



NO.: RZA2008-0730



OET 65

TEST REPORT

Test name	Electromagnetic Field (Specific Absorption Rate)
Product	WCDMA/GPRS/GSM Mobile Phone with Bluetooth
Model	U5800/V730/Vodafone 730
FCC ID	QISV730
Client	Huawei Technologies Co., Ltd.

TA Technology (Shanghai) Co., Ltd.



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GENERAL SUMMARY

Product	WCDMA/GPRS/GSM Mobile Phone with Bluetooth	Model	U5800/V730 /Vodafone 730
Client	Huawei Technologies Co., Ltd.	Type of test	Entrusted
Manufacturer	Huawei Technologies Co., Ltd.	Arrival Date of sample	June.2 nd , 2008
Place of sampling	(Blank)	Carrier of the samples	Yan Xie
Quantity of the samples	One	Date of product	(Blank)
Base of the samples	(Blank)	Items of test	SAR
IMEI No.	354267020002512		
Standard(s)	EN 50360–2001: Product standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones. EN 50361–2001: Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones. ANSI C95.1–1999: 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 Body 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). Vodafone SAR_Data_cards_V1.1: Global Test Specification for Terminals for Performance Measurements –Performance TST- Specific Absorption Rate (SAR) for Data Cards and External Antennas.		
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 6.2 of this test report. Maximum localized SAR is below exposure limits specified in the relevant standards cited in Clause 6.1 of this test report. General Judgment: Pass (Stamp) Date of issue: June. 10th, 2008		
Comment	The test result only responds to the measured sample.		

Approved by 郑晨光
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1 COMPETENCE AND WARRANTIES

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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	Huawei Technologies Co., Ltd.
Address/Post	Bantian, Longgang District
City	Shenzhen
Postal Code	518129
Country	P.R. China
Telephone	0755-28780808
Fax	0755-28780808

Table 2: Manufacturer

Name or Company	Huawei Technologies Co., Ltd.
Address/Post	Bantian, Longgang District
City	Shenzhen
Postal Code	518129
Country	P.R. China
Telephone	0755-28780808
Fax	0755-28780808

3.2 Constituents of EUT

Table 3: Constituents of Samples

Description	Model	IMEI	Manufacturer
Handset	U5800/V730 /Vodafone 730	354267020002512	Huawei Technologies Co.,Ltd.
Lithium Battery	HBU570	FMT7B0100168Y	FMT Electronics Co.,Ltd.
AC/DC Adapter	TPCA-050065UY	TP17A1602842	TECH-POWER INTERNATIONAL CO.,LTD
	CHG5065-3C	HKY7C2200005	Shen Zhen Huntkey Power Technology Co.,Ltd
	HS-050040E2	TPI810600016	TECH-POWER INTERNATIONAL CO.,LTD
	HS-050040E2	HKA812200001	Shen Zhen Huntkey Power Technology Co.,Ltd

Note:

The EUT appearances see ANNEX G.

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3.3 Operating conditions

Mode	GSM1900
TX frequency range	1850.2~1909.8MHz
RX frequency range	1930.2 ~1989.8 MHz
Standard output power	30dBm (1W)
Power level	Tested with power level 0
Modulation	GMSK

3.4 General Description

Equipment Under Test (EUT) is a model of WCDMA/GPRS/GSM Mobile Phone with Bluetooth 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 1900. It has the GPRS and Bluetooth functions, the GPRS class is 10.

The sample undergoing test was selected by the Client.

Components list please refer to documents of the manufacturer.

Under the loop back mode between mobile station and E5515C, the transmitter continuously emits with maximum power more strong than voice mode, so the SAR test was done with loop back mode. 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 "all up" and 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 OPERATIONAL CONDITIONS DURING TEST

4.1 GSM Test Configuration

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

Since the EUT not only has the data transfer function, but also have the speech transfer function.

The test in the band of GSM 1900 is 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. According to specification 3GPP TS 51.010, the maximum power of the GSM can do the power reduction for the multi-slot. The allowed power reduction in the multi-slot configuration is as following:

Number of timeslots in uplink assignment	Permissible nominal reduction of maximum output power,(dB)
1	0
2	0 to 3.0

For this EUT, the tests for GSM 1900 GPRS bands will be performed under the following 2 setups at one same test position:

- 1) Using 1 timeslot in uplink with the power of 30 dBm for GSM1900
- 2) Using 2 timeslots in uplink with the power reduced 2dB

After drawn the worst case, the tests will be continued to perform with the same EUT setup for the whole tests for GSM 1900 of GPRS.

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 $\pm 0.02\text{mm}$. Special E- and H-field probes have been developed for measurements close to material discontinuity, the sensors of which are directly loaded with a Schottky diode and connected via highly resistive lines (length = 300mm) to the data acquisition unit.

A cell controller system contains the power supply, robot controller, teaches pendant (Joystick) and remote control, is used to drive the robot motors. The PC consists of the Micron Pentium III 800 MHz computer with Windows 2000 system and SAR Measurement Software DASY4, 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.

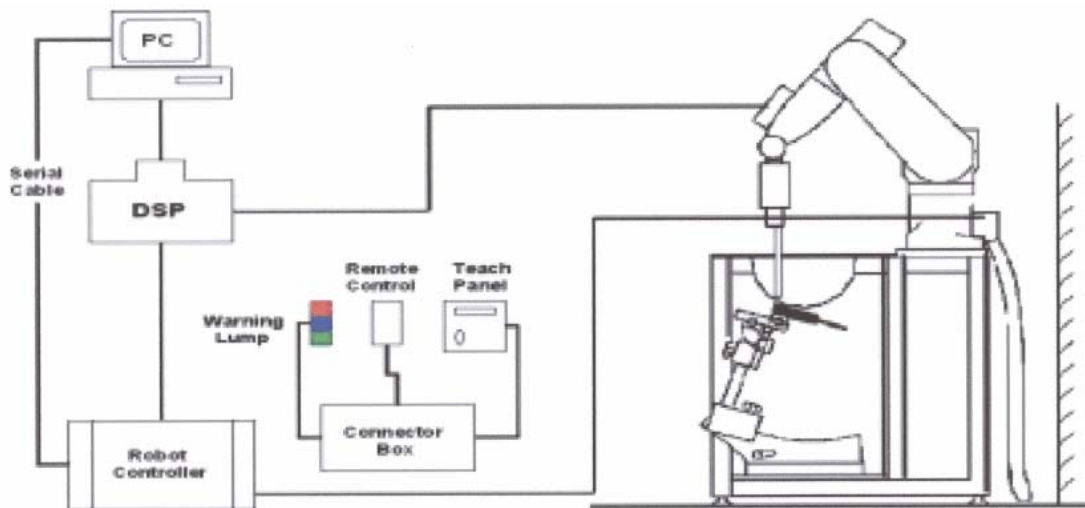


Figure 1. SAR Lab Test Measurement Set-up

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 ET3DV6 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe has been calibrated according to the standard procedure with an accuracy of better than $\pm 10\%$. The spherical isotropy was evaluated and found to be better than $\pm 0.25\text{dB}$.

ET3DV6 Probe Specification

Construction	Symmetrical design with triangular core Built-in optical fiber for surface detection System (ET3DV6 only) Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., glycol)
Calibration	In air from 10 MHz to 2.5 GHz In brain and muscle simulating tissue at frequencies of 900MHz, 1750MHz, 1950MHz and 2450MHz (accuracy $\pm 8\%$) Calibration for other liquids and frequencies upon request
Frequency	10 MHz to > 6 GHz; Linearity: $\pm 0.2\text{ dB}$ (30 MHz to 3 GHz)
Directivity	$\pm 0.2\text{ dB}$ in brain tissue (rotation around probe axis) $\pm 0.4\text{ dB}$ in brain tissue (rotation around probe axis)
Dynamic Range	5u W/g to > 100mW/g; Linearity: $\pm 0.2\text{dB}$
Surface Detection	$\pm 0.2\text{ mm}$ repeatability in air and clear liquids over diffuse reflecting surface (ET3DV6 only)
Dimensions	Overall length: 330mm Tip length: 16mm Body diameter: 12mm Tip diameter: 6.8mm Distance from probe tip to dipole centers: 2.7mm
Application	General dosimetry up to 3GHz Compliance tests of mobile phones Fast automatic scanning in arbitrary phantoms

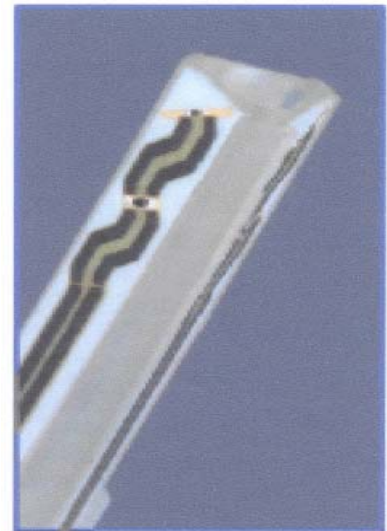


Figure 2. ET3DV6 E-field Probe

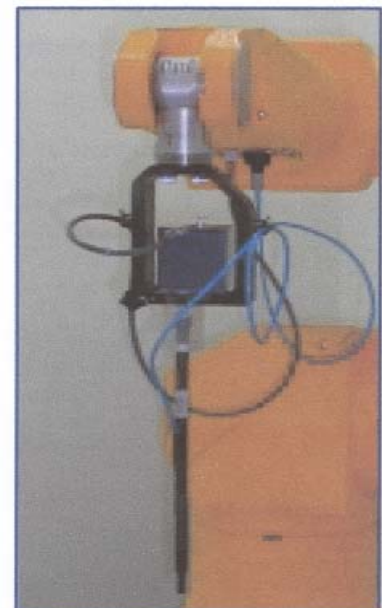


Figure 3. ET3DV6 E-field probe

5.3 E-field Probe Calibration

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

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

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

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

Where: Δt = Exposure time (30 seconds),

C = Heat capacity of tissue (brain or muscle),

ΔT = Temperature increase due to RF exposure.

Or

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

Where:

σ = Simulated tissue conductivity,

ρ = Tissue density (kg/m^3).

5.4 Other Test Equipment

5.4.1 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 repeatedly 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

5.4.2 Phantom

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

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



Figure 5. Generic Twin Phantom

5.5 Equivalent Tissues

The liquid used for the frequency range of 1800-2000 MHz consisted of water, salt, and Glycol monobutyl. The liquid has previously been proven to be suited for worst-case. The Table 4 and Table 5 show the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the IEEE 1528.

Table 4: Composition of the Head Tissue Equivalent Matter

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 5: Composition of the Body Tissue Equivalent Matter

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

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 2000

Data Converter

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

Software: DASY4 software

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

6 CHARACTERISTICS OF THE TEST

6.1 Applicable Limit Regulations

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

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

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

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

6.2 Applicable Measurement Standards

EN 50361–2001: Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones.

It specifies the measurement method for demonstration of compliance with the SAR limits for such equipments.

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

OET Bulletin 65 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)

Vodafone SAR_Data_cards_V1.1: Global Test Specification for Terminals for Performance Measurements –Performance TST- Specific Absorption Rate (SAR) for Data Cards and External Antennas.

7 LABORATORY ENVIRONMENT

Table 6: 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.	

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 and ERP for the EUT. In all cases, the measured peak output power should be greater and within 5% than EMI measurement.

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 11 to Table 13 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. These measurements were done at 3 channels 512, 661 and 810 before SAR test and after SAR test.

8.3.2 Measurement result

Table 7: Conducted Power Measurement Results

GSM 1900	Conducted Power		
	Channel 512	Channel 661	Channel 810
Before Test (dBm)	29.64	29.57	29.67
After Test (dBm)	29.60	29.53	29.66
GSM 1900+GPRS	Conducted Power		
	Channel 512	Channel 661	Channel 810
Before Test (dBm)	29.67	29.54	29.66
After Test (dBm)	29.62	29.51	29.62

9 TEST RESULTS

9.1 Dielectric Performance

Table 8: 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
1900 (Head)	Permittivity ϵ_r	40.00	39.68	-0.80 %
	Conductivity σ	1.40	1.43	2.14 %

Table 9: 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
1900 (Body)	Permittivity ϵ_r	53.30	52.06	-2.32 %
	Conductivity σ	1.52	1.52	0.00 %

9.2 System Validation

Table 10: System Validation

Measurement is made at temperature 23.2 °C, relative humidity 50%, and input power 250 mW. Liquid temperature during the test: 22.3°C							
Liquid parameters	Frequency	Permittivity ϵ		Conductivity σ (S/m)			
	39.68	1.43		39.68			
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
	1900MHz	4.98	9.45	4.93	9.36	-1.00%	-1.06%

Note:

- Target Values used derive from the SPEAG calibration certificate and 250 mW is used as feeding power to the validation dipole (SPEAG using).
- The graph results see ANNEX D.

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9.3 Summary of Measurement Results

Table 11: SAR Values (GSM1900, Head, Open)

Liquid Temperature: 22.5℃					
Limit of SAR (W/kg)		10 g Average	1 g Average	Power Drift (dB)	Graph Results
		2.0	1.6	± 0.2	
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	0.372	0.621	-0.196	Figure 7
	Middle	0.312	0.520	0.062	Figure 9
	Low	0.281	0.469	0.168	Figure 11
Left hand, Tilt 15 Degree	High	0.038	0.057	-0.098	Figure 13
	Middle	0.033	0.049	0.167	Figure 15
	Low	0.028	0.041	0.188	Figure 17
Right hand, Touch cheek	High	0.168	0.248	0.125	Figure 19
	Middle	0.155	0.227	0.065	Figure 21
	Low	0.135	0.196	-0.022	Figure 23
Right hand, Tilt 15 Degree	High	0.029	0.042	-0.031	Figure 25
	Middle	0.024	0.034	-0.020	Figure 27
	Low	0.023	0.032	-0.035	Figure 29

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

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Table 12: SAR Values (GSM1900, Body, Open, 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	± 0.2	
Test Case Of Body		Measurement Result (W/kg)		Power Drift (dB)	
		10 g Average	1 g Average		
Different Test Position	Channel				
Towards Ground	High	0.196	0.298	-0.080	Figure 31
	Middle	0.170	0.257	-0.046	Figure 33
	Low	0.144	0.217	0.034	Figure 35
Worst case position of Body with Earphone					
Towards Ground	High	0.196	0.301	0.023	Figure 37
Worst case position of Body with Bluetooth Earphone					
Towards Ground	High	0.227	0.345	-0.167	Figure 39
Test Case Of Body with GPRS(2 timeslots in uplink)					
Towards Ground	High	0.394	0.596	-0.072	Figure 41
	Middle	0.349	0.522	-0.099	Figure 43
	Low	0.274	0.411	0.010	Figure 45

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Table 13: SAR Values (GSM1900, Body, Close, 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	± 0.2	
Test Case Of Body		Measurement Result (W/kg)		Power Drift (dB)	
		10 g Average	1 g Average		
Different Test Position	Channel				
Towards Ground	High	0.120	0.212	-0.003	Figure 47
	Middle	0.097	0.171	0.011	Figure 49
	Low	0.087	0.130	0.011	Figure 51
Towards Phantom	High	0.069	0.111	-0.063	Figure 53
	Middle	0.062	0.101	-0.014	Figure 55
	Low	0.051	0.082	-0.006	Figure 57
Worst case position of Body with Earphone					
Towards Ground	High	0.161	0.297	-0.084	Figure 59
Worst case position of Body with Bluetooth Earphone					
Towards Ground	High	0.210	0.318	-0.068	Figure 61
Test Case Of Body with GPRS(2 timeslots in uplink)					
Towards Ground	High	0.218	0.383	-0.068	Figure 63
	Middle	0.202	0.304	0.020	Figure 65
	Low	0.167	0.258	-0.054	Figure 67
Towards Phantom	High	0.100	0.163	-0.001	Figure 69
	Middle	0.094	0.149	-0.033	Figure 71
	Low	0.080	0.126	-0.097	Figure 73

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 6.2 of this report. Maximum localized SAR is below exposure limits specified in the relevant standards cited in Clause 6.1 of this test report.

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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	$\sqrt{3}$	$(1-c_p)^{1/2}$	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	

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11 MAIN TEST INSTRUMENTS

Table 14: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	Agilent 8753E	US37390326	September 15, 2007	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 15, 2007	One year
06	Amplifier	IXA-020	0401	No Calibration Requested	
07	BTS	E5515C	GB46490218	September 15, 2007	One year
08	E-field Probe	ET3DV6	1531	January 29, 2008	One year
09	DAE	DAE3	452	September 6, 2007	One year
10	Validation Kit 1900MHz	D1900V2	5d018	March 21, 2008	One year

12 TEST PERIOD

The test is performed from June 6, 2008 to June 8, 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 SAR distribution at the exposed side of the head was measured at a distance of 3.9 mm from the inner surface of the shell. The area covered the entire dimension of the head and the horizontal grid spacing was 20 mm x 20 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 7 x 7 points. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

- a. The data at the surface were extrapolated, since the center of the dipoles is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2 mm. The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.
- b. The maximum interpolated value was searched with a straightforward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1g or 10g) were computed using the 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the "Not a knot"-condition (in x ~ y and z-directions). The volume was integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the average.
- c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

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

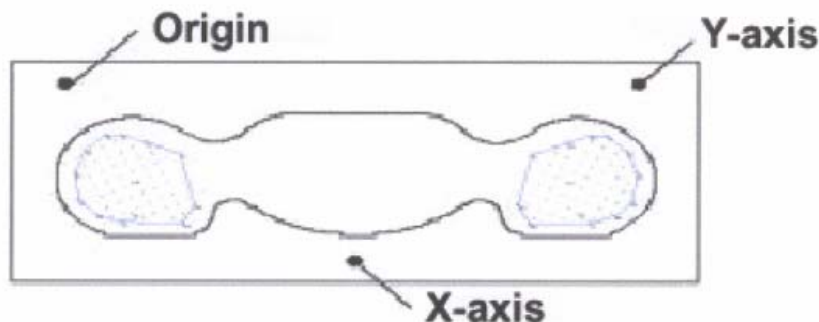
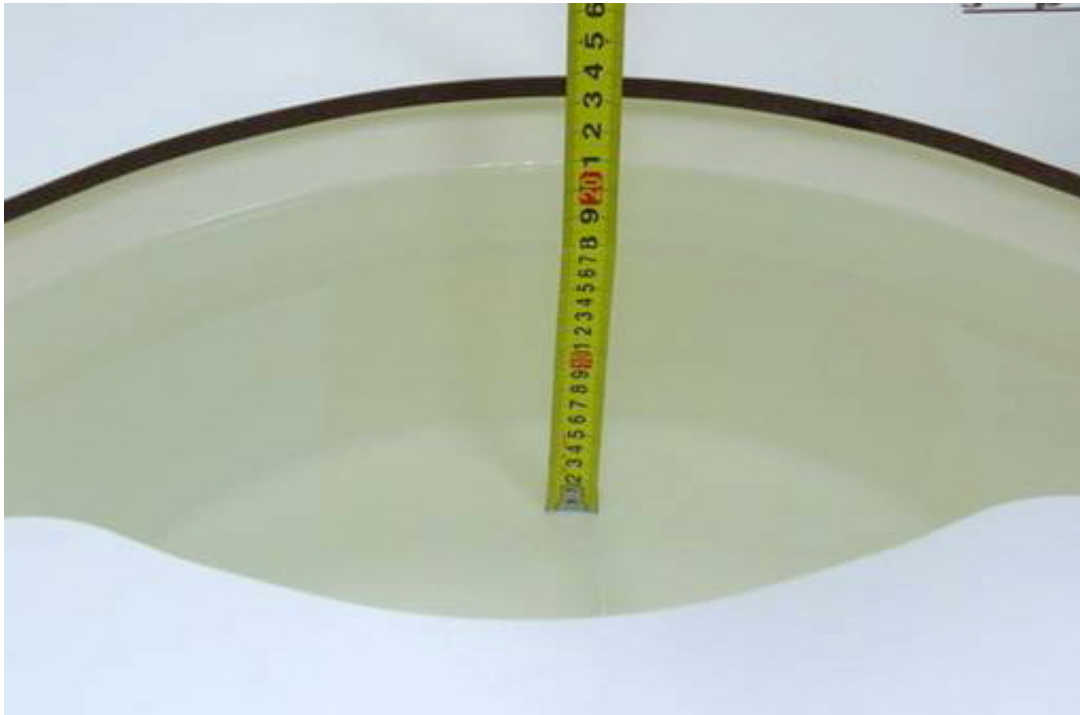


Figure 6 SAR Measurement Points in Area Scan

ANNEX B: TEST LAYOUT



Picture 1 Specific Absorption Rate Test Layout



Picture 2: Liquid depth in the Phantom (1900 MHz)



Picture 3: liquid depth in the head Phantom (1900 MHz)

ANNEX C: GRAPH RESULTS

GSM 1900 Left Cheek High Open

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

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.44$ mho/m; $\epsilon_r = 39.7$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(5.15, 5.15, 5.15);

Electronics: DAE3 Sn452;

Cheek High/Area Scan (51x141x1): Measurement grid: $dx=15$ mm, $dy=15$ mm

Maximum value of SAR (interpolated) = 0.715 mW/g

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

Reference Value = 0.878 V/m; Power Drift = -0.196 dB

Peak SAR (extrapolated) = 0.945 W/kg

SAR(1 g) = 0.621 mW/g; SAR(10 g) = 0.372 mW/g

Maximum value of SAR (measured) = 0.682 mW/g

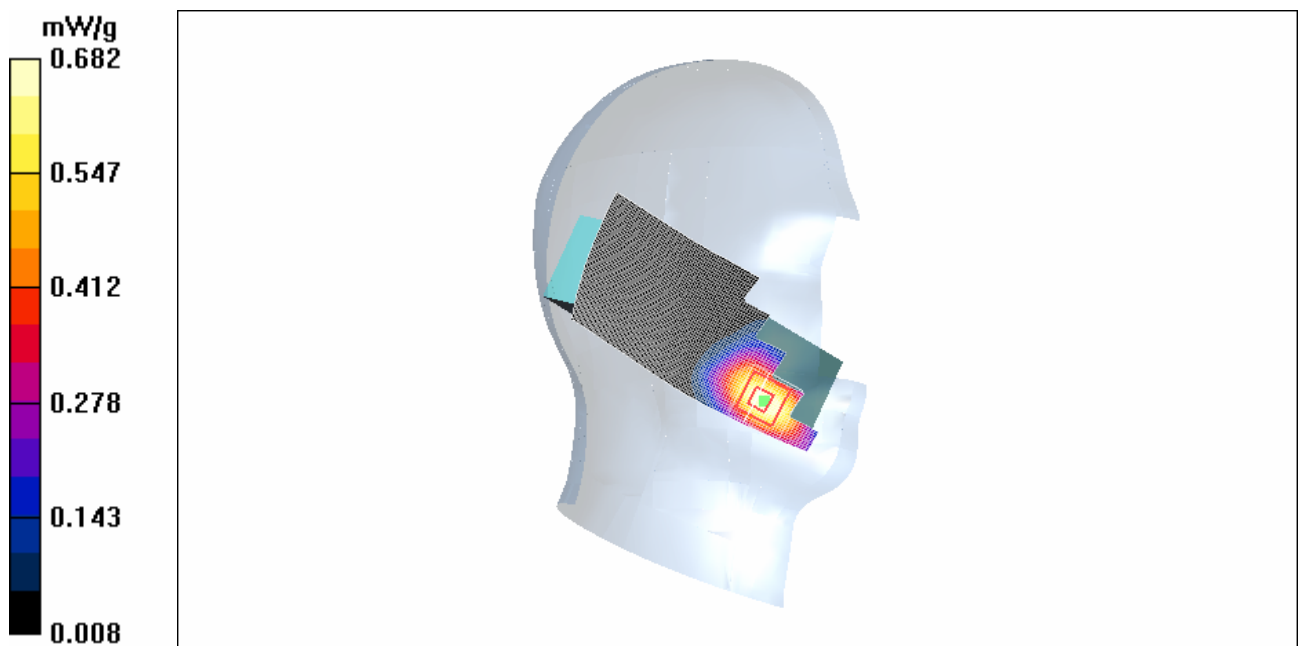


Figure 7 Left Hand Touch Cheek Open GSM 1900 Channel 810

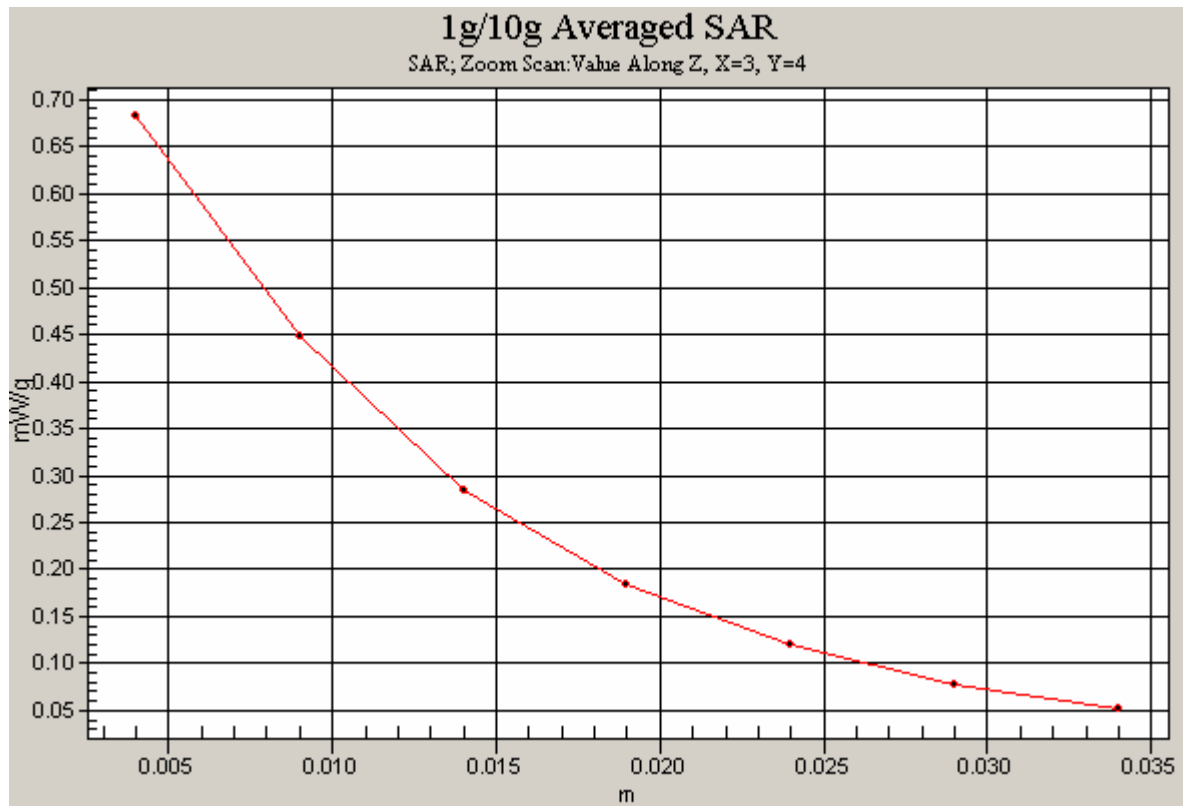


Figure 8 Z-Scan at power reference point (Left Hand Touch Cheek Open GSM 1900 Channel 810)

GSM 1900 Left Cheek Middle Open

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.41$ mho/m; $\epsilon_r = 39.7$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(5.15, 5.15, 5.15);

Electronics: DAE3 Sn452;

Cheek Middle/Area Scan (51x141x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.572 mW/g

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

Reference Value = 0.696 V/m; Power Drift = 0.062 dB

Peak SAR (extrapolated) = 0.774 W/kg

SAR(1 g) = 0.520 mW/g; SAR(10 g) = 0.312 mW/g

Maximum value of SAR (measured) = 0.572 mW/g

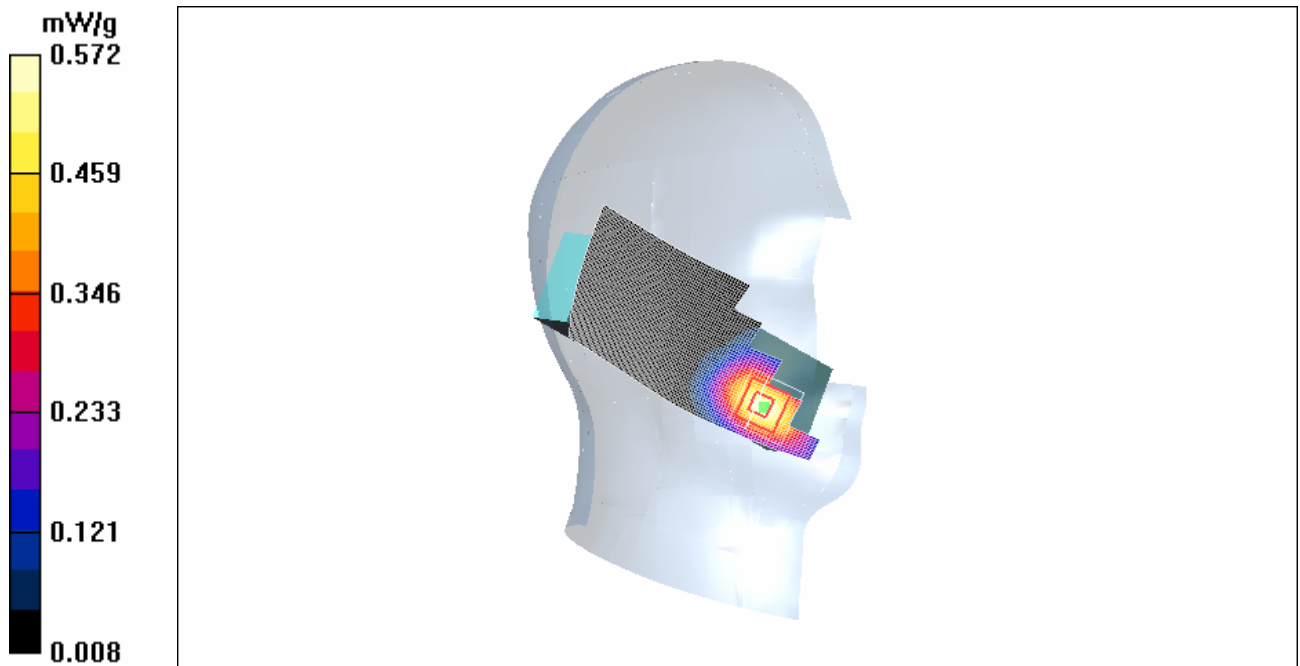


Figure 9 Left Hand Touch Cheek Open GSM 1900 Channel 661

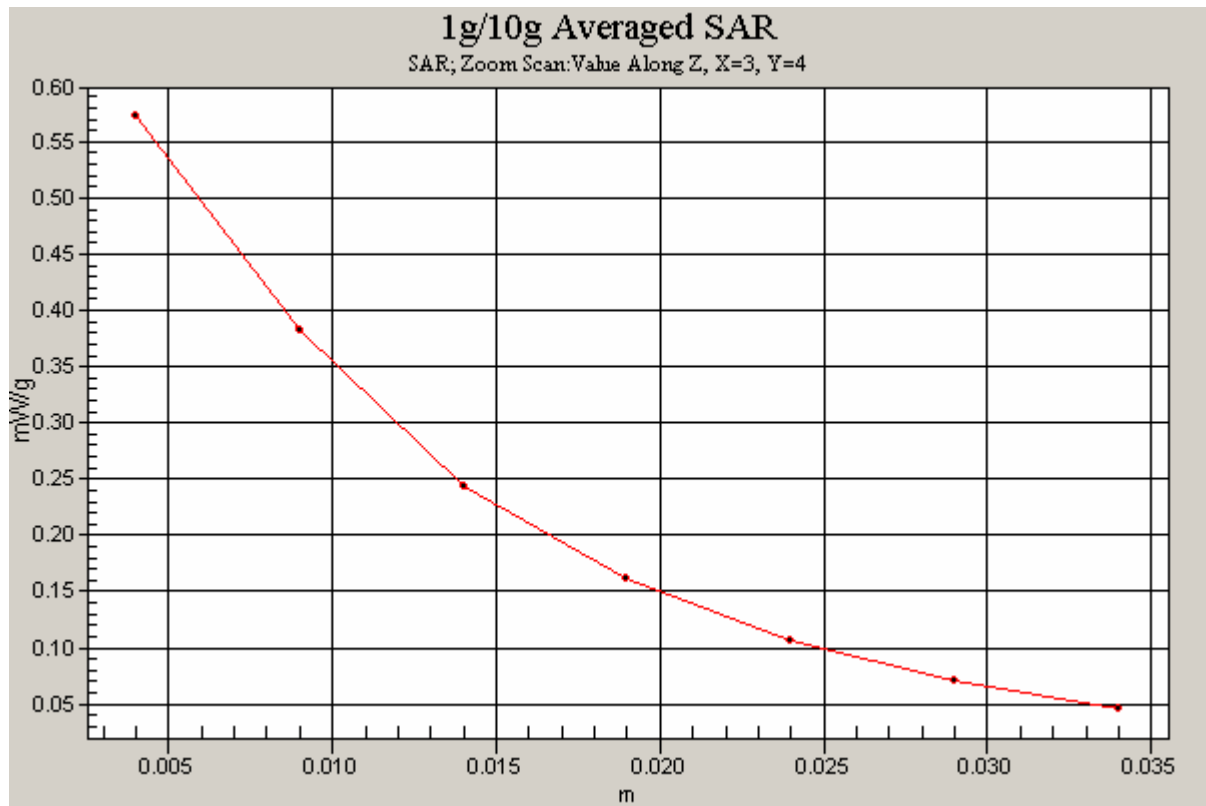


Figure 10 Z-Scan at power reference point (Left Hand Touch Cheek Open GSM 1900 Channel 661)

GSM 1900 Left Cheek Low Open

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

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 39.9$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(5.15, 5.15, 5.15);

Electronics: DAE3 Sn452;

Cheek Low/Area Scan (51x141x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.533 mW/g

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

Reference Value = 0.751 V/m; Power Drift = 0.168 dB

Peak SAR (extrapolated) = 0.698 W/kg

SAR(1 g) = 0.469 mW/g; SAR(10 g) = 0.281 mW/g

Maximum value of SAR (measured) = 0.518 mW/g

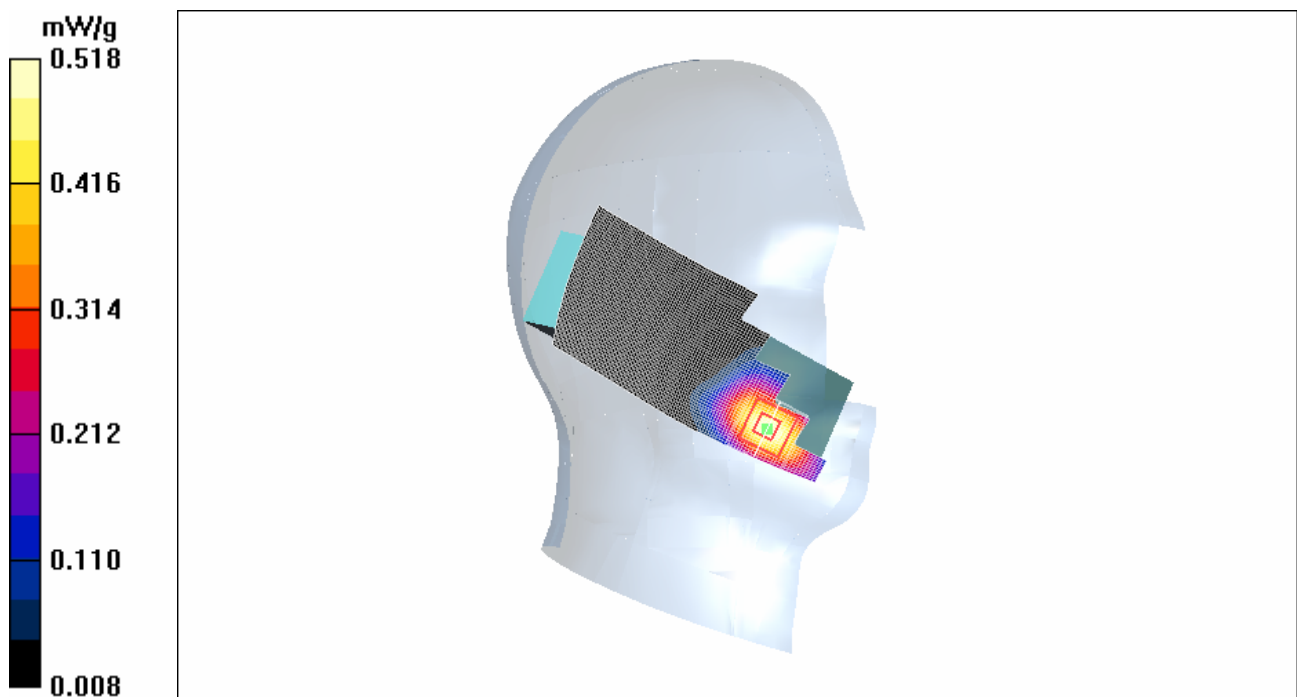


Figure 11 Left Hand Touch Cheek Open GSM 1900 Channel 512

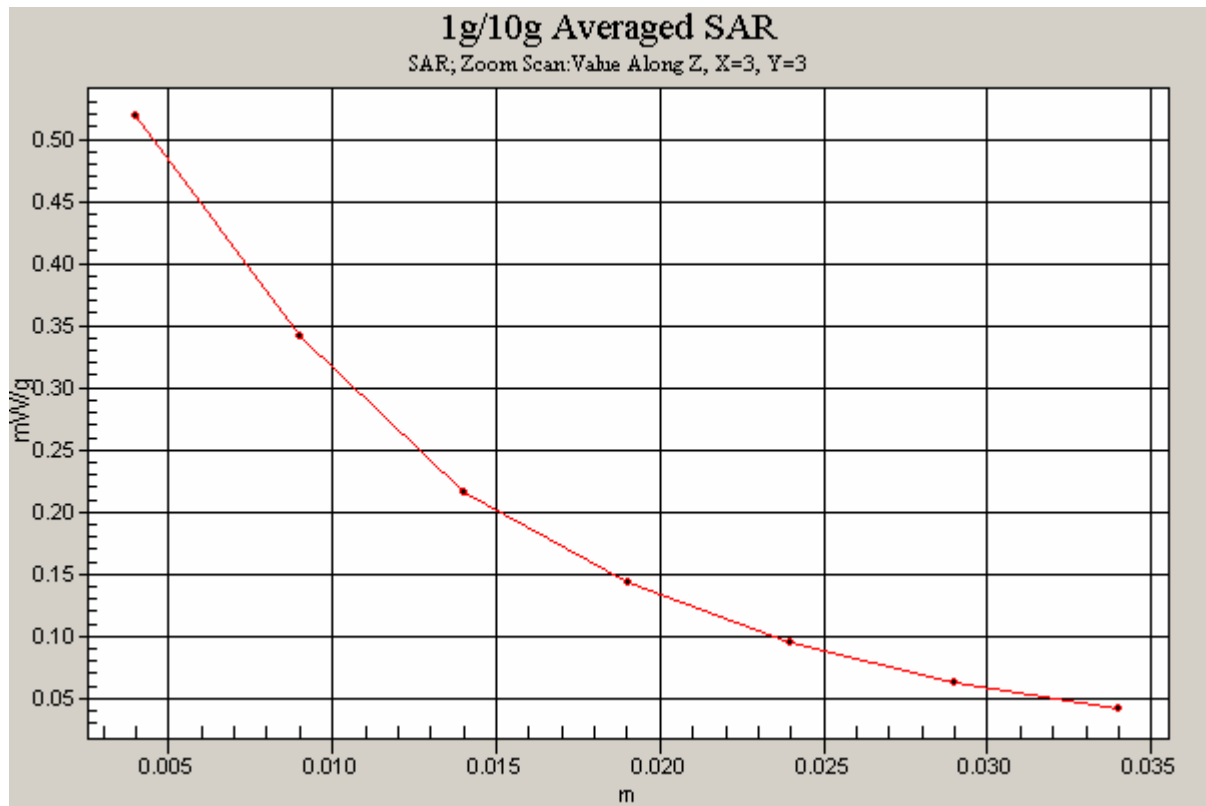


Figure 12 Z-Scan at power reference point (Left Hand Touch Cheek Open GSM 1900 Channel 512)

GSM 1900 Left Tilt High Open

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

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.44$ mho/m; $\epsilon_r = 39.7$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(5.15, 5.15, 5.15);

Electronics: DAE3 Sn452;

Tilt High/Area Scan (51x141x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.060 mW/g

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

Reference Value = 1.94 V/m; Power Drift = -0.098 dB

Peak SAR (extrapolated) = 0.081 W/kg

SAR(1 g) = 0.057 mW/g; SAR(10 g) = 0.038 mW/g

Maximum value of SAR (measured) = 0.061 mW/g

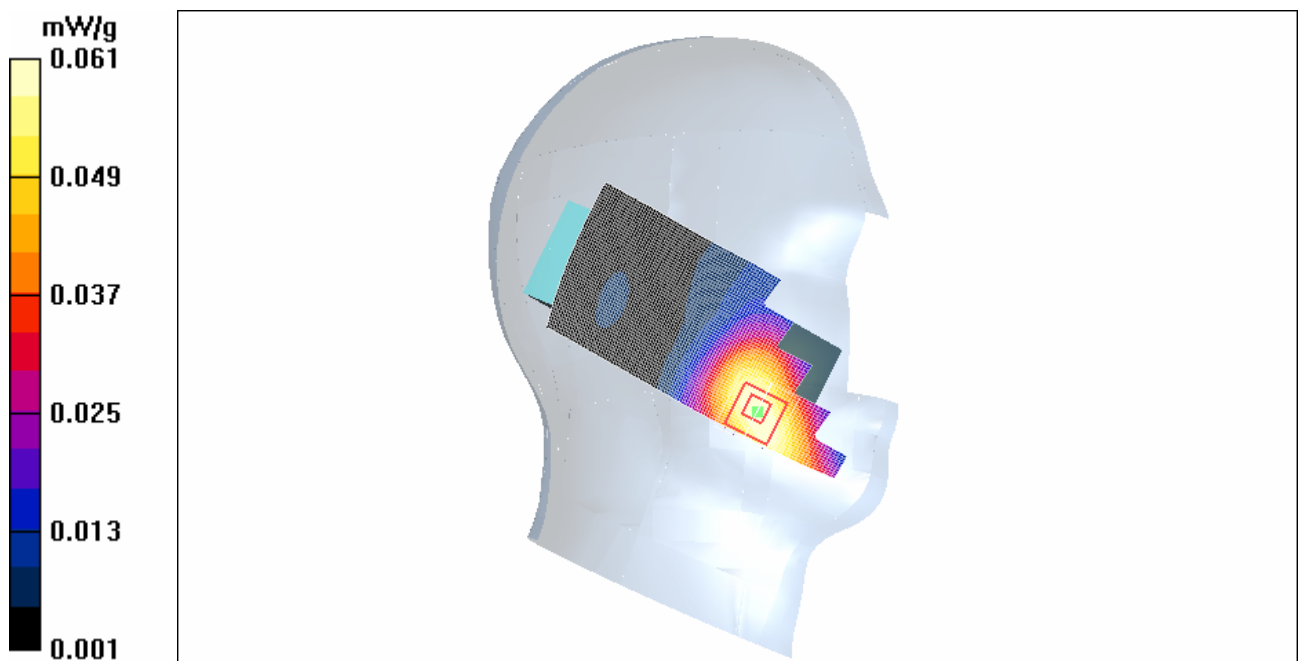


Figure 13 Left Hand Tilt 15°Open GSM 1900 Channel 810

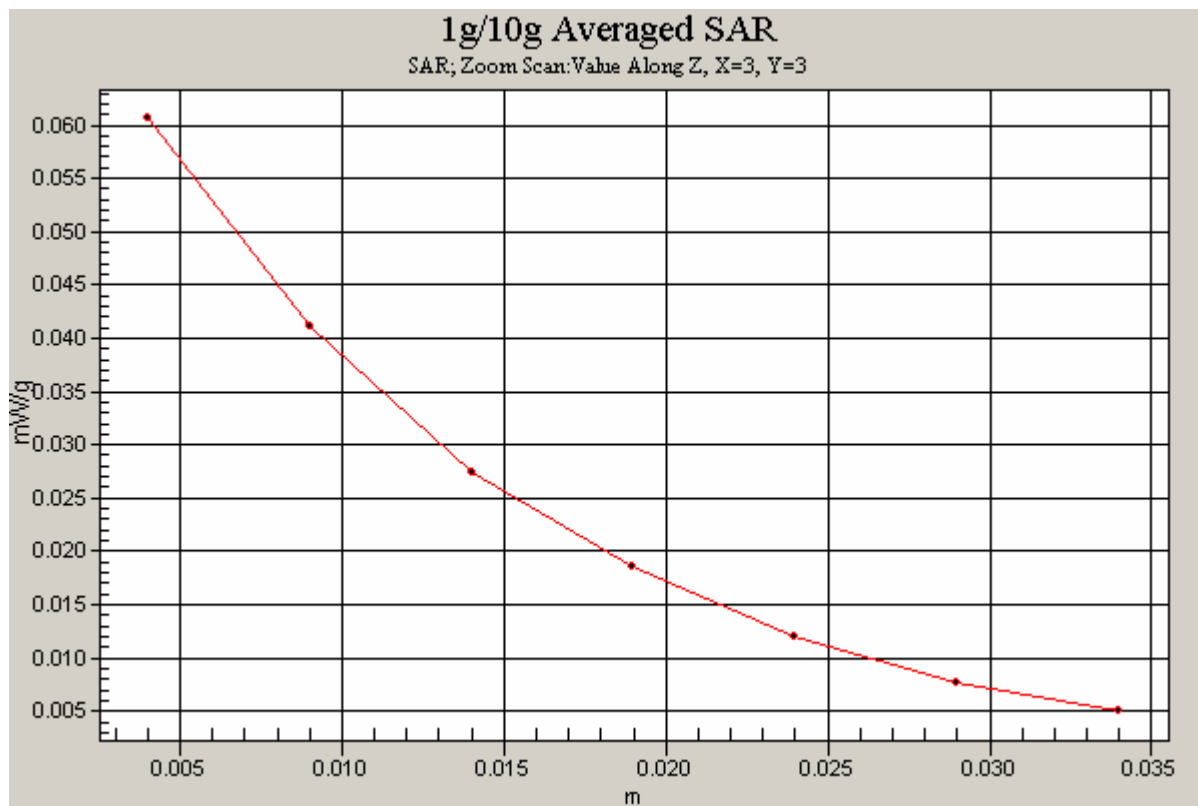


Figure 14 Z-Scan at power reference point (Left Hand Tilt 15° Open GSM 1900 Channel 810)

GSM 1900 Left Tilt Middle Open

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.41$ mho/m; $\epsilon_r = 39.7$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(5.15, 5.15, 5.15);

Electronics: DAE3 Sn452;

Tilt Middle/Area Scan (51x141x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.052 mW/g

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

Reference Value = 1.80 V/m; Power Drift = 0.167 dB

Peak SAR (extrapolated) = 0.067 W/kg

SAR(1 g) = 0.049 mW/g; SAR(10 g) = 0.033 mW/g

Maximum value of SAR (measured) = 0.052 mW/g

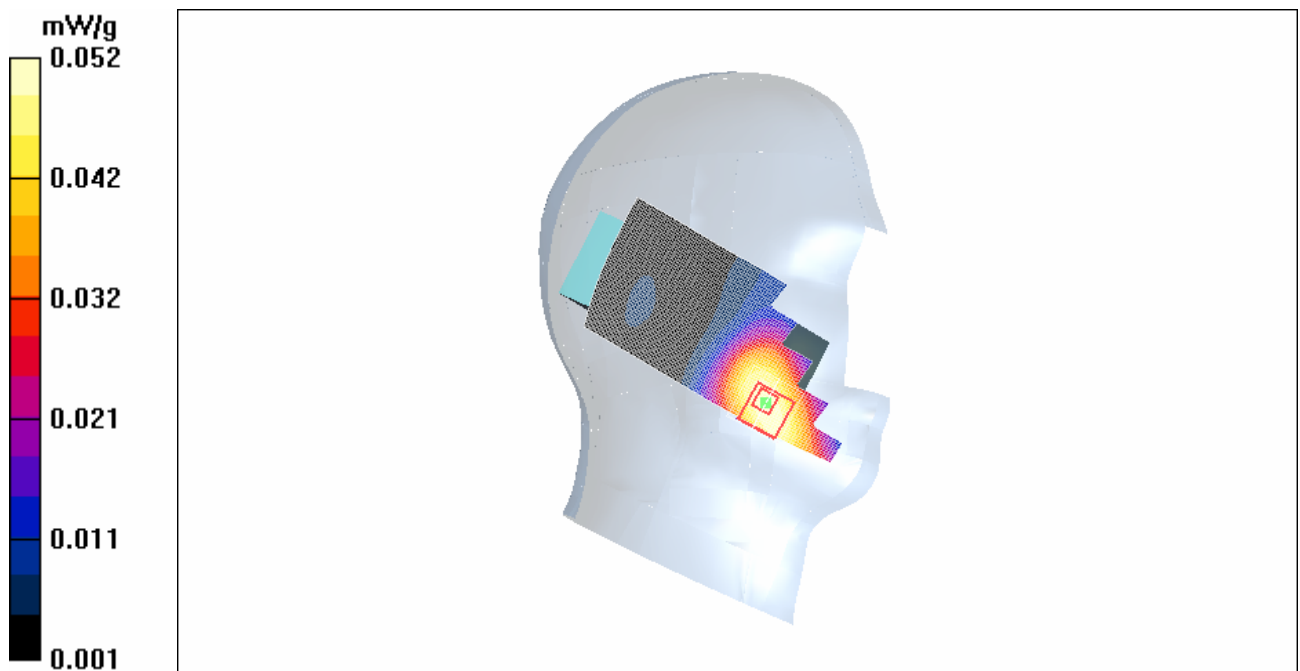


Figure 15 Left Hand Tilt 15° Open GSM 1900 Channel 661

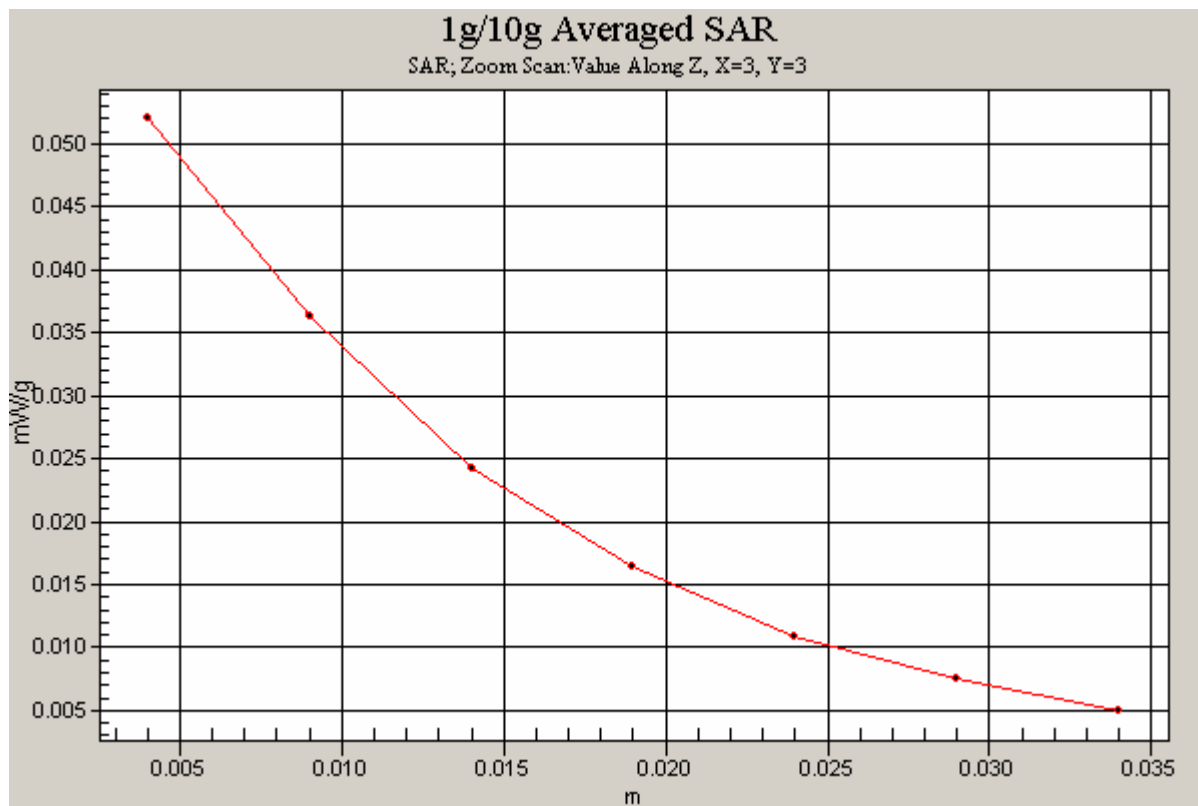


Figure 16 Z-Scan at power reference point (Left Hand Tilt 15° Open GSM 1900 Channel 661)

GSM 1900 Left Tilt Low Open

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

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 39.9$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(5.15, 5.15, 5.15);

Electronics: DAE3 Sn452;

Tilt Low/Area Scan (51x141x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.043 mW/g

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

Reference Value = 1.69 V/m; Power Drift = 0.188 dB

Peak SAR (extrapolated) = 0.057 W/kg

SAR(1 g) = 0.041 mW/g; SAR(10 g) = 0.028 mW/g

Maximum value of SAR (measured) = 0.044 mW/g

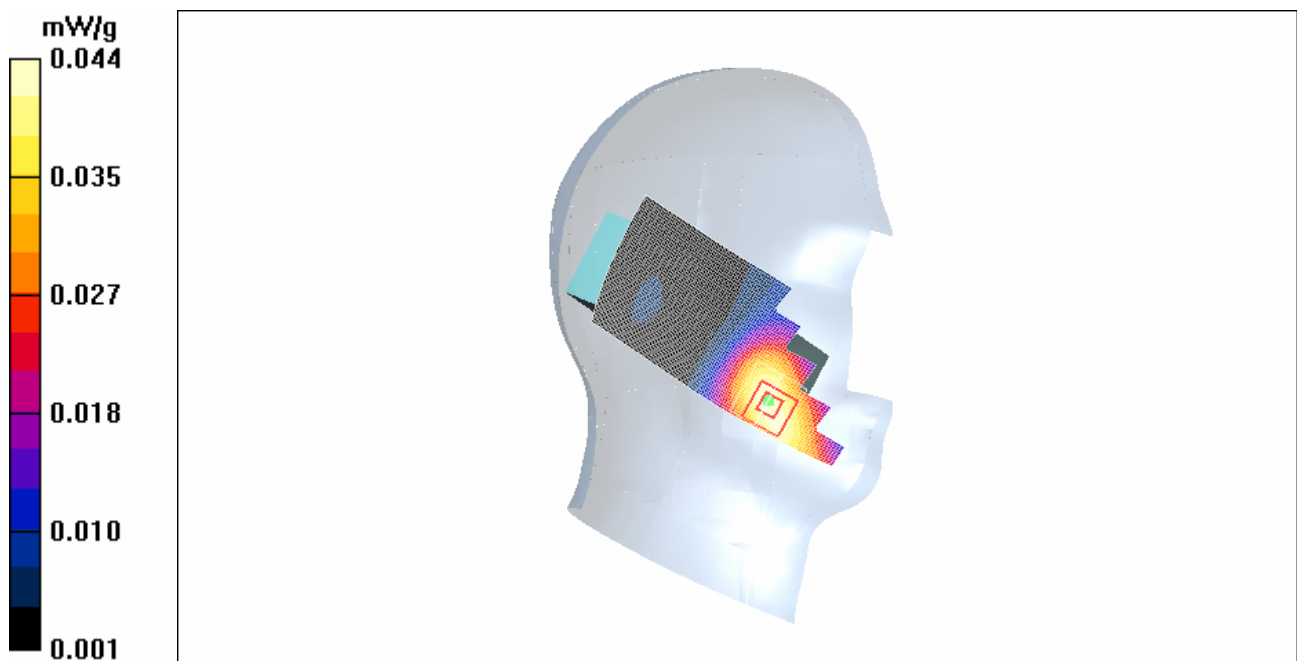


Figure 17 Left Hand Tilt 15° Open GSM 1900 Channel 512

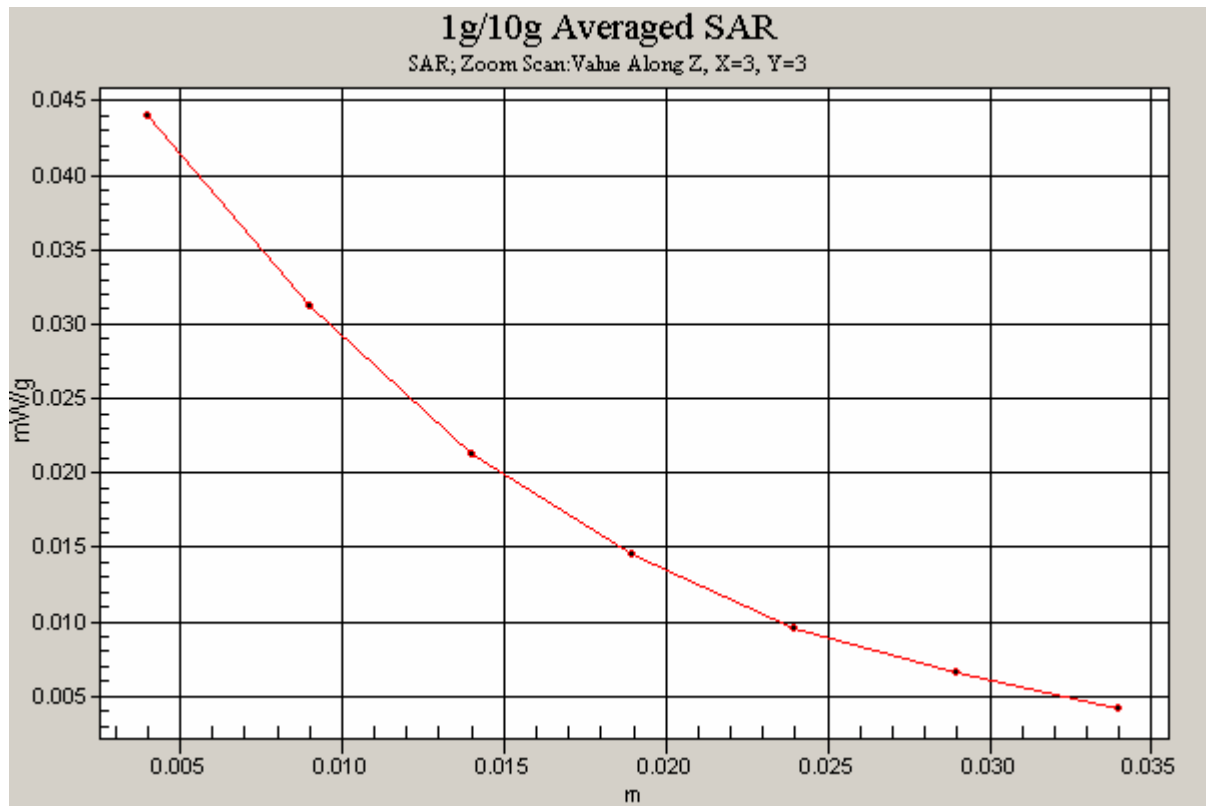


Figure 18 Z-Scan at power reference point (Left Hand Tilt 15° Open GSM 1900 Channel 512)

GSM 1900 Right Cheek High Open

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

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.44$ mho/m; $\epsilon_r = 39.7$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(5.15, 5.15, 5.15);

Electronics: DAE3 Sn452;

Cheek High/Area Scan (51x131x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.314 mW/g

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

Reference Value = 0.348 V/m; Power Drift = 0.125 dB

Peak SAR (extrapolated) = 0.323 W/kg

SAR(1 g) = 0.248 mW/g; SAR(10 g) = 0.168 mW/g

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

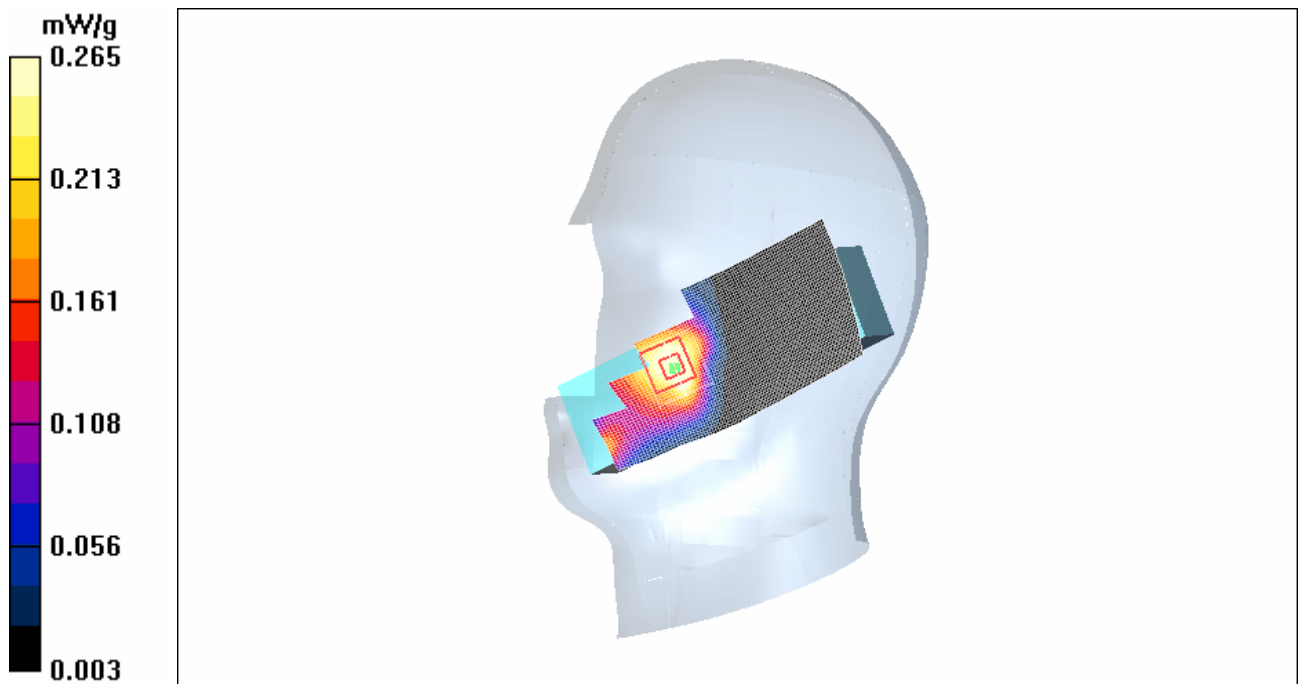


Figure 19 Right Hand Touch Cheek Open GSM 1900 Channel 810

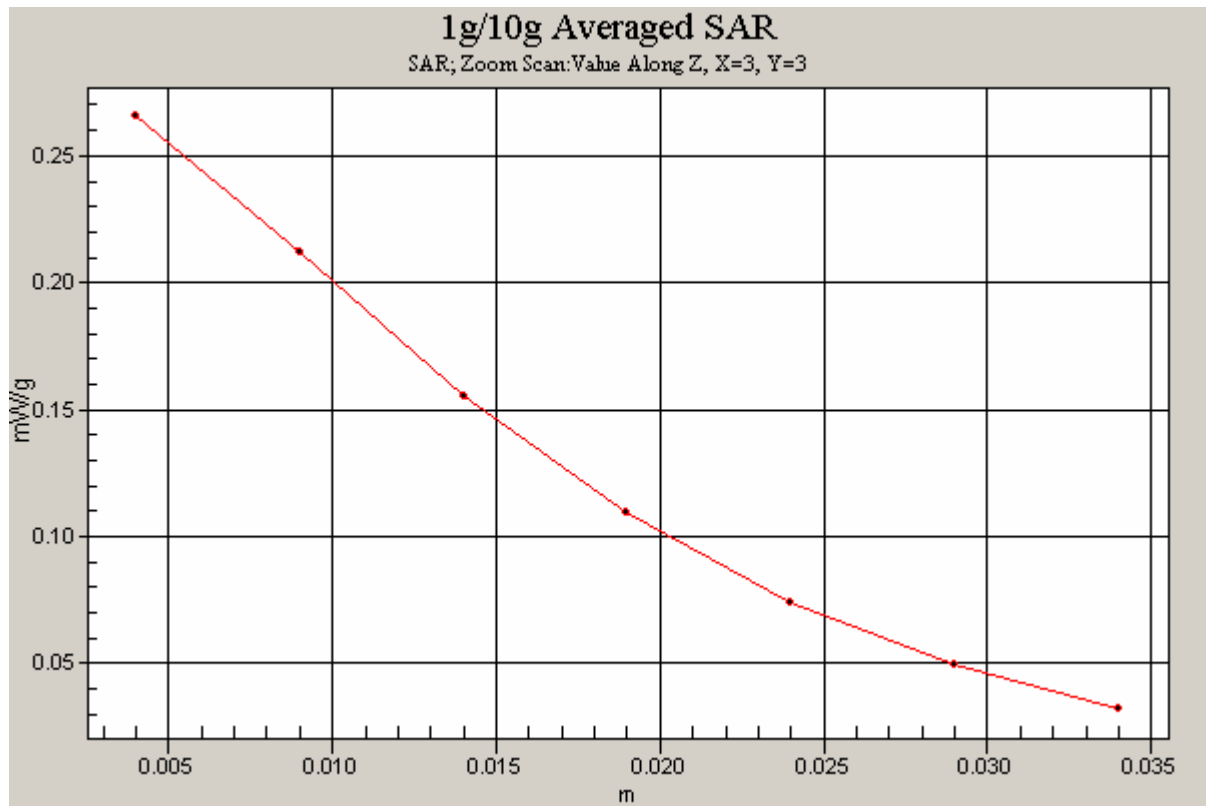


Figure 20 Z-Scan at power reference point (Right Hand Touch Cheek Open GSM 1900 Channel 810)

GSM 1900 Right Cheek Middle Open

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.41$ mho/m; $\epsilon_r = 39.7$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(5.15, 5.15, 5.15);

Electronics: DAE3 Sn452;

Cheek Middle/Area Scan (51x131x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.267 mW/g

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

Reference Value = 0.425 V/m; Power Drift = 0.065 dB

Peak SAR (extrapolated) = 0.292 W/kg

SAR(1 g) = 0.227 mW/g; SAR(10 g) = 0.155 mW/g

Maximum value of SAR (measured) = 0.240 mW/g

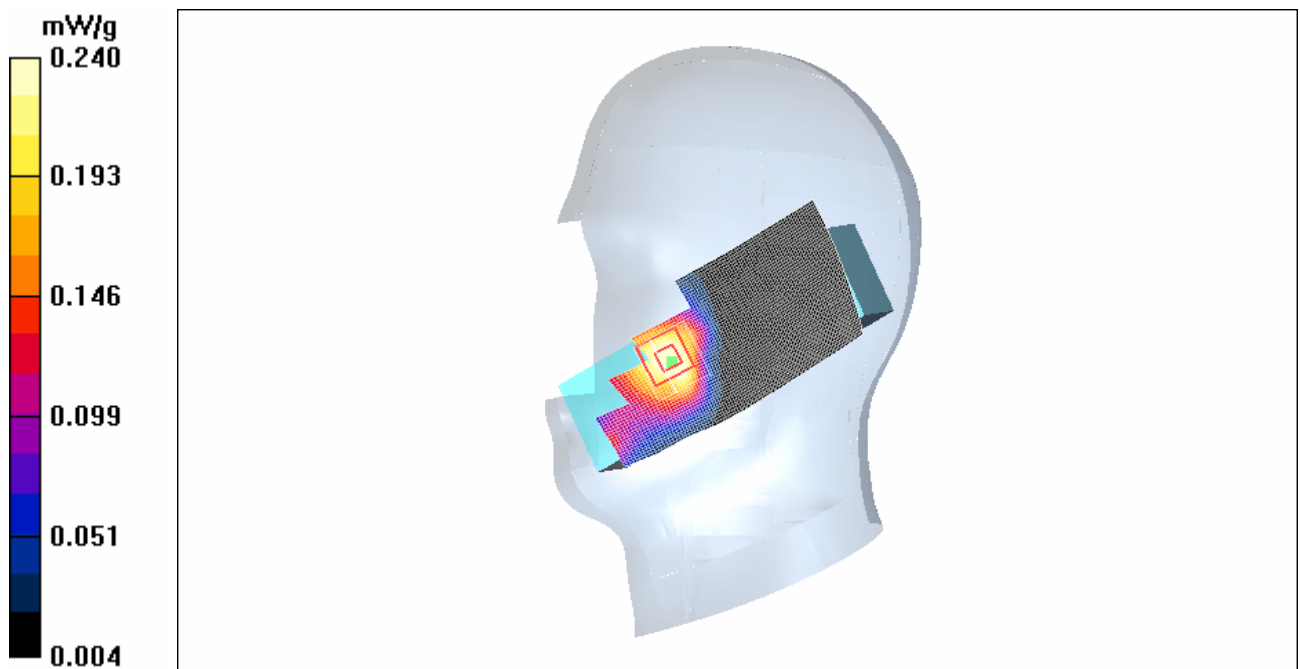


Figure 21 Right Hand Touch Cheek Open GSM 1900 Channel 661

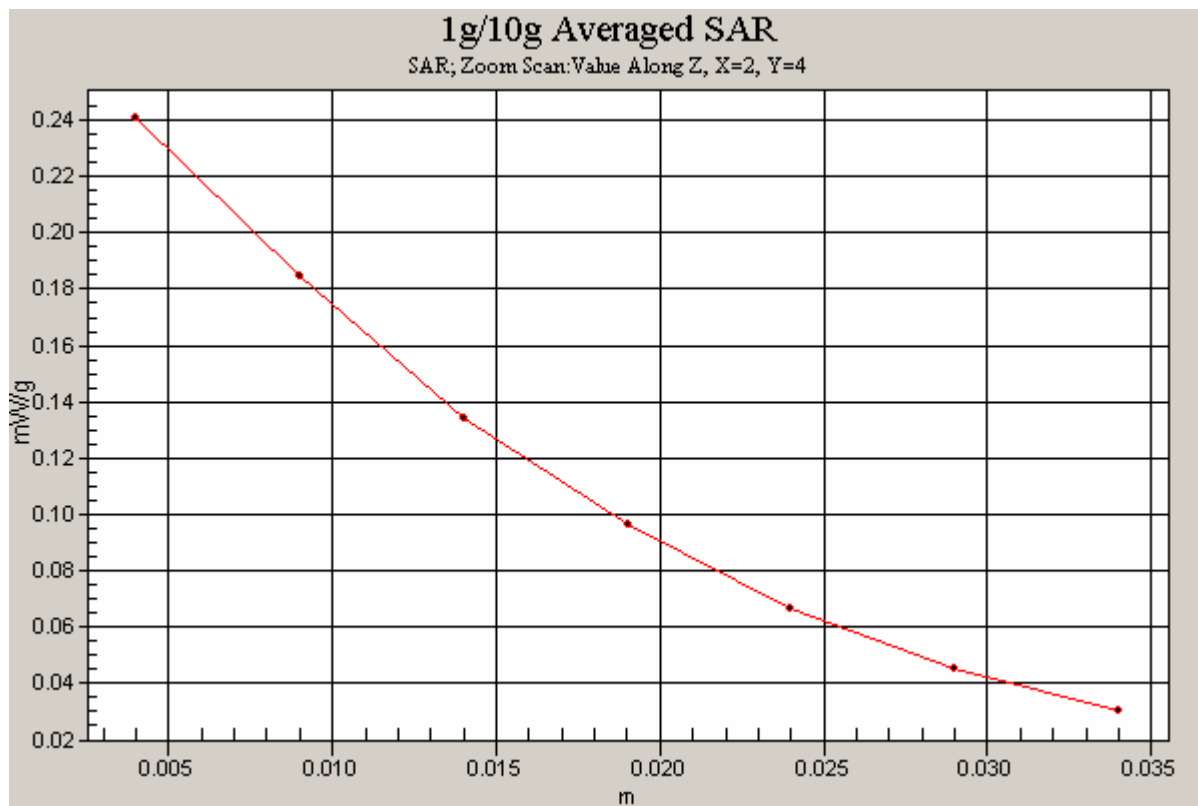


Figure 22 Z-Scan at power reference point (Right Hand Touch Cheek Open GSM 1900 Channel 661)

GSM 1900 Right Cheek Low Open

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

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 39.9$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(5.15, 5.15, 5.15);

Electronics: DAE3 Sn452;

Cheek Low/Area Scan (51x131x1): Measurement grid: dx=15mm, dy=15mm

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

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

Reference Value = 0.483 V/m; Power Drift = -0.022B

Peak SAR (extrapolated) = 0.276 W/kg

SAR(1 g) = 0.196 mW/g; SAR(10 g) = 0.135 mW/g

Maximum value of SAR (measured) = 0.209 mW/g

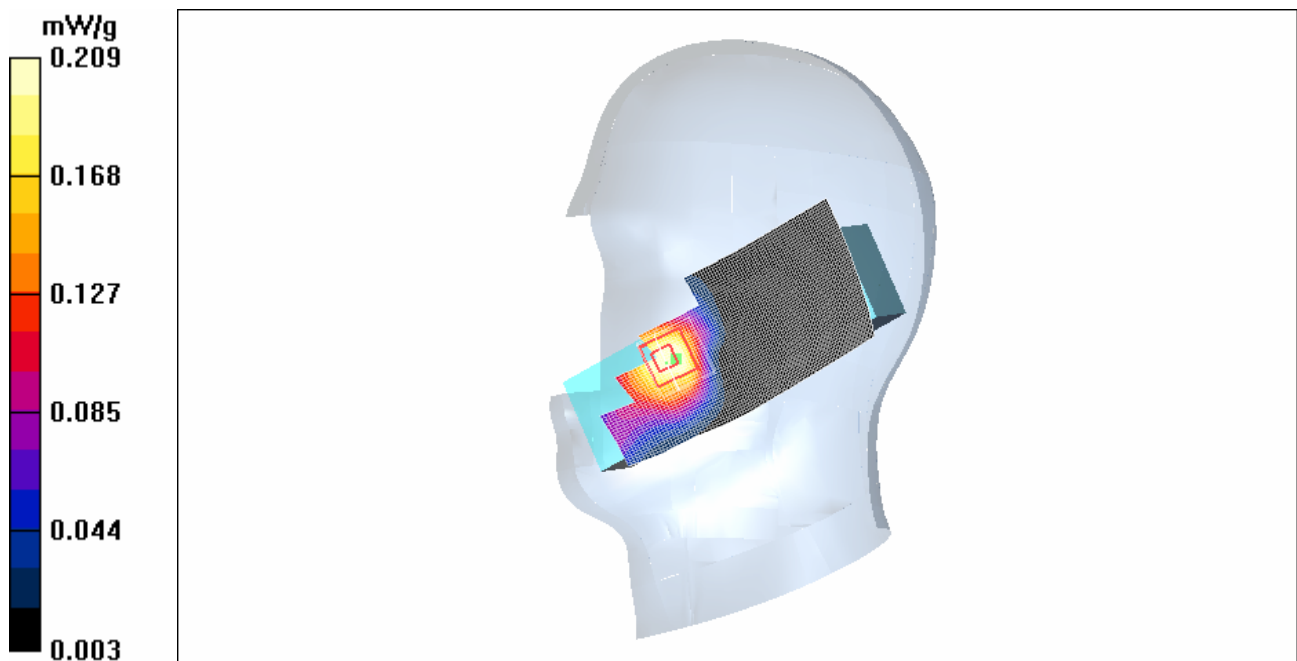


Figure 23 Right Hand Touch Cheek Open GSM 1900 Channel 512

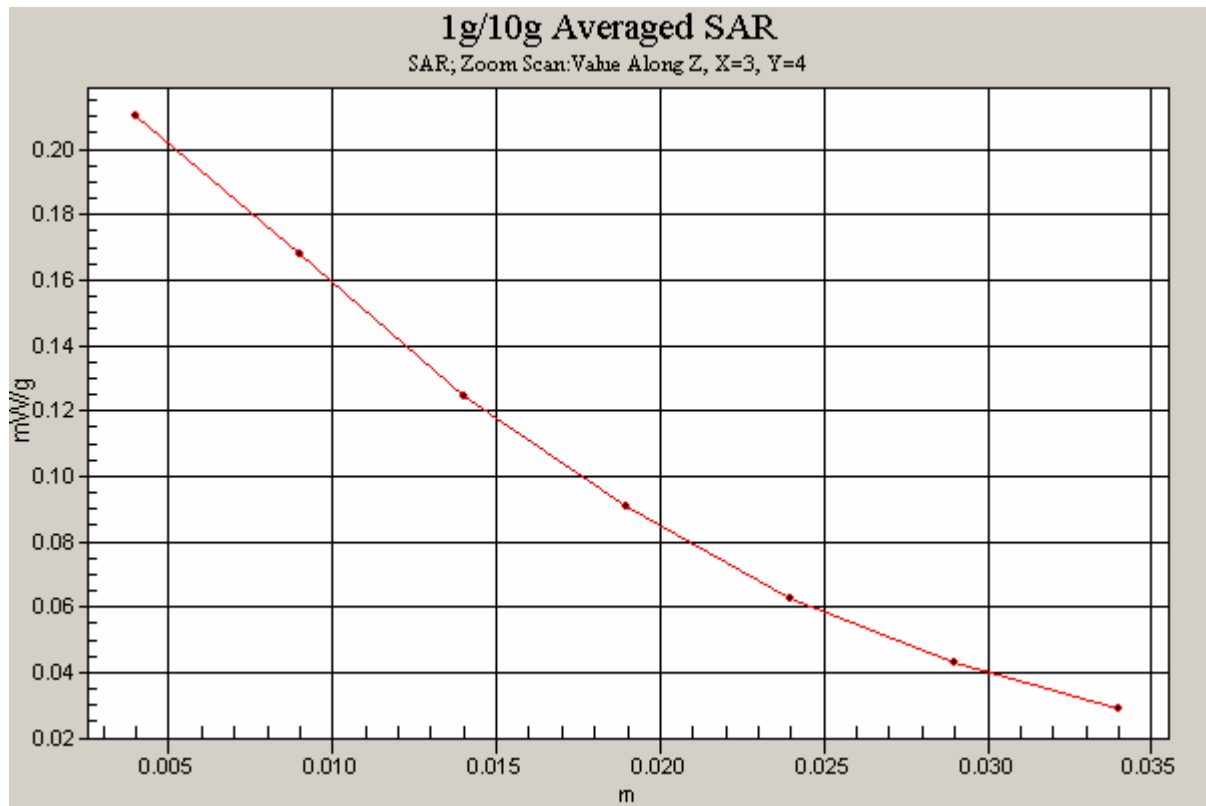


Figure 24 Z-Scan at power reference point (Right Hand Touch Cheek Open GSM 1900 Channel 512)

GSM 1900 Right Tilt High Open

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

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.44$ mho/m; $\epsilon_r = 39.7$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(5.15, 5.15, 5.15);

Electronics: DAE3 Sn452;

Tilt High/Area Scan (51x131x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.047 mW/g

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

Reference Value = 2.10 V/m; Power Drift = -0.031 dB

Peak SAR (extrapolated) = 0.058 W/kg

SAR(1 g) = 0.042 mW/g; SAR(10 g) = 0.029 mW/g

Maximum value of SAR (measured) = 0.045 mW/g

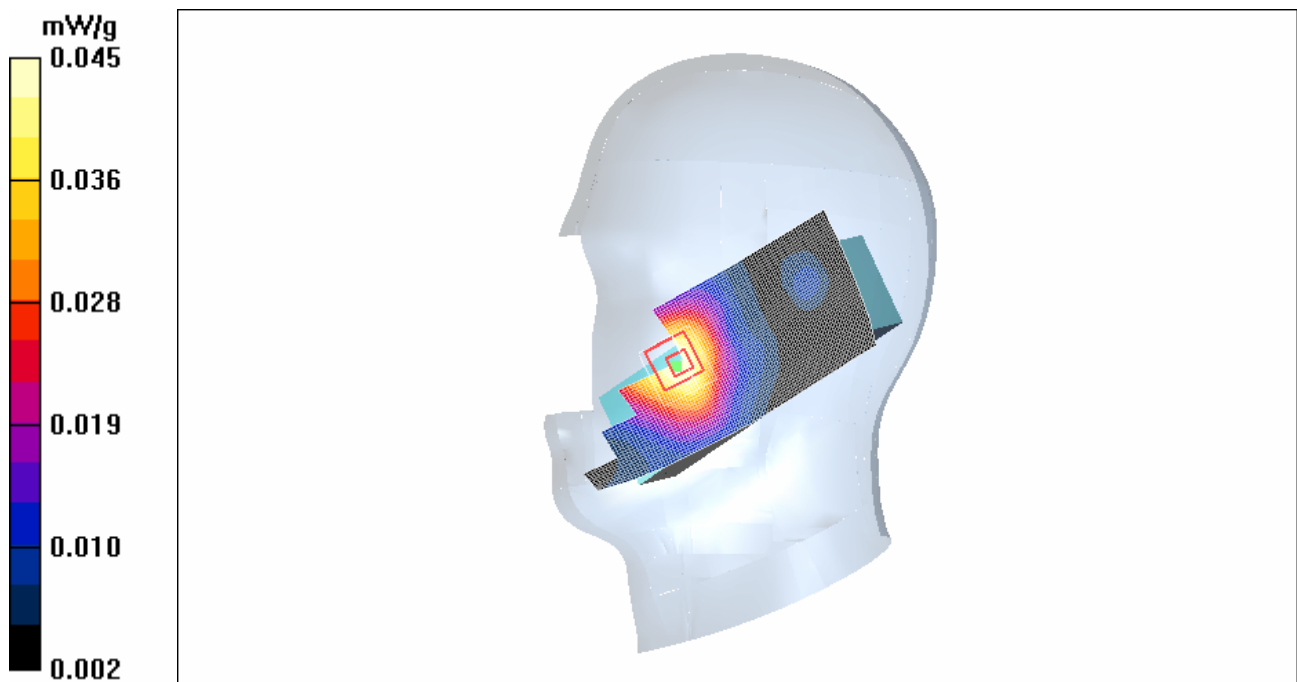


Figure 25 Right Hand Tilt 15° Open GSM 1900 Channel 810

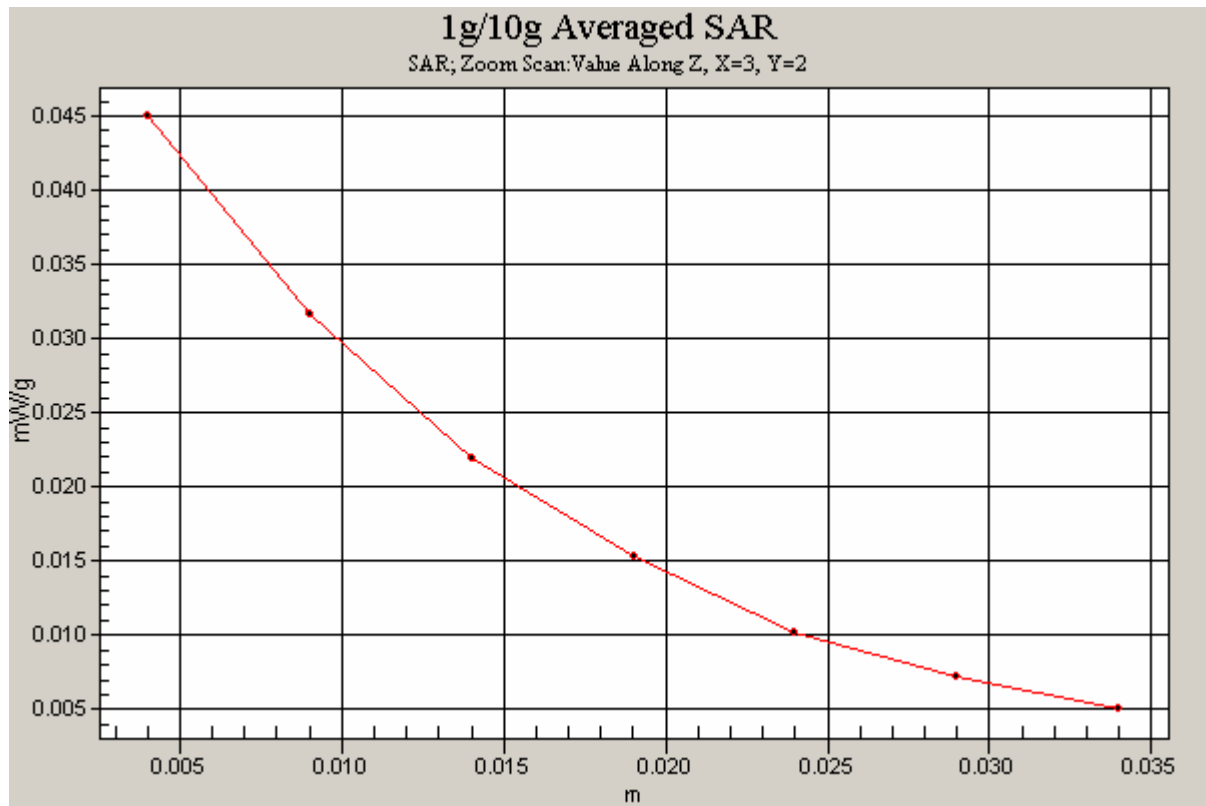


Figure 26 Z-Scan at power reference point (Right Hand Tilt 15° Open GSM 1900 Channel 810)

GSM 1900 Right Tilt Middle Open

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.41$ mho/m; $\epsilon_r = 39.7$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(5.15, 5.15, 5.15);

Electronics: DAE3 Sn452;

Tilt Middle/Area Scan (51x131x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.037 mW/g

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

Reference Value = 2.14 V/m; Power Drift = -0.020 dB

Peak SAR (extrapolated) = 0.046 W/kg

SAR(1 g) = 0.034 mW/g; SAR(10 g) = 0.024 mW/g

Maximum value of SAR (measured) = 0.035 mW/g

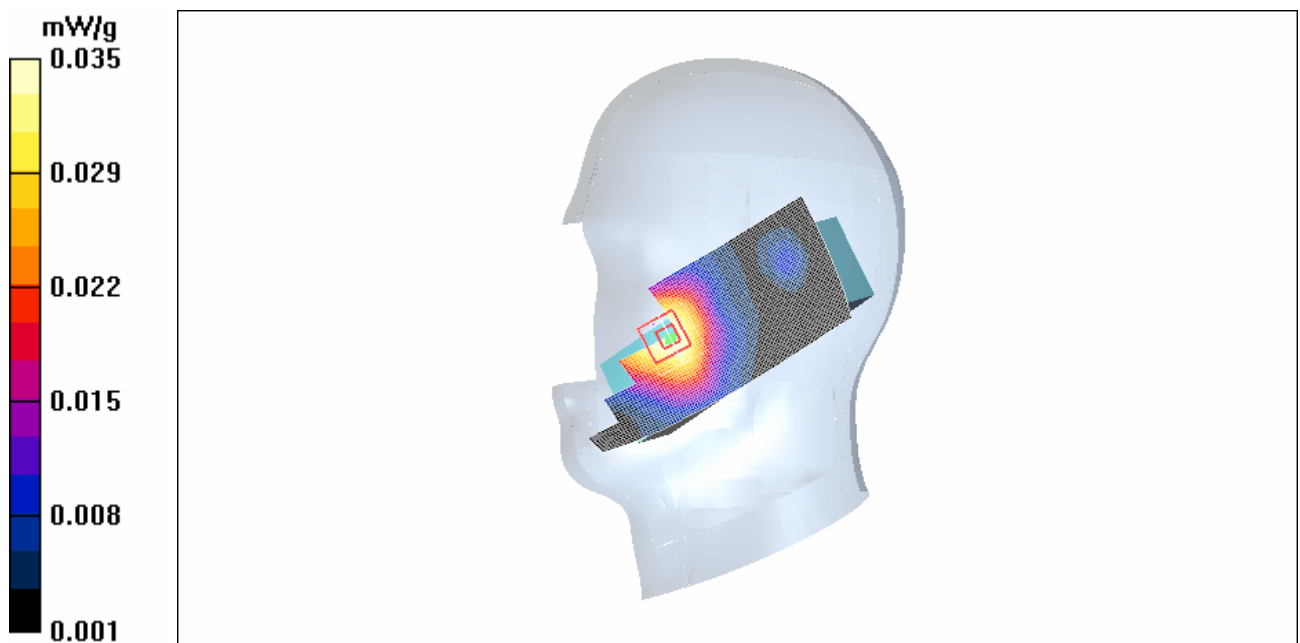


Figure 27 Right Hand Tilt 15° Open GSM 1900 Channel 661

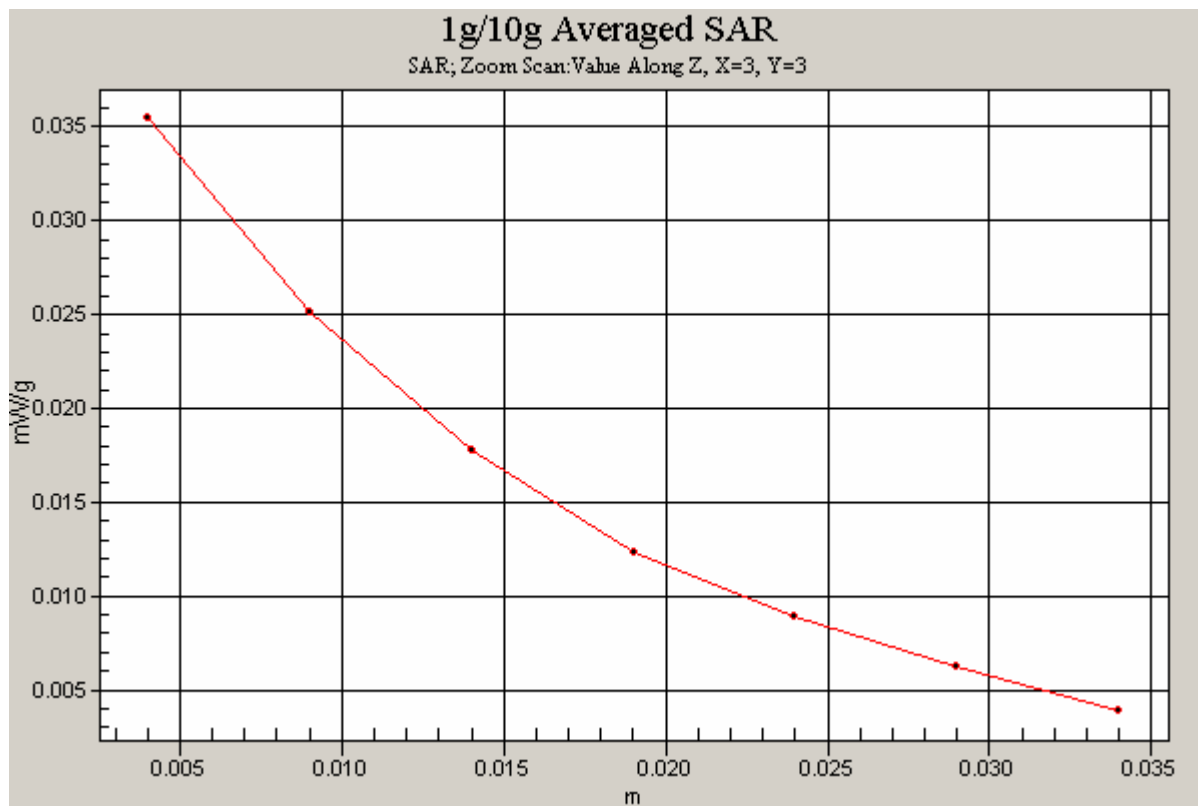


Figure 28 Z-Scan at power reference point (Right Hand Tilt 15° Open GSM 1900 Channel 661)

GSM 1900 Right Tilt Low Open

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

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 39.9$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(5.15, 5.15, 5.15);

Electronics: DAE3 Sn452;

Tilt Low/Area Scan (51x131x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.035 mW/g

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

Reference Value = 2.08 V/m; Power Drift = -0.035 dB

Peak SAR (extrapolated) = 0.043 W/kg

SAR(1 g) = 0.032 mW/g; SAR(10 g) = 0.023 mW/g

Maximum value of SAR (measured) = 0.034 mW/g

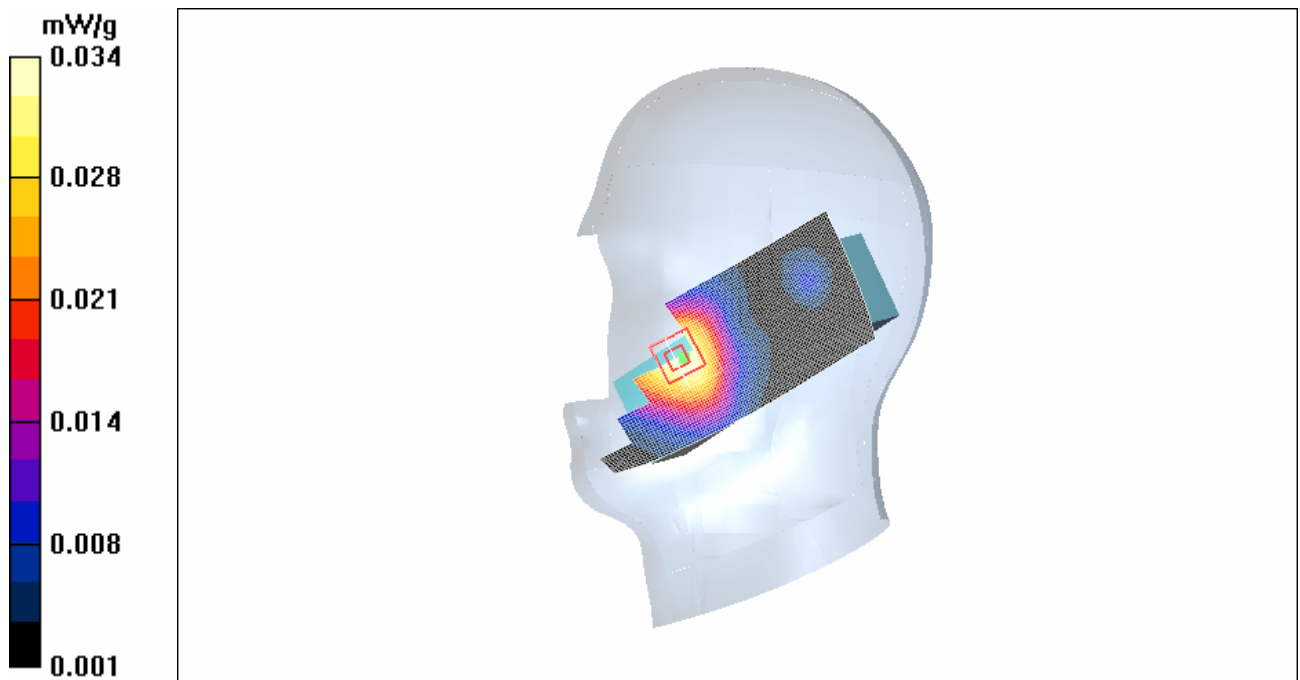


Figure 29 Right Hand Tilt 15° Open GSM 1900 Channel 512

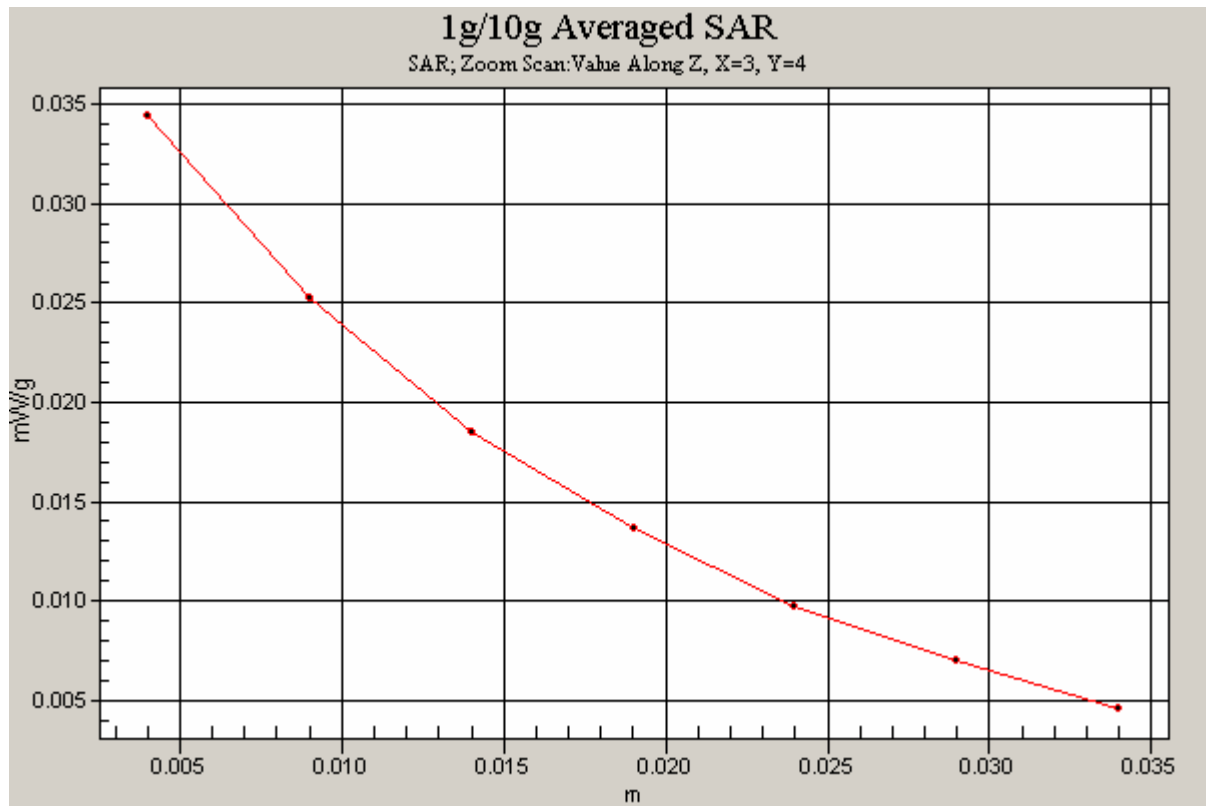


Figure 30 Z-Scan at power reference point (Right Hand Tilt 15° Open GSM 1900 Channel 512)

GSM 1900 Towards Ground High Open

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

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

Towards ground High frequency/Area Scan (51x131x1): Measurement grid: dx=15mm, dy=15mm

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

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

Reference Value = 6.03 V/m; Power Drift = -0.080 dB

Peak SAR (extrapolated) = 0.424 W/kg

SAR(1 g) = 0.298 mW/g; SAR(10 g) = 0.196 mW/g

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

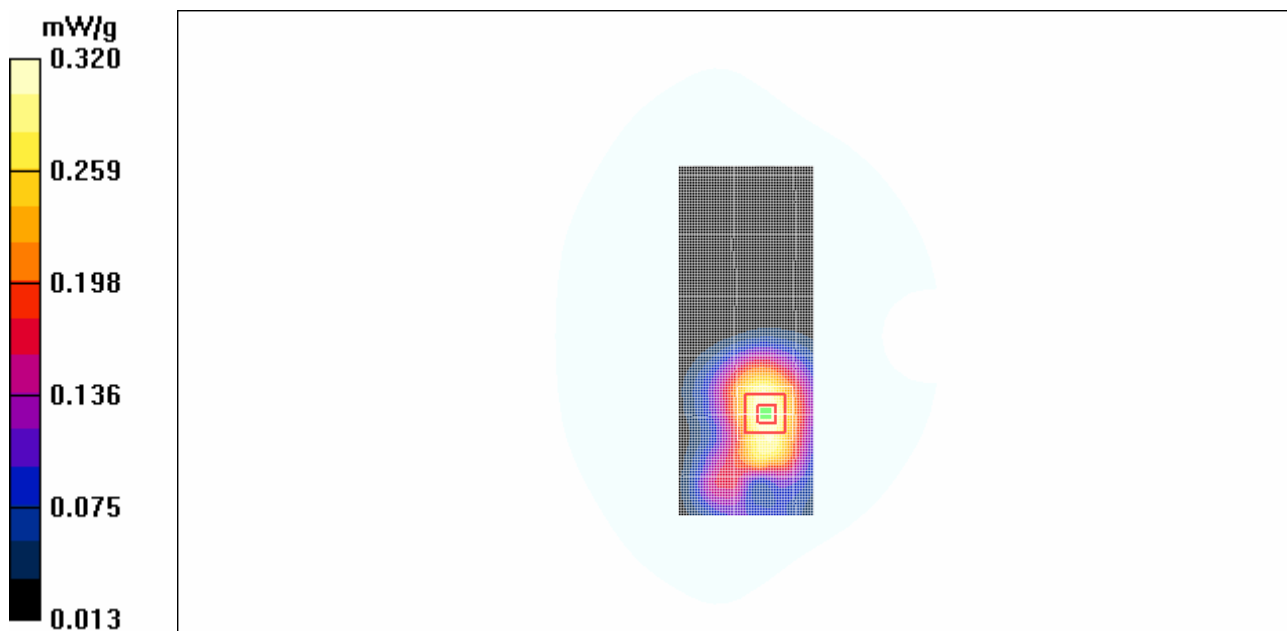


Figure 31 Body, Towards Ground, Open GSM 1900 Channel 810

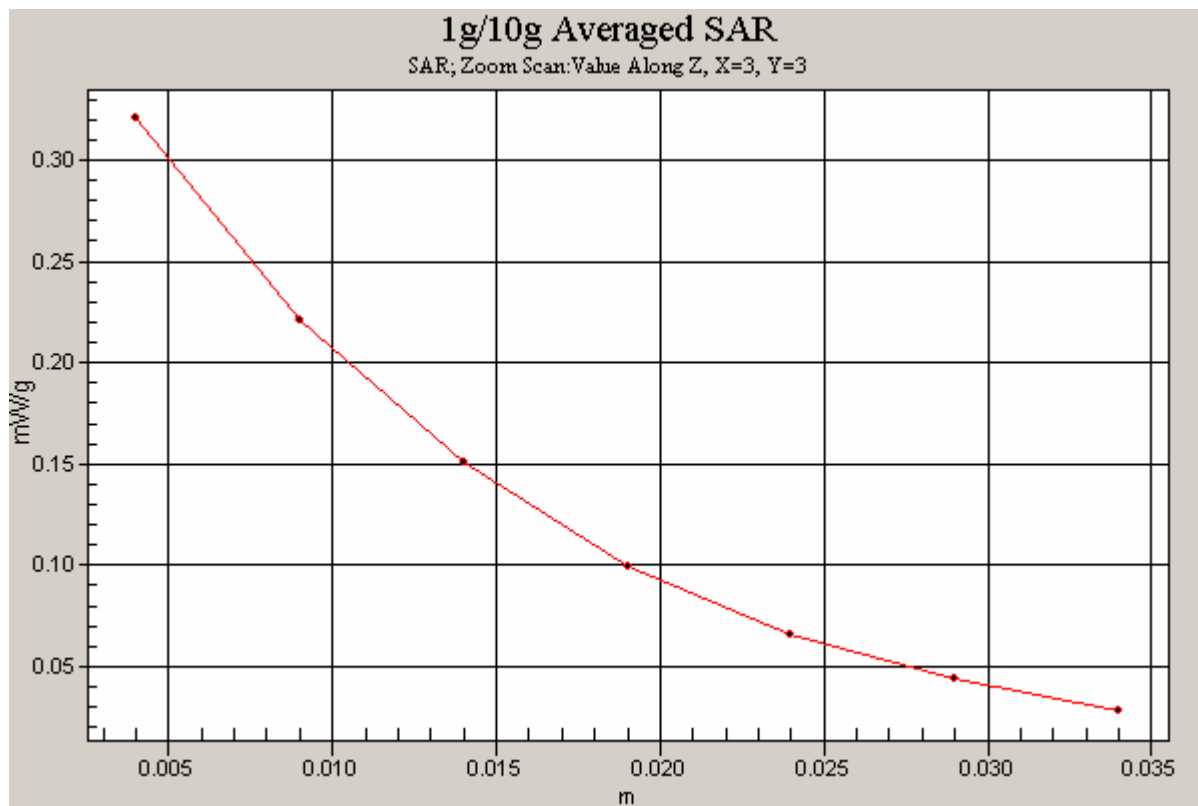


Figure 32 Z-Scan at power reference point (Body, Towards Ground, Open GSM 1900 Channel 810)

GSM 1900 Towards Ground Middle Open

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

Towards ground Middle frequency/Area Scan (51x131x1): Measurement grid: dx=15mm, dy=15mm

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

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

Reference Value = 4.91 V/m; Power Drift = -0.046 dB

Peak SAR (extrapolated) = 0.358 W/kg

SAR(1 g) = 0.257 mW/g; SAR(10 g) = 0.170 mW/g

Maximum value of SAR (measured) = 0.274 mW/g

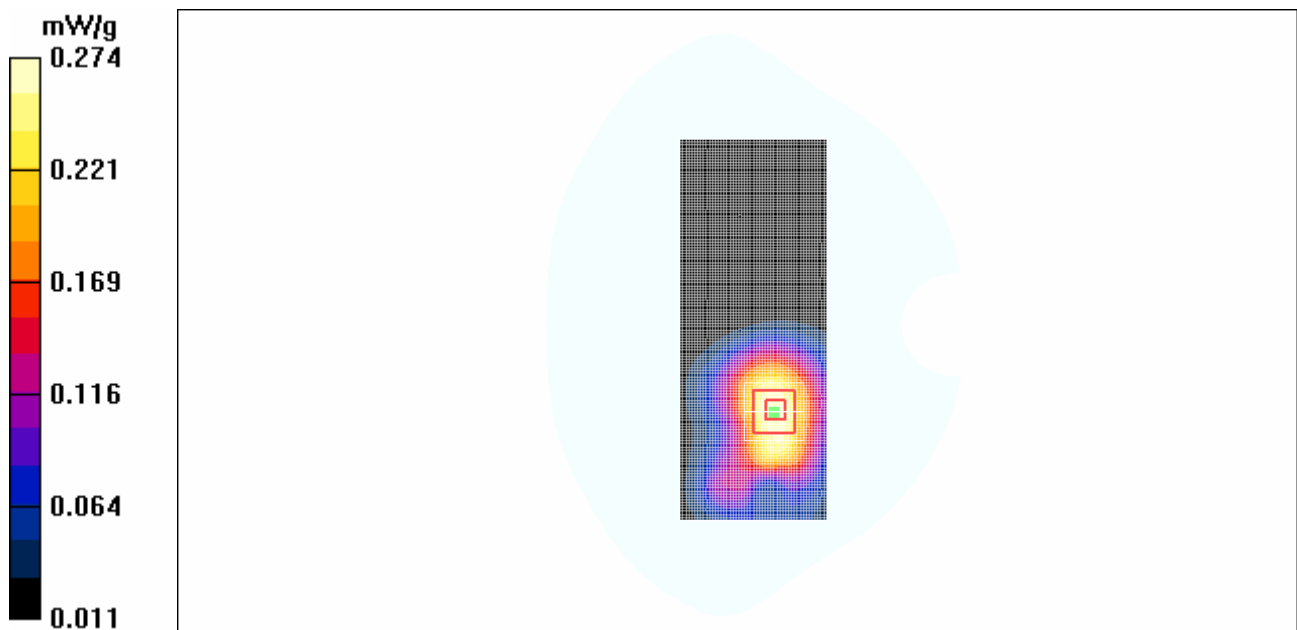


Figure 33 Body, Towards Ground, Open GSM 1900 Channel 661

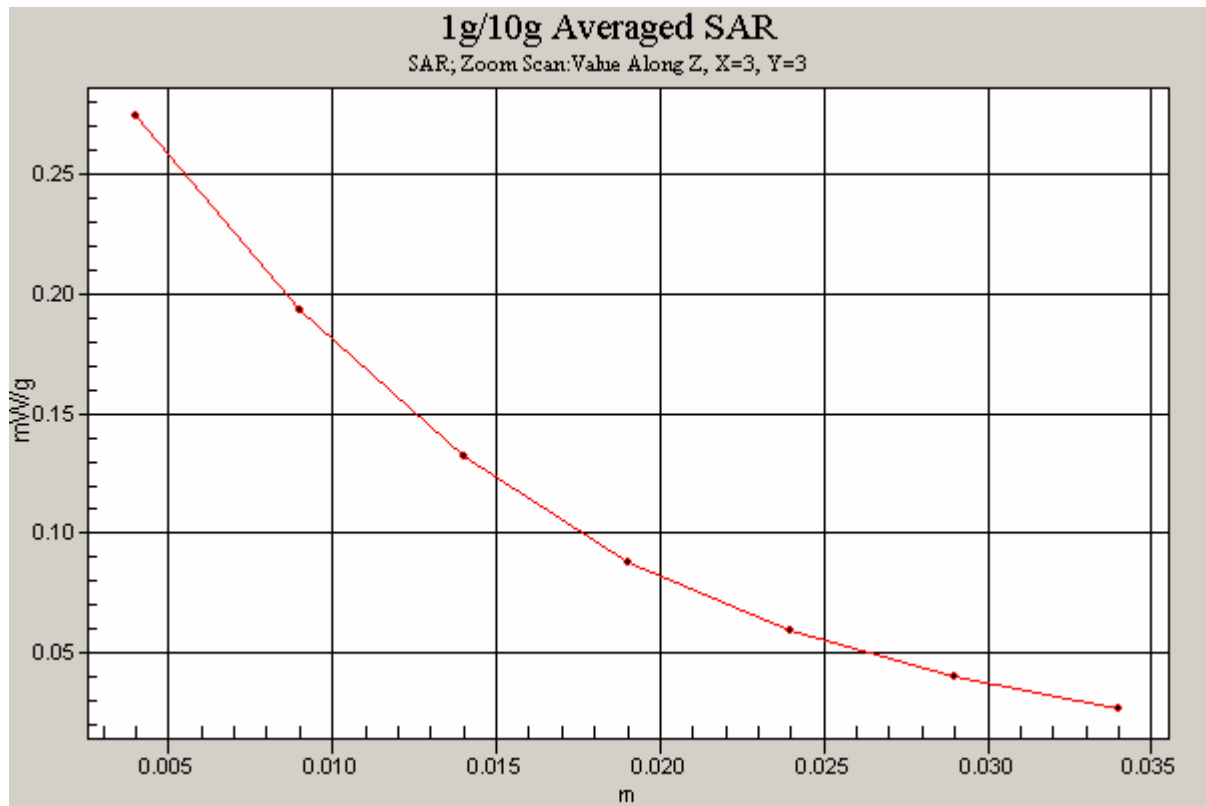


Figure 34 Z-Scan at power reference point (Body, Towards Ground, Open GSM 1900 Channel 661)

GSM 1900 Towards Ground Low Open

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

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

Towards ground Low frequency/Area Scan (51x131x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.234 mW/g

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

Reference Value = 3.83 V/m; Power Drift = 0.034 dB

Peak SAR (extrapolated) = 0.298 W/kg

SAR(1 g) = 0.217 mW/g; SAR(10 g) = 0.144 mW/g

Maximum value of SAR (measured) = 0.232 mW/g

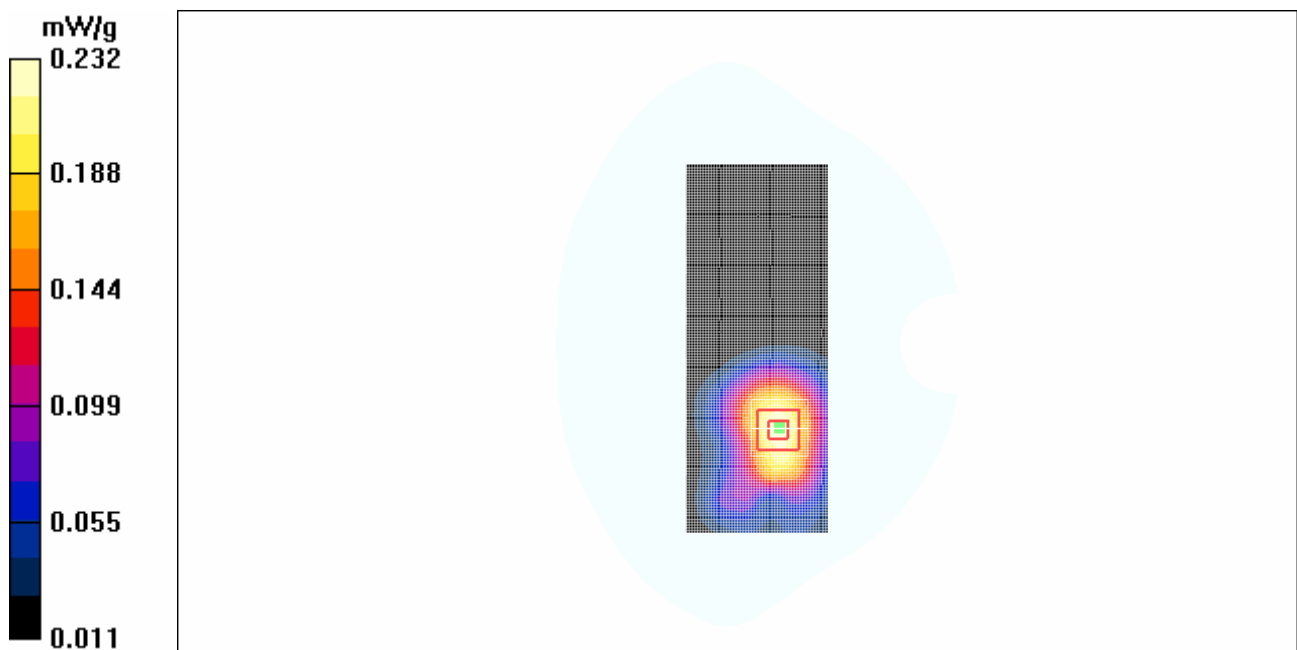


Figure 35 Body, Towards Ground, Open GSM 1900 Channel 512

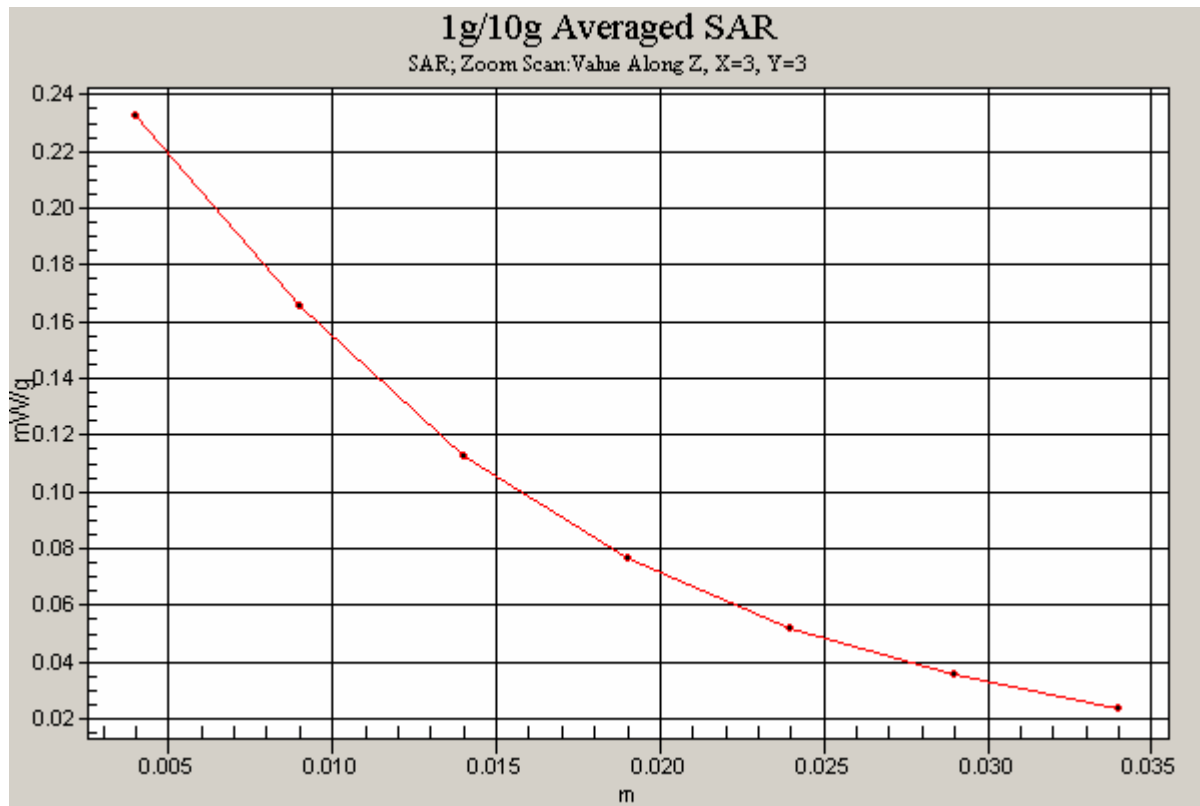


Figure 36 Z-Scan at power reference point (Body, Towards Ground, Open GSM 1900 Channel 512)

GSM 1900 Earphone Towards Ground High Open

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

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

Towards Ground High/Area Scan (51x141x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.331 mW/g

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

Reference Value = 1.94 V/m; Power Drift = 0.023 dB

Peak SAR (extrapolated) = 0.430 W/kg

SAR(1 g) = 0.301 mW/g; SAR(10 g) = 0.196 mW/g

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

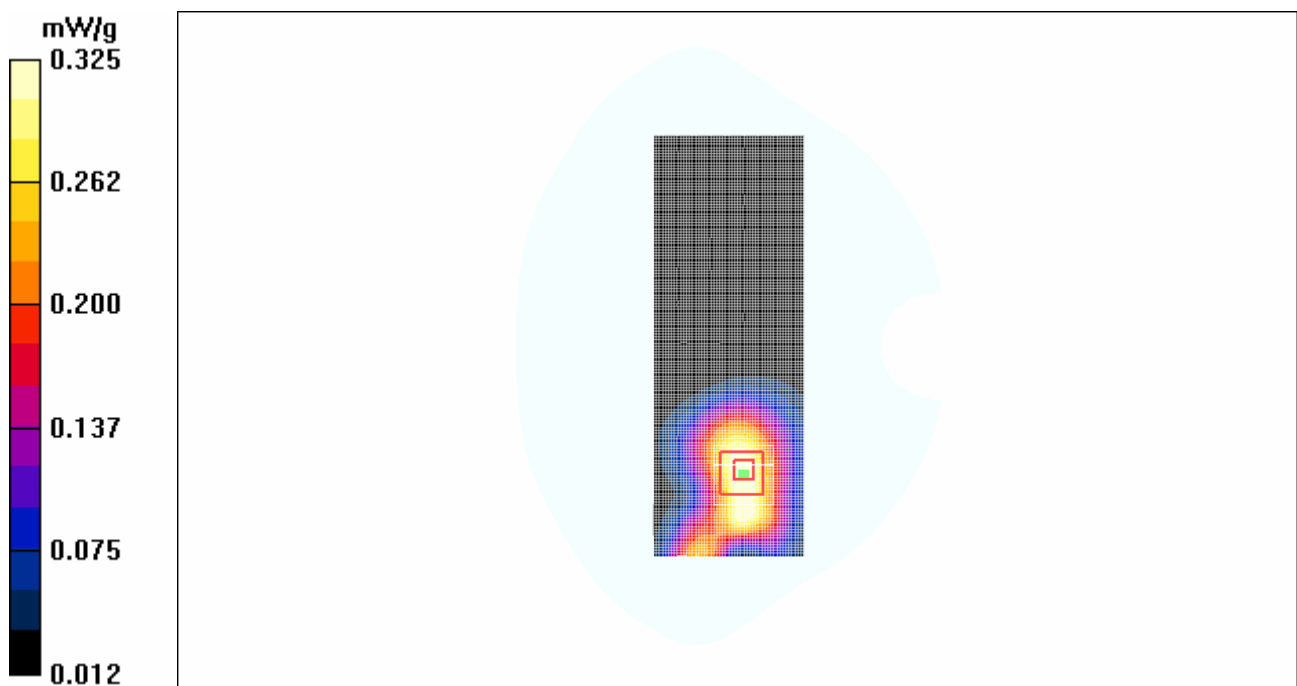


Figure 37 Body with Earphone, Towards Ground, Open GSM 1900, Channel 810

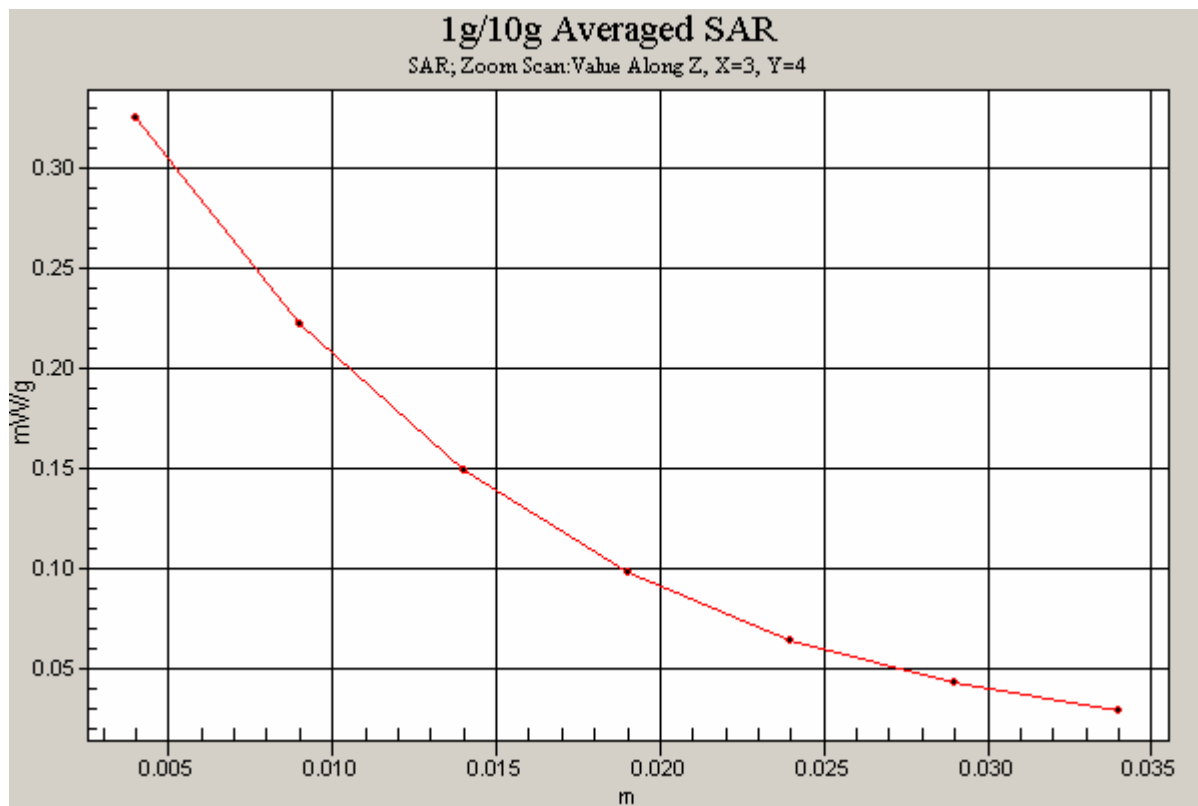


Figure 38 Z-Scan at power reference point (Body with Earphone, Towards Ground, Open GSM 1900, Channel 810)

GSM 1900 Bluetooth Earphone Towards Ground High Open

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

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

Towards Ground High/Area Scan (51x141x1): Measurement grid: dx=15mm, dy=15mm

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

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

Reference Value = 8.33 V/m; Power Drift = -0.167 dB

Peak SAR (extrapolated) = 0.492 W/kg

SAR(1 g) = 0.345 mW/g; SAR(10 g) = 0.227 mW/g

Maximum value of SAR (measured) = 0.371 mW/g

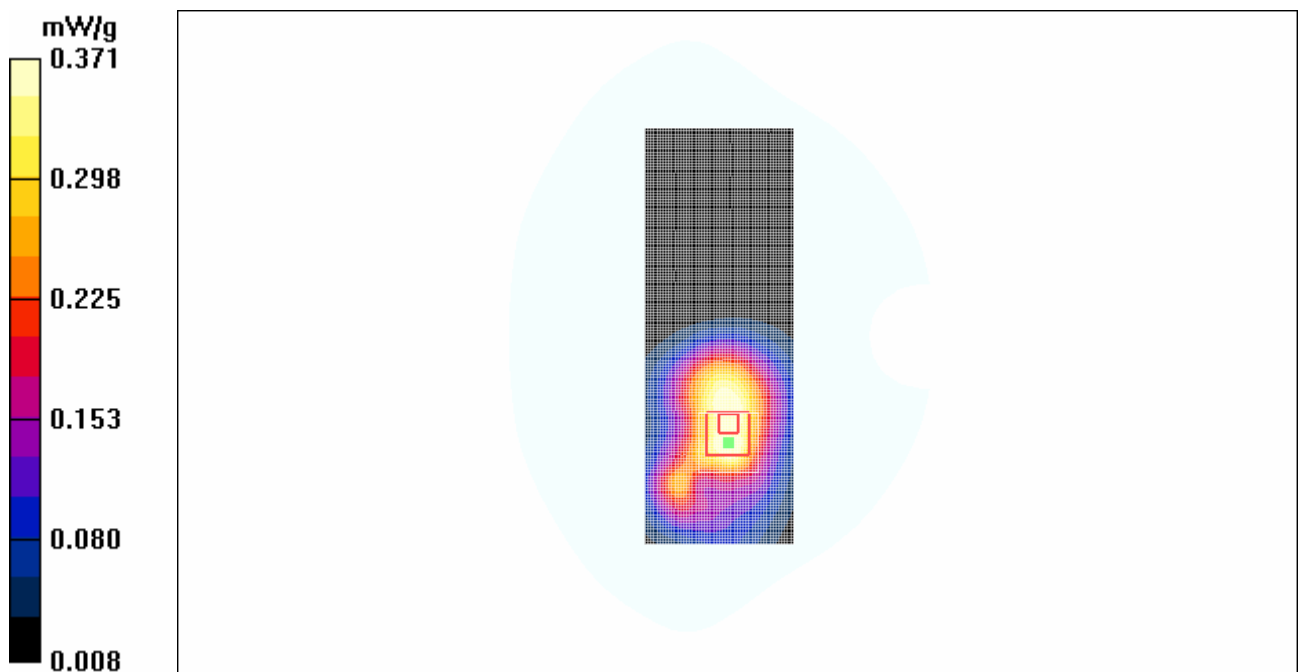


Figure 39 Body with Bluetooth earphone, Towards Ground, Open GSM 1900, Channel 810

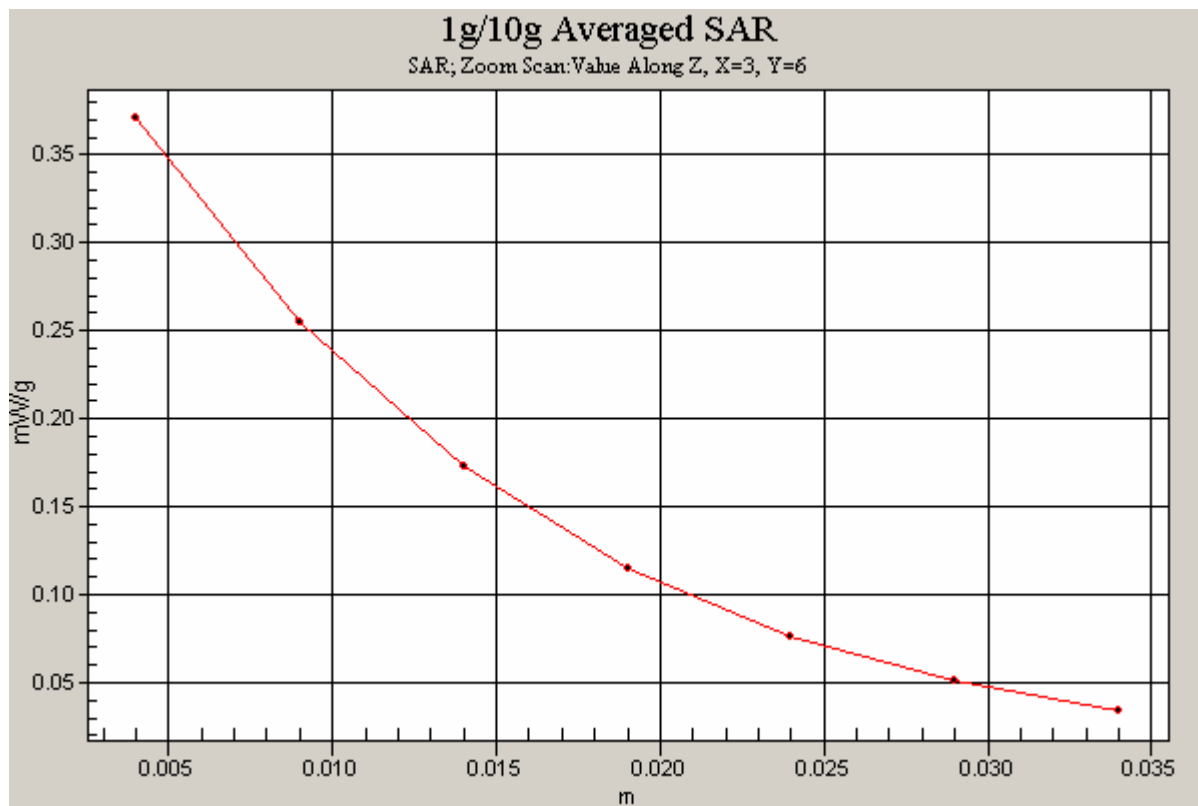


Figure 40 Z-Scan at power reference point (Body with Bluetooth earphone, Towards Ground, Open GSM 1900, Channel 810)

GSM 1900 GPRS Towards Ground High Open

Communication System: GSM 1900+GPRS(2Up); Frequency: 1909.8 MHz; Duty Cycle: 1:4

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

Towards Ground High/Area Scan (51x141x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.665 mW/g

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

Reference Value = 11.6 V/m; Power Drift = -0.072 dB

Peak SAR (extrapolated) = 1.11 W/kg

SAR(1 g) = 0.596 mW/g; SAR(10 g) = 0.394 mW/g

Maximum value of SAR (measured) = 0.640 mW/g

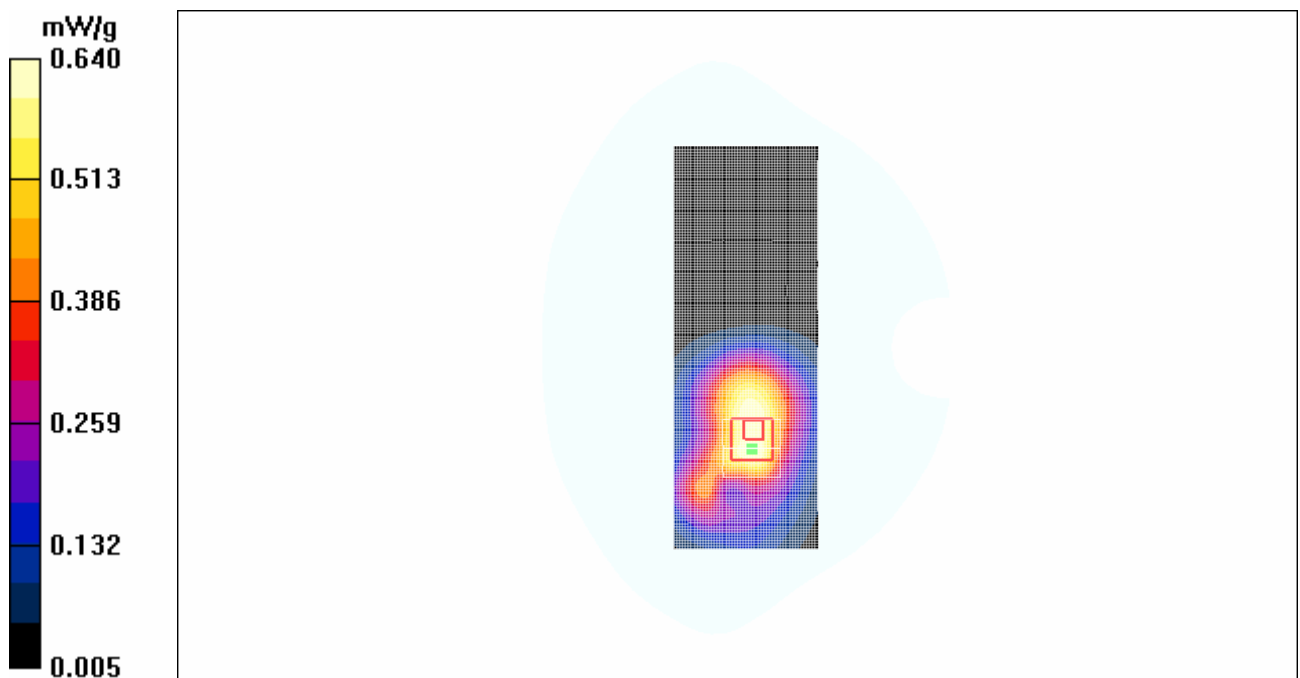


Figure 41 Body, Towards Ground, Open GSM 1900 GPRS, Channel 810

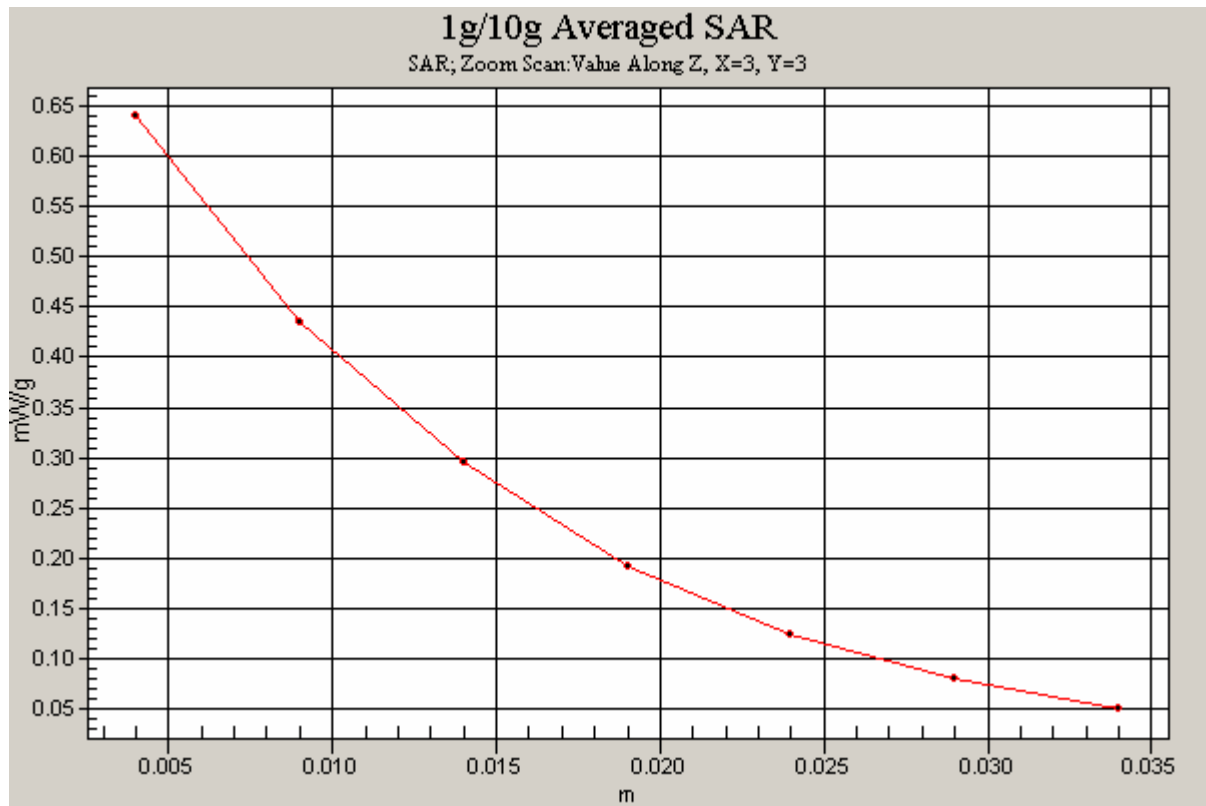


Figure 42 Z-Scan at power reference point (Body, Towards Ground, Open GSM 1900 GPRS, Channel 810)

GSM 1900 GPRS Towards Ground Middle Open

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

Towards Ground Middle/Area Scan (51x131x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.579 mW/g

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

Reference Value = 9.79 V/m; Power Drift = -0.099 dB

Peak SAR (extrapolated) = 0.738 W/kg

SAR(1 g) = 0.522 mW/g; SAR(10 g) = 0.349 mW/g

Maximum value of SAR (measured) = 0.560 mW/g

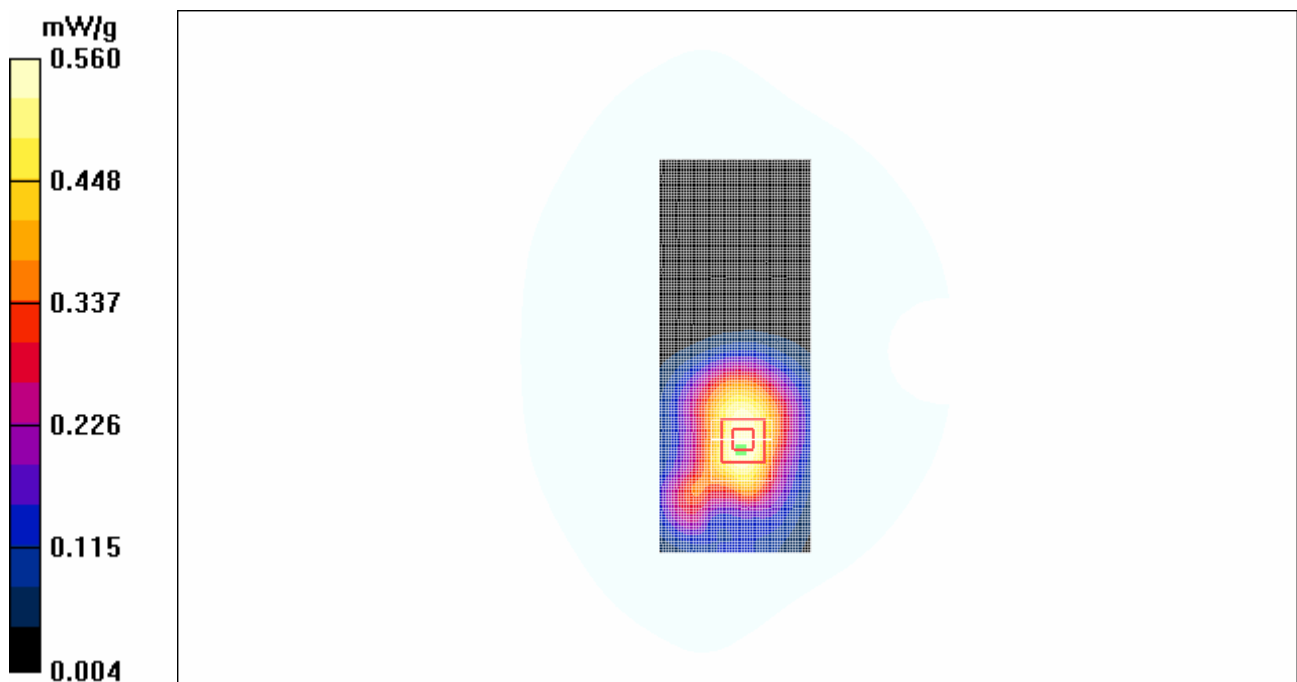


Figure 43 Body, Towards Ground, Open GSM 1900 GPRS Channel 661

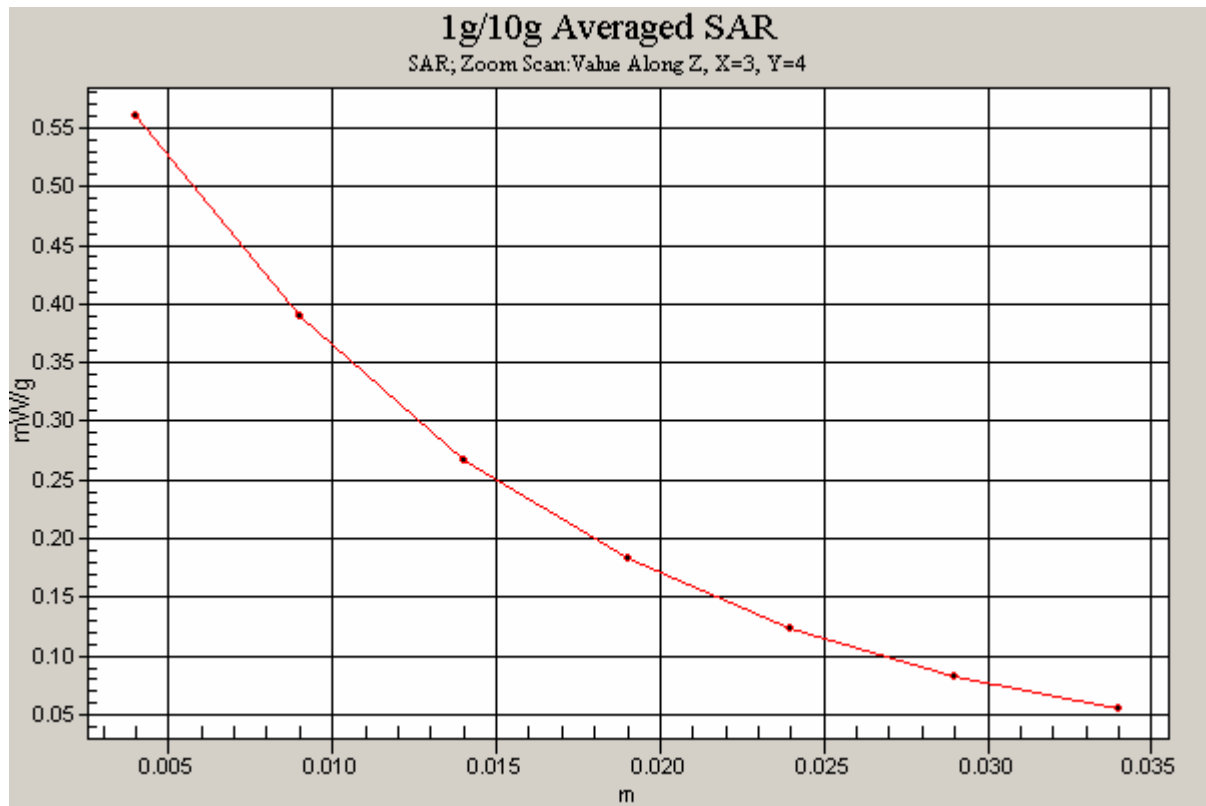


Figure 44 Z-Scan at power reference point (Body, Towards Ground, Open GSM 1900 GPRS Channel 661)

GSM 1900 GPRS Towards Ground Low Open

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

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

Towards Ground Low/Area Scan (51x131x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.441 mW/g

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

Reference Value = 10.3 V/m; Power Drift = 0.010 dB

Peak SAR (extrapolated) = 0.686 W/kg

SAR(1 g) = 0.411 mW/g; SAR(10 g) = 0.274 mW/g

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

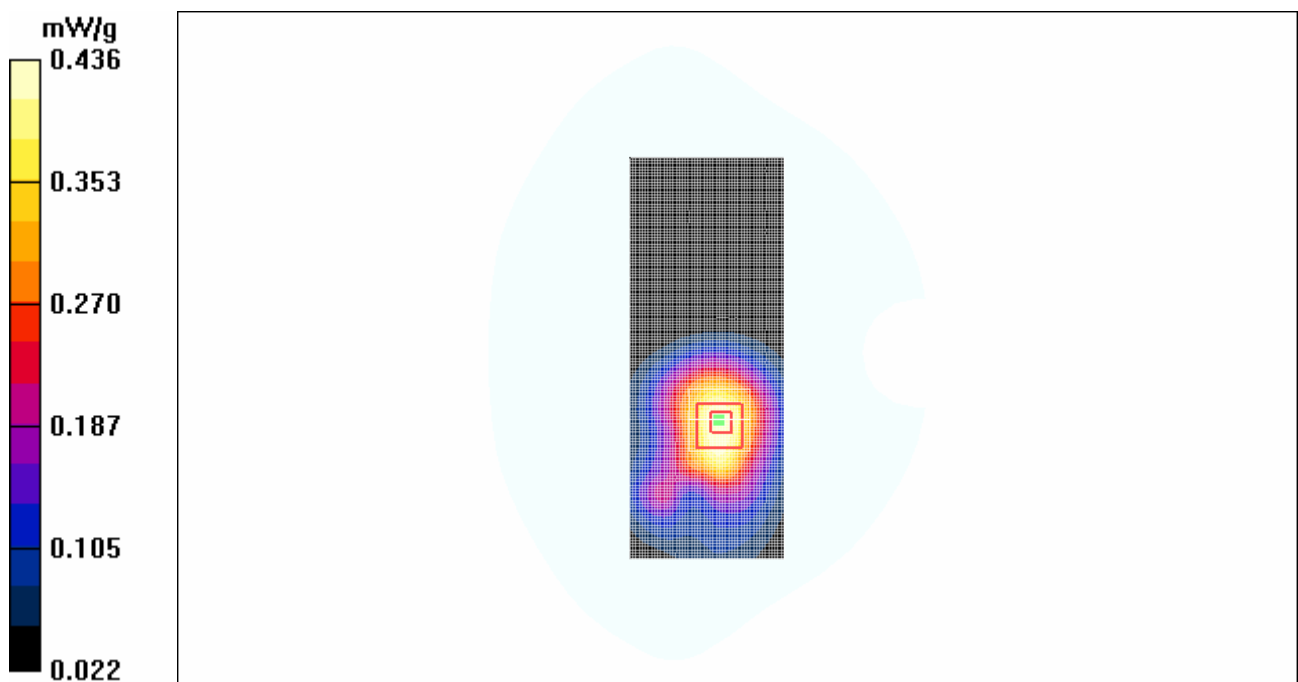


Figure 45 Body, Towards Ground, Open GSM 1900 GPRS Channel 512

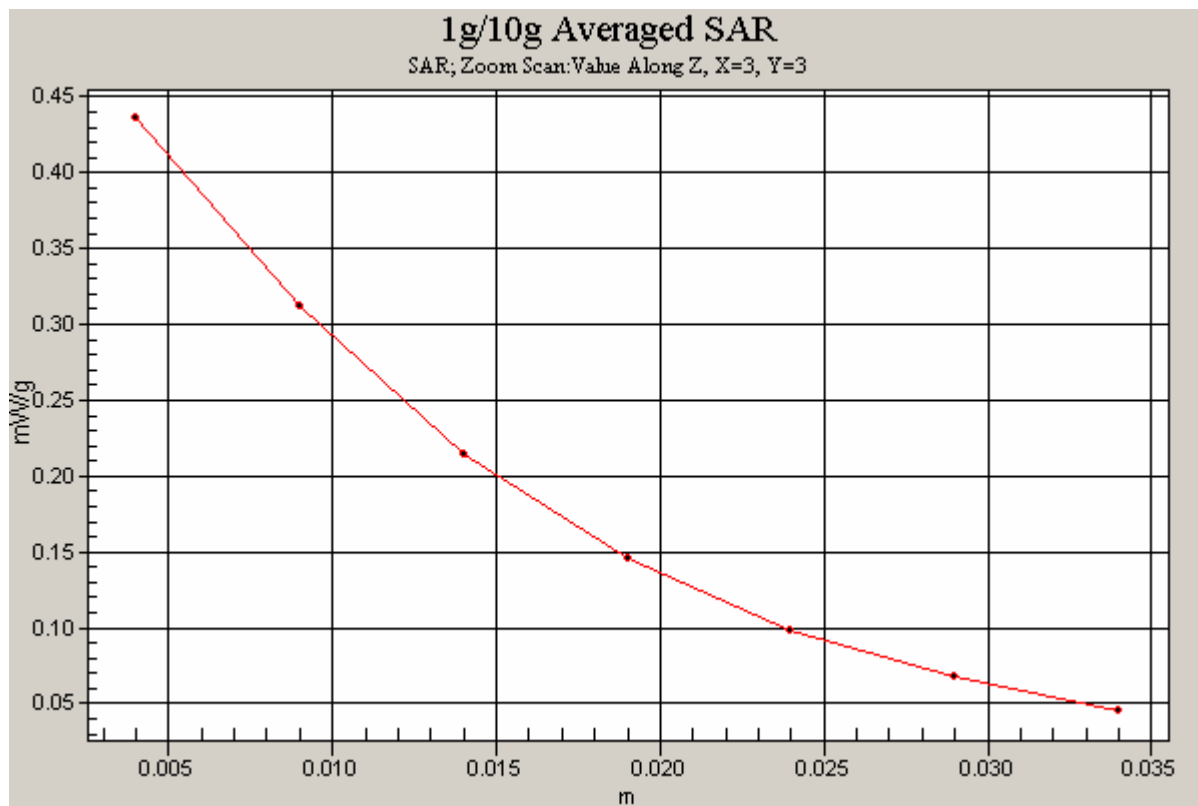


Figure 46 Z-Scan at power reference point (Body, Towards Ground, Open GSM 1900 GPRS Channel 512)

GSM 1900 Towards Ground High Close

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

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

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

Maximum value of SAR (interpolated) = 0.231 mW/g

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

Reference Value = 10.3 V/m; Power Drift = -0.003 dB

Peak SAR (extrapolated) = 0.359 W/kg

SAR(1 g) = 0.212 mW/g; SAR(10 g) = 0.120 mW/g

Maximum value of SAR (measured) = 0.234 mW/g

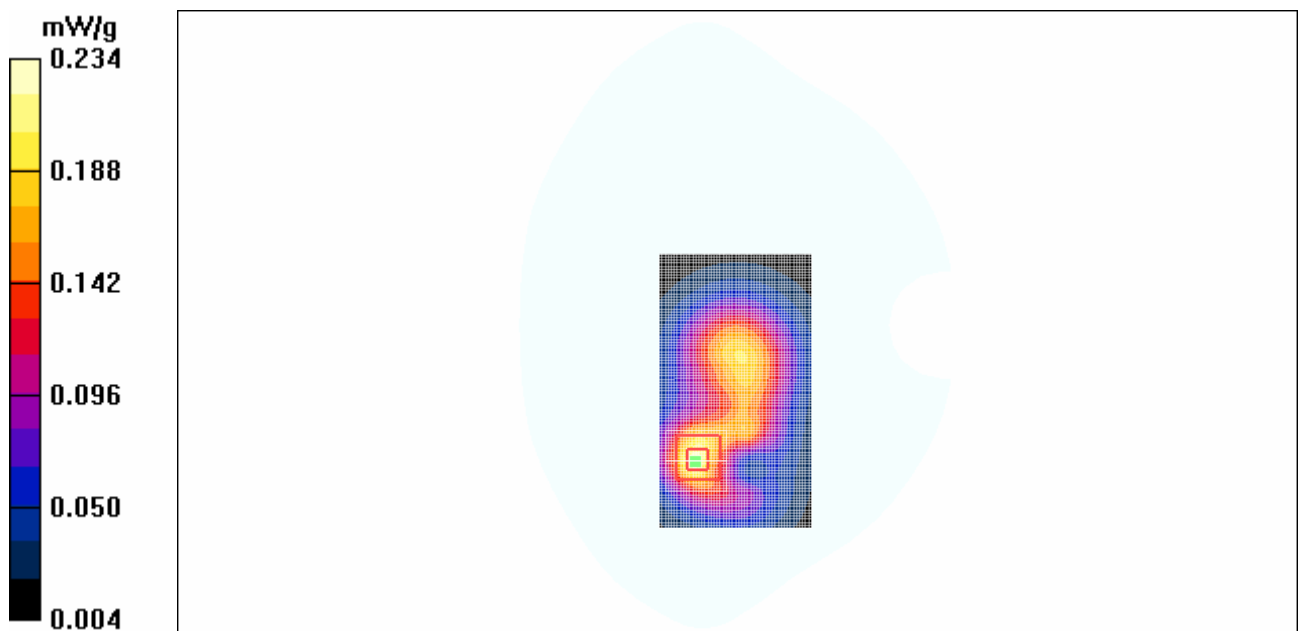


Figure 47 Body, Towards Ground, Close GSM 1900 Channel 810

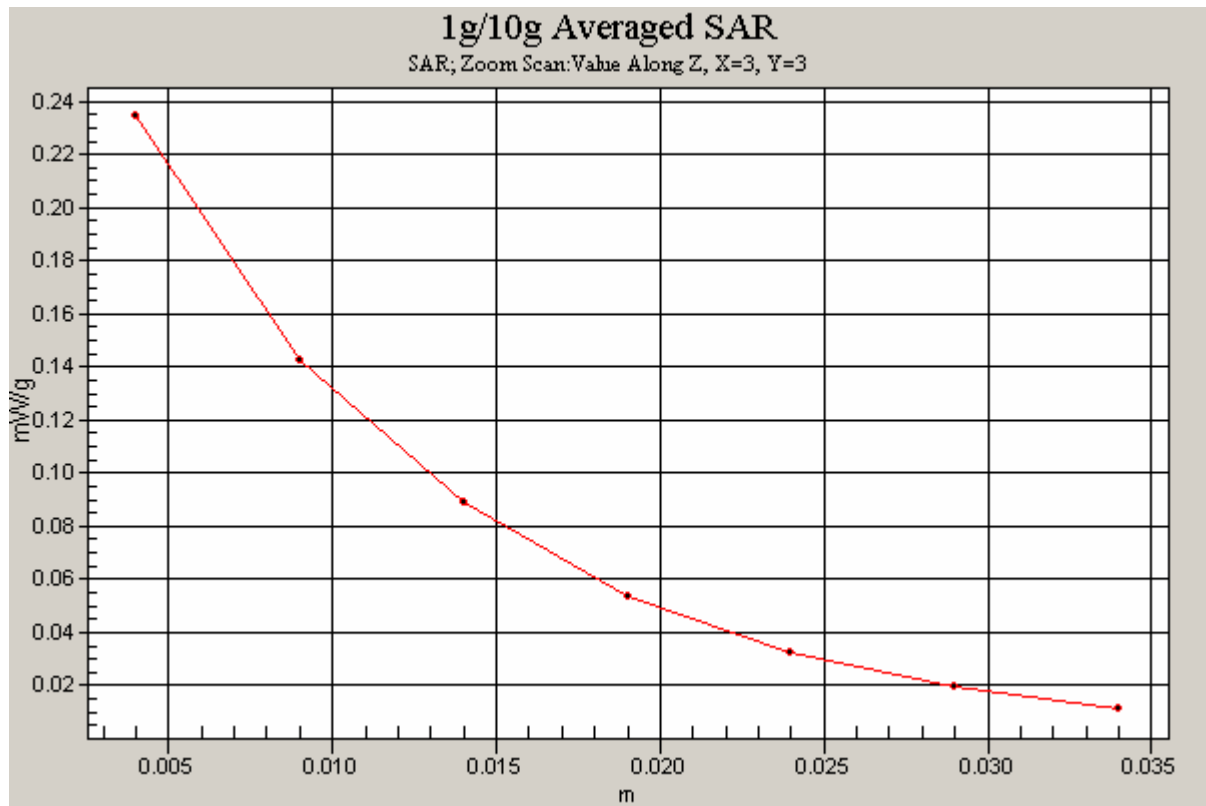


Figure 48 Z-Scan at power reference point (Body, Towards Ground, Close GSM 1900 Channel 810)

GSM 1900 Towards Ground Middle Close

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

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

Maximum value of SAR (interpolated) = 0.187 mW/g

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

Reference Value = 9.26 V/m; Power Drift = 0.011 dB

Peak SAR (extrapolated) = 0.281 W/kg

SAR(1 g) = 0.171 mW/g; SAR(10 g) = 0.097 mW/g

Maximum value of SAR (measured) = 0.189 mW/g

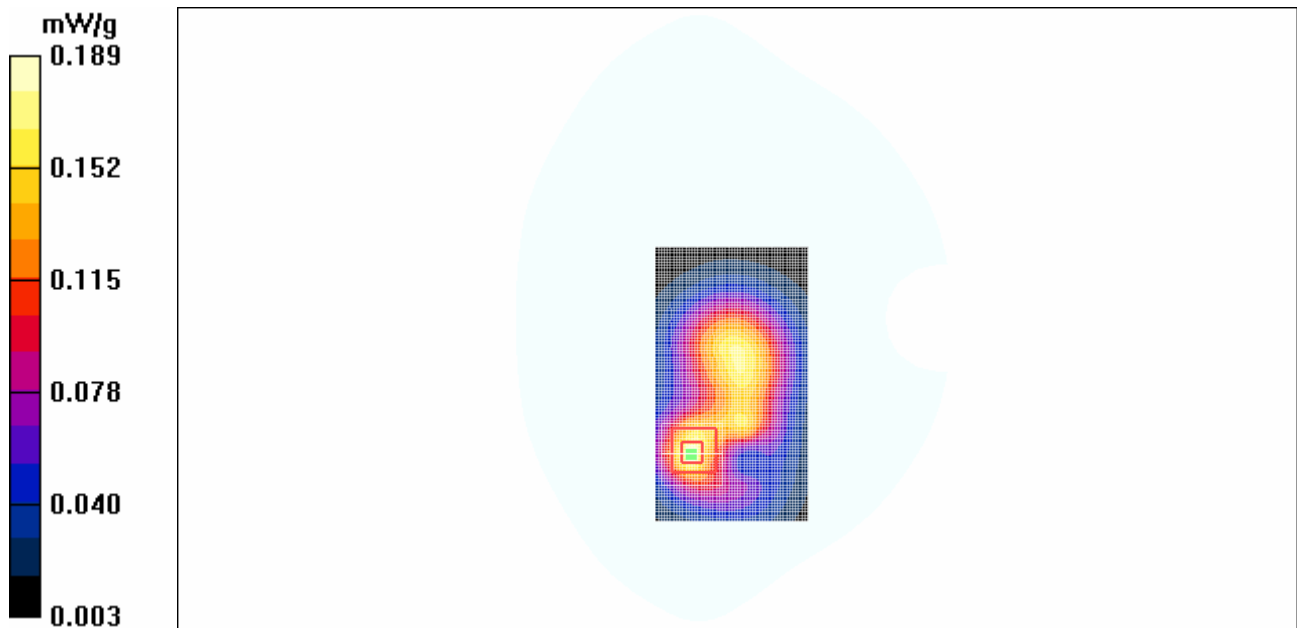


Figure 49 Body, Towards Ground, Close GSM 1900 Channel 661

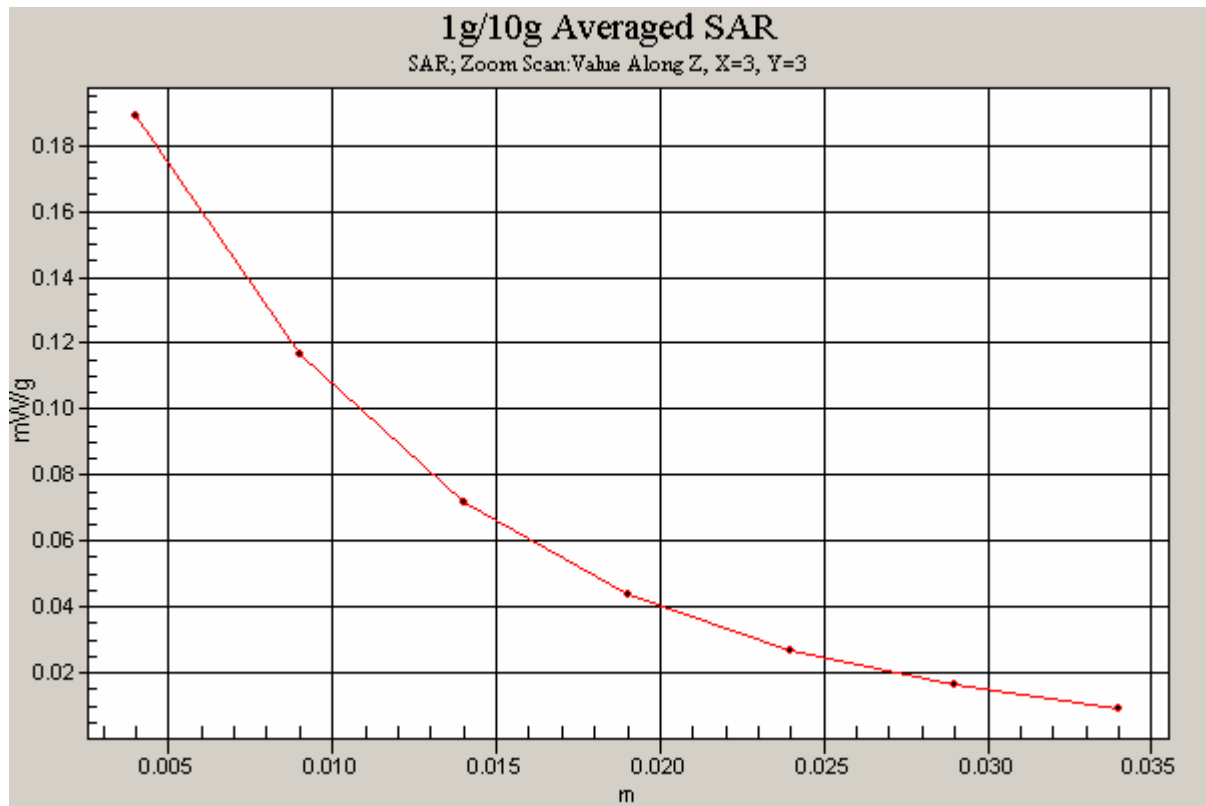


Figure 50 Z-Scan at power reference point (Body, Towards Ground, Close GSM 1900 Channel 661)

GSM 1900 Towards Ground Low Close

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

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

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

Maximum value of SAR (interpolated) = 0.140 mW/g

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

Reference Value = 8.14 V/m; Power Drift = 0.011 dB

Peak SAR (extrapolated) = 0.180 W/kg

SAR(1 g) = 0.130 mW/g; SAR(10 g) = 0.087 mW/g

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

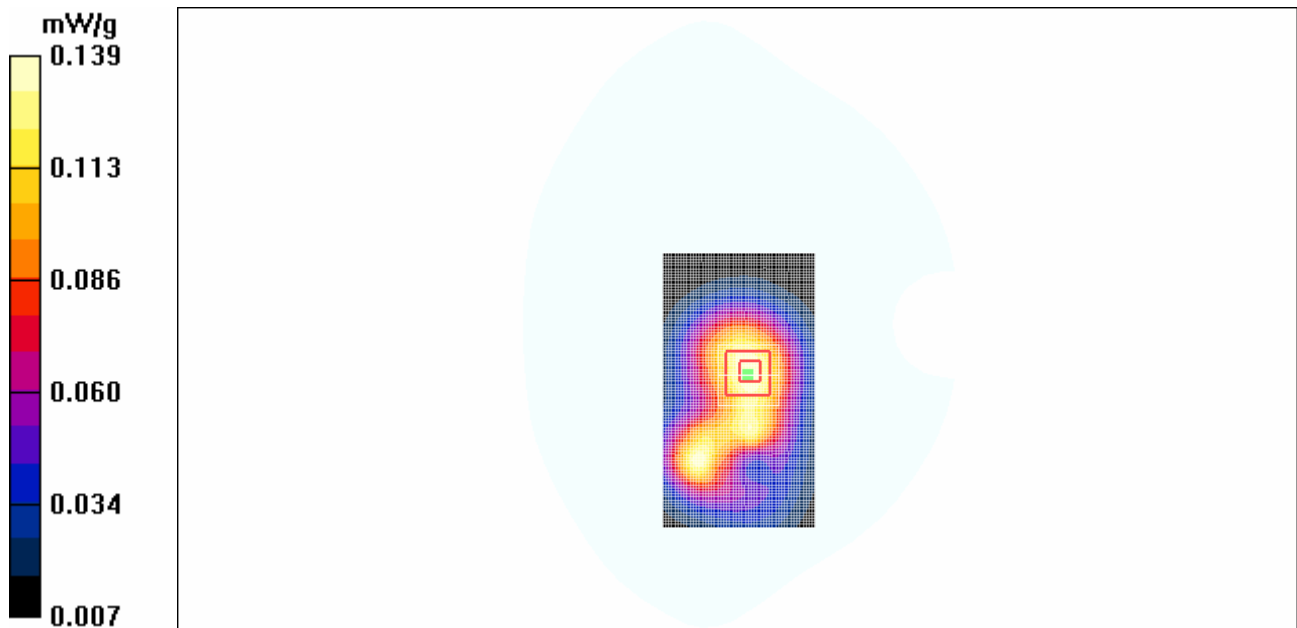


Figure 51 Body, Towards Ground, Close GSM 1900 Channel 512

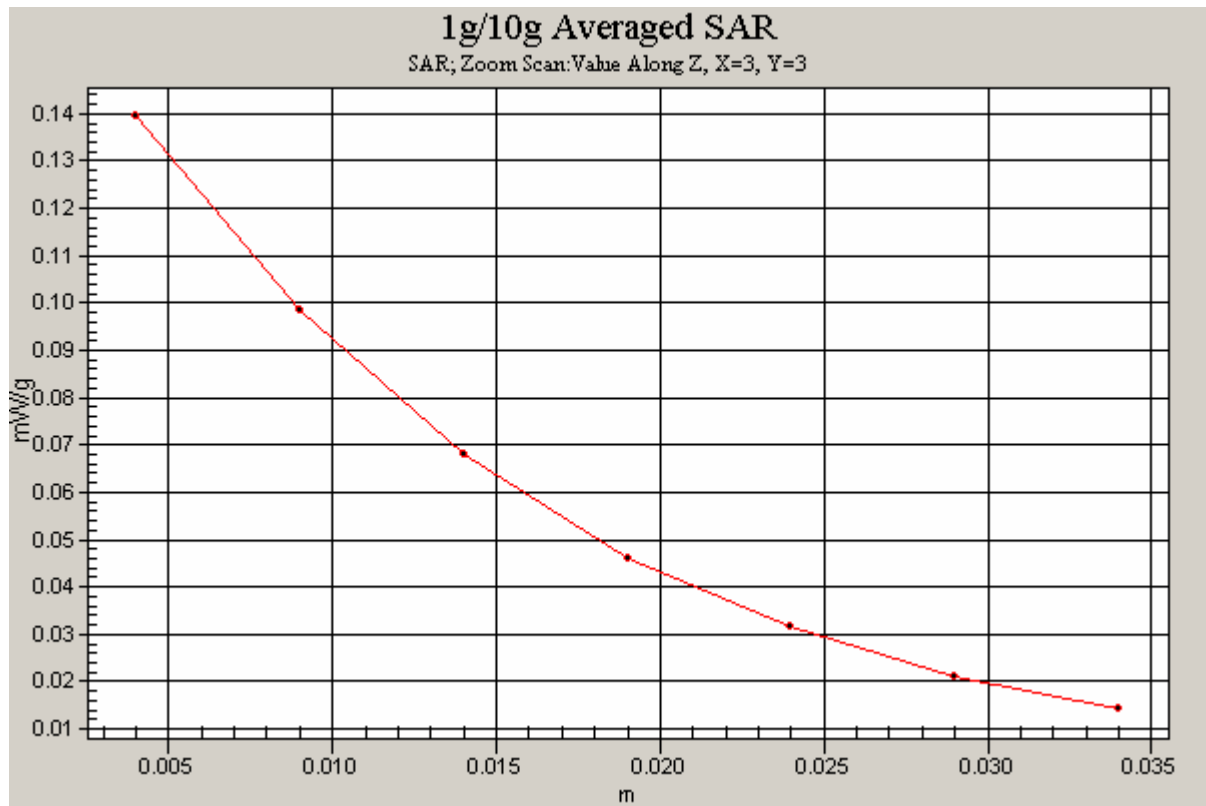


Figure 52 Z-Scan at power reference point (Body, Towards Ground, Close GSM 1900 Channel 512)

GSM 1900 Towards Phantom High Close

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

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

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

Maximum value of SAR (interpolated) = 0.122 mW/g

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

Reference Value = 8.04 V/m; Power Drift = -0.063 dB

Peak SAR (extrapolated) = 0.169 W/kg

SAR(1 g) = 0.111 mW/g; SAR(10 g) = 0.069 mW/g

Maximum value of SAR (measured) = 0.121 mW/g

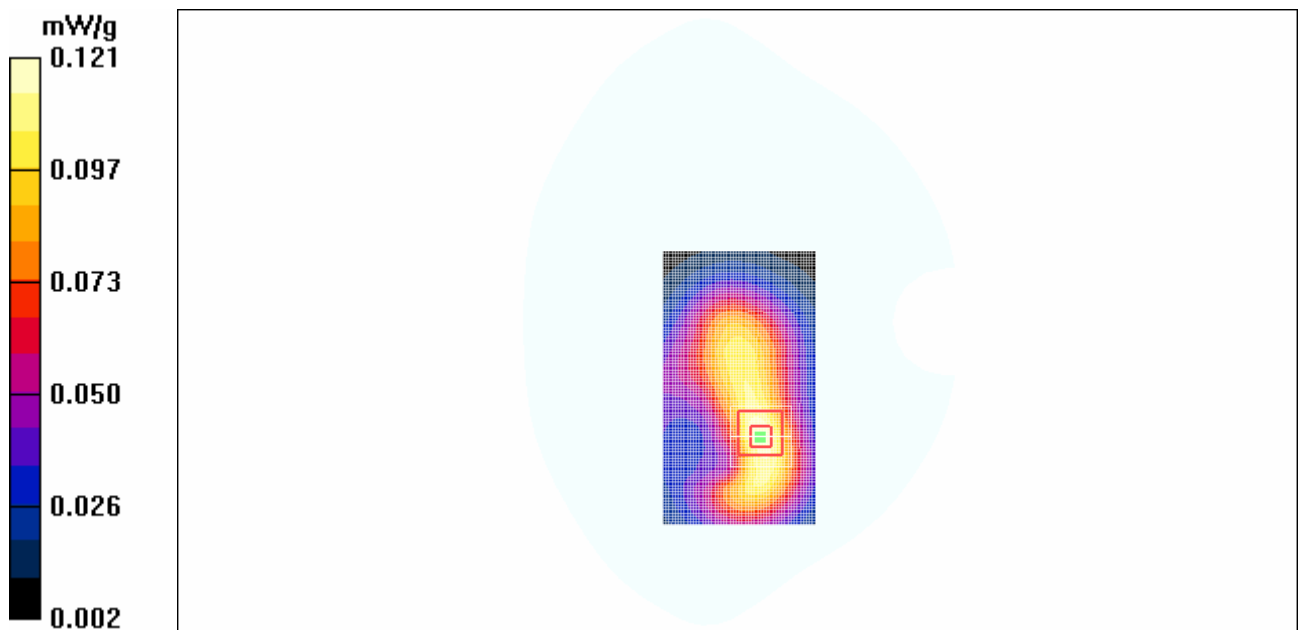


Figure 53 Body, Towards Phantom, Close GSM 1900 Channel 810

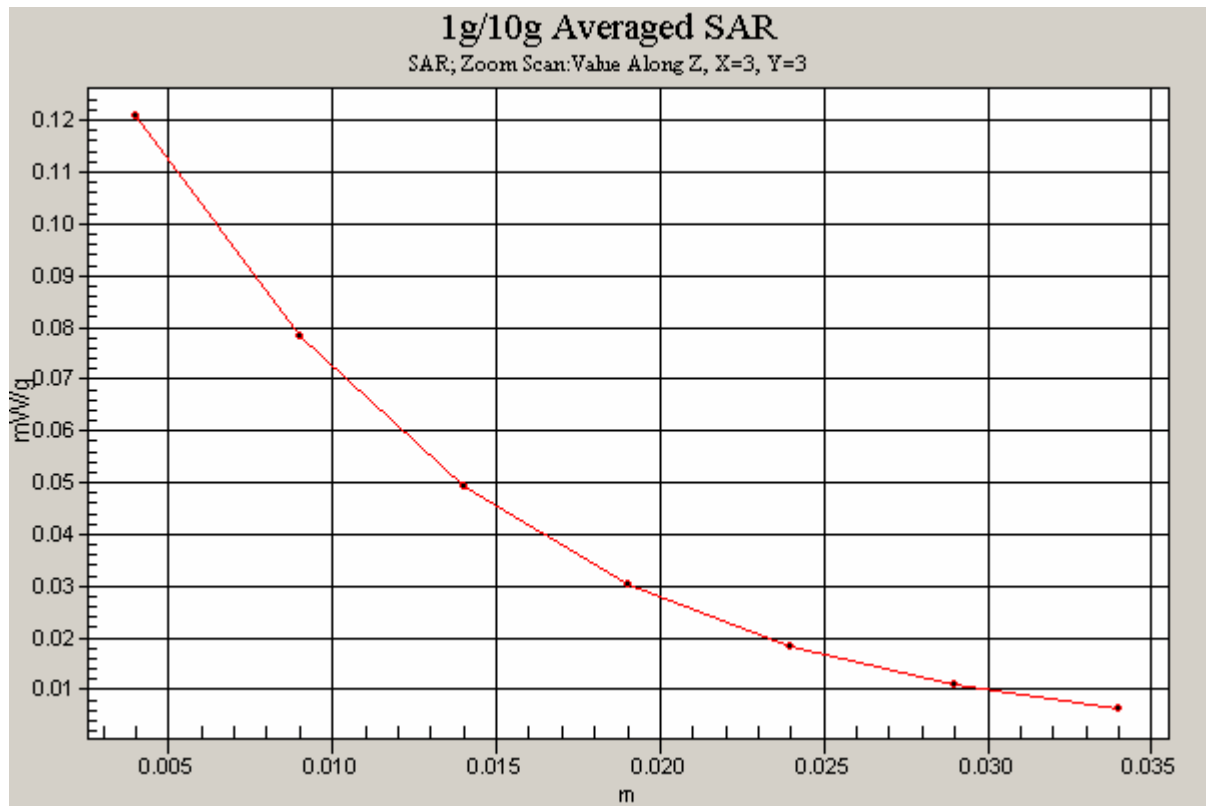


Figure 54 Z-Scan at power reference point (Body, Towards Phantom, Close GSM 1900 Channel 810)

GSM 1900 Towards Phantom Middle Close

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

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

Maximum value of SAR (interpolated) = 0.110 mW/g

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

Reference Value = 7.17 V/m; Power Drift = -0.014 dB

Peak SAR (extrapolated) = 0.153 W/kg

SAR(1 g) = 0.101 mW/g; SAR(10 g) = 0.062 mW/g

Maximum value of SAR (measured) = 0.110 mW/g

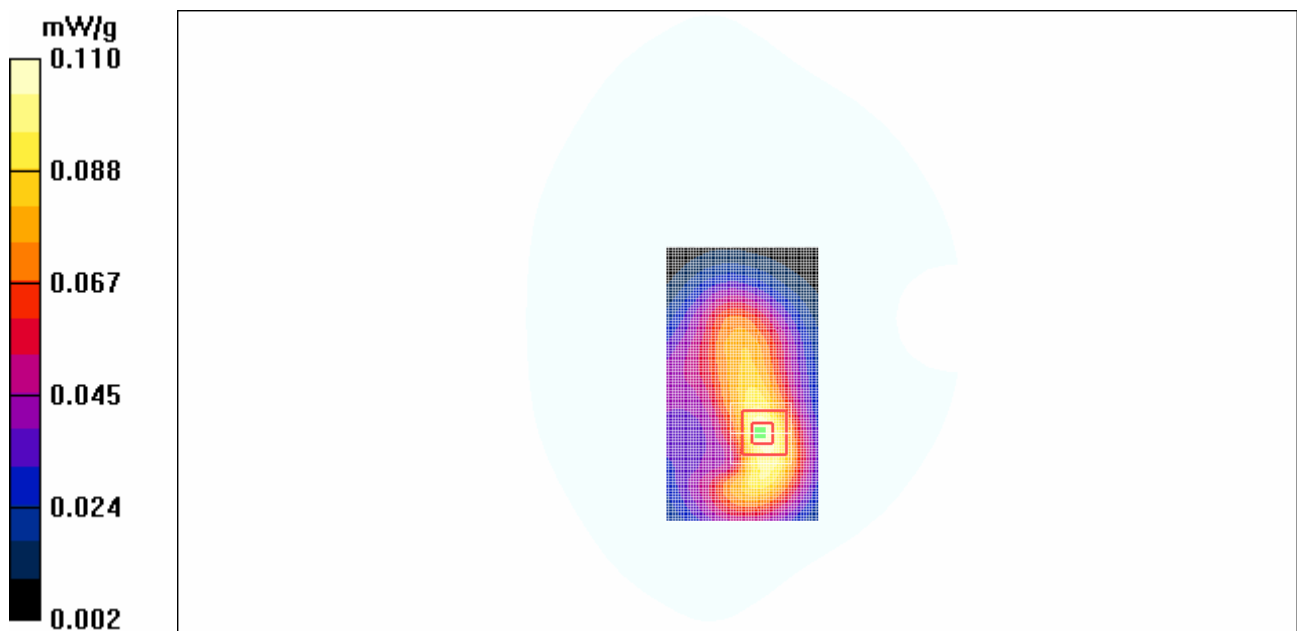


Figure 55 Body, Towards Phantom, Close GSM 1900 Channel 661

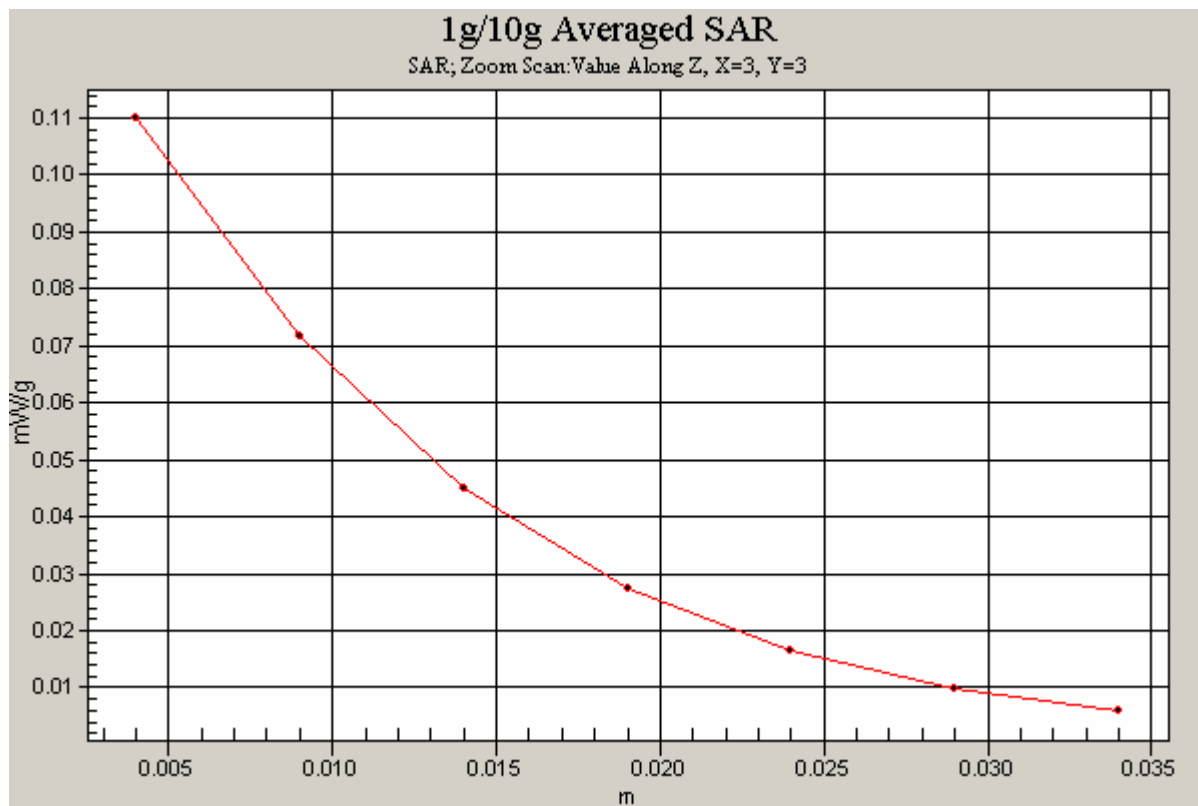


Figure 56 Z-Scan at power reference point (Body, Towards Phantom, Close GSM 1900 Channel 661)

GSM 1900 Towards Phantom Low Close

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

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

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

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

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

Reference Value = 6.16 V/m; Power Drift = -0.006 dB

Peak SAR (extrapolated) = 0.123 W/kg

SAR(1 g) = 0.082 mW/g; SAR(10 g) = 0.051 mW/g

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

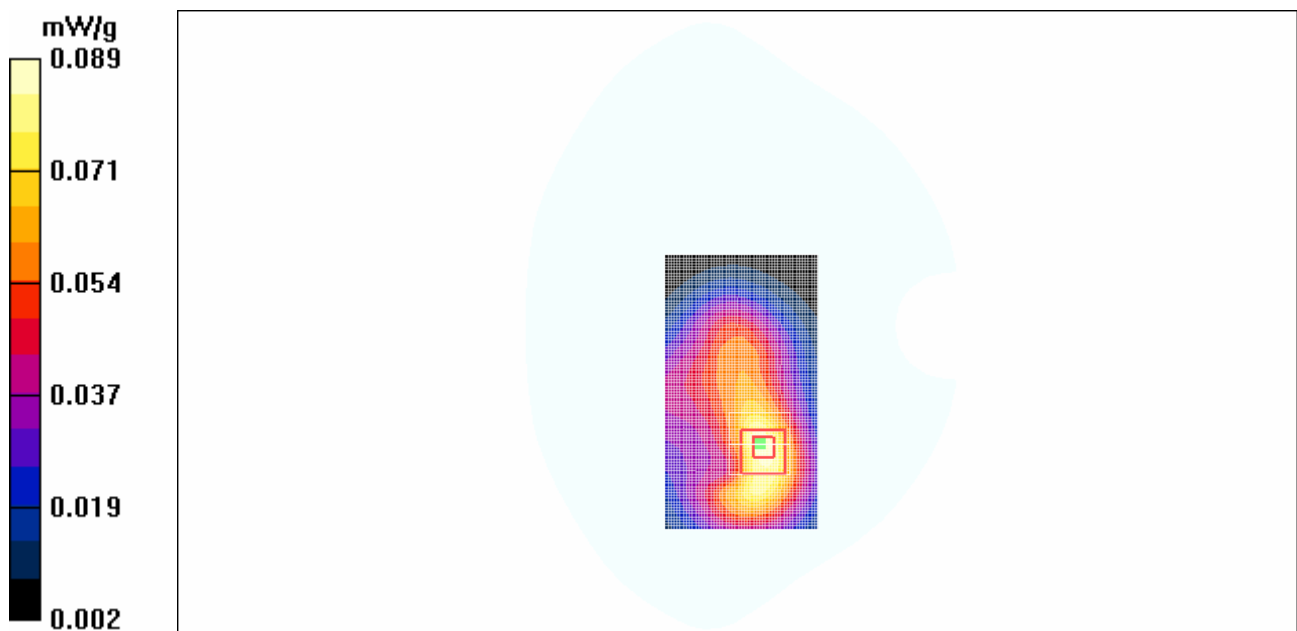


Figure 57 Body, Towards Phantom, Close GSM 1900 Channel 512

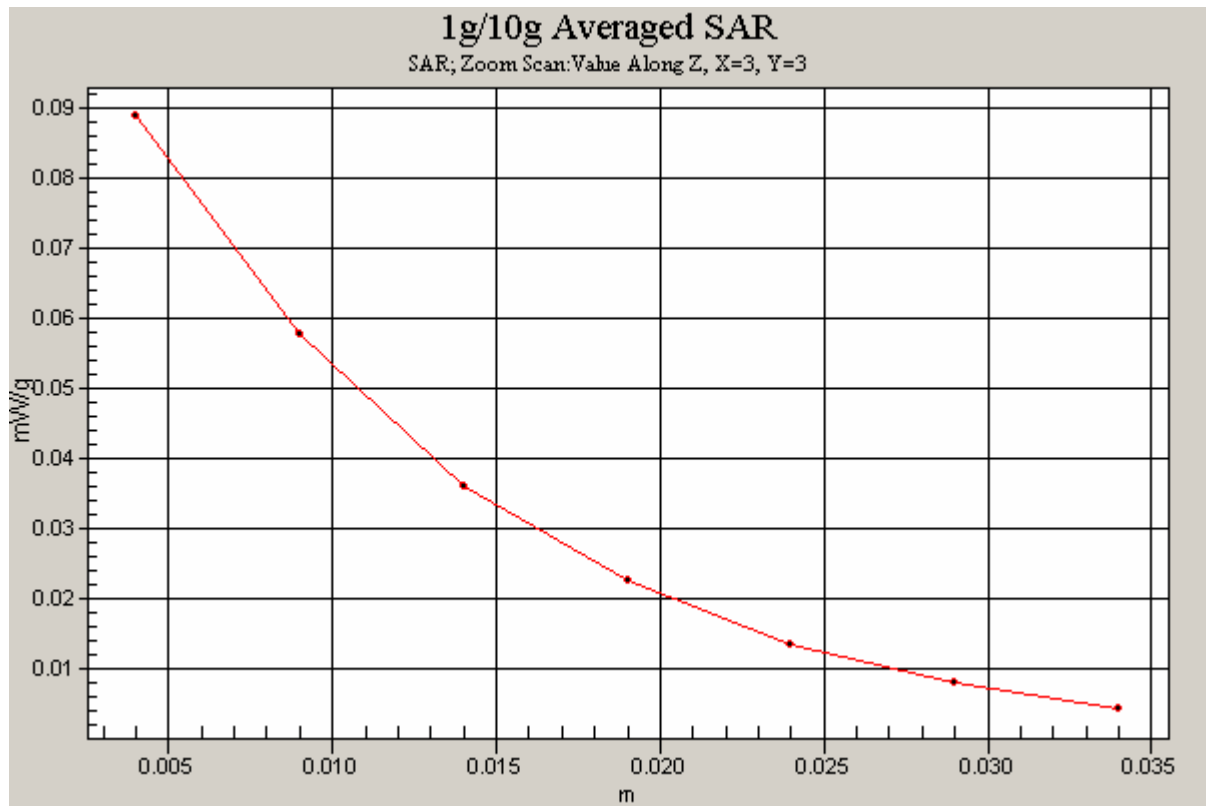


Figure 58 Z-Scan at power reference point (Body, Towards Phantom, Close GSM 1900 Channel 512)

GSM 1900 Earphone Towards Ground High Close

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

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

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

Maximum value of SAR (interpolated) = 0.342 mW/g

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

Reference Value = 9.31 V/m; Power Drift = -0.084 dB

Peak SAR (extrapolated) = 0.503 W/kg

SAR(1 g) = 0.297 mW/g; SAR(10 g) = 0.161 mW/g

Maximum value of SAR (measured) = 0.329 mW/g

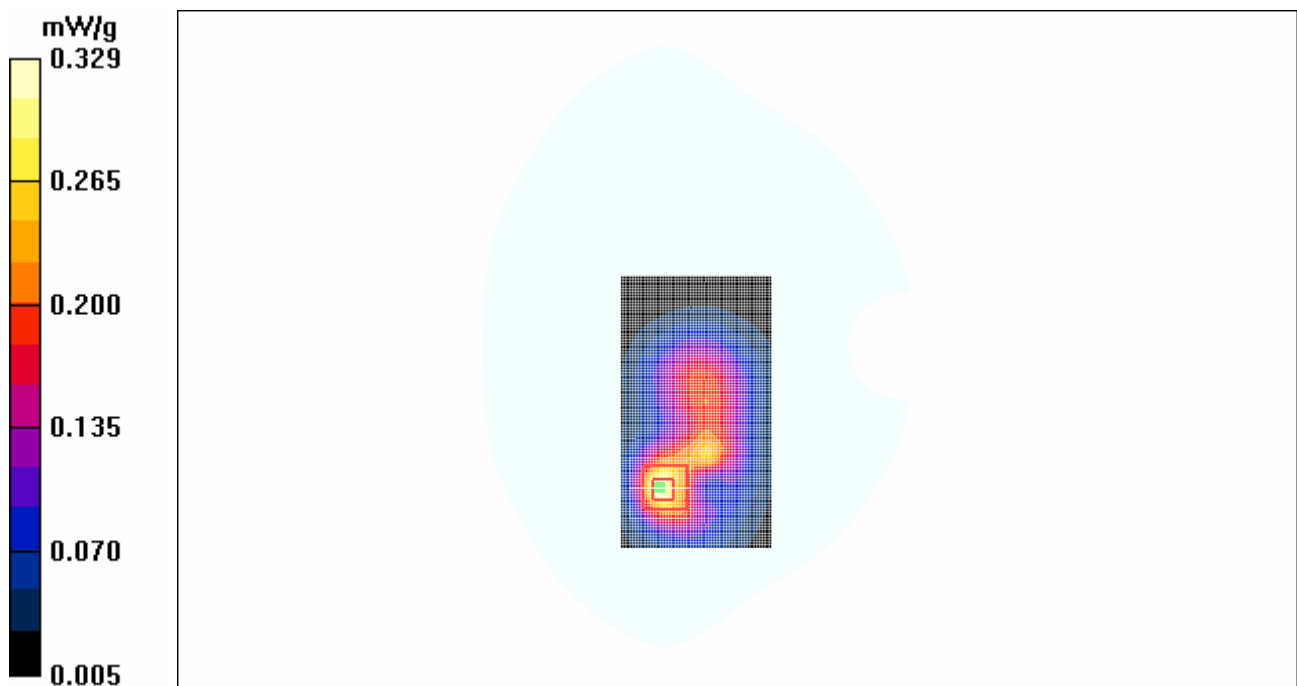


Figure 59 Body with Earphone, Towards Ground, Close GSM 1900, Channel 810

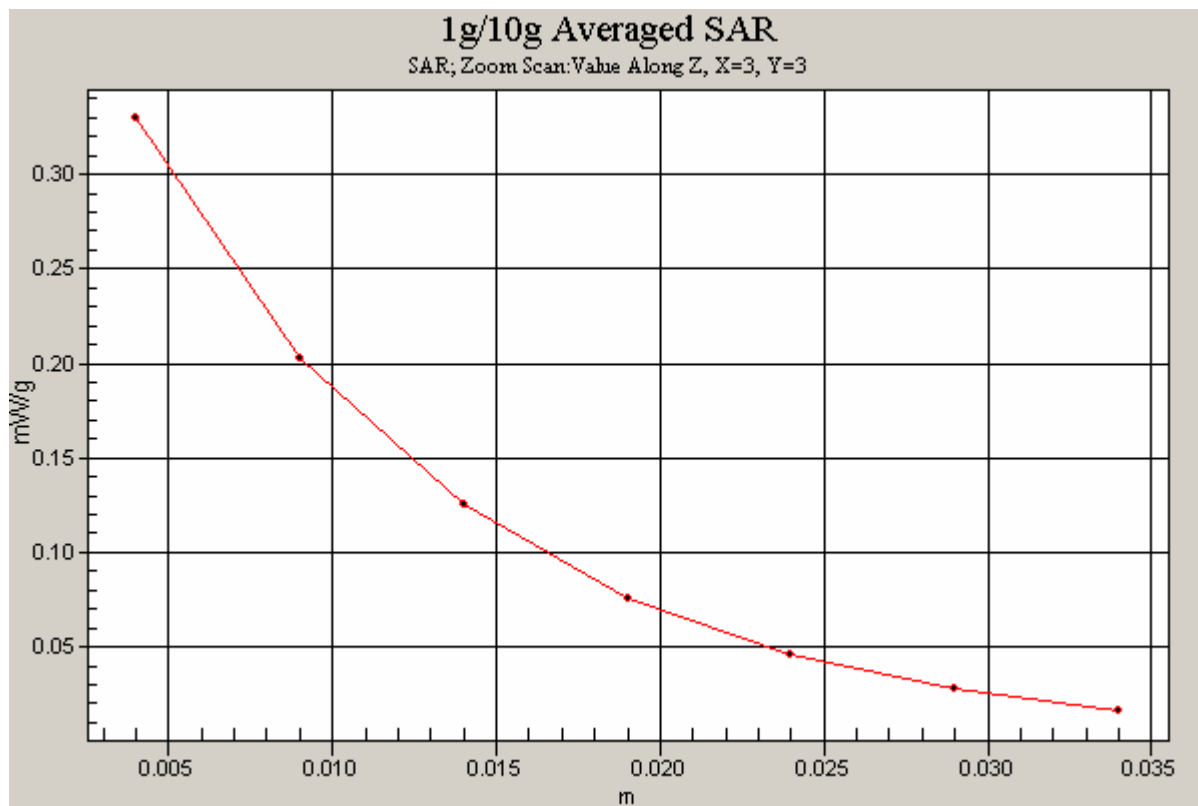


Figure 60 Z-Scan at power reference point (Body with Earphone, Towards Ground, Close GSM 1900, Channel 810)

GSM 1900 Bluetooth Earphone Towards Ground High Close

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

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

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

Maximum value of SAR (interpolated) = 0.351 mW/g

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

Reference Value = 6.76 V/m; Power Drift = -0.068 dB

Peak SAR (extrapolated) = 0.453 W/kg

SAR(1 g) = 0.318 mW/g; SAR(10 g) = 0.210 mW/g

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

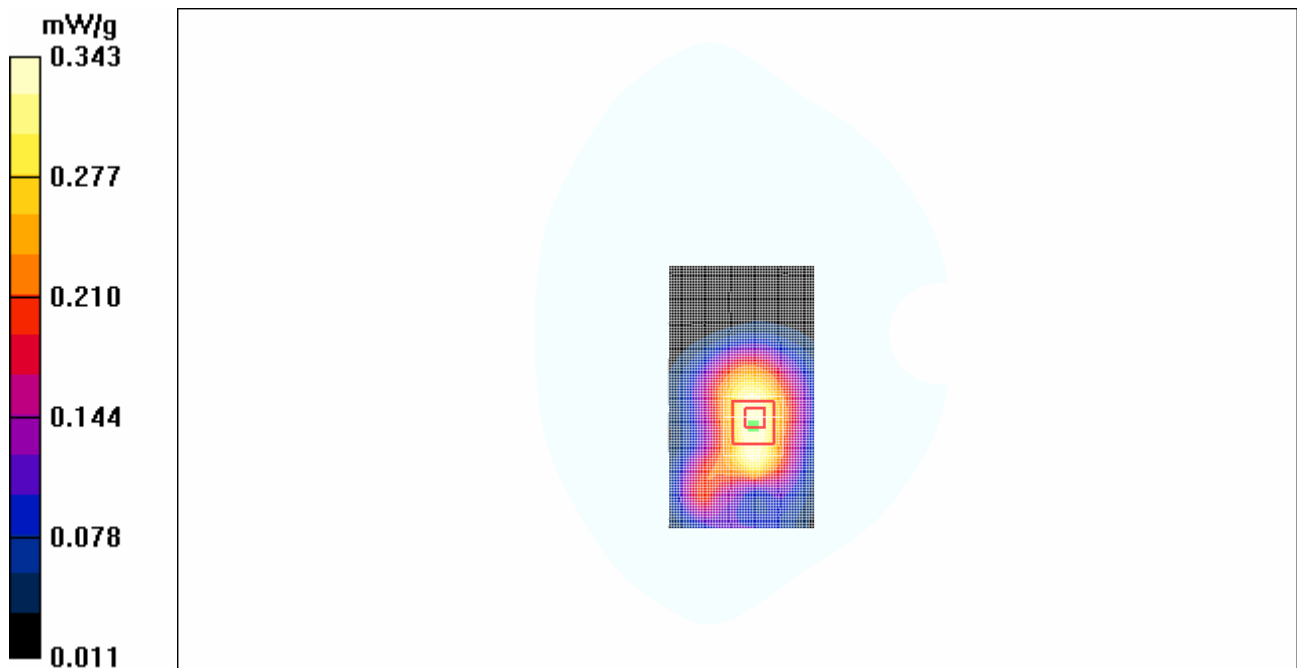


Figure 61 Body with Bluetooth earphone, Towards Ground, Close GSM 1900, Channel 810

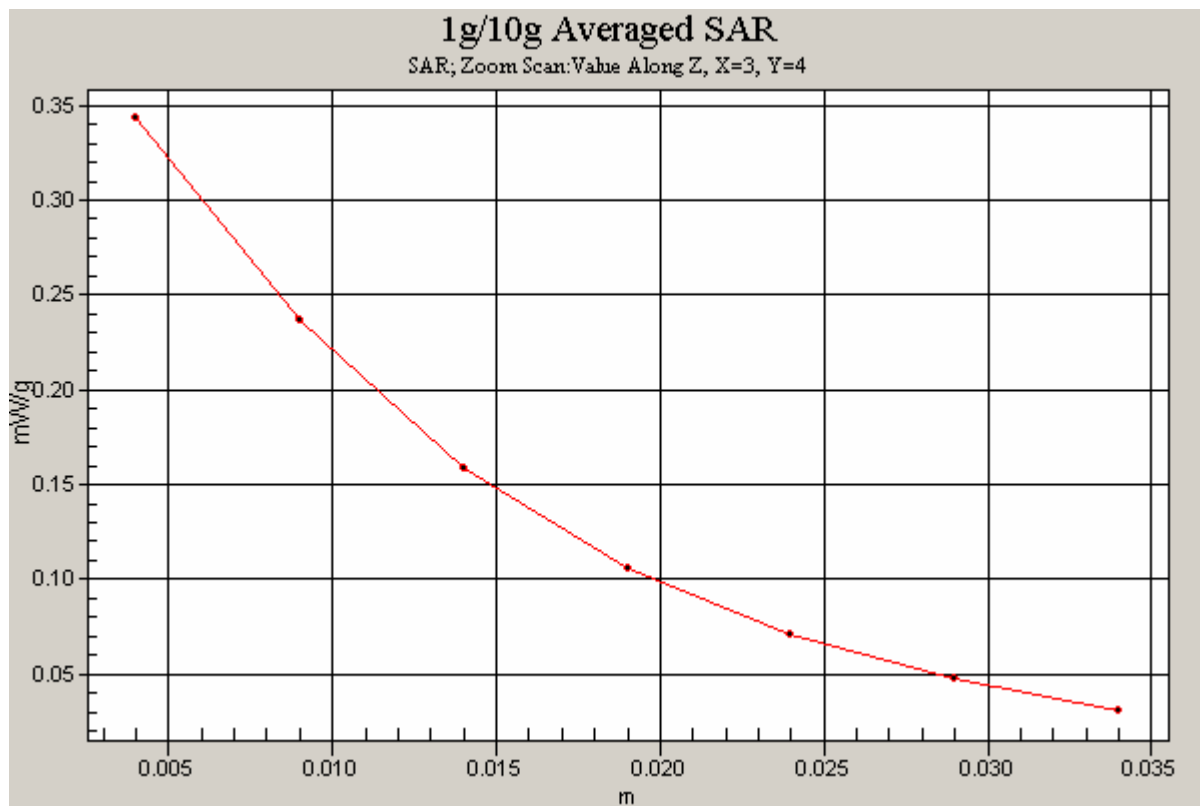


Figure 62 Z-Scan at power reference point (Body with Bluetooth earphone, Towards Ground, Close GSM 1900, Channel 810)

GSM 1900 GPRS Towards Ground High Close

Communication System: GSM 1900+GPRS(2Up); Frequency: 1909.8 MHz; Duty Cycle: 1:4

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

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

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

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

Reference Value = 13.8 V/m; Power Drift = -0.068 dB

Peak SAR (extrapolated) = 0.638 W/kg

SAR(1 g) = 0.383 mW/g; SAR(10 g) = 0.218 mW/g

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

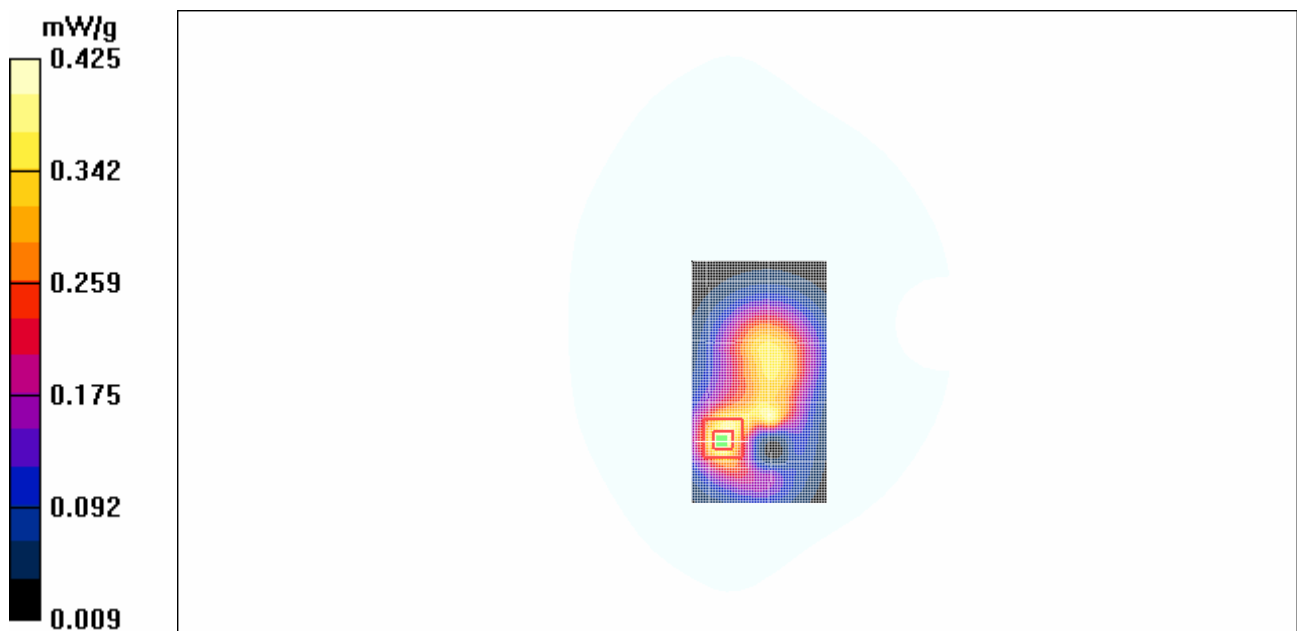


Figure 63 Body, Towards Ground, Close GSM 1900 GPRS, Channel 810

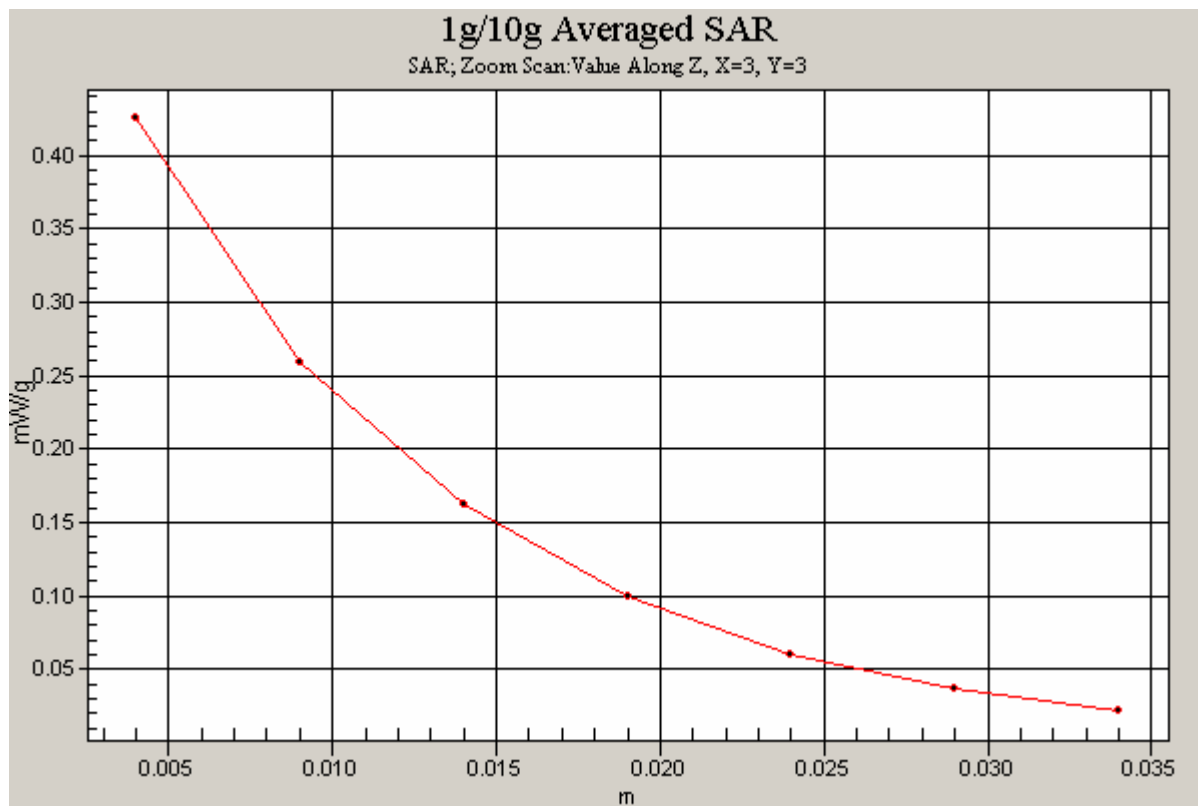


Figure 64 Z-Scan at power reference point (Body, Towards Ground, Close GSM 1900 GPRS, Channel 810)

GSM 1900 GPRS Towards Ground Middle Close

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

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

Maximum value of SAR (interpolated) = 0.374 mW/g

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

Reference Value = 12.5 V/m; Power Drift = 0.020 dB

Peak SAR (extrapolated) = 0.430 W/kg

SAR(1 g) = 0.304 mW/g; SAR(10 g) = 0.202 mW/g

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

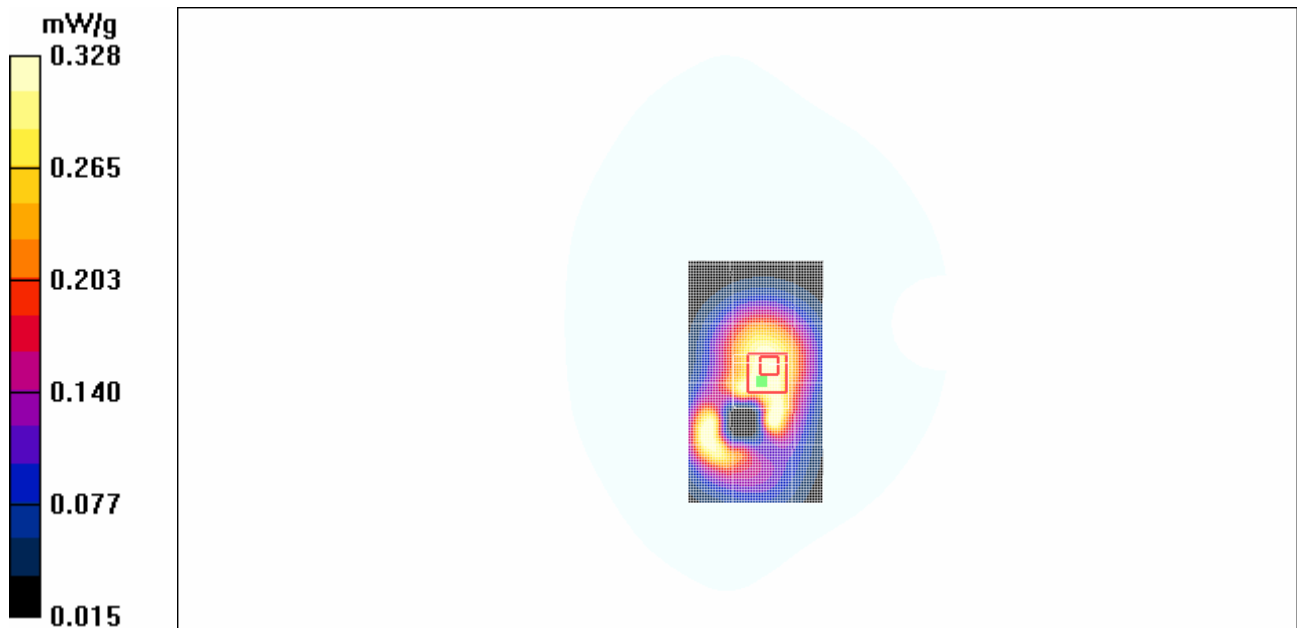


Figure 65 Body, Towards Ground, Close GSM 1900 GPRS Channel 661

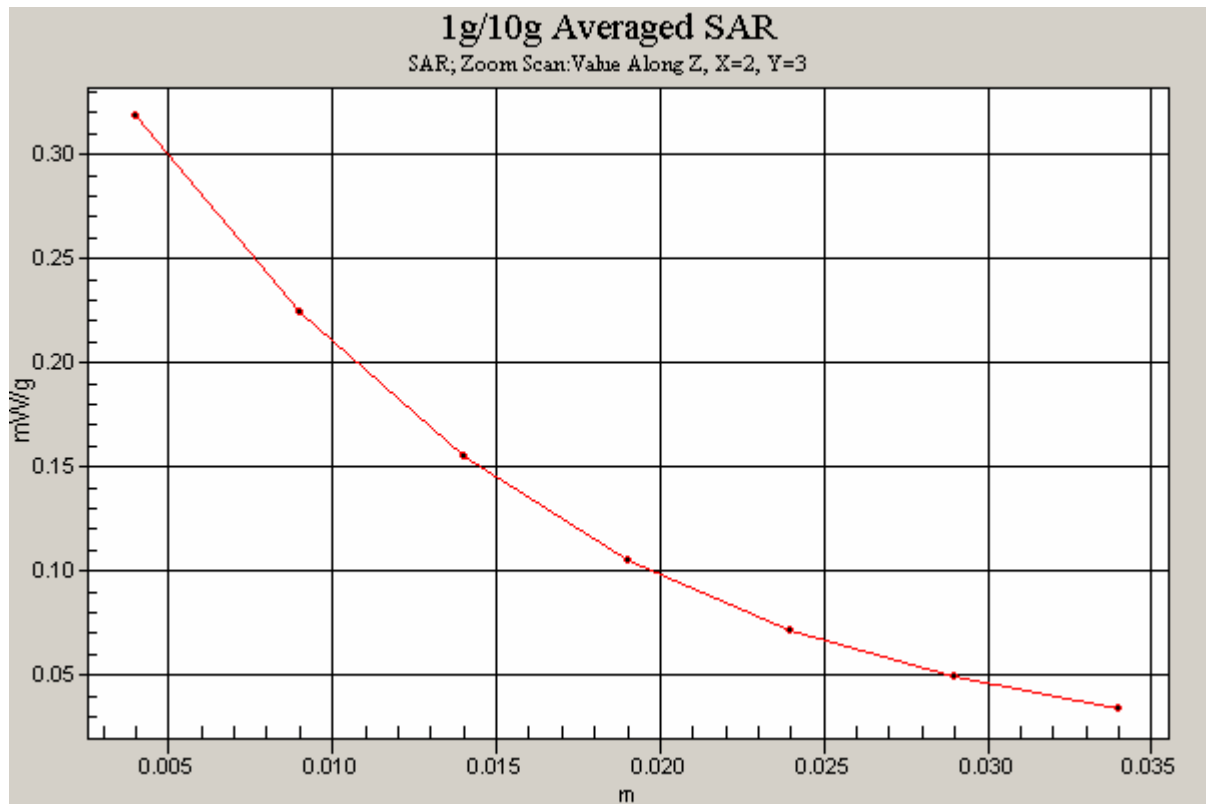


Figure 66 Z-Scan at power reference point (Body, Towards Ground, Close GSM 1900 GPRS Channel 661)

GSM 1900 GPRS Towards Ground Low Close

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

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

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

Maximum value of SAR (interpolated) = 0.290 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 = -0.054 dB

Peak SAR (extrapolated) = 0.379 W/kg

SAR(1 g) = 0.258 mW/g; SAR(10 g) = 0.167 mW/g

Maximum value of SAR (measured) = 0.282 mW/g

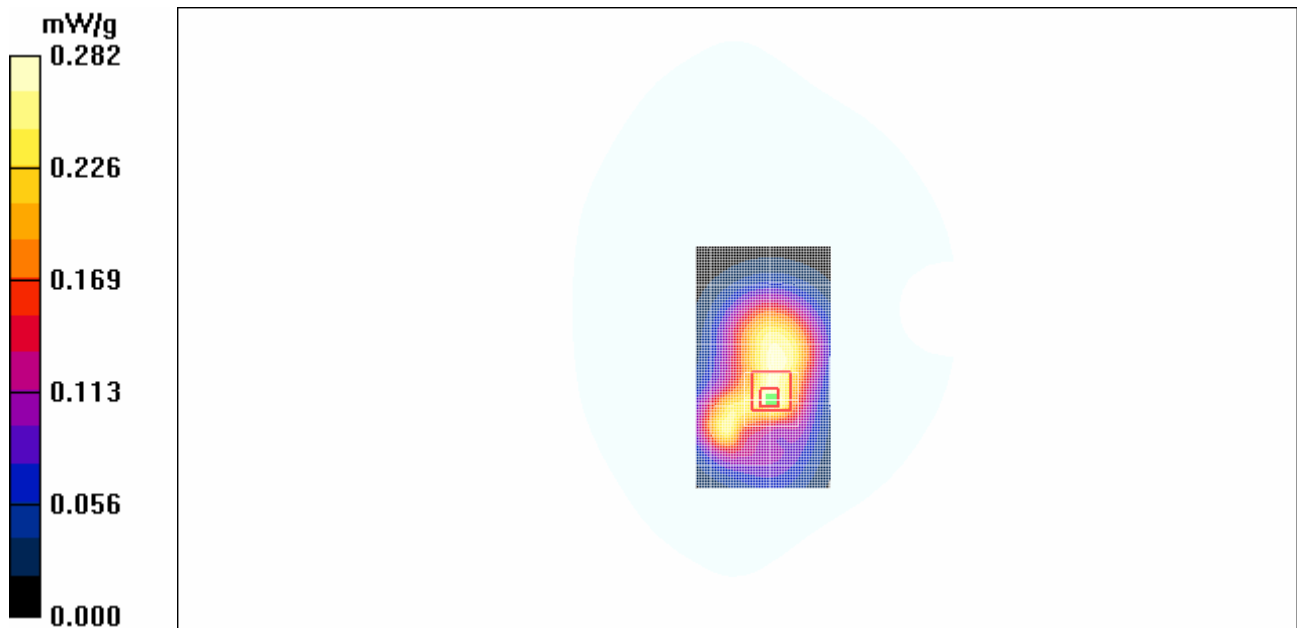


Figure 67 Body, Towards Ground, Close GSM 1900 GPRS Channel 512

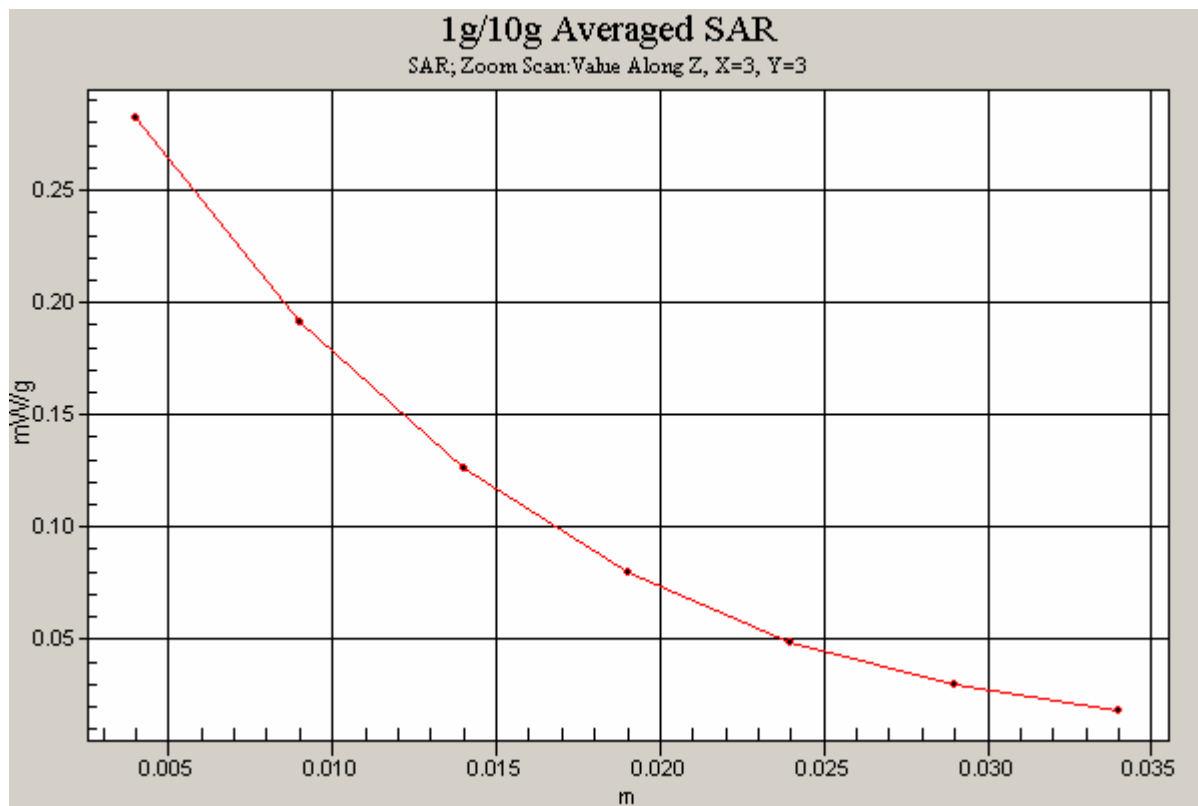


Figure 68 Z-Scan at power reference point (Body, Towards Ground, Close GSM 1900 GPRS Channel 512)

GSM 1900 GPRS Towards Phantom High Close

Communication System: GSM 1900+GPRS(2Up); Frequency: 1909.8 MHz; Duty Cycle: 1:4

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

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

Maximum value of SAR (interpolated) = 0.202 mW/g

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

Reference Value = 11.2 V/m; Power Drift = -0.001 dB

Peak SAR (extrapolated) = 0.249 W/kg

SAR(1 g) = 0.163 mW/g; SAR(10 g) = 0.100 mW/g

Maximum value of SAR (measured) = 0.178 mW/g

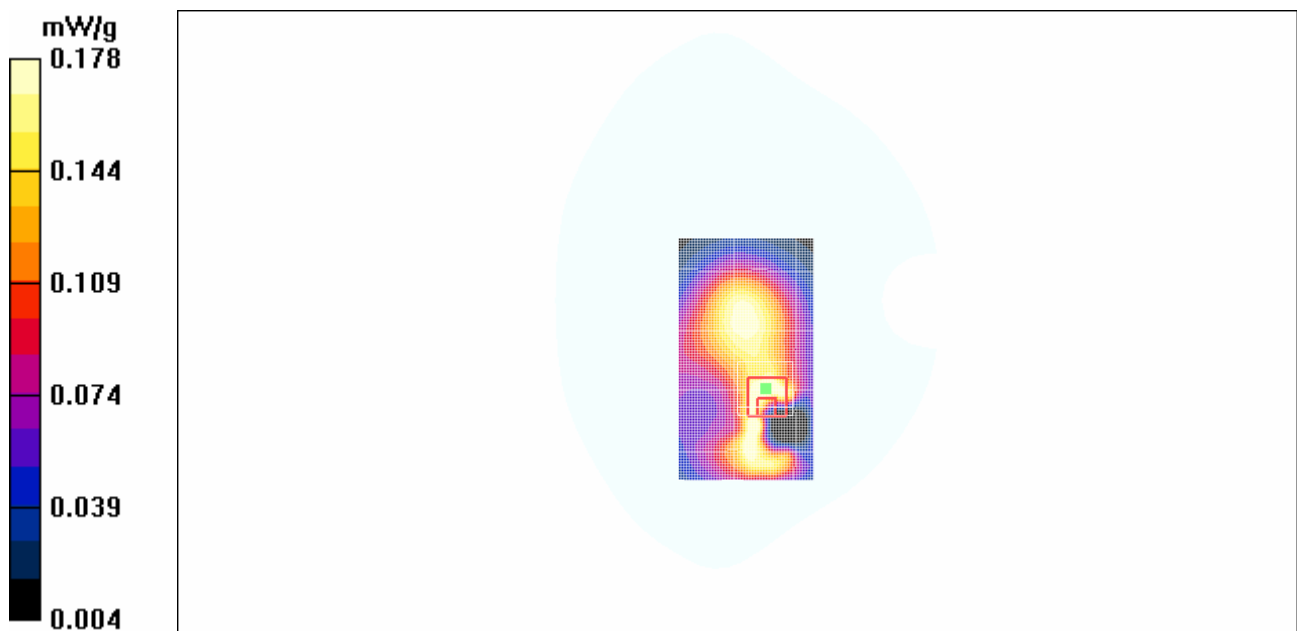


Figure 69 Body, Towards Phantom, Close GSM 1900 GPRS, Channel 810

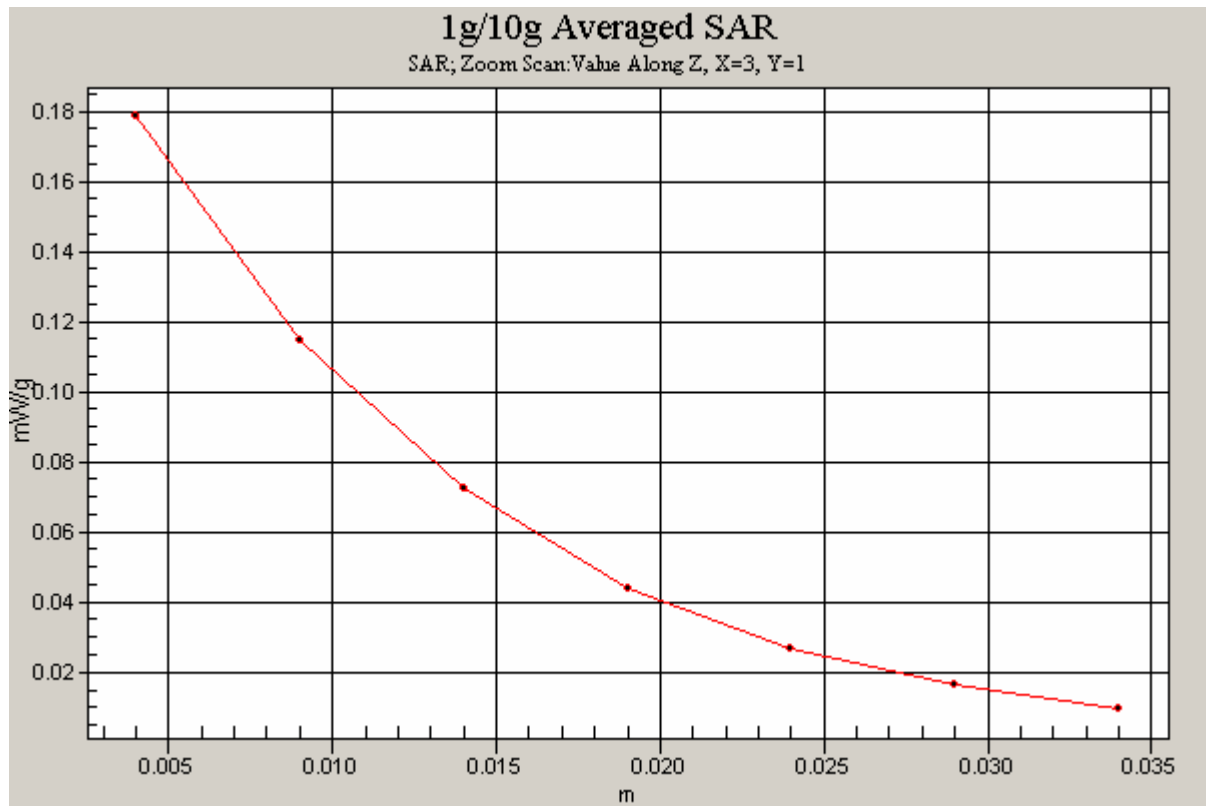


Figure 70 Z-Scan at power reference point (Body, Towards Phantom, Close GSM 1900 GPRS, Channel 810)

GSM 1900 GPRS Towards Phantom Middle Close

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

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

Maximum value of SAR (interpolated) = 0.181 mW/g

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

Reference Value = 9.92 V/m; Power Drift = -0.033 dB

Peak SAR (extrapolated) = 0.221 W/kg

SAR(1 g) = 0.149 mW/g; SAR(10 g) = 0.094 mW/g

Maximum value of SAR (measured) = 0.160 mW/g



Figure 71 Body, Towards Phantom, Close GSM 1900 GPRS Channel 661

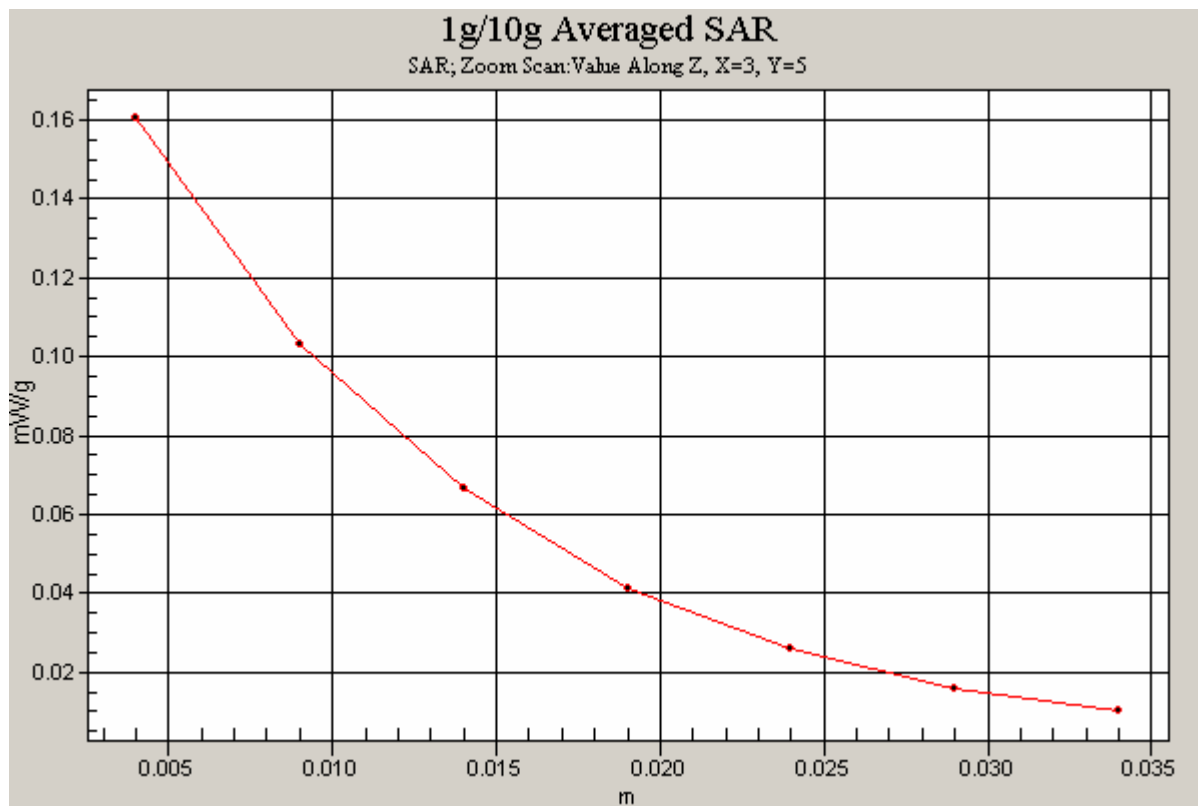


Figure 72 Z-Scan at power reference point (Body, Towards Phantom, Close GSM 1900 GPRS Channel 661)

GSM 1900 GPRS Towards Phantom Low Close

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

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

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

Maximum value of SAR (interpolated) = 0.141 mW/g

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

Reference Value = 8.85 V/m; Power Drift = -0.097 dB

Peak SAR (extrapolated) = 0.185 W/kg

SAR(1 g) = 0.126 mW/g; SAR(10 g) = 0.079 mW/g

Maximum value of SAR (measured) = 0.140 mW/g

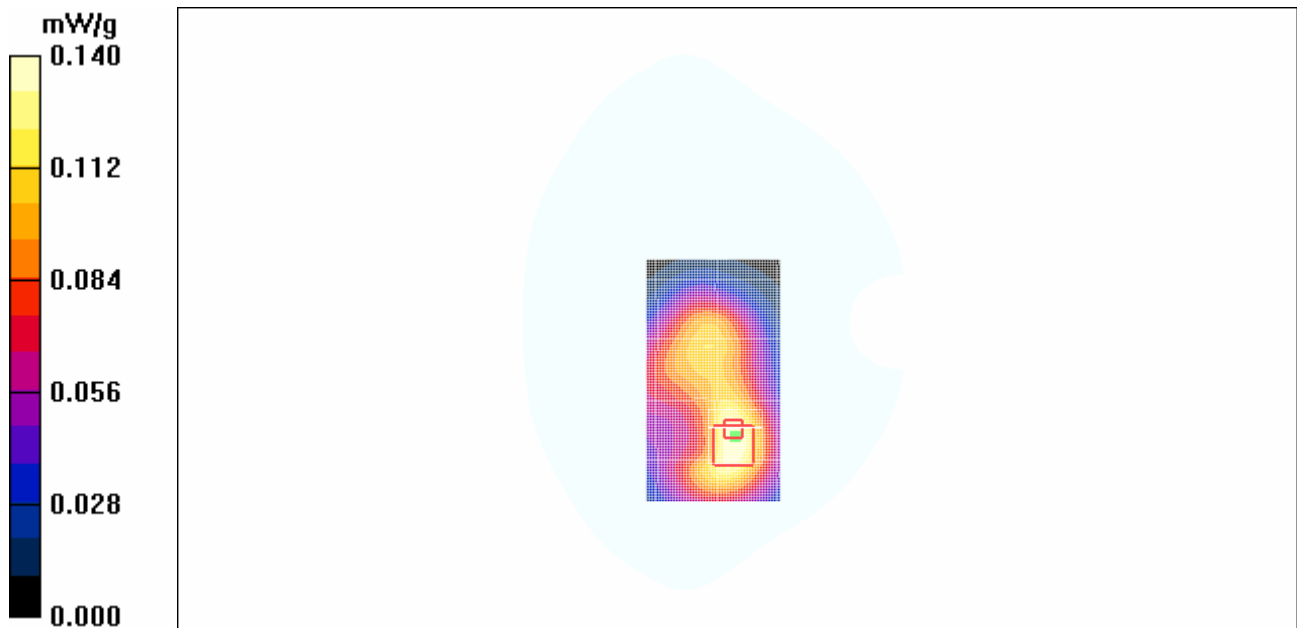


Figure 73 Body, Towards Phantom, Close GSM 1900 GPRS Channel 512

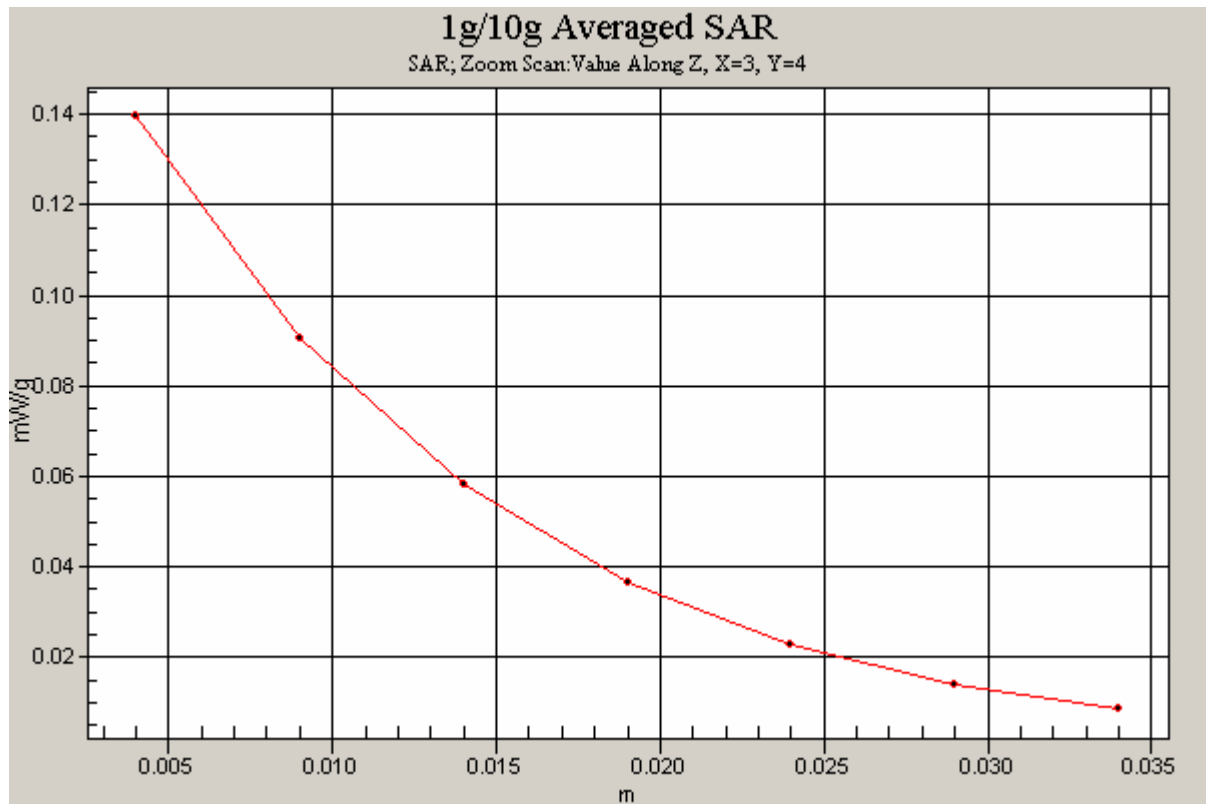


Figure 74 Z-Scan at power reference point (Body, Towards Phantom, Close GSM 1900 GPRS Channel 512)

ANNEX D: SYSTEM VALIDATION RESULTS

System Performance Check at 1900 MHz

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

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

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.43$ mho/m; $\epsilon_r = 39.68$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(5.15, 5.15, 5.15);

Electronics: DAE3 Sn452;

d=10mm, Pin=250mW 2/Area Scan (101x121x1): Measurement grid: dx=10mm, dy=10mm

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

d=10mm, Pin=250mW 2/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 92.8 V/m; Power Drift = -0.018 dB

Peak SAR (extrapolated) = 16.0 W/kg

SAR(1 g) = 9.36 mW/g; SAR(10 g) = 4.93 mW/g

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

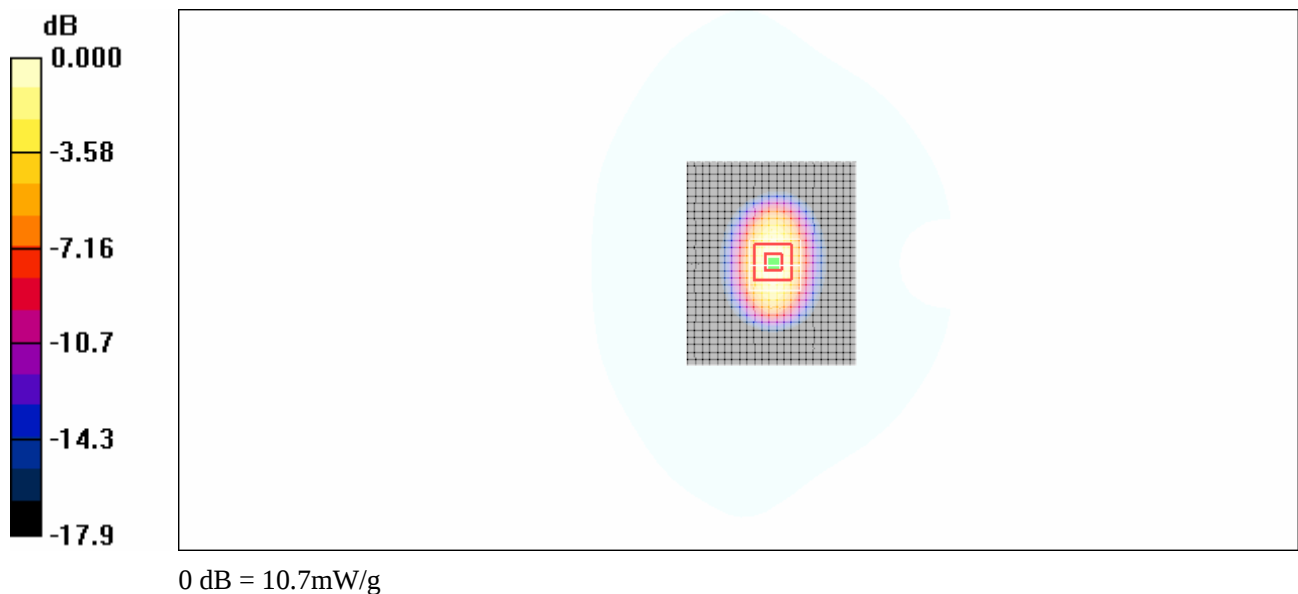


Figure 75 System Performance Check 1900MHz 250mW

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

No. RZA2008-0730

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ANNEX E: PROBE CALIBRATION CERTIFICATE

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



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

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

Accreditation No.: SCS 108

Client ATL (Auden)

Certificate No. ET3-1531_Jan08

CALIBRATION CERTIFICATE

Object ET3DV6 - SN:1531

Calibration procedure(s) QA CAL-01.v6 and QA CAL-12.v5
Calibration procedure for dosimetric E-field probes

Calibration date: January 29, 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 $(22 \pm 3)^{\circ}\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&E critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Power sensor E4412A	MY41495277	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Power sensor E4412A	MY41498087	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Reference 3 dB Attenuator	SN: S5054 (3c)	8-Aug-07 (METAS, No. 217-00719)	Aug-08
Reference 20 dB Attenuator	SN: S5058 (20b)	29-Mar-07 (METAS, No. 217-00671)	Mar-08
Reference 30 dB Attenuator	SN: S5129 (30b)	8-Aug-07 (METAS, No. 217-00720)	Aug-08
Reference Probe ES3DV2	SN: 3013	2-Jan-08 (SPEAG, No. ES3-3013_Jan08)	Jan-09
DAE4	SN: 654	20-Apr-07 (SPEAG, No. DAE4-654_Apr07)	Apr-08

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (SPEAG, in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Oct-07)	In house check: Oct-08

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Technical Manager	
Approved by:	Nils Kuster	Quality Manager	

Issued: January 29, 2008

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

Certificate No: ET3-1531_Jan08

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Calibration Laboratory of
Schmid & Partner
Engineering AG
Zauggstrasse 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

Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConF	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., $\theta = 0$ 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 $\theta = 0$ ($f \leq 900$ 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.