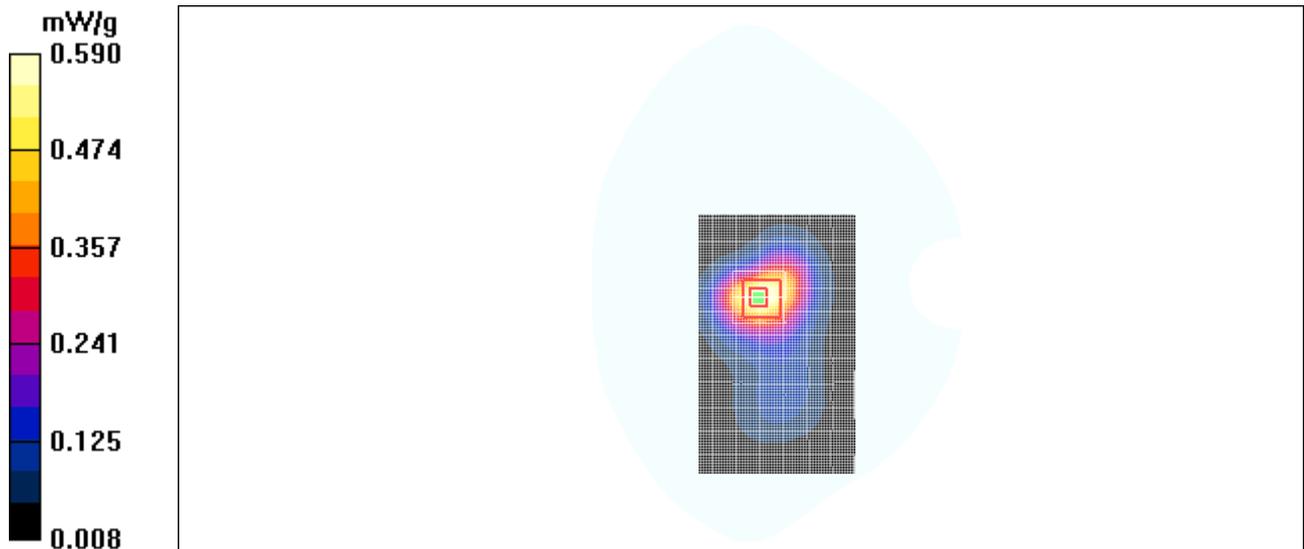


Figure 65 Body, Towards Ground, GSM 1900 Channel 512

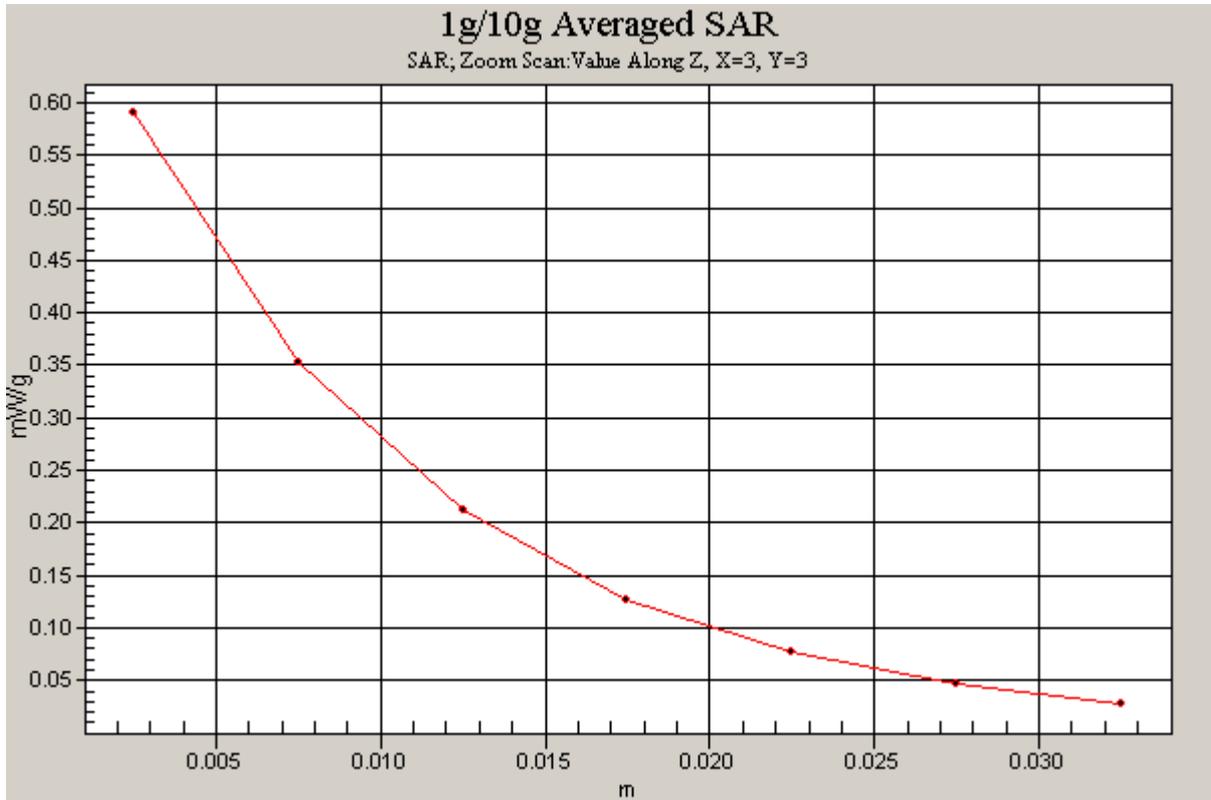


Figure 66 Z-Scan at power reference point (Body, Towards Ground, GSM 1900 Channel 512)

Date/Time: 12/14/2008 11:19:05 AM

GSM 1900 Towards Phantom Middle

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.54$ mho/m; $\epsilon_r = 51.7$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(7.45, 7.45, 7.45);
- Electronics: DAE3 Sn536;

Towards Phantom Middle/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.328 mW/g

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

Reference Value = 12.1 V/m; Power Drift = -0.106 dB

Peak SAR (extrapolated) = 0.413 W/kg

SAR(1 g) = 0.257 mW/g; SAR(10 g) = 0.157 mW/g

Maximum value of SAR (measured) = 0.320 mW/g

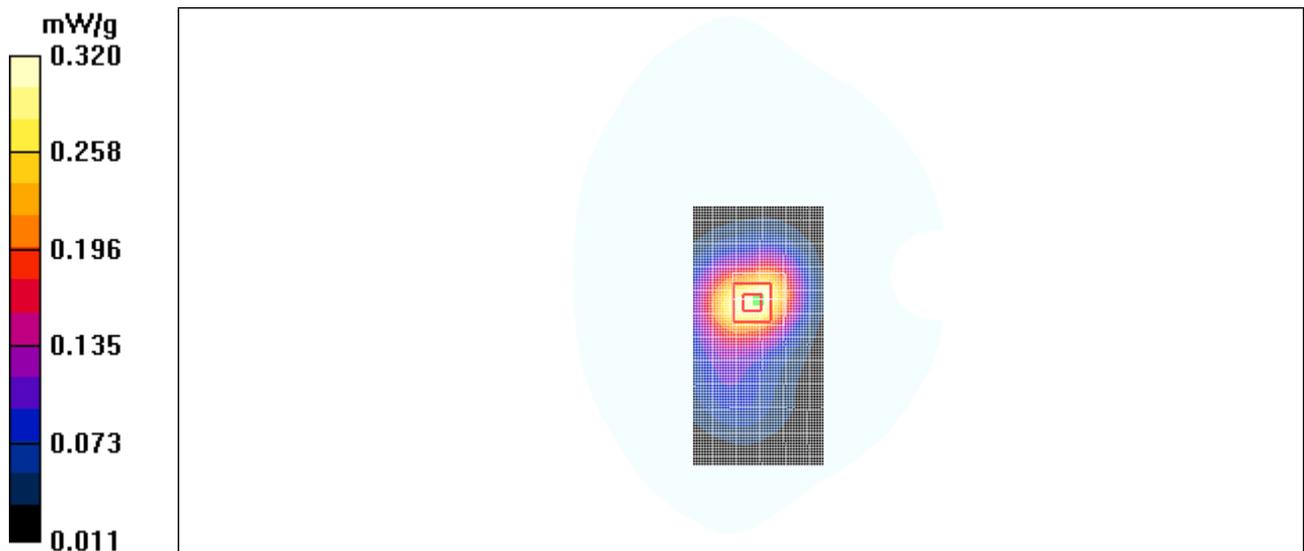


Figure 67 Body, Towards Phantom, GSM 1900 Channel 661

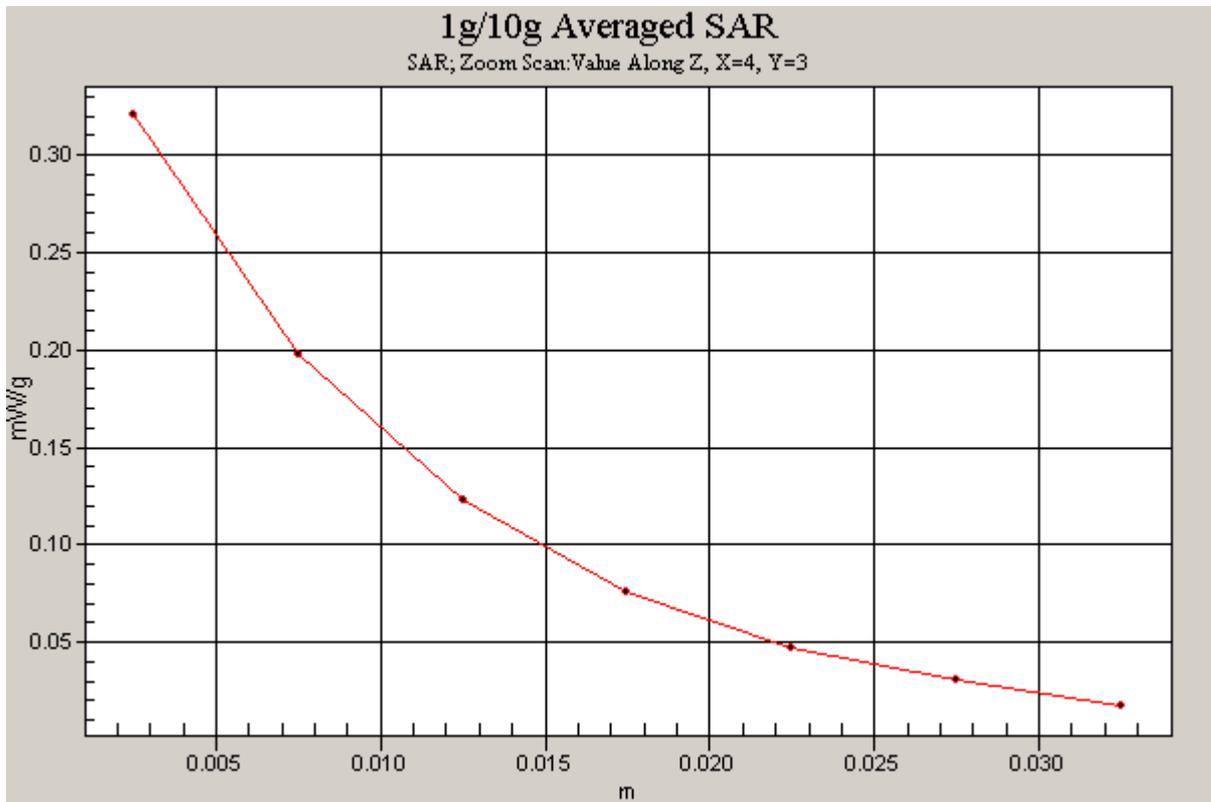


Figure 68 Z-Scan at power reference point (Body, Towards Phantom, GSM 1900 Channel 661)

Date/Time: 12/14/2008 2:02:51 PM

GSM 1900 Earphone Towards Ground Low

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

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.55$ mho/m; $\epsilon_r = 51.8$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(7.45, 7.45, 7.45);
- Electronics: DAE3 Sn536;

Towards Ground Low/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.751 mW/g

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

Reference Value = 19.6 V/m; Power Drift = 0.007 dB

Peak SAR (extrapolated) = 0.910 W/kg

SAR(1 g) = 0.538 mW/g; SAR(10 g) = 0.312 mW/g

Maximum value of SAR (measured) = 0.691 mW/g

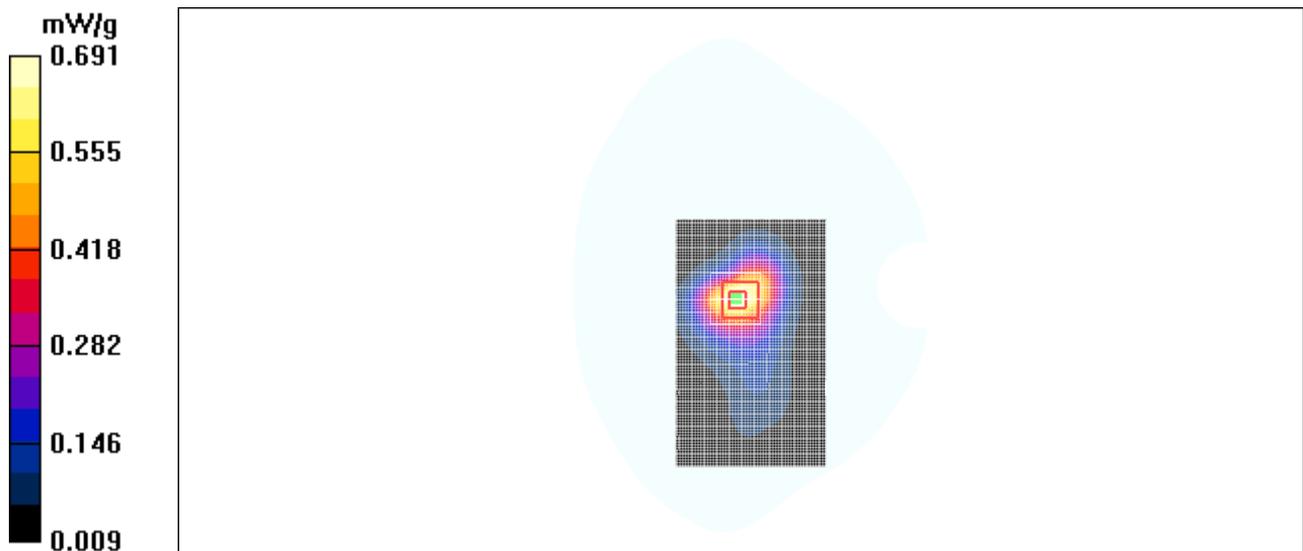


Figure 69 Body with Earphone, Towards Ground, GSM 1900, Channel 512

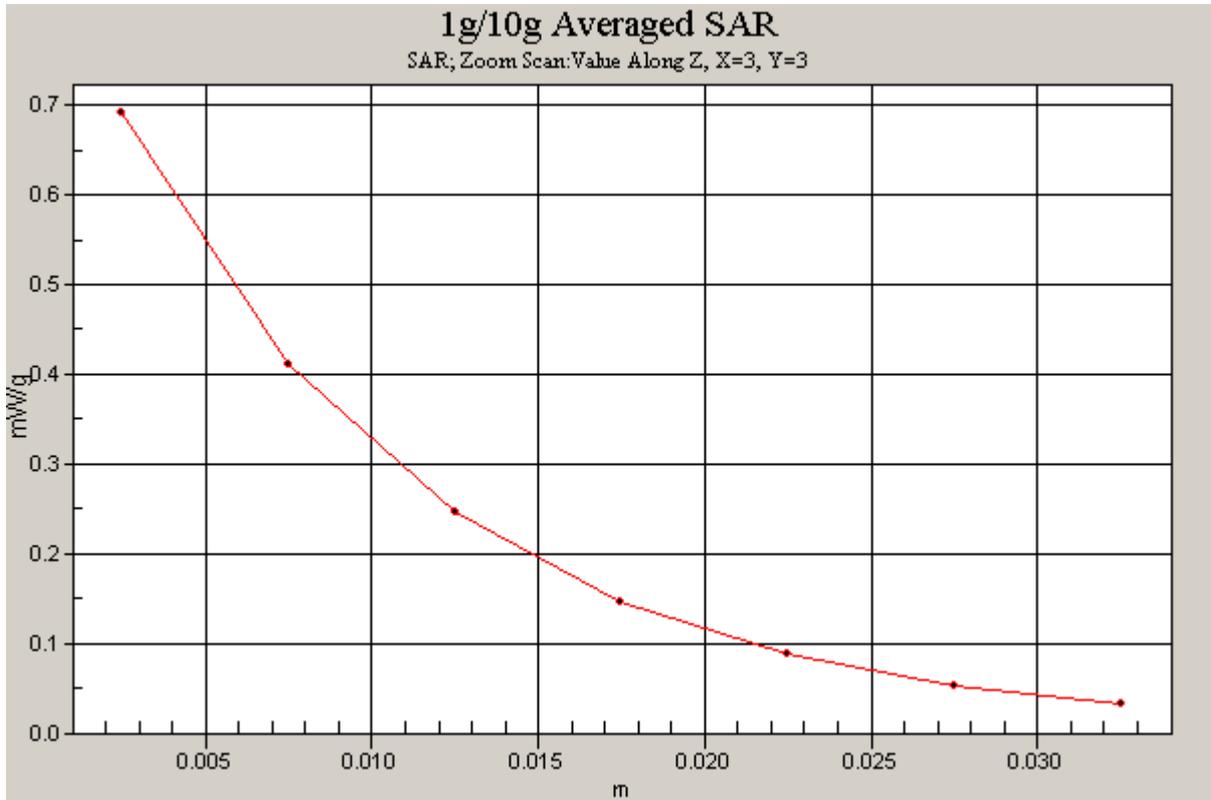


Figure 70 Z-Scan at power reference point (Body with Earphone, Towards Ground, GSM 1900, Channel 512)

Date/Time: 12/14/2008 1:37:44 PM

GSM 1900 GPRS Towards Ground High

Communication System: PCS 1900+GPRS(2Up); Frequency: 1909.8 MHz; Duty Cycle: 1:4
Medium parameters used: $f = 1910$ MHz; $\sigma = 1.58$ mho/m; $\epsilon_r = 51.5$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(7.45, 7.45, 7.45);
- Electronics: DAE3 Sn536;

Towards Ground High/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.711 mW/g

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

Reference Value = 17.5 V/m; Power Drift = 0.007 dB

Peak SAR (extrapolated) = 0.930 W/kg

SAR(1 g) = 0.557 mW/g; SAR(10 g) = 0.323 mW/g

Maximum value of SAR (measured) = 0.710 mW/g

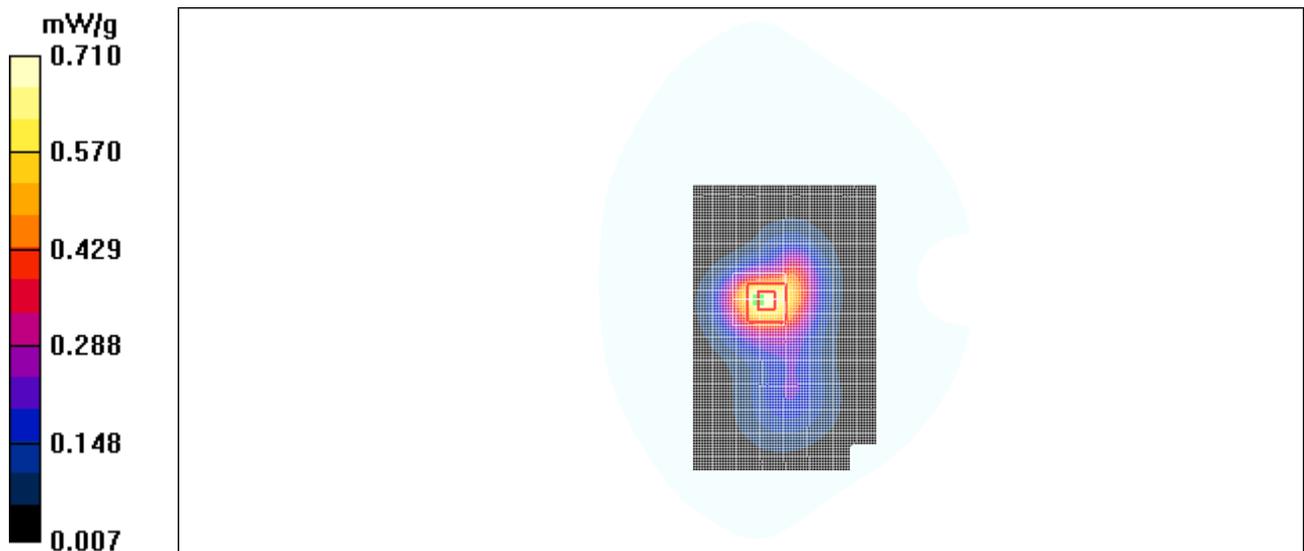


Figure 71 Body, Towards Ground, GSM 1900 GPRS, Channel 810

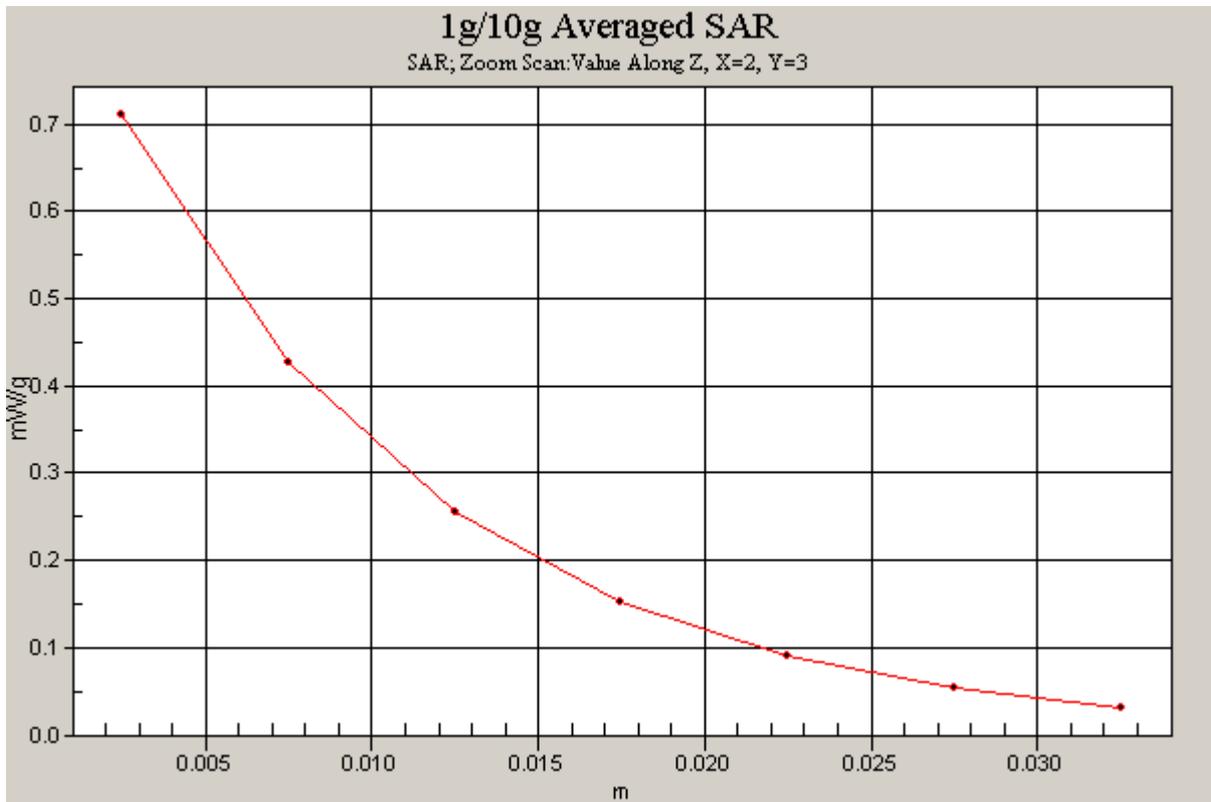


Figure 72 Z-Scan at power reference point (Body, Towards Ground, GSM 1900 GPRS, Channel 810)

Date/Time: 12/14/2008 1:15:42 PM

GSM 1900 GPRS Towards Ground Middle

Communication System: PCS 1900+GPRS(2Up); Frequency: 1880 MHz; Duty Cycle: 1:4

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.54$ mho/m; $\epsilon_r = 51.7$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(7.45, 7.45, 7.45);
- Electronics: DAE3 Sn536;

Towards Ground Middle/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.927 mW/g

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

Reference Value = 21.0 V/m; Power Drift = 0.021 dB

Peak SAR (extrapolated) = 1.19 W/kg

SAR(1 g) = 0.724 mW/g; SAR(10 g) = 0.420 mW/g

Maximum value of SAR (measured) = 0.916 mW/g

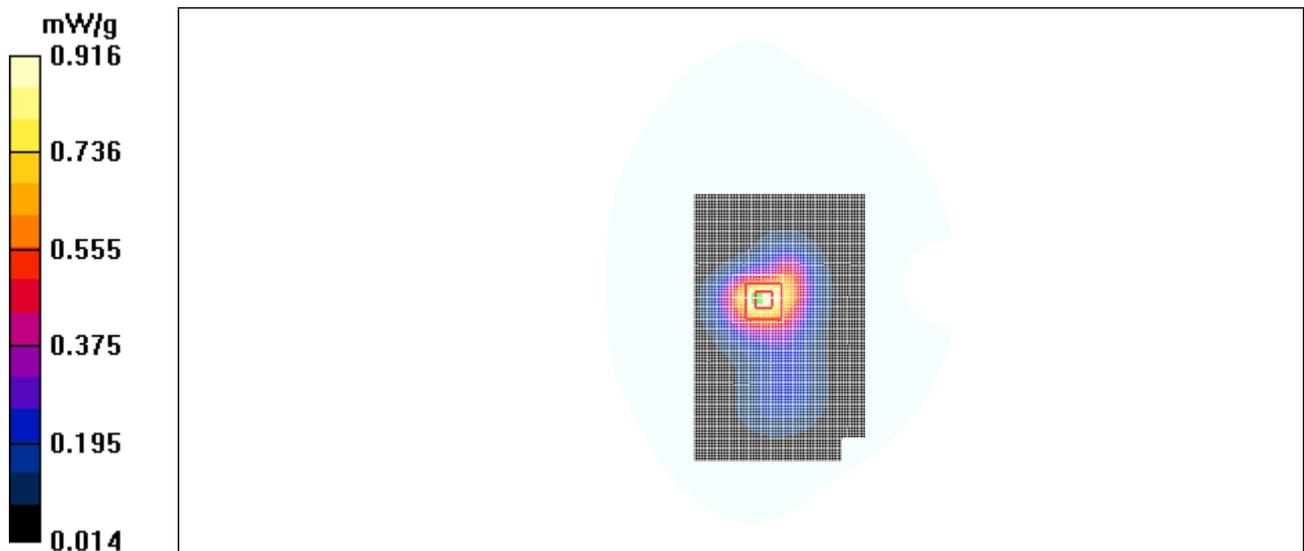


Figure 73 Body, Towards Ground, GSM 1900 GPRS, Channel 661

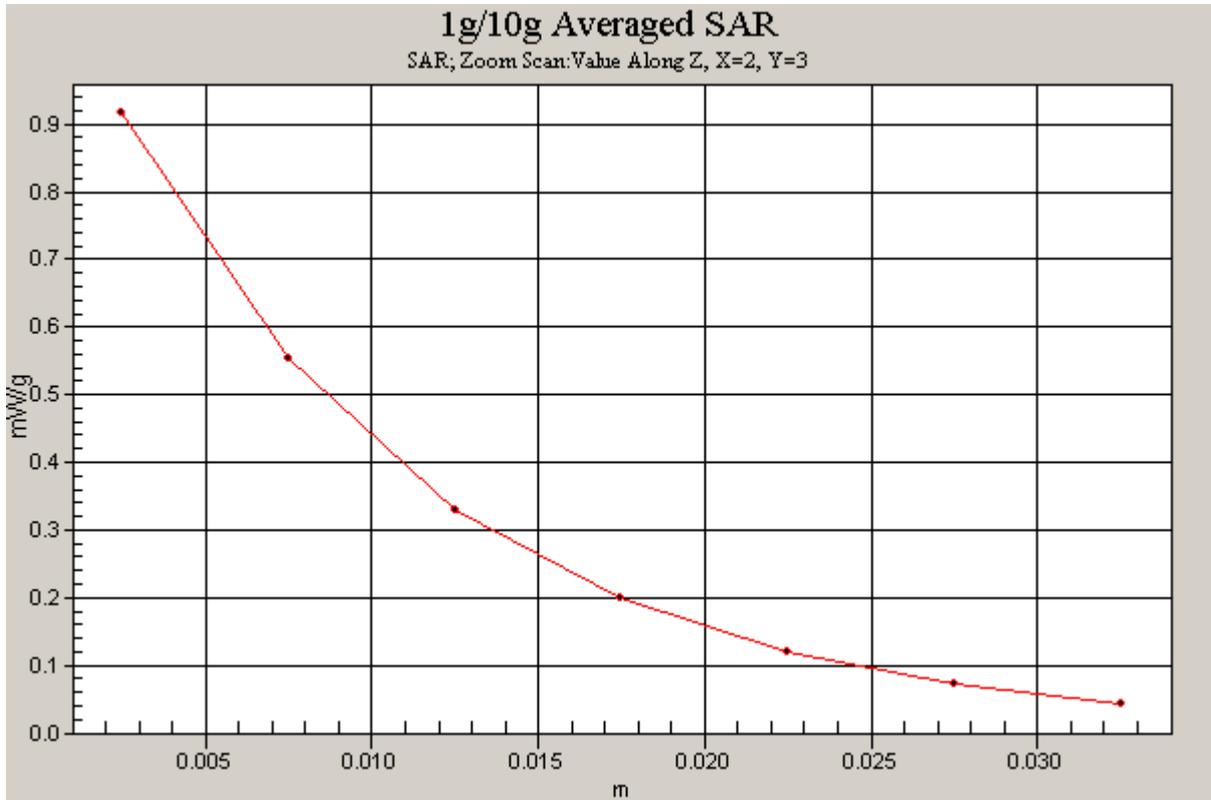


Figure 74 Z-Scan at power reference point (Body, Towards Ground, GSM 1900 GPRS, Channel 661)

Date/Time: 12/14/2008 12:52:35 PM

GSM 1900 GPRS Towards Ground Low

Communication System: PCS 1900+GPRS(2Up); Frequency: 1850.2 MHz; Duty Cycle: 1:4

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.55$ mho/m; $\epsilon_r = 51.8$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(7.45, 7.45, 7.45);
- Electronics: DAE3 Sn536;

Towards Ground Low/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.958 mW/g

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

Reference Value = 22.4 V/m; Power Drift = -0.150 dB

Peak SAR (extrapolated) = 1.24 W/kg

SAR(1 g) = 0.741 mW/g; SAR(10 g) = 0.428 mW/g

Maximum value of SAR (measured) = 0.946 mW/g

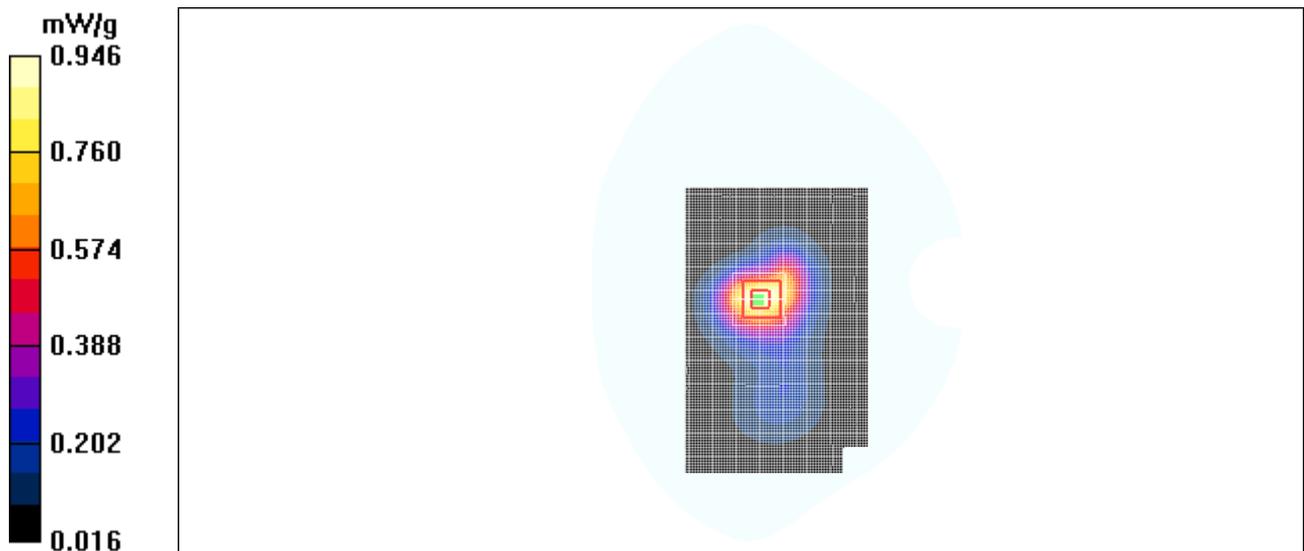


Figure 75 Body, Towards Ground, GSM 1900 GPRS, Channel 512

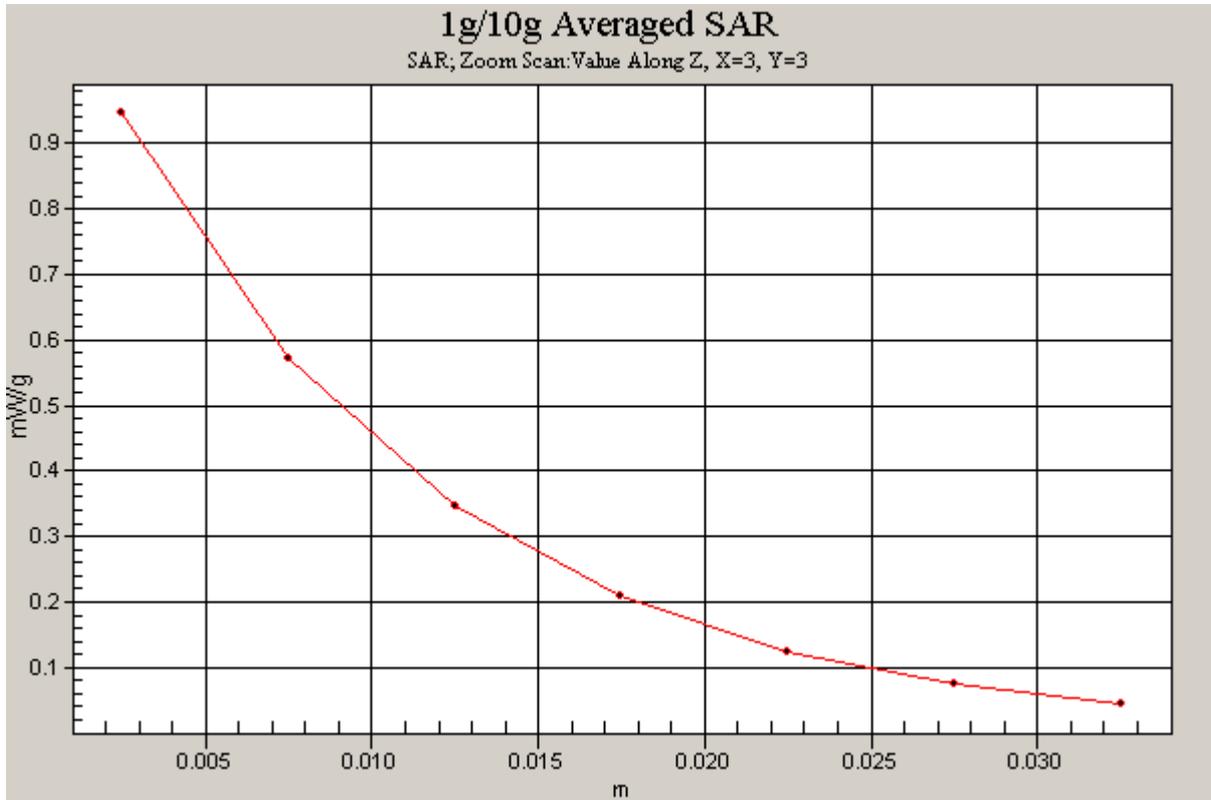


Figure 76 Z-Scan at power reference point (Body, Towards Ground, GSM 1900 GPRS, Channel 512)

Date/Time: 12/14/2008 9:14:08 AM

GSM 1900 GPRS Towards Phantom Middle

Communication System: PCS 1900+GPRS(2Up); Frequency: 1880 MHz; Duty Cycle: 1:4

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.54$ mho/m; $\epsilon_r = 51.7$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3660; ConvF(7.45, 7.45, 7.45);
- Electronics: DAE3 Sn536;

Towards Phantom Middle/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

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

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

Reference Value = 15.9 V/m; Power Drift = -0.092dB

Peak SAR (extrapolated) = 1.01 W/kg

SAR(1 g) = 0.462 mW/g; SAR(10 g) = 0.237 mW/g

Maximum value of SAR (measured) = 0.629 mW/g

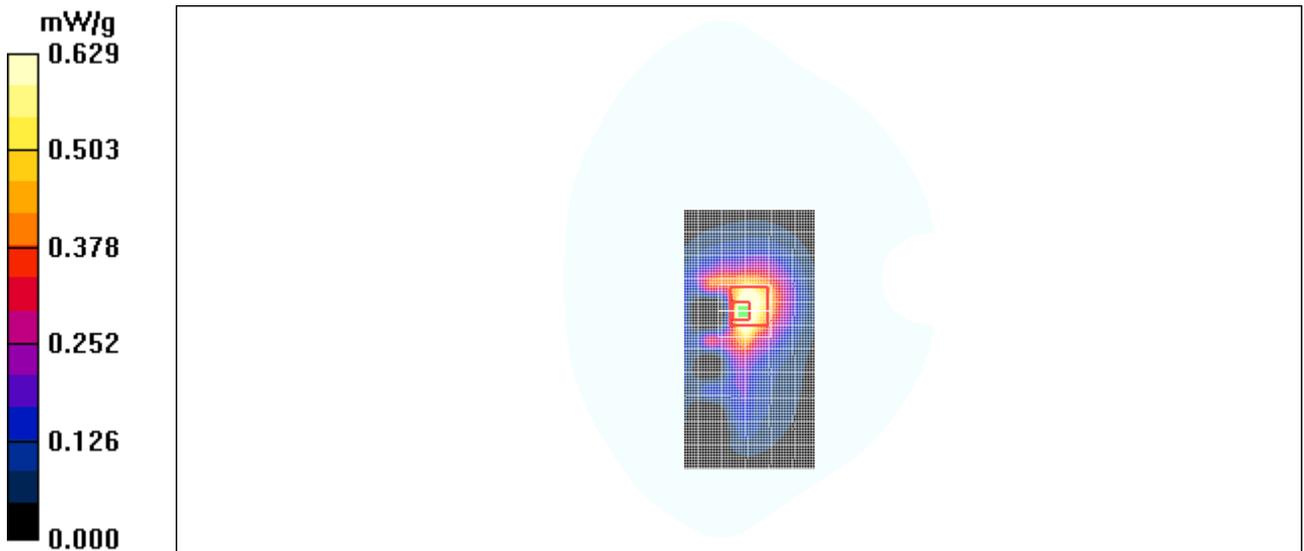


Figure 77 Body, Towards Phantom, GSM 1900 GPRS, Channel 661

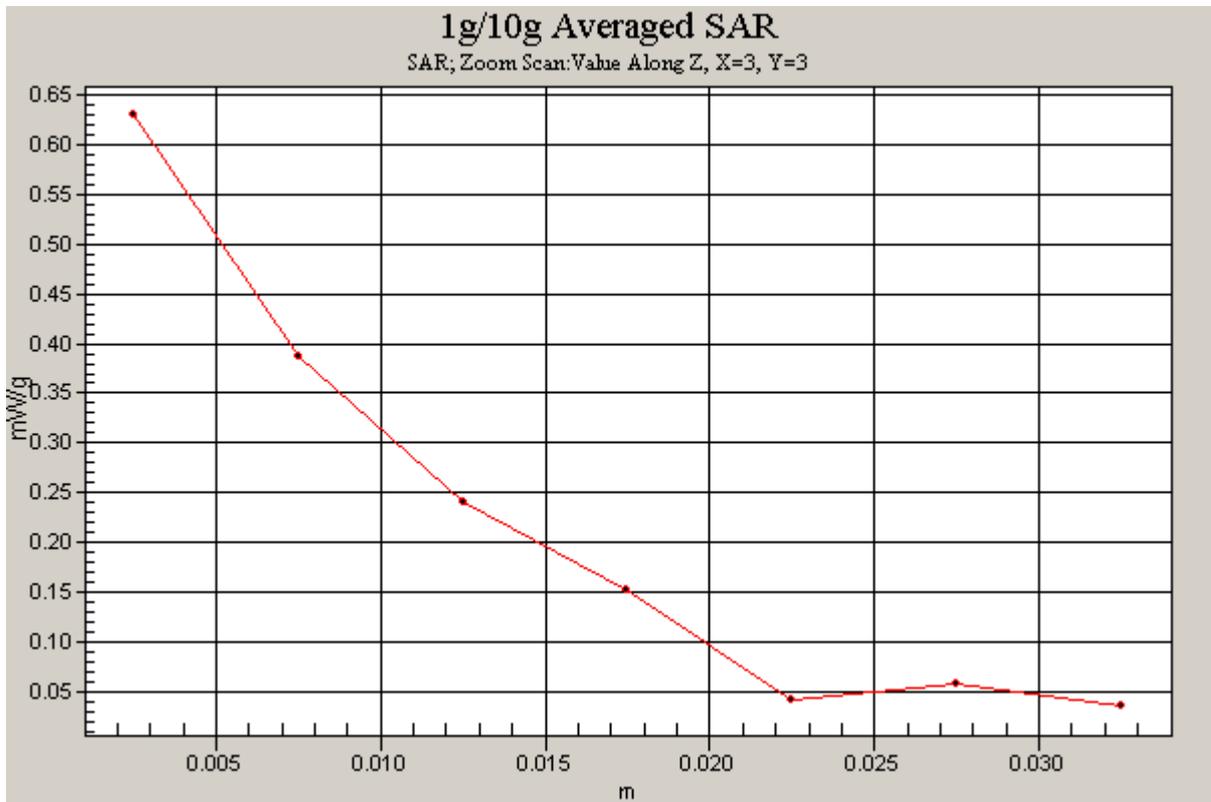


Figure 78 Z-Scan at power reference point (Body, Towards Phantom, GSM 1900 GPRS, Channel 661)

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

No. RZC2008-1581

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ANNEX D: PROBE CALIBRATION CERTIFICATE

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



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

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

Accreditation No.: **SCS 108**

Client **TA (Auden)**

Certificate No: **EX3-3660_Sep08**

CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:3660**

Calibration procedure(s) **QA CAL-01.v6 and QA CAL-23.v3
Calibration procedure for dosimetric E-field probes**

Calibration date: **September 3, 2008**

Condition of the calibrated item **In Tolerance**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-08 (No. 217-00788)	Apr-09
Power sensor E4412A	MY41495277	1-Apr-08 (No. 217-00788)	Apr-09
Power sensor E4412A	MY41498087	1-Apr-08 (No. 217-00788)	Apr-09
Reference 3 dB Attenuator	SN: S5054 (3c)	1-Jul-08 (No. 217-00685)	Jul-09
Reference 20 dB Attenuator	SN: S5086 (20b)	31-Mar-08 (No. 217-00787)	Apr-09
Reference 30 dB Attenuator	SN: S5129 (30b)	1-Jul-08 (No. 217-00666)	Jul-09
Reference Probe ES3DV2	SN: 3013	2-Jan-08 (No. ES3-3013_Jan08)	Jan-09
DAE4	SN: 660	3-Sep-07 (No. DAE4-660_Sep07)	Sep-08
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-07)	In house check: Oct-08

Calibrated by:	Name	Function	Signature
	Katja Pokovic	Technical Manager	

Approved by:	Name	Function	Signature
	Fin Bomholt	R&D Director	

Issued: September 3, 2008

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Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConvF	sensitivity in TSL / NORM _{x,y,z}
DCP	diode compression point
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis

Calibration is Performed According to the Following Standards:

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

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}:** Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not effect the E²-field uncertainty inside TSL (see below ConvF).
- NORM(f)_{x,y,z} = NORM_{x,y,z} * frequency_response** (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCP_{x,y,z}:** DCP are numerical linearization parameters assessed based on the data of power sweep (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_{x,y,z} * ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- Spherical isotropy (3D deviation from isotropy):** in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset:** The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

EX3DV4 SN:3660

September 3, 2008

Probe EX3DV4

SN:3660

Manufactured: April 29, 2008

Calibrated: September 3, 2008

Calibrated for DASY Systems

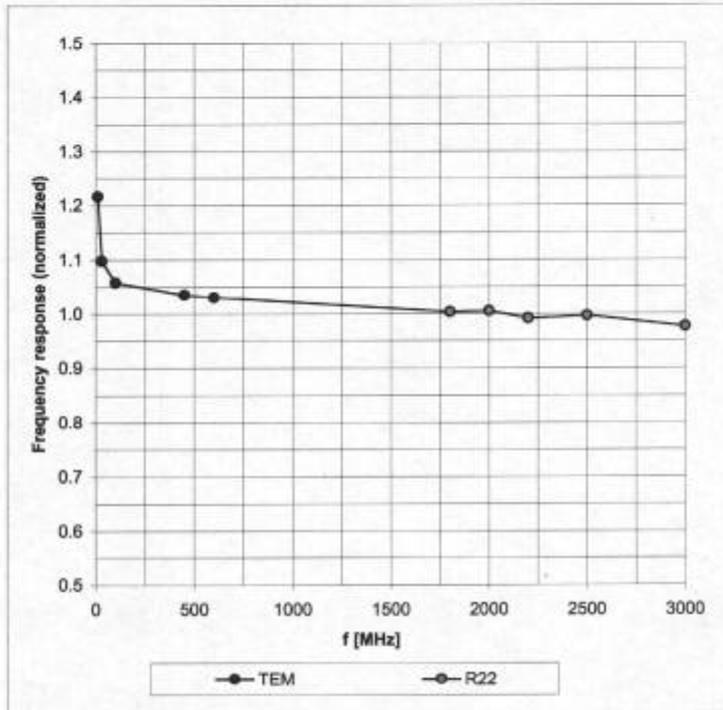
(Note: non-compatible with DASY2 system!)

EX3DV4 SN:3660

September 3, 2008

Frequency Response of E-Field

(TEM-Cell:ifi110 EXX, Waveguide: R22)

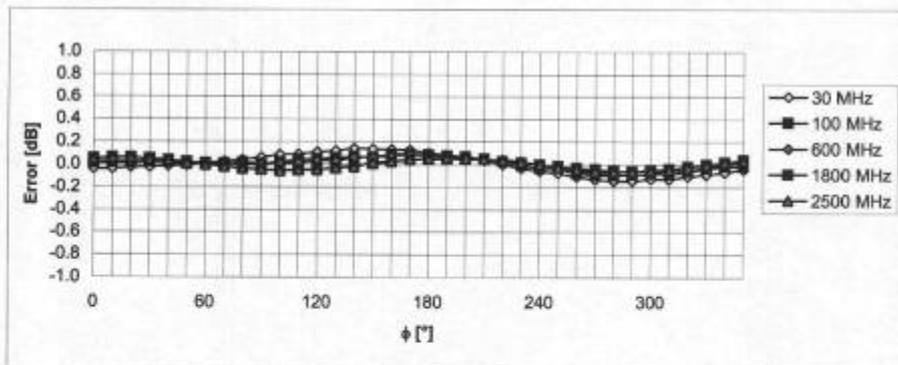
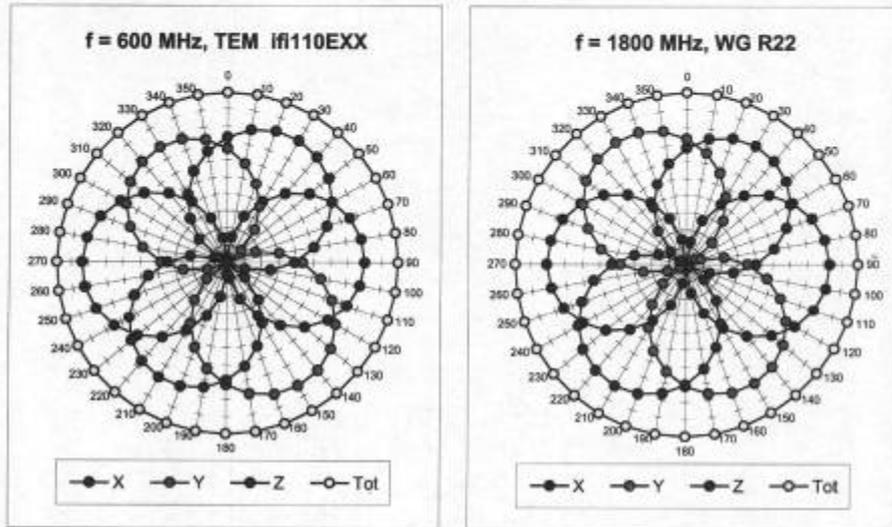


Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

EX3DV4 SN:3660

September 3, 2008

Receiving Pattern (ϕ), $\vartheta = 0^\circ$

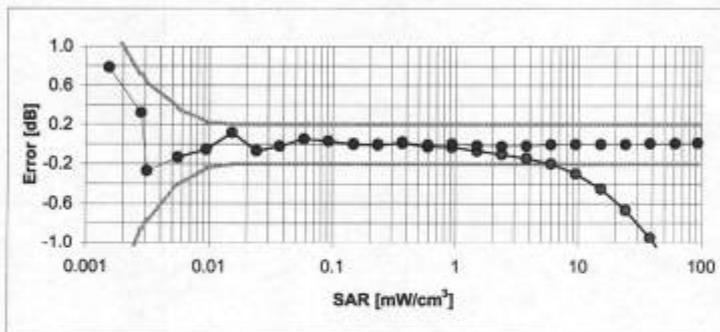
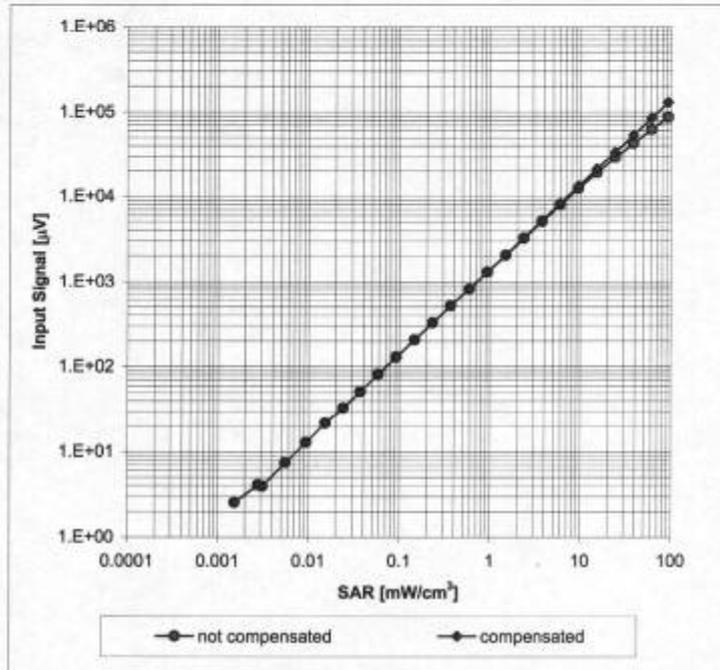


Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ (k=2)

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Dynamic Range $f(\text{SAR}_{\text{head}})$
(Waveguide R22, $f = 1800 \text{ MHz}$)

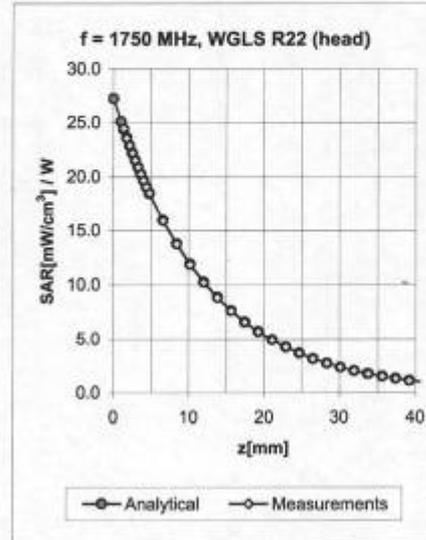
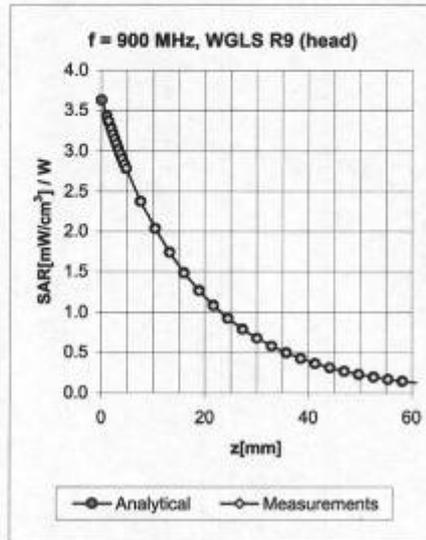


Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

EX3DV4 SN:3660

September 3, 2008

Conversion Factor Assessment



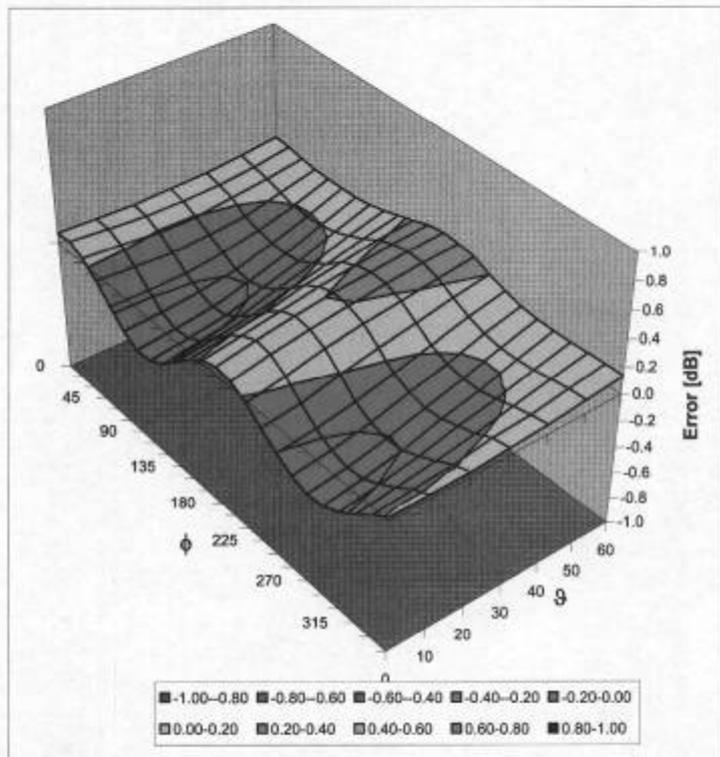
f [MHz]	Validity [MHz] ^c	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
835	± 50 / ± 100	Head	41.5 ± 5%	0.90 ± 5%	0.49	0.76	9.19 ± 11.0% (k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.43	0.83	8.84 ± 11.0% (k=2)
1750	± 50 / ± 100	Head	40.1 ± 5%	1.37 ± 5%	0.68	0.63	7.79 ± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.31	0.80	7.35 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.32	0.85	6.94 ± 11.0% (k=2)
835	± 50 / ± 100	Body	55.2 ± 5%	0.97 ± 5%	0.63	0.71	9.10 ± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.30	1.08	8.76 ± 11.0% (k=2)
1750	± 50 / ± 100	Body	53.4 ± 5%	1.49 ± 5%	0.34	0.86	7.55 ± 11.0% (k=2)
1950	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.60	0.67	7.45 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.30	1.15	6.75 ± 11.0% (k=2)

^c The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

EX3DV4 SN:3660

September 3, 2008

Deviation from Isotropy in HSL
Error (ϕ , θ), $f = 900$ MHz



Uncertainty of Spherical Isotropy Assessment: $\pm 2.6\%$ ($k=2$)

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Test Report

No. RZC2008-1581

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ANNEX E: D835V2 DIPOLE CALIBRATION CERTIFICATE

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Zeughausstrasse 43, 8004 Zurich, Switzerland



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Accreditation No.: **SCS 108**

Client **Auden**

Certificate No: **D835V2-4d020_Jul08**

CALIBRATION CERTIFICATE

Object **D835V2 - SN: 4d020**

Calibration procedure(s) **QA CAL-05.v7
Calibration procedure for dipole validation kits**

Calibration date: **July 21, 2008**

Condition of the calibrated item **In Tolerance**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (Si).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	04-Oct-07 (No. 217-00736)	Oct-08
Power sensor HP 8481A	US37292783	04-Oct-07 (No. 217-00736)	Oct-08
Reference 20 dB Attenuator	SN: 5086 (20g)	01-Jul-06 (No. 217-00864)	Jul-09
Type-N mismatch combination	SN: 5047.2 / 06327	01-Jul-06 (No. 217-00867)	Jul-09
Reference Probe ES3DV2	SN: 3025	28-Apr-08 (No. ES3-3025_Apr08)	Apr-09
DAE4	SN: 601	14-Mar-08 (No. DAE4-601_Mar08)	Mar-09
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-07)	In house check: Oct-09
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-07)	In house check: Oct-08

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: July 21, 2008

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Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65
- EN 50361, "Basic standard for the measurement of specific absorption rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz)", July 2001

Additional Documentation:

- DASY4 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.