SAR TEST REPORT

No. 2008EEE04424

For

HUAWEI Technologies Co., Ltd.

WCDMA/GPRS/GSM/EDGE Mobile Phone with Bluetooth

U1315

With

Hardware Version: HD2U130M VER.C

Software Version: U1315V100R001C01B126

FCCID: QISU1305

Issued Date: 2008-12-12

Deutscher Akkreditierungs Rat

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

检 测
CNAS L0442

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of TMC Beijing.

Test Laboratory:

TMC Beijing, Telecommunication Metrology Center of Ministry of Information Industry

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TABLE OF CONTENT

1 Test Laboratory

1.1 Testing Location

Company Name:	TMC Beijing, Telecommunication Metrology Center of MII
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Telephone:	+86-10-62303288
Fax:	+86-10-62304793

1.2 Testing Environment

Temperature:	18°C~25 °C,
Relative humidity:	30%~ 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:	December 10, 2008
Testing End Date:	December 11, 2008

1.4 Signature

Lin Xiaojun
(Prepared this test report)

Sun Qian
(Reviewed this test report)

Lu Bingsong
Deputy Director of the laboratory
(Approved this test report)

2 Client Information

2.1 Applicant Information

Company Name:	HUAWEI Technologies Co., Ltd.
Address /Post:	Bantian, Longgang District, Shenzhen, Guangdong
City:	Shenzhen
Postal Code:	518129
Country:	China
Telephone:	010－82836505/010-82836728
Fax:	010－82836567

2.2 Manufacturer Information

Company Name:	HUAWEI Technologies Co., Ltd.
Address /Post:	Bantian, Longgang District, Shenzhen, Guangdong
City:	Shenzhen
Postal Code:	518129
Country:	China
Telephone:	010－82836505/010-82836728
Fax:	010－82836567

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

3.1 About EUT

Description:	WCDMA/GPRS/GSM/EDGE Mobile Phone with Bluetooth
Model:	U1315
Test Frequency Band:	WCDMA850/WCDMA1900/GSM 850/GSM 1900
GPRS Class:	10

3.2 Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	35674402000122-1-26	HD2U130M VER.C	U1315V100R001C01B126

*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	HS—050040U2	TPA863006364	HUAWEI technologies Co., Ltd
AE2	Battery	HBU570	FMT7B0106297Y	Shenzhen FMT Co., Ltd.

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

4 CHARACTERISTICS OF THE TEST

4.1 Applicable Limit Regulations

EN 50360–2006: 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.

4.2 Applicable Measurement Standards

EN 62209-1–2006: 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).

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.

5 OPERATIONAL CONDITIONS DURING TEST

5.1 Schematic Test Configuration

5.1.1 SAR Measurement Procedures for WCDMA 850MHz and WCDMA 1900MHZ

For the SAR tests at WCDMA 850MHz and WCDMA 1900MHz, a communication link is set up with a System Simulator (SS) by air link. The maximum output power were verified on high, middle and low channels for each test band according to section 5.2 of 3GPP TS 34.121 using 12.2kbps RMC and AMR with TPC set to all “1’s”

(Please see 6.2.2 Table 3 for the above detailed power measurement results.)

Head and body SAR are both measured using the 12.2kbps RMC with TPC bits configured to all “1”s, and not required for 12.2kbps AMR, because the maximum output power for 1.2kps AMR is less than 0.25dB higher than that measured in 12.2kbps RMC. For body SAR measurement, the multiple $DPDCH_n$ configurations are also not required, because the EUT can’t support it.

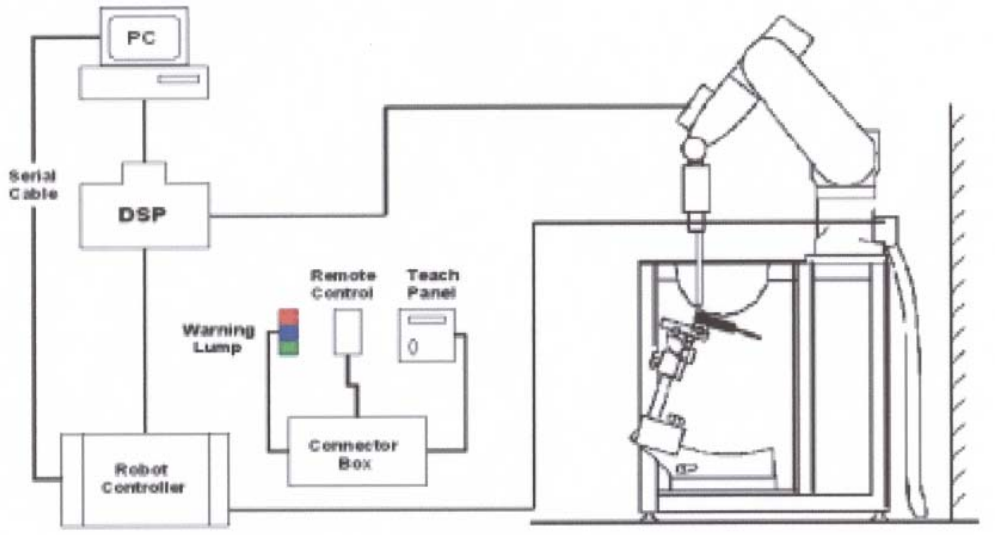
5.1.2 SAR Measurement Procedures for GSM 850MHz and GSM 1900MHZ

For the SAR tests at GSM 850 and GSM 1900, a communication link is set up with a System Simulator (SS) by air link. The EUT is commanded to operate at maximum transmitting power.

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

A cell controller system contains the power supply, robot controller, teaches pendant (Joystick), and remote control, is used to drive the robot motors. The PC consists of the Micron Pentium III 800 MHz computer with Windows 2000 system and SAR Measurement Software DASY4, A/D interface card, monitor, mouse, and keyboard. The Stäubli Robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card.



Picture 1: 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.

5.3 Dasy4 E-field Probe System

The SAR measurements were conducted with the dosimetric probe ES3DV3 (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.

ES3DV3 Probe Specification

Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	Basic Broad Band Calibration in air Conversion Factors (CF) for HSL 900 and HSL 1810 Additional CF for other liquids and frequencies upon request
Frequency	10 MHz to 4 GHz; Linearity: ± 0.2 dB (30 MHz to 4 GHz)
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.3 dB in tissue material (rotation normal to probe axis)

Picture 2: ES3DV3 E-field Probe

Dynamic Range	5 μW/g to > 100 mW/g; Linearity: ± 0.2 dB
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 3.9 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.0 mm
Application	General dosimetry up to 4 GHz Dosimetry in strong gradient fields Compliance tests of mobile phones

Picture3:ES3DV3 E-field probe

5.4 E-field Probe Calibration

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

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

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

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

Where: Δt = Exposure time (30 seconds),
C = Heat capacity of tissue (brain or muscle),
ΔT = Temperature increase due to RF exposure.

Or

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

Where:
σ = Simulated tissue conductivity,
ρ = Tissue density (kg/m^3).

Picture 4: Device Holder

5.5 Other Test Equipment

5.5.1 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).

5.5.2 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 5: Generic Twin Phantom

5.6 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

5.7 System Specifications

5.7.1 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

6 CONDUCTED OUTPUT POWER MEASUREMENT

6.1 Summary

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

6.2 Conducted Power

6.2.1 Measurement Methods

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

6.2.2 Measurement result

Table 3: Conducted Power Measurement Results

	Conducted Power		
WCDMA 850 (12.2kbps RMC)	**Channel 4132 (826.4MHz)**	**Channel 4182 (836.4MHz)**	**Channel 4233 (846.6MHz)**
Before Test (dBm)	22.51	22.63	22.40
After Test (dBm)	22.50	22.63	22.41
WCDMA 1900 (12.2kbps RMC)	**Channel 9262 (1852.4MHz)**	**Channel 9400 (1880MHz)**	**Channel 9538 (1907.6MHz)**
Before Test (dBm)	22.55	22.41	22.90
After Test (dBm)	22.54	22.40	22.91
WCDMA 850 (64kbps AMR)	**Channel 4132 (826.4MHz)**	**Channel 4182 (836.4MHz)**	**Channel 4233 (846.6MHz)**
Before Test (dBm)	22.51	22.60	22.40
After Test (dBm)	22.51	22.61	22.41
WCDMA 1900 (64kbps AMR)	**Channel 9262 (1852.4MHz)**	**Channel 9400 (1880MHz)**	**Channel 9538 (1907.6MHz)**
Before Test (dBm)	22.55	22.42	22.89
After Test (dBm)	22.56	22.41	22.91
GSM 850MHz	**Channel 128 (824.2MHz)**	**Channel 190 (836.6MHz)**	**Channel 251 (848.8MHz)**
Before Test (dBm)	32.58	32.77	32.70
After Test (dBm)	32.59	32.78	32.70
GSM 1900MHZ	**Channel 512 (1850.2MHz)**	**Channel 661 (1880MHz)**	**Channel 810 (1909.8MHz)**
Before Test (dBm)	29.00	28.92	28.79
After Test (dBm)	29.01	28.92	28.79
GSM 850MHz GPRS	**Channel 128 (824.2MHz)**	**Channel 190 (836.6MHz)**	**Channel 251 (848.8MHz)**
Before Test (dBm)	32.59	32.79	32.71
After Test (dBm)	32.59	32.78	32.71
GSM 1900MHZ GPRS	**Channel 512 (1850.2MHz)**	**Channel 661 (1880MHz)**	**Channel 810 (1909.8MHz)**
Before Test (dBm)	29.02	28.93	28.78
After Test (dBm)	29.01	28.92	28.79
GSM 850MHz EGPRS	**Channel 128 (824.2MHz)**	**Channel 190 (836.6MHz)**	**Channel 251 (848.8MHz)**
Before Test (dBm)	26.90	27.25	26.98
After Test (dBm)	26.90	27.25	26.96
GSM 1900MHZ EGPRS	**Channel 512 (1850.2MHz)**	**Channel 661 (1880MHz)**	**Channel 810 (1909.8MHz)**
Before Test (dBm)	25.51	25.32	25.66

After Test (dBm)	25.51	25.31	25.67

6.2.3 Power Drift

To control the output power stability during the SAR test, DASY4 system calculates the power drift by measuring the E-field at the same location at the beginning and at the end of the measurement for each test position. These drift values can be found in Table 11 to Table 32 labeled as: (Power Drift [dB]). This ensures that the power drift during one measurement is within 5%.

7 TEST RESULTS

7.1 Dielectric Performance

Table 4: Dielectric Performance of Head Tissue Simulating Liquid

Measurement is made at temperature 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	40.2	0.89
	1900 MHz	40.9	1.38

Table 5: Dielectric Performance of Body Tissue Simulating Liquid

Measurement is made at temperature 23.3 °C and relative humidity 49%. Liquid temperature during the test: 22.5°C			
/	**Frequency**	**Permittivity ε**	**Conductivity σ (S/m)**
Target value	850 MHz	55.2	0.97
	1900 MHz	53.3	1.52
Measurement value (Average of 10 tests)	850 MHz	53.7	1.02
	1900 MHz	53.0	1.46

7.2 System Validation

Table 6: System Validation

Measurement is made at temperature 23.3 °C, relative humidity 49%, input power 250 mW. Liquid temperature during the test: 22.5°C							
Liquid parameters		**Frequency**		**Permittivity ε**		**Conductivity σ (S/m)**	
		835 MHz		43.5		0.91	
		1900 MHz		40.9		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.

7.3 Summary of Measurement Results (WCDMA 850)

Table 7: SAR Values (Head, WCDMA 850 MHz Band)

Limit of SAR (W/kg)	10 g Average	1 g Average	Power Drift (dB)
	2.0	1.6	
Test Case	Measurement Result (W/kg)		
	10 g Average	1 g Average	
Left hand, Touch cheek, Top frequency(See Fig.1)	0.178	0.245	-0.014
Left hand, Touch cheek, Mid frequency(See Fig.3)	0.259	0.354	0.022
Left hand, Touch cheek, Bottom frequency(See Fig.5)	0.174	0.238	-0.018
Left hand, Tilt 15 Degree, Top frequency(See Fig.7)	0.106	0.166	-0.073
Left hand, Tilt 15 Degree, Mid frequency(See Fig.9)	0.160	0.249	0.142
Left hand, Tilt 15 Degree, Bottom frequency(See Fig.11)	0.109	0.165	0.168
Right hand, Touch cheek, Top frequency(See Fig.13)	0.192	0.259	-0.200
Right hand, Touch cheek, Mid frequency(See Fig.15)	0.283	0.381	-0.090
Right hand, Touch cheek, Bottom frequency(See Fig.17)	0.182	0.242	0.002
Right hand, Tilt 15 Degree, Top frequency(See Fig.19)	0.114	0.155	0.062
Right hand, Tilt 15 Degree, Mid frequency(See Fig.21)	0.180	0.244	0.105
Right hand, Tilt 15 Degree, Bottom frequency(See Fig.23)	0.114	0.154	0.174

Table 8: SAR Values (Body, WCDMA 850 MHz Band)

Limit of SAR (W/kg)	10 g Average	1 g Average	Power Drift (dB)
	2.0	1.6	
Test Case	Measurement Result (W/kg)		
	10 g Average	1 g Average	
Body, Towards Ground, Top frequency (See Fig.25)	0.440	0.612	-0.038
Body, Towards Ground, Mid frequency (See Fig.27)	0.528	0.731	-0.062
Body, Towards Ground, Bottom frequency (See Fig.29)	0.424	0.585	-0.055
Body, Towards Phantom, Top frequency (See Fig.31)	0.160	0.218	-0.009
Body, Towards Phantom, Mid frequency (See Fig.33)	0.241	0.328	0.075
Body, Towards Phantom, Bottom frequency (See Fig.35)	0.151	0.204	0.076
Body, Towards Ground, Mid frequency with Headset(See Fig.37)	0.335	0.458	-0.073

7.4 Summary of Measurement Results (WCDMA 1900)

Table 9: SAR Values (Head, WCDMA 1900 MHz Band)

Limit of SAR (W/kg)	10 g Average	1 g Average	Power Drift (dB)
	2.0	1.6	
Test Case	Measurement Result (W/kg)		
	10 g Average	1 g Average	
Left hand, Touch cheek, Top frequency(See Fig.39)	0.382	0.713	-0.200
Left hand, Touch cheek, Mid frequency(See Fig.41)	0.408	0.745	0.140
Left hand, Touch cheek, Bottom frequency(See Fig.43)	0.354	0.641	0.117
Left hand, Tilt 15 Degree, Top frequency(See Fig.45)	0.459	0.854	0.053
Left hand, Tilt 15 Degree, Mid frequency(See Fig.47)	0.459	0.857	0.079
Left hand, Tilt 15 Degree, Bottom frequency(See Fig.49)	0.380	0.707	-0.142
Right hand, Touch cheek, Top frequency(See Fig.51)	0.322	0.559	-0.105
Right hand, Touch cheek, Mid frequency(See Fig.53)	0.352	0.610	-0.090
Right hand, Touch cheek, Bottom frequency(See Fig.55)	0.296	0.514	-0.074
Right hand, Tilt 15 Degree, Top frequency(See Fig.57)	0.376	0.674	-0.021
Right hand, Tilt 15 Degree, Mid frequency(See Fig.59)	0.402	0.724	0.017
Right hand, Tilt 15 Degree, Bottom frequency(See Fig.61)	0.362	0.645	-0.010

Table 10: SAR Values (Body, WCDMA 1900 MHz Band)

Limit of SAR (W/kg)	10 g Average	1 g Average	Power Drift (dB)
	2.0	1.6	
Test Case	Measurement Result (W/kg)		
	10 g Average	1 g Average	
Body, Towards Ground, Top frequency (See Fig.63)	0.290	0.474	-0.157
Body, Towards Ground, Mid frequency (See Fig.65)	0.308	0.507	-0.179
Body, Towards Ground, Bottom frequency (See Fig.67)	0.308	0.511	-0.021
Body, Towards Phantom, Top frequency (See Fig.69)	0.141	0.228	-0.041
Body, Towards Phantom, Mid frequency (See Fig.71)	0.155	0.247	0.119
Body, Towards Phantom, Bottom frequency (See Fig.73)	0.133	0.213	0.104
Body, Towards Ground, Bottom frequency with Headset(See Fig.75)	0.242	0.407	0.024

7.5 Summary of Measurement Results (GSM 850)

Table 11: SAR Values (Head, GSM 850 MHz Band)

Limit of SAR (W/kg)	10 g Average	1 g Average	Power Drift (dB)
	2.0	1.6	
Test Case	Measurement Result (W/kg)		
	10 g Average	1 g Average	
Left hand, Touch cheek, Top frequency(See Fig.77)	0.281	0.384	-0.056
Left hand, Touch cheek, Mid frequency(See Fig.79)	0.249	0.342	0.026
Left hand, Touch cheek, Bottom frequency(See Fig.81)	0.259	0.354	0.031
Left hand, Tilt 15 Degree, Top frequency(See Fig.83)	0.180	0.248	0.024
Left hand, Tilt 15 Degree, Mid frequency(See Fig.85)	0.163	0.225	-0.048
Left hand, Tilt 15 Degree, Bottom frequency(See Fig.87)	0.169	0.233	0.004
Right hand, Touch cheek, Top frequency(See Fig.89)	0.299	0.401	-0.039
Right hand, Touch cheek, Mid frequency(See Fig.91)	0.267	0.358	-0.168
Right hand, Touch cheek, Bottom frequency(See Fig.93)	0.262	0.350	0.023
Right hand, Tilt 15 Degree, Top frequency(See Fig.95)	0.186	0.253	-0.079
Right hand, Tilt 15 Degree, Mid frequency(See Fig.97)	0.164	0.222	0.015
Right hand, Tilt 15 Degree, Bottom frequency(See Fig.99)	0.169	0.229	0.069

Table 12: SAR Values (Body, GSM 850 MHz Band)

Limit of SAR (W/kg)	10 g Average	1 g Average	Power Drift (dB)
	2.0	1.6	
Test Case	Measurement Result (W/kg)		
	10 g Average	1 g Average	
Body, Towards Ground, Top frequency (See Fig.101)	0.606	0.849	-0.014
Body, Towards Ground, Mid frequency (See Fig.103)	0.592	0.823	0.007
Body, Towards Ground, Bottom frequency (See Fig.105)	0.580	0.803	0.013
Body, Towards Phantom, Top frequency (See Fig.107)	0.269	0.367	-0.035
Body, Towards Phantom, Mid frequency (See Fig.109)	0.231	0.315	0.053
Body, Towards Phantom, Bottom frequency (See Fig.111)	0.234	0.317	-0.015
Body, Towards Ground, Top frequency with GPRS(See Fig.113)	0.837	1.16	-0.097
Body, Towards Ground, Mid frequency with GPRS (See Fig.115)	0.828	1.15	0.016
Body, Towards Ground, Bottom frequency with GPRS (See Fig.117)	0.803	1.11	0.038
Body, Towards Phantom, Top frequency with GPRS (See Fig.119)	0.405	0.551	-0.200
Body, Towards Phantom, Mid frequency with GPRS (See Fig.121)	0.344	0.465	-0.007
Body, Towards Phantom, Bottom frequency with GPRS (See Fig.123)	0.331	0.449	0.008
Body, Towards Phantom, Bottom frequency with EGPRS (See Fig.125)	0.307	0.427	-0.012
Body, Towards Ground, Top frequency with Headset(See Fig.127)	0.483	0.677	0.008

7.6 Summary of Measurement Results (GSM 1900)

Table 13: SAR Values (Head, GSM 1900 MHz Band)

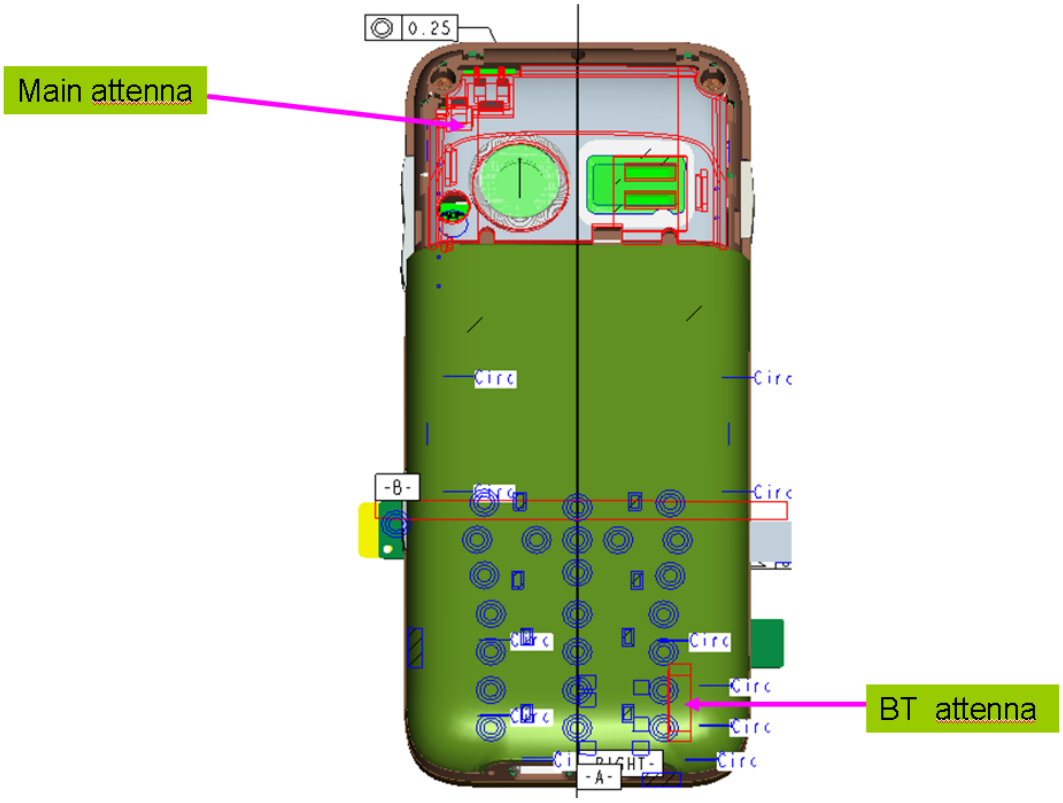
Limit of SAR (W/kg)	10 g Average	1 g Average	Power Drift (dB)
	2.0	1.6	
Test Case	Measurement Result (W/kg)		
	10 g Average	1 g Average	
Left hand, Touch cheek, Top frequency(See Fig.129)	0.264	0.486	-0.200
Left hand, Touch cheek, Mid frequency(See Fig.131)	0.358	0.651	0.005
Left hand, Touch cheek, Bottom frequency(See Fig.133)	0.315	0.572	-0.077
Left hand, Tilt 15 Degree, Top frequency(See Fig.135)	0.315	0.587	0.017
Left hand, Tilt 15 Degree, Mid frequency(See Fig.137)	0.424	0.785	0.042
Left hand, Tilt 15 Degree, Bottom frequency(See Fig.139)	0.385	0.717	0.200
Right hand, Touch cheek, Top frequency(See Fig.141)	0.224	0.394	-0.069
Right hand, Touch cheek, Mid frequency(See Fig.143)	0.305	0.532	-0.048
Right hand, Touch cheek, Bottom frequency(See Fig.145)	0.273	0.479	-0.013
Right hand, Tilt 15 Degree, Top frequency(See Fig.147)	0.268	0.491	-0.030
Right hand, Tilt 15 Degree, Mid frequency(See Fig.149)	0.367	0.666	-0.035
Right hand, Tilt 15 Degree, Bottom frequency(See Fig.151)	0.345	0.624	0.065

Table 14: SAR Values (Body, GSM 1900 MHz Band)

Limit of SAR (W/kg)	10 g Average	1 g Average	Power Drift (dB)
	2.0	1.6	
Test Case	Measurement Result (W/kg)		
	10 g Average	1 g Average	
Body, Towards Ground, Top frequency (See Fig.153)	0.175	0.285	-0.020
Body, Towards Ground, Mid frequency (See Fig.155)	0.205	0.335	0.008
Body, Towards Ground, Bottom frequency (See Fig.157)	0.216	0.356	-0.001
Body, Towards Phantom, Top frequency (See Fig.159)	0.084	0.135	0.074
Body, Towards Phantom, Mid frequency (See Fig.161)	0.126	0.202	0.165
Body, Towards Phantom, Bottom frequency (See Fig.163)	0.127	0.202	-0.039
Body, Towards Ground, Top frequency with GPRS(See Fig.165)	0.344	0.562	-0.012
Body, Towards Ground, Mid frequency with GPRS (See Fig.167)	0.403	0.662	-0.045
Body, Towards Ground, Bottom frequency with GPRS (See Fig.169)	0.426	0.706	-0.059
Body, Towards Phantom, Top frequency with GPRS (See Fig.171)	0.162	0.261	0.184
Body, Towards Phantom, Mid frequency with GPRS (See Fig.173)	0.235	0.375	0.058
Body, Towards Phantom, Bottom frequency with GPRS (See Fig.175)	0.237	0.376	-0.001
Body, Towards Phantom, Mid frequency with EGPRS (See Fig.177)	0.217	0.362	-0.038
Body, Towards Ground, Bottom frequency with Headset(See Fig.179)	0.175	0.290	-0.004

7.7 Summary of Measurement Results (Bluetooth function)

The distance between BT antenna and GSM antenna is >5cm. The location of the antennas inside mobile phone is shown below:



The output power of BT antenna is as following:

Channel	Ch 0 2402 MHz	Ch 39 2441 Mhz	Ch 78 2480 MHz
Peak Conducted Output Power(dBm)	2.85	2.55	2.92

According to the output power measurement result and the distance between the two antennas, we can draw the conclusion that: stand-alone SAR and simultaneous transmission SAR are not required for BT transmitter, because the output power of BT transmitter is $\leqslant 2P_{Ref}$ and its antenna is $\geqslant$5cm from other antenna

With the request of the client, we perform the tests with dominant GSM transmitter and co-located Bluetooth transmitter both ON under the worst case for body tests.

Table 15: SAR Values (WCDMA 850MHz Band-Body with Bluetooth)

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, Mid frequency(See Fig.181)	0.541	0.749	0.068

Table 16: SAR Values (WCDMA 1900 MHz Band-Body with Bluetooth)

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, Bottom frequency(See Fig.183)	0.318	0.531	-0.050

Table 17: SAR Values (GSM 850MHz Band-Body with Bluetooth)

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.185)	0.621	0.867	-0.067

Table 18: SAR Values (GSM 1900 MHz Band-Body with Bluetooth)

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, Bottom frequency(See Fig.187)	0.222	0.366	0.120

7.8 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.

The maximum SAR values are obtained at the case of **GSM 850 Body, Towards Ground, Top frequency with GPRS (Table 12)**, and the value are: **0.837(10g), 1.16(1g)**

8 Measurement Uncertainty

SN	a	Type	c	d	e = f(d,k)	f	h = c x f / e	k
	Uncertainty Component		Tol. (± %)	Prob. Dist.	Div.	c_i (1 g)	1 g u_i (±%)	v_i

1	System repetivity	A	0.5	N	1	1	0.5	9
	Measurement System							
2	Probe Calibration	B	5	N	2	1	2.5	∞
3	Axial Isotropy	B	4.7	R	√3	$(1\text{-cp})^{1/2}$	4.3	∞
4	Hemispherical Isotropy	B	9.4	R	√3	$\sqrt{c_p}$		∞
5	Boundary Effect	B	0.4	R	√3	1	0.23	∞
6	Linearity	B	4.7	R	√3	1	2.7	∞
7	System Detection Limits	B	1.0	R	√3	1	0.6	∞
8	Readout Electronics	B	1.0	N	1	1	1.0	∞
9	RF Ambient Conditions	B	3.0	R	√3	1	1.73	∞
10	Probe Positioner Mechanical Tolerance	B	0.4	R	√3	1	0.2	∞
11	Probe Positioning with respect to Phantom Shell	B	2.9	R	√3	1	1.7	∞
12	Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	B	3.9	R	√3	1	2.3	∞
	Test sample Related							
13	Test Sample Positioning	A	4.9	N	1	1	4.9	N-1
14	Device Holder Uncertainty	A	6.1	N	1	1	6.1	N-1
15	Output Power Variation - SAR drift measurement	B	5.0	R	√3	1	2.9	∞
	Phantom and Tissue Parameters							
16	Phantom Uncertainty (shape and thickness tolerances)	B	1.0	R	√3	1	0.6	∞
17	Liquid Conductivity - deviation from target values	B	5.0	R	√3	0.64	1.7	∞
18	Liquid Conductivity - measurement uncertainty	B	5.0	N	1	0.64	1.7	M
19	Liquid Permittivity - deviation from target values	B	5.0	R	√3	0.6	1.7	∞
20	Liquid Permittivity - measurement uncertainty	B	5.0	N	1	0.6	1.7	M
	Combined Standard Uncertainty			RSS			11.25	
	Expanded Uncertainty (95% CONFIDENCE INTERVAL)			K=2			22.5	

9 MAIN TEST INSTRUMENTS

Table 19: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	HP 8753E	US38433212	August 30,2008	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 2, 2008	One year
05	Signal Generator	E4433B	US37230472	September 4, 2008	One Year
06	Amplifier	VTL5400	0505	No Calibration Requested	
07	BTS	CMU 200	105948	August 15, 2008	One year
08	E-field Probe	SPEAG ES3DV3	3149	December 8, 2008	One year
09	DAE	SPEAG DAE4	771	November 20, 2008	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.

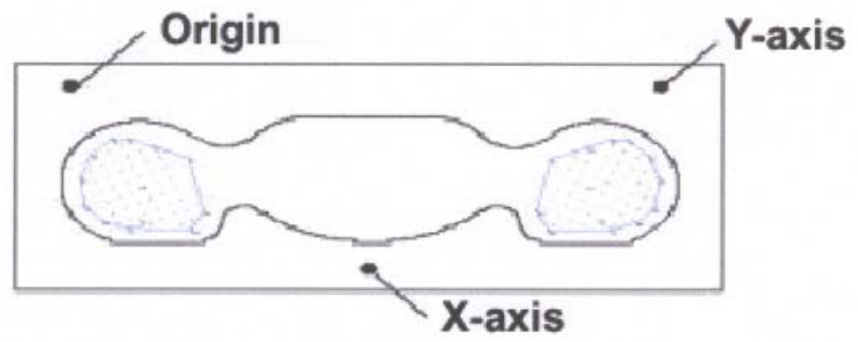
Step 3: Around this point, a volume of 30 mm x 30 mm x 30 mm was assessed by measuring 7 x 7x 7 points. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

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.

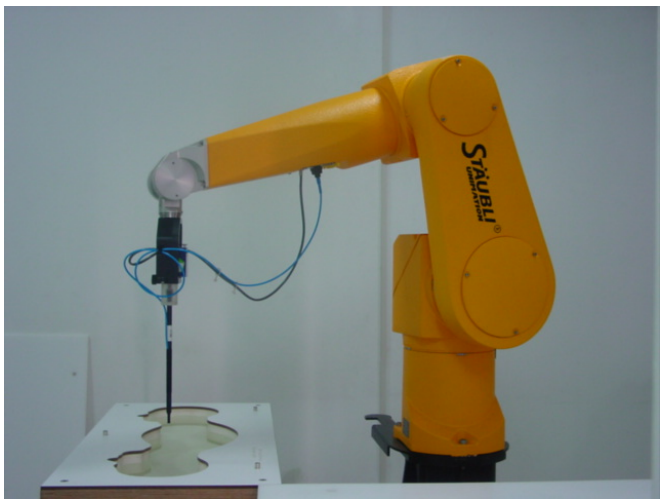
c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

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.

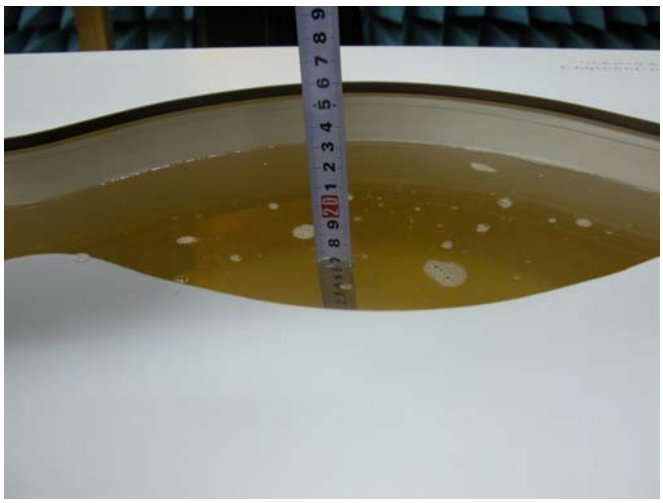


Picture A: SAR Measurement Points in Area Scan

ANNEX B TEST LAYOUT



Picture B1: Specific Absorption Rate Test Layout



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

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

Picture B4: Liquid depth in the Flat Phantom (850 MHz Body)

Picture B5: Liquid depth in the Flat Phantom (1900MHz Body)

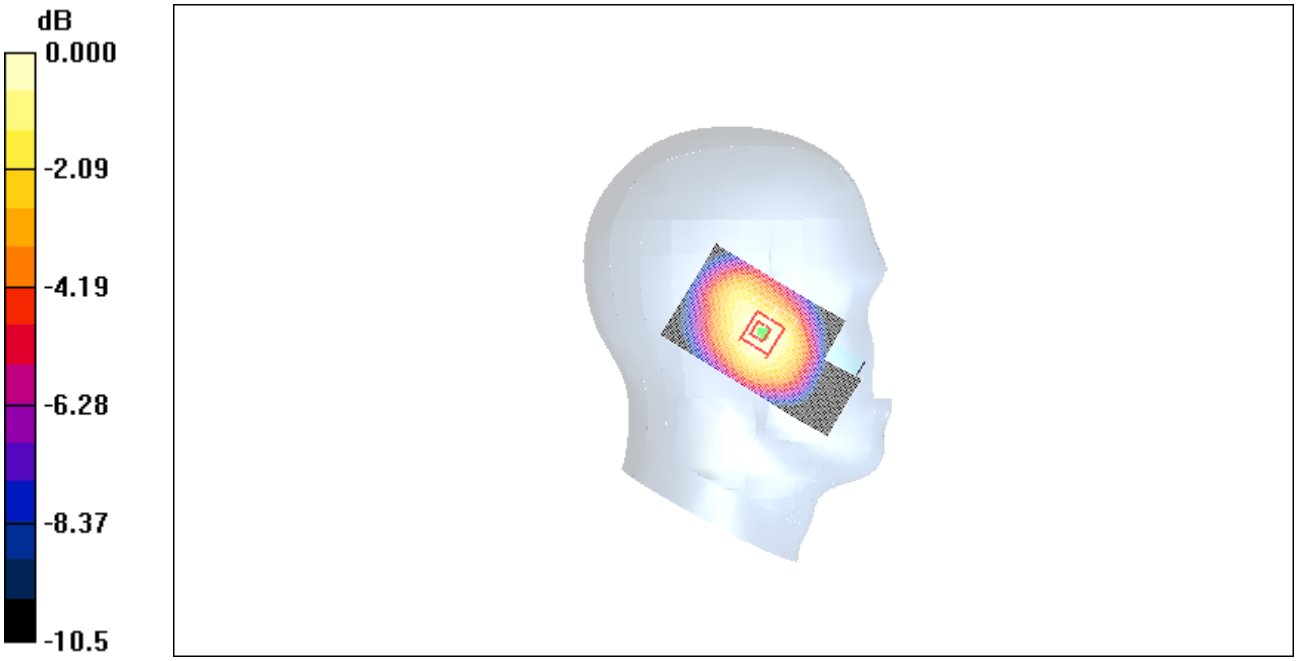
ANNEX C GRAPH RESULTS

WCDMA 850 Left Cheek High

Date/Time: 2008-12-10 7:20:20
Electronics: DAE4 Sn771
Medium: 850 HEAD
Medium parameters used (interpolated): f = 846.6 MHz; σ = 0.883 mho/m; ε_r = 40.2; ρ = 1000 kg/m^3
Ambient Temperature:23.3°C Liqiud Temperature: 22.5°C
Communication System: WCDMA 850 Frequency: 846.6 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

Cheek High/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.265 mW/g

Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.8 V/m; Power Drift = -0.014 dB
Peak SAR (extrapolated) = 0.318 W/kg
SAR(1 g) = 0.245 mW/g; SAR(10 g) = 0.178 mW/g
Maximum value of SAR (measured) = 0.263 mW/g



0 dB = 0.263mW/g

Fig. 1 Left Hand Touch Cheek WCDMA 850MHz CH4233

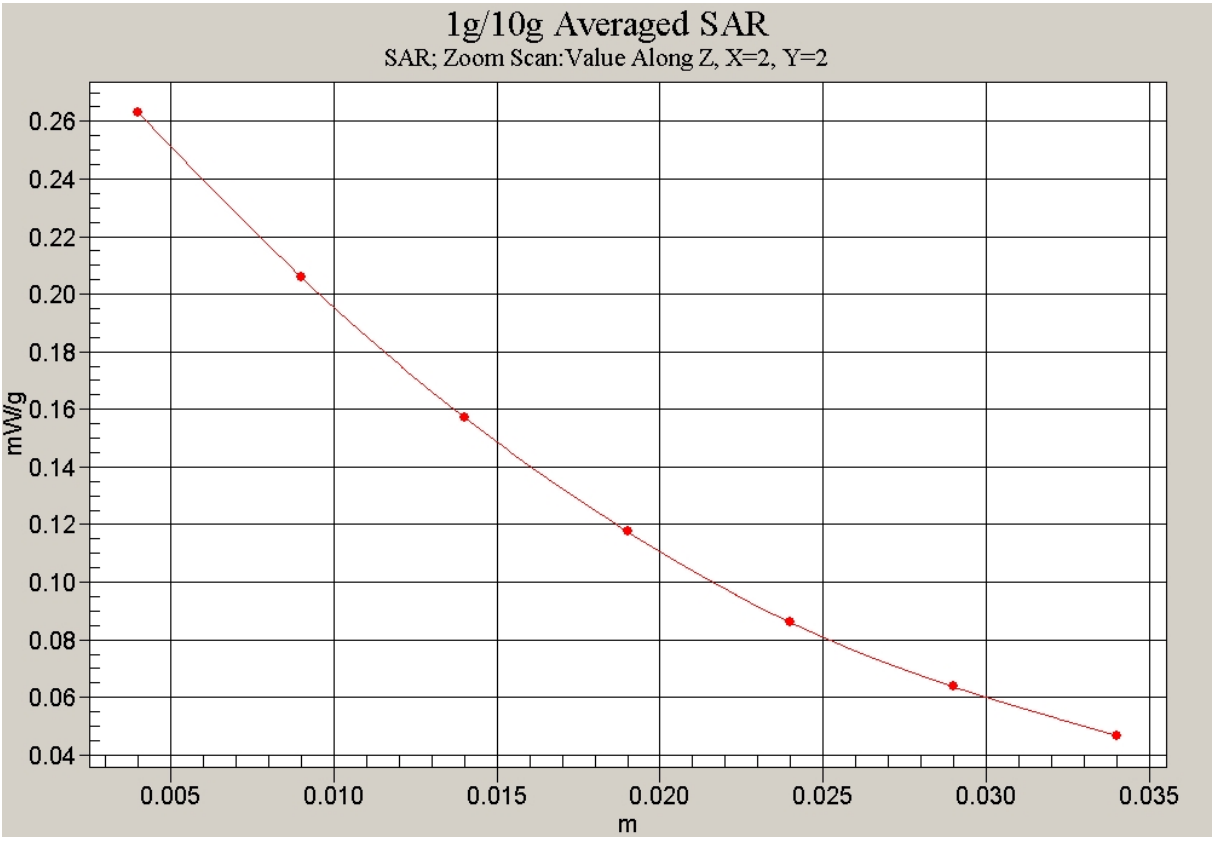
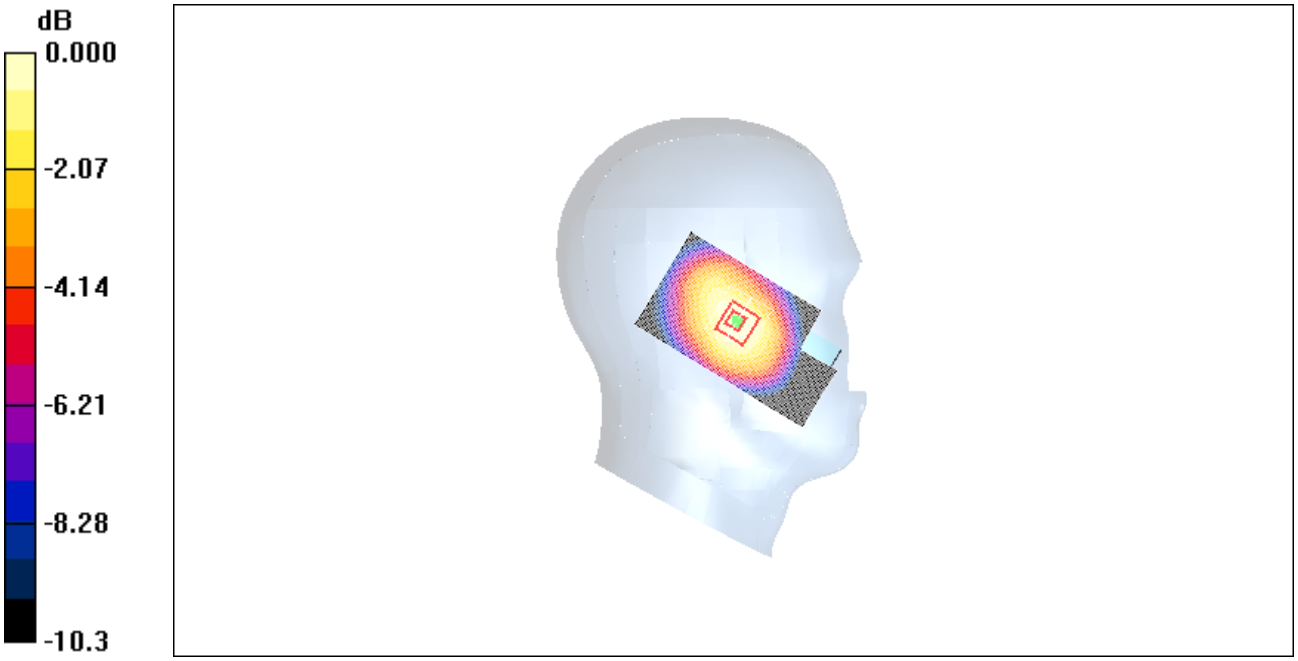


Fig. 2 Z-Scan at power reference point (WCDMA 850MHz CH4233)

WCDMA 850 Left Cheek Middle
Date/Time: 2008-12-10 7:35:42
Electronics: DAE4 Sn771
Medium: 850 HEAD
Medium parameters used (interpolated): f = 836.4 MHz; σ = 0.875 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3
Ambient Temperature:23.3°C Liqiud Temperature: 22.5°C
Communication System: WCDMA 850 Frequency: 836.4 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

Cheek Middle/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.385 mW/g

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.6 V/m; Power Drift = 0.022 dB
Peak SAR (extrapolated) = 0.464 W/kg
SAR(1 g) = 0.354 mW/g; SAR(10 g) = 0.259 mW/g
Maximum value of SAR (measured) = 0.377 mW/g



0 dB = 0.377mW/g

Fig. 3 Left Hand Touch Cheek WCDMA 850MHz CH4182

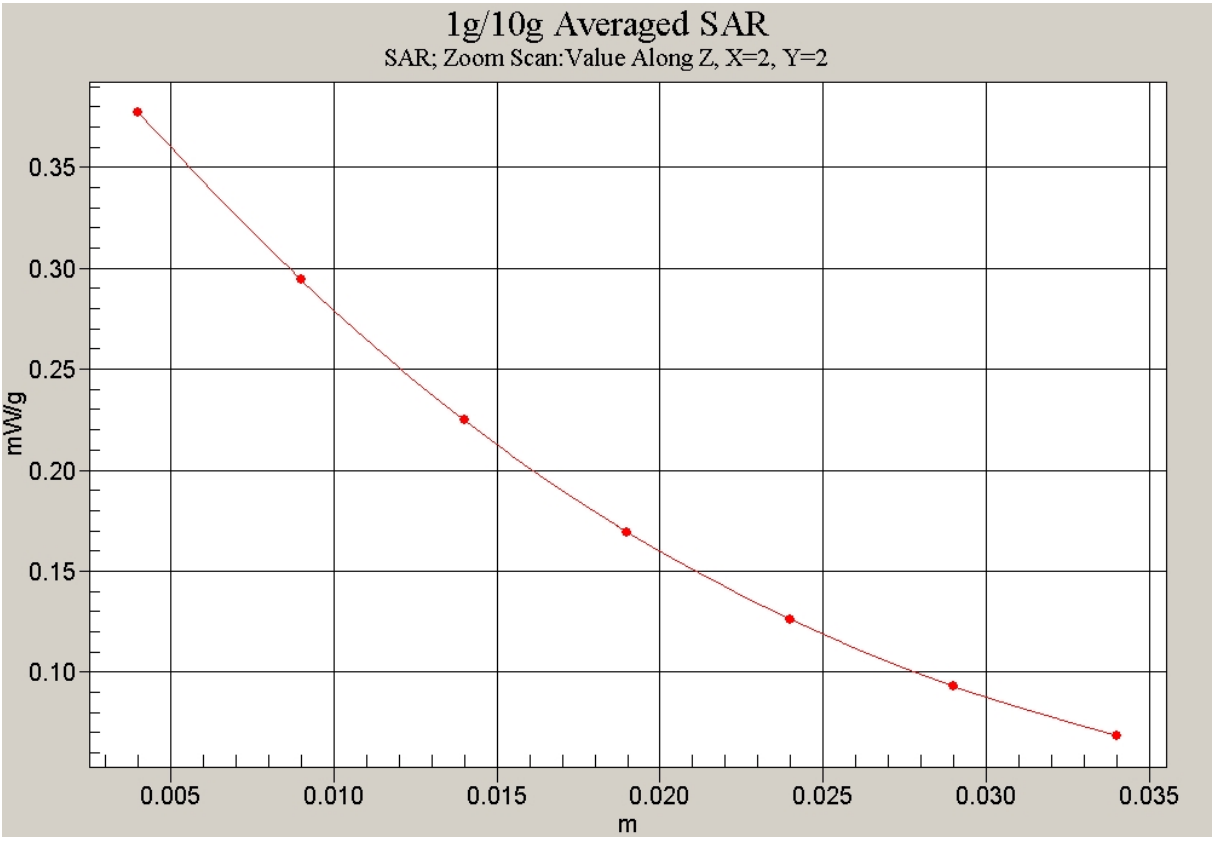
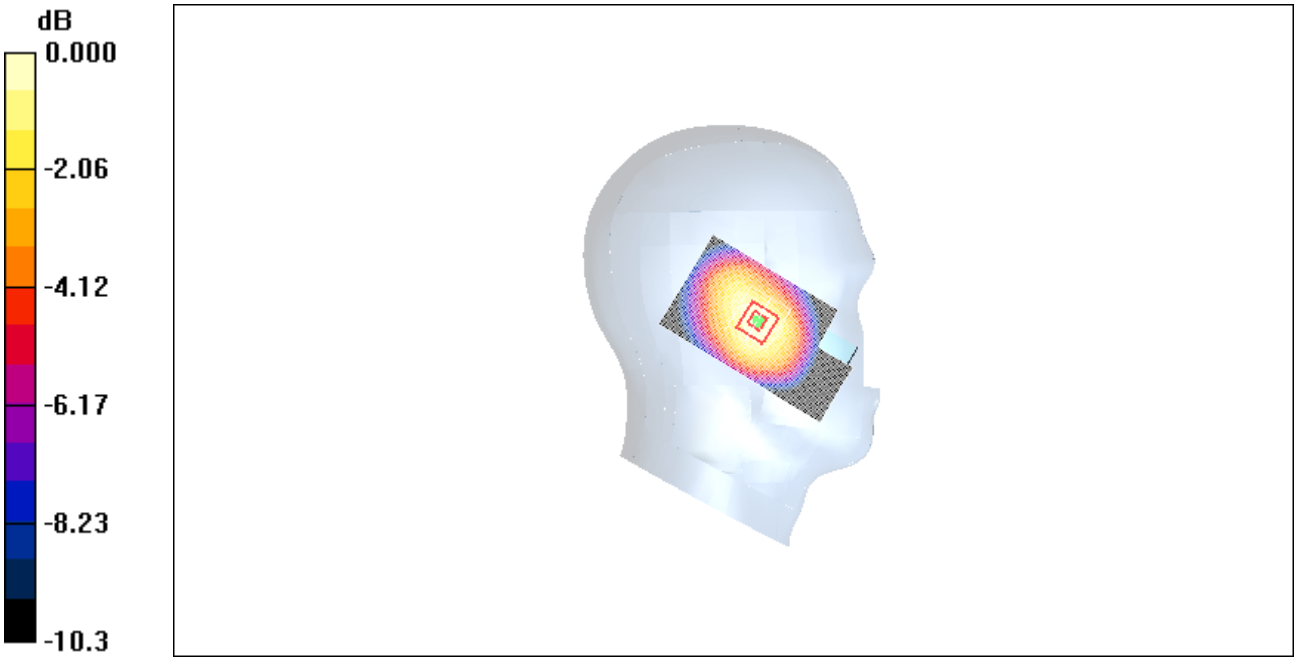


Fig. 4 Z-Scan at power reference point (WCDMA 850MHz CH4182)

WCDMA 850 Left Cheek Low
Date/Time: 2008-12-10 7:45:27
Electronics: DAE4 Sn771
Medium: 850 HEAD
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.868 mho/m; ε_r = 40.6; ρ = 1000 kg/m^3
Ambient Temperature:23.3°C Liqiud Temperature: 22.5°C
Communication System: WCDMA 850 Frequency: 826.4 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

Cheek Low/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.255 mW/g

Cheek Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.8 V/m; Power Drift = -0.018 dB
Peak SAR (extrapolated) = 0.309 W/kg
SAR(1 g) = 0.238 mW/g; SAR(10 g) = 0.174 mW/g
Maximum value of SAR (measured) = 0.255 mW/g



0 dB = 0.255mW/g

Fig. 5 Left Hand Touch Cheek WCDMA 850MHz CH4132

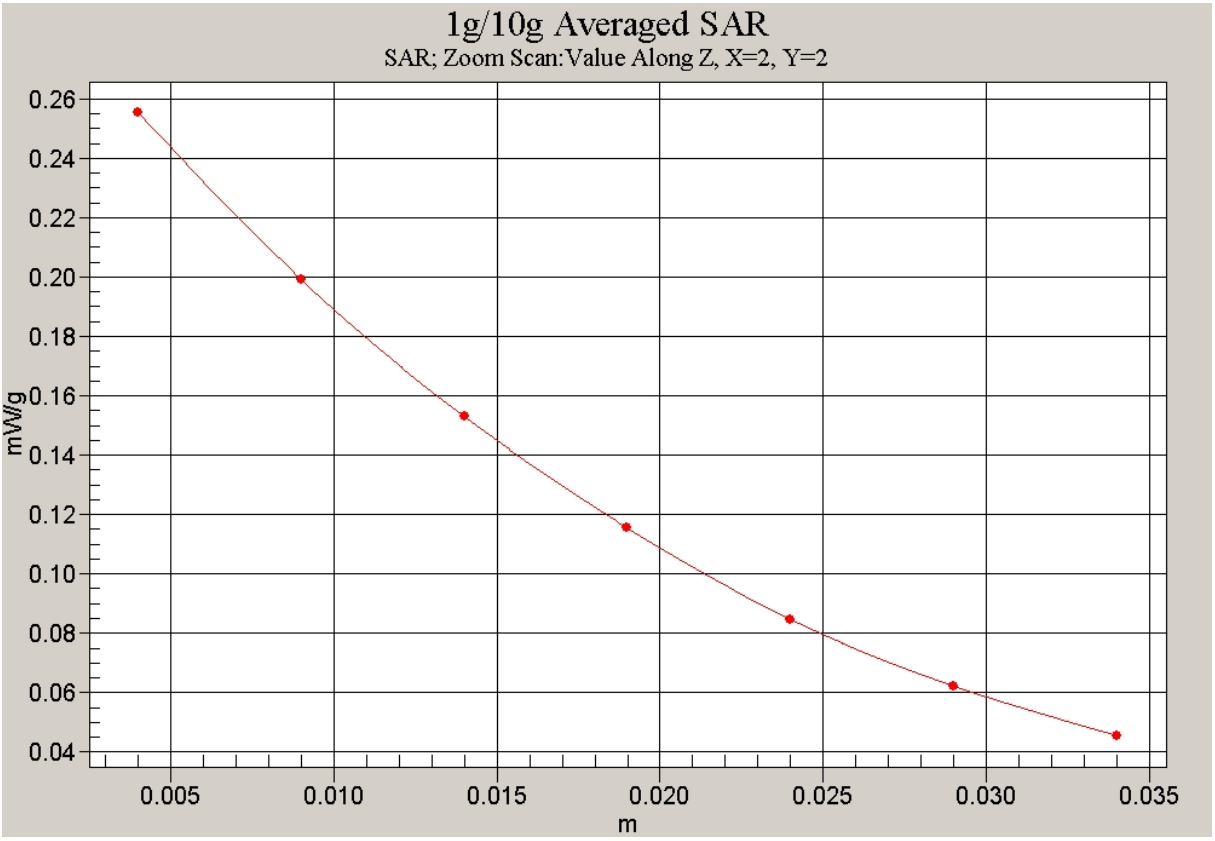
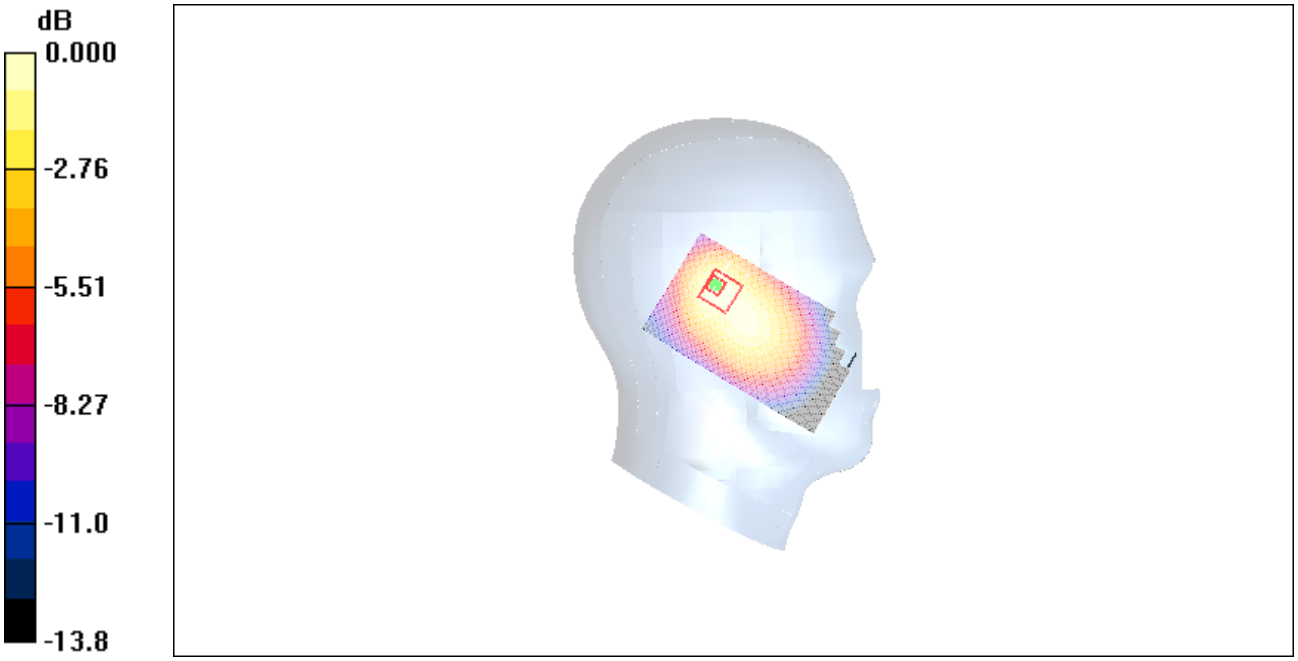


Fig. 6 Z-Scan at power reference point (WCDMA 850MHz CH4132)

WCDMA 850 Left Tilt High
Date/Time: 2008-12-10 8:24:45
Electronics: DAE4 Sn771
Medium: 850 HEAD
Medium parameters used (interpolated): f = 846.6 MHz; σ = 0.883 mho/m; ε_r = 40.2; ρ = 1000 kg/m^3
Ambient Temperature:23.3°C Liqiud Temperature: 22.5°C
Communication System: WCDMA 850 Frequency: 846.6 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

Tilt High/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.178 mW/g

Tilt High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.1 V/m; Power Drift = -0.073 dB
Peak SAR (extrapolated) = 0.299 W/kg
SAR(1 g) = 0.166 mW/g; SAR(10 g) = 0.106 mW/g
Maximum value of SAR (measured) = 0.183 mW/g



0 dB = 0.183mW/g

Fig. 7 Left Hand Tilt 15°WCDMA 850MHz CH4233

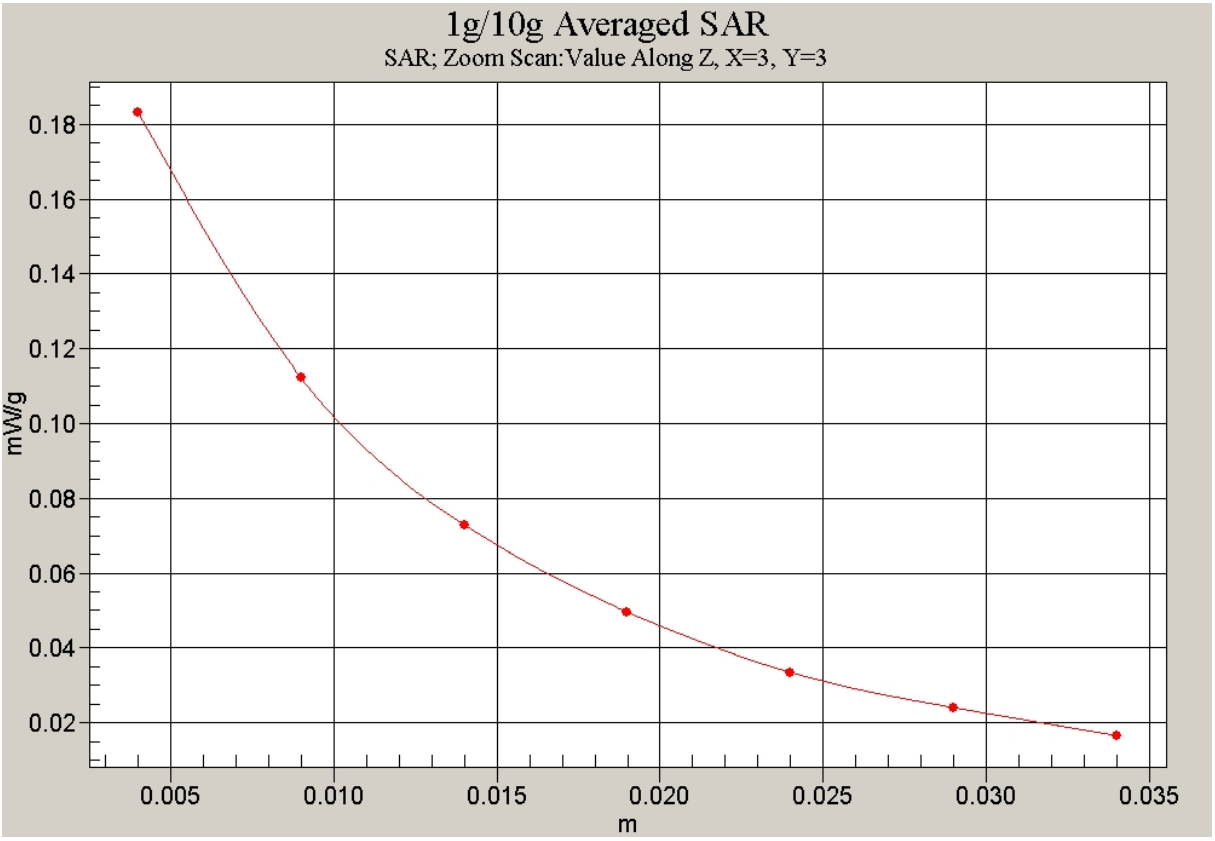
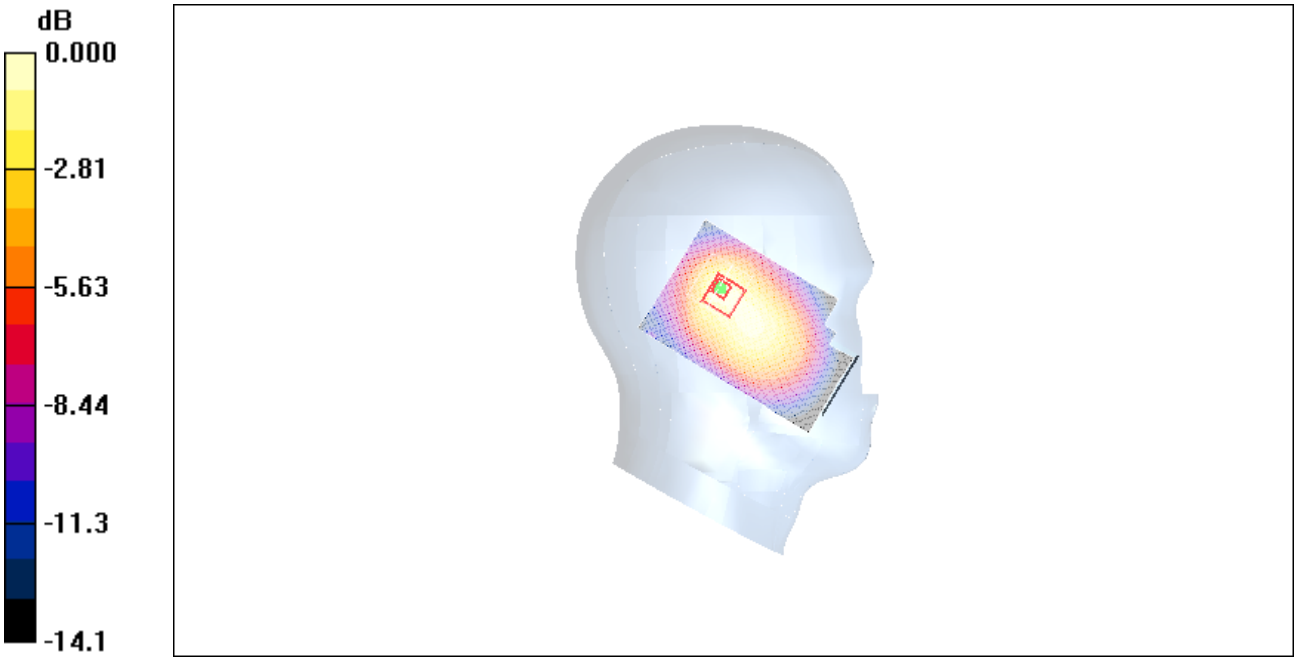


Fig. 8 Z-Scan at power reference point (WCDMA 850MHz CH4233)

WCDMA 850 Left Tilt Middle
Date/Time: 2008-12-10 8:11:03
Electronics: DAE4 Sn771
Medium: 850 HEAD
Medium parameters used (interpolated): f = 836.4 MHz; σ = 0.875 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3
Ambient Temperature:23.3°C Liqiud Temperature: 22.5°C
Communication System: WCDMA 850 Frequency: 836.4 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

Tilt Middle/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.272 mW/g

Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.6 V/m; Power Drift = 0.142 dB
Peak SAR (extrapolated) = 0.439 W/kg
SAR(1 g) = 0.249 mW/g; SAR(10 g) = 0.160 mW/g
Maximum value of SAR (measured) = 0.280 mW/g



0 dB = 0.280mW/g

Fig. 9 Left Hand Tilt 15°WCDMA 850MHz CH4182

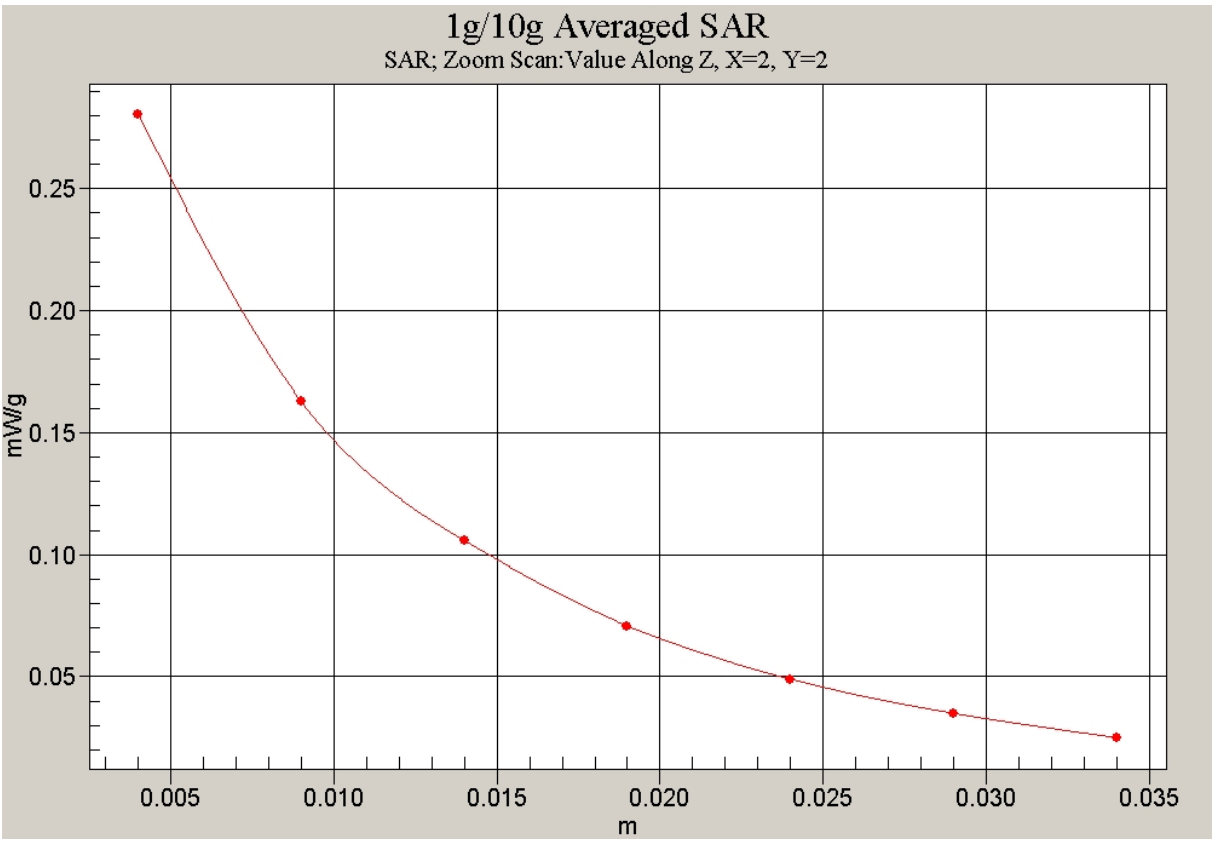
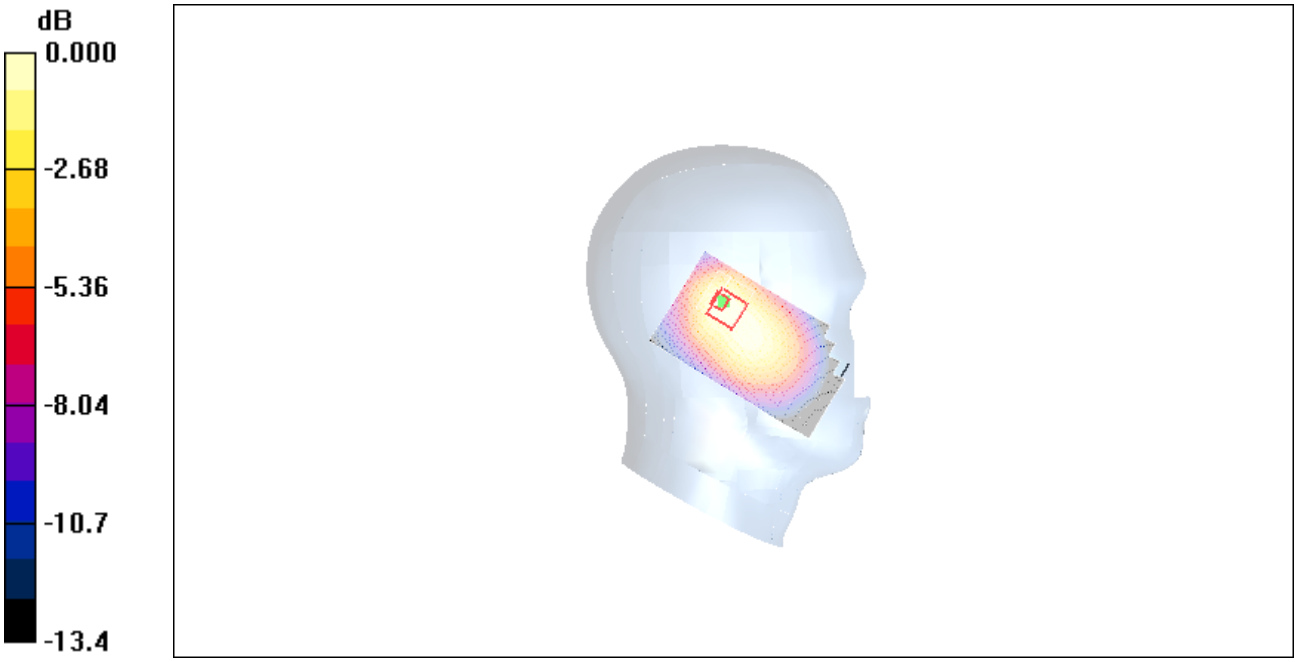


Fig. 10 Z-Scan at power reference point (WCDMA 850MHz CH4182)

WCDMA 850 Left Tilt Low
Date/Time: 2008-12-10 7:59:44
Electronics: DAE4 Sn771
Medium: 850 HEAD
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.868 mho/m; ε_r = 40.6; ρ = 1000 kg/m^3
Ambient Temperature:23.3°C Liqiud Temperature: 22.5°C
Communication System: WCDMA 850 Frequency: 826.4 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

Tilt Low/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.179 mW/g

Tilt Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.0 V/m; Power Drift = 0.168 dB
Peak SAR (extrapolated) = 0.294 W/kg
SAR(1 g) = 0.165 mW/g; SAR(10 g) = 0.109 mW/g
Maximum value of SAR (measured) = 0.179 mW/g



0 dB = 0.179mW/g

Fig. 11 Left Hand Tilt 15°WCDMA 850MHz CH4132

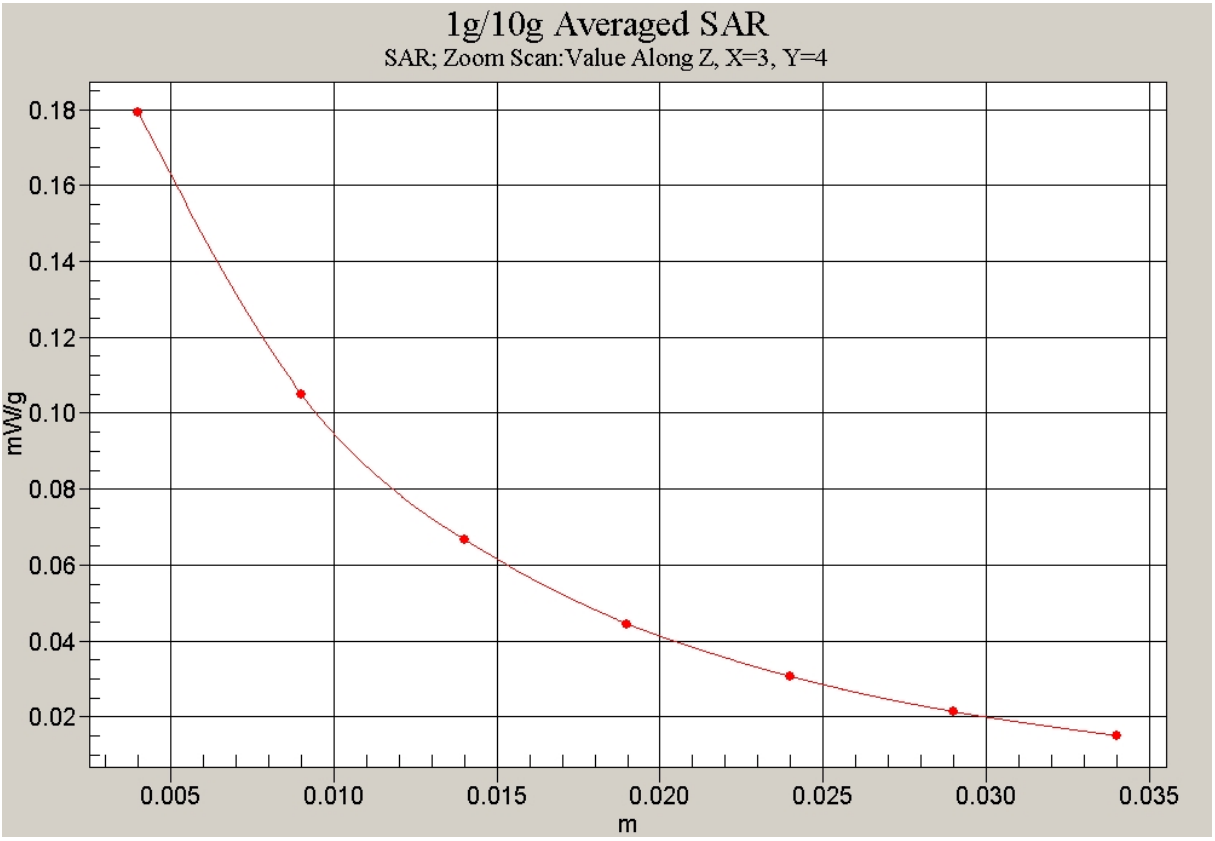
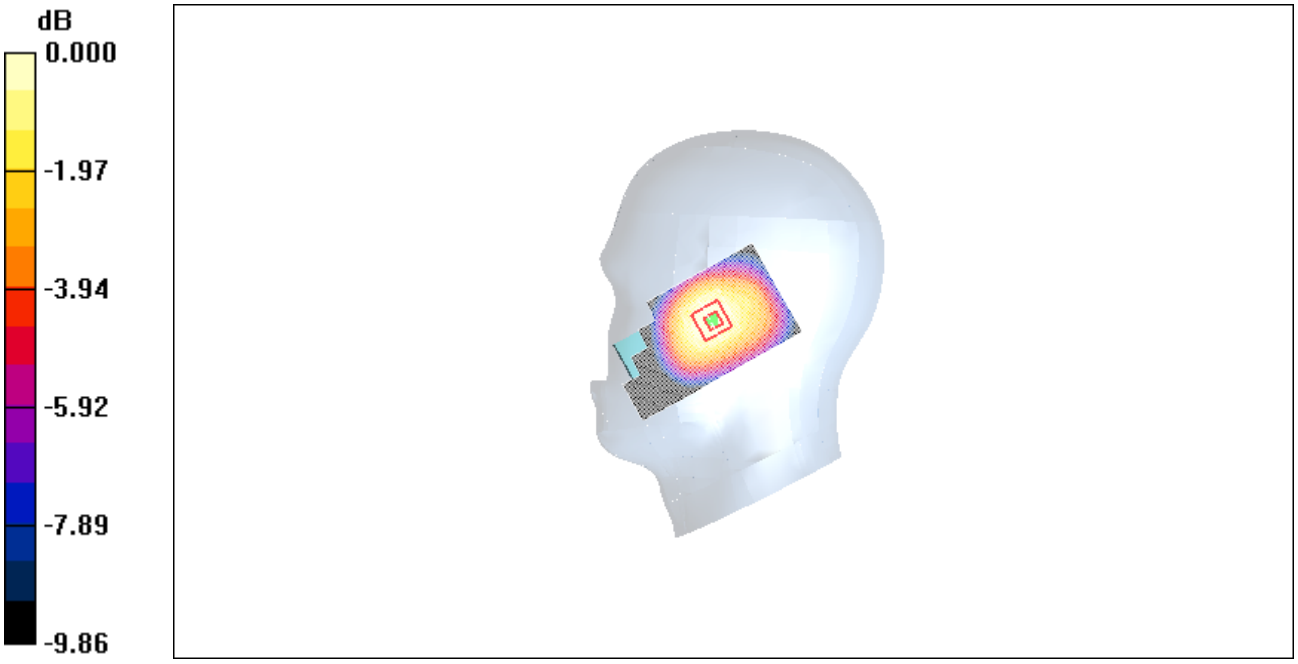


Fig. 12 Z-Scan at power reference point (WCDMA 850MHz CH4132)

WCDMA 850 Right Cheek High
Date/Time: 2008-12-10 8:37:03
Electronics: DAE4 Sn771
Medium: 850 HEAD
Medium parameters used (interpolated): f = 846.6 MHz; σ = 0.883 mho/m; ε_r = 40.2; ρ = 1000 kg/m^3
Ambient Temperature:23.3°C Liqiud Temperature: 22.5°C
Communication System: WCDMA 850 Frequency: 846.6 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

Cheek High/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.279 mW/g

Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.1 V/m; Power Drift = -0.200 dB
Peak SAR (extrapolated) = 0.318 W/kg
SAR(1 g) = 0.259 mW/g; SAR(10 g) = 0.192 mW/g
Maximum value of SAR (measured) = 0.273 mW/g



0 dB = 0.273mW/g

Fig. 13 Right Hand Touch Cheek WCDMA 850MHz CH4233

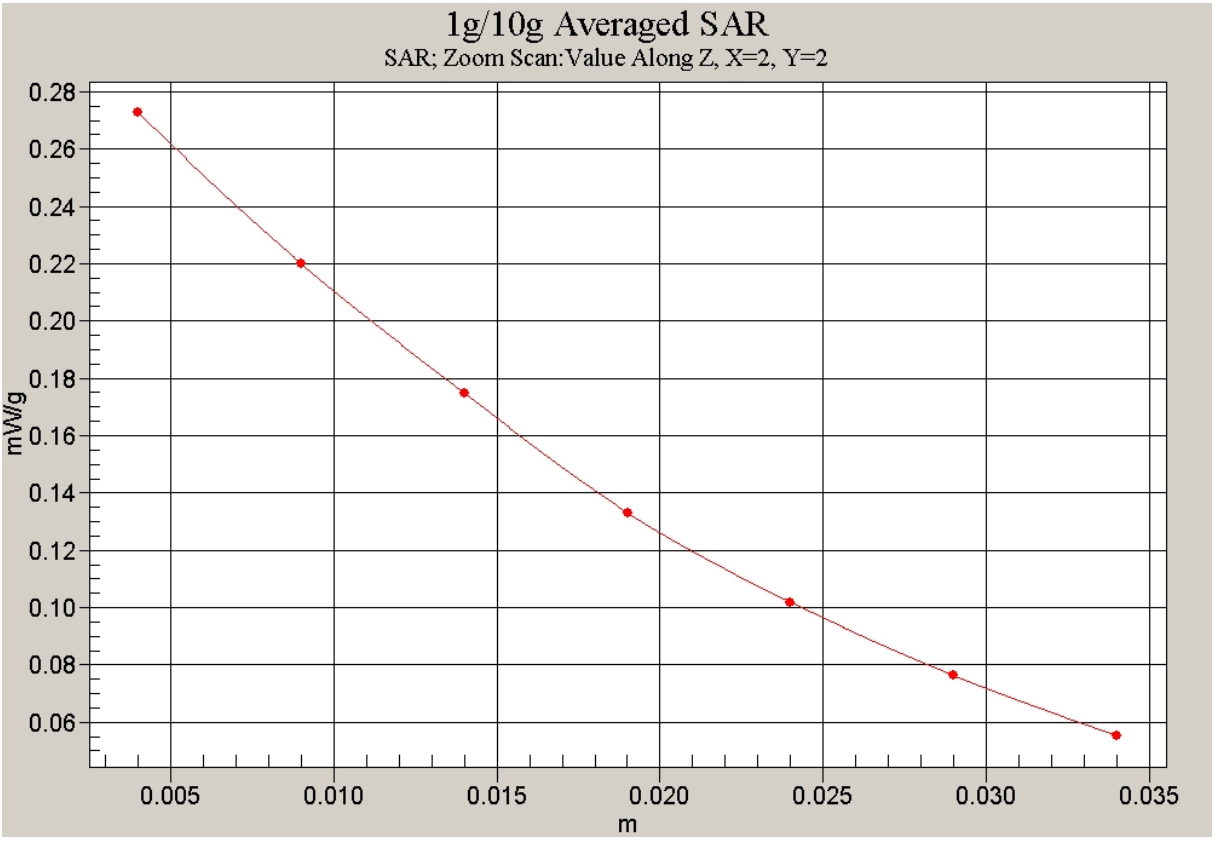
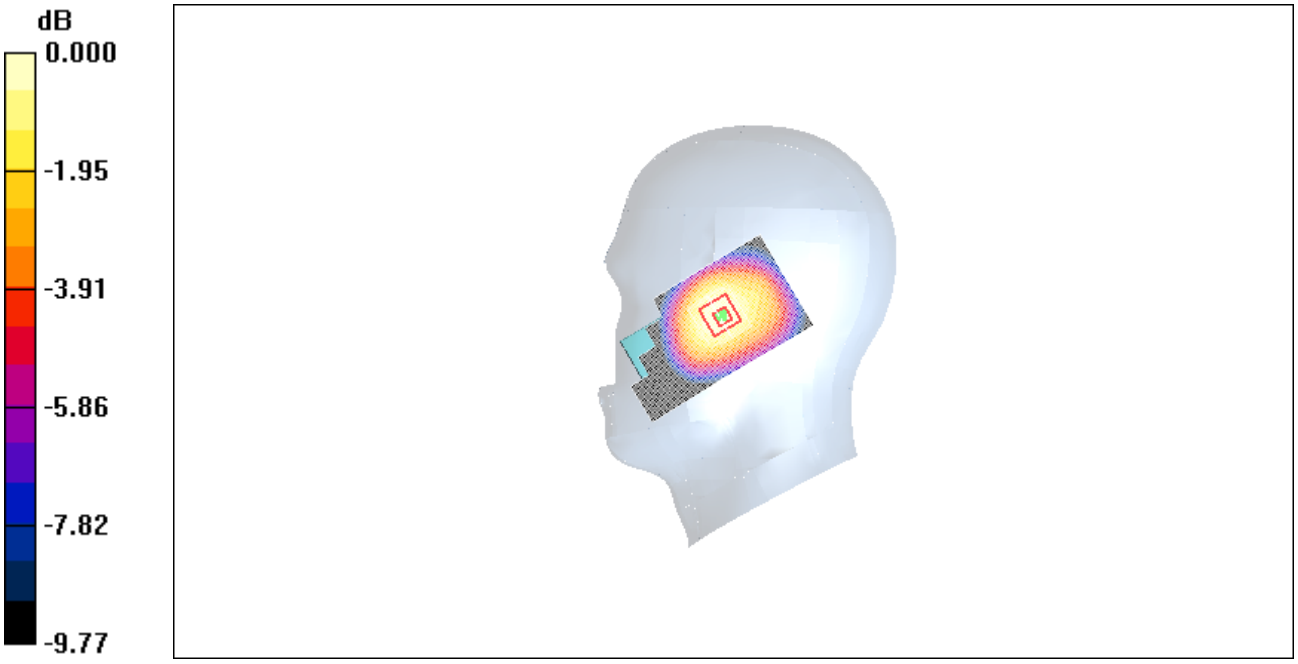


Fig. 14 Z-Scan at power reference point (WCDMA 850MHz CH4233)

WCDMA 850 Right Cheek Middle
Date/Time: 2008-12-10 8:50:39
Electronics: DAE4 Sn771
Medium: 850 HEAD
Medium parameters used (interpolated): f = 836.4 MHz; σ = 0.875 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3
Ambient Temperature:23.3°C Liqiud Temperature: 22.5°C
Communication System: WCDMA 850 Frequency: 836.4 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

Cheek Middle/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.400 mW/g

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.6 V/m; Power Drift = -0.090 dB
Peak SAR (extrapolated) = 0.469 W/kg
SAR(1 g) = 0.381 mW/g; SAR(10 g) = 0.283 mW/g
Maximum value of SAR (measured) = 0.406 mW/g



0 dB = 0.406mW/g

Fig.15 Right Hand Touch Cheek WCDMA 850MHz CH4182

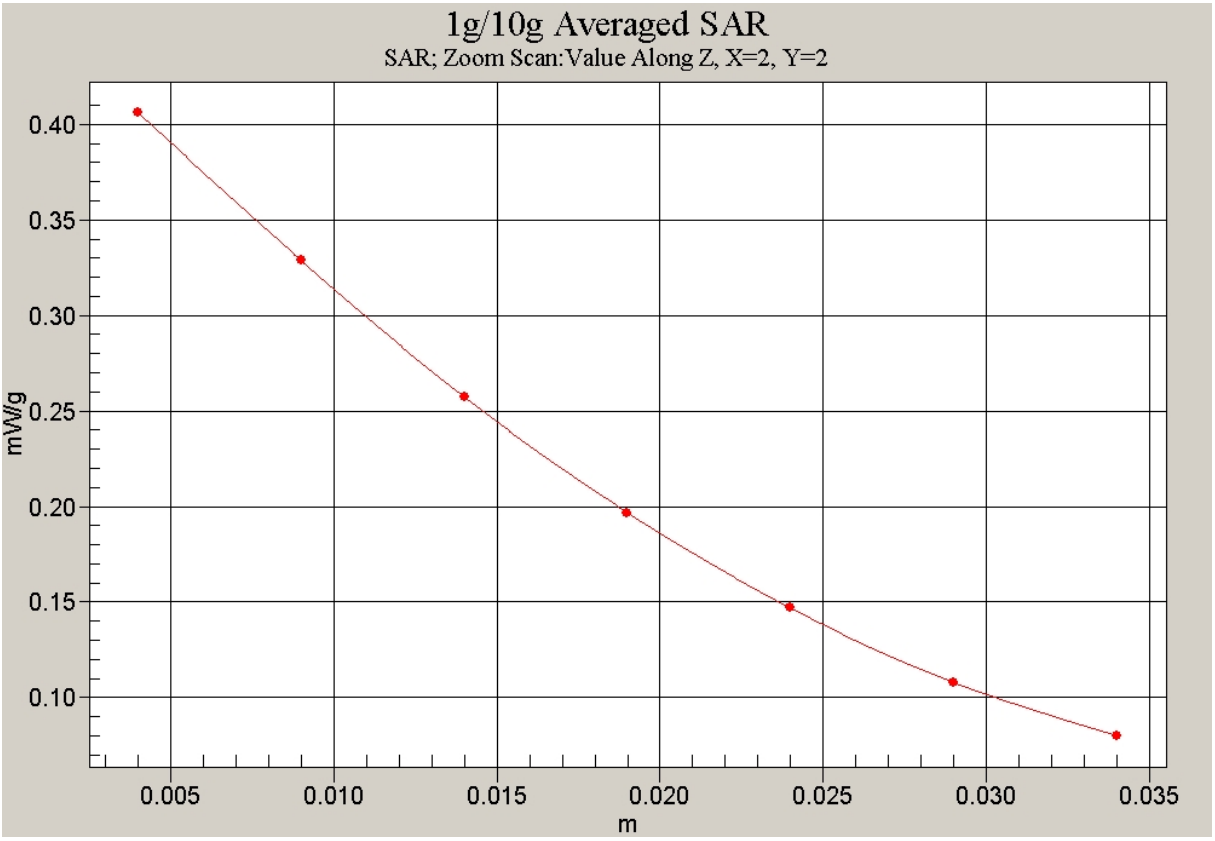
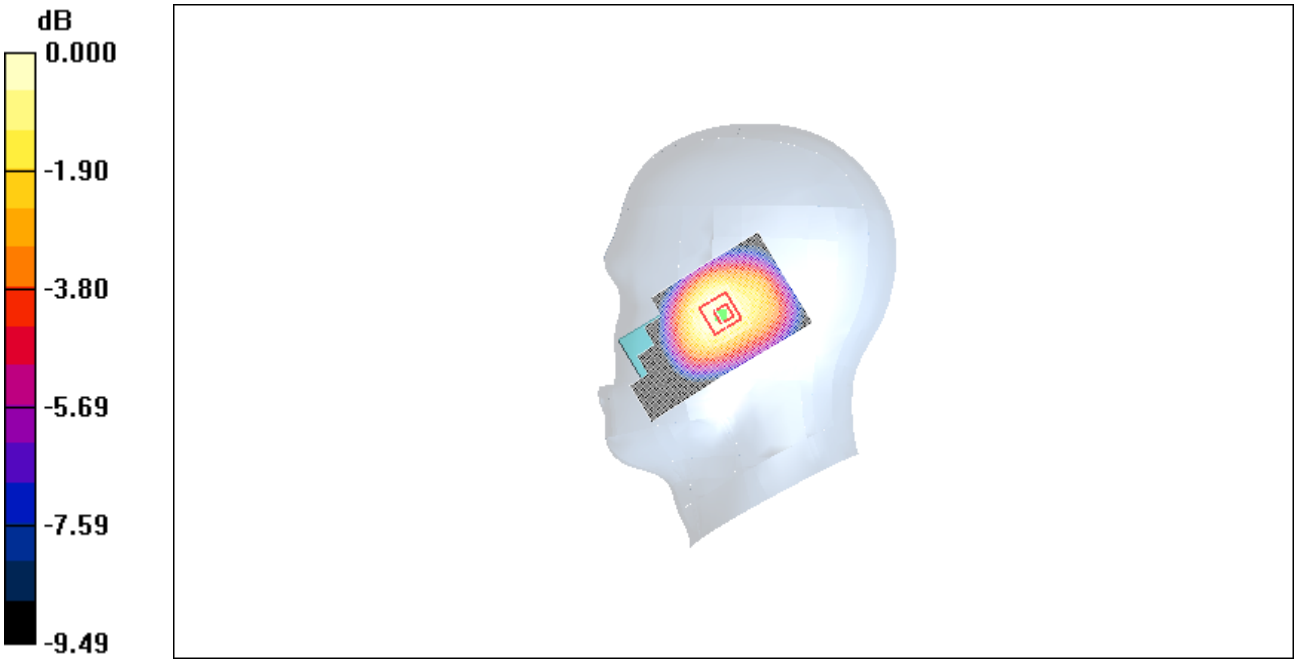


Fig. 16 Z-Scan at power reference point (WCDMA 850MHz CH4182)

WCDMA 850 Right Cheek Low
Date/Time: 2008-12-10 9:04:47
Electronics: DAE4 Sn771
Medium: 850 HEAD
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.868 mho/m; ε_r = 40.6; ρ = 1000 kg/m^3
Ambient Temperature:23.3°C Liqiud Temperature: 22.5°C
Communication System: WCDMA 850 Frequency: 826.4 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

Cheek Low/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.263 mW/g

Cheek Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.3 V/m; Power Drift = 0.002 dB
Peak SAR (extrapolated) = 0.299 W/kg
SAR(1 g) = 0.242 mW/g; SAR(10 g) = 0.182 mW/g
Maximum value of SAR (measured) = 0.254 mW/g



0 dB = 0.254mW/g

Fig. 17 Right Hand Touch Cheek WCDMA 850MHz CH4132

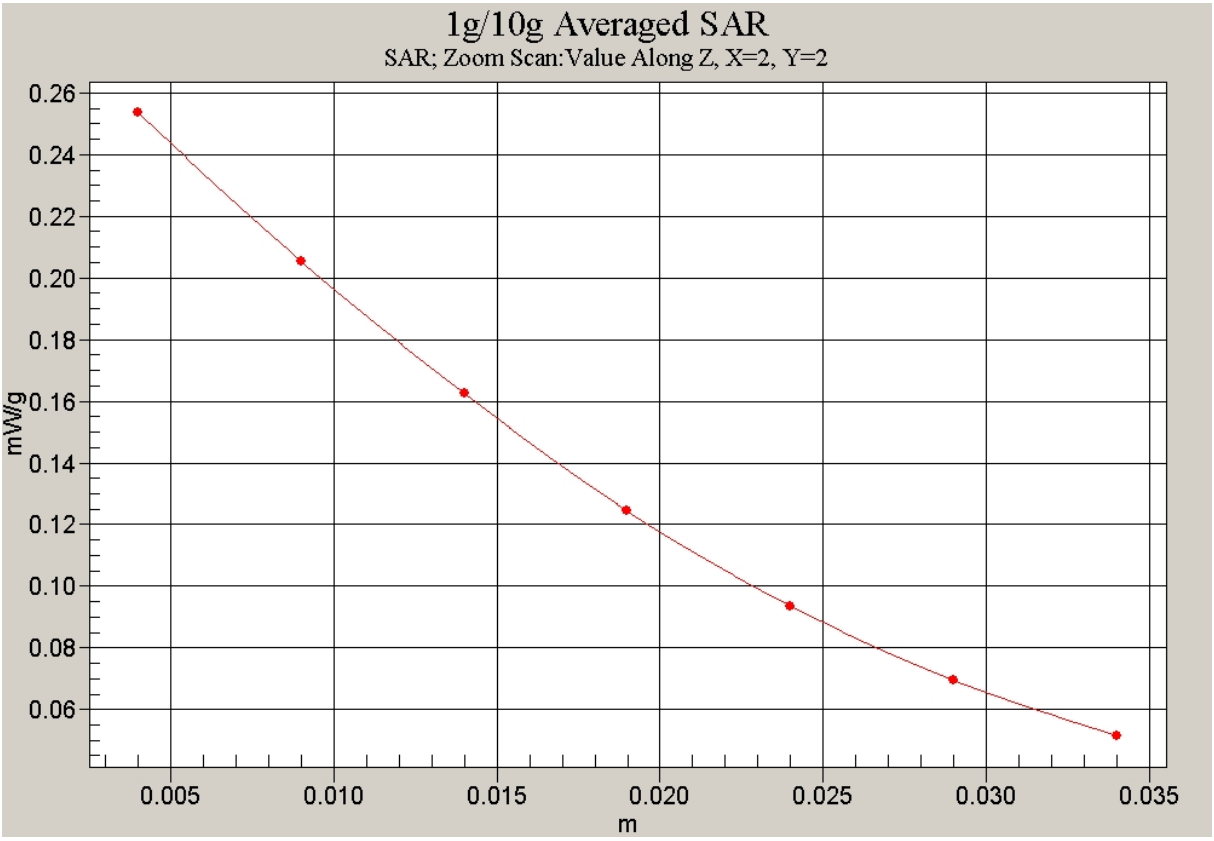
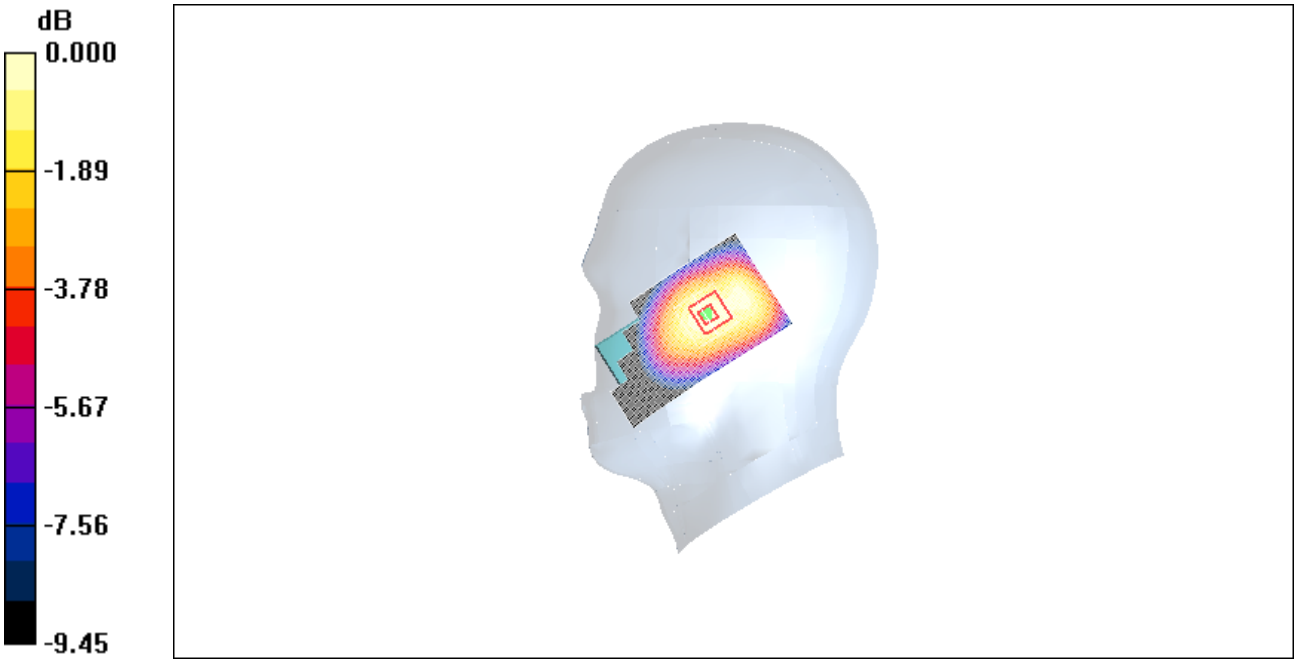


Fig. 18 Z-Scan at power reference point (WCDMA 850MHz CH4132)

WCDMA 850 Right Tilt High
Date/Time: 2008-12-10 9:45:10
Electronics: DAE4 Sn771
Medium: 850 HEAD
Medium parameters used (interpolated): f = 846.6 MHz; σ = 0.883 mho/m; ε_r = 40.2; ρ = 1000 kg/m^3
Ambient Temperature:23.3°C Liqiud Temperature: 22.5°C
Communication System: WCDMA 850 Frequency: 846.6 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

Tilt High/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.164 mW/g

Tilt High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.9 V/m; Power Drift = 0.062 dB
Peak SAR (extrapolated) = 0.197 W/kg
SAR(1 g) = 0.155 mW/g; SAR(10 g) = 0.114 mW/g
Maximum value of SAR (measured) = 0.165 mW/g



0 dB = 0.165mW/g

Fig. 19 Right Hand Tilt 15°WCDMA 850MHz CH4233

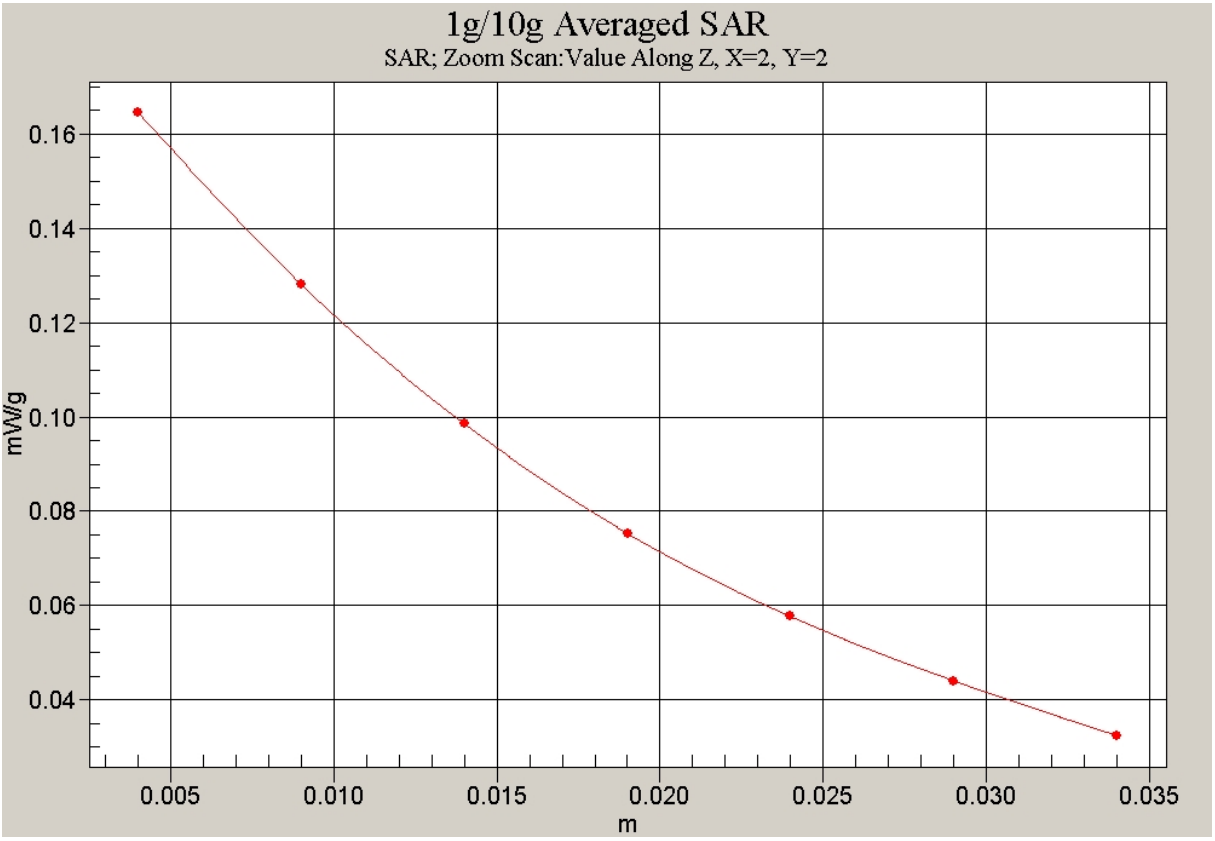


Fig. 20 Z-Scan at power reference point (WCDMA 850MHz CH4233)

WCDMA 850 Right Tilt Middle
Date/Time: 2008-12-10 9:31:18
Electronics: DAE4 Sn771
Medium: 850 HEAD
Medium parameters used (interpolated): f = 836.4 MHz; σ = 0.875 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3
Ambient Temperature:23.3°C Liqiud Temperature: 22.5°C
Communication System: WCDMA 850 Frequency: 836.4 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

Tilt Middle/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.254 mW/g

Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.0 V/m; Power Drift = 0.105 dB
Peak SAR (extrapolated) = 0.309 W/kg
SAR(1 g) = 0.244 mW/g; SAR(10 g) = 0.180 mW/g
Maximum value of SAR (measured) = 0.260 mW/g

0 dB = 0.260mW/g

Fig. 21 Right Hand Tilt 15°WCDMA 850MHz CH4182

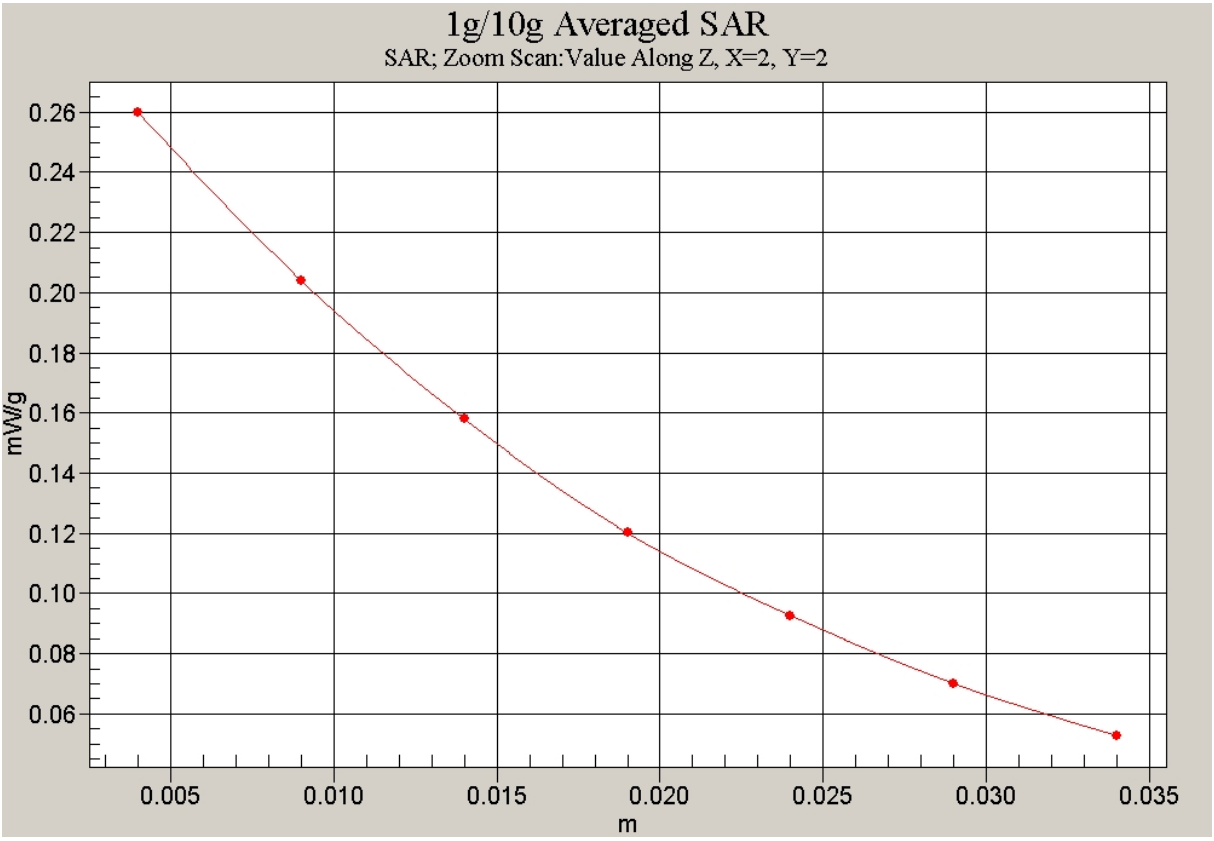
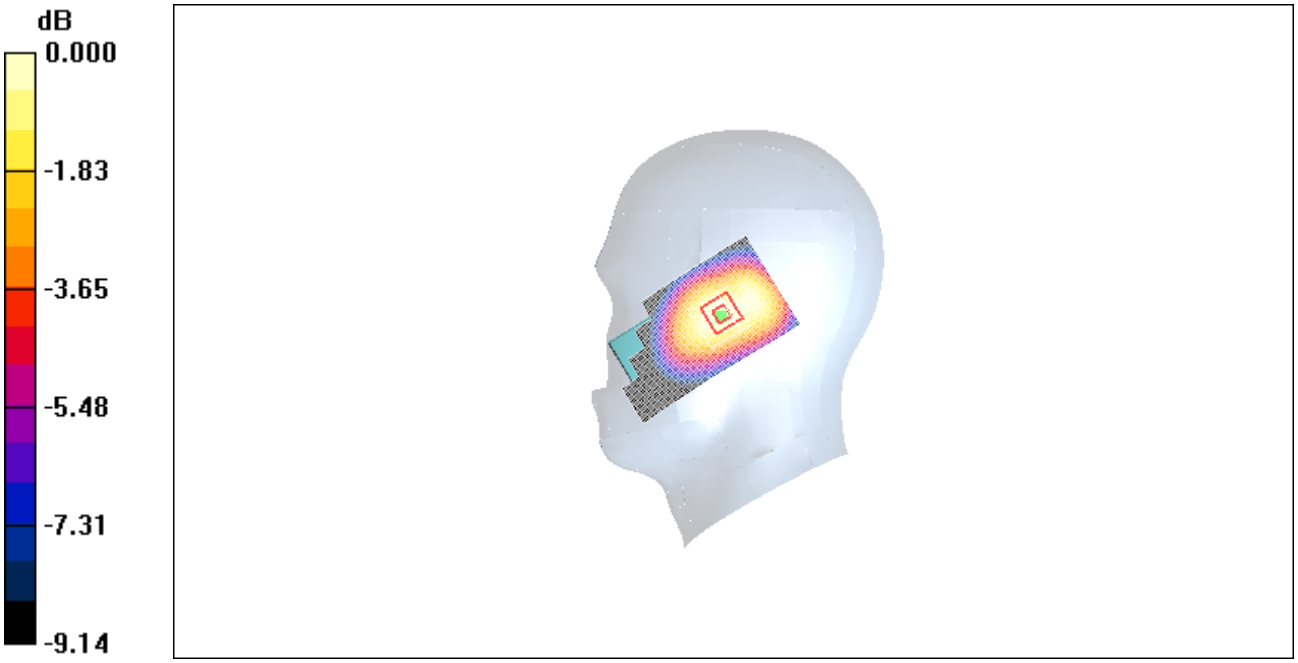


Fig. 22 Z-Scan at power reference point (WCDMA 850MHz CH4182)

WCDMA 850 Right Tilt Low
Date/Time: 2008-12-10 9:16:16
Electronics: DAE4 Sn771
Medium: 850 HEAD
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.868 mho/m; ε_r = 40.6; ρ = 1000 kg/m^3
Ambient Temperature:23.3°C Liqiud Temperature: 22.5°C
Communication System: WCDMA 850 Frequency: 826.4 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

Tilt Low/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.164 mW/g

Tilt Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.8 V/m; Power Drift = 0.173 dB
Peak SAR (extrapolated) = 0.197 W/kg
SAR(1 g) = 0.154 mW/g; SAR(10 g) = 0.114 mW/g
Maximum value of SAR (measured) = 0.164 mW/g



0 dB = 0.164mW/g

Fig. 23 Right Hand Tilt 15°WCDMA 850MHz CH4132

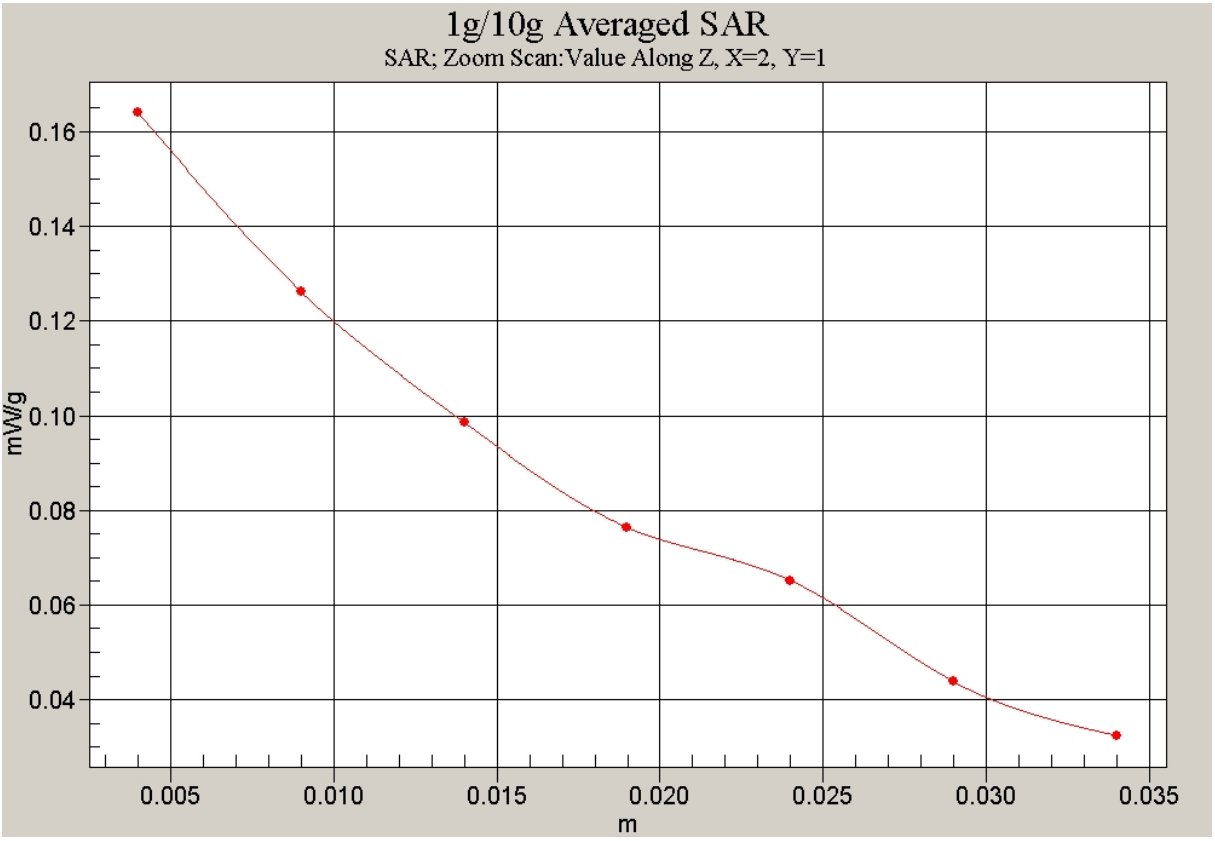
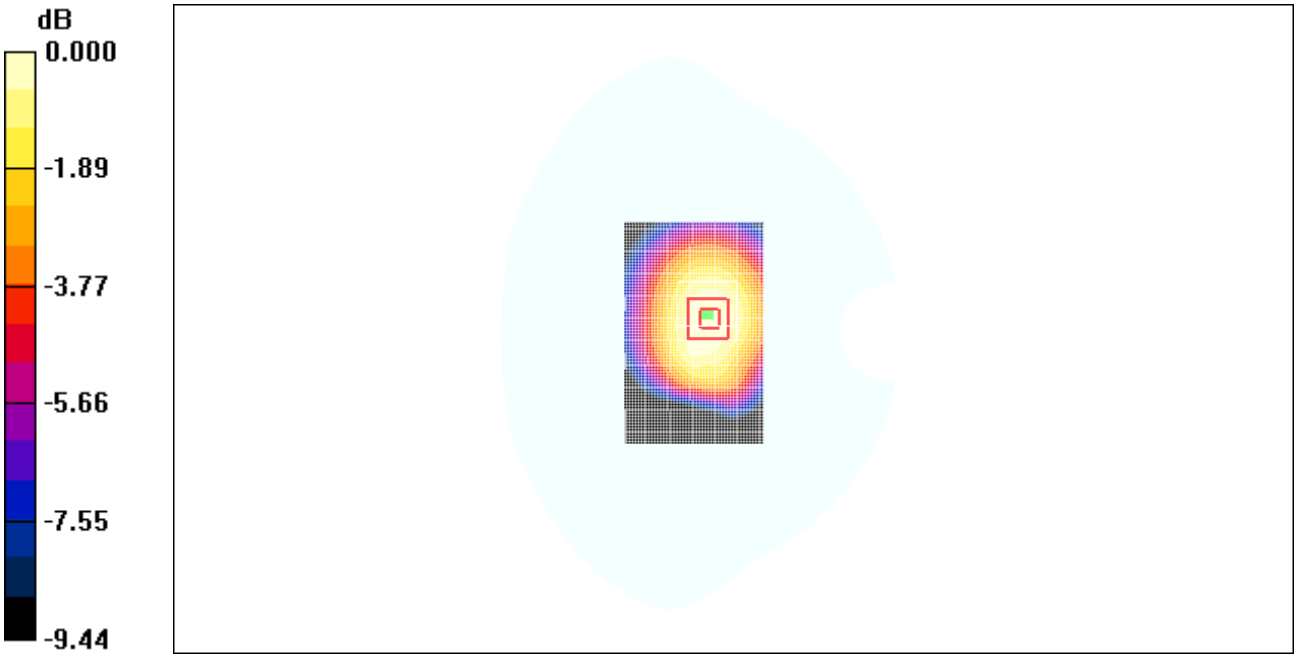


Fig. 24 Z-Scan at power reference point (WCDMA 850MHz CH4132)

WCDMA 850 Body Toward Ground High
Date/Time: 2008-12-10 13:05:34
Electronics: DAE4 Sn771
Medium: 850 Body
Medium parameters used (interpolated): f = 846.6 MHz; σ = 1.02 mho/m; ε_r = 53.7; ρ = 1000 kg/m^3
Ambient Temperature:23.3°C Liqiud Temperature: 22.5°C
Communication System: WCDMA 850 Frequency: 846.6 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

Toward Ground High/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.643 mW/g

Toward Ground High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 25.1 V/m; Power Drift = -0.038 dB
Peak SAR (extrapolated) = 0.799 W/kg
SAR(1 g) = 0.612 mW/g; SAR(10 g) = 0.440 mW/g
Maximum value of SAR (measured) = 0.643 mW/g



0 dB = 0.643mW/g

Fig. 25 WCDMA850 MHz, Body, Towards Ground, CH4233

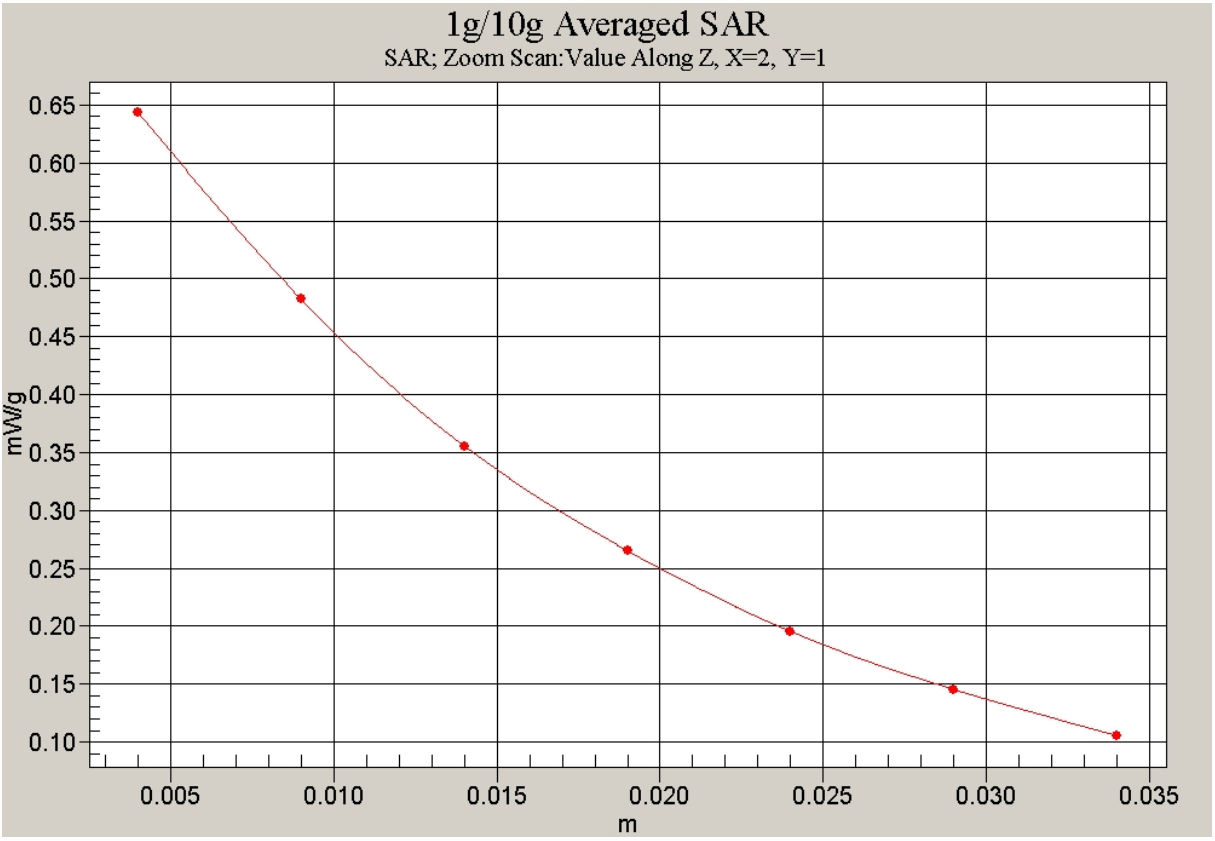
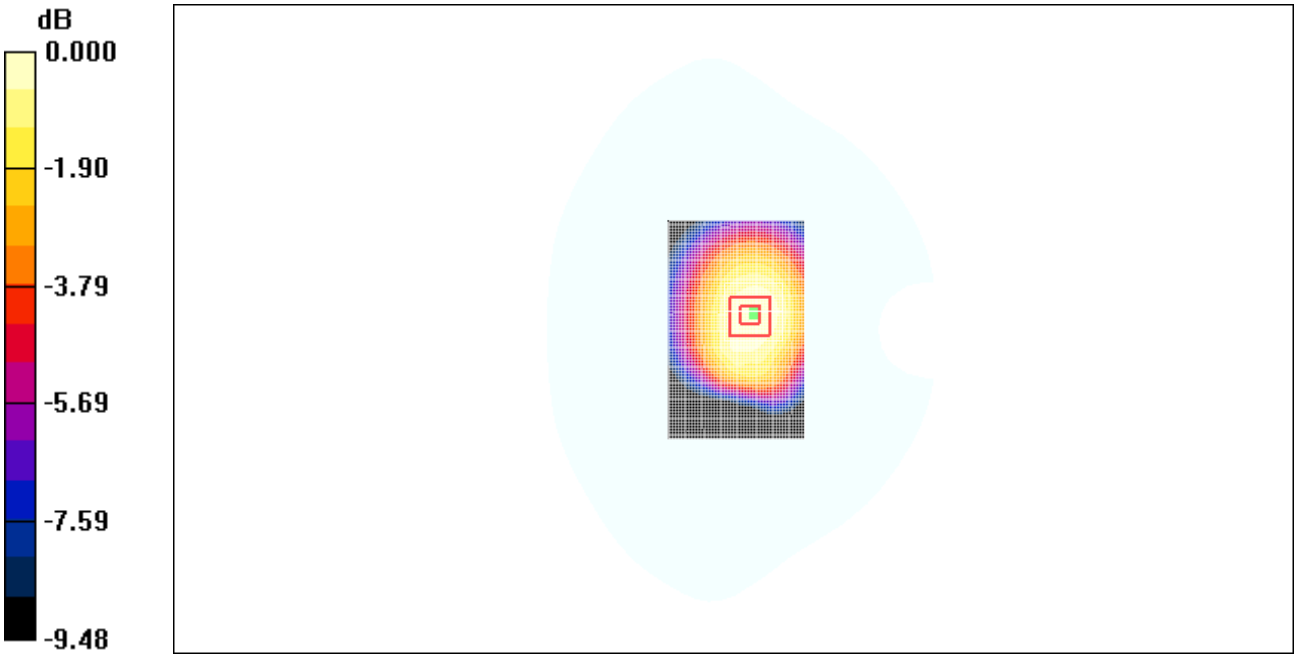


Fig. 26 Z-Scan at power reference point (WCDMA850 MHz, Body, Towards Ground, CH4233)

WCDMA 850 Body Toward Ground Middle
Date/Time: 2008-12-10 13:18:33
Electronics: DAE4 Sn771
Medium: 850 Body
Medium parameters used (interpolated): f = 836.4 MHz; σ = 1.01 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3
Ambient Temperature:23.3°C Liqiud Temperature: 22.5°C
Communication System: WCDMA 850 Frequency: 836.4 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

Toward Ground Middle/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.772 mW/g

Toward Ground Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 28.1 V/m; Power Drift = -0.062 dB
Peak SAR (extrapolated) = 0.947 W/kg
SAR(1 g) = 0.731 mW/g; SAR(10 g) = 0.528 mW/g
Maximum value of SAR (measured) = 0.774 mW/g



0 dB = 0.774mW/g

Fig. 27 WCDMA850 MHz, Body, Towards Ground, CH4182

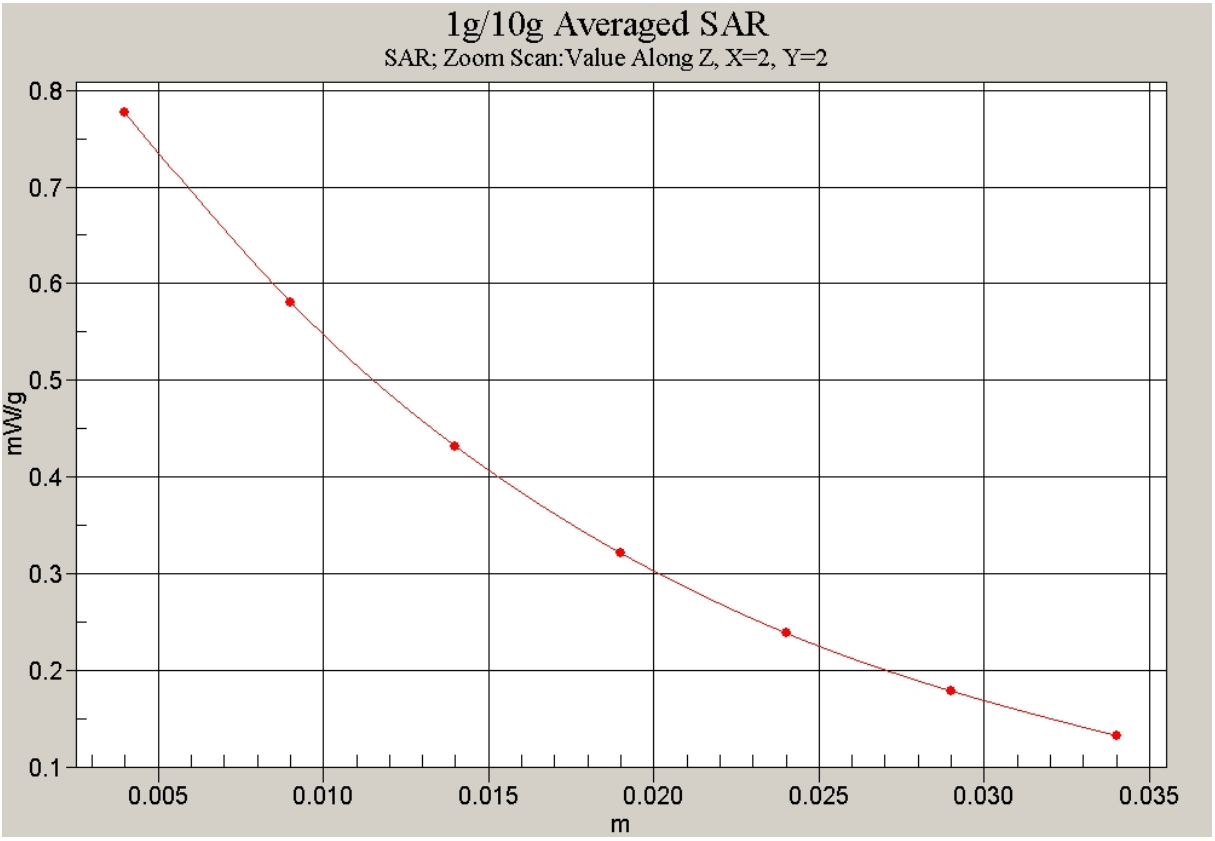
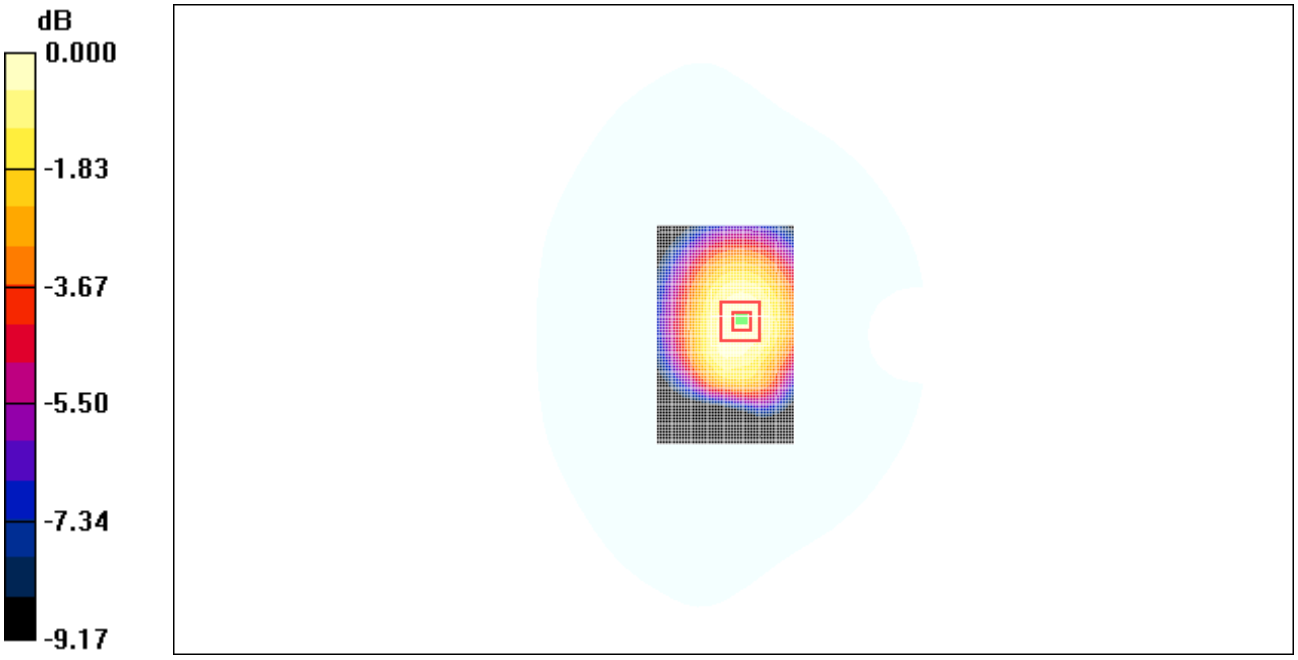


Fig. 28 Z-Scan at power reference point (WCDMA850 MHz, Body, Towards Ground, CH4182)

WCDMA 850 Body Toward Ground Low
Date/Time: 2008-12-10 13:32:51
Electronics: DAE4 Sn771
Medium: 850 Body
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.995 mho/m; ε_r = 53.9; ρ = 1000 kg/m^3
Ambient Temperature:23.3°C Liqiud Temperature: 22.5°C
Communication System: WCDMA 850 Frequency: 826.4 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

Toward Ground Low/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.616 mW/g

Toward Ground Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 25.1 V/m; Power Drift = -0.055 dB
Peak SAR (extrapolated) = 0.755 W/kg
SAR(1 g) = 0.585 mW/g; SAR(10 g) = 0.424 mW/g
Maximum value of SAR (measured) = 0.622 mW/g



0 dB = 0.622mW/g

Fig. 29 WCDMA850 MHz, Body, Towards Ground, CH4132

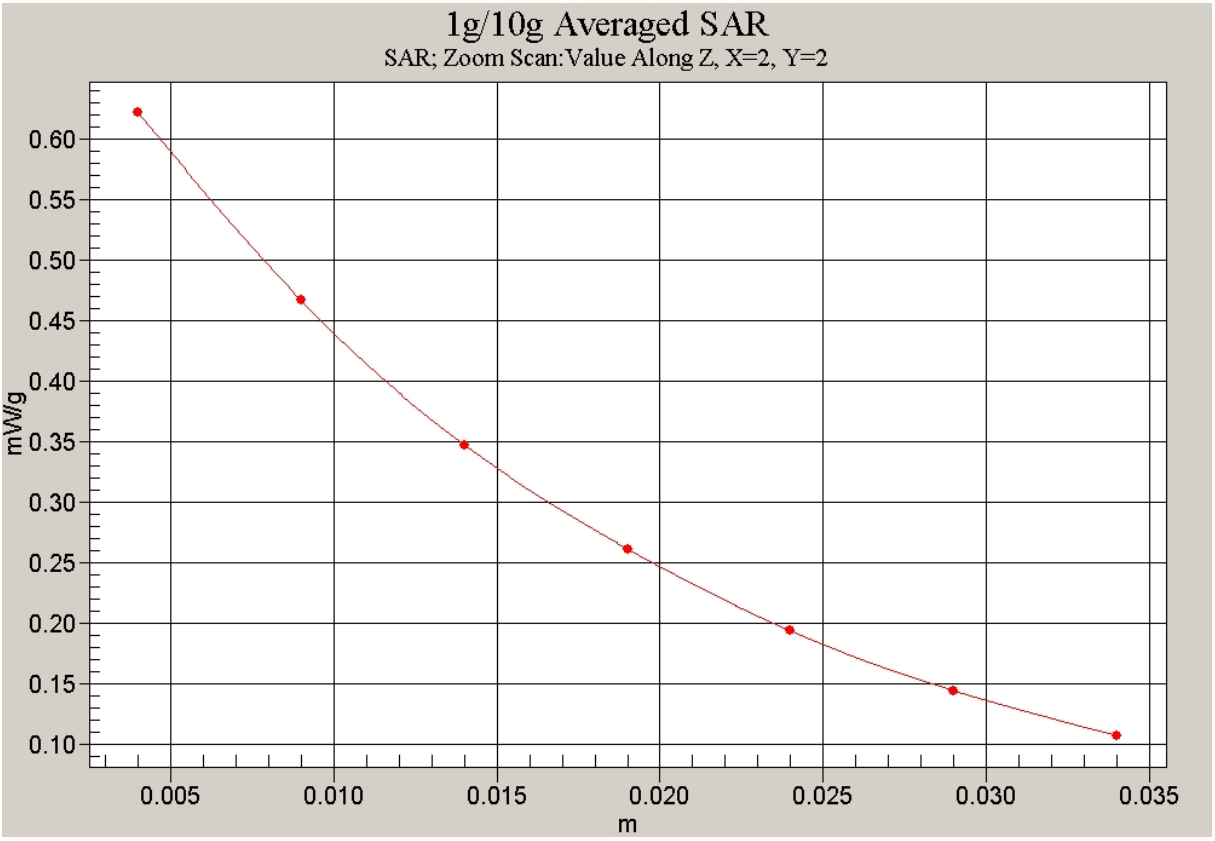
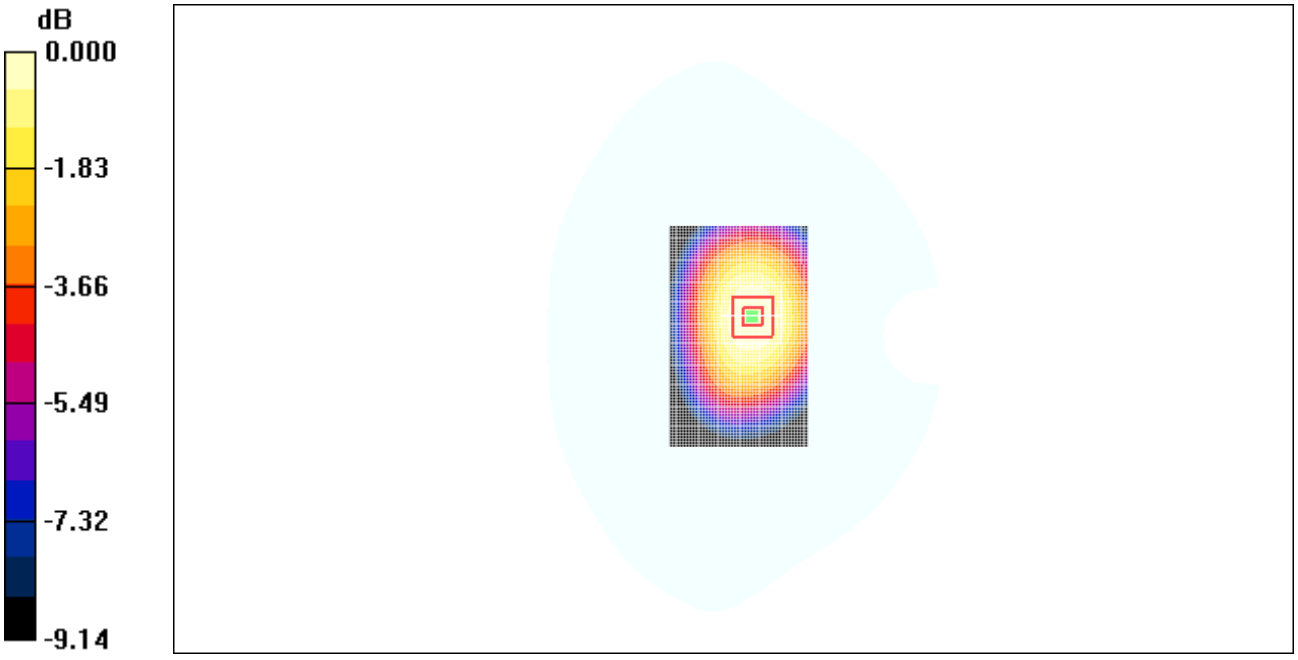


Fig. 30 Z-Scan at power reference point (WCDMA850 MHz, Body, Towards Ground, CH4132)

WCDMA 850 Body Toward Phantom High
Date/Time: 2008-12-10 14:12:38
Electronics: DAE4 Sn771
Medium: 850 Body
Medium parameters used (interpolated): f = 846.6 MHz; σ = 1.02 mho/m; ε_r = 53.7; ρ = 1000 kg/m^3
Ambient Temperature:23.3°C Liqiud Temperature: 22.5°C
Communication System: WCDMA 850 Frequency: 846.6 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

Toward Phantom High/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.231 mW/g

Toward Phantom High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.9 V/m; Power Drift = -0.009 dB
Peak SAR (extrapolated) = 0.271 W/kg
SAR(1 g) = 0.218 mW/g; SAR(10 g) = 0.160 mW/g
Maximum value of SAR (measured) = 0.230 mW/g



0 dB = 0.230mW/g

Fig. 31 WCDMA850 MHz, Body, Towards Phantom, CH4233

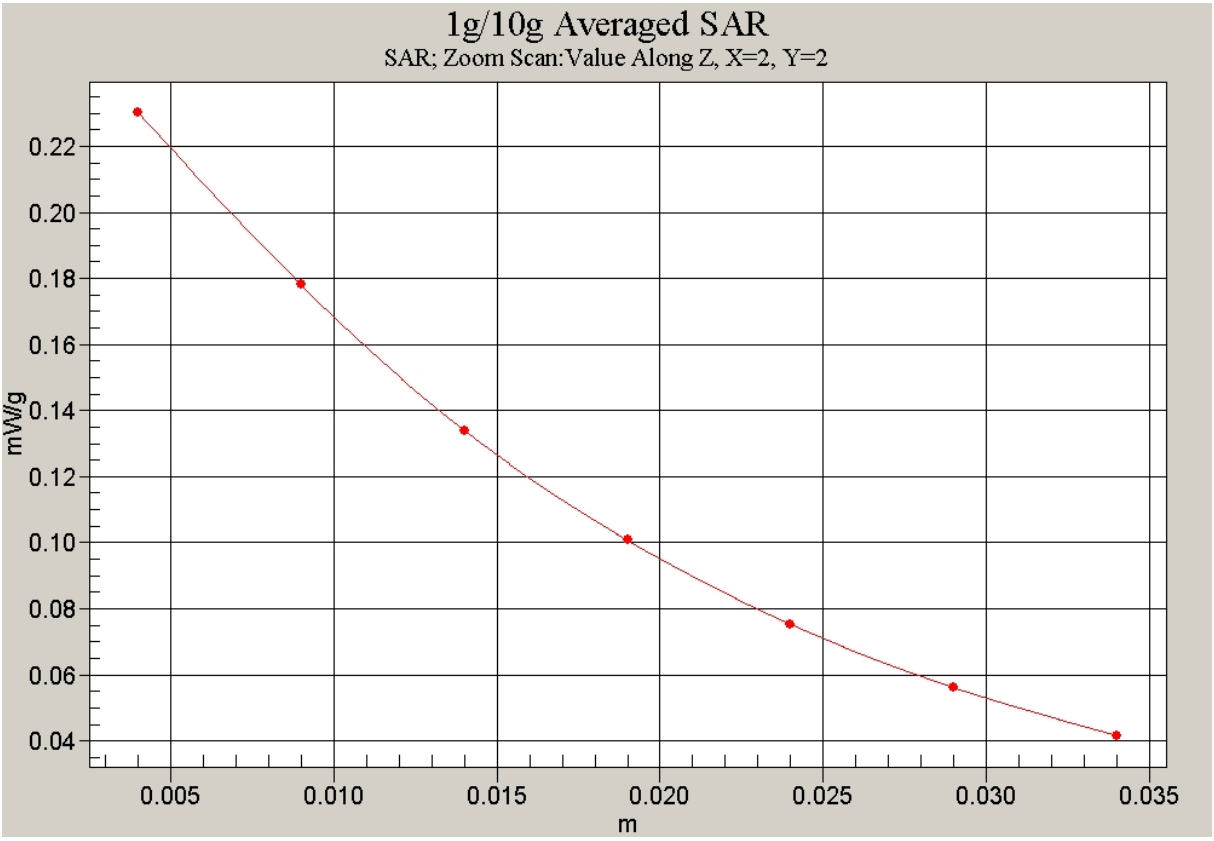
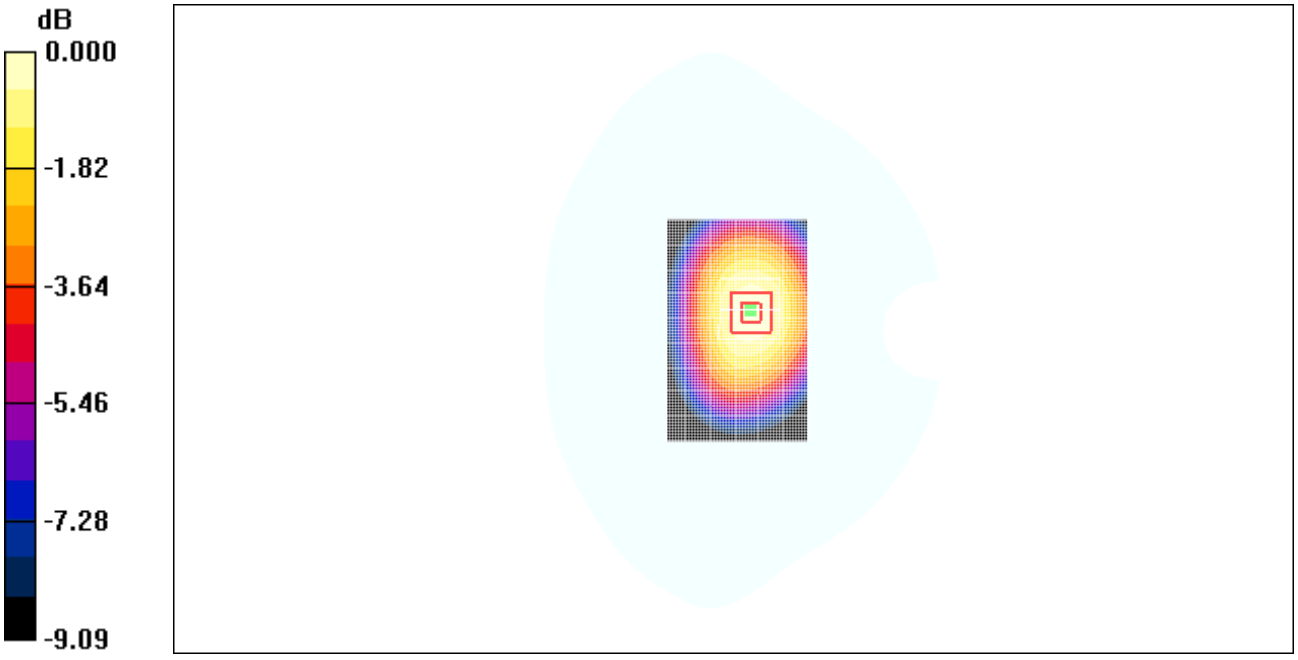


Fig. 32 Z-Scan at power reference point (WCDMA850 MHz, Body, Towards Phantom, CH4233)

WCDMA 850 Body Toward Phantom Middle
Date/Time: 2008-12-10 13:59:15
Electronics: DAE4 Sn771
Medium: 850 Body
Medium parameters used (interpolated): f = 836.4 MHz; σ = 1.01 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3
Ambient Temperature:23.3°C Liqiud Temperature: 22.5°C
Communication System: WCDMA 850 Frequency: 836.4 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

Toward Phantom Middle/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.335 mW/g

Toward Phantom Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.2 V/m; Power Drift = 0.075 dB
Peak SAR (extrapolated) = 0.410 W/kg
SAR(1 g) = 0.328 mW/g; SAR(10 g) = 0.241 mW/g
Maximum value of SAR (measured) = 0.347 mW/g



0 dB = 0.347mW/g

Fig. 33 WCDMA850 MHz, Body, Towards Phantom, CH4182

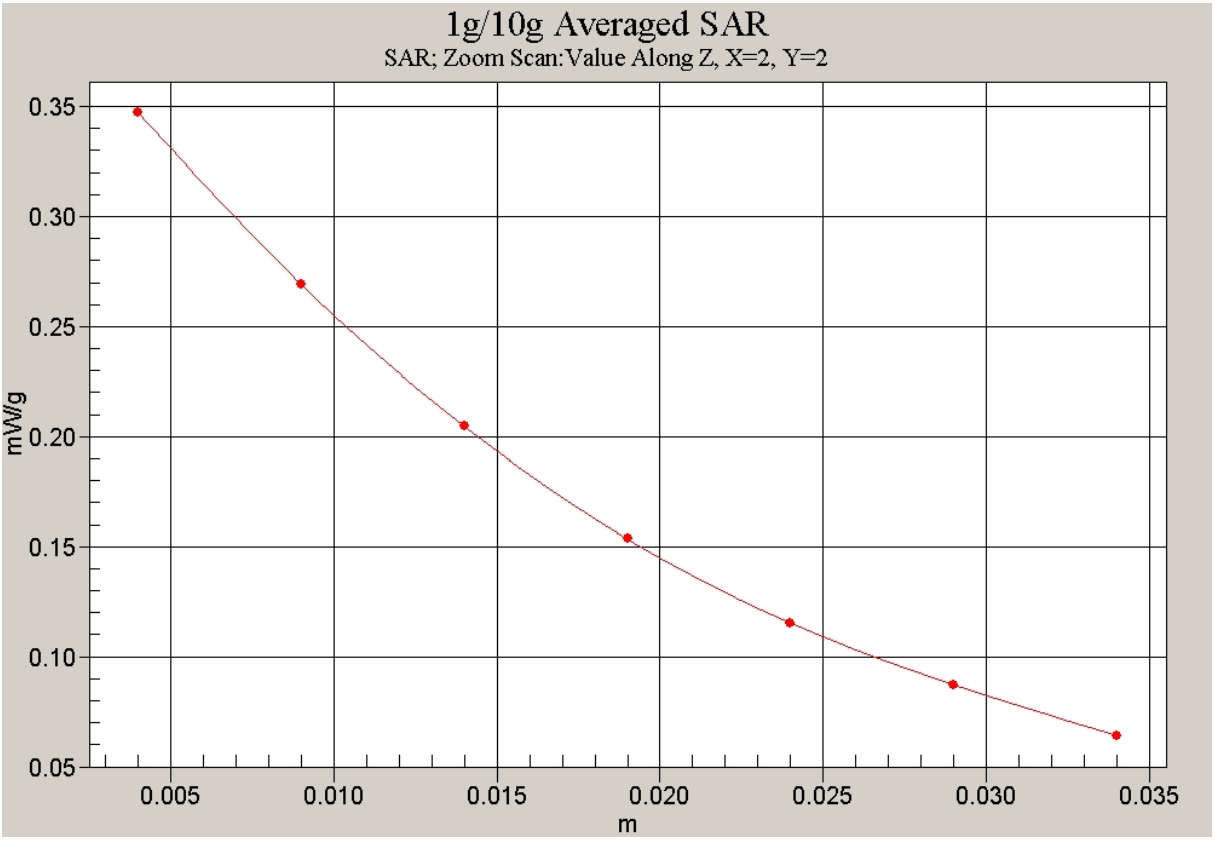
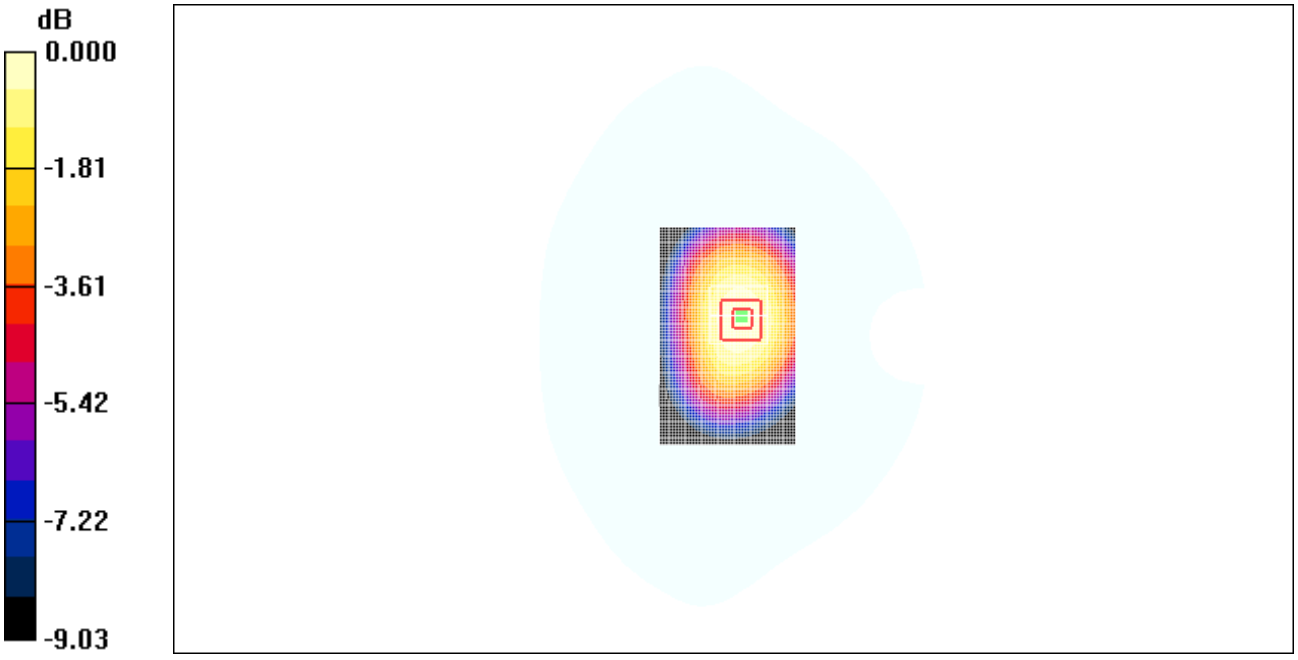


Fig. 34 Z-Scan at power reference point (WCDMA850 MHz, Body, Towards Phantom, CH4182)

WCDMA 850 Body Toward Phantom Low
Date/Time: 2008-12-10 13:46:04
Electronics: DAE4 Sn771
Medium: 850 Body
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.995 mho/m; ε_r = 53.9; ρ = 1000 kg/m^3
Ambient Temperature:23.3°C Liqiud Temperature: 22.5°C
Communication System: WCDMA 850 Frequency: 826.4 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

Toward Phantom Low/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.217 mW/g

Toward Phantom Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.6 V/m; Power Drift = 0.076 dB
Peak SAR (extrapolated) = 0.250 W/kg
SAR(1 g) = 0.204 mW/g; SAR(10 g) = 0.151 mW/g
Maximum value of SAR (measured) = 0.217 mW/g



0 dB = 0.217mW/g

Fig. 35 WCDMA850 MHz, Body, Towards Phantom, CH4132

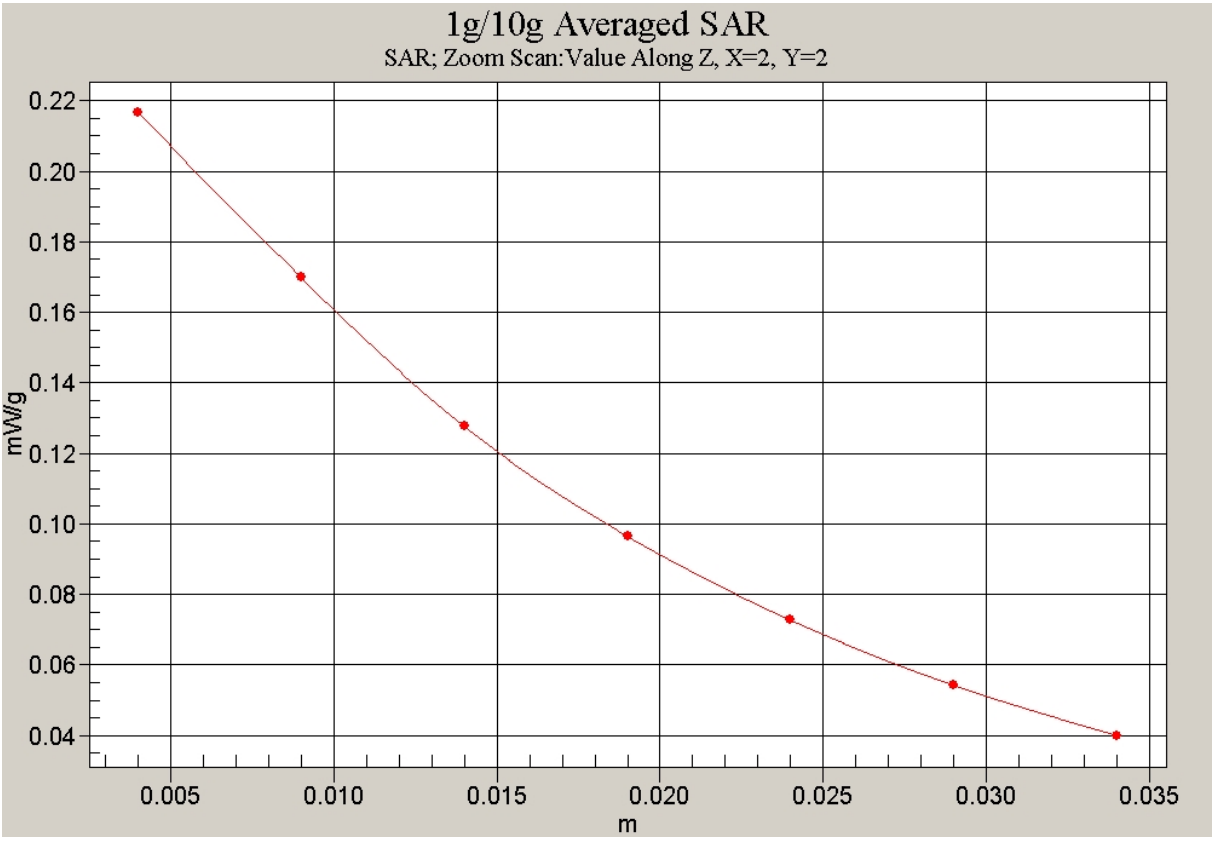


Fig. 36 Z-Scan at power reference point (WCDMA850 MHz, Body, Towards Phantom, CH4132)