SAR TEST REPORT

No. 2010SAR00003

For

TCT Mobile Limited

GSM/GPRS/EDGE 850/1900 dual band mobile phone

Piano A

OT-880A

With

Hardware Version: PIO

Software Version: V121

FCCID: RAD126

Issued Date: 2010-1-22

Deutscher Akkreditierungs Rat

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

Note:

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TABLE OF CONTENT

1 Test Laboratory

1.1 Testing Location

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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:	January 19, 2010
Testing End Date:	January 20, 2010

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

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2.2 Manufacturer Information

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City:	Shanghai
Postal Code:	201203
Country:	P. R. China
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3 Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1 About EUT

EUT Description:	GSM/GPRS/EDGE 850/1900 dual band mobile phone
Model Name:	Piano A
Marketing Name:	OT-880A
GSM Frequency Band:	GSM 850/GSM 1900

3.2 Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	012108000200334	PIO	V121

*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	CBA3120AG0C1	\	BYD
AE2	Battery	CAB3120000C1	B297960242A	BYD
AE3	Headset	STEREO HEADSET	CCB3160A10C1	Shunda/Juwei
AE4	Headset	STEREO HEADSET	CCB3120A11C1	Shunda/Juwei

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

4 CHARACTERISTICS OF THE TEST

4.1 Applicable Limit Regulations

EN 50360–2001: 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.

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

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.

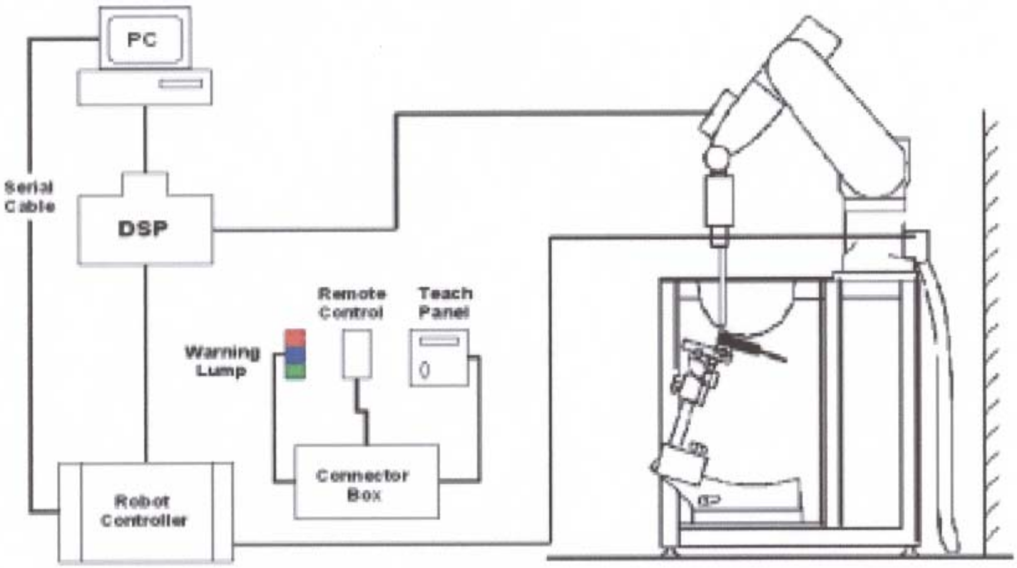
The EUT shall use its internal transmitter. The antenna(s), battery and accessories shall be those specified by the manufacturer. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output. If a wireless link is used, the antenna connected to the 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.

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- 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.

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)

Picture 3: ES3DV3 E-field

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)

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

Picture4: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 5: 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 6: 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 1 and 2 shows the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the IEEE 1528.

Table 1. Composition of the Head Tissue Equivalent Matter

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

Table 2. Composition of the Body Tissue Equivalent Matter

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

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 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.

Because the EUT has speech function and data transfer function, the tests for GSM 850/1900 are performed in Speech, GPRS and EGPRS mode (The EGPRS don't support 8PSK modulation in uplink, we test in EGPRS mode with GMSK modulation. Since the GPRS/EGPRS class is 12, the tests are performed for the case of the slots in uplink with the maximum averaged power).

7.2.2 Measurement result

The conducted power for GSM 850/1900 is as following:

GSM 850	Measured Power (dBm)		
	128	190	251
	32.7	32	31.8
DCS1900	Measured Power (dBm)		
	512	661	810
	30	30	30

The conducted power for GPRS/EGPRS 850/1900 is as following:

GSM 850 GPRS	Measured Power (dBm)			calculation	Averaged Power (dBm)		
	128	**190**	**251**		**128**	**190**	**251**
1 Txslot	32.7	32	31.8	-9.03dB	23.67	22.97	22.77
2 Txslots	31.4	30.8	30.5	-6.02dB	25.38	24.78	24.48
3Txslots	30.5	29.8	29.6	-4.26dB	**26.24**	**25.54**	**25.34**
4 Txslots	28.7	28	27.8	-3.01dB	25.69	24.99	24.79
GSM 850 EGPRS	Measured Power (dBm)				Averaged Power (dBm)		
	128	**190**	**251**		**128**	**190**	**251**
1 Txslot	32.7	32	31.8	-9.03dB	23.67	22.97	22.77
2 Txslots	31.4	30.8	30.5	-6.02dB	25.38	24.78	24.48
3Txslots	30.5	29.8	29.6	-4.26dB	**26.24**	**25.54**	**25.34**
4 Txslots	28.7	28	27.8	-3.01dB	25.69	24.99	24.79
DCS1900 GPRS	Measured Power (dBm)				Averaged Power (dBm)		
	512	**661**	**810**		**512**	**661**	**810**
1 Txslot	30	30	30	-9.03dB	20.97	20.97	20.97
2 Txslots	28.1	28.1	28.1	-6.02dB	22.08	22.08	22.08
3Txslots	27.2	27.2	27.2	-4.26dB	**22.94**	**22.94**	**22.94**
4 Txslots	25	25	25	-3.01dB	21.99	21.99	21.99
DCS1900 EGPRS	Measured Power (dBm)				Averaged Power (dBm)		
	512	**661**	**810**		**512**	**661**	**810**
1 Txslot	30	30	30	-9.03dB	20.97	20.97	20.97
2 Txslots	28.1	28.1	28.1	-6.02dB	22.08	22.08	22.08
3Txslots	27.2	27.2	27.2	-4.26dB	**22.94**	**22.94**	**22.94**
4 Txslots	25	25	25	-3.01dB	21.99	21.99	21.99

NOTES:

1) Division Factors

To average the power, the division factor is as follows:

1TX-slot = 1 transmit time slot out of 8 time slots=> conducted power divided by (8/1) => -9.03dB

2TX-slots = 2 transmit time slots out of 8 time slots=> conducted power divided by (8/2) => -6.02dB

3TX-slots = 3 transmit time slots out of 8 time slots=> conducted power divided by (8/3) => -4.26dB

4TX-slots = 4 transmit time slots out of 8 time slots=> conducted power divided by (8/4) => -3.01dB

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 7 to Table 10 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 4: Dielectric Performance of Head Tissue Simulating Liquid

Measurement is made at temperature 23.0 °C and relative humidity 41%.
Liquid temperature during the test: 22.5°C
Measurement Date : 850 MHz **January 19, 2010** 1900 MHz **January 20, 2010**

/	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	40.3	0.91
	1900 MHz	39.1	1.41

Table 5: Dielectric Performance of Body Tissue Simulating Liquid

Measurement is made at temperature 23.0 °C and relative humidity 41%.
Liquid temperature during the test: 22.5°C
Measurement Date : 850 MHz **January 19, 2010** 1900 MHz **January 20, 2010**

/	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	54.1	0.96
	1900 MHz	52.3	1.55

8.2 System Validation

Table 6: System Validation

Measurement is made at temperature 23.0 °C and relative humidity 41%.
Liquid temperature during the test: 22.5°C
Measurement Date : 850 MHz **January 19, 2010** 1900 MHz **January 20, 2010**

		Frequency		Permittivity ε		Conductivity σ (S/m)	
Liquid parameters	Dipole calibration Target value	835 MHz		39.9		0.88	
		1900 MHz		38.9		1.38	
	Actural Measurement value	835 MHz		40.4		0.89	
		1900 MHz		39.1		1.41	
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	1.61	2.53	0.62%	2.02%
	1900 MHz	5.09	9.73	5.22	9.81	2.55%	0.82%

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 7: 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)	0.551	0.771	-0.129
Left hand, Touch cheek, Mid frequency (See Fig.2)	0.553	0.776	-0.050
Left hand, Touch cheek, Bottom frequency (See Fig.3)	0.454	0.638	-0.040
Left hand, Tilt 15 Degree, Top frequency (See Fig.4)	0.288	0.387	-0.062
Left hand, Tilt 15 Degree, Mid frequency (See Fig.5)	0.294	0.394	-0.041
Left hand, Tilt 15 Degree, Bottom frequency (See Fig.6)	0.248	0.330	-0.030
Right hand, Touch cheek, Top frequency (See Fig.7)	0.507	0.720	-0.065
Right hand, Touch cheek, Mid frequency (See Fig.8)	0.512	0.727	0.031
Right hand, Touch cheek, Bottom frequency (See Fig.9)	0.424	0.601	-0.019
Right hand, Tilt 15 Degree, Top frequency (See Fig.10)	0.295	0.396	-0.045
Right hand, Tilt 15 Degree, Mid frequency (See Fig.11)	0.302	0.403	-0.026
Right hand, Tilt 15 Degree, Bottom frequency (See Fig.12)	0.265	0.351	-0.088

Table 8: SAR Values (850MHz-Body)

Limit of SAR (W/kg)	10 g Average	1g 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 with GPRS(See Fig.13)	0.822	1.16	0.018
Body, Towards Ground, Mid frequency with GPRS (See Fig.14)	0.874	1.23	-0.011
Body, Towards Ground, Bottom frequency with GPRS(See Fig.15)	0.952	1.34	0.030
Body, Towards Phantom, Top frequency with GPRS(See Fig.16)	0.531	0.719	-0.088
Body, Towards Phantom, Mid frequency with GPRS (See Fig.17)	0.553	0.749	0.034
Body,Towards Phantom,Bottom frequency with GPRS(See Fig.18)	0.587	0.794	0.061
Body, Towards Ground, Bottom frequency with EGPRS_GMSK modulation (See Fig.19)	0.941	1.32	0.065
Body, Towards Ground, Bottom frequency with Headset_ CCB3160A10C1 (See Fig.20)	0.430	0.601	-0.022

Body, Towards Ground, Bottom frequency with Headset_ CCB3120A11C1 (See Fig.21)	0.508	0.718	-0.110

8.4 Summary of Measurement Results (1900MHz)

Table 9: 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.22)	0.314	0.579	-0.023
Left hand, Touch cheek, Mid frequency (See Fig.23)	0.305	0.563	0.109
Left hand, Touch cheek, Bottom frequency (See Fig.24)	0.273	0.512	-0.013
Left hand, Tilt 15 Degree, Top frequency (See Fig.25)	0.131	0.220	0.078
Left hand, Tilt 15 Degree, Mid frequency (See Fig.26)	0.126	0.213	0.007
Left hand, Tilt 15 Degree, Bottom frequency (See Fig.27)	0.109	0.182	0.017
Right hand, Touch cheek, Top frequency (See Fig.28)	0.343	0.670	-0.032
Right hand, Touch cheek, Mid frequency (See Fig.29)	0.329	0.628	0.074
Right hand, Touch cheek, Bottom frequency (See Fig.30)	0.323	0.612	-0.032
Right hand, Tilt 15 Degree, Top frequency (See Fig.31)	0.153	0.273	-0.061
Right hand, Tilt 15 Degree, Mid frequency (See Fig.32)	0.152	0.265	-0.023
Right hand, Tilt 15 Degree, Bottom frequency(See Fig.33)	0.149	0.261	0.049

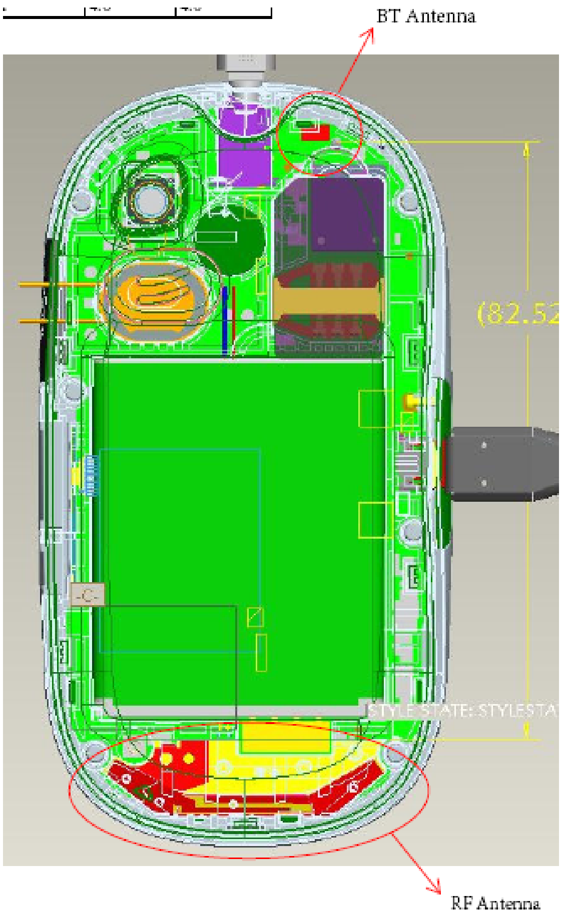
Table 10: SAR Values (1900MHz-Body)

Limit of SAR (W/kg)	**10 g Average**	**1g 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 with GPRS(See Fig.34)	0.192	0.338	0.000
Body, Towards Ground, Mid frequency with GPRS (See Fig.35)	0.212	0.368	0.096
Body, Towards Ground, Bottom frequency with GPRS(See Fig.36)	0.217	0.376	0.026
Body, Towards Phantom, Top frequency with GPRS(See Fig.37)	0.095	0.152	0.051
Body, Towards Phantom, Mid frequency with GPRS (See Fig.38)	0.101	0.162	0.039
Body, Towards Phantom, Bottom frequency with GPRS(See Fig.39)	0.102	0.164	0.044
Body, Towards Ground, Bottom frequency with EGPRS_GMSK modulation (See Fig.40)	0.213	0.366	-0.115

Body, Towards Ground, Bottom frequency with Headset_ CCB3160A10C1 (See Fig.41)	0.151	0.259	0.012
Body, Towards Ground, Bottom frequency with Headset_ CCB3120A11C1 (See Fig.42)	0.154	0.264	-0.085

8.5 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)	-0.02	-0.53	0.68

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 ≤$2P_{Ref}$ and its antenna is ＞5cm from other antenna

8.6 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 4.2 of this report. Maximum localized SAR is below exposure limits specified in the relevant standards cited in Clause 4.1 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	B	5.0	N	1	0.64	1.7	M

	uncertainty							
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 11: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	HP 8753E	US38433212	August 29,2009	One year
02	Power meter	NRVD	101253	September 4, 2009	One year
03	Power sensor	NRV-Z5	100333		
04	Signal Generator	E4433B	US37230472	September 3, 2009	One Year
05	Amplifier	VTL5400	0505	No Calibration Requested	
06	BTS	CMU 200	113312	August 10, 2009	One year
07	E-field Probe	SPEAG ES3DV3	3149	September 25, 2009	One year
08	DAE	SPEAG DAE4	771	November 19, 2009	One year
09	Dipole Validation Kit	SPEAG D835V2	443	February 18, 2009	Two years
10	Dipole Validation Kit	SPEAG D1900V2	541	February 19, 2009	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.

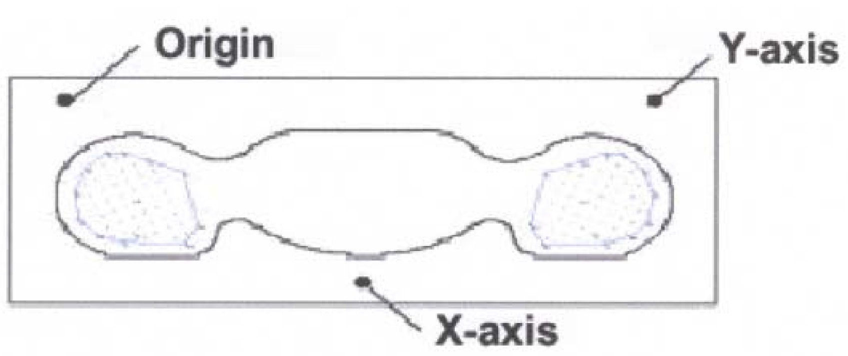
Step 3: Around this point, a volume of 30 mm x 30 mm x 30 mm was assessed by measuring 7 x 7x 7 points. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

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.

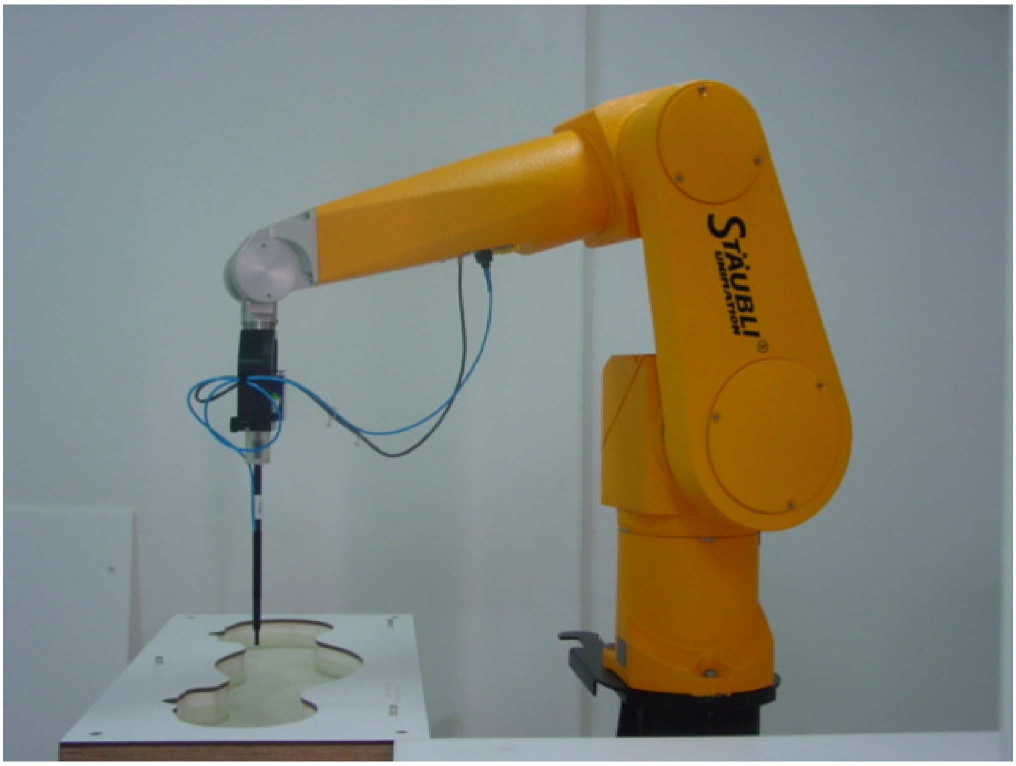
c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

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.

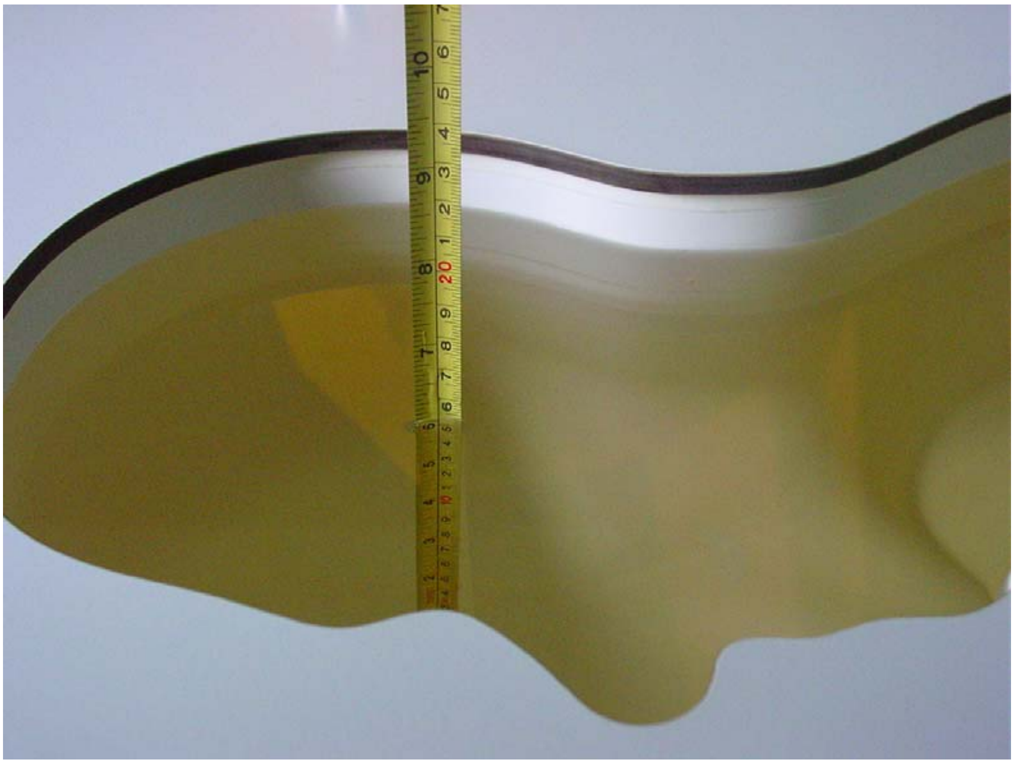


Picture A: SAR Measurement Points in Area Scan

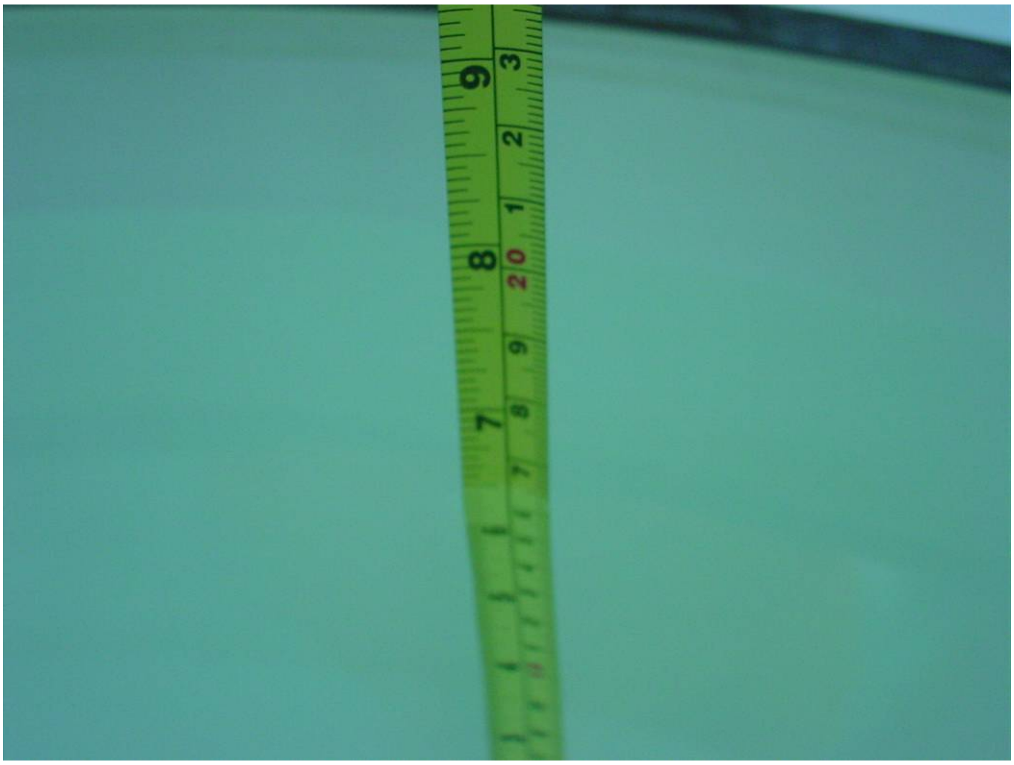
ANNEX B TEST LAYOUT



Picture B1: Specific Absorption Rate Test Layout



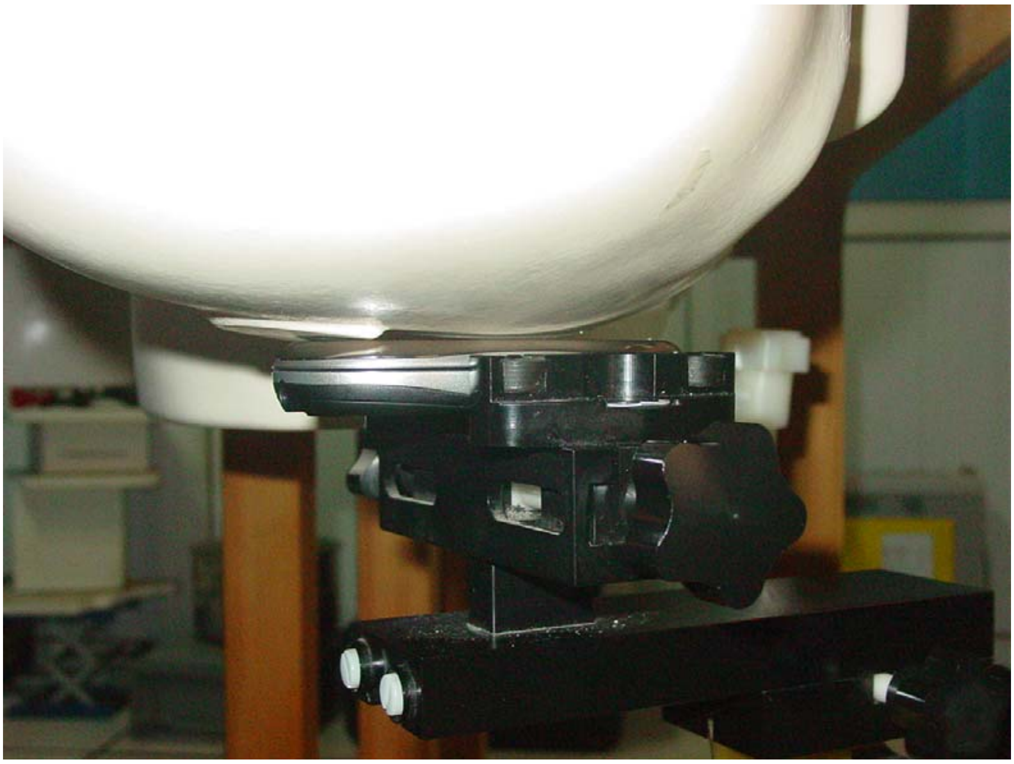
Picture B2: Liquid depth in the Flat Phantom (850 MHz)



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

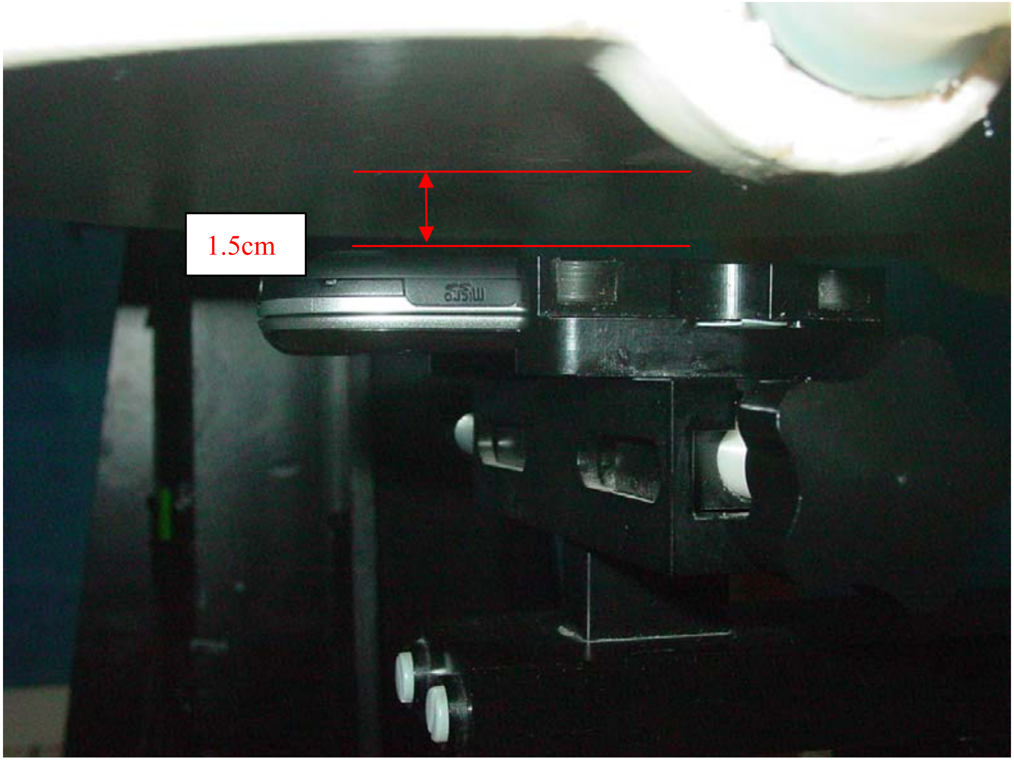
Picture B4: Left Hand Touch Cheek Position

Picture B5: Left Hand Tilt 15° Position

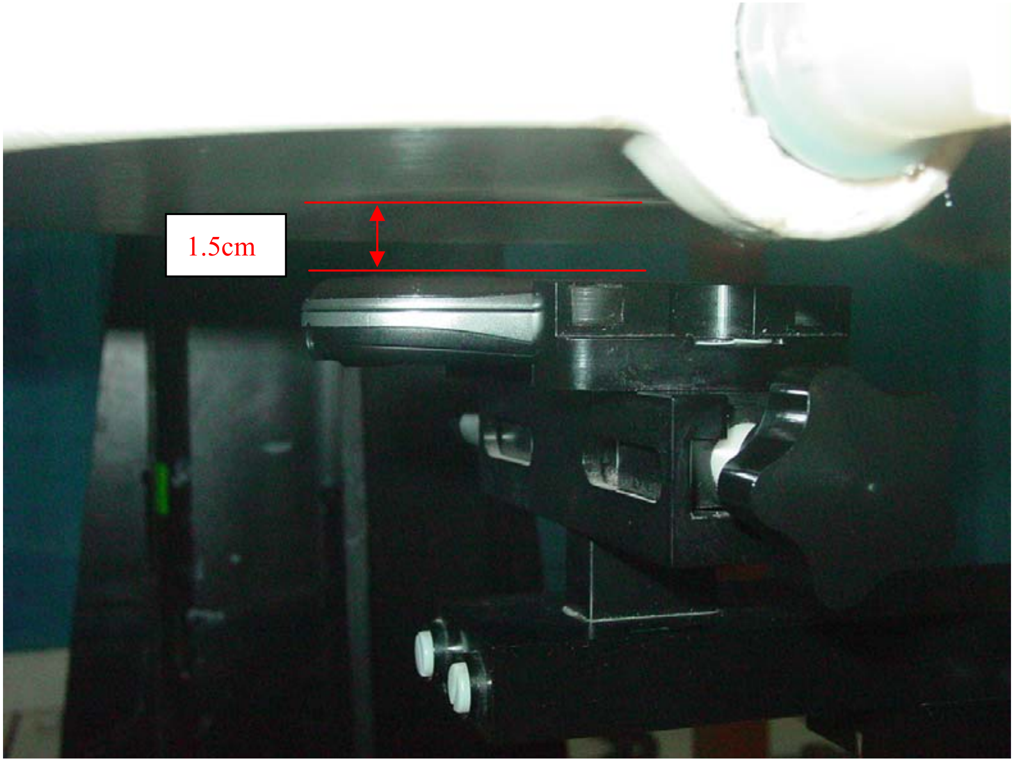


Picture B6: Right Hand Touch Cheek Position

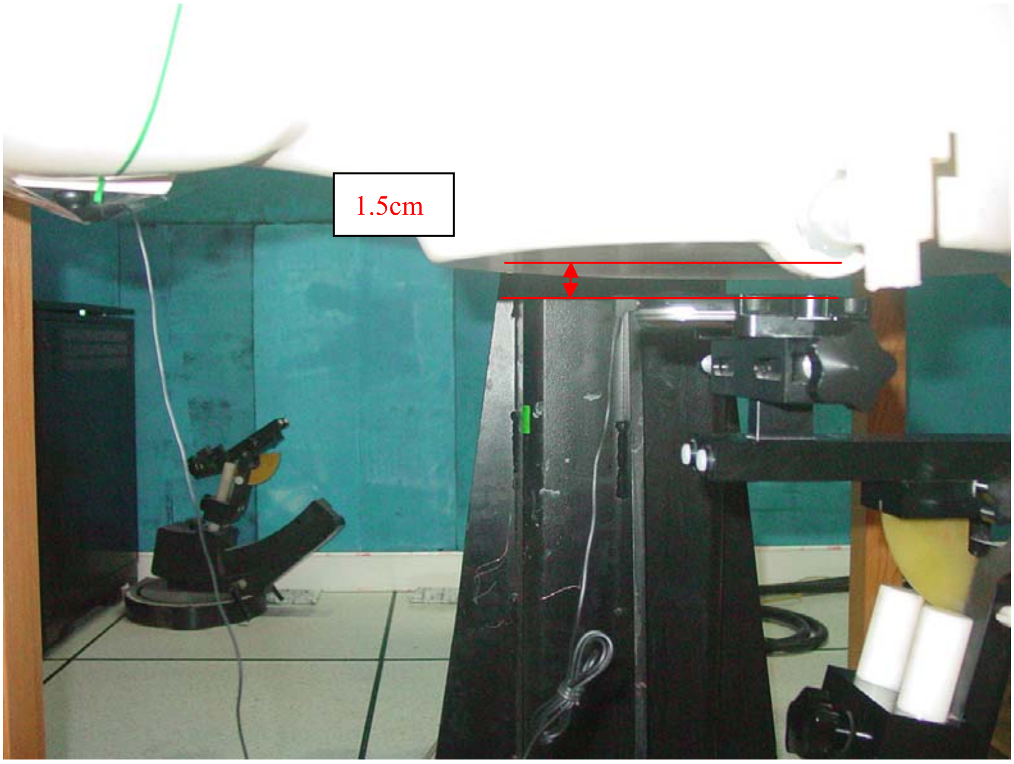
Picture B7: Right Hand Tilt 15° Position



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



Picture B9: Body-worn Position (towards Phantom, the distance from handset to the bottom of the Phantom is 1.5cm)



Picture B10: Body-worn Position with Headset (towards ground, the distance from handset to the bottom of the Phantom is 1.5cm)

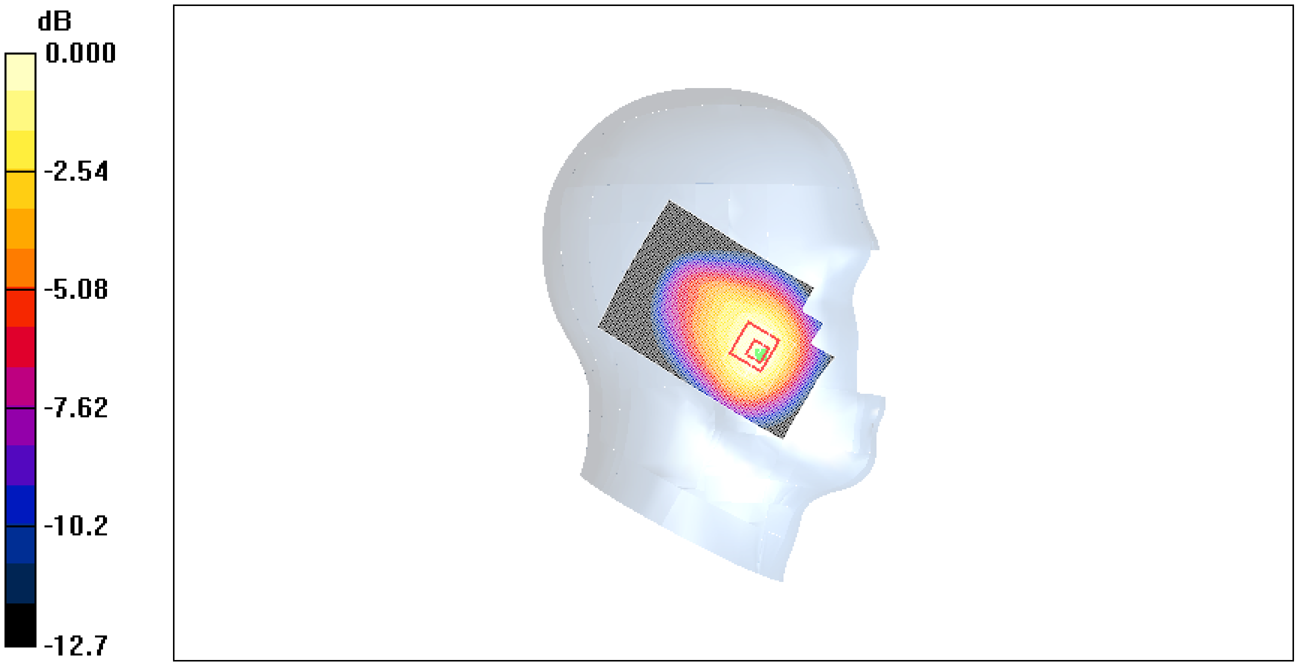
ANNEX C　GRAPH RESULTS

850 Left Cheek High

Date/Time: 2010-1-19 8:19:35
Electronics: DAE4 Sn771
Medium: Head 850
Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.91 mho/m; εr = 40.3; ρ = 1000 kg/m3
Ambient Temperature:23.0°C　　　Liquid Temperature: 22.5°C
Communication System: GSM 850 Frequency: 848.8 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

Cheek High/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.853 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 = -0.129 dB
Peak SAR (extrapolated) = 0.995 W/kg
SAR(1 g) = 0.771 mW/g; SAR(10 g) = 0.551 mW/g
Maximum value of SAR (measured) = 0.819 mW/g



0 dB = 0.819mW/g

Fig. 1　850MHz CH251

850 Left Cheek Middle

Date/Time: 2010-1-19 8:33:42

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.898 mho/m; εr = 40.4; ρ = 1000 kg/m3

Ambient Temperature:23.0°C Liquid Temperature: 22.5°C

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

Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

Cheek Middle/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.850 mW/g

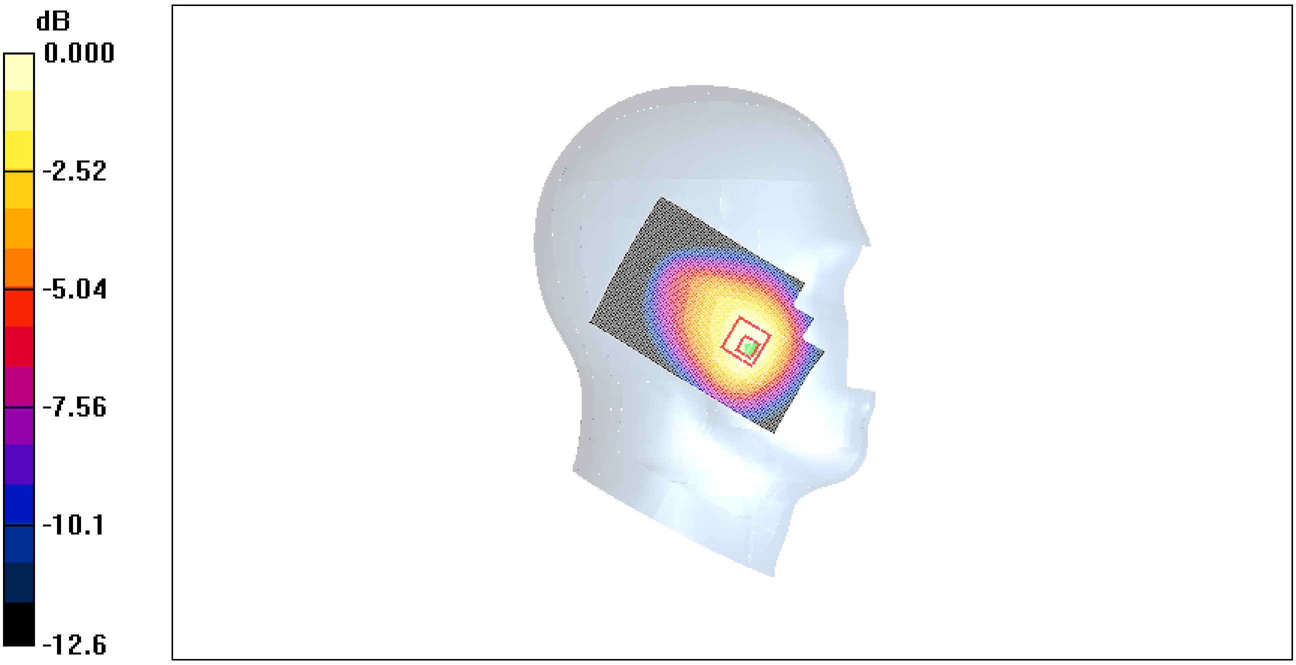
Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.8 V/m; Power Drift = -0.050 dB

Peak SAR (extrapolated) = 1.01 W/kg

SAR(1 g) = 0.776 mW/g; SAR(10 g) = 0.553 mW/g

Maximum value of SAR (measured) = 0.826 mW/g



0 dB = 0.826mW/g

Fig. 2 850 MHz CH190

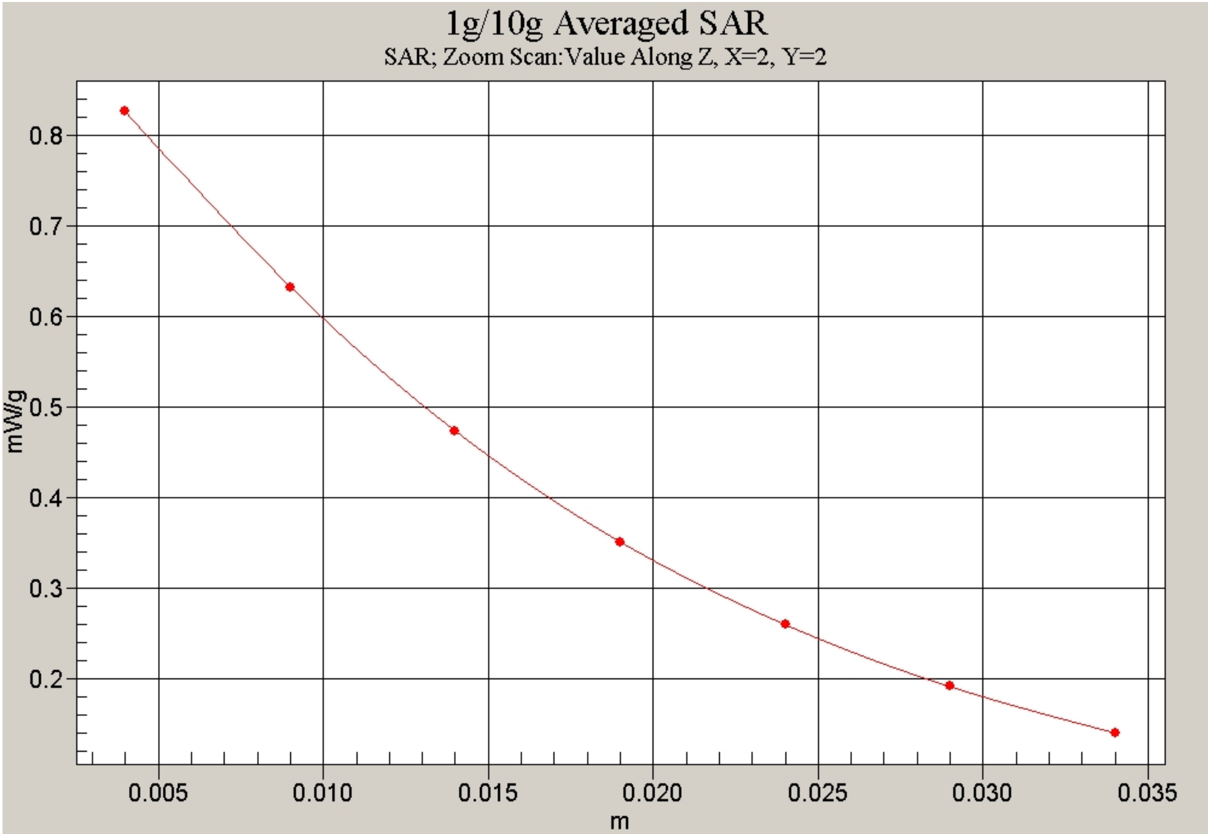


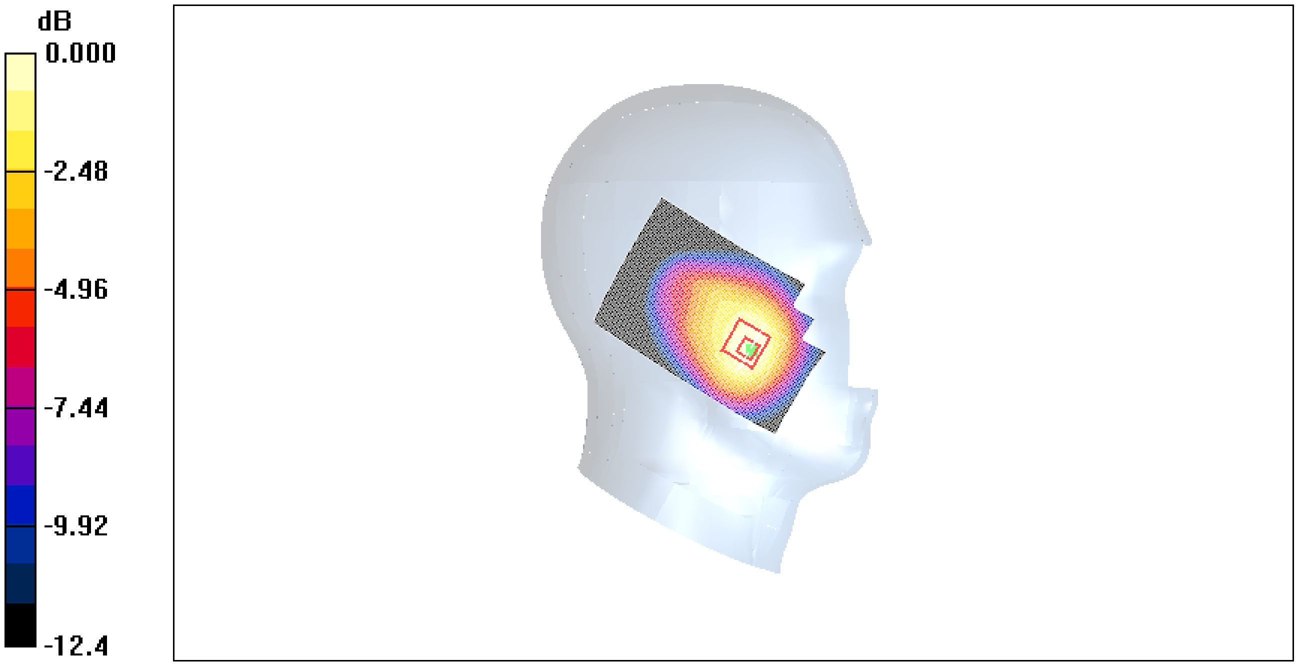
Fig. 2-1 Z-Scan at power reference point (850 MHz CH190)

850 Left Cheek Low

Date/Time: 2010-1-19 8:47:56
Electronics: DAE4 Sn771
Medium: Head 850
Medium parameters used: f = 825 MHz; σ = 0.886 mho/m; εr = 40.4; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: GSM 850 Frequency: 824.2 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

Cheek Low/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.701 mW/g

Cheek Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.6 V/m; Power Drift = -0.040 dB
Peak SAR (extrapolated) = 0.844 W/kg
SAR(1 g) = 0.638 mW/g; SAR(10 g) = 0.454 mW/g
Maximum value of SAR (measured) = 0.683 mW/g



0 dB = 0.683mW/g

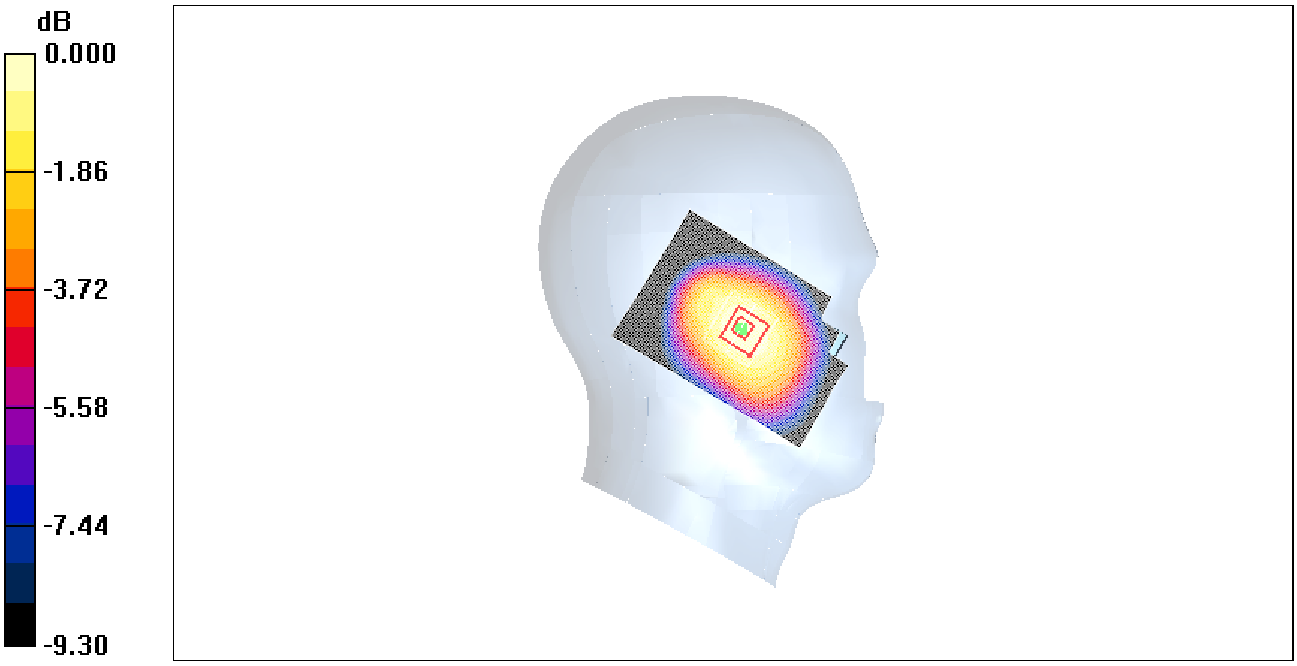
Fig. 3 850 MHz CH128

850 Left Tilt High

Date/Time: 2010-1-19 9:02:18
Electronics: DAE4 Sn771
Medium: Head 850
Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.91 mho/m; εr = 40.3; ρ = 1000 kg/m3
Ambient Temperature:23.0°C   Liquid Temperature: 22.5°C
Communication System: GSM 850 Frequency: 848.8 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

Tilt High/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.415 mW/g

Tilt High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.2 V/m; Power Drift = -0.062 dB
Peak SAR (extrapolated) = 0.483 W/kg
SAR(1 g) = 0.387 mW/g; SAR(10 g) = 0.288 mW/g
Maximum value of SAR (measured) = 0.408 mW/g



0 dB = 0.408mW/g

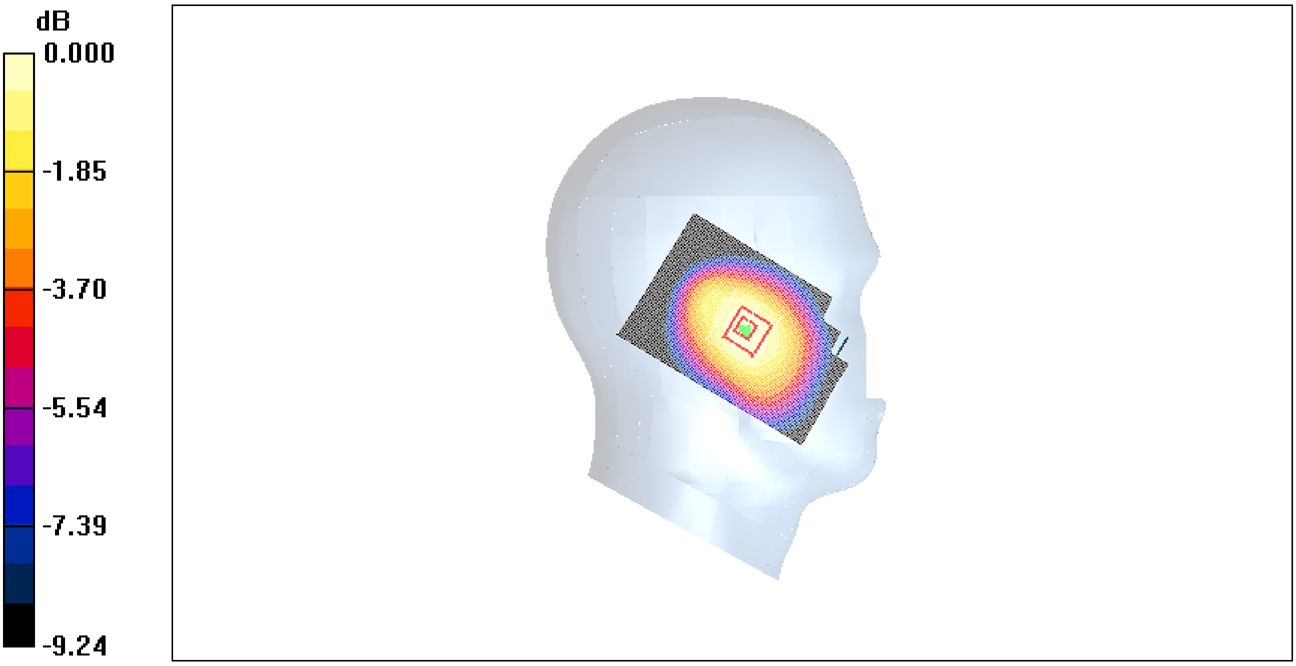
Fig.4 850 MHz CH251

850 Left Tilt Middle

Date/Time: 2010-1-19 9:16:22
Electronics: DAE4 Sn771
Medium: Head 850
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.898 mho/m; εr = 40.4; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: GSM 850 Frequency: 836.6 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

Tilt Middle/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.419 mW/g

Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.5 V/m; Power Drift = -0.041 dB
Peak SAR (extrapolated) = 0.501 W/kg
SAR(1 g) = 0.394 mW/g; SAR(10 g) = 0.294 mW/g
Maximum value of SAR (measured) = 0.418 mW/g



0 dB = 0.418mW/g

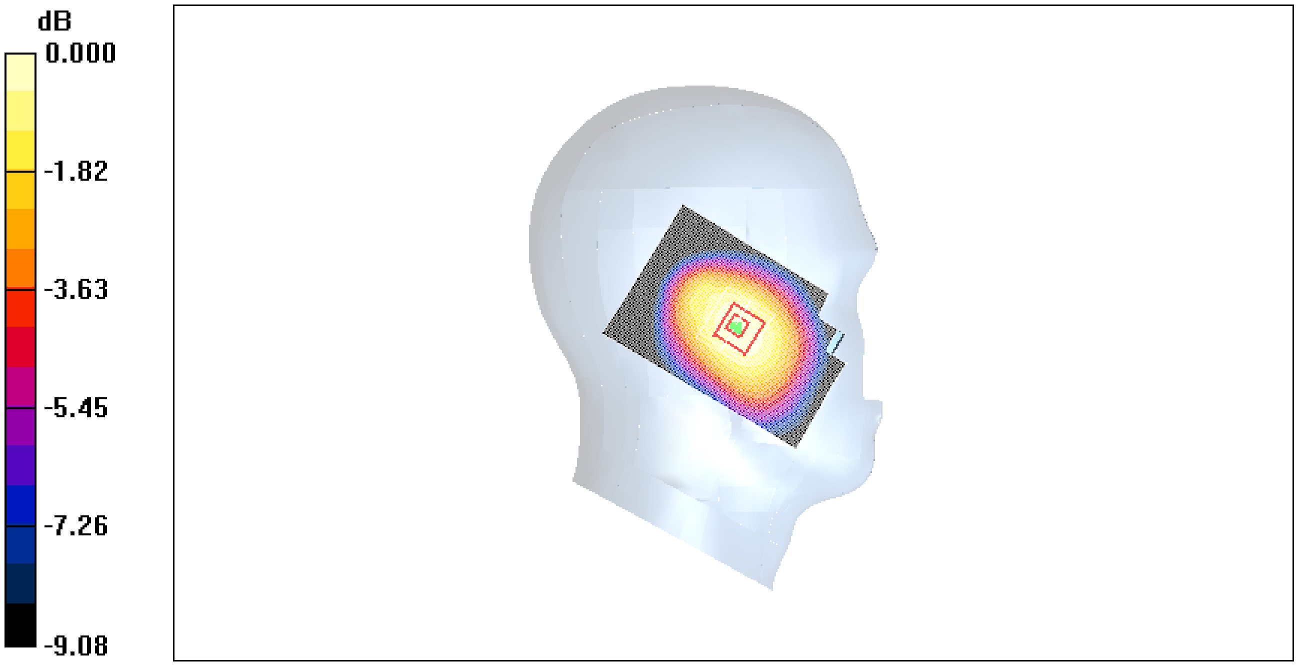
Fig.5 850 MHz CH190

850 Left Tilt Low

Date/Time: 2010-1-19 9:30:29
Electronics: DAE4 Sn771
Medium: Head 850
Medium parameters used: f = 825 MHz; σ = 0.886 mho/m; εr = 40.4; ρ = 1000 kg/m3
Ambient Temperature:23.0°C   Liquid Temperature: 22.5°C
Communication System: GSM 850 Frequency: 824.2 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

Tilt Low/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.351 mW/g

Tilt Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.2 V/m; Power Drift = -0.030 dB
Peak SAR (extrapolated) = 0.411 W/kg
SAR(1 g) = 0.330 mW/g; SAR(10 g) = 0.248 mW/g
Maximum value of SAR (measured) = 0.346 mW/g



0 dB = 0.346mW/g

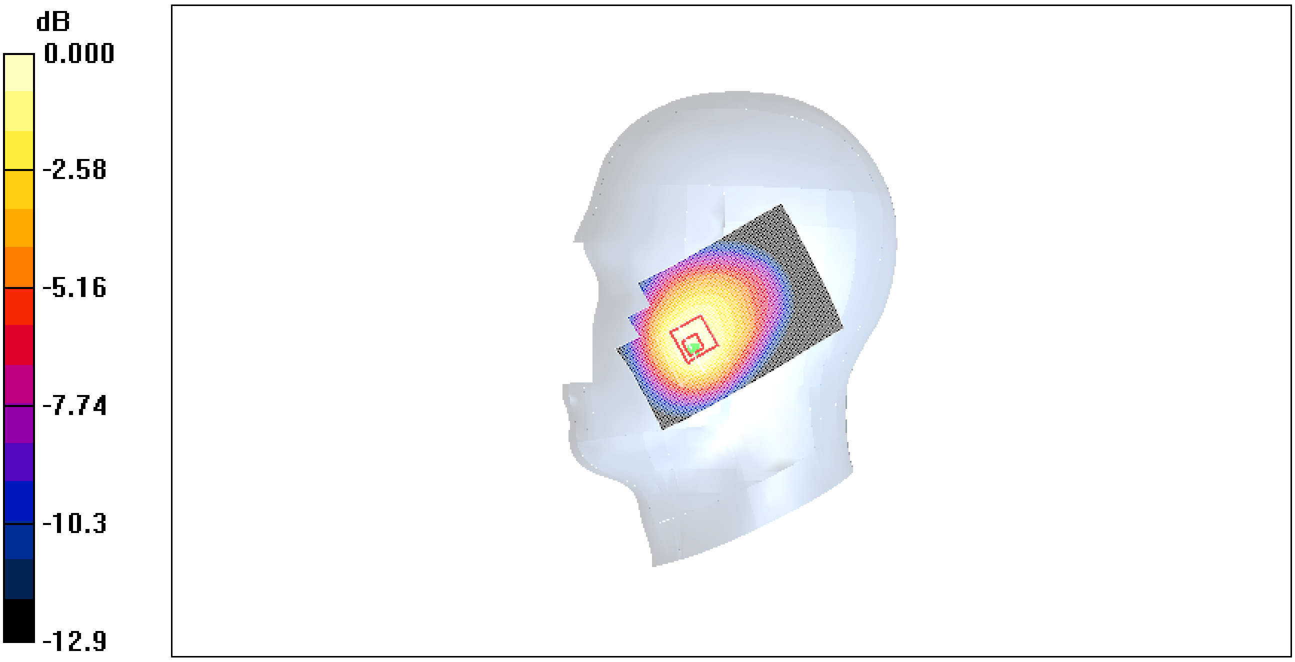
Fig. 6   850 MHz CH128

850 Right Cheek High

Date/Time: 2010-1-19 9:45:53
Electronics: DAE4 Sn771
Medium: Head 850
Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.91 mho/m; εr = 40.3; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: GSM 850 Frequency: 848.8 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

Cheek High/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.797 mW/g

Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.3 V/m; Power Drift = -0.065 dB
Peak SAR (extrapolated) = 0.990 W/kg
SAR(1 g) = 0.720 mW/g; SAR(10 g) = 0.507 mW/g
Maximum value of SAR (measured) = 0.757 mW/g



0 dB = 0.757mW/g

Fig. 7 850 MHz CH251

850 Right Cheek Middle

Date/Time: 2010-1-19 10:00:04

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.898 mho/m; εr = 40.4; ρ = 1000 kg/m3

Ambient Temperature:23.0°C Liquid Temperature: 22.5°C

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

Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

Cheek Middle/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm

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

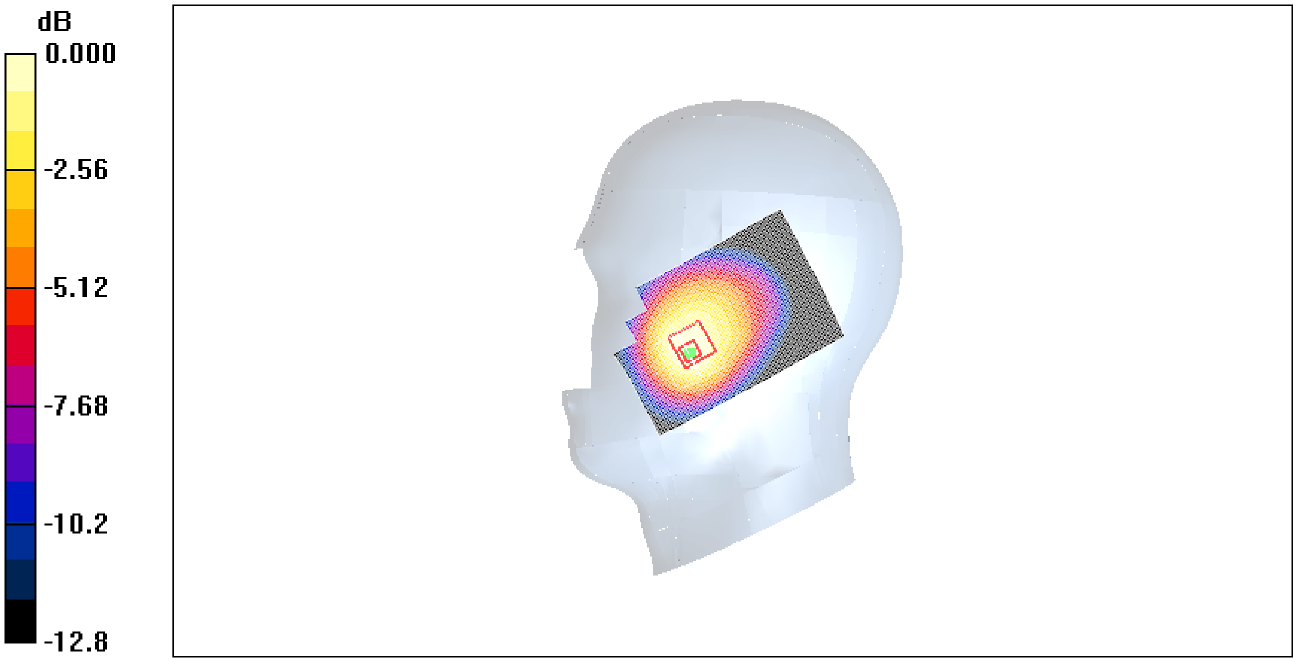
Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.3 V/m; Power Drift = 0.031 dB

Peak SAR (extrapolated) = 0.998 W/kg

SAR(1 g) = 0.727 mW/g; SAR(10 g) = 0.512 mW/g

Maximum value of SAR (measured) = 0.767 mW/g



0 dB = 0.767mW/g

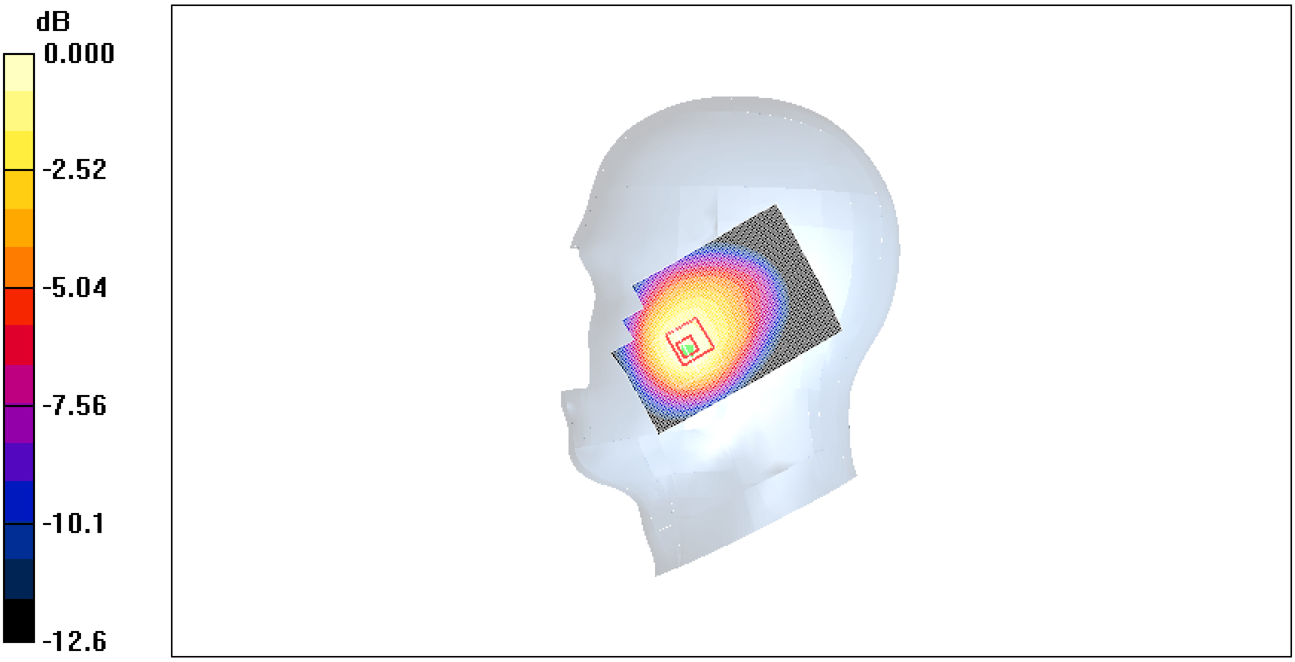
Fig. 8 850 MHz CH128

850 Right Cheek Low

Date/Time: 2010-1-19 10:14:10
Electronics: DAE4 Sn771
Medium: Head 850
Medium parameters used: f = 825 MHz; σ = 0.886 mho/m; εr = 40.4; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: GSM 850 Frequency: 824.2 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

Cheek Low/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.669 mW/g

Cheek Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.5 V/m; Power Drift = -0.019 dB
Peak SAR (extrapolated) = 0.831 W/kg
SAR(1 g) = 0.601 mW/g; SAR(10 g) = 0.424 mW/g
Maximum value of SAR (measured) = 0.635 mW/g



0 dB = 0.635mW/g

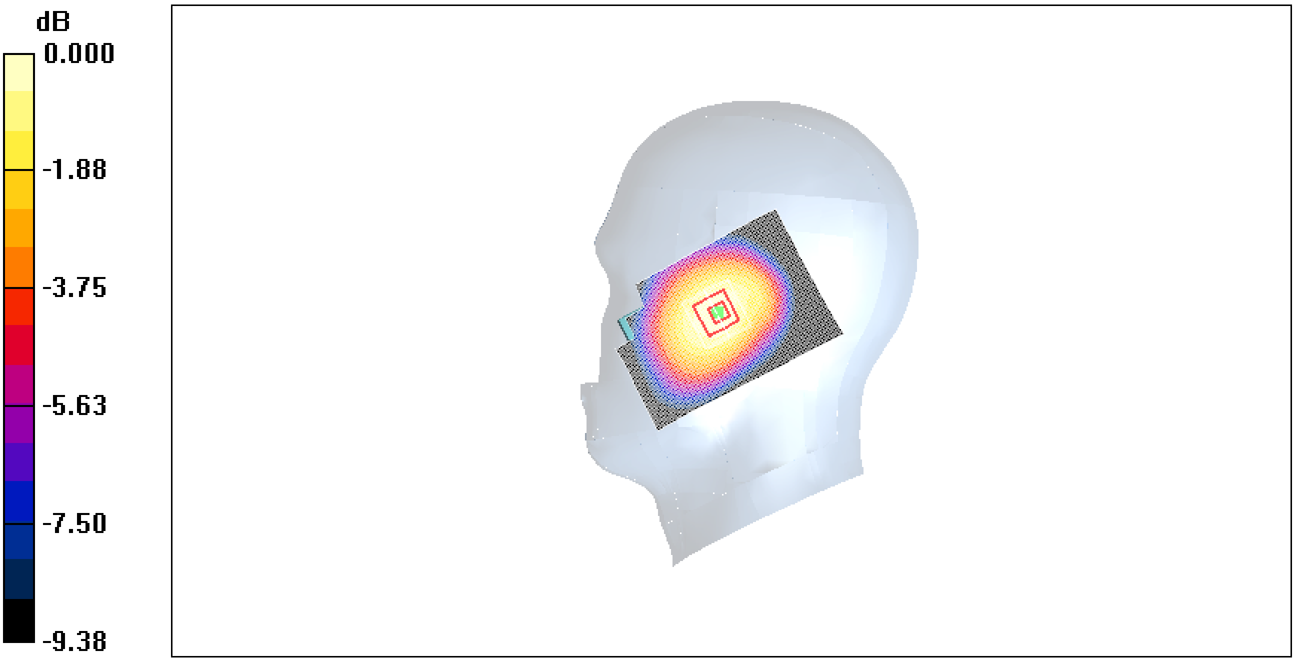
Fig. 9 850 MHz CH128

850 Right Tilt High

Date/Time: 2010-1-19 10:29:34
Electronics: DAE4 Sn771
Medium: Head 850
Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.91 mho/m; εr = 40.3; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: GSM 850 Frequency: 848.8 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

Tilt High/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.422 mW/g

Tilt High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.0 V/m; Power Drift = -0.045 dB
Peak SAR (extrapolated) = 0.501 W/kg
SAR(1 g) = 0.396 mW/g; SAR(10 g) = 0.295 mW/g
Maximum value of SAR (measured) = 0.418 mW/g



0 dB = 0.418mW/g

Fig.10 850 MHz CH251

850 Right Tilt Middle

Date/Time: 2010-1-19 10:33:27

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.898 mho/m; εr = 40.4; ρ = 1000 kg/m3

Ambient Temperature:23.0°C Liquid Temperature: 22.5°C

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

Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

Tilt Middle/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.431 mW/g

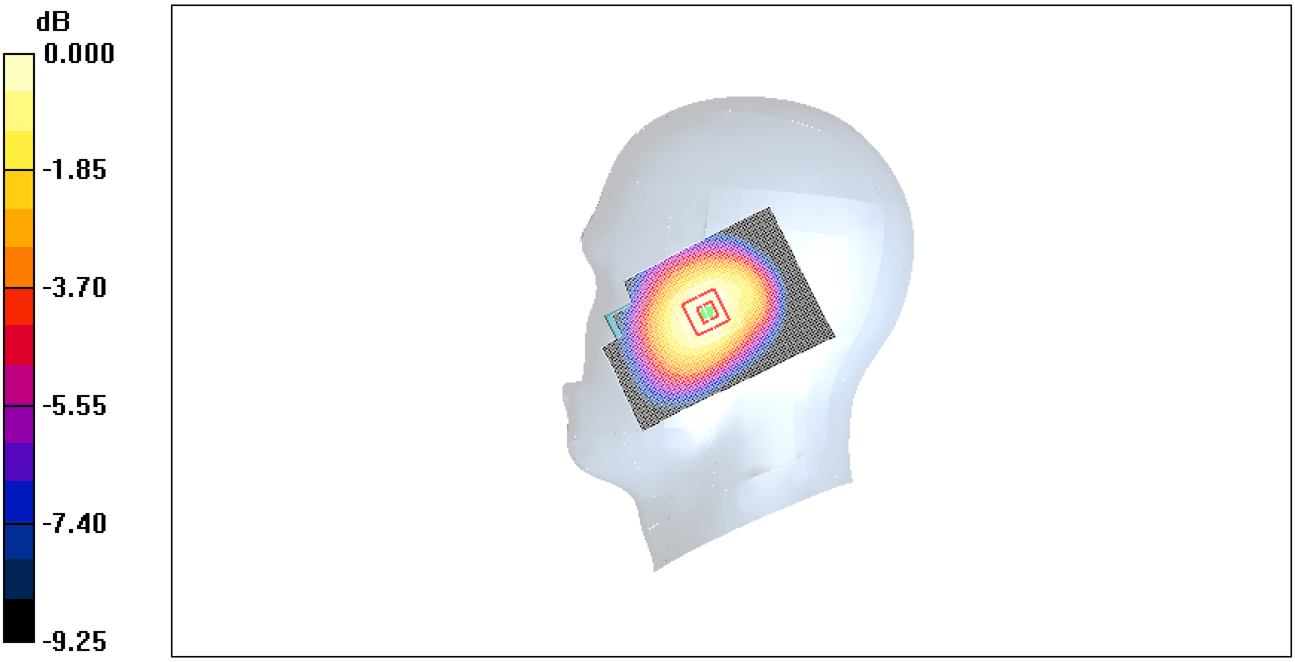
Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 16.4 V/m; Power Drift = -0.026 dB

Peak SAR (extrapolated) = 0.509 W/kg

SAR(1 g) = 0.403 mW/g; SAR(10 g) = 0.302 mW/g

Maximum value of SAR (measured) = 0.426 mW/g



0 dB = 0.426mW/g

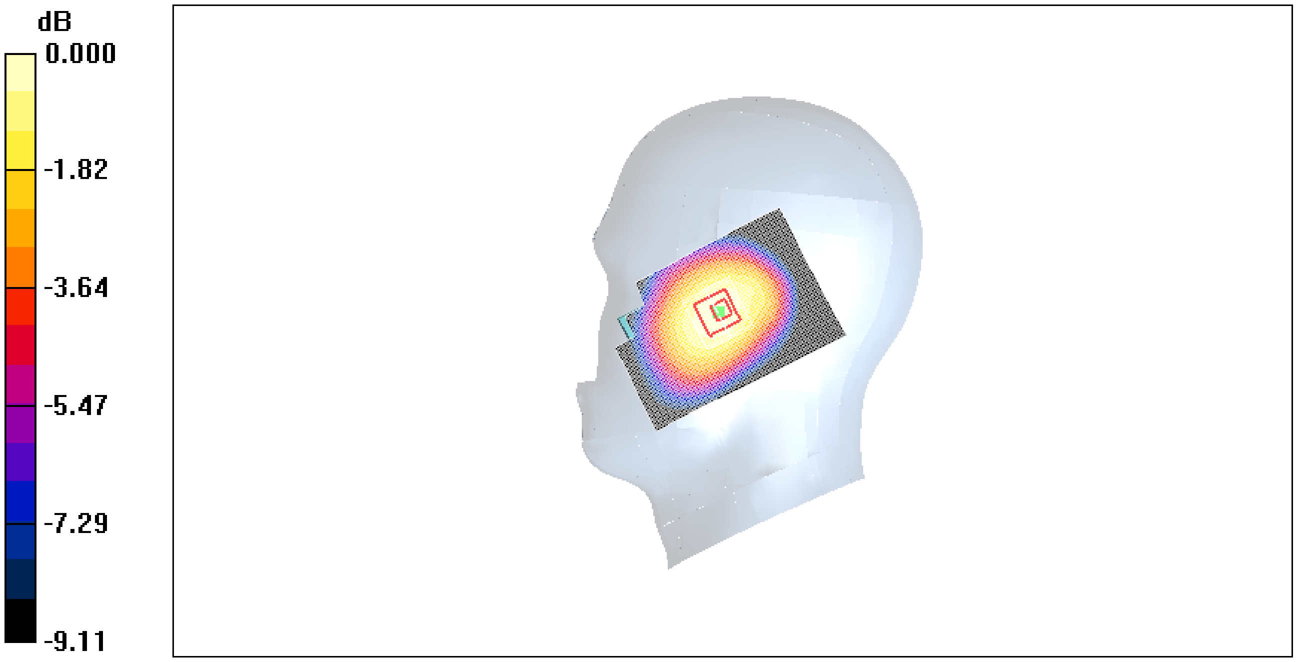
Fig.11 850 MHz CH190

850 Right Tilt Low

Date/Time: 2010-1-19 10:47:31
Electronics: DAE4 Sn771
Medium: Head 850
Medium parameters used: f = 825 MHz; σ = 0.886 mho/m; εr = 40.4; ρ = 1000 kg/m3
Ambient Temperature:23.0°C   Liquid Temperature: 22.5°C
Communication System: GSM 850 Frequency: 824.2 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

Tilt Low/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.377 mW/g

Tilt Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.6 V/m; Power Drift = -0.088 dB
Peak SAR (extrapolated) = 0.439 W/kg
SAR(1 g) = 0.351 mW/g; SAR(10 g) = 0.265 mW/g
Maximum value of SAR (measured) = 0.369 mW/g



0 dB = 0.369mW/g

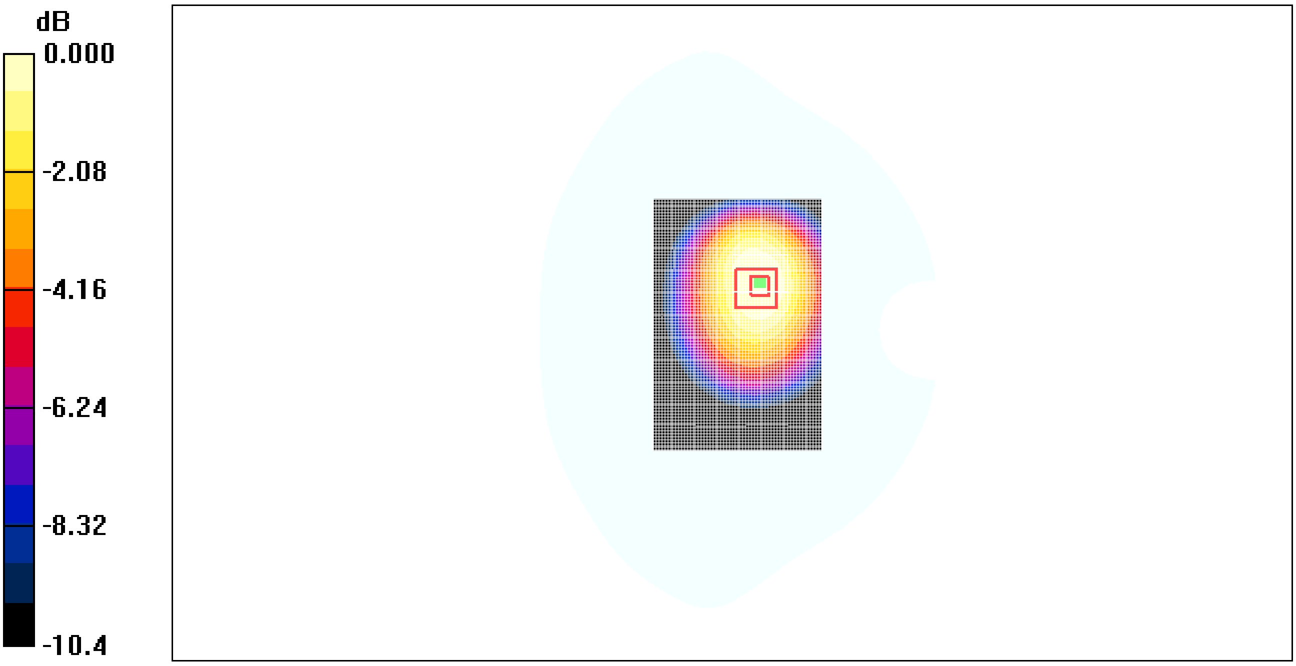
Fig. 12   850 MHz CH128

850 Body Towards Ground High With GPRS

Date/Time: 2010-1-19 13:22:06
Electronics: DAE4 Sn771
Medium: 850 Body
Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.96 mho/m; εr = 54.1; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: GSM 850 GPRS Frequency: 848.8 MHz Duty Cycle: 1:2.67
Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

Toward Ground High/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.25 mW/g

Toward Ground High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 29.0 V/m; Power Drift = 0.018 dB
Peak SAR (extrapolated) = 1.56 W/kg
SAR(1 g) = 1.16 mW/g; SAR(10 g) = 0.822 mW/g
Maximum value of SAR (measured) = 1.20 mW/g



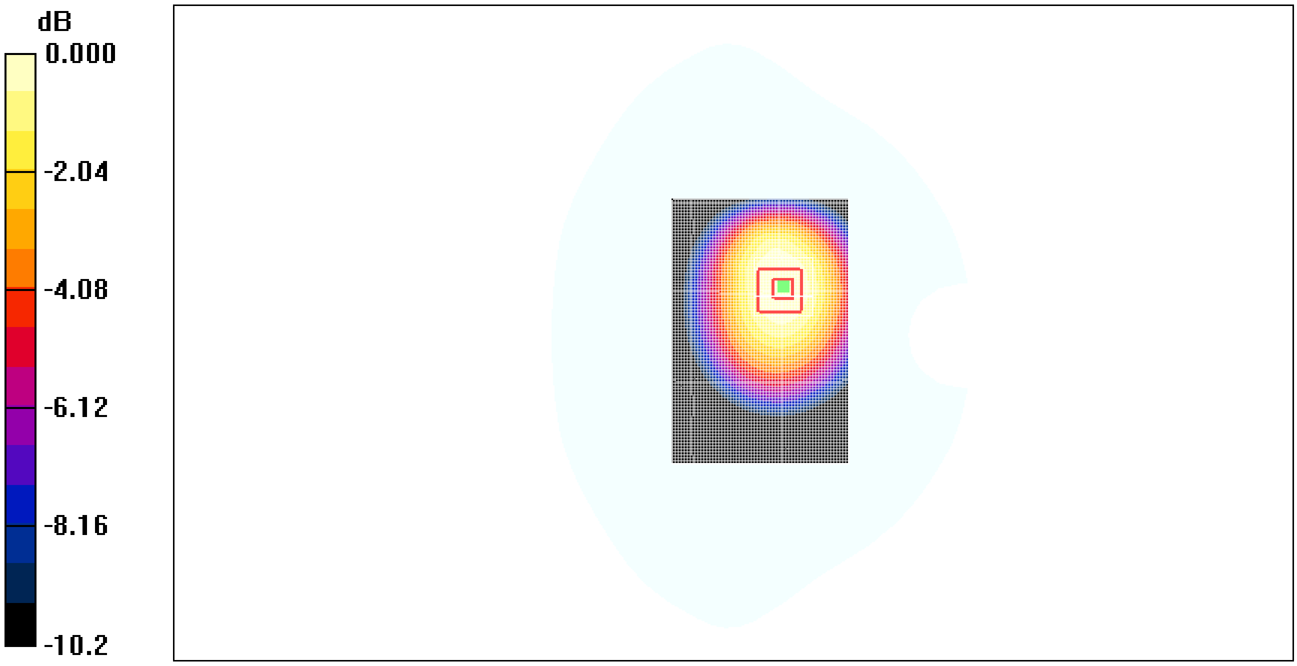
0 dB = 1.20mW/g

Fig. 13 850 MHz CH251

850 Body Towards Ground Middle With GPRS
Date/Time: 2010-1-19 13:37:18
Electronics: DAE4 Sn771
Medium: 850 Body
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.95 mho/m; εr = 54.2; ρ = 1000 kg/m3
Ambient Temperature:23.0°C   Liquid Temperature: 22.5°C
Communication System: GSM 850 GPRS Frequency: 836.6 MHz Duty Cycle: 1:2.67
Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

Toward Ground Middle/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.31 mW/g

Toward Ground Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 29.8 V/m; Power Drift = -0.011 dB
Peak SAR (extrapolated) = 1.67 W/kg
SAR(1 g) = 1.23 mW/g; SAR(10 g) = 0.874 mW/g
Maximum value of SAR (measured) = 1.27 mW/g



0 dB = 1.27mW/g

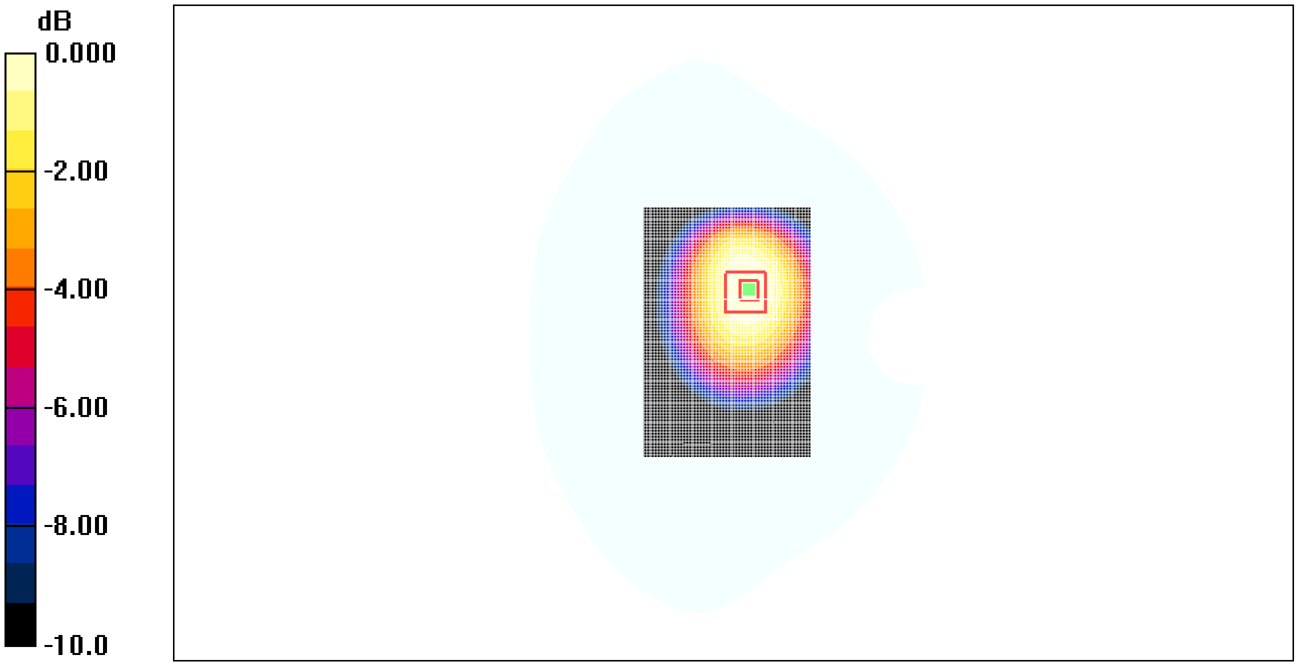
Fig. 14 850 MHz CH190

850 Body Towards Ground Low With GPRS

Date/Time: 2010-1-19 13:52:29
Electronics: DAE4 Sn771
Medium: 850 Body
Medium parameters used: f = 825 MHz; σ = 0.933 mho/m; εr = 54.3; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: GSM 850 GPRS Frequency: 824.2 MHz Duty Cycle: 1:2.67
Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

Toward Ground Low/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.43 mW/g

Toward Ground Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 30.9 V/m; Power Drift = 0.030 dB
Peak SAR (extrapolated) = 1.80 W/kg
SAR(1 g) = 1.34 mW/g; SAR(10 g) = 0.952 mW/g
Maximum value of SAR (measured) = 1.37 mW/g



0 dB = 1.37mW/g

Fig. 15 850 MHz CH128

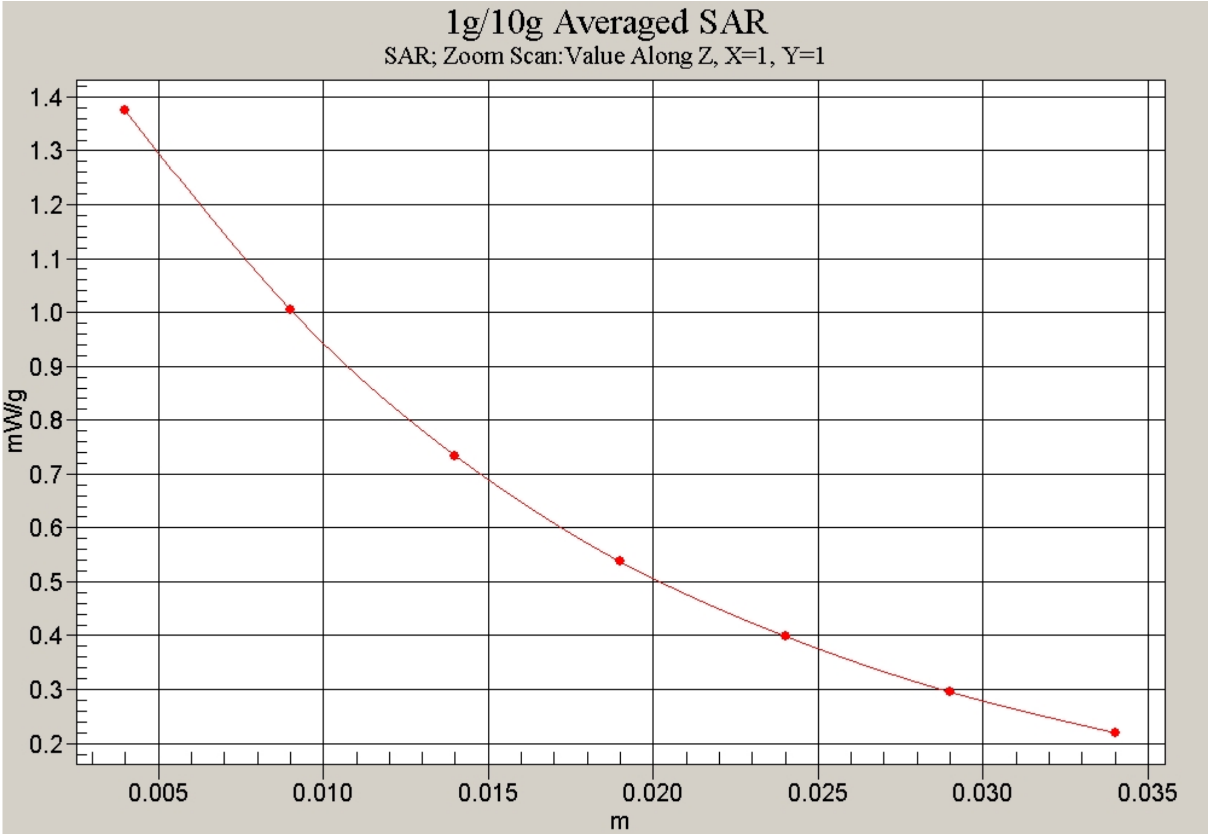


Fig. 15-1 Z-Scan at power reference point (850 MHz CH128)

850 Body Towards Phantom High With GPRS

Date/Time: 2010-1-19 14:09:13

Electronics: DAE4 Sn771

Medium: 850 Body

Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.96 mho/m; εr = 54.1; ρ = 1000 kg/m3

Ambient Temperature:23.0°C   Liquid Temperature: 22.5°C

Communication System: GSM 850 GPRS Frequency: 848.8 MHz Duty Cycle: 1:2.67

Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

Toward Phantom High/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.778 mW/g

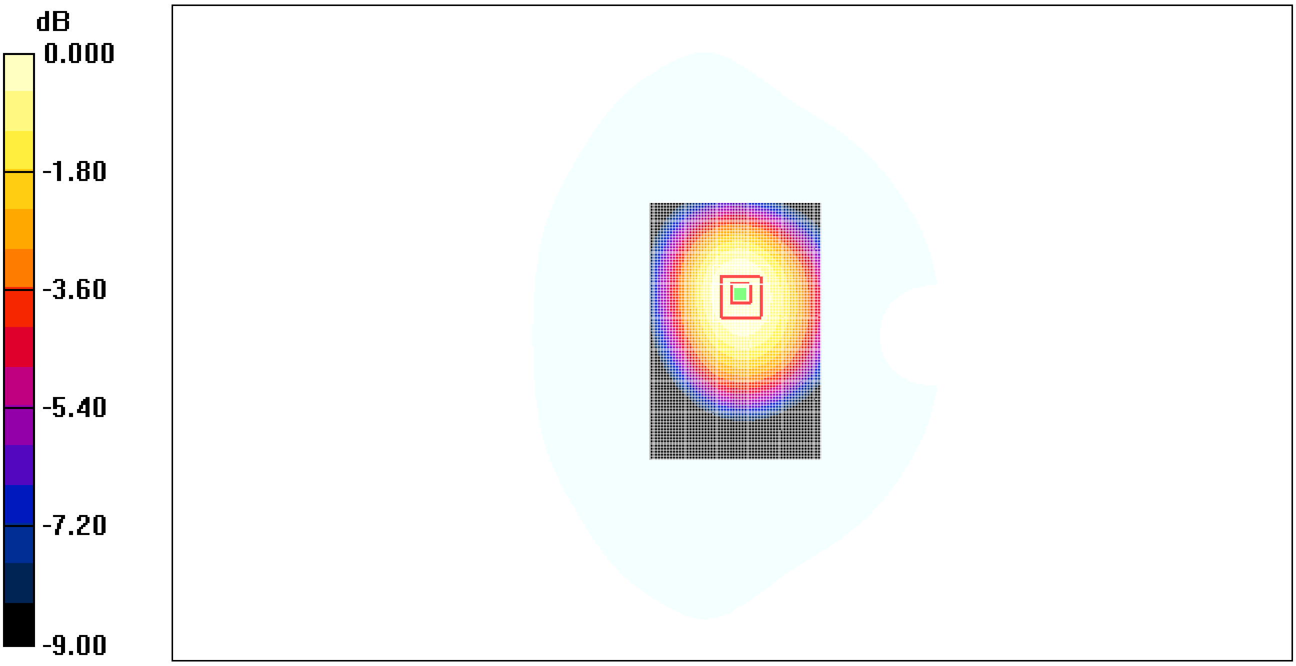
Toward Phantom High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 25.5 V/m; Power Drift = -0.088 dB

Peak SAR (extrapolated) = 0.918 W/kg

SAR(1 g) = 0.719 mW/g; SAR(10 g) = 0.531 mW/g

Maximum value of SAR (measured) = 0.741 mW/g



0 dB = 0.741mW/g

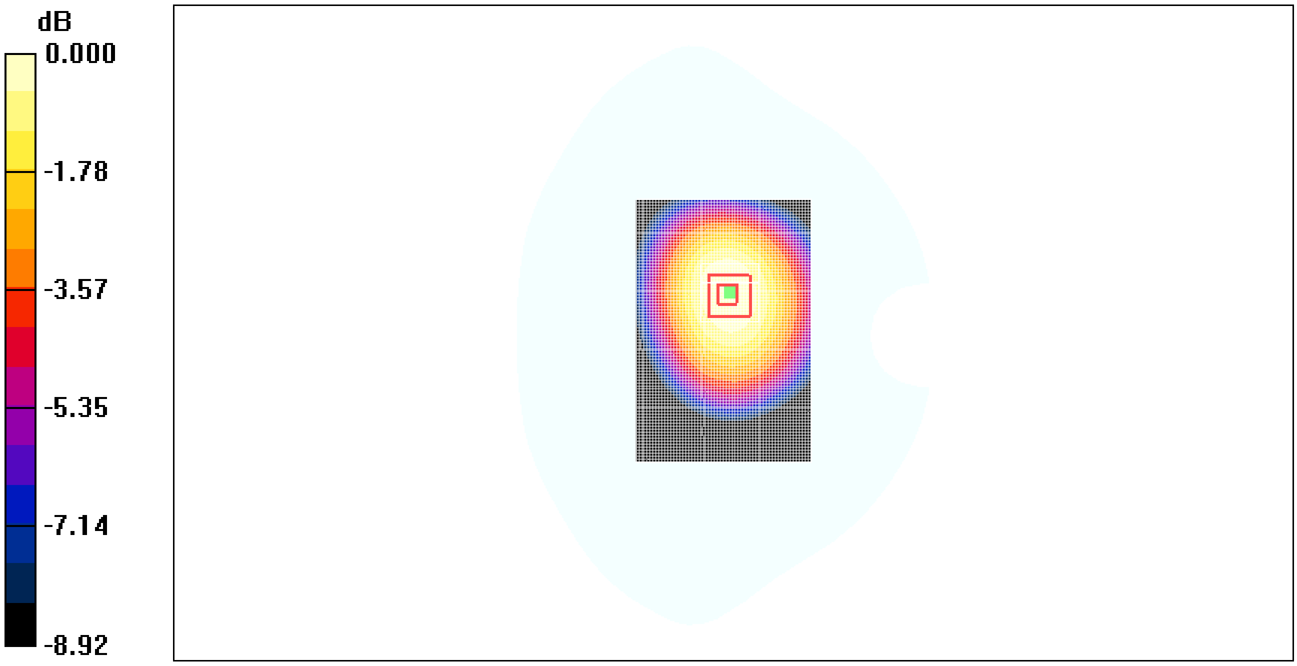
Fig. 16 850 MHz CH251

850 Body Towards Phantom Middle With GPRS

Date/Time: 2010-1-19 14:24:17
Electronics: DAE4 Sn771
Medium: 850 Body
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.95 mho/m; εr = 54.2; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: GSM 850 GPRS Frequency: 836.6 MHz Duty Cycle: 1:2.67
Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

Toward Phantom Middle/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.796 mW/g

Toward Phantom Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 25.7 V/m; Power Drift = 0.034 dB
Peak SAR (extrapolated) = 0.955 W/kg
SAR(1 g) = 0.749 mW/g; SAR(10 g) = 0.553 mW/g
Maximum value of SAR (measured) = 0.775 mW/g



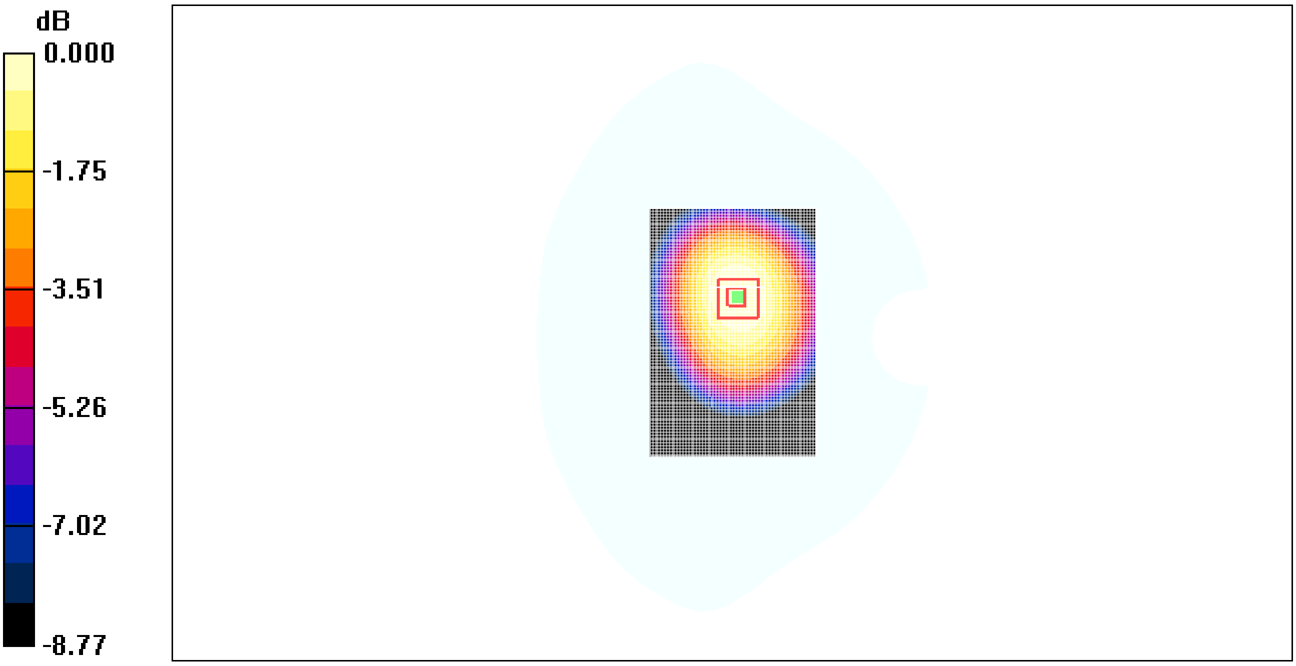
0 dB = 0.775mW/g

Fig. 17 850 MHz CH190

850 Body Towards Phantom Low With GPRS
Date/Time: 2010-1-19 14:39:26
Electronics: DAE4 Sn771
Medium: 850 Body
Medium parameters used: f = 825 MHz; σ = 0.933 mho/m; εr = 54.3; ρ = 1000 kg/m3
Ambient Temperature:23.0°C   Liquid Temperature: 22.5°C
Communication System: GSM 850 GPRS Frequency: 824.2 MHz Duty Cycle: 1:2.67
Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

Toward Phantom Low/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.842 mW/g

Toward Phantom Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 26.4 V/m; Power Drift = 0.061 dB
Peak SAR (extrapolated) = 1.01 W/kg
SAR(1 g) = 0.794 mW/g; SAR(10 g) = 0.587 mW/g
Maximum value of SAR (measured) = 0.821 mW/g



0 dB = 0.821mW/g

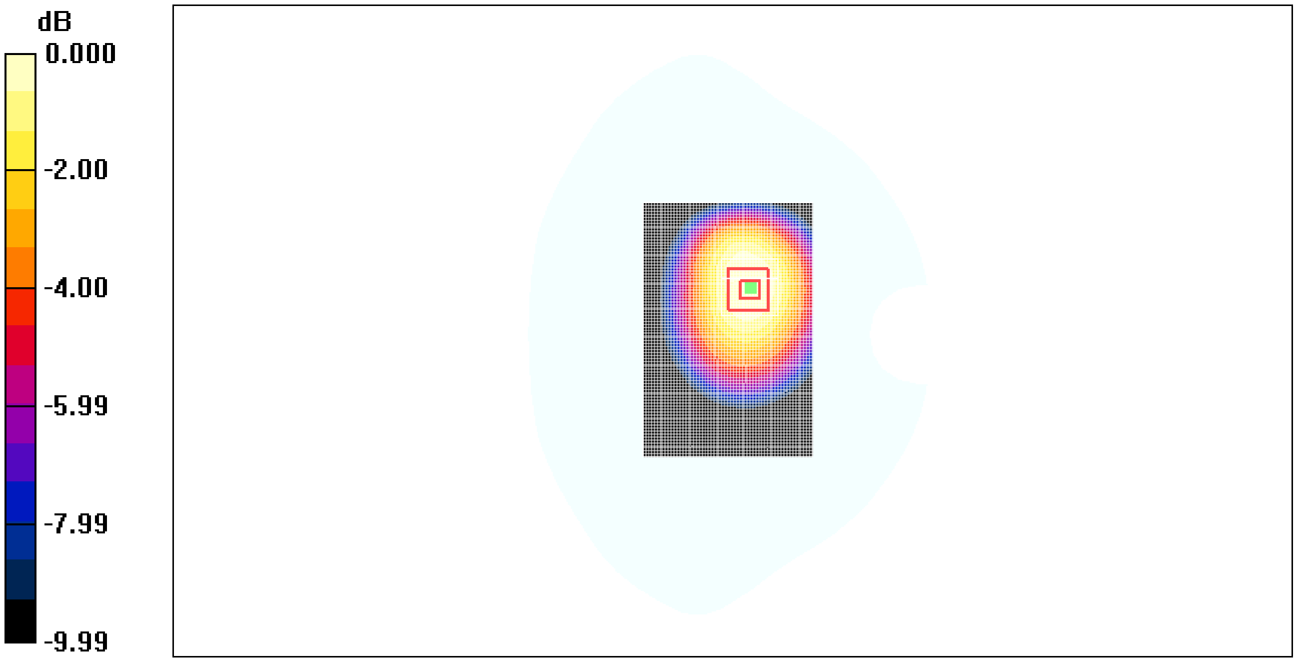
Fig. 18   850 MHz CH128

850 Body Towards Ground Low With EGPRS

Date/Time: 2010-1-19 14:58:03
Electronics: DAE4 Sn771
Medium: 850 Body
Medium parameters used: f = 825 MHz; σ = 0.933 mho/m; εr = 54.3; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: GSM 850 GPRS Frequency: 824.2 MHz Duty Cycle: 1:2.67
Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

Toward Ground Low/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.41 mW/g

Toward Ground Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 30.7 V/m; Power Drift = 0.065 dB
Peak SAR (extrapolated) = 1.78 W/kg
SAR(1 g) = 1.32 mW/g; SAR(10 g) = 0.941 mW/g
Maximum value of SAR (measured) = 1.36 mW/g



0 dB = 1.36mW/g

Fig. 19 850 MHz CH128

850 Body Towards Ground Low With Headset__CCB3160A10C1

Date/Time: 2010-1-19 15:19:30

Electronics: DAE4 Sn771

Medium: 850 Body

Medium parameters used: f = 825 MHz; σ = 0.933 mho/m; εr = 54.3; ρ = 1000 kg/m3

Ambient Temperature:23.0^{o}C   Liquid Temperature: 22.5^{o}C

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

Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

Toward Ground Low/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.646 mW/g

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

Reference Value = 22.3 V/m; Power Drift = -0.022 dB

Peak SAR (extrapolated) = 0.803 W/kg

SAR(1 g) = 0.601 mW/g; SAR(10 g) = 0.430 mW/g

Maximum value of SAR (measured) = 0.622 mW/g

0 dB = 0.622mW/g

Fig. 20 850 MHz CH128

850 Body Towards Ground Low With Headset__CCB3120A11C1

Date/Time: 2010-1-19 15:36:44
Electronics: DAE4 Sn771
Medium: 850 Body
Medium parameters used: f = 825 MHz; σ = 0.933 mho/m; εr = 54.3; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: GSM 850 Frequency: 824.2 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

Toward Ground Low/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.787 mW/g

Toward Ground Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 23.8 V/m; Power Drift = -0.110 dB
Peak SAR (extrapolated) = 0.964 W/kg
SAR(1 g) = 0.718 mW/g; SAR(10 g) = 0.508 mW/g
Maximum value of SAR (measured) = 0.746 mW/g

0 dB = 0.746mW/g

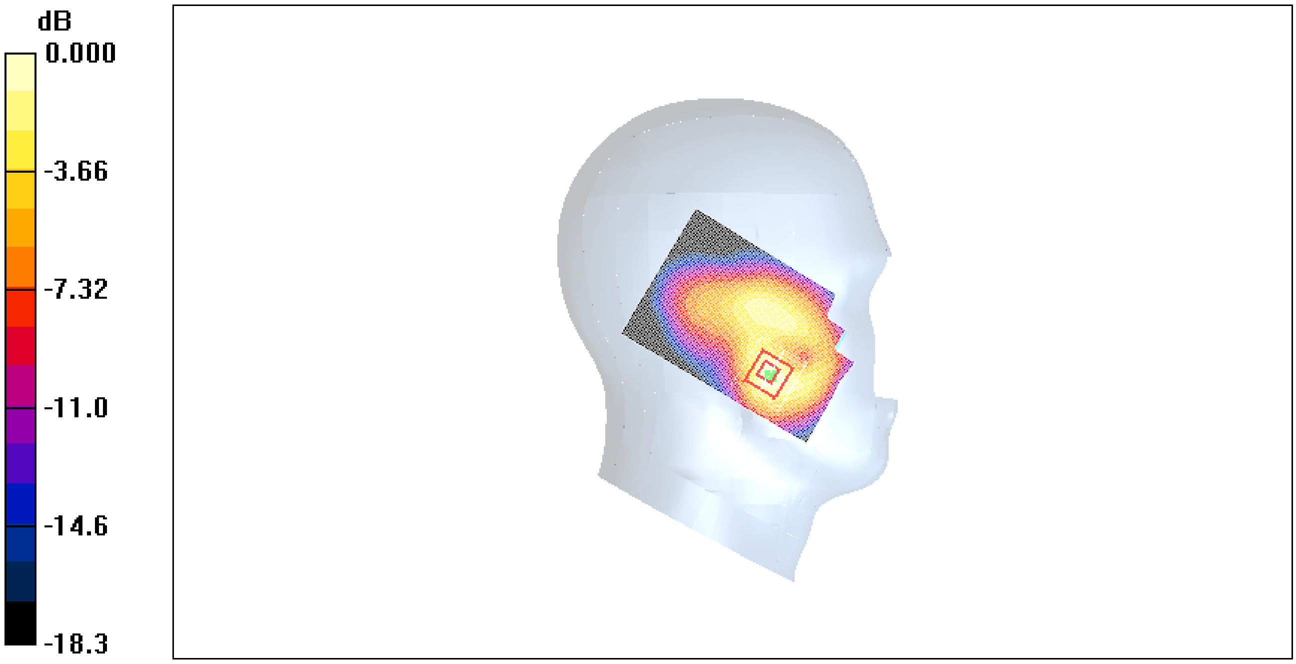
Fig. 21 850 MHz CH128

1900 Left Cheek High

Date/Time: 2010-1-20 8:20:45
Electronics: DAE4 Sn771
Medium: 1900 Head
Medium parameters used: f = 1910 MHz; σ = 1.42 mho/m; εr = 39.0; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: GSM 1900MHz Frequency: 1909.8 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

Cheek High/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.630 mW/g

Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.8 V/m; Power Drift = -0.023 dB
Peak SAR (extrapolated) = 0.989 W/kg
SAR(1 g) = 0.579 mW/g; SAR(10 g) = 0.314 mW/g
Maximum value of SAR (measured) = 0.639 mW/g



0 dB = 0.639mW/g

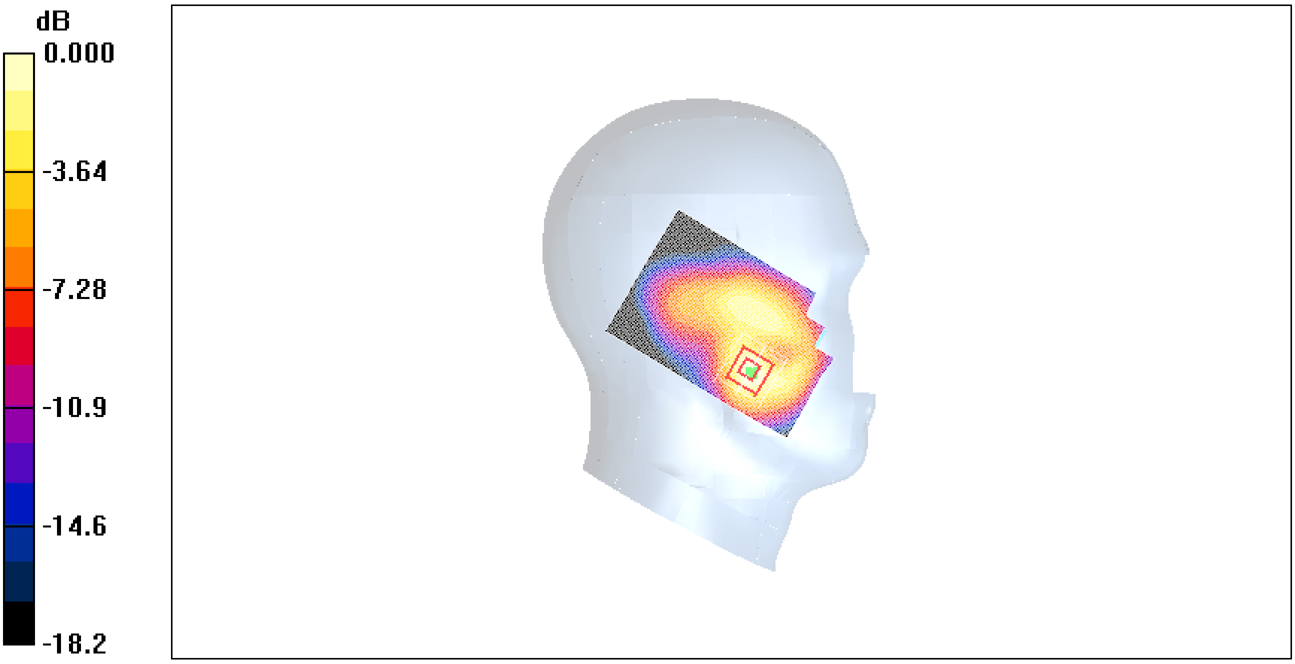
Fig. 22 1900 MHz CH810

1900 Left Cheek Middle

Date/Time: 2010-1-20 8:34:54
Electronics: DAE4 Sn771
Medium: Head 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.40 mho/m; εr = 39.1; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: GSM 1900MHz Frequency: 1880 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

Cheek Middle/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.611 mW/g

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.6 V/m; Power Drift = 0.109 dB
Peak SAR (extrapolated) = 0.957 W/kg
SAR(1 g) = 0.563 mW/g; SAR(10 g) = 0.305 mW/g
Maximum value of SAR (measured) = 0.618 mW/g



0 dB = 0.618mW/g

Fig. 23 1900 MHz CH661

1900 Left Cheek Low

Date/Time: 2010-1-20 8:49:07

Electronics: DAE4 Sn771

Medium: 1900 Head

Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.37 mho/m; εr = 39.2; ρ = 1000 kg/m3

Ambient Temperature:23.0°C   Liquid Temperature: 22.5°C

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

Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

Cheek Low/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.547 mW/g

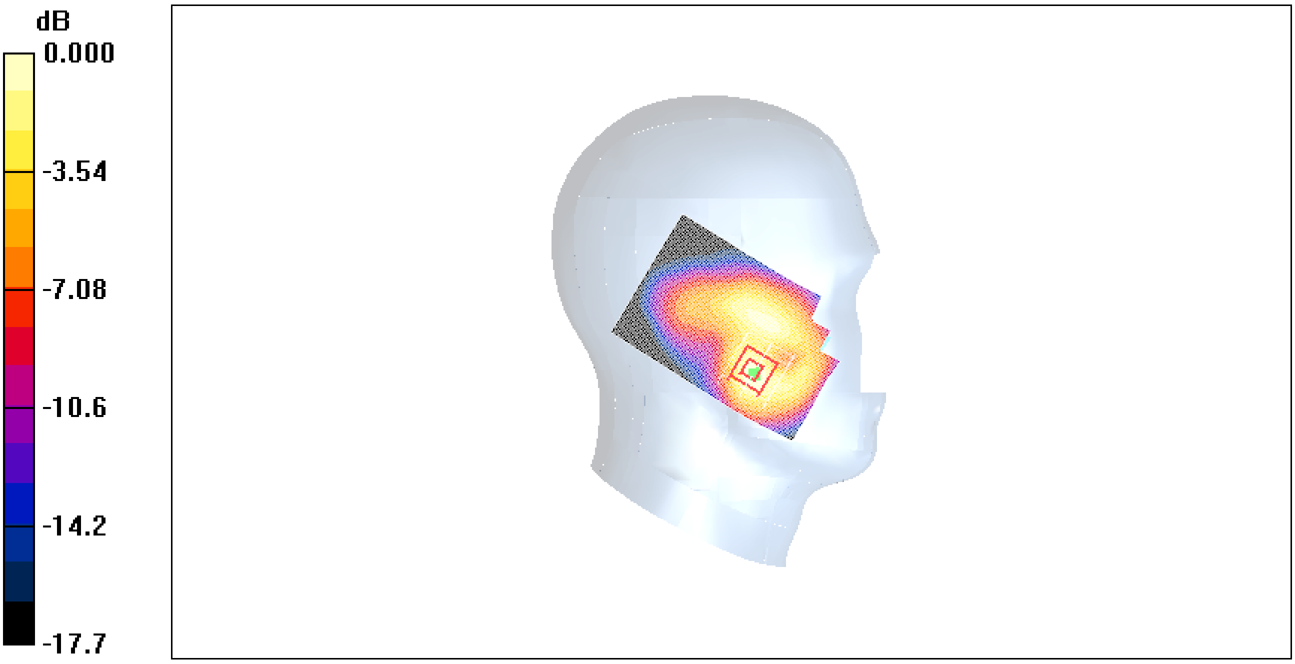
Cheek Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.0 V/m; Power Drift = -0.013 dB

Peak SAR (extrapolated) = 0.904 W/kg

SAR(1 g) = 0.512 mW/g; SAR(10 g) = 0.273 mW/g

Maximum value of SAR (measured) = 0.554 mW/g



0 dB = 0.554mW/g

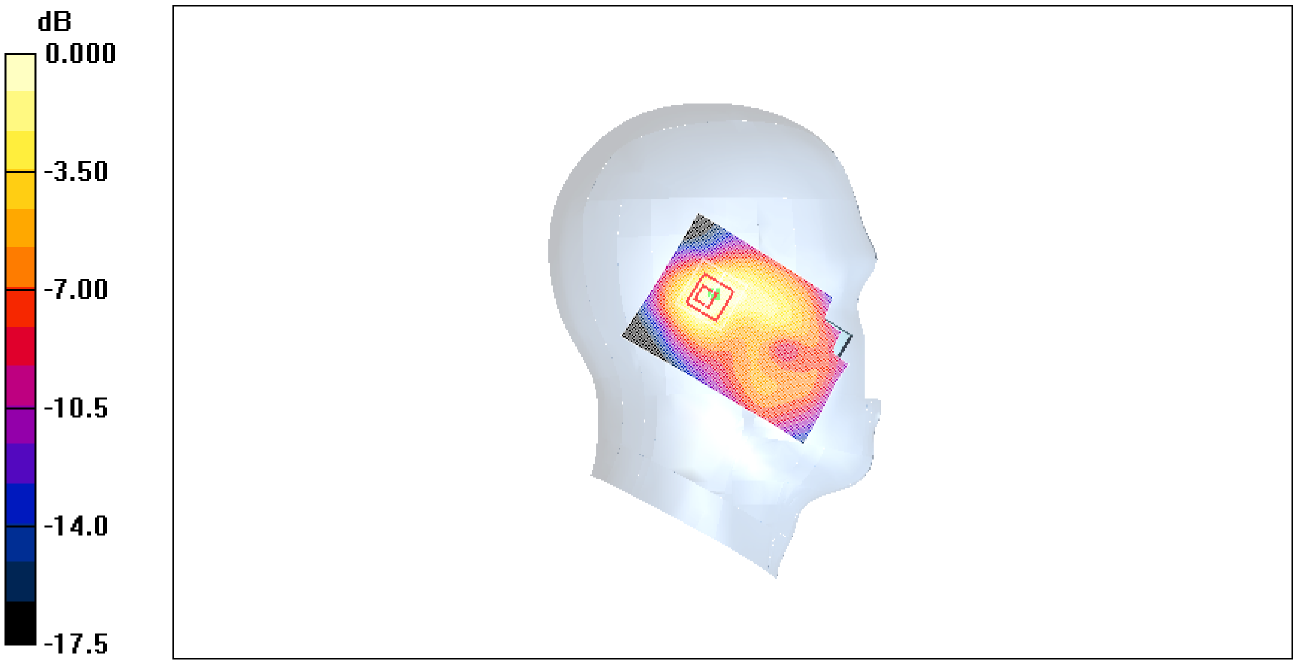
Fig. 24 1900 MHz CH512

1900 Left Tilt High

Date/Time: 2010-1-20 9:04:19
Electronics: DAE4 Sn771
Medium: 1900 Head
Medium parameters used: f = 1910 MHz; σ = 1.42 mho/m; εr = 39.0; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: GSM 1900MHz Frequency: 1909.8 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

Tilt High/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.260 mW/g

Tilt High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.5 V/m; Power Drift = 0.078 dB
Peak SAR (extrapolated) = 0.344 W/kg
SAR(1 g) = 0.220 mW/g; SAR(10 g) = 0.131 mW/g
Maximum value of SAR (measured) = 0.235 mW/g



0 dB = 0.235mW/g

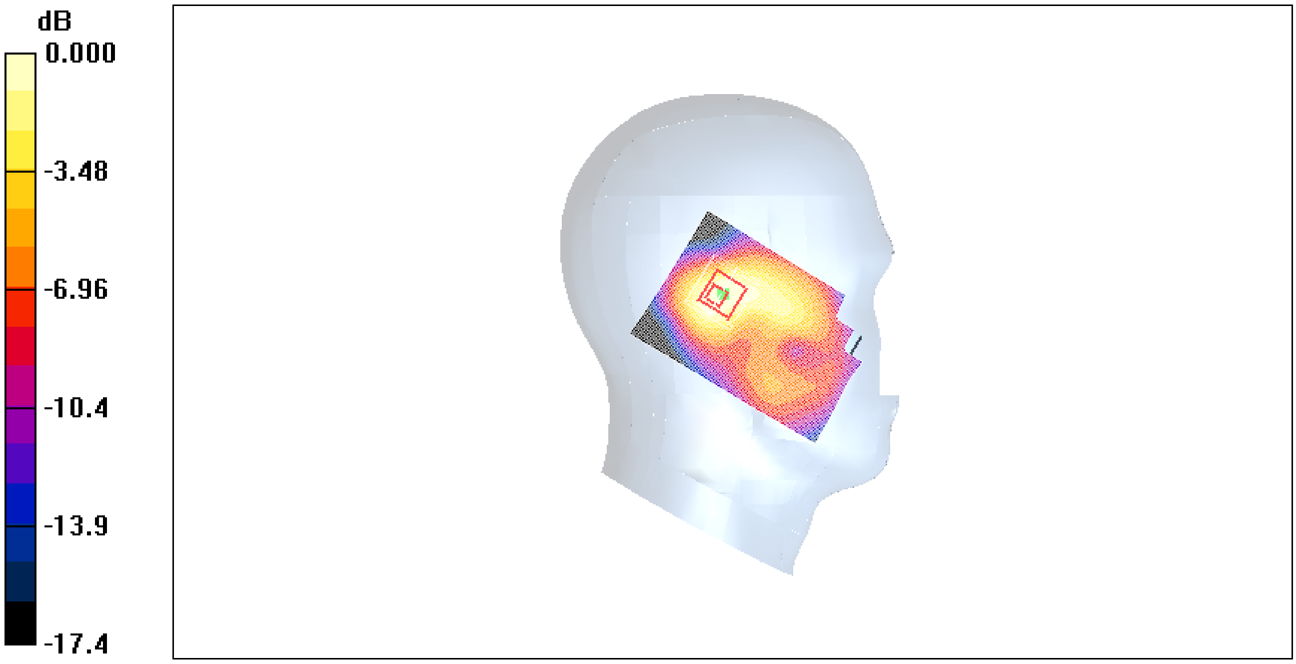
Fig.25 1900 MHz CH810

1900 Left Tilt Middle

Date/Time: 2010-1-20 9:18:24
Electronics: DAE4 Sn771
Medium: 1900 Head
Medium parameters used: f = 1880 MHz; σ = 1.40 mho/m; εr = 39.1; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: GSM 1900MHz Frequency: 1880 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

Tilt Middle/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.256 mW/g

Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.2 V/m; Power Drift = 0.007 dB
Peak SAR (extrapolated) = 0.334 W/kg
SAR(1 g) = 0.213 mW/g; SAR(10 g) = 0.126 mW/g
Maximum value of SAR (measured) = 0.230 mW/g



0 dB = 0.230mW/g

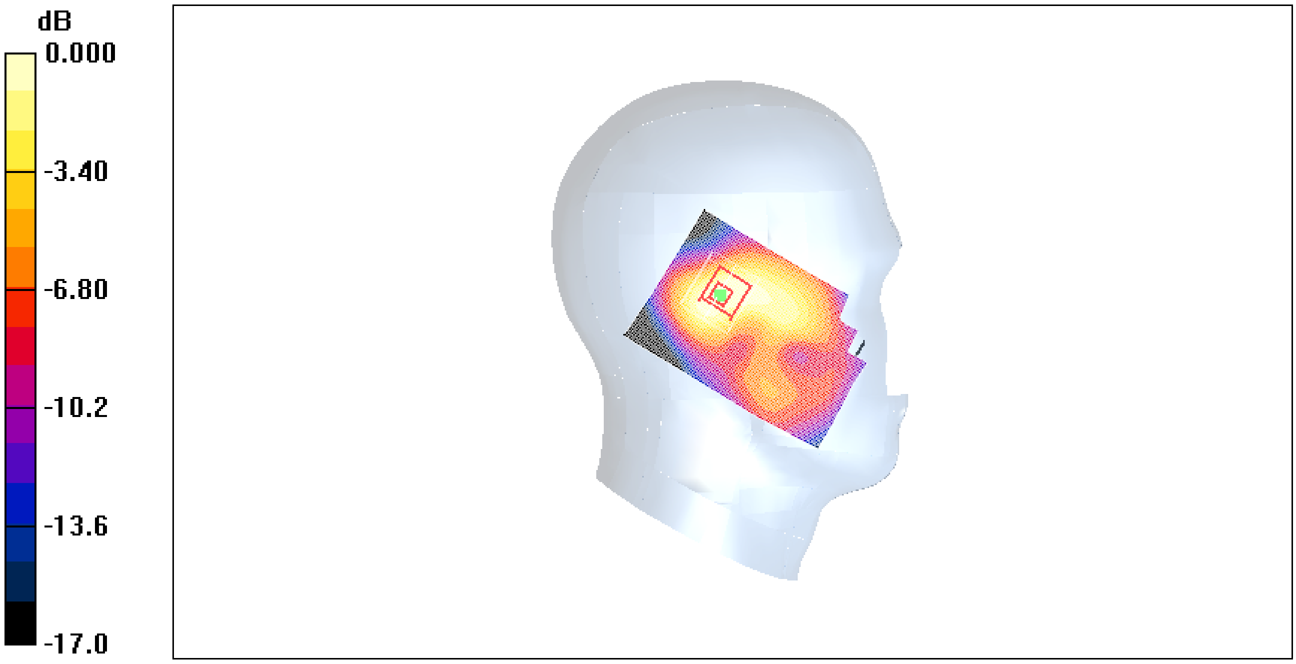
Fig. 26 1900 MHz CH661

1900 Left Tilt Low

Date/Time: 2010-1-20 9:32:41
Electronics: DAE4 Sn771
Medium: 1900 Head
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.37 mho/m; εr = 39.2; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: GSM 1900MHz Frequency: 1850.2 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

Tilt Low/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.220 mW/g

Tilt Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.9 V/m; Power Drift = 0.017 dB
Peak SAR (extrapolated) = 0.287 W/kg
SAR(1 g) = 0.182 mW/g; SAR(10 g) = 0.109 mW/g
Maximum value of SAR (measured) = 0.201 mW/g



0 dB = 0.201mW/g

Fig. 27 1900 MHz CH512

1900 Right Cheek High

Date/Time: 2010-1-20 9:47:53

Electronics: DAE4 Sn771

Medium: 1900 Head

Medium parameters used: f = 1910 MHz; σ = 1.42 mho/m; εr = 39.0; ρ = 1000 kg/m3

Ambient Temperature:23.0°C Liquid Temperature: 22.5°C

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

Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

Cheek High/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.746 mW/g

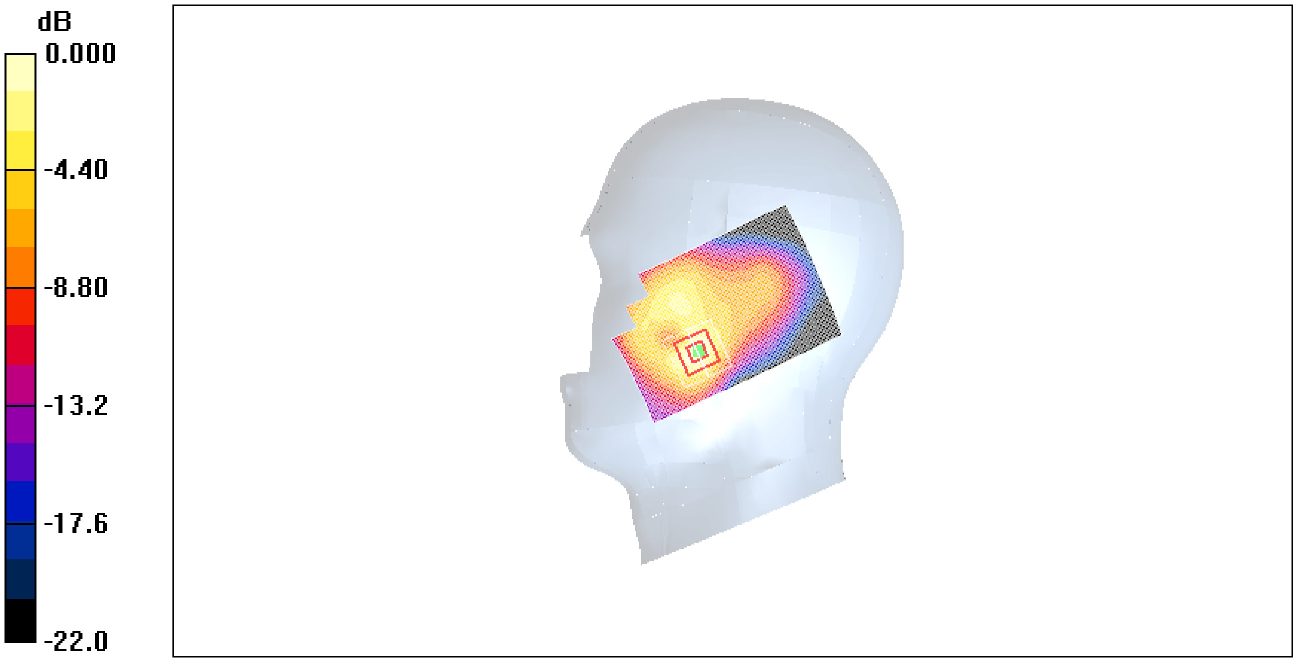
Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.93 V/m; Power Drift = -0.032 dB

Peak SAR (extrapolated) = 1.18 W/kg

SAR(1 g) = 0.670 mW/g; SAR(10 g) = 0.343 mW/g

Maximum value of SAR (measured) = 0.740 mW/g



0 dB = 0.740mW/g

Fig. 28 1900 MHz CH810

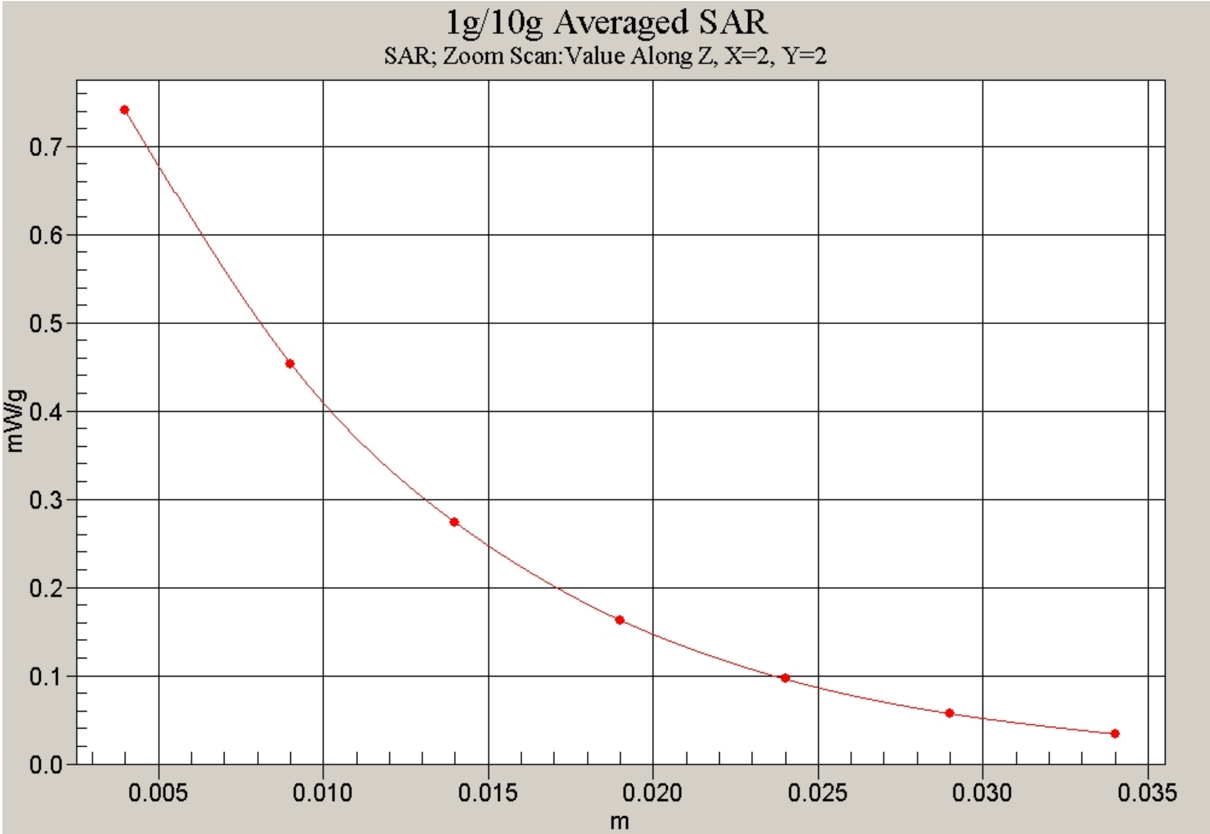


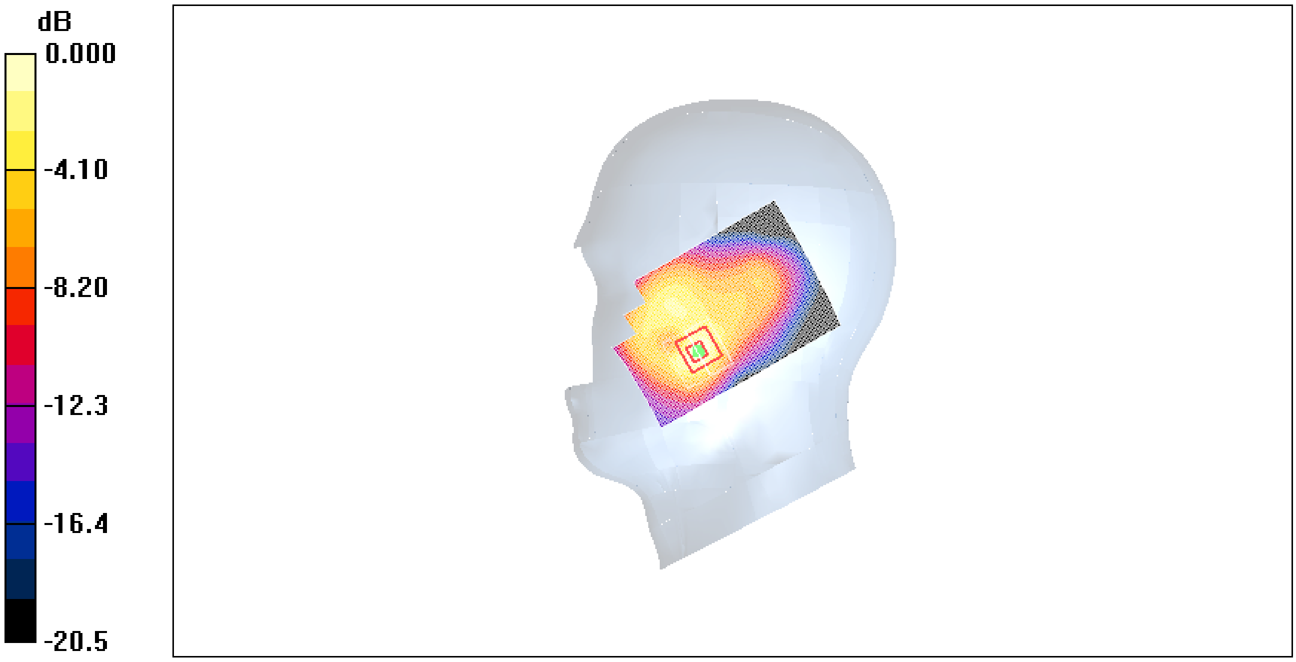
Fig. 28-1 Z-Scan at power reference point (1900 MHz CH810)

1900 Right Cheek Middle

Date/Time: 2010-1-20 10:01:12
Electronics: DAE4 Sn771
Medium: 1900 Head
Medium parameters used: f = 1880 MHz; σ = 1.40 mho/m; εr = 39.1; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: GSM 1900MHz Frequency: 1880 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

Cheek Middle/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.692 mW/g

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.2 V/m; Power Drift = 0.074 dB
Peak SAR (extrapolated) = 1.08 W/kg
SAR(1 g) = 0.628 mW/g; SAR(10 g) = 0.329 mW/g
Maximum value of SAR (measured) = 0.697 mW/g



0 dB = 0.697mW/g

Fig. 29 1900 MHz CH661

1900 Right Cheek Low

Date/Time: 2010-1-20 10:15:32

Electronics: DAE4 Sn771

Medium: 1900 Head

Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.37 mho/m; εr = 39.2; ρ = 1000 kg/m3

Ambient Temperature:23.0°C Liquid Temperature: 22.5°C

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

Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

Cheek Low/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.666 mW/g

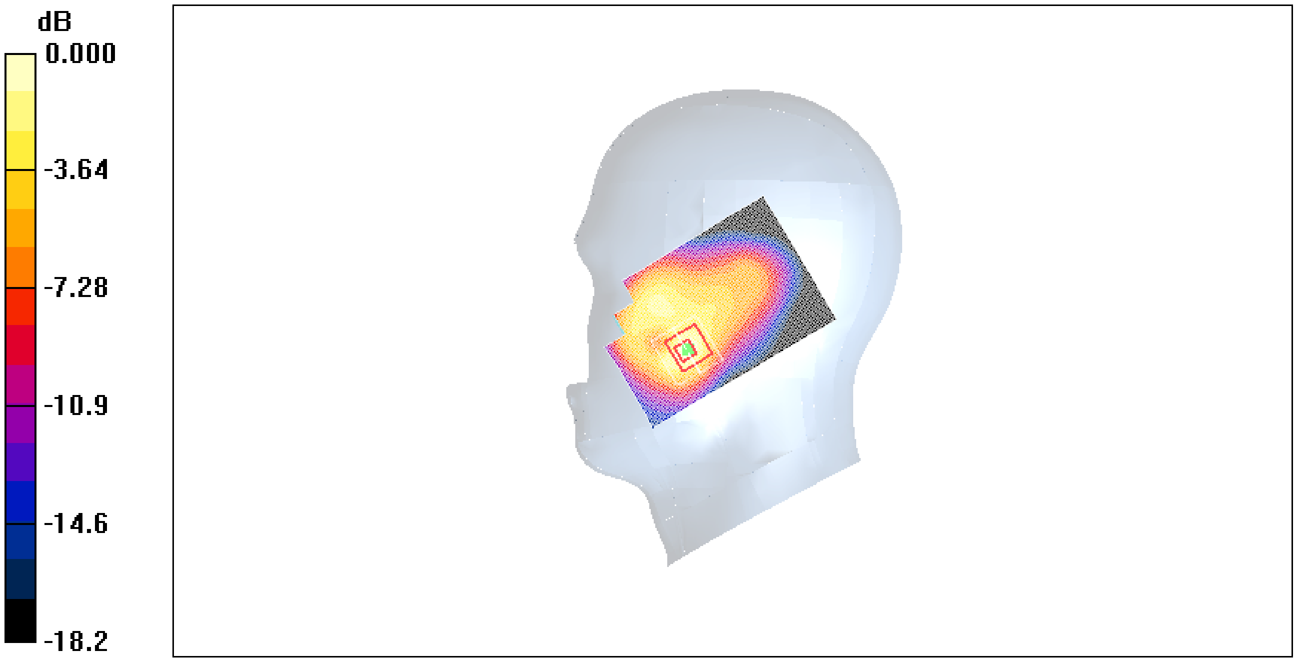
Cheek Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.8 V/m; Power Drift = -0.032 dB

Peak SAR (extrapolated) = 1.05 W/kg

SAR(1 g) = 0.612 mW/g; SAR(10 g) = 0.323 mW/g

Maximum value of SAR (measured) = 0.680 mW/g



0 dB = 0.680mW/g

Fig. 30 1900 MHz CH512

1900 Right Tilt High

Date/Time: 2010-1-20 10:30:51

Electronics: DAE4 Sn771

Medium: 1900 Head

Medium parameters used: f = 1910 MHz; σ = 1.42 mho/m; εr = 39.0; ρ = 1000 kg/m3

Ambient Temperature:23.0°C Liquid Temperature: 22.5°C

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

Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

Tilt High/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.318 mW/g

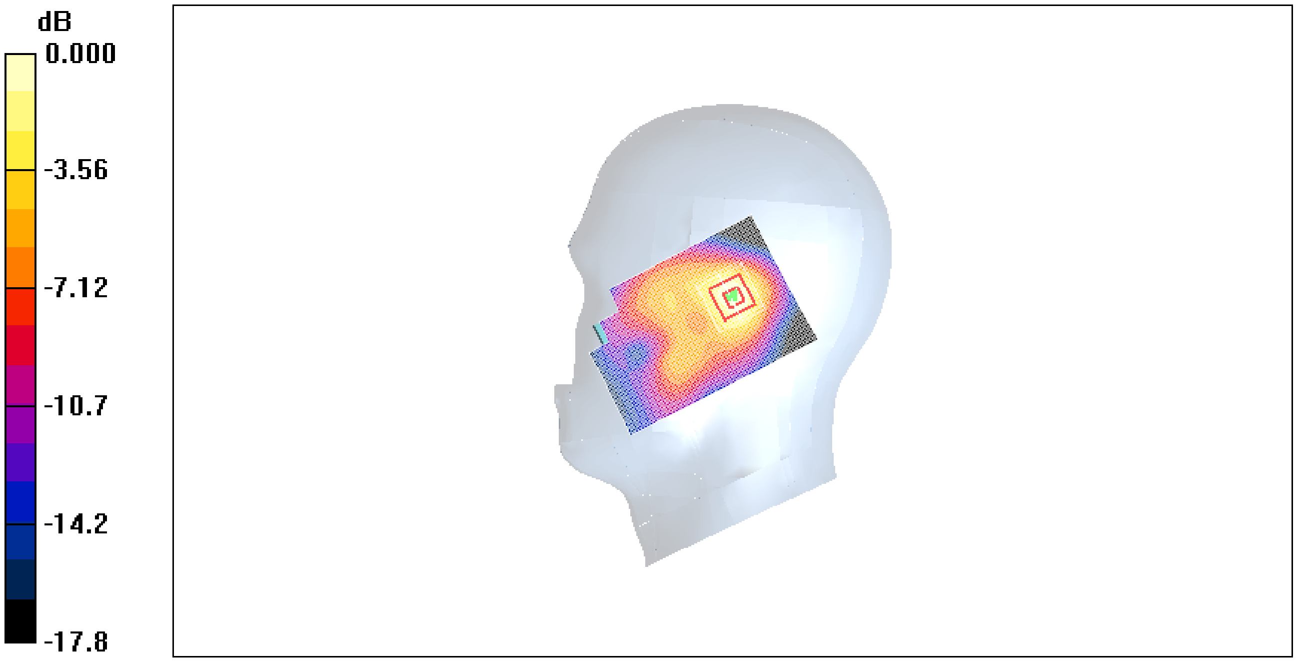
Tilt High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 14.4 V/m; Power Drift = -0.061 dB

Peak SAR (extrapolated) = 0.445 W/kg

SAR(1 g) = 0.273 mW/g; SAR(10 g) = 0.153 mW/g

Maximum value of SAR (measured) = 0.301 mW/g



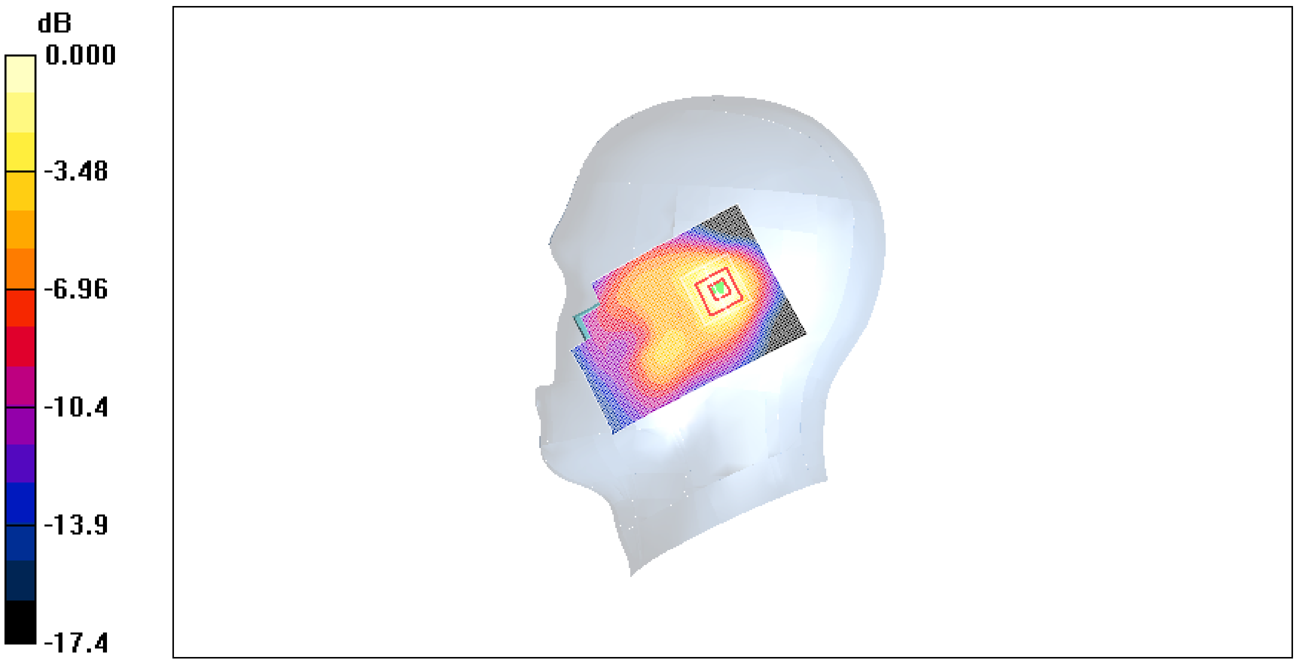
0 dB = 0.301mW/g

Fig. 31 1900 MHz CH810

1900 Right Tilt Middle
Date/Time: 2010-1-20 10:45:09
Electronics: DAE4 Sn771
Medium: 1900 Head
Medium parameters used: f = 1880 MHz; σ = 1.40 mho/m; εr = 39.1; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: GSM 1900MHz Frequency: 1880 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

Tilt Middle/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.312 mW/g

Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.5 V/m; Power Drift = -0.023 dB
Peak SAR (extrapolated) = 0.427 W/kg
SAR(1 g) = 0.265 mW/g; SAR(10 g) = 0.152 mW/g
Maximum value of SAR (measured) = 0.286 mW/g



0 dB = 0.286mW/g

Fig.32 1900 MHz CH661

1900 Right Tilt Low

Date/Time: 2010-1-20 10:59:16

Electronics: DAE4 Sn771

Medium: 1900 Head

Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.37 mho/m; εr = 39.2; ρ = 1000 kg/m3

Ambient Temperature:23.0°C Liquid Temperature: 22.5°C

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

Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

Tilt Low/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.313 mW/g

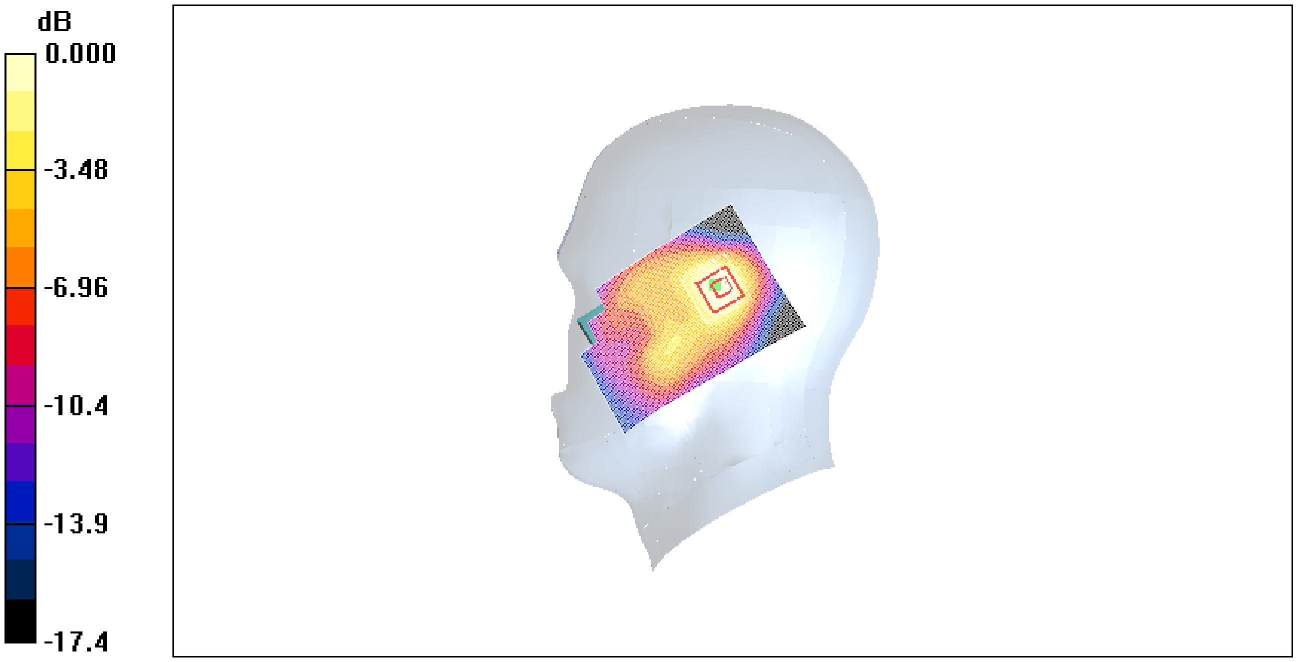
Tilt Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 14.6 V/m; Power Drift = 0.049 dB

Peak SAR (extrapolated) = 0.417 W/kg

SAR(1 g) = 0.261 mW/g; SAR(10 g) = 0.149 mW/g

Maximum value of SAR (measured) = 0.275 mW/g



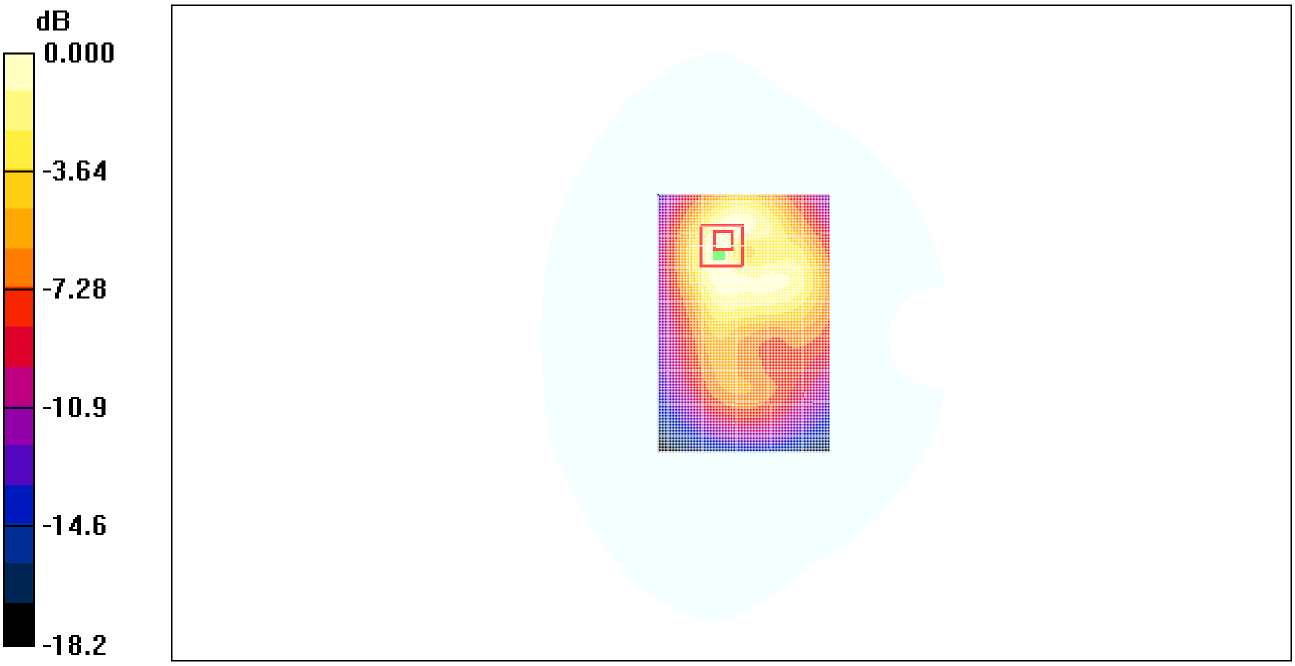
0 dB = 0.275mW/g

Fig.33 1900 MHz CH512

1900 Body Towards Ground High With GPRS
Date/Time: 2010-1-20 13:26:45
Electronics: DAE4 Sn771
Medium: Body 1900 MHz
Medium parameters used: f = 1910 MHz; σ = 1.56 mho/m; εr = 52.3; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: GSM 1900MHz GPRS Frequency: 1909.8 MHz Duty Cycle: 1:2.67
Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

Toward Ground High/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.359 mW/g

Toward Ground High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.67 V/m; Power Drift = 0.000 dB
Peak SAR (extrapolated) = 0.573 W/kg
SAR(1 g) = 0.338 mW/g; SAR(10 g) = 0.192 mW/g
Maximum value of SAR (measured) = 0.359 mW/g



0 dB = 0.359mW/g

Fig. 34 1900 MHz CH810

1900 Body Towards Ground Middle With GPRS

Date/Time: 2010-1-20 13:41:59

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; εr = 52.4; ρ = 1000 kg/m3

Ambient Temperature:23.0°C Liquid Temperature: 22.5°C

Communication System: GSM 1900MHz GPRS Frequency: 1880 MHz Duty Cycle: 1:2.67

Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

Toward Ground Middle/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.409 mW/g

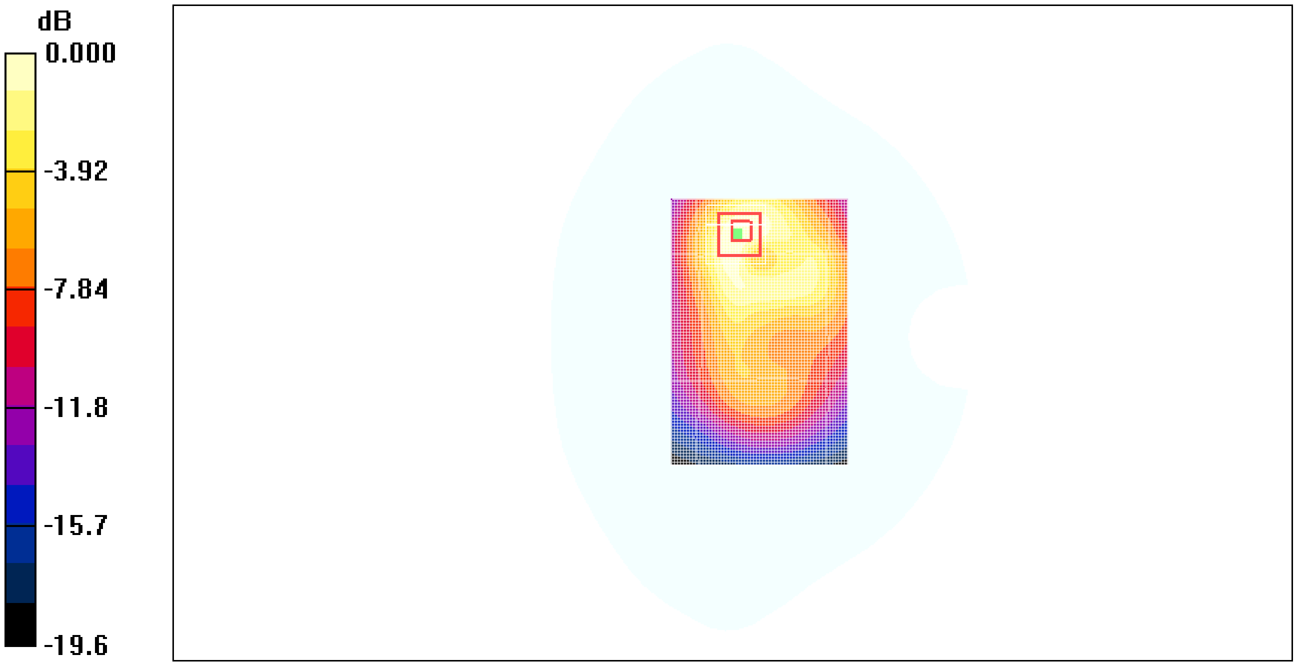
Toward Ground Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.16 V/m; Power Drift = 0.096 dB

Peak SAR (extrapolated) = 0.619 W/kg

SAR(1 g) = 0.368 mW/g; SAR(10 g) = 0.212 mW/g

Maximum value of SAR (measured) = 0.403 mW/g



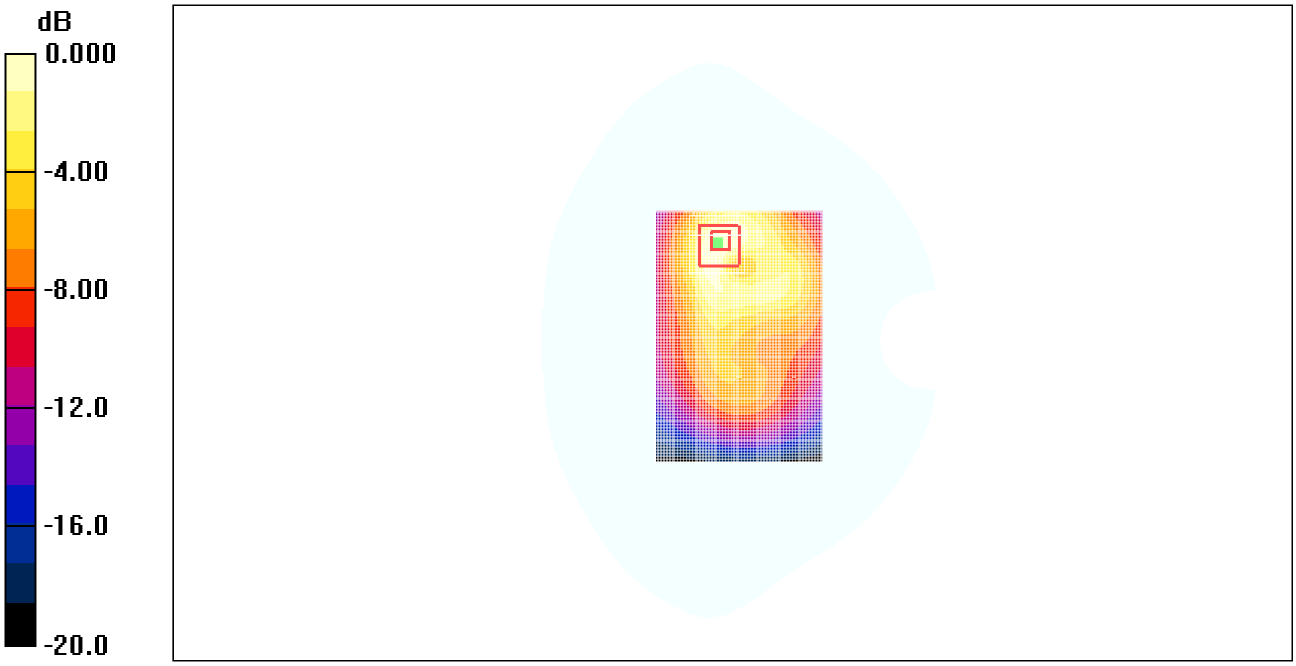
0 dB = 0.403mW/g

Fig. 35 1900 MHz CH661

1900 Body Towards Ground Low With GPRS
Date/Time: 2010-1-20 13:57:03
Electronics: DAE4 Sn771
Medium: Body 1900 MHz
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.51 mho/m; εr = 52.4; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: GSM 1900MHz GPRS Frequency: 1850.2 MHz Duty Cycle: 1:2.67
Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

Toward Ground Low/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.419 mW/g

Toward Ground Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.73 V/m; Power Drift = 0.026 dB
Peak SAR (extrapolated) = 0.621 W/kg
SAR(1 g) = 0.376 mW/g; SAR(10 g) = 0.217 mW/g
Maximum value of SAR (measured) = 0.408 mW/g



0 dB = 0.408mW/g

Fig. 36 1900 MHz CH512

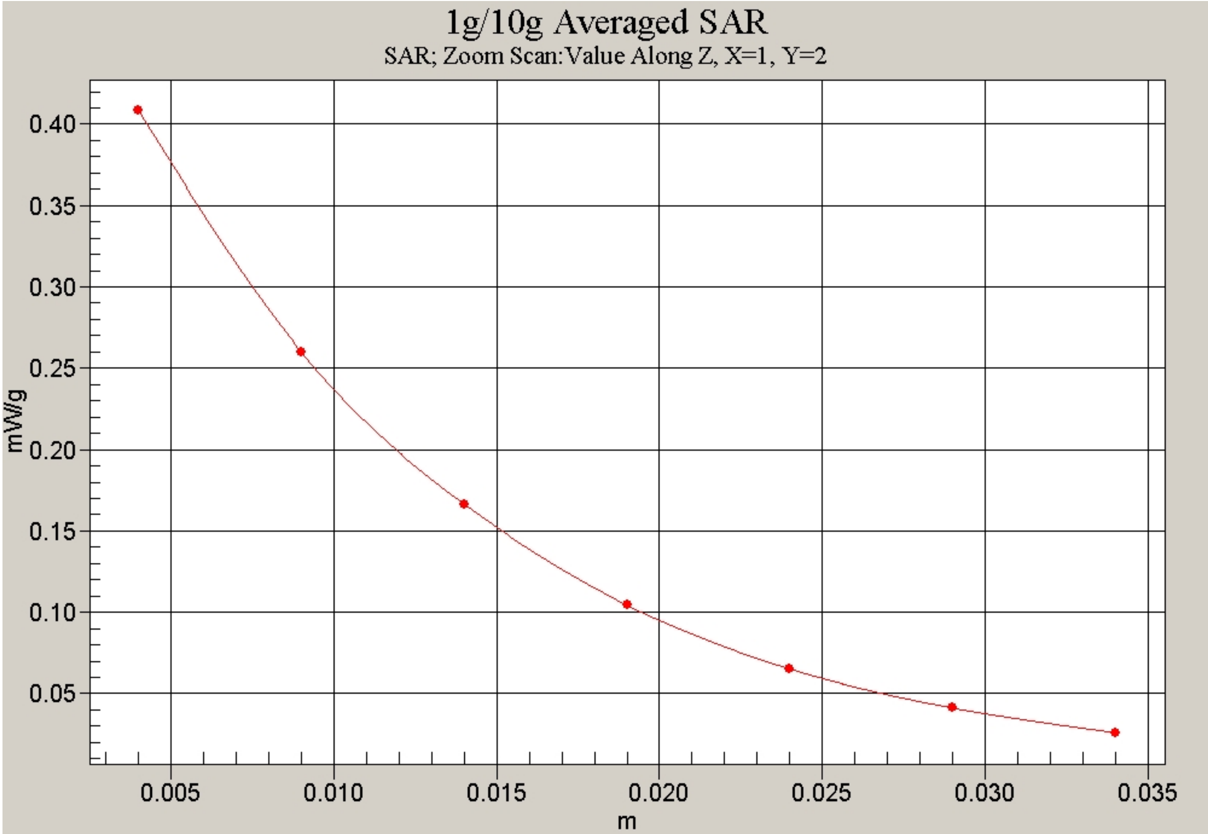


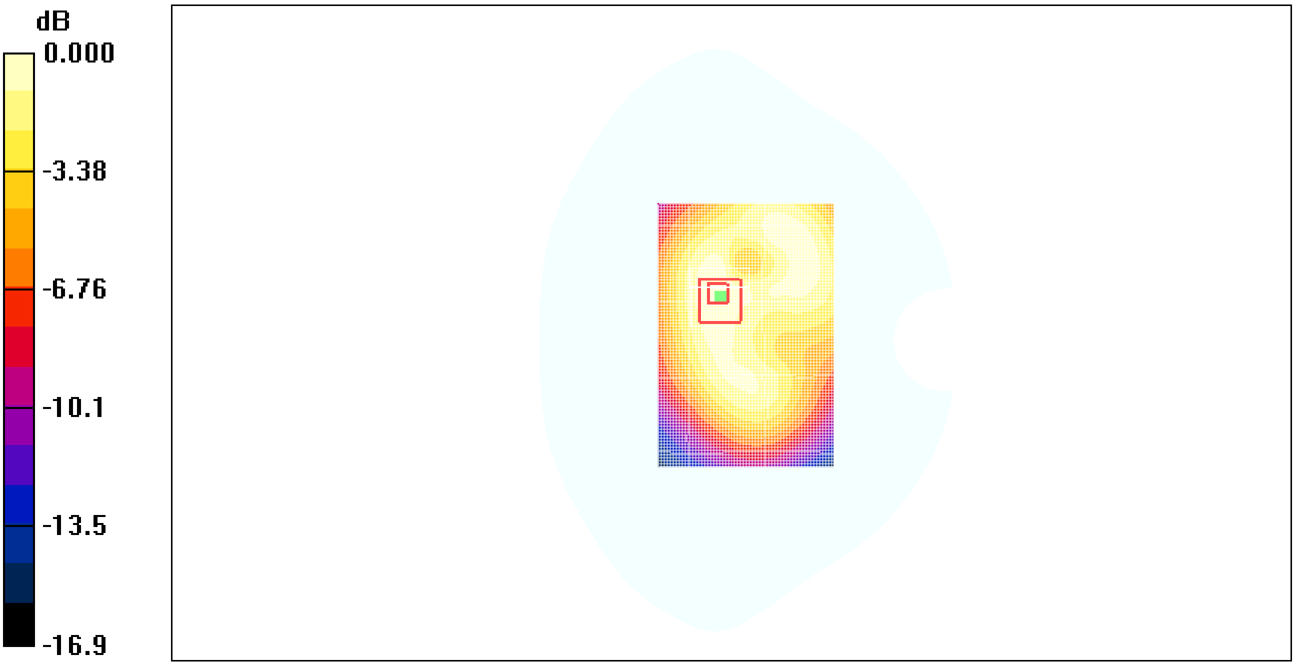
Fig. 36-1 Z-Scan at power reference point (1900 MHz CH512)

1900 Body Towards Phantom High With GPRS

Date/Time: 2010-1-20 14:12:20
Electronics: DAE4 Sn771
Medium: Body 1900 MHz
Medium parameters used: f = 1910 MHz; σ = 1.56 mho/m; εr = 52.3; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: GSM 1900MHz GPRS Frequency: 1909.8 MHz Duty Cycle: 1:2.67
Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

Toward Phantom High/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.168 mW/g

Toward Phantom High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.08 V/m; Power Drift = 0.051 dB
Peak SAR (extrapolated) = 0.238 W/kg
SAR(1 g) = 0.152 mW/g; SAR(10 g) = 0.095 mW/g
Maximum value of SAR (measured) = 0.158 mW/g



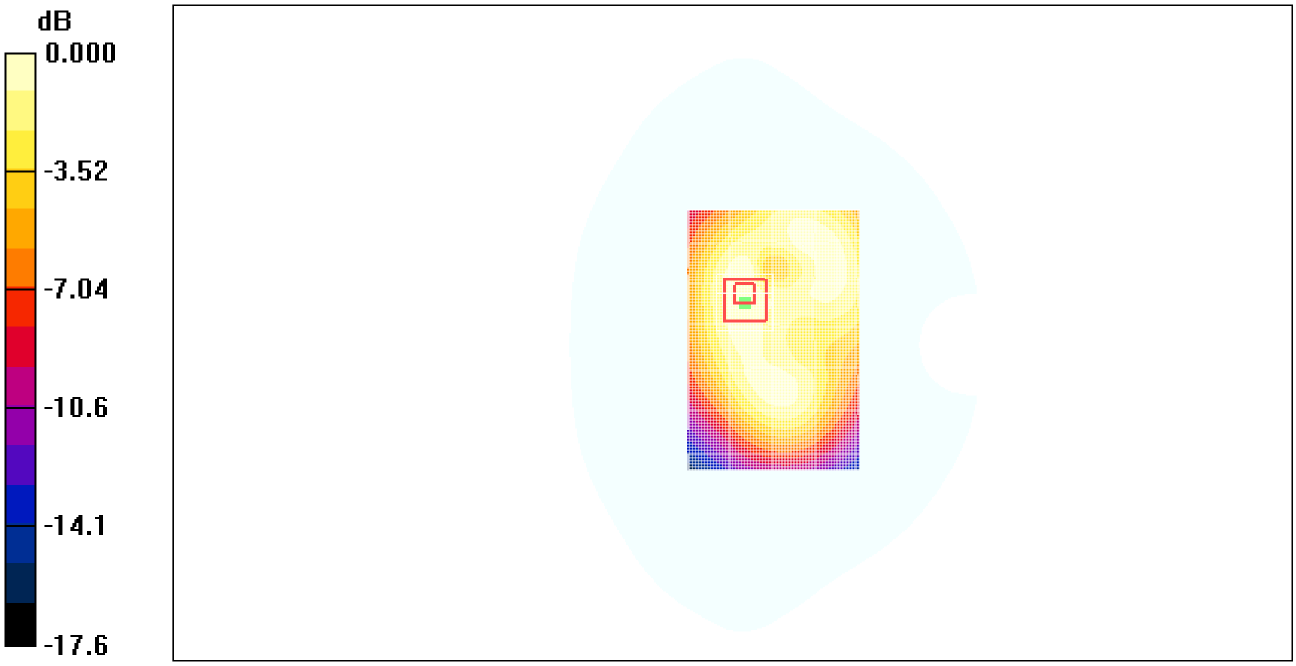
0 dB = 0.158mW/g

Fig. 37 1900 MHz CH810

1900 Body Towards Phantom Middle With GPRS
Date/Time: 2010-1-20 14:27:33
Electronics: DAE4 Sn771
Medium: Body 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; εr = 52.4; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: GSM 1900MHz GPRS Frequency: 1880 MHz Duty Cycle: 1:2.67
Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

Toward Phantom Middle/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.178 mW/g

Toward Phantom Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.49 V/m; Power Drift = 0.039 dB
Peak SAR (extrapolated) = 0.252 W/kg
SAR(1 g) = 0.162 mW/g; SAR(10 g) = 0.101 mW/g
Maximum value of SAR (measured) = 0.166 mW/g



0 dB = 0.166mW/g

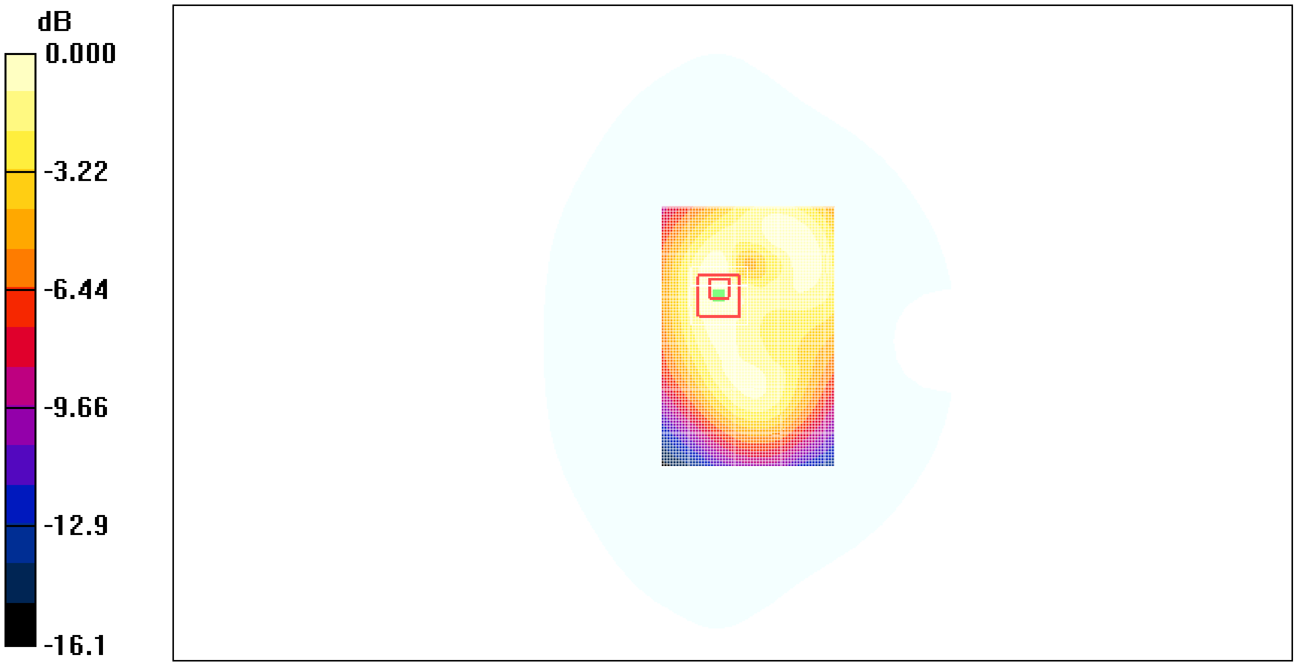
Fig. 38 1900 MHz CH661

1900 Body Towards Phantom Low With GPRS

Date/Time: 2010-1-20 14:42:35
Electronics: DAE4 Sn771
Medium: Body 1900 MHz
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.51 mho/m; εr = 52.4; ρ = 1000 kg/m3
Ambient Temperature:23.0°C   Liquid Temperature: 22.5°C
Communication System: GSM 1900MHz GPRS Frequency: 1850.2 MHz Duty Cycle: 1:2.67
Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

Toward Phantom Low/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.177 mW/g

Toward Phantom Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.73 V/m; Power Drift = 0.044 dB
Peak SAR (extrapolated) = 0.257 W/kg
SAR(1 g) = 0.164 mW/g; SAR(10 g) = 0.102 mW/g
Maximum value of SAR (measured) = 0.167 mW/g



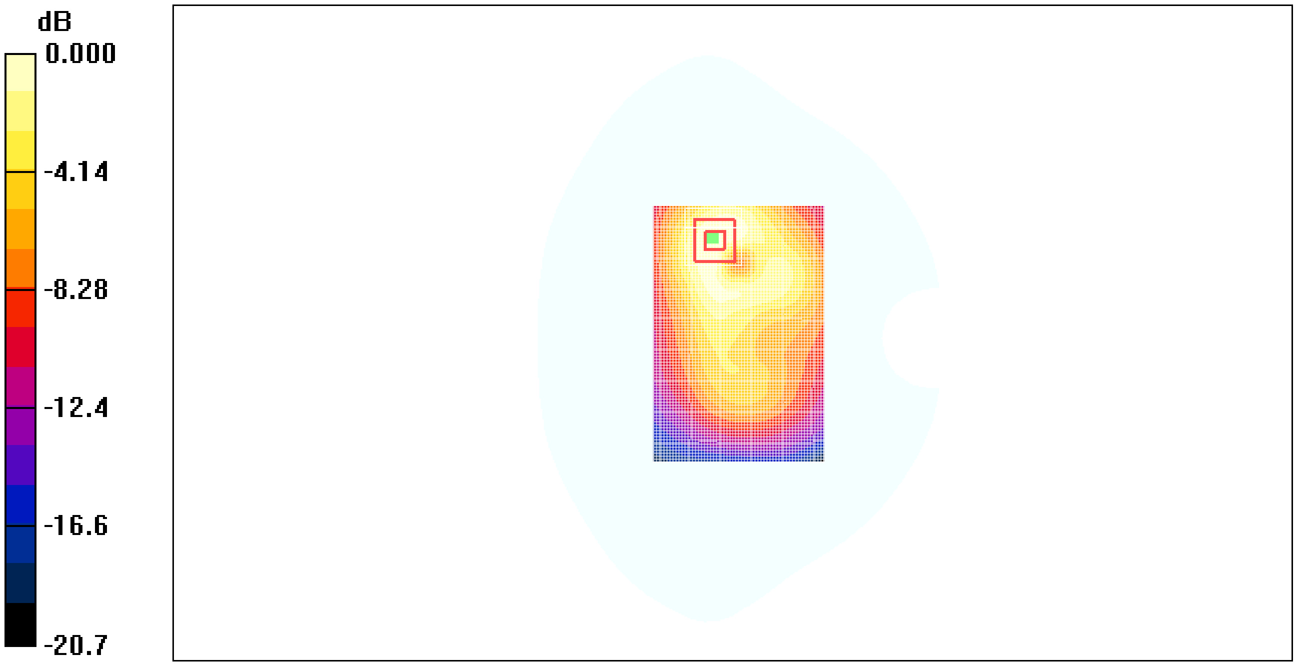
0 dB = 0.167mW/g

Fig. 39 1900 MHz CH512

1900 Body Towards Ground Low With EGPRS
Date/Time: 2010-1-20 14:59:41
Electronics: DAE4 Sn771
Medium: Body 1900 MHz
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.51 mho/m; εr = 52.4; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: GSM 1900MHz GPRS Frequency: 1850.2 MHz Duty Cycle: 1:2.67
Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

Toward Ground Low/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.394 mW/g

Toward Ground Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.91 V/m; Power Drift = -0.115 dB
Peak SAR (extrapolated) = 0.607 W/kg
SAR(1 g) = 0.366 mW/g; SAR(10 g) = 0.213 mW/g
Maximum value of SAR (measured) = 0.373 mW/g



0 dB = 0.373mW/g

Fig. 40 1900 MHz CH512

1900 Body Towards Ground Low With Headset__CCB3160A10C1

Date/Time: 2010-1-20 15:19:32
Electronics: DAE4 Sn771
Medium: Body 1900 MHz
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.51 mho/m; εr = 52.4; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: GSM 1900MHz Frequency: 1850.2 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

Toward Ground Low/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.285 mW/g

Toward Ground Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.01 V/m; Power Drift = 0.012 dB
Peak SAR (extrapolated) = 0.424 W/kg
SAR(1 g) = 0.259 mW/g; SAR(10 g) = 0.151 mW/g
Maximum value of SAR (measured) = 0.283 mW/g

0 dB = 0.283mW/g

Fig. 41 1900 MHz CH512

1900 Body Towards Ground Low With Headset__CCB3120A11C1
Date/Time: 2010-1-20 15:37:48
Electronics: DAE4 Sn771
Medium: Body 1900 MHz
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.51 mho/m; εr = 52.4; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: GSM 1900MHz Frequency: 1850.2 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

Toward Ground Low/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.292 mW/g

Toward Ground Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.01 V/m; Power Drift = -0.085 dB
Peak SAR (extrapolated) = 0.428 W/kg
SAR(1 g) = 0.264 mW/g; SAR(10 g) = 0.154 mW/g
Maximum value of SAR (measured) = 0.288 mW/g

0 dB = 0.288mW/g

Fig. 42 1900 MHz CH512

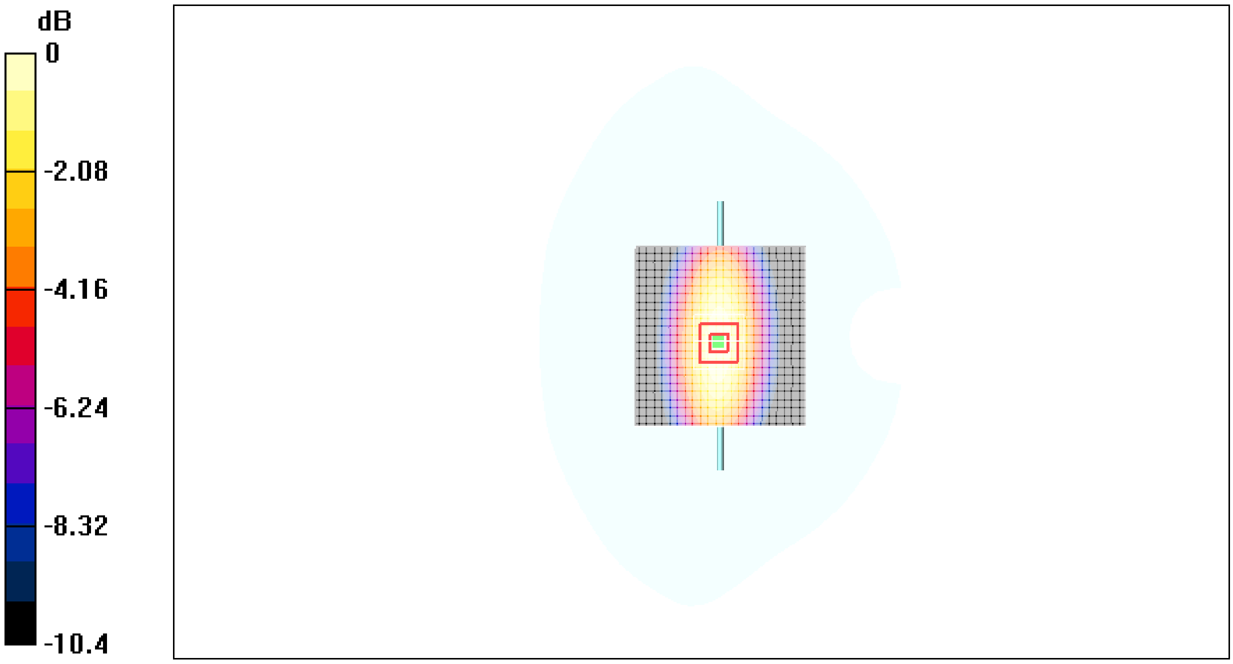
ANNEX D SYSTEM VALIDATION RESULTS

835MHz

Date/Time: 2010-1-19 7:24:06
Electronics: DAE4 Sn771
Medium: Head 835
Medium parameters used: f = 835 MHz; σ = 0.89 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(6.56, 6.56, 6.56)

835MHz/Area Scan (101x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 2.76 mW/g

835MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.5 V/m; Power Drift = -0.073 dB
Peak SAR (extrapolated) = 3.70 W/kg
SAR(1 g) = 2.53 mW/g; SAR(10 g) = 1.61 mW/g
Maximum value of SAR (measured) = 2.72 mW/g



0 dB = 2.72mW/g

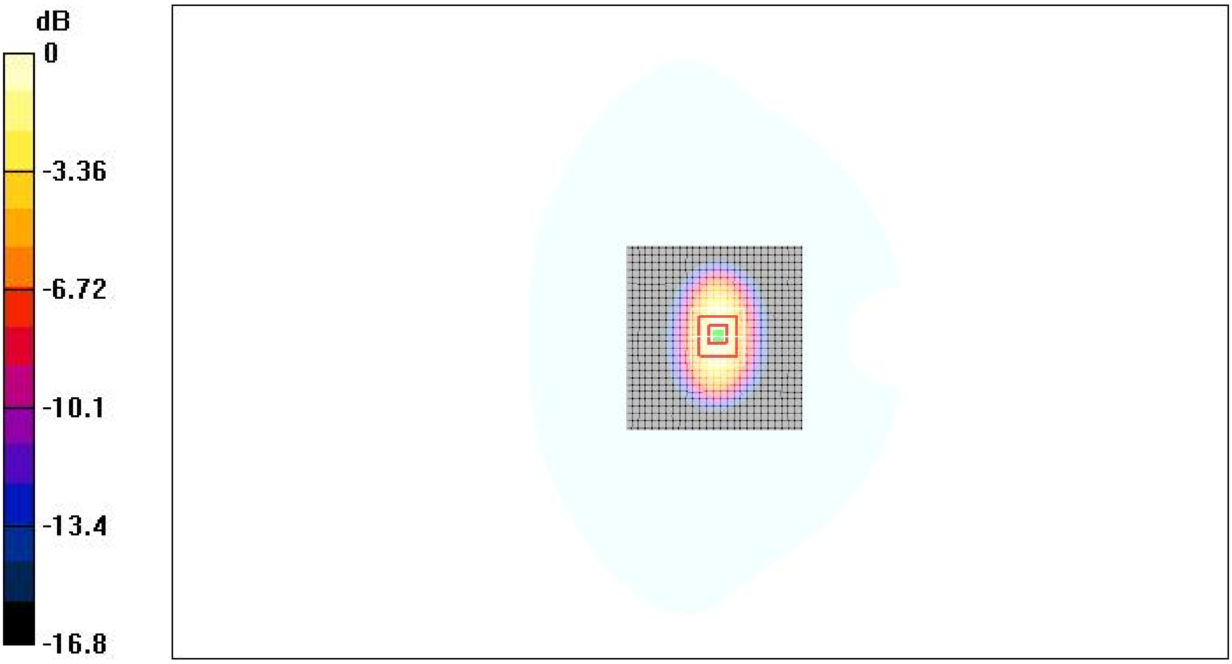
Fig.43 validation 835MHz 250mW

1900MHz

Date/Time: 2010-1-20 7:18:37
Electronics: DAE4 Sn771
Medium: 1900 Head
Medium parameters used: f = 1900 MHz; σ = 1.41 mho/m; ε_r = 39.1; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 1900 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

System Validation/Area Scan (101x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 11.3 mW/g

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 90.7 V/m; Power Drift = 0.042 dB
Peak SAR (extrapolated) = 16.1 W/kg
SAR(1 g) = 9.81 mW/g; SAR(10 g) = 5.22 mW/g
Maximum value of SAR (measured) = 10.8 mW/g



0 dB = 10.8mW/g

Fig.44 validation 1900MHz 250mW

ANNEX E PROBE CALIBRATION CERTIFICATE

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

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

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

Accreditation No.: **SCS 108**

Client TMC China | Certificate No: ES3DV3-3149_Sep09

CALIBRATION CERTIFICATE

Object	**ES3DV3-SN: 3149**
Calibration procedure(s)	**QA CAL-01.v6** **Calibration procedure for dosimetric E-field probes**
Calibration date:	**September 25, 2009**
Condition of the calibrated item	**In Tolerance**

This calibration certify 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)^{0}C and humidity<70%

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID#	Cal Data (Calibrated by, Certification NO.)	Scheduled Calibration
Power meter E4419B	GB41293874	5-May-09 (METAS, NO. 251-00388)	May-10
Power sensor E4412A	MY41495277	5-May-09 (METAS, NO. 251-00388)	May-10
Reference 3 dB Attenuator	SN:S5054 (3c)	10-Aug-09 (METAS, NO. 251-00403)	Aug-10
Reference 20 dB Attenuator	SN:S5086 (20b)	3-May-09 (METAS, NO. 251-00389)	May-10
Reference 30 dB Attenuator	SN:S5129 (30b)	10-Aug-09 (METAS, NO. 251-00404)	Aug-10
DAE4	SN:617	10-Jun-09 (SPEAG, NO.DAE4-907_Jun09)	Jun-10
Reference Probe ES3DV2	SN: 3013	12-Jan-09 (SPEAG, NO. ES3-3013_Jan09)	Jan-10

Secondary Standards	ID#	Check Data (in house)	Scheduled Calibration
RF generator HP8648C	US3642U01700	4-Aug-99(SPEAG, in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585	18-Oct-01(SPEAG, in house check Nov-07)	In house check: Nov-09

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

Issued: September 25, 2009

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
S Swiss Calibration Service

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

Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
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: 3149

Manufactured: June 12, 2007

Calibrated: September 25, 2009

Calibrated for DASY4 System

DASY – Parameters of Probe: ES3DV3 SN:3149

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

NormX	1.14±10.1%	$\mu V/(V/m)^2$	DCP X	94mV
NormY	1.23±10.1%	$\mu V/(V/m)^2$	DCP Y	95mV
NormZ	1.29±10.1%	$\mu V/(V/m)^2$	DCP Z	91mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)
Please see Page 8

Boundary Effect

TSL 900MHz Typical SAR gradient: 5% per mm

Sensor Center to Phantom Surface Distance		3.0 mm	4.0 mm
SARbe[%]	Without Correction Algorithm	3.8	1.6
SARbe[%]	With Correction Algorithm	0.8	0.7

TSL 1810MHz Typical SAR gradient: 10% per mm

Sensor Center to Phantom Surface Distance		3.0 mm	4.0 mm
SARbe[%]	Without Correction Algorithm	6.8	3.6
SARbe[%]	With Correction Algorithm	0.4	0.2

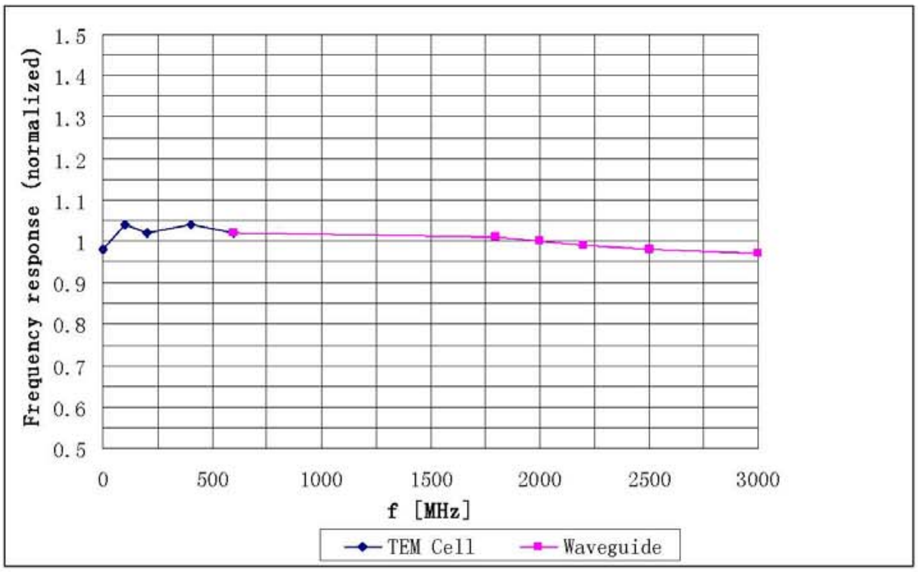
Sensor Offset

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 distributio 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.

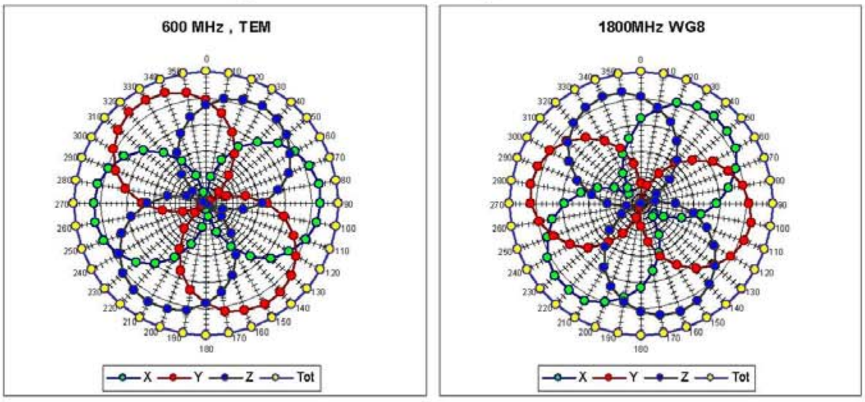
Frequency Response of E-Field

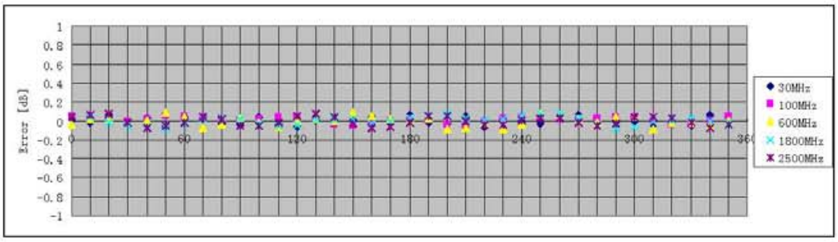


Uncertainty of Frequency Response of E-field: ±5.0% (k=2)

ES3DV3 SN: 3149 September 25, 2009

Receiving Pattern (φ), θ =0°

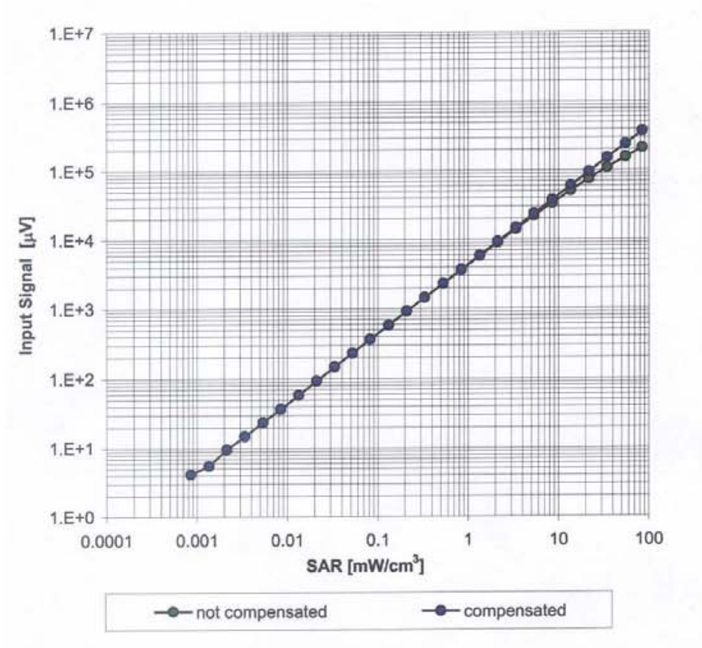


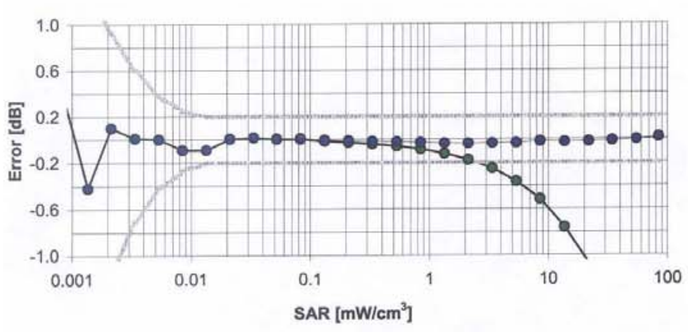


Uncertainty of Axial Isotropy Assessment: ±0.5% (k=2)

Dynamic Range f(SAR_{head})

(Waveguide: WG8, f = 1800 MHz)

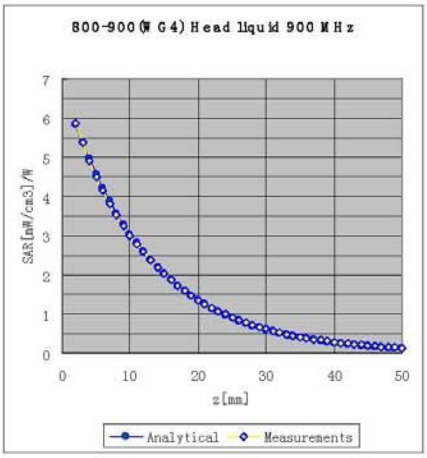


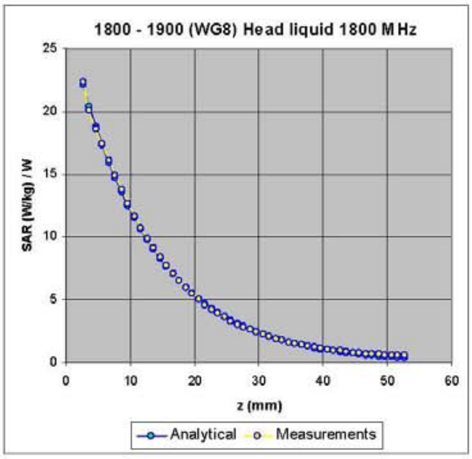


Uncertainty of Linearity Assessment: ±0.5% (k=2)

ES3DV3 SN: 3149 September 25, 2009

Conversion Factor Assessment



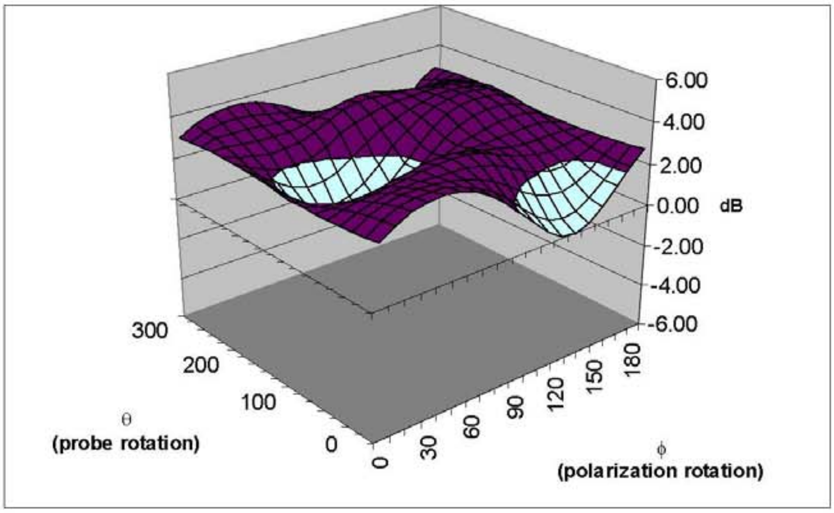


f[MHz]	Validity[MHz][C]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF	Uncertainty
850	±50 / ±100	Head	41.5±5%	0.90±5%	0.91	1.13	6.56	±11.0% (k=2)
900	±50 / ±100	Head	41.5±5%	0.97±5%	0.83	1.26	6.34	±11.0% (k=2)
1800	±50 / ±100	Head	40.0±5%	1.40±5%	0.69	1.47	5.18	±11.0% (k=2)
1900	±50 / ±100	Head	40.0±5%	1.40±5%	0.72	1.38	5.03	±11.0% (k=2)
2100	±50 / ±100	Head	39.8±5%	1.49±5%	0.66	1.34	4.58	±11.0% (k=2)
850	±50 / ±100	Body	55.2±5%	0.97±5%	0.76	1.26	6.22	±11.0% (k=2)
900	±50 / ±100	Body	55.0±5%	1.05±5%	0.99	1.06	6.02	±11.0% (k=2)
1800	±50 / ±100	Body	53.3±5%	1.52±5%	0.75	1.34	4.97	±11.0% (k=2)
1900	±50 / ±100	Body	53.3±5%	1.52±5%	0.62	1.33	4.68	±11.0% (k=2)
2100	±50 / ±100	Body	53.5±5%	1.57±5%	0.68	1.34	4.35	±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

Error (Φ, θ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ±2.5% (k=2)

ANNEX F DIPOLE CALIBRATION CERTIFICATE

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

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

Accreditation No.: **SCS 108**

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

Client TMC China

Certificate No: D835V2-443_Feb09

CALIBRATION CERTIFICATE

Object	**D835V2-SN: 443**
Calibration procedure(s)	**QA CAL-05.v6** **Calibration procedure for dipole validation kits**
Calibration date:	**February 18, 2009**
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)^{0}C and humidity<70%

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID#	Cal Data (Calibrated by, Certification NO.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	01-Oct-08 (METAS, NO. 217-00608)	Oct-09
Power sensor 8481A	US37292783	01-Oct-08 (METAS, NO. 217-00608)	Oct-09
Reference 20 dB Attenuator	SN:5086 (20g)	08-Aug-08 (METAS, NO. 217-00591)	Aug-09
Reference 10 dB Attenuator	SN:5047_2 (10r)	08-Aug-08 (METAS, NO. 217-00591)	Aug-09
DAE4	SN:601	28-Jan-09 (SPEAG, NO.DAE4-601_Jan09)	Jan-10
Reference Probe ET3DV6 (HF)	SN: 1507	17-Oct-08 (SPEAG, NO. ET3-1507_Oct08)	Oct-09
Secondary Standards	**ID#**	**Check Data (in house)**	**Scheduled Calibration**
Power sensor HP 8481A	MY41092317	18-Oct-02(SPEAG, in house check Oct-07)	In house check: Oct-09
RF generator Aglient E4421B	MY41000676	11-May-05(SPEAG, in house check Nov-07)	In house check: Nov -09
Network Analyzer HP 8753E	US37390585S4206	18-Oct-01(SPEAG, in house check Oct-08)	In house check: Oct -09

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

Issued: February 19, 2009

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

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Swiss Calibration Service

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

Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
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: 18.02.2009 10:13:45

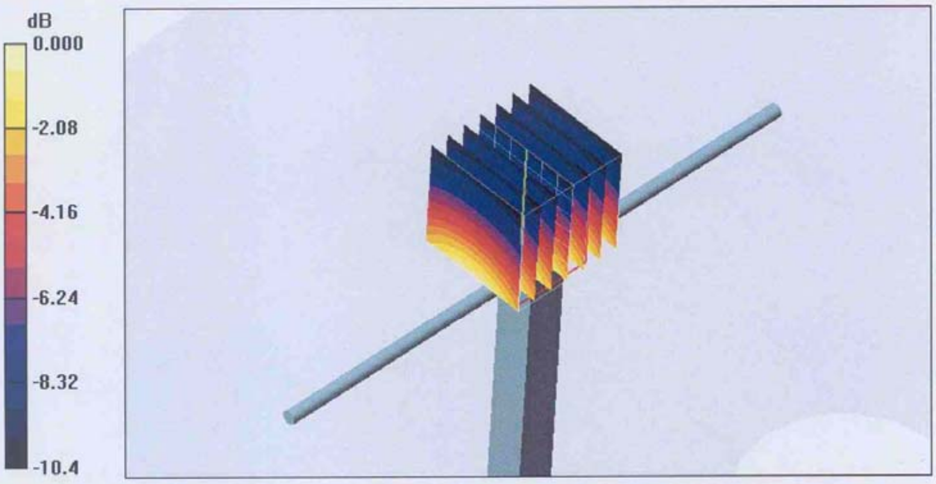
Test laboratory: SPEAG, Zurich, Switzerland

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:

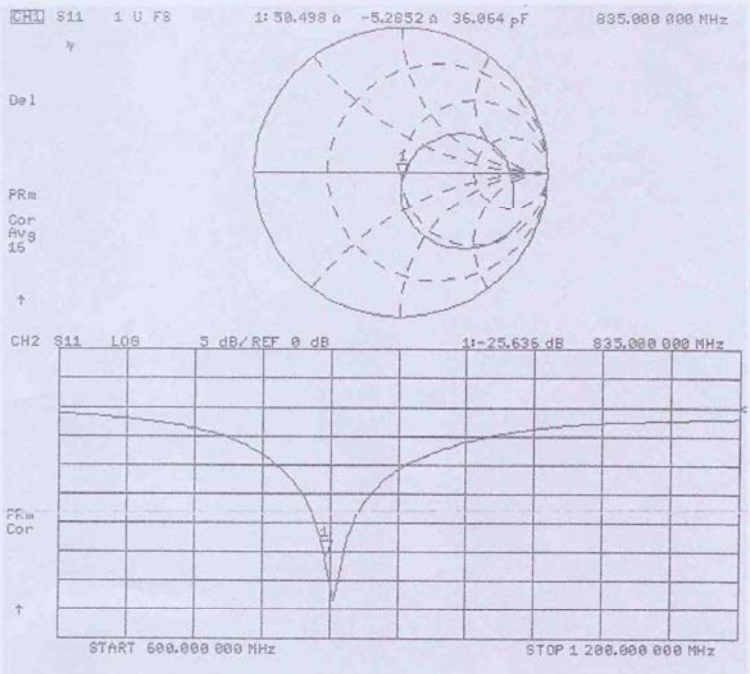
- Probe: ET3DV6-SN1507(HF); ConvF(6.01,6.01,6.01); Calibrated: 17.10.2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.1_2009
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA;
- Measurement SW: DASY, V4.7 Build 53; Post processing SW: SEMCAD, V1.8 Build 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, Swizerland

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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client TMC China

Certificate No: D1900V2-541_Feb09

CALIBRATION CERTIFICATE

Object	**D1900V2-SN: 541**
Calibration procedure(s)	**QA CAL-05.v6** **Calibration procedure for dipole validation kits**
Calibration date:	**February 19, 2009**
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)^{0}C and humidity<70%

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID#	Cal Data (Calibrated by, Certification NO.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	01-Oct-08 (METAS, NO. 217-00608)	Oct-09
Power sensor 8481A	US37292783	01-Oct-08 (METAS, NO. 217-00608)	Oct-09
Reference 20 dB Attenuator	SN:5086 (20g)	08-Aug-08 (METAS, NO. 217-00591)	Aug-09
Reference 10 dB Attenuator	SN:5047_2 (10r)	08-Aug-08 (METAS, NO. 217-00591)	Aug-09
DAE4	SN:601	28-Jan-09 (SPEAG, NO.DAE4-601_Jan09)	Jan-10
Reference Probe ET3DV6 (HF)	SN: 1507	17-Oct-08 (SPEAG, NO. ET3-1507_Oct08)	Oct-09
Secondary Standards	**ID#**	**Check Data (in house)**	**Scheduled Calibration**
Power sensor HP 8481A	MY41092317	18-Oct-02(SPEAG, in house check Oct-07)	In house check: Oct-09
RF generator Aglient E4421B	MY41000676	11-May-05(SPEAG, in house check Nov-07)	In house check: Nov -09
Network Analyzer HP 8753E	US37390585S4206	18-Oct-01(SPEAG, in house check Oct-08)	In house check: Oct -10

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

Issued: February 20, 2009

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

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Swiss Calibration Service

Accredited by the Swiss Federal Office of Metrology and Accreditation
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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 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: 19.02.2009 09:37:10

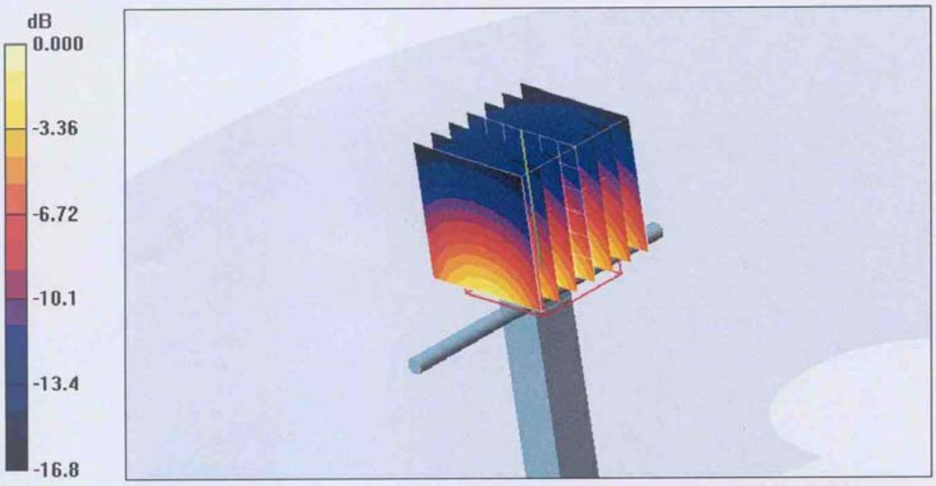
Test laboratory: SPEAG, Zurich, Switzerland

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: 17.10.2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.1_2009
- 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