SAR TEST REPORT

No. 2007SAR00029

for

T&A Mobile Phones

OT-C700A

B7CA

With

FCCID: RAD064

Hardware Version: PROTO

Software Version: V321

Issued Date: 2007-08-06

No. **DAT-P-114/01-01**

Note:

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Test Laboratory:

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信息产业部通信计量中心 TMC
Telecommunication Metrology Center of MII

SAR TEST REPORT

Test report No.	2007SAR00029	Date of report	August 06th, 2007
Test laboratory	TMC Beijing, Telecommunication Metrology Center of MII	Client	T&A Mobile Phones
Test device	Product name: OT-C700A Model type: B7CA Series number: 011290000000715 GPRS Class: 10		
Test reference documents	**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 62209-1-2005:** Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures –Part 1:Procedure to determine the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz) **IEC 62209-2 (Draft):** Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures – Part 2: Procedure to determine the Specific Absorption Rate (SAR)in the head and body for 30MHz to 6GHz Handheld and Body-Mounted Devices used in close proximity to the Body		
Test 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**		
Signature	Lu Bingsong **Deputy Director of the laboratory** (Approved for this report)	Sun Qian **SAR Project Leader** (Reviewed for this report)	Lin Xiaojun **SAR Test Engineer** (Prepared for this report)

1 Test Laboratory

1.1 Testing Location

Company Name:	TMC Beijing, Telecommunication Metrology Center of MII
Address:	No 52, Huayuan beilu, Haidian District, Beijing,P.R.China
Postal Code:	100083
Telephone:	+86-10-62303288
Fax:	+86-10-62304793

1.2 Testing Environment

Temperature:	Min. = 15 °C, Max. = 30 °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.

1.3 Project data

Project Leader:	Sun Qian
Test Engineer:	Lin Xiaojun
Testing Start Date:	August 02, 2007
Testing End Date:	August 03, 2007

2 Client Information

2.1 Applicant Information

Company Name:	T&A Mobile Phones
Address /Post:	4F, South Building, No.2966, JinKe Road, Zhangjiang High-Tech Park Shanghai 201203, P.R.China
City:	Shanghai
Postal Code:	201203
Country:	P. R. China
Telephone:	0086-21-61460885
Fax:	0086-21-61460602

2.2 Manufacturer Information

Company Name:	T&A Mobile Phones
Address /Post:	4F, South Building, No.2966, JinKe Road, Zhangjiang High-Tech Park Shanghai 201203, P.R.China
City:	Shanghai
Postal Code:	201203
Country:	P. R. China
Telephone:	0086-21-61460885
Fax:	0086-21-61460602

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

3.1 About EUT

Description:	OT-C700A
Model:	B7CA
Frequency Band:	850 MHz/ 1900 MHz

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

3.2 Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	011290000000715	PROTO	V321

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

3.3 Internal Identification of AE used during the test

AE ID*	Description	Model	SN	Manufacturer
AE1	Lithium Battery	T5001418AAAA	B011750070A	BYD
AE2	AC/DC Adapter	T5000436AGAA	\	Tenpao

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

4 OPERATIONAL CONDITIONS DURING TEST

4.1 Schematic Test Configuration

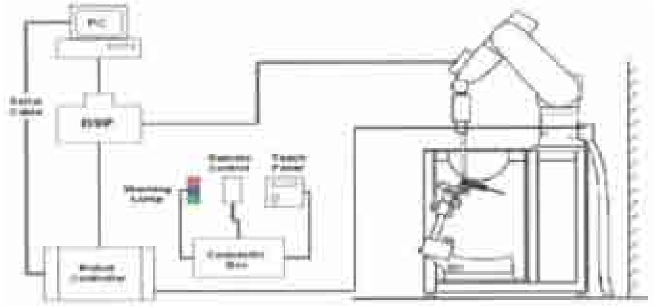
During SAR test, EUT is in Traffic Mode (Channel Allocated) at Normal Voltage Condition. A communication link is set up with a System Simulator (SS) by air link, and a call is established. The Absolute Radio Frequency Channel Number (ARFCN) is allocated to 128, 190 and 251 respectively in the case of GSM 850 MHz, or to 512, 661 and 810 respectively in the case of PCS 1900 MHz. The EUT is commanded to operate at maximum transmitting power.

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

4.2 SAR Measurement Set-up

These measurements were performed with the automated near-field scanning system DASY4 Professional from Schmid & Partner Engineering AG (SPEAG). The system is based on a high precision robot (working range greater than 0.9m) which positions the probes with a positional repeatability of better than ± 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.



Picture 2: SAR Lab Test Measurement Set-up

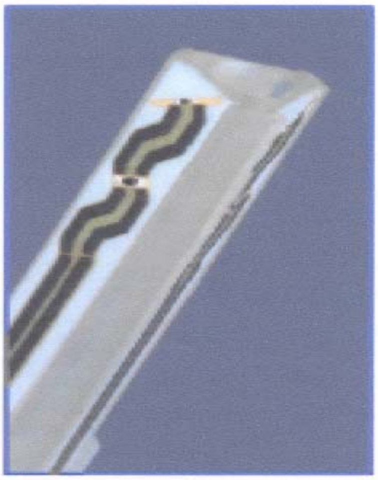
The DAE consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information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

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



Picture 3: ET3DV6 E-field Probe

Picture4: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.

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

Where: Δt = Exposure time (30 seconds),

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

ΔT = Temperature increase due to RF exposure.

Or

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

Where:σ = Simulated tissue conductivity,

ρ = Tissue density (kg/m3).

Note: Please check Annex E to see the Probe Certificate.

Picture 5:Device Holder

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).

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 all predefined phantom positions and measurement grids by the complete setup of manually teaching three points in the robot.

Shell Thickness 2±0. l mm

Filling Volume Approx. 20 liters

Dimensions 810 x l000 x 500 mm (H x L x W)

Available Special

Picture6: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 1 and 2 shows the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the IEEE 1528.

Table 1. Composition of the Head Tissue Equivalent Matter

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

Table 2. Composition of the Body Tissue Equivalent Matter

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

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.

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 62209-1-2005: Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures –Part 1:Procedure to determine the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)

IEC 62209-2 (Draft): Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures – Part 2: Procedure to determine the Specific Absorption Rate (SAR)in the head and body for 30MHz to 6GHz Handheld and Body-Mounted Devices used in close proximity to the Body

They specify the measurement method for demonstration of compliance with the SAR limits for such equipments.

6 CONDUCTED OUTPUT POWER MEASUREMENT

6.1 Summary

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

6.2 Conducted Power

6.2.1 Measurement Methods

The EUT was set up for the maximum output power. The channel power was measured with Agilent Spectrum Analyzer E4440A.

6.2.2 Measurement result

Table 3: Conducted Power Measurement Results

850MHZ	**Conducted Power**		
	Channel 251 (848.8MHz)	**Channel 190 (836.6MHz)**	**Channel 128 (824.2MHz)**
Before SAR Test (dBm)	32.3	32.0	32.1
After SAR Test (dBm)	32.4	32.2	32.0
1900MHZ	**Conducted Power**		
	Channel 810 (1909.8MHz)	**Channel 661 (1880MHz)**	**Channel 512 (1850.2MHz)**
Before SAR Test (dBm)	29.9	30.2	30.1
After SAR Test (dBm)	30.0	30.4	29.9

6.2.3 Power Drift

To control the output power stability during the SAR test, DASY4 system calculates the power drift by measuring the E-field at the same location at the beginning and at the end of the measurement for each test position. These drift values can be found in Table 7 to Table 10 labeled as: (Power Drift [dB]). This ensures that the power drift during one measurement is within 5%.

7 TEST RESULTS

7.1 Dielectric Performance

Table 4: Dielectric Performance of Head Tissue Simulating Liquid

Measurement is made at temperature 22.5 °C and relative humidity 40%.

/	Frequency	Permittivity ε	Conductivity σ (S/m)
Target value	850 MHz	41.5	0.90
	1900 MHz	40.0	1.40
Measurement value (Average of 10 tests)	850 MHz	43.1	0.92
	1900 MHz	39.3	1.40

Table 5: Dielectric Performance of Body Tissue Simulating Liquid

Measurement is made at temperature 23.3 °C and relative humidity 49%.
Liquid temperature during the test: 22.5°C

/	Frequency	Permittivity ε	Conductivity σ (S/m)
Target value	850 MHz	55.2	0.97
	1900 MHz	53.3	1.52
Measurement value (Average of 10 tests)	850 MHz	53.2	1.01
	1900 MHz	52.0	1.54

7.2 System Validation

Table 6: System Validation

Measurement is made at temperature 23.3 °C, relative humidity 49%, input power 250 mW.
Liquid temperature during the test: 22.5°C

	Frequency	Permittivity ε	Conductivity σ (S/m)
Liquid parameters	835 MHz	41.7	0.88
	1900 MHz	39.2	1.45

	Frequency	**Target value (W/kg)**		**Measured value (W/kg)**		**Deviation**	
		10 g Average	**1 g Average**	**10 g Average**	**1 g Average**	**10 g Average**	**1 g Average**
Verification results	835 MHz (Validated on Aug 02nd)	1.55	2.375	1.62	2.48	4.5%	4.4%
	1900 MHz (Validated on Aug 03rd)	5.125	9.925	5.27	9.91	2.8%	-0.15%

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).

7.3 Summary of Measurement Results (Head)

Table 7: SAR Values (850 MHz Band)

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, Top frequency(See Fig.1)	0.513	0.743	-0.200
Left hand, Touch cheek, Mid frequency(See Fig.3)	0.445	0.645	-0.200
Left hand, Touch cheek, Bottom frequency(See Fig.5)	0.313	0.450	-0.134
Left hand, Tilt 15 Degree, Top frequency(See Fig.7)	0.211	0.298	0.051
Left hand, Tilt 15 Degree, Mid frequency(See Fig.9)	0.160	0.224	0.011
Left hand, Tilt 15 Degree, Bottom frequency(See Fig.11)	0.101	0.140	0.126
Right hand, Touch cheek, Top frequency(See Fig.13)	0.481	0.724	-0.063
Right hand, Touch cheek, Mid frequency(See Fig.15)	0.413	0.623	-0.129
Right hand, Touch cheek, Bottom frequency(See Fig.17)	0.284	0.431	0.056
Right hand, Tilt 15 Degree, Top frequency(See Fig.19)	0.202	0.278	-0.021
Right hand, Tilt 15 Degree, Mid frequency(See Fig.21)	0.154	0.211	0.155
Right hand, Tilt 15 Degree, Bottom frequency(See Fig.23)	0.093	0.126	-0.200

Table 8: SAR Values (1900 MHz Band)

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, Top frequency(See Fig.25)	0.346	0.542	-0.200
Left hand, Touch cheek, Mid frequency(See Fig.27)	0.260	0.408	-0.195
Left hand, Touch cheek, Bottom frequency(See Fig.29)	0.197	0.308	-0.046
Left hand, Tilt 15 Degree, Top frequency(See Fig.31)	0.231	0.368	0.018
Left hand, Tilt 15 Degree, Mid frequency(See Fig.33)	0.188	0.297	0.031
Left hand, Tilt 15 Degree, Bottom frequency(See Fig.35)	0.144	0.226	0.200
Right hand, Touch cheek, Top frequency(See Fig.37)	0.336	0.524	-0.178
Right hand, Touch cheek, Mid frequency(See Fig.39)	0.233	0.411	0.189
Right hand, Touch cheek, Bottom frequency(See Fig.41)	0.201	0.347	0.182
Right hand, Tilt 15 Degree, Top frequency(See Fig.43)	0.270	0.437	-0.018
Right hand, Tilt 15 Degree, Mid frequency(See Fig.45)	0.233	0.376	-0.017
Right hand, Tilt 15 Degree, Bottom frequency(See Fig.47)	0.191	0.307	0.103

7.4 Summary of Measurement Results (Body GPRS)

Table 9: SAR Values (850 MHz GPRS)

Limit of SAR (W/kg)	10 g Average	1 g Average	Power Drift (dB)
	2.0	1.6	
	10 g Average	**1 g Average**	
Body Towards Ground, Top frequency(See Fig.49)	0.862	1.21	-0.193
Body Towards Ground, Mid frequency(See Fig.51)	0.783	1.14	-0.138
Body Towards Ground, Bottom frequency(See Fig.53)	0.587	0.855	-0.072

Table 10: SAR Values (1900 MHZ GPRS)

Limit of SAR (W/kg)	10 g Average	1 g Average	Power Drift (dB)
	2.0	1.6	
	10 g Average	**1 g Average**	
Body Towards Ground, Top frequency(See Fig.55)	0.468	0.739	-0.024
Body Towards Ground, Mid frequency(See Fig.57)	0.386	0.612	-0.081
Body Towards Ground, Bottom frequency(See Fig.59)	0.293	0.460	-0.023

7.5 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.

8 Measurement Uncertainty

SN	a	Type	c	d	e = f(d,k)	f	h = c x f / e	k
	Uncertainty Component		Tol. (± %)	Prob. Dist.	Div.	c_i (1 g)	1 g u_i (±%)	v_i
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	√3	$(1-cp)^{1/2}$	4.3	∞
4	Hemispherical Isotropy	B	9.4	R	√3	$\sqrt{c_p}$		∞
5	Boundary Effect	B	0.4	R	√3	1	0.23	∞
6	Linearity	B	4.7	R	√3	1	2.7	∞
7	System Detection Limits	B	1.0	R	√3	1	0.6	∞

8	Readout Electronics	B	1.0	N	1	1	1.0	∞
9	RF Ambient Conditions	B	3.0	R	√3	1	1.73	∞
10	Probe Positioner Mechanical Tolerance	B	0.4	R	√3	1	0.2	∞
11	Probe Positioning with respect to Phantom Shell	B	2.9	R	√3	1	1.7	∞
12	Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	B	3.9	R	√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	√3	1	2.9	∞
	Phantom and Tissue Parameters							
16	Phantom Uncertainty (shape and thickness tolerances)	B	1.0	R	√3	1	0.6	∞
17	Liquid Conductivity - deviation from target values	B	5.0	R	√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	√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	

9 MAIN TEST INSTRUMENTS

Table 11: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	HP 8753E	US38433212	August 30,2006	One year
02	Power meter	NRVD	101253	June 21, 2007	One year
03	Power sensor	NRV-Z5	100333		
04	Power sensor	NRV-Z6	100011	September 2, 2006	One year
05	Signal Generator	E4433B	US37230472	September 4, 2006	One Year
06	Amplifier	VTL5400	0505	No Calibration Requested	
07	BTS	CMU 200	105948	August 15, 2006	One year
08	E-field Probe	SPEAG ET3DV6	1736	December 1, 2006	One year
09	DAE	SPEAG DAE3	536	July 12, 2007	One year

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

ANNEX A MEASUREMENT PROCESS

The evaluation was performed with the following procedure:

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

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

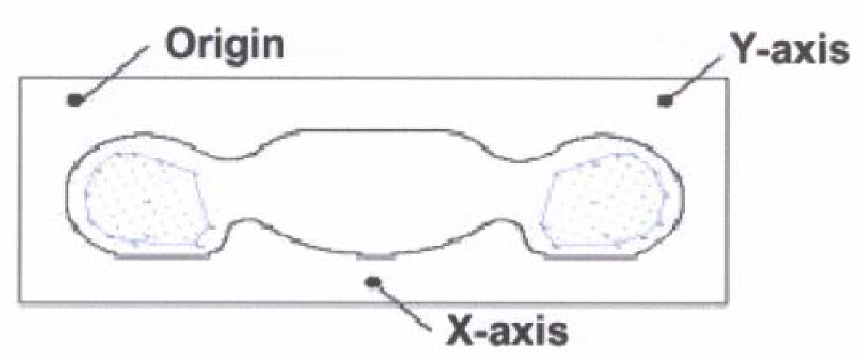
Step 3: Around this point, a volume of 30 mm x 30 mm x 30 mm was assessed by measuring 7 x 7x 7 points. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

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

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

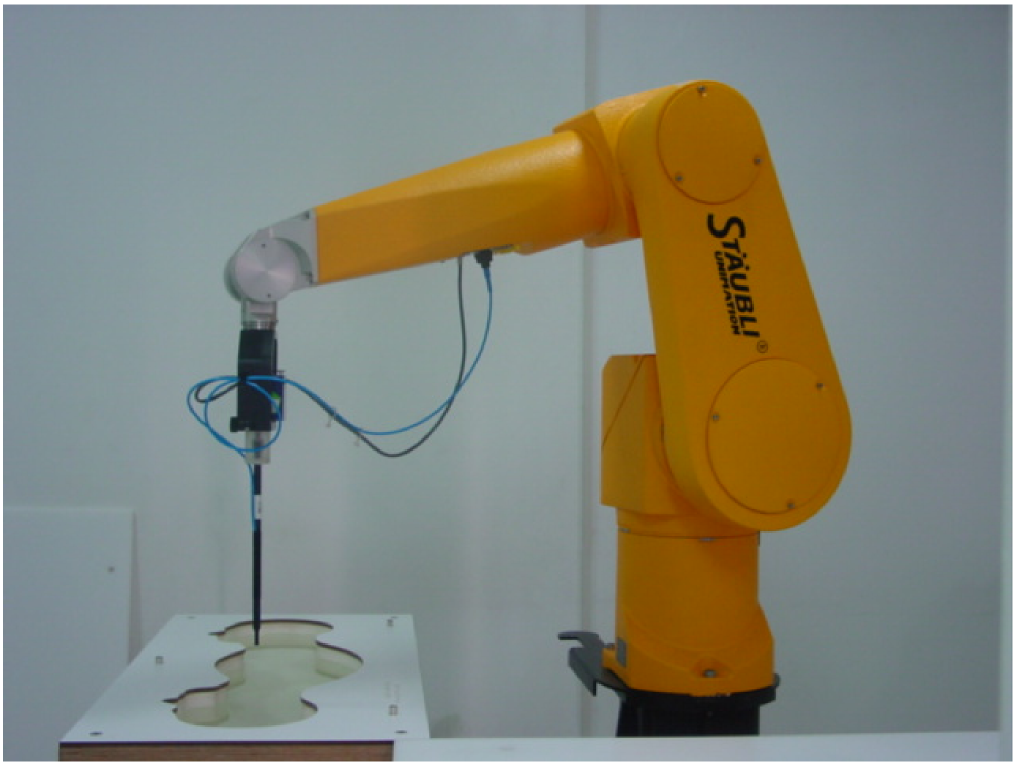
c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

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

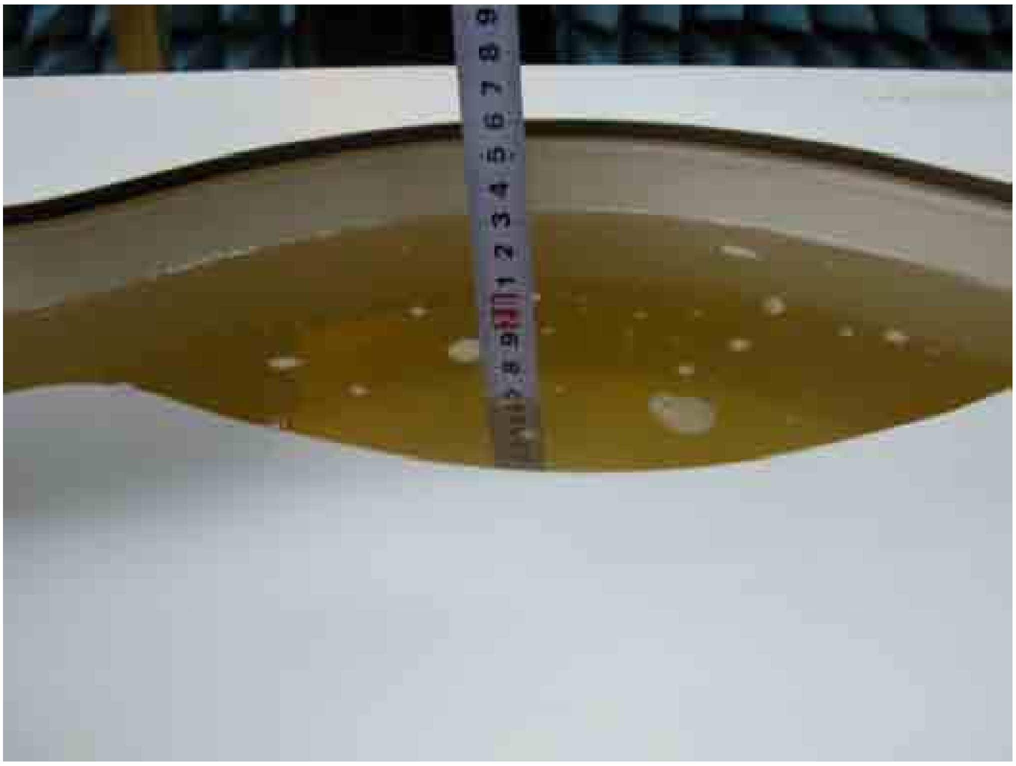


Picture A: SAR Measurement Points in Area Scan

ANNEX B TEST LAYOUT



Picture B1: Specific Absorption Rate Test Layout



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

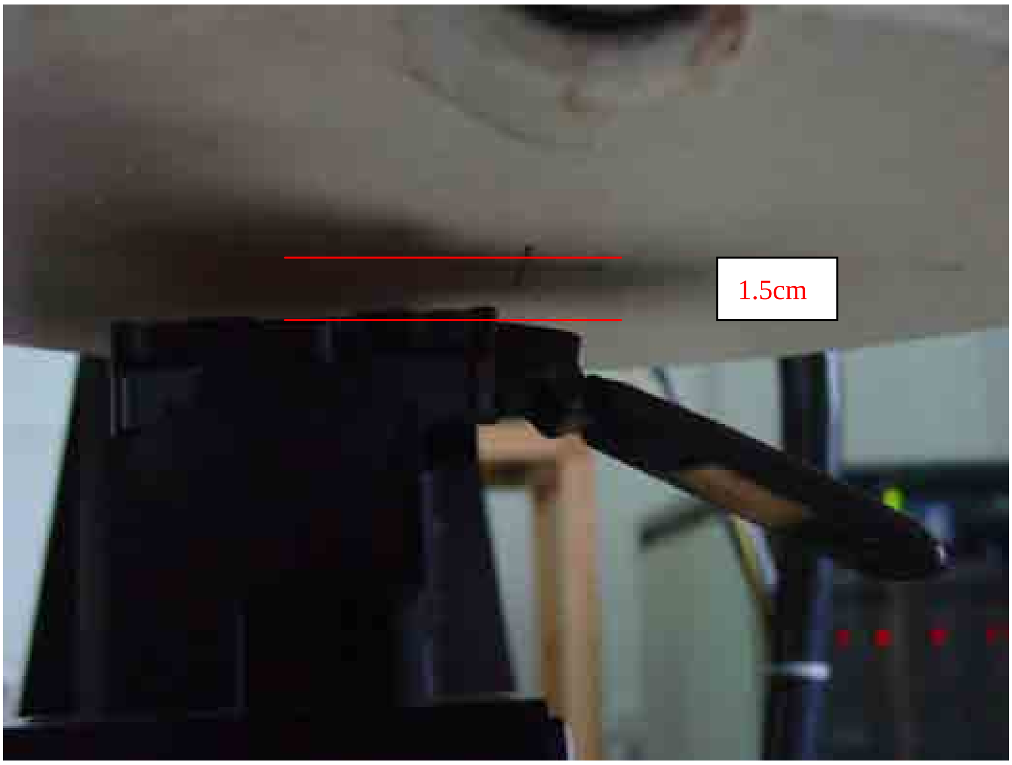
Picture B3 Liquid depth in the Flat Phantom (1900 MHz)

Picture B4: Left Hand Touch Cheek Position

Picture B5: Left Hand Tilt 15° Position

Picture B6: Right Hand Touch Cheek Position

Picture B7: Right Hand Tilt 15° Position



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

ANNEX C GRAPH RESULTS

850 Left Cheek High

Date/Time: 2007-8-2 8:15:13

Electronics: DAE3 Sn536

Medium: 850 Head

Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.917 mho/m; ε_r = 43.1; ρ = 1000 kg/m^3

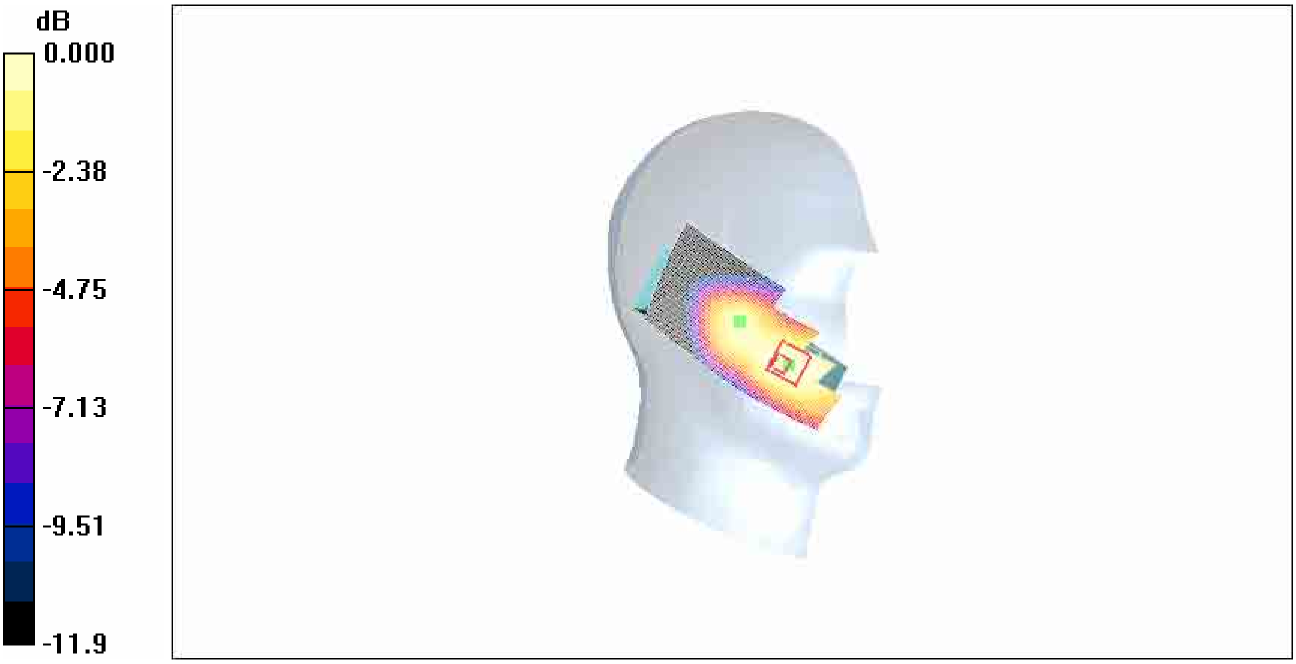
Ambient Temperature:23.3^{o}C Liqiud Temperature: 22.5^{o}C

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

Probe: ET3DV6 - SN1736 ConvF(6.51, 6.51, 6.51)

Cheek High/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.766 mW/g

Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.59 V/m; Power Drift = -0.200 dB
Peak SAR (extrapolated) = 1.09 W/kg
SAR(1 g) = 0.743 mW/g; SAR(10 g) = 0.513 mW/g
Maximum value of SAR (measured) = 0.790 mW/g



0 dB = 0.790mW/g

Fig. 1 850MHz CH251

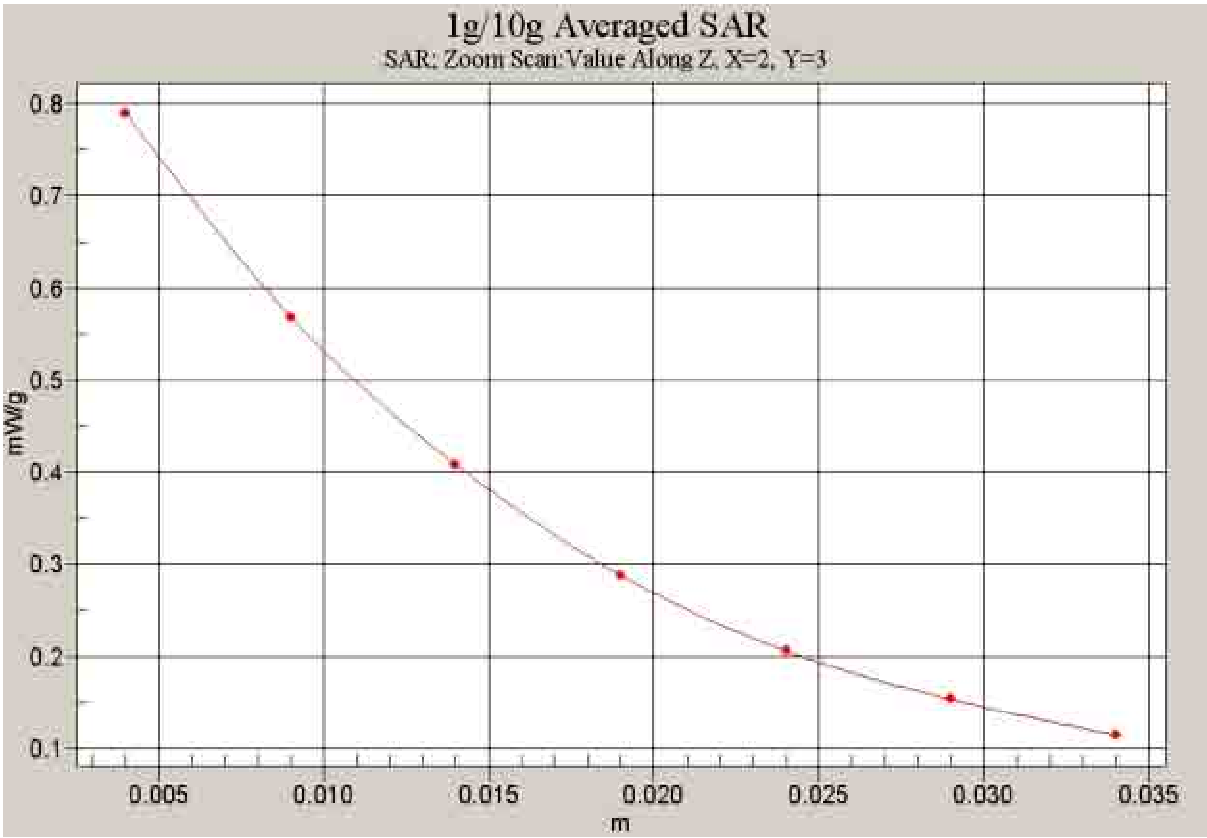


Fig. 2 Z-Scan at power reference point (850 MHz CH251)

850 Left Cheek Middle
Date/Time: 2007-8-2 8:31:45

Electronics: DAE3 Sn536

Medium: 850 Head

Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.907 mho/m; ε_r = 43.2; ρ = 1000 kg/m^3

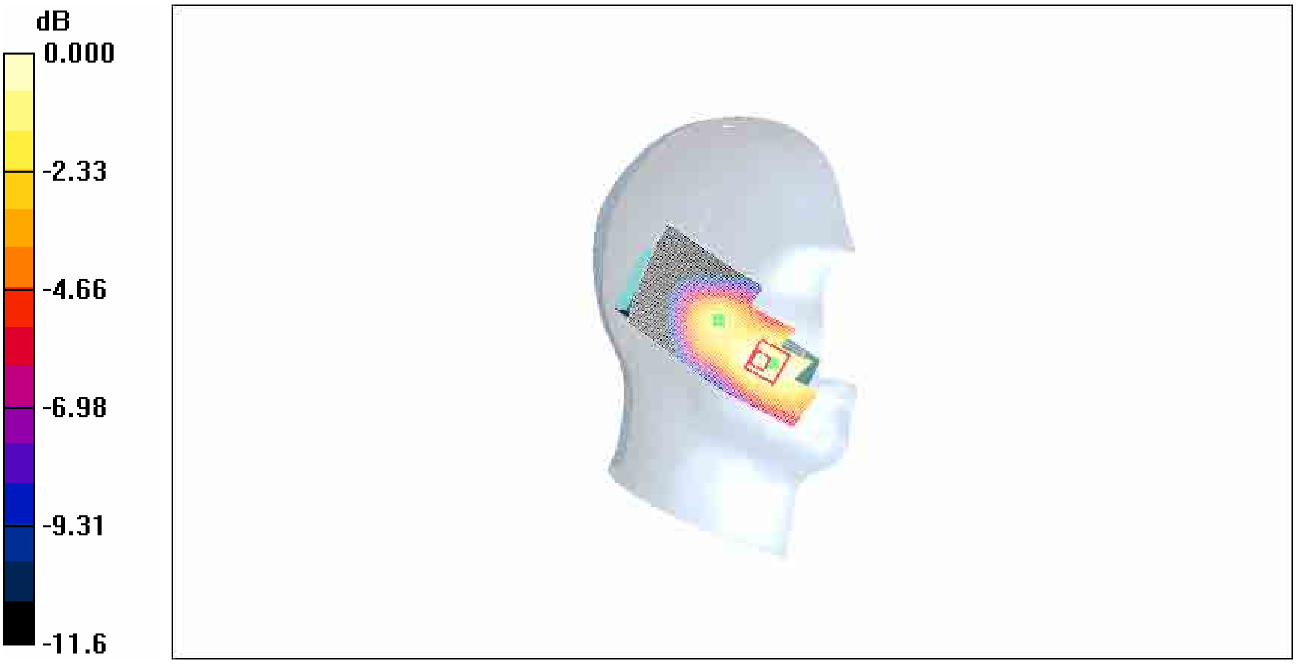
Ambient Temperature:23.3^{o}C Liqiud Temperature: 22.5^{o}C

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

Probe: ET3DV6 - SN1736 ConvF(6.51, 6.51, 6.51)

Cheek Middle/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.671 mW/g

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.78 V/m; Power Drift = -0.200 dB
Peak SAR (extrapolated) = 0.927 W/kg
SAR(1 g) = 0.645 mW/g; SAR(10 g) = 0.445 mW/g
Maximum value of SAR (measured) = 0.683 mW/g



0 dB = 0.683mW/g

Fig. 3 850 MHz CH190

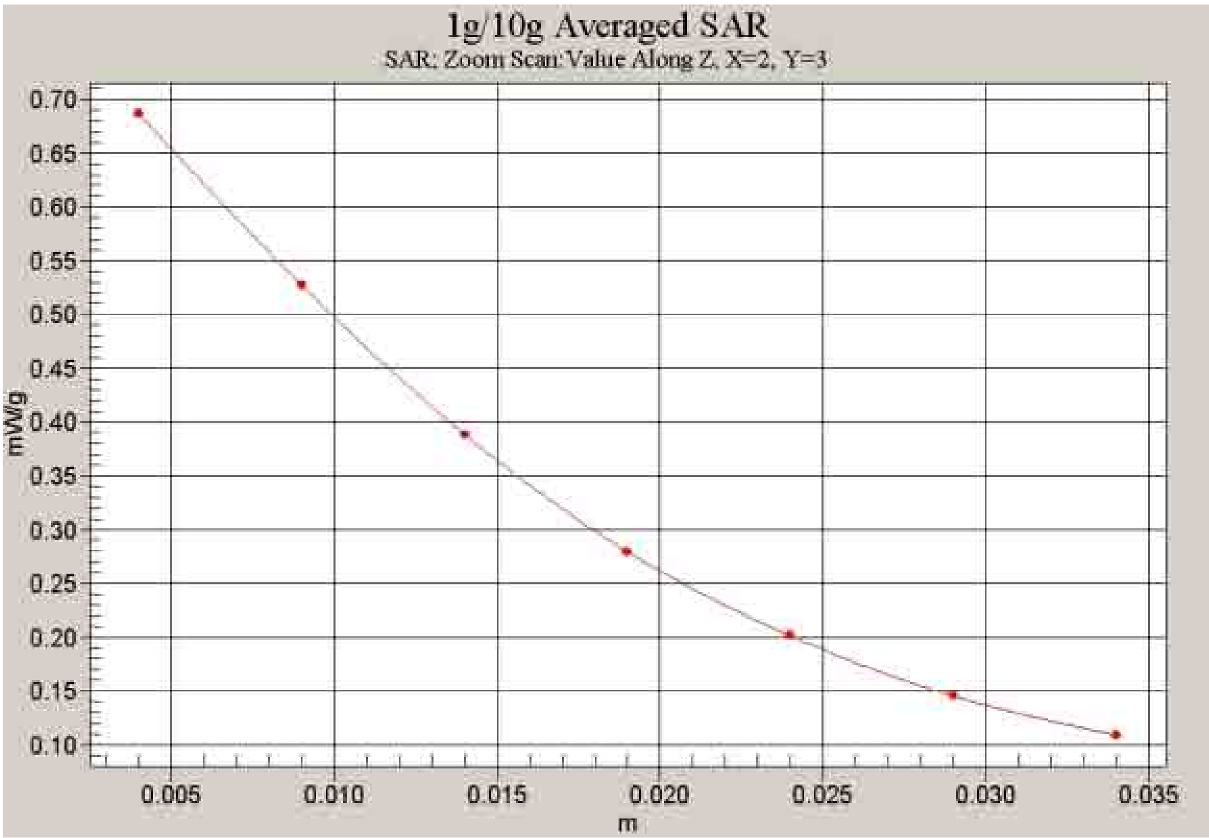


Fig. 4 Z-Scan at power reference point (850 MHz CH190)

850 Left Cheek Low
Date/Time: 2007-8-2 8:53:08

Electronics: DAE3 Sn536

Medium: 850 Head

Medium parameters used: f = 825 MHz; σ = 0.896 mho/m; ε_r = 43.3; ρ = 1000 kg/m^3

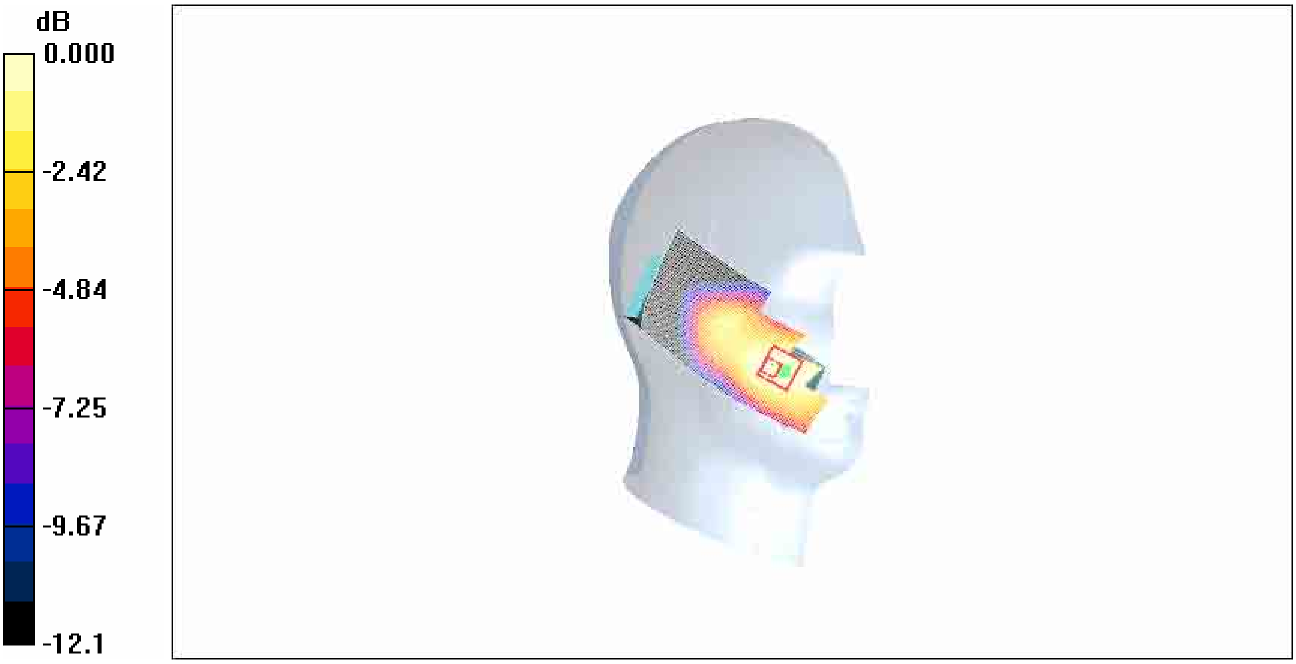
Ambient Temperature:23.3°C Liqiud Temperature: 22.5°C

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

Probe: ET3DV6 - SN1736 ConvF(6.51, 6.51, 6.51)

Cheek Low/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.480 mW/g

Cheek Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.70 V/m; Power Drift = -0.134 dB
Peak SAR (extrapolated) = 0.617 W/kg
SAR(1 g) = 0.450 mW/g; SAR(10 g) = 0.313 mW/g
Maximum value of SAR (measured) = 0.477 mW/g



0 dB = 0.477mW/g

Fig. 5 850 MHz CH128

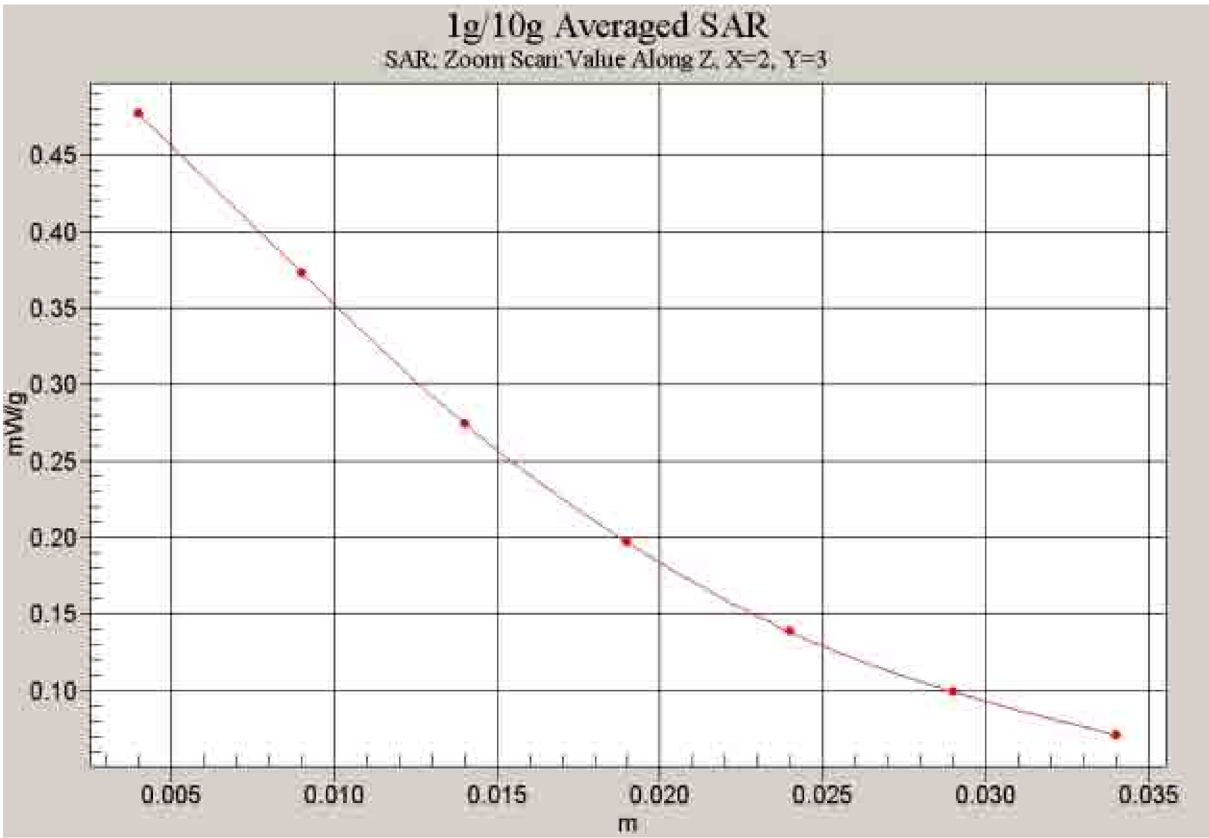


Fig. 6 Z-Scan at power reference point (850 MHz CH128)

850 Left Tilt High
Date/Time: 2007-8-2 10:02:32

Electronics: DAE3 Sn536

Medium: 850 Head

Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.917 mho/m; ε_r = 43.1; ρ = 1000 kg/m^3

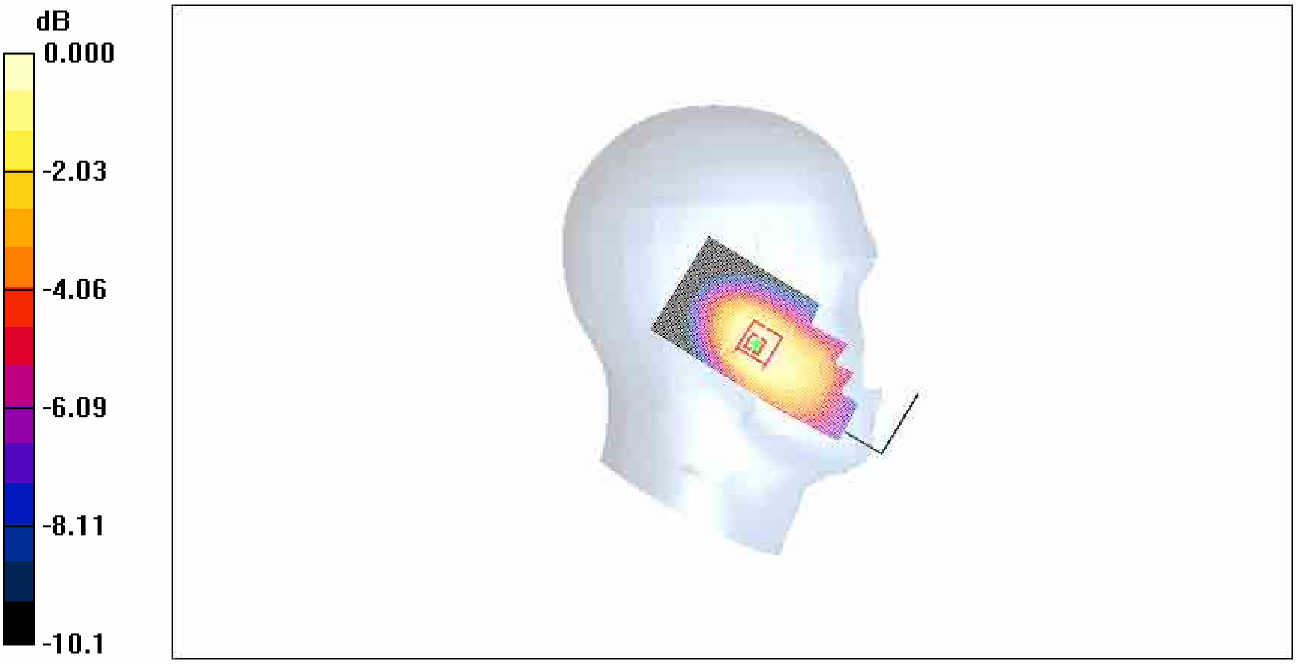
Ambient Temperature:23.3°C Liqiud Temperature: 22.5°C

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

Probe: ET3DV6 - SN1736 ConvF(6.51, 6.51, 6.51)

Tilt High/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.316 mW/g

Tilt High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.61 V/m; Power Drift = 0.051 dB
Peak SAR (extrapolated) = 0.392 W/kg
SAR(1 g) = 0.298 mW/g; SAR(10 g) = 0.211 mW/g
Maximum value of SAR (measured) = 0.318 mW/g



0 dB = 0.318mW/g

Fig.7 850 MHz CH251

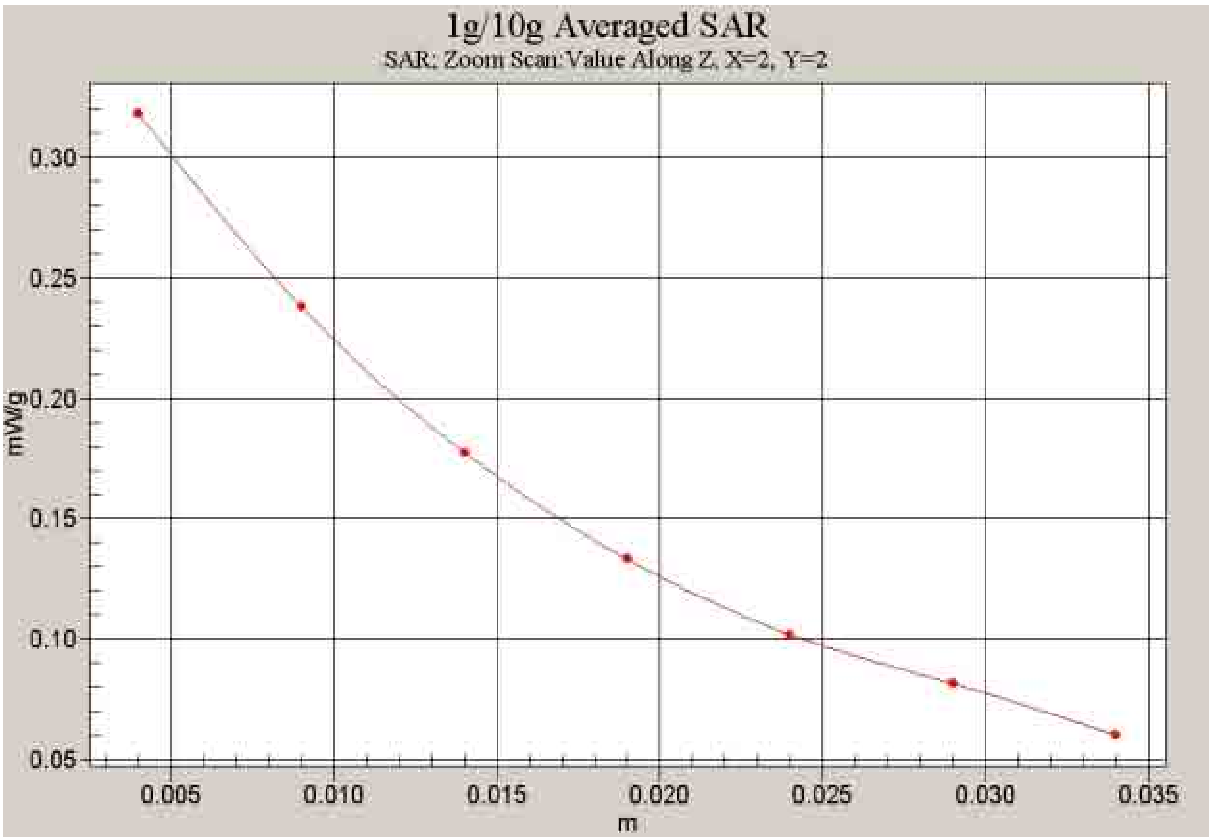


Fig. 8 Z-Scan at power reference point (850 MHz CH251)

850 Left Tilt Middle
Date/Time: 2007-8-2 9:39:25

Electronics: DAE3 Sn536

Medium: 850 Head

Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.907 mho/m; ε_r = 43.2; ρ = 1000 kg/m^3

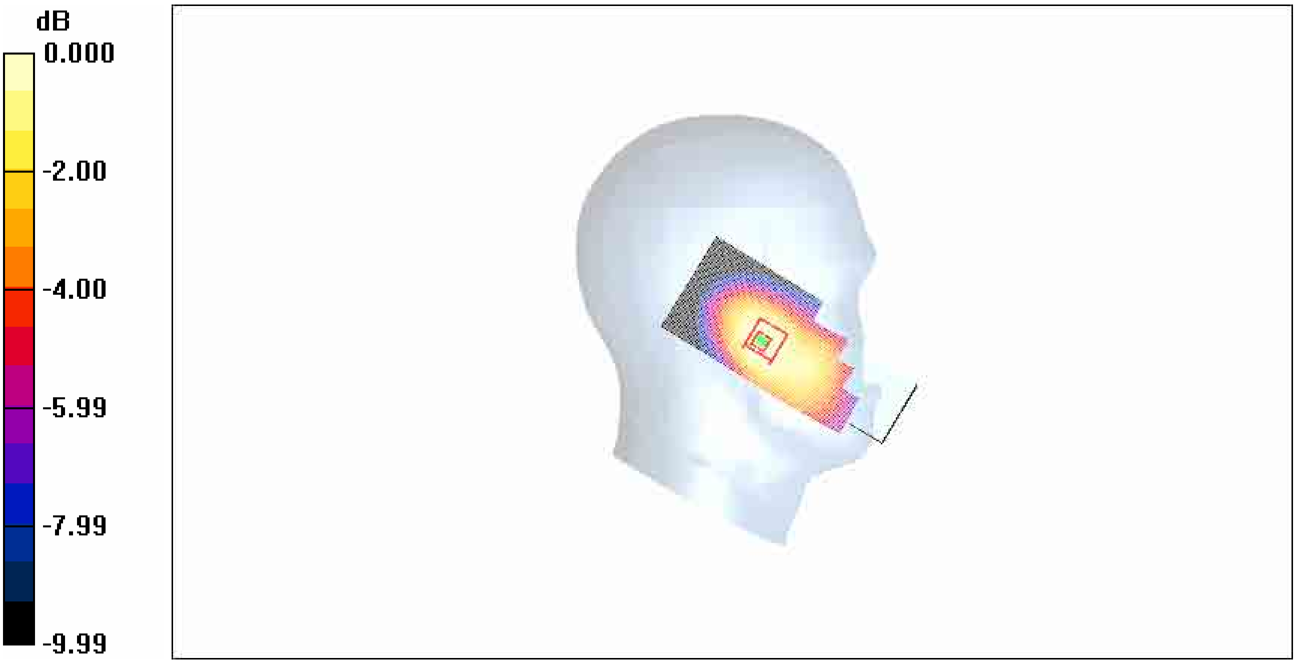
Ambient Temperature:23.3^{o}C Liqiud Temperature: 22.5^{o}C

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

Probe: ET3DV6 - SN1736 ConvF(6.51, 6.51, 6.51)

Tilt Middle/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.240 mW/g

Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.40 V/m; Power Drift = 0.011 dB
Peak SAR (extrapolated) = 0.296 W/kg
SAR(1 g) = 0.224 mW/g; SAR(10 g) = 0.160 mW/g
Maximum value of SAR (measured) = 0.240 mW/g



0 dB = 0.240mW/g

Fig.9 850 MHz CH190

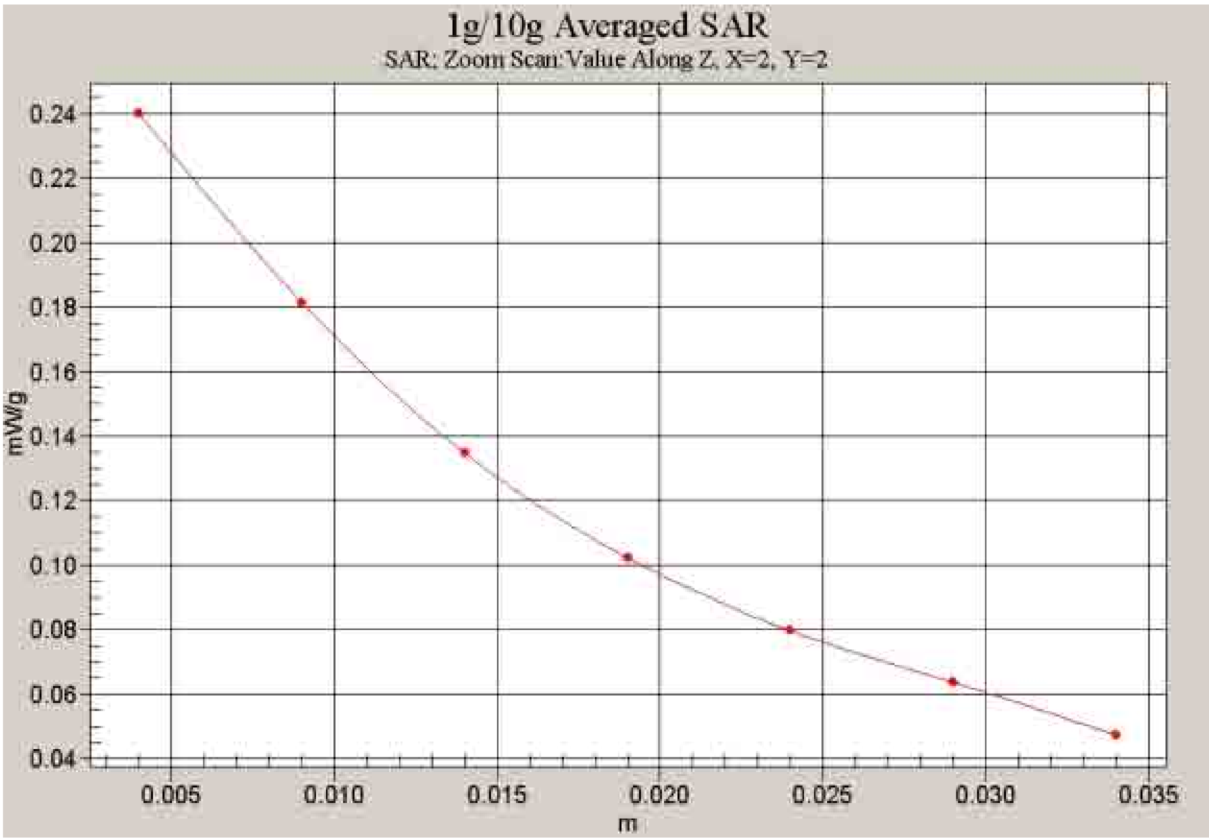


Fig. 10 Z-Scan at power reference point (850 MHz CH190)

850 Left Tilt Low
Date/Time: 2007-8-2 9:16:56

Electronics: DAE3 Sn536

Medium: 850 Head

Medium parameters used: f = 825 MHz; σ = 0.896 mho/m; ε_r = 43.3; ρ = 1000 kg/m^3

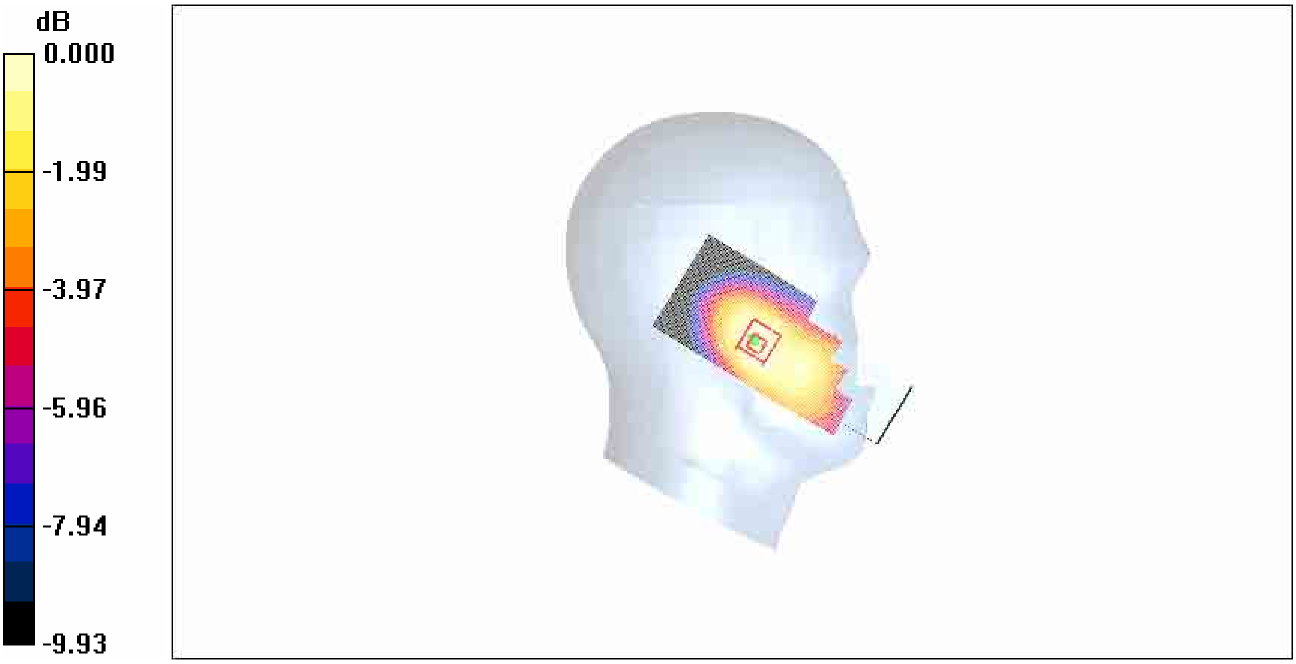
Ambient Temperature:23.3^{o}C Liqiud Temperature: 22.5^{o}C

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

Probe: ET3DV6 - SN1736 ConvF(6.51, 6.51, 6.51)

Tilt Low/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.150 mW/g

Tilt Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.65 V/m; Power Drift = 0.126 dB
Peak SAR (extrapolated) = 0.185 W/kg
SAR(1 g) = 0.140 mW/g; SAR(10 g) = 0.101 mW/g
Maximum value of SAR (measured) = 0.148 mW/g



0 dB = 0.148mW/g

Fig. 11 850 MHz CH128

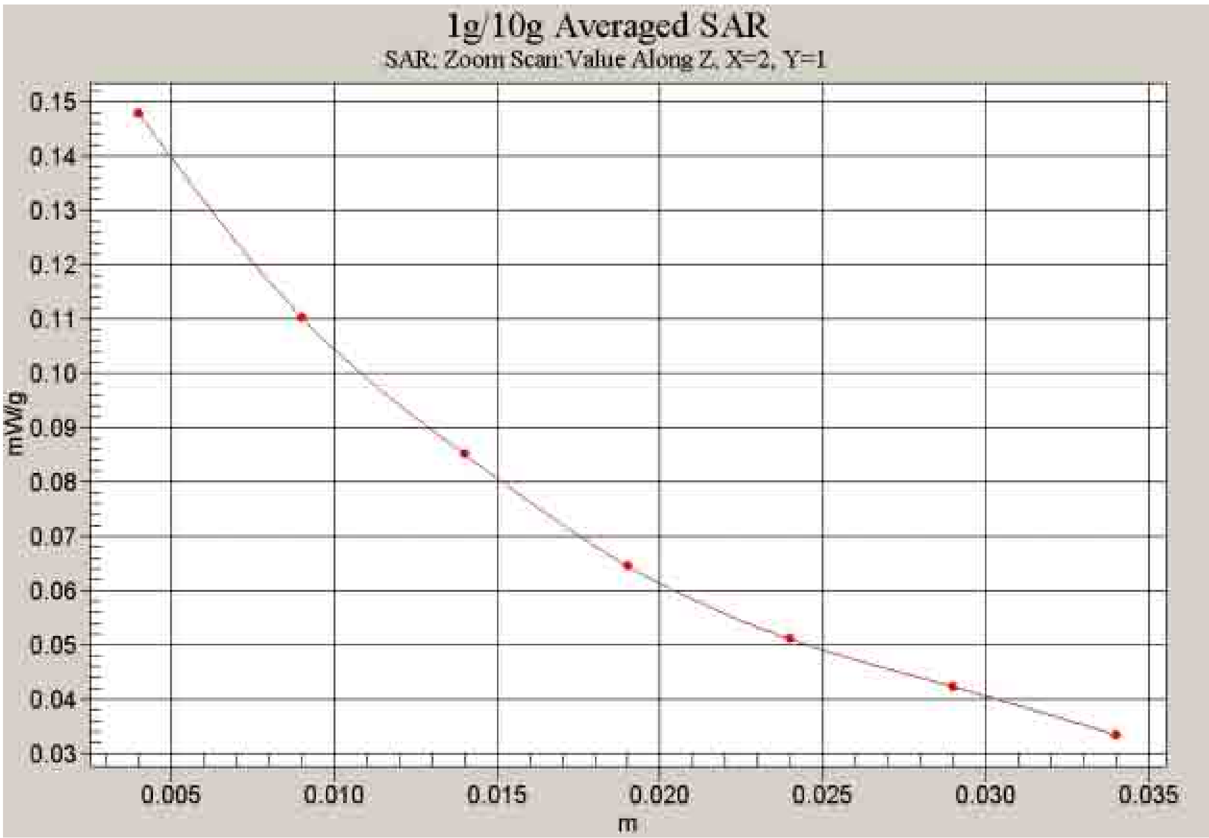


Fig. 12 Z-Scan at power reference point (850 MHz CH128)

850 Right Cheek High
Date/Time: 2007-8-2 10:25:35

Electronics: DAE3 Sn536

Medium: 850 Head

Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.917 mho/m; ε_r = 43.1; ρ = 1000 kg/m^3

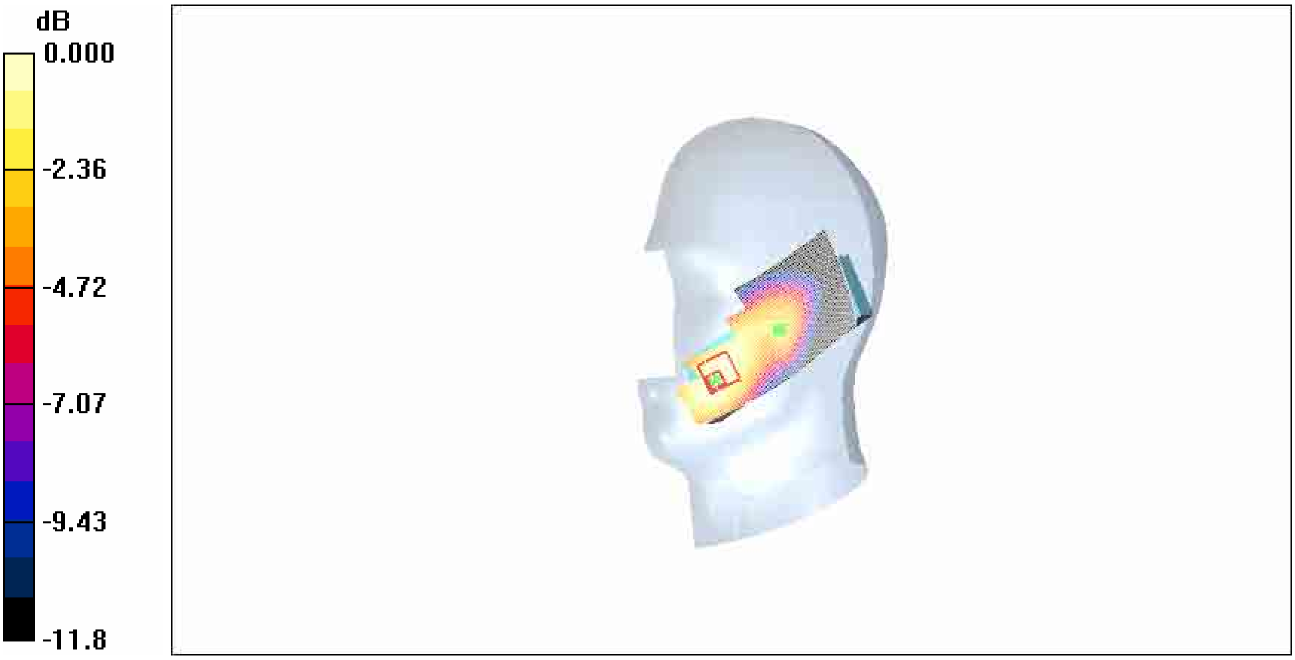
Ambient Temperature:23.3^{o}C Liqiud Temperature: 22.5^{o}C

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

Probe: ET3DV6 - SN1736 ConvF(6.51, 6.51, 6.51)

Cheek High/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.768 mW/g

Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.34 V/m; Power Drift = -0.063 dB
Peak SAR (extrapolated) = 1.06 W/kg
SAR(1 g) = 0.724 mW/g; SAR(10 g) = 0.481 mW/g
Maximum value of SAR (measured) = 0.791 mW/g



0 dB = 0.791mW/g

Fig. 13 850 MHz CH251

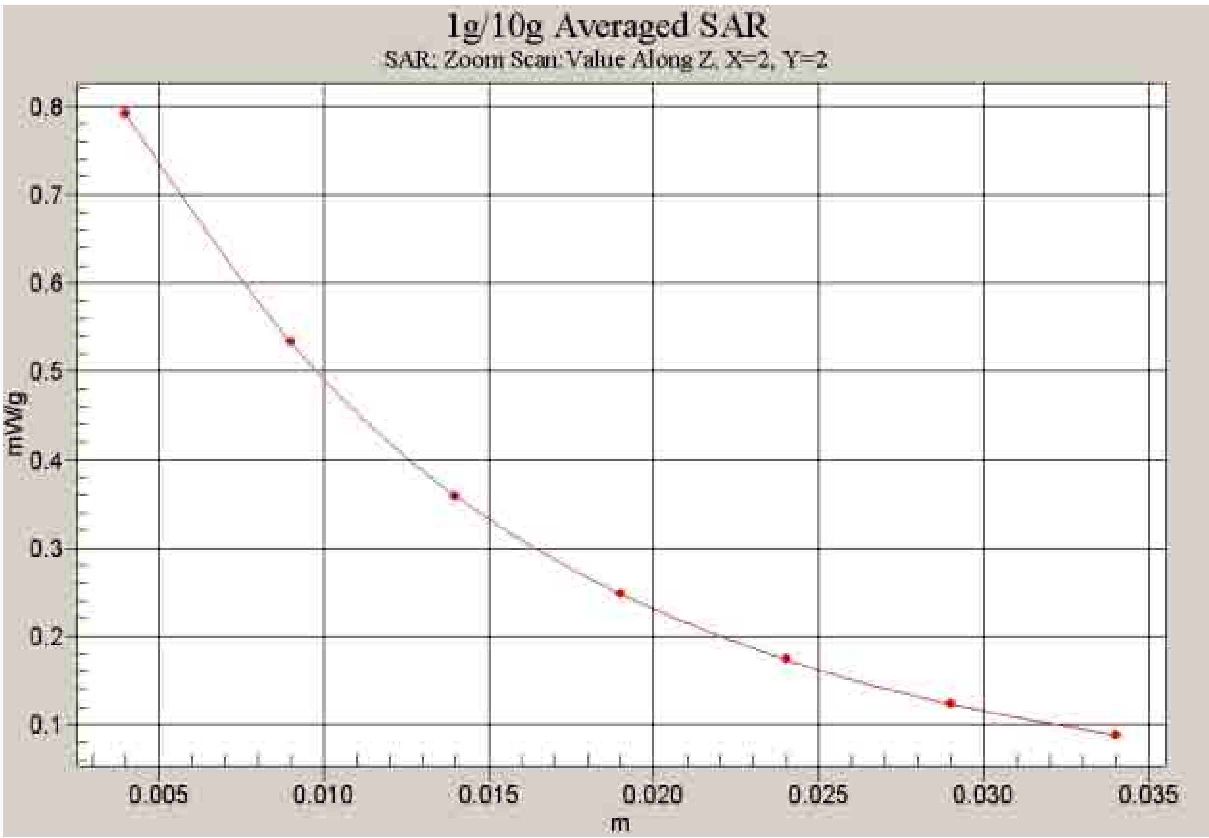


Fig. 14 Z-Scan at power reference point (850 MHz CH251)

850 Right Cheek Middle
Date/Time: 2007-8-2 10:48:45

Electronics: DAE3 Sn536

Medium: 850 Head

Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.907 mho/m; ε_r = 43.2; ρ = 1000 kg/m^3

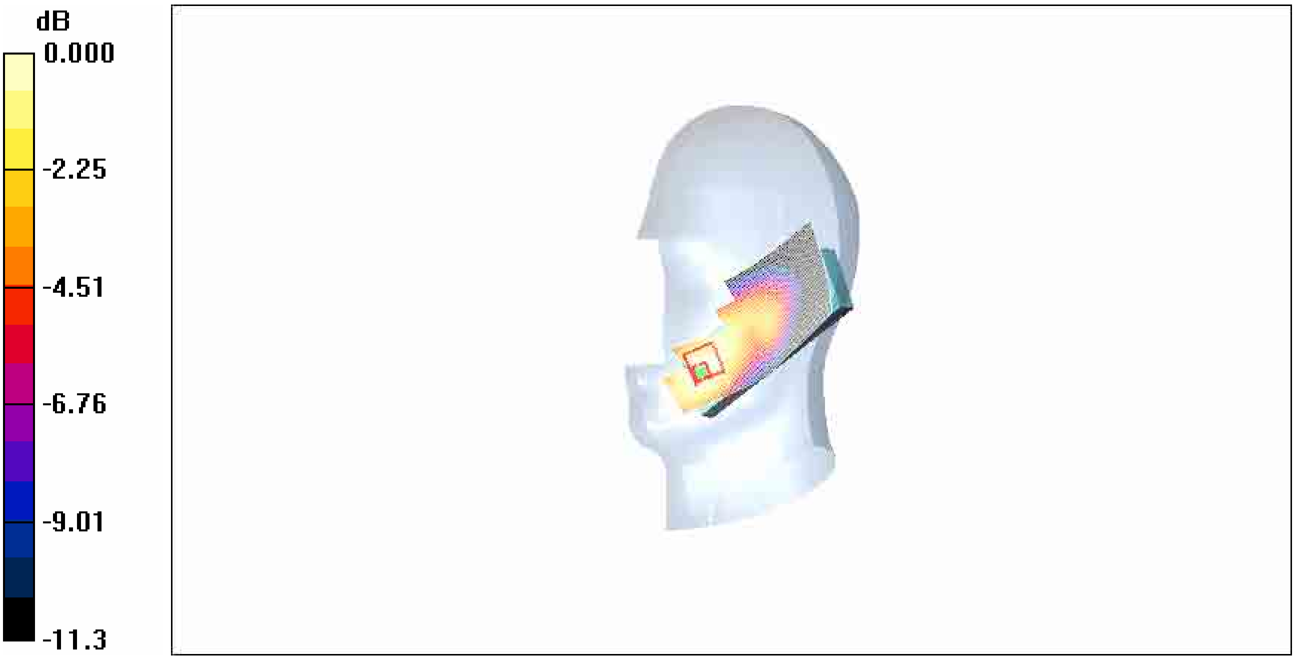
Ambient Temperature:23.3°C   Liqiud Temperature: 22.5°C

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

Probe: ET3DV6 - SN1736 ConvF(6.51, 6.51, 6.51)

Cheek Middle/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.667 mW/g

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.37 V/m; Power Drift = -0.129 dB
Peak SAR (extrapolated) = 0.901 W/kg
SAR(1 g) = 0.623 mW/g; SAR(10 g) = 0.413 mW/g
Maximum value of SAR (measured) = 0.670 mW/g



0 dB = 0.670mW/g

Fig. 15 850 MHz CH190

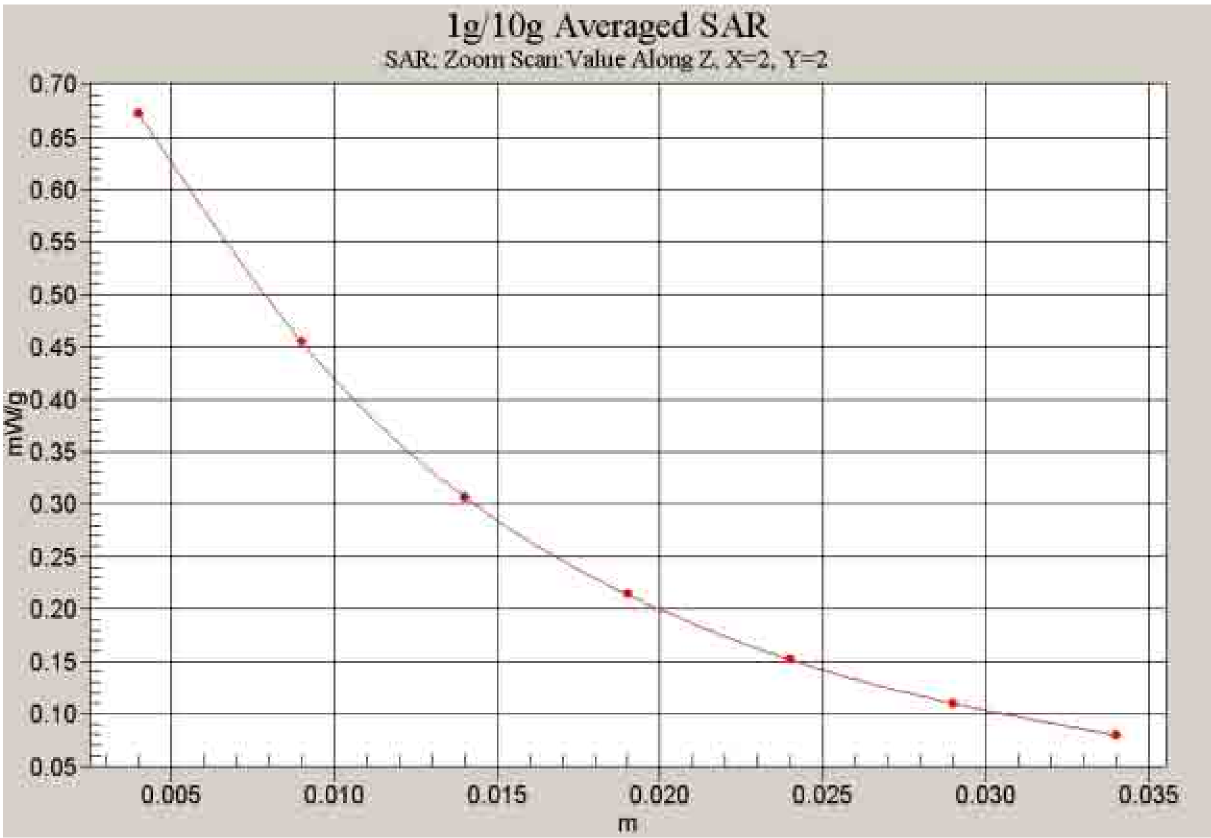


Fig. 16 Z-Scan at power reference point (850 MHz CH190)

850 Right Cheek Low
Date/Time: 2007-8-2 11:09:14

Electronics: DAE3 Sn536

Medium: 850 Head

Medium parameters used: f = 825 MHz; σ = 0.896 mho/m; ε_r = 43.3; ρ = 1000 kg/m^3

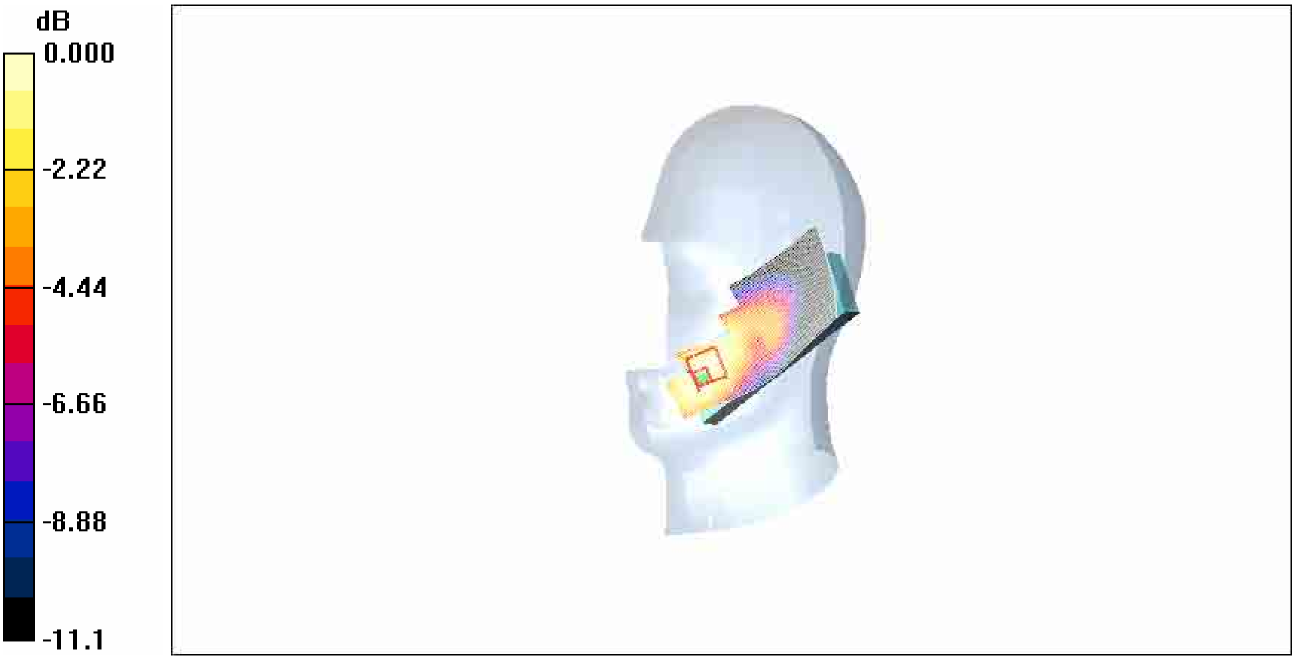
Ambient Temperature:23.3^{o}C Liqiud Temperature: 22.5^{o}C

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

Probe: ET3DV6 - SN1736 ConvF(6.51, 6.51, 6.51)

Cheek Low/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.459 mW/g

Cheek Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.00 V/m; Power Drift = 0.056 dB
Peak SAR (extrapolated) = 0.630 W/kg
SAR(1 g) = 0.431 mW/g; SAR(10 g) = 0.284 mW/g
Maximum value of SAR (measured) = 0.463 mW/g



0 dB = 0.463mW/g

Fig. 17 850 MHz CH128

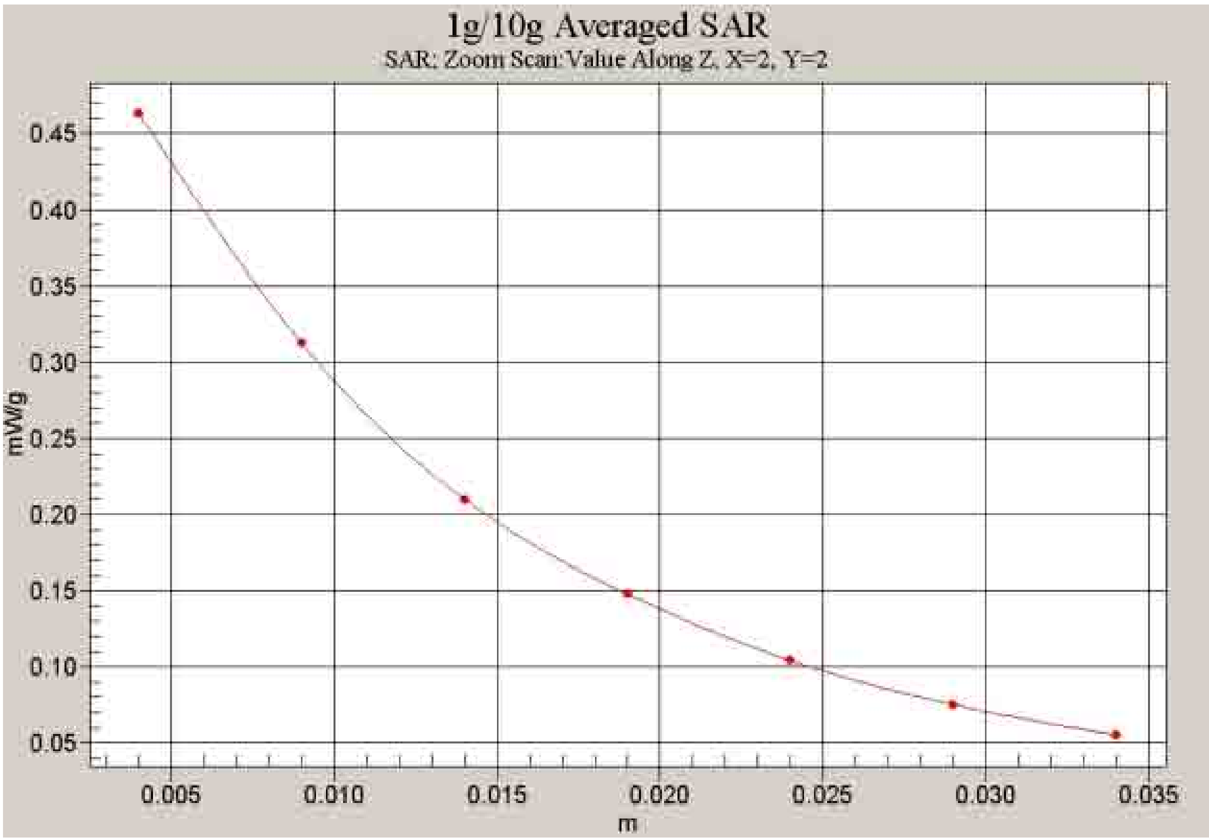


Fig. 18 Z-Scan at power reference point (850 MHz CH128)

850 Right Tilt High
Date/Time: 2007-8-2 12:17:22

Electronics: DAE3 Sn536

Medium: 850 Head

Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.917 mho/m; ε_r = 43.1; ρ = 1000 kg/m^3

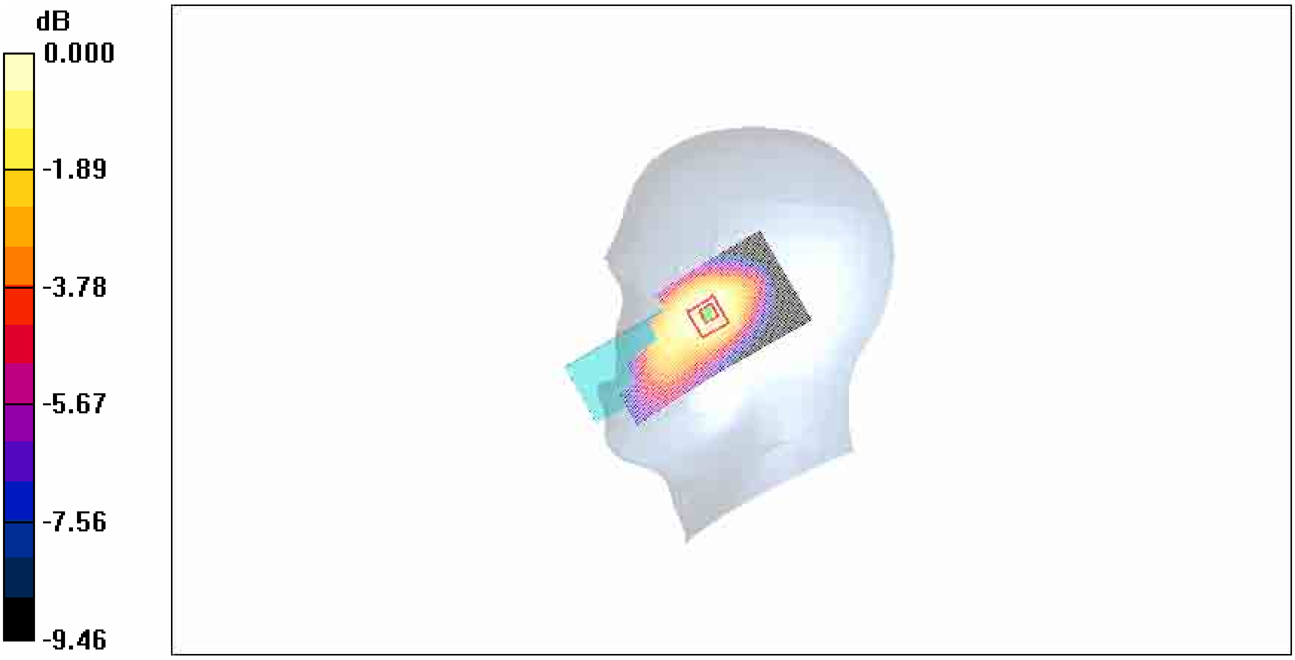
Ambient Temperature:23.3^{o}C Liqiud Temperature: 22.5^{o}C

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

Probe: ET3DV6 - SN1736 ConvF(6.51, 6.51, 6.51)

Tilt High/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.298 mW/g

Tilt High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.92 V/m; Power Drift = -0.021 dB
Peak SAR (extrapolated) = 0.356 W/kg
SAR(1 g) = 0.278 mW/g; SAR(10 g) = 0.202 mW/g
Maximum value of SAR (measured) = 0.293 mW/g



0 dB = 0.293mW/g

Fig.19 850 MHz CH251

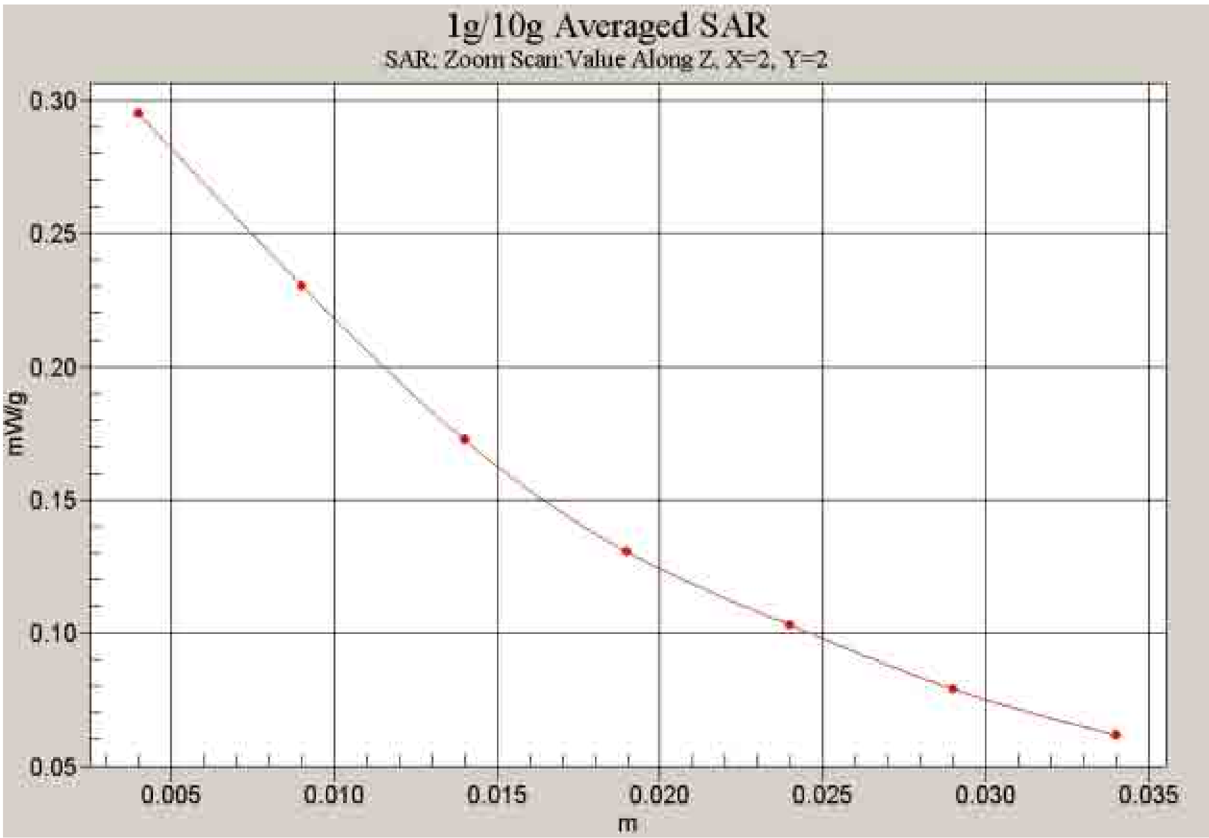


Fig. 20 Z-Scan at power reference point (850 MHz CH251)

850 Right Tilt Middle
Date/Time: 2007-8-2 11:53:41

Electronics: DAE3 Sn536

Medium: 850 Head

Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.907 mho/m; ε_r = 43.2; ρ = 1000 kg/m^3

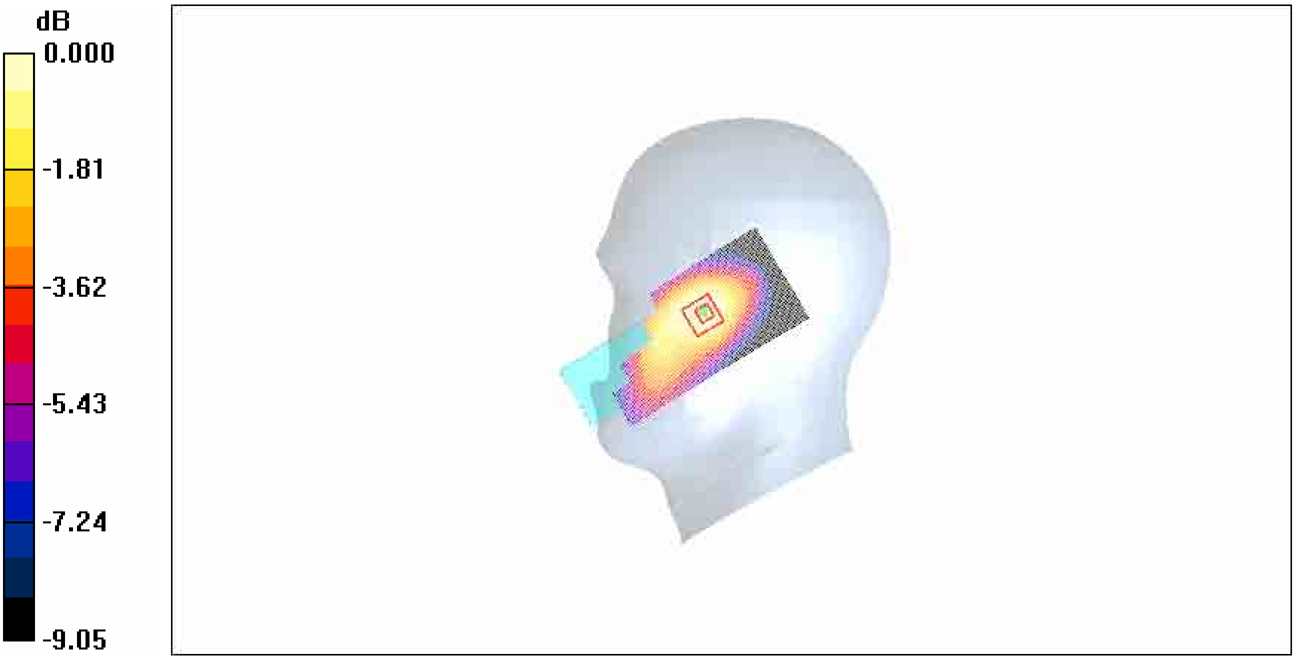
Ambient Temperature:23.3^{o}C Liqiud Temperature: 22.5^{o}C

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

Probe: ET3DV6 - SN1736 ConvF(6.51, 6.51, 6.51)

Tilt Middle/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.213 mW/g

Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.52 V/m; Power Drift = 0.155 dB
Peak SAR (extrapolated) = 0.265 W/kg
SAR(1 g) = 0.211 mW/g; SAR(10 g) = 0.154 mW/g
Maximum value of SAR (measured) = 0.223 mW/g



0 dB = 0.223mW/g

Fig. 21 850 MHz CH190

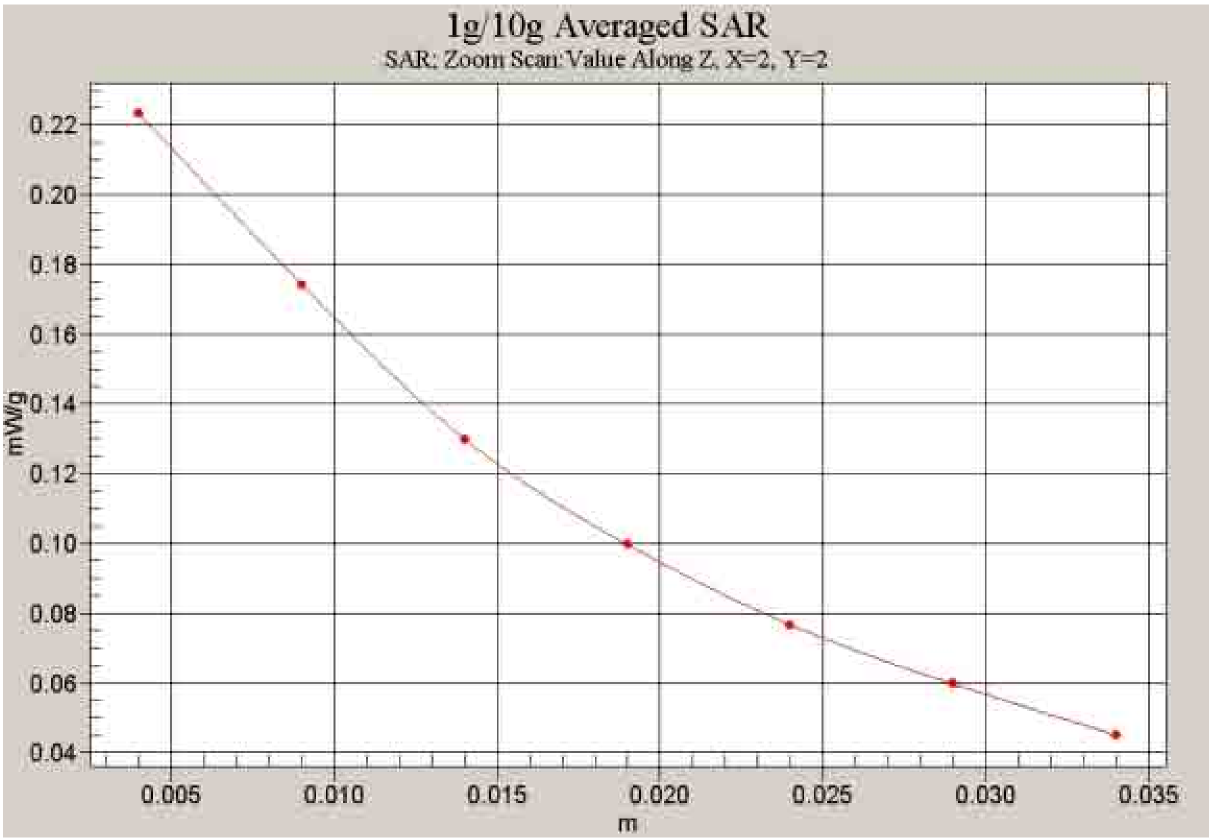


Fig. 22 Z-Scan at power reference point (850 MHz CH190)

850 Right Tilt Low

Date/Time: 2007-8-2 11:30:03

Electronics: DAE3 Sn536

Medium: 850 Head

Medium parameters used: f = 825 MHz; σ = 0.896 mho/m; ε_r = 43.3; ρ = 1000 kg/m^3

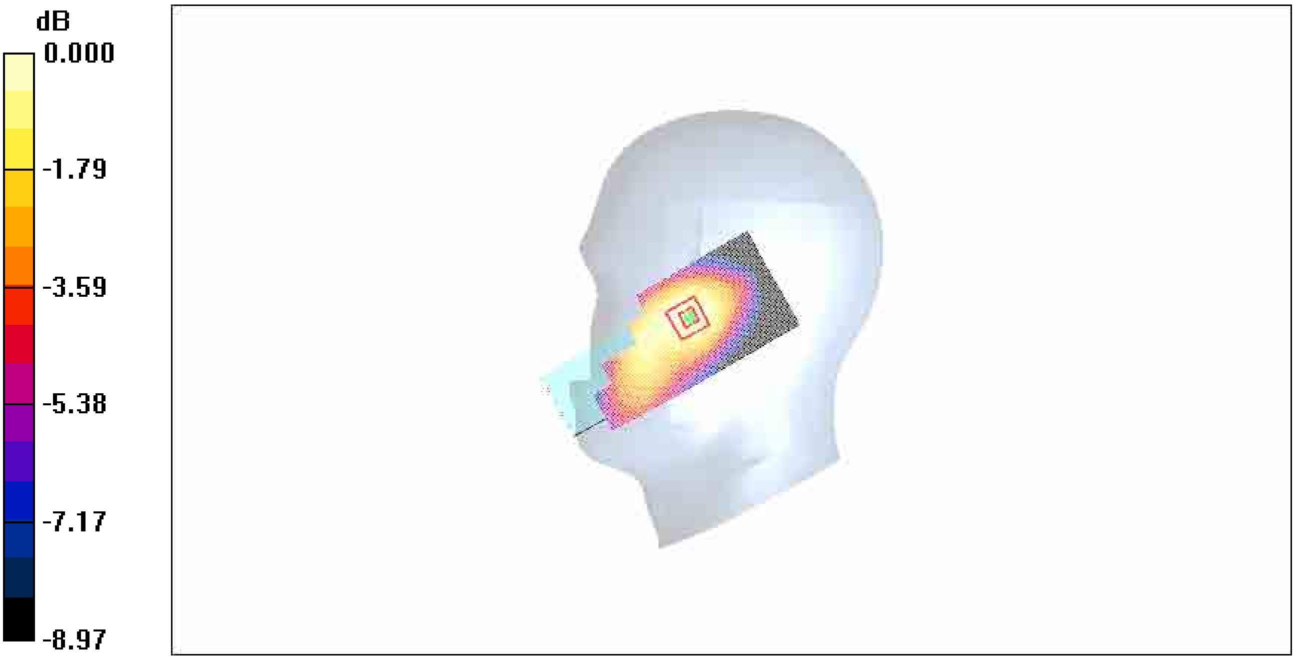
Ambient Temperature:23.3^{o}C Liqiud Temperature: 22.5^{o}C

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

Probe: ET3DV6 - SN1736 ConvF(6.51, 6.51, 6.51)

Tilt Low/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.131 mW/g

Tilt Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.83 V/m; Power Drift = -0.200 dB
Peak SAR (extrapolated) = 0.164 W/kg
SAR(1 g) = 0.126 mW/g; SAR(10 g) = 0.093 mW/g
Maximum value of SAR (measured) = 0.133 mW/g



0 dB = 0.133mW/g

Fig. 23 850 MHz CH128

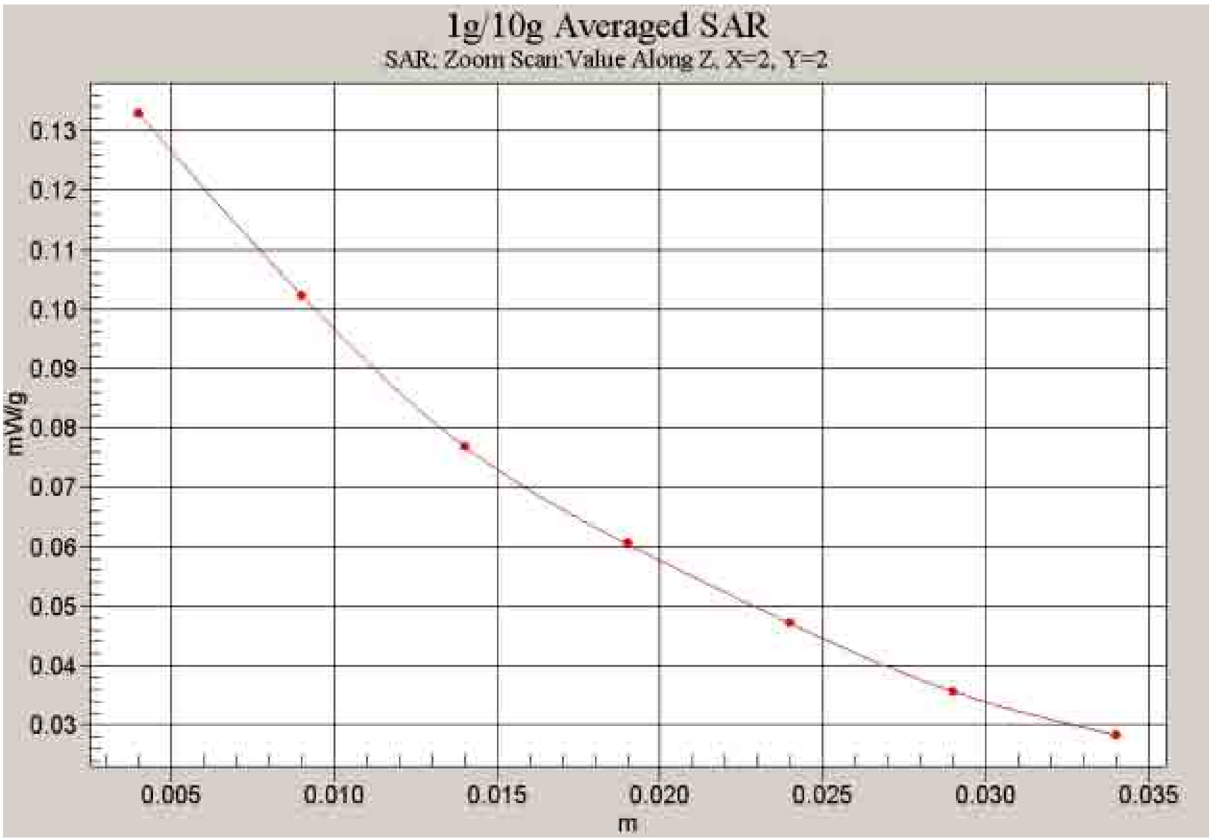


Fig. 24 Z-Scan at power reference point (850 MHz CH128)

1900 Left Cheek High
Date/Time: 2007-8-3 10:07:15

Electronics: DAE3 Sn536

Medium: Head 1900 MHz

Medium parameters used: f = 1910 MHz; σ = 1.40 mho/m; ε_r = 39.3; ρ = 1000 kg/m^3

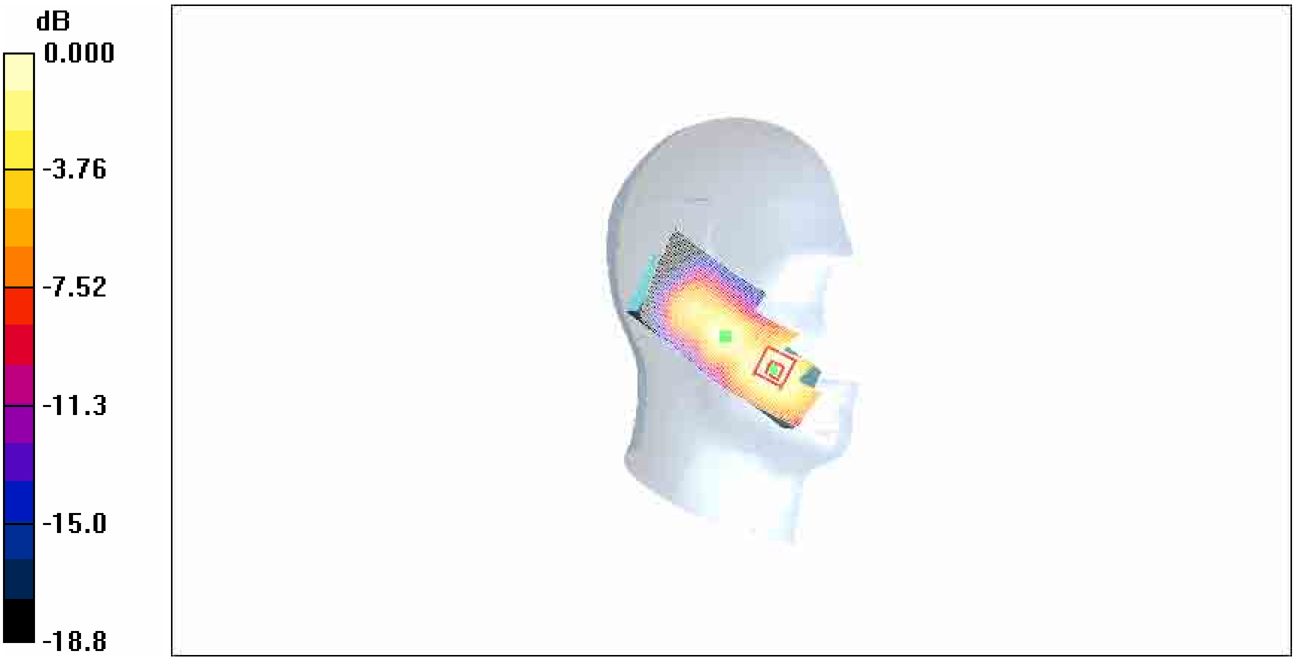
Ambient Temperature:23.3°C Liqiud Temperature: 22.5°C

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

Probe: ET3DV6 - SN1736 ConvF(5.4, 5.4, 5.4)

Cheek High/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.594 mW/g

Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.19 V/m; Power Drift = -0.200 dB
Peak SAR (extrapolated) = 0.754 W/kg
SAR(1 g) = 0.542 mW/g; SAR(10 g) = 0.346 mW/g
Maximum value of SAR (measured) = 0.583 mW/g



0 dB = 0.583mW/g

Fig. 25 1900 MHz CH810

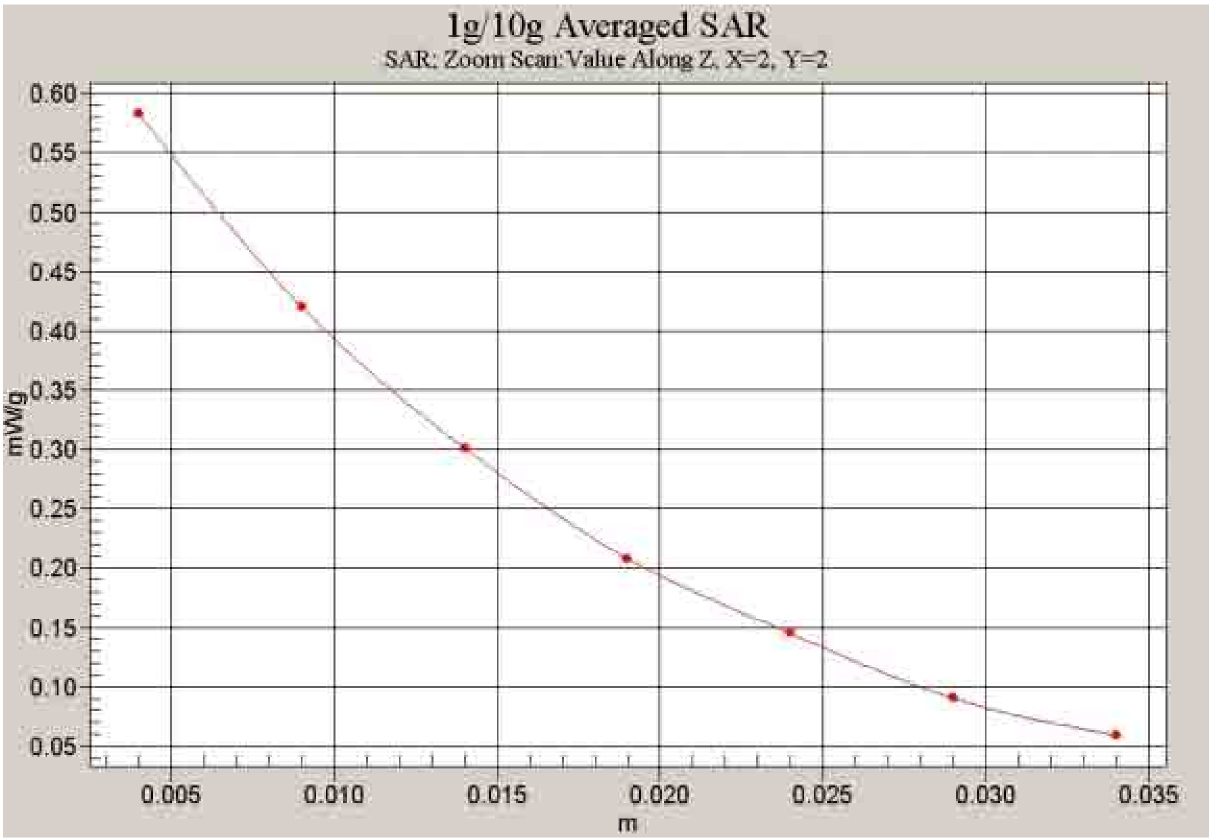


Fig. 26 Z-Scan at power reference point (1900 MHz CH810)

1900 Left Cheek Middle
Date/Time: 2007-8-3 10:29:22

Electronics: DAE3 Sn536

Medium: Head 1900 MHz

Medium parameters used: f = 1880 MHz; σ = 1.37 mho/m; ε_r = 39.4; ρ = 1000 kg/m^3

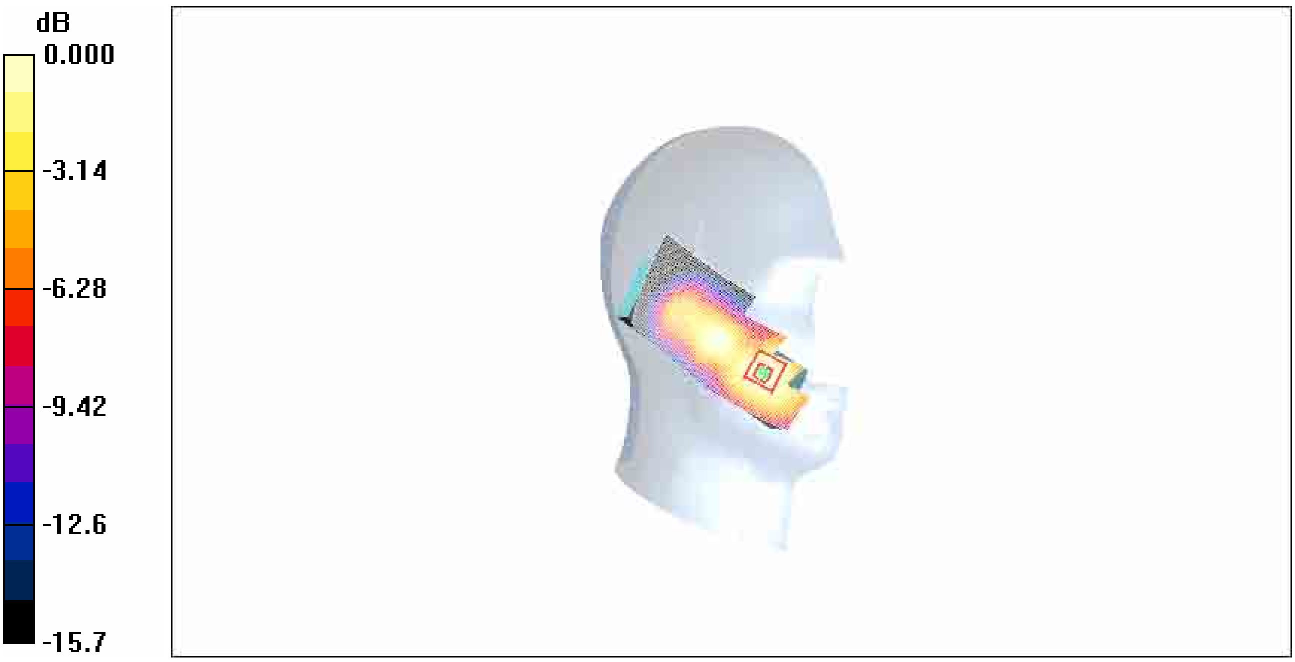
Ambient Temperature:23.3°C Liqiud Temperature: 22.5°C

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

Probe: ET3DV6 - SN1736 ConvF(5.4, 5.4, 5.4)

Cheek Middle/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.451 mW/g

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.45 V/m; Power Drift = -0.195 dB
Peak SAR (extrapolated) = 0.557 W/kg
SAR(1 g) = 0.408 mW/g; SAR(10 g) = 0.260 mW/g
Maximum value of SAR (measured) = 0.446 mW/g



0 dB = 0.446mW/g

Fig. 27 1900 MHz CH661

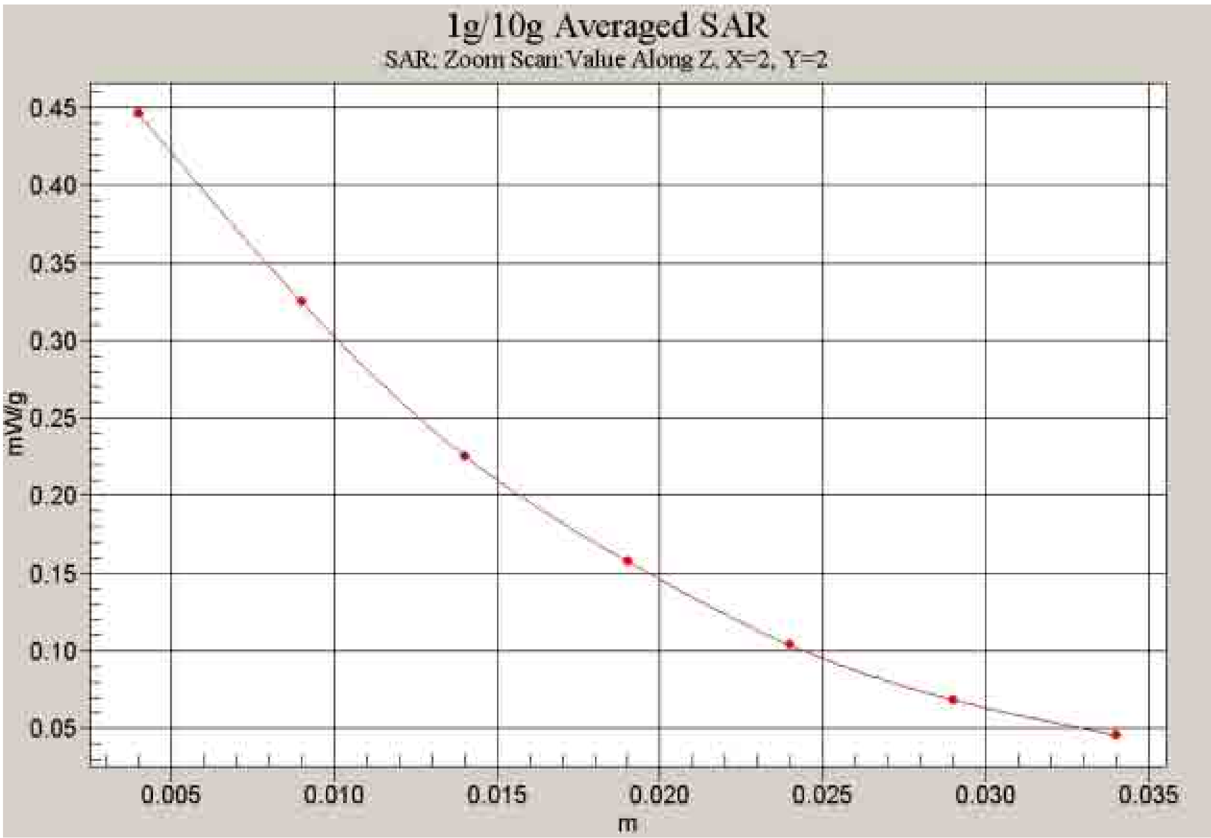


Fig. 28 Z-Scan at power reference point (1900 MHz CH661)

1900 Left Cheek Low
Date/Time: 2007-8-3 10:54:37

Electronics: DAE3 Sn536

Medium: Head 1900 MHz

Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.34 mho/m; ε_r = 39.4; ρ = 1000 kg/m^3

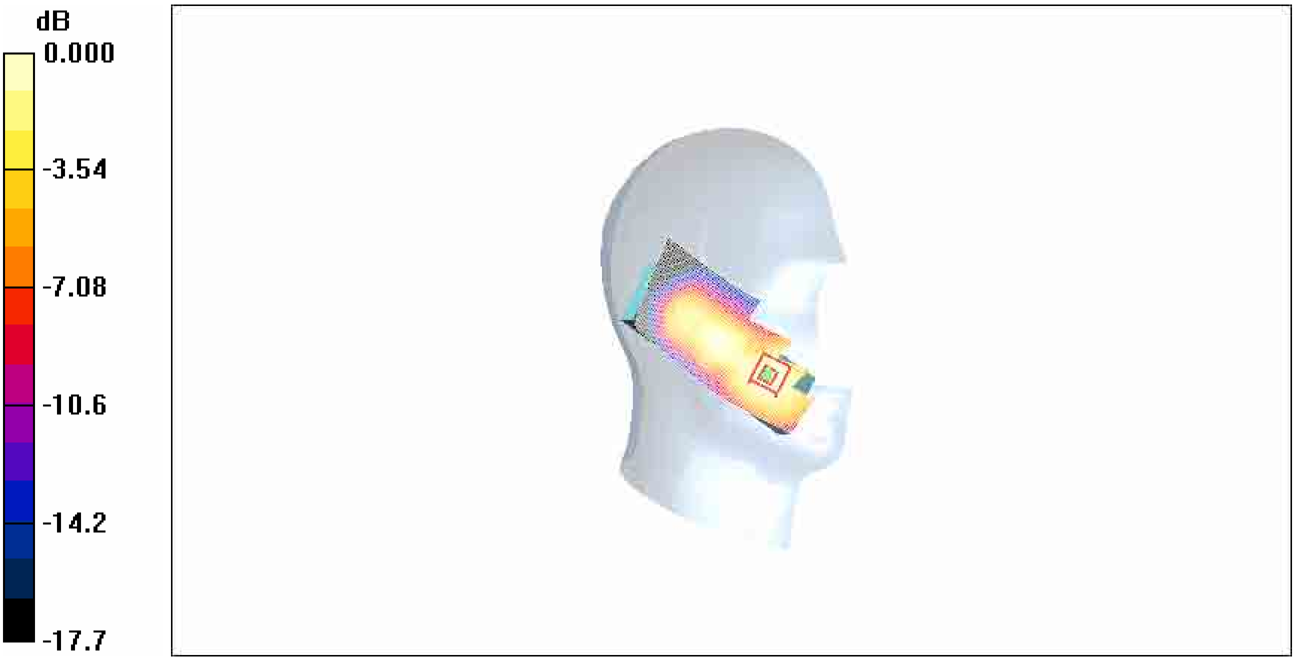
Ambient Temperature:23.3°C Liqiud Temperature: 22.5°C

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

Probe: ET3DV6 - SN1736 ConvF(5.4, 5.4, 5.4)

Cheek Low/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.334 mW/g

Cheek Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.84 V/m; Power Drift = -0.046 dB
Peak SAR (extrapolated) = 0.417 W/kg
SAR(1 g) = 0.308 mW/g; SAR(10 g) = 0.197 mW/g
Maximum value of SAR (measured) = 0.333 mW/g



0 dB = 0.333mW/g

Fig. 29 1900 MHz CH512

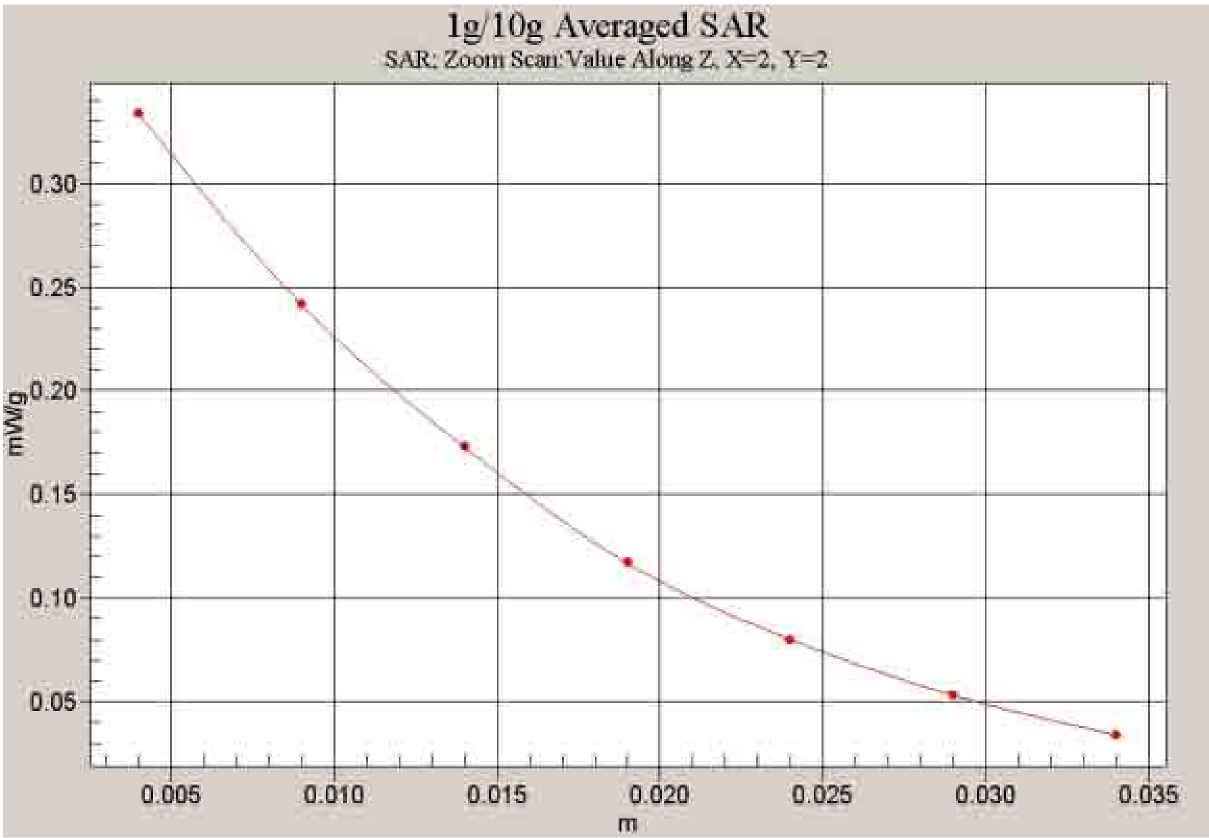


Fig. 30 Z-Scan at power reference point (1900 MHz CH512)

1900 Left Tilt High
Date/Time: 2007-8-3 12:04:48

Electronics: DAE3 Sn536

Medium: Head 1900 MHz

Medium parameters used: f = 1910 MHz; σ = 1.40 mho/m; ε_r = 39.3; ρ = 1000 kg/m^3

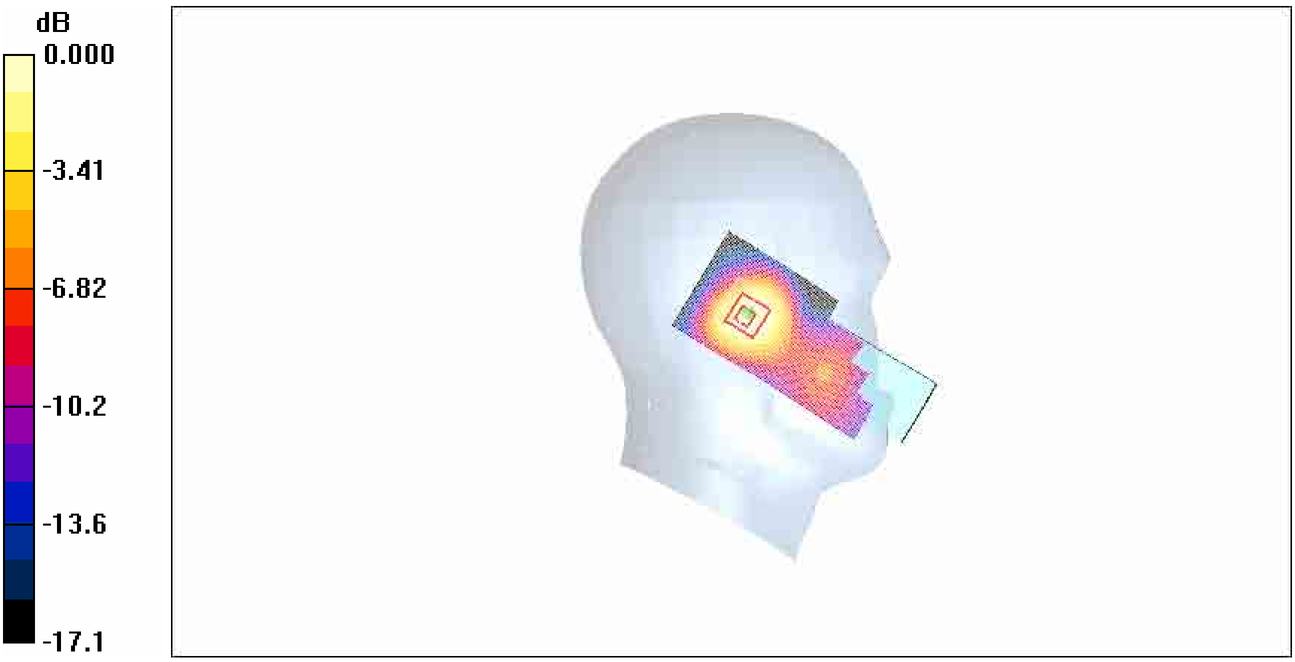
Ambient Temperature:23.3^{o}C   Liqiud Temperature: 22.5^{o}C

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

Probe: ET3DV6 - SN1736 ConvF(5.4, 5.4, 5.4)

Tilt High/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.445 mW/g

Tilt High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.9 V/m; Power Drift = 0.018 dB
Peak SAR (extrapolated) = 0.513 W/kg
SAR(1 g) = 0.368 mW/g; SAR(10 g) = 0.231 mW/g
Maximum value of SAR (measured) = 0.396 mW/g



0 dB = 0.396mW/g

Fig.31 1900 MHz CH810

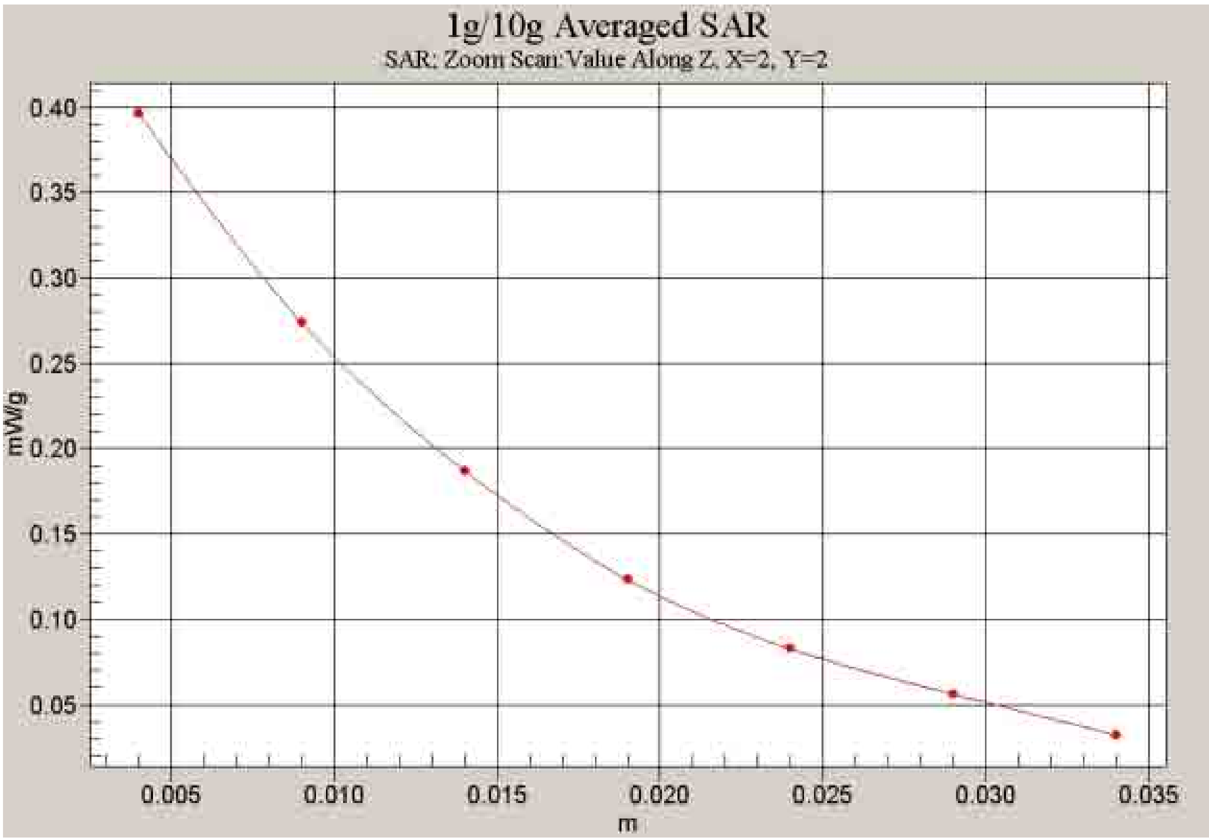


Fig. 32 Z-Scan at power reference point (1900 MHz CH810)

1900 Left Tilt Middle
Date/Time: 2007-8-3 11:40:53

Electronics: DAE3 Sn536

Medium: Head 1900 MHz

Medium parameters used: f = 1880 MHz; σ = 1.37 mho/m; ε_r = 39.4; ρ = 1000 kg/m^3

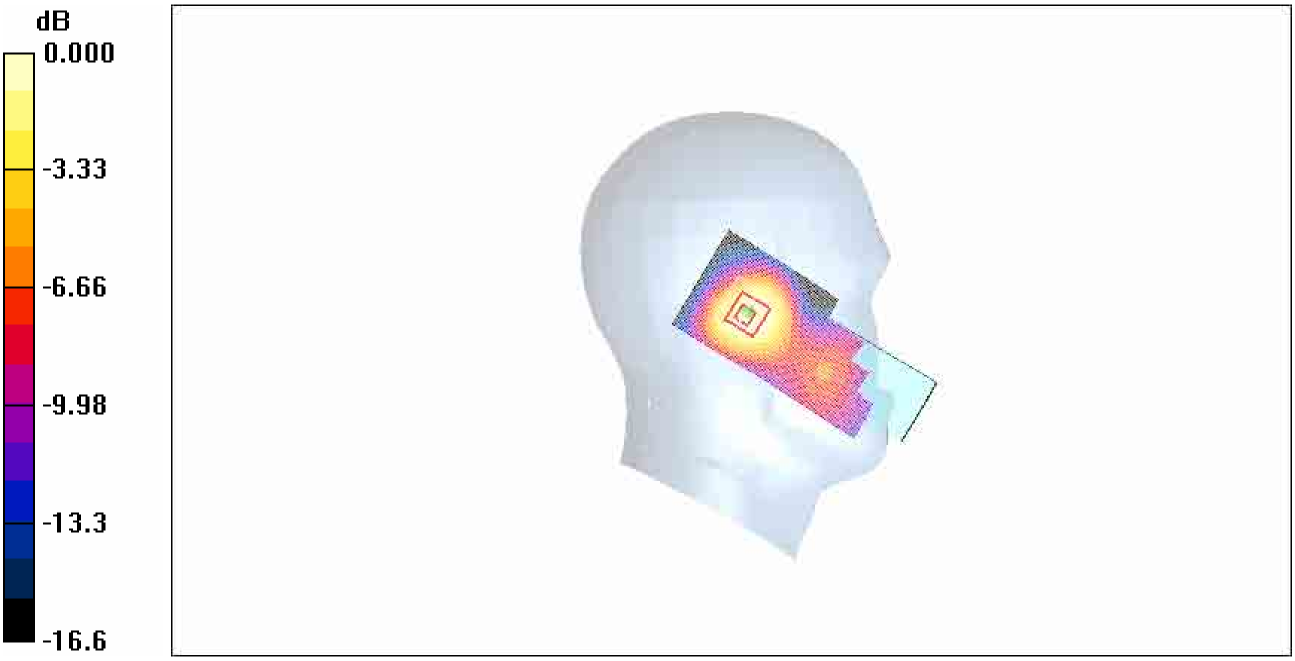
Ambient Temperature:23.3^{o}C Liqiud Temperature: 22.5^{o}C

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

Probe: ET3DV6 - SN1736 ConvF(5.4, 5.4, 5.4)

Tilt Middle/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.361 mW/g

Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.99 V/m; Power Drift = 0.031 dB
Peak SAR (extrapolated) = 0.407 W/kg
SAR(1 g) = 0.297 mW/g; SAR(10 g) = 0.188 mW/g
Maximum value of SAR (measured) = 0.318 mW/g



0 dB = 0.318mW/g

Fig.33 1900 MHz CH661

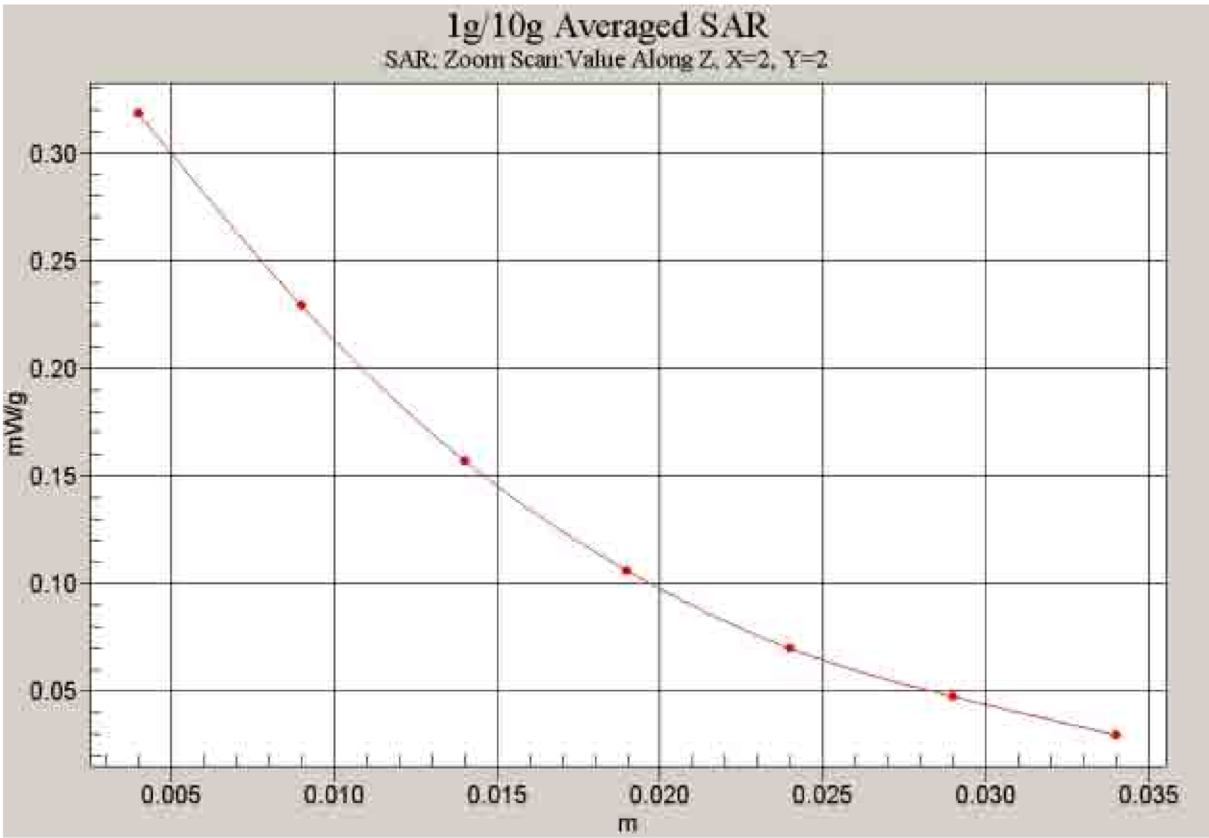


Fig. 34 Z-Scan at power reference point (1900 MHz CH661)

1900 Left Tilt Low
Date/Time: 2007-8-3 11:17:10

Electronics: DAE3 Sn536

Medium: Head 1900 MHz

Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.34 mho/m; ε_r = 39.4; ρ = 1000 kg/m^3

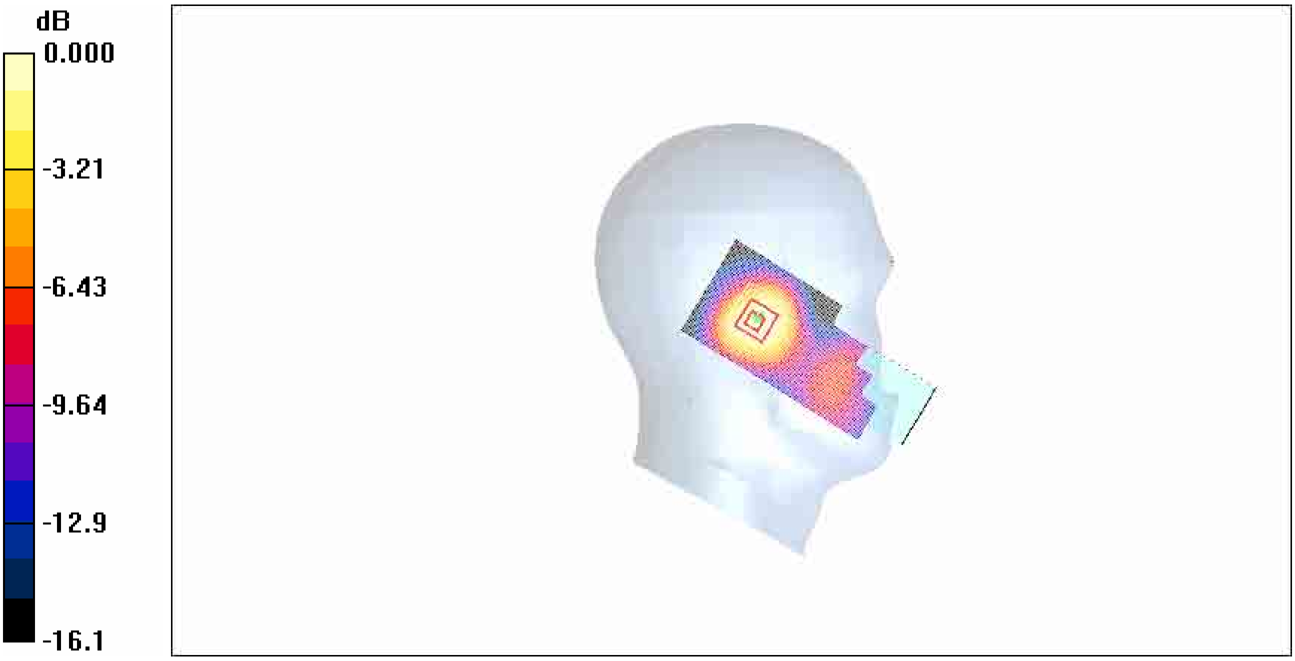
Ambient Temperature:23.3^{o}C Liqiud Temperature: 22.5^{o}C

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

Probe: ET3DV6 - SN1736 ConvF(5.4, 5.4, 5.4)

Tilt Low/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.274 mW/g

Tilt Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.36 V/m; Power Drift = 0.200 dB
Peak SAR (extrapolated) = 0.307 W/kg
SAR(1 g) = 0.226 mW/g; SAR(10 g) = 0.144 mW/g
Maximum value of SAR (measured) = 0.241 mW/g



0 dB = 0.241mW/g

Fig. 35 1900 MHz CH512

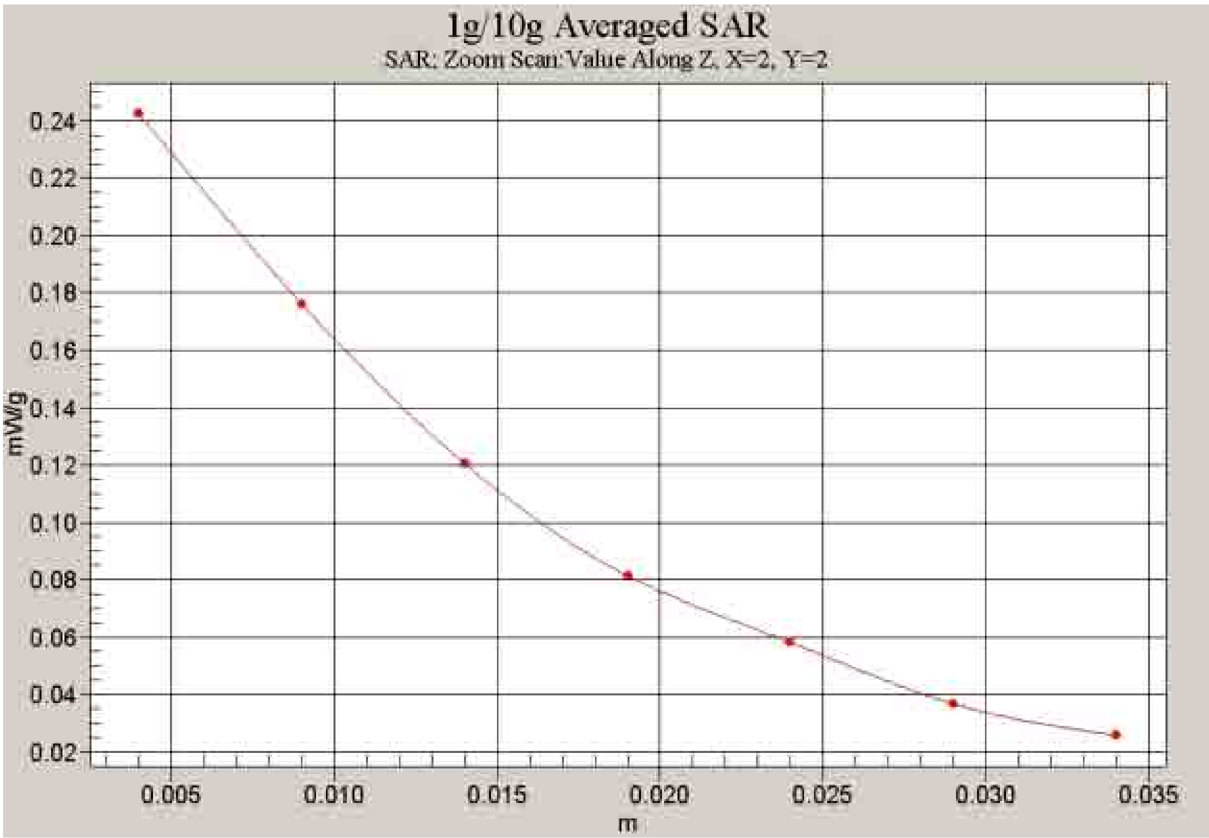


Fig. 36 Z-Scan at power reference point (1900 MHz CH512)

1900 Right Cheek High
Date/Time: 2007-8-3 12:47:45

Electronics: DAE3 Sn536

Medium: Head 1900 MHz

Medium parameters used: f = 1910 MHz; σ = 1.40 mho/m; ε_r = 39.3; ρ = 1000 kg/m^3

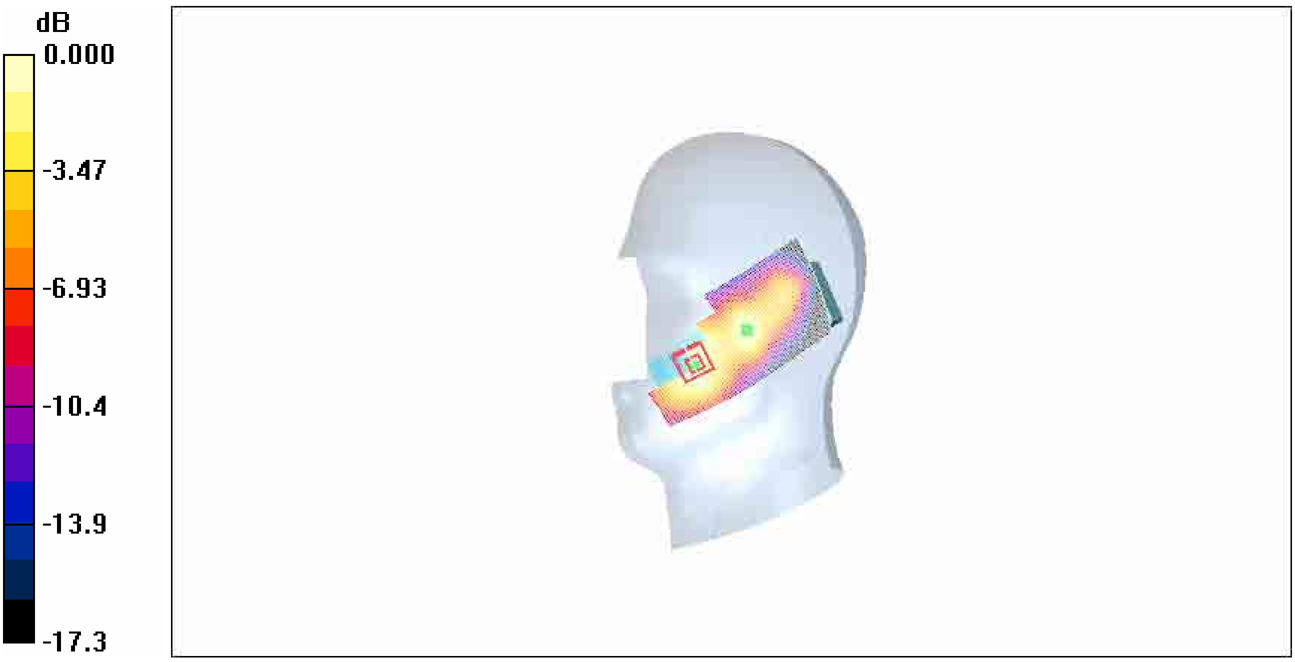
Ambient Temperature:23.3°C   Liqiud Temperature: 22.5°C

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

Probe: ET3DV6 - SN1736 ConvF(5.4, 5.4, 5.4)

Cheek High/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.567 mW/g

Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.34 V/m; Power Drift = -0.178 dB
Peak SAR (extrapolated) = 0.720 W/kg
SAR(1 g) = 0.524 mW/g; SAR(10 g) = 0.336 mW/g
Maximum value of SAR (measured) = 0.563 mW/g



0 dB = 0.563mW/g

Fig. 37 1900 MHz CH810

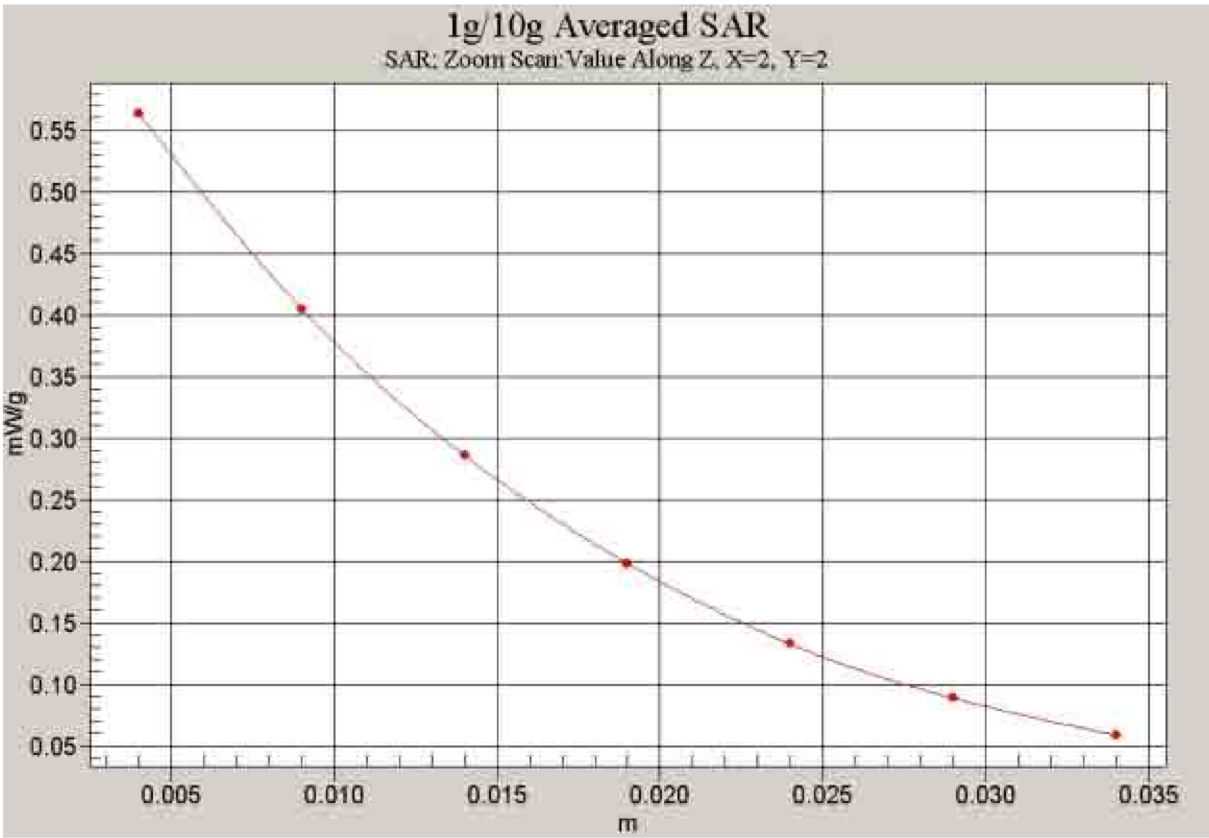


Fig. 38 Z-Scan at power reference point (1900 MHz CH810)

1900 Right Cheek Middle
Date/Time: 2007-8-3 13:08:19

Electronics: DAE3 Sn536

Medium: Head 1900 MHz

Medium parameters used: f = 1880 MHz; σ = 1.37 mho/m; ε_r = 39.4; ρ = 1000 kg/m^3

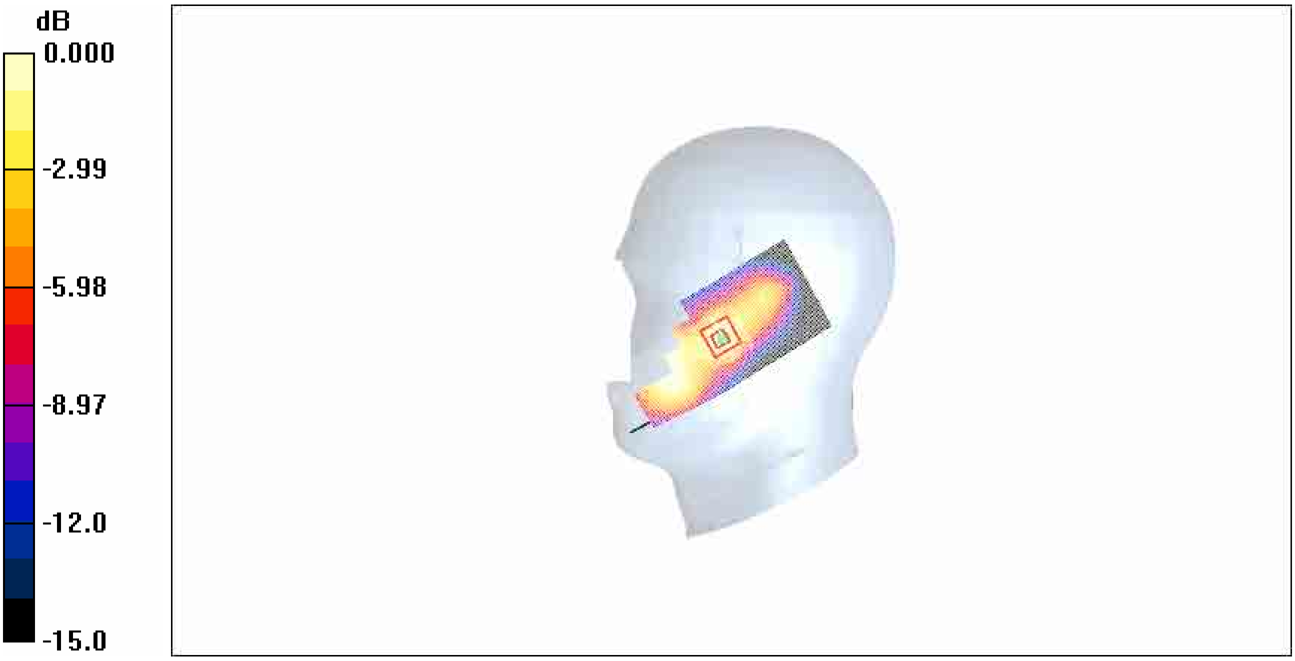
Ambient Temperature:23.3^{o}C Liqiud Temperature: 22.5^{o}C

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

Probe: ET3DV6 - SN1736 ConvF(5.4, 5.4, 5.4)

Cheek Middle/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.479 mW/g

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.22 V/m; Power Drift = 0.189 dB
Peak SAR (extrapolated) = 0.629 W/kg
SAR(1 g) = 0.411 mW/g; SAR(10 g) = 0.233 mW/g
Maximum value of SAR (measured) = 0.443 mW/g



0 dB = 0.443mW/g

Fig. 39 1900 MHz CH661

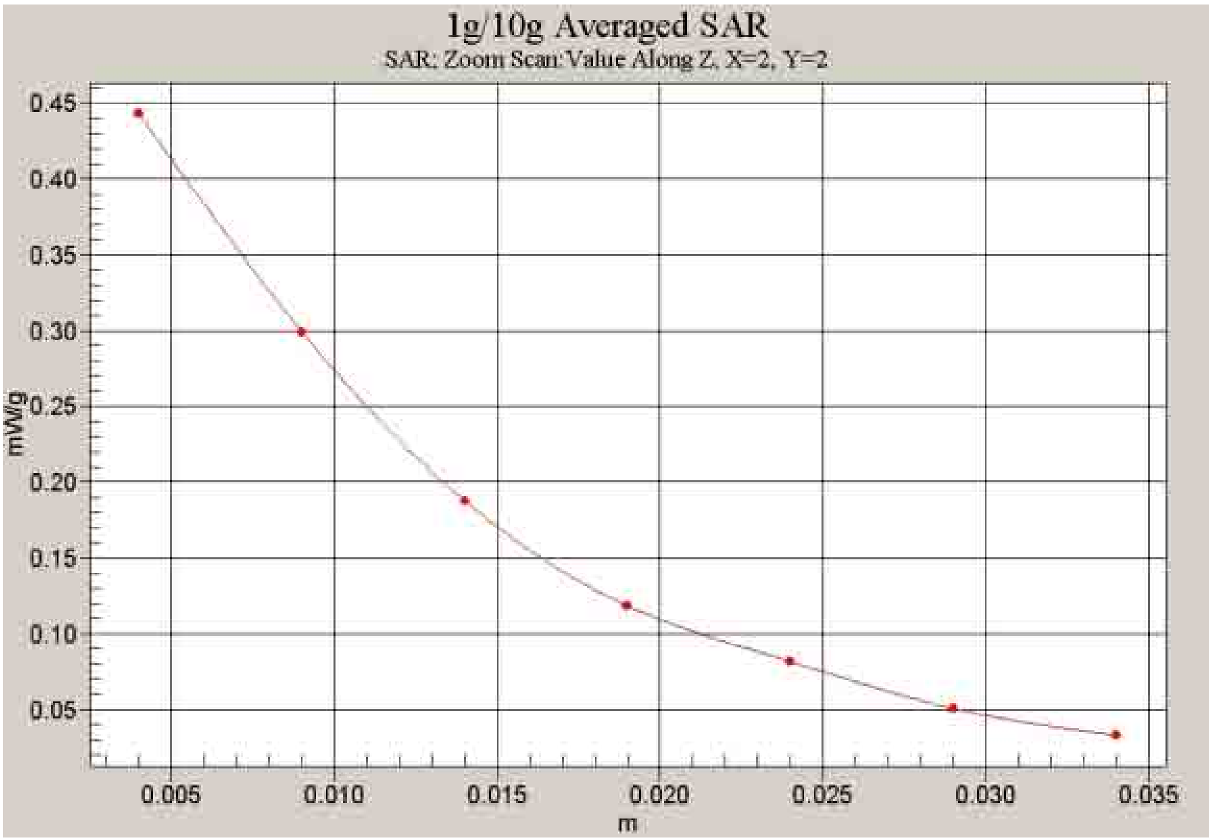


Fig. 40 Z-Scan at power reference point (1900 MHz CH661)

1900 Right Cheek Low
Date/Time: 2007-8-3 13:31:44

Electronics: DAE3 Sn536

Medium: Head 1900 MHz

Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.34 mho/m; ε_r = 39.4; ρ = 1000 kg/m^3

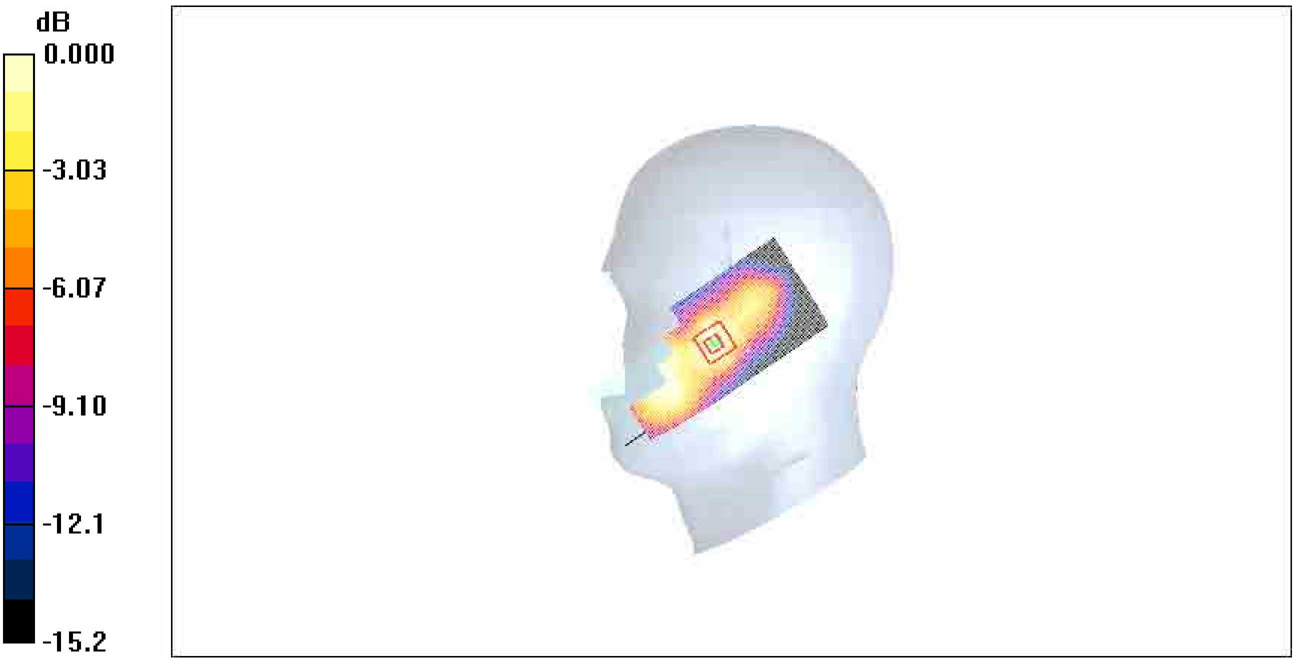
Ambient Temperature:23.3^{o}C Liqiud Temperature: 22.5^{o}C

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

Probe: ET3DV6 - SN1736 ConvF(5.4, 5.4, 5.4)

Cheek Low/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.400 mW/g

Cheek Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.43 V/m; Power Drift = 0.182 dB
Peak SAR (extrapolated) = 0.532 W/kg
SAR(1 g) = 0.347 mW/g; SAR(10 g) = 0.201 mW/g
Maximum value of SAR (measured) = 0.376 mW/g



0 dB = 0.376mW/g

Fig. 41 1900 MHz CH512

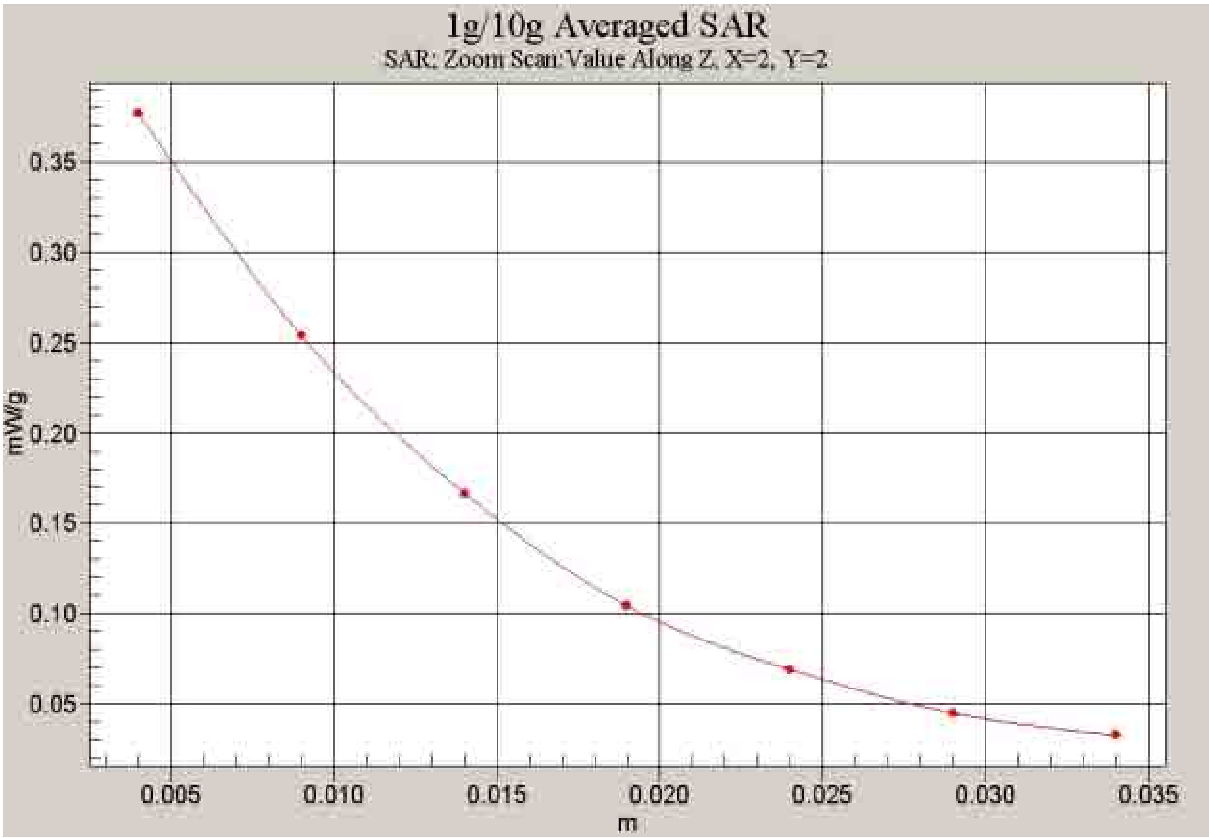


Fig. 42 Z-Scan at power reference point (1900 MHz CH512)

1900 Right Tilt High
Date/Time: 2007-8-3 14:32:28

Electronics: DAE3 Sn536

Medium: Head 1900 MHz

Medium parameters used: f = 1910 MHz; σ = 1.40 mho/m; ε_r = 39.3; ρ = 1000 kg/m^3

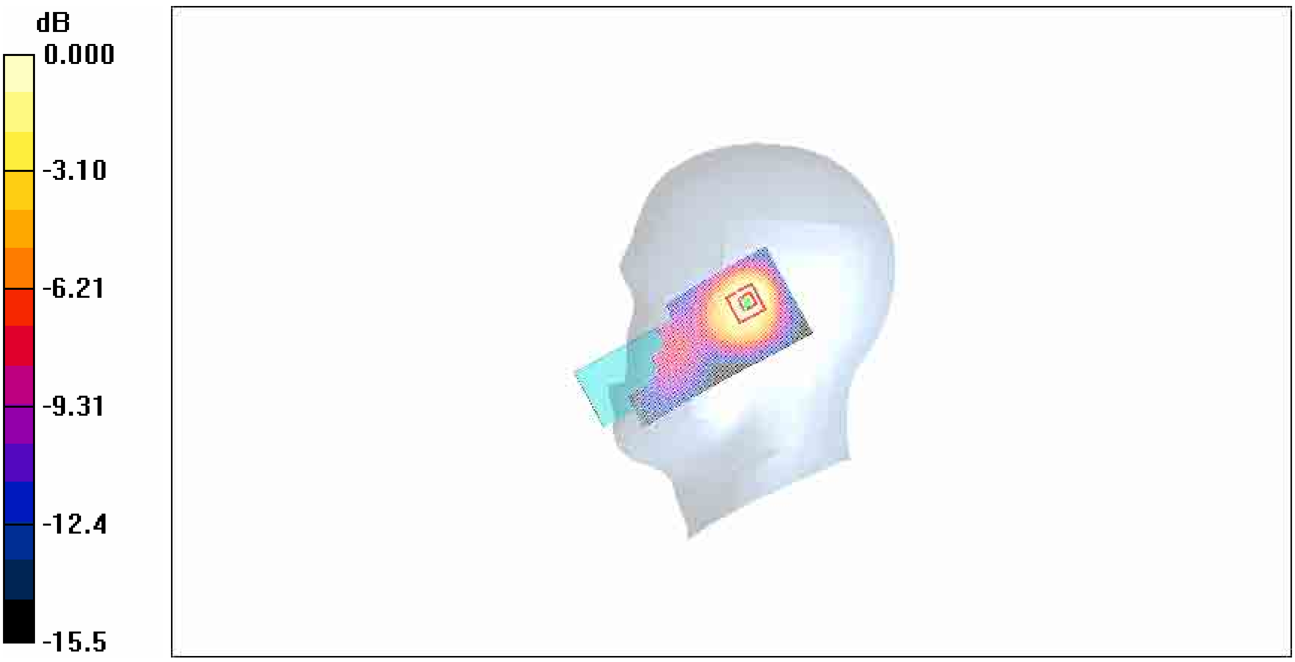
Ambient Temperature:23.3^{o}C Liqiud Temperature: 22.5^{o}C

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

Probe: ET3DV6 - SN1736 ConvF(5.4, 5.4, 5.4)

Tilt High/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.508 mW/g

Tilt High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.3 V/m; Power Drift = -0.018 dB
Peak SAR (extrapolated) = 0.630 W/kg
SAR(1 g) = 0.437 mW/g; SAR(10 g) = 0.270 mW/g
Maximum value of SAR (measured) = 0.460 mW/g



0 dB = 0.460mW/g

Fig. 43 1900 MHz CH810

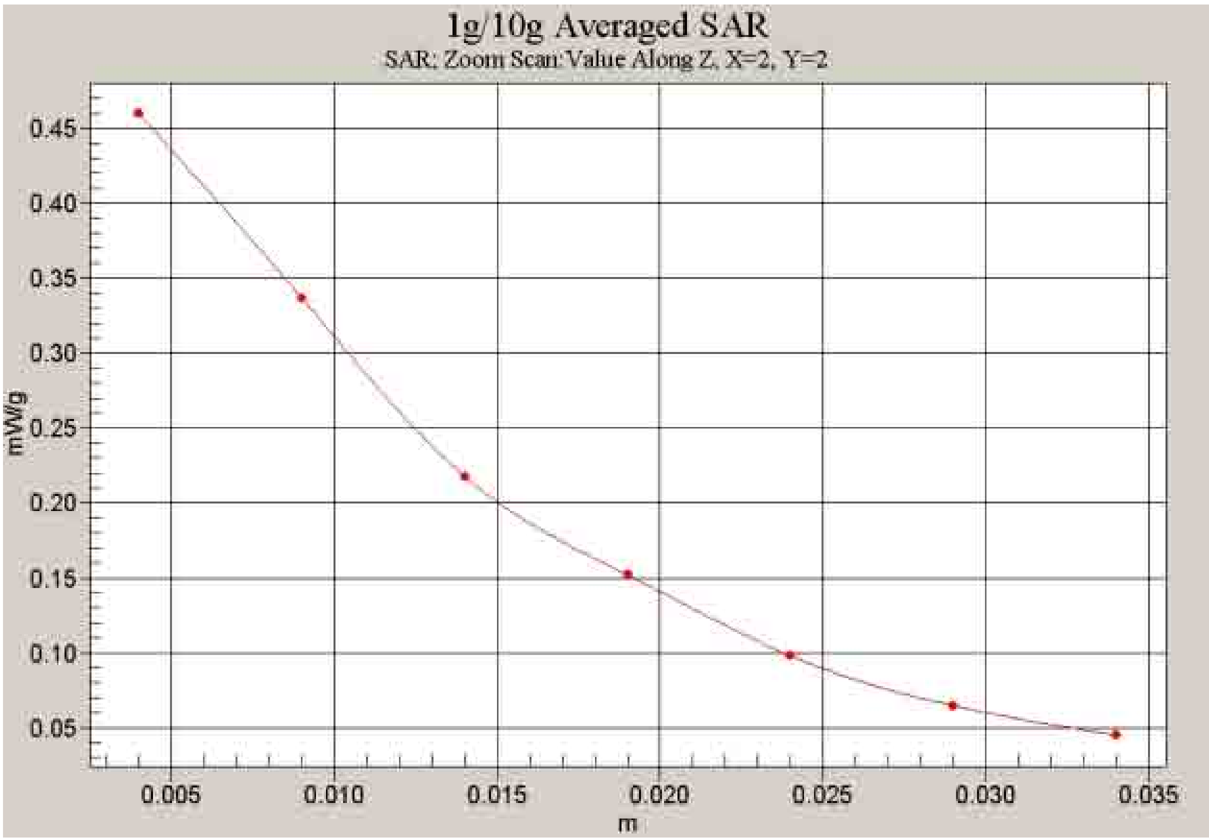


Fig. 44 Z-Scan at power reference point (1900 MHz CH810)

1900 Right Tilt Middle
Date/Time: 2007-8-3 14:18:57

Electronics: DAE3 Sn536

Medium: Head 1900 MHz

Medium parameters used: f = 1880 MHz; σ = 1.37 mho/m; ε_r = 39.4; ρ = 1000 kg/m^3

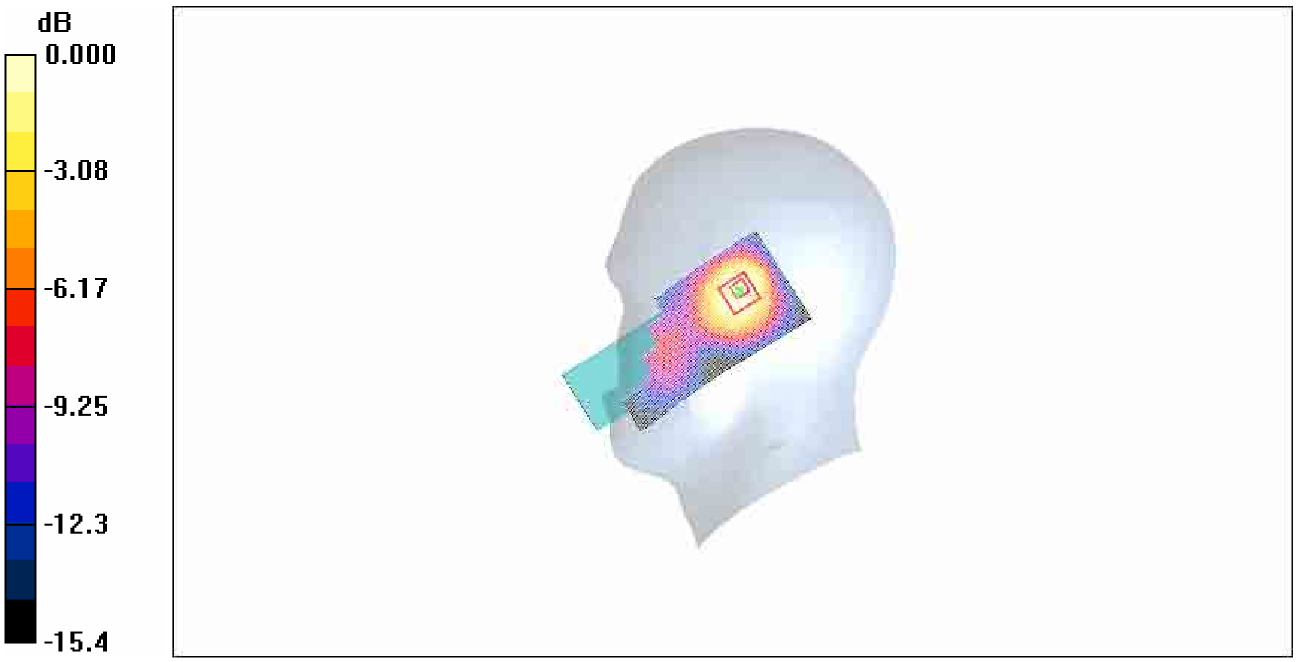
Ambient Temperature:23.3^{o}C Liqiud Temperature: 22.5^{o}C

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

Probe: ET3DV6 - SN1736 ConvF(5.4, 5.4, 5.4)

Tilt Middle/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.438 mW/g

Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.2 V/m; Power Drift = -0.017 dB
Peak SAR (extrapolated) = 0.533 W/kg
SAR(1 g) = 0.376 mW/g; SAR(10 g) = 0.233 mW/g
Maximum value of SAR (measured) = 0.392 mW/g



0 dB = 0.392mW/g

Fig.45 1900 MHz CH661

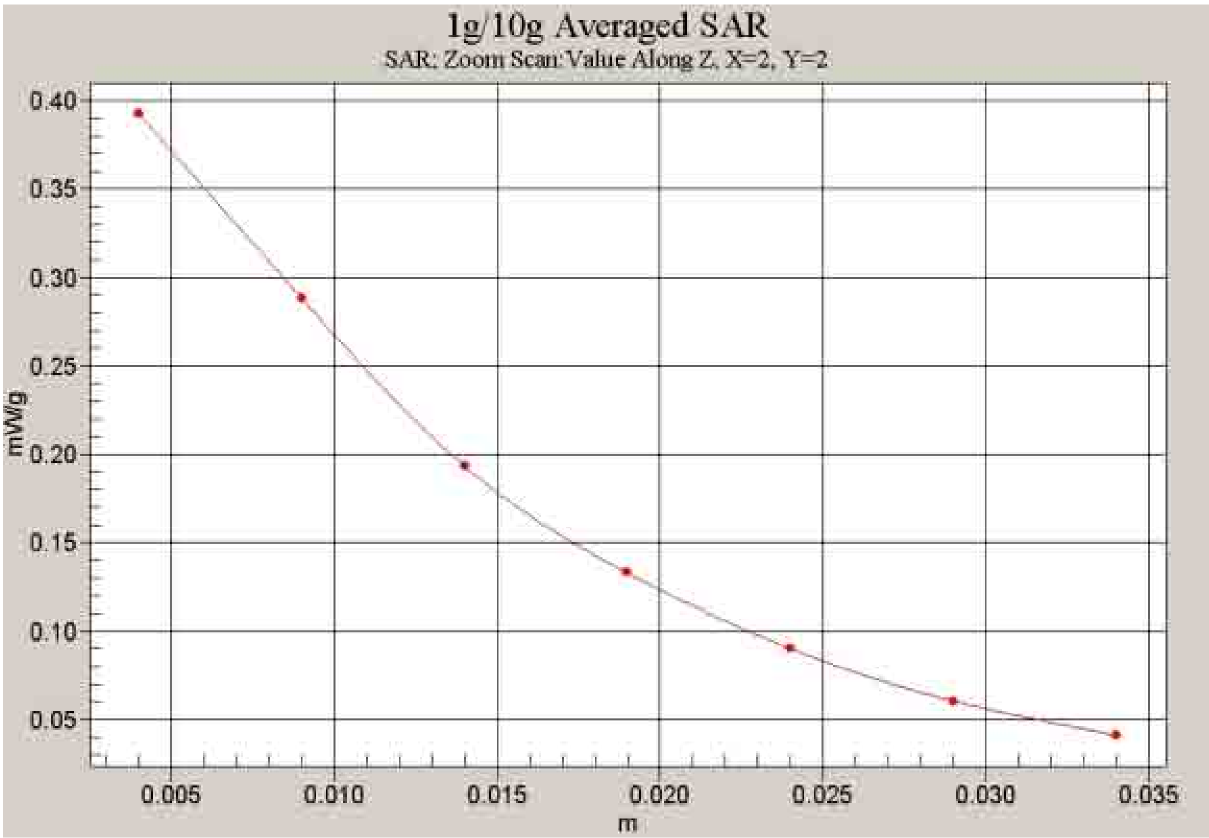


Fig. 46 Z-Scan at power reference point (1900 MHz CH661)

1900 Right Tilt Low
Date/Time: 2007-8-3 13:54:04

Electronics: DAE3 Sn536

Medium: Head 1900 MHz

Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.34 mho/m; ε_r = 39.4; ρ = 1000 kg/m^3

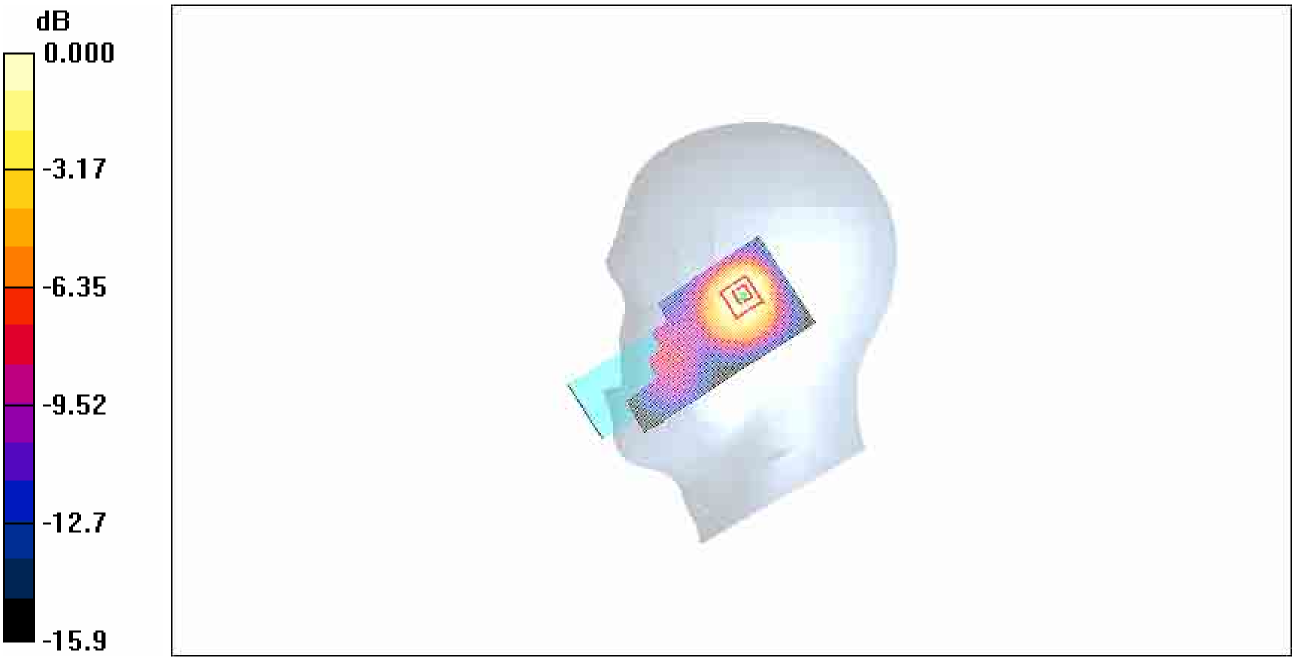
Ambient Temperature:23.3^{o}C　　Liqiud Temperature: 22.5^{o}C

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

Probe: ET3DV6 - SN1736 ConvF(5.4, 5.4, 5.4)

Tilt Low/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.359 mW/g

Tilt Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.6 V/m; Power Drift = 0.103 dB
Peak SAR (extrapolated) = 0.437 W/kg
SAR(1 g) = 0.307 mW/g; SAR(10 g) = 0.191 mW/g
Maximum value of SAR (measured) = 0.325 mW/g



0 dB = 0.325mW/g

Fig.47 1900 MHz CH512

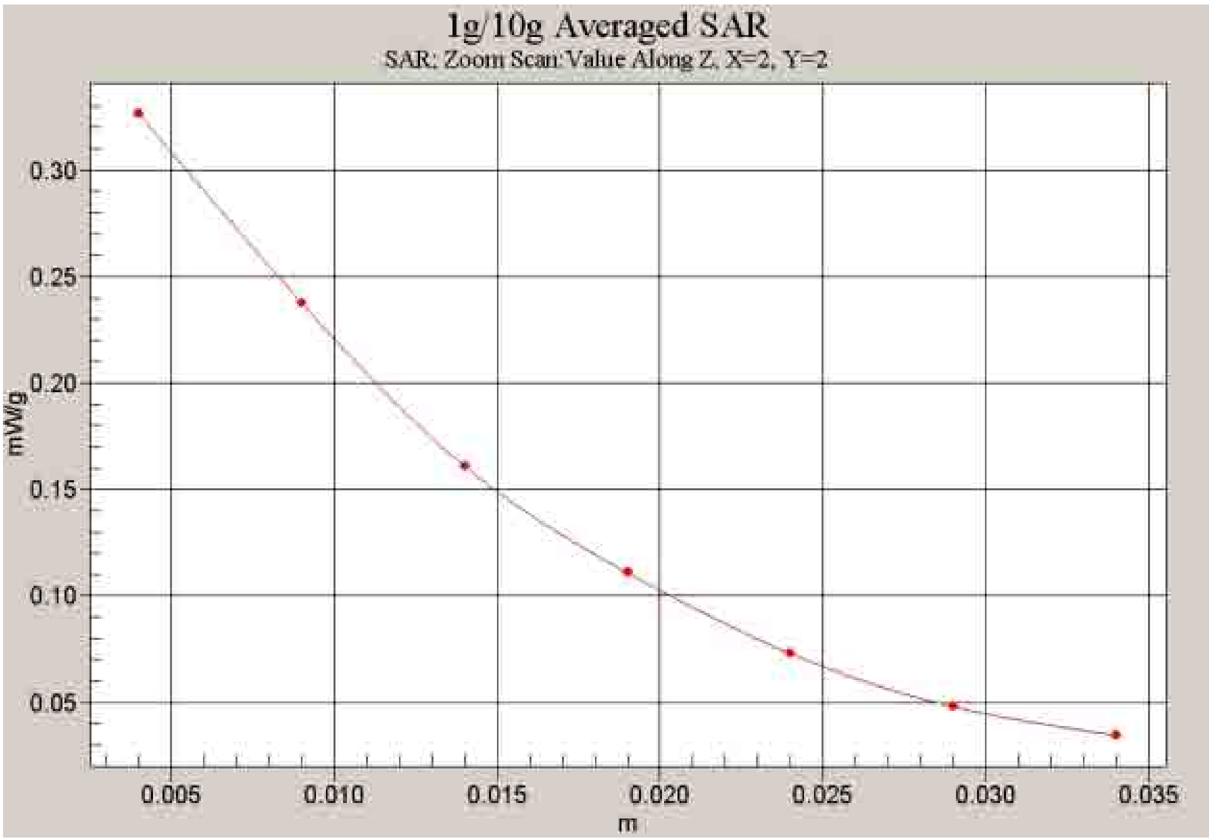


Fig. 48 Z-Scan at power reference point (1900 MHz CH512)

850 Body GPRS Toward Ground High
Date/Time: 2007-8-2 13:55:26

Electronics: DAE3 Sn536

Medium: 850 Body

Medium parameters used (interpolated): f = 848.8 MHz; σ = 1.01 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3

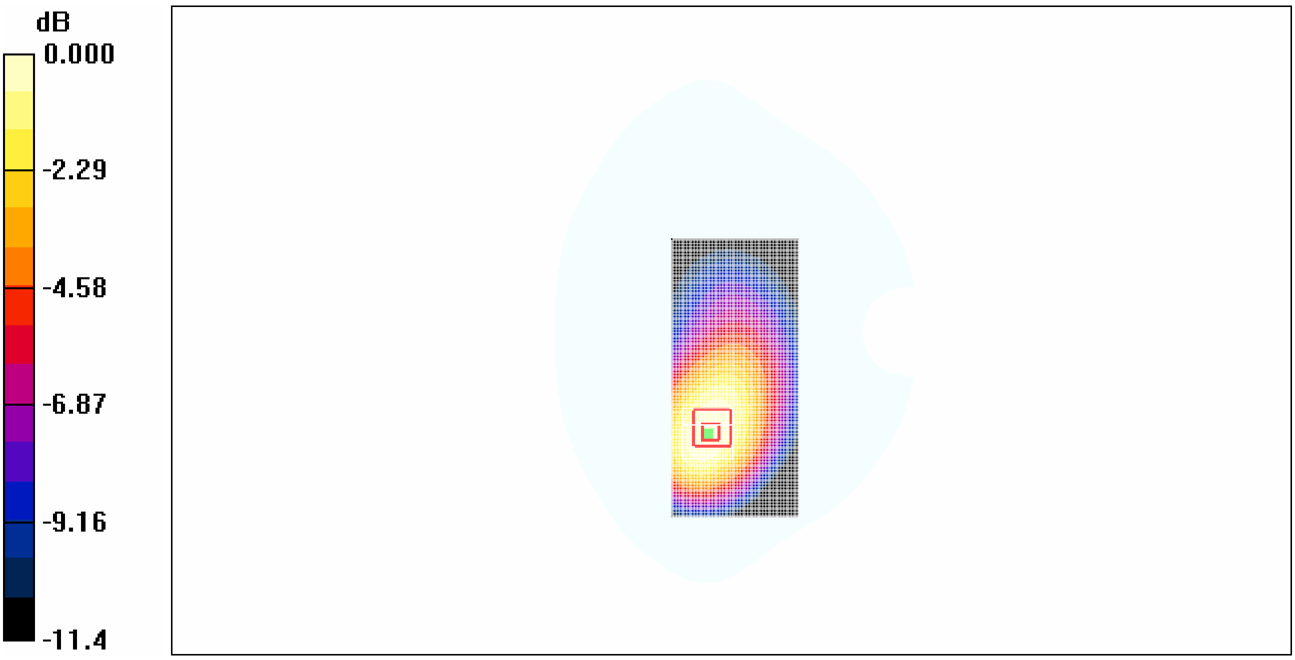
Ambient Temperature:23.3^{o}C Liqiud Temperature: 22.5^{o}C

Communication System: GSM 850 GPRS Frequency: 848.8 MHz Duty Cycle: 1:4

Probe: ET3DV6 - SN1736 ConvF(6.45, 6.45, 6.45)

Toward Ground High/Area Scan (51x111x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.38 mW/g

Toward Ground High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.7 V/m; Power Drift = -0.193 dB
Peak SAR (extrapolated) = 1.69 W/kg
SAR(1 g) = 1.21 mW/g; SAR(10 g) = 0.862 mW/g
Maximum value of SAR (measured) = 1.31 mW/g



0 dB = 1.31mW/g

Fig. 49 850 MHz CH251

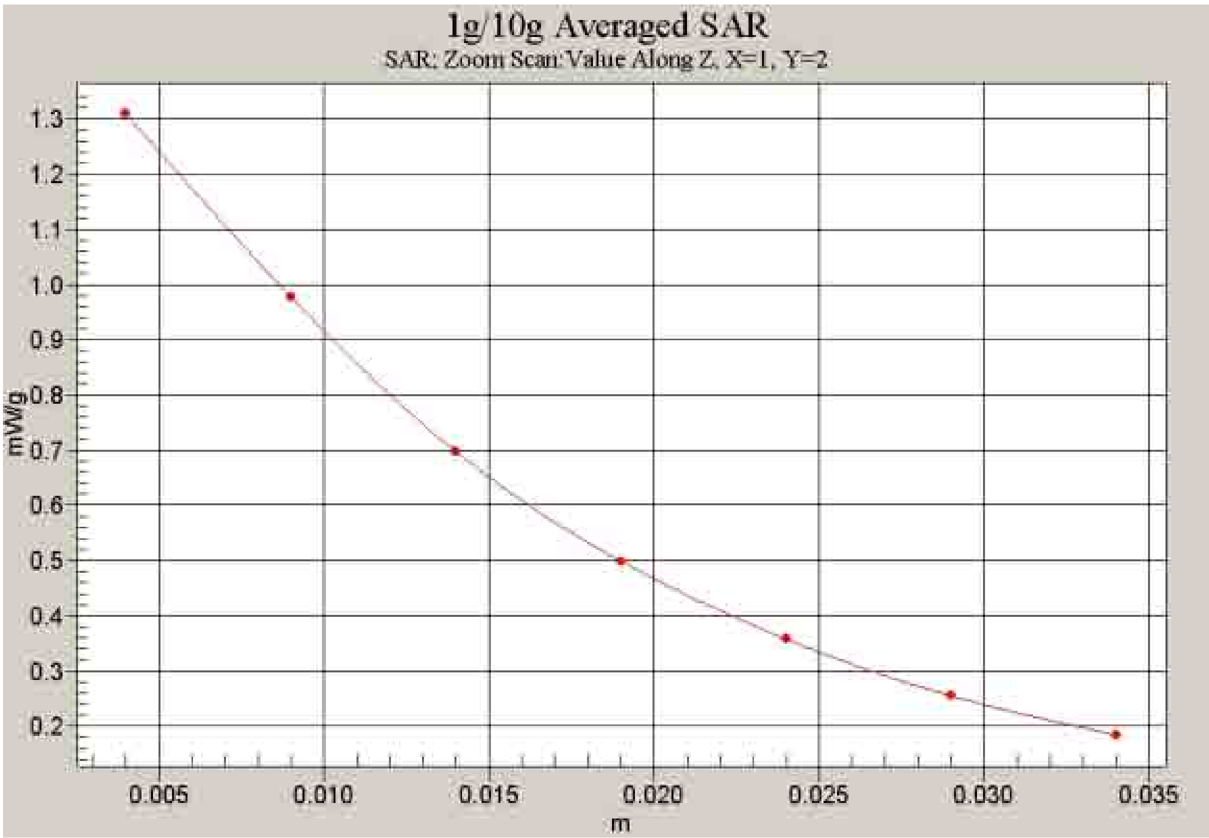


Fig. 50 Z-Scan at power reference point (850 MHz CH251)

850 Body GPRS Toward Ground Middle
Date/Time: 2007-8-2 14:10:38

Electronics: DAE3 Sn536

Medium: 850 Body

Medium parameters used (interpolated): f = 836.6 MHz; σ = 1 mho/m; ε_r = 53.3; ρ = 1000 kg/m^3

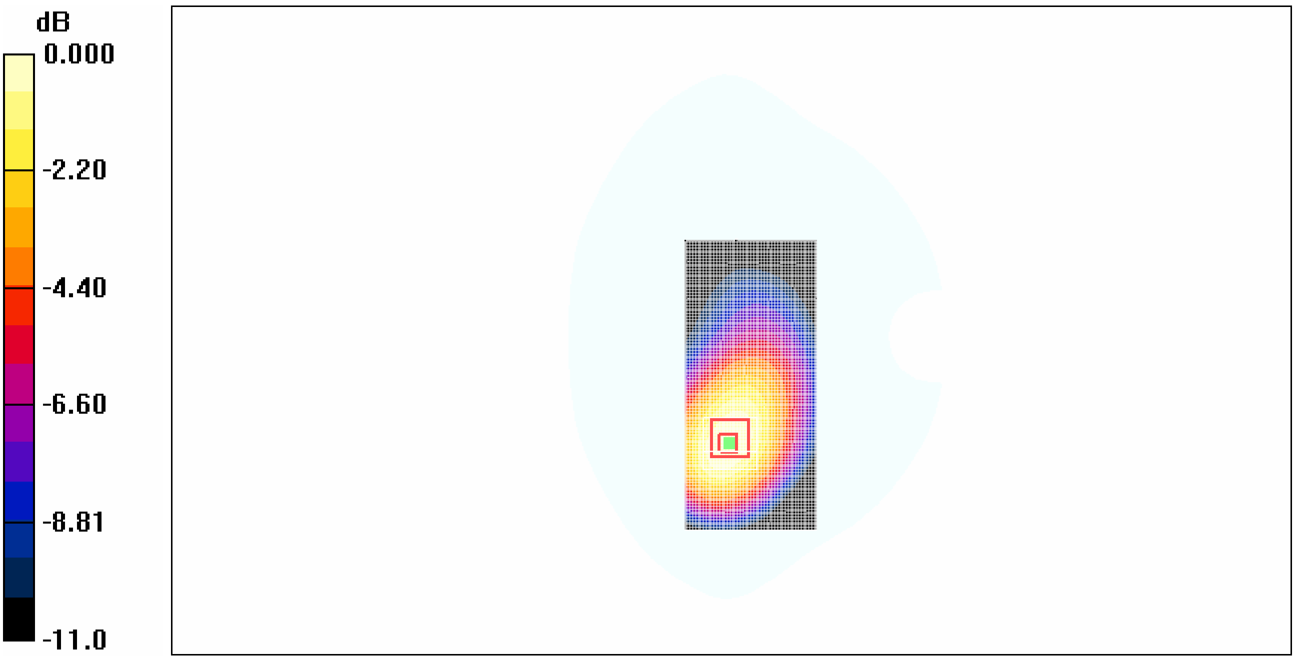
Ambient Temperature:23.3°C Liqiud Temperature: 22.5°C

Communication System: GSM 850 GPRS Frequency: 836.6 MHz Duty Cycle: 1:4

Probe: ET3DV6 - SN1736 ConvF(6.45, 6.45, 6.45)

Toward Ground Middle/Area Scan (51x111x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.23 mW/g

Toward Ground Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.5 V/m; Power Drift = -0.138 dB
Peak SAR (extrapolated) = 1.57 W/kg
SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.783 mW/g
Maximum value of SAR (measured) = 1.19 mW/g



0 dB = 1.19mW/g

Fig. 51 850 MHz CH190

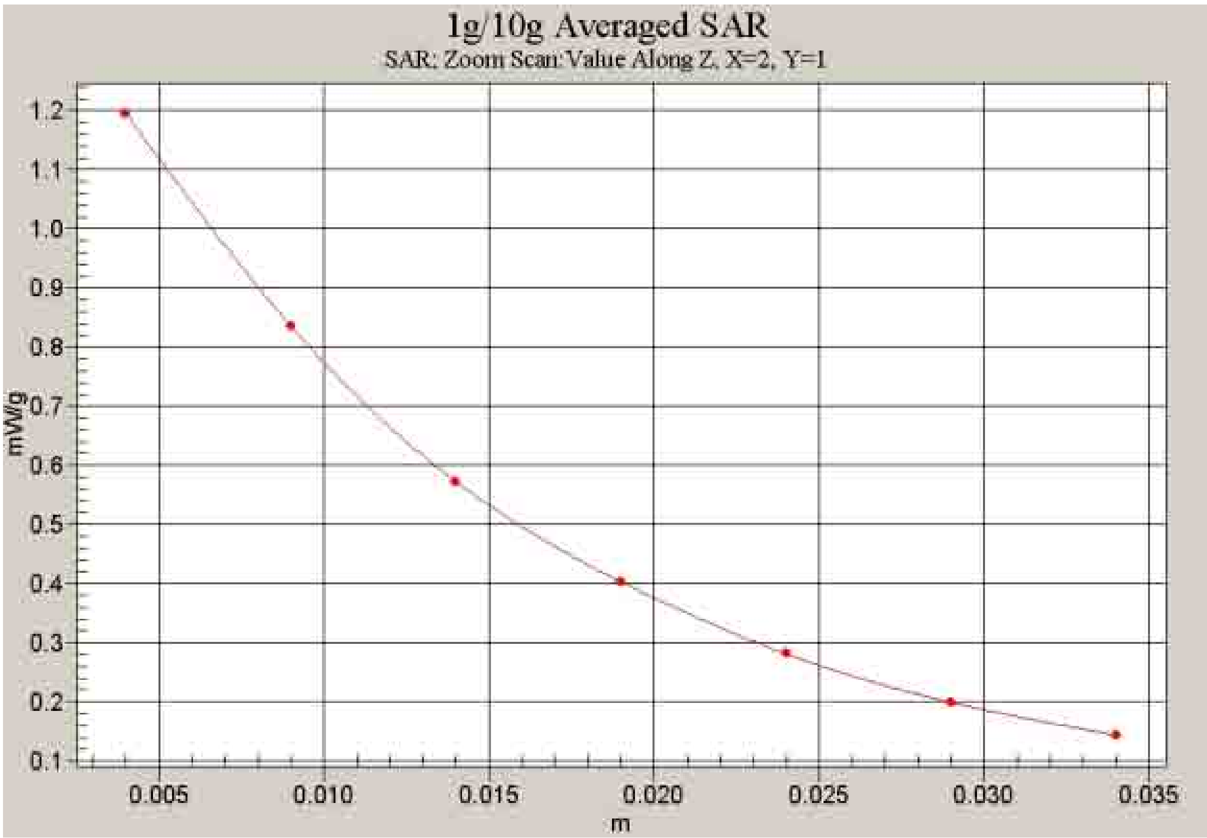


Fig. 52 Z-Scan at power reference point (850 MHz CH190)

850 Body GPRS Toward Ground Low
Date/Time: 2007-8-2 14:37:55

Electronics: DAE3 Sn536

Medium: 850 Body

Medium parameters used: f = 825 MHz; σ = 0.99 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3

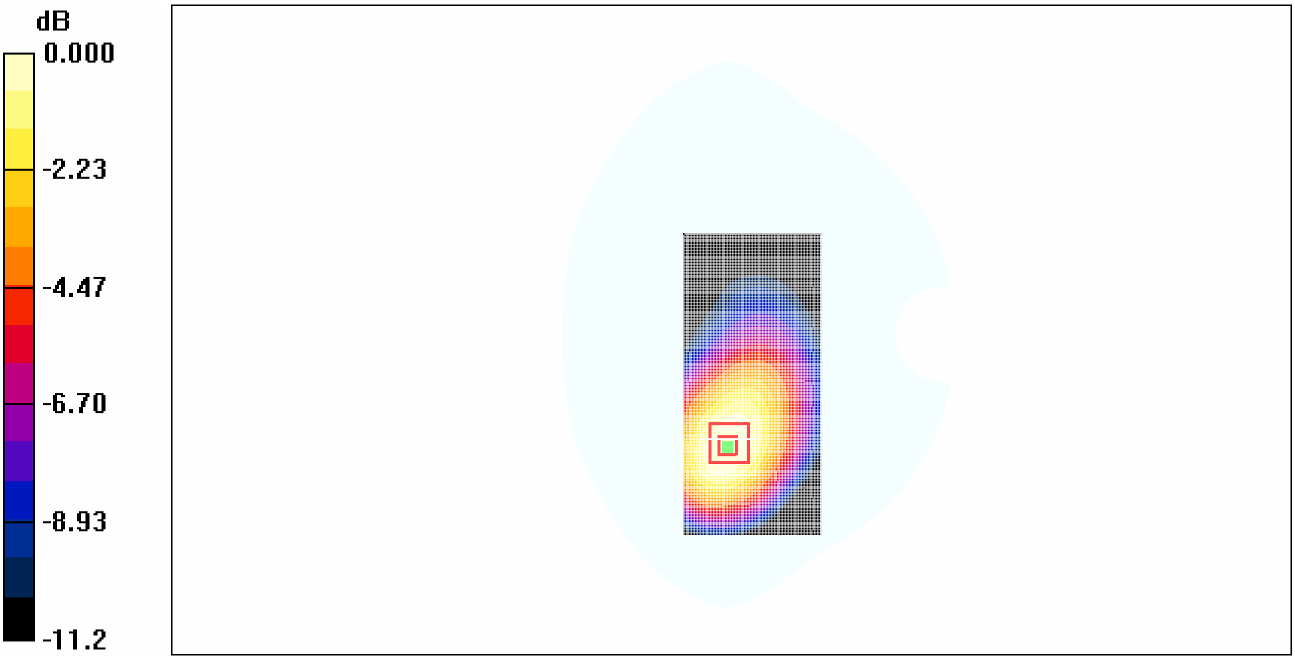
Ambient Temperature:23.3°C   Liqiud Temperature: 22.5°C

Communication System: GSM 850 GPRS Frequency: 824.2 MHz Duty Cycle: 1:4

Probe: ET3DV6 - SN1736 ConvF(6.45, 6.45, 6.45)

Toward Ground Low/Area Scan (51x111x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.921 mW/g

Toward Ground Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.0 V/m; Power Drift = -0.072 dB
Peak SAR (extrapolated) = 1.17 W/kg
SAR(1 g) = 0.855 mW/g; SAR(10 g) = 0.587 mW/g
Maximum value of SAR (measured) = 0.886 mW/g



0 dB = 0.886mW/g

Fig. 53 850 MHz CH128

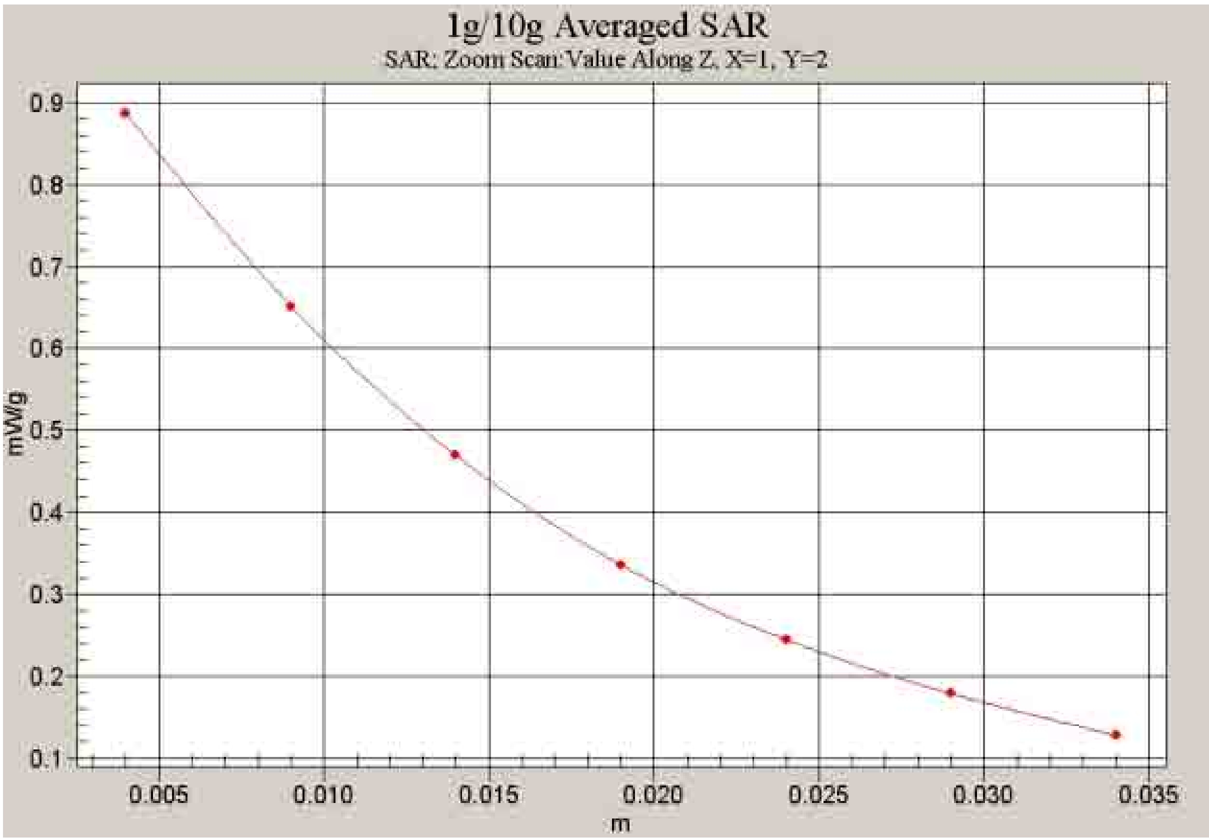


Fig. 54 Z-Scan at power reference point (850 MHz CH128)

1900 Body GPRS Toward Ground High
Date/Time: 2007-8-3 15:35:10

Electronics: DAE3 Sn536

Medium: Body 1900

Medium parameters used: f = 1910 MHz; σ = 1.54 mho/m; ε_r = 52; ρ = 1000 kg/m^3

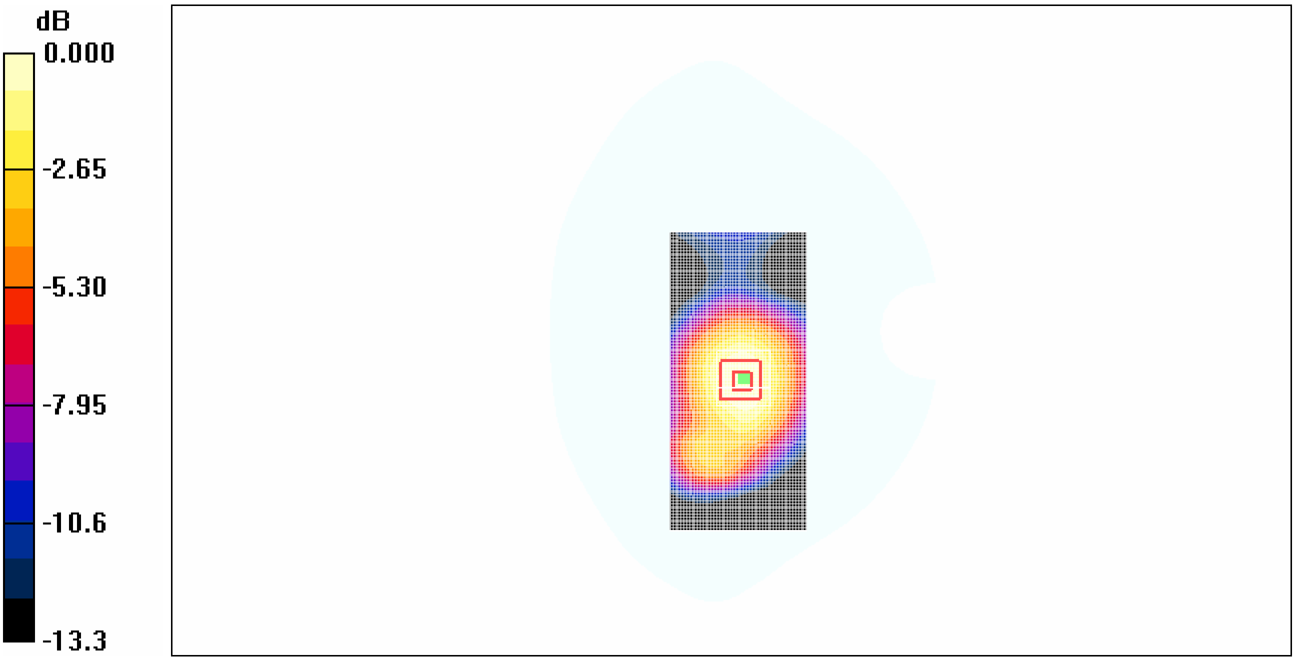
Ambient Temperature:23.3°C   Liqiud Temperature: 22.5°C

Communication System: GSM 1900MHz GPRS Frequency: 1909.8 MHz Duty Cycle: 1:4

Probe: ET3DV6 - SN1736 ConvF(4.88, 4.88, 4.88)

Toward Ground High/Area Scan (51x111x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.821 mW/g

Toward Ground High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.1 V/m; Power Drift = -0.024 dB
Peak SAR (extrapolated) = 1.15 W/kg
SAR(1 g) = 0.739 mW/g; SAR(10 g) = 0.468 mW/g
Maximum value of SAR (measured) = 0.760 mW/g



0 dB = 0.760mW/g

Fig. 55 1900 MHz CH810

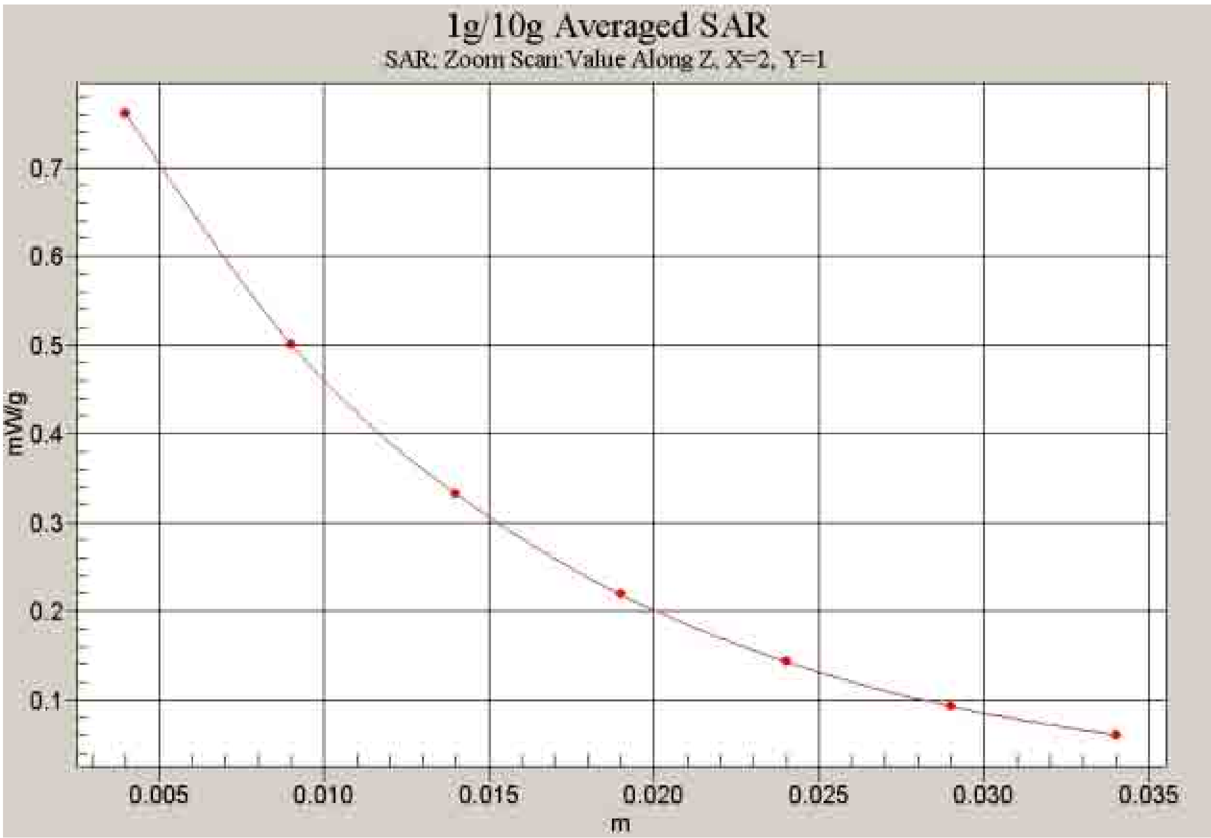


Fig. 56 Z-Scan at power reference point (1900 MHz CH810)

1900 Body GPRS Toward Ground Middle
Date/Time: 2007-8-3 15:58:36

Electronics: DAE3 Sn536

Medium: Body 1900

Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 52.1; ρ = 1000 kg/m^3

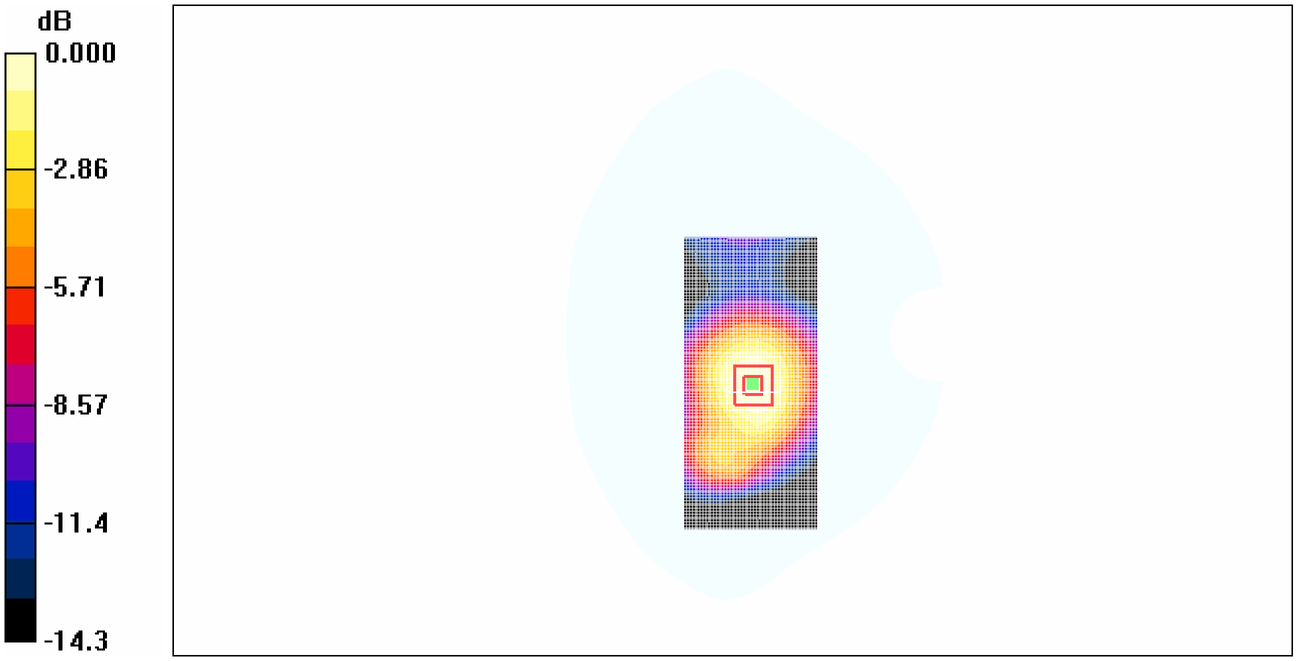
Ambient Temperature:23.3°C   Liqiud Temperature: 22.5°C

Communication System: GSM 1900MHz GPRS Frequency: 1880 MHz Duty Cycle: 1:4

Probe: ET3DV6 - SN1736 ConvF(4.88, 4.88, 4.88)

Toward Ground Middle/Area Scan (51x111x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.671 mW/g

Toward Ground Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.1 V/m; Power Drift = -0.081 dB
Peak SAR (extrapolated) = 0.972 W/kg
SAR(1 g) = 0.612 mW/g; SAR(10 g) = 0.386 mW/g
Maximum value of SAR (measured) = 0.623 mW/g



0 dB = 0.623mW/g

Fig. 57 1900 MHz CH661

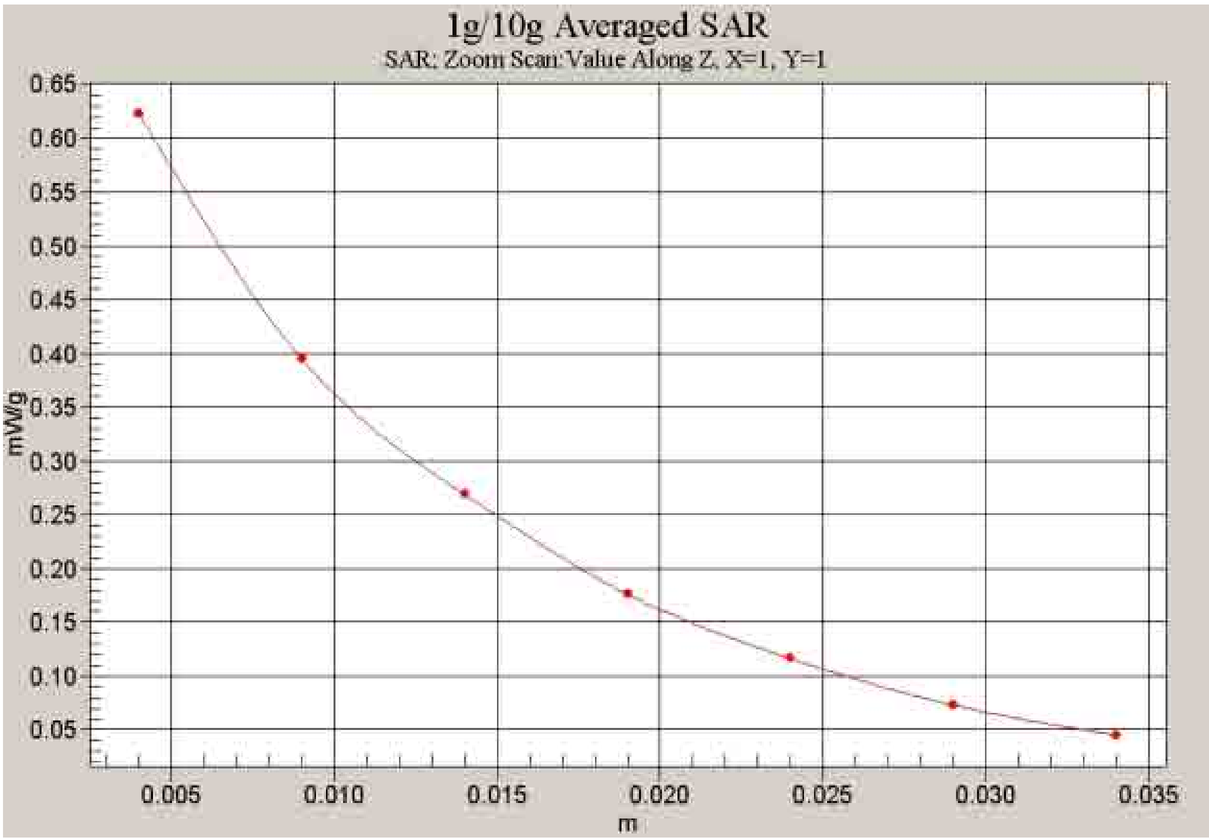


Fig. 58 Z-Scan at power reference point (1900 MHz CH661)

1900 Body GPRS Toward Ground Low
Date/Time: 2007-8-3 16:21:42

Electronics: DAE3 Sn536

Medium: Body 1900

Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.48 mho/m; ε_r = 52.2; ρ = 1000 kg/m^3

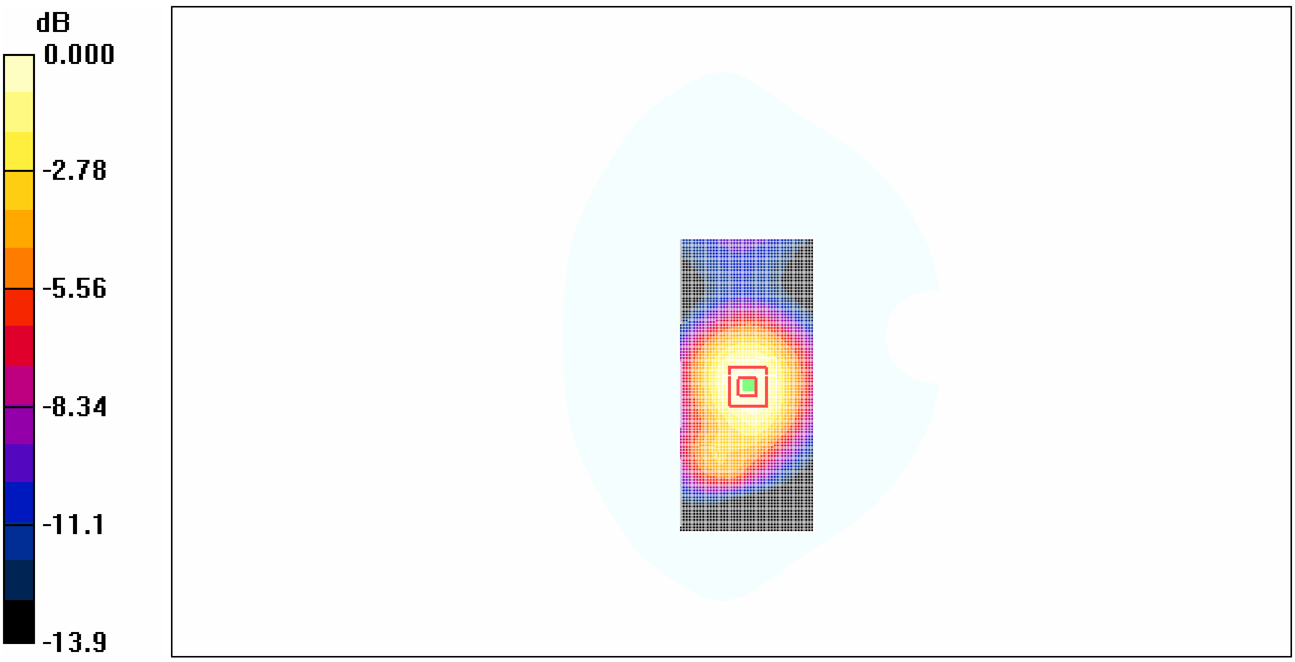
Ambient Temperature:23.3^{o}C Liqiud Temperature: 22.5^{o}C

Communication System: GSM 1900MHz GPRS Frequency: 1850.2 MHz Duty Cycle: 1:4

Probe: ET3DV6 - SN1736 ConvF(4.88, 4.88, 4.88)

Toward Ground Low/Area Scan (51x111x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.505 mW/g

Toward Ground Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.2 V/m; Power Drift = -0.023 dB
Peak SAR (extrapolated) = 0.722 W/kg
SAR(1 g) = 0.460 mW/g; SAR(10 g) = 0.293 mW/g
Maximum value of SAR (measured) = 0.466 mW/g



0 dB = 0.466mW/g

Fig. 59 1900 MHz CH512

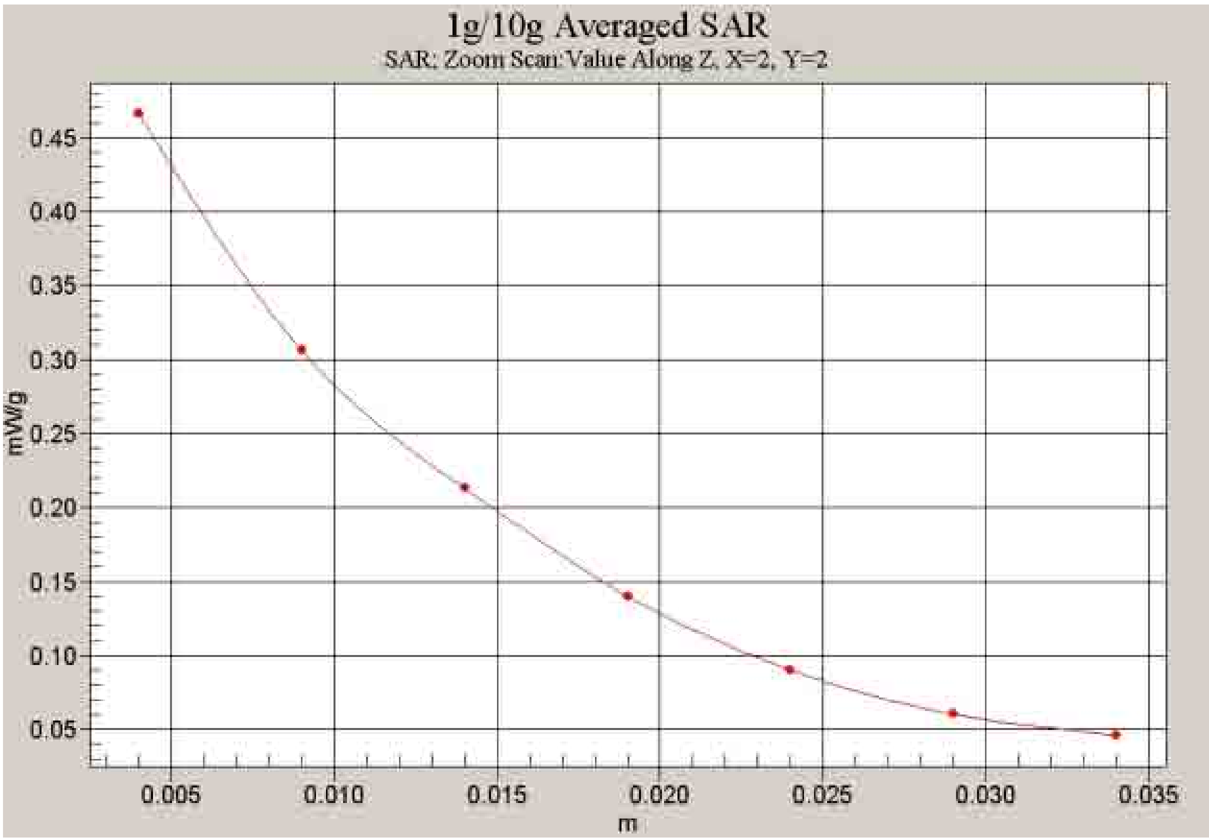


Fig. 60 Z-Scan at power reference point (1900 MHz CH512)

ANNEX D: SYSTEM VALIDATION RESULTS

835MHzDAE589Probe1736

Date/Time: 2007-8-2 7:35:39

Electronics: DAE3 Sn536

Medium: 835 Head

Medium parameters used: f=835 MHz; σ = 0.90 mho/m; ε_r = 43.2; ρ = 1000 kg/m^3

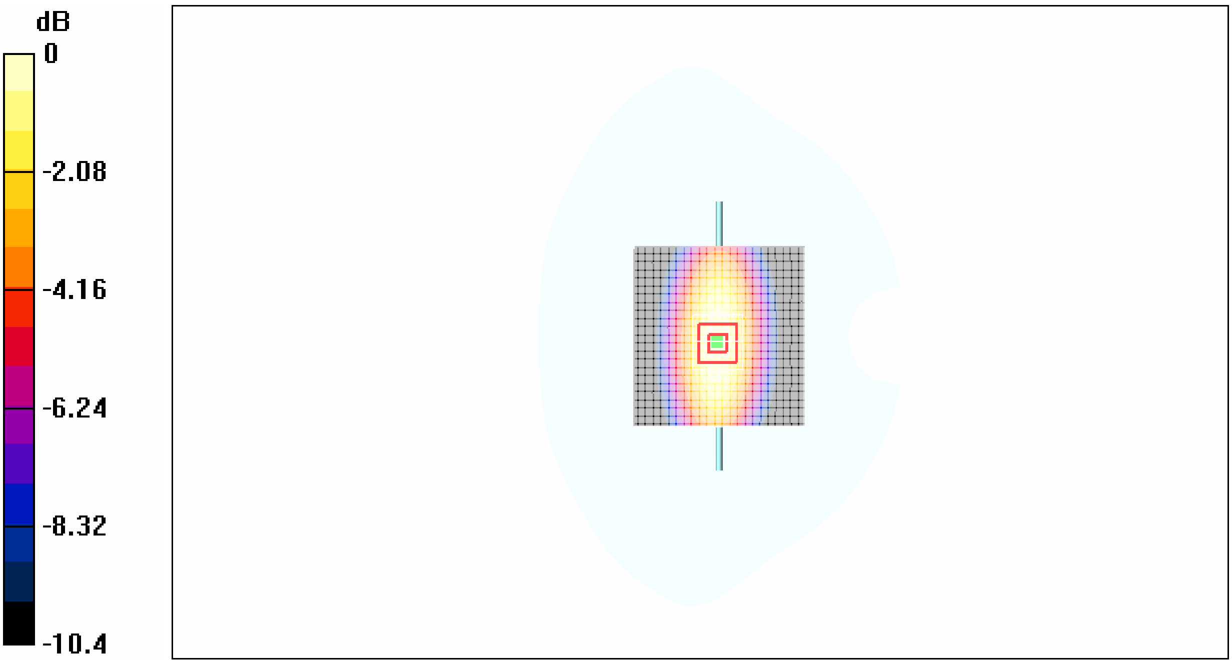
Ambient Temperature:23.3^{o}C Liqiud Temperature: 22.3^{o}C

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

Probe: ET3DV6 - SN1736 ConvF(6.51, 6.51, 6.51)

835MHz/Area Scan (101x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 2.68 mW/g

835MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.8 V/m; Power Drift = -0.0 dB
Peak SAR (extrapolated) = 3.67 W/kg
SAR(1 g) = 2.48 mW/g; SAR(10 g) = 1.62 mW/g
Maximum value of SAR (measured) = 2.69 mW/g



0 dB = 2.69mW/g

Fig.61 validation 835MHz 250mW

1900MHzDAE536Probe1736
Date/Time: 2007-8-3 8:38:20

Electronics: DAE3 Sn536

Medium: 1900 Head

Medium parameters used: f=1900MHz; σ = 1.40 mho/m; ε_r = 39.3; ρ = 1000 kg/m^3

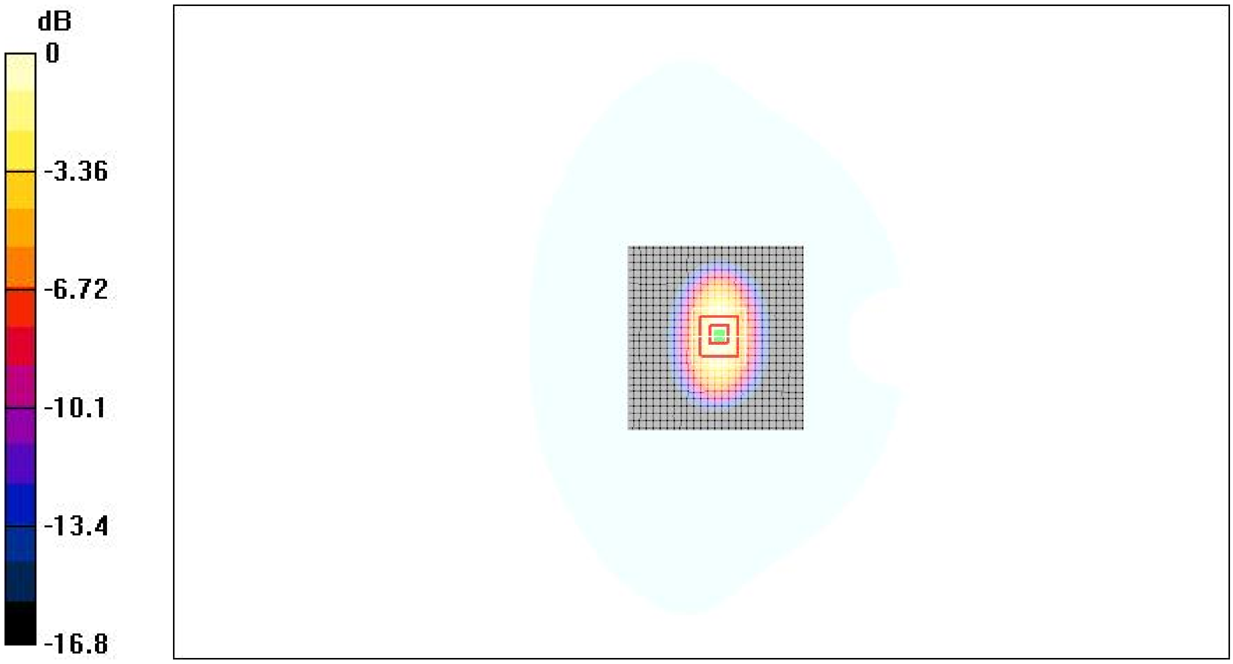
Ambient Temperature:23.3^{o}C   Liqiud Temperature: 22.3^{o}C

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

Probe: ET3DV6 - SN1736 ConvF(5.4, 5.4, 5.4)

System Validation/Area Scan (101x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 11.2 mW/g

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 92.1 V/m; Power Drift = 0.1 dB
Peak SAR (extrapolated) = 16.9 W/kg
SAR(1 g) = 9.91 mW/g; SAR(10 g) = 5.27 mW/g
Maximum value of SAR (measured) = 11.3 mW/g



0 dB = 11.3mW/g

Fig.62 validation 1900MHz 250mW

ANNEX E： PROBE CALIBRATION CERTIFICATE

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

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

Accredited by the Swiss Federal Office of metrology and Accreditation
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client TMC China

Certificate No: ET3DV6-1736_Dec06

CALIBRATION CERTIFICATE

Object	**ET3DV6-SN: 1736**
Calibration procedure(s)	**QA CAL-01.v5** **Calibration procedure for dosimetric E-field probes**
Calibration date:	**December 1, 2006**
Condition of the calibrated item	**In Tolerance**

This calibration certify documents the traceability to national standards, which realize the physical units of measurements(SI).
All calibrations have been conducted at an environment temperature (22±3)^{0}C and humidity<70%

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID#	Cal Data (Calibrated by, Certification NO.)	Scheduled Calibration
Power meter E4419B	GB341293874	22-May-06 (METAS, NO. 251-00466)	May-07
Power sensor E4412A	MY41495277	22-May-06 (METAS, NO. 251-00466)	May-07
Power sensor E4412A	MY41498087	22-May-06 (METAS, NO. 251-00466)	May-07
Reference 20 dB Attenuator	SN:S5086 (20b)	22-May-06 (METAS, NO. 251-00467)	May-07
Reference Probe ES3DV2	SN:S5086 (20b)	22-May-06 (METAS, NO. 251-00467)	May-07
DAE4	SN:3013	13-Jan-06 (SPEAG, NO. ES3-3013_Jan06)	Jan-07
Reference Probe ES3DV2	SN: 907	11-Jun-06 (SPEAG, NO.DAE4-907_Jun06)	Jun-07

Secondary Standards	ID#	Check Data (in house)	Scheduled Calibration
RF generator HP8648C	US3642U01700	4-Dec-05(SPEAG, in house check Dec-03)	In house check: Dec-09
Network Analyzer HP 8753E	US37390585	10-Nov-05(SPEAG, NO. DAE4-901_Nov-04)	In house check: Nov-09

	Name	Function	Signature
Calibrated by:	Nico Vetterli	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Director	

Issued: December 1, 2006

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

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

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

Accredited by the Swiss Federal Office of Metrology and Accreditation
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
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: 1736

Manufactured:	September 27, 2002
Last calibrated:	November 25, 2005
Recalibrated:	December 1, 2006

Calibrated for DASY System

DASY - Parameters of Probe: ET3DV6 SN:1736

Sensitivity in Free Space[A]

NormX	**1.97** ± 10.1%	$\mu V/(V/m)^2$	DCP X	**93** mV
NormY	**1.75** ± 10.1%	$\mu V/(V/m)^2$	DCP Y	**93** mV
NormZ	**1.97** ± 10.1%	$\mu V/(V/m)^2$	DCP Z	**93** mV

Diode Compression[B]

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	9.6	5.0
SAR_{be} [%]	With Correction Algorithm	0.1	0.3

TSL 1810 MHz Typical SAR gradient: 10 % per mm

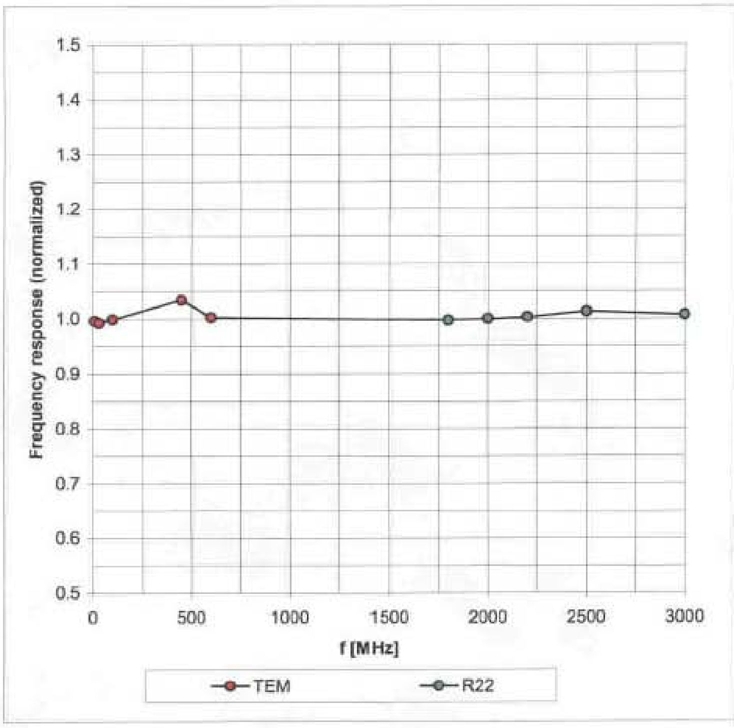
Sensor Center to Phantom Surface Distance		**3.7 mm**	**4.7 mm**
SAR_{be} [%]	Without Correction Algorithm	13.2	8.8
SAR_{be} [%]	With Correction Algorithm	0.6	0.1

Sensor Offset

Probe Tip to Sensor Center **2.7** mm

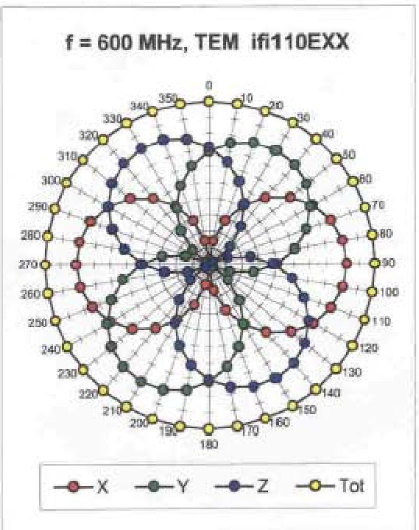
Frequency Response of E-Field

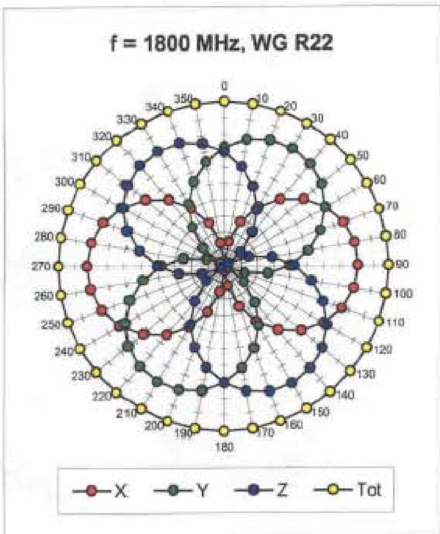
(TEM-Cell:ifi110 EXX, Waveguide: R22)

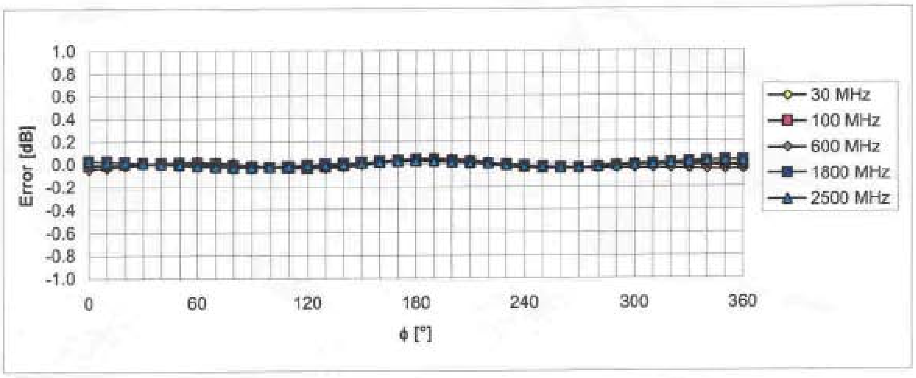


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Receiving Pattern (ϕ), $\vartheta = 0°$





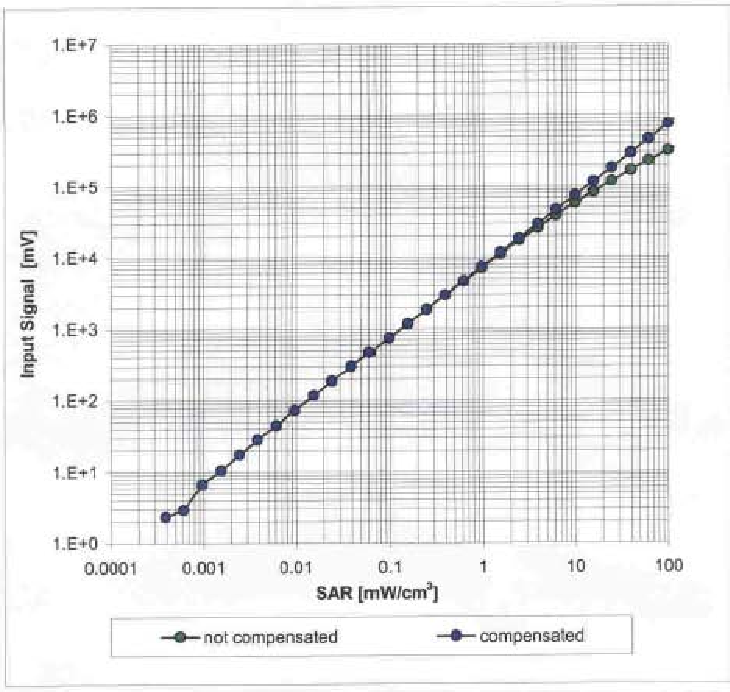


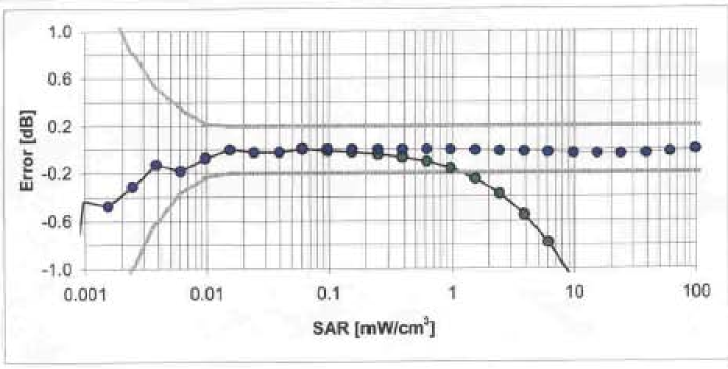
Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

ET3DV6 SN: 1736 December 1, 2006

Dynamic Range f(SAR_{head})

(Waveguide R22, f = 1800 MHz)

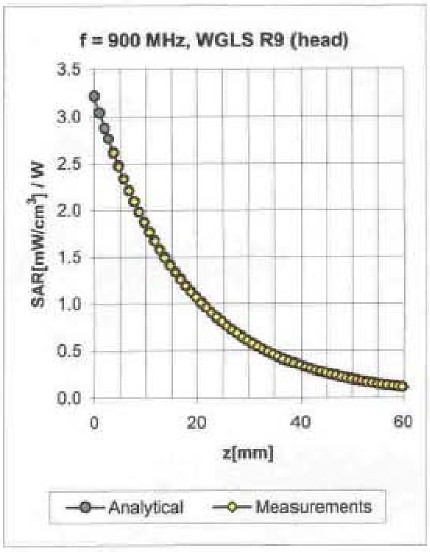


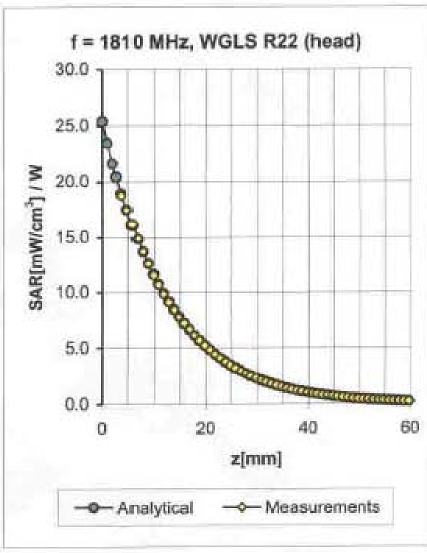


Uncertainty of Linearity Assessment: ± 0.6% (k=2)

ET3DV6 SN: 1736 December 1, 2006

Conversion Factor Assessment

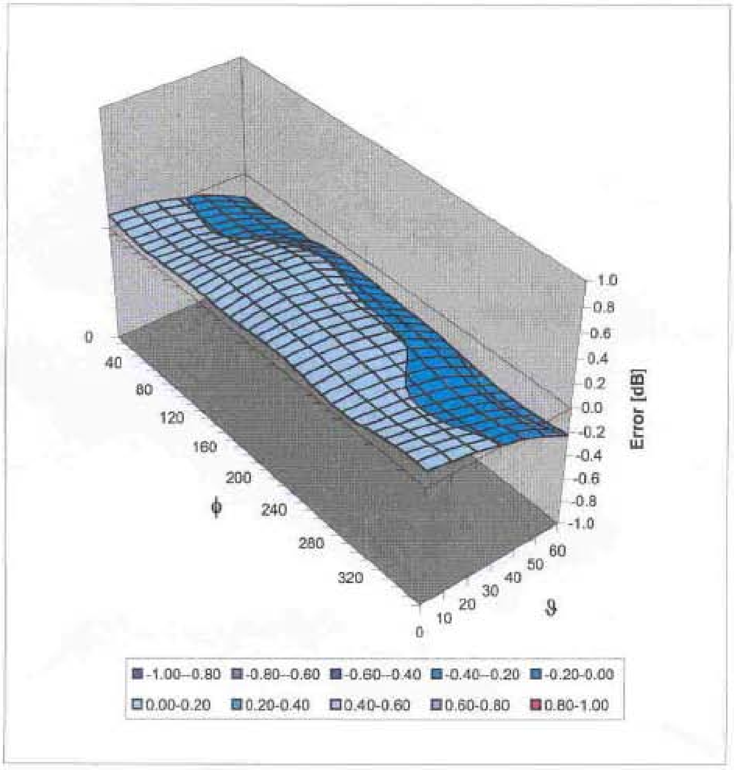




f [MHz]	Validity [MHz][C]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF	Uncertainty
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.56	1.85	6.51	± 11.0% (k=2)
1810	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.57	2.47	5.40	± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.62	2.29	4.67	± 11.8% (k=2)
450	± 50 / ± 100	Body	56.7 ± 5%	0.94 ± 5%	0.12	1.61	7.74	± 13.3% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.47	2.15	6.45	± 11.0% (k=2)
1810	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.53	2.78	4.88	± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.65	2.11	4.35	± 11.8% (k=2)

Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz



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