SAR TEST REPORT for FCC

No. 2010SAR00009

For

Sony Ericsson Mobile Communications(China) Co., Ltd.

GSM 850/1900 dual bands mobile phone

W100a

With

Hardware Version: A

Software Version: P1BC014

SEMC ID: AAB-1880026-BV

Industry Canada ID: 4170B-A1880026

FCCID: PY7A1880026

FCC 2.948 Listed: No.733176

IC O.A.T.S listed: No.6629A-1

Issued Date: 2010-3-8

Deutscher Akkreditierungs Rat
DAR

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

Note:

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

Test Laboratory:

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TABLE OF CONTENT

1 Test Laboratory

1.1 Testing Location

Company Name:	TMC Beijing, Telecommunication Metrology Center of MIIT
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Postal Code:	100191
Telephone:	+86-10-62303288
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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:	February 3, 2010
Testing End Date:	February 4, 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 General Information

2.1 Statement of Compliance

The SAR values found for the AAB-1880026-BV Mobile Phone are below the maximum recommended levels of 1.6 W/Kg as averaged over any 1g tissue according to the FCC rule, the ANSI C95.1-1999.

For body worn operation, this device has been tested and meets FCC RF exposure guidelines when used with any accessory that contains no metal and that positions the handset a minimum of 15mm from the body. Use of other accessories may not ensure compliance with FCC RF exposure guidelines.

The measurement together with the test system set-up is described in chapter 5 of this test report. A detailed description of the equipment under test can be found in chapter 3 of this test report.

2.2 Applicant Information

Company Name:	Sony Ericsson Mobile Communications(China) Co., Ltd.
Address /Post:	1/F, China Digital Kingdom Building, No.1 North Road, Wangjing, Chaoyang District, Beijing, China
City:	Beijing
Postal Code:	/
Country:	China
Contact:	Ma, Gang
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2.3 Manufacturer Information

Company Name:	Sony Ericsson Mobile Communications AB
Address /Post:	Nya Vattentornet 22188 Lund Sweden
City:	Lund
Postal Code:	22188
Country:	Sweden
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Email:	Anders.Nordlof@sonyericsson.com
Telephone:	+46 46 193919
Fax:	+46 46 193295

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

3.1 About EUT

Description:	GSM850/1900, GPRS EDGE, BT EDR 2.0, FM-receiver mobile phone
Model:	W100a
Operating mode(s):	GSM, PCS, Bluetooth
GPRS Multislot Class:	10
GPRS capability Class:	B
EGPRS Multislot Class:	10
Test device Production information:	Production unit
Device type:	Portable device
Antenna type:	Integrated antenna
Accessories/Body-worn configurations:	Headset

3.2 Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	WUJ07C0136	A	P1BC014

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

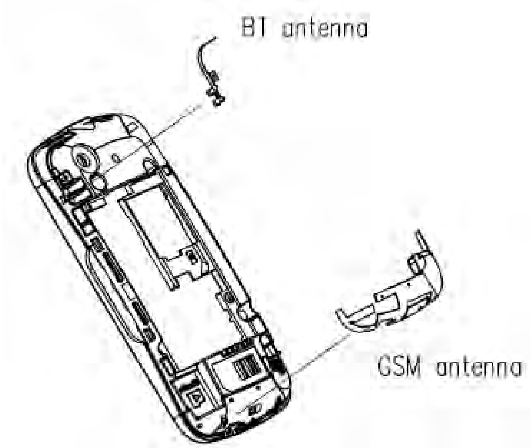
3.3 Internal Identification of AE used during the test

AE ID*	Description	Model	SN	Manufacturer
AE1	Travel Adapter	CAA-0004001-BV	3109W38600030	Sony Ericsson
AE2	Battery	BST-33	003010HNNIXH	Sony Ericsson
AE3	Battery	BST-33	003271HNNIXH	Sony Ericsson
AE4	Headset	EMC262-002	/	MERRY ELECTRONICS

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

3.4 Antenna description

There are two antennae in the EUT, Main antenna and BT antenna.



Antenna dimension:

Max length: 45mm

Max width: 14mm

4 CHARACTERISTICS OF THE TEST

4.1 Applicable Limit Regulations

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

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.

KDB648474 D01 SAR Handsets Multi Xmiter and Ant, v01r05: SAR Evaluation Considerations for Handsets with Multiple Transmitters and Antennas.

5 OPERATIONAL CONDITIONS DURING TEST

5.1 Schematic Test Configuration

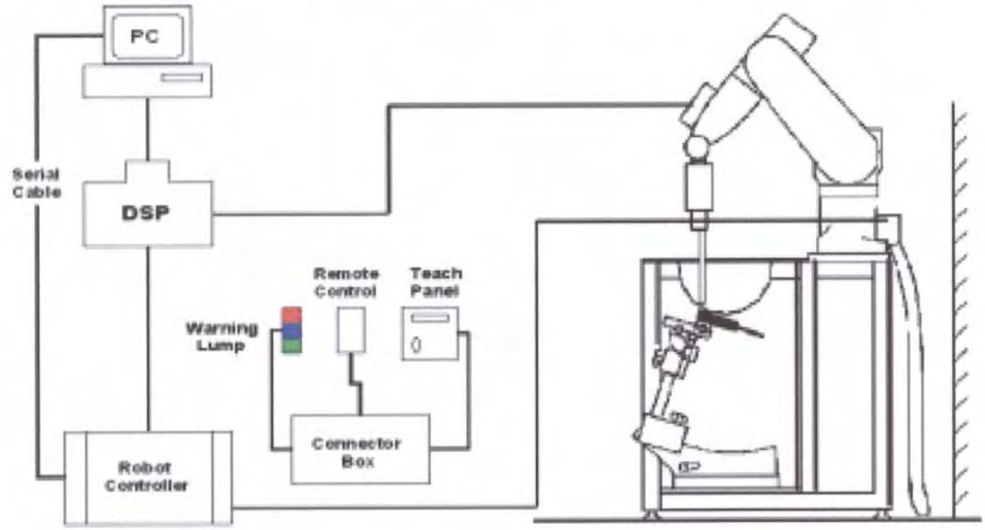
For the SAR tests at GSM 850 and GSM 1900, a communication link is set up with a System Simulator (SS) by air link. The EUT is commanded to operate at maximum transmitting power.

In order to determine the highest value of the peak spatial-average SAR of the EUT, it was tested at middle frequency (cheek and tilt, for both left and right sides of the SAM phantom). After found the worst case, perform the tests at the high and low frequencies. In addition, for all other conditions where the peak spatial-average SAR value determined is within 3 dB of the applicable SAR limit, all other test frequencies shall be tested as well.

5.2 SAR Measurement Set-up

These measurements were performed with the automated near-field scanning system DASY4 Professional from Schmid & Partner Engineering AG (SPEAG). The system is based on a high precision robot (working range greater than 0.9m) which positions the probes with a positional repeatability of better than ± 0.02mm. Special E-field and H-field probes have been developed for measurements close to material discontinuity, the sensors of which are directly loaded with a Schottky diode and connected via highly resistive lines (length =300mm) to the data acquisition unit.

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



Picture 1: SAR Lab Test Measurement Set-up

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

5.3 Dasy4 E-field Probe System

The SAR measurements were conducted with the dosimetric probe ES3DV3 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe has been calibrated according to the standard procedure with an accuracy of better than ± 10%. The spherical isotropy was evaluated and found to be better than ± 0.25dB.

ES3DV3 Probe Specification

Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)

Calibration	Basic Broad Band Calibration in air Conversion Factors (CF) for HSL 900 and HSL 1810 Additional CF for other liquids and frequencies upon request
Frequency	10 MHz to 4 GHz; Linearity: ± 0.2 dB (30 MHz to 4 GHz)
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.3 dB in tissue material (rotation normal to probe axis)
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

Picture 2: ES3DV3 E-field Probe

Picture3:ES3DV3 E-field probe

5.4 E-field Probe Calibration

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

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

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

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

Where: Δt = Exposure time (30 seconds),

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

ΔT = Temperature increase due to RF exposure.

Or

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

Where:

σ = Simulated tissue conductivity,

ρ = Tissue density (kg/m^3).

Picture 4: Device Holder

5.5 Other Test Equipment

5.5.1 Device Holder for Transmitters

In combination with the Generic Twin Phantom V3.0, the Mounting Device (POM) enables the rotation of the mounted transmitter in spherical coordinates whereby the rotation points is the ear opening. The devices can be easily, accurately, and repeatably positioned according to the FCC and CENELEC specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).

5.5.2 Phantom

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

Shell Thickness	2±0. l mm
Filling Volume	Approx. 20 liters
Dimensions	810 x l000 x 500 mm (H x L x W)
Available	Special

Picture 5: Generic Twin Phantom

5.6 Equivalent Tissues

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

6.1 Summary

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

6.2 Conducted Power

6.2.1 Measurement Methods

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

6.2.2 Measurement result

Table 3: Conducted Power Measurement Results

GSM 850MHz Speech	**Conducted Power (dBm)**		
	Channel 128 (824.2MHz)	**Channel 190 (836.6MHz)**	**Channel 251 (848.8MHz)**
	33.3	33.3	33.3
Max Power	33.3	33.3	33.3
GSM 850MHz GPRS	**Conducted Power (dBm)**		
	Channel 128 (824.2MHz)	**Channel 190 (836.6MHz)**	**Channel 251 (848.8MHz)**
	30.9	30.9	30.9
Max Power	30.9	30.9	30.9
GSM 850MHz EGPRS	**Conducted Power (dBm)**		
	Channel 128 (824.2MHz)	**Channel 190 (836.6MHz)**	**Channel 251 (848.8MHz**
	30.9	30.9	30.9
Max Power	30.9	30.9	30.9
GSM 1900MHz Speech	**Conducted Power (dBm)**		
	Channel 512 (1850.2MHz)	**Channel 661 (1880MHz)**	**Channel 810 (1909.8MHz)**
	30.4	30.4	30.4
Max Power	30.3	30.3	30.3
GSM 1900MHz GPRS	**Conducted Power (dBm)**		
	Channel 512 (1850.2MHz)	**Channel 661 (1880MHz)**	**Channel 810 (1909.8MHz)**
	30.3	30.3	30.3
Max Power	30.3	30.3	30.3

GSM 1900MHz EGPRS	Conducted Power (dBm)		
	Channel 512 (1850.2MHz)	**Channel 661 (1880MHz)**	**Channel 810 (1909.8MHz)**
	30.2	30.3	30.2
Max Power	30.3	30.3	30.3

6.2.3 Power Drift

To control the output power stability during the SAR test, DASY4 system calculates the power drift by measuring the E-field at the same location at the beginning and at the end of the measurement for each test position. These drift values can be found in Table 7 to Table 12 labeled as: (Power Drift [dB]). This ensures that the power drift during one measurement is within 5%.

7 TEST RESULTS

7.1 Dielectric Performance

Table 4: Dielectric Performance of Head Tissue Simulating Liquid

Measurement is made at temperature 23.5 °C and relative humidity 41%.
Liquid temperature during the test: 22.5°C
Measurement Date : 850 MHz **February 3, 2010** 1900 MHz **February 4, 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 23.5 °C and relative humidity 41%.
Liquid temperature during the test: 22.5°C
Measurement Date : 850 MHz **February 3, 2010** 1900 MHz **February 4, 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

7.2 System Validation

Table 6: System Validation

Measurement is made at temperature 23.5 °C and relative humidity 41%.
Liquid temperature during the test: 22.5°C
Measurement Date : 850 MHz **February 3, 2010** 1900 MHz **February 4, 2010**

Liquid parameters	Dipole calibration Target value	Frequency	Permittivity ε	Conductivity σ (S/m)
		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.

7.3 Summary of Measurement Results

	Duty Cycle
Speech	**1 : 8.3**
GPRS/EGPRS	**1 : 4**

Table 7: SAR Values (Head, GSM 850 MHz Band) – Slide down

Limit of SAR (W/kg)	1 g Average	Power Drift (dB)
	1.6	
Test Case	**Measurement**	
	1 g Average	
Left hand, Touch cheek, High frequency (See Fig.1)	1.17	-0.099
Left hand, Touch cheek, Mid frequency (See Fig.2)	1.2	-0.055
Left hand, Touch cheek, Low frequency (See Fig.3)	0.955	-0.024
Left hand, Tilt 15 Degree, Mid frequency (See Fig.4)	0.453	0.007
Right hand, Touch cheek, High frequency (See Fig.5)	0.923	-0.187
Right hand, Touch cheek, Mid frequency (See Fig.6)	0.995	-0.145
Right hand, Touch cheek, Low frequency (See Fig.7)	0.746	-0.122
Right hand, Tilt 15 Degree, Mid frequency (See Fig.8)	0.505	-0.105

Table 8: SAR Values (Head, GSM 850 MHz Band) – Slide up

Limit of SAR (W/kg)	1 g Average	Power Drift (dB)
	1.6	
Test Case	**Measurement**	
	1 g Average	
Left hand, Touch cheek, High frequency (See Fig.9)	1.09	-0.028
Left hand, Touch cheek, Mid frequency (See Fig.10)	0.843	-0.118
Left hand, Touch cheek, Low frequency (See Fig.11)	0.754	-0.095
Left hand, Tilt 15 Degree, Mid frequency (See Fig.12)	0.449	-0.057

Right hand, Touch cheek, High frequency (See Fig.13)	1.03	-0.125
Right hand, Touch cheek, Mid frequency (See Fig.14)	0.822	0.010
Right hand, Touch cheek, Low frequency (See Fig.15)	0.655	-0.056
Right hand, Tilt 15 Degree, Mid frequency (See Fig.16)	0.407	0.040

Table 9: SAR Values (Body, GSM 850 MHz Band) – Slide down

Limit of SAR (W/kg)	1 g Average 1.6	Power Drift (dB)
Test Case	**Measurement Result (W/kg) 1 g Average**	
Body, Towards Ground, High frequency with GPRS (See Fig.17)	0.901	-0.183
Body, Towards Ground, Mid frequency with GPRS (See Fig.18)	1.01	-0.005
Body, Towards Ground, Low frequency with GPRS (See Fig.19)	1.03	0.055
Body, Towards Ground, Low frequency with EGPRS (See Fig.20)	1.01	-0.026
Body, Towards Ground, Low frequency with Headset (See Fig.21)	0.651	-0.072
Body, Towards Phantom, Low frequency with GPRS (See Fig.22)	0.618	-0.055

Table 10: SAR Values (Head, GSM 1900 MHz Band) – Slide down

Limit of SAR (W/kg)	1 g Average 1.6	Power Drift (dB)
Test Case	**Measurement 1 g Average**	
Left hand, Touch cheek, High frequency (See Fig.23)	1.08	-0.070
Left hand, Touch cheek, Mid frequency (See Fig.24)	1.03	-0.155
Left hand, Touch cheek, Low frequency (See Fig.25)	0.923	-0.011
Left hand, Tilt 15 Degree, Mid frequency (See Fig.26)	0.453	-0.031
Right hand, Touch cheek, High frequency (See Fig.27)	0.689	-0.137
Right hand, Touch cheek, Mid frequency (See Fig.28)	0.673	-0.021
Right hand, Touch cheek, Low frequency (See Fig.29)	0.574	0.126
Right hand, Tilt 15 Degree, Mid frequency (See Fig.30)	0.489	-0.026

Table 11: SAR Values (Head, GSM 1900 MHz Band) – Slide up

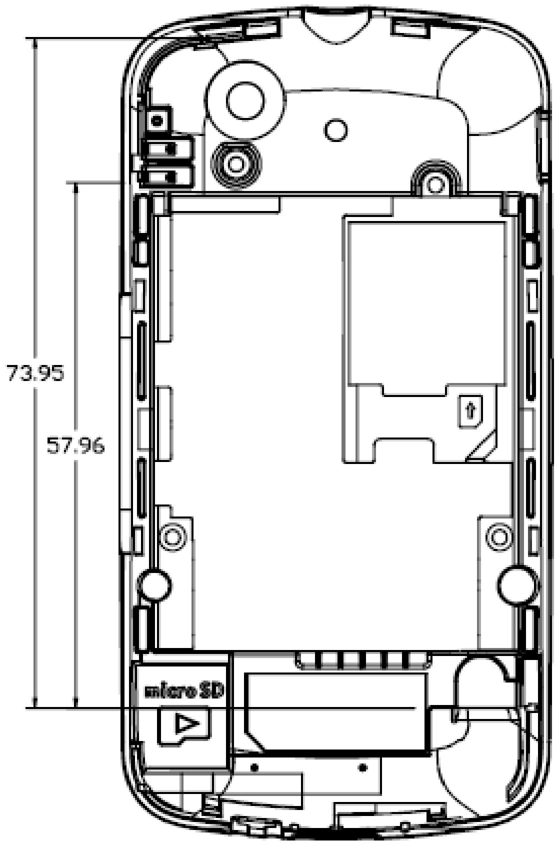
Limit of SAR (W/kg)	1 g Average 1.6	Power Drift (dB)
Test Case	**Measurement 1 g Average**	
Left hand, Touch cheek, Mid frequency (See Fig.31)	0.570	0.034
Left hand, Tilt 15 Degree, Mid frequency (See Fig.32)	0.337	0.003
Right hand, Touch cheek, Mid frequency (See Fig.33)	0.520	-0.197
Right hand, Tilt 15 Degree, Mid frequency (See Fig.34)	0.271	0.049

Table 12: SAR Values (Body, GSM 1900 MHz Band) – Slide down

Limit of SAR (W/kg)	1 g Average 1.6	Power Drift (dB)
Test Case	**Measurement Result (W/kg)** **1 g Average**	
Body, Towards Ground, High frequency with GPRS (See Fig.35)	0.626	-0.041
Body, Towards Ground, Mid frequency with GPRS (See Fig.36)	0.498	-0.006
Body, Towards Ground, Low frequency with GPRS (See Fig.37)	0.444	-0.003
Body, Towards Ground, High frequency with EGPRS (See Fig.38)	0.624	-0.055
Body, Towards Ground, High frequency with Headset (See Fig.39)	0.311	0.027
Body,Towards Phantom, High frequency with GPRS (See Fig.40)	0.423	0.073

7.4 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 3.2mW. According to the output power measurement results 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 are $\leqslant 2P_{Ref}$ and its antenna is $\geqslant$5cm from other antenna.

7.5 Conclusion

Localized Specific Absorption Rate (SAR) of this portable wireless device has been measured in all cases requested by the relevant standards cited in Clause 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.

The maximum SAR values are obtained at the case of **GSM 850 MHz Band, Head, Slide down, Left hand, Touch cheek, Mid frequency (Table 7)**, and the value are: **0.798(10g), 1.2(1g).**

8 Measurement Uncertainty

No.	Error source	Type	Uncertainty Value (%)	Probability Distribution	k	c_i	Standard Uncertainty (%) u_i' (%)	Degree of freedom V_{eff} or v_i
1	System repeatability	A	0.5	N	1	1	0.5	9
	Measurement system							
2	—probe calibration	B	7	N	2	1	3.5	∞
3	—axial isotropy of the probe	B	4.7	R	$\sqrt{3}$	0.5	4.3	∞
4	—hemisphere isotropy of the probe	B	9.4	R	$\sqrt{3}$			
5	—space resolution	B	0	R	$\sqrt{3}$	1	0	∞
6	—boundary effect	B	11.0	R	$\sqrt{3}$	1	6.4	∞
7	—probe linearity	B	4.7	R	$\sqrt{3}$	1	2.7	∞
8	—detection limit	B	1.0	R	$\sqrt{3}$	1	0.6	∞
9	—readout electronics	B	1.0	N	1	1	1.0	∞
10	—RF Ambient Conditions	B	3.0	R	$\sqrt{3}$	1	1.73	∞
11	—Probe Positioner Mechanical Tolerance	B	0.4	R	$\sqrt{3}$	1	0.2	∞
12	— Probe Positioning with respect to Phantom Shell	B	2.9	R	$\sqrt{3}$	1	1.7	∞
13	— Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	B	3.9	R	$\sqrt{3}$	1	2.3	∞
	Test sample Related							

14	—Test Sample Positioning	A	4.9	N	1	1	4.9	5
15	—Device Holder	A	6.1	N	1	1	6.1	5
16	— Output Power Variation - SAR drift measurement	B	5.0	R	$\sqrt{3}$	1	2.9	∞
	Phantom and Tissue Parameters							
17	—Phantom Uncertainty (shape and thickness tolerances)	B	1.0	R	$\sqrt{3}$	1	0.6	∞
18	—liquid conductivity (deviation from target)	B	5.0	R	$\sqrt{3}$	0.6	1.7	∞
19	— liquid conductivity (measurement error)	A	0.23	N	1	1	0.23	9
20	-liquid permittivity (deviation from target)	B	5.0	R	$\sqrt{3}$	0.6	1.7	∞
21	— liquid permittivity (measurement error)	A	0.46	N	1	1	0.46	9
Combined standard uncertainty		$u_c' = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$		/			12.2	88.7
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$		N	k=2		24.4	/

9 MAIN TEST INSTRUMENTS

Table 13: 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.

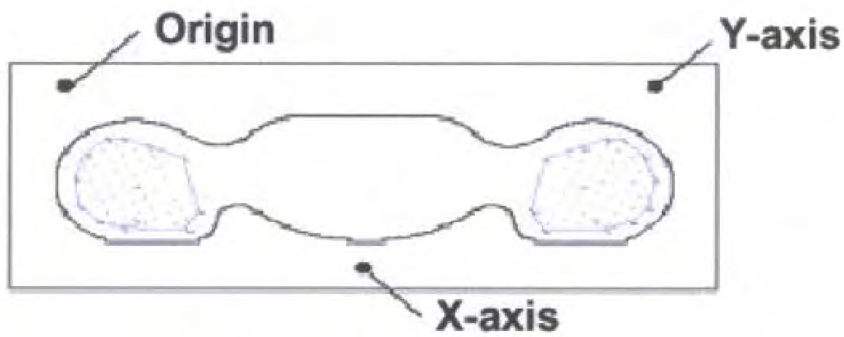
Step 3: Around this point, a volume of 30 mm x 30 mm x 30 mm was assessed by measuring 7 x 7x 7 points. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

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.

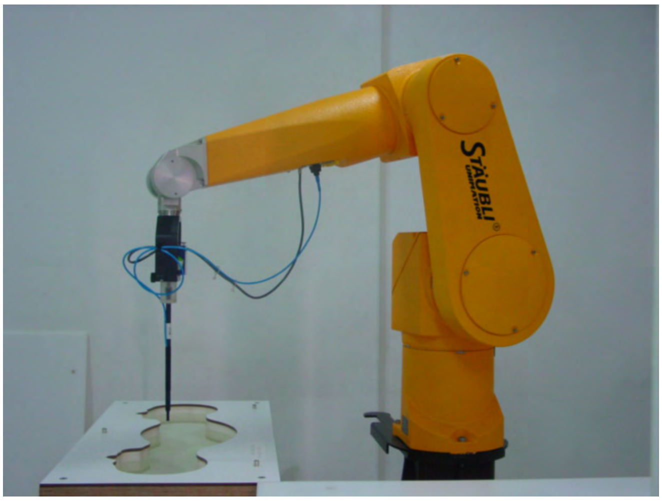
c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

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.

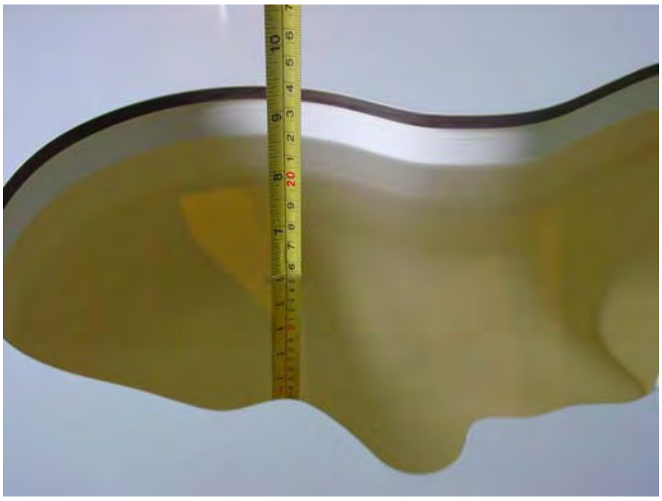


Picture A: SAR Measurement Points in Area Scan

ANNEX B TEST LAYOUT

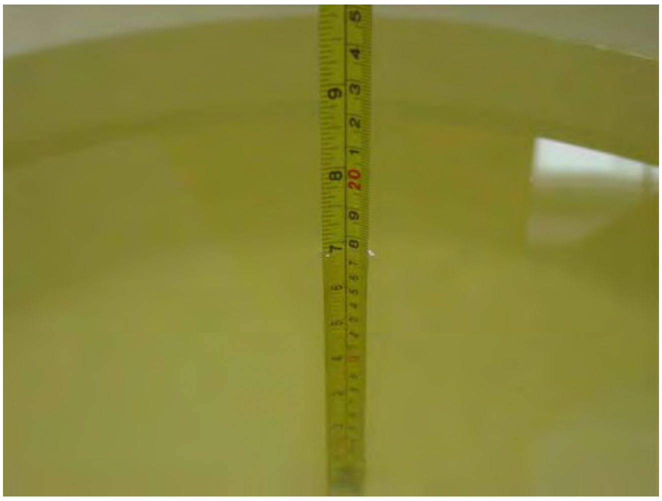


Picture B1: Specific Absorption Rate Test Layout

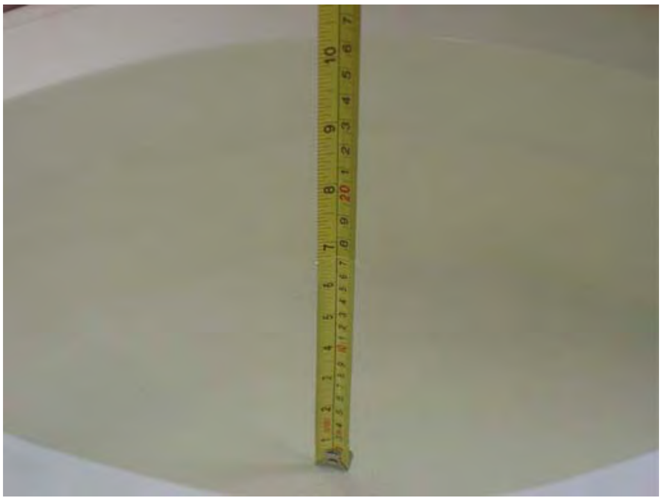


Picture B2: Liquid depth in the Flat Phantom (850 MHz Head)

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



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



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

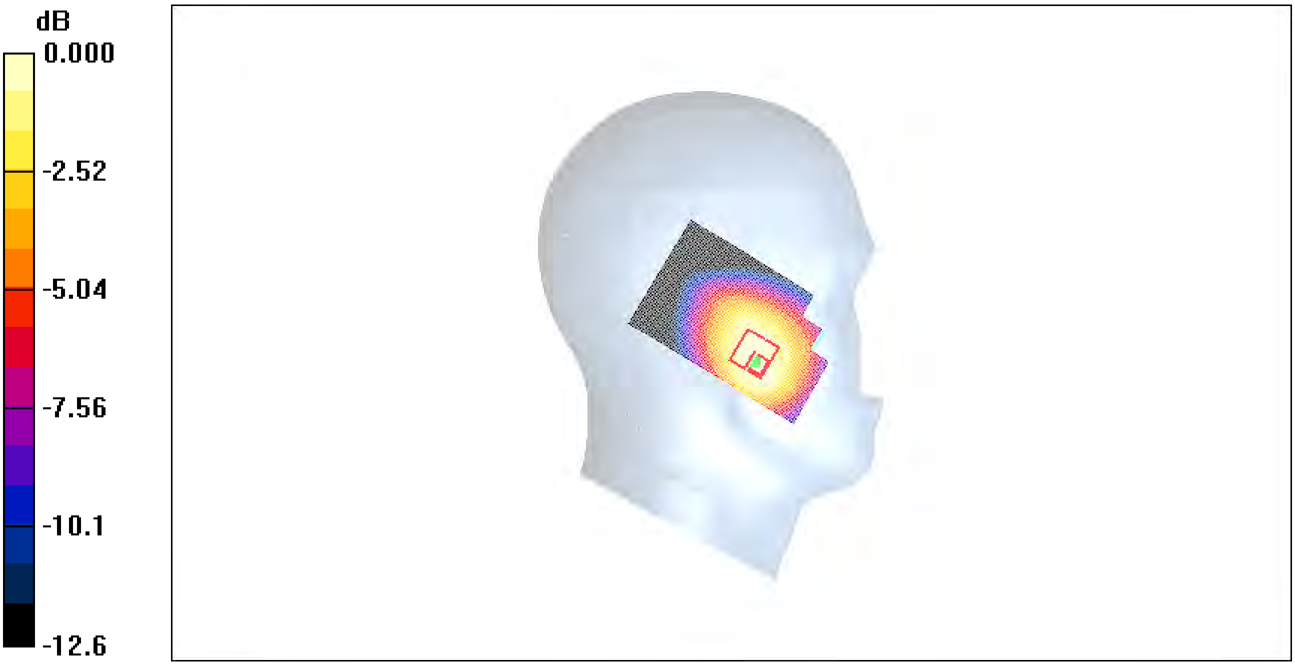
ANNEX C GRAPH RESULTS

850 Left Cheek High – Slide down

Date/Time: 2010-2-3 8:22:14
Electronics: DAE4 Sn771
Medium: 850 HEAD
Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.91 mho/m; εr = 40.3; ρ = 1000 kg/m^3
Ambient Temperature:23.5°C Liqiud 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 (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.26 mW/g

Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.4 V/m; Power Drift = -0.099 dB
Peak SAR (extrapolated) = 1.82 W/kg
SAR(1 g) = 1.17 mW/g; SAR(10 g) = 0.770 mW/g
Maximum value of SAR (measured) = 1.23 mW/g



0 dB = 1.23mW/g

Fig. 1 850MHz CH251 – Slide down

850 Left Cheek Middle – Slide down
Date/Time: 2010-2-3 8:36:25
Electronics: DAE4 Sn771
Medium: 850 HEAD
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.898 mho/m; εr = 40.4; ρ = 1000 kg/m^3
Ambient Temperature:23.5^{o}C Liqiud Temperature: 22.5^{o}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 (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.29 mW/g

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.8 V/m; Power Drift = -0.055 dB
Peak SAR (extrapolated) = 1.85 W/kg
SAR(1 g) = 1.2 mW/g; SAR(10 g) = 0.798 mW/g
Maximum value of SAR (measured) = 1.29 mW/g

0 dB = 1.29mW/g

Fig. 2 850 MHz CH190 – Slide down

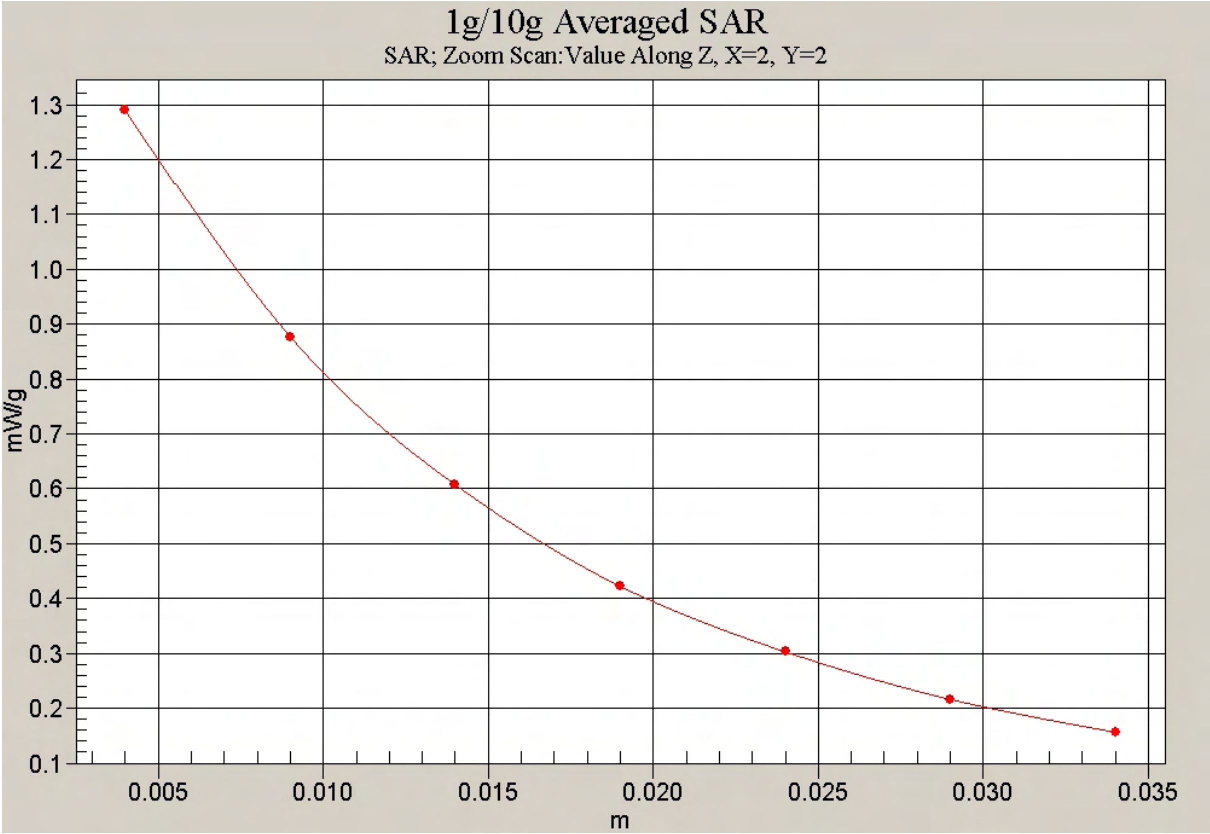


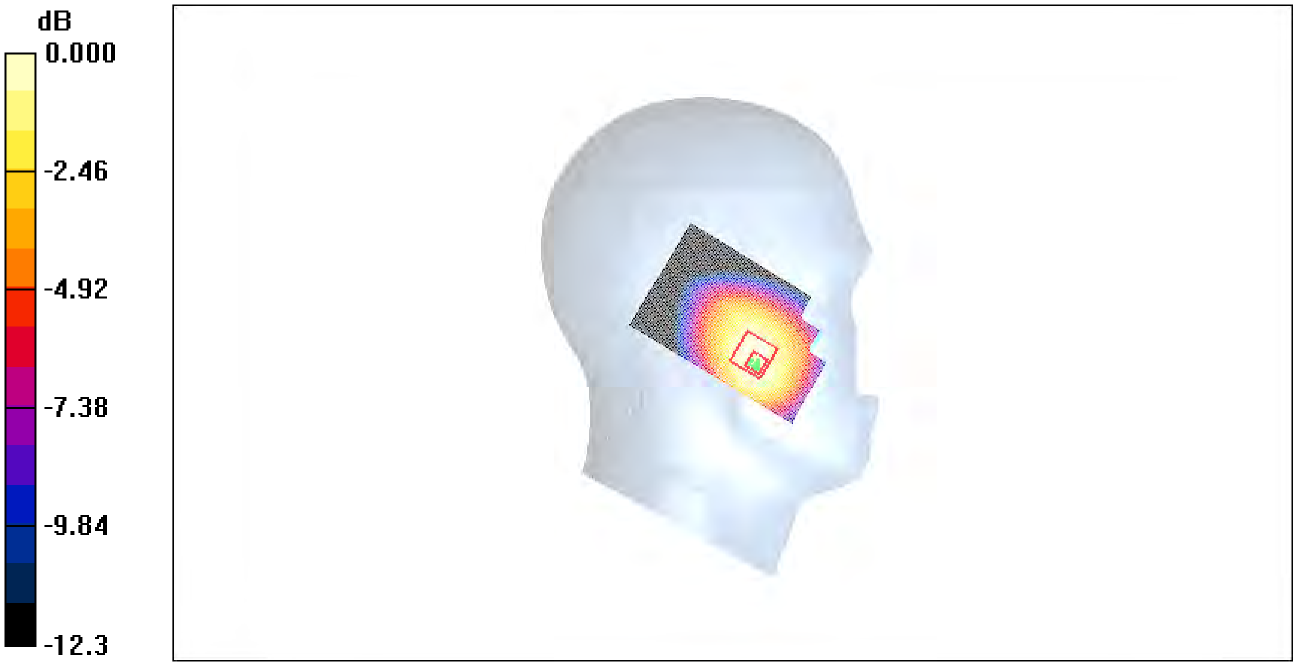
Fig.2-1 Z-Scan at power reference point (850 MHz CH190) – Slide down

850 Left Cheek Low – Slide down

Date/Time: 2010-2-3 8:50:39
Electronics: DAE4 Sn771
Medium: 850 HEAD
Medium parameters used: f = 825 MHz; σ = 0.886 mho/m; εr = 40.4; ρ = 1000 kg/m^3
Ambient Temperature:23.5^oC Liqiud Temperature: 22.5^oC
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 (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.02 mW/g

Cheek Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.8 V/m; Power Drift = -0.024 dB
Peak SAR (extrapolated) = 1.43 W/kg
SAR(1 g) = 0.955 mW/g; SAR(10 g) = 0.643 mW/g
Maximum value of SAR (measured) = 1.02 mW/g



0 dB = 1.02mW/g

Fig. 3 850 MHz CH128 – Slide down

850 Left Tilt Middle – Slide down
Date/Time: 2010-2-3 9:04:51
Electronics: DAE4 Sn771
Medium: 850 HEAD
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.898 mho/m; εr = 40.4; ρ = 1000 kg/m^3
Ambient Temperature:23.5^{o}C Liqiud Temperature: 22.5^{o}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 (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.476 mW/g

Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.8 V/m; Power Drift = 0.007 dB
Peak SAR (extrapolated) = 0.591 W/kg
SAR(1 g) = 0.453 mW/g; SAR(10 g) = 0.329 mW/g
Maximum value of SAR (measured) = 0.481 mW/g

0 dB = 0.481mW/g

Fig. 4 850 MHz CH190 – Slide down

850 Right Cheek High – Slide down

Date/Time: 2010-2-3 9:19:08
Electronics: DAE4 Sn771
Medium: 850 HEAD
Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.91 mho/m; εr = 40.3; ρ = 1000 kg/m^3
Ambient Temperature:23.5°C Liqiud 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 (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.02 mW/g

Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.8 V/m; Power Drift = -0.187 dB
Peak SAR (extrapolated) = 1.30 W/kg
SAR(1 g) = 0.923 mW/g; SAR(10 g) = 0.646 mW/g
Maximum value of SAR (measured) = 0.978 mW/g

0 dB = 0.978mW/g

Fig. 5 850MHz CH251 – Slide down

850 Right Cheek Middle – Slide down

Date/Time: 2010-2-3 9:34:11
Electronics: DAE4 Sn771
Medium: 850 HEAD
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.898 mho/m; εr = 40.4; ρ = 1000 kg/m^3
Ambient Temperature:23.5^{o}C Liqiud Temperature: 22.5^{o}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 (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.12 mW/g

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.0 V/m; Power Drift = -0.145 dB
Peak SAR (extrapolated) = 1.38 W/kg
SAR(1 g) = 0.995 mW/g; SAR(10 g) = 0.706 mW/g
Maximum value of SAR (measured) = 1.05 mW/g

0 dB = 1.05mW/g

Fig. 6 850 MHz CH190 – Slide down

850 Right Cheek Low – Slide down

Date/Time: 2010-2-3 9:48:27
Electronics: DAE4 Sn771
Medium: 850 HEAD
Medium parameters used: f = 825 MHz; σ = 0.886 mho/m; εr = 40.4; ρ = 1000 kg/m^3
Ambient Temperature:23.5^{o}C   Liqiud Temperature: 22.5^{o}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 (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.809 mW/g

Cheek Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.0 V/m; Power Drift = -0.122 dB
Peak SAR (extrapolated) = 1.04 W/kg
SAR(1 g) = 0.746 mW/g; SAR(10 g) = 0.527 mW/g
Maximum value of SAR (measured) = 0.793 mW/g

0 dB = 0.793mW/g

Fig. 7 850 MHz CH128 – Slide down

850 Right Tilt Middle – Slide down

Date/Time: 2010-2-3 10:02:41
Electronics: DAE4 Sn771
Medium: 850 HEAD
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.898 mho/m; εr = 40.4; ρ = 1000 kg/m^3
Ambient Temperature:23.5°C   Liqiud 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 (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.541 mW/g

Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.7 V/m; Power Drift = -0.105 dB
Peak SAR (extrapolated) = 0.653 W/kg
SAR(1 g) = 0.505 mW/g; SAR(10 g) = 0.369 mW/g
Maximum value of SAR (measured) = 0.536 mW/g

0 dB = 0.536mW/g

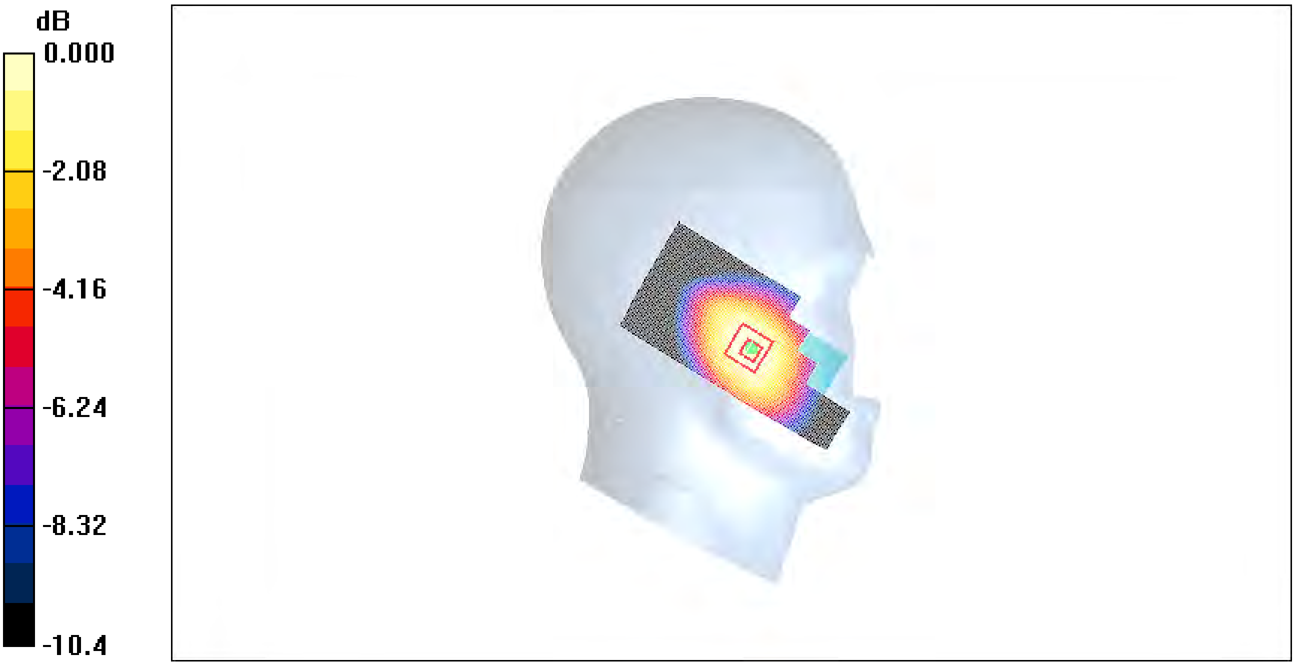
Fig. 8 850 MHz CH190 – Slide down

850 Left Cheek High – Slide up

Date/Time: 2010-2-3 10:17:58
Electronics: DAE4 Sn771
Medium: 850 HEAD
Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.91 mho/m; εr = 40.3; ρ = 1000 kg/m^3
Ambient Temperature:23.5^{o}C   Liqiud Temperature: 22.5^{o}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 (51x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.16 mW/g

Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.9 V/m; Power Drift = -0.028 dB
Peak SAR (extrapolated) = 1.47 W/kg
SAR(1 g) = 1.09 mW/g; SAR(10 g) = 0.775 mW/g
Maximum value of SAR (measured) = 1.16 mW/g



0 dB = 1.16mW/g

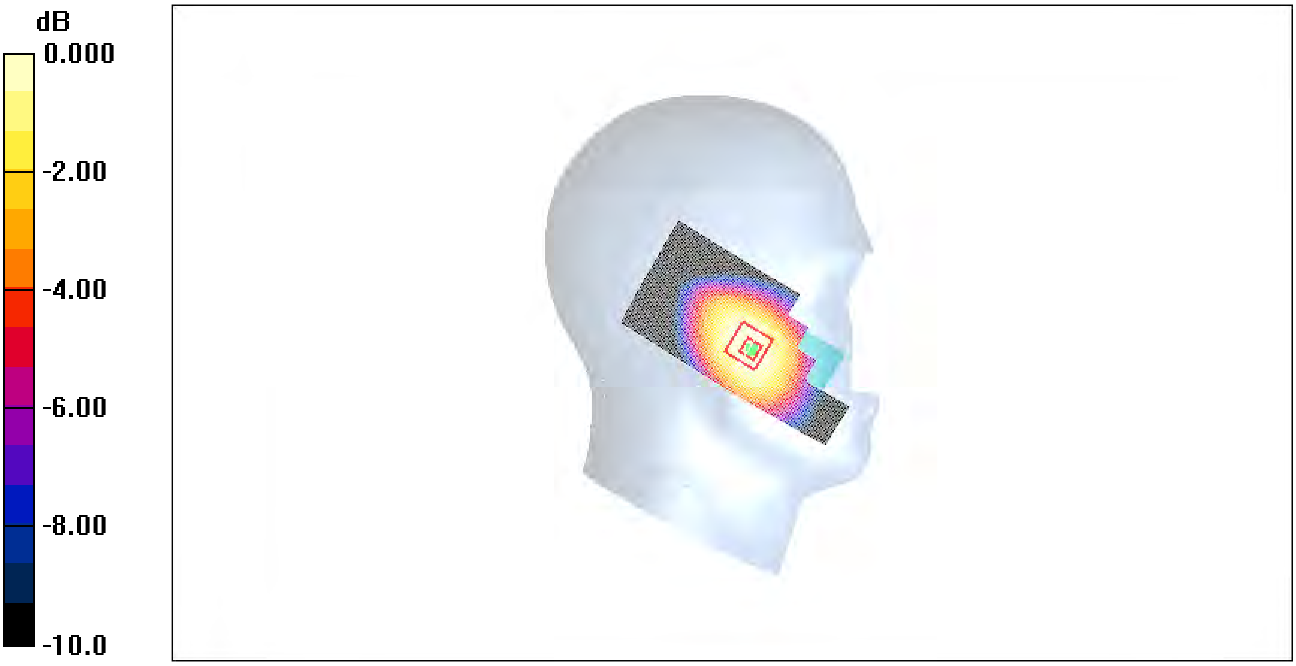
Fig. 9 850MHz CH251 – Slide up

850 Left Cheek Middle – Slide up

Date/Time: 2010-2-3 10:32:11
Electronics: DAE4 Sn771
Medium: 850 HEAD
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.898 mho/m; εr = 40.4; ρ = 1000 kg/m^3
Ambient Temperature:23.5°C   Liqiud 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 (51x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.926 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 = -0.118 dB
Peak SAR (extrapolated) = 1.09 W/kg
SAR(1 g) = 0.843 mW/g; SAR(10 g) = 0.612 mW/g
Maximum value of SAR (measured) = 0.884 mW/g



0 dB = 0.884mW/g

Fig. 10 850 MHz CH190 – Slide up

850 Left Cheek Low – Slide up

Date/Time: 2010-2-3 10:46:19

Electronics: DAE4 Sn771

Medium: 850 HEAD

Medium parameters used: f = 825 MHz; σ = 0.886 mho/m; εr = 40.4; ρ = 1000 kg/m^3

Ambient Temperature:23.5°C Liqiud 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 (51x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.804 mW/g

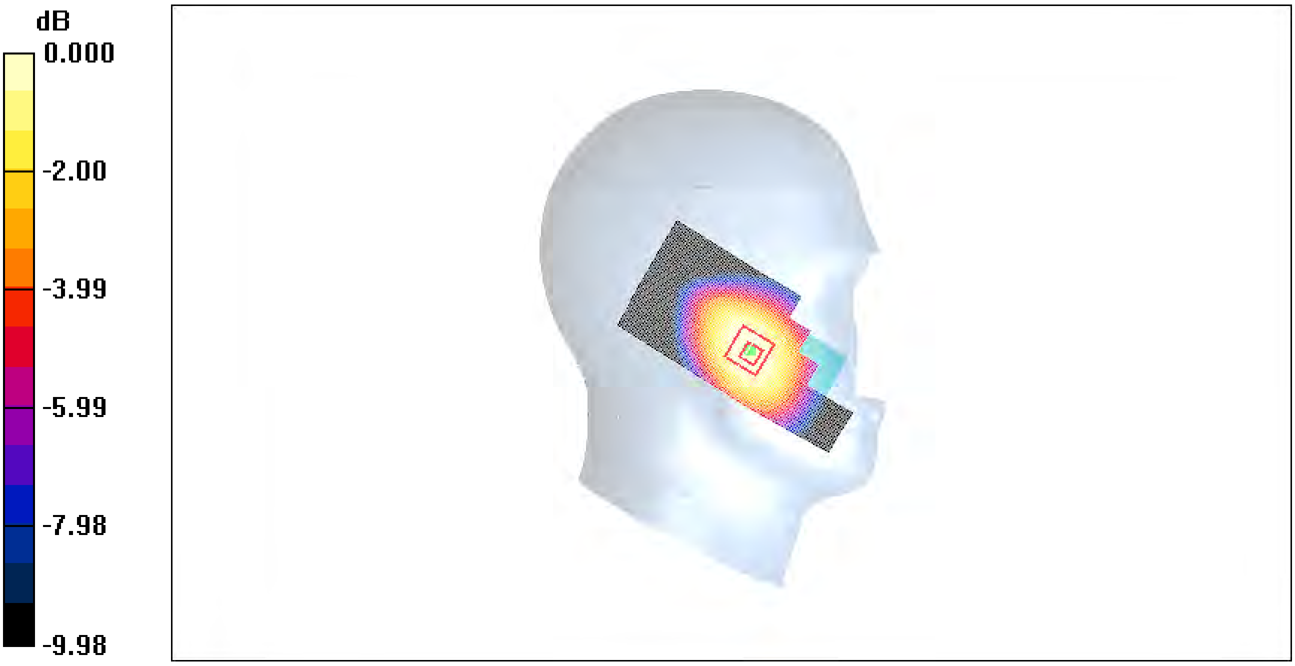
Cheek Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.59 V/m; Power Drift = -0.095 dB

Peak SAR (extrapolated) = 1.01 W/kg

SAR(1 g) = 0.754 mW/g; SAR(10 g) = 0.539 mW/g

Maximum value of SAR (measured) = 0.798 mW/g



0 dB = 0.798mW/g

Fig. 11 850 MHz CH128 – Slide up

850 Left Tilt Middle – Slide up

Date/Time: 2010-2-3 11:00:35

Electronics: DAE4 Sn771

Medium: 850 HEAD

Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.898 mho/m; εr = 40.4; ρ = 1000 kg/m^3

Ambient Temperature:23.5^{o}C Liqiud Temperature: 22.5^{o}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 (51x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.473 mW/g

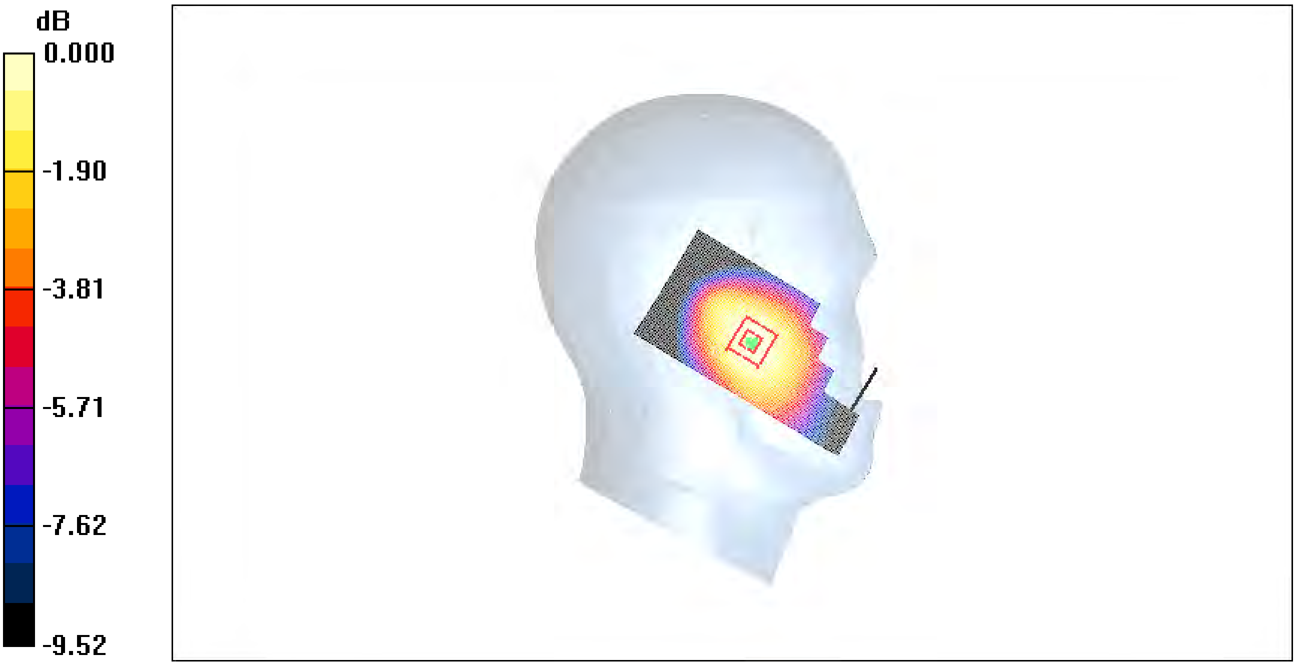
Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.3 V/m; Power Drift = -0.057 dB

Peak SAR (extrapolated) = 0.580 W/kg

SAR(1 g) = 0.449 mW/g; SAR(10 g) = 0.329 mW/g

Maximum value of SAR (measured) = 0.467 mW/g



0 dB = 0.467mW/g

Fig. 12 850 MHz CH190 – Slide up

850 Right Cheek High – Slide up

Date/Time: 2010-2-3 11:14:54
Electronics: DAE4 Sn771
Medium: 850 HEAD
Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.91 mho/m; εr = 40.3; ρ = 1000 kg/m^3
Ambient Temperature:23.5^{o}C Liqiud Temperature: 22.5^{o}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 (51x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.11 mW/g

Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.4 V/m; Power Drift = -0.125 dB
Peak SAR (extrapolated) = 1.35 W/kg
SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.739 mW/g
Maximum value of SAR (measured) = 1.08 mW/g

0 dB = 1.08mW/g

Fig. 13 850MHz CH251 – Slide up

850 Right Cheek Middle – Slide up
Date/Time: 2010-2-3 11:29:06
Electronics: DAE4 Sn771
Medium: 850 HEAD
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.898 mho/m; εr = 40.4; ρ = 1000 kg/m^3
Ambient Temperature:23.5°C Liqiud 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 (51x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.868 mW/g

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.95 V/m; Power Drift = 0.010 dB
Peak SAR (extrapolated) = 1.10 W/kg
SAR(1 g) = 0.822 mW/g; SAR(10 g) = 0.591 mW/g
Maximum value of SAR (measured) = 0.875 mW/g

0 dB = 0.875mW/g

Fig. 14 850 MHz CH190 – Slide up

850 Right Cheek Low – Slide up

Date/Time: 2010-2-3 11:43:21
Electronics: DAE4 Sn771
Medium: 850 HEAD
Medium parameters used: f = 825 MHz; σ = 0.886 mho/m; εr = 40.4; ρ = 1000 kg/m^3
Ambient Temperature:23.5^{o}C Liqiud Temperature: 22.5^{o}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 (51x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.710 mW/g

Cheek Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.2 V/m; Power Drift = -0.056 dB
Peak SAR (extrapolated) = 0.854 W/kg
SAR(1 g) = 0.655 mW/g; SAR(10 g) = 0.476 mW/g
Maximum value of SAR (measured) = 0.692 mW/g

0 dB = 0.692mW/g

Fig. 15 850 MHz CH128 – Slide up

850 Right Tilt Middle – Slide up

Date/Time: 2010-2-3 11:57:33
Electronics: DAE4 Sn771
Medium: 850 HEAD
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.898 mho/m; εr = 40.4; ρ = 1000 kg/m^3
Ambient Temperature:23.5°C Liqiud 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 (51x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.436 mW/g

Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.0 V/m; Power Drift = 0.040 dB
Peak SAR (extrapolated) = 0.521 W/kg
SAR(1 g) = 0.407 mW/g; SAR(10 g) = 0.299 mW/g
Maximum value of SAR (measured) = 0.430 mW/g

0 dB = 0.430mW/g

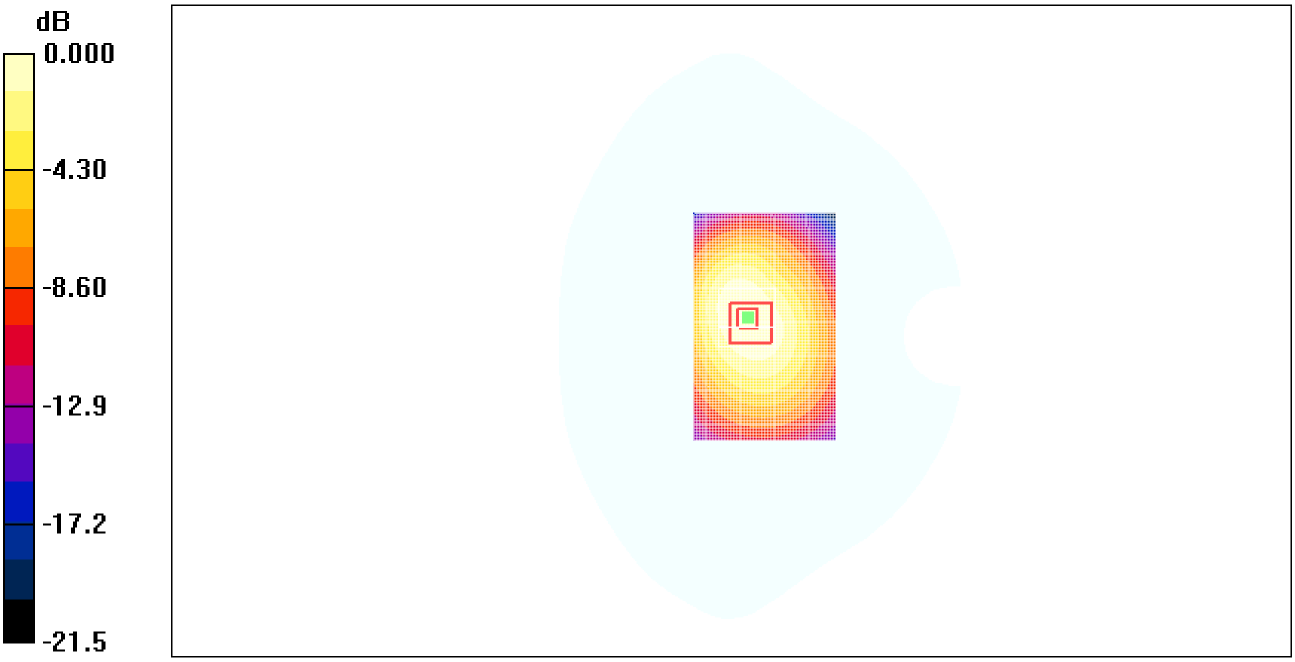
Fig. 16 850 MHz CH190 – Slide up

850 Body Towards Ground High with GPRS – Slide down

Date/Time: 2010-2-3 13:34:02
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/m^3
Ambient Temperature:23.5°C Liqiud Temperature: 22.5°C
Communication System: GSM 850 GPRS Frequency: 848.8 MHz Duty Cycle: 1:4
Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

Toward Ground High/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.966 mW/g

Toward Ground High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 30.4 V/m; Power Drift = -0.183 dB
Peak SAR (extrapolated) = 1.29 W/kg
SAR(1 g) = 0.901 mW/g; SAR(10 g) = 0.608 mW/g
Maximum value of SAR (measured) = 0.930 mW/g



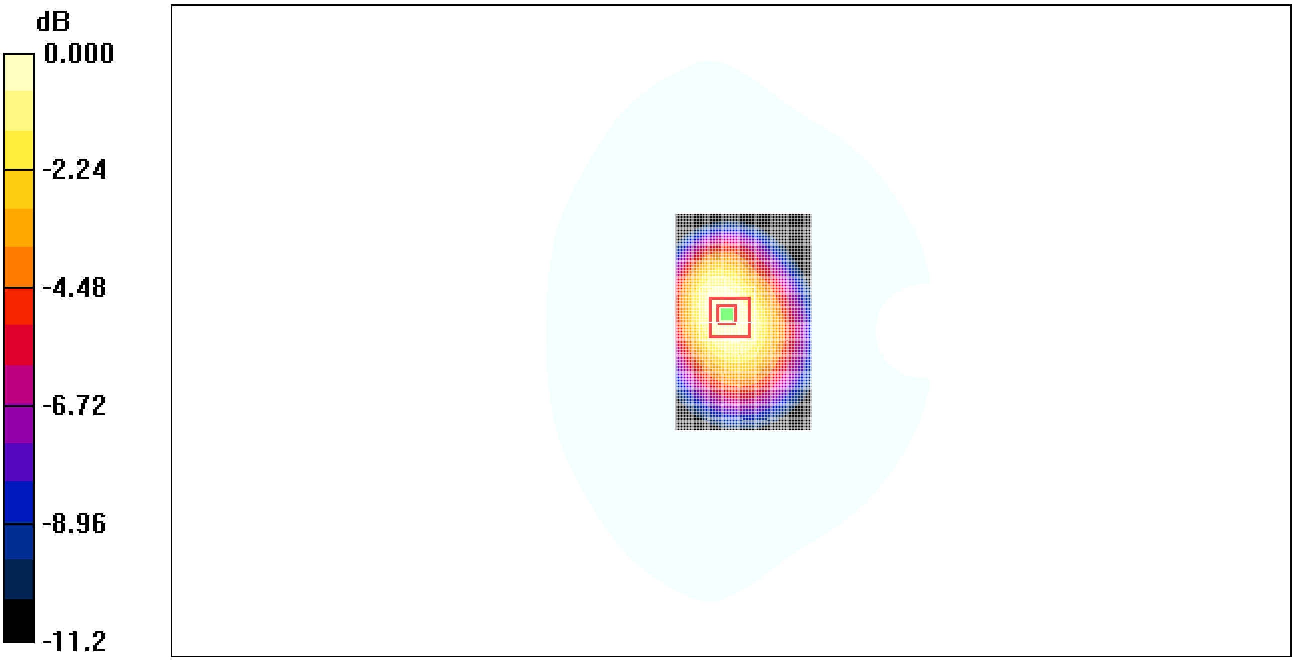
0 dB = 0.930mW/g

Fig. 17 850 MHz CH251 – Slide down

850 Body Towards Ground Middle with GPRS – Slide down
Date/Time: 2010-2-3 13:49:17
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/m^3
Ambient Temperature:23.5°C Liqiud Temperature: 22.5°C
Communication System: GSM 850 GPRS Frequency: 836.6 MHz Duty Cycle: 1:4
Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

Toward Ground Middle/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.08 mW/g

Toward Ground Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 31.7 V/m; Power Drift = -0.005 dB
Peak SAR (extrapolated) = 1.42 W/kg
SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.684 mW/g
Maximum value of SAR (measured) = 1.04 mW/g



0 dB = 1.04mW/g

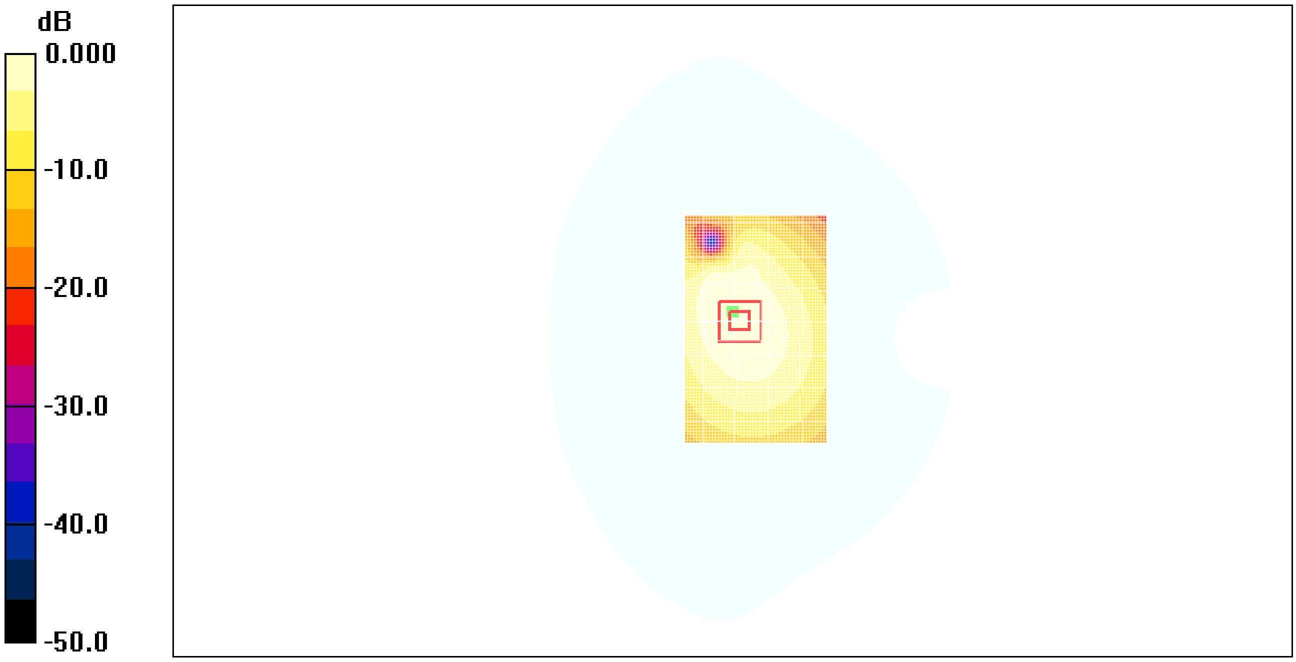
Fig. 18 850 MHz CH190 – Slide down

850 Body Towards Ground Low with GPRS – Slide down

Date/Time: 2010-2-3 14:04:30
Electronics: DAE4 Sn771
Medium: 850 Body
Medium parameters used (interpolated): f = 825 MHz; σ = 0.933 mho/m; εr = 54.3; ρ = 1000 kg/m^3
Ambient Temperature:23.5°C Liqiud Temperature: 22.5°C
Communication System: GSM 850 GPRS Frequency: 824.2 MHz Duty Cycle: 1:4
Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

Toward Ground Low/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.15 mW/g

Toward Ground Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 32.0 V/m; Power Drift = 0.055 dB
Peak SAR (extrapolated) = 1.69 W/kg
SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.701 mW/g
Maximum value of SAR (measured) = 1.12 mW/g



0 dB = 1.12mW/g

Fig. 19 850 MHz CH128 – Slide down

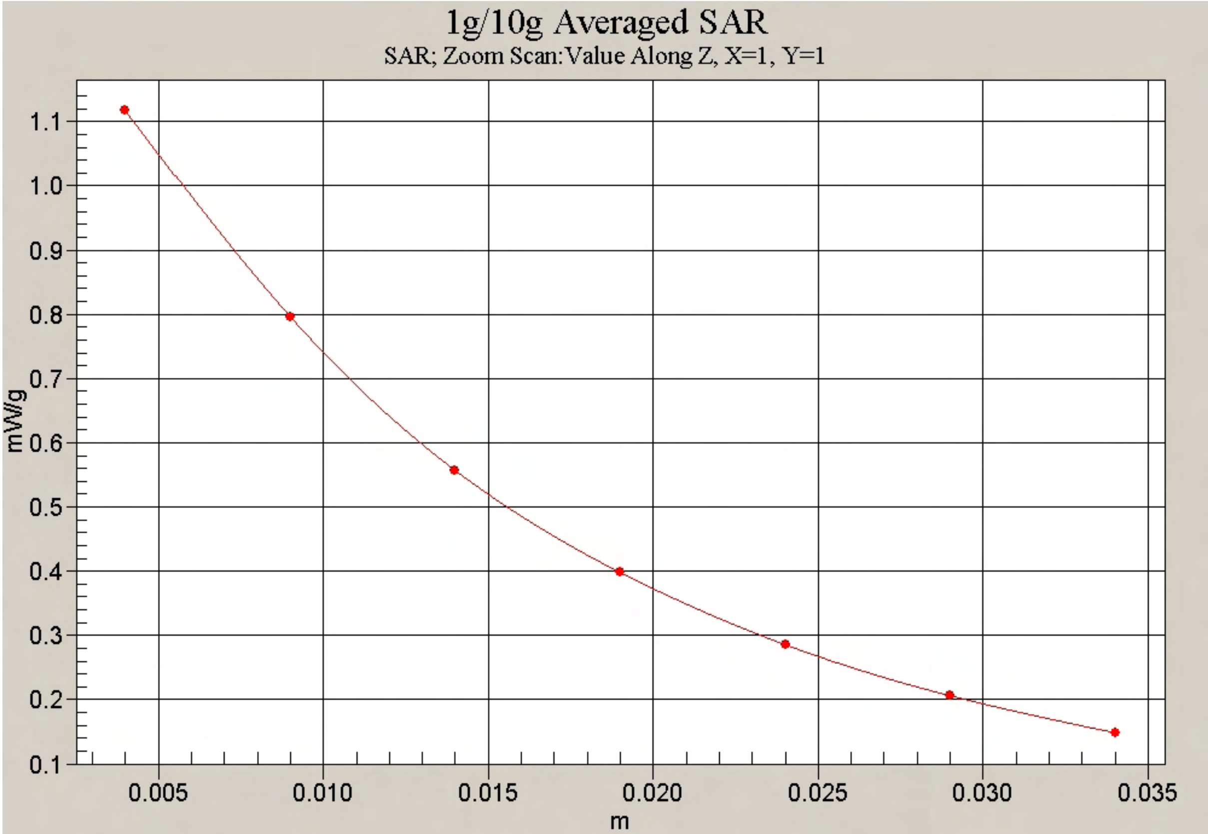


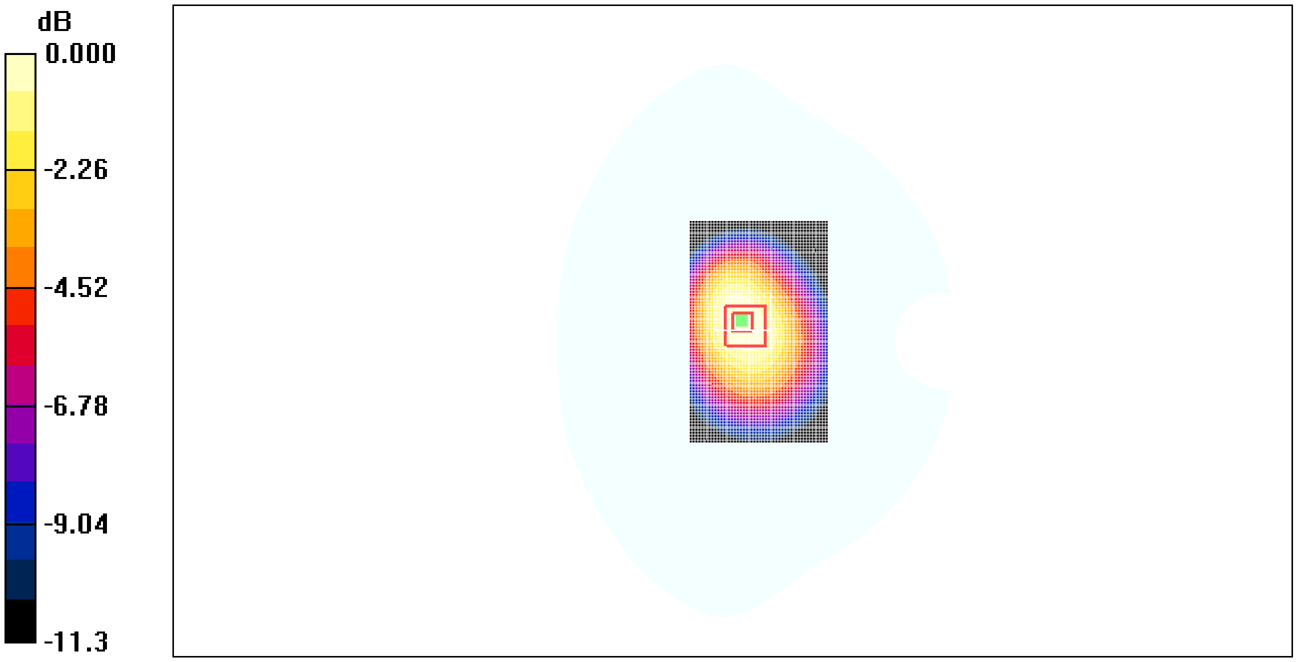
Fig. 19-1 Z-Scan at power reference point (850 MHz CH128) – Slide down

850 Body Towards Ground Low with EGPRS – Slide down

Date/Time: 2010-2-3 14:22:37
Electronics: DAE4 Sn771
Medium: 850 Body
Medium parameters used (interpolated): f = 825 MHz; σ = 0.933 mho/m; εr = 54.3; ρ = 1000 kg/m^3
Ambient Temperature:23.5°C   Liqiud Temperature: 22.5°C
Communication System: GSM 850 EGPRS Frequency: 824.2 MHz Duty Cycle: 1:4
Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

Toward Ground Low/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.08 mW/g

Toward Ground Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 31.1 V/m; Power Drift = -0.026 dB
Peak SAR (extrapolated) = 1.51 W/kg
SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.697 mW/g
Maximum value of SAR (measured) = 1.04 mW/g



0 dB = 1.04mW/g

Fig. 20 850 MHz CH128 – Slide down

850 Body Towards Ground Low with Headset – Slide down

Date/Time: 2010-2-3 14:40:25

Electronics: DAE4 Sn771

Medium: 850 Body

Medium parameters used (interpolated): f = 825 MHz; σ = 0.933 mho/m; εr = 54.3; ρ = 1000 kg/m^3

Ambient Temperature:23.5°C Liqiud Temperature: 22.5°C

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

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

Toward Ground Low/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.706 mW/g

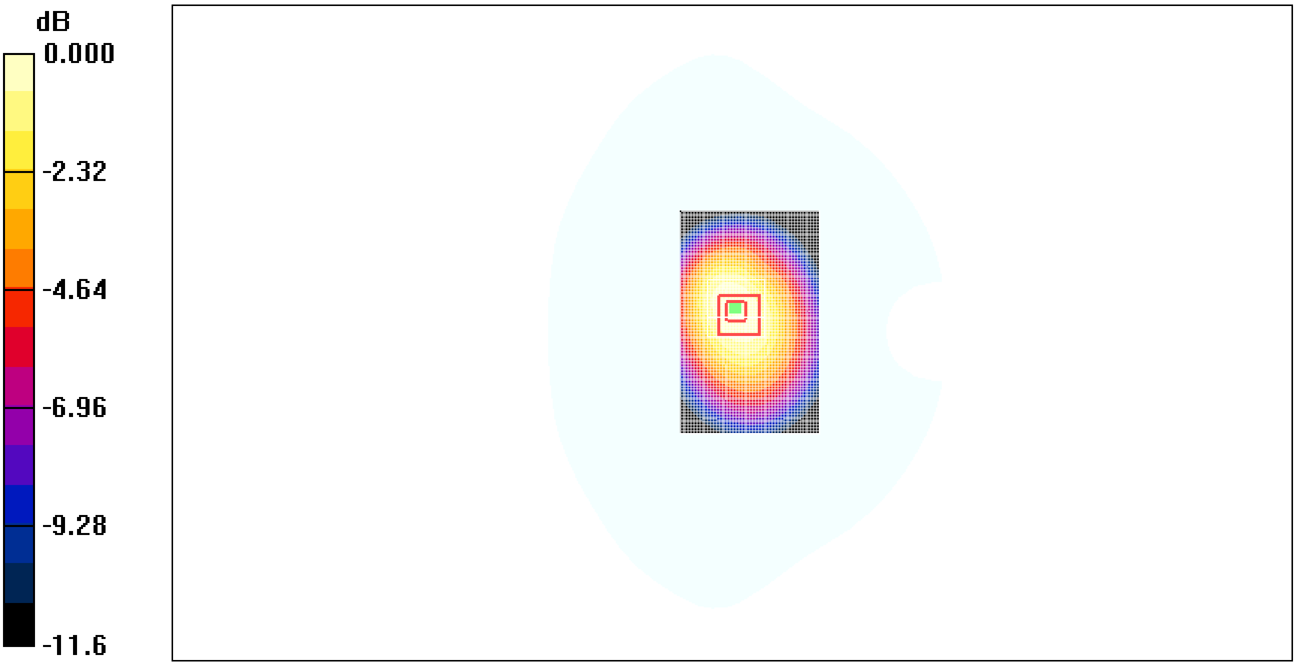
Toward Ground Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 25.6 V/m; Power Drift = -0.072 dB

Peak SAR (extrapolated) = 0.931 W/kg

SAR(1 g) = 0.651 mW/g; SAR(10 g) = 0.440 mW/g

Maximum value of SAR (measured) = 0.676 mW/g



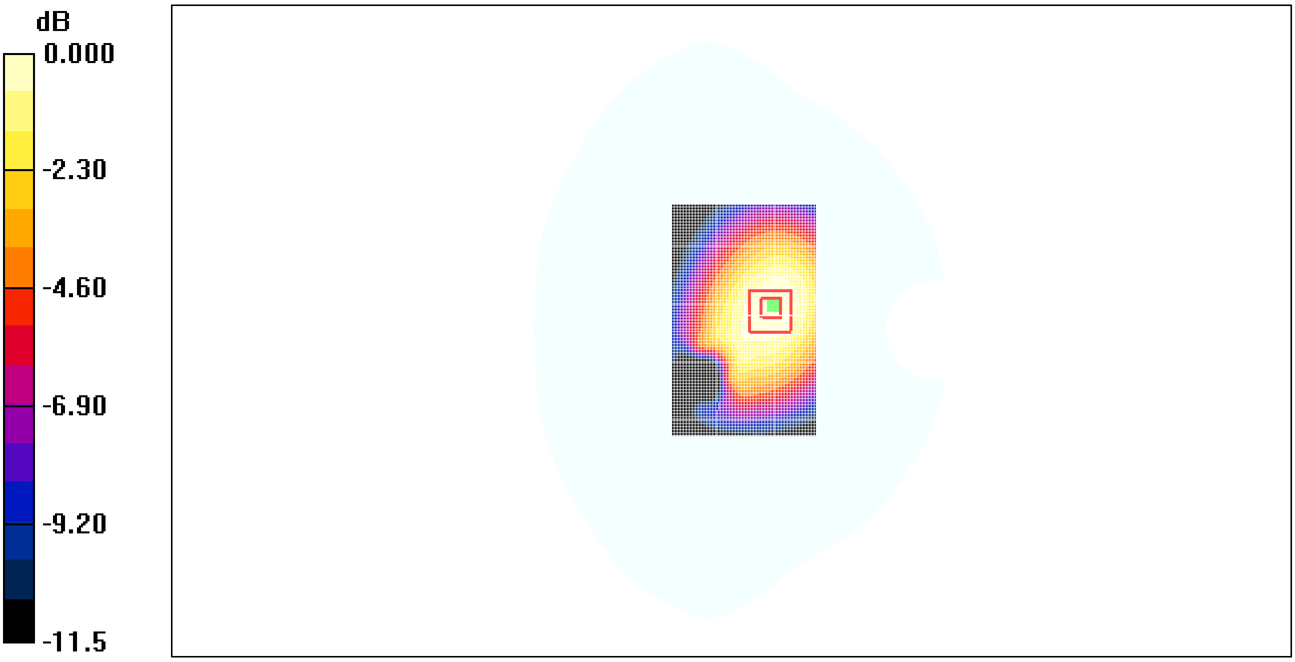
0 dB = 0.676mW/g

Fig. 21 850 MHz CH128 – Slide down

850 Body Towards Phantom Low with GPRS – Slide down
Date/Time: 2010-2-3 14:59:03
Electronics: DAE4 Sn771
Medium: 850 Body
Medium parameters used: f = 825 MHz; σ = 0.933 mho/m; εr = 54.3; ρ = 1000 kg/m^3
Ambient Temperature:23.5^{o}C   Liqiud Temperature: 22.5^{o}C
Communication System: GSM 850 GPRS Frequency: 824.2 MHz Duty Cycle: 1:4
Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

Toward Phantom Low/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.657 mW/g

Toward Phantom Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 22.7 V/m; Power Drift = -0.055 dB
Peak SAR (extrapolated) = 0.844 W/kg
SAR(1 g) = 0.618 mW/g; SAR(10 g) = 0.435 mW/g
Maximum value of SAR (measured) = 0.643 mW/g



0 dB = 0.643mW/g

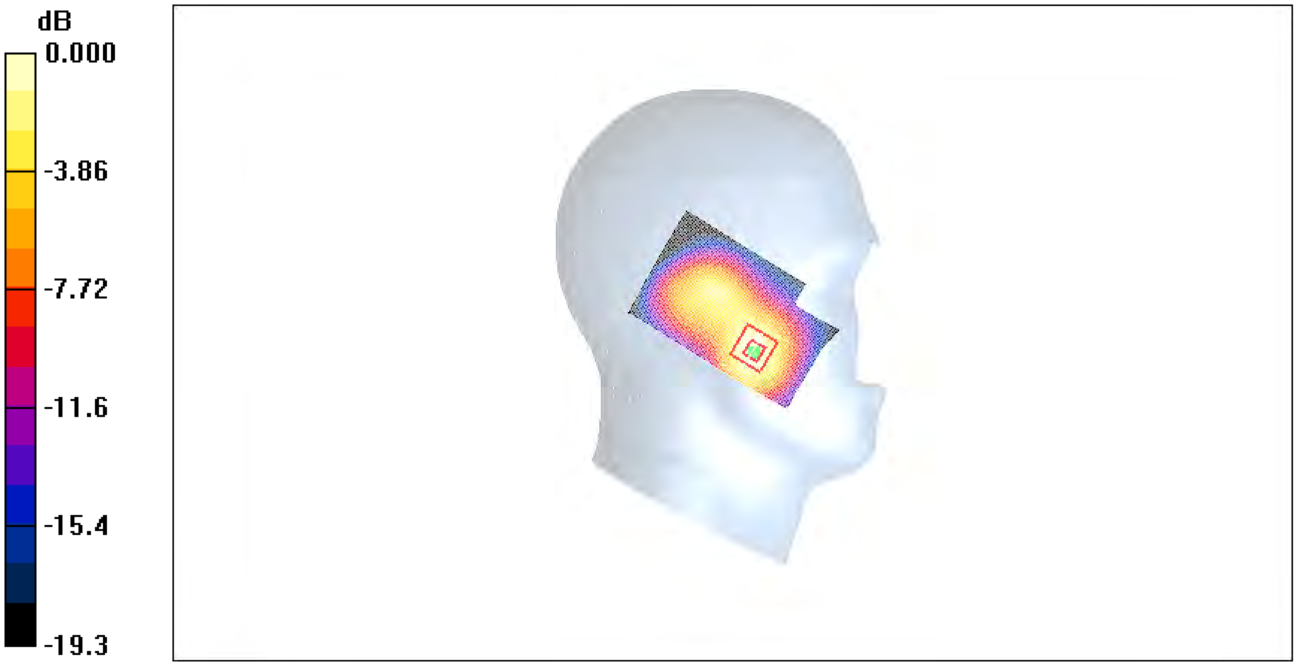
Fig. 22 850 MHz CH128 – Slide down

1900 Left Cheek High – Slide down

Date/Time: 2010-2-4 8:13:17
Electronics: DAE4 Sn771
Medium: Head 1900 MHz
Medium parameters used: f = 1910 MHz; σ = 1.42 mho/m; εr = 39.0; ρ = 1000 kg/m^3
Ambient Temperature:23.5°C   Liqiud Temperature: 22.5°C
Communication System: GSM 1900MHz new Frequency: 1909.8 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

Cheek High/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.26 mW/g

Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.2 V/m; Power Drift = -0.070 dB
Peak SAR (extrapolated) = 1.73 W/kg
SAR(1 g) = 1.08 mW/g; SAR(10 g) = 0.622 mW/g
Maximum value of SAR (measured) = 1.18 mW/g



0 dB = 1.18mW/g

Fig. 23 1900 MHz CH810 – Slide down

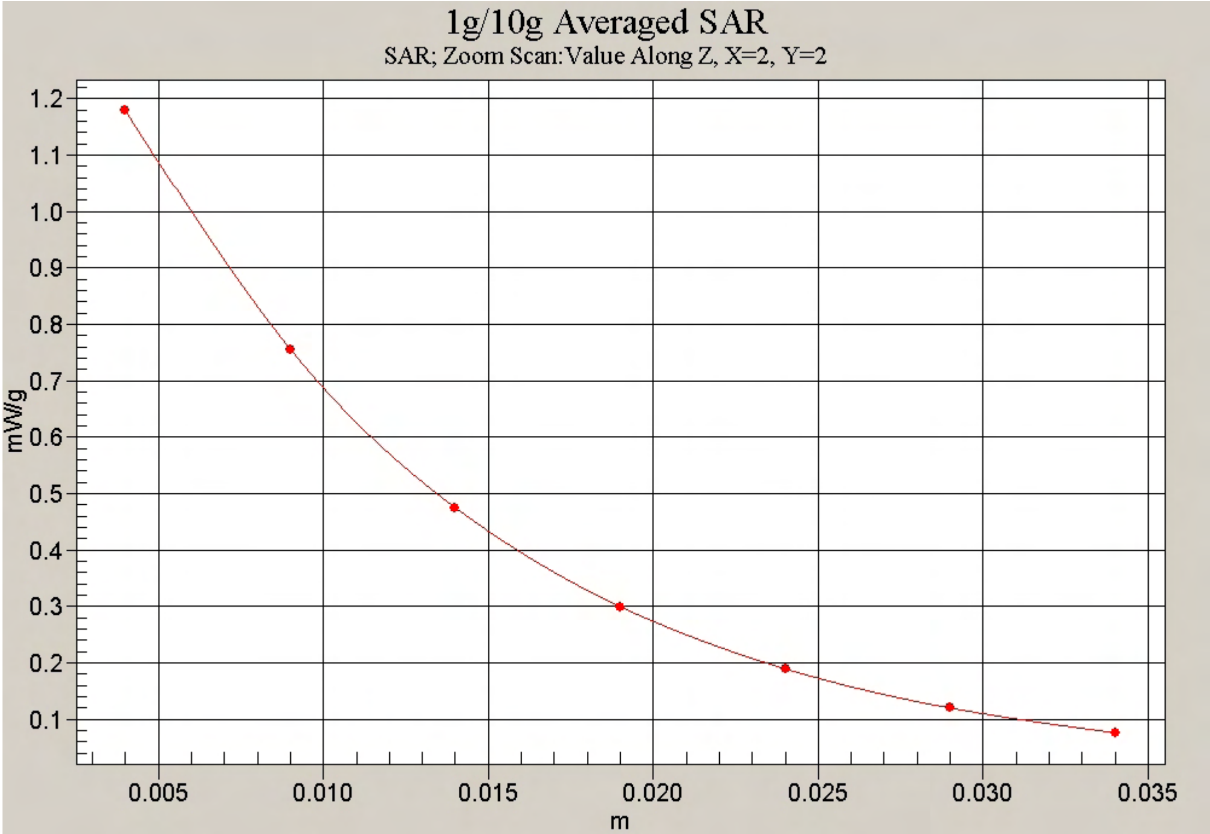
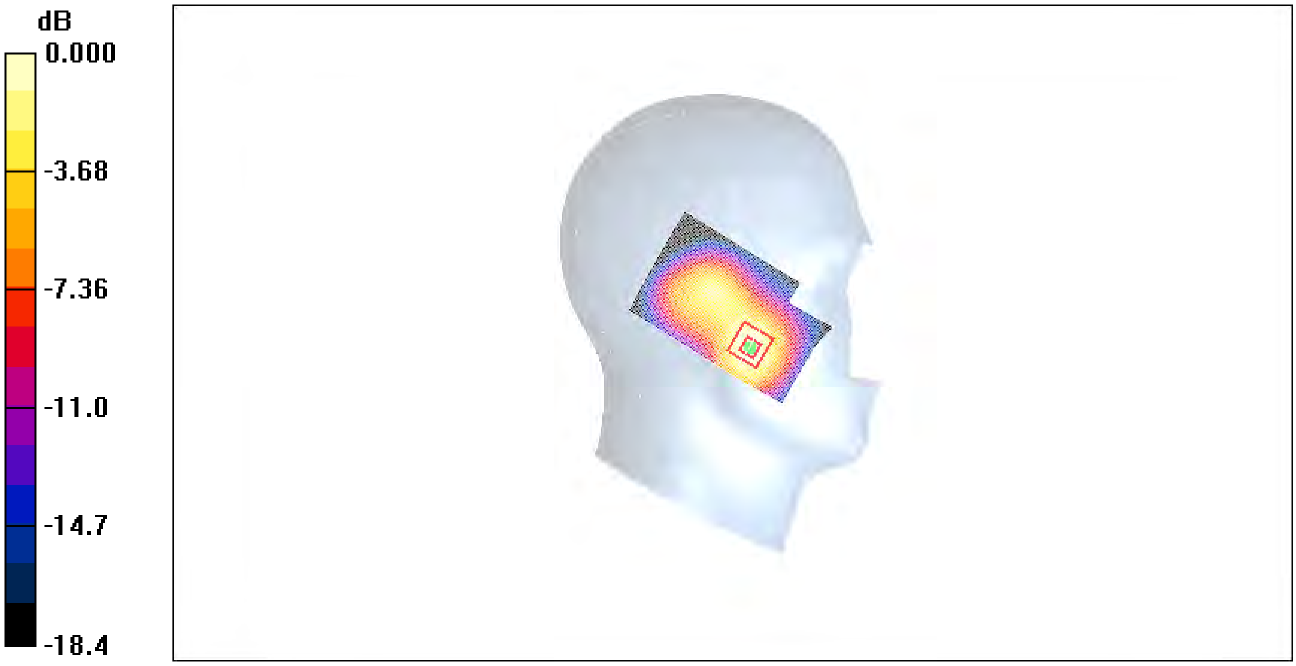


Fig. 23-1 Z-Scan at power reference point (1900 MHz CH810) – Slide down

1900 Left Cheek Middle – Slide down
Date/Time: 2010-2-4 8:27:38
Electronics: DAE4 Sn771
Medium: Head 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.40 mho/m; εr = 39.1; ρ = 1000 kg/m^3
Ambient Temperature:23.5°C Liqiud Temperature: 22.5°C
Communication System: GSM 1900MHz new Frequency: 1880 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

Cheek Middle/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.20 mW/g

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.9 V/m; Power Drift = -0.155 dB
Peak SAR (extrapolated) = 1.62 W/kg
SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.597 mW/g
Maximum value of SAR (measured) = 1.13 mW/g



0 dB = 1.13mW/g

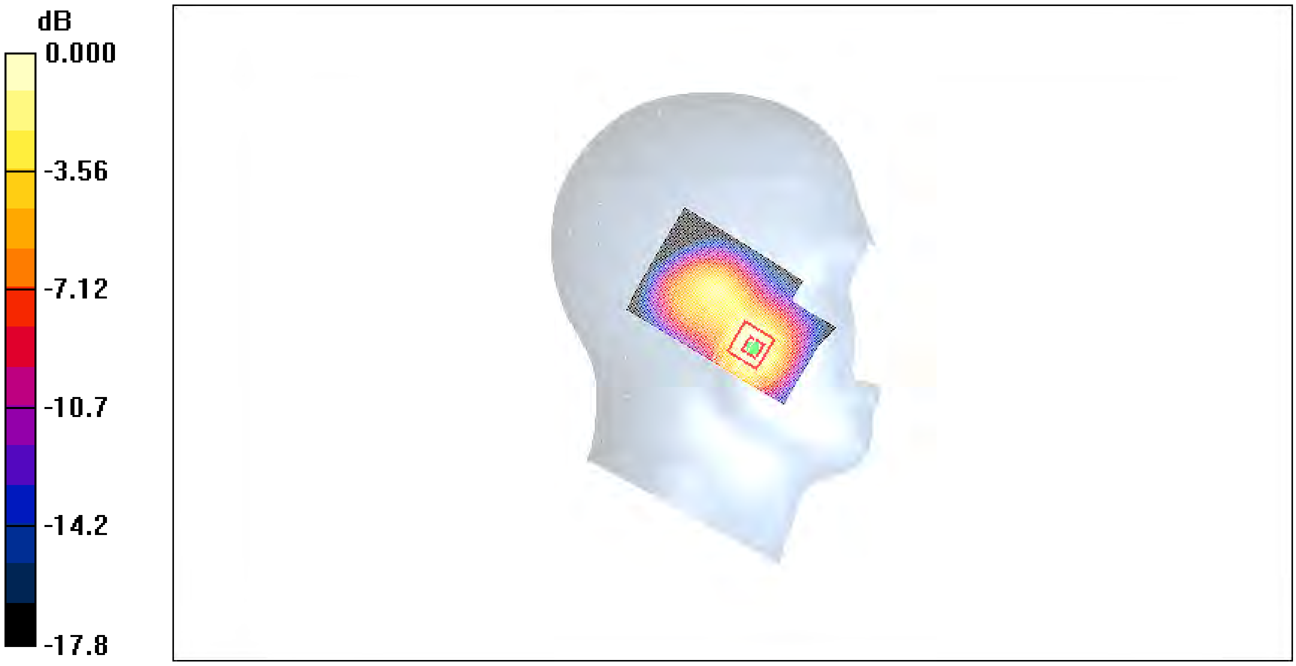
Fig. 24 1900 MHz CH661 – Slide down

1900 Left Cheek Low – Silde down

Date/Time: 2010-2-4 8:41:55
Electronics: DAE4 Sn771
Medium: Head 1900 MHz
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.37 mho/m; εr = 39.2; ρ = 1000 kg/m^3
Ambient Temperature:23.5^{o}C Liqiud Temperature: 22.5^{o}C
Communication System: GSM 1900MHz new Frequency: 1850.2 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

Cheek Low/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.05 mW/g

Cheek Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.4 V/m; Power Drift = -0.011 dB
Peak SAR (extrapolated) = 1.46 W/kg
SAR(1 g) = 0.923 mW/g; SAR(10 g) = 0.542 mW/g
Maximum value of SAR (measured) = 1.01 mW/g



0 dB = 1.01mW/g

Fig. 25 1900 MHz CH512 – Slide down

1900 Left Tilt Middle – Slide down
Date/Time: 2010-2-4 8:56:10
Electronics: DAE4 Sn771
Medium: Head 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.40 mho/m; εr = 39.1; ρ = 1000 kg/m^3
Ambient Temperature:23.5^{o}C Liqiud Temperature: 22.5^{o}C
Communication System: GSM 1900MHz new Frequency: 1880 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

Tilt Middle/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.539 mW/g

Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.5 V/m; Power Drift = -0.031 dB
Peak SAR (extrapolated) = 0.641 W/kg
SAR(1 g) = 0.453 mW/g; SAR(10 g) = 0.295 mW/g
Maximum value of SAR (measured) = 0.483 mW/g

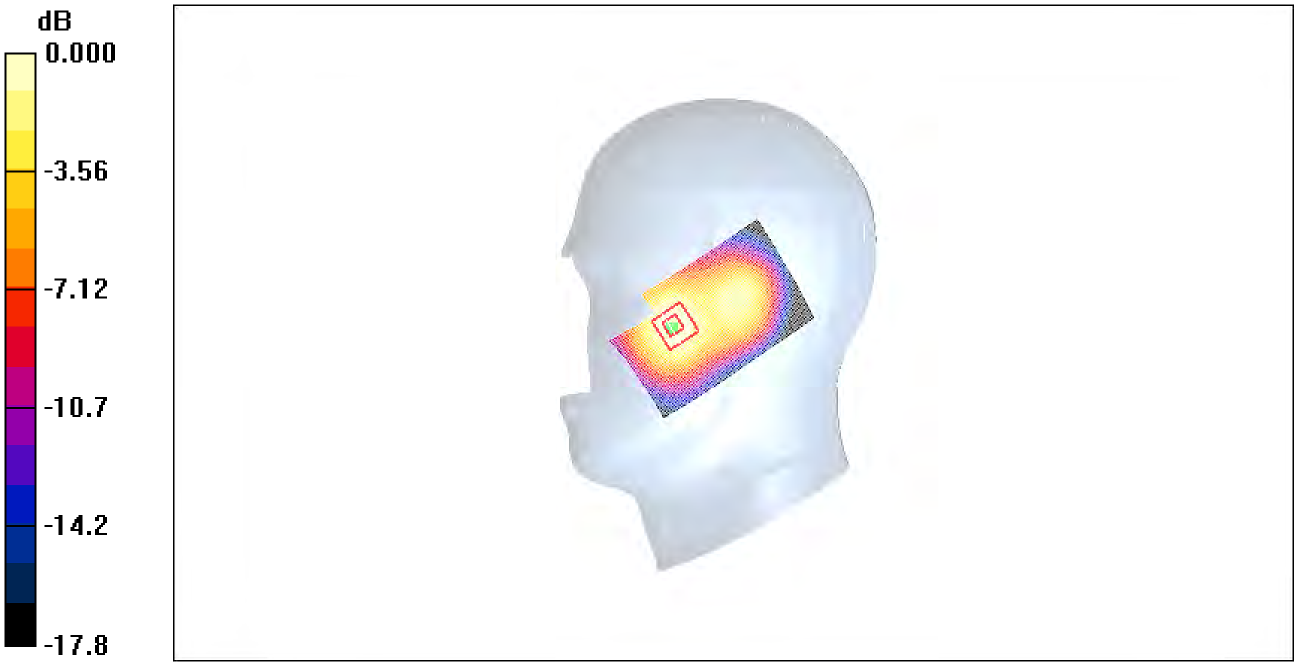
0 dB = 0.483mW/g

Fig. 26 1900 MHz CH661 – Slide down

1900 Right Cheek High – Slide down
Date/Time: 2010-2-4 9:10:23
Electronics: DAE4 Sn771
Medium: Head 1900 MHz
Medium parameters used: f = 1910 MHz; σ = 1.42 mho/m; εr = 39.0; ρ = 1000 kg/m^3
Ambient Temperature:23.5°C   Liqiud Temperature: 22.5°C
Communication System: GSM 1900MHz new Frequency: 1909.8 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

Cheek High/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.769 mW/g

Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.2 V/m; Power Drift = -0.137 dB
Peak SAR (extrapolated) = 1.10 W/kg
SAR(1 g) = 0.689 mW/g; SAR(10 g) = 0.427 mW/g
Maximum value of SAR (measured) = 0.742 mW/g



0 dB = 0.742mW/g

Fig. 27 1900 MHz CH810 – Slide down

1900 Right Cheek Middle – Slide down
Date/Time: 2010-2-4 9:24:41
Electronics: DAE4 Sn771
Medium: Head 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.40 mho/m; εr = 39.1; ρ = 1000 kg/m^3
Ambient Temperature:23.5^{o}C Liqiud Temperature: 22.5^{o}C
Communication System: GSM 1900MHz new Frequency: 1880 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

Cheek Middle/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.760 mW/g

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.9 V/m; Power Drift = -0.021 dB
Peak SAR (extrapolated) = 1.02 W/kg
SAR(1 g) = 0.673 mW/g; SAR(10 g) = 0.428 mW/g
Maximum value of SAR (measured) = 0.723 mW/g

0 dB = 0.723mW/g

Fig. 28 1900 MHz CH661 – Slide down

1900 Right Cheek Low – Silde down

Date/Time: 2010-2-4 9:38:50
Electronics: DAE4 Sn771
Medium: Head 1900 MHz
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.37 mho/m; εr = 39.2; ρ = 1000 kg/m^3
Ambient Temperature:23.5°C Liqiud Temperature: 22.5°C
Communication System: GSM 1900MHz new Frequency: 1850.2 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

Cheek Low/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.635 mW/g

Cheek Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.1 V/m; Power Drift = 0.126 dB
Peak SAR (extrapolated) = 0.879 W/kg
SAR(1 g) = 0.574 mW/g; SAR(10 g) = 0.353 mW/g
Maximum value of SAR (measured) = 0.623 mW/g

0 dB = 0.623mW/g

Fig. 29 1900 MHz CH512 – Slide down

1900 Right Tilt Middle – Slide down

Date/Time: 2010-2-4 9:53:04
Electronics: DAE4 Sn771
Medium: Head 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.40 mho/m; εr = 39.1; ρ = 1000 kg/m^3
Ambient Temperature:23.5°C　　Liqiud Temperature: 22.5°C
Communication System: GSM 1900MHz new Frequency: 1880 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

Tilt Middle/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.562 mW/g

Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.2 V/m; Power Drift = -0.026 dB
Peak SAR (extrapolated) = 0.738 W/kg
SAR(1 g) = 0.489 mW/g; SAR(10 g) = 0.299 mW/g
Maximum value of SAR (measured) = 0.505 mW/g

0 dB = 0.505mW/g

Fig.30 1900 MHz CH661 – Slide down

1900 Left Cheek Middle – Slide up

Date/Time: 2010-2-4 10:07:56

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used: f = 1880 MHz; σ = 1.40 mho/m; εr = 39.1; ρ = 1000 kg/m^3

Ambient Temperature:23.5^{o}C   Liqiud Temperature: 22.5^{o}C

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

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

Cheek Middle/Area Scan (51x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.601 mW/g

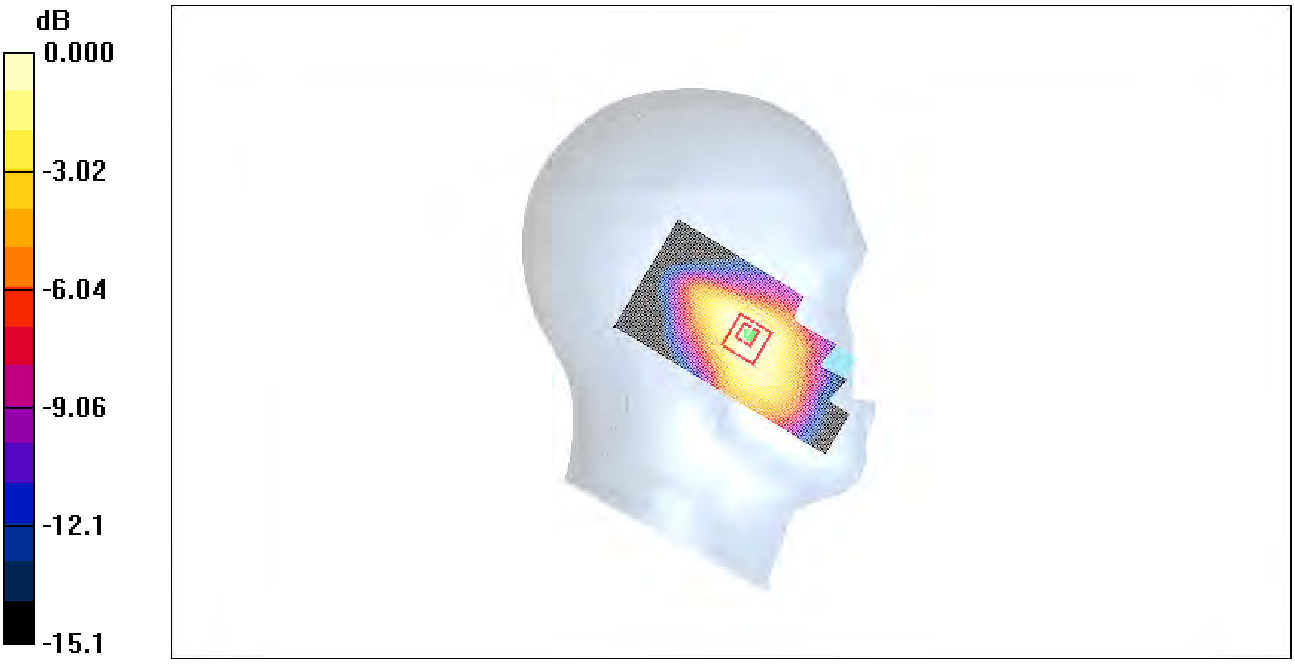
Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.15 V/m; Power Drift = 0.034 dB

Peak SAR (extrapolated) = 0.797 W/kg

SAR(1 g) = 0.570 mW/g; SAR(10 g) = 0.371 mW/g

Maximum value of SAR (measured) = 0.629 mW/g



0 dB = 0.629mW/g

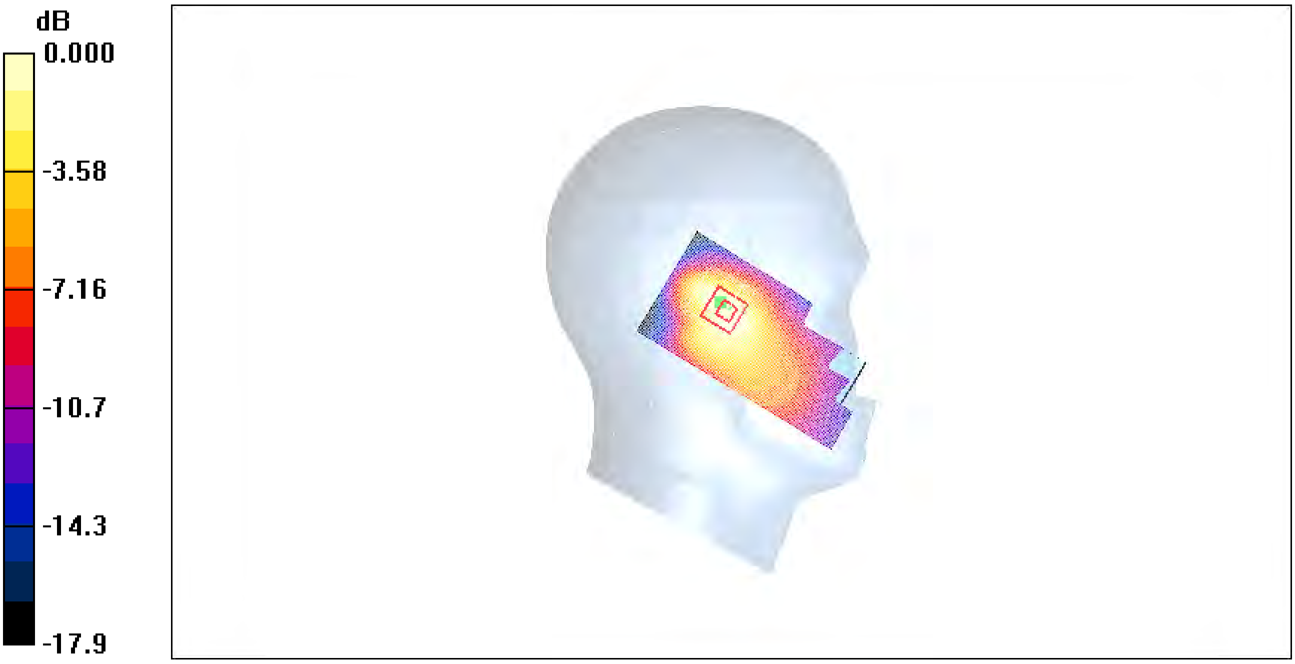
Fig. 31 1900 MHz CH661 – Slide up

1900 Left Tilt Middle – Slide up

Date/Time: 2010-2-4 10:22:19
Electronics: DAE4 Sn771
Medium: Head 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.40 mho/m; εr = 39.1; ρ = 1000 kg/m^3
Ambient Temperature:23.5°C   Liqiud Temperature: 22.5°C
Communication System: GSM 1900MHz new Frequency: 1880 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

Tilt Middle/Area Scan (51x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.400 mW/g

Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.4 V/m; Power Drift = 0.003 dB
Peak SAR (extrapolated) = 0.508 W/kg
SAR(1 g) = 0.337 mW/g; SAR(10 g) = 0.211 mW/g
Maximum value of SAR (measured) = 0.365 mW/g



0 dB = 0.365mW/g

Fig. 32 1900 MHz CH661 – Slide up

1900 Right Cheek Middle – Slide up
Date/Time: 2010-2-4 10:36:31
Electronics: DAE4 Sn771
Medium: Head 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.40 mho/m; εr = 39.1; ρ = 1000 kg/m^3
Ambient Temperature:23.5°C Liqiud Temperature: 22.5°C
Communication System: GSM 1900MHz new Frequency: 1880 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)

Cheek Middle/Area Scan (51x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.591 mW/g

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.70 V/m; Power Drift = -0.197 dB
Peak SAR (extrapolated) = 0.753 W/kg
SAR(1 g) = 0.520 mW/g; SAR(10 g) = 0.330 mW/g
Maximum value of SAR (measured) = 0.565 mW/g

0 dB = 0.565mW/g

Fig. 33 1900 MHz CH661 – Slide up

1900 Right Tilt Middle – Slide up

Date/Time: 2010-2-4 10:50:48

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used: f = 1880 MHz; σ = 1.40 mho/m; εr = 39.1; ρ = 1000 kg/m^3

Ambient Temperature:23.5°C Liqiud Temperature: 22.5°C

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

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

Tilt Middle/Area Scan (51x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.299 mW/g

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

Reference Value = 8.77 V/m; Power Drift = 0.049 dB

Peak SAR (extrapolated) = 0.388 W/kg

SAR(1 g) = 0.271 mW/g; SAR(10 g) = 0.176 mW/g

Maximum value of SAR (measured) = 0.291 mW/g

0 dB = 0.291mW/g

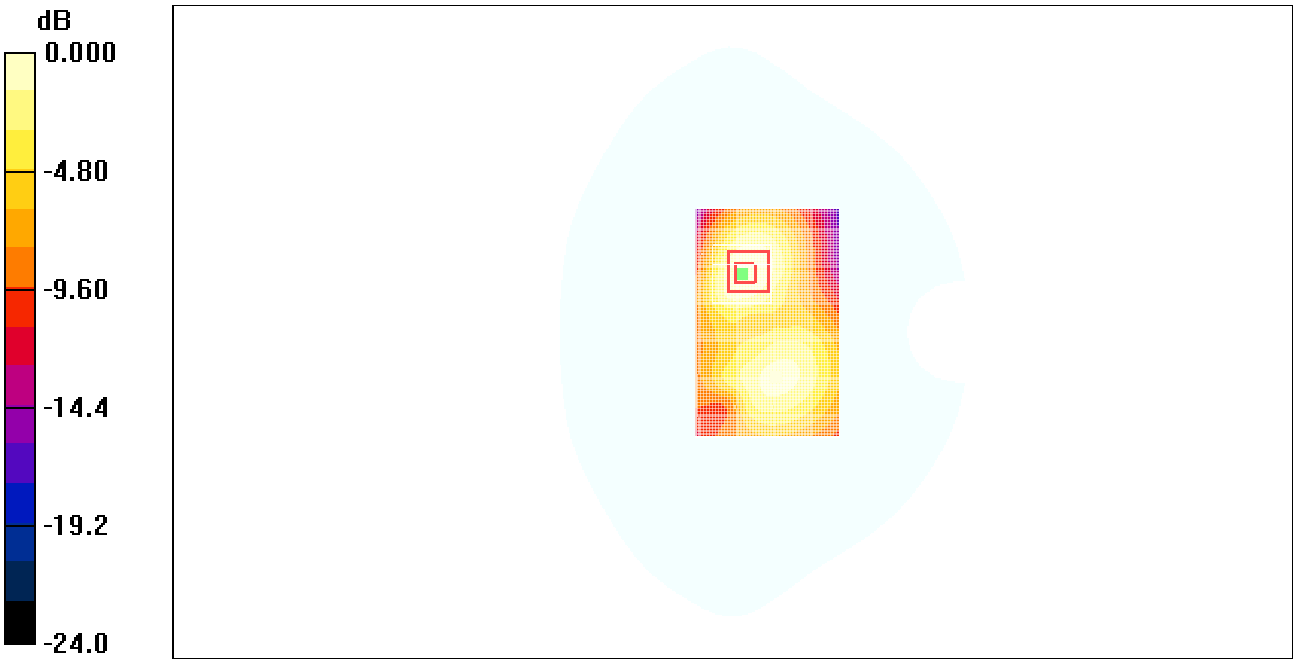
Fig.34 1900 MHz CH661 – Slide up

1900 Body Towards Ground High with GPRS – Slide down

Date/Time: 2010-2-4 13:22:43
Electronics: DAE4 Sn771
Medium: Body 1900 MHz
Medium parameters used: f = 1910 MHz; σ = 1.56 mho/m; εr = 52.3; ρ = 1000 kg/m^3
Ambient Temperature:23.5^{o}C Liqiud Temperature: 22.5^{o}C
Communication System: GSM 1900MHz GPRS Frequency: 1909.8 MHz Duty Cycle: 1:4
Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

Toward Ground High/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.690 mW/g

Toward Ground High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.3 V/m; Power Drift = -0.041 dB
Peak SAR (extrapolated) = 1.07 W/kg
SAR(1 g) = 0.626 mW/g; SAR(10 g) = 0.357 mW/g
Maximum value of SAR (measured) = 0.641 mW/g



0 dB = 0.641mW/g

Fig. 35 1900 MHz CH810 – Slide down

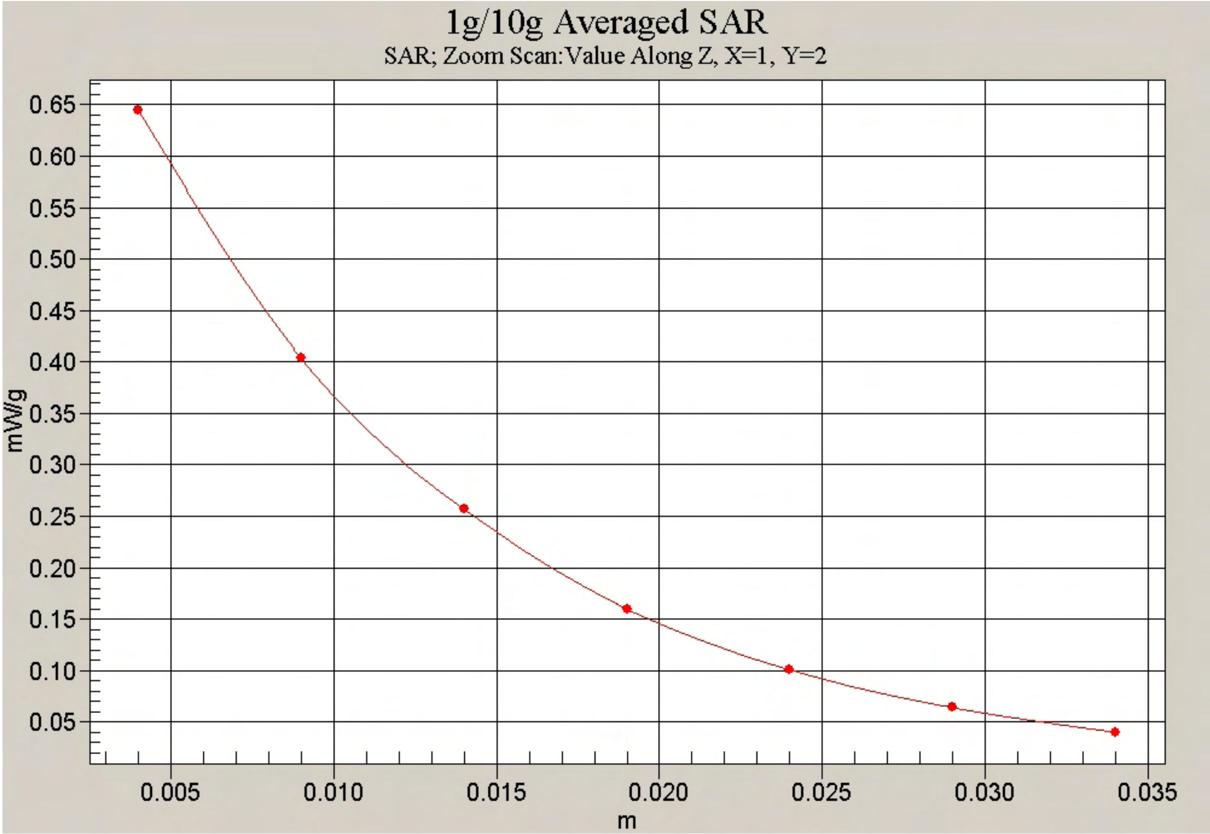
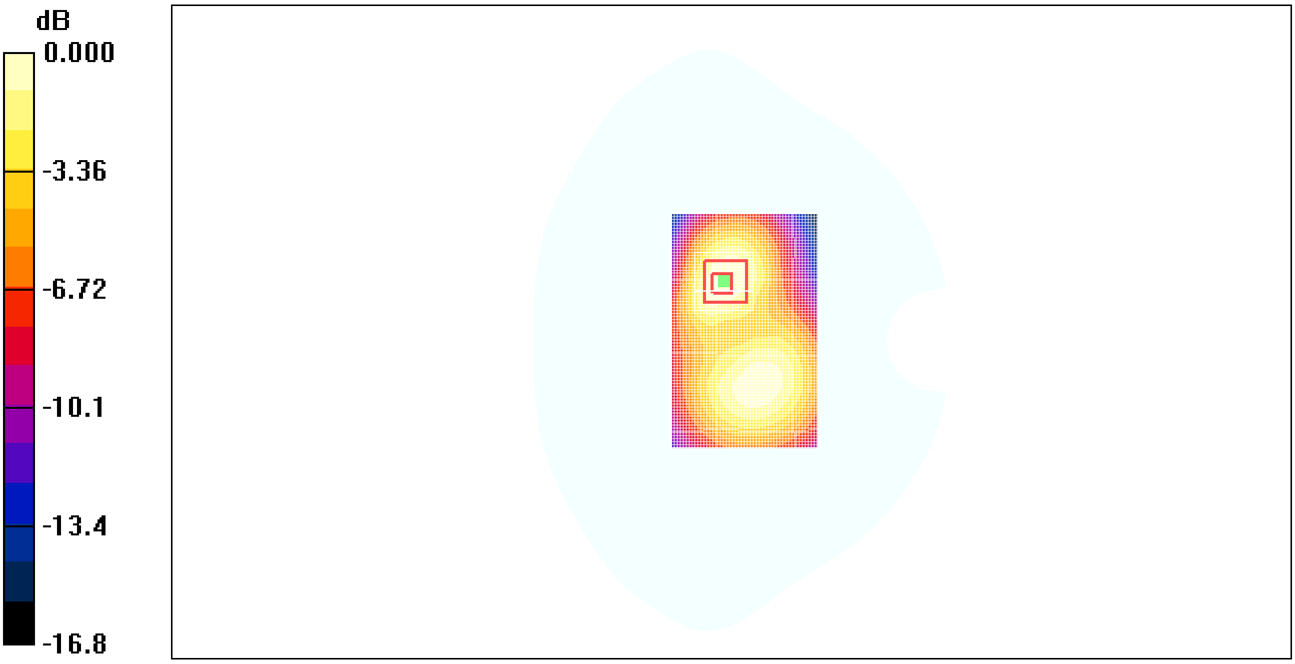


Fig. 35-1 Z-Scan at power reference point (1900 MHz CH810) – Slide down

1900 Body Towards Ground Middle with GPRS – Slide down
Date/Time: 2010-2-4 13:38:00
Electronics: DAE4 Sn771
Medium: Body 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; εr = 52.4; ρ = 1000 kg/m^3
Ambient Temperature:23.5^{o}C Liqiud Temperature: 22.5^{o}C
Communication System: GSM 1900MHz GPRS Frequency: 1880 MHz Duty Cycle: 1:4
Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

Toward Ground Middle/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.537 mW/g

Toward Ground Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.0 V/m; Power Drift = -0.006 dB
Peak SAR (extrapolated) = 0.841 W/kg
SAR(1 g) = 0.498 mW/g; SAR(10 g) = 0.288 mW/g
Maximum value of SAR (measured) = 0.521 mW/g



0 dB = 0.521mW/g

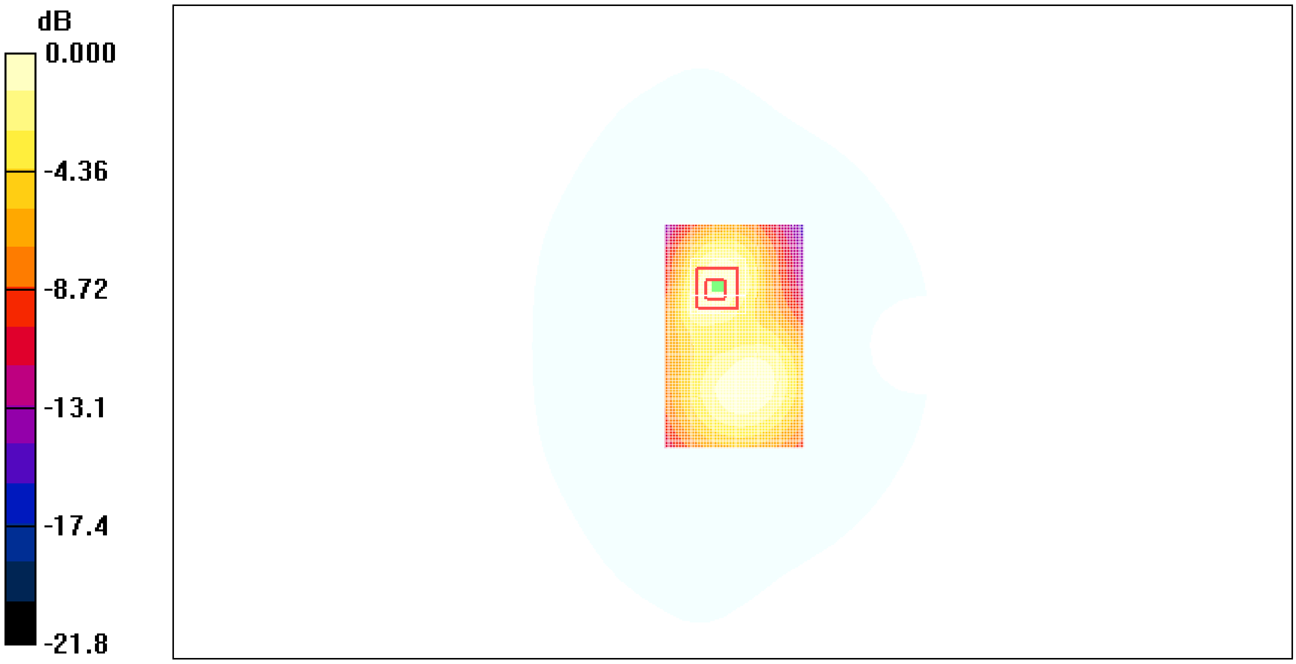
Fig. 36 1900 MHz CH661 – Slide down

1900 Body Towards Ground Low with GPRS – Slide down

Date/Time: 2010-2-4 13:53:16
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/m^3
Ambient Temperature:23.5°C   Liqiud Temperature: 22.5°C
Communication System: GSM 1900MHz GPRS Frequency: 1850.2 MHz Duty Cycle: 1:4
Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

Toward Ground Low/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.481 mW/g

Toward Ground Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.1 V/m; Power Drift = -0.003 dB
Peak SAR (extrapolated) = 0.741 W/kg
SAR(1 g) = 0.444 mW/g; SAR(10 g) = 0.257 mW/g
Maximum value of SAR (measured) = 0.474 mW/g



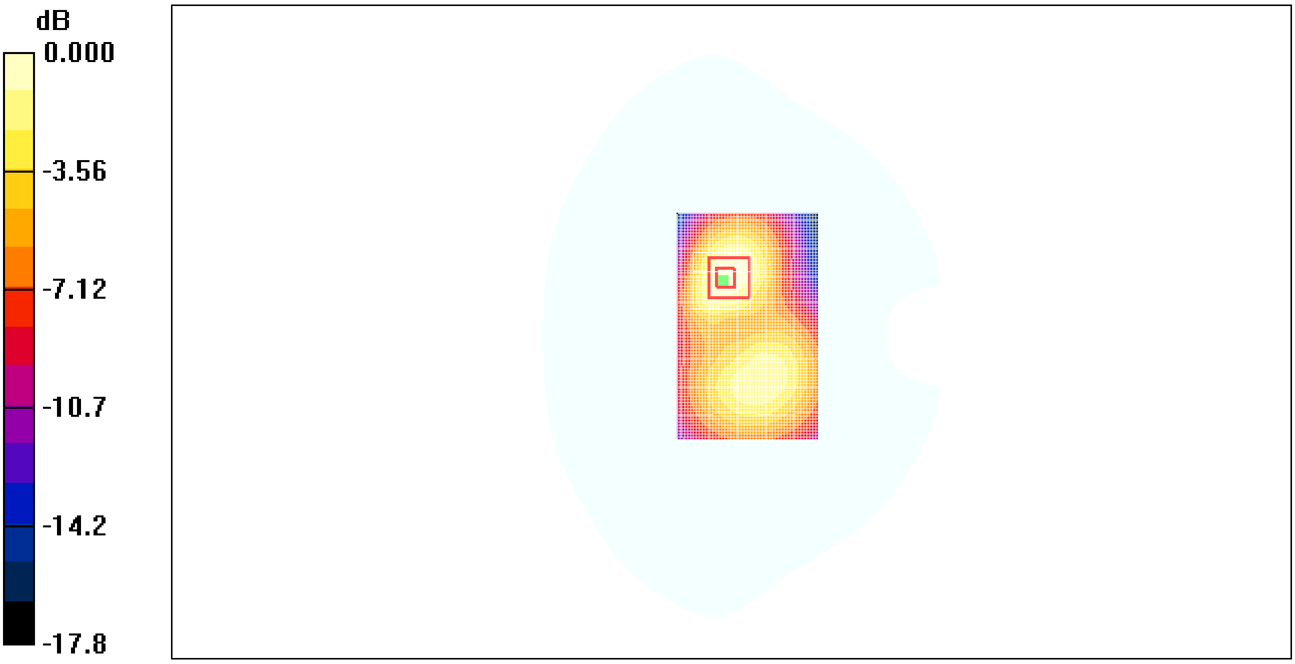
0 dB = 0.474mW/g

Fig. 37 1900 MHz CH512 – Slide down

1900 Body Towards Ground High with EGPRS – Slide down
Date/Time: 2010-2-4 14:12:37
Electronics: DAE4 Sn771
Medium: Body 1900 MHz
Medium parameters used: f = 1910 MHz; σ = 1.56 mho/m; εr = 52.3; ρ = 1000 kg/m^3
Ambient Temperature:23.5°C Liqiud Temperature: 22.5°C
Communication System: GSM 1900MHz EGPRS Frequency: 1909.8 MHz Duty Cycle: 1:4
Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

Toward Ground High/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.680 mW/g

Toward Ground High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.2 V/m; Power Drift = -0.055 dB
Peak SAR (extrapolated) = 1.07 W/kg
SAR(1 g) = 0.624 mW/g; SAR(10 g) = 0.355 mW/g
Maximum value of SAR (measured) = 0.656 mW/g



0 dB = 0.656mW/g

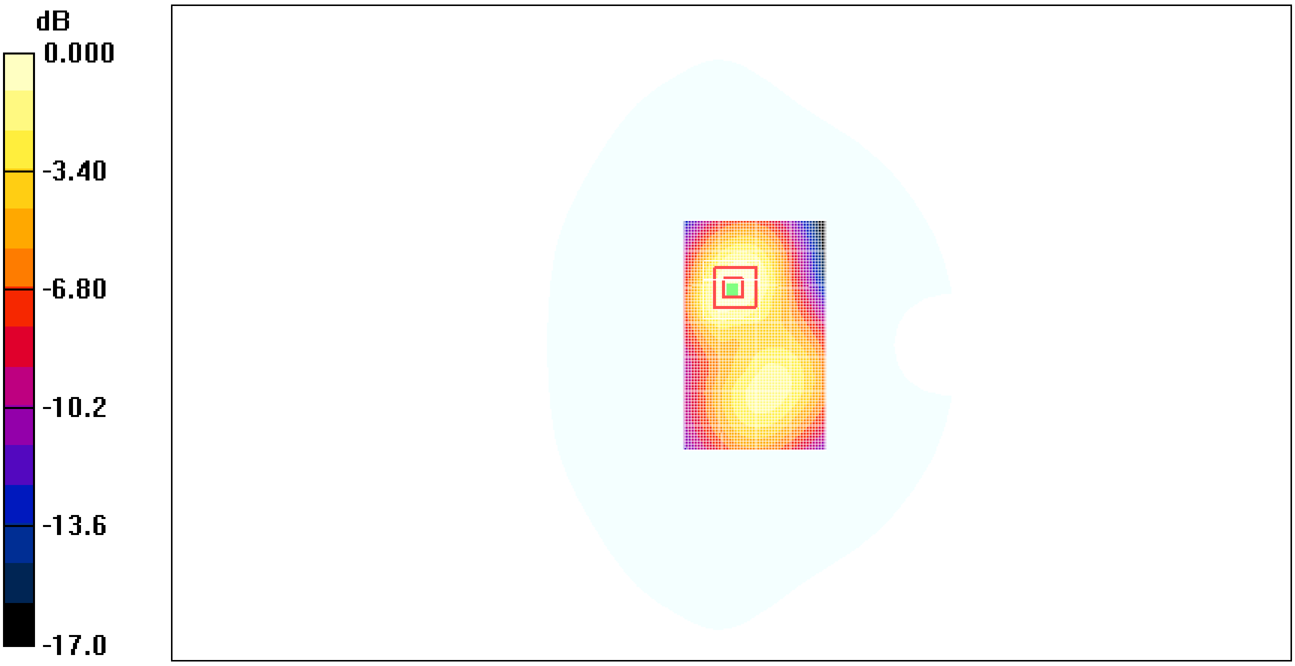
Fig. 38 1900 MHz CH810 – Slide down

1900 Body Towards Ground High with Headset – Slide down

Date/Time: 2010-2-4 14:30:52
Electronics: DAE4 Sn771
Medium: Body 1900 MHz
Medium parameters used: f = 1910 MHz; σ = 1.56 mho/m; εr = 52.3; ρ = 1000 kg/m^3
Ambient Temperature:23.5°C Liqiud Temperature: 22.5°C
Communication System: GSM 1900MHz GPRS Frequency: 1909.8 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

Toward Ground High/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.337 mW/g

Toward Ground High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.63 V/m; Power Drift = 0.027 dB
Peak SAR (extrapolated) = 0.531 W/kg
SAR(1 g) = 0.311 mW/g; SAR(10 g) = 0.180 mW/g
Maximum value of SAR (measured) = 0.320 mW/g



0 dB = 0.320mW/g

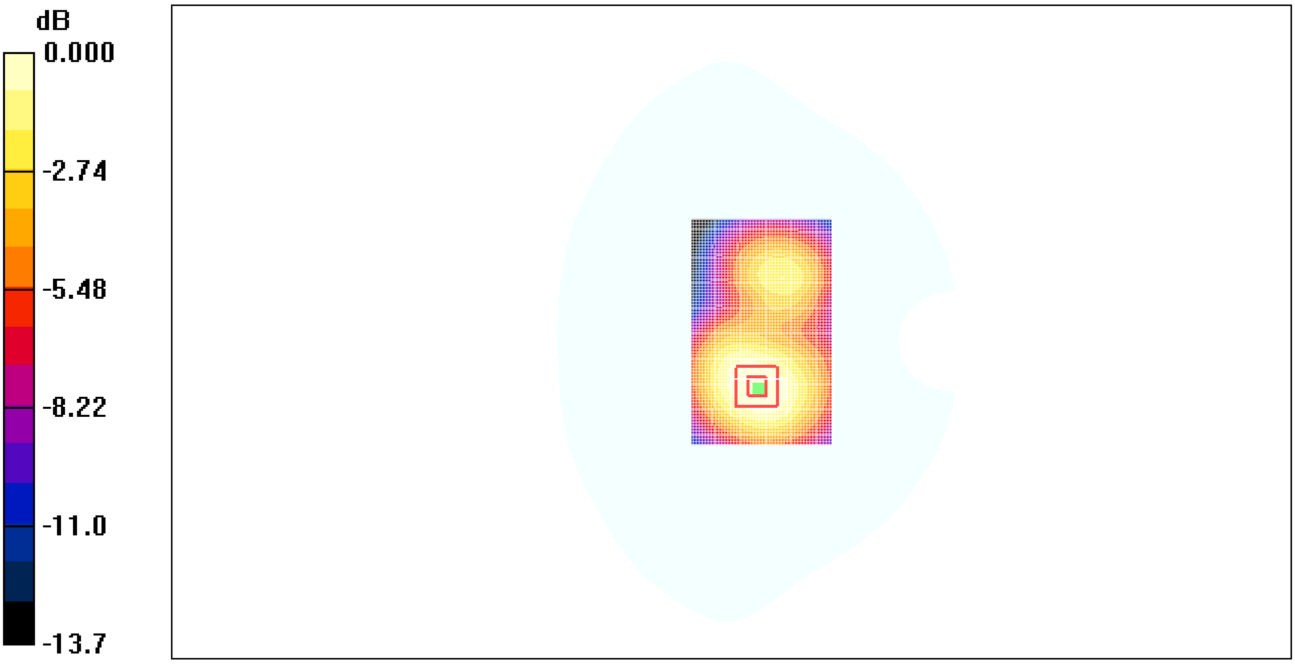
Fig. 39 1900 MHz CH810 – Slide down

1900 Body Towards Phantom High with GPRS – Slide down

Date/Time: 2010-2-4 14:51:12
Electronics: DAE4 Sn771
Medium: Body 1900 MHz
Medium parameters used: f = 1910 MHz; σ = 1.56 mho/m; εr = 52.3; ρ = 1000 kg/m^3
Ambient Temperature:23.5°C Liqiud Temperature: 22.5°C
Communication System: GSM 1900MHz GPRS Frequency: 1909.8 MHz Duty Cycle: 1:4
Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

Toward Phantom High/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.460 mW/g

Toward Phantom High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.1 V/m; Power Drift = 0.073 dB
Peak SAR (extrapolated) = 0.641 W/kg
SAR(1 g) = 0.423 mW/g; SAR(10 g) = 0.272 mW/g
Maximum value of SAR (measured) = 0.439 mW/g



0 dB = 0.439mW/g

Fig.40 1900 MHz CH810 – Slide down

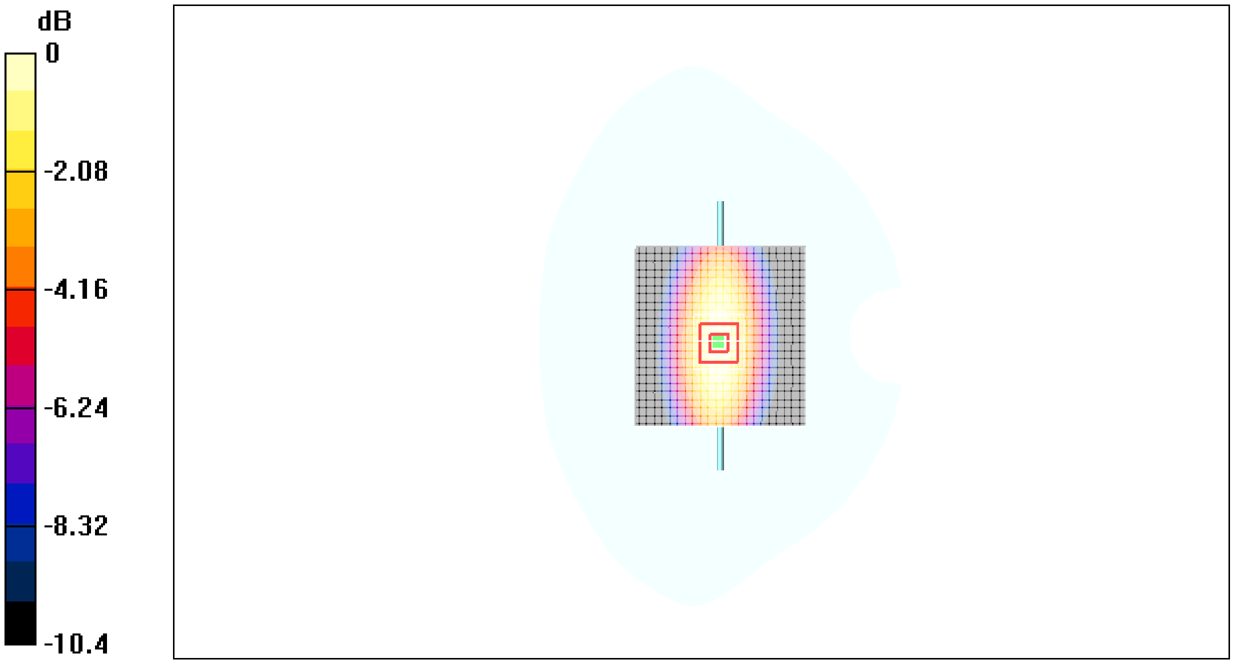
ANNEX D SYSTEM VALIDATION RESULTS

835MHz

Date/Time: 2010-2-3 7:31:20
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:23.5°C Liqiud Temperature: 22.5°C
Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1
Probe: ES3DV3 – SN3149 ConvF(6.56, 6.56, 6.56)

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

System Validation /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



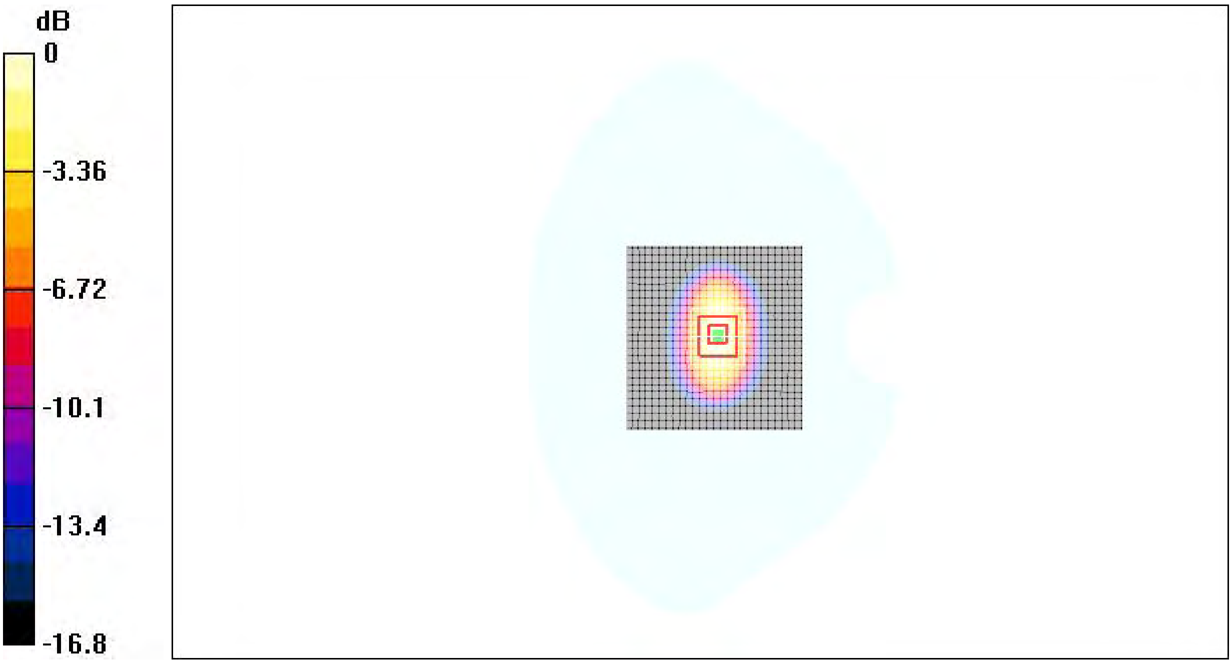
0 dB = 2.72mW/g

Fig.41 validation 835MHz 250mW

1900MHz

Date/Time: 2010-2-4 7:36:27
Electronics: DAE4 Sn771
Medium: Head 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.41 mho/m; ε_r = 39.1; ρ = 1000 kg/m^3
Ambient Temperature:23.5°C Liqiud 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.42 validation 1900MHz 250mW

ANNEX E PROBE CALIBRATION CERTIFICATE

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

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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

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

Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
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

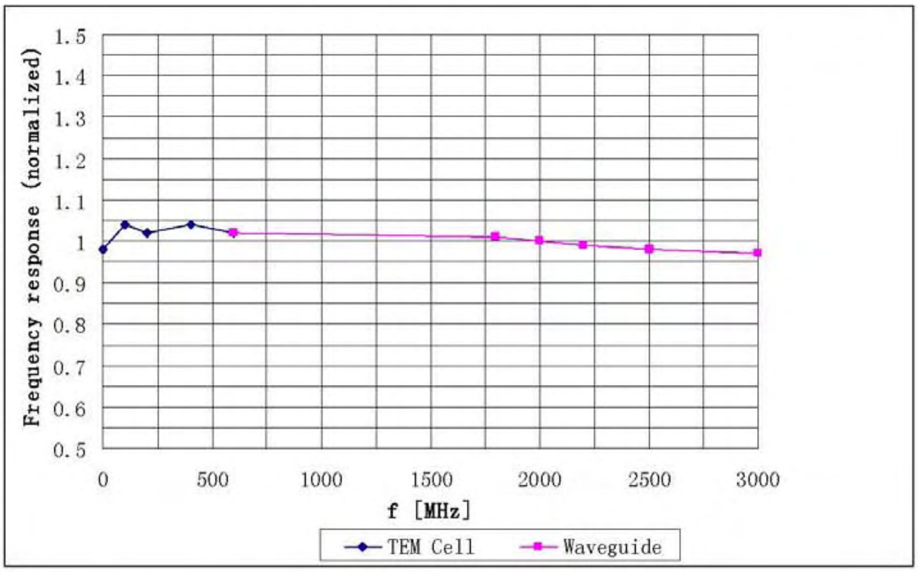
Sensor Offset

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.

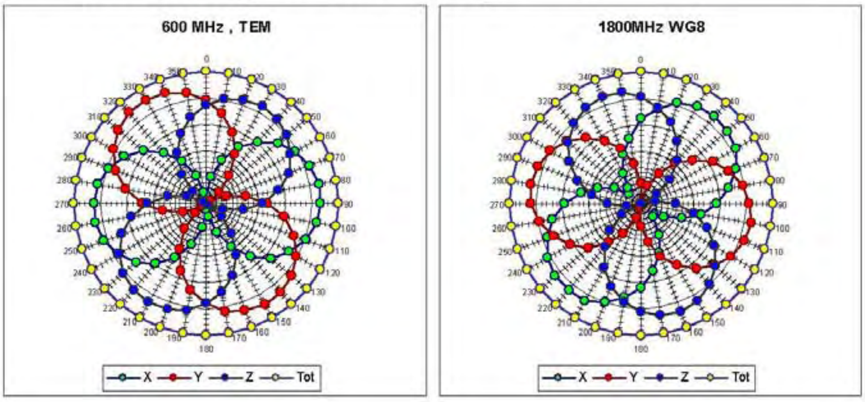
Frequency Response of E-Field

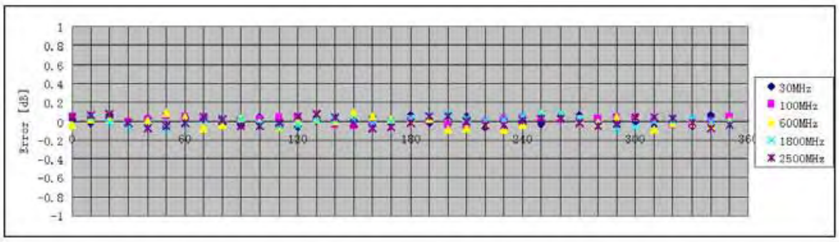


Uncertainty of Frequency Response of E-field: ±5.0% (k=2)

ES3DV3 SN: 3149 September 25, 2009

Receiving Pattern (φ), θ = 0°

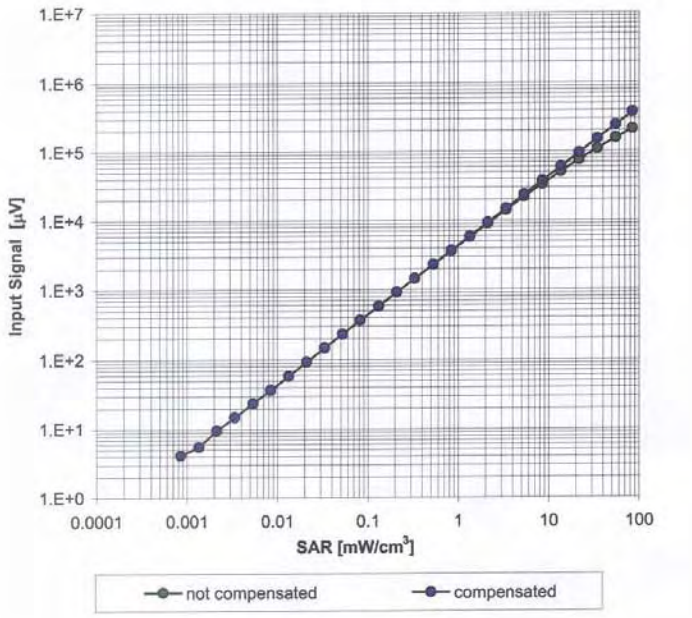


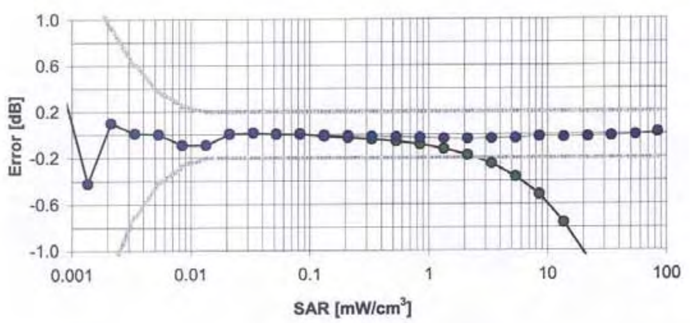


Uncertainty of Axial Isotropy Assessment: ±0.5% (k=2)

Dynamic Range f(SAR_{head})

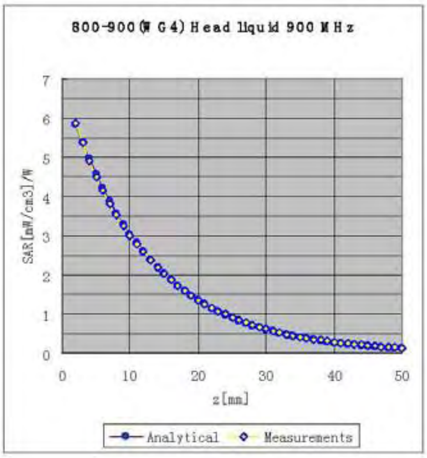
(Waveguide: WG8, f = 1800 MHz)

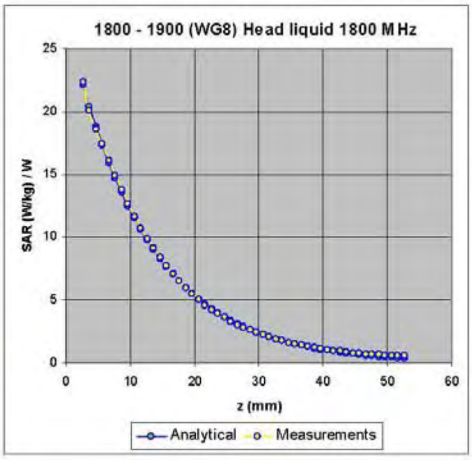




Uncertainty of Linearity Assessment: ±0.5% (k=2)

Conversion Factor Assessment



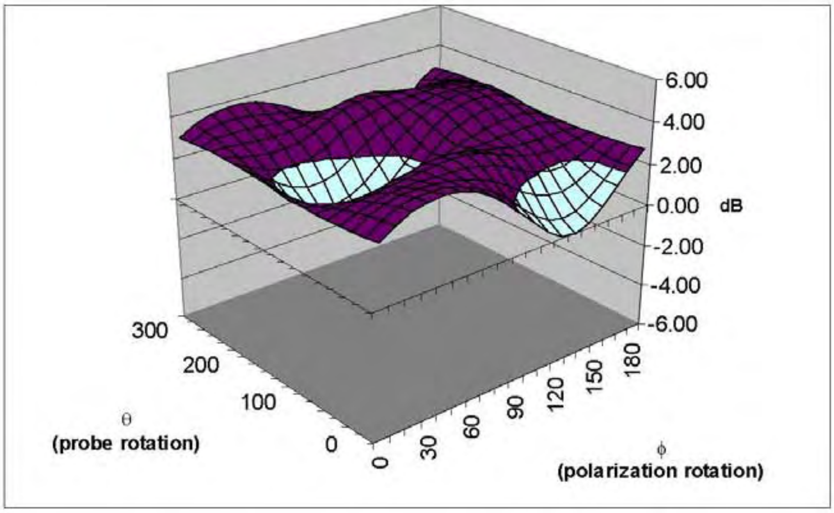


f[MHz]	Validity[MHz][C]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF	Uncertainty
850	±50 /±100	Head	41.5±5%	0.90±5%	0.91	1.13	6.56	±11.0% (k=2)
900	±50 /±100	Head	41.5±5%	0.97±5%	0.83	1.26	6.34	±11.0% (k=2)
1800	±50 /±100	Head	40.0±5%	1.40±5%	0.69	1.47	5.18	±11.0% (k=2)
1900	±50 /±100	Head	40.0±5%	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

835 MHz Dipole Calibration Certificate

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

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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

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	[signature]
Approved by:	Katja Pokovic	Technical Director	[signature]

Issued: February 19, 2009

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

Certificate No: D835V2-443_Feb09 Page 1 of 6

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

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Swiss Calibration Service

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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	50.5Ω - 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

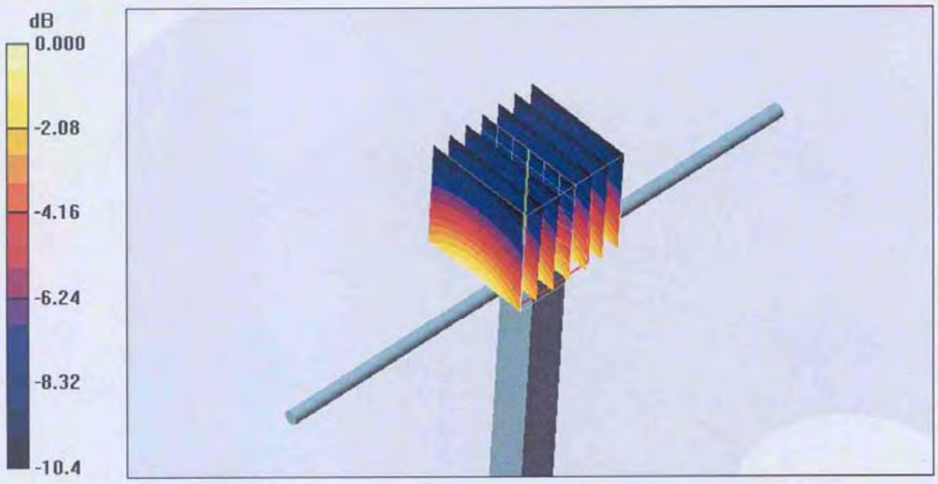
Test laboratory: SPEAG, Zurich, Switzerland

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:

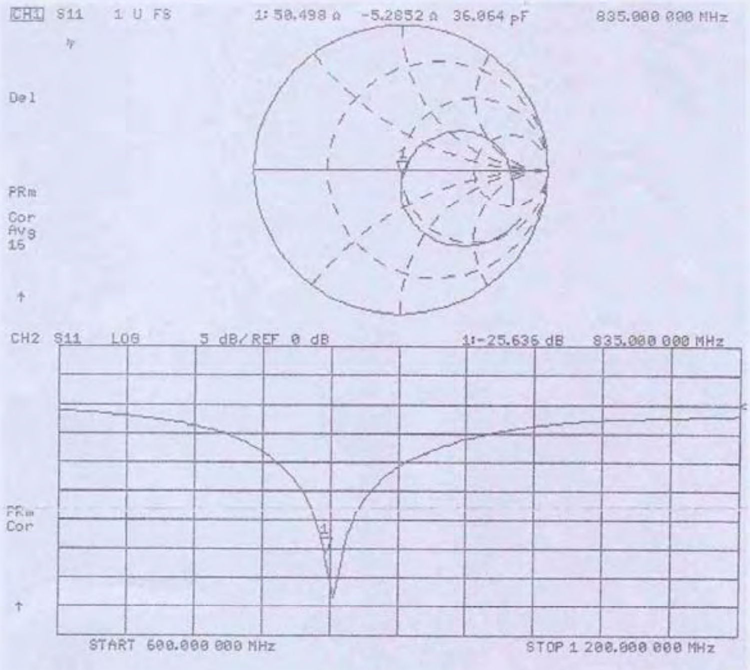
- Probe: ET3DV6-SN1507(HF); ConvF(6.01,6.01,6.01); Calibrated: 17.10.2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.1_2009
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA;
- Measurement SW: DASY, V4.7 Build 53; Post processing SW: SEMCAD, V1.8 Build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



1900 MHz 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
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: 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)°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	[signature]
Approved by:	Katja Pokovic	Technical Director	[signature]

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

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

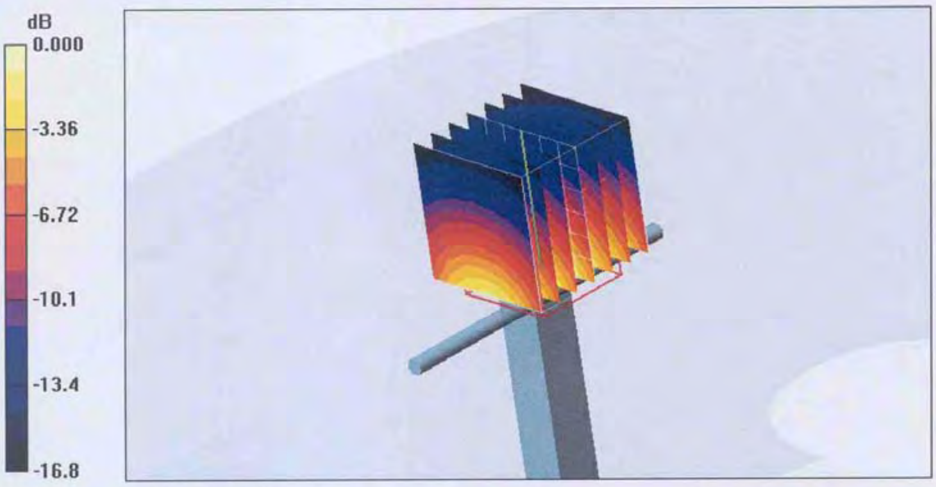
Test laboratory: SPEAG, Zurich, Switzerland

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:

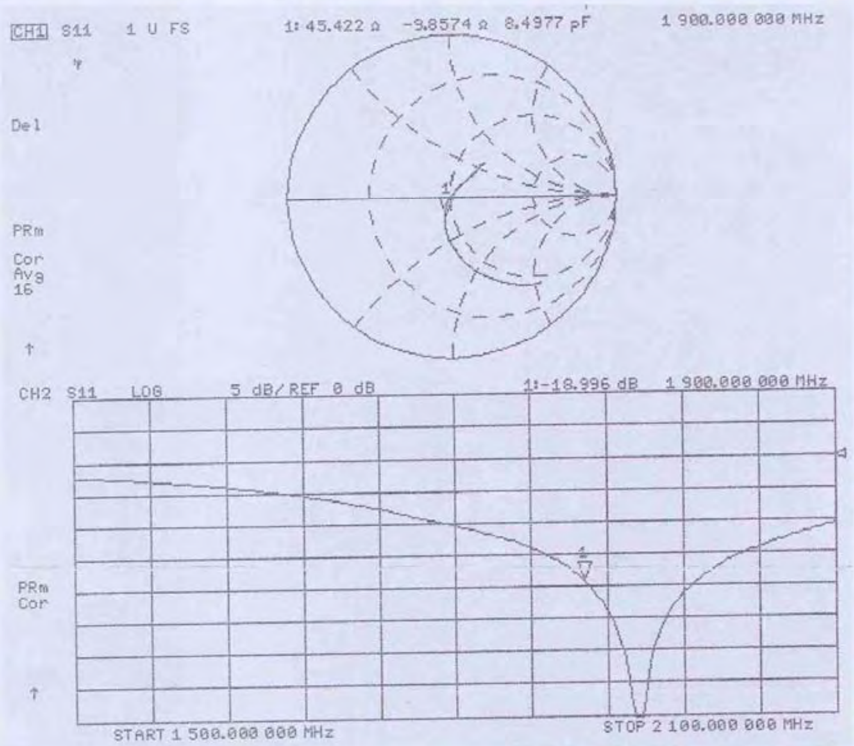
- Probe: ET3DV6-SN1507(HF); ConvF(5.03, 5.03, 5.03); Calibrated: 17.10.2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.1_2009
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA;
- Measurement SW: DASY, V4.7 Build 53; Post processing SW: SEMCAD, V1.8 Build 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



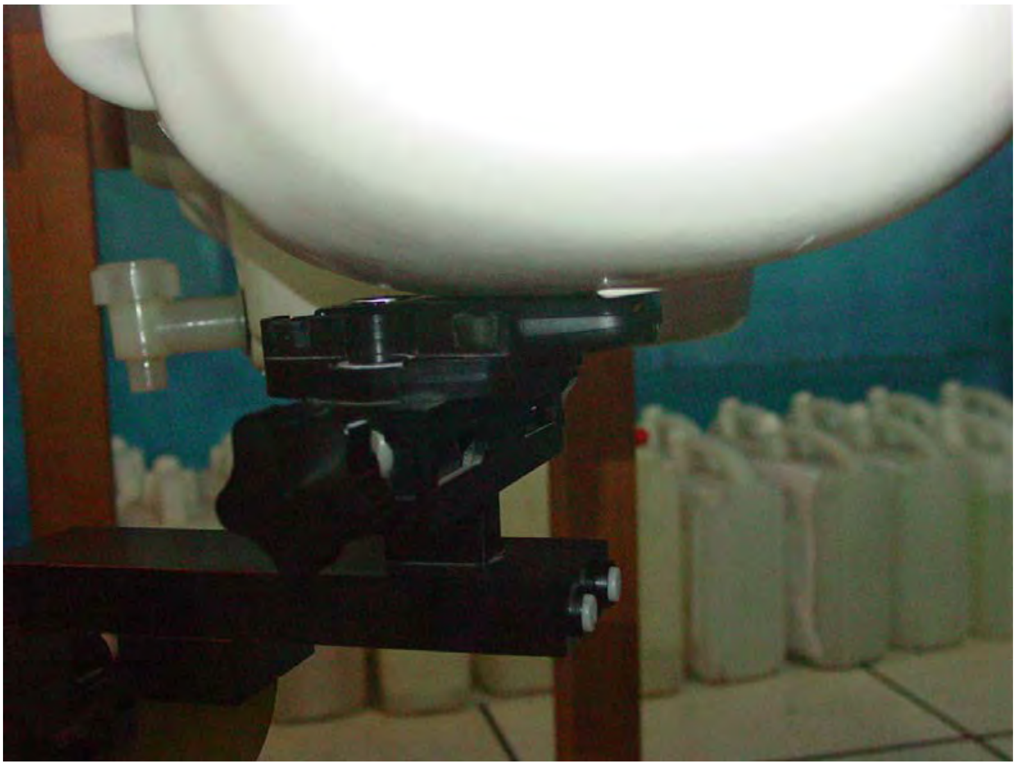
0 dB = 11.3mW/g

Impedance measurement Plot for Head TSL



ANNEX G EUT APPEARANCE AND TEST POSITIONS

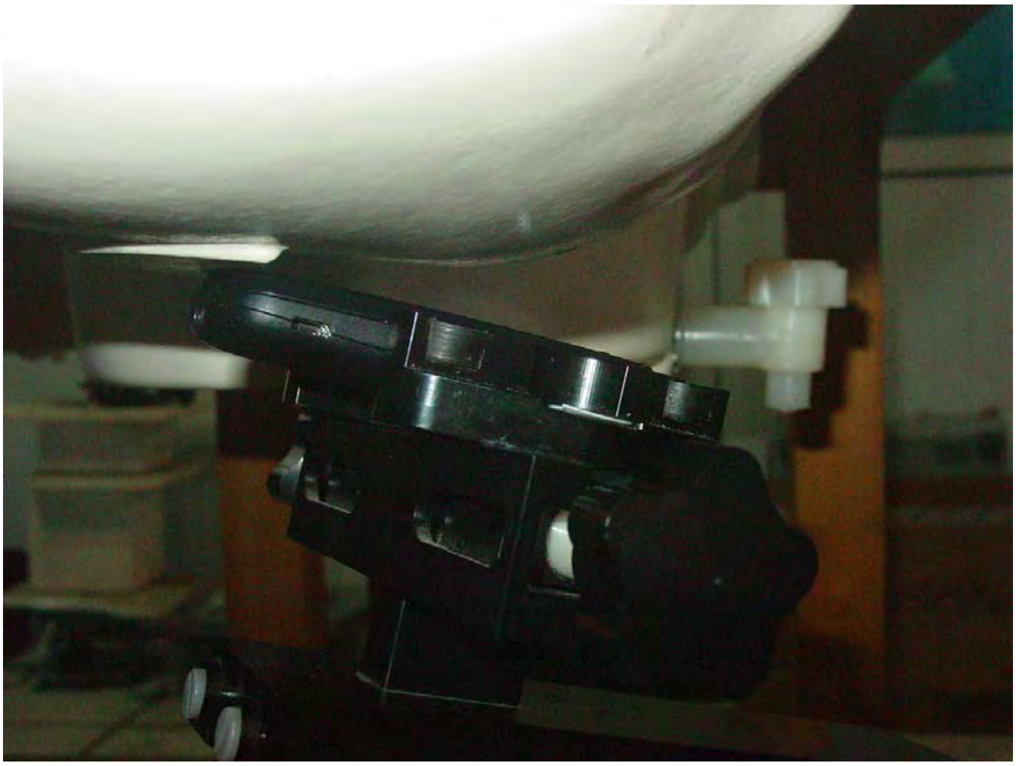
Picture G1: Constituents of the sample (Lithium Battery is in the Handset)



Picture G2: Left Hand Touch Cheek Position – Slide down

Picture G3: Left Hand Tilt 15° Position – Slide down

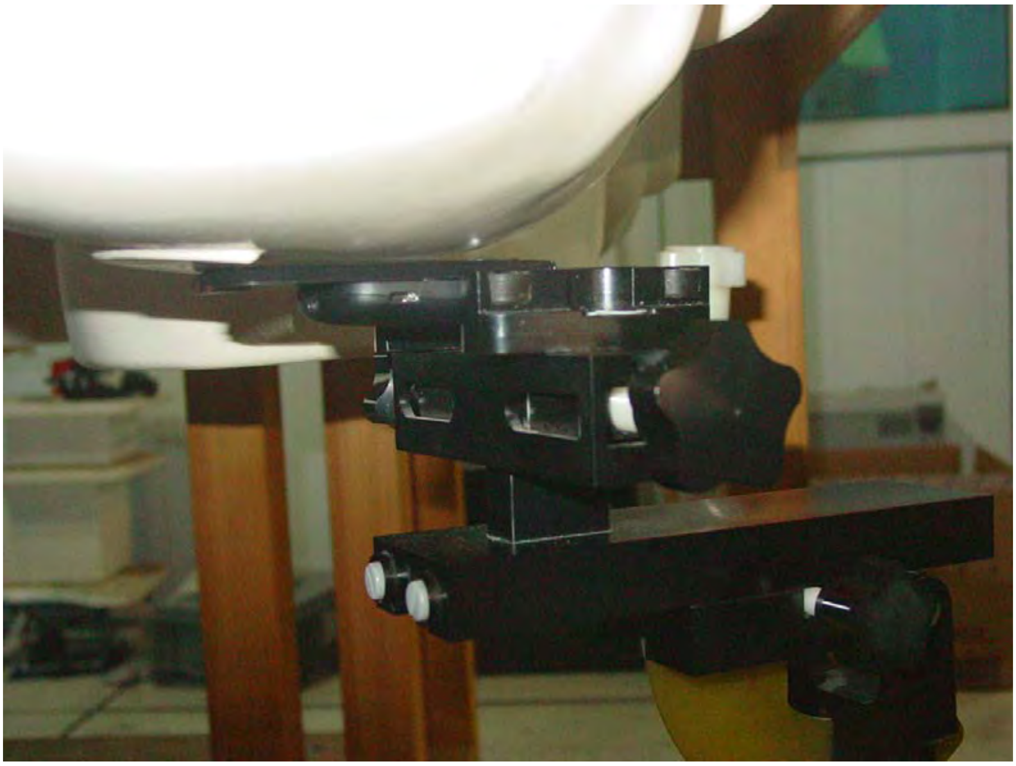
Picture G4: Right Hand Touch Cheek Position – Slide down



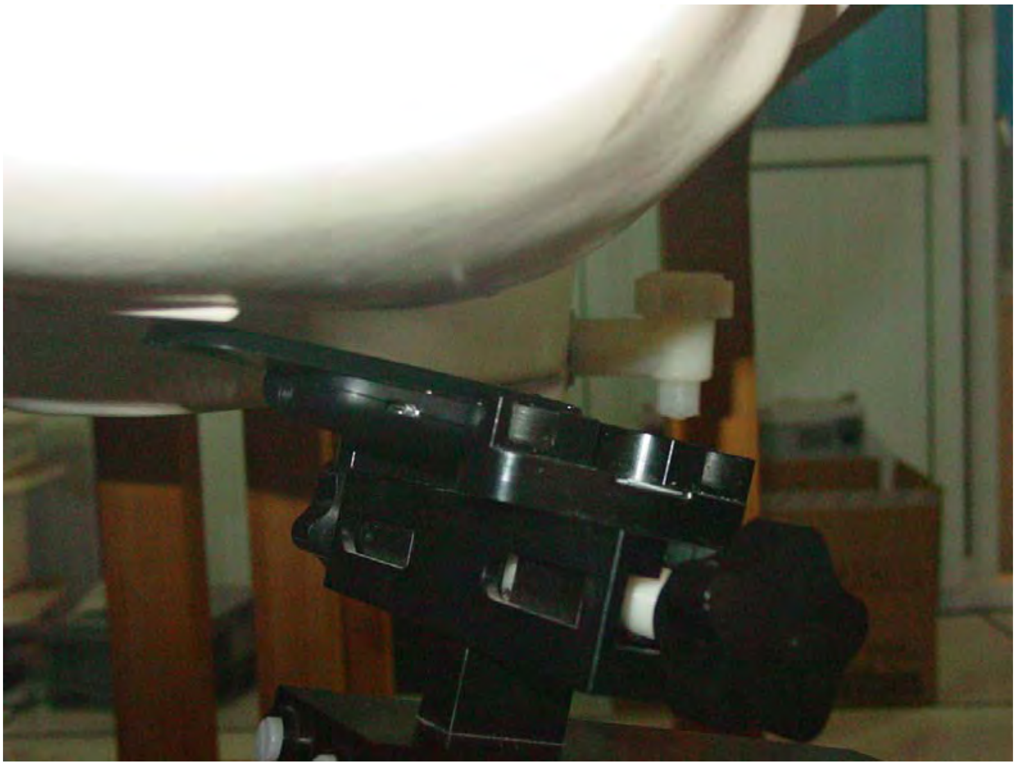
Picture G5: Right Hand Tilt 15° Position – Slide down

Picture G6: Left Hand Touch Cheek Position – Slide up

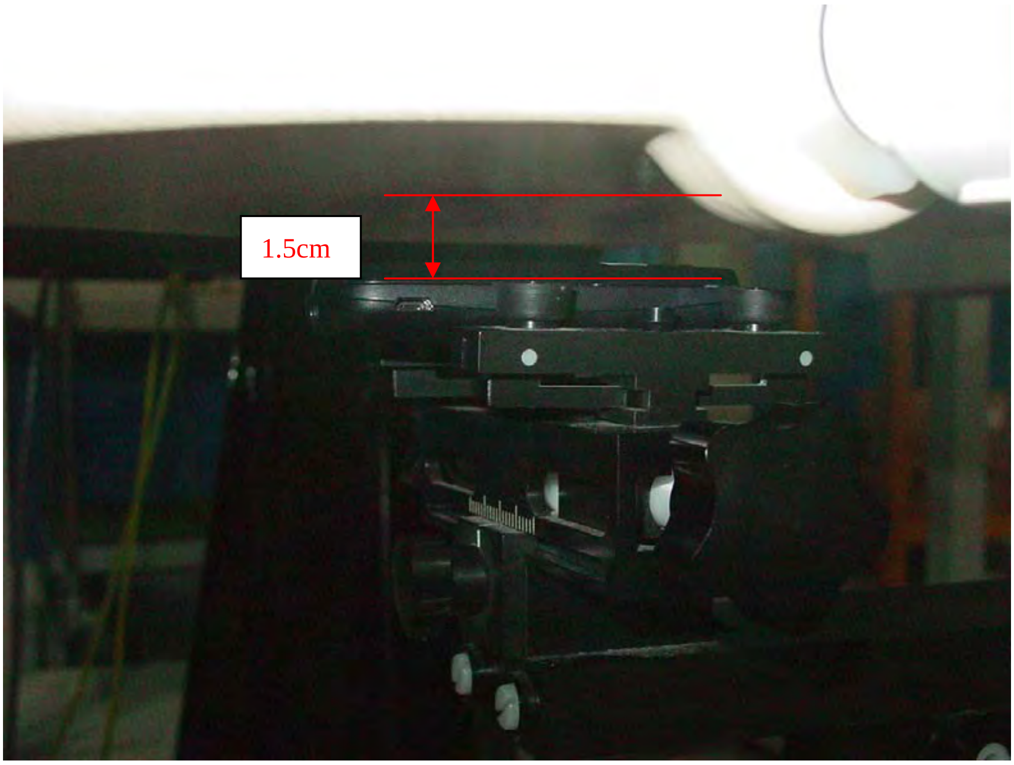
Picture G7: Left Hand Tilt 15° Position – Slide up



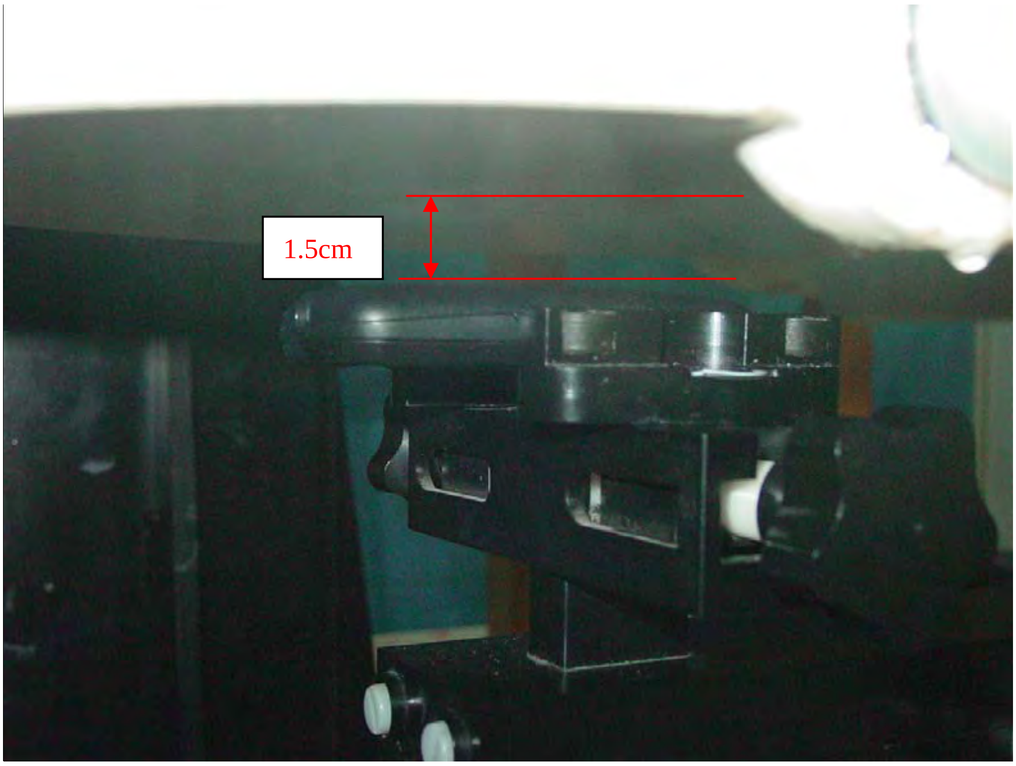
Picture G8: Right Hand Touch Cheek Position – Slide up



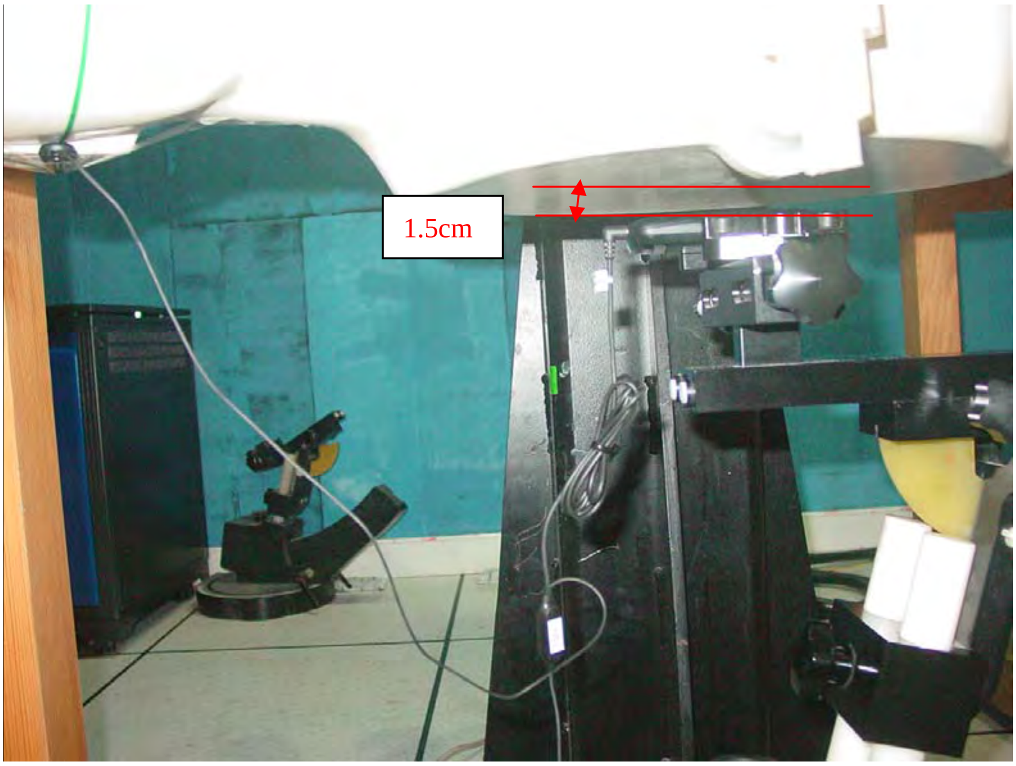
Picture G9: Right Hand Tilt 15° Position – Slide up



Picture G10: Body-worn Position (towards phantom, the distance from handset to the bottom of the Phantom is 1.5cm) – Slide down



Picture G11: Body-worn Position (towards ground, the distance from handset to the bottom of the Phantom is 1.5cm) – Slide down



Picture G12: Body-worn Position with headset (EUT towards ground, the distance from handset to the bottom of the Phantom is 1.5cm) – Slide down