No. CNAS L2264

NO.: RZA2007-0900

TEST REPORT

Test name	Electromagnetic Field (Specific Absorption Rate)
Product	CDMA 1X Digital Mobile Telephone
Model	HUAWEI C5330
FCC ID	QISC5330
Client	HUAWEI Technologies Co., Ltd.

TA Technology (Shanghai) Co., Ltd.

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GENERAL SUMMARY

Product	CDMA 1X Digital Mobile Telephone	**Model**	HUAWEI C5330
Client	HUAWEI Technologies Co., Ltd.	**Type of test**	Entrusted
Manufacturer	HUAWEI Technologies Co., Ltd.	**Arrival Date of sample**	Sept.19th, 2007
Place of sampling	(Blank)	**Carrier of the samples**	Xie Yan
Quantity of the samples	One	**Date of product**	(Blank)
Base of the samples	(Blank)	**Items of test**	SAR
Series number	0F8D9100		
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 (Edition 97-01) and Supplement C (Edition 01-01):** Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits. **IEC 62209-1:** Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures –Part 1: Procedure to determine the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)			
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 5.2 of this test report. Maximum localized SAR is below exposure limits specified in the relevant standards cited in Clause 5.1 of this test report. General Judgment: **Pass** (Stamp) **Date of issue: Sep.24th, 2007**		
Comment	TX Freq. Band: 824–849MHz (CDMA) Max. Power: 0.25W(CDMA) The test result only responds to the measured sample.		

Approved by_____ **Revised by**_____ **Performed by**_____

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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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	Serial Number	Manufacturer
Handset	HUAWEI C5330	0F8D9100	HUAWEI Technologies Co., Ltd.
Lithium Battery	HBC85S	BYD722675164	Shenzhen BYD Co., Ltd.
AC/DC Adapter	TPCA-053065UY	TPI6A2706130	TECH-POWER Electronics （Shenzhen） Co., Ltd.

Picture 1: Constituents of the sample (Lithium Battery is in the Handset)

3.3 General Description

Equipment Under Test (EUT) is a model of CDMA 1X portable Mobile Station (MS) with internal antenna. It consists of Handset and normal options: Lithium Battery and AC/DC Adapter as Table 3 and Figure 1. SAR is tested for CDMA Cellular.

The sample undergoing test was selected by the Client.

Components list please refer to documents of the manufacturer.

4 OPERATIONAL CONDITIONS DURING TEST

4.1 Schematic Test Configuration

A communication link is set up with a System Simulator (SS) by air link, and a call is established. The Absolute Radio Frequency Channel Number (ARFCN) is allocated to 1013, 384 and 777 respectively in the case of CDMA Cellular. The EUT is commanded to operate at maximum transmitting power.

SAR is measured in RC3 with the DUT configured to transmit at full rate using Loopback Service Option SO55.SAR for RC1 is not required because the maximum average output of each channel is less than 0.25 dB higher than that measured in RC3.

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.

Test communication setup meet as followings:

Communication standard between mobile station and base station simulator	3GPP2 C.S0011-B
Radio configuration	RC3（Supporting CDMA 1X）
Spreading Rate	SR1
Data Rate	9600bps
Service Options	SO55 （loop back mode）
Service Options	SO3 （voice mode）
Multiplex Options	The mobile station does not support this service.

Test Parameter setup for maximum RF output power according to section 4.4.5 of 3GPP2

Parameter	Units	Value
I or	dBm/1.23MHz	-104
PilotE c /I or	dB	-7
TrafficE c /I or	dB	-7.4

For SAR test, the maximum power output is very important and essential; it is identical under the measurement uncertainty. It is proper to use typical Test Mode 3 (FW RC3, RVS RC3, SO55) as the worst case for SAR test.

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.

4.2 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 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.

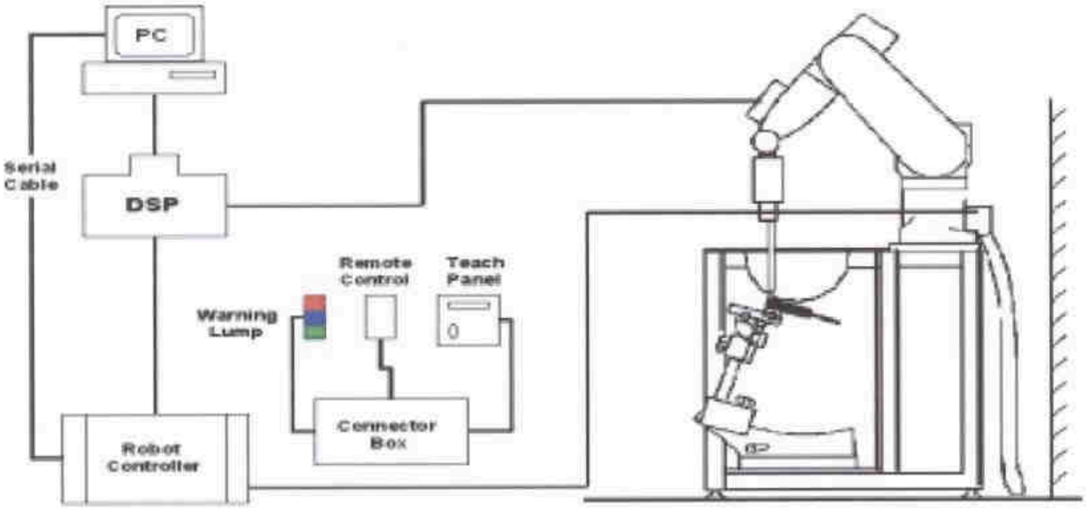


Figure1. SAR Lab Test Measurement Set-up

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.

4.3 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 ± 10%. The spherical isotropy was evaluated and found to be better than ± 0.25dB.

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.q., glycol)
Calibration	In air from 10 MHz to 2.5 GHz In brain and muscle simulating tissue at frequencies of 450MHz, 900MHz and 1.8GHz (accuracy±8%) Calibration for other liquids and frequencies upon request
Frequency	l 0 MHz to > 6 GHz; Linearity: ±0.2 dB (30 MHz to 3 GHz)
Directivity	±0.2 dB in brain tissue (rotation around probe axis) ±0.4 dB in brain tissue (rotation normal probe axis)
Dynamic Range	5u W/g to > 100mW/g; Linearity: ±0.2dB
Surface Detection	±0.2 mm repeatability in air and clear liquids over diffuse reflecting surface(ET3DV6 only)
Dimensions	Overall length: 330mm Tip length: 16mm Body diameter: 12mm Tip diarneter: 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

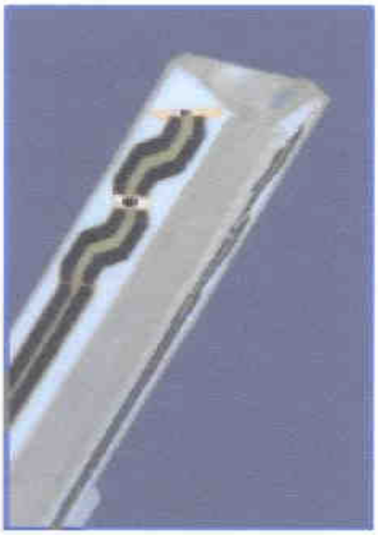


Figure2. ET3DV6 E-field Probe

Figure3. ET3DV6 E-field probe

4.4 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).

4.5 Other Test Equipment

4.5.1 Device Holder for Transmitters

In combination with the Generic Twin Phantom V3.0, the Mounting Device (POM) enables the rotation of the mounted transmitter in spherical coordinates whereby the rotation points is the ear opening. The devices can be easily, accurately, and 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).

Figure4. Device Holder

4.5.2 Phantom

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

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

Figure5. Generic Twin Phantom

4.6 Equivalent Tissues

The liquid used for the frequency range of 800-2000 MHz consisted of water, sugar, salt and Cellulose. The liquid has previously been proven to be suited for worst-case. The Table 4 shows 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) 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

Table 5: 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

4.7 System Specifications

4.7.1 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.

5 CHARACTERISTICS OF THE TEST

5.1 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.

5.2 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 (Edition 97-01) and Supplement C (Edition 01-01): Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits.
IEC 62209-1: Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures –Part 1: Procedure to determine the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)

6 LABORATORY ENVIRONMENT

Table 6: The Ambient Conditions during Test

Temperature	Min. = 18 °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 CONDUCTED OUTPUT POWER MEASUREMENT

7.1 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.

7.2 Conducted Power

7.2.1 Measurement Methods

The EUT was set up for the maximum output power. The channel power was measured. These measurements were done at 3 channels 1013, 384 and 777 before SAR test and after SAR test.

7.2.2 Measurement result

Table 7: Conducted Power Measurement Results

CDMA2000 1X (RC3)	Conducted Power		
	Channel 1013 (824.7MHz)	Channel 384 (836.52MHz)	Channel 777 (848.31MHz)
Before Test (dBm)	24.1	24.1	24.1
After Test (dBm)	24	24	24
CDMA2000 1X (RC1)	Conducted Power		
	Channel 1013 (824.7MHz)	Channel 384 (836.52MHz)	Channel 777 (848.31MHz)
Before Test (dBm)	24.1	24.1	24.1
After Test (dBm)	24	24	24

7.2.3 Power Drift

To control the output power stability during the SAR test, DASY4 system calculates the power drift by measuring the E-field at the same location at the beginning and at the end of the measurement for each test position. These drift values can be found in Table 11 to Table 13 labeled as: (Power Drift [dB]). This ensures that the power drift during one measurement is within 5%.

8 TEST RESULTS

8.1 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**	**Permittivity ε**	**Conductivity σ (S/m)**
Target value	835 MHz	41.50	0.90
Measurement value (Average of 10 tests)	835 MHz	42.48	0.94

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**	**Permittivity ε**	**Conductivity σ (S/m)**
Target value	835 MHz	55.20	0.97
Measurement value (Average of 10 tests)	835 MHz	55.22	0.99

8.2 System Validation

Table 10: System Validation

Measurement is made at temperature 23.2 °C, relative humidity 50%, input power 250 mW. Liquid temperature during the test: 22.3°C					
Liquid parameters		**Frequency**	**Permittivity ε**	**Conductivity σ (S/m)**	
		835 MHz	42.8	0.89	
Verification results	**Frequency**	**Target value (W/kg)**		**Measurement value (W/kg)**	
		10 g Average	**1 g Average**	**10 g Average**	**1 g Average**
	835 MHz	1.60	2.48	1.53	2.34

Note：Target Values used are one fourth of those in IEEE Std 1528-2003 (feeding power is normalized to 1 Watt), i.e.250 mW is used as feeding power to the validation dipole (SPEAG using).

8.3 Summary of Measurement Results (Head, CDMA Cellular)

Table 11: SAR Values (Head, CDMA Cellular)

Liquid Temperature: 22.5℃			
Limit of SAR (W/kg)	**10 g Average**	**1 g Average**	**Power Drift (dB)**
	2.0	1.6	
Test Case	**Measurement Result (W/kg)**		
	10 g Average	**1 g Average**	
Left hand, Touch cheek, High frequency (See Fig.7)	0.73	1.05	-0.198
Left hand, Touch cheek, Mid frequency(See Fig.9)	0.543	0.782	-0.131
Left hand, Touch cheek, Low frequency (See Fig.11)	0.742	1.070	0.145
Left hand, Tilt 15 Degree, High frequency(See Fig.13)	0.424	0.635	-0.077
Left hand, Tilt 15 Degree, Mid frequency(See Fig.15)	0.335	0.481	-0.043
Left hand, Tilt 15 Degree, Low frequency(See Fig.17)	0.425	0.601	-0.053
Right hand, Touch cheek, High frequency(See Fig.19)	0.705	1.030	-0.045
Right hand, Touch cheek, Mid frequency(See Fig.21)	0.619	0.907	0.112
Right hand, Touch cheek, Low frequency(See Fig.23)	0.879	1.270	0.098
Right hand, Tilt 15 Degree, High frequency(See Fig.25)	0.423	0.621	0.109
Right hand, Tilt 15 Degree, Mid frequency(See Fig.27)	0.332	0.474	0.092
Right hand, Tilt 15 Degree, Low frequency(See Fig.29)	0.557	0.810	-0.058

Table 12: SAR Values (Body, CDMA Cellular, Distance 20mm)

Liquid Temperature: 22.4℃			
Limit of SAR (W/kg)	**10 g Average**	**1 g Average**	**Power Drift (dB)**
	2.0	1.6	
Test Case	**Measurement Result (W/kg)**		
	10 g Average	**1 g Average**	
Body, Towards Phantom, High frequency(See Fig.31)	0.213	0.294	0.070
Body, Towards Phantom, Mid frequency(See Fig.33)	0.226	0.315	-0.089
Body, Towards Phantom, Low frequency(See Fig.35)	0.336	0.464	0.008
Body, Towards Ground, High frequency(See Fig.37)	0.339	0.468	-0.136
Body, Towards Ground, Mid frequency(See Fig.39)	0.441	0.611	-0.023
Body, Towards Ground, Low frequency(See Fig.41)	0.673	0.936	-0.127

Table 13: SAR Values (Body with ear phone, CDMA Cellular, Distance 20mm)

<table>
<tr><td colspan="4">Liquid Temperature: 22.4℃</td></tr>
<tr><th rowspan="2">Limit of SAR (W/kg)</th><th>10 g Average</th><th>1 g Average</th><th rowspan="4">Power Drift (dB)</th></tr>
<tr><td>2.0</td><td>1.6</td></tr>
<tr><th rowspan="2">Test Case</th><th colspan="2">Measurement Result (W/kg)</th></tr>
<tr><th>10 g Average</th><th>1 g Average</th></tr>
<tr><td>Body, Towards Ground, Low frequency(See Fig.43)</td><td>0.673</td><td>0.935</td><td>0.164</td></tr>
</table>

8.4 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 5.2 of this report. Maximum localized SAR is below exposure limits specified in the relevant standards cited in Clause 5.1 of this test report.

9 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	

10 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	January 25, 2007	One year
04	Power sensor	Agilent 8481H	MY41091316	January 25, 2007	
05	Signal Generator	HP 8341B	2730A00804	September 15 2007	One year
06	Amplifier	IXA-020	0401	No Calibration Requested	
07	Validation Kit 835MHz	SPEAG D835V2	443	February 19, 2007	Two years
08	BTS	E5515C	GB46490218	December 16,2006	One year
09	E-field Probe	ET3DV6	1737	February 20, 2007	One year
10	DAE	DAE3	452	September 6, 2007	One year

11 TEST PERIOD

The test is performed from Sep.19th, 2007 to Sep.21st, 2007.

12 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 7x 7 points. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

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

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

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

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

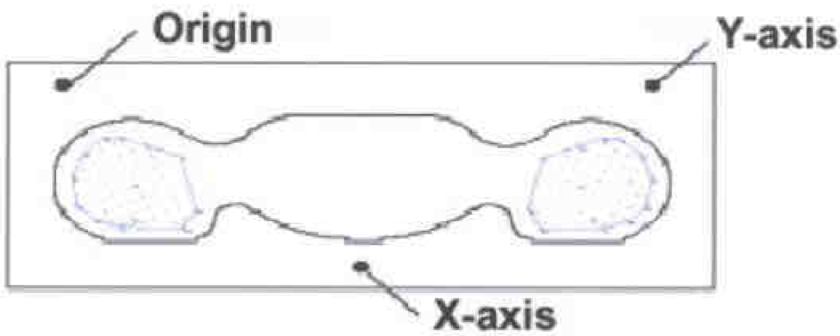
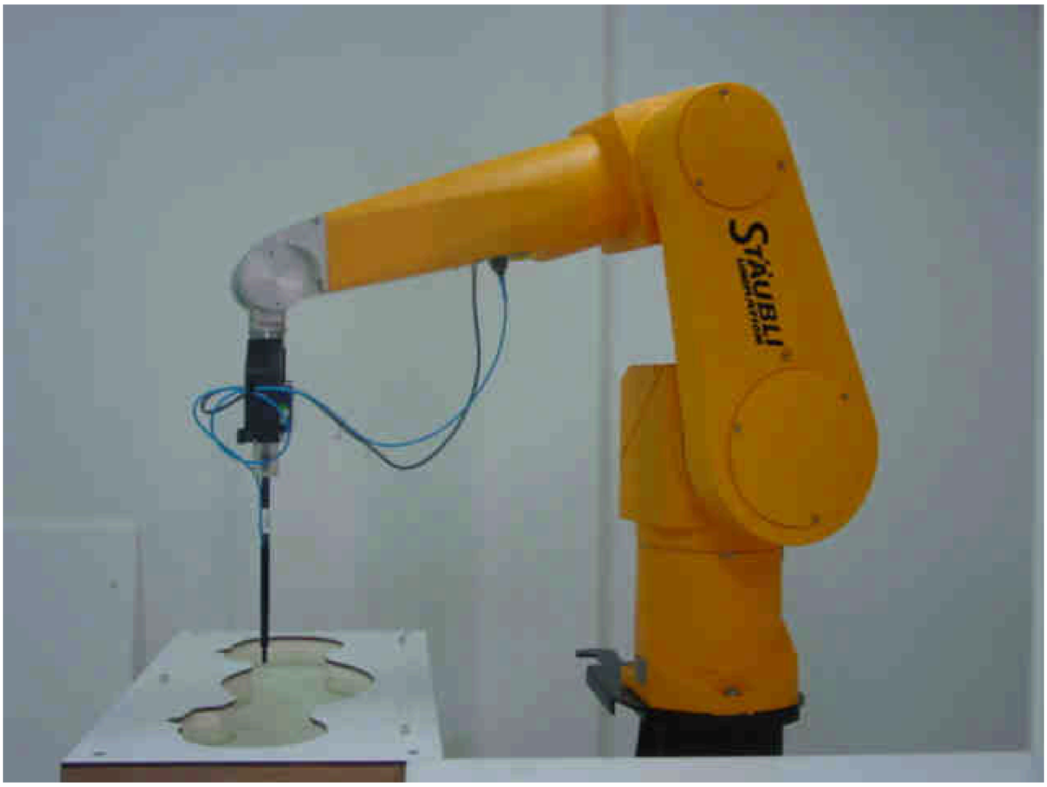
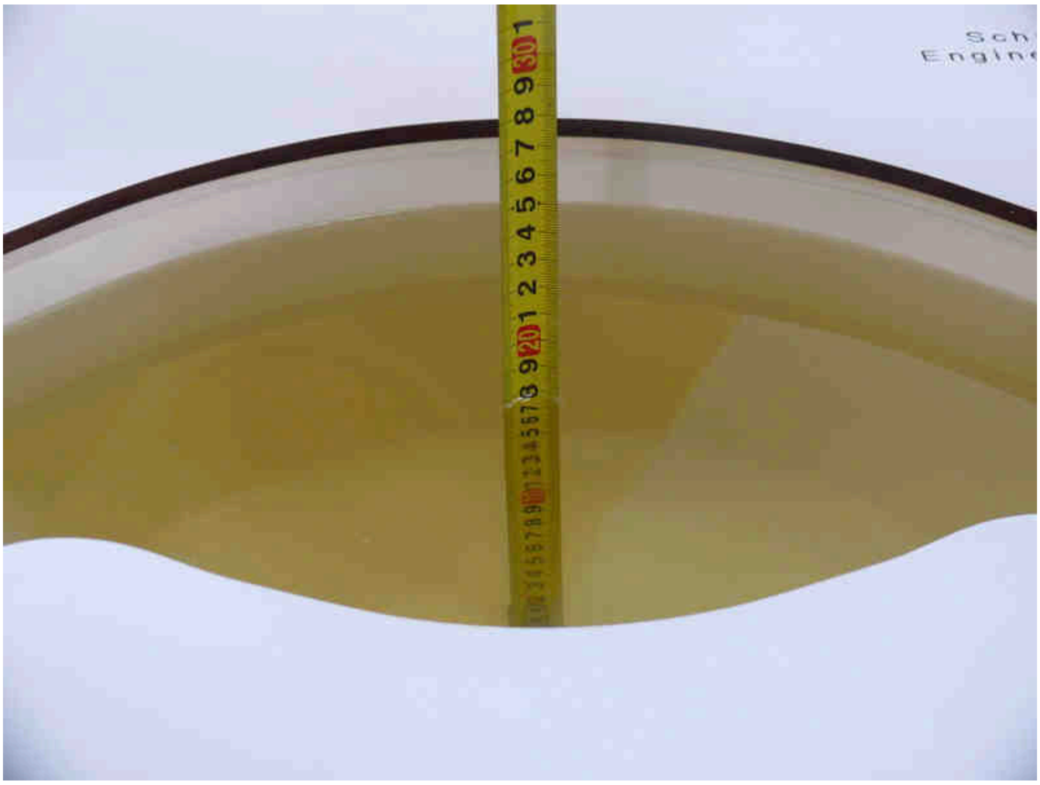


Figure 6 SAR Measurement Points in Area Scan

ANNEX B: TEST LAYOUT



Picture 2 Specific Absorption Rate Test Layout



Picture 3 Liquid depth in the Flat Phantom (835 MHz)

Picture 4 Left Hand Touch Cheek Position

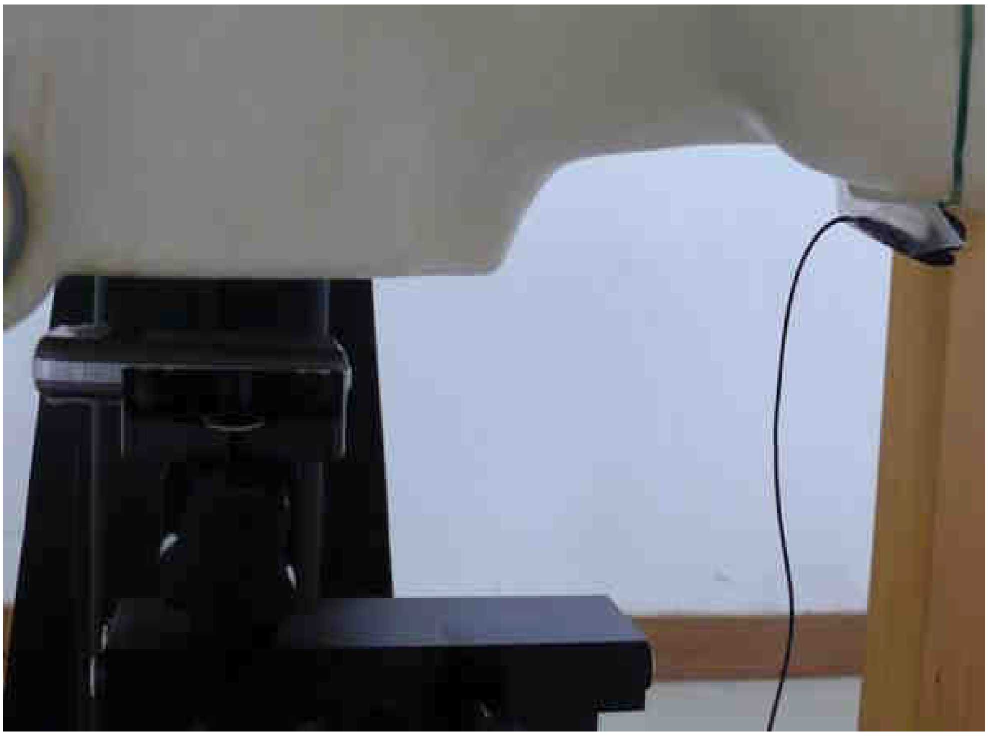
Picture 5 Left Hand Tilt 15 Degree Position

Picture 6 Right Hand Touch Cheek Position

Picture 7 Right Hand Tilt 15 Degree Position

Picture 8 Body, towards the ground, the distance from handset to the bottom of the Phantom is 20mm)

Picture 9 Body, towards the Phantom, the distance from handset to the bottom of the Phantom is 20mm)



Picture 10 Body with ear phone, towards the Ground, the distance from handset to the bottom of the Phantom is 20mm)

ANNEX C： GRAPH RESULTS

CDMA Cellular Left Cheek High

Communication System: CDMA Cellular; Frequency: 848.31 MHz; Duty Cycle: 1:1

Medium: Head 835MHz

Medium parameters used (interpolated): f = 848.31 MHz; σ = 0.947 mho/m; ε_r = 42.4; ρ = 1000 kg/m^3

- Probe: ET3DV6 - SN1737; ConvF(6.85, 6.85, 6.85);
- Electronics: DAE3 Sn452;

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

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

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

Reference Value = 29.0 V/m; Power Drift = -0.198 dB

Peak SAR (extrapolated) = 1.41 W/kg

SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.730 mW/g

Maximum value of SAR (measured) = 1.13 mW/g

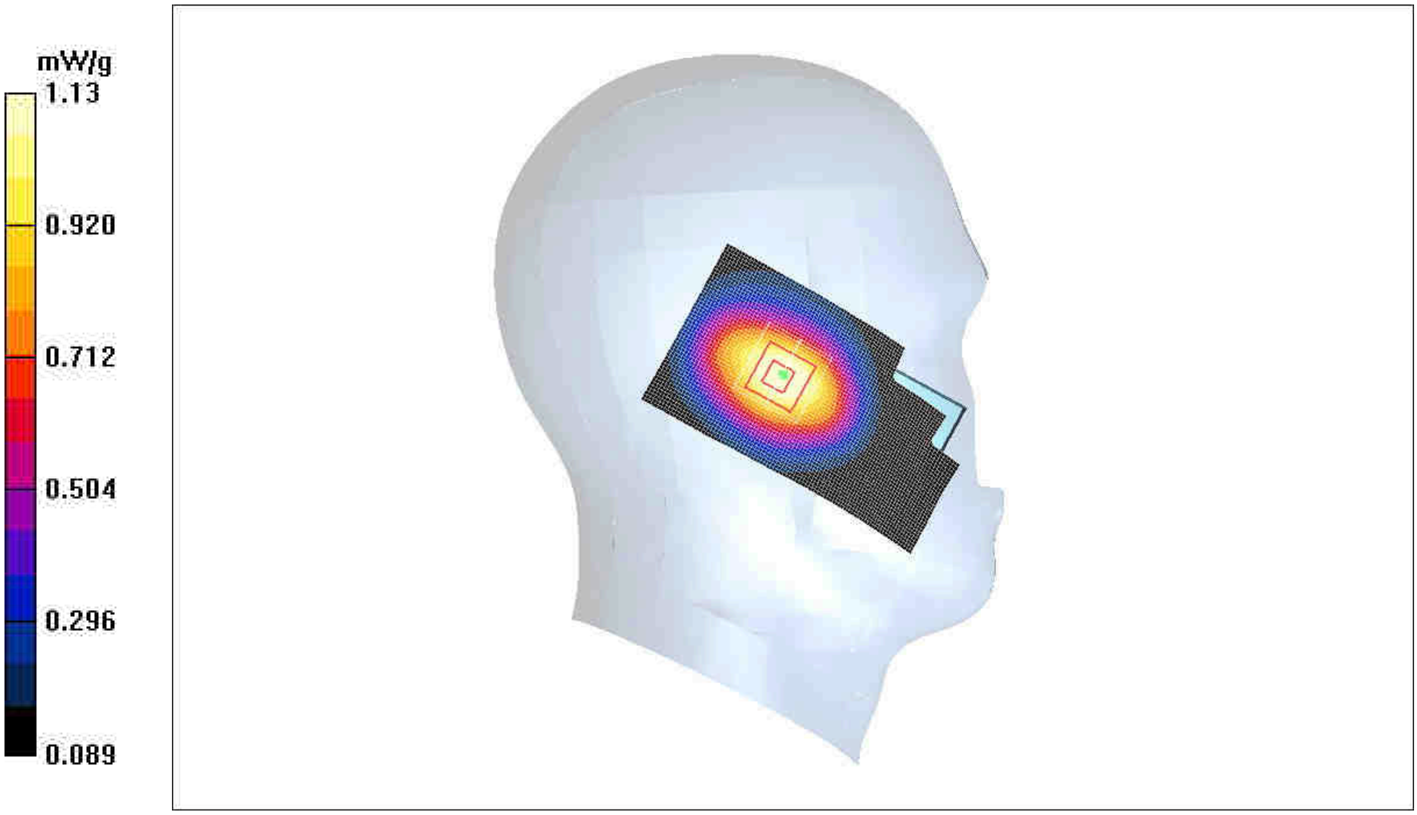


Fig. 7 Left Hand Touch Cheek CDMA Cellular CH777

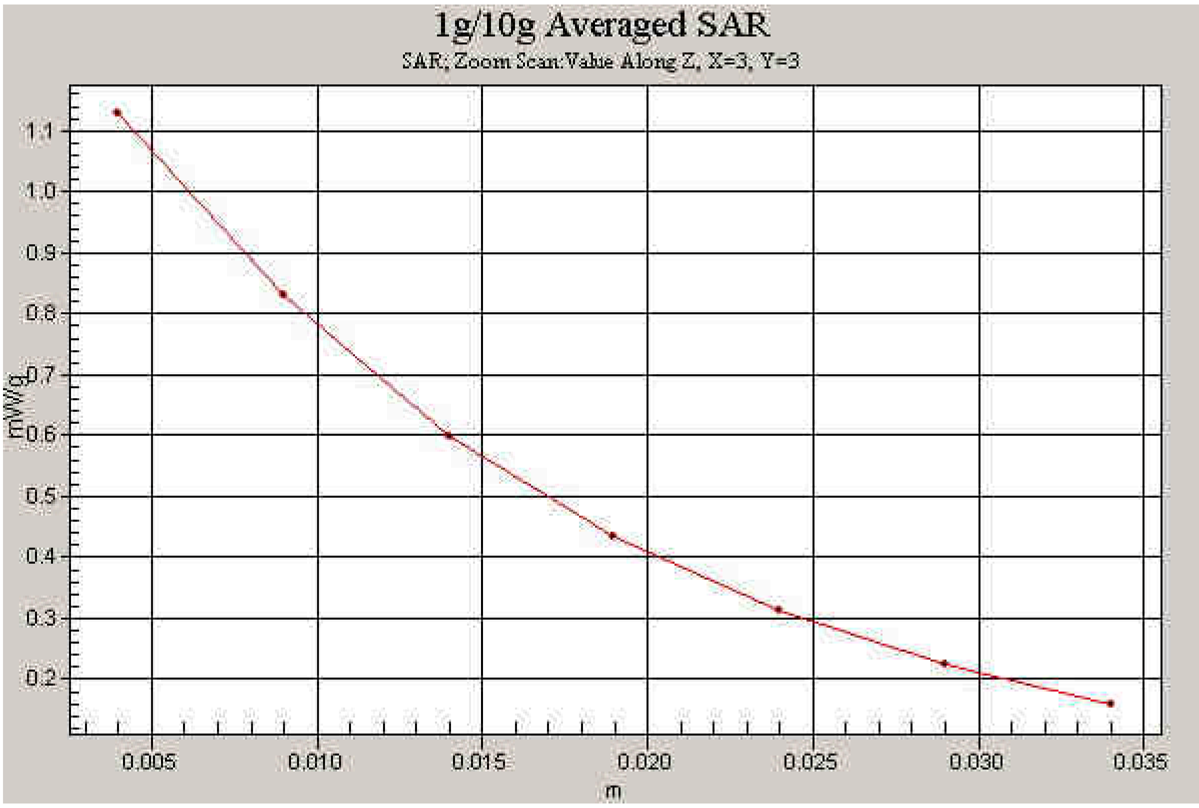


Fig. 8 Z-Scan at power reference point (CDMA Cellular CH777)

CDMA Cellular Left Cheek Middle
Communication System: CDMA Cellular; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: Head 835MHz
Medium parameters used: f = 837 MHz; σ = 0.943 mho/m; ε_r = 42.5; ρ = 1000 kg/m^3
- Probe: ET3DV6 - SN1737; ConvF(6.85, 6.85, 6.85);
- Electronics: DAE3 Sn452;

Cheek Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.888 mW/g

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 25.1 V/m; Power Drift = -0.131 dB
Peak SAR (extrapolated) = 1.05 W/kg
SAR(1 g) = 0.782 mW/g; SAR(10 g) = 0.543 mW/g
Maximum value of SAR (measured) = 0.836 mW/g

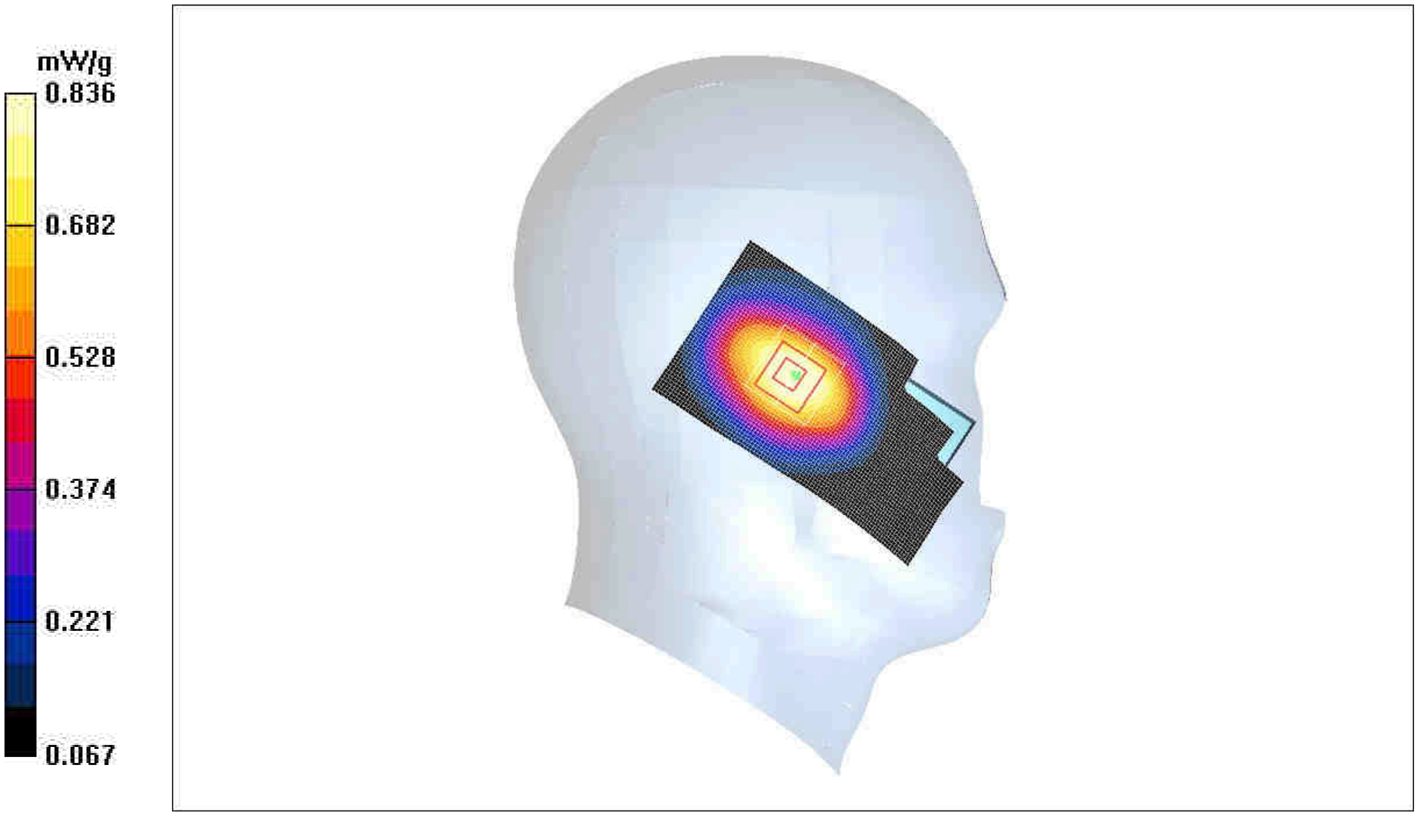


Fig. 9 Left Hand Touch Cheek CDMA Cellular CH384

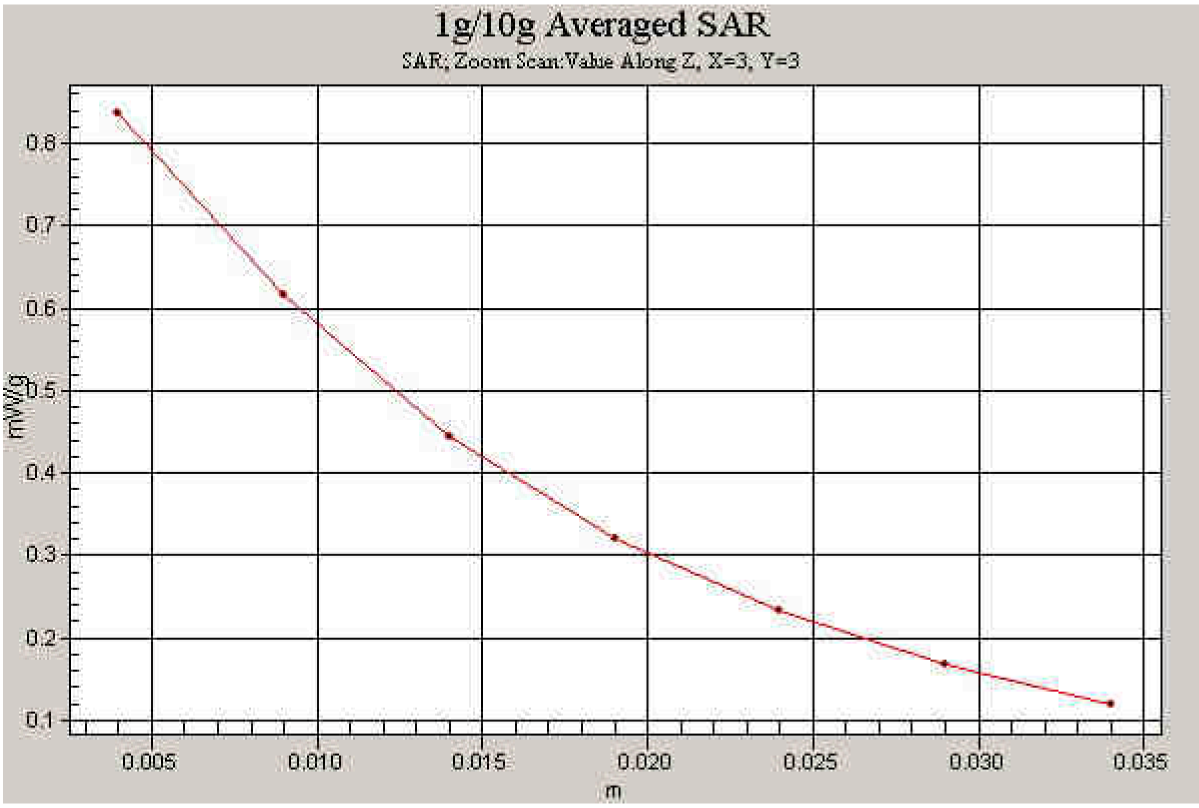


Fig. 10 Z-Scan at power reference point (CDMA Cellular CH384)

CDMA Cellular Left Cheek Low

Communication System: CDMA Cellular; Frequency: 824.7 MHz; Duty Cycle: 1:1

Medium: Head 835MHz

Medium parameters used: f = 825 MHz; σ = 0.925 mho/m; ε_r = 42.6; ρ = 1000 kg/m^3

- Probe: ET3DV6 - SN1737; ConvF(6.85, 6.85, 6.85);
- Electronics: DAE3 Sn452;

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 = 28.5 V/m; Power Drift = 0.145 dB

Peak SAR (extrapolated) = 1.45 W/kg

SAR(1 g) = 1.07 mW/g; SAR(10 g) = 0.742 mW/g

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

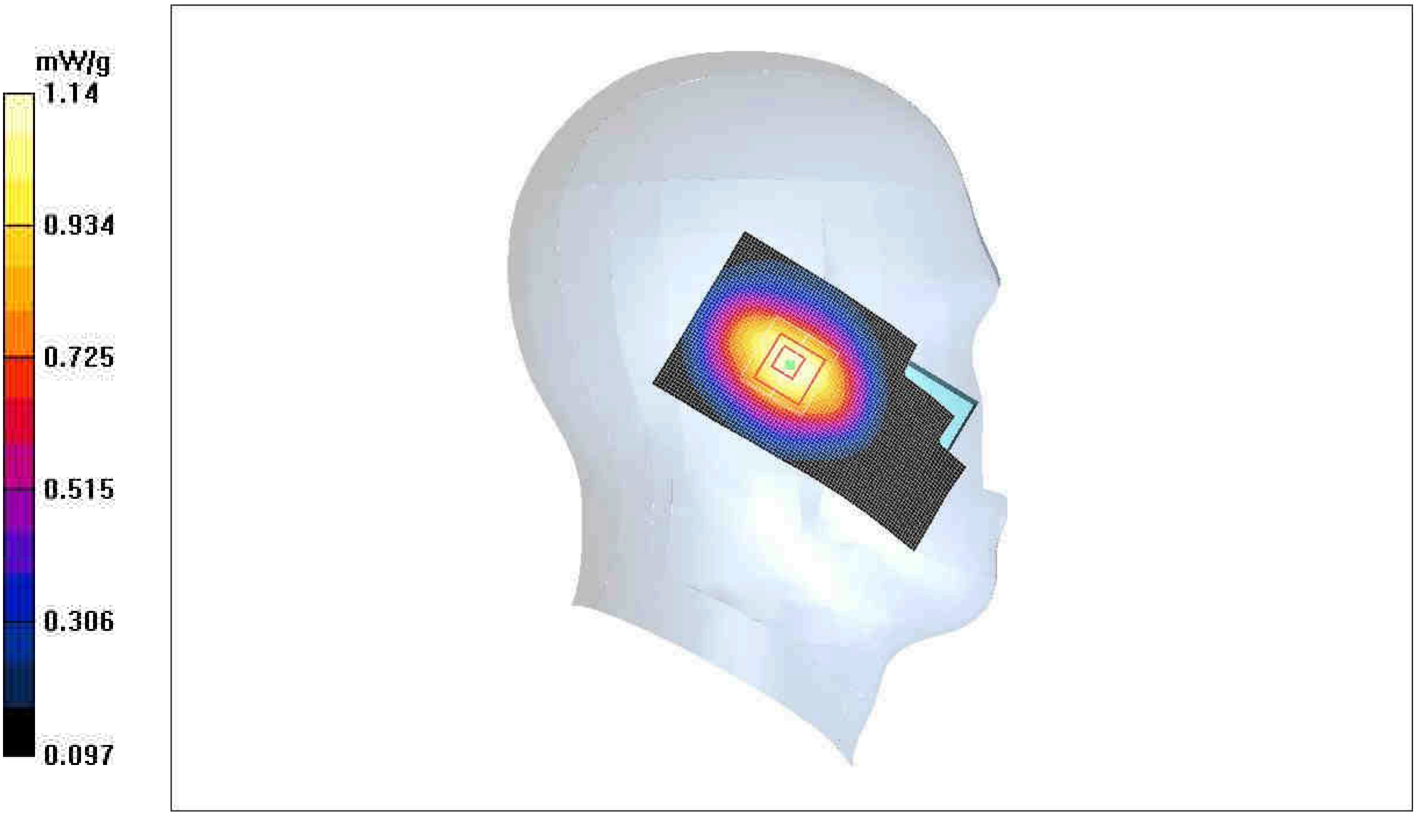


Fig. 11 Left Hand Touch Cheek CDMA Cellular CH1013

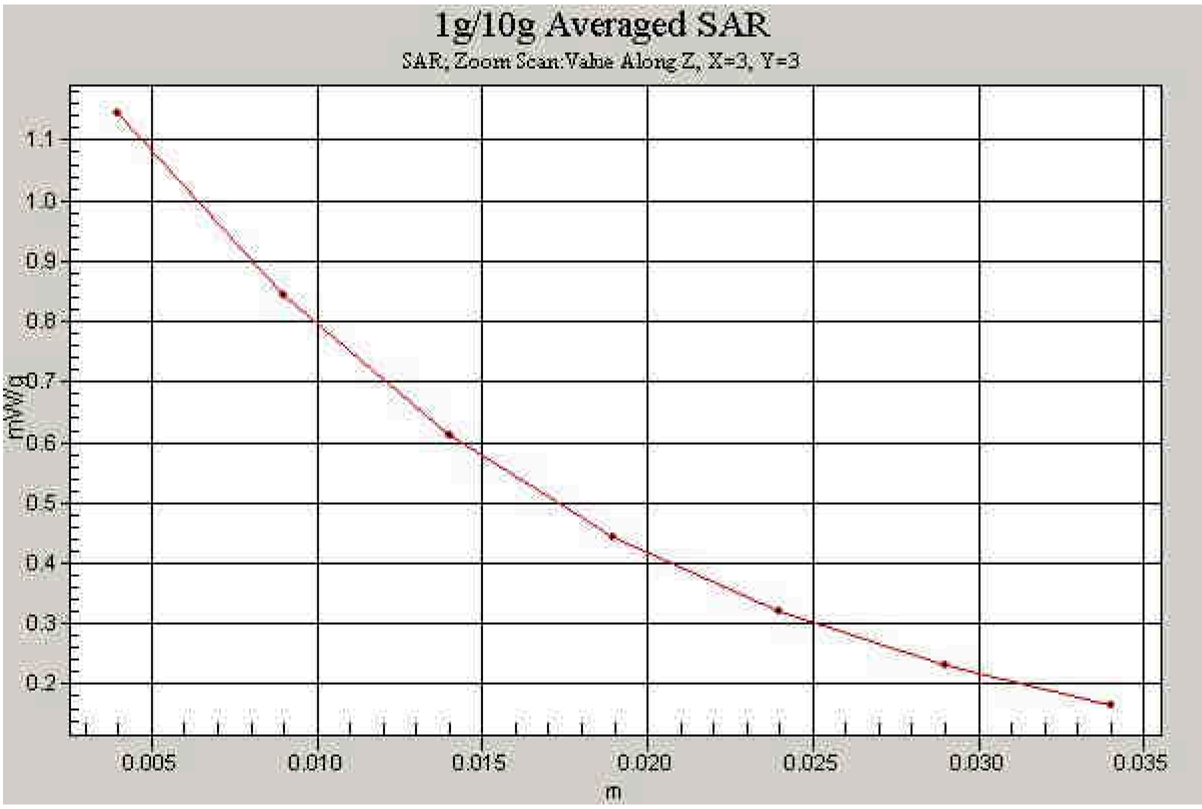


Fig. 12 Z-Scan at power reference point (CDMA Cellular CH1013)

CDMA Cellular Left Tilt High
Communication System: CDMA Cellular; Frequency: 848.31 MHz; Duty Cycle: 1:1
Medium: Head 835MHz
Medium parameters used (interpolated): f = 848.31 MHz; σ = 0.947 mho/m; ε r = 42.4; ρ = 1000 kg/m3
- Probe: ET3DV6 - SN1737; ConvF(6.85, 6.85, 6.85);
- Electronics: DAE3 Sn452;

Tilt High/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.706 mW/g

Tilt High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 24.6 V/m; Power Drift = -0.077 dB
Peak SAR (extrapolated) = 0.915 W/kg
SAR(1 g) = 0.635 mW/g; SAR(10 g) = 0.424 mW/g
Maximum value of SAR (measured) = 0.684 mW/g

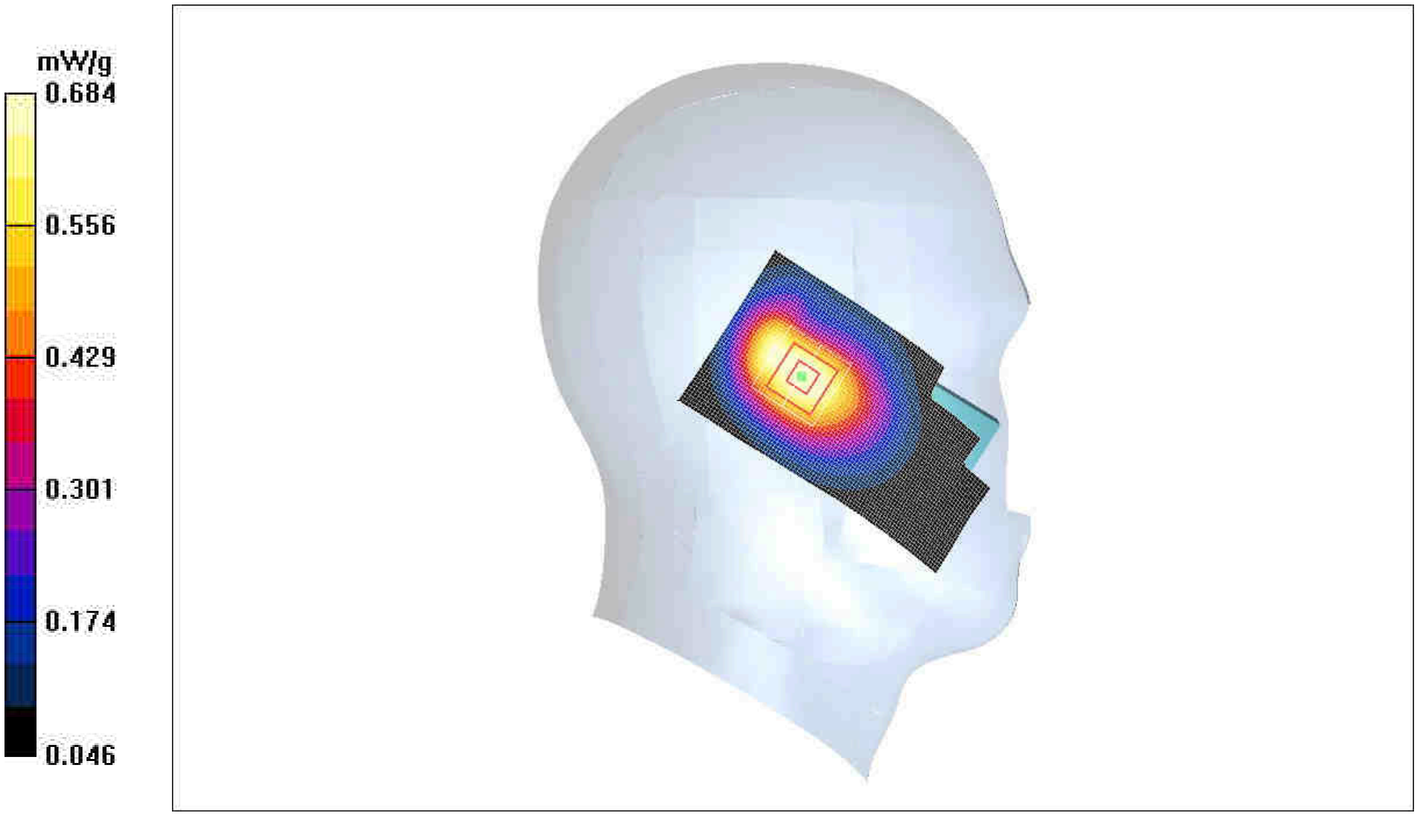


Fig. 13 Left Hand Tilt 15° CDMA Cellular CH777

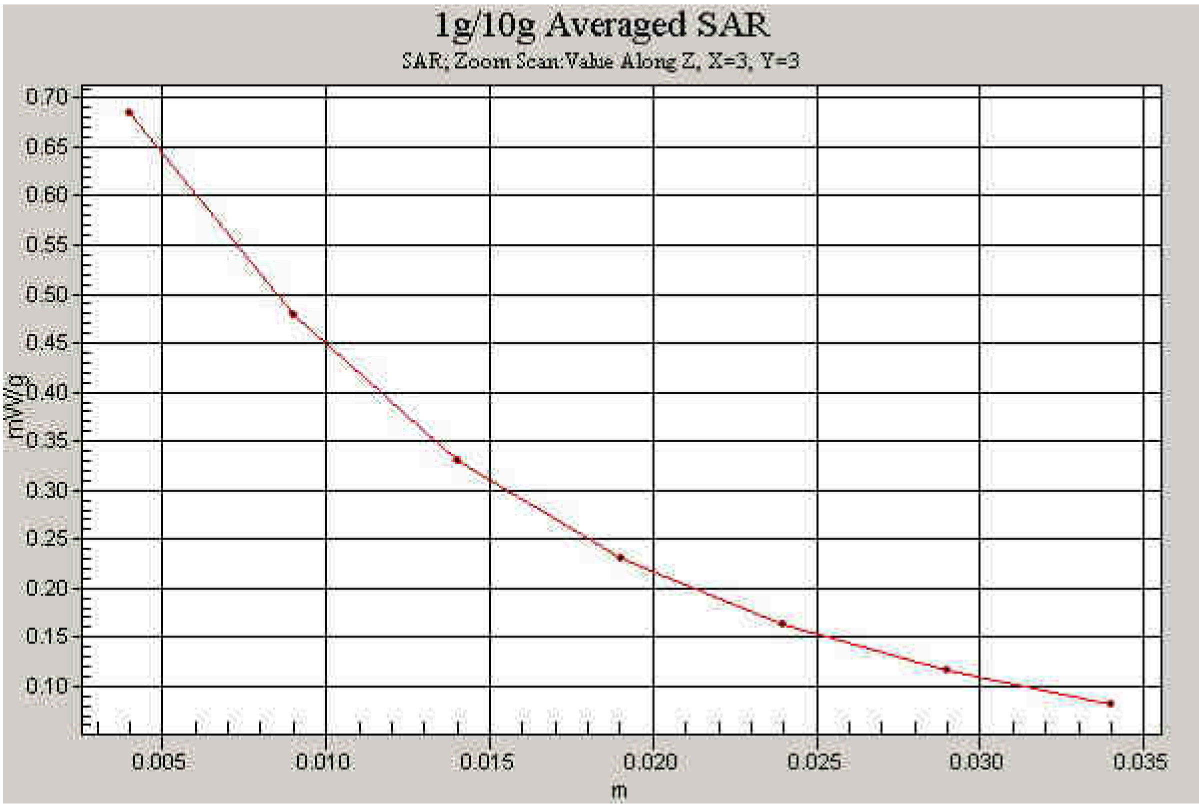


Fig. 14 Z-Scan at power reference point (CDMA Cellular CH777)

CDMA Cellular Left Tilt Middle

Communication System: CDMA Cellular; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium: Head 835MHz

Medium parameters used: f = 837 MHz; σ = 0.943 mho/m; ε_r = 42.5; ρ = 1000 kg/m^3

- Probe: ET3DV6 - SN1737; ConvF(6.85, 6.85, 6.85);
- Electronics: DAE3 Sn452;

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

Maximum value of SAR (interpolated) = 0.573 mW/g

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

Reference Value = 24.8 V/m; Power Drift = -0.043 dB

Peak SAR (extrapolated) = 0.667 W/kg

SAR(1 g) = 0.481 mW/g; SAR(10 g) = 0.335 mW/g

Maximum value of SAR (measured) = 0.510 mW/g

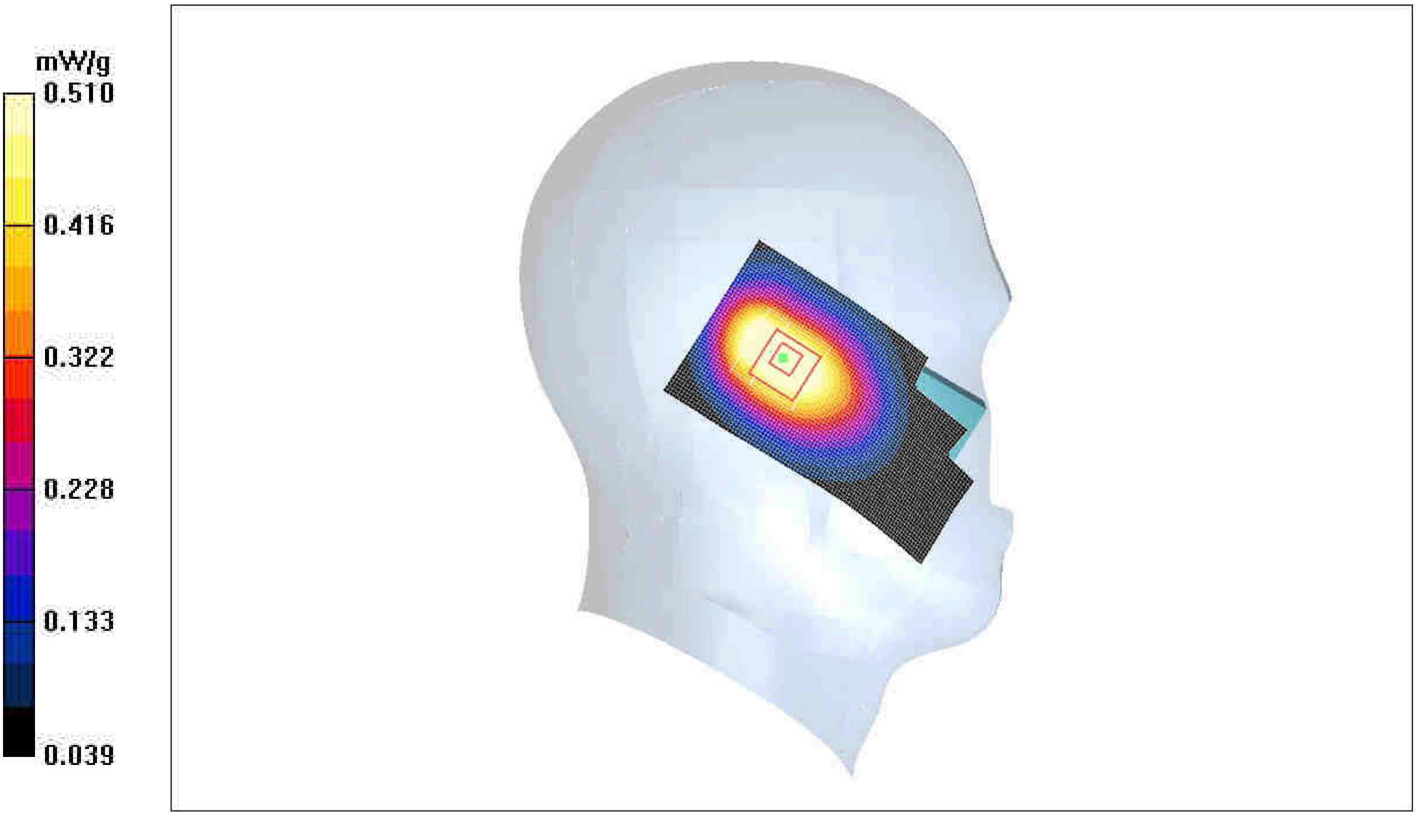


Fig. 15 Left Hand Tilt 15° CDMA Cellular CH384

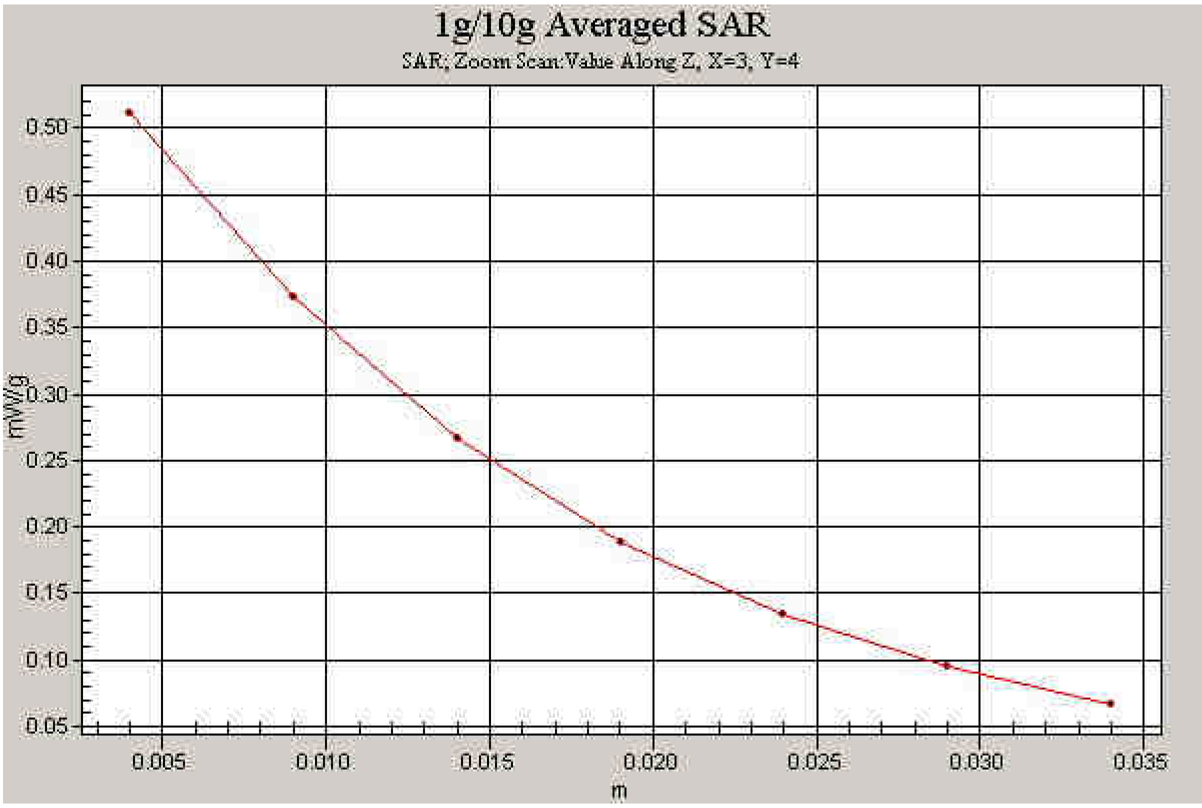


Fig. 16 Z-Scan at power reference point (CDMA Cellular CH384)

CDMA Cellular Left Tilt Low
Communication System: CDMA Cellular; Frequency: 824.7 MHz; Duty Cycle: 1:1
Medium: Head 835MHz
Medium parameters used: f = 825 MHz; σ = 0.925 mho/m; ε_r = 42.6; ρ = 1000 kg/m^3
- Probe: ET3DV6 - SN1737; ConvF(6.85, 6.85, 6.85);
- Electronics: DAE3 Sn452;

Tilt Low/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.680 mW/g

Tilt Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 26.5 V/m; Power Drift = -0.053 dB
Peak SAR (extrapolated) = 0.821 W/kg
SAR(1 g) = 0.601 mW/g; SAR(10 g) = 0.425 mW/g
Maximum value of SAR (measured) = 0.641 mW/g

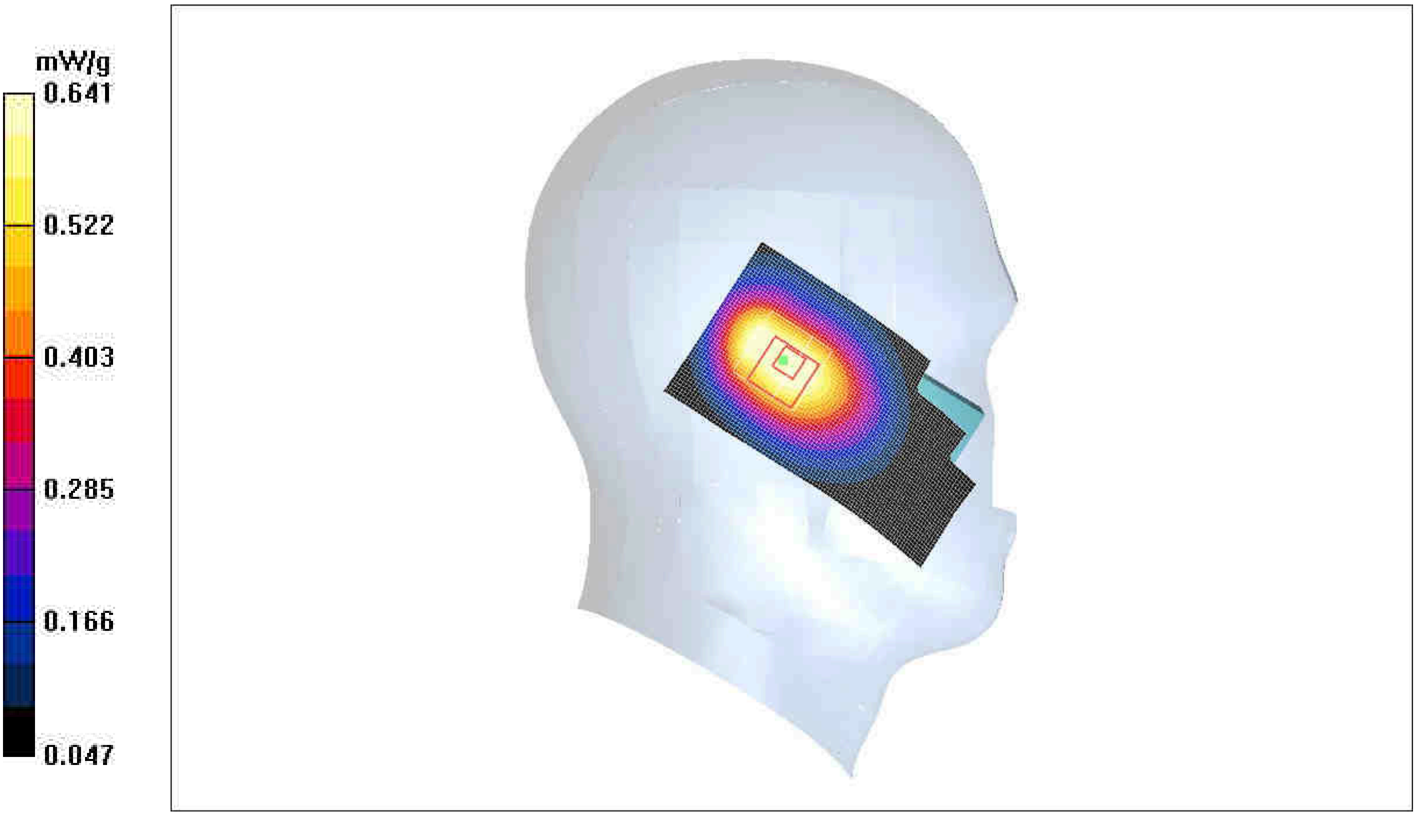


Fig. 17 Left Hand Tilt 15° CDMA Cellular CH1013

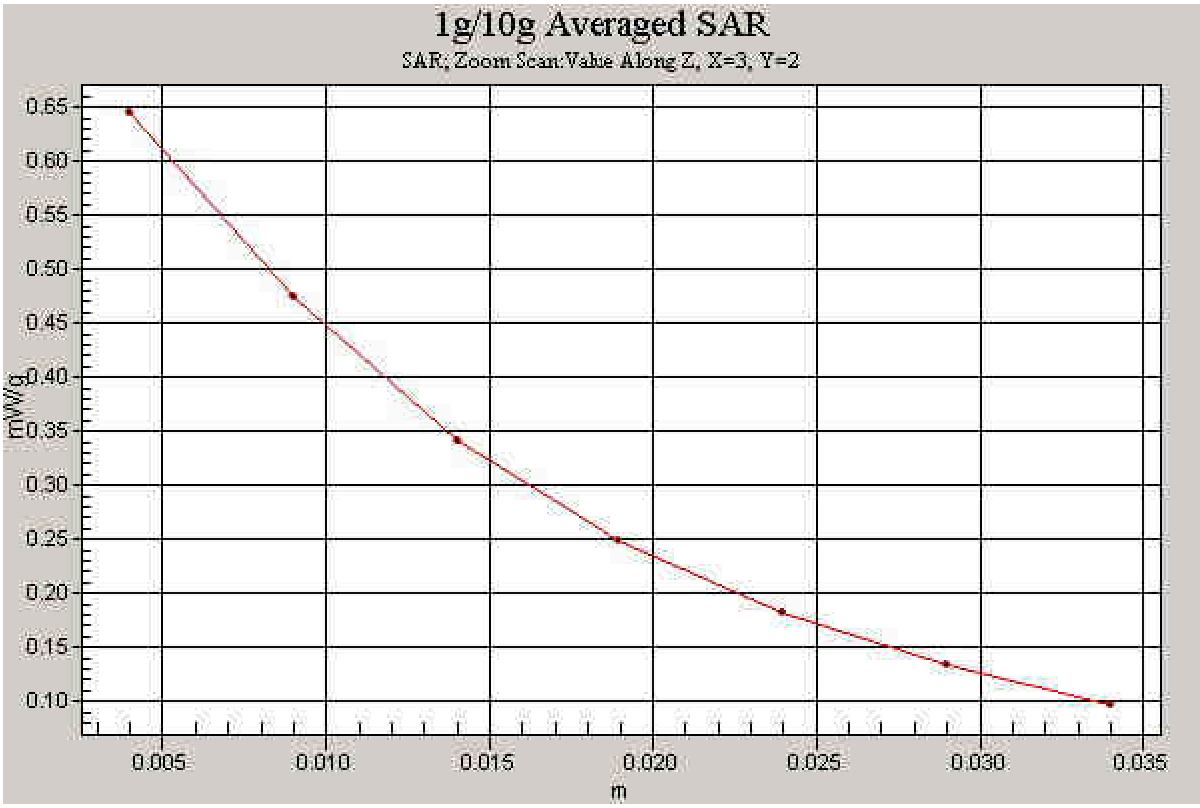


Fig.18 Z-Scan at power reference point (CDMA Cellular CH1013)

CDMA Cellular Right Cheek High
Communication System: CDMA Cellular; Frequency: 848.31 MHz; Duty Cycle: 1:1
Medium: Head 835MHz
Medium parameters used (interpolated): f = 848.31 MHz; σ = 0.947 mho/m; ε_r = 42.4; ρ = 1000 kg/m^3
- Probe: ET3DV6 - SN1737; ConvF(6.85, 6.85, 6.85);
- Electronics: DAE3 Sn452;

Cheek High/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.13 mW/g

Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 26.0 V/m; Power Drift = -0.045 dB
Peak SAR (extrapolated) = 1.40 W/kg
SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.705 mW/g
Maximum value of SAR (measured) = 1.10 mW/g

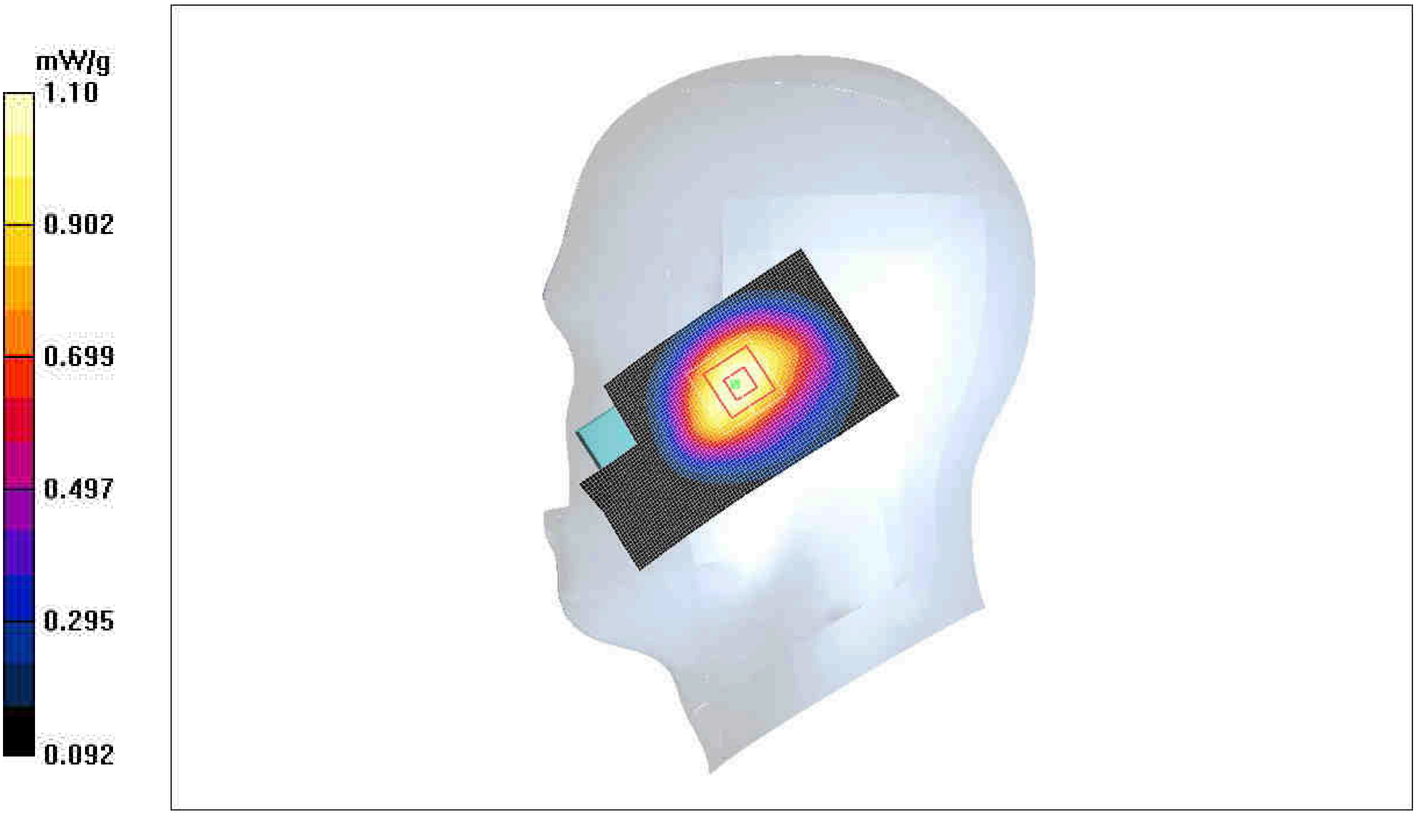


Fig. 19 Right Hand Touch Cheek CDMA Cellular CH777

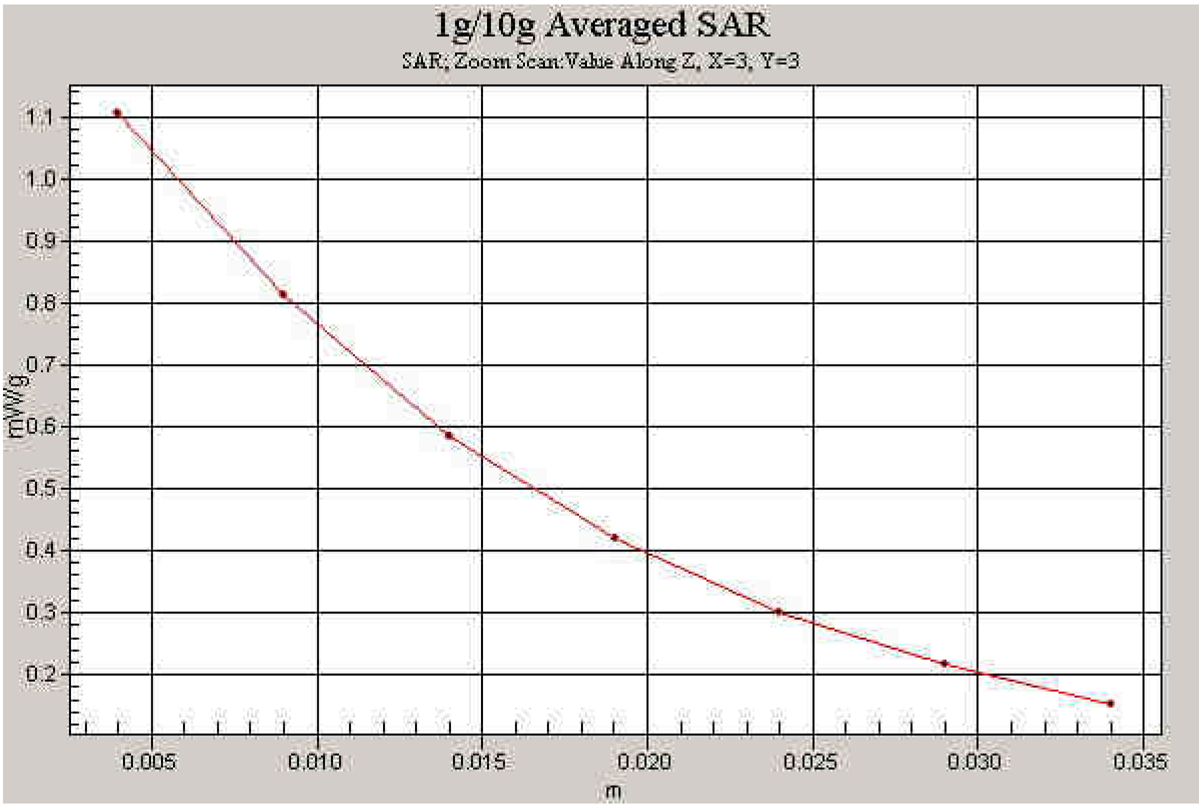


Fig. 20 Z-Scan at power reference point (CDMA Cellular CH777)

CDMA Cellular Right Cheek Middle

Communication System: CDMA Cellular; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium: Head 835MHz

Medium parameters used: f = 837 MHz; σ = 0.943 mho/m; ε_r = 42.5; ρ = 1000 kg/m^3

- Probe: ET3DV6 - SN1737; ConvF(6.85, 6.85, 6.85);
- Electronics: DAE3 Sn452;

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

Maximum value of SAR (interpolated) = 0.874 mW/g

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

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

Peak SAR (extrapolated) = 1.22 W/kg

SAR(1 g) = 0.907 mW/g; SAR(10 g) = 0.619 mW/g

Maximum value of SAR (measured) = 0.962 mW/g

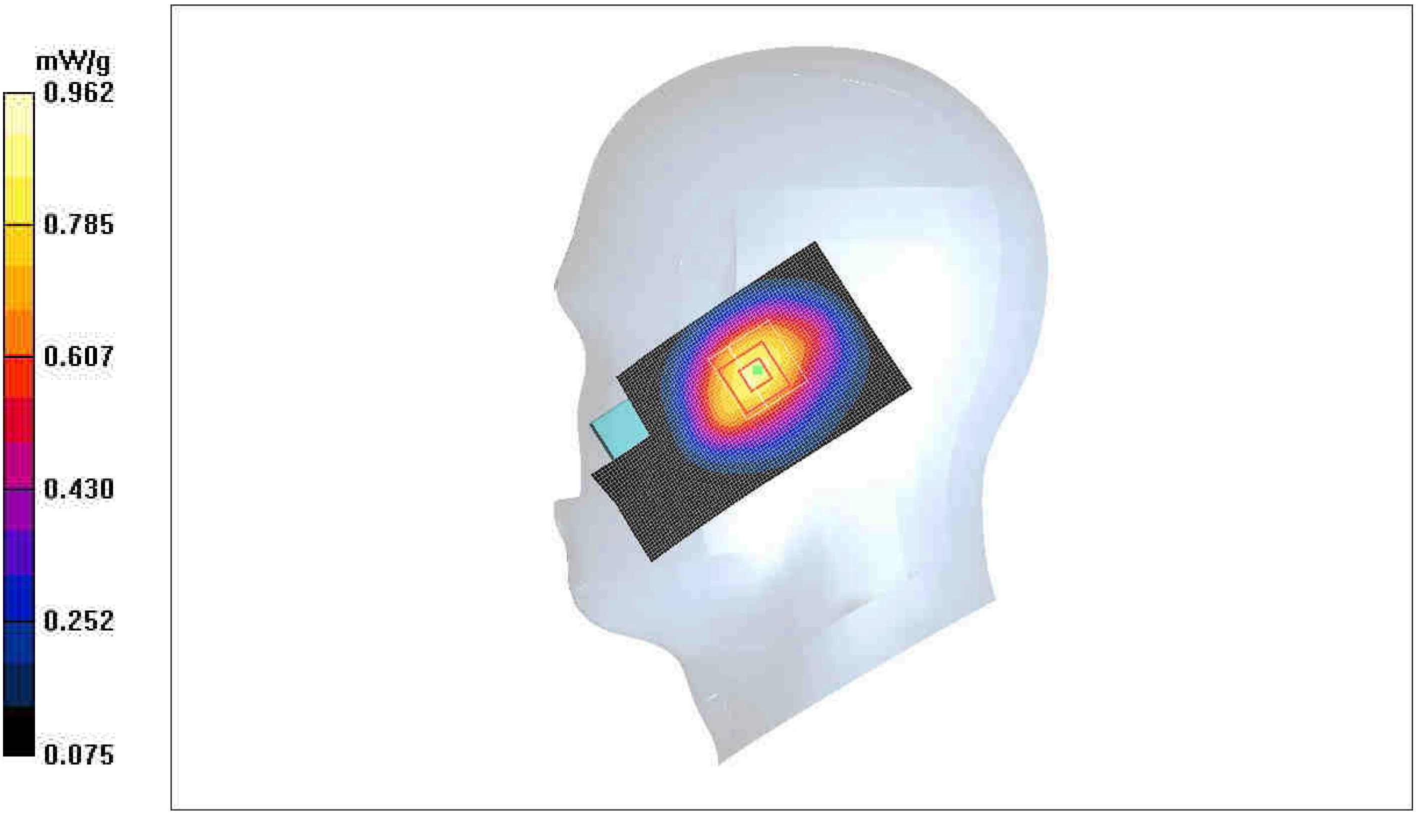


Fig. 21 Right Hand Touch Cheek CDMA Cellular CH384

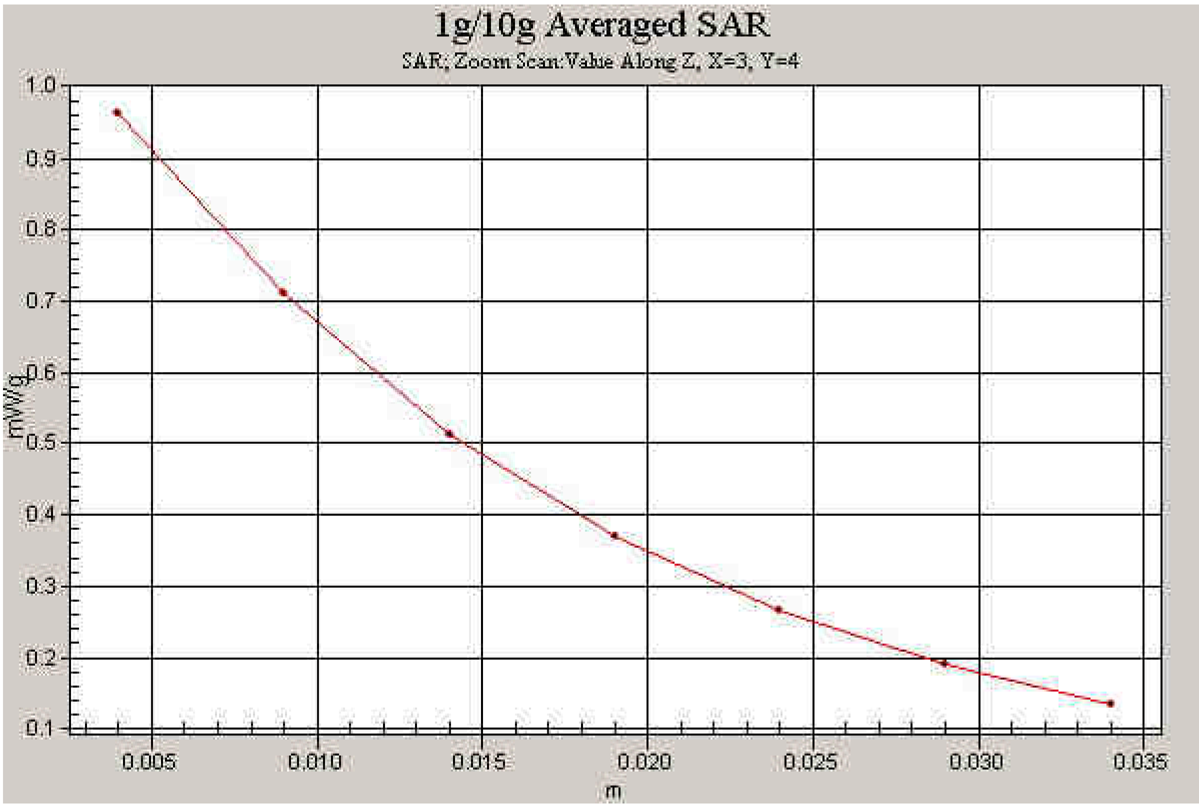


Fig. 22 Z-Scan at power reference point (CDMA Cellular CH384)

CDMA Cellular Right Cheek Low

Communication System: CDMA Cellular; Frequency: 824.7 MHz; Duty Cycle: 1:1

Medium: Head 835MHz

Medium parameters used: f = 825 MHz; σ = 0.925 mho/m; ε_r = 42.6; ρ = 1000 kg/m^3

- Probe: ET3DV6 - SN1737; ConvF(6.85, 6.85, 6.85);
- Electronics: DAE3 Sn452;

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

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

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

Reference Value = 27.0 V/m; Power Drift = 0.098 dB

Peak SAR (extrapolated) = 1.73 W/kg

SAR(1 g) = 1.27 mW/g; SAR(10 g) = 0.879 mW/g

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

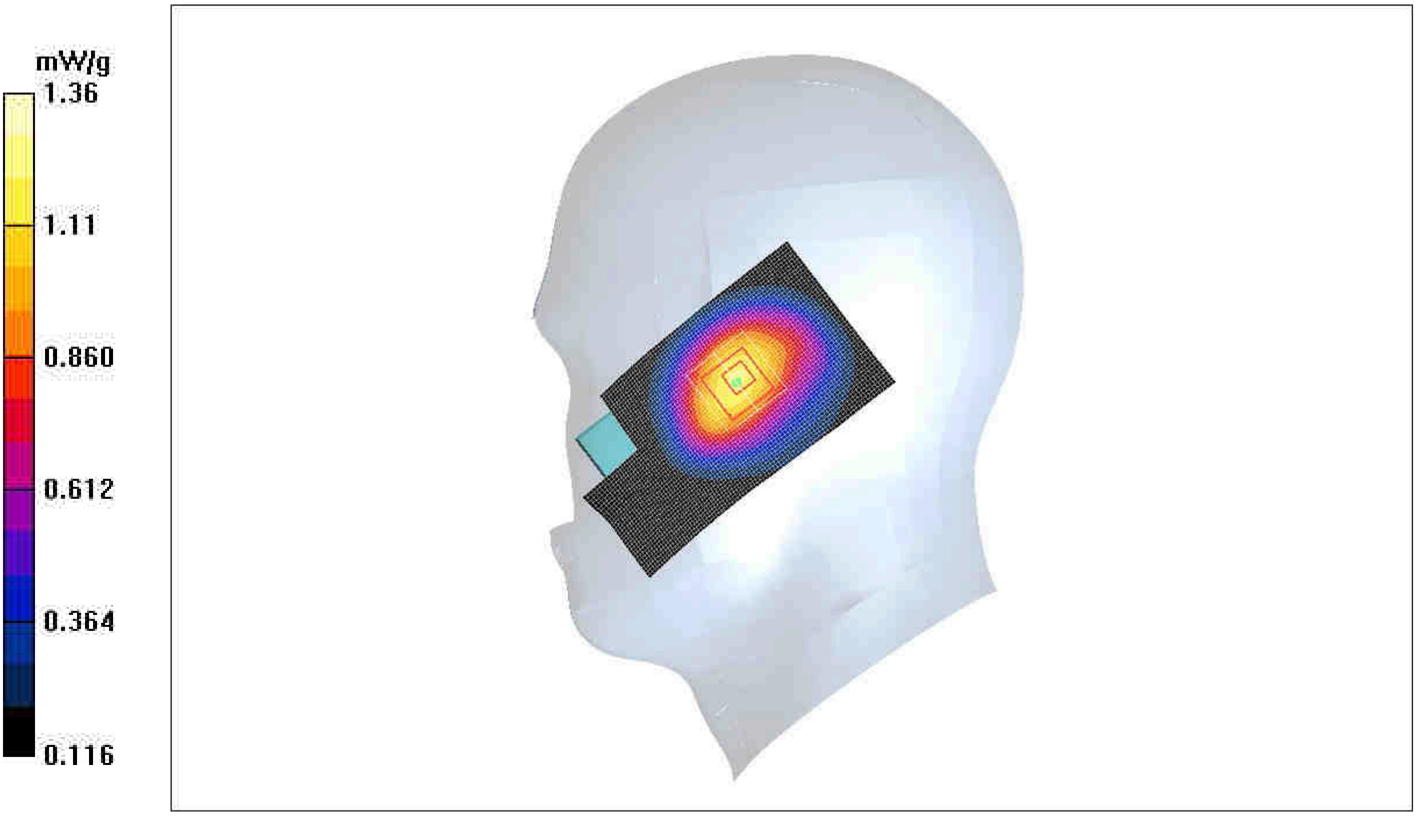


Fig. 23 Right Hand Touch Cheek CDMA Cellular CH1013

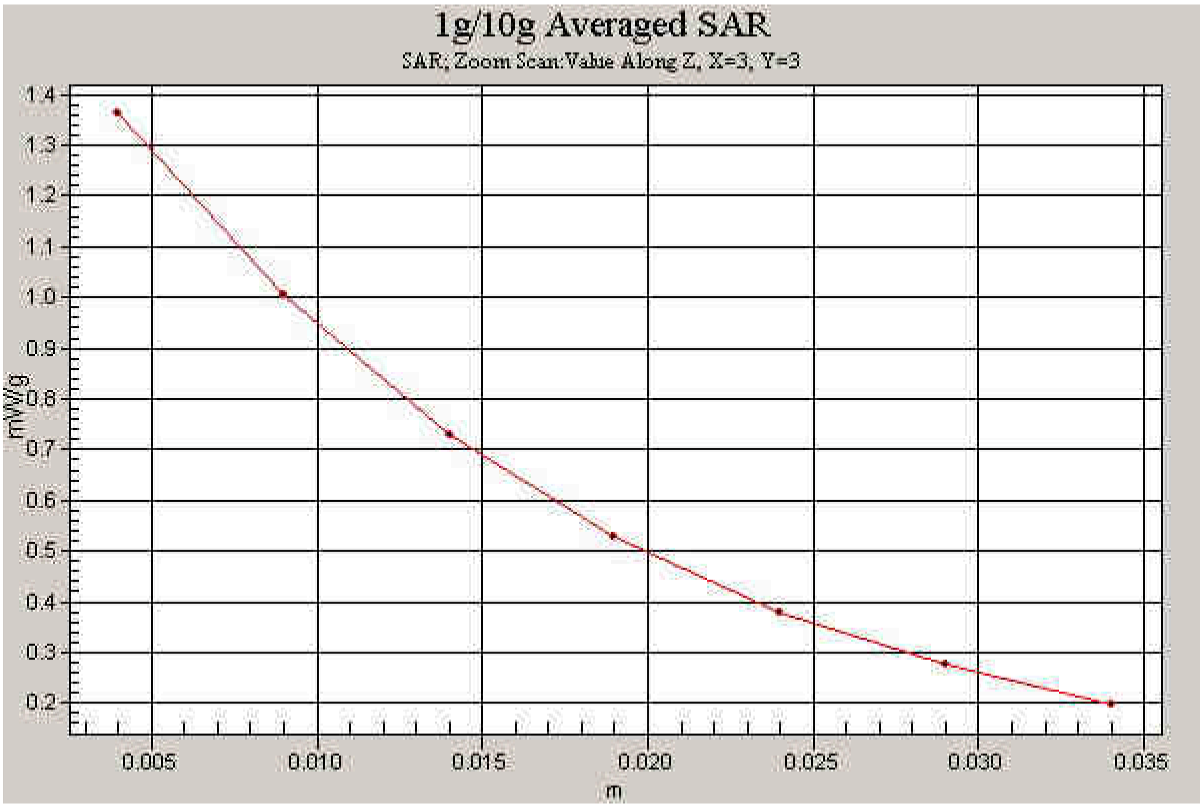


Fig. 24 Z-Scan at power reference point (CDMA Cellular CH1013)

CDMA Cellular Right Tilt High
Communication System: CDMA Cellular; Frequency: 848.31 MHz; Duty Cycle: 1:1
Medium: Head 835MHz
Medium parameters used (interpolated): f = 848.31 MHz; σ = 0.947 mho/m; ε_r = 42.4; ρ = 1000 kg/m^3
- Probe: ET3DV6 - SN1737; ConvF(6.85, 6.85, 6.85);
- Electronics: DAE3 Sn452;

Tilt High/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.699 mW/g

Tilt High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 24.8 V/m; Power Drift = 0.109 dB
Peak SAR (extrapolated) = 0.859 W/kg
SAR(1 g) = 0.621 mW/g; SAR(10 g) = 0.423 mW/g
Maximum value of SAR (measured) = 0.662 mW/g

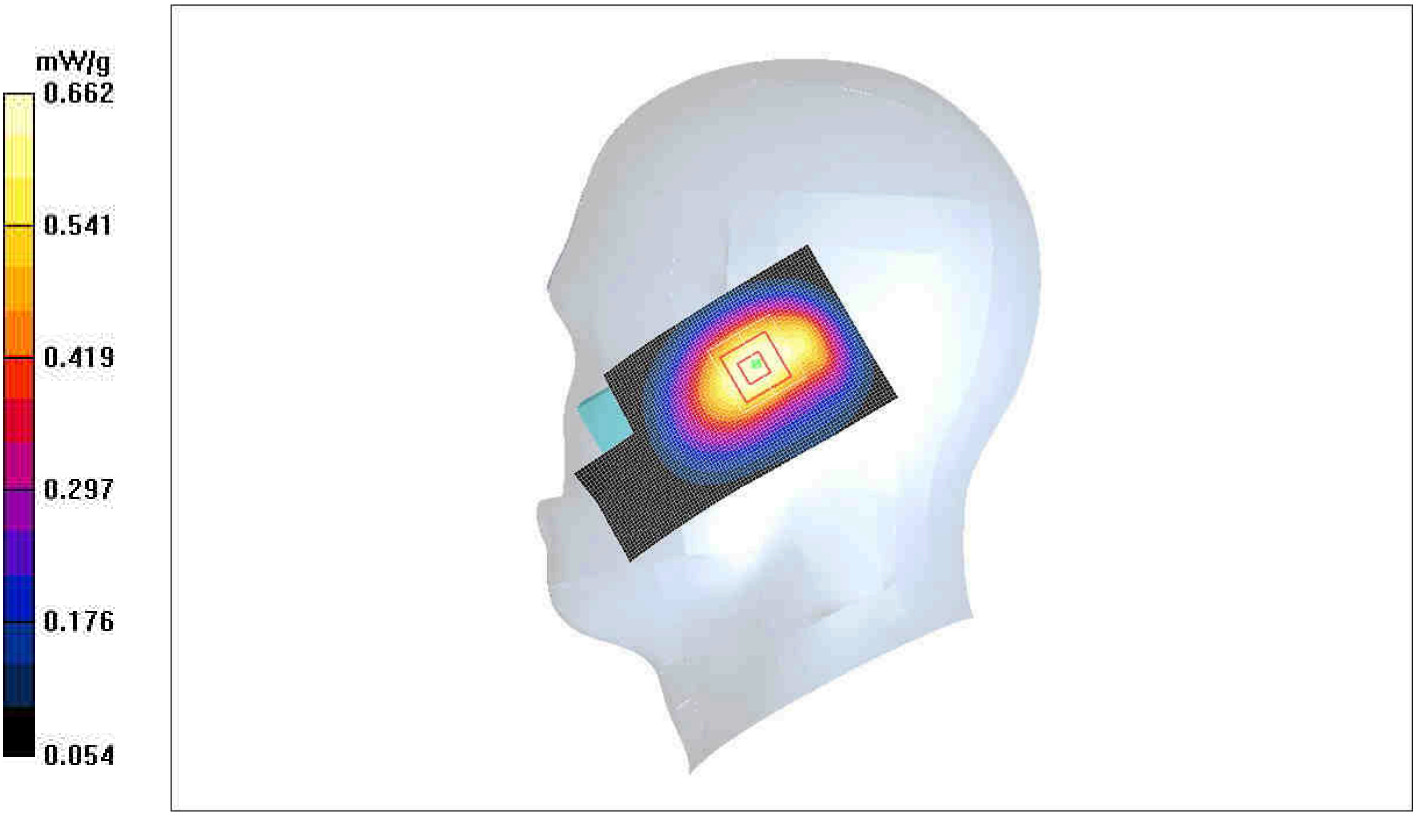


Fig. 25 Right Hand Tilt 15° CDMA Cellular CH777

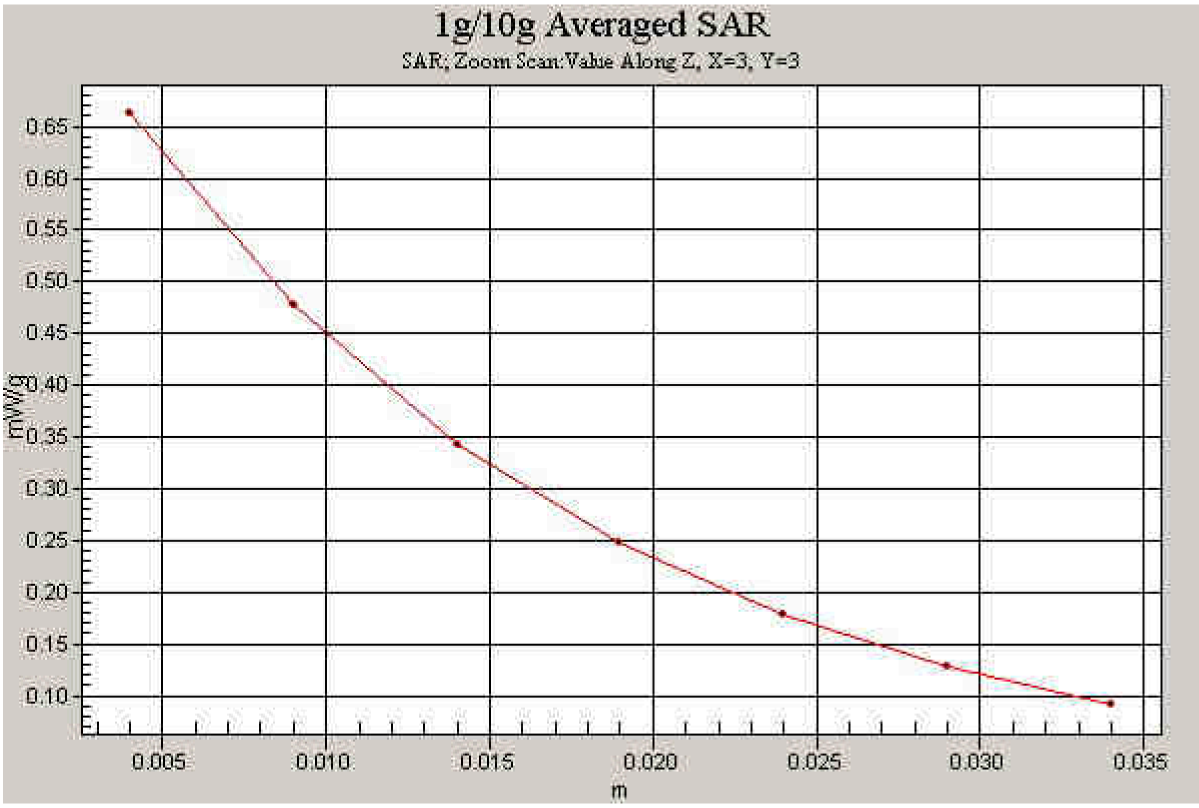


Fig. 26 Z-Scan at power reference point (CDMA Cellular CH777)

CDMA Cellular Right Tilt Middle
Communication System: CDMA Cellular; Frequency: 836.52 MHz; Duty Cycle: 1:1
Medium: Head 835MHz
Medium parameters used: f = 837 MHz; σ = 0.943 mho/m; ε_r = 42.5; ρ = 1000 kg/m^3
- Probe: ET3DV6 - SN1737; ConvF(6.85, 6.85, 6.85);
- Electronics: DAE3 Sn452;

Tilt Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.530 mW/g

Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 24.1 V/m; Power Drift = 0.092 dB
Peak SAR (extrapolated) = 0.637 W/kg
SAR(1 g) = 0.474 mW/g; SAR(10 g) = 0.332 mW/g
Maximum value of SAR (measured) = 0.507 mW/g

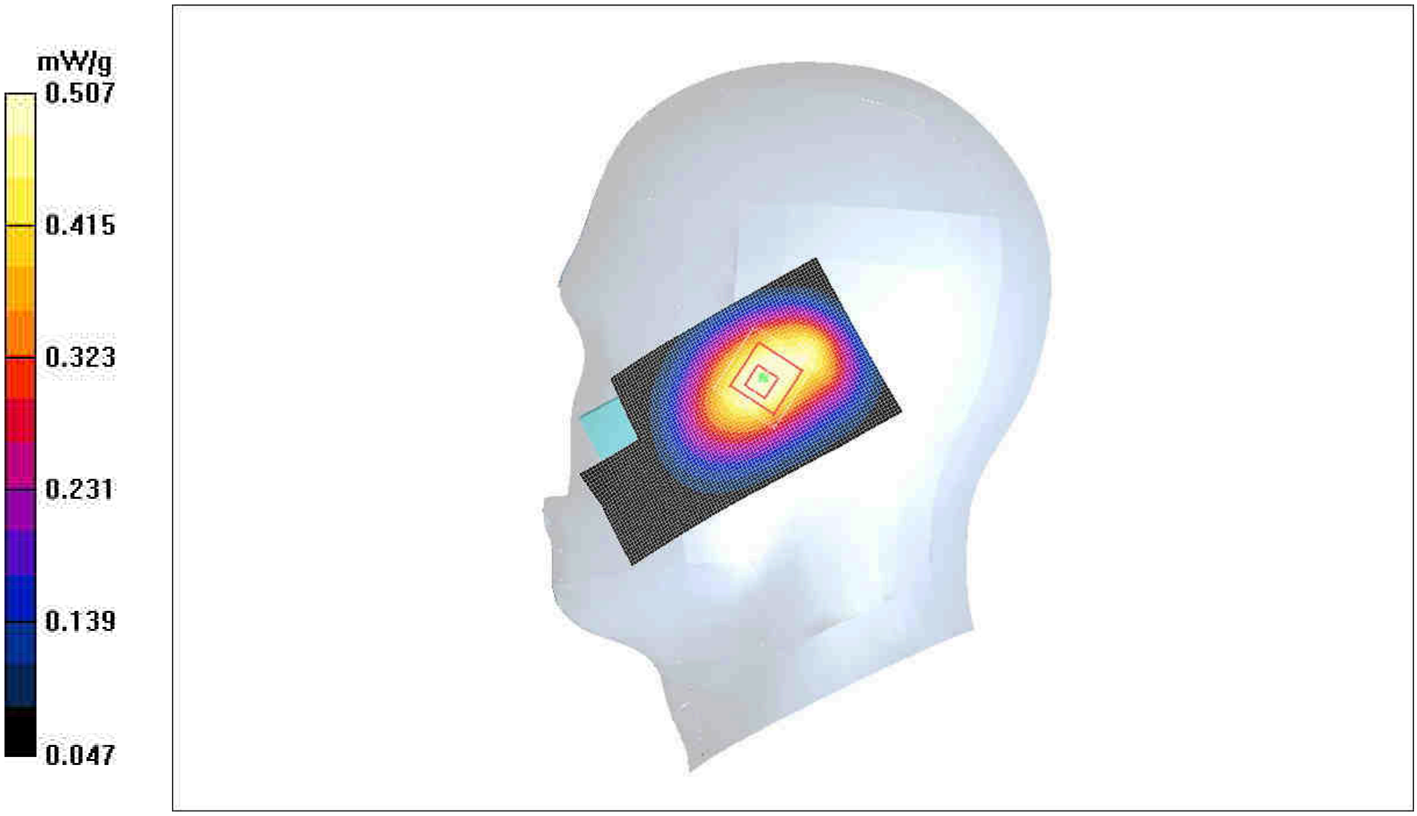


Fig. 27 Right Hand Tilt 15° CDMA Cellular CH384

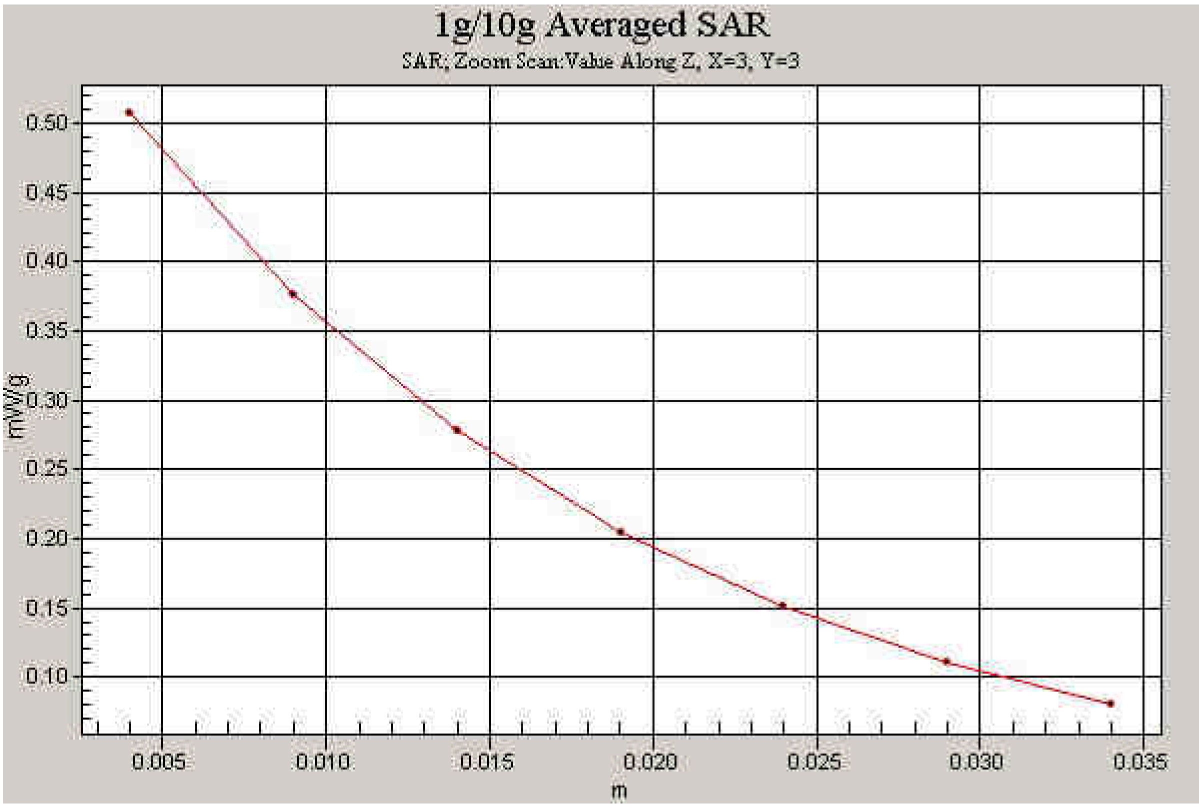


Fig.28 Z-Scan at power reference point (CDMA Cellular CH384)

CDMA Cellular Right Tilt Low
Communication System: CDMA Cellular; Frequency: 824.7 MHz; Duty Cycle: 1:1
Medium: Head 835MHz
Medium parameters used: f = 825 MHz; σ = 0.925 mho/m; ε_r = 42.6; ρ = 1000 kg/m^3
- Probe: ET3DV6 - SN1737; ConvF(6.85, 6.85, 6.85);
- Electronics: DAE3 Sn452;

Tilt Low/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.882 mW/g

Tilt Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 28.7 V/m; Power Drift = -0.058 dB
Peak SAR (extrapolated) = 1.11 W/kg
SAR(1 g) = 0.810 mW/g; SAR(10 g) = 0.557 mW/g
Maximum value of SAR (measured) = 0.870 mW/g

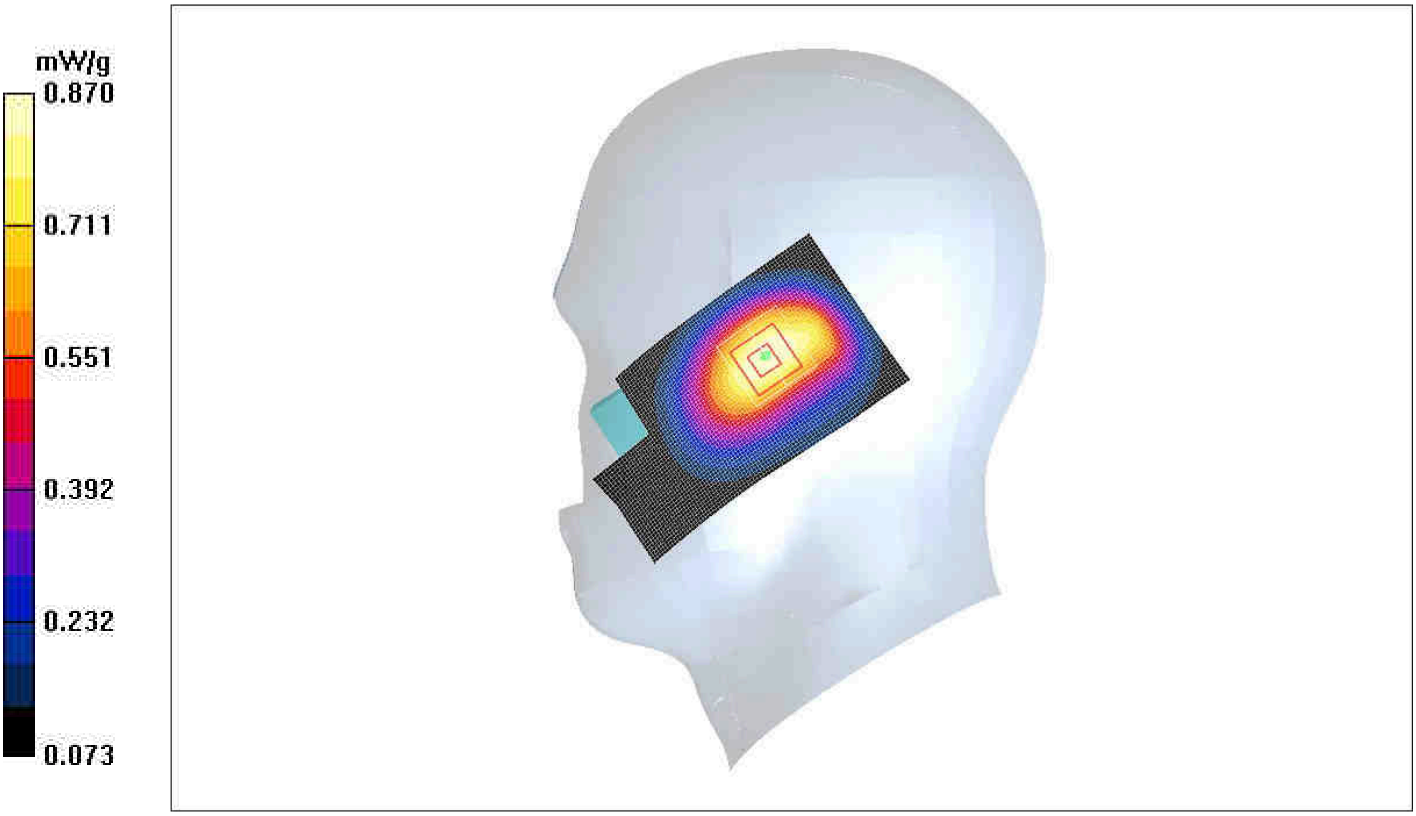


Fig. 29 Right Hand Tilt 15° ， CDMA Cellular CH1013

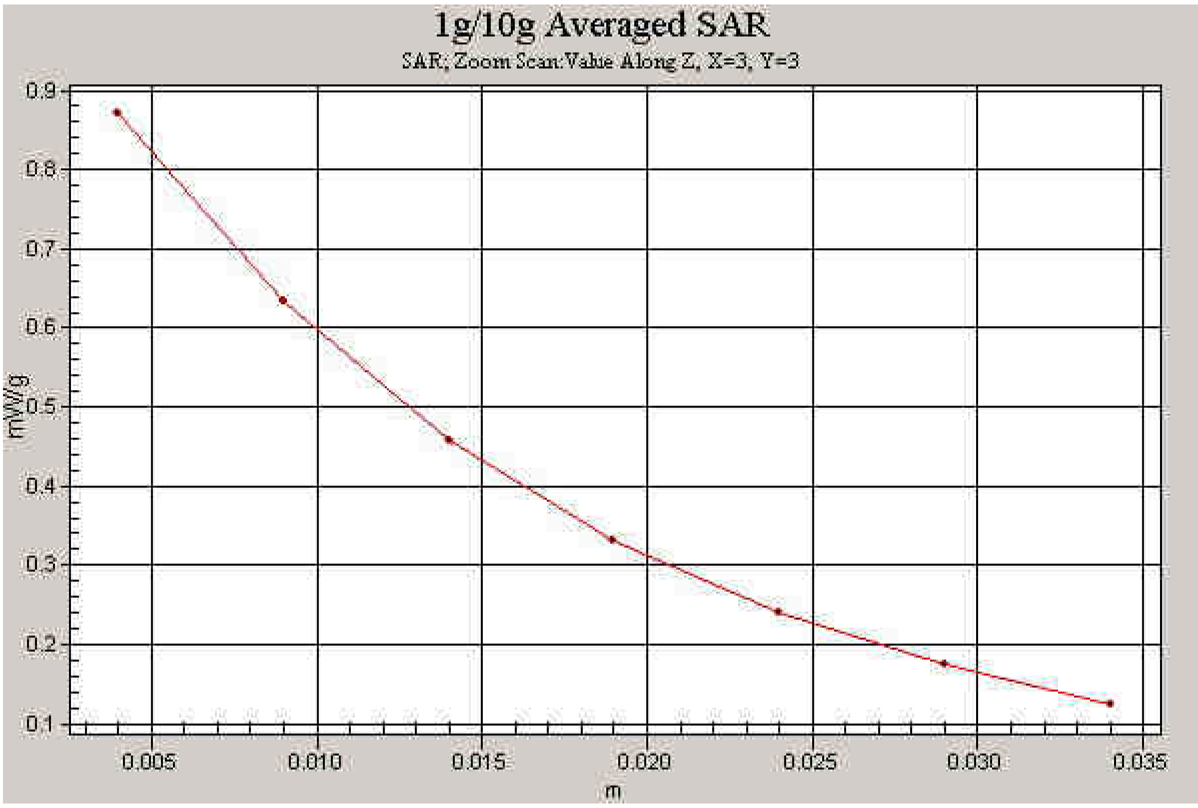


Fig. 30 Z-Scan at power reference point (CDMA Cellular CH1013)

CDMA Cellular Towards the Phantom High
Communication System: CDMA Cellular; Frequency: 848.31 MHz; Duty Cycle: 1:1
Medium: Body 835MHz
Medium parameters used (interpolated): f = 848.31 MHz; σ = 1.01 mho/m; ε_r = 55; ρ = 1000 kg/m^3
- Probe: ET3DV6 - SN1737; ConvF(6.52, 6.52, 6.52);
- Electronics: DAE3 Sn452;

Towards the Phantom, High/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.334 mW/g
Towards the Phantom, High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.5 V/m; Power Drift = 0.070 dB
Peak SAR (extrapolated) = 0.376 W/kg
SAR(1 g) = 0.294 mW/g; SAR(10 g) = 0.213 mW/g
Maximum value of SAR (measured) = 0.315 mW/g

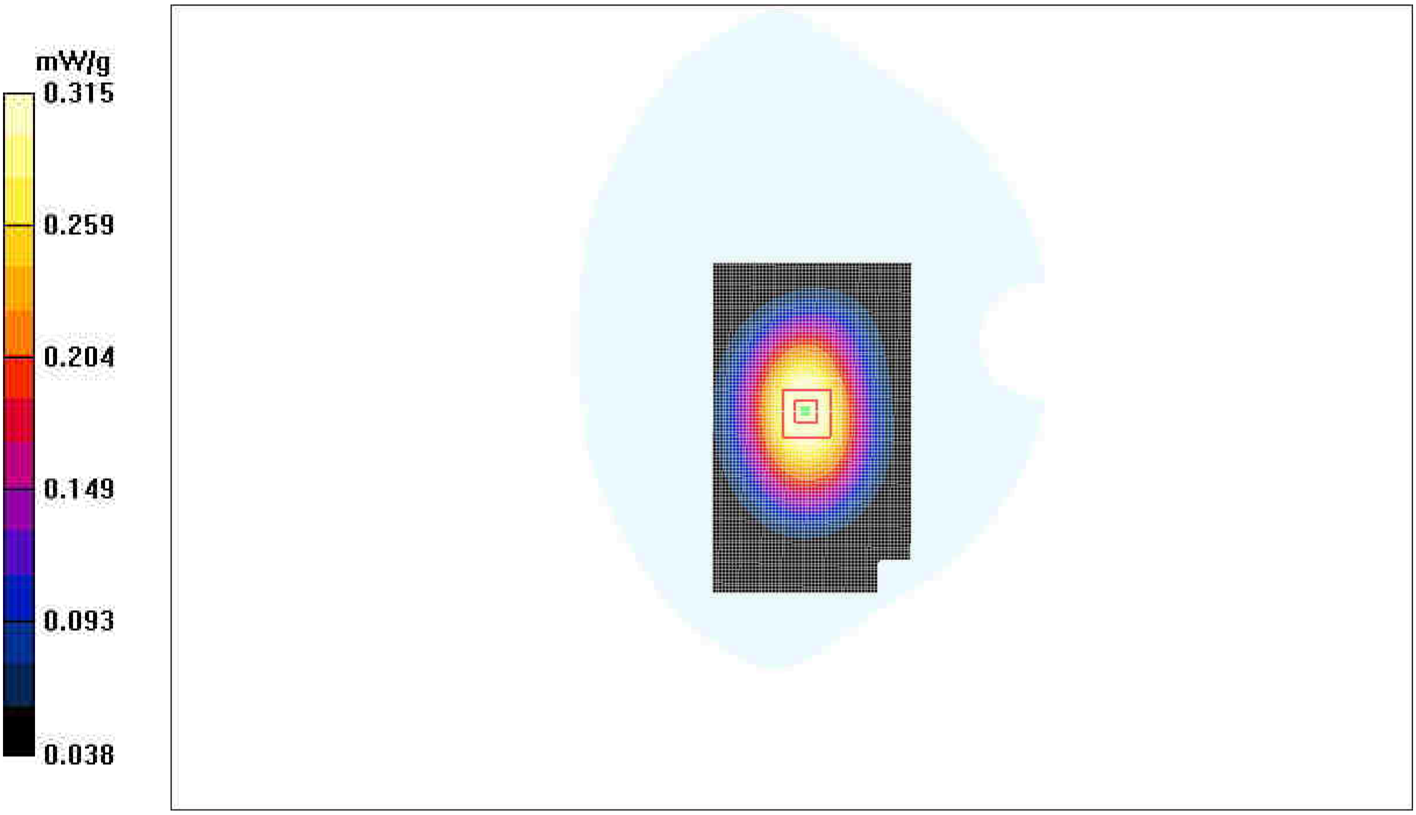


Fig. 31 Body, Towards Phantom, CDMA Cellular CH777

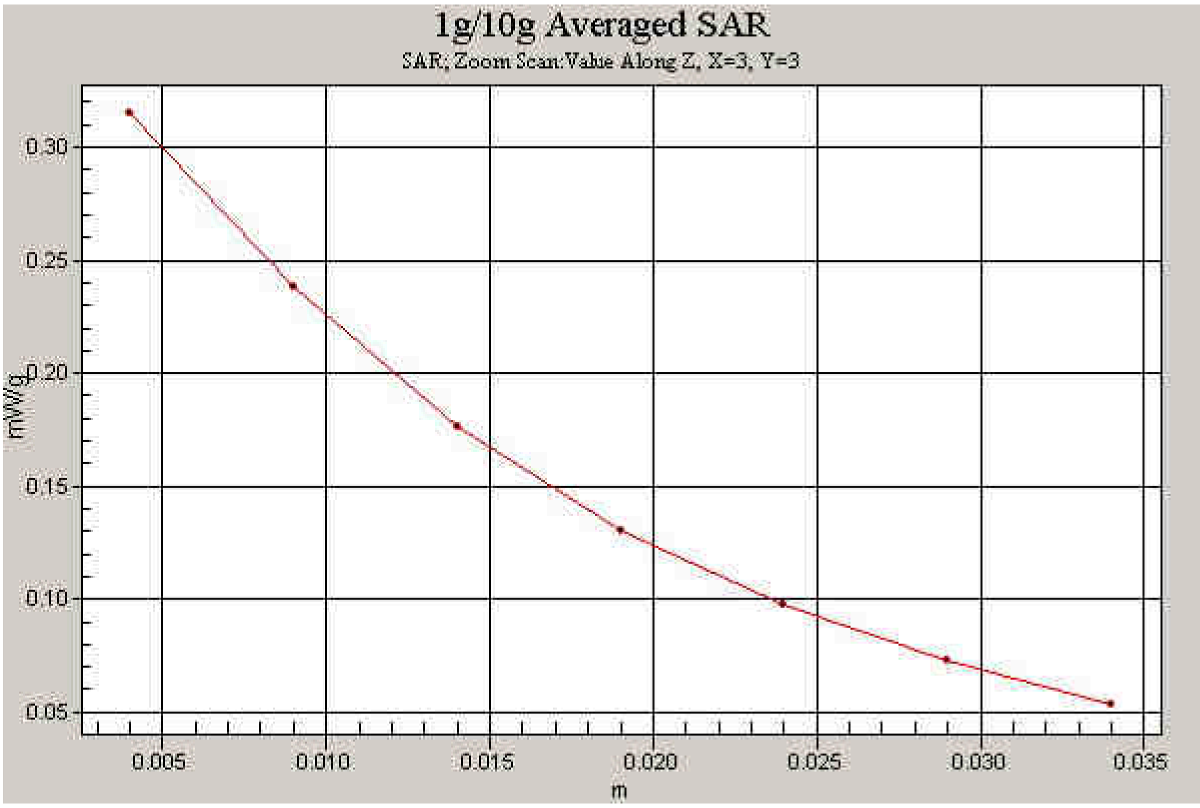


Fig. 32 Z-Scan at power reference point (Body, Towards Phantom, CDMA Cellular CH777)

CDMA Cellular Towards the Phantom Middle
Communication System: CDMA Cellular; Frequency: 836.52 MHz; Duty Cycle: 1:1
Medium: Body 835MHz
Medium parameters used (interpolated): f = 836.52 MHz; σ = 0.989 mho/m; ε_r = 55.2; ρ = 1000 kg/m^3
- Probe: ET3DV6 - SN1737; ConvF(6.52, 6.52, 6.52);
- Electronics: DAE3 Sn452;

Towards the Phantom, Middle /Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.341 mW/g
Towards the Phantom, Middle /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.9 V/m; Power Drift = -0.089 dB
Peak SAR (extrapolated) = 0.403 W/kg
SAR(1 g) = 0.315 mW/g; SAR(10 g) = 0.226 mW/g
Maximum value of SAR (measured) = 0.337 mW/g

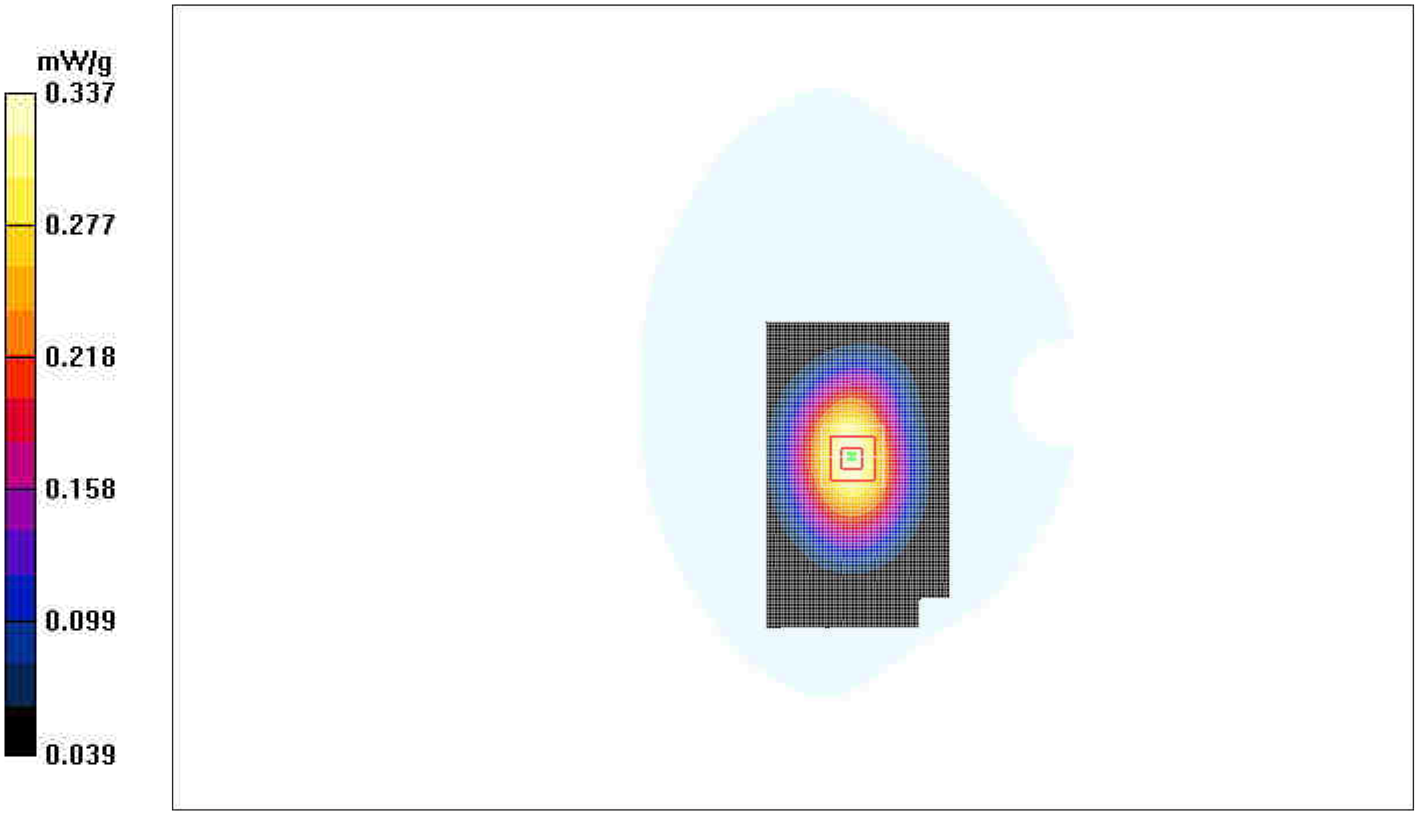


Fig. 33 Body, Towards Phantom, CDMA Cellular CH384

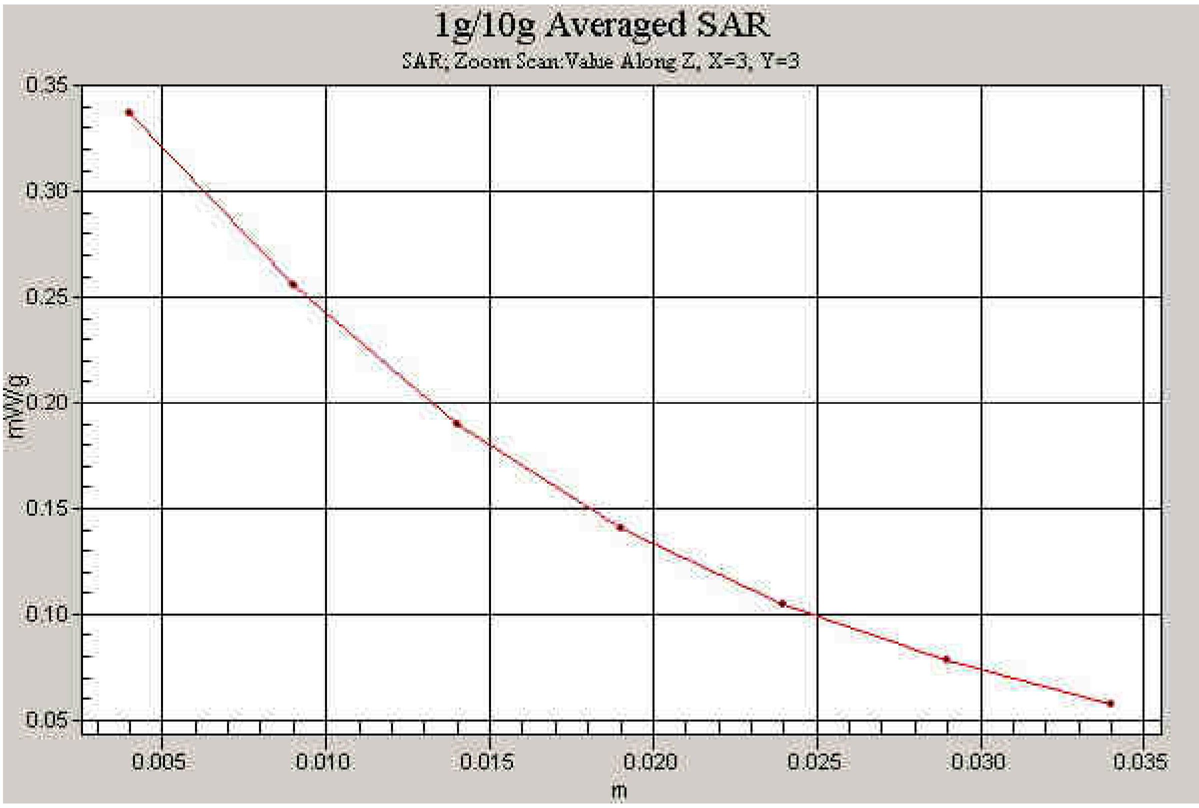


Fig. 34 Z-Scan at power reference point (Body, Towards Phantom, CDMA Cellular CH384)

CDMA Cellular Towards the Phantom Low

Communication System: CDMA Cellular; Frequency: 824.7 MHz; Duty Cycle: 1:1

Medium: Body 835MHz

Medium parameters used (interpolated): f = 824.7 MHz; σ = 0.984 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3

- Probe: ET3DV6 - SN1737; ConvF(6.52, 6.52, 6.52);
- Electronics: DAE3 Sn452;

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

Maximum value of SAR (interpolated) = 0.429 mW/g

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

Reference Value = 13.0 V/m; Power Drift = 0.008 dB

Peak SAR (extrapolated) = 0.593 W/kg

SAR(1 g) = 0.464 mW/g; SAR(10 g) = 0.336 mW/g

Maximum value of SAR (measured) = 0.490 mW/g

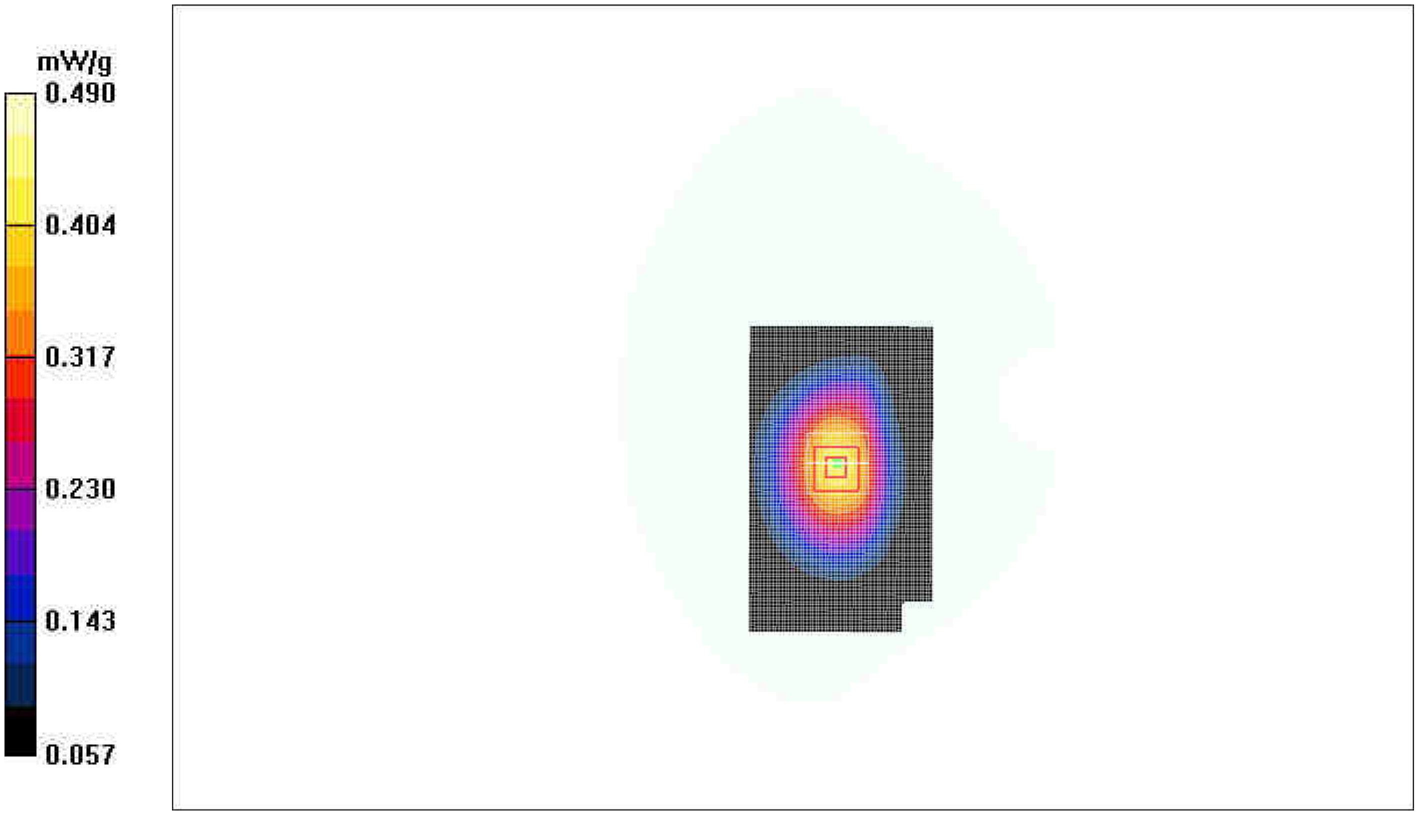


Fig. 35 Body, Towards Phantom, CDMA Cellular CH1013

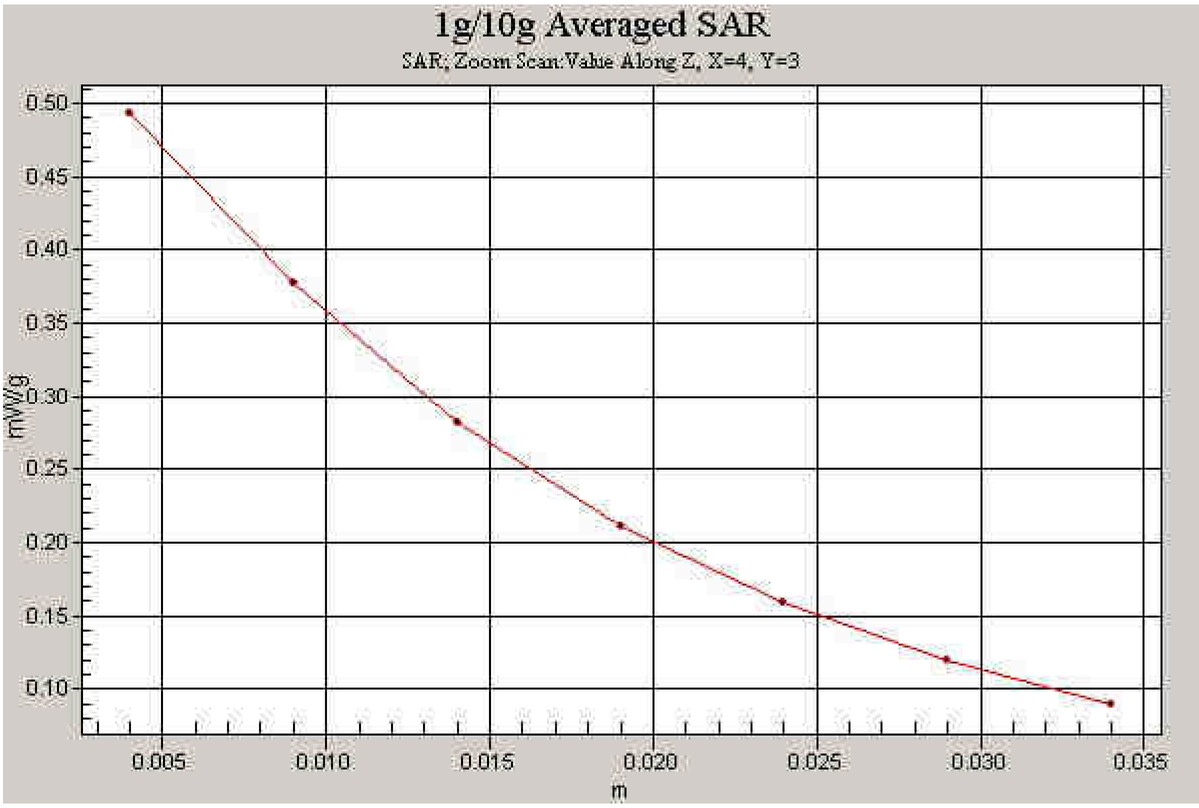


Fig. 36 Z-Scan at power reference point (Body, Towards Phantom, CDMA Cellular CH1013)

CDMA Cellular Towards the Ground High
Communication System: CDMA Cellular; Frequency: 848.31 MHz; Duty Cycle: 1:1
Medium: Body 835MHz
Medium parameters used (interpolated): f = 848.31 MHz; σ = 1.01 mho/m; ε_r = 55; ρ = 1000 kg/m^3
- Probe: ET3DV6 - SN1737; ConvF(6.52, 6.52, 6.52);
- Electronics: DAE3 Sn452;

Towards the Ground, High /Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.512 mW/g

Towards the Ground, High /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.9 V/m; Power Drift = -0.136 dB
Peak SAR (extrapolated) = 0.645 W/kg
SAR(1 g) = 0.468 mW/g; SAR(10 g) = 0.339 mW/g
Maximum value of SAR (measured) = 0.496 mW/g

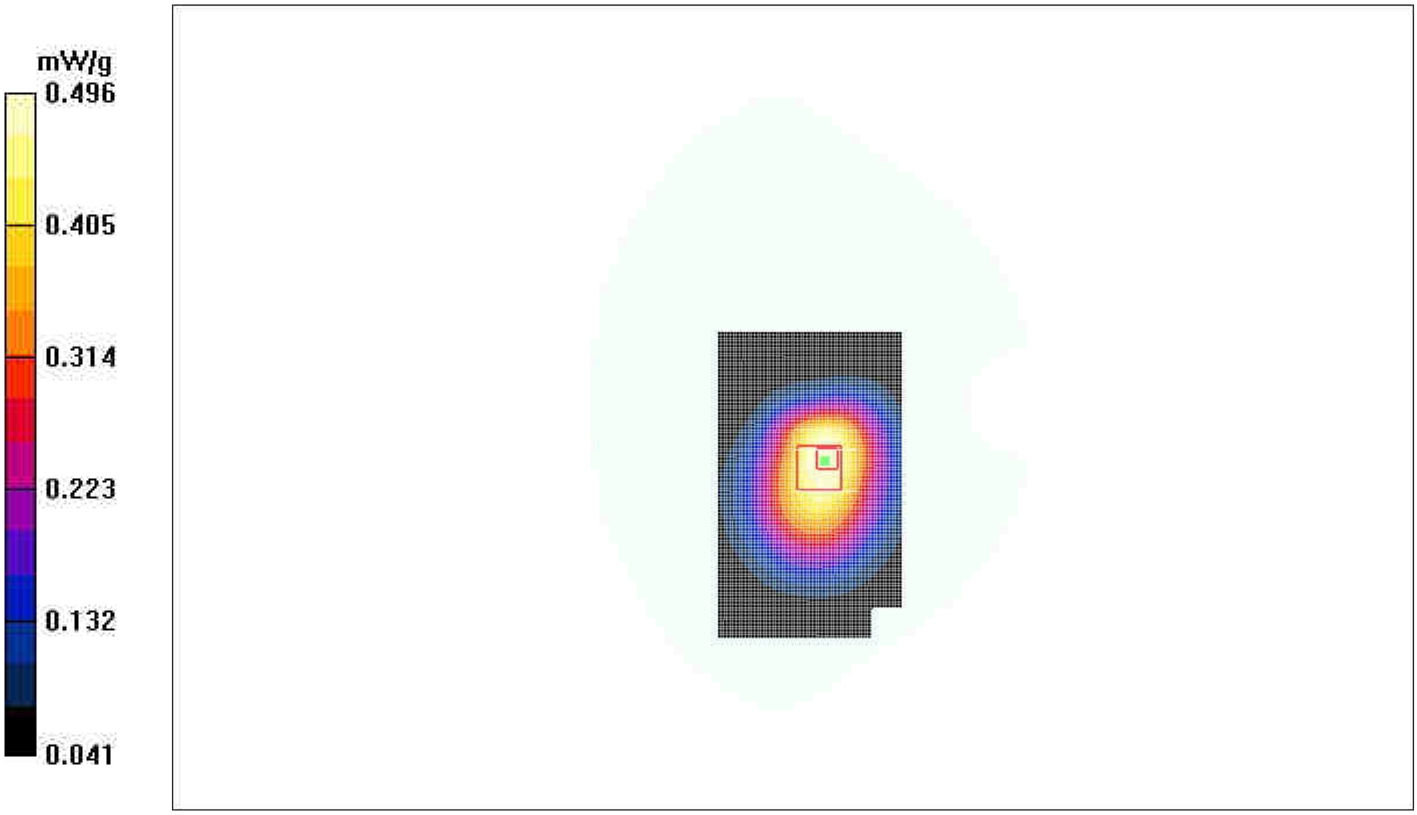


Fig. 37 Body, Towards Ground, CDMA Cellular CH777

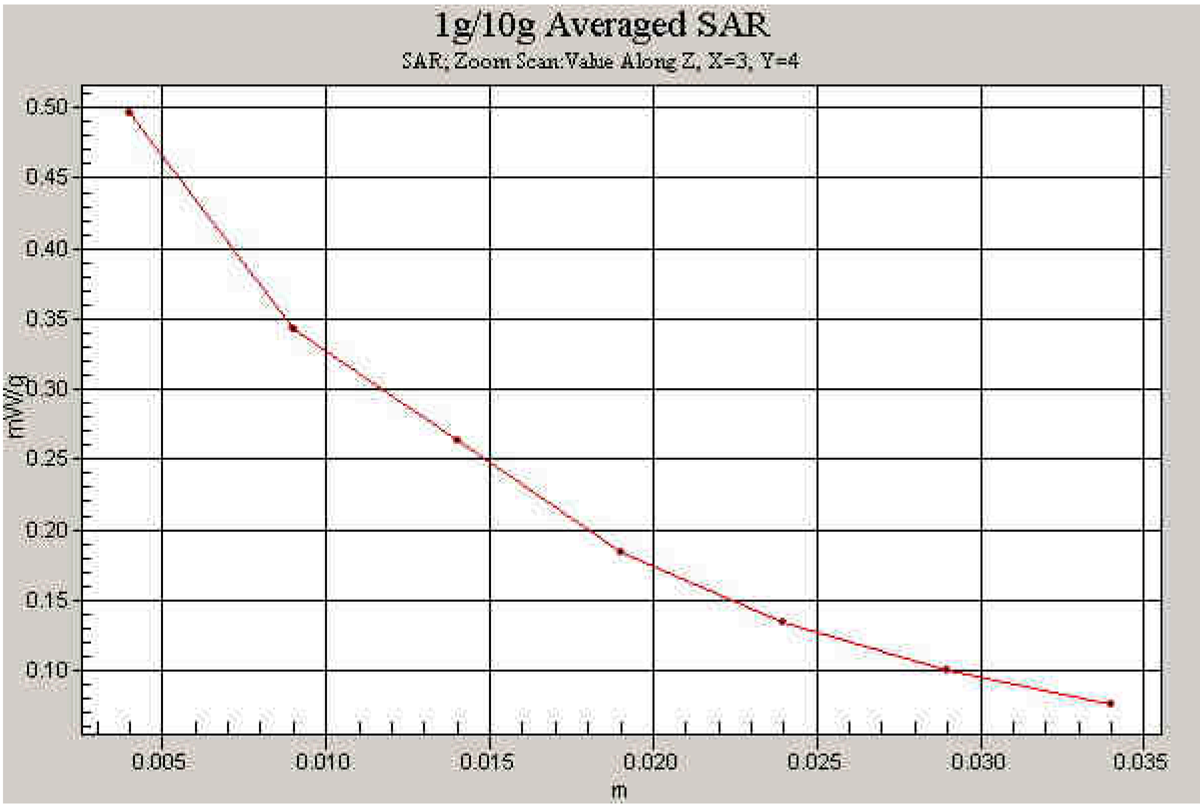


Fig. 38 Z-Scan at power reference point (Body, Towards Ground, CDMA Cellular CH777)

CDMA Cellular Towards the Ground Middle

Communication System: CDMA Cellular; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium: Body 835MHz

Medium parameters used (interpolated): f = 836.52 MHz; σ = 0.989 mho/m; ε_r = 55.2; ρ = 1000 kg/m^3

- Probe: ET3DV6 - SN1737; ConvF(6.52, 6.52, 6.52);
- Electronics: DAE3 Sn452;

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

Maximum value of SAR (interpolated) = 0.615 mW/g

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

Reference Value = 15.3 V/m; Power Drift = -0.023 dB

Peak SAR (extrapolated) = 0.779 W/kg

SAR(1 g) = 0.611 mW/g; SAR(10 g) = 0.441 mW/g

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

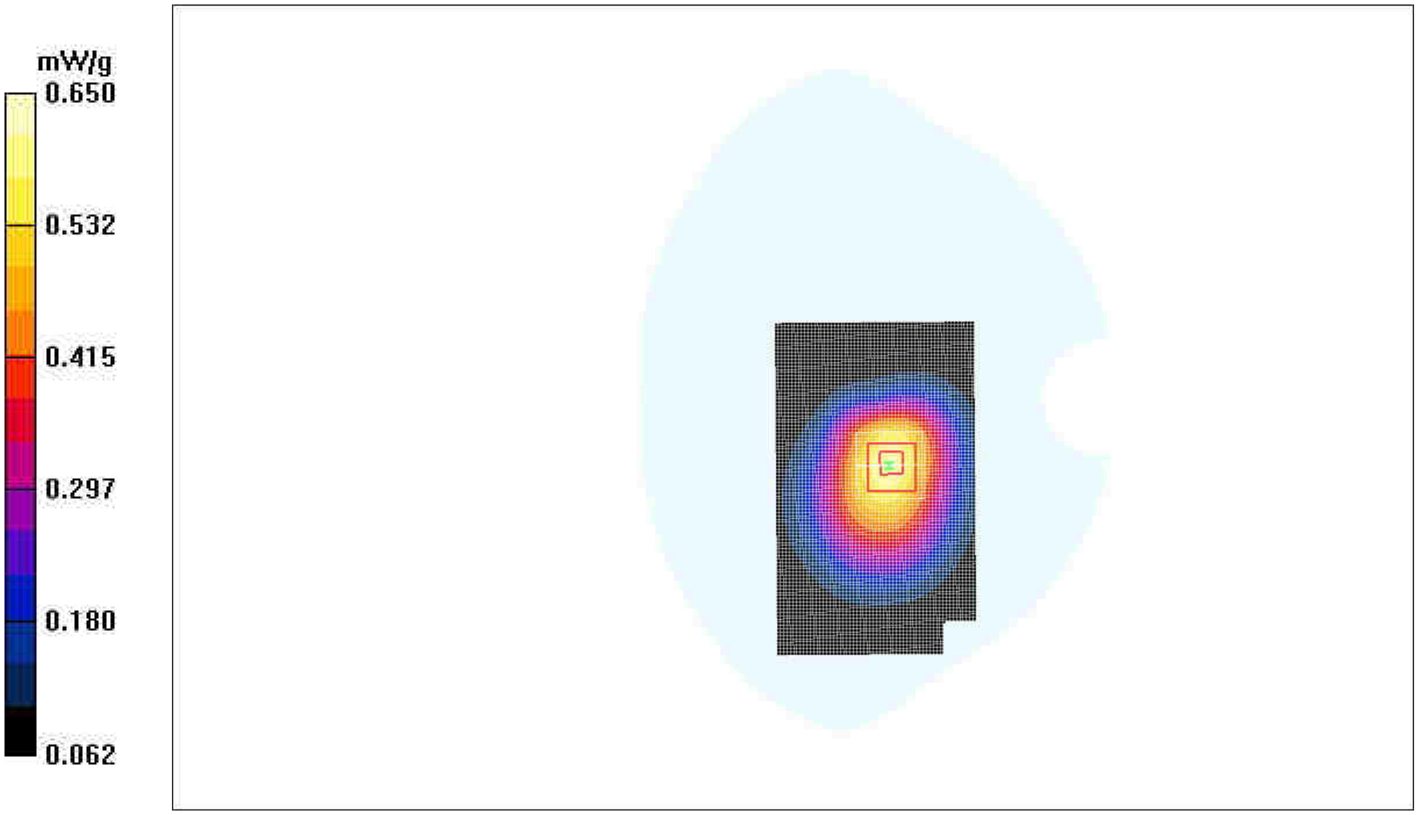


Fig. 39 Body, Towards Ground, CDMA Cellular CH384

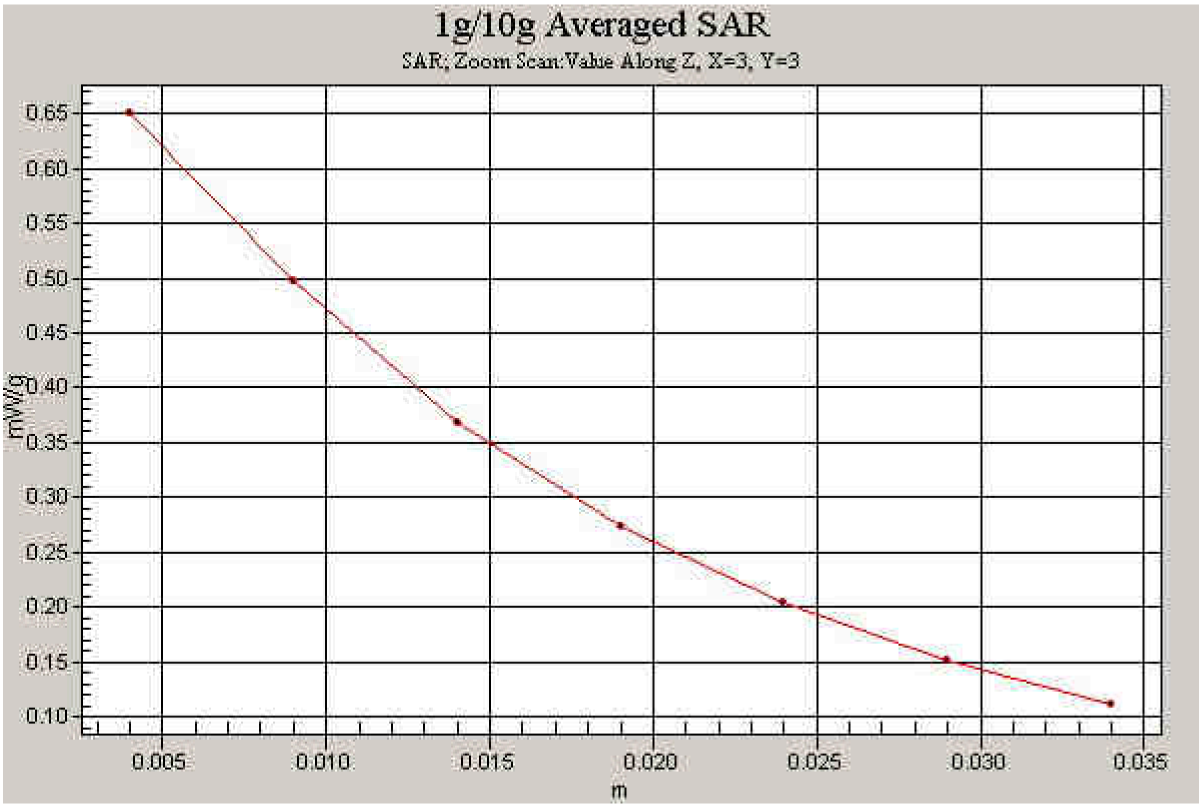


Fig. 40 Z-Scan at power reference point (Body, Towards Ground, CDMA Cellular CH384)

CDMA Cellular Towards the Ground Low

Communication System: CDMA Cellular; Frequency: 824.7 MHz; Duty Cycle: 1:1

Medium: Body 835MHz

Medium parameters used (interpolated): f = 824.7 MHz; σ = 0.984 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3

- Probe: ET3DV6 - SN1737; ConvF(6.52, 6.52, 6.52);
- Electronics: DAE3 Sn452;

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

Maximum value of SAR (interpolated) = 0.962 mW/g

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

Reference Value = 18.3 V/m; Power Drift = -0.127 dB

Peak SAR (extrapolated) = 1.23 W/kg

SAR(1 g) = 0.936 mW/g; SAR(10 g) = 0.673 mW/g

Maximum value of SAR (measured) = 0.990 mW/g

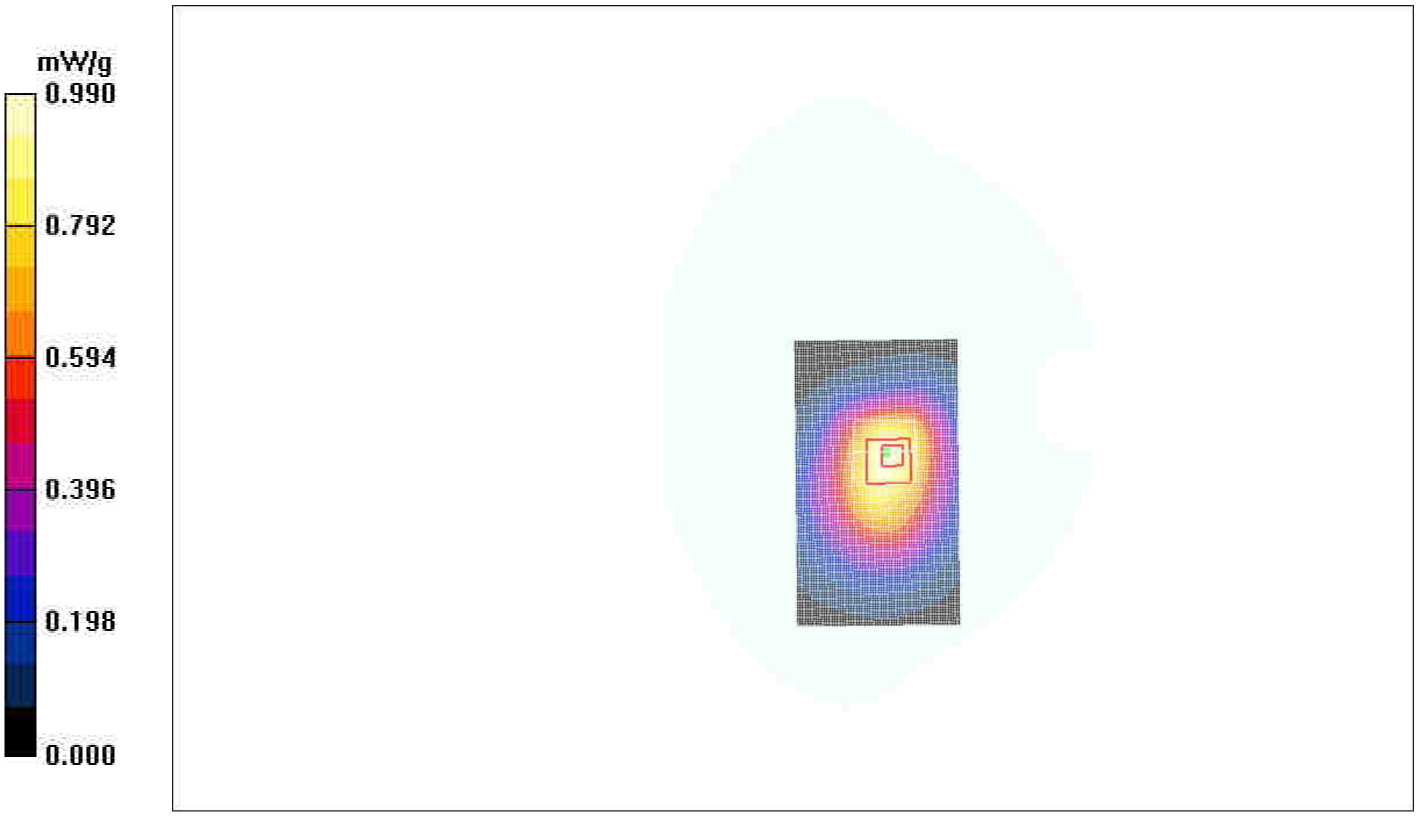


Fig. 41 Body, Towards Ground, CDMA Cellular CH1013

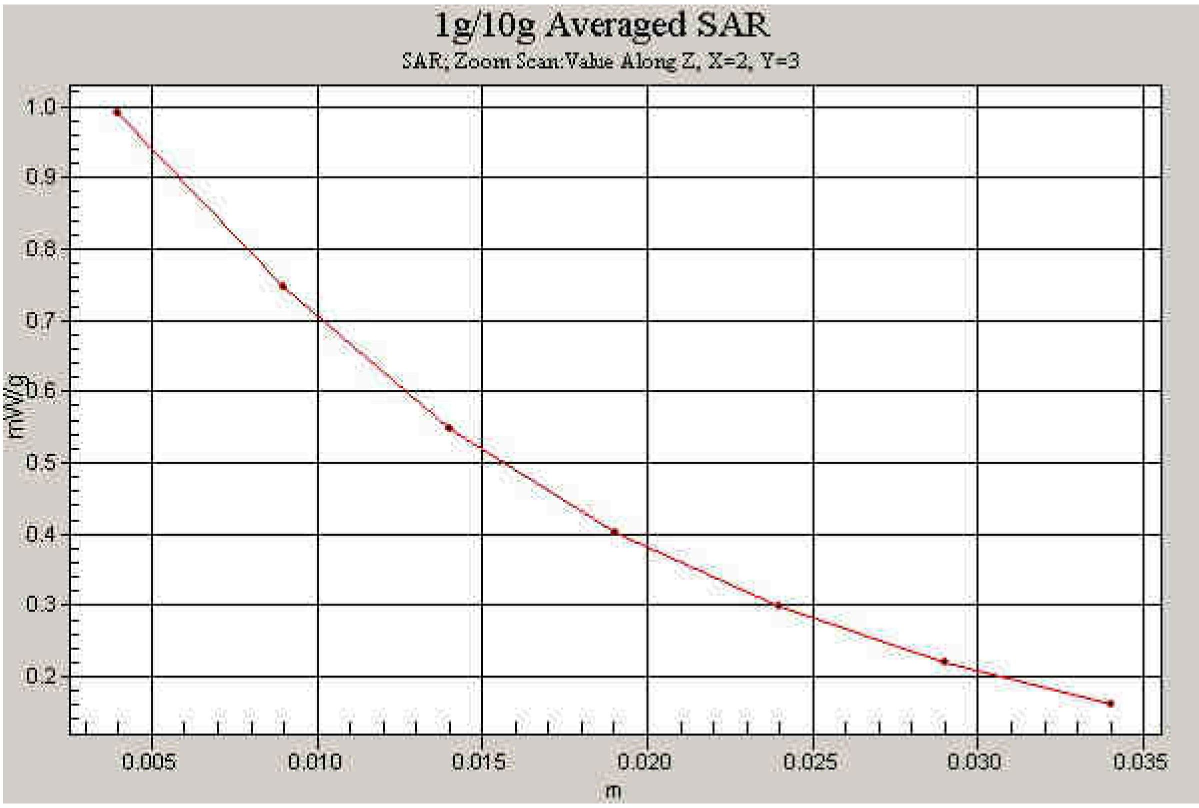


Fig. 42 Z-Scan at power reference point (Body, Towards Ground, CDMA Cellular CH1013)

CDMA Cellular with Ear phone Towards the Ground Low

Communication System: CDMA Cellular; Frequency: 824.7 MHz; Duty Cycle: 1:1
Medium: Body 835MHz
Medium parameters used (interpolated): f = 824.7 MHz; σ = 0.984 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3

- Probe: ET3DV6 - SN1737; ConvF(6.52, 6.52, 6.52);
- Electronics: DAE3 Sn452;

Towards the Ground, Low /Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.957 mW/g
Towards the Ground, Low /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.8 V/m; Power Drift = 0.164 dB
Peak SAR (extrapolated) = 1.20 W/kg
SAR(1 g) = 0.935 mW/g; SAR(10 g) = 0.673 mW/g
Maximum value of SAR (measured) = 0.988 mW/g

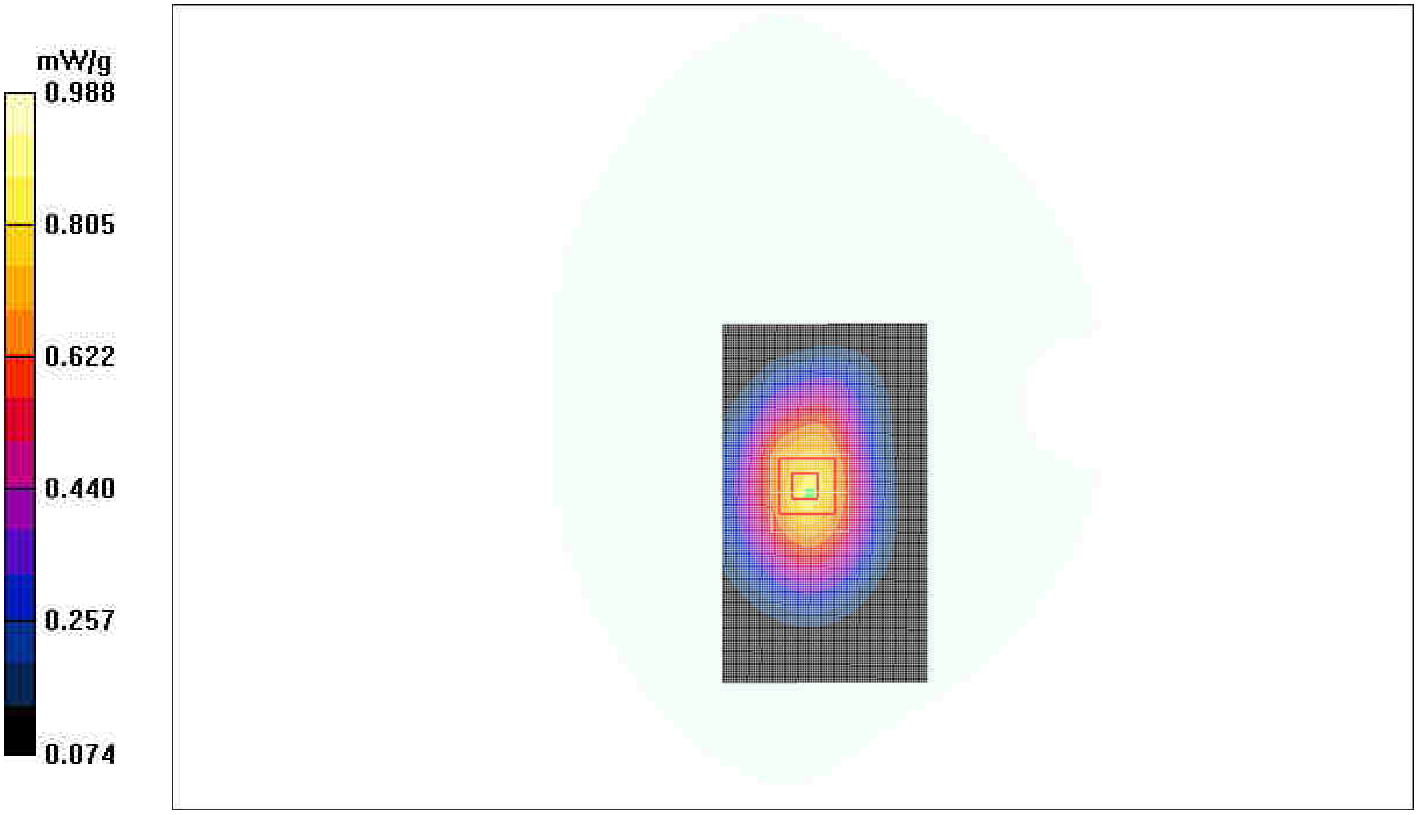


Fig. 43 Body with ear phone, Towards Ground, CDMA Cellular CH1013

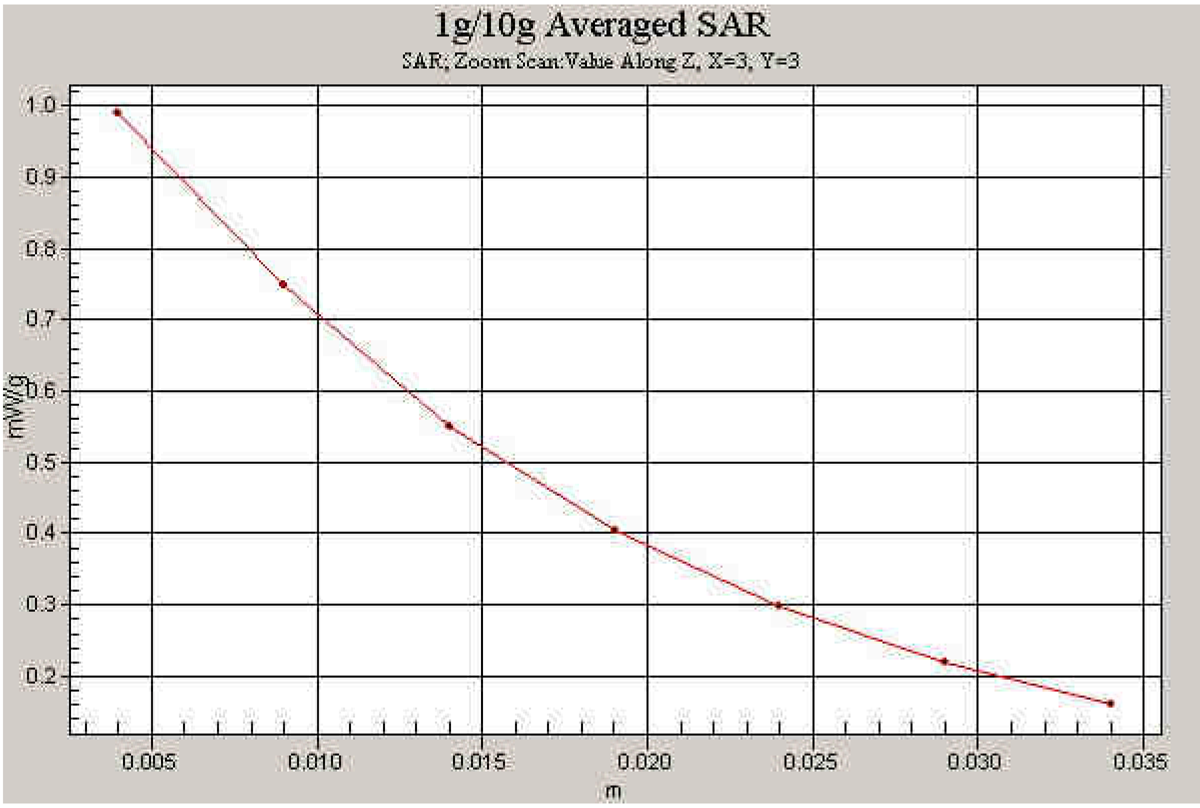
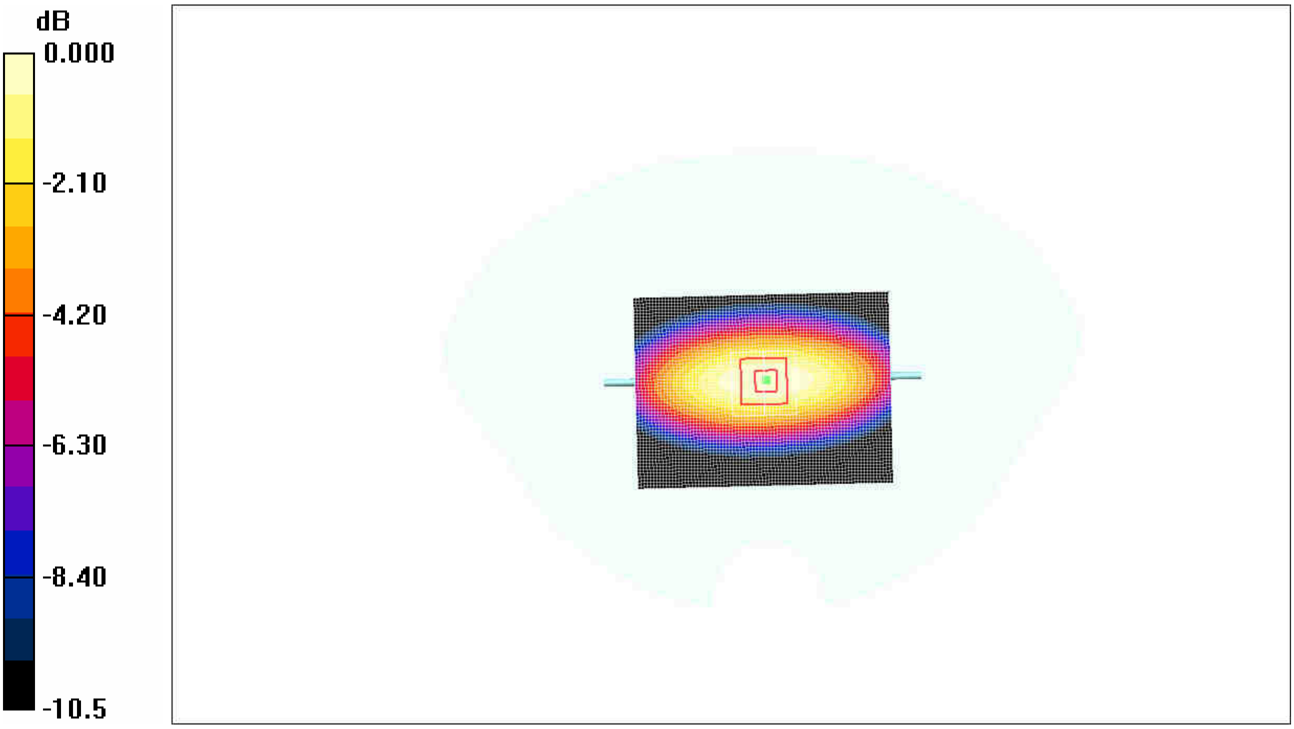


Fig. 44 Z-Scan at power reference point (Body with ear phone, Towards Ground, CDMA Cellular CH1013)

ANNEX D: SYSTEM VALIDATION RESULTS

System Performance Check at 835 MHz
Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: Head 835MHz
Medium parameters used: f = 835 MHz; σ = 0.899 mho/m; ε_r = 42.8; ρ = 1000 kg/m^3
- Probe: ET3DV6 - SN1737; ConvF(6.52, 6.52, 6.52);
- Electronics: DAE3 Sn452;

d=15mm, Pin=250mW/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.54 mW/g
d=15mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.0 V/m; Power Drift = -0.061 dB
Peak SAR (extrapolated) = 3.44 W/kg
SAR(1 g) = 2.34 mW/g; SAR(10 g) = 1.53 mW/g
Maximum value of SAR (measured) = 2.52 mW/g



0 dB = 2.52mW/g

Fig. 45 System Performance Check 835MHz 250mW

ANNEX E： PROBE CALIBRATION CERTIFICATE

Calibration Laboratory of
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Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

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The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **TMC-Auden**

Certificate No: **ET3-1737_Feb07**

CALIBRATION CERTIFICATE

Object	ET3DV6 - SN:1737
Calibration procedure(s)	QA CAL-01.v5 Calibration procedure for dosimetric E-field probes
Calibration date:	February 19, 2007
Condition of the calibrated item	In Tolerance

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	5-Apr-06 (METAS, No. 251-00557)	Apr-07
Power sensor E4412A	MY41495277	5-Apr-06 (METAS, No. 251-00557)	Apr-07
Power sensor E4412A	MY41498087	5-Apr-06 (METAS, No. 251-00557)	Apr-07
Reference 3 dB Attenuator	SN: S5054 (3c)	10-Aug-06 (METAS, No. 217-00592)	Aug-07
Reference 20 dB Attenuator	SN: S5086 (20b)	4-Apr-06 (METAS, No. 251-00558)	Apr-07
Reference 30 dB Attenuator	SN: S5129 (30b)	10-Aug-06 (METAS, No. 217-00593)	Aug-07
Reference Probe ES3DV2	SN: 3013	4-Jan-07 (SPEAG, No. ES3-3013_Jan07)	Jan-08
DAE4	SN: 654	21-Jun-06 (SPEAG, No. DAE4-654_Jun06)	Jun-07

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (SPEAG, in house check Nov-05)	In house check: Nov-07
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Oct-06)	In house check: Oct-07

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

Issued: February 19, 2007

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

Certificate No: ET3-1737_Feb07 Page 1 of 9

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Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConF	sensitivity in TSL / NORMx,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., ϑ = 0 is normal to probe axis

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,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*.
- *DCPx,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 ≤ 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 *NORMx,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.

Probe ET3DV6

SN:1737

Manufactured:	September 27, 2002
Last calibrated:	February 23, 2005
Recalibrated:	February 19, 2007

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

ET3DV6 SN:1737 February 19, 2007

DASY - Parameters of Probe: ET3DV6 SN:1737

Sensitivity in Free Space[A] Diode Compression[B]

NormX	**1.52** ± 10.1%	$\mu V/(V/m)^2$	DCP X	**95** mV
NormY	**1.66** ± 10.1%	$\mu V/(V/m)^2$	DCP Y	**94** mV
NormZ	**1.71** ± 10.1%	$\mu V/(V/m)^2$	DCP Z	**93** mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

TSL **900 MHz** **Typical SAR gradient: 5 % per mm**

Sensor Center to Phantom Surface Distance		**3.7 mm**	**4.7 mm**
SAR_{be} [%]	Without Correction Algorithm	8.3	4.5
SAR_{be} [%]	With Correction Algorithm	0.7	0.0

TSL **1750 MHz** **Typical SAR gradient: 10 % per mm**

Sensor Center to Phantom Surface Distance		**3.7 mm**	**4.7 mm**
SAR_{be} [%]	Without Correction Algorithm	11.9	8.0
SAR_{be} [%]	With Correction Algorithm	0.5	0.1

Sensor Offset

Probe Tip to Sensor Center **2.7** mm

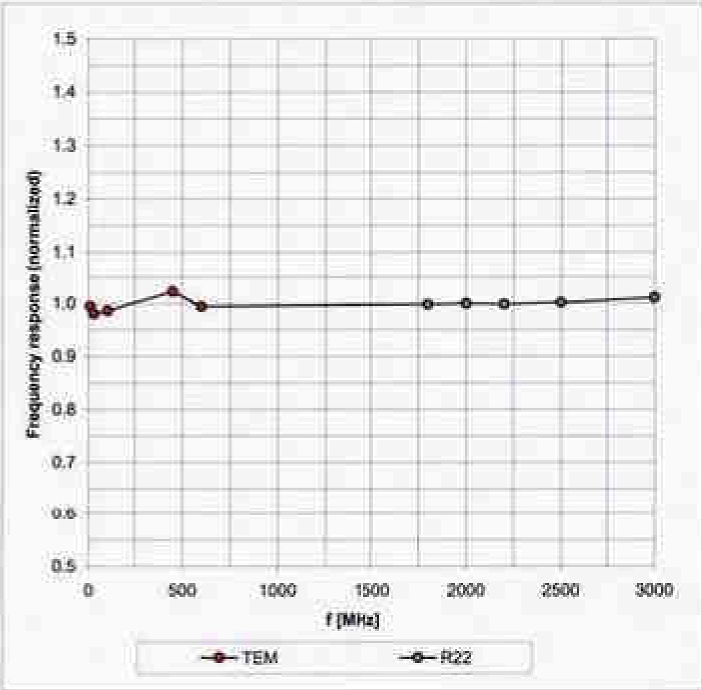
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Page 8).
[B] Numerical linearization parameter: uncertainty not required.

ET3DV6 SN:1737 February 19, 2007

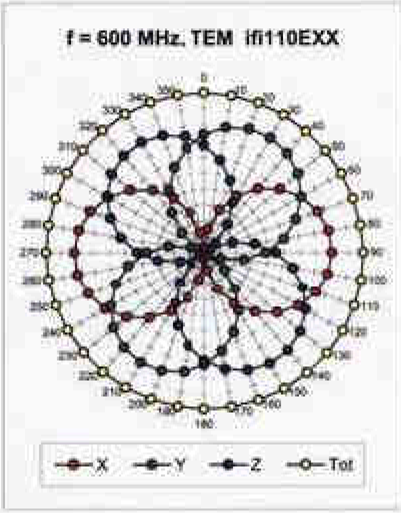
Frequency Response of E-Field

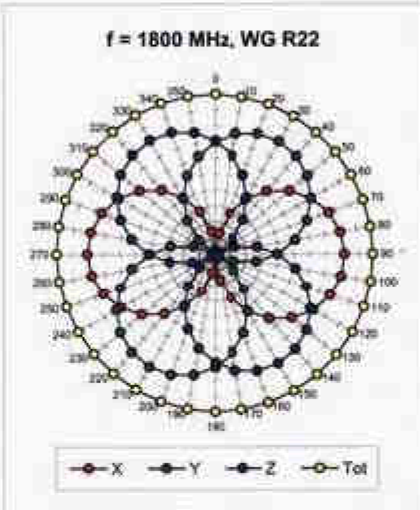
(TEM-Cell:ifi110 EXX, Waveguide: R22)

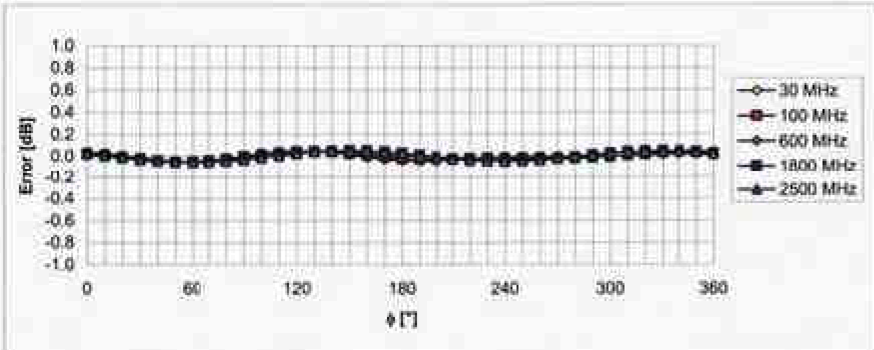


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Receiving Pattern (ϕ), ϑ = 0°



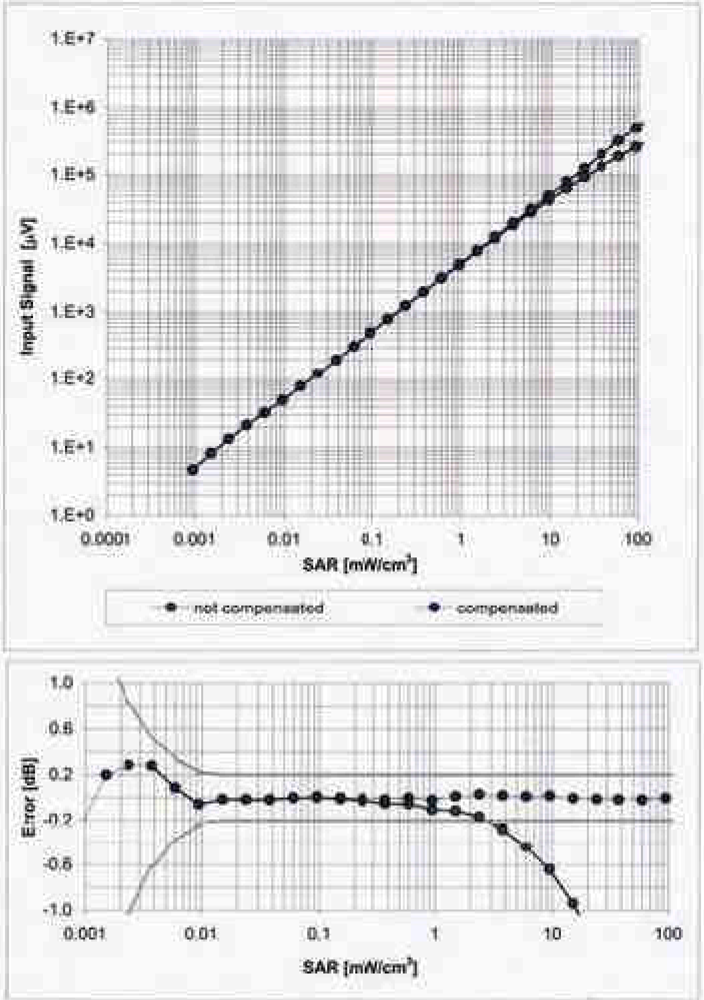




Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})

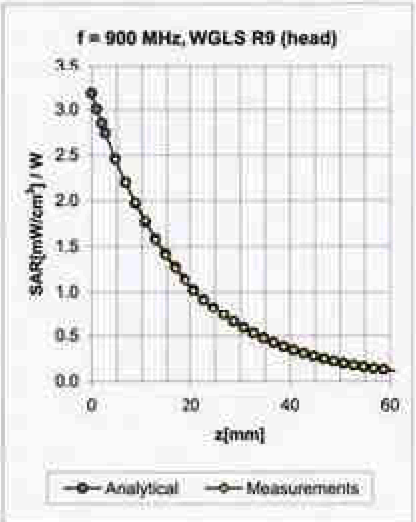
(Waveguide R22, f = 1800 MHz)

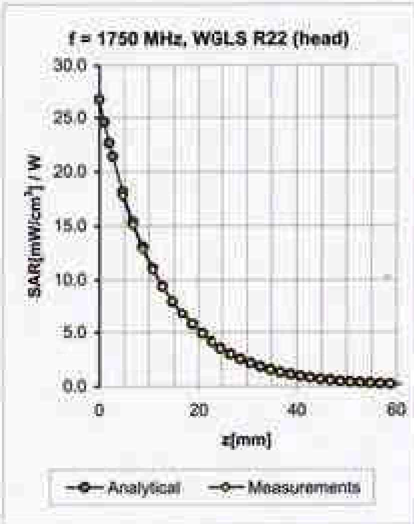


Uncertainty of Linearity Assessment: ± 0.6% (k=2)

ET3DV6 SN:1737 February 19, 2007

Conversion Factor Assessment





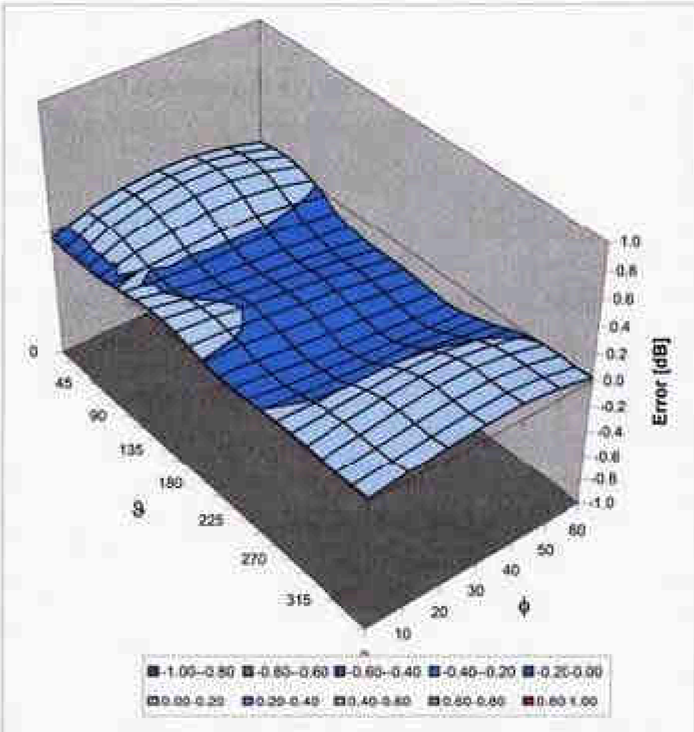
f [MHz]	Validity [MHz][C]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF	Uncertainty
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.27	2.89	6.85	± 11.0% (k=2)
1750	± 50 / ± 100	Head	40.1 ± 5%	1.37 ± 5%	0.52	2.56	5.42	± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.49	2.89	5.15	± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.35	2.82	6.52	± 11.0% (k=2)
1750	± 50 / ± 100	Body	53.4 ± 5%	1.49 ± 5%	0.56	2.68	4.97	± 11.0% (k=2)
1950	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.88	2.07	4.64	± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.66	2.16	4.10	± 11.8% (k=2)

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

ET3DV6 SN:1737 February 19, 2007

Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

ANNEX F: DIPOLE CALIBRATION CERTIFICATE

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

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Accreditation No.: SCS 108

Client: TMC China

Certificate No: D835V2-443_Feb07

CALIBRATION CERTIFICATE

Object	D835V2-SN: 443
Calibration procedure(s)	QA CAL-05.v6 Calibration procedure for dipole validation kits
Calibration date:	February 19, 2007
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 at an environment temperature (22±3)°C and humidity<70%

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID#	Cal Data (Calibrated by, Certification NO.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	03-Oct-06 (METAS, NO. 217-00608)	Oct-07
Power sensor 8481A	US37292783	03-Oct-06 (METAS, NO. 217-00608)	Oct-07
Reference 20 dB Attenuator	SN:5086 (20g)	10-Aug-06 (METAS, NO. 217-00591)	Aug-07
Reference 10 dB Attenuator	SN:5047_2 (10r)	10-Aug-06 (METAS, NO. 217-00591)	Aug-07
DAE4	SN:601	30-Jan-07 (SPEAG, NO.DAE4-601_Jan07)	Jan-08
Reference Probe ET3DV6 (HF)	SN: 1507	19-Oct-06 (SPEAG, NO. ET3-1507_Oct06)	Oct-07
Secondary Standards	**ID#**	**Check Data (in house)**	**Scheduled Calibration**
Power sensor HP 8481A	MY41092317	18-Oct-02(SPEAG, in house check Oct-05)	In house check: Oct-07
RF generator Agilent E4421B	MY41000675	11-May-05(SPEAG, in house check Nov-05)	In house check: Nov -07
Network Analyzer HP 8753E	US37390585S4206	18-Oct-01(SPEAG, in house check Oct-06)	In house check: Oct -07

	Name	Function	Signature
Calibrated by:	Marcel Fehr	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Director	

Issued: February 21, 2007

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

Calibration Laboratory of
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Accreditation No.: SCS 108

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4 System Handbook

Methods Applied and Interpretation of Parameters:

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

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY4	V4.7
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V4.9	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.9 ± 6 %	0.88 mho/m ± 6 %
Head TSL temperature during test	(21.2 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.48 mW / g
SAR normalized	normalized to 1W	9.90 mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**9.70 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.60 mW / g
SAR normalized	normalized to 1W	6.40 mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**6.31 mW /g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.5 Ω - 6.8 jΩ
Return Loss	- 25.8 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.402 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	September 3, 2001

DASY4 Validation Report for Head TSL

Date/Time: 19.02.2007 10:04:15

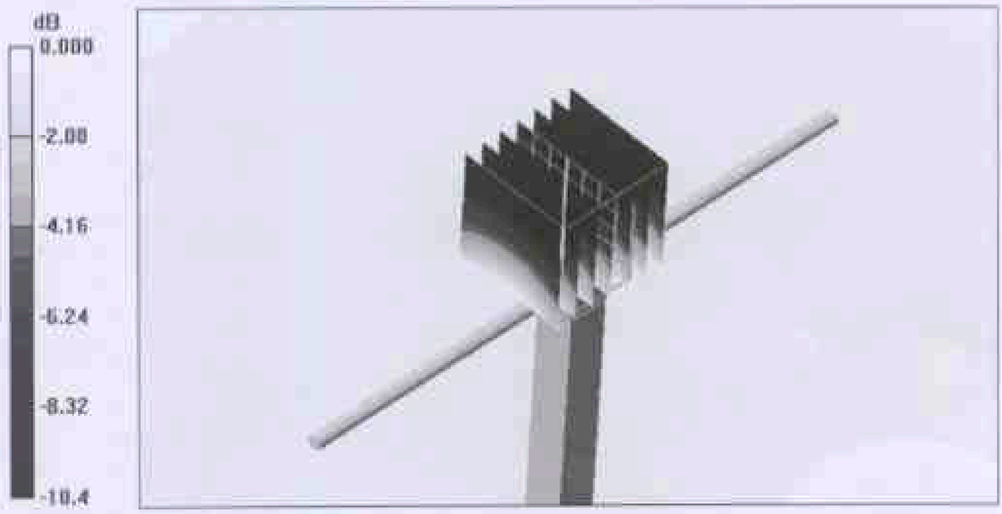
Test laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; serial: D835V2-SN: 443

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL 835 MHz
Medium parameters used: f=835 MHz; σ=0.88 mho/m; ε_r=39.9; ρ= 1000kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)
DASY4 Configuration:

- Probe: ET3DV6-SN1507(HF); ConvF(6.01,6.01,6.01); Calibrated: 19.10.2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.1_2007
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA;
- Measurement SW: DASY, V4.7 Build 53; Post processing SW: SEMCAD, V1.8 Build 172

Pin = 250 mW; d = 15 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.6 V/m; Power Drift = 0.010 dB
Peak SAR (extrapolated) = 3.72 W/kg
SAR(1 g) = 2.48 mW/g; SAR(10 g) = 1.60 mW/g
Maximum value of SAR (measured) = 2.70 mW/g



0 dB = 2.70mW/g

Impedance measurement Plot for Head TSL