No.: RZC2008-1462

OET 65

TEST REPORT

Test name	Electromagnetic Field (Specific Absorption Rate)
Product	GSM Dual-Band Digital Moblie Phone
Model	ZTE A301+
FCC ID	Q78-ZTEA301PLUS
Client	ZTE CORPORATION

TA Technology (Shanghai) Co., Ltd.

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GENERAL SUMMARY

Product	GSM Dual-Band Digital Moblie Phone	**Model**	ZTE A301+
Client	ZTE CORPORATION	**Type of test**	Entrusted
Manufacturer	ZTE CORPORATION	**Arrival Date of sample**	November 12th, 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	356519020004817		
Standard(s)	**ANSI C95.1–2005:** IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz. **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. **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). **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)		
Conclusion	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. General Judgment: **Pass** (Stamp) **Date of issue: November 27th, 2008**		
Comment	The test result only responds to the measured sample.		

Approved by 杨伟中 Weizhong Yang **Revised by** 凌敏宝 Minbao Ling **Performed by** 石峰 Feng Shi

TABLE OF CONTENT

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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This report only refers to the item that has undergone 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 A301+	356519020004817	ZTE CORPORATION
Lithium Battery	Li3706T42P3h383857	40040809290350677	ZTE CORPORATION
AC/DC Adapter	STC-A22O50U8-C	800810060329445	ZTE CORPORATION

Note:
The EUT appearances see ANNEX I.

3.3. General Description

Equipment Under Test (EUT) is a model of GSM Dual-Band Digital Moblie 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 sample under test was selected by the Client.

Components list please refer to documents of the manufacturer.

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）	
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:	EF-P108A15FM(U)V1.0.0B01\\g3dBV2.0	
Antenna type:	integrated antenna	

4. OPERATIONAL CONDITIONS DURING TEST

4.1. General description of test procedures

The EUT is tested using a E5515C communications tester as controller unit to set test channels and maximum output power to the EUT, as well as for measuring the conducted peak power. Test positions as described in ANNEX I are in accordance with the specified test standard. Conducted output power was measured using an integrated RF connector and attached RF cable.

To make the mobile emits maximum power; the output power of E5515C would be adjusted to minimum power with the sensitivity of the mobile station to build steady connection with mobile station. The power level control parameter”5” of GSM850,”0” of GSM1900.It means that requires mobile station to emit with maximum power.

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

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 lever is set to”5” in head SAR and body SAR of GSM850, set to”0” in head SAR and body SAR of GSM1900,

5. SAR MEASUREMENTS SYSTEM CONFIGURATION

5.1. SAR Measurement Set-up

These measurements were performed with the automated near-field scanning system DASY4 from Schmid & Partner Engineering AG (SPEAG). The system is based on a high precision robot (working range greater than 0.9m) which positions the probes with a positional repeatability of better than ± 0.02mm. Special E- and H-field probes have been developed for measurements close to material discontinuity, the sensors of which are directly loaded with a Schottky diode and connected via highly resistive lines (length =300mm) to the data acquisition unit.

A cell controller system contains the power supply, robot controller, teaches pendant (Joystick) and remote control, is used to drive the robot motors. The PC consists of the Micron Pentium III 800 MHz computer with Windows 2003 system and SAR Measurement Software DASY4, A/D interface card, monitor, mouse, and keyboard. The Stäubli Robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card.

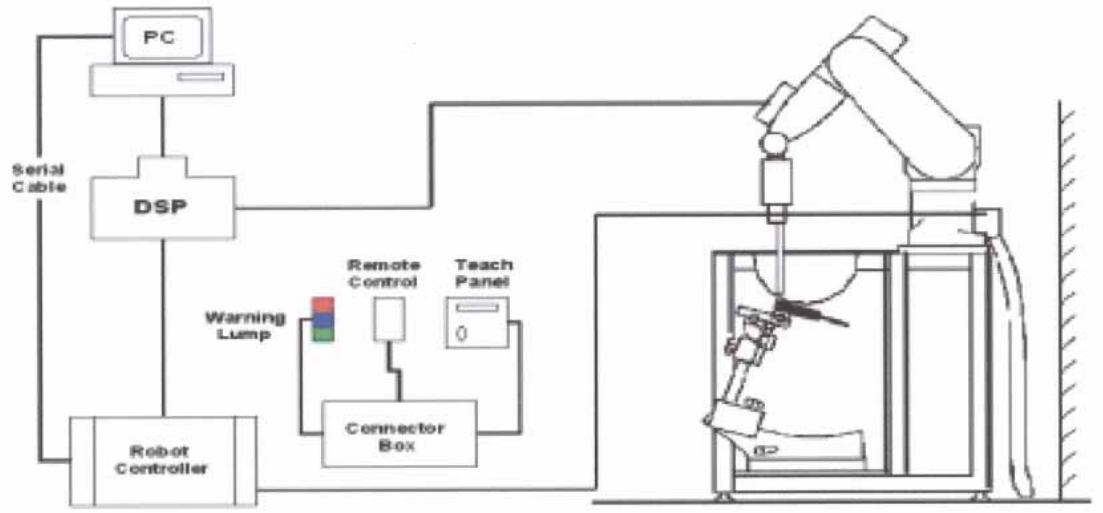


Figure 1 SAR Lab Test Measurement Set-up

The DAE3 consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer.

5.2. 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 1800 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 μW/g to > 100 mW/g Linearity: ± 0.2dB (noise: typically < 1 μW/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 ± 10%. The spherical isotropy was evaluated and found to be better than ± 0.25dB. 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 bellow 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

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

Figure 4 Device Holder

5.3.2. Phantom

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

Shell Thickness	2±0.1 mm
Filling Volume	Approx. 20 liters
Dimensions	810 x l000 x 500 mm (H x L x W)
Aailable	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°.)

- The “area scan“ measures the SAR above the DUT or verification dipole on a parallel plane to the surface. It is used to locate the approximate location of the peak SAR with 2D spline interpolation. The robot performs a stepped movement along one grid axis while the local electrical field strength is measured by the probe. The probe is touching the surface of the SAM during acquisition of measurement values. The standard scan uses large grid spacing for faster measurement. Standard grid
  spacing for head measurements is 15 mm in x- and y- dimension. If a finer resolution is needed, the grid spacing can be reduced. Grid spacing and orientation have no influence on the SAR result. For special applications where the standard scan method does not find the peak SAR within the grid, e.g. mobile phones with flip cover, the grid can be adapted in orientation.

- A” 7x7x7 zoom scan” measures the field in a volume around the 2D peak SAR value acquired in the previous ”coarse“ scan. This is a fine 7x7 grid where the robot additionally moves the probe in 7 steps along the z-axis away from the bottom of the Phantom. Grid spacing for the cube measurement is 5mm in x and y-direction and 5 mm in z-direction. DASY4 is also able to perform repeated zoom scans if more than 1 peak is found during area scan.

- 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 2mm 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 $\boldsymbol{SAR}$ = local specific absorption rate in mW/g

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

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

ρ = equivalent tissue density in g/cm^3

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.

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

with P_{pwe} = equivalent power density of a plane wave in mW/cm^2

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

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

5.6. System Specifications

5.6.1. Robotic System Specifications

Specifications

Positioner: Stäubli Unimation Corp. Robot Model: RX90L
Repeatability: ±0.02 mm
No. of Axis: 6

Data Acquisition Electronic (DAE) System

Cell Controller

Processor: Pentium III
Clock Speed: 800 MHz
Operating System: Windows 2003

Data Converter

Features: Signal Amplifier, multiplexer, A/D converter, and control logic
Software: DASY4 software
Connecting Lines: Optical downlink for data and status info. Optical uplink for commands and clock.

5.7. 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 adaption 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 (±10 %).

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

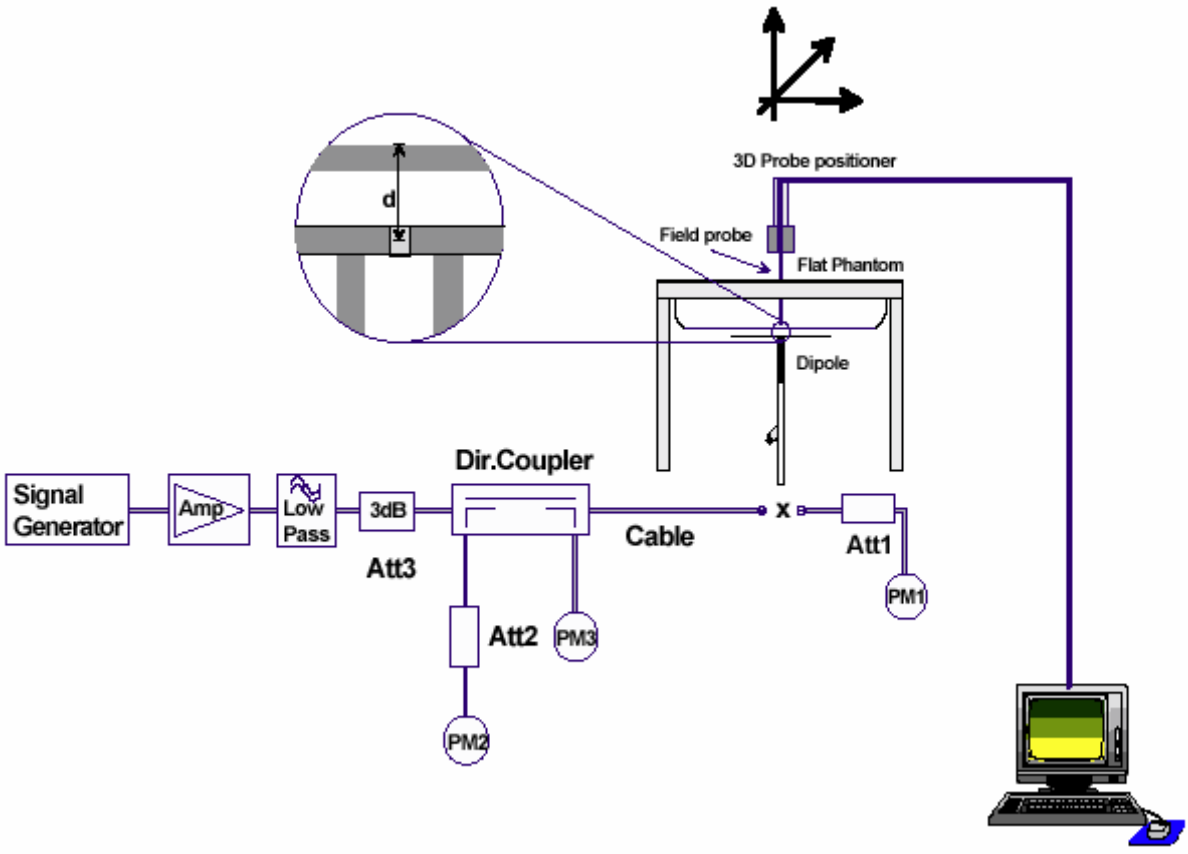


Figure 6 System validation Set-up

5.8. 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 ε=41.5 σ=0.9

MIXTURE%	FREQUENCY(Brain)1900MHz
Water	55.242
Glycol monobutyl	44.452
Salt	0.306
Dielectric Parameters Target Value	f=1900MHz ε=40.0 σ=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 ε=55.2 σ=0.97

MIXTURE%	FREQUENCY (Body) 1900MHz
Water	69.91
Glycol monobutyl	29.96
Salt	0.13
Dielectric Parameters Target Value	f=1900MHz ε=53.3 σ=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.

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).

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)

8. CONDUCTED OUTPUT POWER MEASUREMENT

8.1. Summary

During the process of testing, the EUT was controlled via Digital Radio Communication tester to ensure the maximum power transmission and proper modulation. This result contains conducted output power for the EUT.

8.2. Power Drift

To control the output power stability during the SAR test, DASY4 system calculates the power drift by measuring the E-field at the same location at the beginning and at the end of the measurement for each test position. These drift values can be found in Table 12 to Table 15 labeled as: (Power Drift [dB]). This ensures that the power drift during one measurement is within 0.21dB.

8.3. Conducted Power

8.3.1. Measurement Methods

The EUT was set up for the maximum output power. The channel power was measured.

8.3.2. Measurement result

Table 8: Conducted Power Measurement Results

GSM 850	**Conducted Power**		
	Channel 128	Channel 190	Channel 251
	(824.2MHz)	(836.6MHz)	(848.8MHz)
Result (dBm)	32.75	32.24	32.09
GSM 1900	**Conducted Power**		
	Channel 512	Channel 661	Channel 810
	(1850.2MHz)	(1880MHz)	(1909.8MHz)
Result (dBm)	28.62	28.58	28.28

9. TEST RESULTS

9.1. Dielectric Performance

Table 9: Dielectric Performance of Head Tissue Simulating Liquid

Measurement is made at temperature 22.5 ℃ and relative humidity 51%. Liquid temperature during the test: 22.3℃					
Frequency (MHz)		**Target value**	**Measurement value**	**Difference percentage**	
835 (Brain)	Permittivity ε_r	41.50	42.24	1.78	%
	Conductivity σ	0.90	0.91	1.11	%
1900 (Brain)	Permittivity ε_r	40.00	40.12	0.30	%
	Conductivity σ	1.40	1.39	-0.71	%

Table 10: Dielectric Performance of Body Tissue Simulating Liquid

Measurement is made at temperature 22.5 ℃ and relative humidity 51%. Liquid temperature during the test: 22.3℃					
Frequency (MHz)		**Target value**	**Measurement value**	**Difference percentage**	
835 (Body)	Permittivity ε_r	55.20	55.62	0.76	%
	Conductivity σ	0.97	0.98	1.03	%
1900 (Body)	Permittivity ε_r	53.30	52.95	0.66	%
	Conductivity σ	1.52	1.55	1.97	%

9.2. System Validation Results

Table 11: System Validation

Measurement is made at temperature 23.2 ℃, relative humidity 50%, and input power 250 mW. Liquid temperature during the test: 22.3℃							
Liquid parameters	**Frequency**	**Permittivity ε**		**Conductivity σ (S/m)**			
	835MHz	42.24		0.91			
	1900MHz	40.12		1.39			
Verification results	**Frequency**	**Target value (W/kg)**		**Measurement value (W/kg)**		**Difference percentage**	
		10 g Average	**1 g Average**	**10 g Average**	**1 g Average**	**10 g Average**	**1g Average**
	835MHz	1.52	2.30	1.50	2.30	-1.32%	0.00%
	1900MHz	5.06	9.84	5.09	9.74	0.59%	-1.02%

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 D.

9.3. Summary of Measurement Results

Table 12: SAR Values (GSM850, 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)**	
Different Test Position	**Channel**	**10 g Average**	**1 g Average**		
Left hand, Touch cheek	High	0.947	1.350	-0.116	Figure 8
	Middle	0.910	1.290	-0.008	Figure 10
	Low	0.786	1.120	-0.001	Figure 12
Left hand, Tilt 15 Degree	Middle	0.478	0.681	0.017	Figure 14
Right hand, Touch cheek	High	0.852	1.210	-0.013	Figure 16
	Middle	0.834	1.180	-0.072	Figure 18
	Low	0.698	0.988	-0.123	Figure 20
Right hand, Tilt 15 Degree	Middle	0.445	0.630	-0.176	Figure 22

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℃					
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	0.353	0.494	-0.036	Figure 24
	Middle	0.318	0.443	-0.037	Figure 26
	Low	0.260	0.362	0.000	Figure 28
Towards Phantom	Middle	0.243	0.336	0.001	Figure 30
Worst case position of Body with Earphone					
Towards Ground	High	0.295	0.412	0.081	Figure 32

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.

Table 14: SAR Values (GSM1900, 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)**	
Different Test Position	**Channel**	**10 g Average**	**1 g Average**		
Left hand, Touch cheek	Middle	0.400	0.754	0.044	Figure 34
Left hand, Tilt 15 Degree	Middle	0.243	0.444	-0.059	Figure 36
Right hand, Touch cheek	High	0.370	0.682	-0.073	Figure 38
	Middle	0.450	0.812	-0.199	Figure 40
	Low	0.608	1.090	-0.061	Figure 42
Right hand, Tilt 15 Degree	Middle	0.261	0.478	-0.012	Figure 44

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℃					
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)**	
Different Test Position	**Channel**	**10 g Average**	**1 g Average**		
Towards Ground	High	0.087	0.149	0.108	Figure 46
	Middle	0.118	0.202	-0.112	Figure 48
	Low	0.174	0.299	-0.087	Figure 50
Towards Phantom	Middle	0.086	0.144	0.044	Figure 52
Worst case position of Body with Earphone					
Towards Ground	Low	0.168	0.289	-0.011	Figure 54

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 is 1.350 W/kg of head and maximum localized SAR is 0.494 W/kg of body that are below exposure limits specified in the relevant standards cited in Clause 7.1 of this test report.

10. MEASUREMENT UNCERTAINTY

No.	a	Type	c	d	e=f(d、k)	f	h=c×f／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	$\sqrt{3}$	$(1\text{-cp})^{1/2}$	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				RSS			11.25	
Expanded Uncertainty (95 % CONFIDENCE INTERVAL)				K=2			22.5	

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 November 23, 2008 to November 24, 2008.

13. TEST LOCATION

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

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

ANNEX A： MEASUREMENT PROCESS

The evaluation was performed with the following procedure:

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

Step 2: The area covered the entire dimension of the head and the horizontal grid spacing was 15 mm x 15 mm. Based on this data, the area of the maximum absorption was determined by spline interpolation.

Step 3: Around this point, a volume of 32 mm x 32 mm x 34 mm was assessed by measuring 7 x 7x 7 points. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

a. The data at the surface were extrapolated , The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.

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

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

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

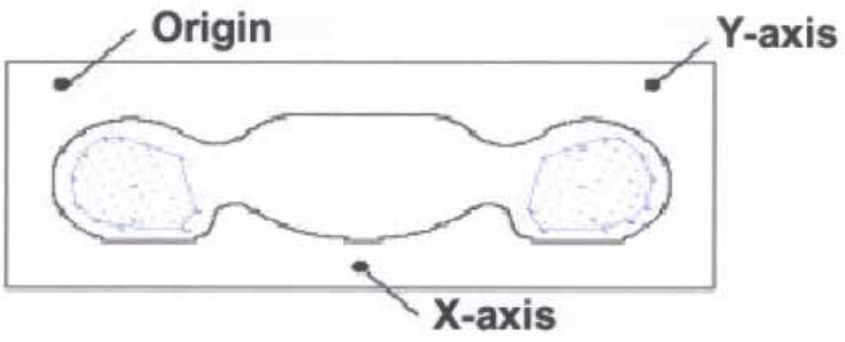
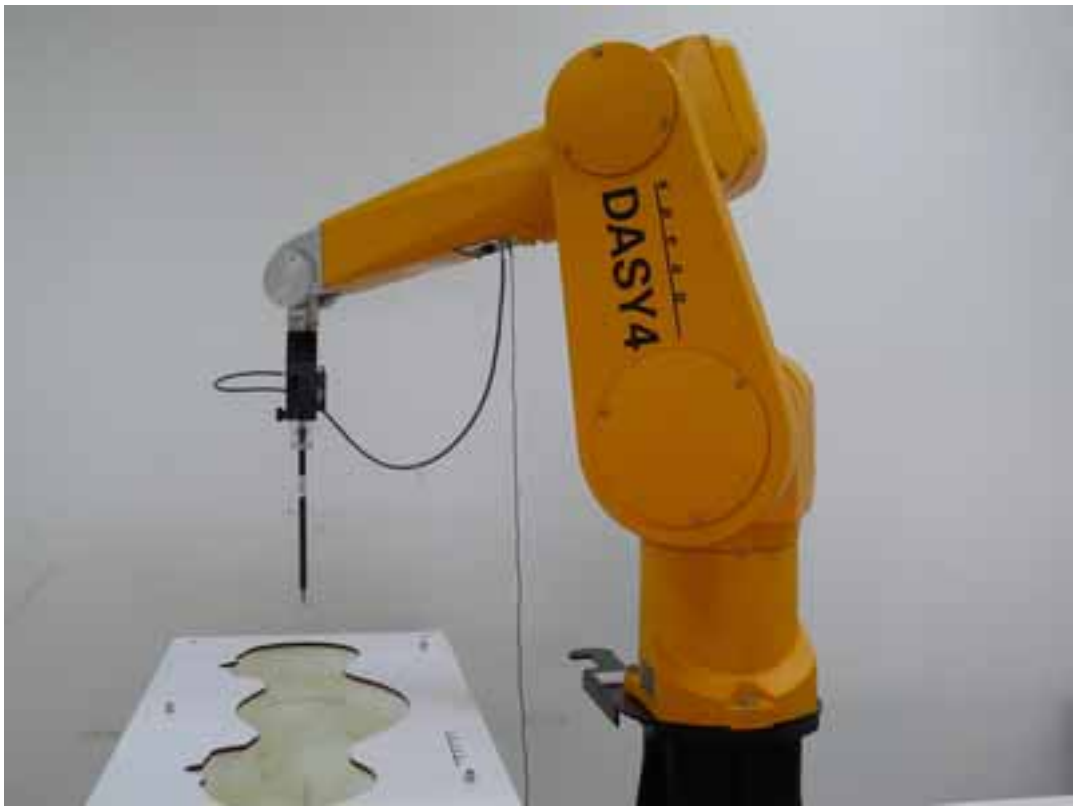


Figure 7 SAR Measurement Points in Area Scan

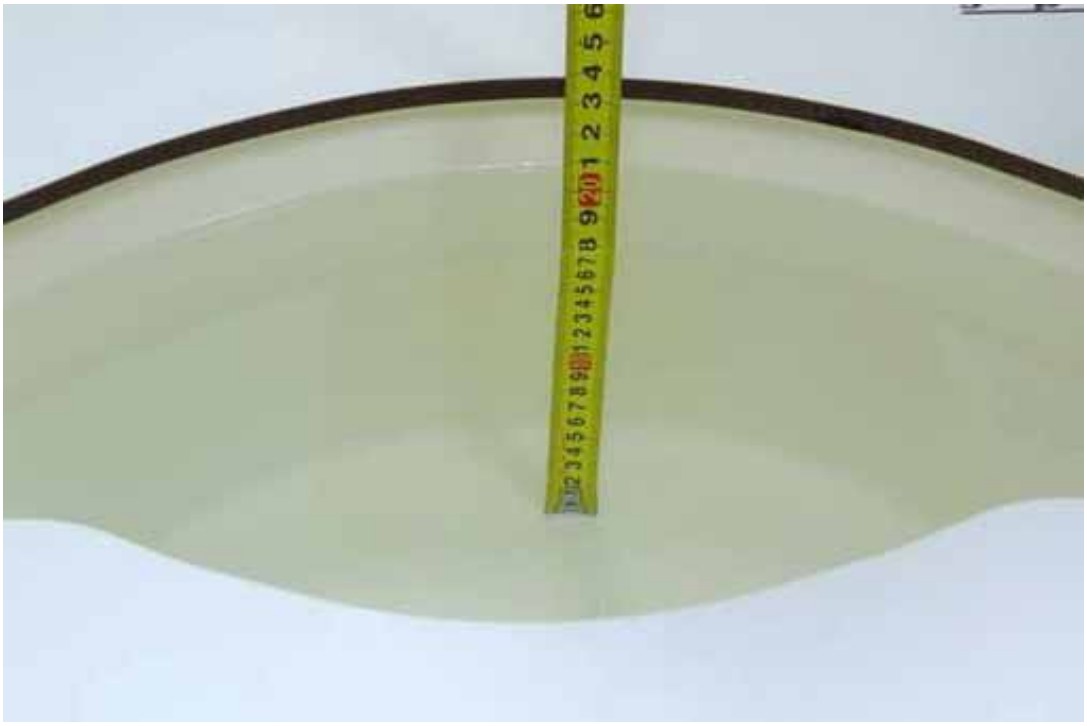
ANNEX B： TEST LAYOUT



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 C： GRAPH RESULTS

Date/Time: 11/24/2008 12:25:17 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; σ = 0.925 mho/m; ε_r = 42.1; ρ = 1000 kg/m^3
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) = 1.49 mW/g

Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 32.8 V/m; Power Drift = -0.116 dB
Peak SAR (extrapolated) = 1.79 W/kg
SAR(1 g) = 1.35 mW/g; SAR(10 g) = 0.947 mW/g
Maximum value of SAR (measured) = 1.43 mW/g

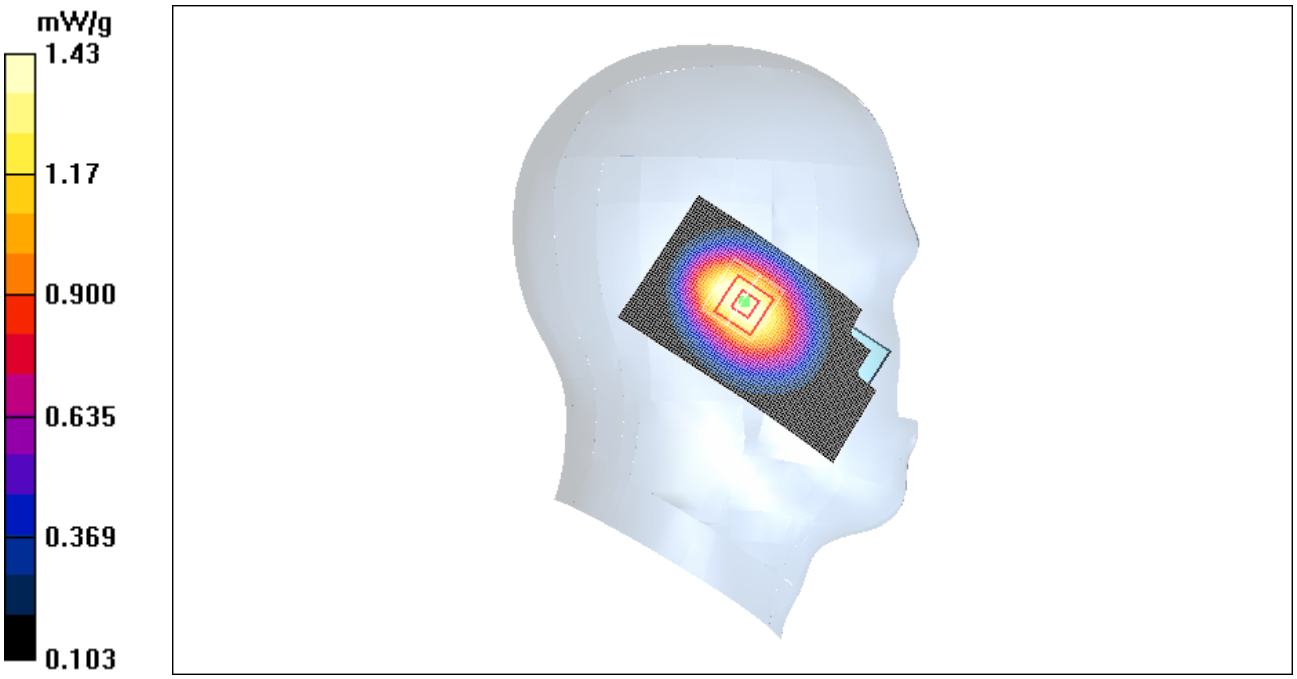


Figure 8 Left Hand Touch Cheek GSM 850 Channel 251

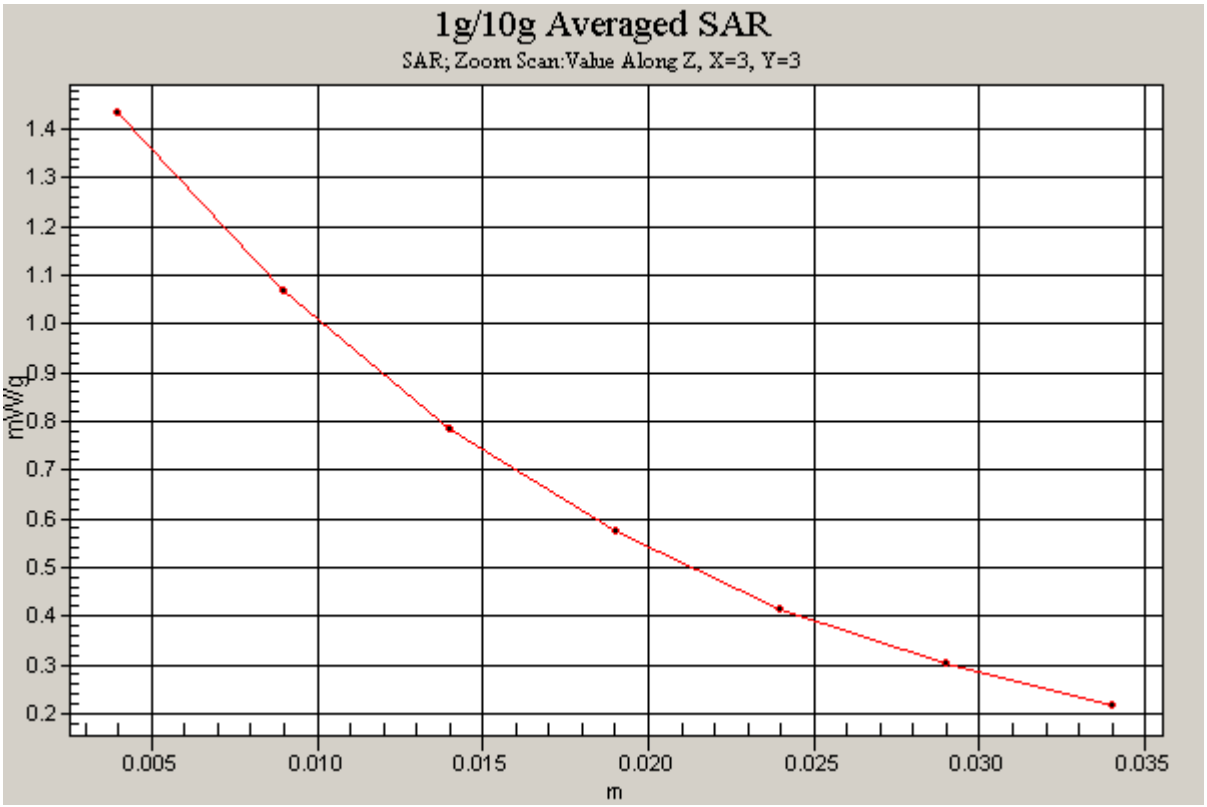


Figure 9 Z-Scan at power reference point (Left Hand Touch Cheek GSM 850 Channel 251)

Date/Time: 11/24/2008 12:43:33 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; σ = 0.912 mho/m; ε_r = 42.2; ρ = 1000 kg/m^3
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) = 1.41 mW/g

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 32.2 V/m; Power Drift = -0.008 dB
Peak SAR (extrapolated) = 1.70 W/kg
SAR(1 g) = 1.29 mW/g; SAR(10 g) = 0.910 mW/g
Maximum value of SAR (measured) = 1.37 mW/g

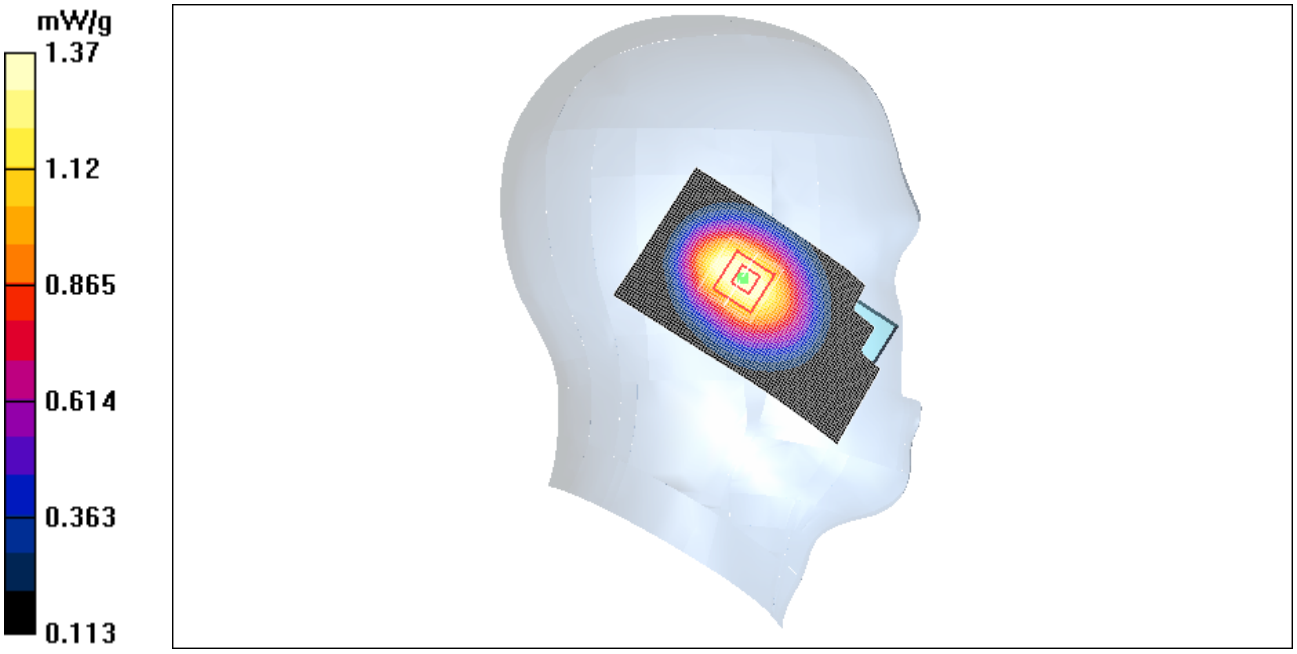


Figure 10 Left Hand Touch Cheek GSM 850 Channel 190

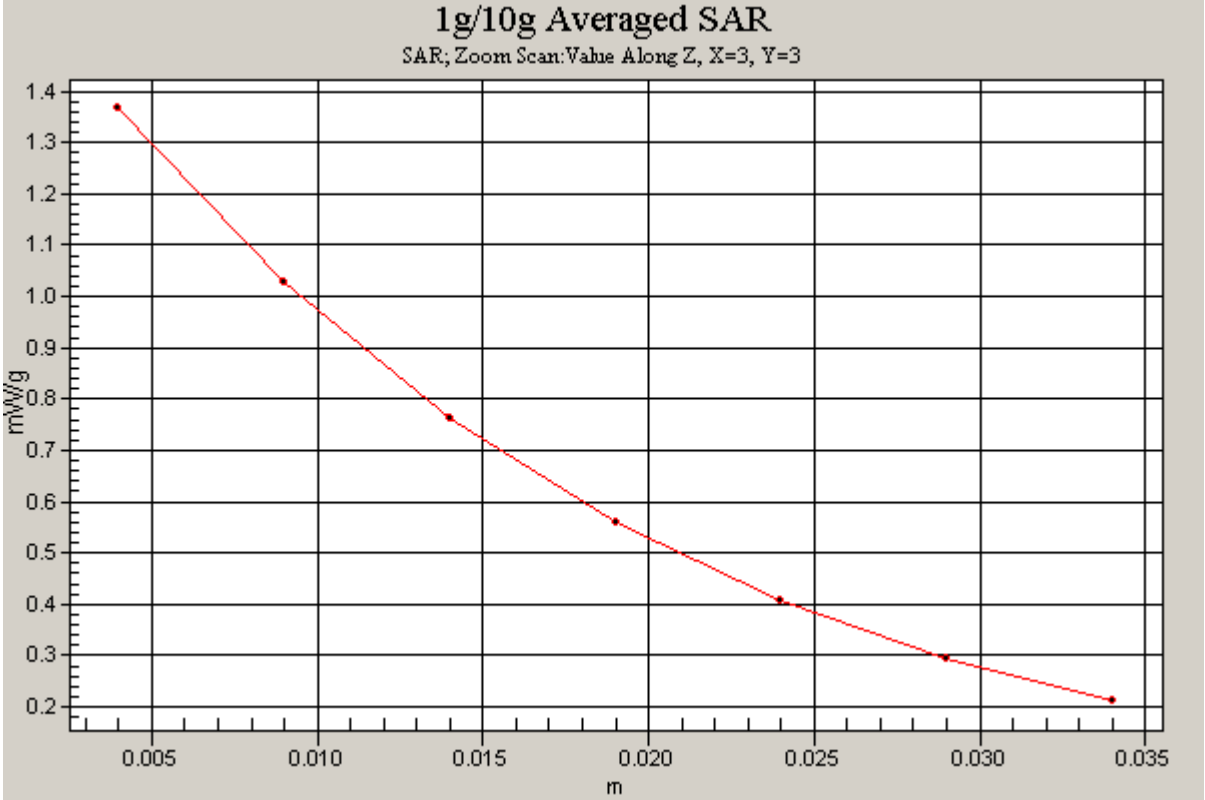


Figure 11 Z-Scan at power reference point (Left Hand Touch Cheek GSM 850 Channel 190)

Date/Time: 11/24/2008 1:01:36 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; σ = 0.9 mho/m; ε_r = 42.4; ρ = 1000 kg/m^3
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 = 30.3 V/m; Power Drift = -0.001 dB
Peak SAR (extrapolated) = 1.49 W/kg
SAR(1 g) = 1.12 mW/g; SAR(10 g) = 0.786 mW/g
Maximum value of SAR (measured) = 1.18 mW/g

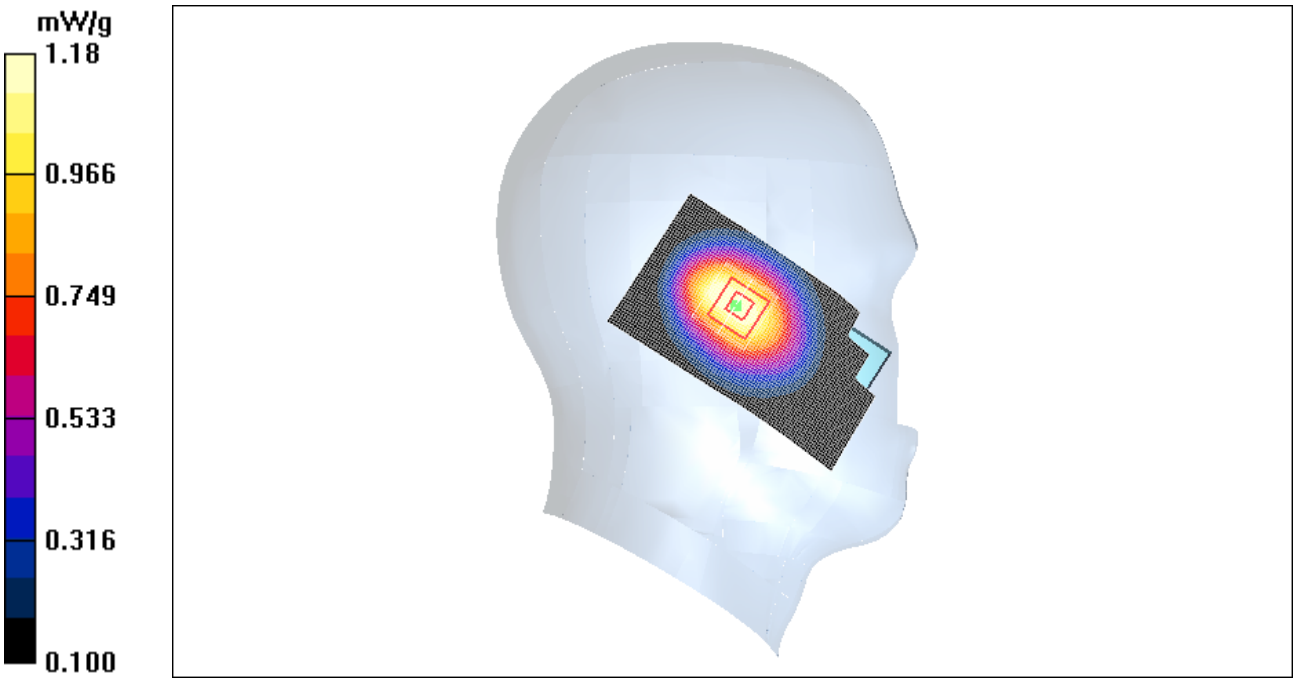


Figure 12 Left Hand Touch Cheek GSM 850 Channel 128

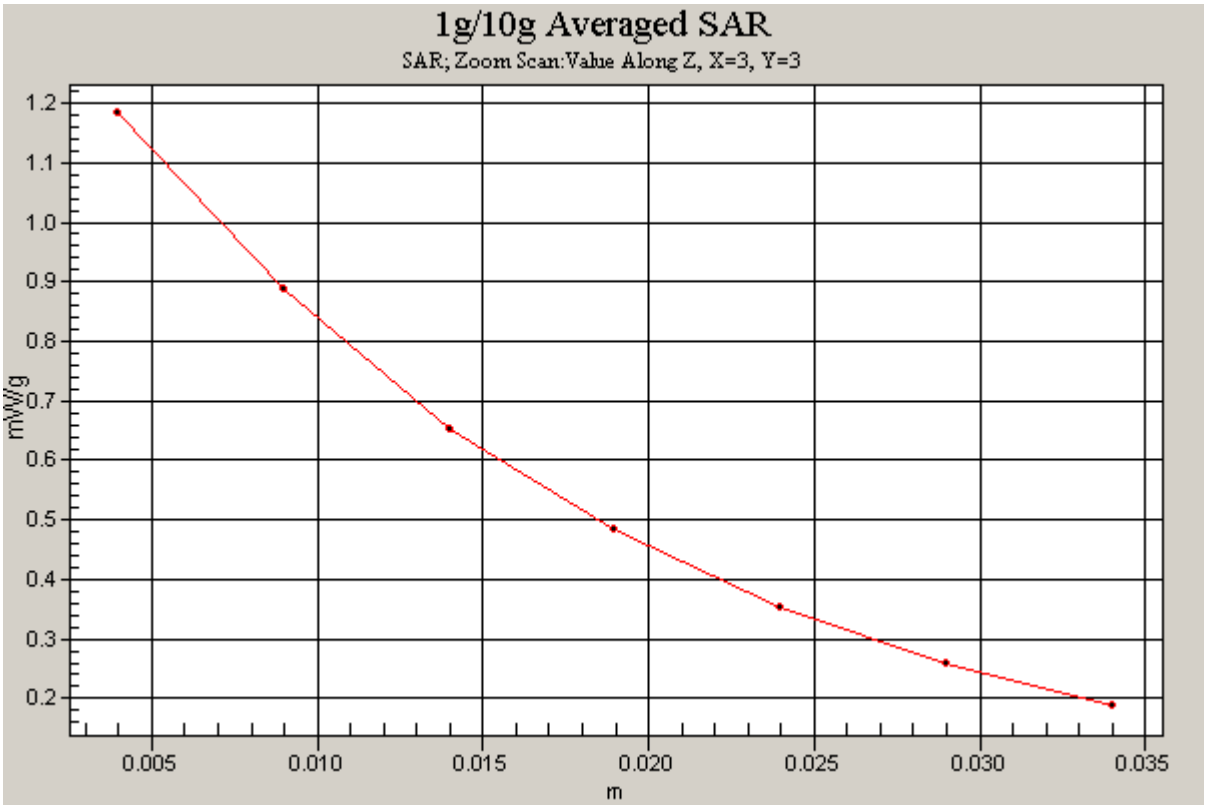


Figure 13 Z-Scan at power reference point (Left Hand Touch Cheek GSM 850 Channel 128)

Date/Time: 11/24/2008 1:40:51 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; σ = 0.912 mho/m; ε_r = 42.2; ρ = 1000 kg/m^3
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) = 0.759 mW/g

Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 26.6 V/m; Power Drift = 0.017 dB
Peak SAR (extrapolated) = 0.902 W/kg
SAR(1 g) = 0.681 mW/g; SAR(10 g) = 0.478 mW/g
Maximum value of SAR (measured) = 0.724 mW/g

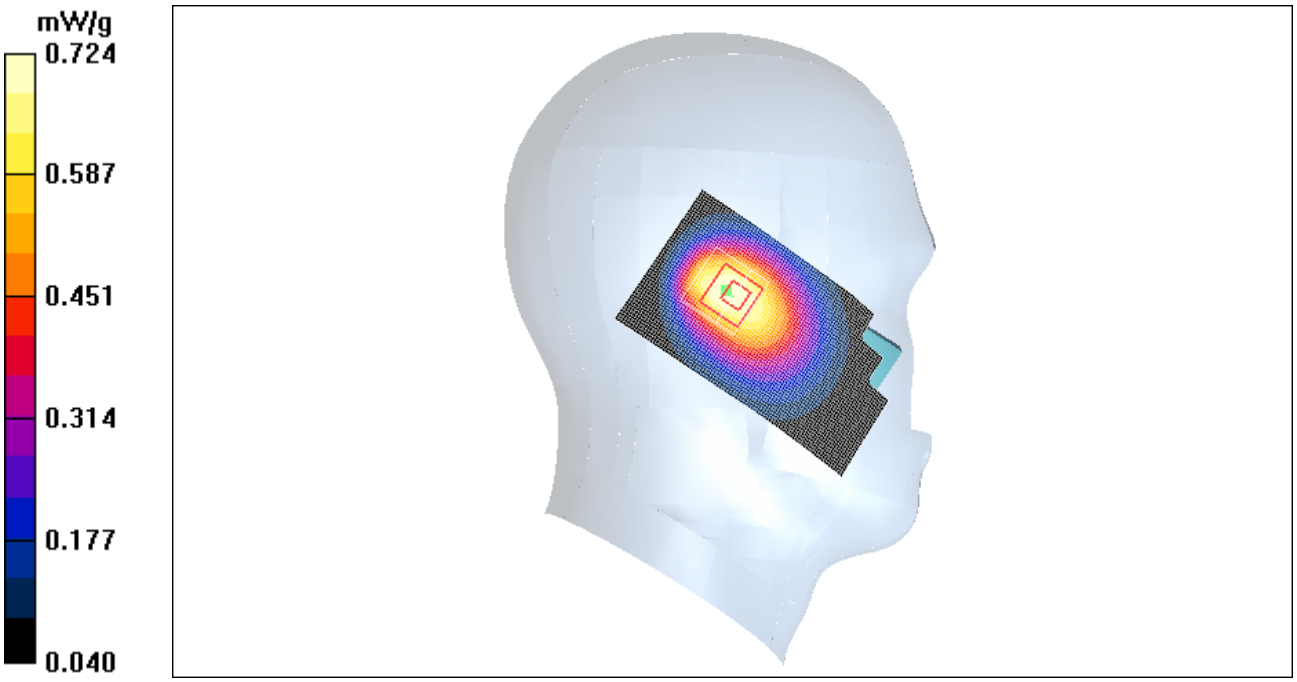


Figure 14 Left Hand Tilt 15 ° GSM 850 Channel 190

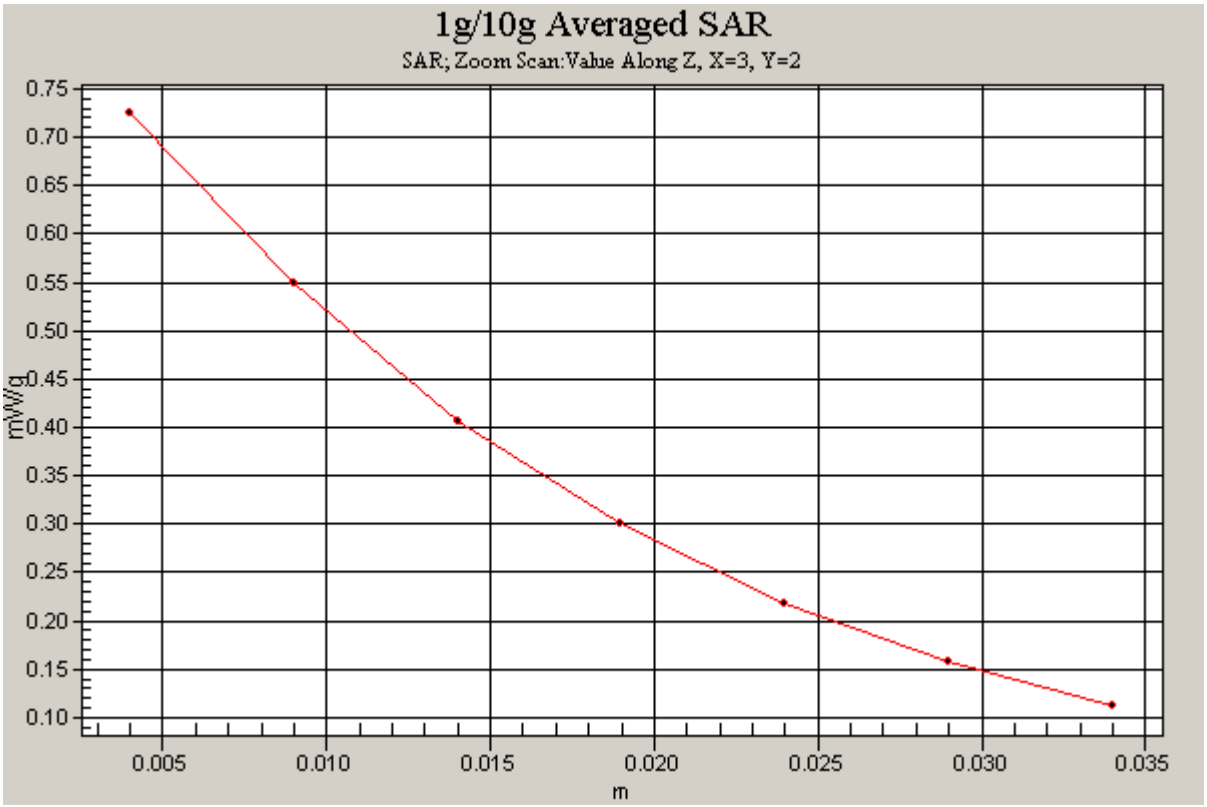


Figure 15 Z-Scan at power reference point (Left Hand Tilt 15 ° GSM 850 Channel 190)

Date/Time: 11/24/2008 2:18:23 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; σ = 0.925 mho/m; ε_r = 42.1; ρ = 1000 kg/m^3
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) = 1.30 mW/g

Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 29.9 V/m; Power Drift = -0.013 dB
Peak SAR (extrapolated) = 1.61 W/kg
SAR(1 g) = 1.21 mW/g; SAR(10 g) = 0.852 mW/g
Maximum value of SAR (measured) = 1.29 mW/g

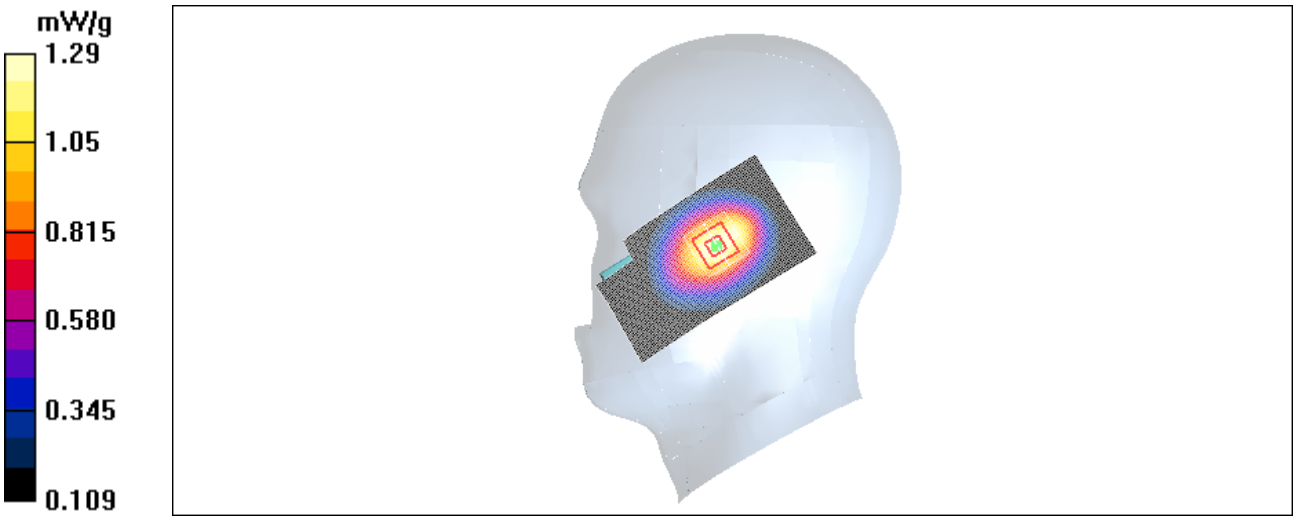


Figure 16 Right Hand Touch Cheek GSM 850 Channel 251

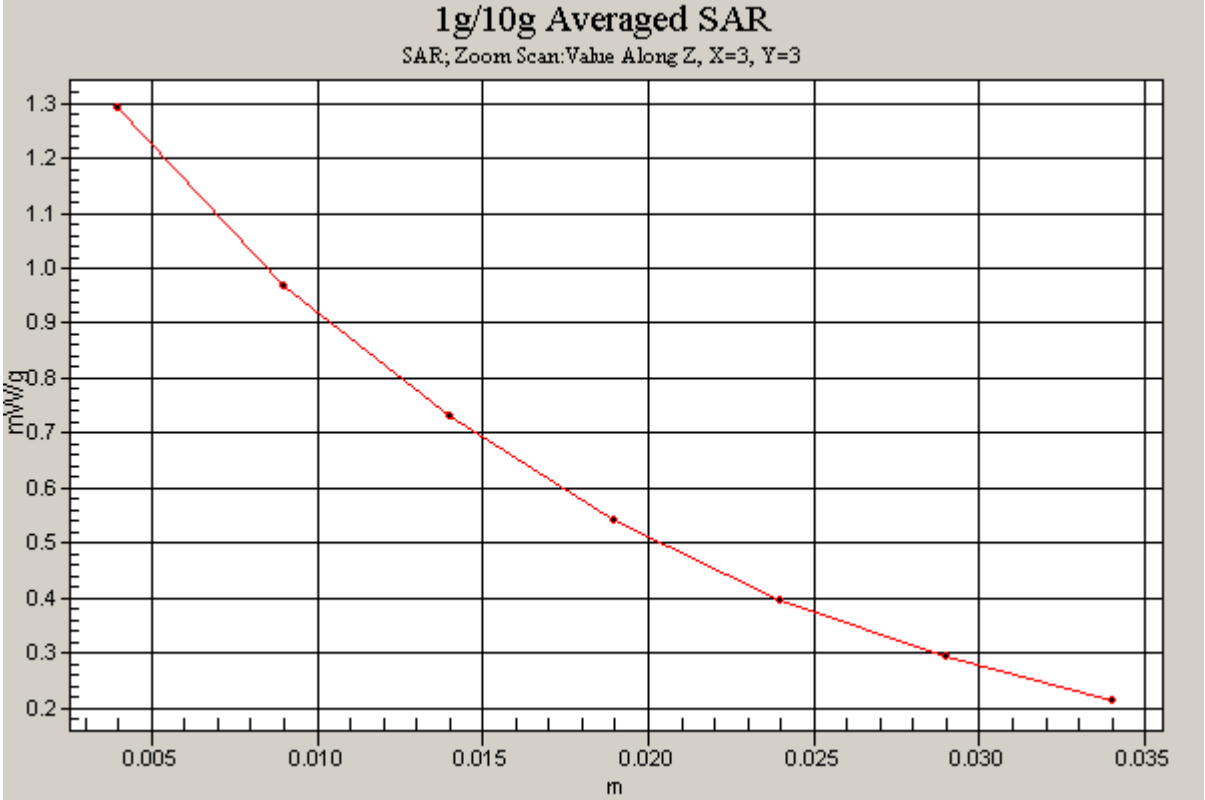


Figure 17 Z-Scan at power reference point (Right Hand Touch Cheek GSM 850 Channel 251)

Date/Time: 11/24/2008 2:00:26 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; σ = 0.912 mho/m; ε_r = 42.2; ρ = 1000 kg/m^3
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) = 1.27 mW/g

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 30.2 V/m; Power Drift = -0.072 dB
Peak SAR (extrapolated) = 1.54 W/kg
SAR(1 g) = 1.18 mW/g; SAR(10 g) = 0.834 mW/g
Maximum value of SAR (measured) = 1.25 mW/g

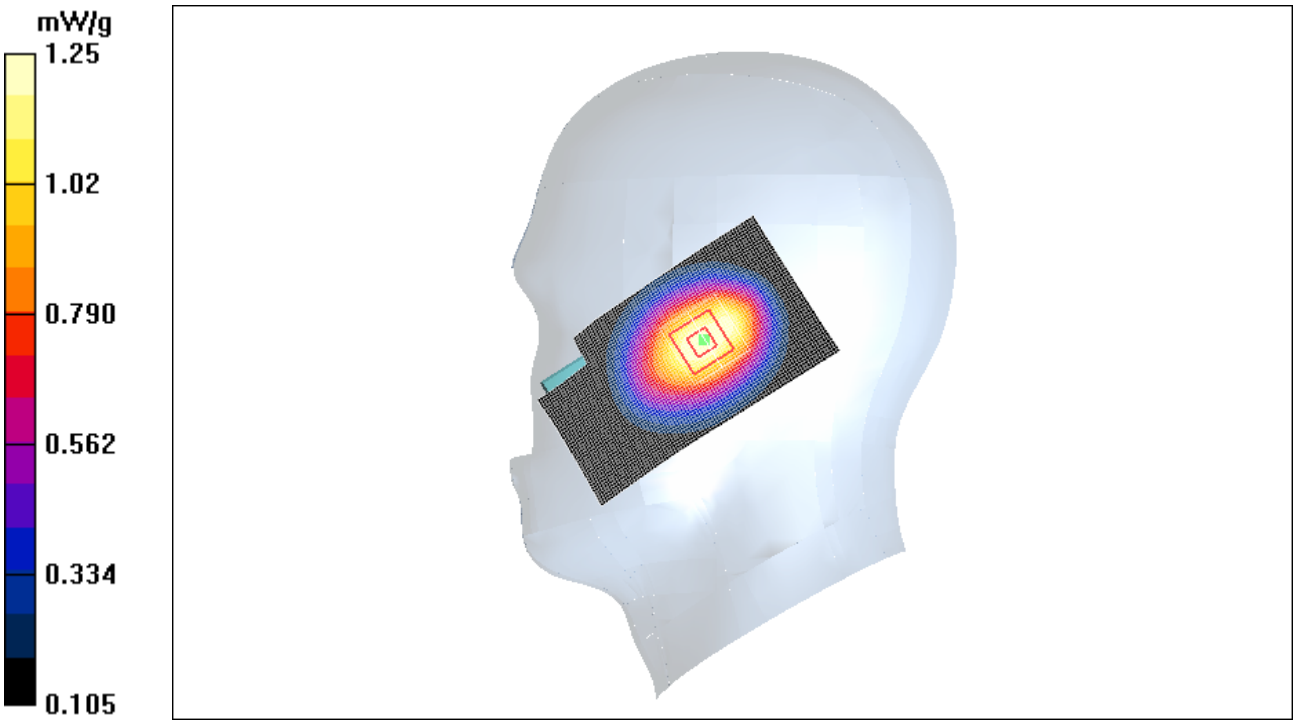


Figure 18 Right Hand Touch Cheek GSM 850 Channel 190

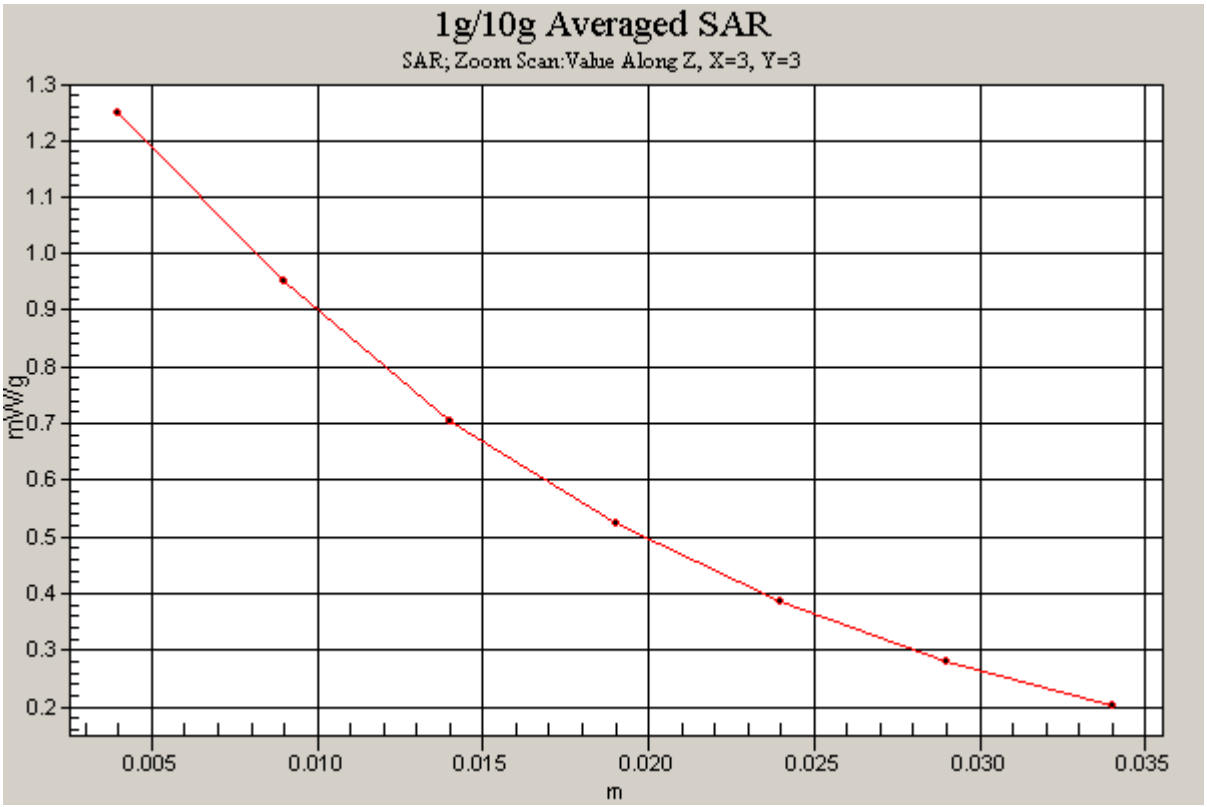


Figure 19 Z-Scan at power reference point (Right Hand Touch Cheek GSM 850 Channel 190)

Date/Time: 11/24/2008 2:51:17 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; σ = 0.9 mho/m; ε_r = 42.4; ρ = 1000 kg/m^3
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) = 1.06 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 = -0.123 dB
Peak SAR (extrapolated) = 1.30 W/kg
SAR(1 g) = 0.988 mW/g; SAR(10 g) = 0.698 mW/g
Maximum value of SAR (measured) = 1.05 mW/g

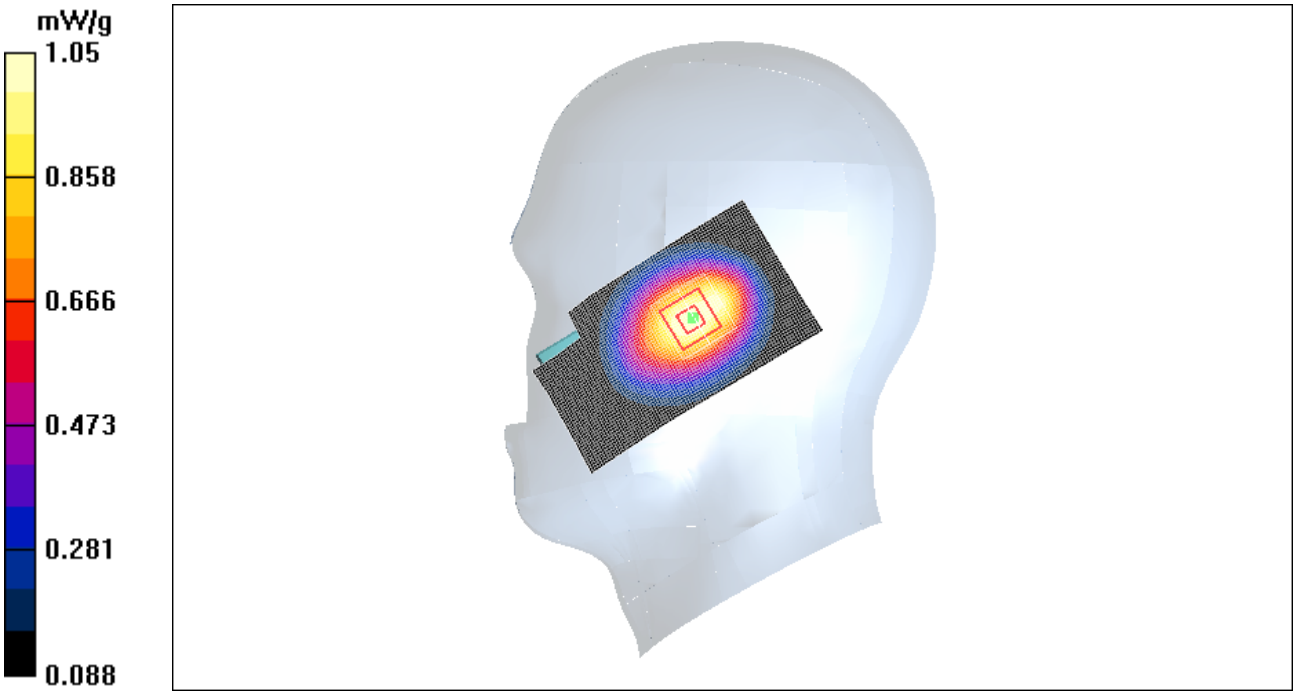


Figure 20 Right Hand Touch Cheek GSM 850 Channel 128

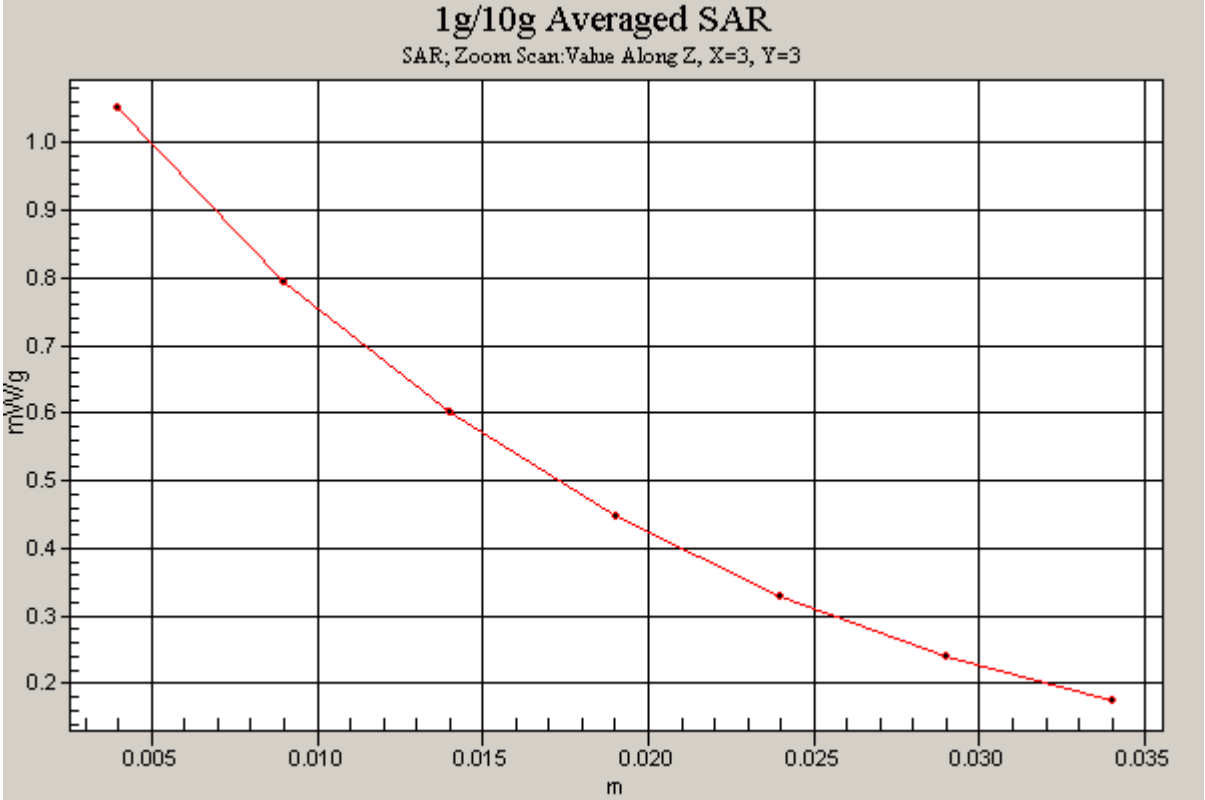


Figure 21 Z-Scan at power reference point (Right Hand Touch Cheek GSM 850 Channel 128)

Date/Time: 11/24/2008 4:24:08 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; σ = 0.912 mho/m; ε_r = 42.2; ρ = 1000 kg/m^3
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) = 0.700 mW/g

Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 25.8 V/m; Power Drift = -0.176 dB
Peak SAR (extrapolated) = 0.842 W/kg
SAR(1 g) = 0.630 mW/g; SAR(10 g) = 0.445 mW/g
Maximum value of SAR (measured) = 0.671 mW/g

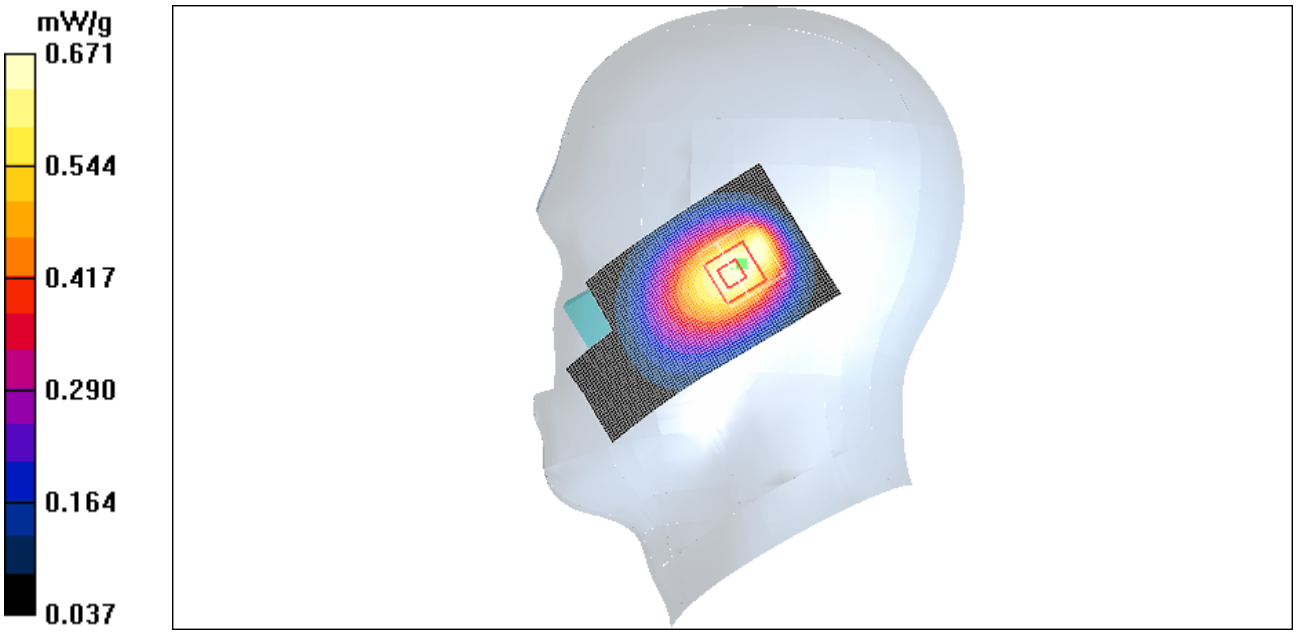


Figure 22 Right Hand Tilt 15 ° GSM 850 Channel 190

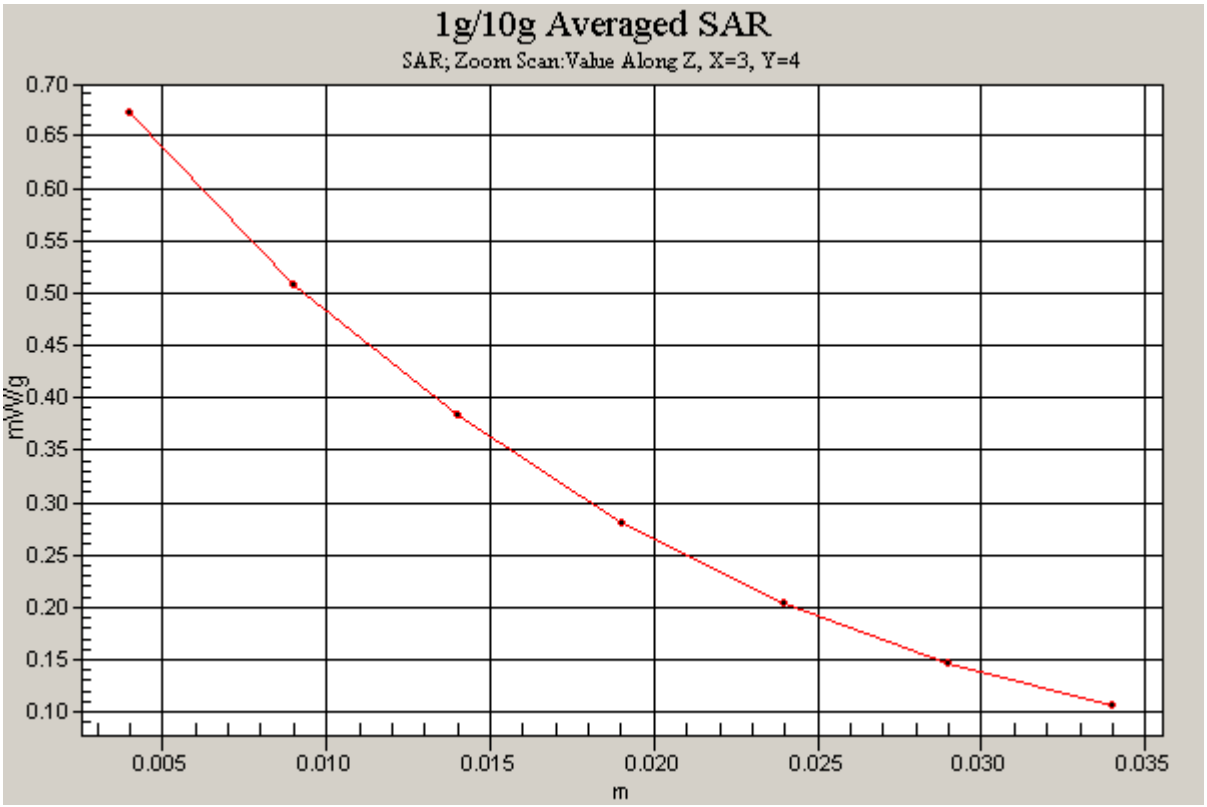


Figure 23 Z-Scan at power reference point (Right Hand Tilt 15 ° GSM 850 Channel 190)

Date/Time: 11/24/2008 5:53:50 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; σ = 0.998 mho/m; ε_r = 55.5; ρ = 1000 kg/m^3
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) = 0.523 mW/g

Towards Ground High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.5 V/m; Power Drift = -0.036 dB
Peak SAR (extrapolated) = 0.664 W/kg
SAR(1 g) = 0.494 mW/g; SAR(10 g) = 0.353 mW/g
Maximum value of SAR (measured) = 0.525 mW/g

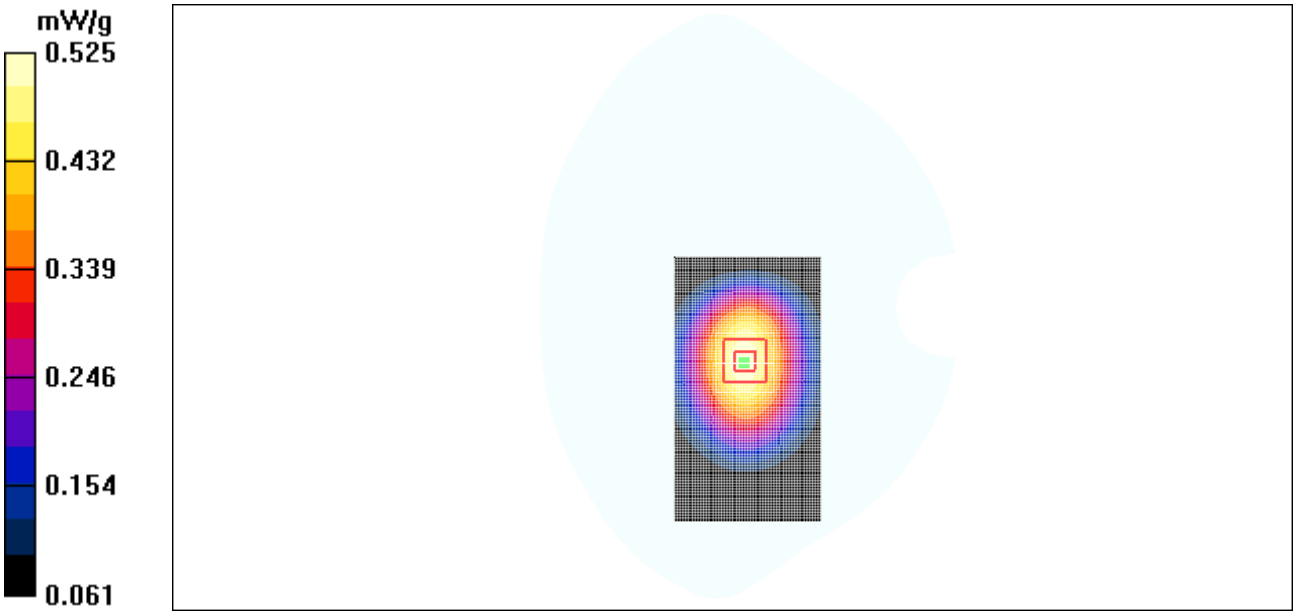


Figure 24 Body, Towards Ground, GSM 850 Channel 251

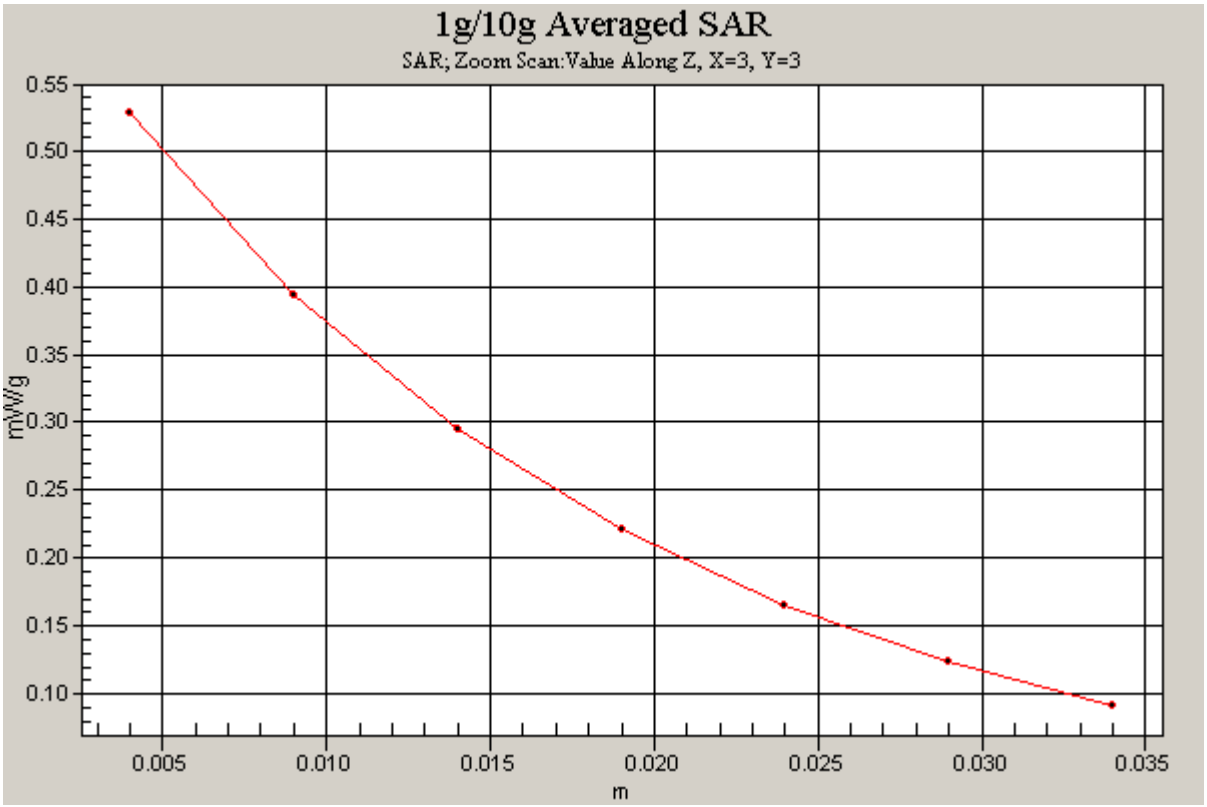


Figure 25 Z-Scan at power reference point (Body, Towards Ground, GSM 850 Channel 251)

Date/Time: 11/24/2008 5:35:57 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; σ = 0.986 mho/m; ε_r = 55.6; ρ = 1000 kg/m^3
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) = 0.470 mW/g

Towards Ground Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.7 V/m; Power Drift = -0.037 dB
Peak SAR (extrapolated) = 0.591 W/kg
SAR(1 g) = 0.443 mW/g; SAR(10 g) = 0.318 mW/g
Maximum value of SAR (measured) = 0.467 mW/g

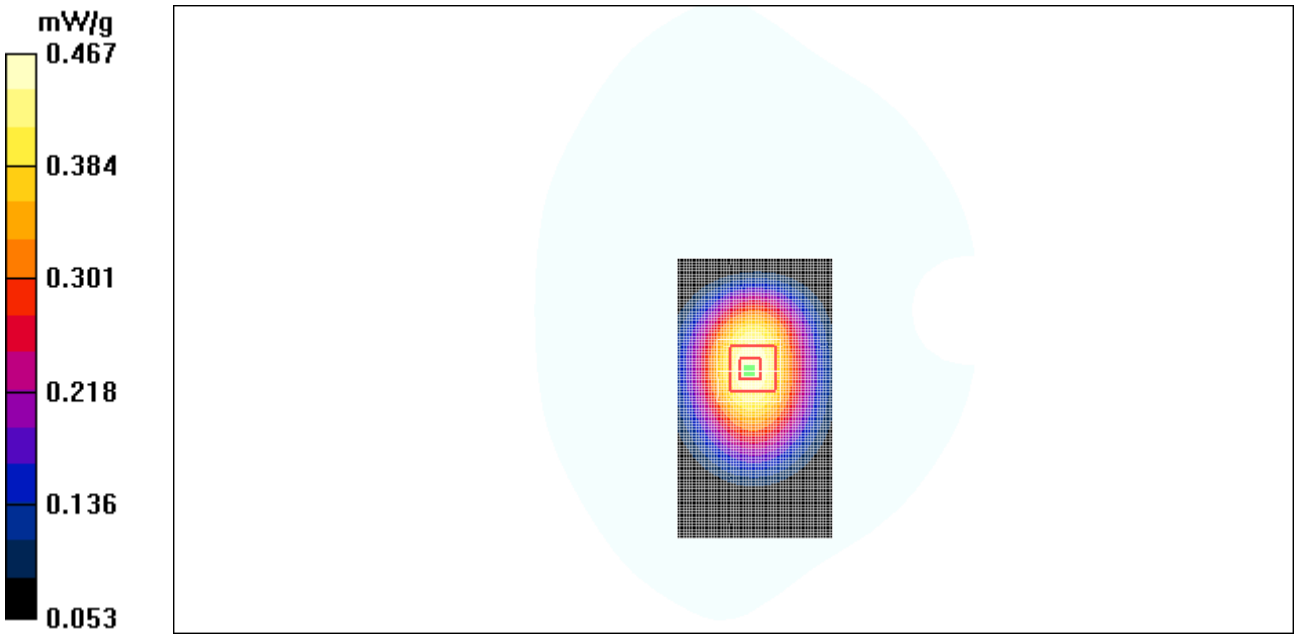


Figure 26 Body, Towards Ground, GSM 850 Channel 190

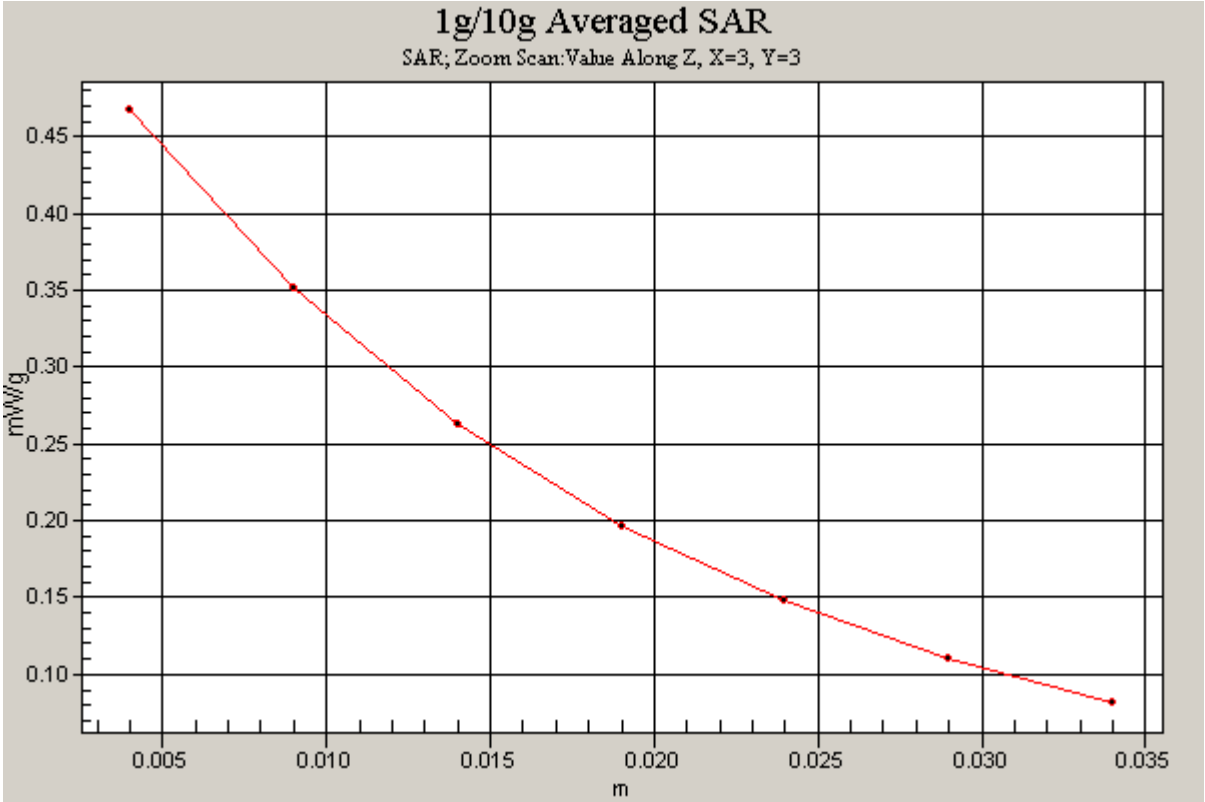


Figure 27 Z-Scan at power reference point (Body, Towards Ground, GSM 850 Channel 190)

Date/Time: 11/24/2008 6:12:38 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; σ = 0.972 mho/m; ε_r = 55.7; ρ = 1000 kg/m^3
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) = 0.384 mW/g

Towards Ground Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.1 V/m; Power Drift = 0.000 dB
Peak SAR (extrapolated) = 0.483 W/kg
SAR(1 g) = 0.362 mW/g; SAR(10 g) = 0.260 mW/g
Maximum value of SAR (measured) = 0.383 mW/g

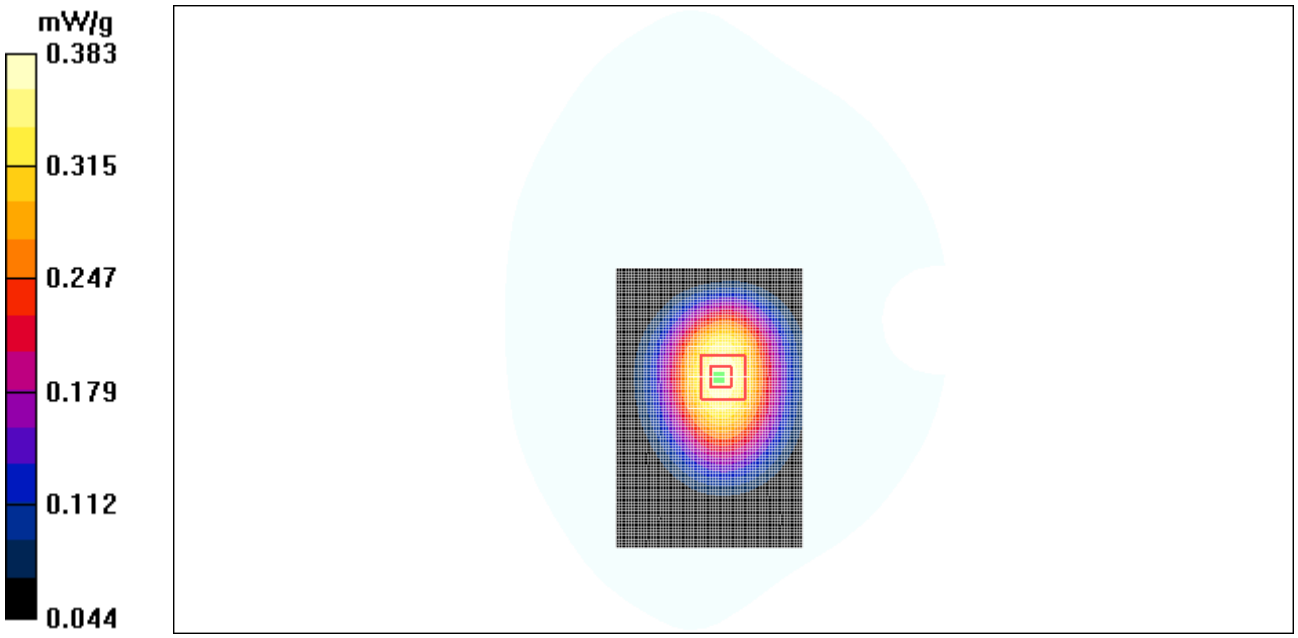


Figure 28 Body, Towards Ground, GSM 850 Channel 128

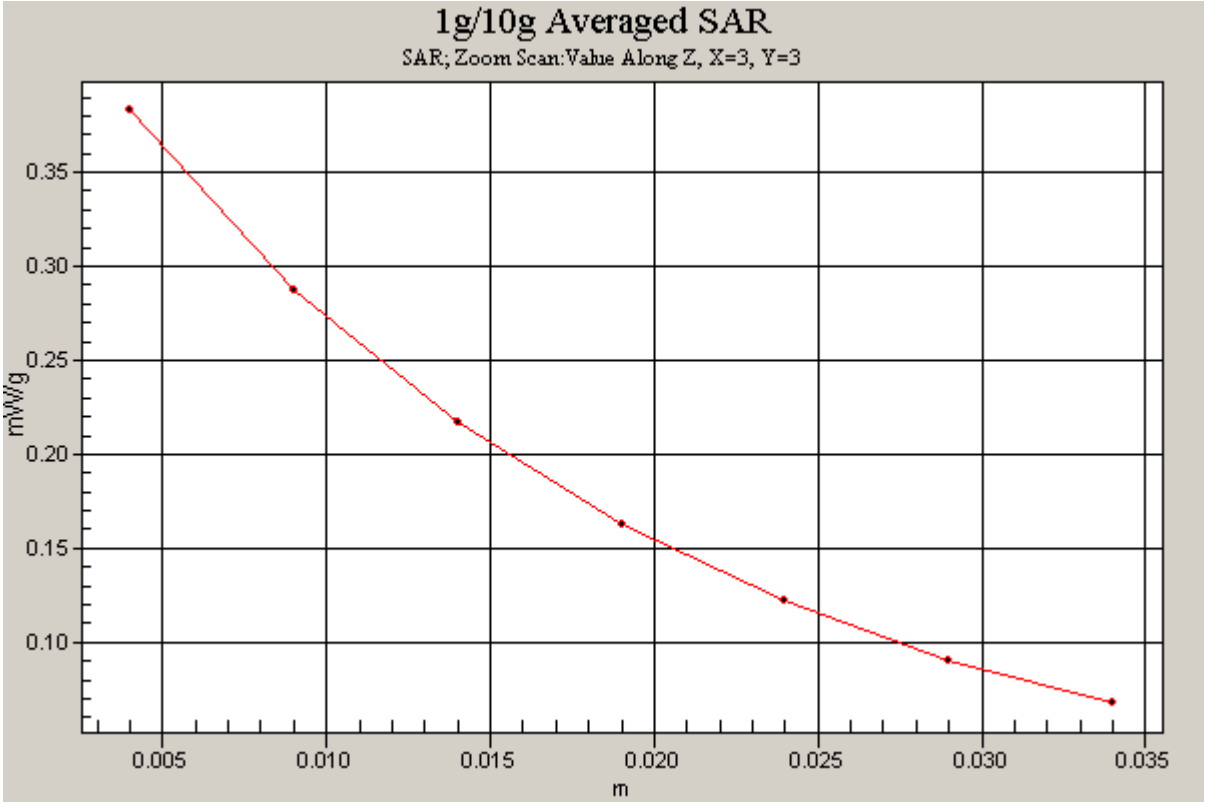


Figure 29 Z-Scan at power reference point (Body, Towards Ground, GSM 850 Channel 128)

Date/Time: 11/24/2008 5:15:50 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; σ = 0.986 mho/m; ε_r = 55.6; ρ = 1000 kg/m^3

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) = 0.383 mW/g

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

Reference Value = 16.0 V/m; Power Drift = 0.001 dB

Peak SAR (extrapolated) = 0.447 W/kg

SAR(1 g) = 0.336 mW/g; SAR(10 g) = 0.243 mW/g

Maximum value of SAR (measured) = 0.357 mW/g

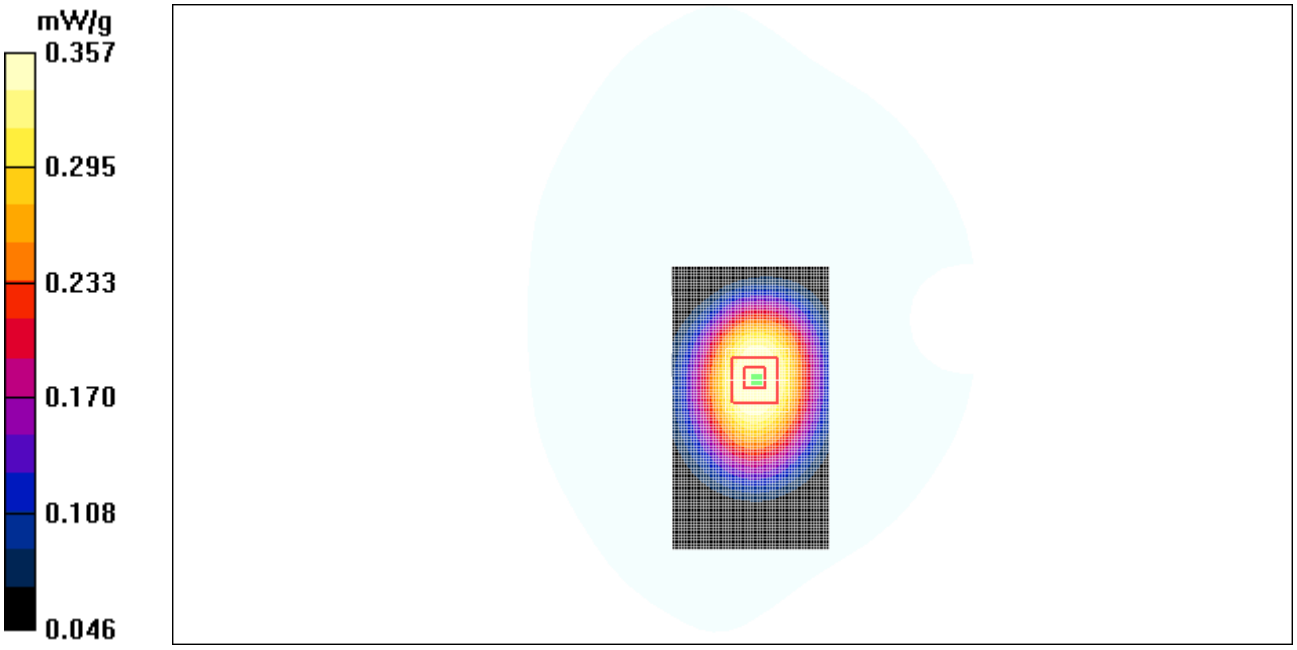


Figure 30 Body, Towards Phantom, GSM 850 Channel 190

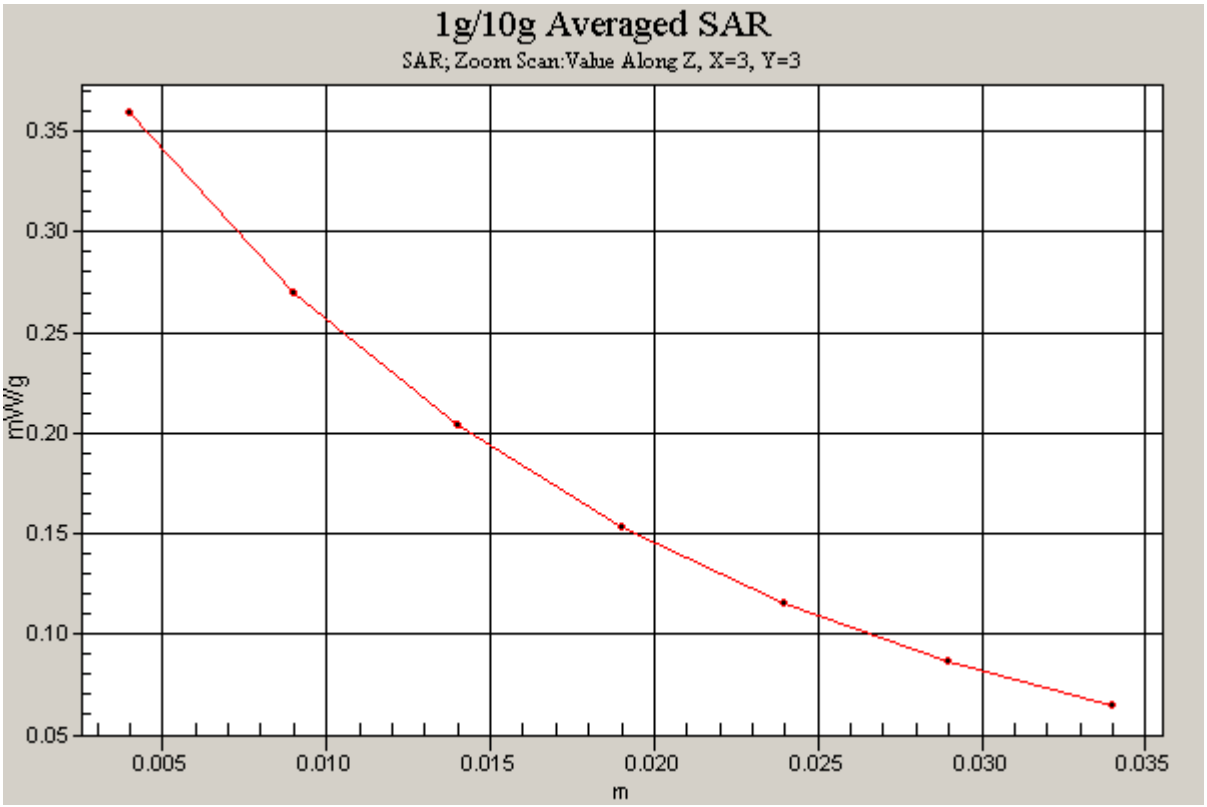


Figure 31 Z-Scan at power reference point (Body, Towards Phantom, GSM 850 Channel 190)

Date/Time: 11/24/2008 6:31:45 PM

GSM 850 Earphone Towards Ground High

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

Medium parameters used: f = 849 MHz; σ = 0.998 mho/m; ε_r = 55.5; ρ = 1000 kg/m^3

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) = 0.432 mW/g

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

Reference Value = 16.6 V/m; Power Drift = 0.081 dB

Peak SAR (extrapolated) = 0.550 W/kg

SAR(1 g) = 0.412 mW/g; SAR(10 g) = 0.295 mW/g

Maximum value of SAR (measured) = 0.436 mW/g

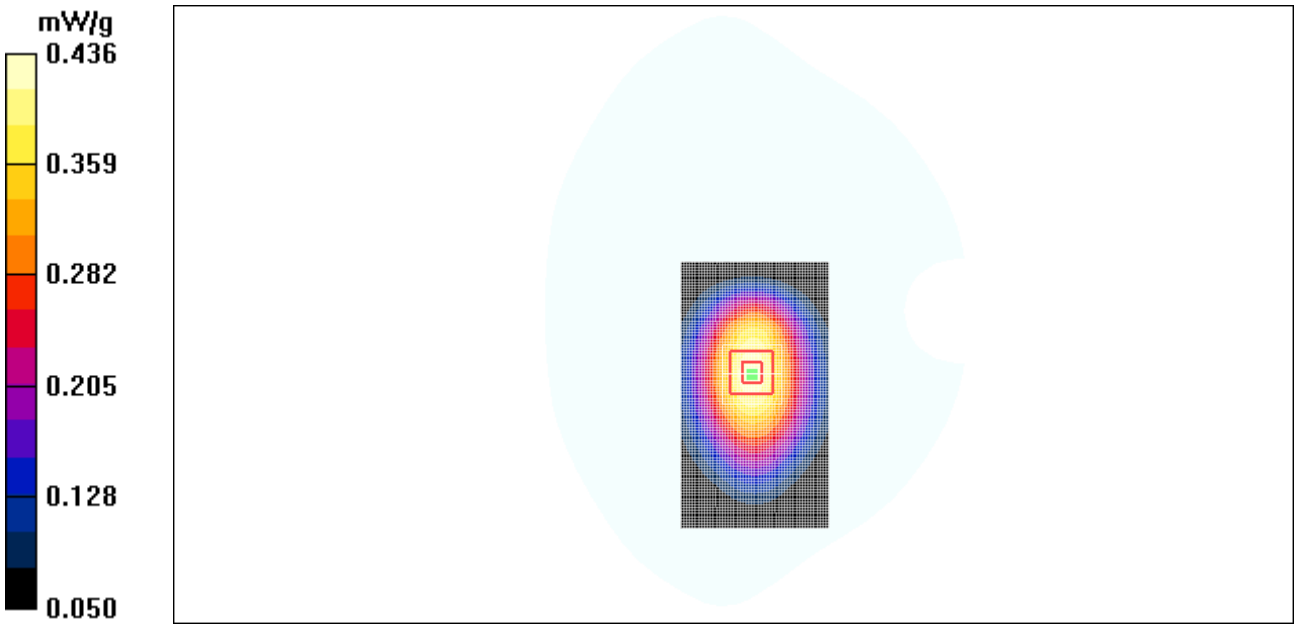


Figure 32 Body with Earphone, Towards Ground, GSM 850, Channel 251

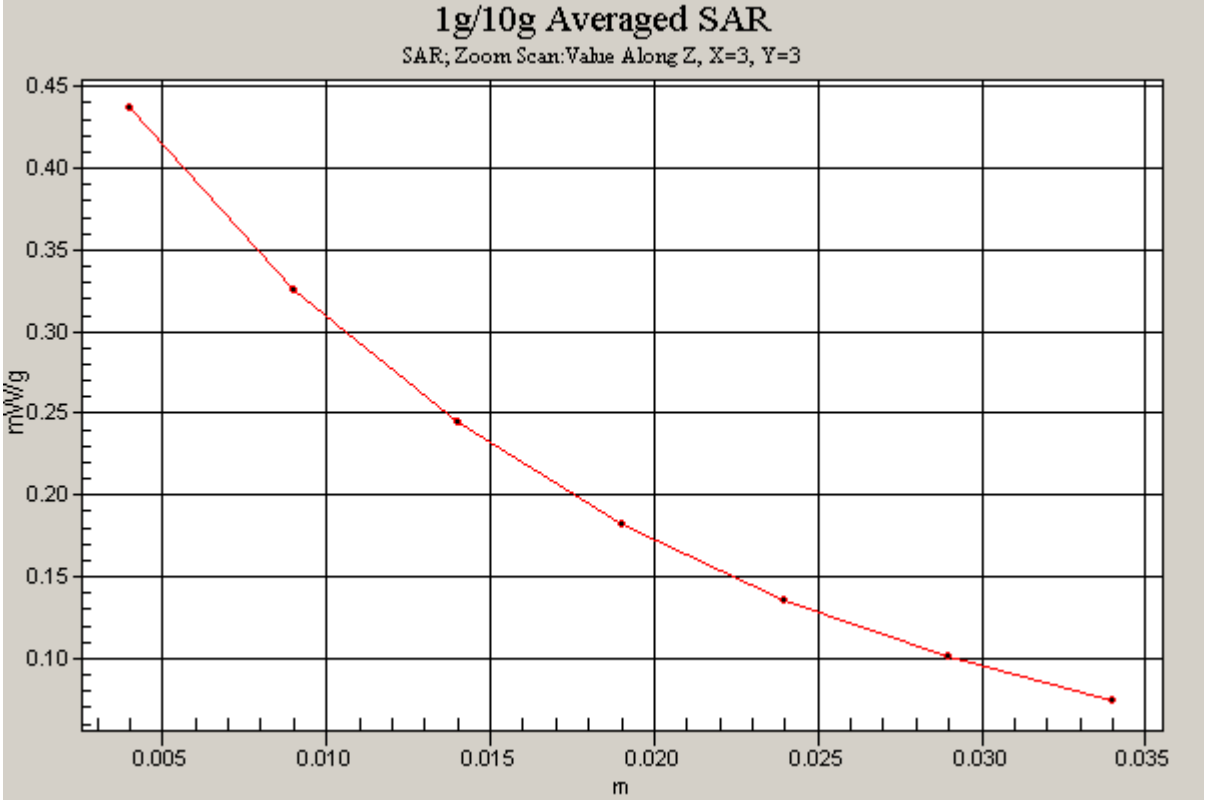


Figure 33 Z-Scan at power reference point (Body with Earphone, Towards Ground, GSM 850, Channel 251)

Date/Time: 11/24/2008 8:23:57 PM

GSM 1900 Left Cheek Middle

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.37 mho/m; ε_r = 40.2; ρ = 1000 kg/m^3
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) = 0.767 mW/g

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.7 V/m; Power Drift = 0.044 dB
Peak SAR (extrapolated) = 1.36 W/kg
SAR(1 g) = 0.754 mW/g; SAR(10 g) = 0.400 mW/g
Maximum value of SAR (measured) = 0.843 mW/g

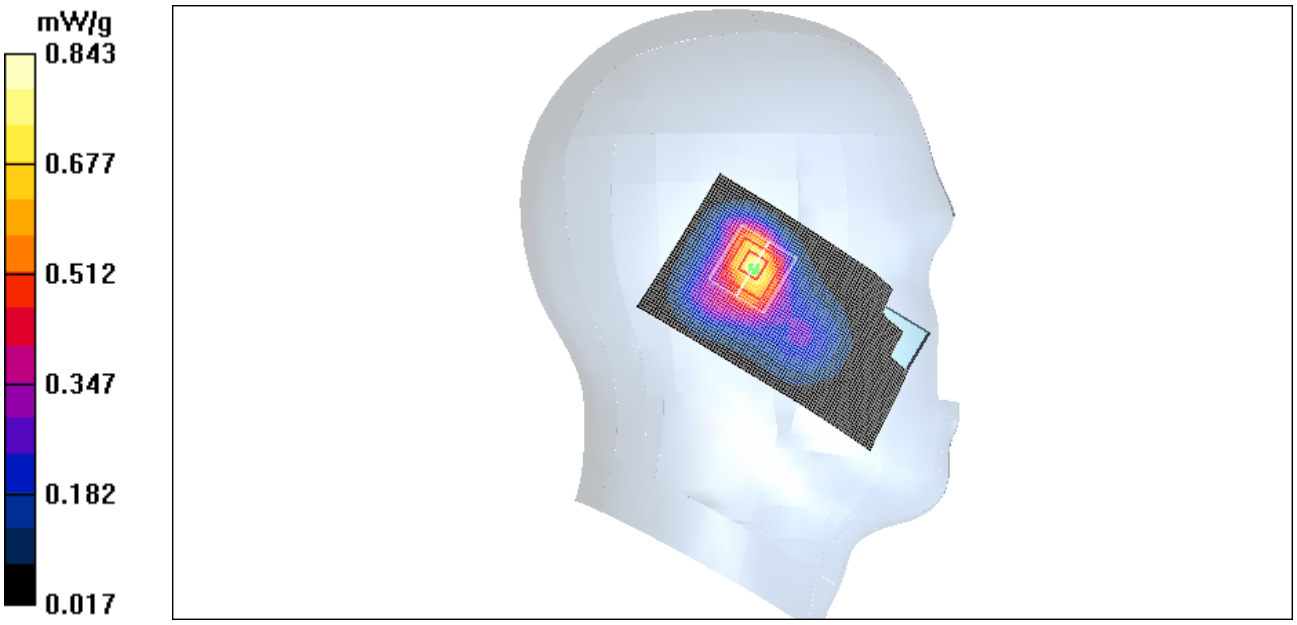


Figure 34 Left Hand Touch Cheek GSM 1900 Channel 661

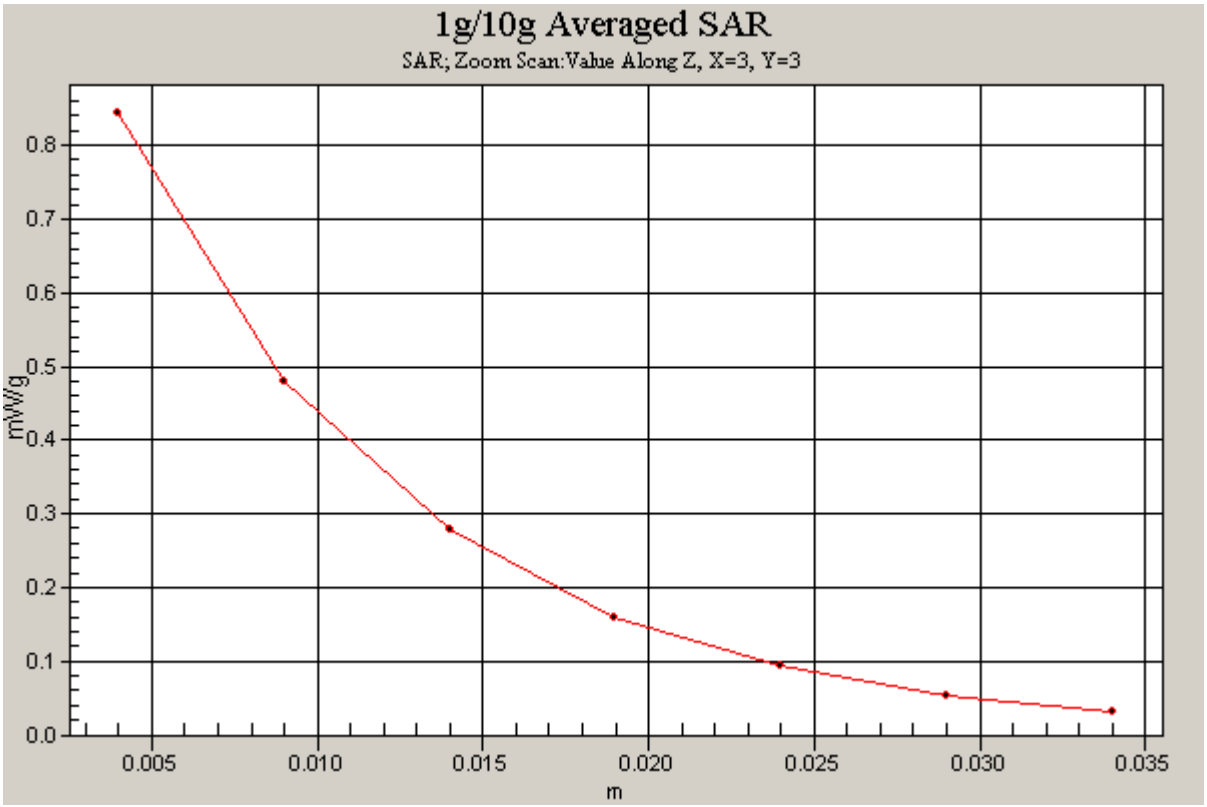


Figure 35 Z-Scan at power reference point (Left Hand Touch Cheek GSM 1900 Channel 661)

Date/Time: 11/24/2008 8:42:48 PM

GSM 1900 Left Tilt Middle

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.37 mho/m; ε_r = 40.2; ρ = 1000 kg/m^3
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) = 0.473 mW/g

Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.2 V/m; Power Drift = -0.059 dB
Peak SAR (extrapolated) = 0.776 W/kg
SAR(1 g) = 0.444 mW/g; SAR(10 g) = 0.243 mW/g
Maximum value of SAR (measured) = 0.492 mW/g

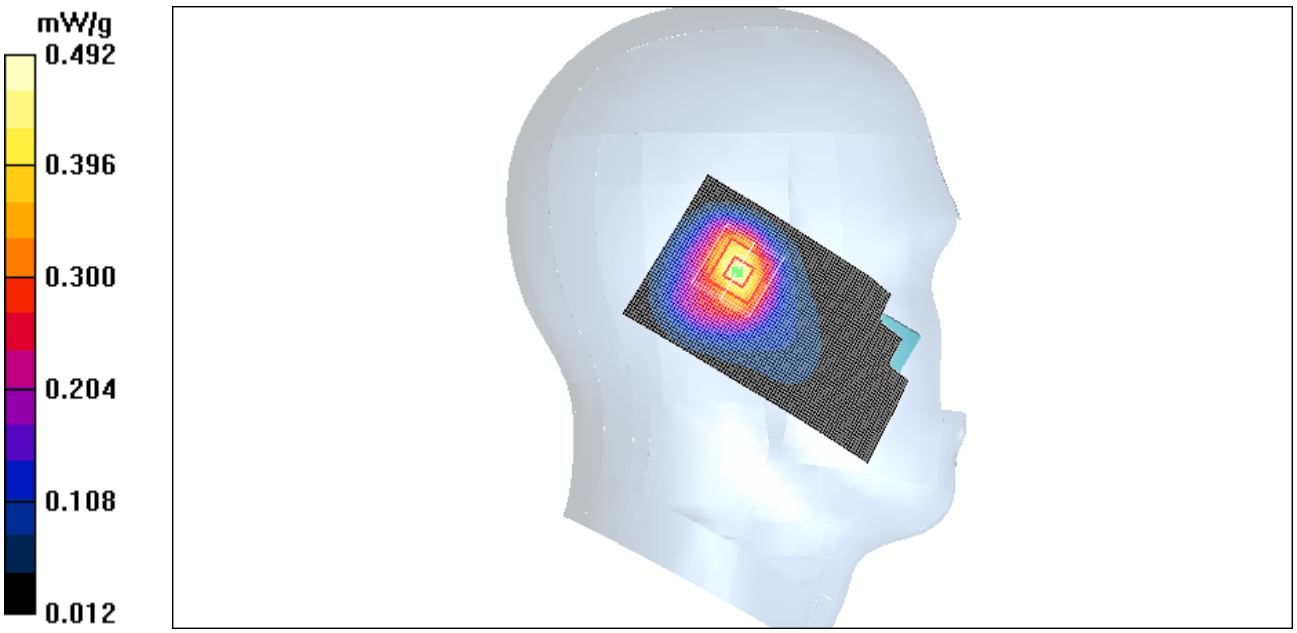


Figure 36 Left Hand Tilt 15 ° GSM 1900 Channel 661

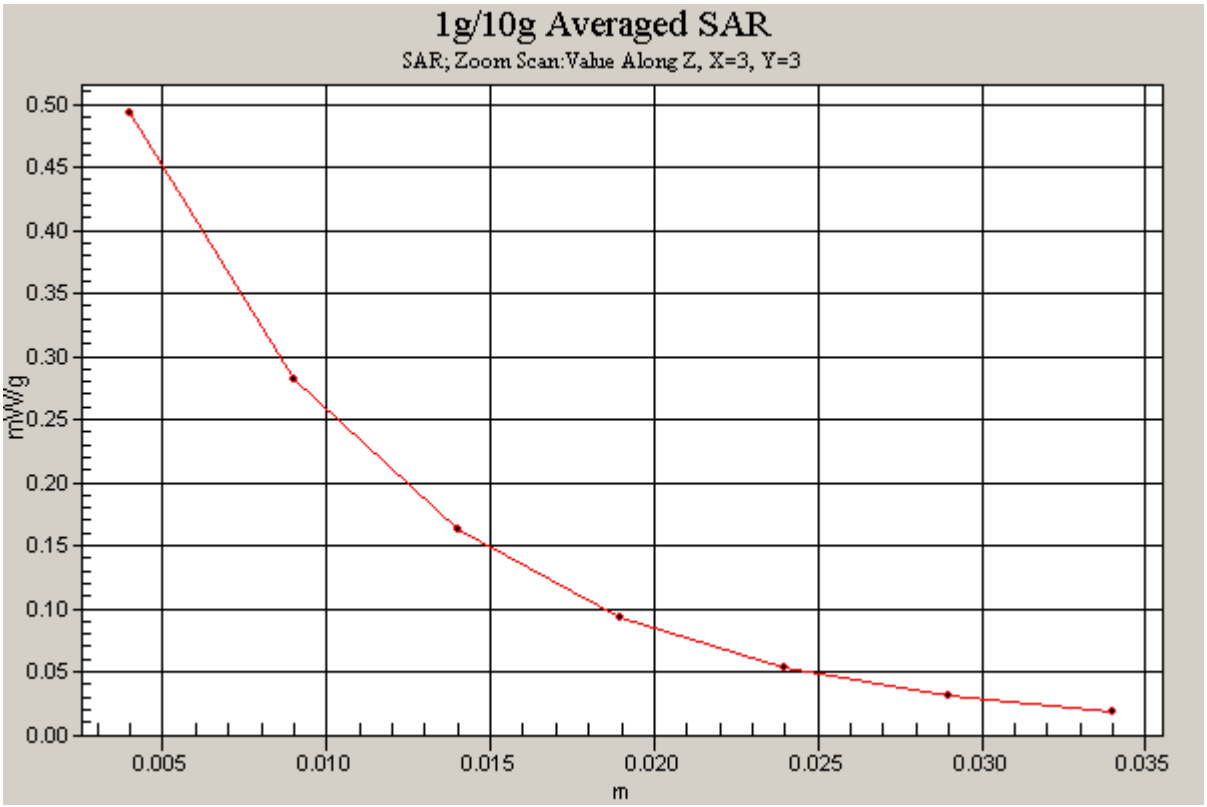


Figure 37 Z-Scan at power reference point (Left Hand Tilt 15 ° GSM 1900 Channel 661)

Date/Time: 11/24/2008 7:26:13 PM

GSM 1900 Right Cheek High

Communication System: GSM 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1910 MHz; σ = 1.4 mho/m; ε_r = 40.1; ρ = 1000 kg/m^3
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) = 0.724 mW/g

Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.2 V/m; Power Drift = -0.073 dB
Peak SAR (extrapolated) = 1.15 W/kg
SAR(1 g) = 0.682 mW/g; SAR(10 g) = 0.370 mW/g
Maximum value of SAR (measured) = 0.767 mW/g

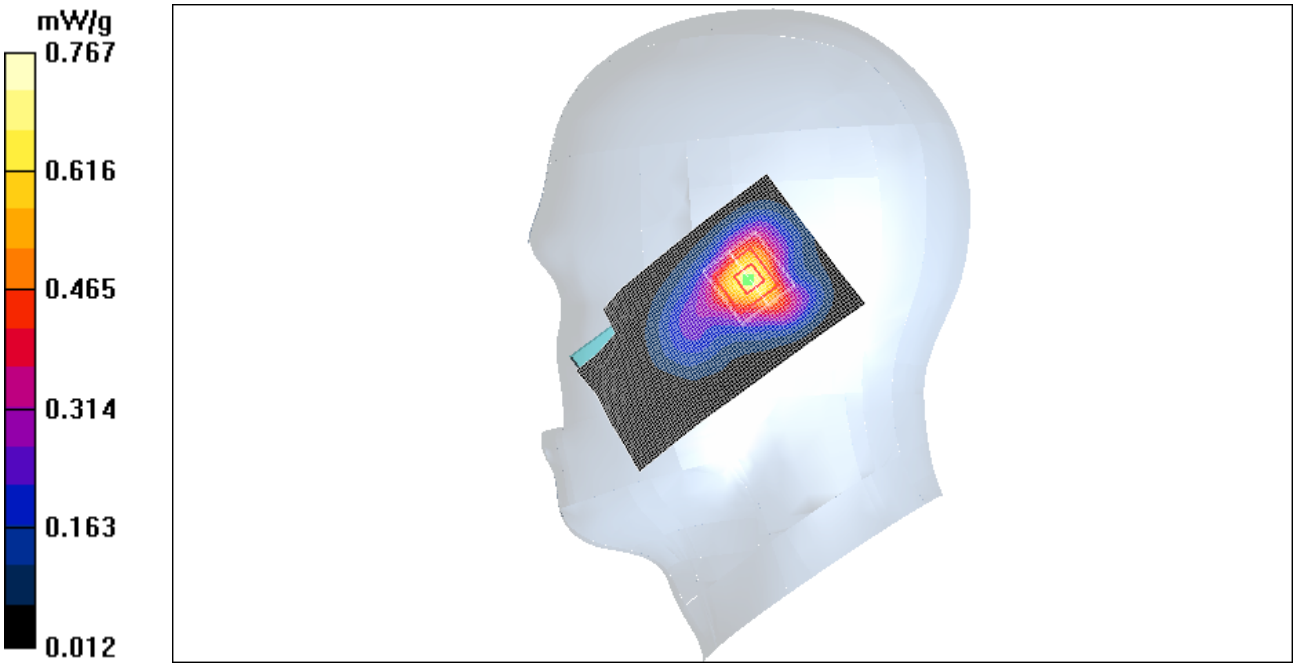


Figure 38 Right Hand Touch Cheek GSM 1900 Channel 810

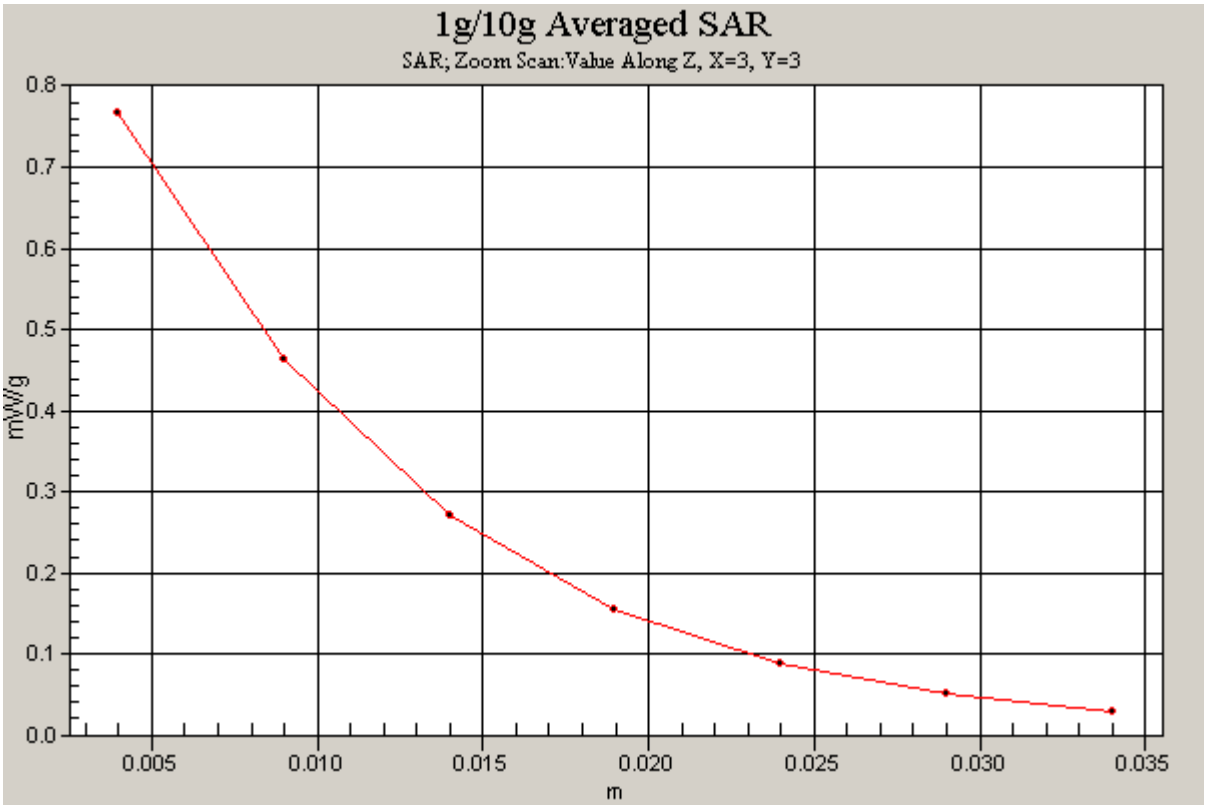


Figure 39 Z-Scan at power reference point (Right Hand Touch Cheek GSM 1900 Channel 810)

Date/Time: 11/24/2008 7:00:51 PM

GSM 1900 Right Cheek Middle

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.37 mho/m; ε_r = 40.2; ρ = 1000 kg/m^3
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) = 0.855 mW/g

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.2 V/m; Power Drift = -0.199 dB
Peak SAR (extrapolated) = 1.34 W/kg
SAR(1 g) = 0.812 mW/g; SAR(10 g) = 0.450 mW/g
Maximum value of SAR (measured) = 0.898 mW/g

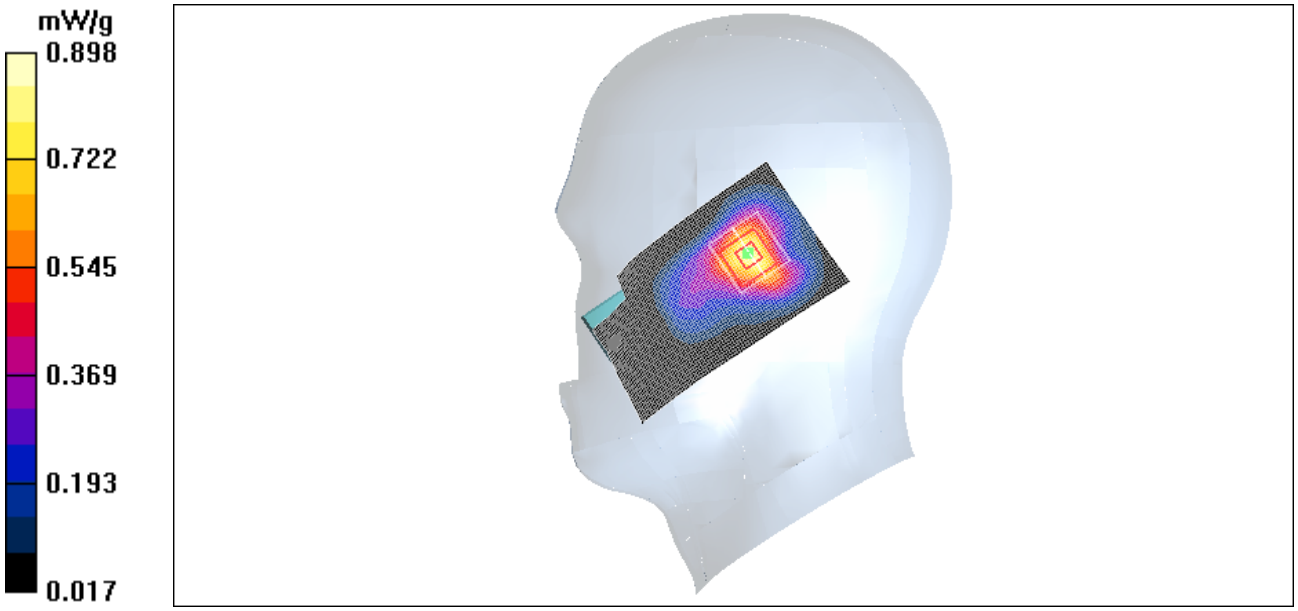


Figure 40 Right Hand Touch Cheek GSM 1900 Channel 661

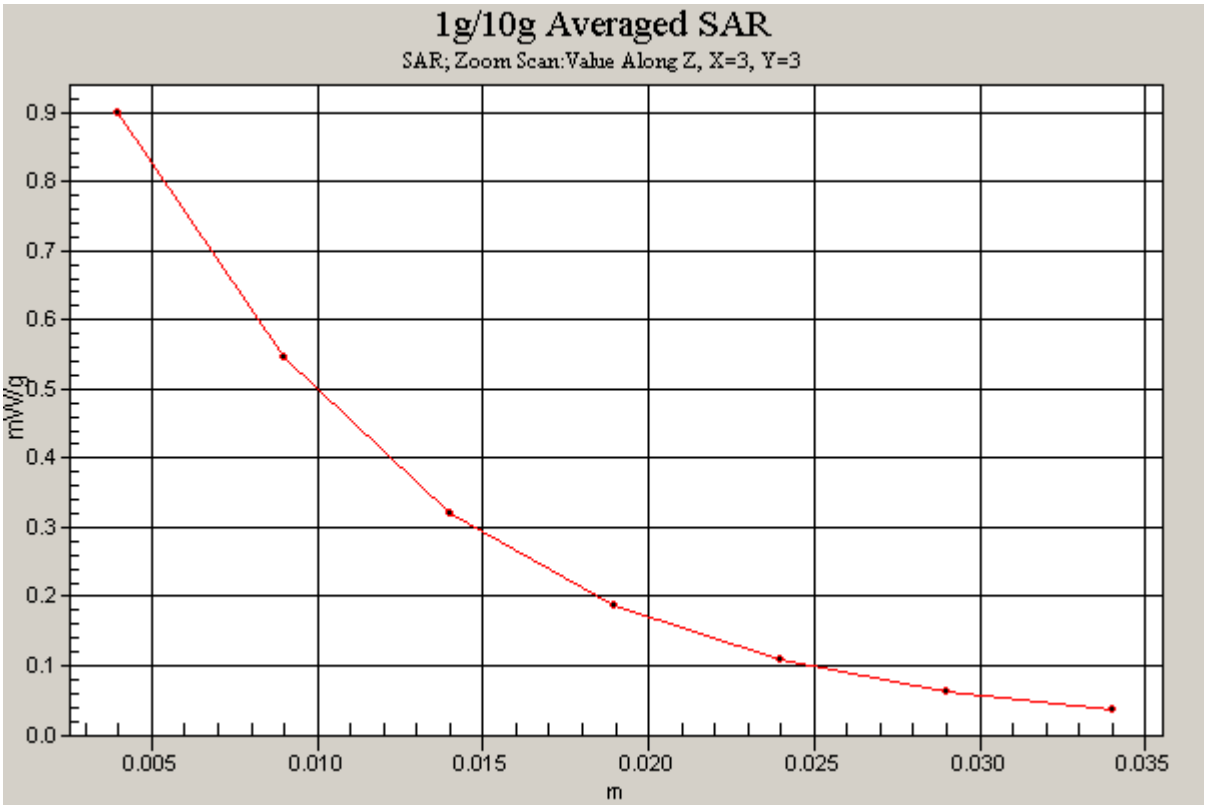


Figure 41 Z-Scan at power reference point (Right Hand Touch Cheek GSM 1900 Channel 661)

Date/Time: 11/24/2008 7:44:14 PM

GSM 1900 Right Cheek Low

Communication System: GSM 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.34 mho/m; ε_r = 40.3; ρ = 1000 kg/m^3
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) = 1.16 mW/g

Cheek Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 22.4 V/m; Power Drift = -0.061 dB
Peak SAR (extrapolated) = 1.77 W/kg
SAR(1 g) = 1.09 mW/g; SAR(10 g) = 0.608 mW/g
Maximum value of SAR (measured) = 1.20 mW/g

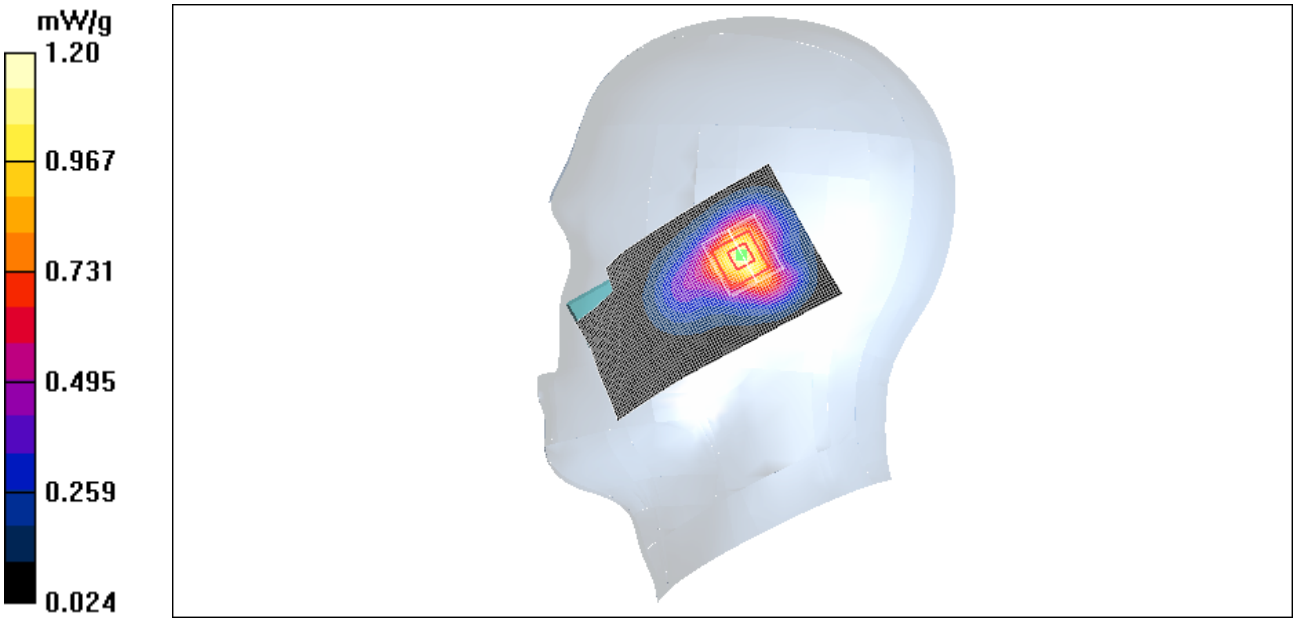


Figure 42 Right Hand Touch Cheek GSM 1900 Channel 512

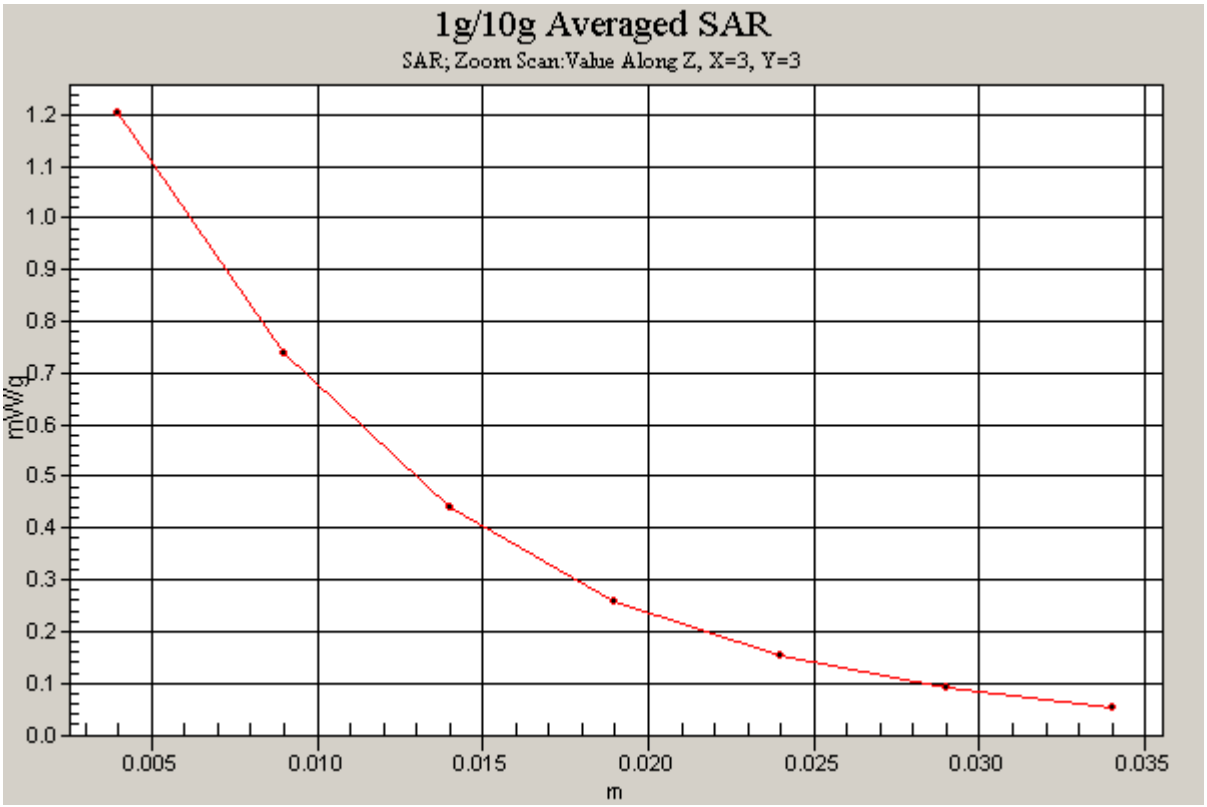


Figure 43 Z-Scan at power reference point (Right Hand Touch Cheek GSM 1900 Channel 512)

Date/Time: 11/24/2008 8:03:12 PM

GSM 1900 Right Tilt Middle

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.37 mho/m; ε_r = 40.2; ρ = 1000 kg/m^3
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) = 0.500 mW/g

Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.2 V/m; Power Drift = -0.012 dB
Peak SAR (extrapolated) = 0.853 W/kg
SAR(1 g) = 0.478 mW/g; SAR(10 g) = 0.261 mW/g
Maximum value of SAR (measured) = 0.534 mW/g

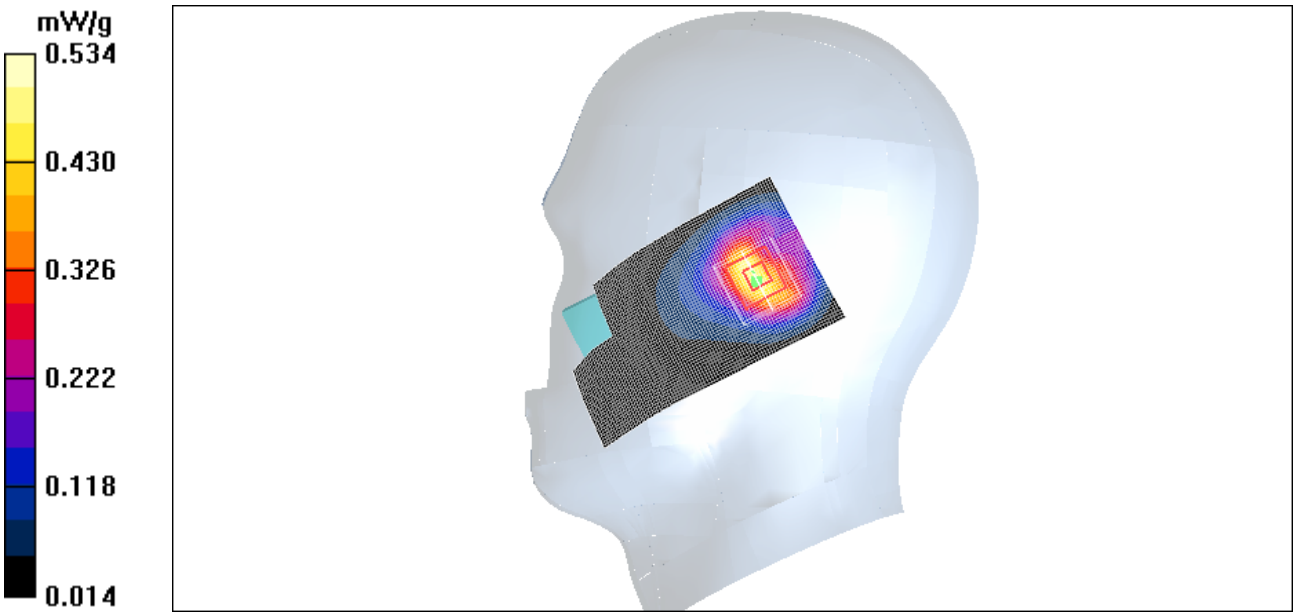


Figure 44 Right Hand Tilt 15 ° GSM 1900 Channel 661

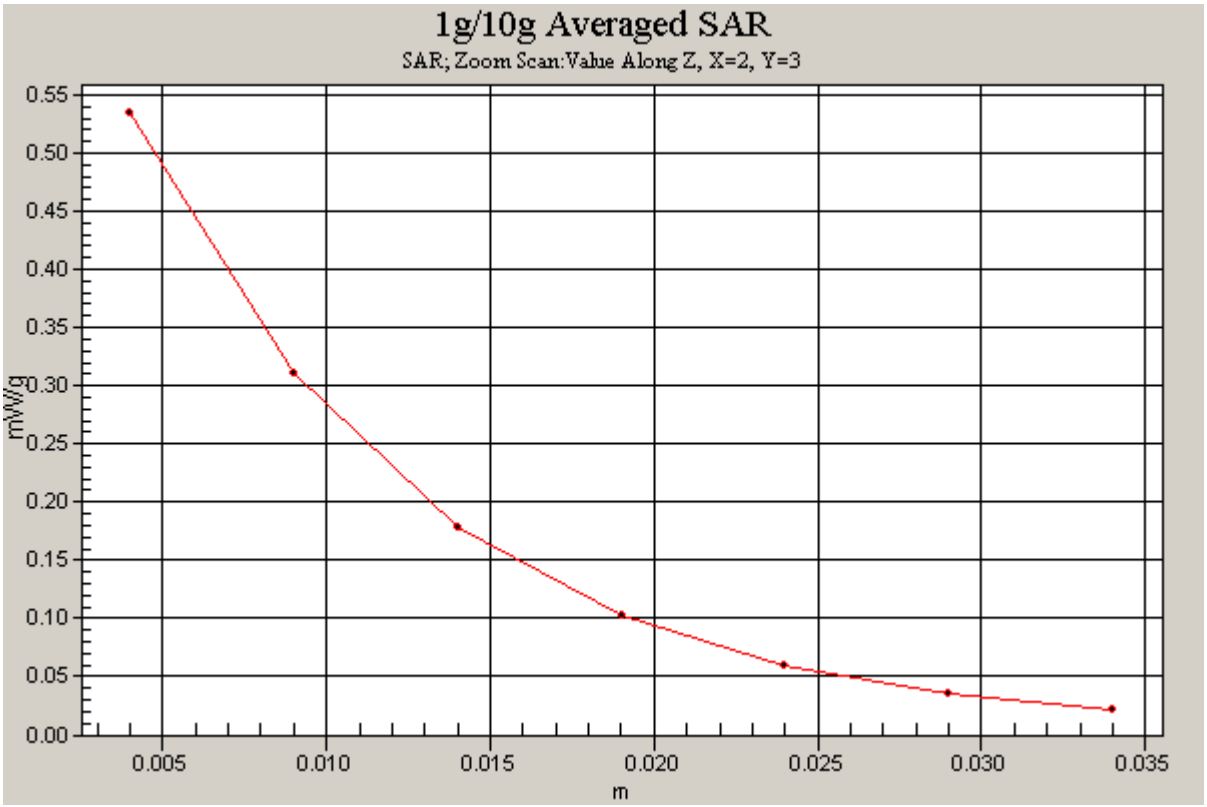


Figure 45 Z-Scan at power reference point (Right Hand Tilt 15 ° GSM 1900 Channel 661)

Date/Time: 11/24/2008 10:00:01 PM

GSM 1900 Towards Ground High

Communication System: GSM 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1910 MHz; σ = 1.56 mho/m; ε_r = 52.9; ρ = 1000 kg/m^3
Probe: EX3DV4 - SN3660; ConvF(7.45, 7.45, 7.45);
Electronics: DAE3 Sn536;
Towards Ground High/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.166 mW/g

Towards Ground High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.28 V/m; Power Drift = 0.108 dB
Peak SAR (extrapolated) = 0.239 W/kg
SAR(1 g) = 0.149 mW/g; SAR(10 g) = 0.087 mW/g
Maximum value of SAR (measured) = 0.162 mW/g

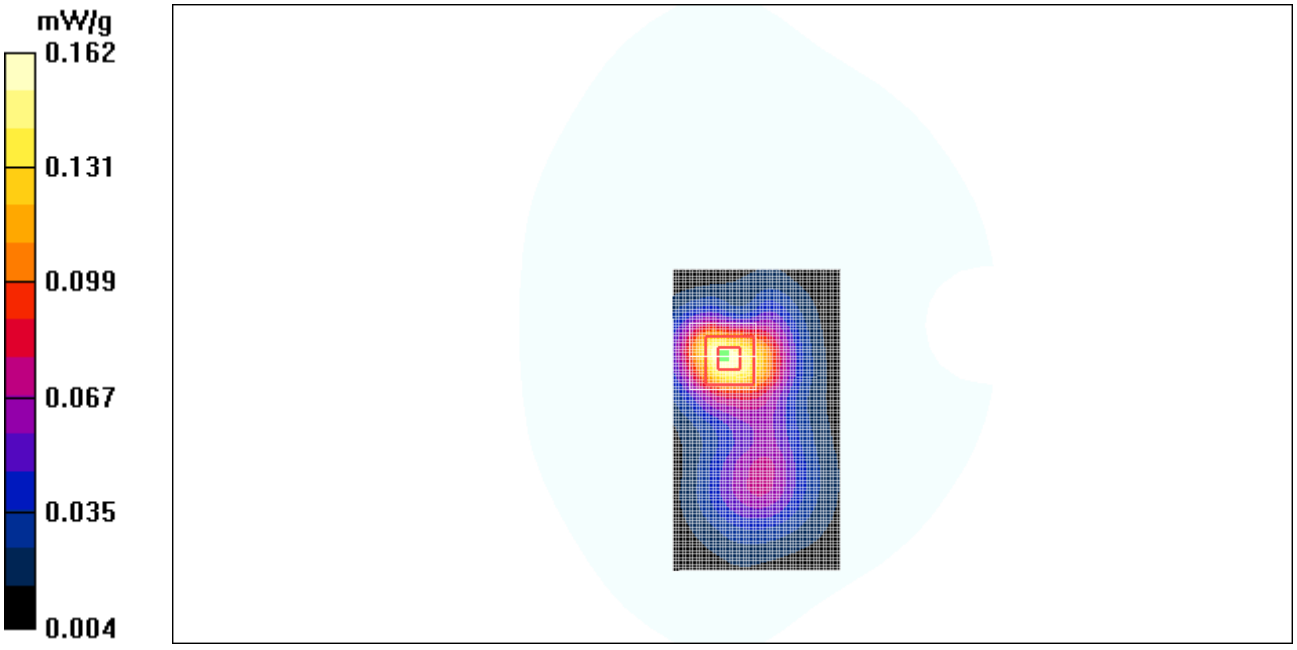


Figure 46 Body, Towards Ground, GSM 1900 Channel 810

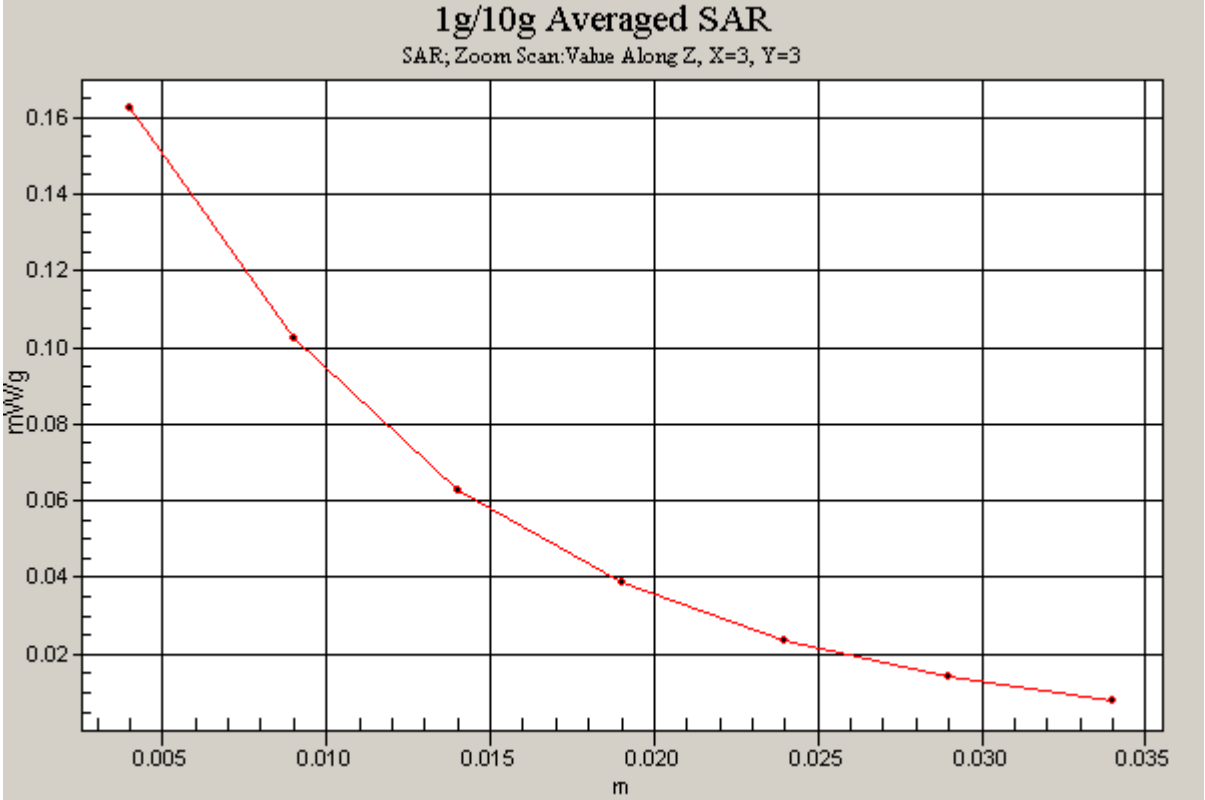


Figure 47 Z-Scan at power reference point (Body, Towards Ground, GSM 1900 Channel 810)

Date/Time: 11/24/2008 9:41:48 PM

GSM 1900 Towards Ground Middle

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 53; ρ = 1000 kg/m^3
Probe: EX3DV4 - SN3660; ConvF(7.45, 7.45, 7.45);
Electronics: DAE3 Sn536;
Towards Ground Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.229 mW/g

Towards Ground Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.17 V/m; Power Drift = -0.112 dB
Peak SAR (extrapolated) = 0.324 W/kg
SAR(1 g) = 0.202 mW/g; SAR(10 g) = 0.118 mW/g
Maximum value of SAR (measured) = 0.221 mW/g

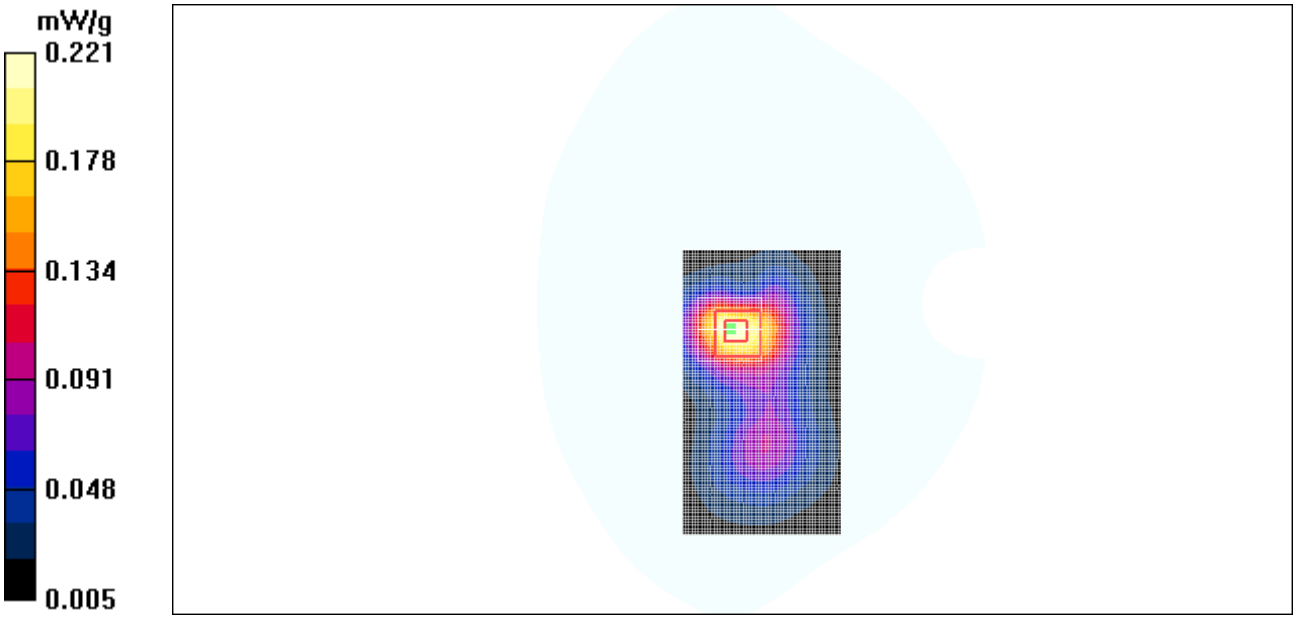


Figure 48 Body, Towards Ground, GSM 1900 Channel 661

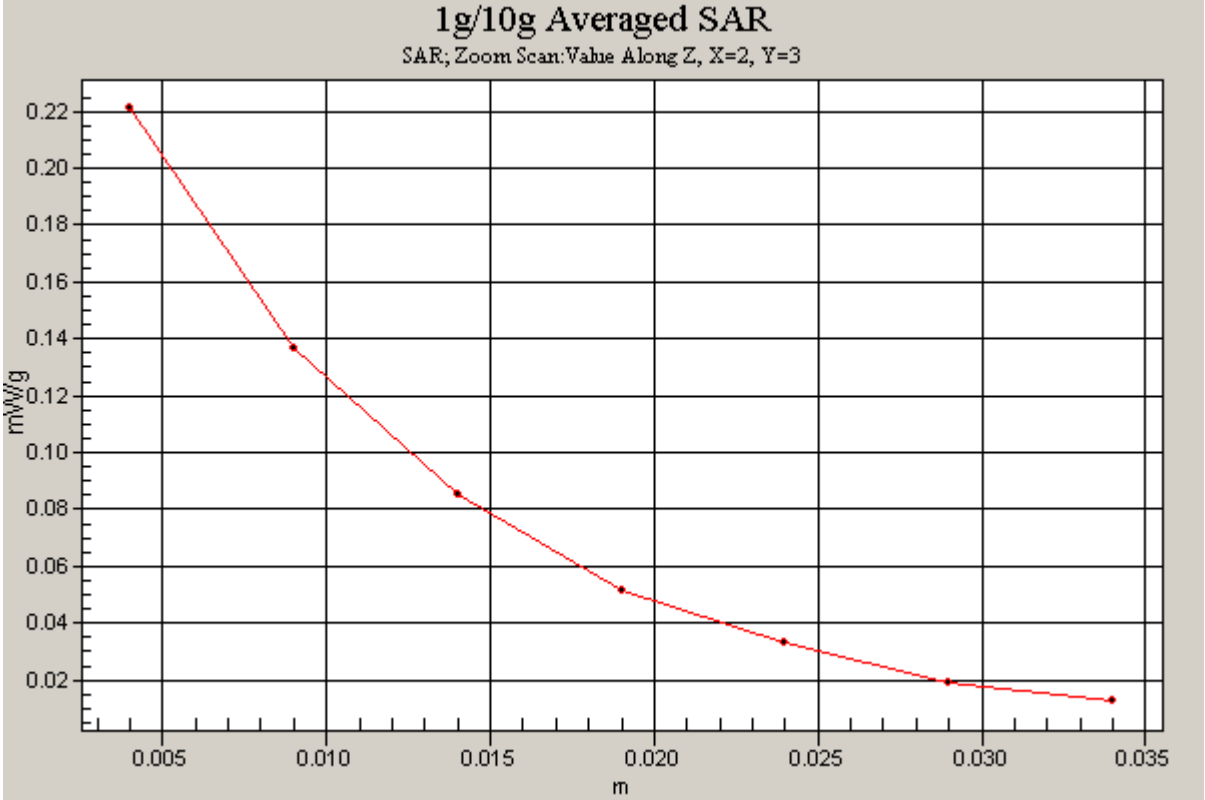


Figure 49 Z-Scan at power reference point (Body, Towards Ground, GSM 1900 Channel 661)

Date/Time: 11/24/2008 10:18:20 PM

GSM 1900 Towards Ground Low

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

Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.49 mho/m; ε_r = 53.1; ρ = 1000 kg/m^3

Probe: EX3DV4 - SN3660; ConvF(7.45, 7.45, 7.45);

Electronics: DAE3 Sn536;

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

Maximum value of SAR (interpolated) = 0.340 mW/g

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

Reference Value = 10.8 V/m; Power Drift = -0.087 dB

Peak SAR (extrapolated) = 0.490 W/kg

SAR(1 g) = 0.299 mW/g; SAR(10 g) = 0.174 mW/g

Maximum value of SAR (measured) = 0.328 mW/g

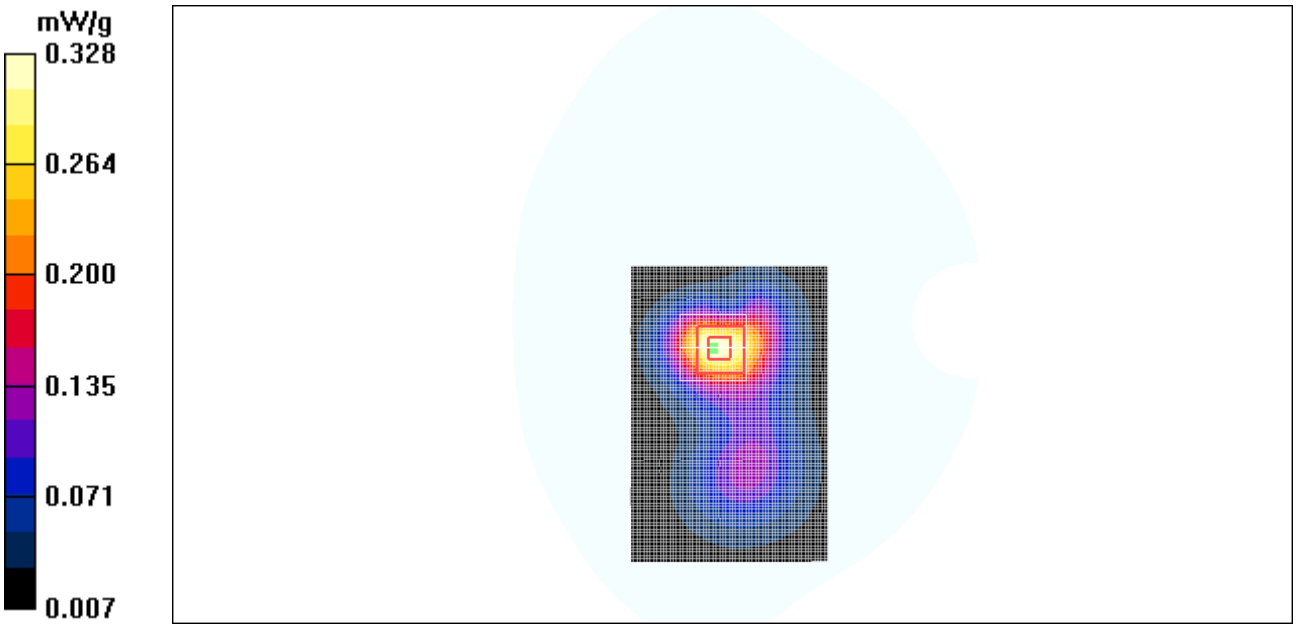


Figure 50 Body, Towards Ground, GSM 1900 Channel 512

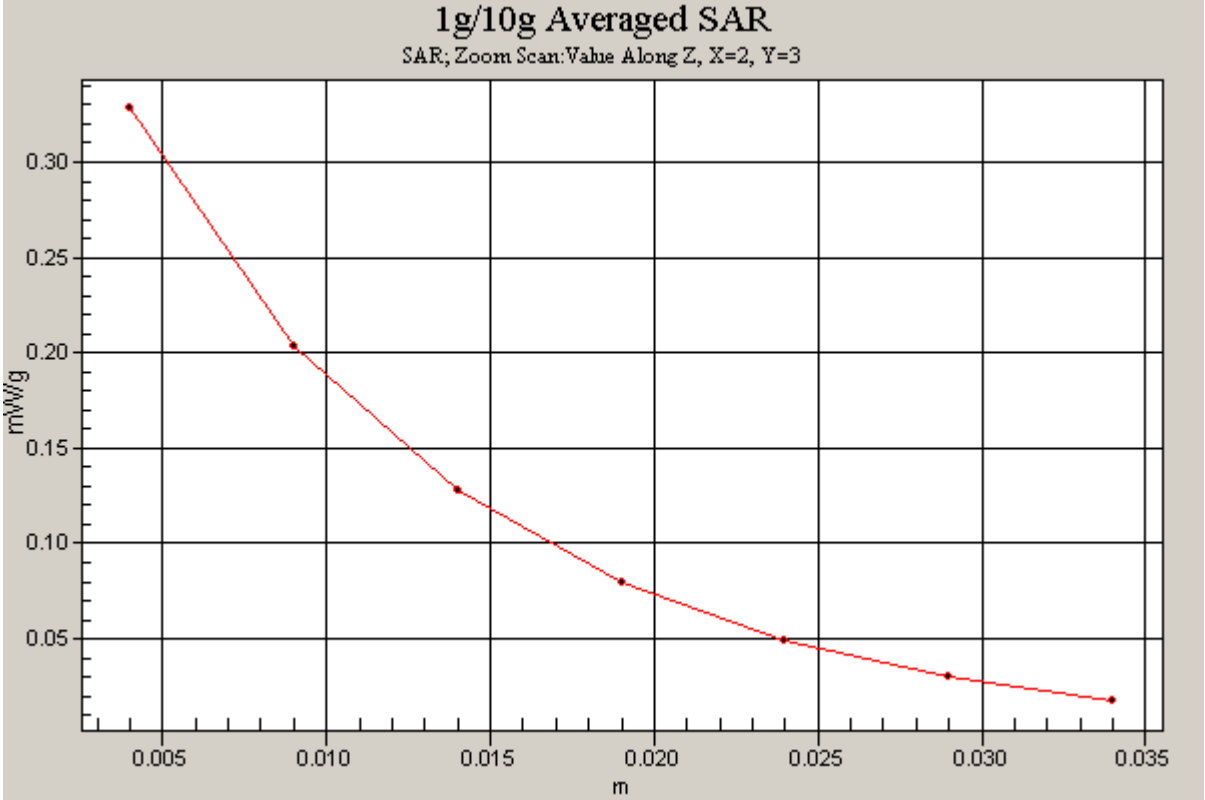


Figure 51 Z-Scan at power reference point (Body, Towards Ground, GSM 1900 Channel 512)

Date/Time: 11/24/2008 9:21:57 PM

GSM 1900 Towards Phantom Middle

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 53; ρ = 1000 kg/m^3
Probe: EX3DV4 - SN3660; ConvF(7.45, 7.45, 7.45);
Electronics: DAE3 Sn536;
Towards Phantom Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.157 mW/g

Towards Phantom Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.44 V/m; Power Drift = 0.044 dB
Peak SAR (extrapolated) = 0.227 W/kg
SAR(1 g) = 0.144 mW/g; SAR(10 g) = 0.086 mW/g
Maximum value of SAR (measured) = 0.156 mW/g

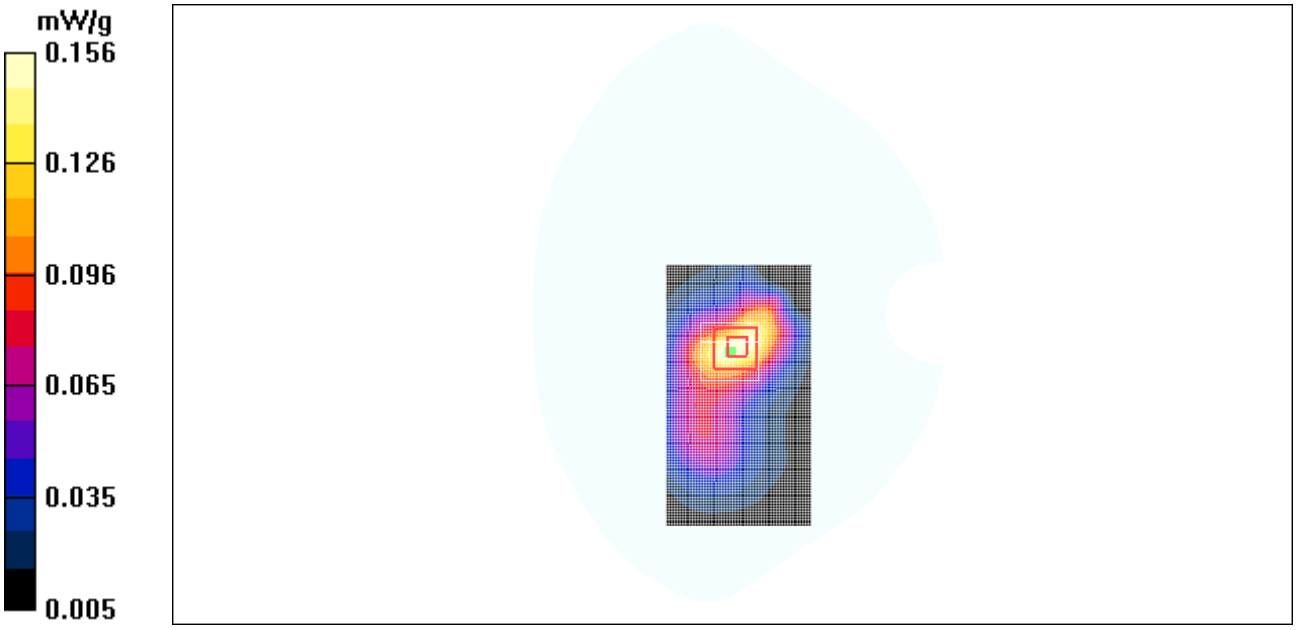


Figure 52 Body, Towards Phantom, GSM 1900 Channel 661

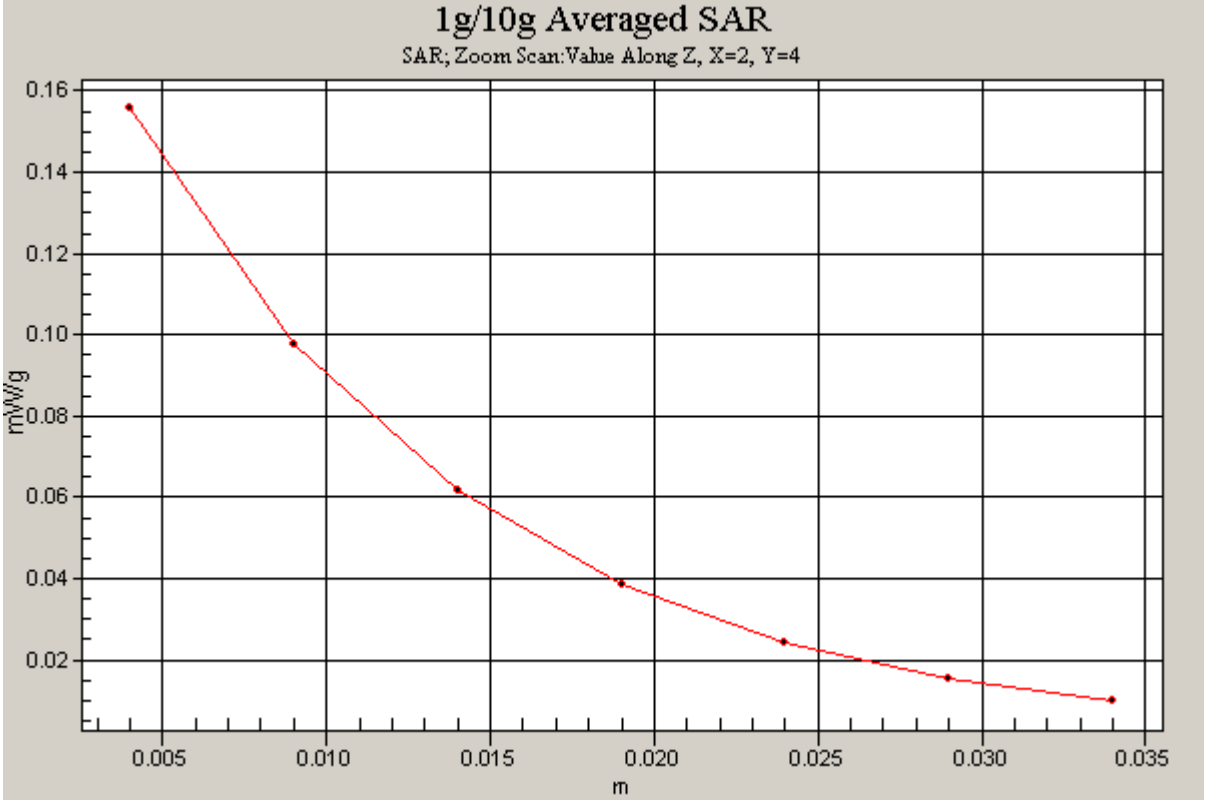


Figure 53 Z-Scan at power reference point (Body, Towards Phantom, GSM 1900 Channel 661)

Date/Time: 11/24/2008 10:38:29 PM

GSM 1900 Earphone Towards Ground Low

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

Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.49 mho/m; ε_r = 53.1; ρ = 1000 kg/m^3

Probe: EX3DV4 - SN3660; ConvF(7.45, 7.45, 7.45);

Electronics: DAE3 Sn536;

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

Maximum value of SAR (interpolated) = 0.326 mW/g

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

Reference Value = 10.9 V/m; Power Drift = -0.011 dB

Peak SAR (extrapolated) = 0.478 W/kg

SAR(1 g) = 0.289 mW/g; SAR(10 g) = 0.168 mW/g

Maximum value of SAR (measured) = 0.317 mW/g

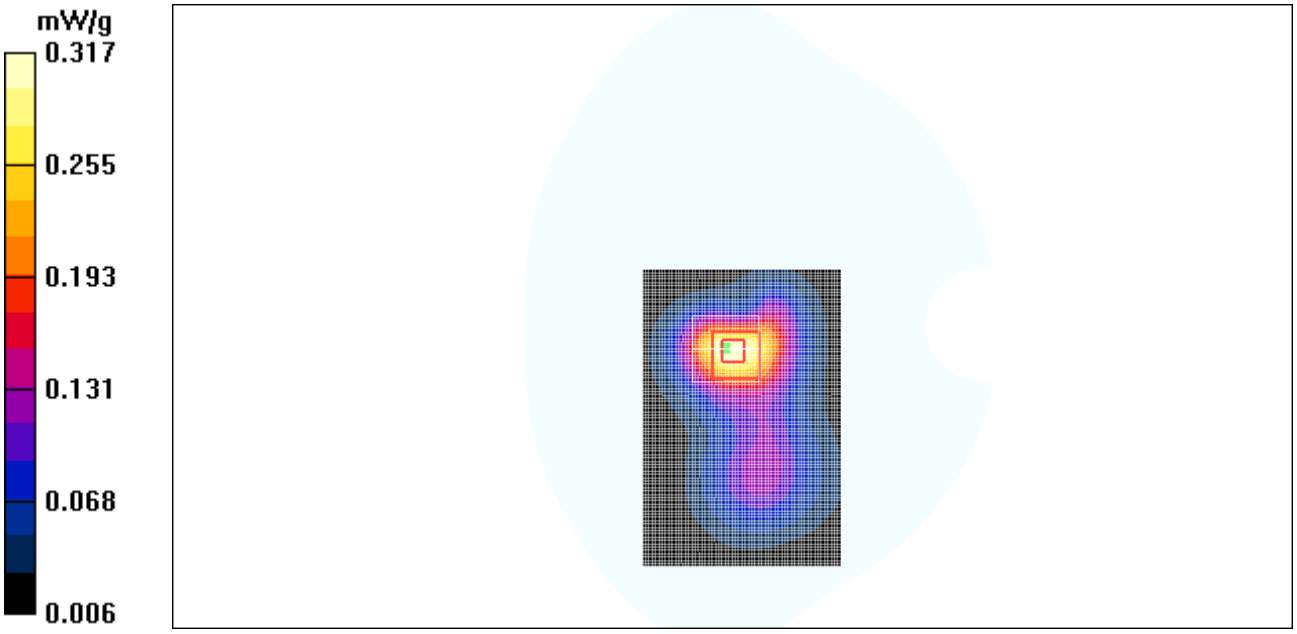


Figure 54 Body with Earphone, Towards Ground, GSM 1900, Channel 512

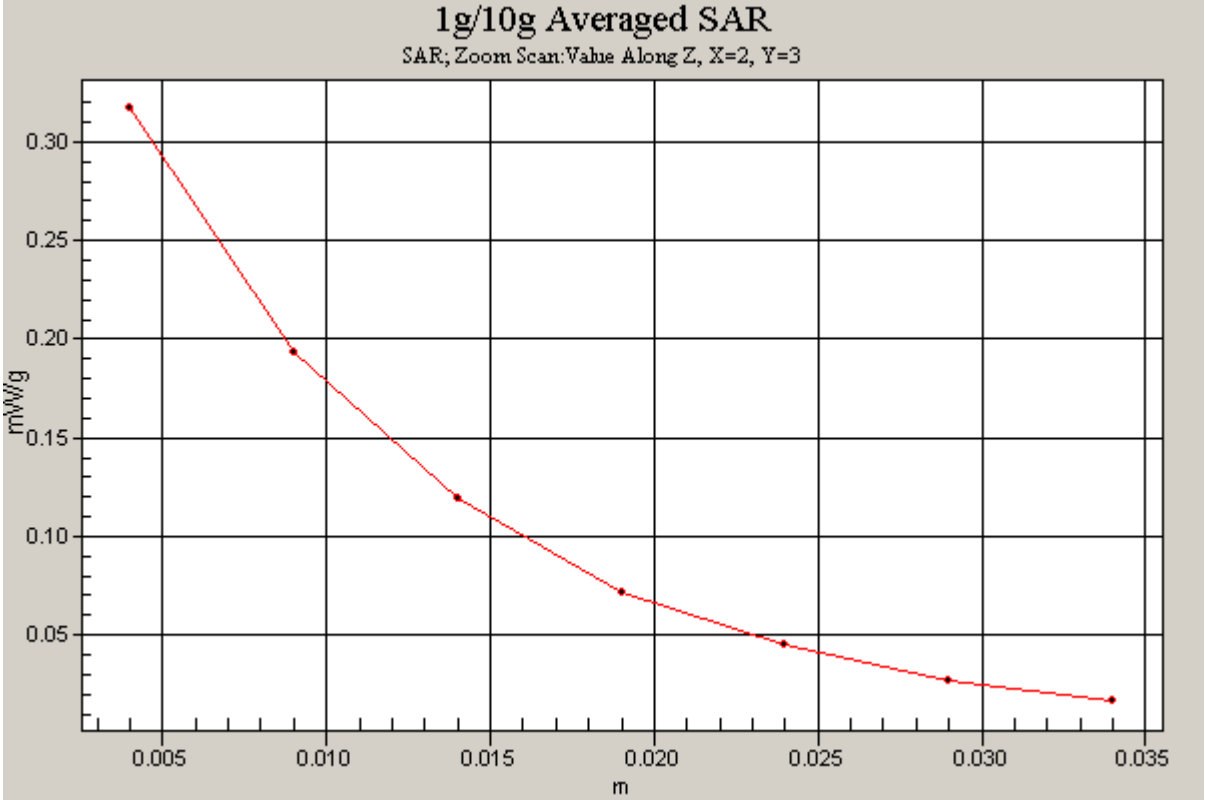


Figure 55 Z-Scan at power reference point (Body with Earphone, Towards Ground, GSM 1900, Channel 512)

ANNEX D： 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 MHz; σ = 0.9113 mho/m; ε_r = 42.24; ρ = 1000 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

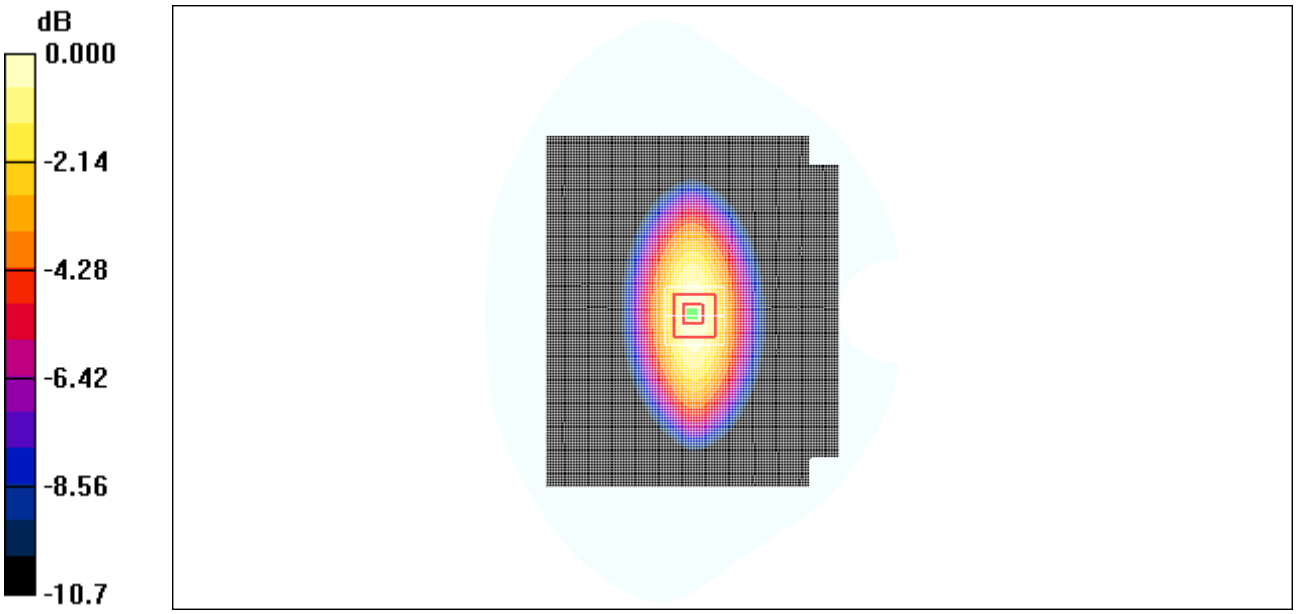
d=15mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

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



0 dB = 2.83mW/g

Figure 56 System Performance Check 835MHz 250mW

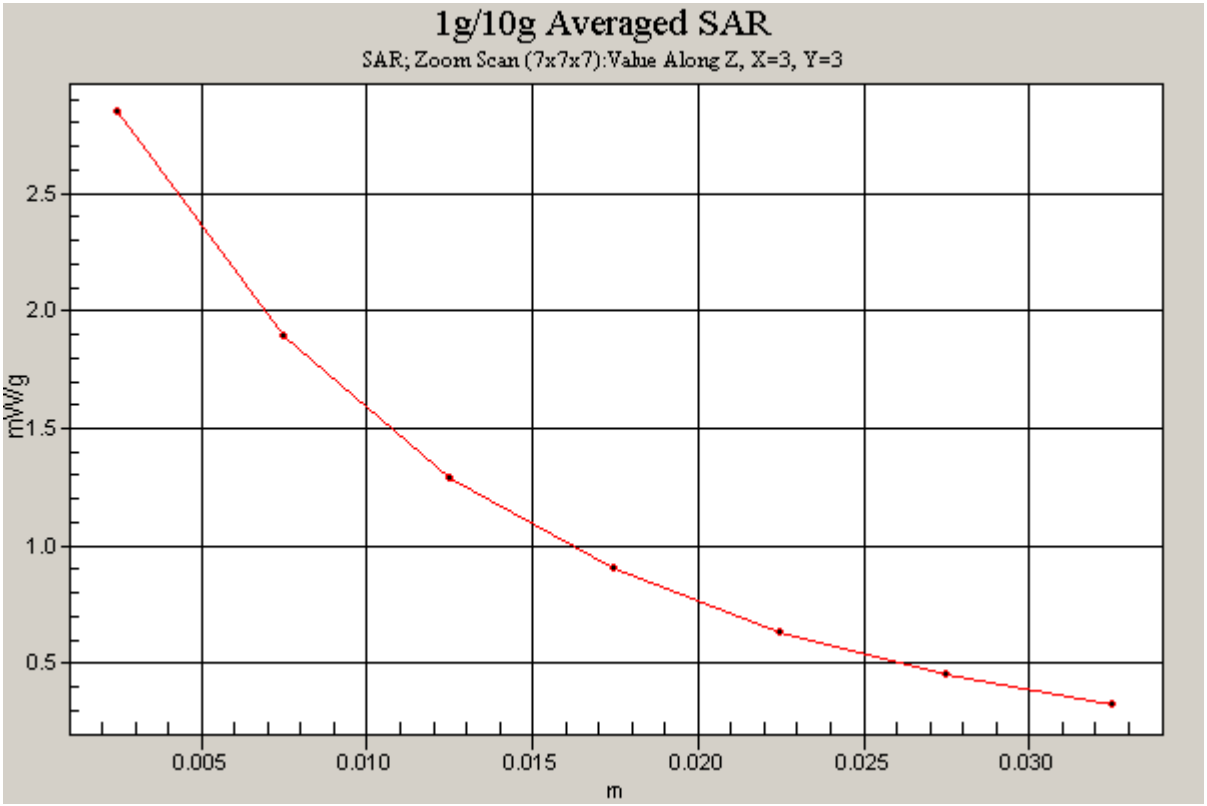


Figure 57 Z-Scan at power reference point (system validation at 835 MHz dipole)

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 MHz; σ = 1.393 mho/m; ε_r = 40.12; ρ = 1000 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

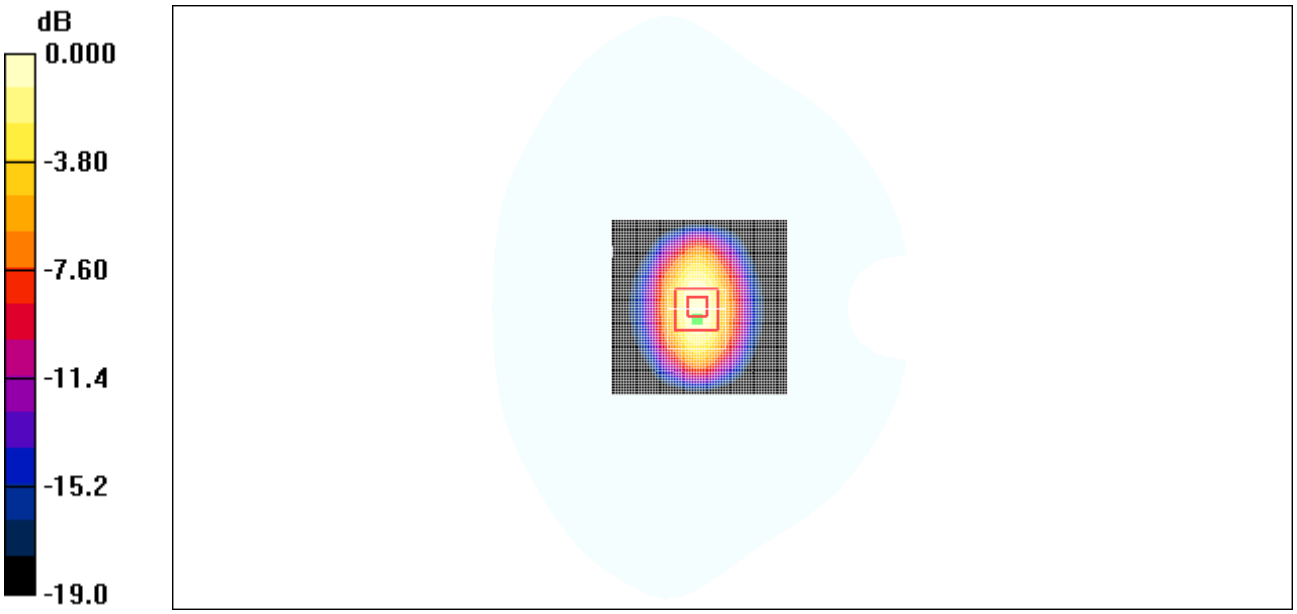
d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

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



0 dB = 11.1mW/g

Figure 58 System Performance Check 1900MHz 250mW

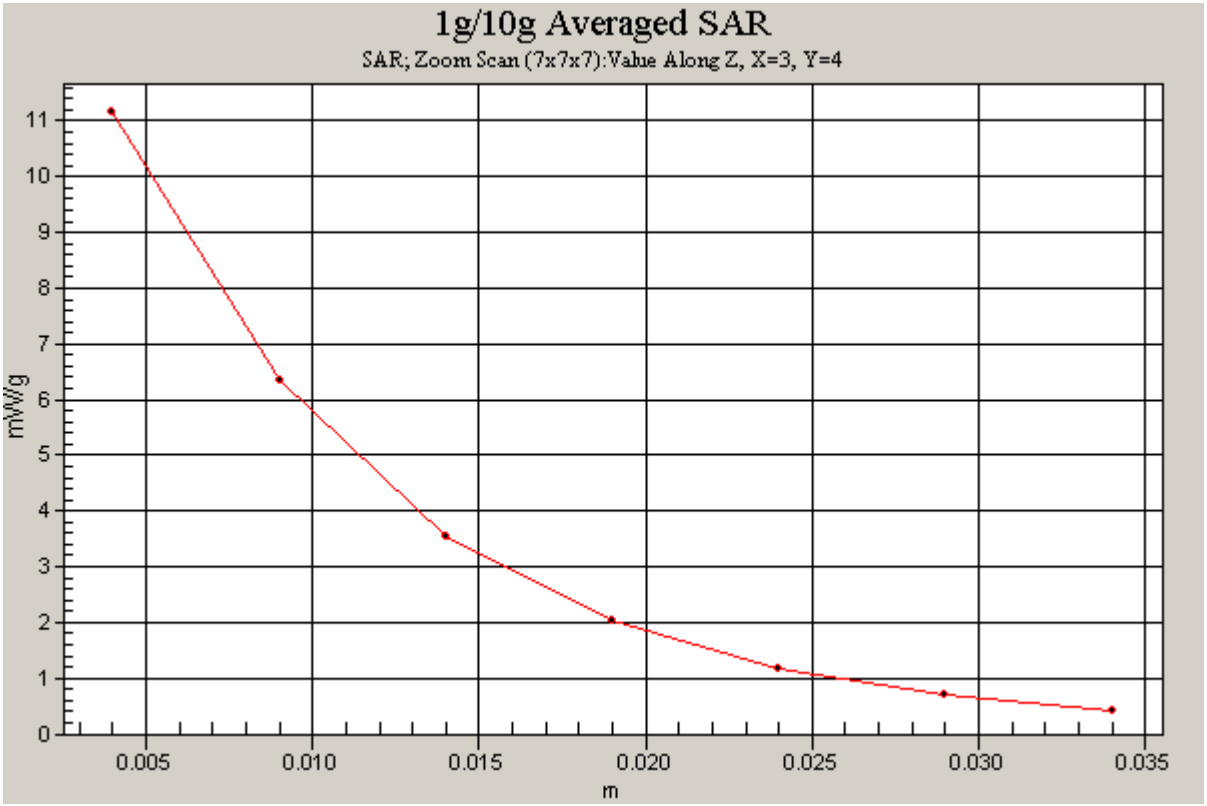


Figure 59 Z-Scan at power reference point (system validation at 1900 MHz dipole)