SAR TEST REPORT

No. 2008SAR00074

For

TCT Mobile Suzhou Limited

GSM/GPRS 850/1900 dual-band mobile phone

OT-V670A

With

Hardware Version: Proto

Software Version: V19q

FCCID: RAD082

Issued Date: 2008-11-13

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

Note:

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SAR TEST REPORT

Test report No.	2008SAR00074	Date of report	November 13th, 2008
Test laboratory	TMC Beijing, Telecommunication Metrology Center of MII	Client	TCT Mobile Suzhou Limited
Test device	Product name: GSM/GPRS 850/1900 dual-band mobile phone Model type: OT-V670A Series number: 011492000001160		
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**: 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
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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:	**July 1, 2008**
Testing End Date:	**July 4, 2008**

2 Client Information

2.1 Applicant Information

Company Name:	TCT Mobile Suzhou Limited
Address /Post:	4/F, South Building,No.2966, Jinke Road, Zhangjiang High-Tech Park, Pudong, Shanghai, 201203, P.R. China
City:	Shanghai
Postal Code:	201203
Country:	P.R. China
Telephone:	+86-21-61460883
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2.2 Manufacturer Information

Company Name:	TCT Mobile Suzhou Limited
Address /Post:	4/F, South Building,No.2966, Jinke Road, Zhangjiang High-Tech Park, Pudong, Shanghai, 201203, P.R. China
City:	Shanghai
Postal Code:	201203
Country:	P.R. China
Telephone:	+86-21-61460883
Fax:	+86-21-61460602

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

3.1 About EUT

Description:	GSM/GPRS 850/1900 dual-band mobile phone
Model:	OT-V670A
Frequency Band:	GSM850/1900
GPRS Class:	10

Picture 1: Constituents of the sample

3.2 Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	011492000001160	Proto	V19q

*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	Travel Adapter	T5000436AGAA	\	Tenpao
		T5002684AGAA	\	Tenpao
AE2	Battery	T5001418AAAA	\	BYD

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

4 OPERATIONAL CONDITIONS DURING TEST

4.1 Schematic Test Configuration

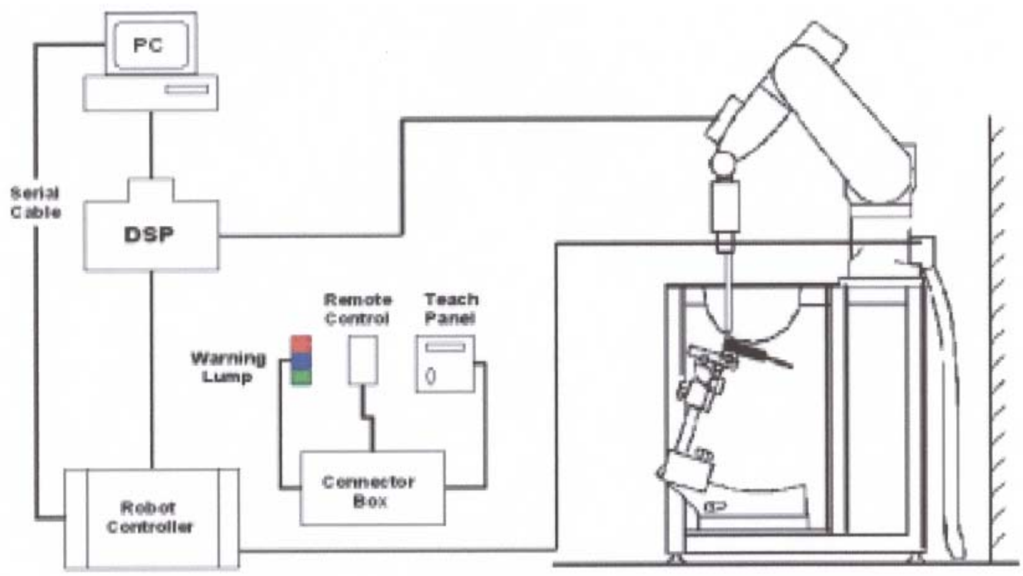
During SAR test, EUT is in Traffic Mode (Channel Allocated) at Normal Voltage Condition. A communication link is set up with a System Simulator (SS) by air link, and a call is established. The Absolute Radio Frequency Channel Number (ARFCN) is allocated to 128, 190 and 251 respectively in the case of 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 Professional, 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

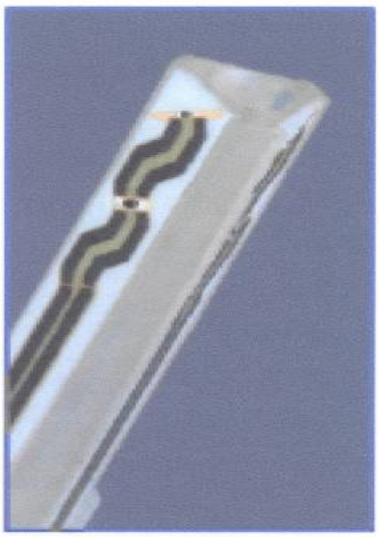
The DAE consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information 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)



Picture 3: ET3DV6 E-field Probe

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 diameter: 6.8mm
	Distance from probe tip to dipole centers: 2.7mm
Application	General dosimetry up to 3GHz
	Compliance tests of mobile phones
	Fast automatic scanning in arbitrary phantoms

Picture 4: ET3DV6 E-field

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/m^3).

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 repeatably 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 the complete setup of all predefined phantom positions and measurement grids by 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

Picture 6: 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 been previously 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 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: 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 LABORATORY ENVIRONMENT

Table 3: The Ambient Conditions during EMF Test

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 surroundi 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 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.

7.2 Conducted Power

7.2.1 Measurement Methods

The EUT was set up for the maximum output power. The channel power was measured with Agilent Spectrum Analyzer E4440A. These measurements were done at low, middle and high channels.

7.2.2 Measurement result

Table 4: Conducted Power Measurement Results

850MHZ	**Conducted Power (dBm)**		
	Channel 251(848.8MHz)	**Channel 190(836.6MHz)**	**Channel 128(824.2MHz)**
Before SAR Test	32.54	32.59	32.68
After SAR Test	32.37	32.67	32.55
1900MHZ	**Conducted Power (dBm)**		
	Channel 810 (1909.8MHz)	**Channel 661 (1880MHz)**	**Channel 512 (1850.2MHz)**
Before SAR Test	29.20	29.29	29.54
After SAR Test	29.31	29.33	29.60

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 8 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 5: Dielectric Performance of Head 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	41.5	0.90
	1900 MHz	40.0	1.40
Measurement value (Average of 10 tests)	850 MHz	43.3	0.92
	1900 MHz	40.6	1.38

Table 6: 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	53.1	1.01
	1900 MHz	52.1	1.49

8.2 System Validation

Table 7: 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							
Liquid parameters		**Frequency**		**Permittivity ε**		**Conductivity σ (S/m)**	
		835 MHz		43.5		0.91	
		1900 MHz		40.6		1.38	
Verification results	**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**
	835 MHz	1.60	2.48	1.62	2.50	1.25%	0.81%
	1900 MHz	5.09	9.73	5.27	9.91	3.3%	1.9%

Note：Target values are the data of the dipole validation results, please check Annex F for the Dipole Calibration Certificate.

8.3 Summary of Measurement Results (850MHz)

Table 8: SAR Values (850MHz-Head)

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)	0.267	0.391	-0.200
Left hand, Touch cheek, Mid frequency(See Fig.3)	0.284	0.418	-0.0746
Left hand, Touch cheek, Bottom frequency(See Fig.5)	0.258	0.382	-0.112
Left hand, Tilt 15 Degree, Top frequency(See Fig.7)	0.0883	0.122	0.100
Left hand, Tilt 15 Degree, Mid frequency(See Fig.9)	0.0914	0.126	-0.009
Left hand, Tilt 15 Degree, Bottom frequency(See Fig.11)	0.0778	0.106	-0.033
Right hand, Touch cheek, Top frequency(See Fig.13)	0.328	0.5	-0.112
Right hand, Touch cheek, Mid frequency(See Fig.15)	0.413	0.633	0.200
Right hand, Touch cheek, Bottom frequency(See Fig.17)	0.367	0.562	-0.200
Right hand, Tilt 15 Degree, Top frequency(See Fig.19)	0.0907	0.126	0.027
Right hand, Tilt 15 Degree, Mid frequency(See Fig.21)	0.0822	0.113	-0.134
Right hand, Tilt 15 Degree, Bottom frequency(See Fig.23)	0.0706	0.0985	-0.075

Table 9: SAR Values (850MHz-GPRS)

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 Ground, Top frequency(See Fig.25)	0.573	0.805	0.019
Body, Towards Ground, Mid frequency(See Fig.27)	0.606	0.849	-0.167
Body, Towards Ground, Bottom frequency(See Fig.29)	0.536	0.753	-0.129

8.4 Summary of Measurement Results (1900MHz)

Table 10: SAR Values (1900MHz-Head)

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.31)	0.572	0.961	-0.069
Left hand, Touch cheek, Mid frequency(See Fig.33)	0.631	1.05	-0.007
Left hand, Touch cheek, Bottom frequency(See Fig.35)	0.57	0.947	0.020
Left hand, Tilt 15 Degree, Top frequency(See Fig.37)	0.0767	0.125	-0.025
Left hand, Tilt 15 Degree, Mid frequency(See Fig.39)	0.125	0.203	-0.049
Left hand, Tilt 15 Degree, Bottom frequency(See Fig.41)	0.144	0.231	0.200
Right hand, Touch cheek, Top frequency(See Fig.43)	0.437	0.722	0.200
Right hand, Touch cheek, Mid frequency(See Fig.45)	0.473	0.771	0.010
Right hand, Touch cheek, Bottom frequency(See Fig.47)	0.431	0.696	-0.030
Right hand, Tilt 15 Degree, Top frequency(See Fig.49)	0.0995	0.172	-0.053
Right hand, Tilt 15 Degree, Mid frequency(See Fig.51)	0.137	0.234	0.070
Right hand, Tilt 15 Degree, Bottom frequency(See Fig.53)	0.163	0.274	0.136

Table 11: SAR Values (1900MHz-GPRS)

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 Ground, Top frequency(See Fig.55)	0.32	0.509	-0.078
Body, Towards Ground, Mid frequency(See Fig.57)	0.348	0.551	-0.107
Body, Towards Ground, Bottom frequency(See Fig.59)	0.281	0.44	-0.098

8.5 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.

9 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	

10 MAIN TEST INSTRUMENTS

Table 12: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	HP 8753E	US38433212	August 31,2007	One year
02	Power meter	NRVD	101253	June 20, 2008	One year
03	Power sensor	NRV-Z5	100333		
04	Power sensor	NRV-Z6	100011	September 3, 2007	One year
05	Signal Generator	E4433B	US37230472	September 5, 2007	One Year
06	Amplifier	VTL5400	0505	No Calibration Requested	
07	BTS	CMU 200	105948	August 16, 2007	One year
08	E-field Probe	SPEAG ES3DV3	3142	September 7, 2007	One year
09	DAE	SPEAG DAE4	777	September 7, 2007	One year
10	Dipole Validation Kit	SPEAG D835V2	443	February 19, 2007	Two years
11	Dipole Validation Kit	SPEAG D1900V2	541	February 20, 2007	Two years

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.

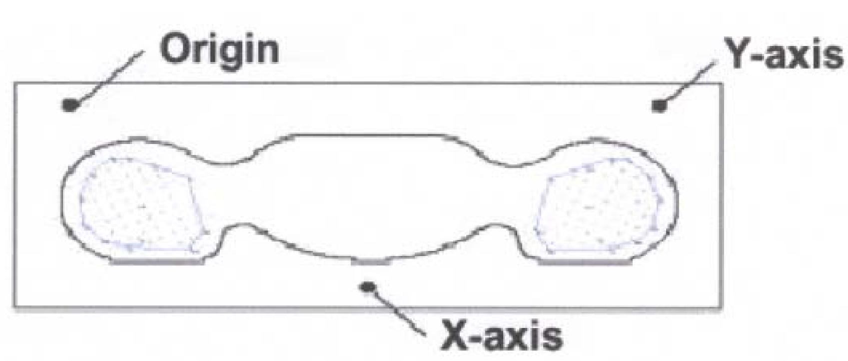
Step 3: Around this point, a volume of 30 mm x 30 mm x 30 mm was assessed by measuring 7 x 7x 7 points. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

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.

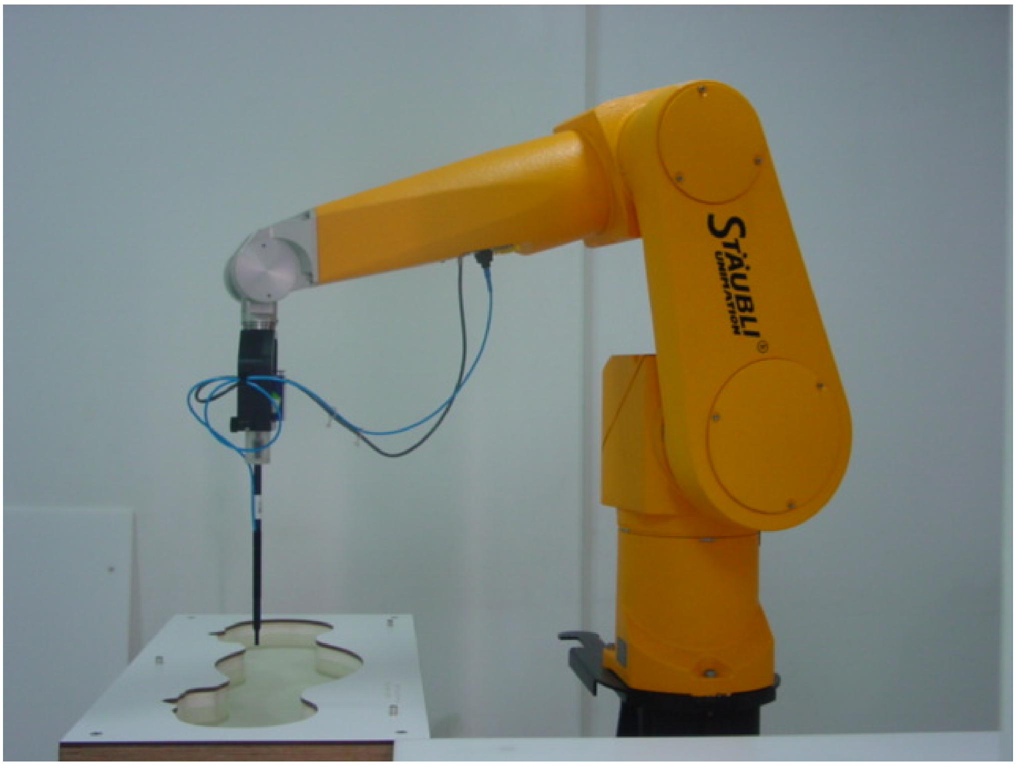
c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

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.

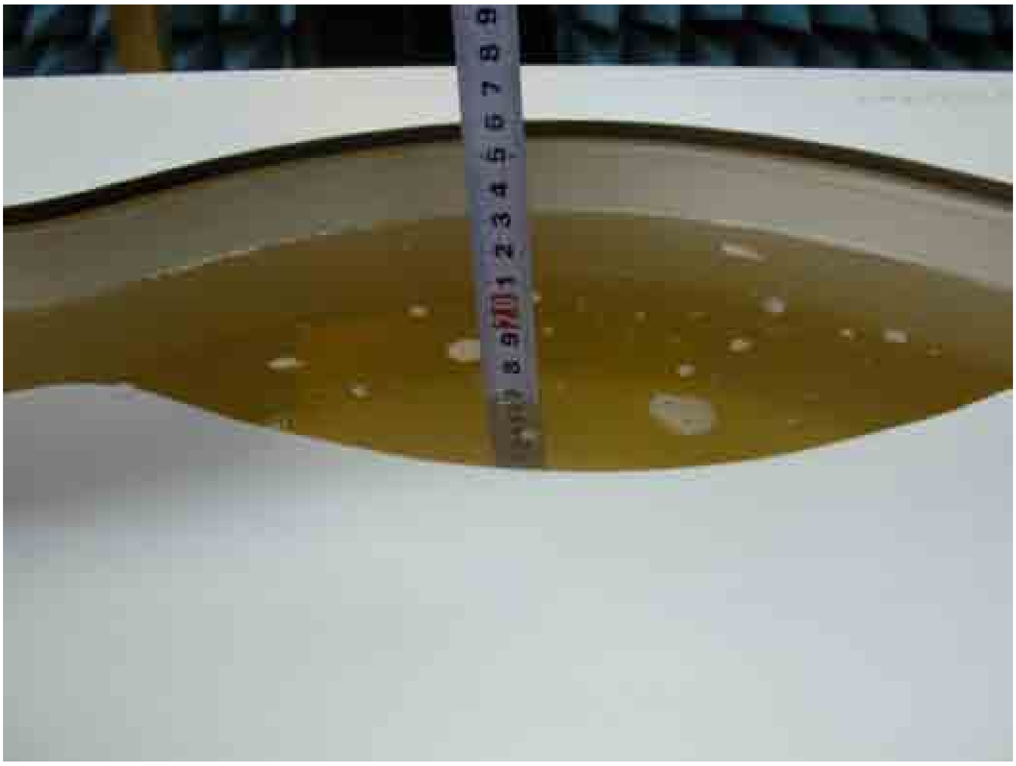


Picture A: SAR Measurement Points in Area Scan

ANNEX B TEST LAYOUT

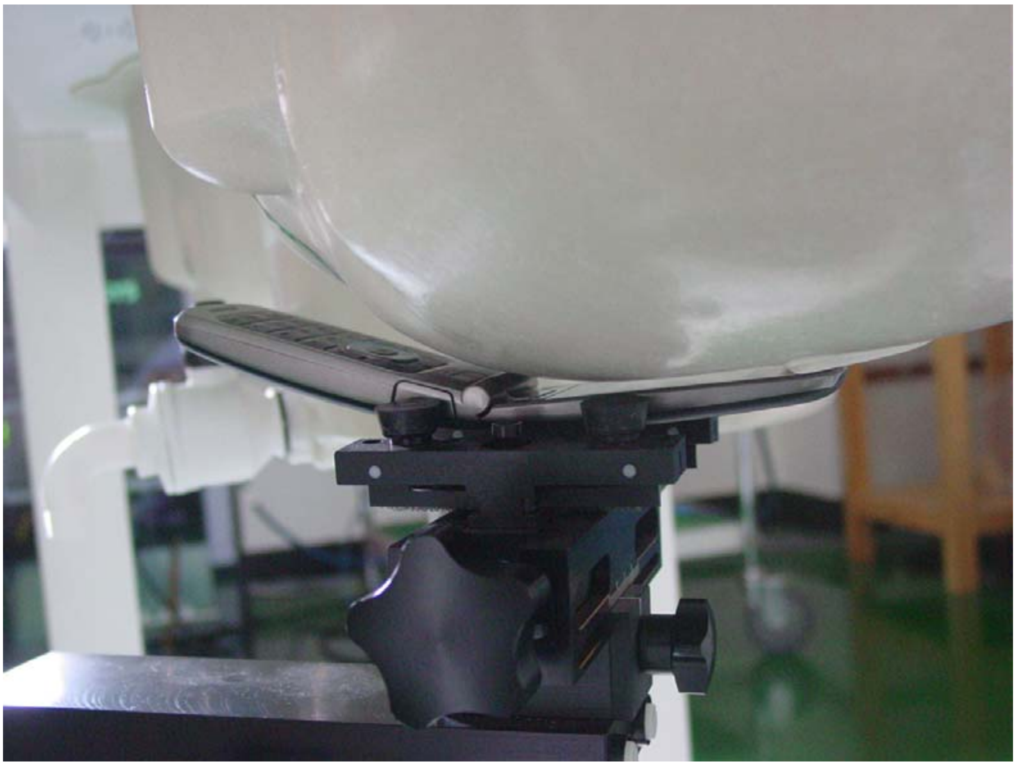


Picture B1: Specific Absorption Rate Test Layout



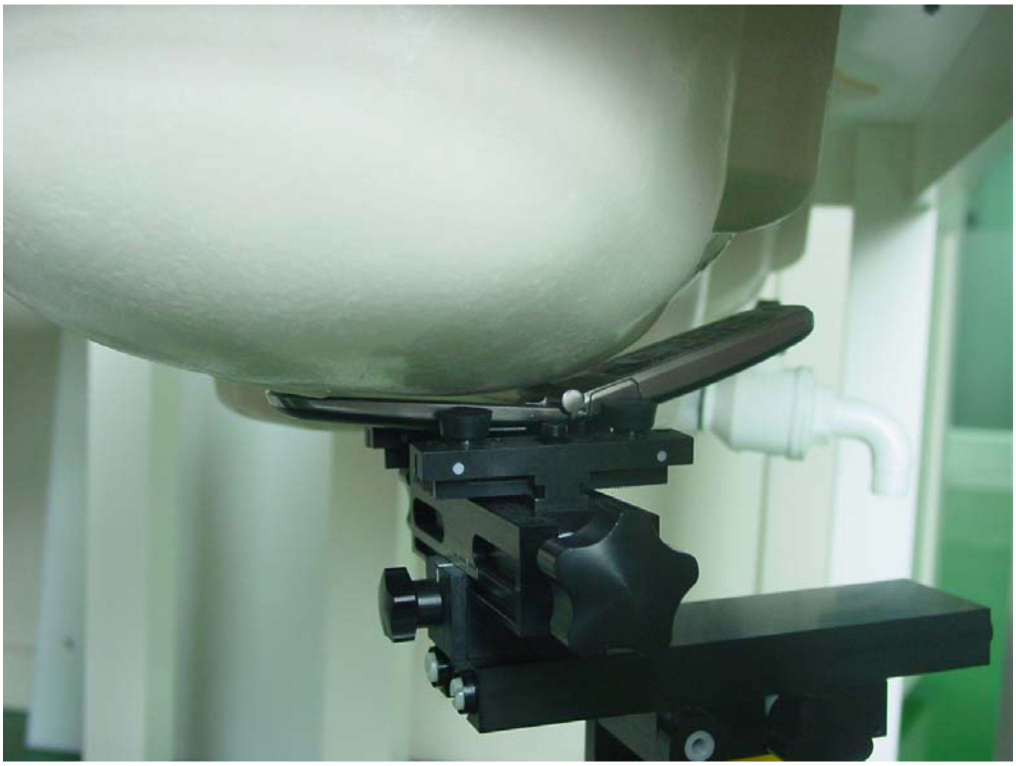
Picture B2: Liquid depth in the Flat Phantom (850 MHz)

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

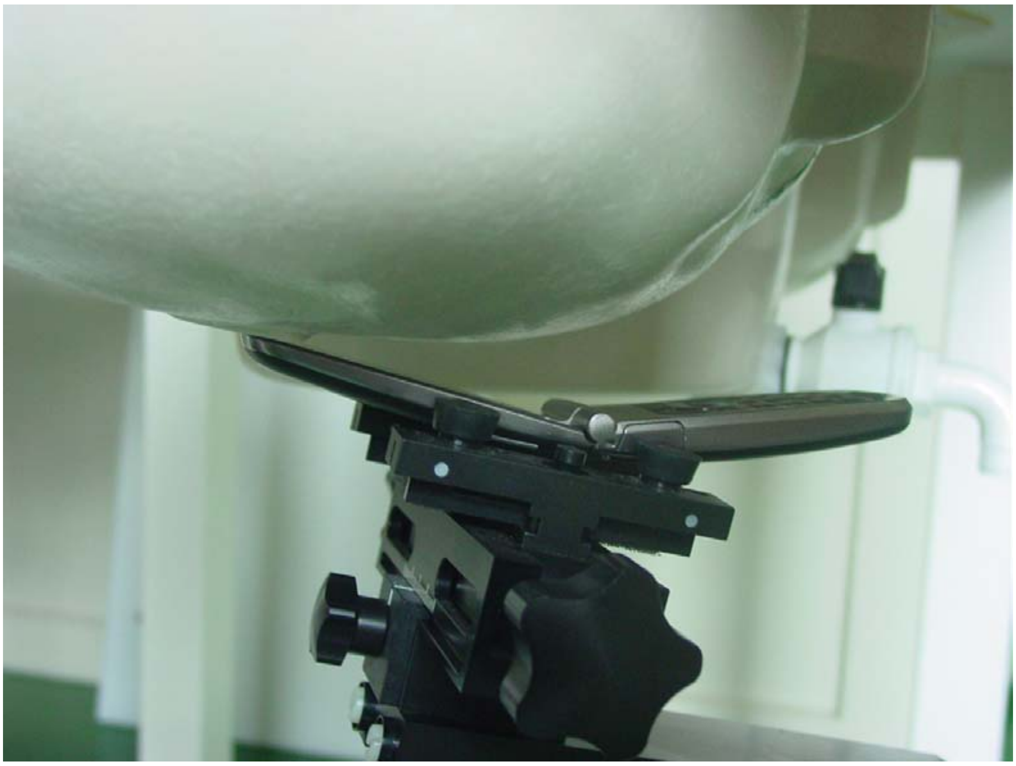


Picture B4: Left Hand Touch Cheek Position

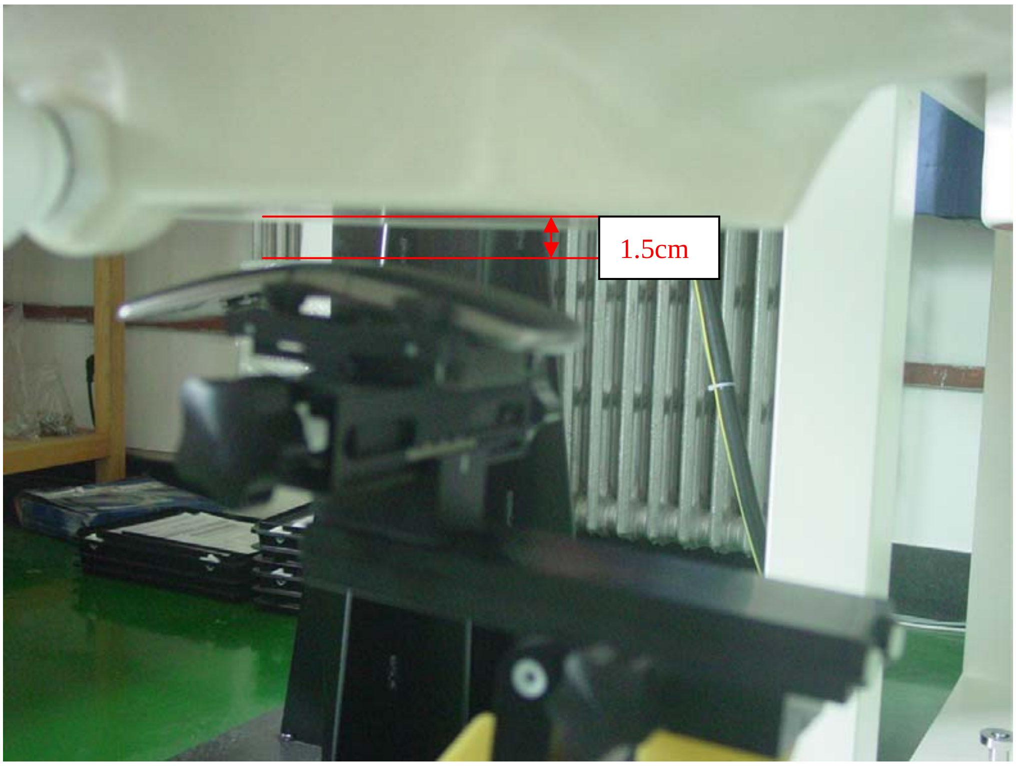
Picture B5: Left Hand Tilt 15° Position



Picture B6: Right Hand Touch Cheek Position



Picture B7: Right Hand Tilt 15° Position



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

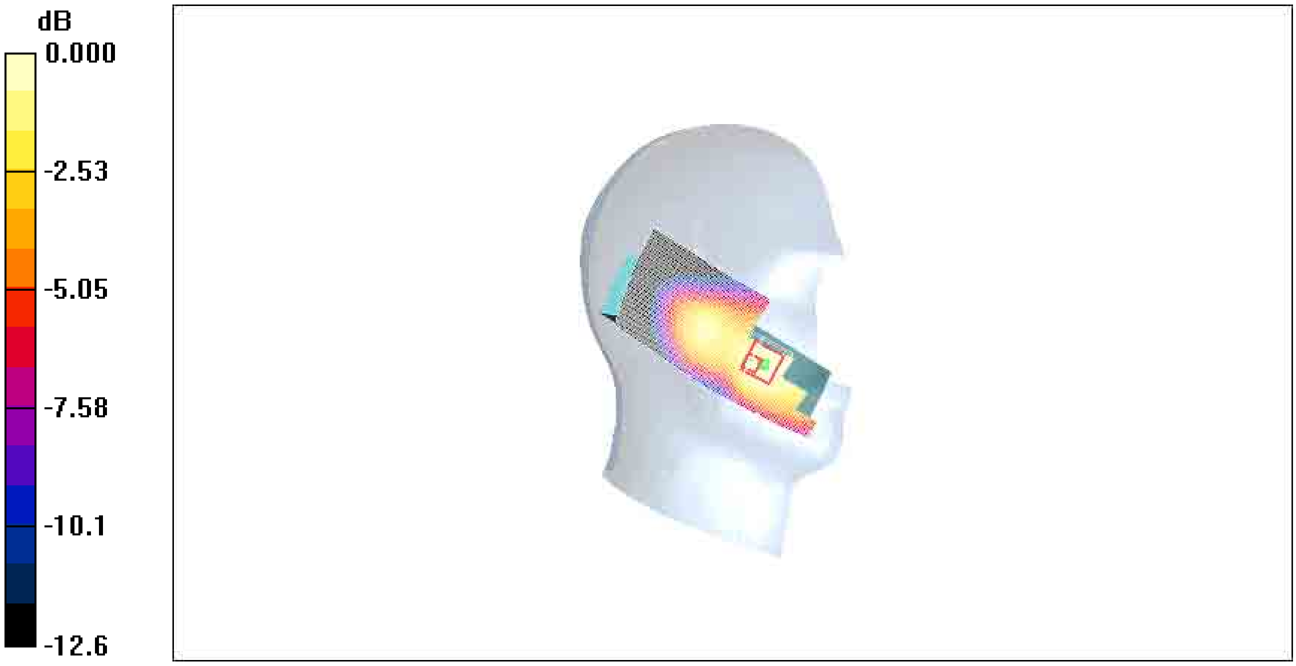
ANNEX C: GRAPH RESULTS

850 Left Cheek High

Date/Time: 2008-7-1 13:47:14
Electronics: DAE4 Sn777
Medium: Head GSM850
Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.92 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: 848.8 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3142 ConvF(5.97, 5.97, 5.97)

Cheek High/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.429 mW/g

Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.32 V/m; Power Drift = -0.200 dB
Peak SAR (extrapolated) = 0.687 W/kg
SAR(1 g) = 0.391 mW/g; SAR(10 g) = 0.267 mW/g
Maximum value of SAR (measured) = 0.417 mW/g



0 dB = 0.417mW/g

Fig. 1 850MHz CH251

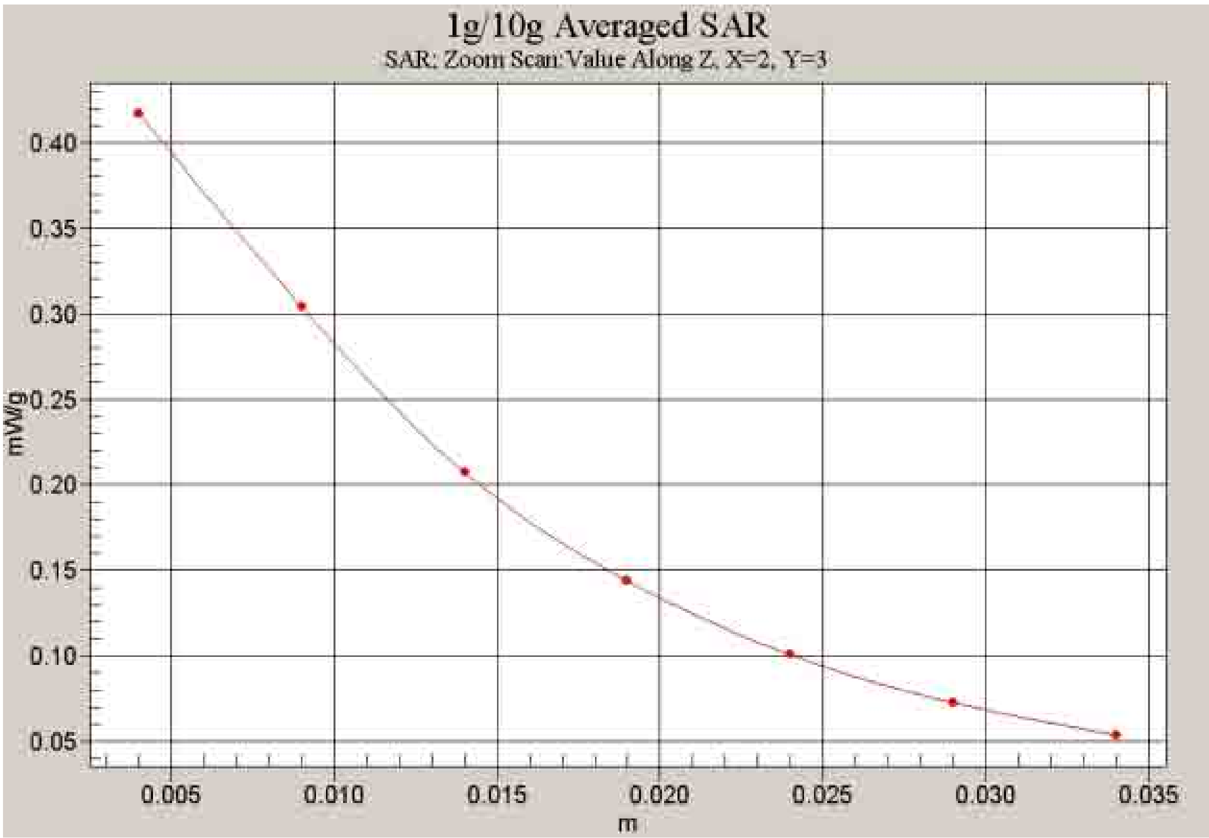


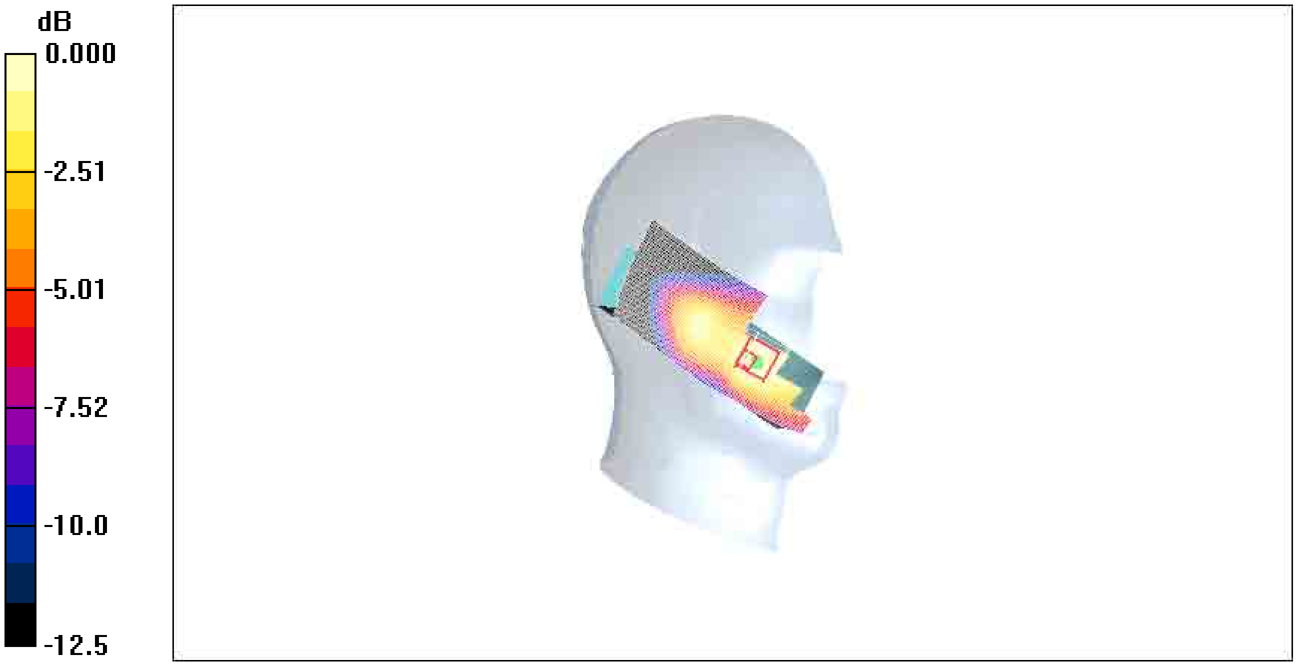
Fig. 2 Z-Scan at power reference point (850 MHz CH251)

850 Left Cheek Middle

Date/Time: 2008-7-1 14:02:50
Electronics: DAE4 Sn777
Medium: Head GSM850
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.909 mho/m; ε_r = 43.5; 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: ES3DV3 - SN3142 ConvF(5.97, 5.97, 5.97)

Cheek Middle/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.448 mW/g

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.42 V/m; Power Drift = -0.075 dB
Peak SAR (extrapolated) = 0.772 W/kg
SAR(1 g) = 0.418 mW/g; SAR(10 g) = 0.284 mW/g
Maximum value of SAR (measured) = 0.446 mW/g



0 dB = 0.446mW/g

Fig. 3 850 MHz CH190

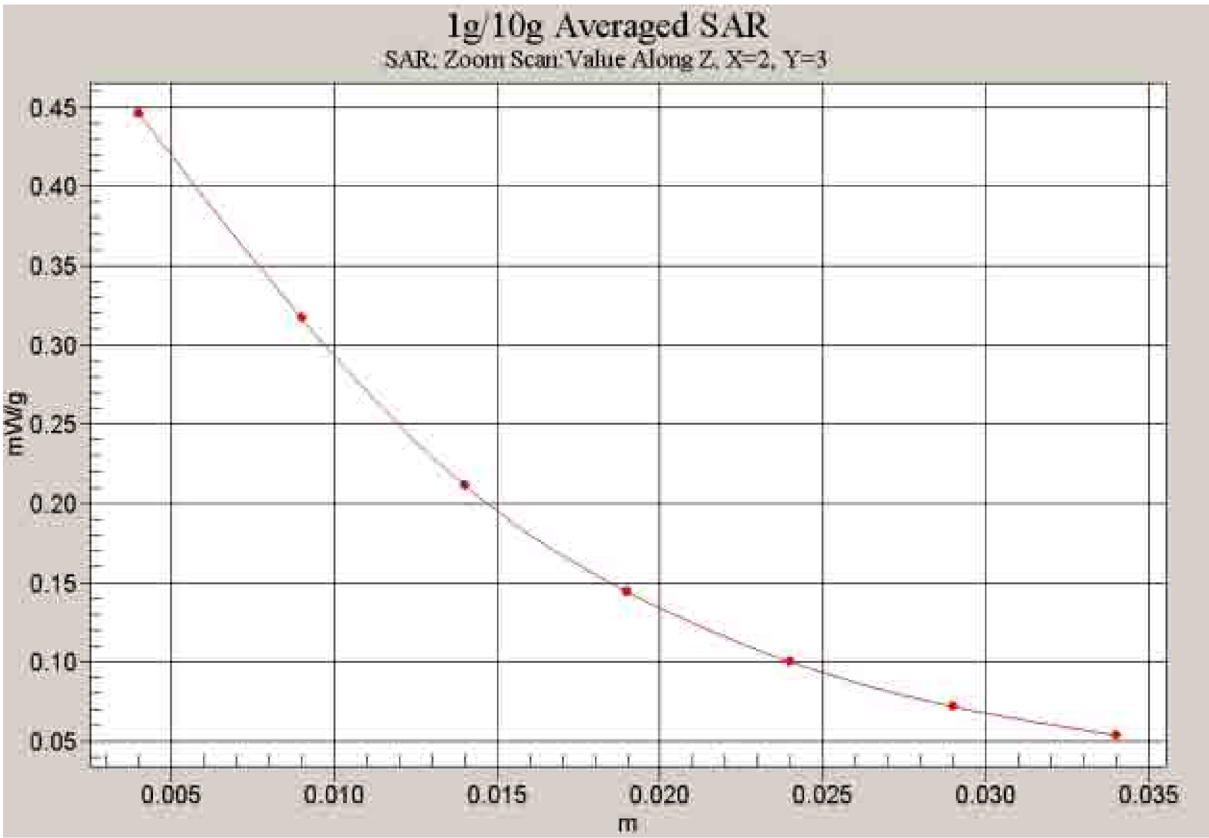


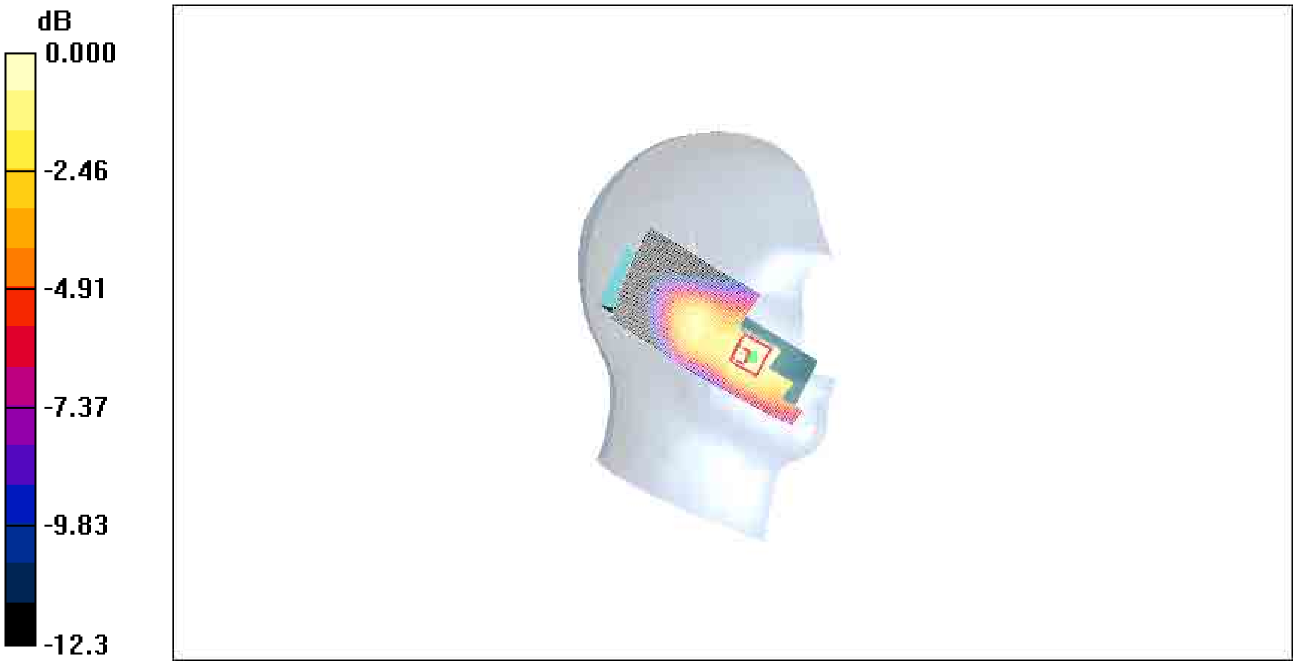
Fig. 4 Z-Scan at power reference point (850 MHz CH190)

850 Left Cheek Low

Date/Time: 2008-7-1 14:28:03
Electronics: DAE4 Sn777
Medium: Head GSM850
Medium parameters used: f = 825 MHz; σ = 0.897 mho/m; ε_r = 43.6; 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: ES3DV3 - SN3142 ConvF(5.97, 5.97, 5.97)

Cheek Low/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.408 mW/g

Cheek Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.06 V/m; Power Drift = -0.112 dB
Peak SAR (extrapolated) = 0.722 W/kg
SAR(1 g) = 0.382 mW/g; SAR(10 g) = 0.258 mW/g
Maximum value of SAR (measured) = 0.405 mW/g



0 dB = 0.405mW/g

Fig. 5 850 MHz CH128

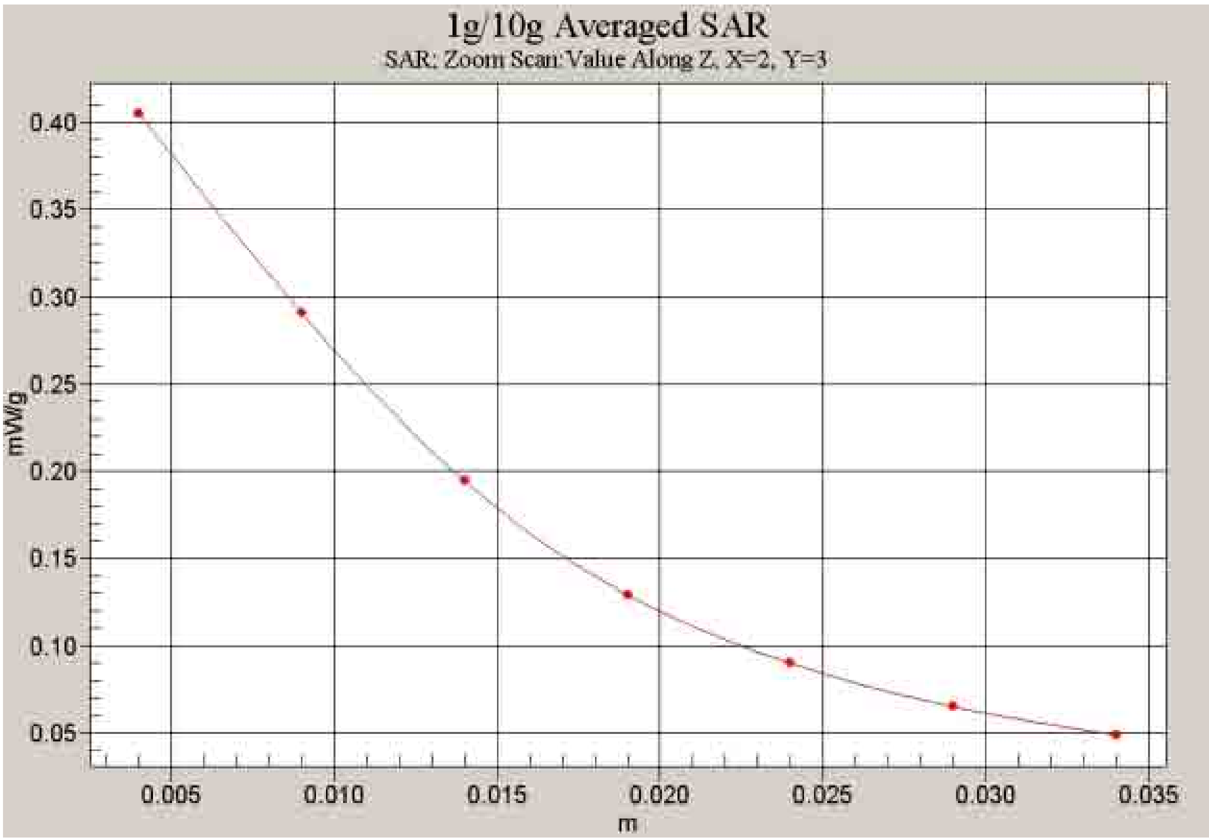


Fig. 6 Z-Scan at power reference point (850 MHz CH190)

850 Left Tilt High

Date/Time: 2008-7-1 14:56:09

Electronics: DAE4 Sn777

Medium: Head GSM850

Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.92 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: 848.8 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3142 ConvF(5.97, 5.97, 5.97)

Tilt High/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.129 mW/g

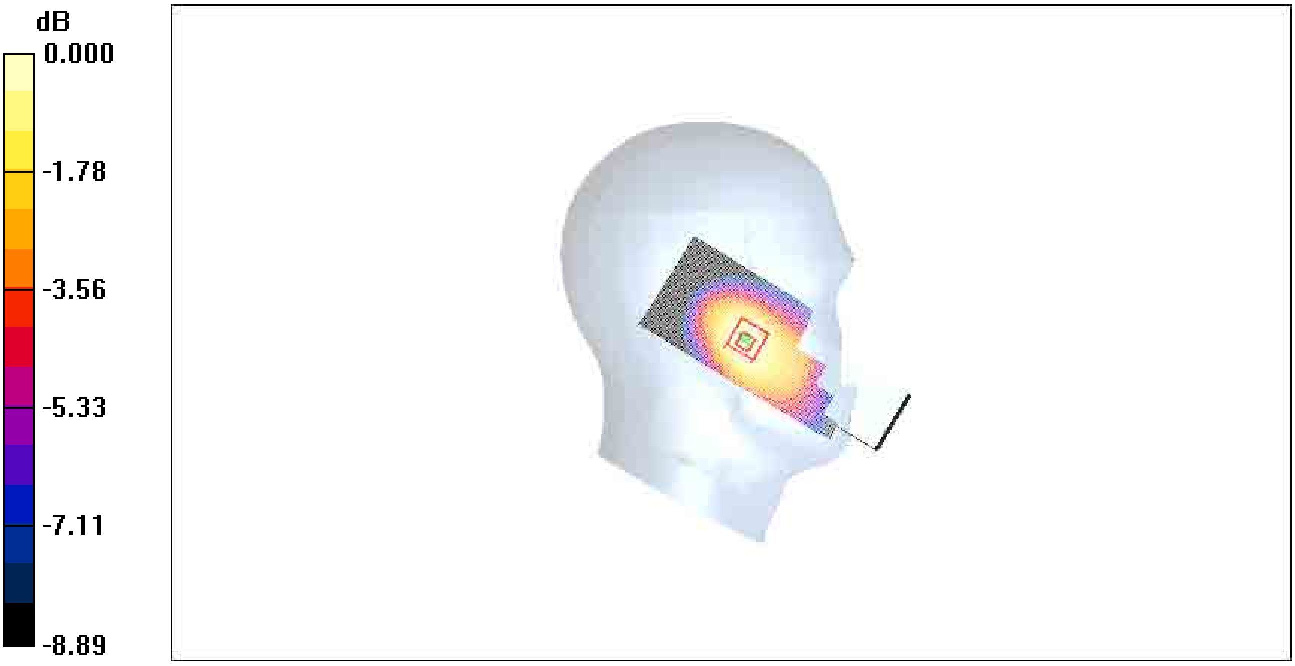
Tilt High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.20 V/m; Power Drift = 0.100 dB

Peak SAR (extrapolated) = 0.159 W/kg

SAR(1 g) = 0.122 mW/g; SAR(10 g) = 0.088 mW/g

Maximum value of SAR (measured) = 0.128 mW/g



0 dB = 0.128mW/g

Fig.7 850 MHz CH251

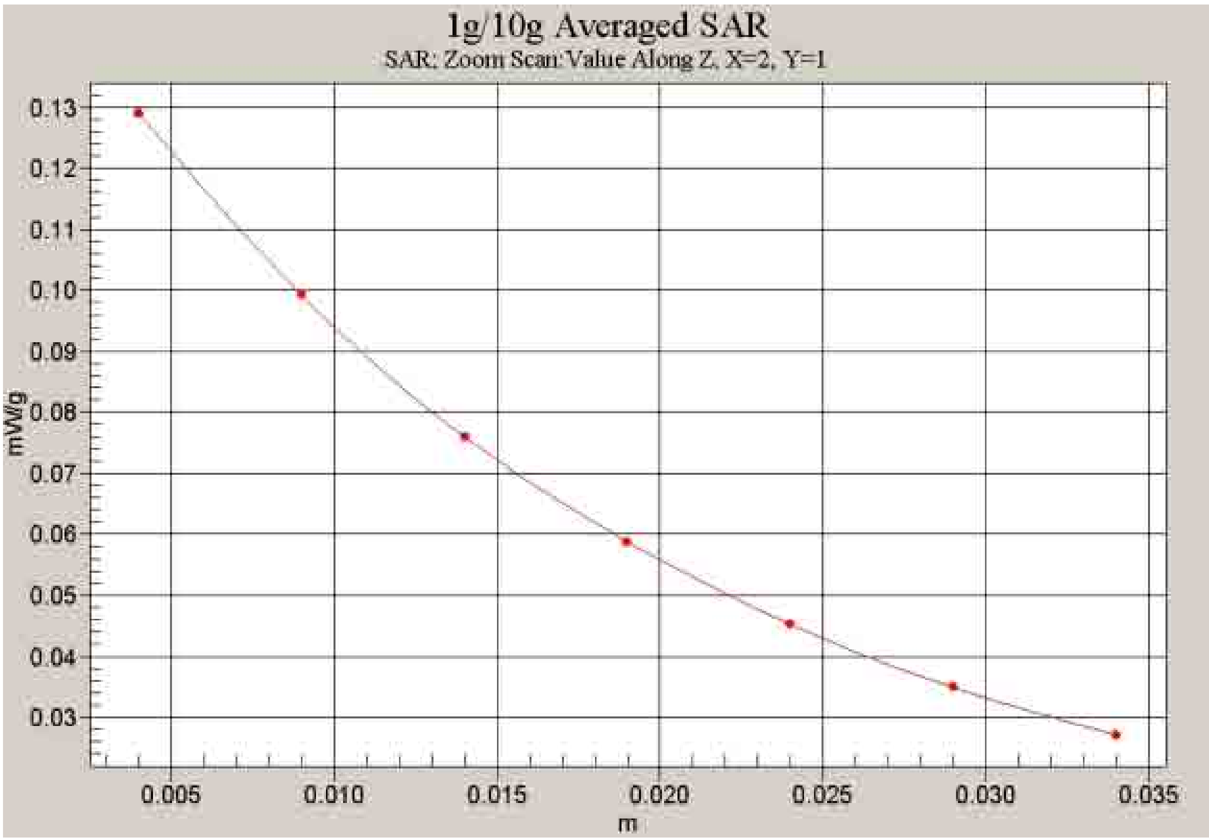


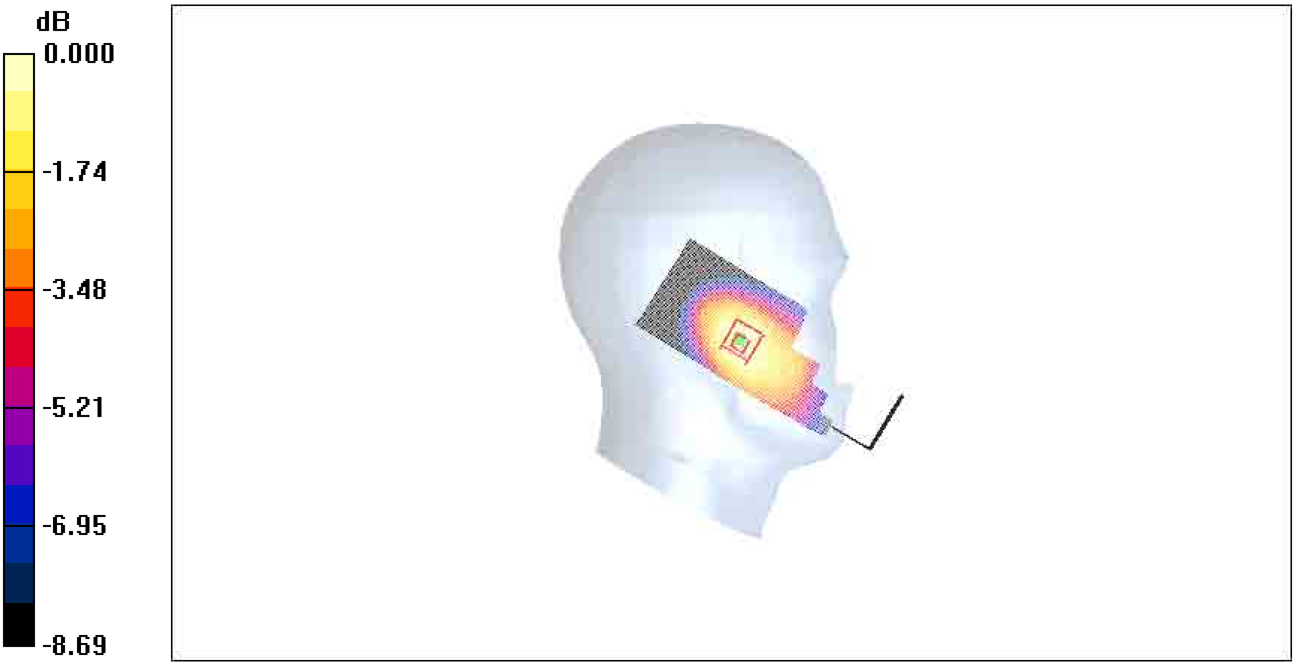
Fig. 8 Z-Scan at power reference point (850 MHz CH251)

850 Left Tilt Middle

Date/Time: 2008-7-1 15:06:56
Electronics: DAE4 Sn777
Medium: Head GSM850
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.909 mho/m; ε_r = 43.5; 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: ES3DV3 - SN3142 ConvF(5.97, 5.97, 5.97)

Tilt Middle/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.132 mW/g

Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.48 V/m; Power Drift = -0.009 dB
Peak SAR (extrapolated) = 0.162 W/kg
SAR(1 g) = 0.126 mW/g; SAR(10 g) = 0.091 mW/g
Maximum value of SAR (measured) = 0.133 mW/g



0 dB = 0.133mW/g

Fig.9 850 MHz CH190

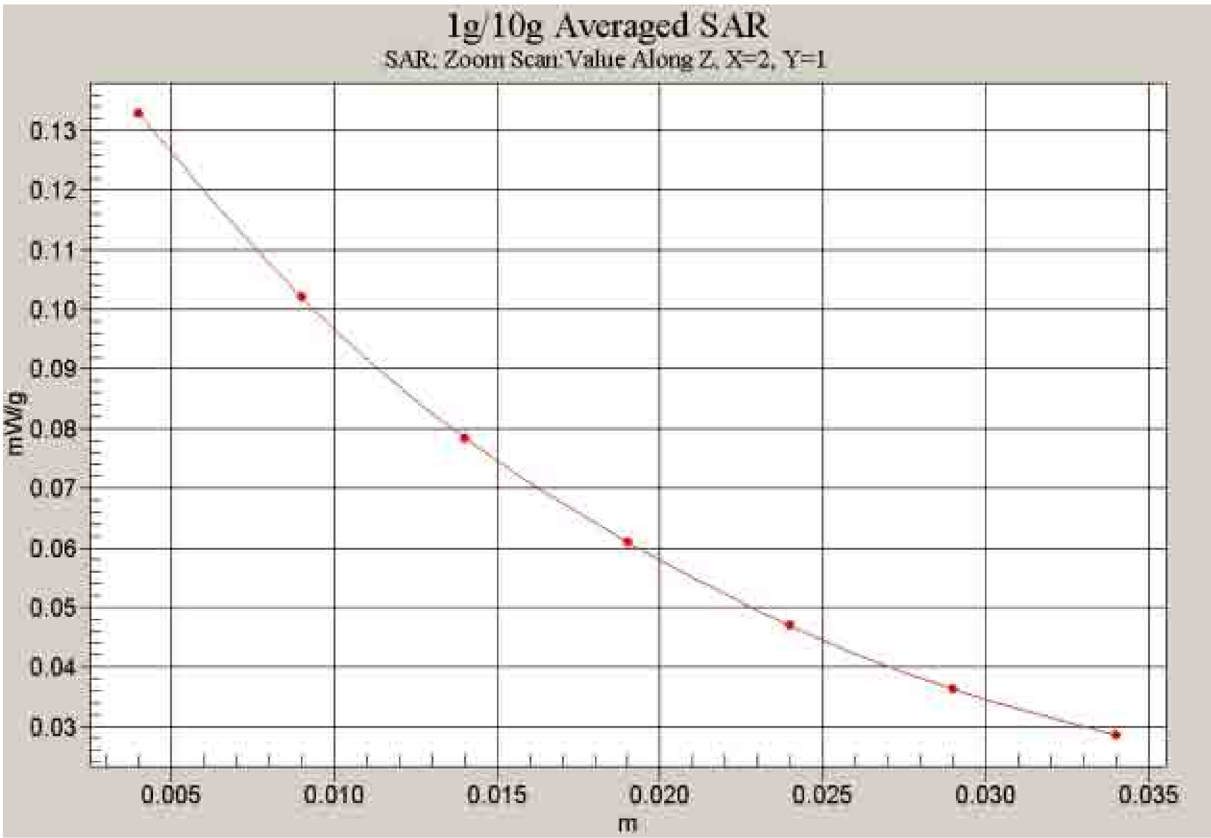


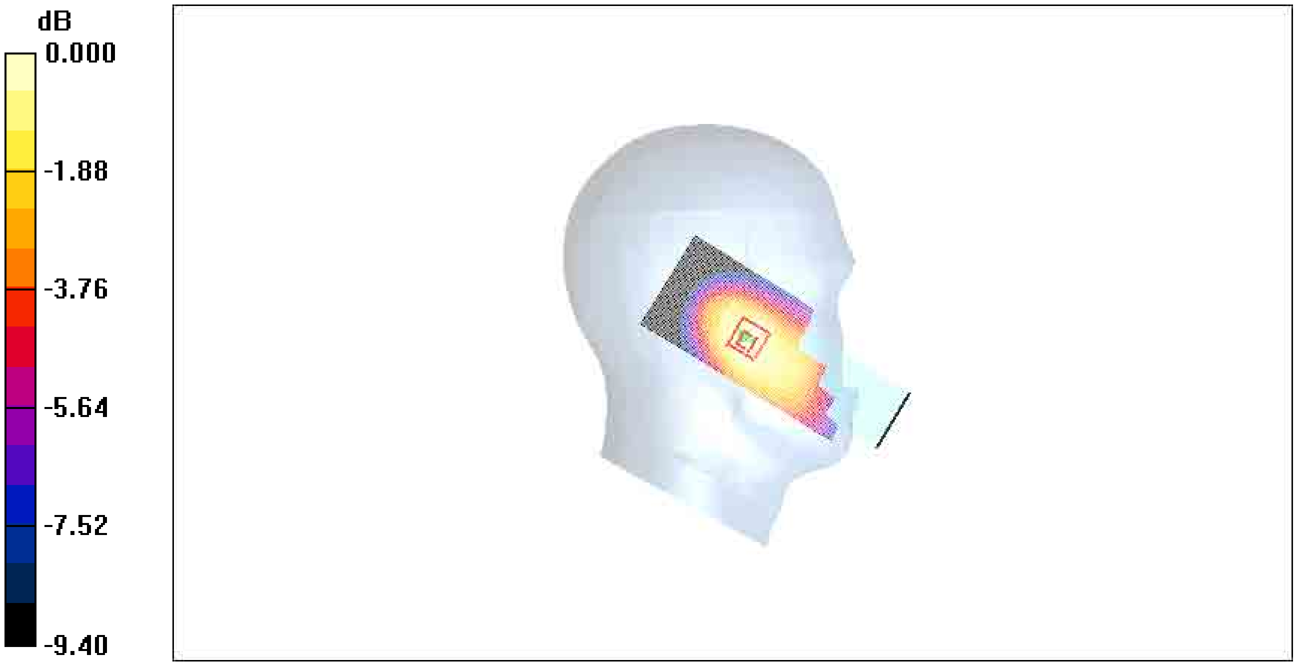
Fig. 10 Z-Scan at power reference point (850 MHz CH190)

850 Left Tilt Low

Date/Time: 2008-7-1 15:18:58
Electronics: DAE4 Sn777
Medium: Head GSM850
Medium parameters used: f = 825 MHz; σ = 0.897 mho/m; ε_r = 43.6; 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: ES3DV3 - SN3142 ConvF(5.97, 5.97, 5.97)

Tilt Low/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.111 mW/g

Tilt Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.07 V/m; Power Drift = -0.033 dB
Peak SAR (extrapolated) = 0.137 W/kg
SAR(1 g) = 0.106 mW/g; SAR(10 g) = 0.078 mW/g
Maximum value of SAR (measured) = 0.111 mW/g



0 dB = 0.111mW/g

Fig. 11 850 MHz CH128

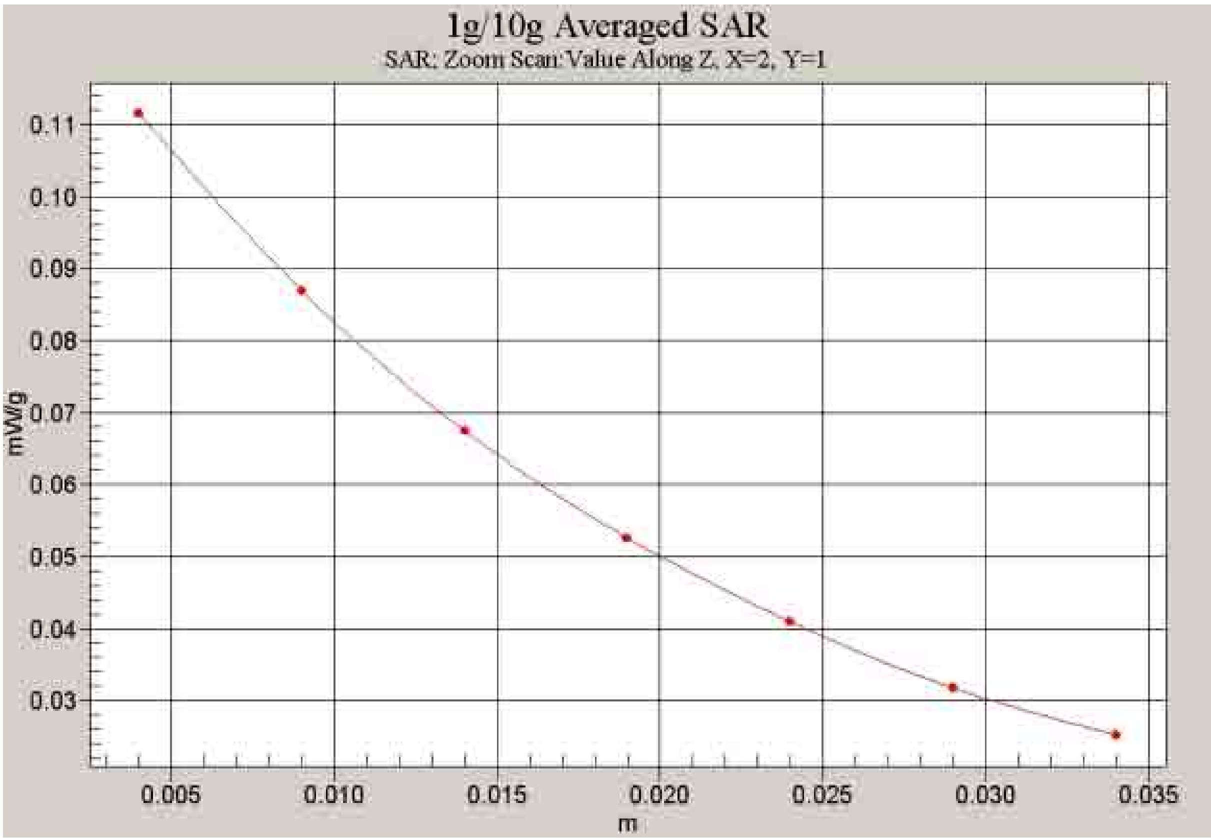
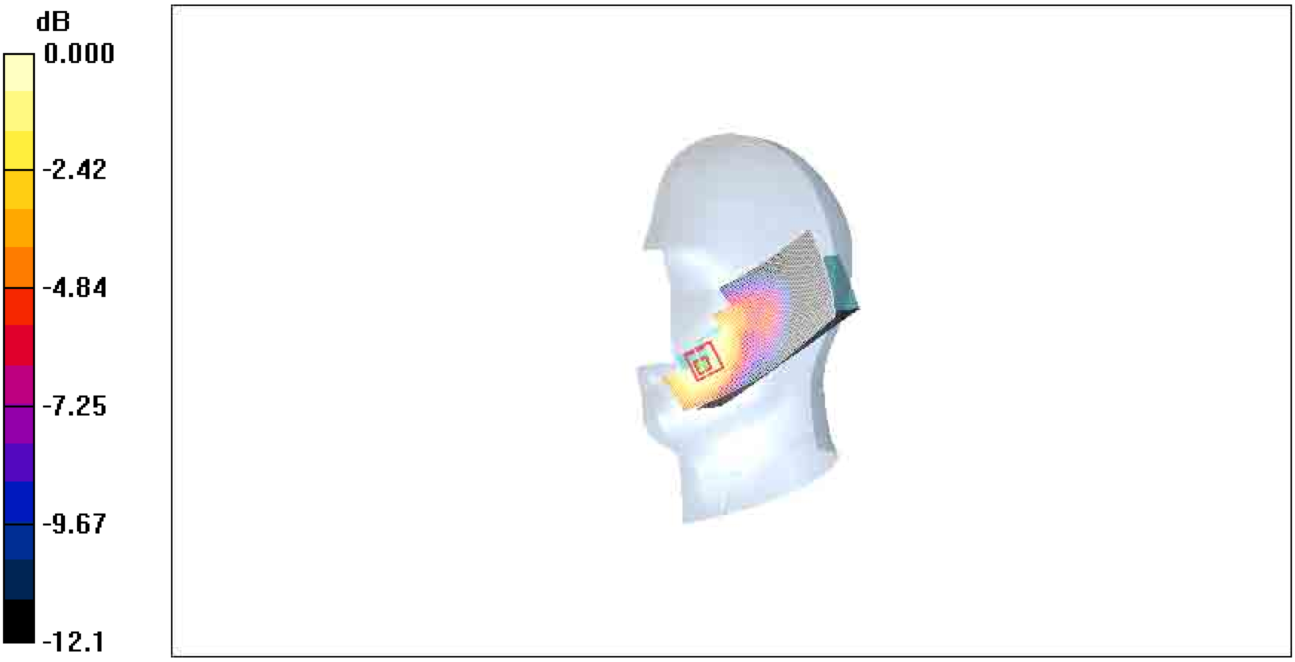


Fig. 12 Z-Scan at power reference point (850 MHz CH128)

850 Right Cheek High
Date/Time: 2008-7-1 15:37:49
Electronics: DAE4 Sn777
Medium: Head GSM850
Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.92 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: 848.8 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3142 ConvF(5.97, 5.97, 5.97)

Cheek High/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.535 mW/g

Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.61 V/m; Power Drift = -0.112 dB
Peak SAR (extrapolated) = 0.752 W/kg
SAR(1 g) = 0.500 mW/g; SAR(10 g) = 0.328 mW/g
Maximum value of SAR (measured) = 0.543 mW/g



0 dB = 0.543mW/g

Fig. 13 850 MHz CH251

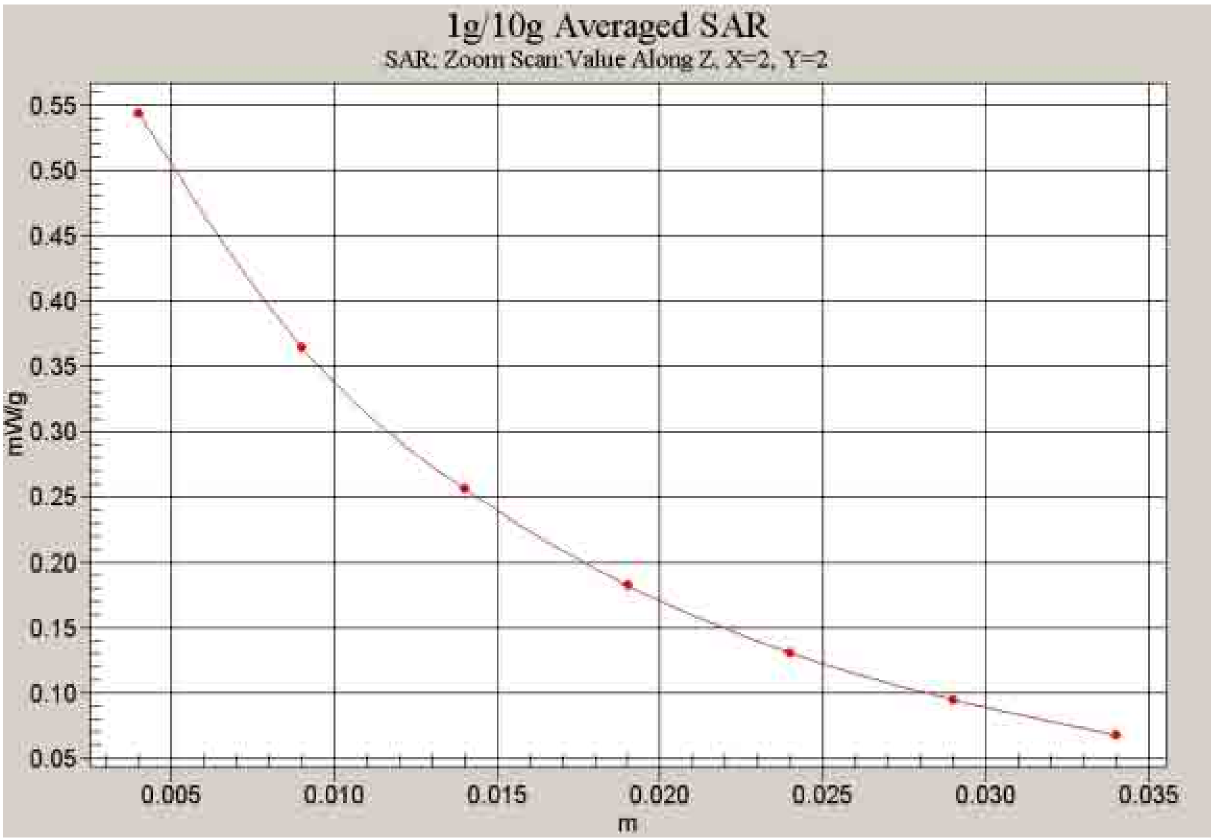
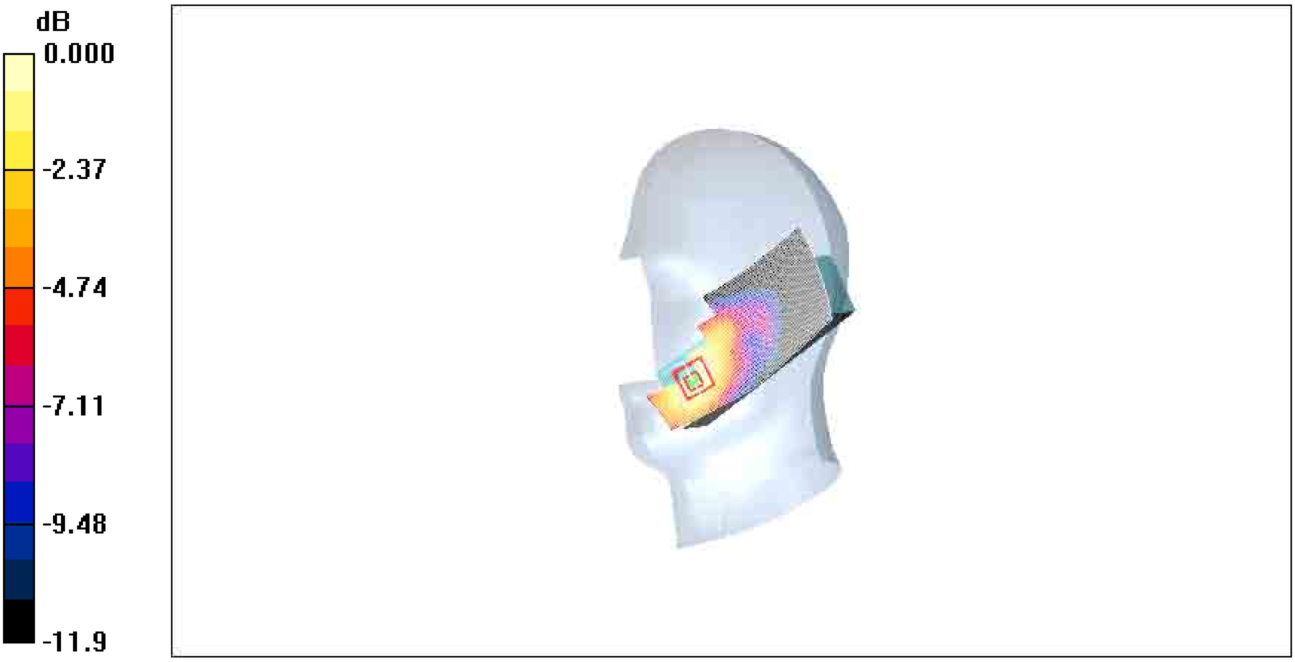


Fig. 14 Z-Scan at power reference point (850 MHz CH251)

850 Right Cheek Middle
Date/Time: 2008-7-1 16:00:05
Electronics: DAE4 Sn777
Medium: Head GSM850
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.909 mho/m; ε_r = 43.5; 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: ES3DV3 - SN3142 ConvF(5.97, 5.97, 5.97)

Cheek Middle/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.685 mW/g

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.72 V/m; Power Drift = 0.200 dB
Peak SAR (extrapolated) = 0.947 W/kg
SAR(1 g) = 0.633 mW/g; SAR(10 g) = 0.413 mW/g
Maximum value of SAR (measured) = 0.689 mW/g



0 dB = 0.689mW/g

Fig. 15 850 MHz CH190

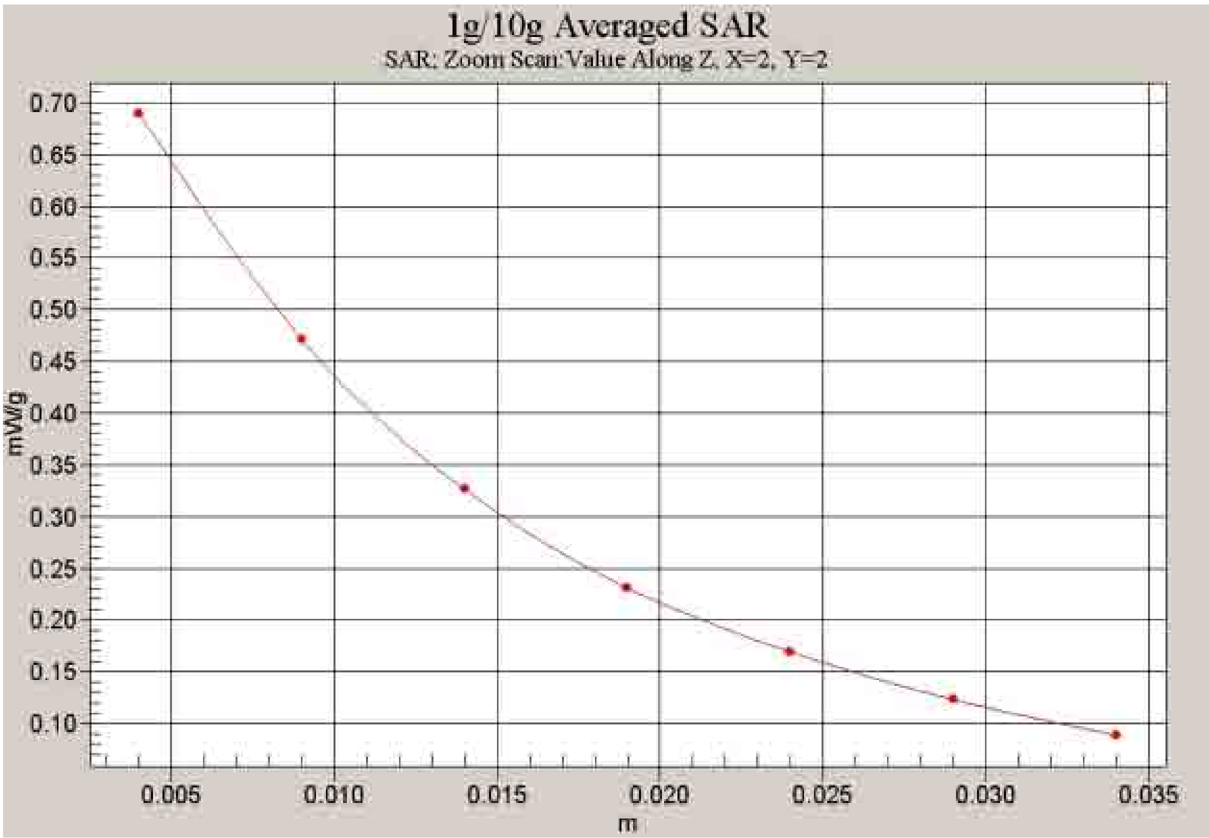
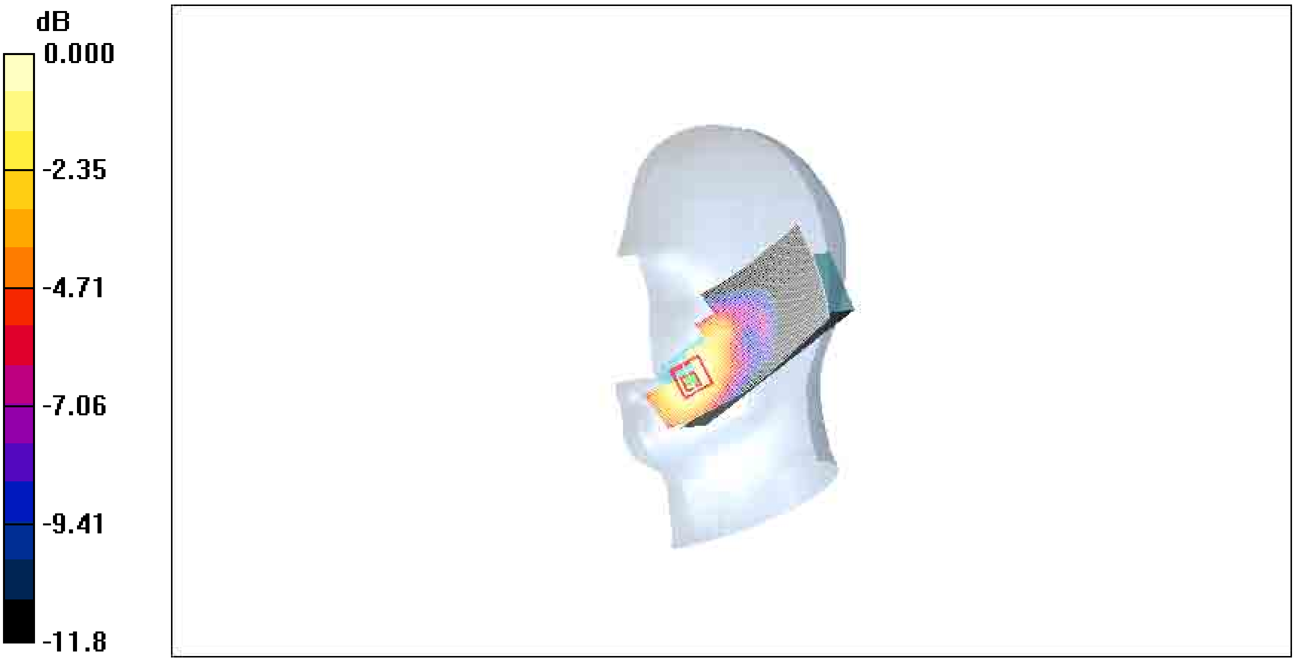


Fig. 16 Z-Scan at power reference point (850 MHz CH190)

850 Right Cheek Low
Date/Time: 2008-7-1 16:15:06
Electronics: DAE4 Sn777
Medium: Head GSM850
Medium parameters used: f = 825 MHz; σ = 0.897 mho/m; ε_r = 43.6; 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: ES3DV3 - SN3142 ConvF(5.97, 5.97, 5.97)

Cheek Low/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.608 mW/g

Cheek Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.56 V/m; Power Drift = -0.200 dB
Peak SAR (extrapolated) = 0.837 W/kg
SAR(1 g) = 0.562 mW/g; SAR(10 g) = 0.367 mW/g
Maximum value of SAR (measured) = 0.612 mW/g



0 dB = 0.612mW/g

Fig. 17 850 MHz CH128

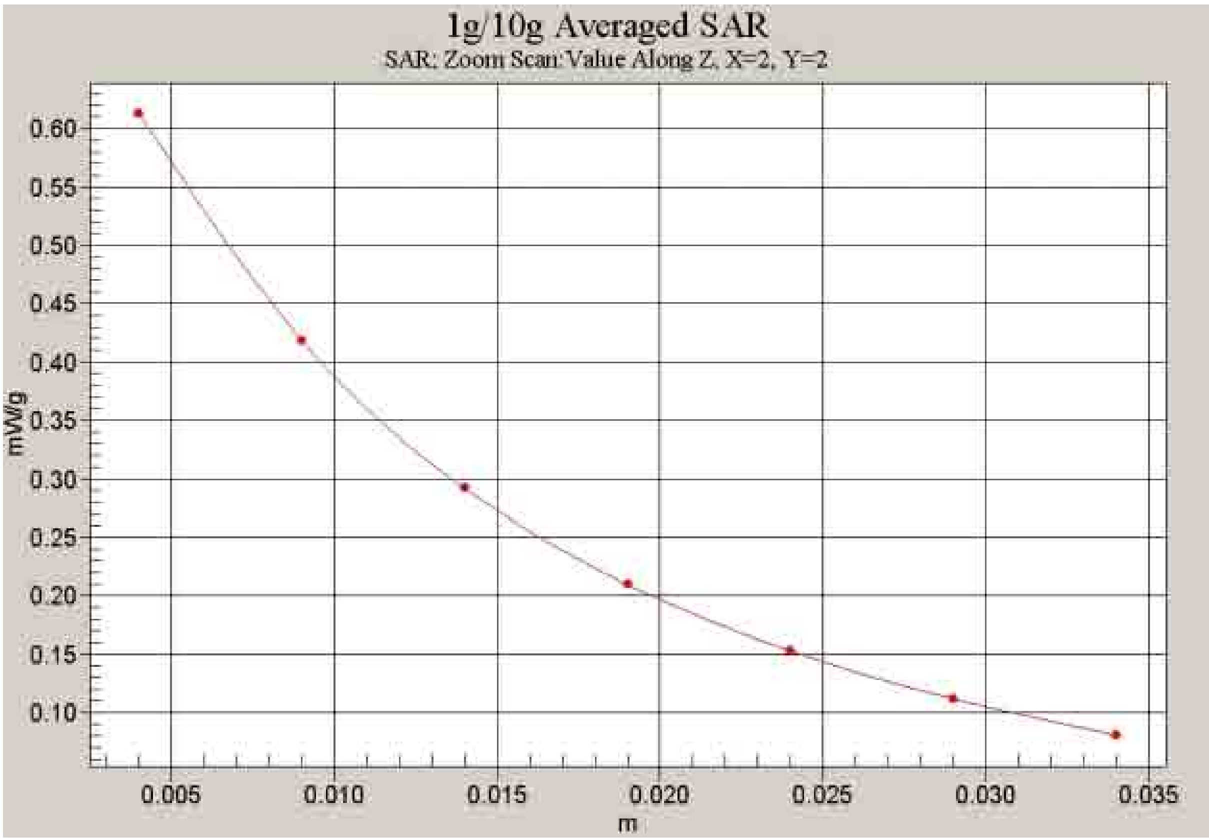


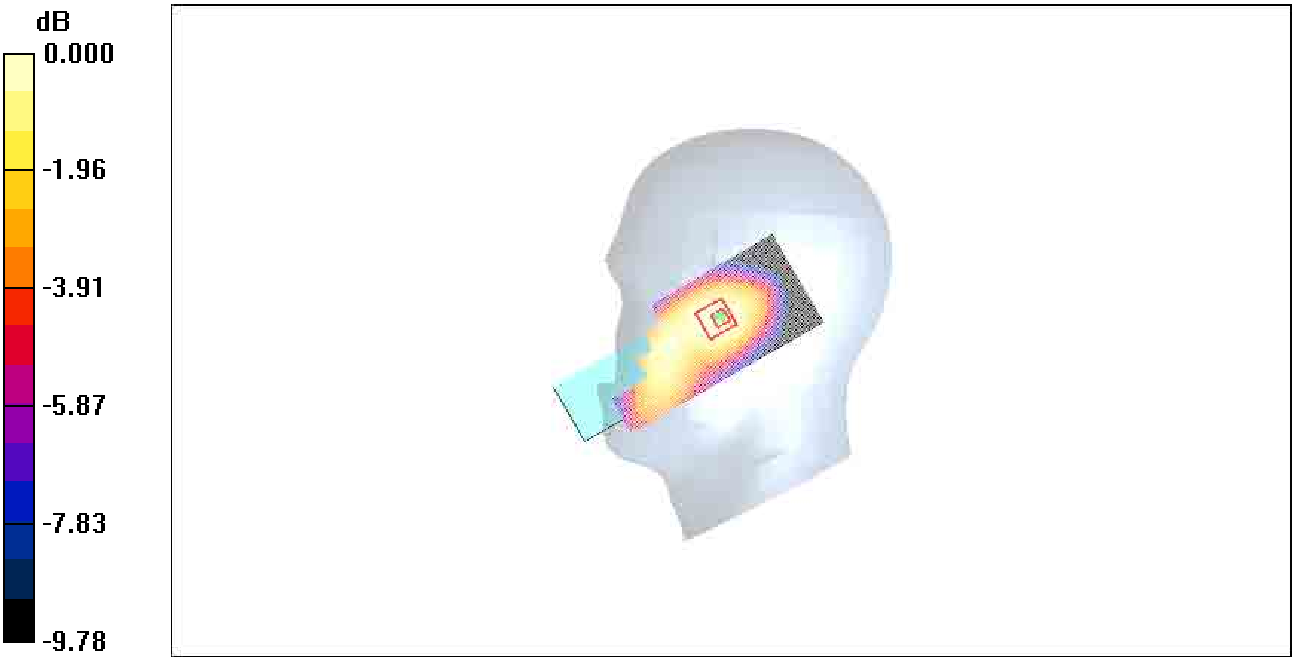
Fig. 18 Z-Scan at power reference point (850 MHz CH128)

850 Right Tilt High

Date/Time: 2008-7-1 16:47:00
Electronics: DAE4 Sn777
Medium: Head GSM850
Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.92 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: 848.8 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3142 ConvF(5.97, 5.97, 5.97)

Tilt High/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.134 mW/g

Tilt High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.98 V/m; Power Drift = 0.027 dB
Peak SAR (extrapolated) = 0.168 W/kg
SAR(1 g) = 0.126 mW/g; SAR(10 g) = 0.091 mW/g
Maximum value of SAR (measured) = 0.132 mW/g



0 dB = 0.132mW/g

Fig.19 850 MHz CH251

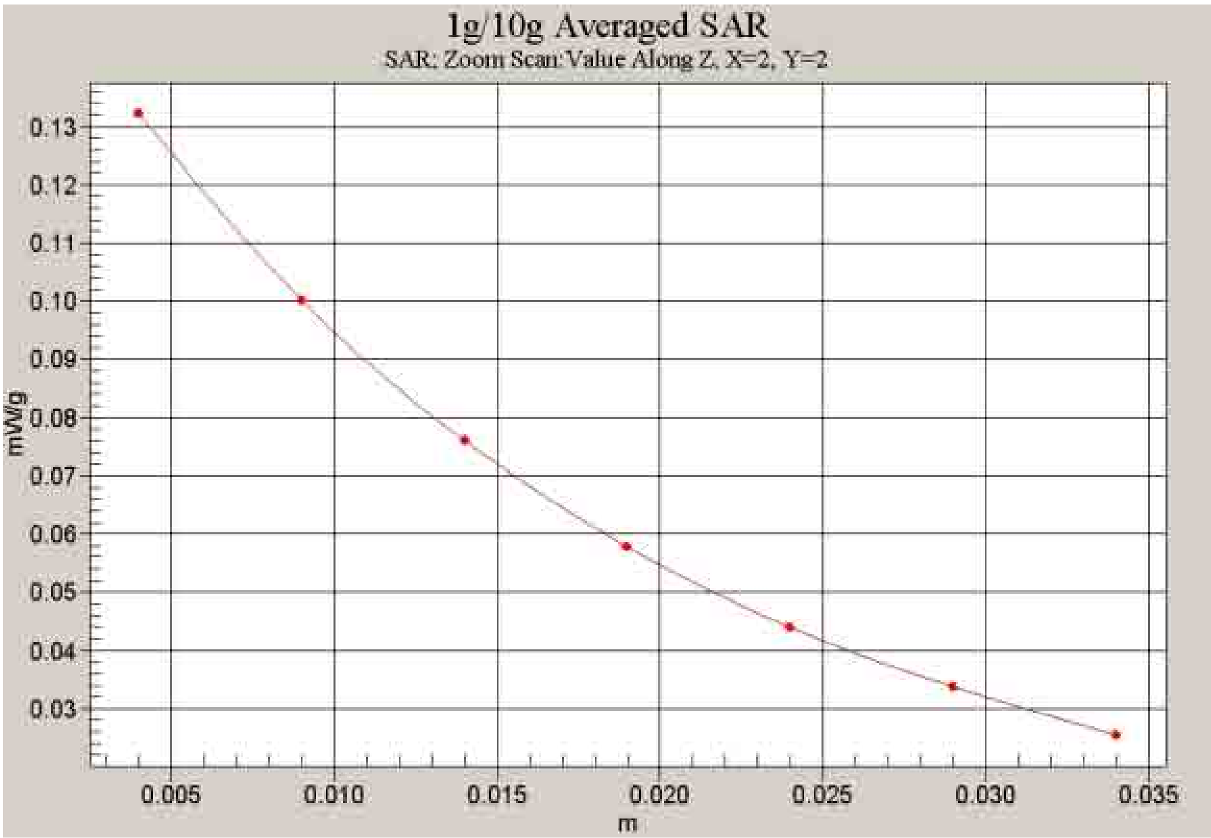


Fig. 20 Z-Scan at power reference point (850 MHz CH251)

850 Right Tilt Middle

Date/Time: 2008-7-1 17:11:28

Electronics: DAE4 Sn777

Medium: Head GSM850

Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.909 mho/m; ε_r = 43.5; 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: ES3DV3 - SN3142 ConvF(5.97, 5.97, 5.97)

Tilt Middle/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm

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

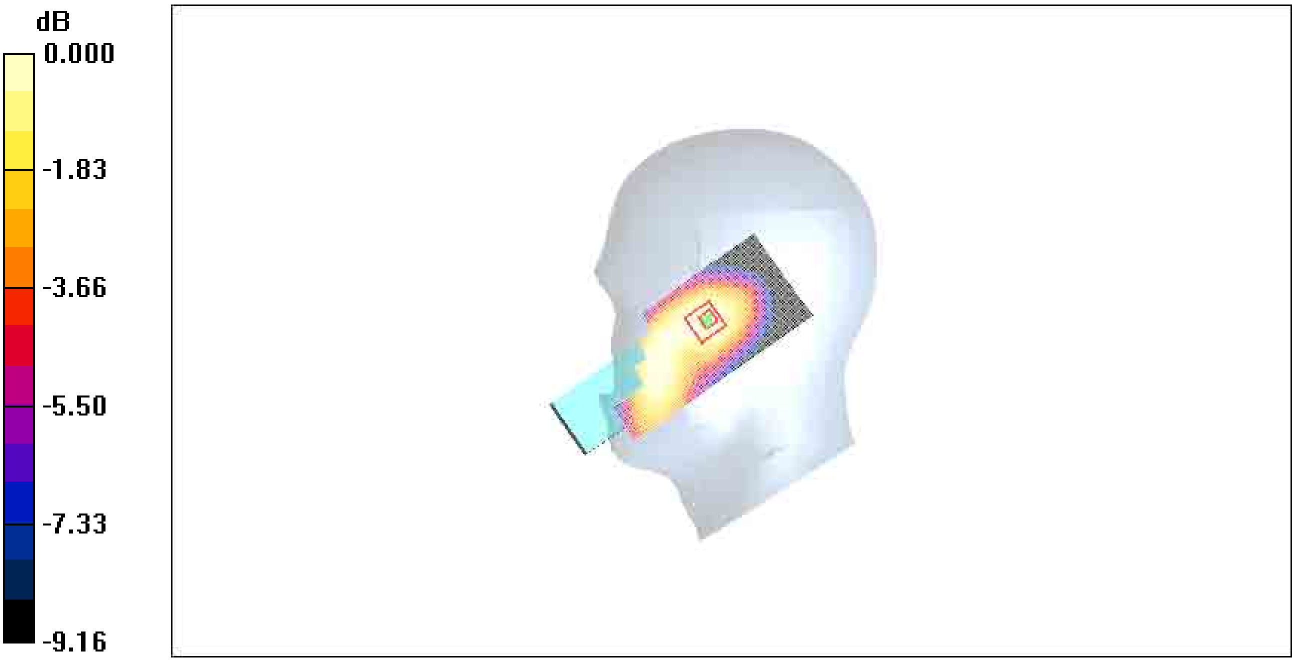
Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.73 V/m; Power Drift = -0.134 dB

Peak SAR (extrapolated) = 0.150 W/kg

SAR(1 g) = 0.113 mW/g; SAR(10 g) = 0.082 mW/g

Maximum value of SAR (measured) = 0.119 mW/g



0 dB = 0.119mW/g

Fig.21 850 MHz CH190

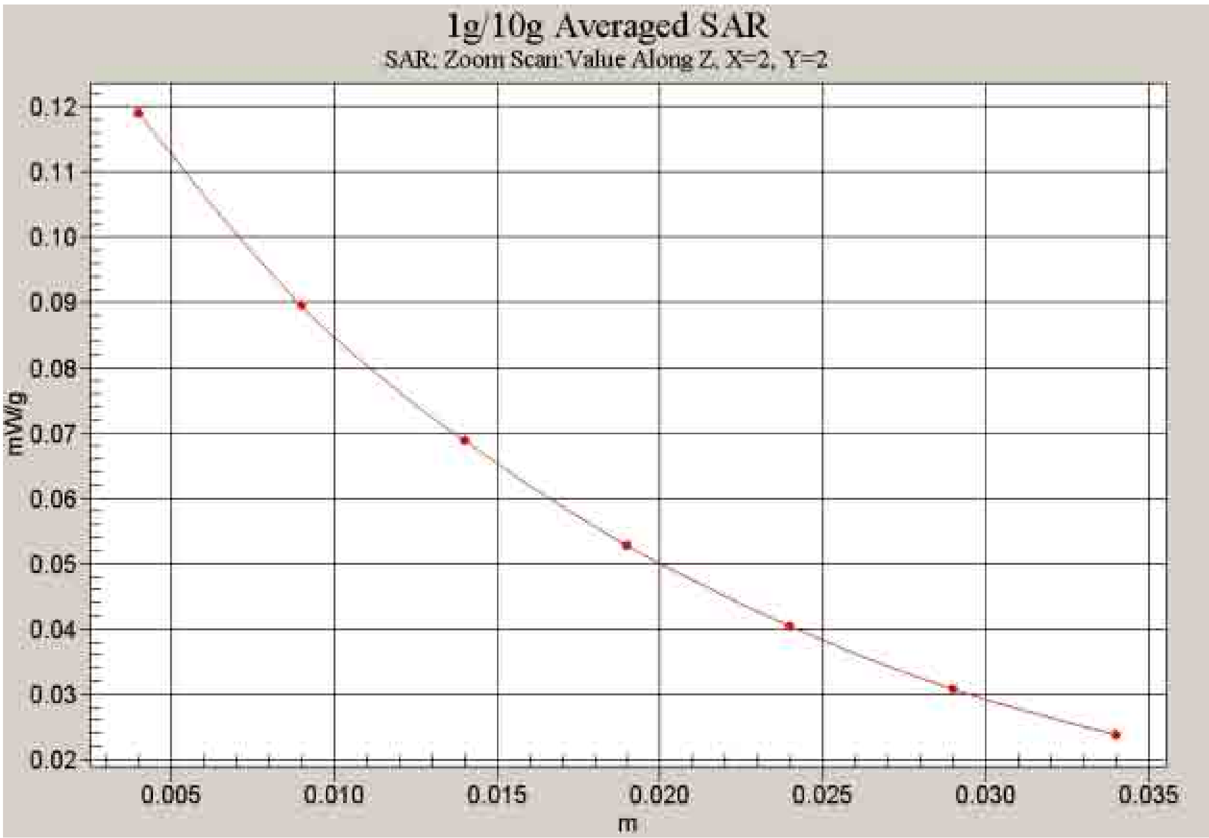


Fig. 22 Z-Scan at power reference point (850 MHz CH190)

850 Right Tilt Low

Date/Time: 2008-7-1 17:32:28

Electronics: DAE4 Sn777

Medium: Head GSM850

Medium parameters used: f = 825 MHz; σ = 0.897 mho/m; ε_r = 43.6; 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: ES3DV3 - SN3142 ConvF(5.97, 5.97, 5.97)

Tilt Low/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.105 mW/g

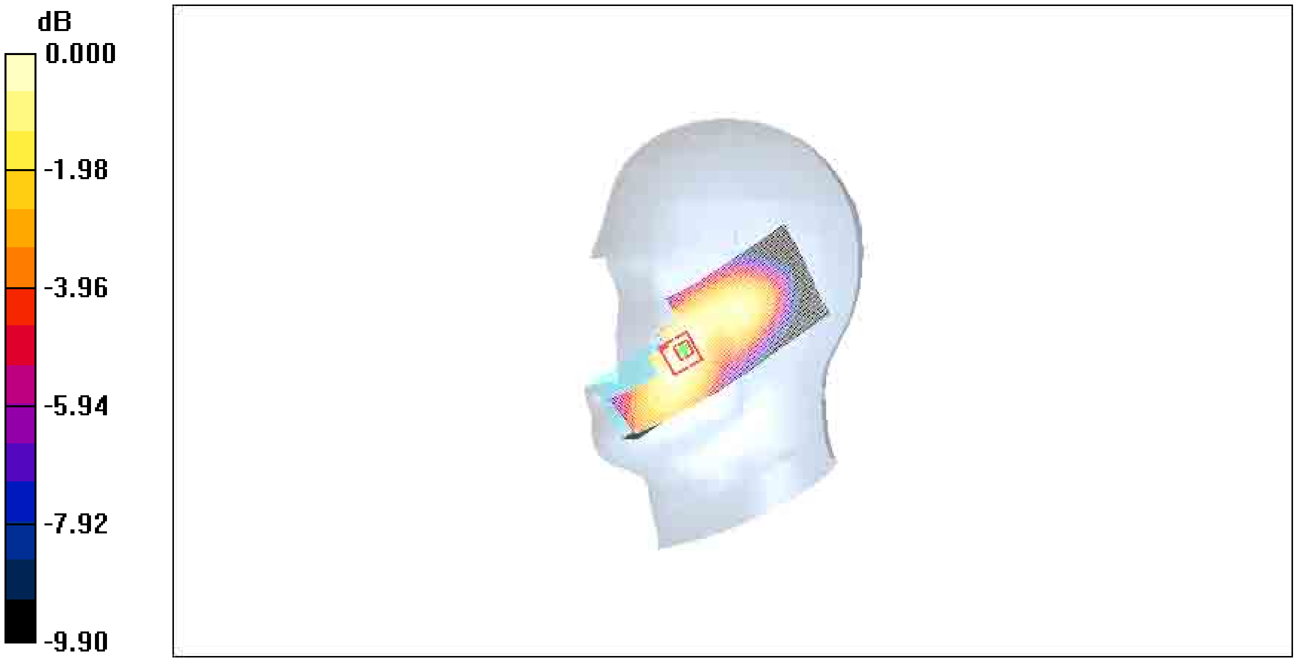
Tilt Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.51 V/m; Power Drift = -0.075 dB

Peak SAR (extrapolated) = 0.130 W/kg

SAR(1 g) = 0.098 mW/g; SAR(10 g) = 0.071 mW/g

Maximum value of SAR (measured) = 0.104 mW/g



0 dB = 0.104mW/g

Fig. 23   850 MHz CH128

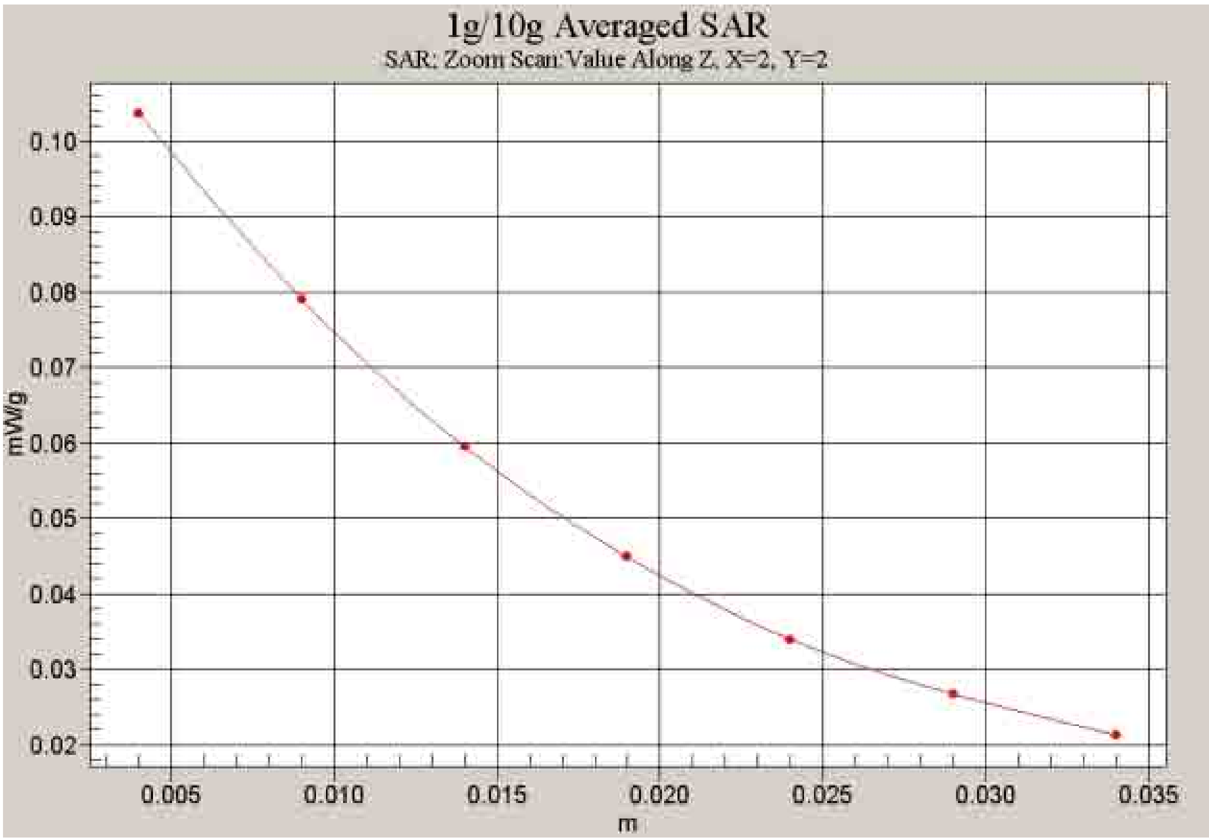


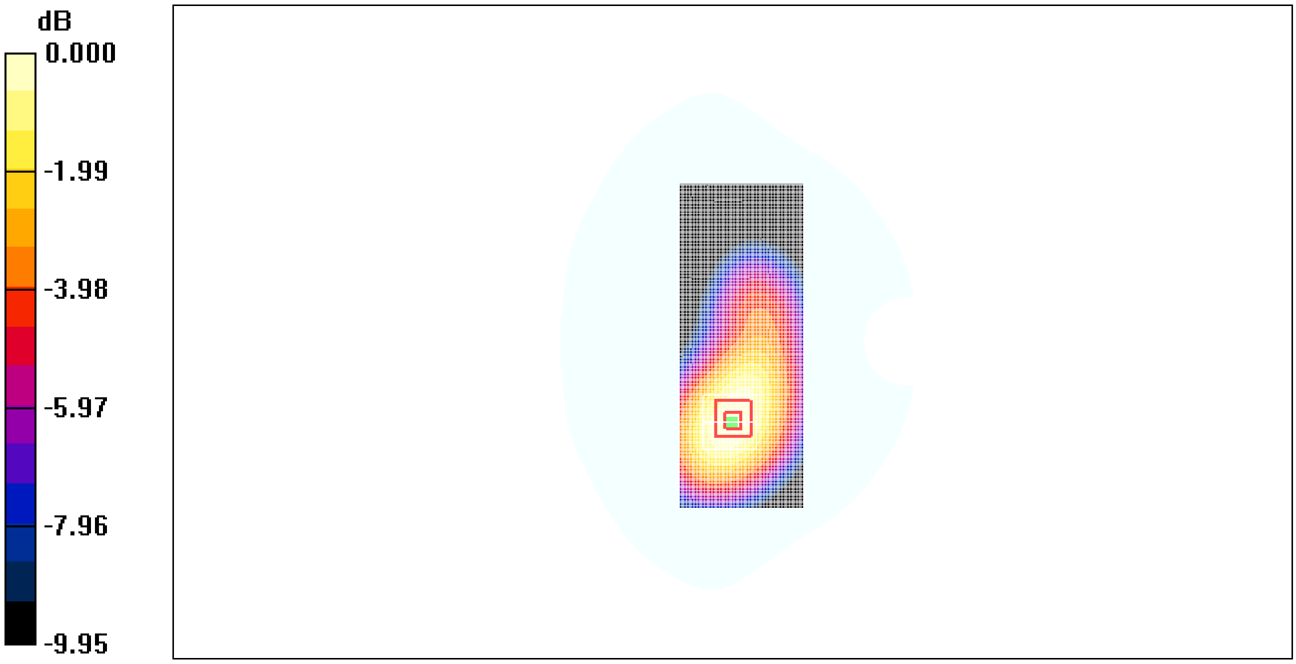
Fig. 24 Z-Scan at power reference point (850 MHz CH128)

850 Body Towards Ground High with GPRS

Date/Time: 2008-7-2 9:28:15
Electronics: DAE4 Sn777
Medium: 850 Body
Medium parameters used (interpolated): f = 848.8 MHz; σ = 1.01 mho/m; ε_r = 53.1; ρ = 1000 kg/m^3
Ambient Temperature:23.3°C   Liqiud Temperature: 22.5°C
Communication System: GSM 850 GPRS Frequency: 848.8 MHz Duty Cycle: 1:4
Probe: ES3DV3 - SN3142 ConvF(5.66, 5.66, 5.66)

Toward Ground High/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.867 mW/g

Toward Ground High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.8 V/m; Power Drift = 0.019 dB
Peak SAR (extrapolated) = 1.05 W/kg
SAR(1 g) = 0.805 mW/g; SAR(10 g) = 0.573 mW/g
Maximum value of SAR (measured) = 0.857 mW/g



0 dB = 0.857mW/g

Fig. 25 850 MHz CH251

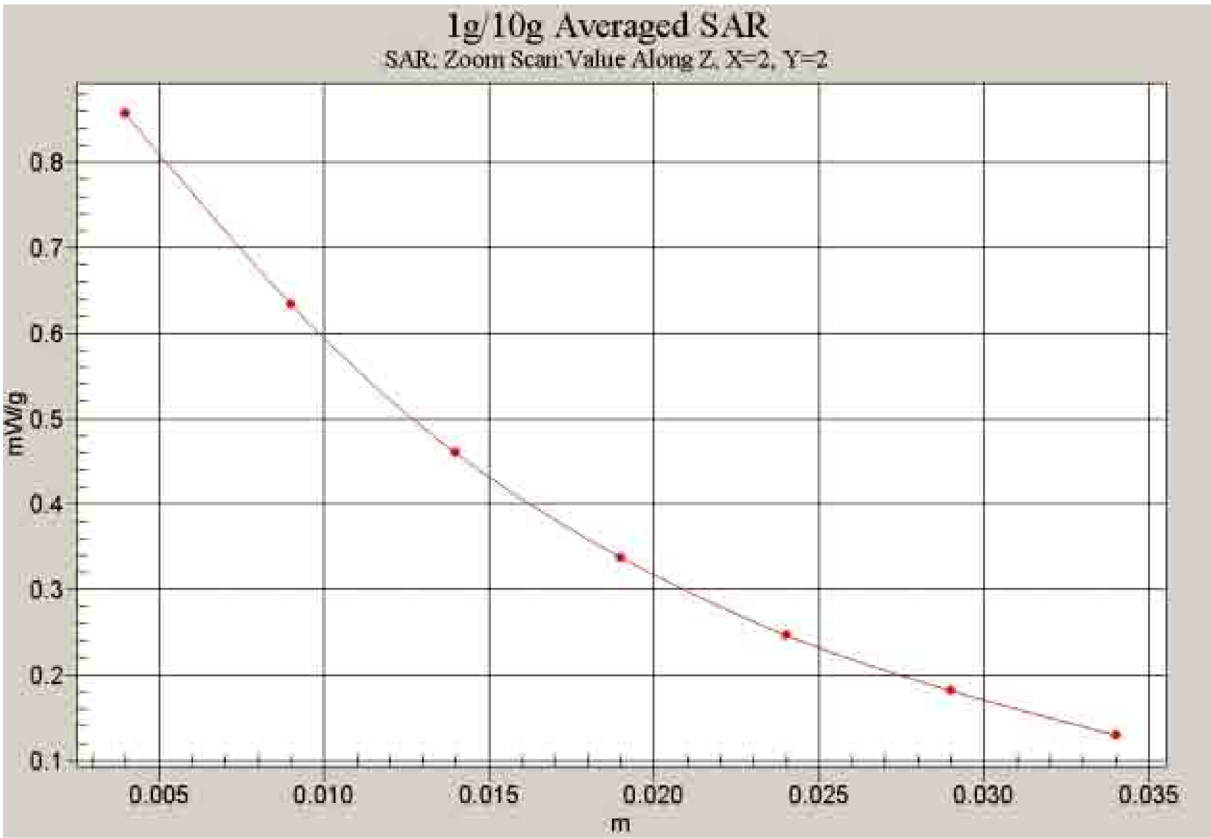


Fig. 26 Z-Scan at power reference point (850 MHz CH251)

850 Body Towards Ground Middle with GPRS

Date/Time: 2008-7-2 9:42:50

Electronics: DAE4 Sn777

Medium: 850 Body

Medium parameters used (interpolated): f = 836.6 MHz; σ = 1 mho/m; ε_r = 53.2; 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: ES3DV3 - SN3142 ConvF(5.66, 5.66, 5.66)

Toward Ground Middle/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.918 mW/g

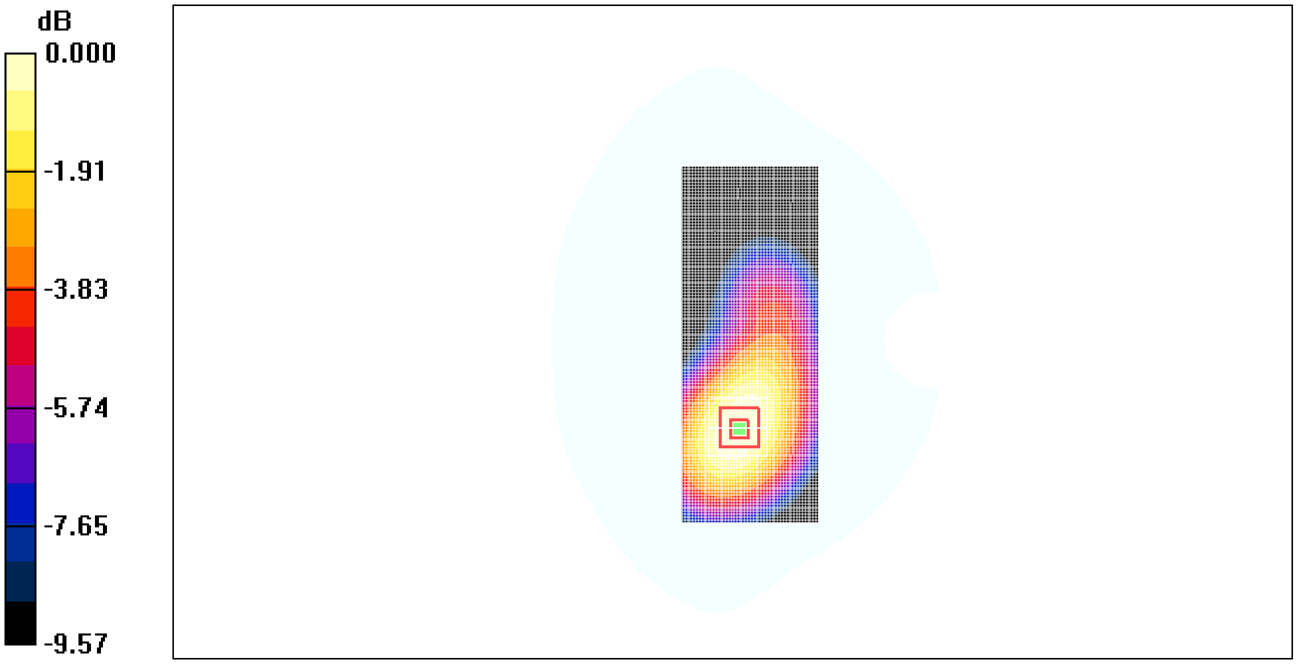
Toward Ground Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 18.4 V/m; Power Drift = -0.167 dB

Peak SAR (extrapolated) = 1.10 W/kg

SAR(1 g) = 0.849 mW/g; SAR(10 g) = 0.606 mW/g

Maximum value of SAR (measured) = 0.899 mW/g



0 dB = 0.899mW/g

Fig. 27 850 MHz CH190

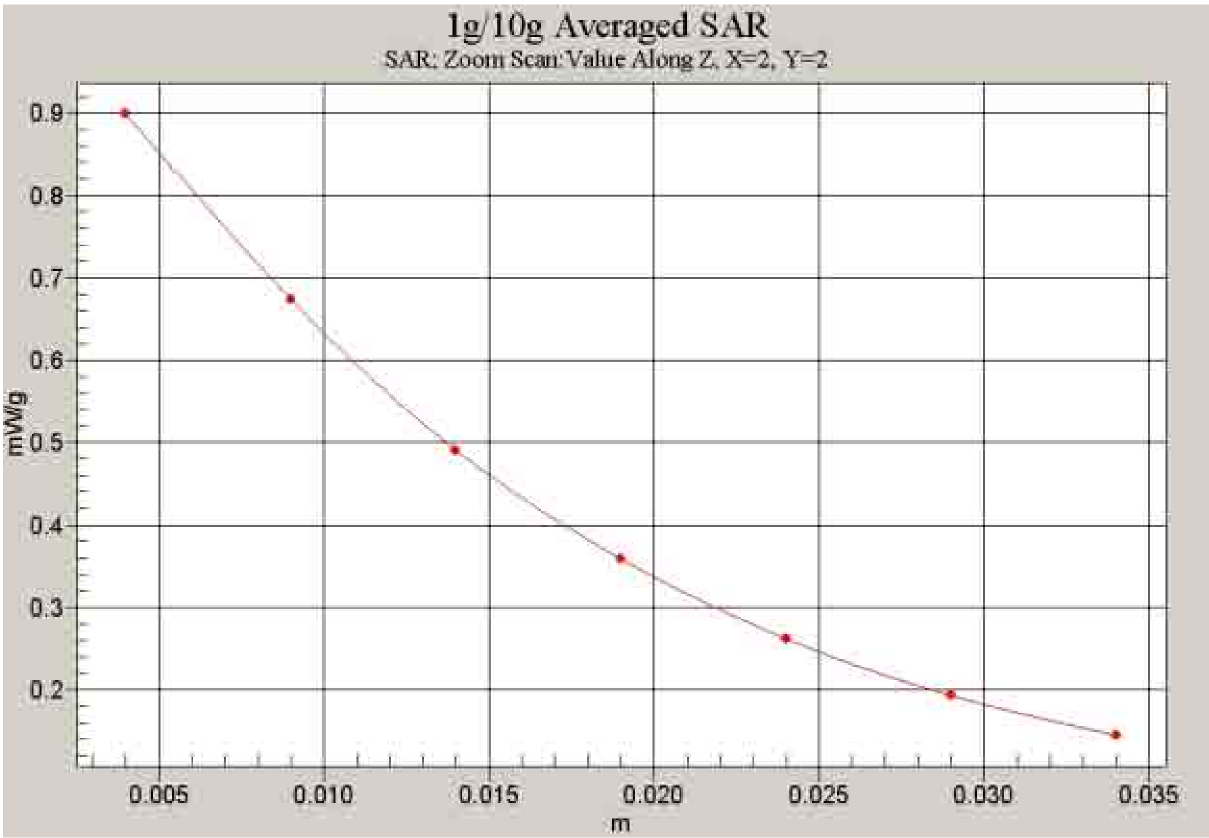


Fig. 28 Z-Scan at power reference point (850 MHz CH190)

850 Body Towards Ground Low with GPRS

Date/Time: 2008-7-2 10:00:46

Electronics: DAE4 Sn777

Medium: 850 Body

Medium parameters used: f = 825 MHz; σ = 0.99 mho/m; ε_r = 53.3; ρ = 1000 kg/m^3

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

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

Probe: ES3DV3 - SN3142 ConvF(5.66, 5.66, 5.66)

Toward Ground Low/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.810 mW/g

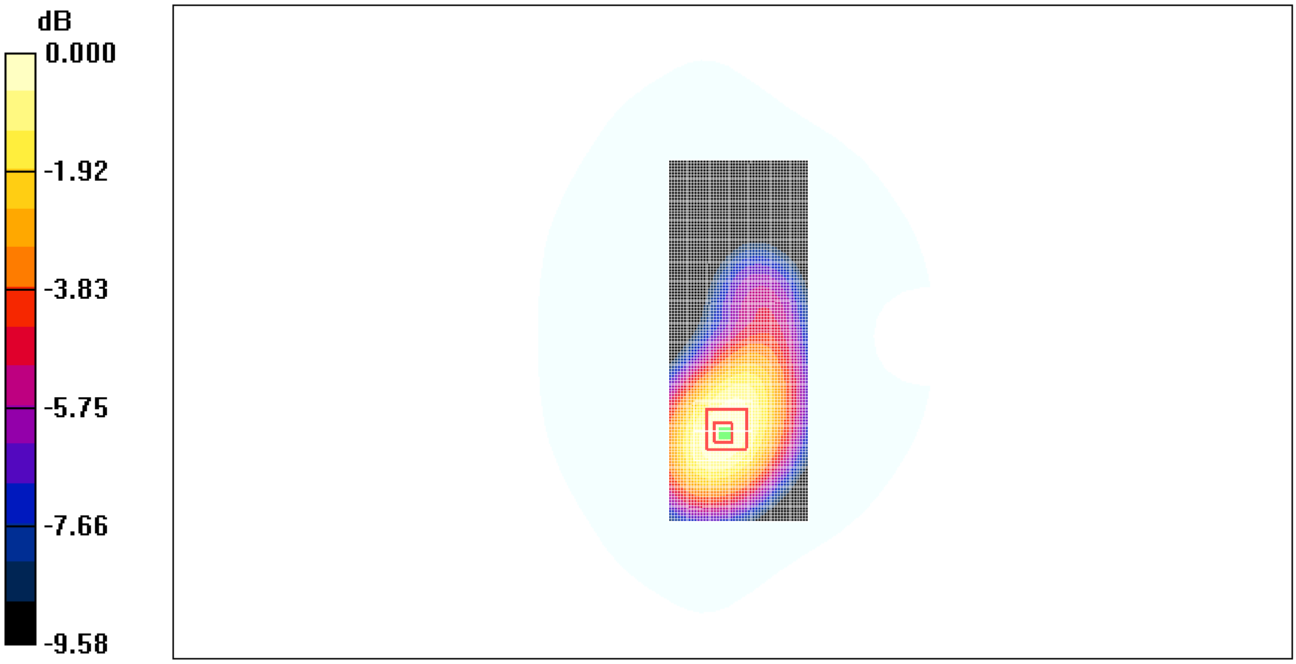
Toward Ground Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.8 V/m; Power Drift = -0.129 dB

Peak SAR (extrapolated) = 0.977 W/kg

SAR(1 g) = 0.753 mW/g; SAR(10 g) = 0.536 mW/g

Maximum value of SAR (measured) = 0.802 mW/g



0 dB = 0.802mW/g

Fig. 29 850 MHz CH128

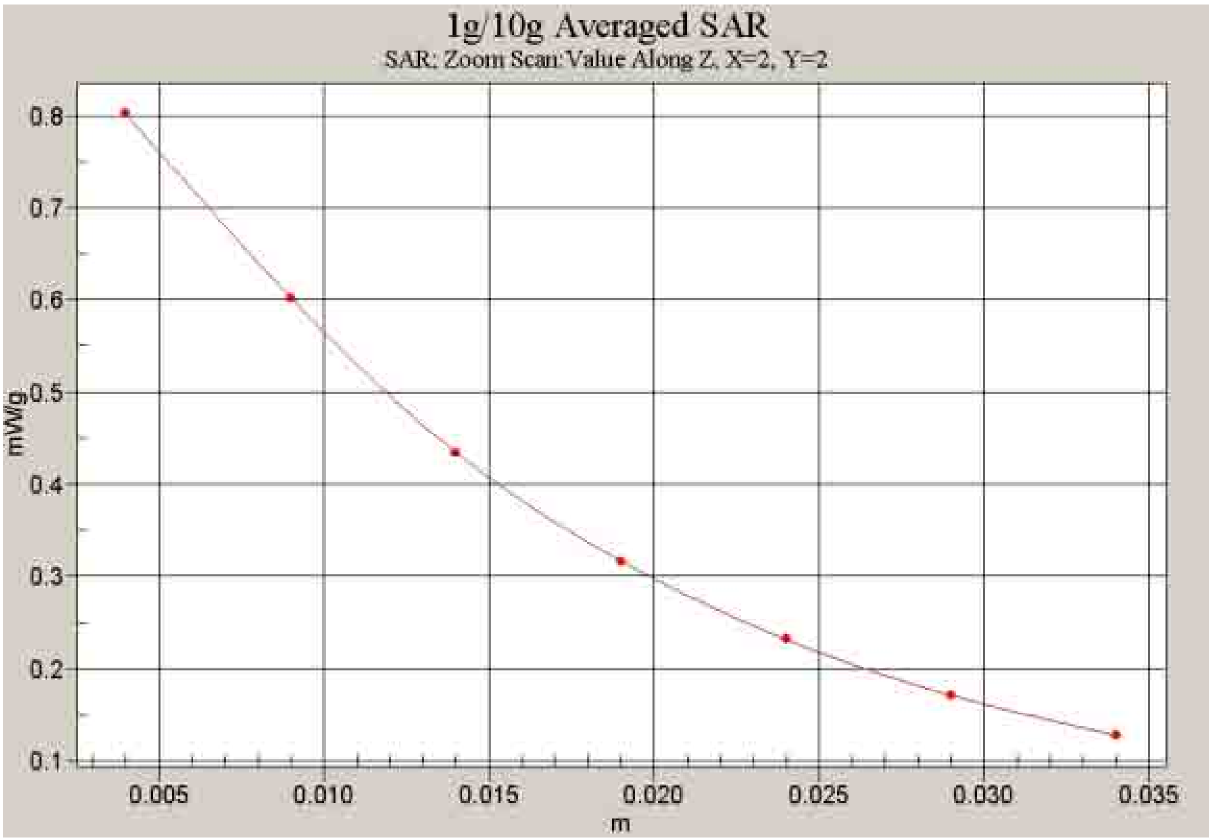


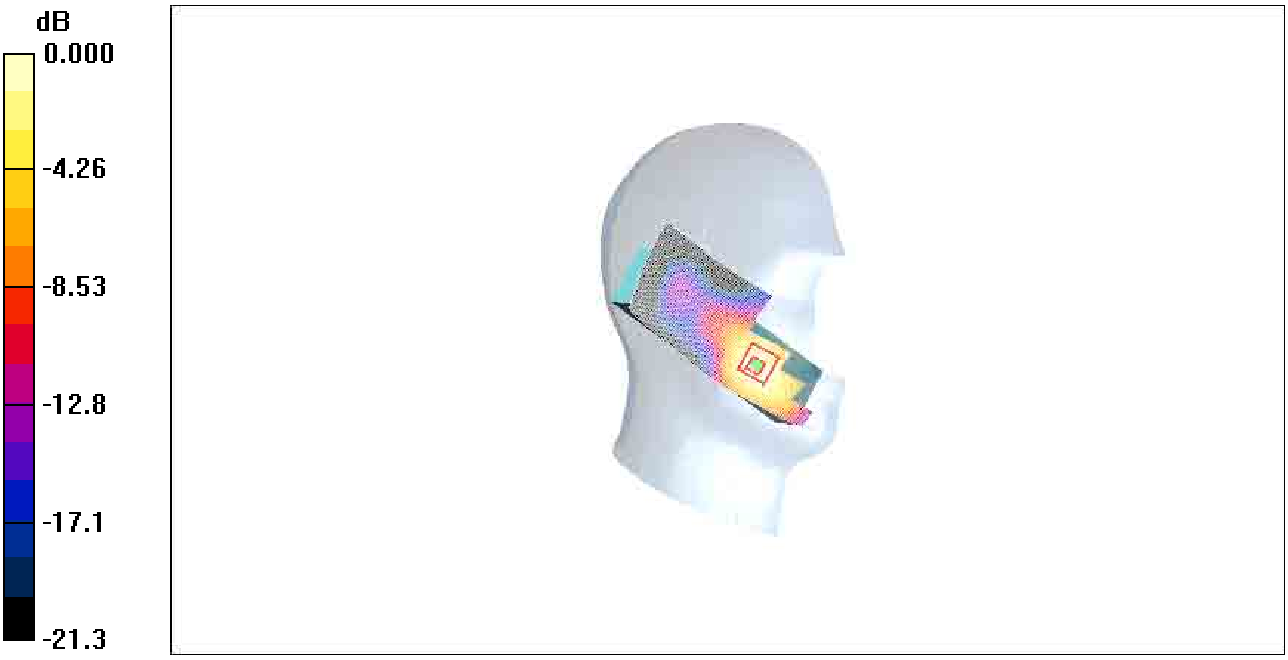
Fig. 30 Z-Scan at power reference point (850 MHz CH128)

1900 Left Cheek High

Date/Time: 2008-7-3 9:13:21
Electronics: DAE4 Sn777
Medium: Head 1900 MHz
Medium parameters used: f = 1910 MHz; σ = 1.39 mho/m; ε_r = 40.6; ρ = 1000 kg/m^3
Ambient Temperature:23.3^{o}C Liqiud Temperature: 22.5^{o}C
Communication System: GSM 1900MHz Frequency: 1909.8 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3142 ConvF(4.87, 4.87, 4.87)

Cheek High/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.09 mW/g

Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.44 V/m; Power Drift = -0.069 dB
Peak SAR (extrapolated) = 1.46 W/kg
SAR(1 g) = 0.961 mW/g; SAR(10 g) = 0.572 mW/g
Maximum value of SAR (measured) = 1.06 mW/g



0 dB = 1.06mW/g

Fig. 31 1900 MHz CH810

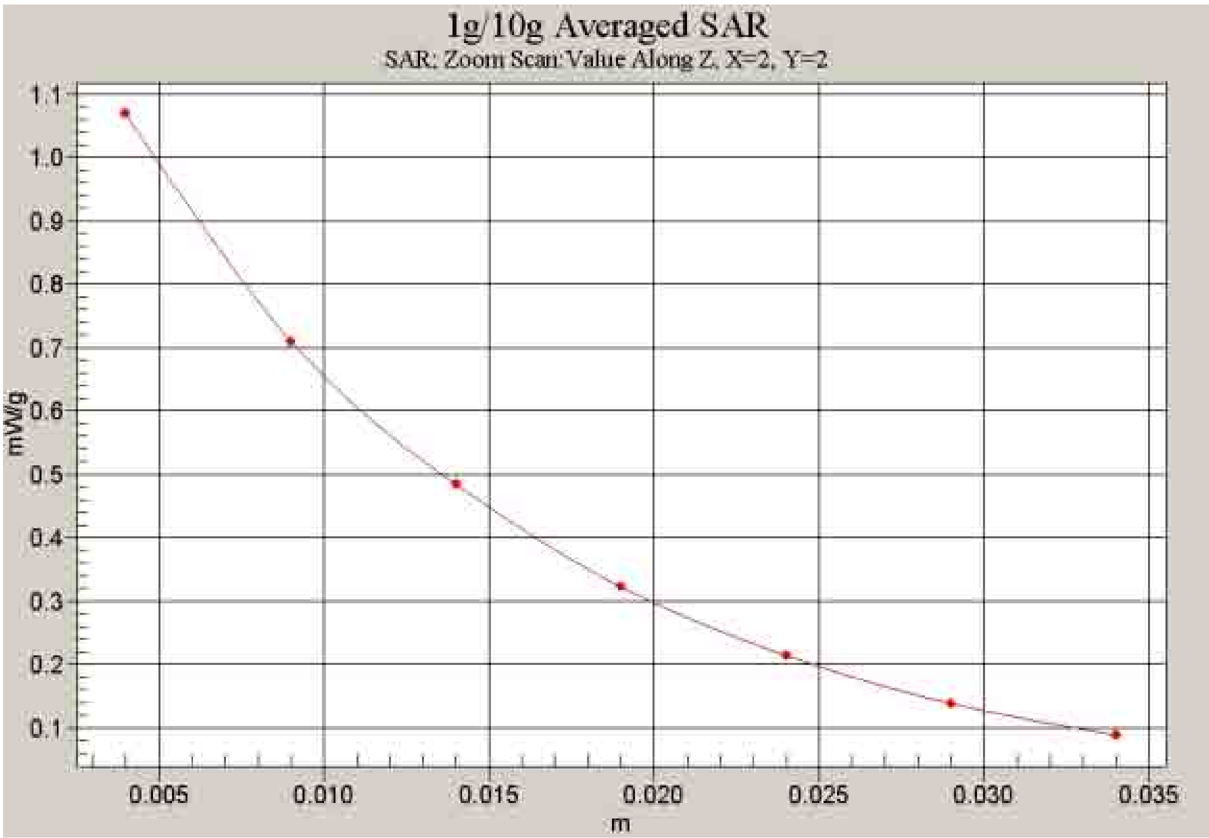


Fig. 32 Z-Scan at power reference point (1900 MHz CH810)

1900 Left Cheek Middle

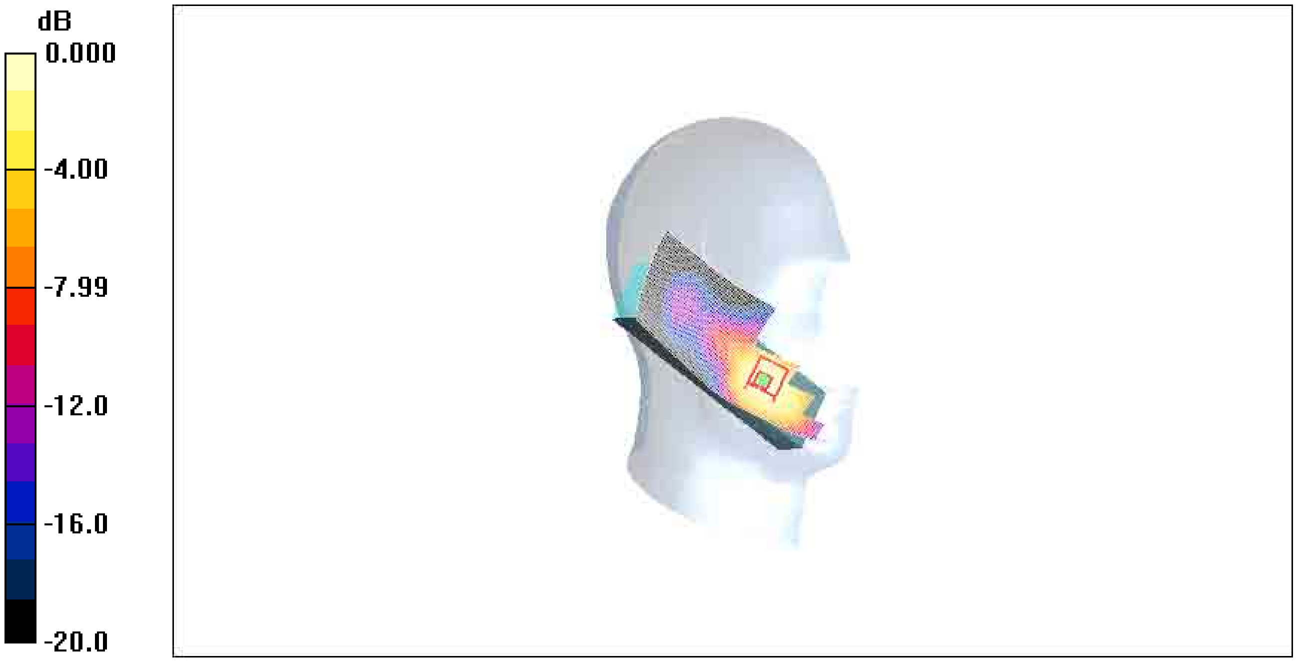
Date/Time: 2008-7-3 9:25:17
Electronics: DAE4 Sn777
Medium: Head 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.37 mho/m; εr = 40.7; ρ = 1000 kg/m3
Ambient Temperature:23.3oC   Liqiud Temperature: 22.5oC
Communication System: GSM 1900MHz new Frequency: 1880 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3142 ConvF(4.87, 4.87, 4.87)

Cheek Middle/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm

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

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

Reference Value = 5.35 V/m; Power Drift = -0.007 dB
Peak SAR (extrapolated) = 1.58 W/kg
SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.631 mW/g
Maximum value of SAR (measured) = 1.16 mW/g



0 dB = 1.16mW/g

Fig. 33 1900 MHz CH661

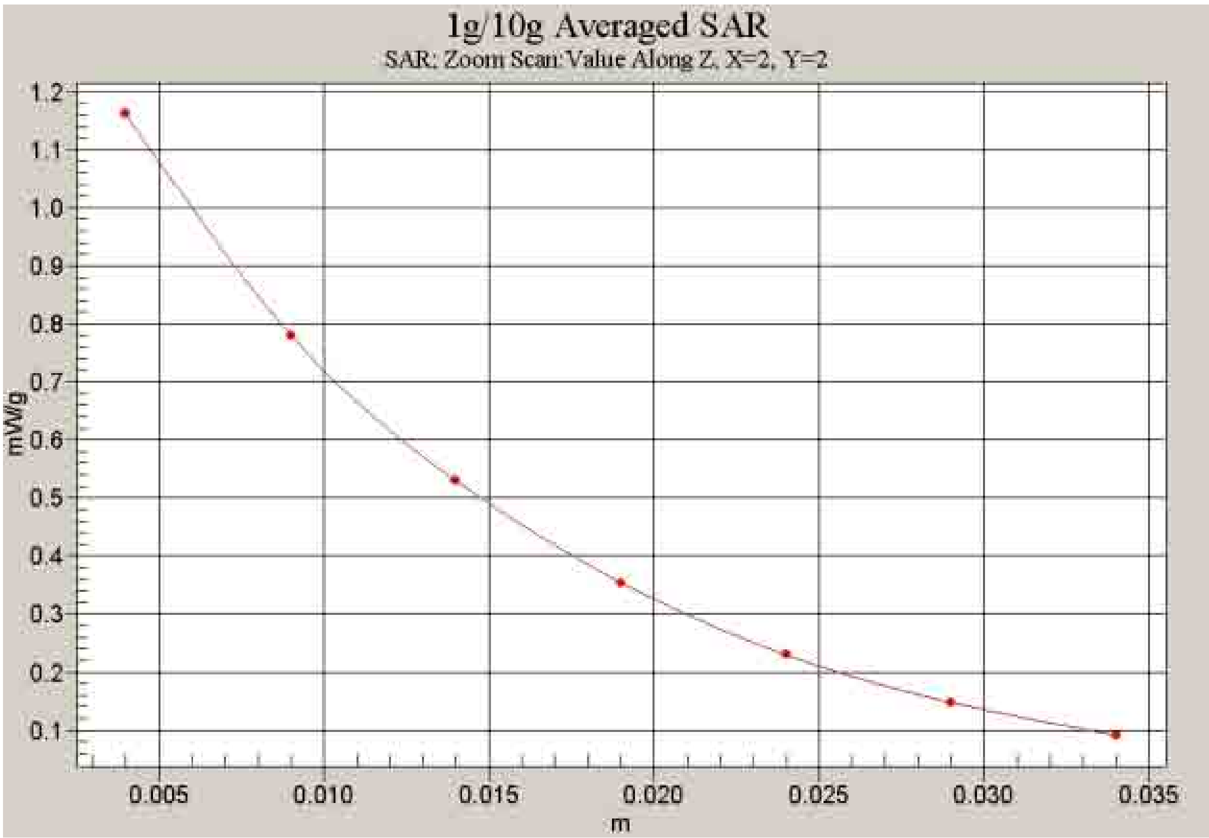


Fig. 34 Z-Scan at power reference point (1900 MHz CH661)

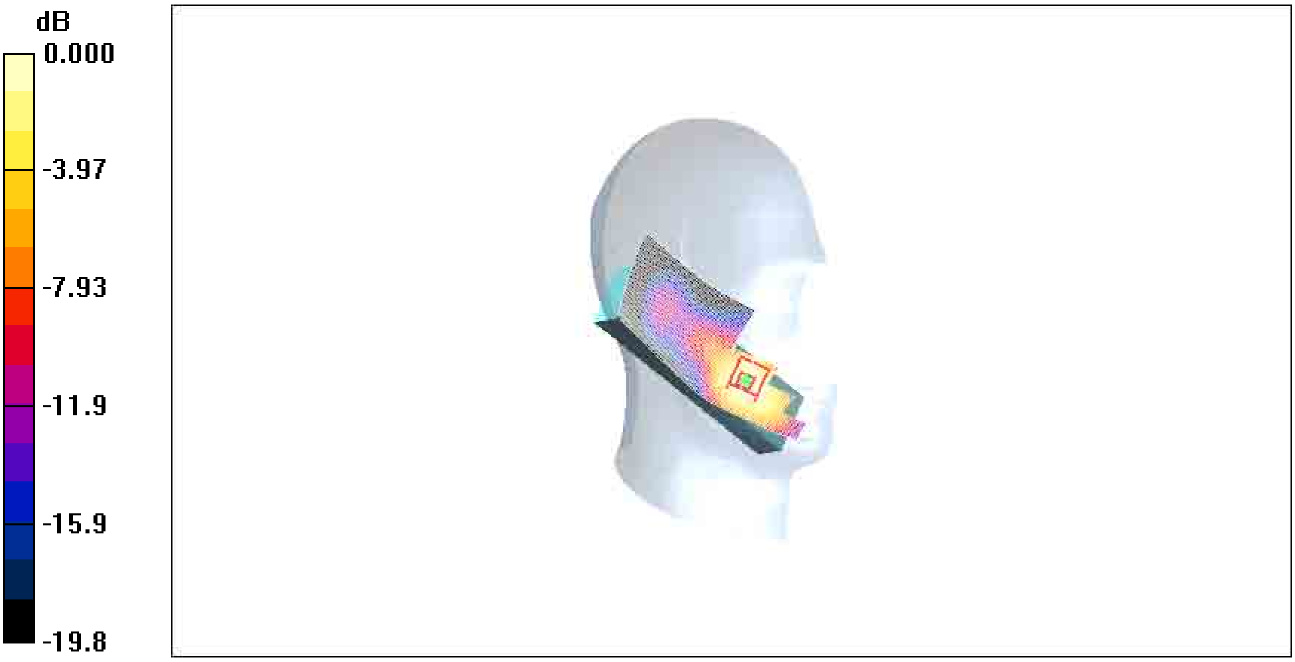
1900 Left Cheek Low

Date/Time: 2008-7-3 9:38:54
Electronics: DAE4 Sn777
Medium: Head 1900 MHz
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.35 mho/m; ε_r = 40.8; ρ = 1000 kg/m^3
Ambient Temperature:23.3°C Liqiud Temperature: 22.5°C
Communication System: GSM 1900MHz Frequency: 1850.2 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3142 ConvF(4.87, 4.87, 4.87)

Cheek Low/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm

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

Cheek Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.71 V/m; Power Drift = 0.020 dB
Peak SAR (extrapolated) = 1.42 W/kg
SAR(1 g) = 0.947 mW/g; SAR(10 g) = 0.570 mW/g
Maximum value of SAR (measured) = 1.05 mW/g



0 dB = 1.05mW/g

Fig. 35 1900 MHz CH512

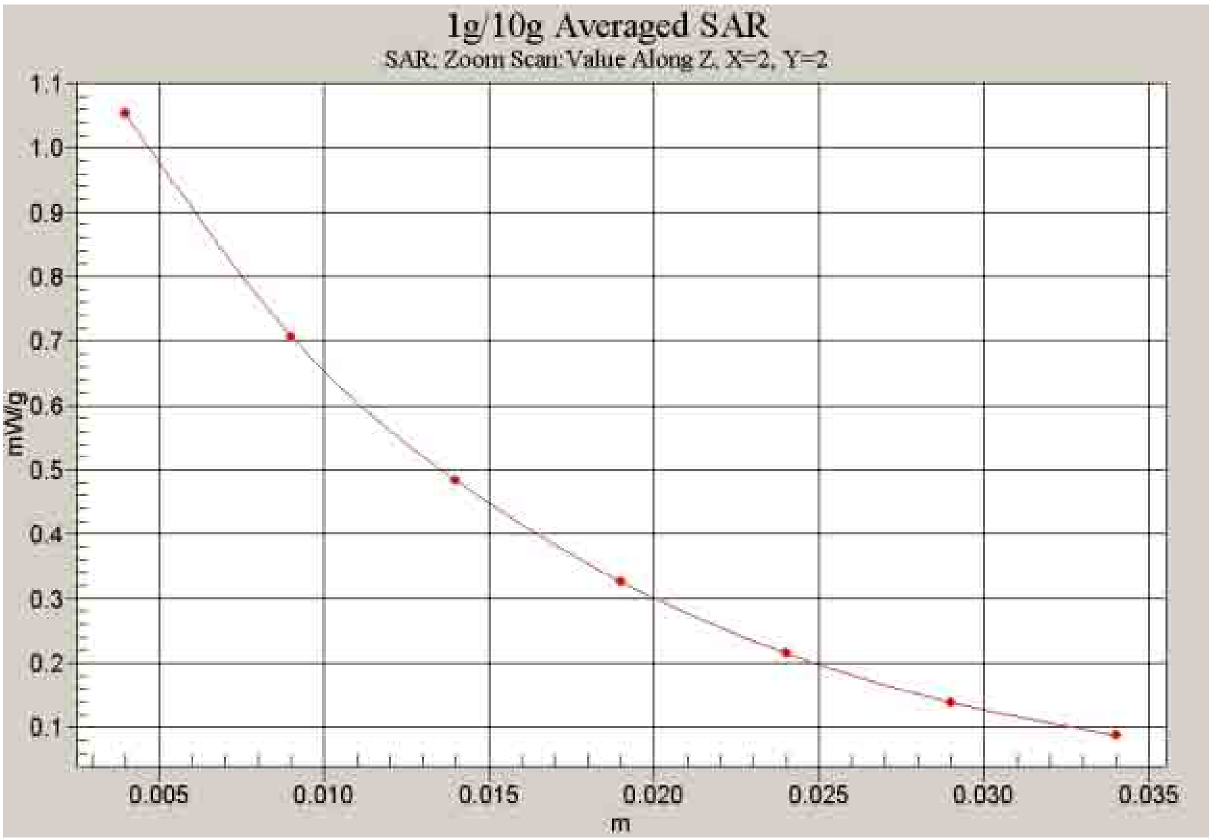


Fig. 36 Z-Scan at power reference point (1900 MHz CH512)

1900 Left Tilt High

Date/Time: 2008-7-3 9:50:13

Electronics: DAE4 Sn777

Medium: Head 1900 MHz

Medium parameters used: f = 1910 MHz; σ = 1.39 mho/m; ε_r = 40.6; ρ = 1000 kg/m^3

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

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

Probe: ES3DV3 - SN3142 ConvF(4.87, 4.87, 4.87)

Tilt High/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.159 mW/g

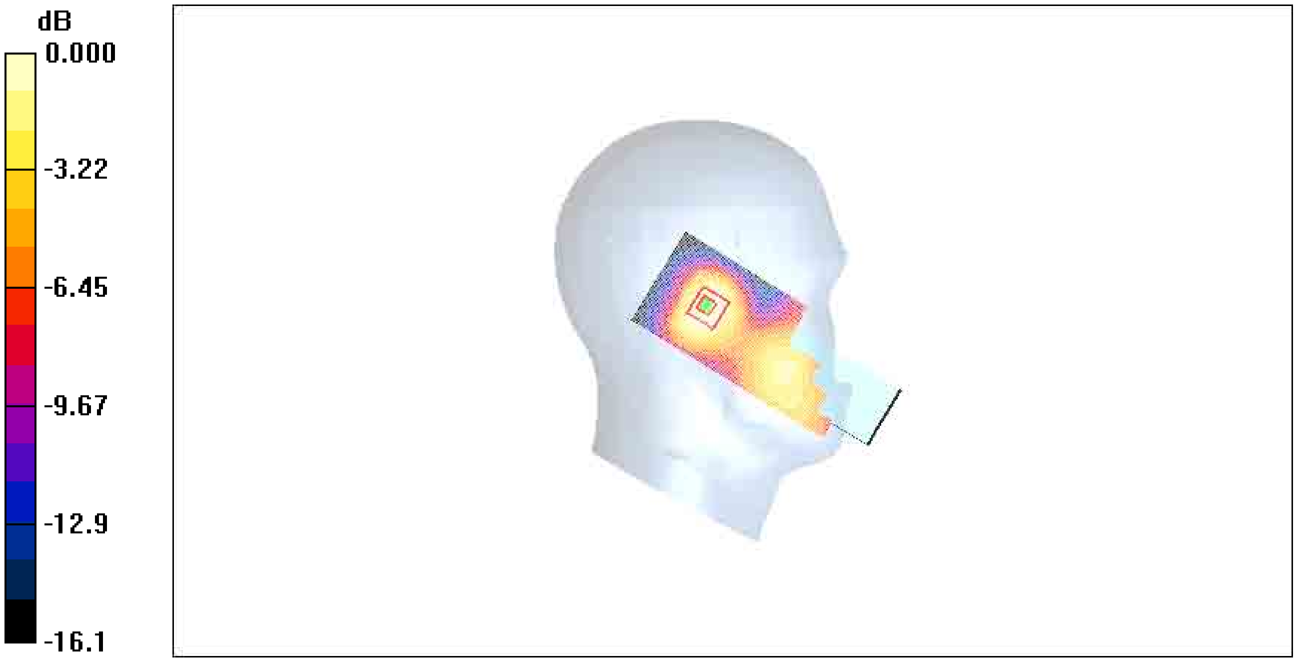
Tilt High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.23 V/m; Power Drift = -0.025 dB

Peak SAR (extrapolated) = 0.184 W/kg

SAR(1 g) = 0.125 mW/g; SAR(10 g) = 0.077 mW/g

Maximum value of SAR (measured) = 0.127 mW/g



0 dB = 0.127mW/g

Fig.37 1900 MHz CH810

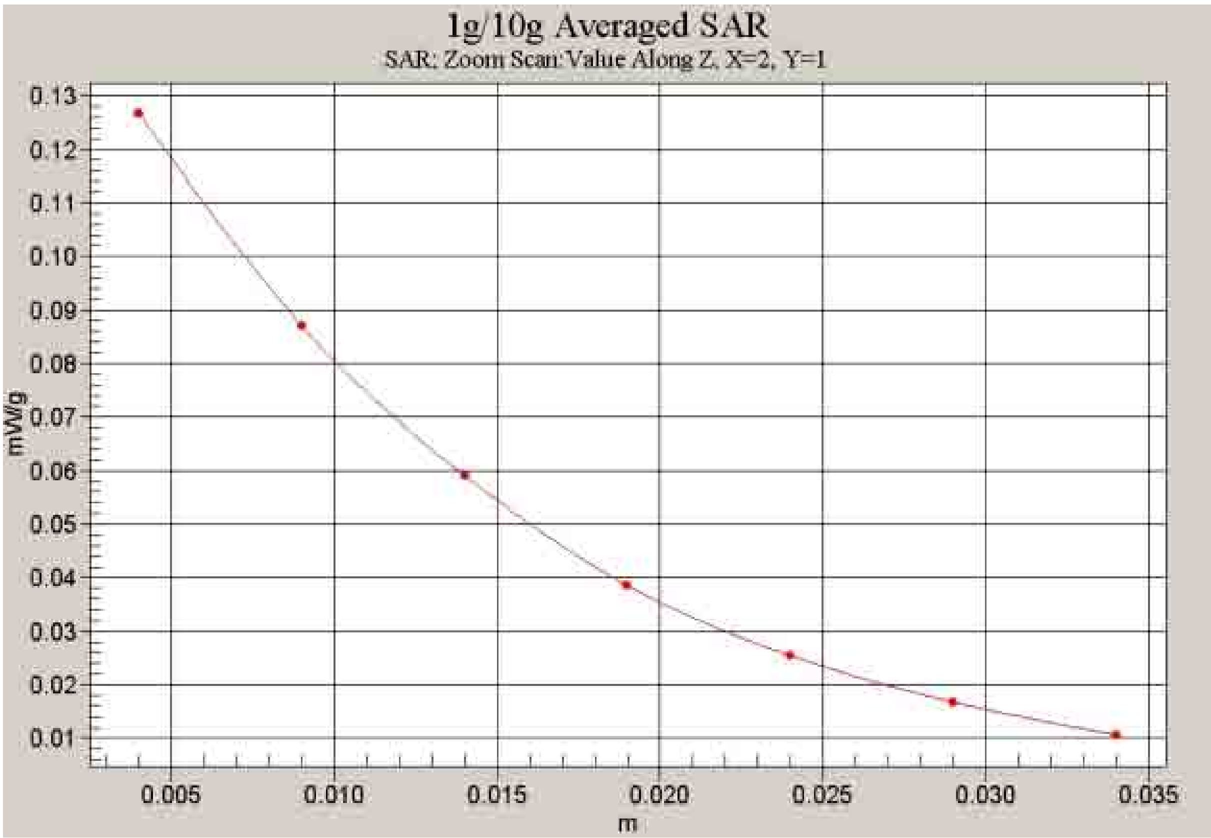


Fig. 38 Z-Scan at power reference point (1900 MHz CH810)

1900 Left Tilt Middle

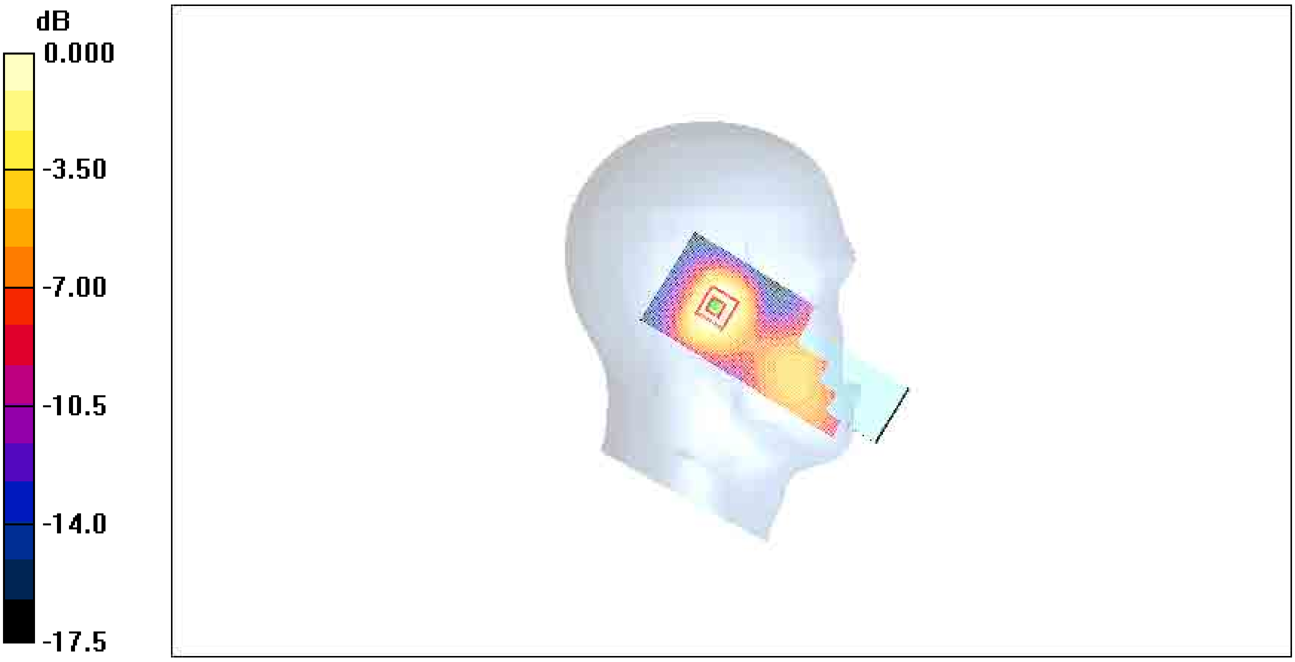
Date/Time: 2008-7-3 10:04:24
Electronics: DAE4 Sn777
Medium: Head 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.37 mho/m; ε_r = 40.7; ρ = 1000 kg/m^3
Ambient Temperature:23.3°C Liqiud Temperature: 22.5°C
Communication System: GSM 1900MHz Frequency: 1880 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3142 ConvF(4.87, 4.87, 4.87)

Tilt Middle/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.251 mW/g

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

Reference Value = 9.29 V/m; Power Drift = -0.049 dB
Peak SAR (extrapolated) = 0.296 W/kg
SAR(1 g) = 0.203 mW/g; SAR(10 g) = 0.125 mW/g
Maximum value of SAR (measured) = 0.209 mW/g



0 dB = 0.209mW/g

Fig. 39 1900 MHz CH661

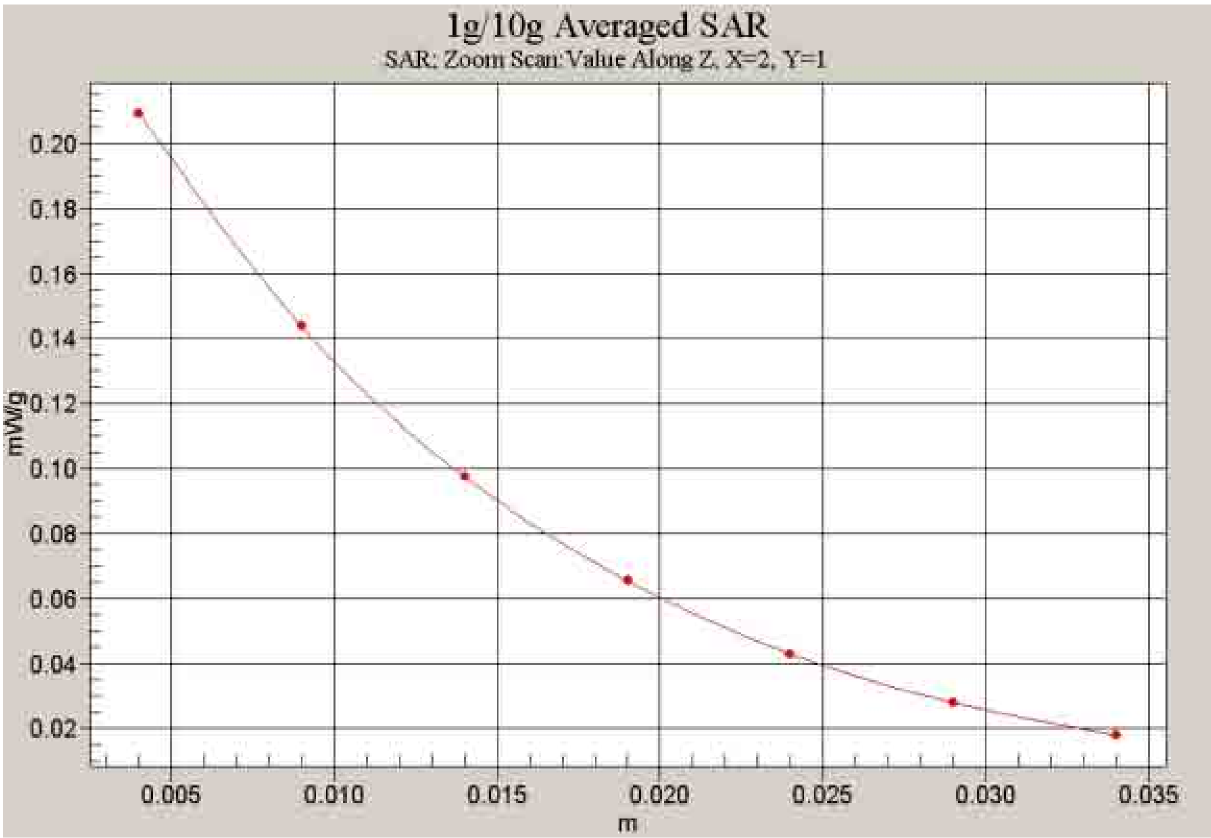


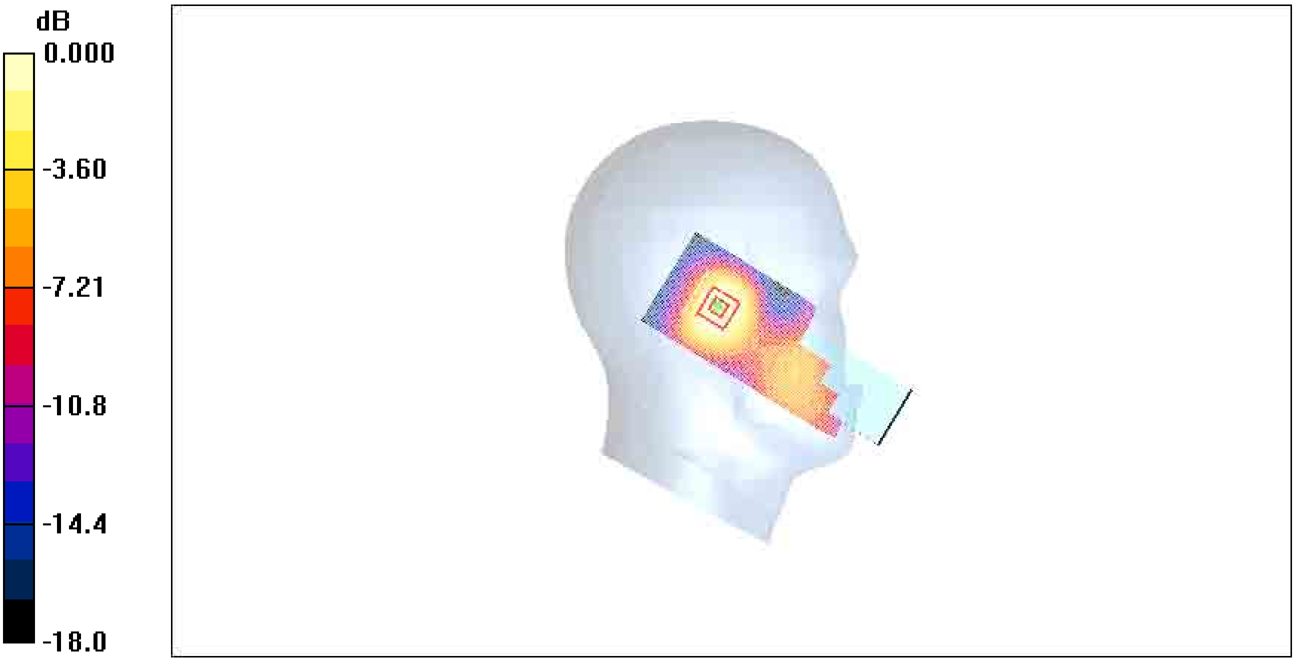
Fig. 40 Z-Scan at power reference point (1900 MHz CH661)

1900 Left Tilt Low

Date/Time: 2008-7-3 10:19:18
Electronics: DAE4 Sn777
Medium: Head 1900 MHz
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.35 mho/m; ε_r = 40.8; ρ = 1000 kg/m^3
Ambient Temperature:23.3^{o}C Liqiud Temperature: 22.5^{o}C
Communication System: GSM 1900MHz Frequency: 1850.2 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3142 ConvF(4.87, 4.87, 4.87)

Tilt Low/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.283 mW/g

Tilt Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.67 V/m; Power Drift = 0.200 dB
Peak SAR (extrapolated) = 0.329 W/kg
SAR(1 g) = 0.231 mW/g; SAR(10 g) = 0.144 mW/g
Maximum value of SAR (measured) = 0.244 mW/g



0 dB = 0.244mW/g

Fig. 41 1900 MHz CH512

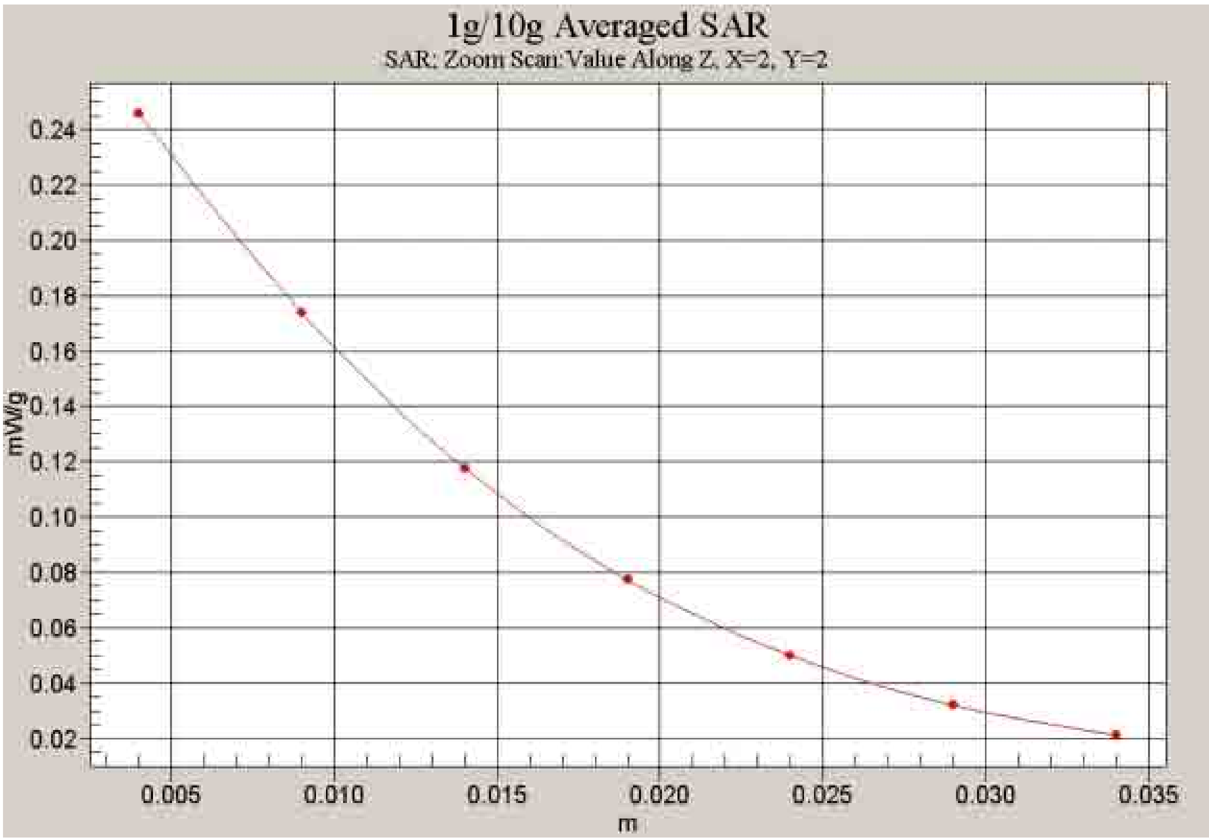


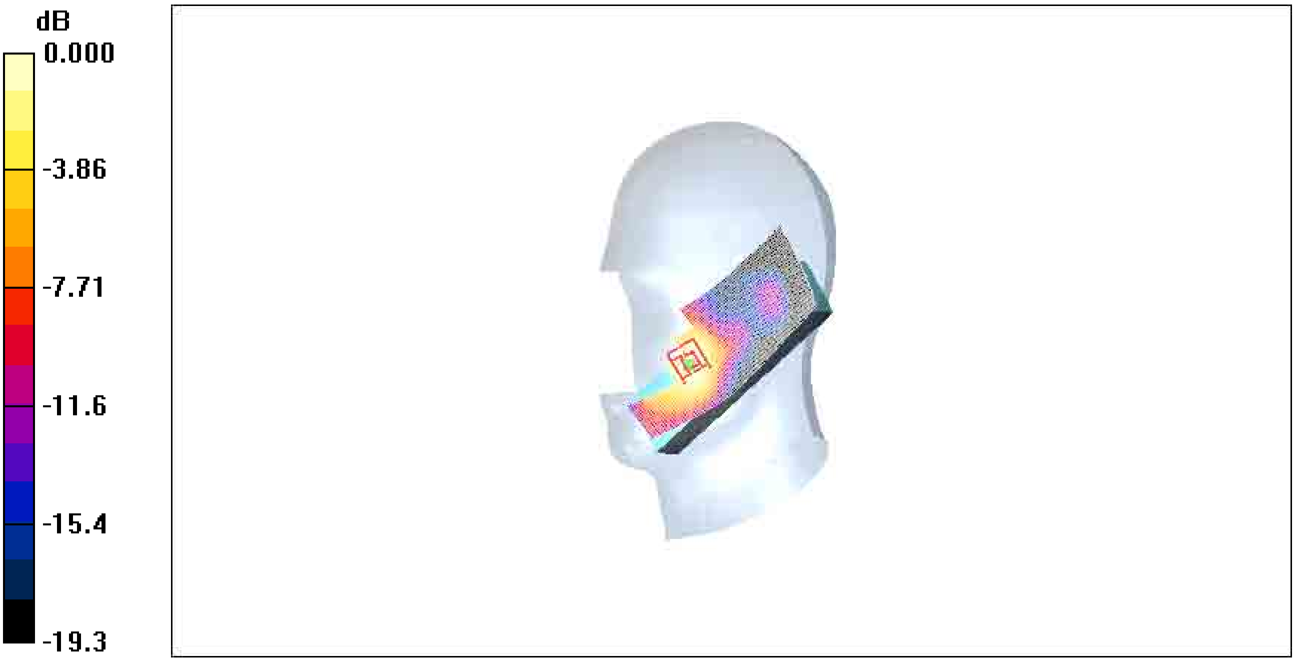
Fig. 42 Z-Scan at power reference point (1900 MHz CH512)

1900 Right Cheek High

Date/Time: 2008-7-3 10:33:32
Electronics: DAE4 Sn777
Medium: Head 1900 MHz
Medium parameters used: f = 1910 MHz; σ = 1.39 mho/m; ε_r = 40.6; ρ = 1000 kg/m^3
Ambient Temperature:23.3^{o}C   Liqiud Temperature: 22.5^{o}C
Communication System: GSM 1900MHz Frequency: 1909.8 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3142 ConvF(4.87, 4.87, 4.87)

Cheek High/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.811 mW/g

Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.31 V/m; Power Drift = 0.200 dB
Peak SAR (extrapolated) = 1.03 W/kg
SAR(1 g) = 0.722 mW/g; SAR(10 g) = 0.437 mW/g
Maximum value of SAR (measured) = 0.757 mW/g



0 dB = 0.757mW/g

Fig. 43 1900 MHz CH810

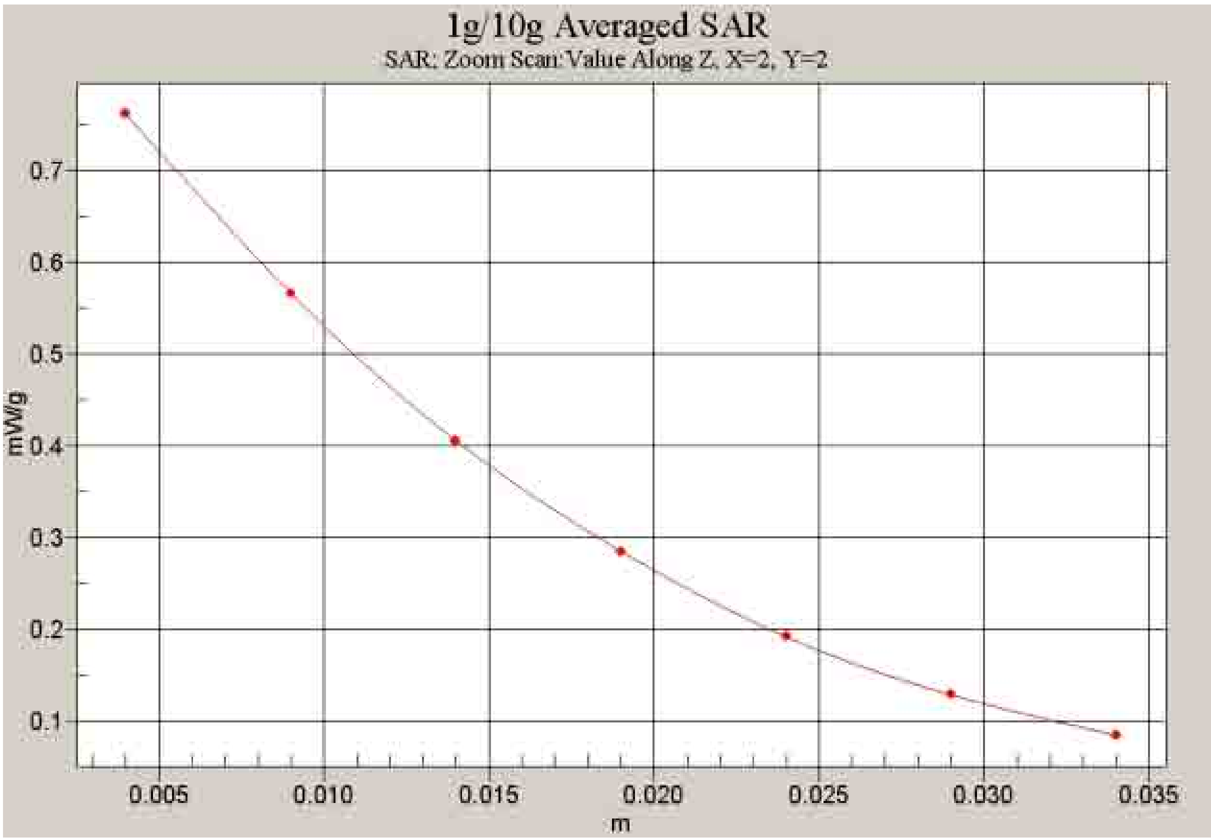
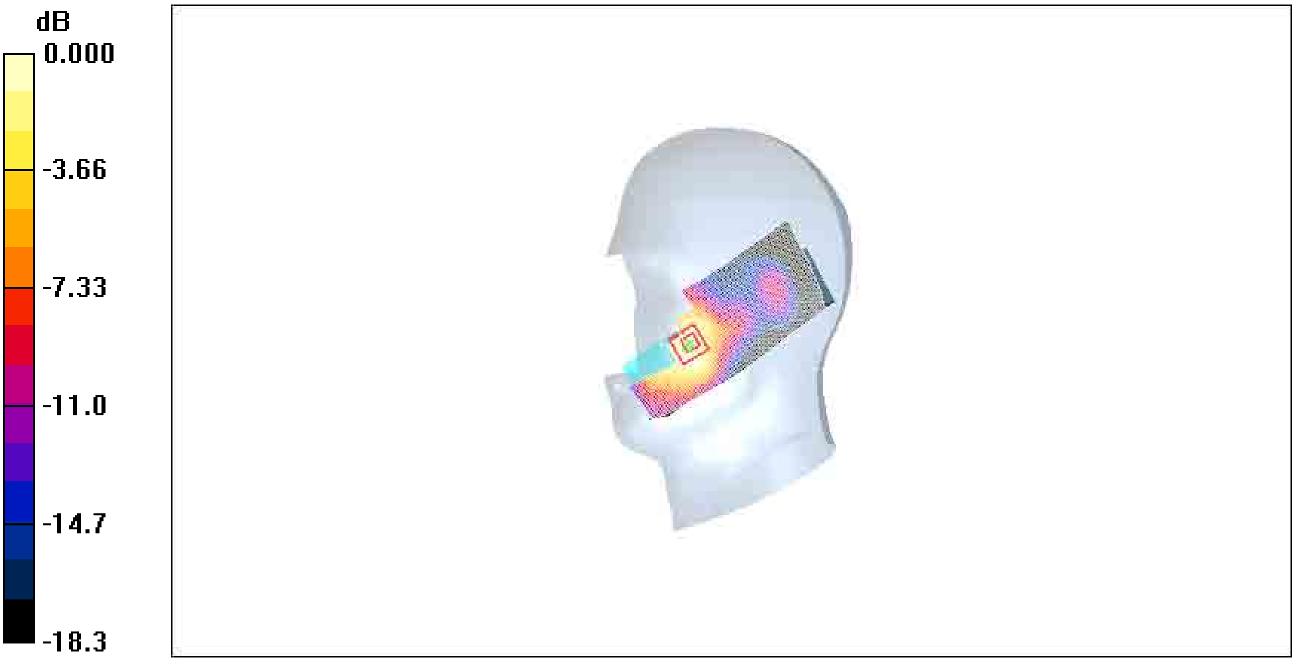


Fig. 44 Z-Scan at power reference point (1900 MHz CH810)

1900 Right Cheek Middle
Date/Time: 2008-7-3 10:47:09
Electronics: DAE4 Sn777
Medium: Head 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.37 mho/m; ε_r = 40.7; 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: ES3DV3 - SN3142 ConvF(4.87, 4.87, 4.87)

Cheek Middle/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.871 mW/g

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.26 V/m; Power Drift = 0.010 dB
Peak SAR (extrapolated) = 1.08 W/kg
SAR(1 g) = 0.771 mW/g; SAR(10 g) = 0.473 mW/g
Maximum value of SAR (measured) = 0.800 mW/g



0 dB = 0.800mW/g

Fig. 45 1900 MHz CH661

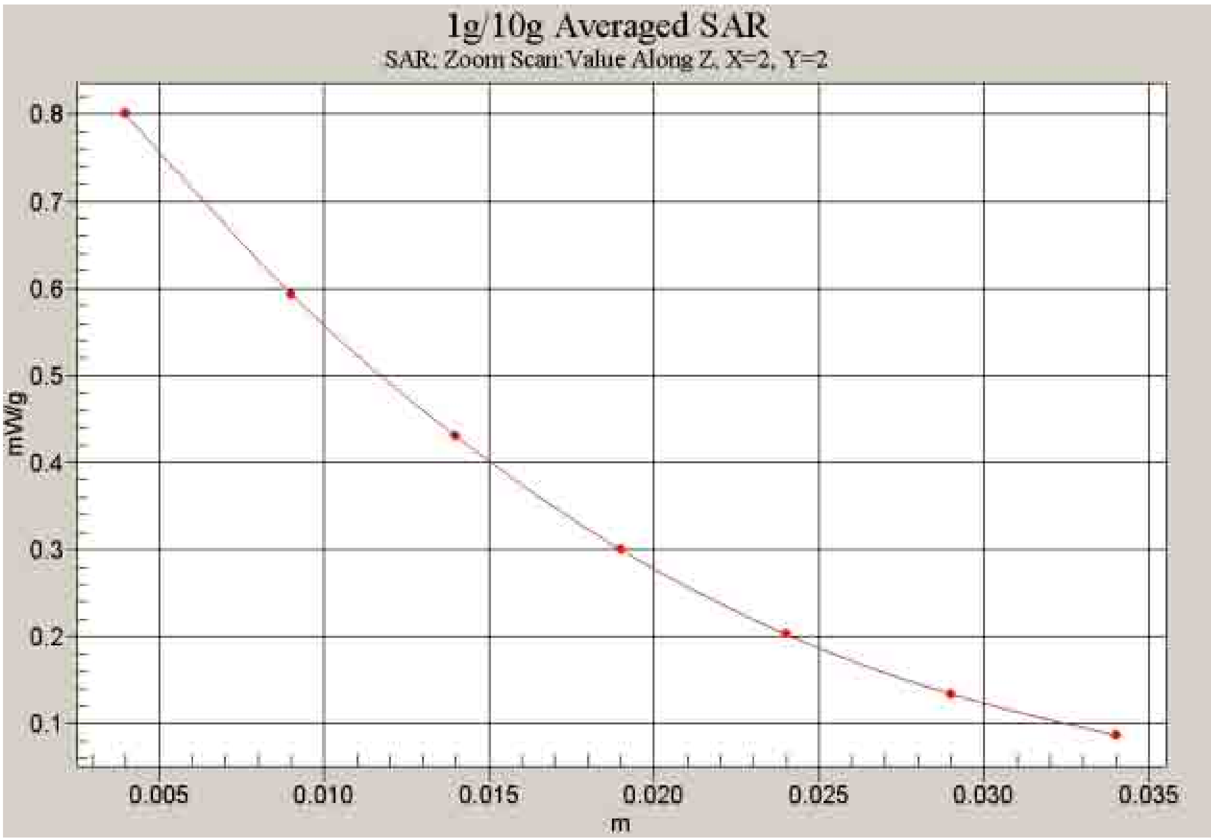


Fig. 46 Z-Scan at power reference point (1900 MHz CH661)

1900 Right Cheek Low

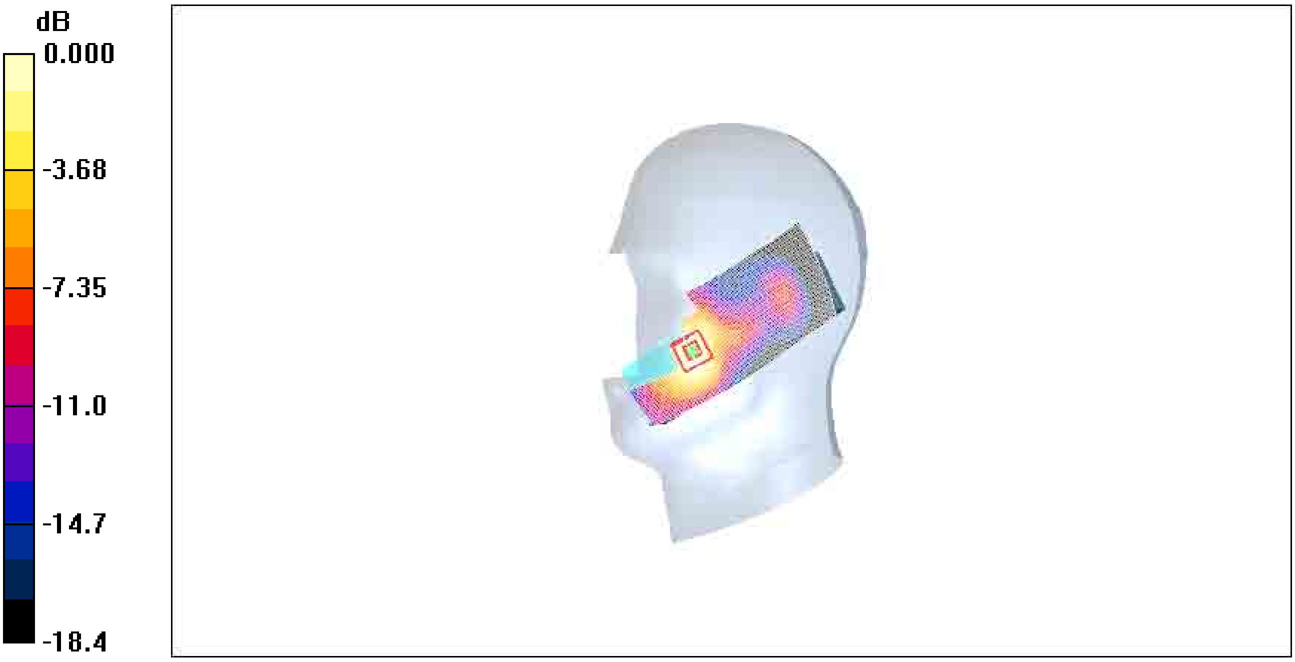
Date/Time: 2008-7-3 11:01:21
Electronics: DAE4 Sn777
Medium: Head 1900 MHz
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.35 mho/m; ε_r = 40.8; ρ = 1000 kg/m^3
Ambient Temperature:23.3^{o}C Liqiud Temperature: 22.5^{o}C
Communication System: GSM 1900MHz Frequency: 1850.2 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3142 ConvF(4.87, 4.87, 4.87)

Cheek Low/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.816 mW/g

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

Reference Value = 8.09 V/m; Power Drift = -0.030 dB
Peak SAR (extrapolated) = 0.955 W/kg
SAR(1 g) = 0.696 mW/g; SAR(10 g) = 0.431 mW/g
Maximum value of SAR (measured) = 0.739 mW/g



0 dB = 0.739mW/g

Fig. 47 1900 MHz CH512

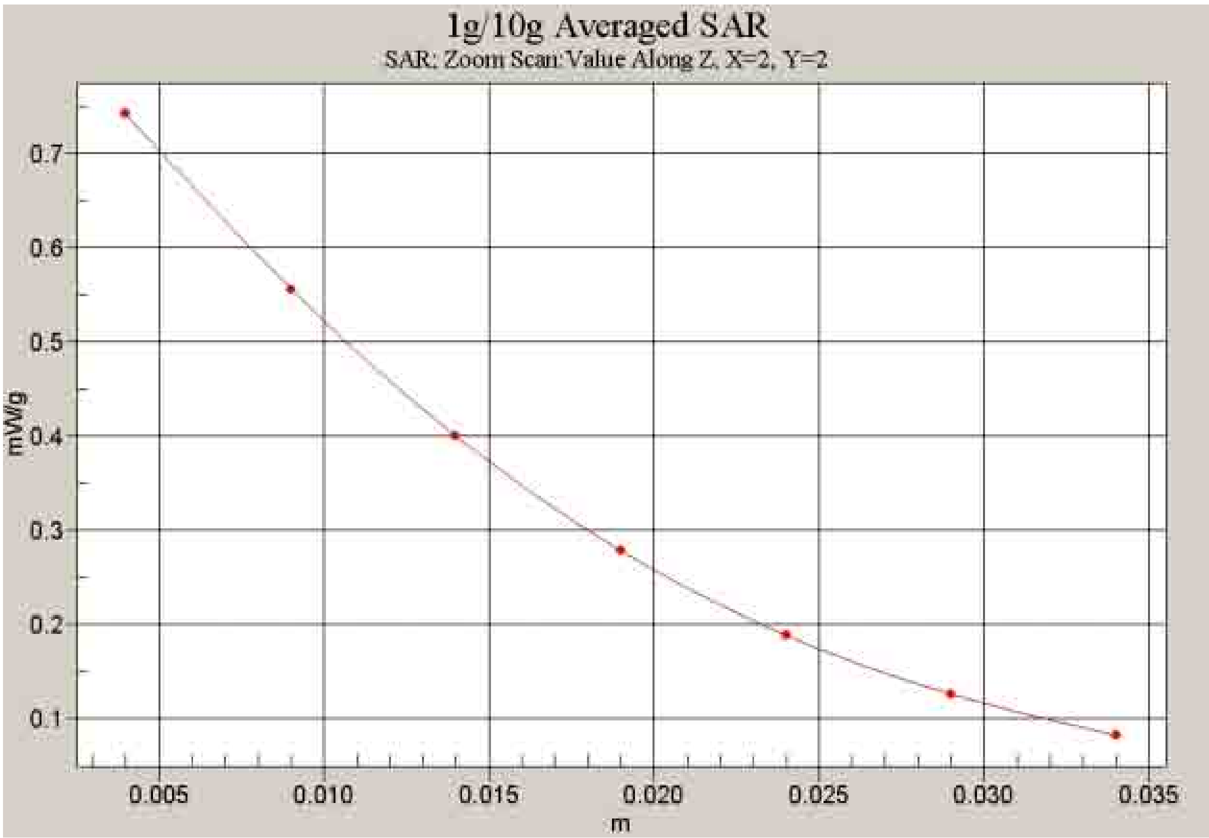
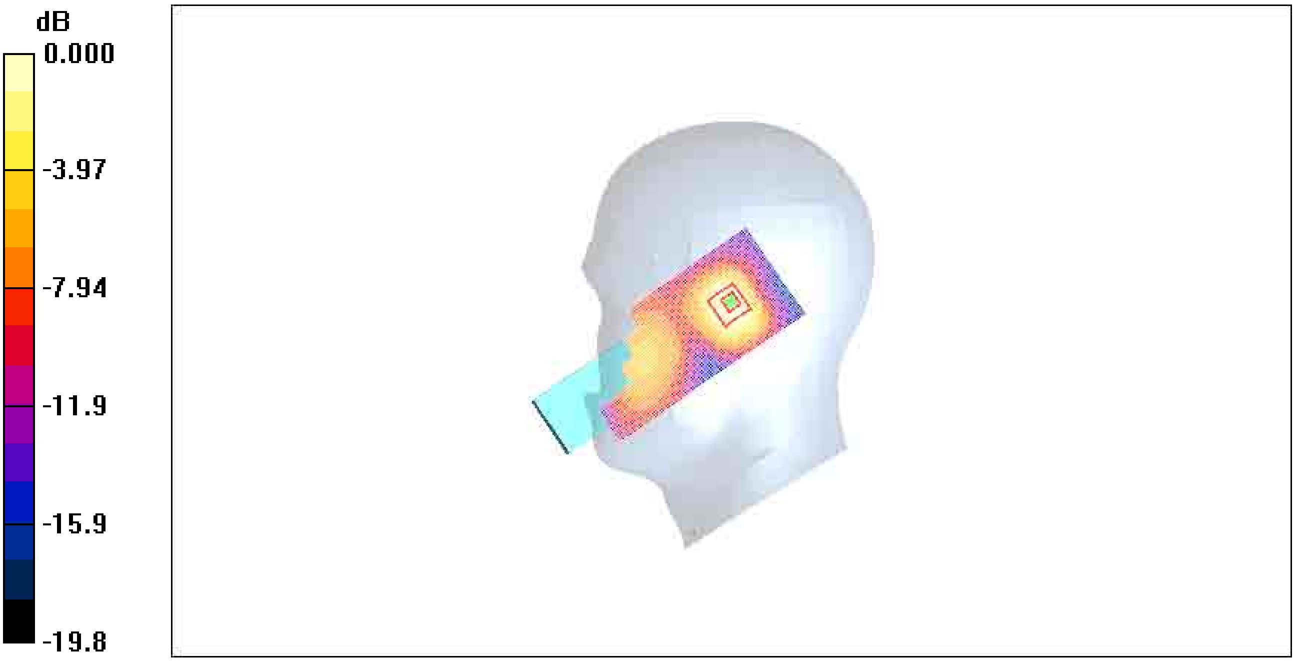


Fig. 48 Z-Scan at power reference point (1900 MHz CH512)

1900 Right Tilt High
Date/Time: 2008-7-3 11:14:26
Electronics: DAE4 Sn777
Medium: Head 1900 MHz
Medium parameters used: f = 1910 MHz; σ = 1.39 mho/m; ε_r = 40.6; 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: ES3DV3 - SN3142 ConvF(4.87, 4.87, 4.87)

Tilt High/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.224 mW/g

Tilt High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.5 V/m; Power Drift = -0.053 dB
Peak SAR (extrapolated) = 0.275 W/kg
SAR(1 g) = 0.172 mW/g; SAR(10 g) = 0.099 mW/g
Maximum value of SAR (measured) = 0.187 mW/g



0 dB = 0.187mW/g

Fig. 49 1900 MHz CH810

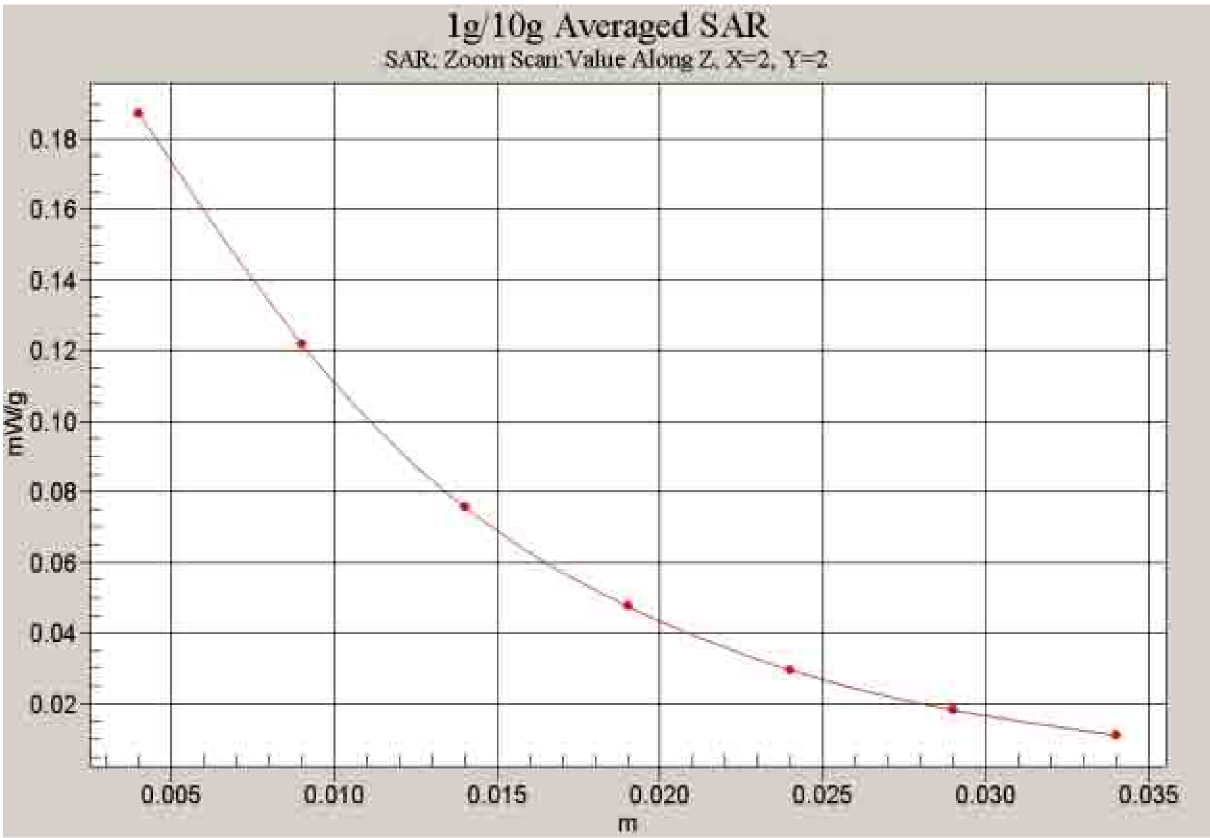


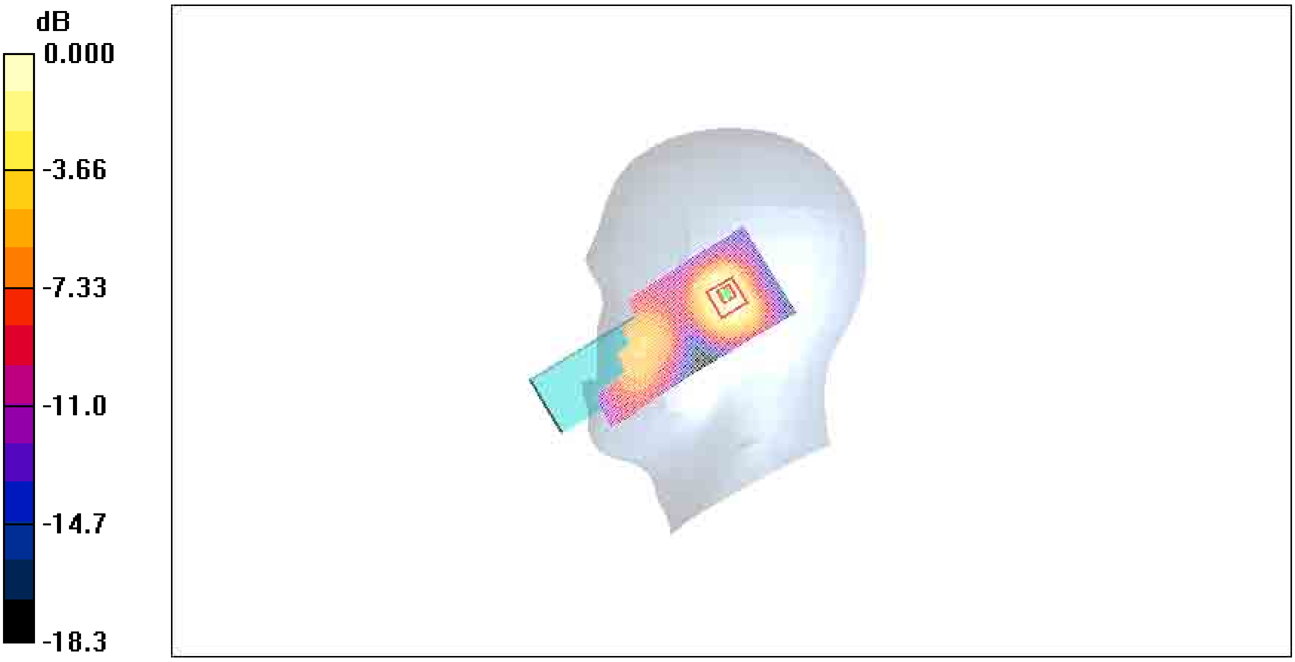
Fig. 50 Z-Scan at power reference point (1900 MHz CH810)

1900 Right Tilt Middle

Date/Time: 2008-7-3 11:26:39
Electronics: DAE4 Sn777
Medium: Head 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.37 mho/m; ε_r = 40.7; 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: ES3DV3 - SN3142 ConvF(4.87, 4.87, 4.87)

Tilt Middle/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.300 mW/g

Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.8 V/m; Power Drift = 0.070 dB
Peak SAR (extrapolated) = 0.371 W/kg
SAR(1 g) = 0.234 mW/g; SAR(10 g) = 0.137 mW/g
Maximum value of SAR (measured) = 0.254 mW/g



0 dB = 0.254mW/g

Fig.51 1900 MHz CH661

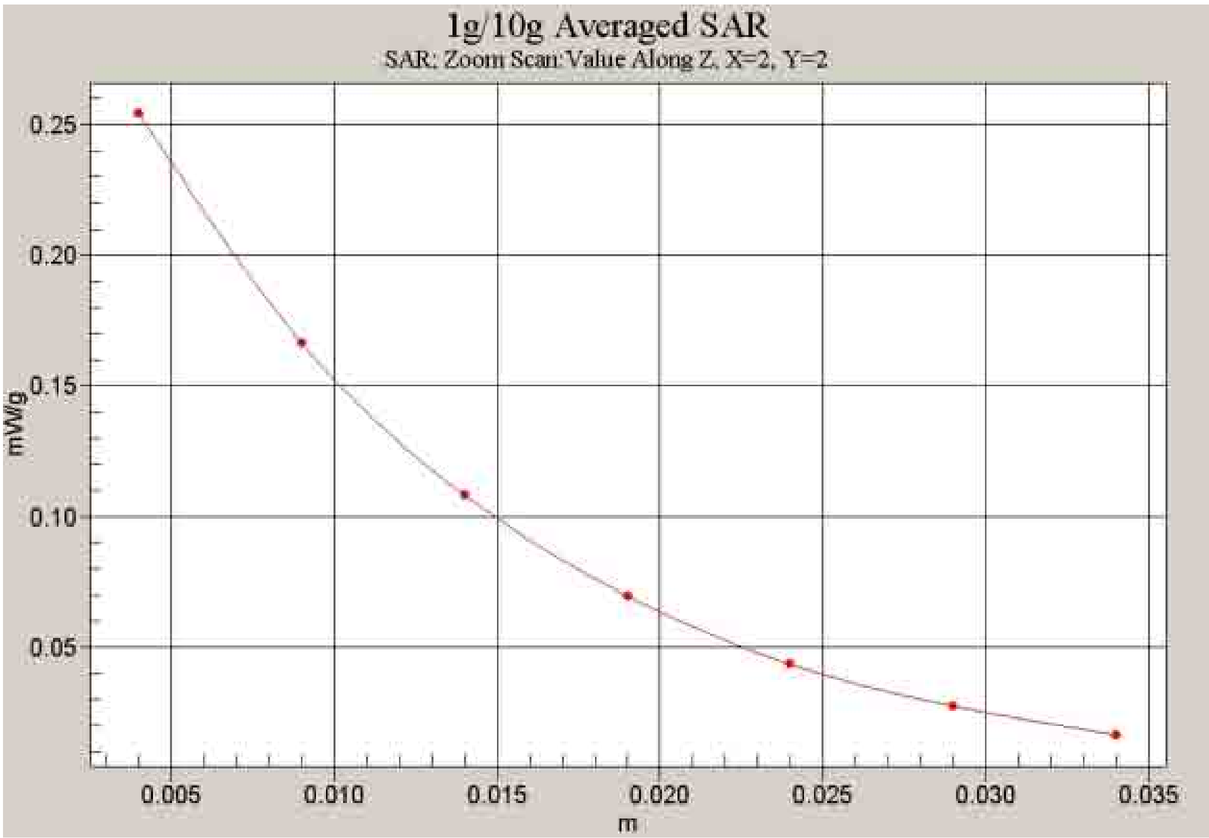


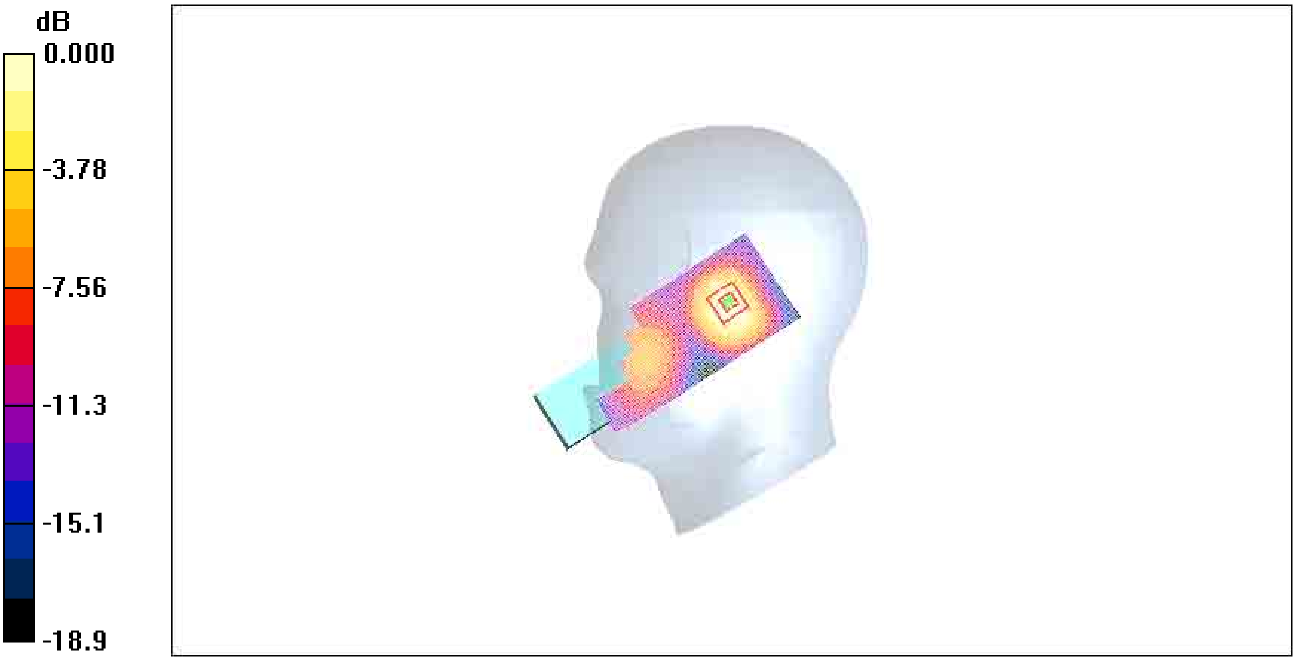
Fig. 52 Z-Scan at power reference point (1900 MHz CH661)

1900 Right Tilt Low

Date/Time: 2008-7-3 11:40:37
Electronics: DAE4 Sn777
Medium: Head 1900 MHz
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.35 mho/m; ε_r = 40.8; 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: ES3DV3 - SN3142 ConvF(4.87, 4.87, 4.87)

Tilt Low/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.350 mW/g

Tilt Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.7 V/m; Power Drift = 0.136 dB
Peak SAR (extrapolated) = 0.415 W/kg
SAR(1 g) = 0.274 mW/g; SAR(10 g) = 0.163 mW/g
Maximum value of SAR (measured) = 0.298 mW/g



0 dB = 0.298mW/g

Fig.53 1900 MHz CH512

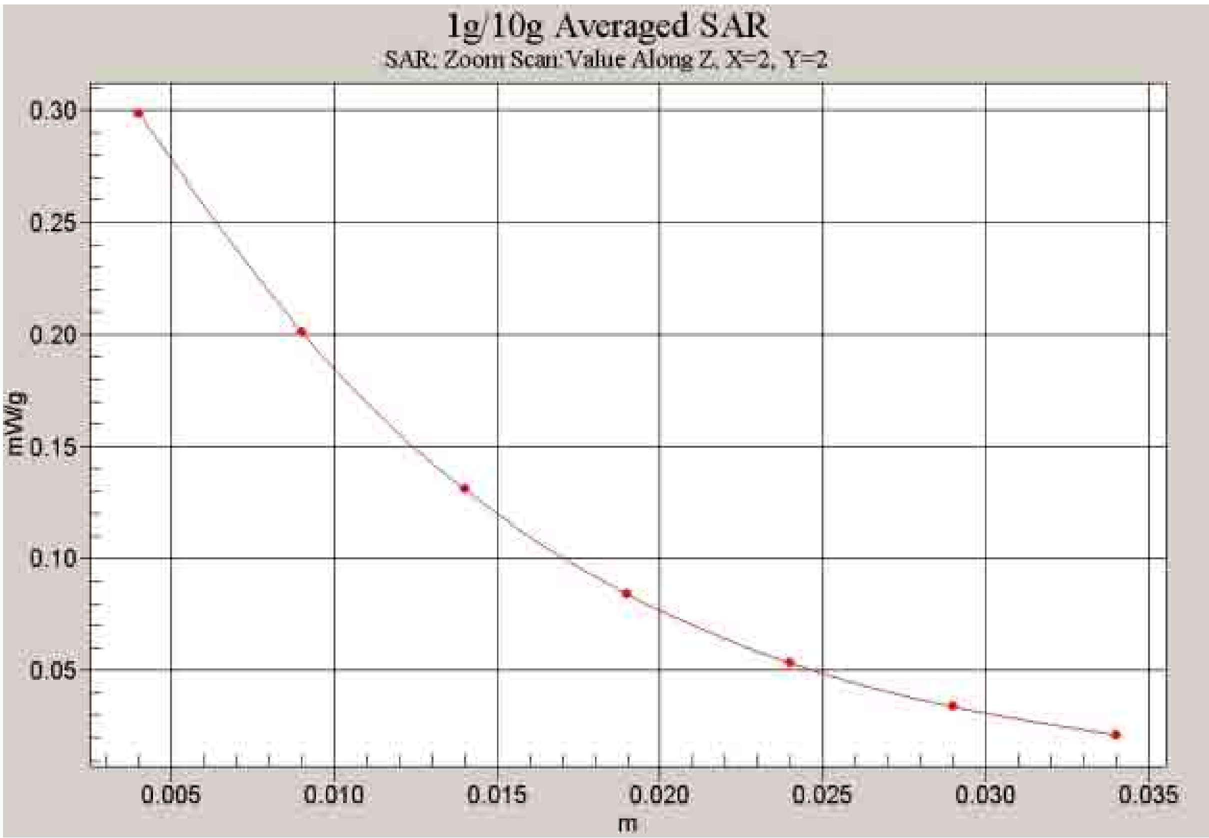


Fig. 54 Z-Scan at power reference point (1900 MHz CH512)

1900 Body Towards Ground High with GPRS

Date/Time: 2008-7-4 9:26:05

Electronics: DAE4 Sn777

Medium: Body 1900 MHz

Medium parameters used: f = 1910 MHz; σ = 1.5 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: 1909.8 MHz Duty Cycle: 1:4

Probe: ES3DV3 - SN3142 ConvF(4.61, 4.61, 4.61)

Toward Ground High/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.557 mW/g

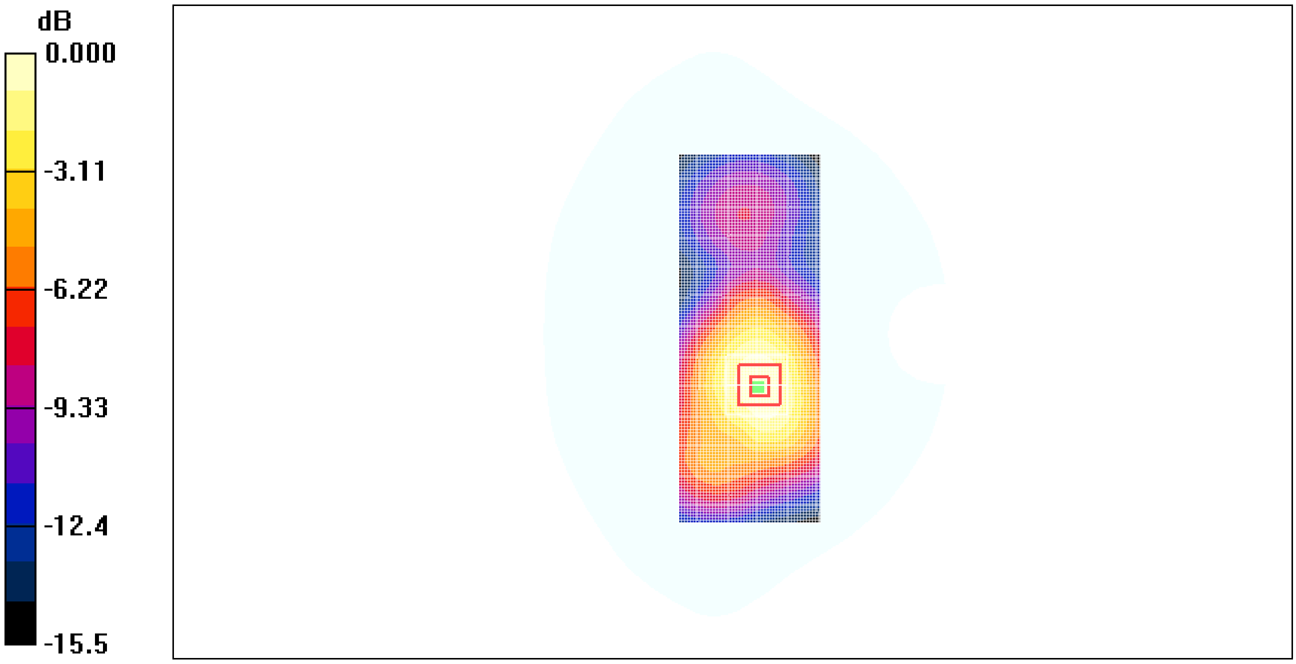
Toward Ground High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 14.0 V/m; Power Drift = -0.078 dB

Peak SAR (extrapolated) = 0.787 W/kg

SAR(1 g) = 0.509 mW/g; SAR(10 g) = 0.320 mW/g

Maximum value of SAR (measured) = 0.548 mW/g



0 dB = 0.548mW/g

Fig. 55 1900 MHz CH810

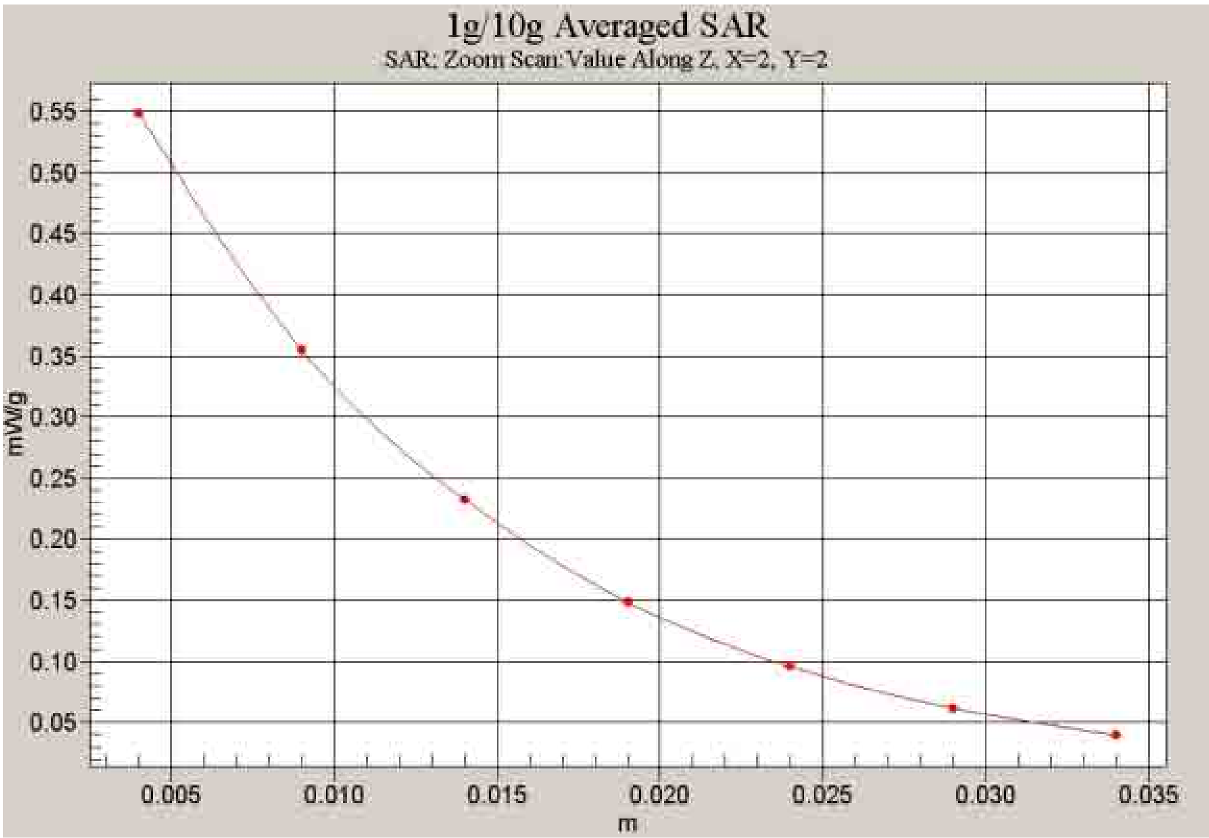


Fig. 56 Z-Scan at power reference point (1900 MHz CH810)

1900 Body Towards Ground Middle with GPRS

Date/Time: 2008-7-4 9:41:50

Electronics: DAE4 Sn777

Medium: Body 1900 MHz

Medium parameters used: f = 1880 MHz; σ = 1.47 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: 1880 MHz Duty Cycle: 1:4

Probe: ES3DV3 - SN3142 ConvF(4.61, 4.61, 4.61)

Toward Ground Middle/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.597 mW/g

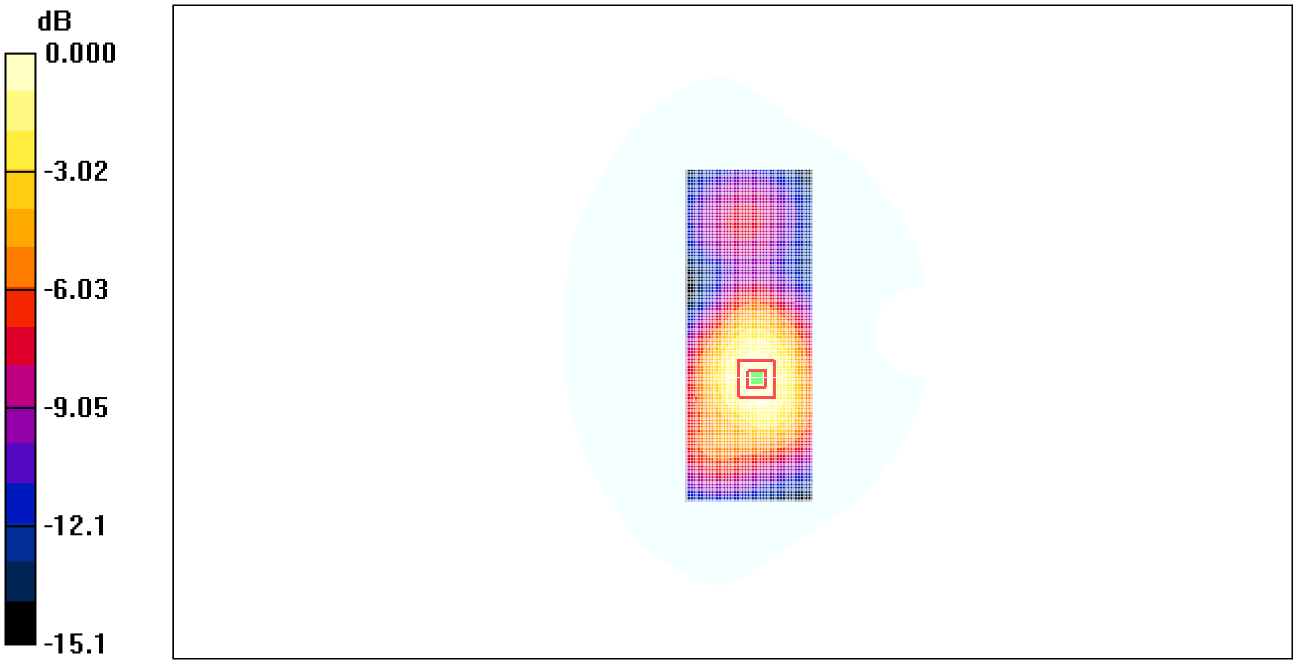
Toward Ground Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 14.4 V/m; Power Drift = -0.107 dB

Peak SAR (extrapolated) = 0.841 W/kg

SAR(1 g) = 0.551 mW/g; SAR(10 g) = 0.348 mW/g

Maximum value of SAR (measured) = 0.592 mW/g



0 dB = 0.592mW/g

Fig. 57 1900 MHz CH661

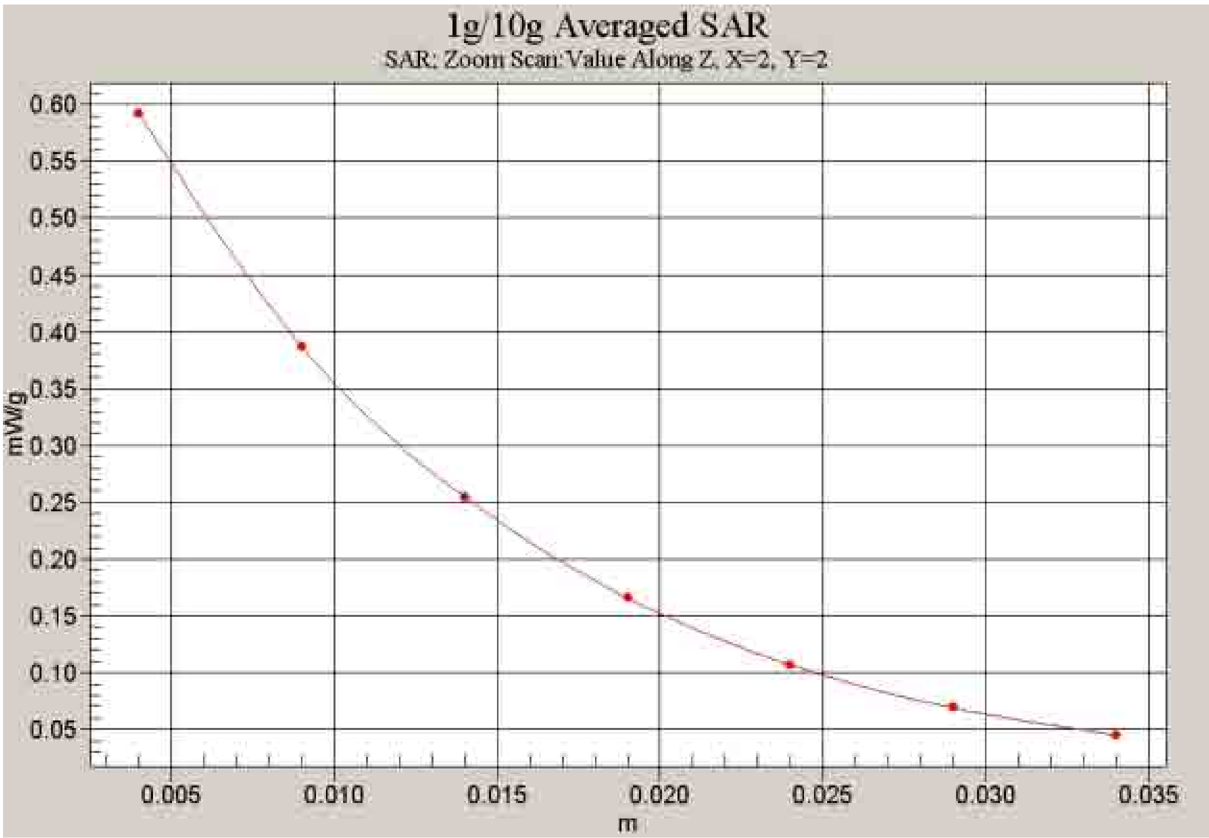


Fig. 58 Z-Scan at power reference point (1900 MHz CH661)

1900 Body Towards Ground Low with GPRS

Date/Time: 2008-7-4 9:56:04

Electronics: DAE4 Sn777

Medium: Body 1900 MHz

Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.45 mho/m; ε_r = 52.2; ρ = 1000 kg/m^3

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

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

Probe: ES3DV3 - SN3142 ConvF(4.61, 4.61, 4.61)

Toward Ground Low/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.475 mW/g

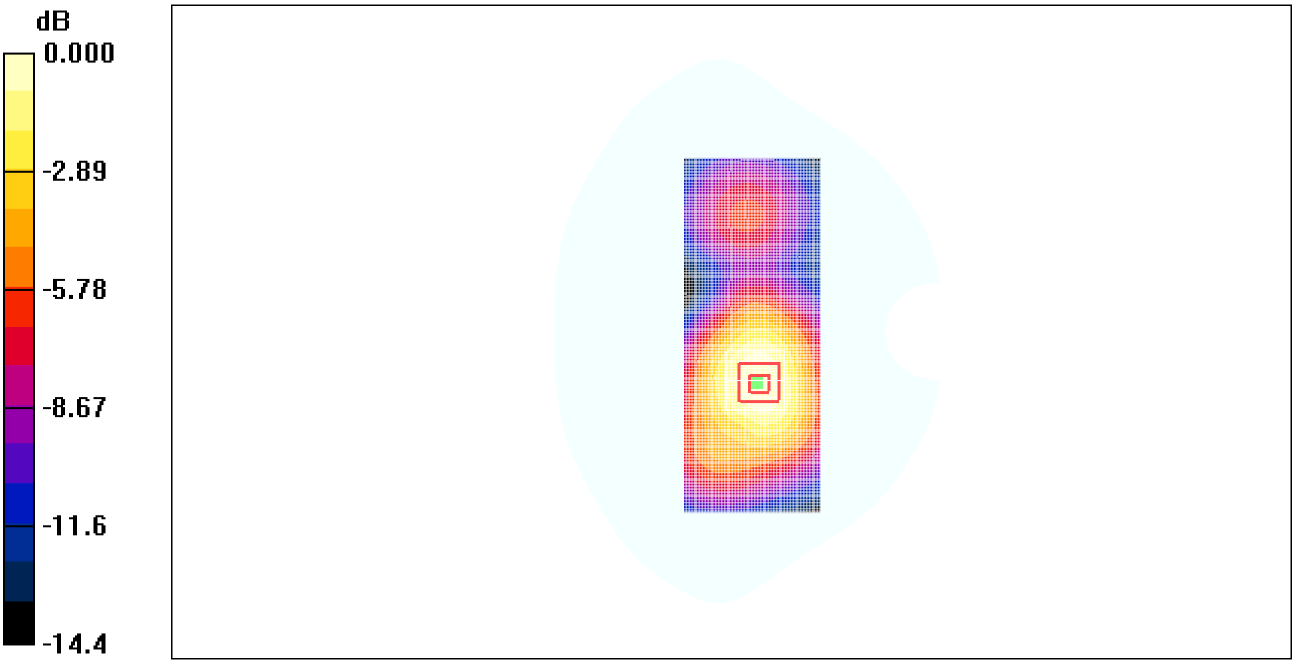
Toward Ground Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.2 V/m; Power Drift = -0.098 dB

Peak SAR (extrapolated) = 0.669 W/kg

SAR(1 g) = 0.440 mW/g; SAR(10 g) = 0.281 mW/g

Maximum value of SAR (measured) = 0.468 mW/g



0 dB = 0.468mW/g

Fig. 59 1900 MHz CH512

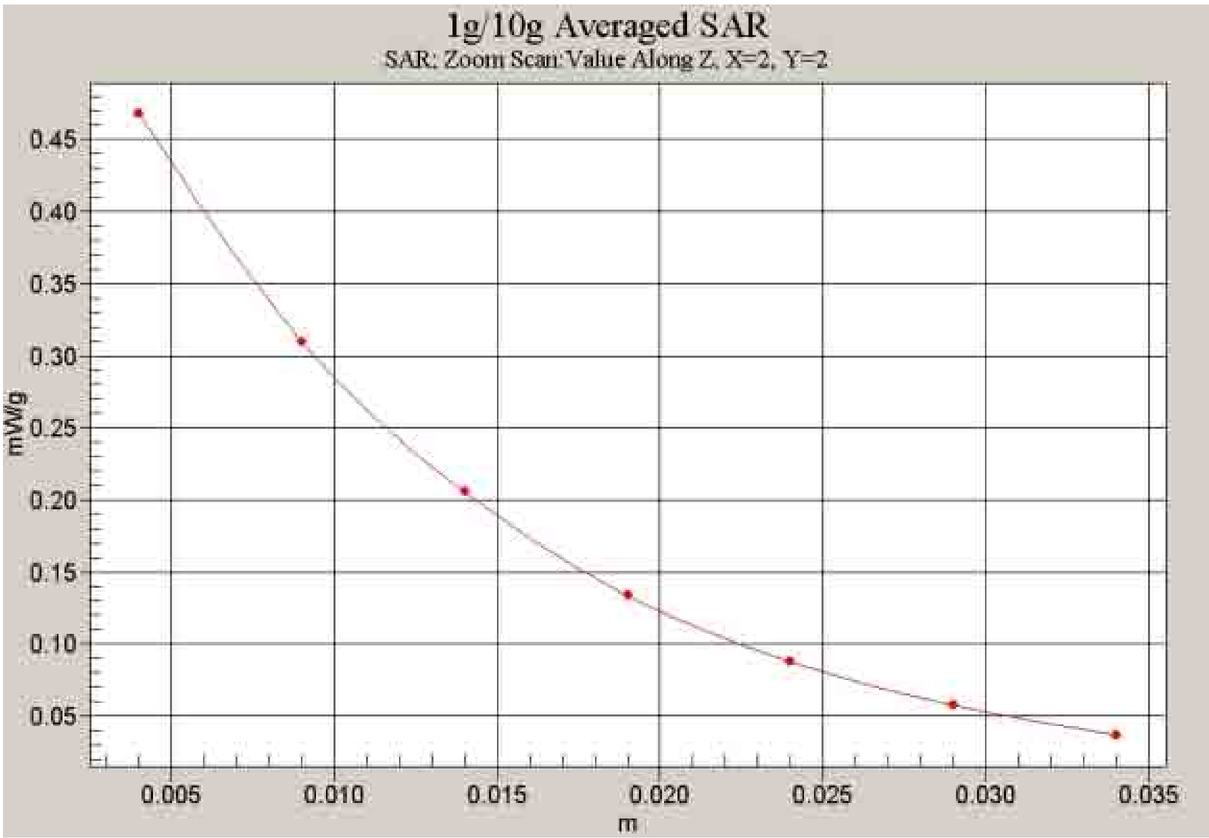


Fig. 60 Z-Scan at power reference point (1900 MHz CH512)

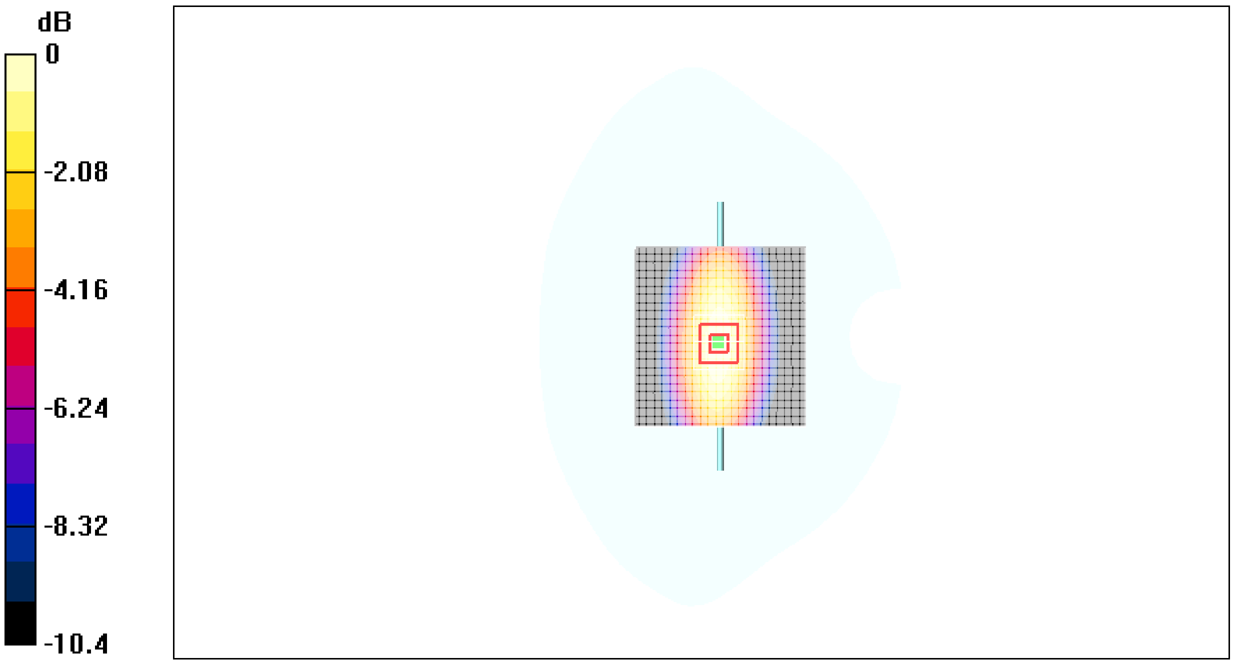
ANNEX D SYSTEM VALIDATION RESULTS

835MHzDAE777Probe3142

Date/Time: 2008-7-1 8:13:54
Electronics: DAE4 Sn777
Medium: 835 Head
Medium parameters used: f = 835 MHz; σ = 0.91 mho/m; ε_r = 43.5; ρ = 1000 kg/m^3
Ambient Temperature:23.3^{o}C Liqiud Temperature: 22.5^{o}C
Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1
Probe: ES3DV3 – SN3142 ConvF(5.97, 5.97, 5.97)

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 = -0.01 dB
Peak SAR (extrapolated) = 3.67 W/kg
SAR(1 g) = 2.50 mW/g; SAR(10 g) = 1.62 mW/g
Maximum value of SAR (measured) = 2.69 mW/g



0 dB = 2.69mW/g

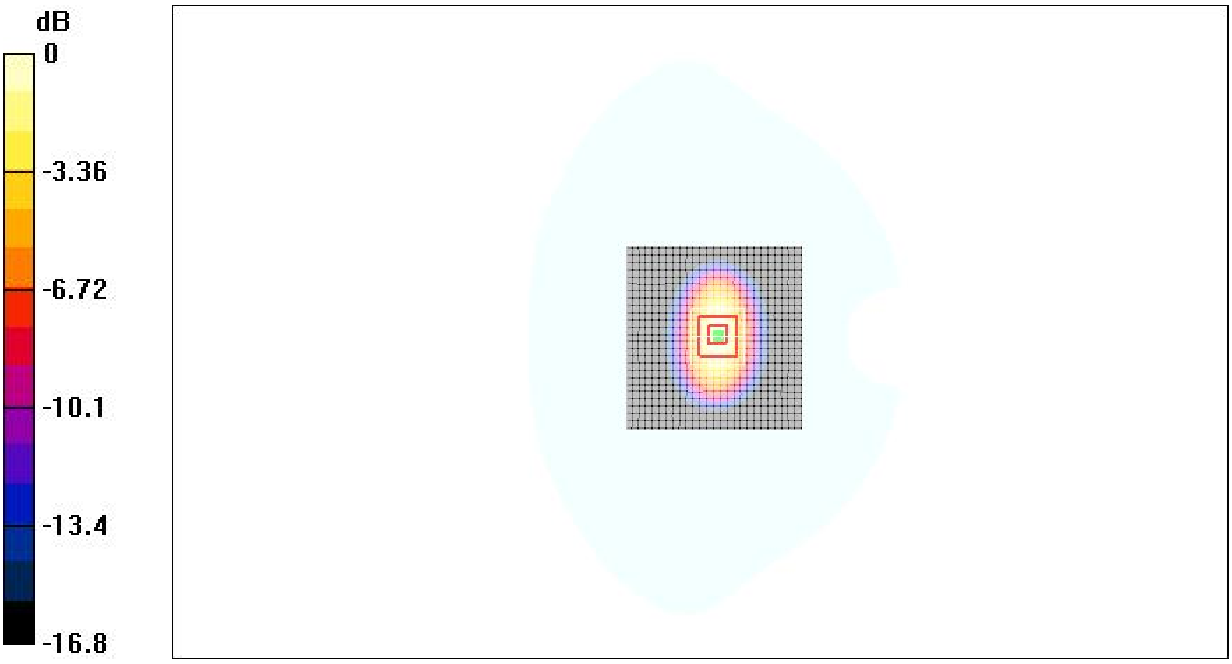
Fig.61 validation 835MHz 250mW

1900MHz DAE777Probe3142

Date/Time: 2008-7-3 7:41:16
Electronics: DAE4 Sn777
Medium: Head 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.38 mho/m; ε_r = 40.6; ρ = 1000 kg/m^3
Ambient Temperature:23.3^{o}C Liqiud Temperature: 22.5^{o}C
Communication System: CW Frequency: 1900 MHz Duty Cycle: 1:1
Probe: ES3DV3 – SN3142 ConvF(5.66, 5.66, 5.66)

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
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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 Beijing**

Certificate No: **ES3-3142_Sep07**

CALIBRATION CERTIFICATE

Object	ES3DV3 - SN:3142
Calibration procedure(s)	QA CAL-01.v6 and QA CAL-12.v5 Calibration procedure for dosimetric E-field probes
Calibration date:	September 7, 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	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Power sensor E4412A	MY41495277	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Power sensor E4412A	MY41498087	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Reference 3 dB Attenuator	SN: S5054 (3c)	8-Aug-07 (METAS, No. 217-00719)	Aug-08
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-07 (METAS, No. 217-00671)	Mar-08
Reference 30 dB Attenuator	SN: S5129 (30b)	8-Aug-07 (METAS, No. 217-00720)	Aug-08
Reference Probe ES3DV2	SN: 3013	4-Jan-07 (SPEAG, No. ES3-3013_Jan07)	Jan-08
DAE4	SN: 654	20-Apr-07 (SPEAG, No. DAE4-654_Apr07)	Apr-08

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (SPEAG, in house check 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: September 10, 2007

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

Certificate No: ES3-3142_Sep07 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) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- *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 ES3DV3

SN:3142

Manufactured: March 13, 2007
Calibrated: September 7, 2007

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

DASY - Parameters of Probe: ES3DV3 SN:3142

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

NormX	**1.21** ± 10.1%	$\mu V/(V/m)^2$	DCP X	**96** mV
NormY	**1.28** ± 10.1%	$\mu V/(V/m)^2$	DCP Y	**95** mV
NormZ	**1.15** ± 10.1%	$\mu V/(V/m)^2$	DCP Z	**96** 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		**3.0 mm**	**4.0 mm**
SAR_{be} [%]	Without Correction Algorithm	2.6	0.8
SAR_{be} [%]	With Correction Algorithm	0.0	0.4

TSL **1810 MHz** **Typical SAR gradient: 10 % per mm**

Sensor Center to Phantom Surface Distance		**3.0 mm**	**4.0 mm**
SAR_{be} [%]	Without Correction Algorithm	7.6	4.5
SAR_{be} [%]	With Correction Algorithm	0.2	0.1

Sensor Offset

Probe Tip to Sensor Center **2.0** mm

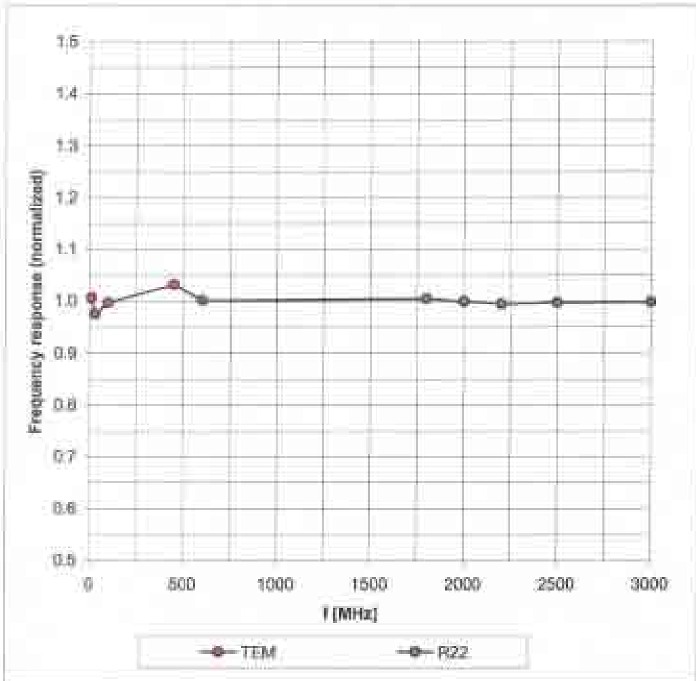
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[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.

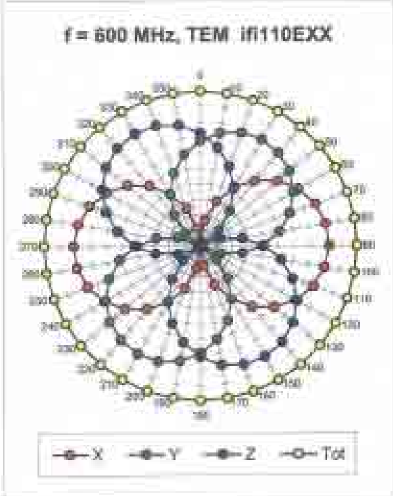
Frequency Response of E-Field

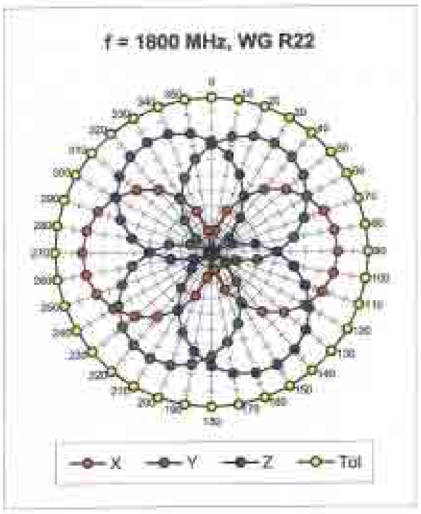
(TEM-Cell:ifi110 EXX, Waveguide: R22)

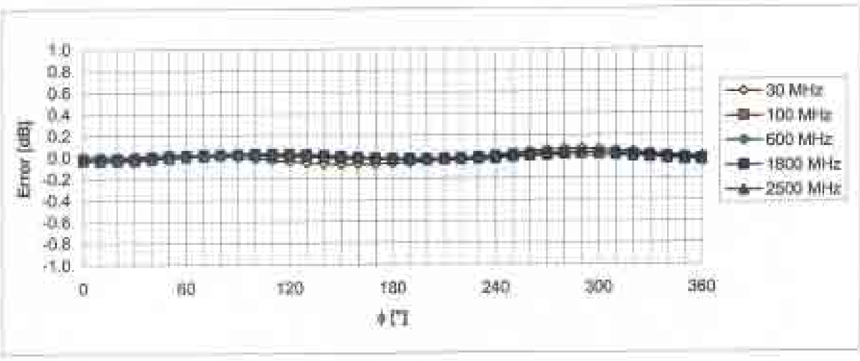


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

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



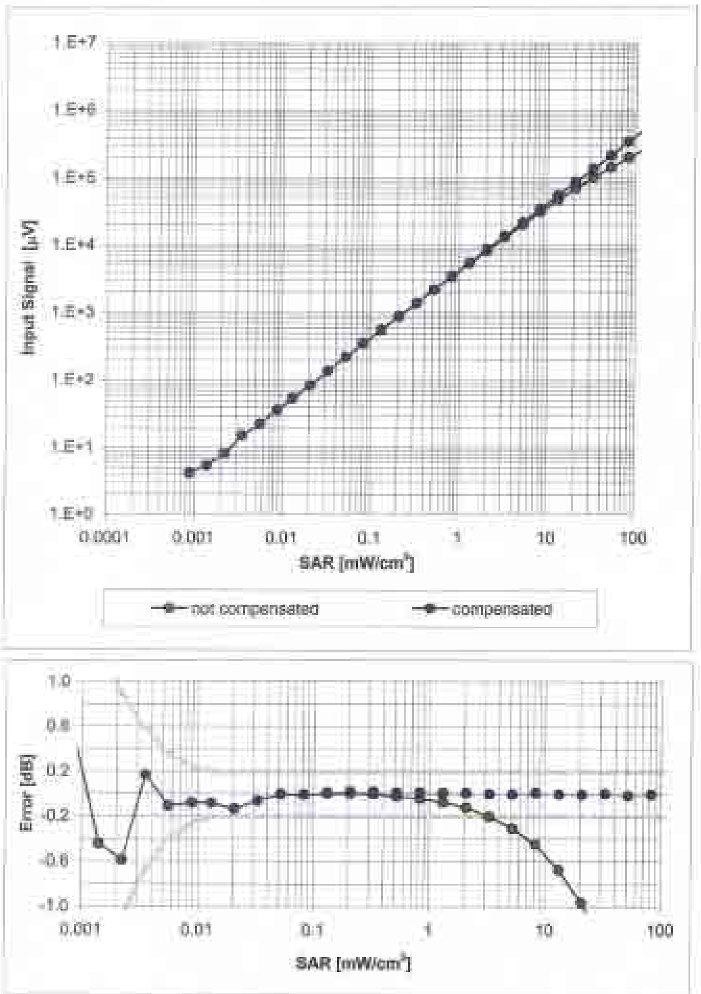




Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

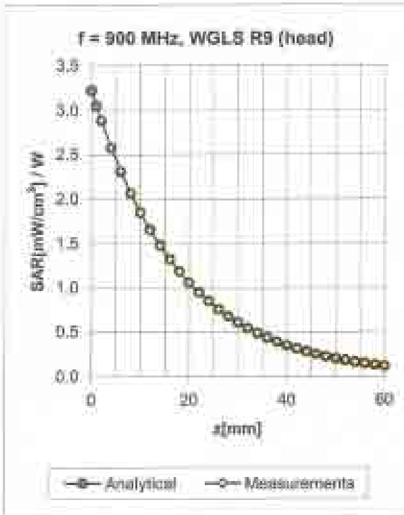
Dynamic Range f(SAR_{head})

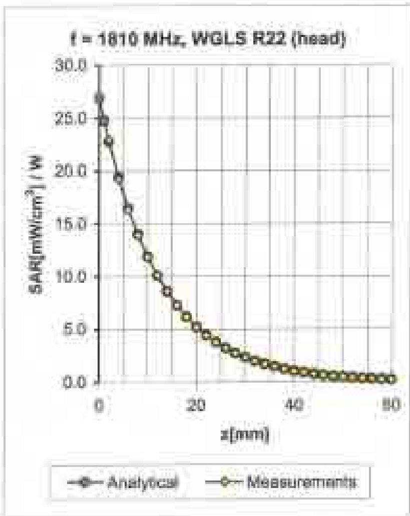
(Waveguide R22, f = 1800 MHz)



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

Conversion Factor Assessment



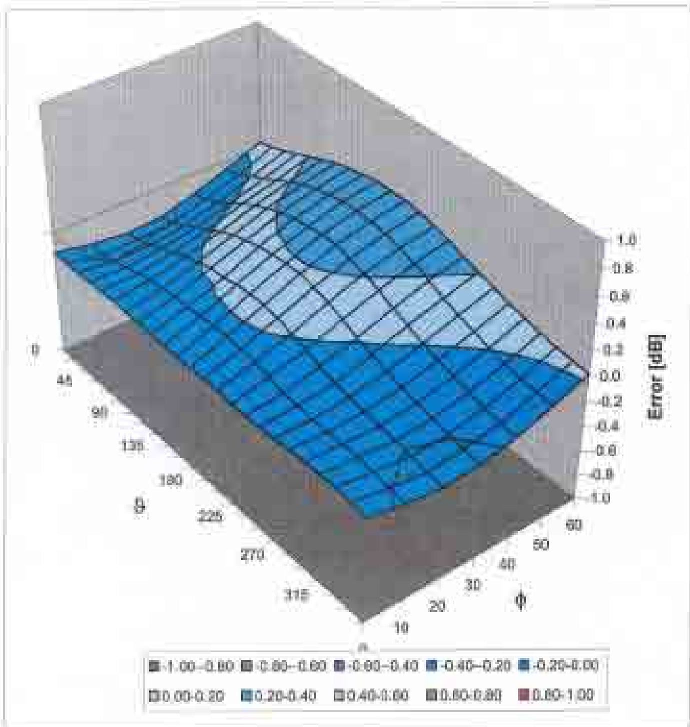


f [MHz]	Validity [MHz][c]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF	Uncertainty
450	± 50 / ± 100	Head	43.5 ± 5%	0.87 ± 5%	0.32	1.29	6.16	± 13.3% (k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	1.00	1.09	5.97	± 11.0% (k=2)
1810	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.60	1.41	4.87	± 11.0% (k=2)
450	± 50 / ± 100	Body	56.7 ± 5%	0.94 ± 5%	0.24	1.24	6.68	± 13.3% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.94	1.16	5.66	± 11.0% (k=2)
1810	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.73	1.33	4.61	± 11.0% (k=2)

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

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

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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 Aglient 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.

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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

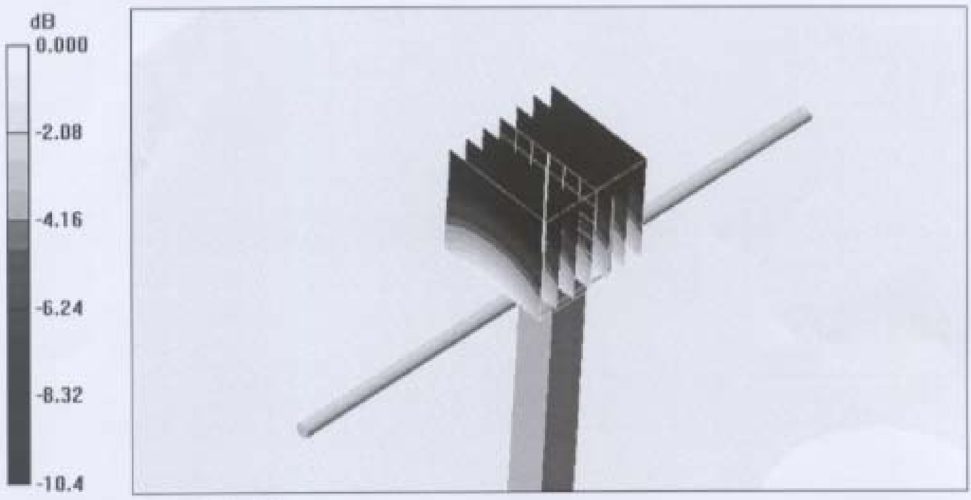
Test laboratory: SPEAG, Zurich, Switzerland

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:

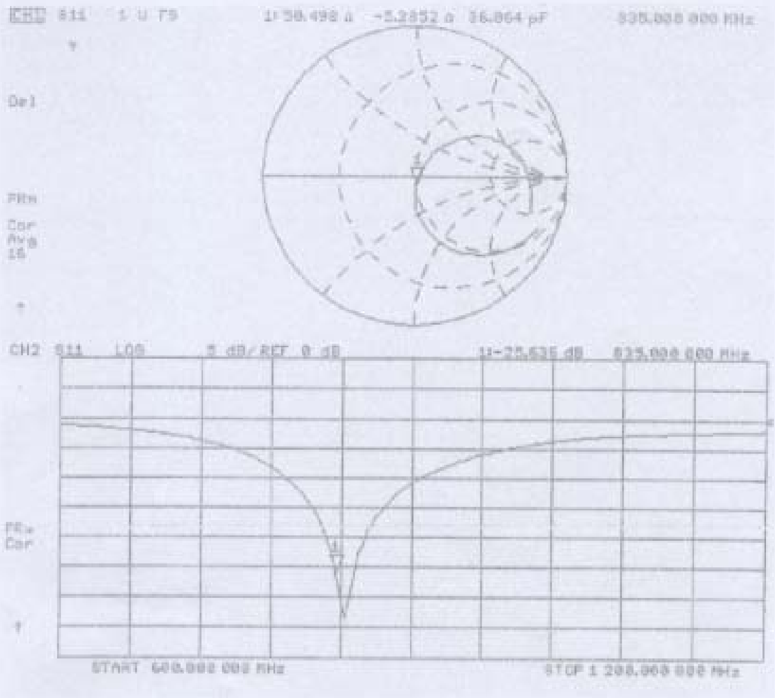
- Probe: ET3DV6-SN1507(HF); ConvF(6.01,6.01,6.01); Calibrated: 19.10.2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.1_2007
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA;
- Measurement SW: DASY, V4.7 Build 53; Post processing SW: SEMCAD, V1.8 Build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



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

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

Accredited by the Swiss 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: D1900V2-541_Feb07

CALIBRATION CERTIFICATE

Object	D1900V2-SN: 541
Calibration procedure(s)	QA CAL-05.v6 Calibration procedure for dipole validation kits
Calibration date:	February 20, 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 Aglient E4421B	MY41000676	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
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

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

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 V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.9 ± 6 %	1.38 mho/m ± 6 %
Head TSL temperature during test	(22.1 ± 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	9.73 mW /g
SAR normalized	normalized to 1W	38.9 mW /g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**38.6 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.09 mW /g
SAR normalized	normalized to 1W	20.4 mW /g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**20.2 mW / g ± 16.5 % (k=2)**

[1] Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	48.4 Ω - 8.9 jΩ
Return Loss	- 26.4 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.214 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	October 4 , 2001

DASY4 Validation Report for Head TSL

Date/Time: 20.02.2007 09:25:37

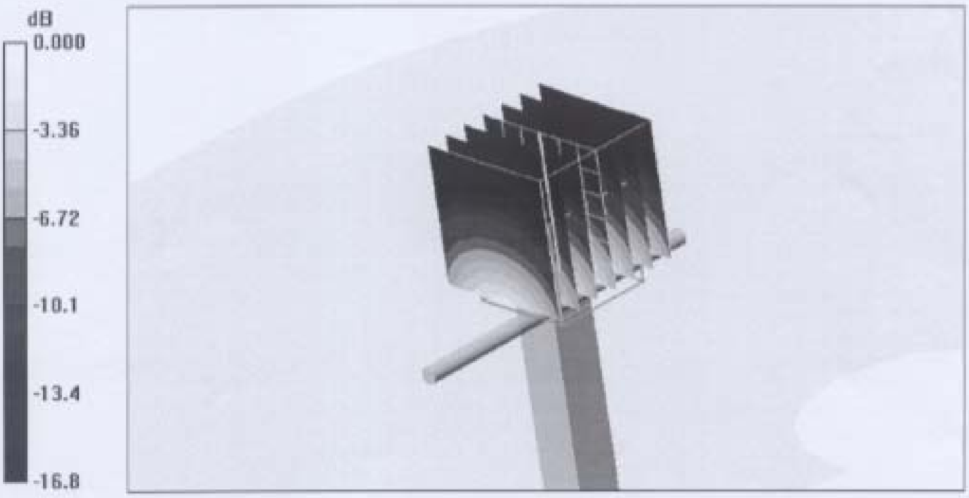
Test laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; serial: D1900V2-SN: 541

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: HSL 1900 MHz;
Medium parameters used: f=1900 MHz; σ=1.38 mho/m; ε_r=38.9; ρ= 1000kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)
DASY4 Configuration:

- Probe: ET3DV6-SN1507(HF); ConvF(5.03, 5.03, 5.03); 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 = 92.1 V/m; Power Drift = 0.059 dB
Peak SAR (extrapolated) = 16.9 W/kg
SAR(1 g) = 9.73 mW/g; SAR(10 g) = 5.09 mW/g
Maximum value of SAR (measured) = 11.3 mW/g



0 dB = 11.3mW/g

Impedance measurement Plot for Head TSL