



SAR TEST REPORT

No. 2010SAR00029

For

Motorola, Inc. (Mobile Devices Business)

GSM/GPRS 850/1900 dual-band mobile phone

WX295

With

Hardware Version: PIO

Software Version: V560

FCCID: IHDT56LZ1

Issued Date: 2010-04-28



No. DGA-PL-114/01-02

Note:

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

Test Laboratory:

TMC Beijing, Telecommunication Metrology Center of MIIT

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1 Test Laboratory

1.1 Testing Location

Company Name: TMC Beijing, Telecommunication Metrology Center of MIIT
Address: No 52, Huayuan beilu, Haidian District, Beijing,P.R.China
Postal Code: 100191
Telephone: +86-10-62304633
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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: April 23, 2010
Testing End Date: April 26, 2010

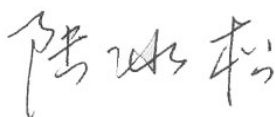
1.4 Signature



Lin Xiaojun
(Prepared this test report)



Sun Qian
(Reviewed this test report)



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

2 Client Information

2.1 Applicant Information

Company Name: Motorola, Inc. (Mobile Devices Business)
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City: Libertyville
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Country: U.S.A.
Contact Person: Mike Roper (Mr)
Contact Email: Mike.roper@motorola.com
Telephone: +44 (0)1926 411371
Fax: +44 (0)1926 411371

2.2 Manufacturer Information

Company Name: TCT Mobile Limited
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Pudong, Shanghai, 201203, P.R.China
City: Shanghai
Postal Code: 201203
Country: P. R. China
Telephone: 0086-21-61460890
Fax: 0086-21-61460602

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

3.1 About EUT

EUT Description: GSM/GPRS 850/1900 dual-band mobile phone
Marketing Name: WX295
GSM Frequency Band: GSM 850 / PCS 1900

3.2 Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	012244000003533	PIO	V560

*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	CBA31B0AG0C1	\	BYD
AE2	Battery	CAB3130010C1	\	BYD
AE3	Battery	CAB3130000C1	B33796876AA	BYD
AE4	Stereo headset	CCB31B0A10C0	\	Shunda/Juwei
AE5	Stereo headset	CCB31B0A11C0	\	Shunda/Juwei

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

4 CHARACTERISTICS OF THE TEST

4.1 Applicable Limit Regulations

EN 50360–2001: Product standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones.

It specifies the maximum exposure limit of **2.0 W/kg** as averaged over any 10 gram of tissue for portable devices being used within 20 cm of the user in the uncontrolled environment.

ANSI C95.1–1999: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

It specifies the maximum exposure limit of **1.6 W/kg** as averaged over any 1 gram of tissue for portable devices being used within 20 cm of the user in the uncontrolled environment.

4.2 Applicable Measurement Standards

EN 62209-1–2006: Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures –Part 1: Procedure to determine the specific absorption rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz).

IEEE 1528–2003: Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques.

OET Bulletin 65 (Edition 97-01) and Supplement C(Edition 01-01): Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits.

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

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

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

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

5 OPERATIONAL CONDITIONS DURING TEST

5.1 Schematic Test Configuration

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

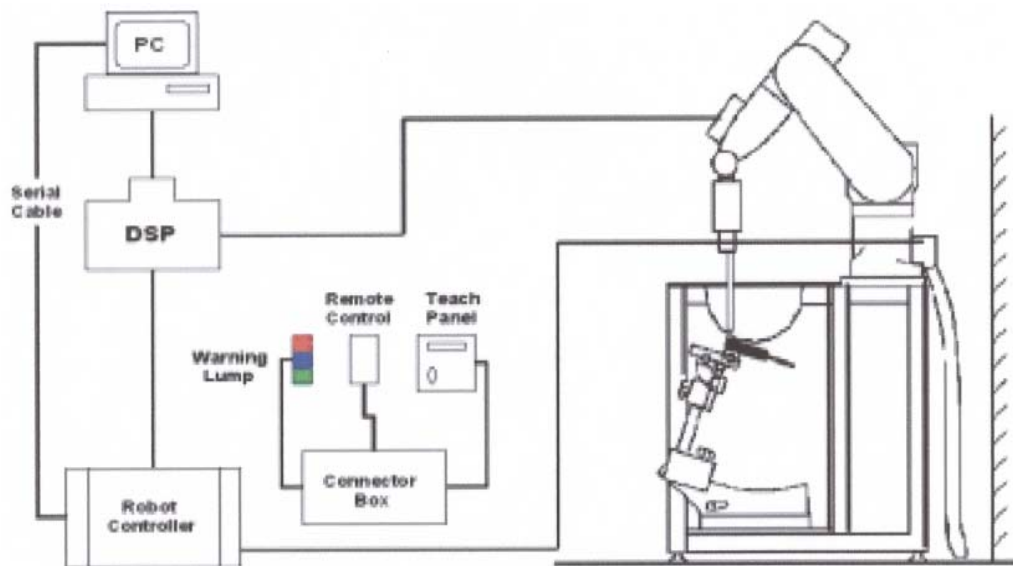
The EUT shall use its internal transmitter. The antenna(s), battery and accessories shall be those specified by the manufacturer. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output. If a wireless link is used, the antenna connected to the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

5.2 SAR Measurement Set-up

These measurements were performed with the automated near-field scanning system DASY4 Professional from Schmid & Partner Engineering AG (SPEAG). The system is based on a high precision robot (working range greater than 0.9m), which positions the probes with a positional repeatability of better than $\pm 0.02\text{mm}$. Special E- and H-field probes have been developed for measurements close to material discontinuity, the sensors of which are directly loaded with a

Schottky diode and connected via highly resistive lines (length =300mm) to the data acquisition unit.

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



Picture 2: SAR Lab Test Measurement Set-up

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

5.3 Dasy4 E-field Probe System

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

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 μ W/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 3: ES3DV3 E-field



Picture4:ES3DV3 E-field probe

5.4 E-field Probe Calibration

Each probe is calibrated according to a dosimetric assessment procedure with accuracy better than $\pm 10\%$. The spherical isotropy was evaluated and found to be better than ± 0.25 dB. 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 below 1 GHz, and in a wave guide above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees.

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

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

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

Or

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

Where:

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



Picture 5: Device Holder

5.5 Other Test Equipment

5.5.1 Device Holder for Transmitters

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

5.5.2 Phantom

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

Shell Thickness	2±0.1 mm
Filling Volume	Approx. 20 liters
Dimensions	810 x 1000 x 500 mm (H x L x W)
Available	Special



Picture 6: Generic Twin Phantom

5.6 Equivalent Tissues

The liquid used for the frequency range of 800-2000 MHz consisted of water, sugar, salt and Cellulose. The liquid has been previously proven to be suited for worst-case. The Table 1 and 2 shows the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the IEEE 1528.

Table 1. Composition of the Head Tissue Equivalent Matter

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

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 $\epsilon=55.2$ $\sigma=0.97$
MIXTURE %	FREQUENCY 1900MHz
Water	69.91
Glycol monobutyl	29.96
Salt	0.13
Dielectric Parameters Target Value	f=1900MHz $\epsilon=53.3$ $\sigma=1.52$

5.7 System Specifications

Specifications

Positioner: Stäubli Unimation Corp. Robot Model: RX90L

Repeatability: ± 0.02 mm

No. of Axis: 6

Data Acquisition Electronic (DAE) System

Cell Controller

Processor: Pentium III

Clock Speed: 800 MHz

Operating System: Windows 2000

Data Converter

Features:Signal Amplifier, multiplexer, A/D converter, and control logic

Software: DASY4 software

Connecting Lines: Optical downlink for data and status info.
Optical uplink for commands and clock

6 LABORATORY ENVIRONMENT

Table 3: The Ambient Conditions during EMF Test

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 30%, Max. = 70%
Ground system resistance	< 0.5 Ω
Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surround objects is minimized and in compliance with requirement of standards.	

7 CONDUCTED OUTPUT POWER MEASUREMENT

7.1 Summary

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

7.2 Conducted Power

7.2.1 Measurement Methods

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

7.2.2 Measurement result

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

GSM 850MHZ	Conducted Power (dBm)		
	Channel 251(848.8MHz)	Channel 190(836.6MHz)	Channel 128(824.2MHz)
	32.36	32.25	32.26
GSM 1900MHZ	Conducted Power (dBm)		
	Channel 810(1909.8MHz)	Channel 661(1880MHz)	Channel 512(1850.2MHz)
	28.81	28.97	28.91
GPRS 850MHZ	Conducted Power (dBm)		
	Channel 251(848.8MHz)	Channel 190(836.6MHz)	Channel 128(824.2MHz)
	30.78	30.77	30.80
GPRS 1900MHZ	Conducted Power (dBm)		
	Channel 810(1909.8MHz)	Channel 661(1880MHz)	Channel 512(1850.2MHz)
	27.37	27.47	27.40

7.2.3 Power Drift

To control the output power stability during the SAR test, DASY4 system calculates the power drift by measuring the E-field at the same location at the beginning and at the end of the measurement

for each test position. These drift values can be found in Table 10 to Table 15 labeled as: (Power Drift [dB]). This ensures that the power drift during one measurement is within 5%.

8 TEST RESULTS

8.1 Dielectric Performance

Table 4: Dielectric Performance of Head Tissue Simulating Liquid

Measurement is made at temperature 23.0 °C and relative humidity 40%.			
Liquid temperature during the test: 22.5°C			
Measurement Date : 850 MHz April 23, 2010 1900 MHz April 26, 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	40.7	0.89
	1900 MHz	39.0	1.39

Table 5: Dielectric Performance of Body Tissue Simulating Liquid

Measurement is made at temperature 23.0 °C and relative humidity 40%.			
Liquid temperature during the test: 22.5°C			
Measurement Date : 850 MHz April 23, 2010 1900 MHz April 26, 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	53.7	0.95
	1900 MHz	52.1	1.54

8.2 System Validation

Table 6: System Validation of Head

Measurement is made at temperature 23.0 °C and relative humidity 40%.							
Liquid temperature during the test: 22.5°C							
Measurement Date : 850 MHz April 23, 2010 1900 MHz April 26, 2010							
Liquid parameters	Dipole calibration Target value	Frequency		Permittivity ϵ		Conductivity σ (S/m)	
		835 MHz	1900 MHz	41.6	39.6	0.92	1.40
	Actural Measurement value	835 MHz	1900 MHz	40.8	39.0	0.87	1.39
		Frequency	Target value (W/kg)		Measured value (W/kg)		Deviation
Verification results		10 g Average	1 g Average	10 g Average	1 g Average	10 g Average	1 g Average
	835 MHz	1.54	2.38	1.51	2.29	-1.95%	-3.78%
	1900 MHz	5.05	9.91	4.87	9.72	-3.56%	-1.92%

Table 7: System Validation of Body

Measurement is made at temperature 23.0 °C and relative humidity 40%.								
Liquid temperature during the test: 22.5°C								
Measurement Date : 850 MHz <u>April 23, 2010</u> 1900 MHz <u>April 26, 2010</u>								
Liquid parameters	Dipole calibration	Frequency		Permittivity ϵ		Conductivity σ (S/m)		
		835 MHz		54.5		0.97		
	Target value	1900 MHz		52.5		1.51		
		Actural Measurement value	835 MHz		53.8		0.93	
			1900 MHz		52.1		1.54	
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	1.57	2.41	1.51	2.37	-3.82%	-1.66%	
	1900 MHz	5.24	10.4	5.16	10.1	-1.53%	-2.88%	

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

8.3 Evaluation of Multi-Batteries

Table 8: Pretest SAR Values (EGSM 850 MHz Band)

Limit of SAR (W/kg)	10 g Average	1 g Average
	2.0	1.6
Test Case	Measurement Result (W/kg)	
	10 g Average	1 g Average
Right hand, Touch cheek, Top frequency (CAB3130000C1)	0.569	0.862
Right hand, Touch cheek, Top frequency (CAB3130010C1)	0.594	0.897

Note: According to the values in the above table, the battery, CAB3130010C1, is the normal battery. We'll perform the head measurement with this battery and retest on highest value point with others.

Table 9: Pretest SAR Values (EGSM 850 MHz Band-Body)

Limit of SAR (W/kg)	10 g Average	1 g Average
	2.0	1.6
Test Case	Measurement Result (W/kg)	
	10 g Average	1 g Average
Body, Towards Ground, High frequency (CAB3130000C1)	0.358	0.505
Body, Towards Ground, High frequency (CAB3130010C1)	0.373	0.526

Note: According to the values in the above table, the battery, CAB3130010C1, is the normal battery. We'll perform the body measurement with this battery and retest on highest value point with others.

8.4 Summary of Measurement Results

Table 10: SAR Values (850MHz-Head) - with battery CAB3130010C1

Limit of SAR (W/kg)	10 g Average	1 g Average	Power Drift (dB)
	2.0	1.6	
Test Case	Measurement Result (W/kg)		Power Drift (dB)
	10 g Average	1 g Average	
Left hand, Touch cheek, Top frequency (See Fig.1)	0.573	1.02	-0.051
Left hand, Touch cheek, Mid frequency (See Fig.2)	0.559	0.992	-0.177
Left hand, Touch cheek, Bottom frequency (See Fig.3)	0.533	0.957	-0.189
Left hand, Tilt 15 Degree, Top frequency (See Fig.4)	0.336	0.466	-0.038
Left hand, Tilt 15 Degree, Mid frequency (See Fig.5)	0.321	0.444	-0.034
Left hand, Tilt 15 Degree, Bottom frequency (See Fig.6)	0.292	0.398	0.039
Right hand, Touch cheek, Top frequency (See Fig.7)	0.594	0.897	-0.176
Right hand, Touch cheek, Mid frequency (See Fig.8)	0.554	0.835	-0.124
Right hand, Touch cheek, Bottom frequency (See Fig.9)	0.507	0.760	-0.013
Right hand, Tilt 15 Degree, Top frequency (See Fig.10)	0.353	0.487	-0.028
Right hand, Tilt 15 Degree, Mid frequency (See Fig.11)	0.343	0.471	-0.014
Right hand, Tilt 15 Degree, Bottom frequency (See Fig.12)	0.299	0.408	-0.012

Table 11: SAR Values (1900MHz-Head) - with battery CAB3130010C1

Limit of SAR (W/kg)	10 g Average	1 g Average	Power Drift (dB)
	2.0	1.6	
Test Case	Measurement Result (W/kg)		Power Drift (dB)
	10 g Average	1 g Average	
Left hand, Touch cheek, Top frequency (See Fig.13)	0.547	0.975	-0.195
Left hand, Touch cheek, Mid frequency (See Fig.14)	0.562	0.988	-0.043
Left hand, Touch cheek, Bottom frequency (See Fig.15)	0.516	0.899	0.108
Left hand, Tilt 15 Degree, Top frequency (See Fig.16)	0.162	0.264	-0.035
Left hand, Tilt 15 Degree, Mid frequency (See Fig.17)	0.181	0.291	0.015
Left hand, Tilt 15 Degree, Bottom frequency (See Fig.18)	0.175	0.279	0.082
Right hand, Touch cheek, Top frequency (See Fig.19)	0.383	0.623	-0.140
Right hand, Touch cheek, Mid frequency (See Fig.20)	0.401	0.642	0.016
Right hand, Touch cheek, Bottom frequency (See Fig.21)	0.393	0.627	-0.190
Right hand, Tilt 15 Degree, Top frequency (See Fig.22)	0.157	0.262	0.001
Right hand, Tilt 15 Degree, Mid frequency (See Fig.23)	0.184	0.302	-0.019
Right hand, Tilt 15 Degree, Bottom frequency(See Fig.24)	0.167	0.271	0.127

Table 12: SAR Values (850MHz-Head) - with battery CAB3130000C1

Limit of SAR (W/kg)	10 g Average	1 g Average	Power Drift (dB)
	2.0	1.6	
Test Case	Measurement Result (W/kg)		
	10 g Average	1 g Average	
Left hand, Touch cheek, Top frequency (See Fig.25)	0.540	0.981	-0.150

Table 13: SAR Values (850MHz-Body) - with battery CAB3130010C1

Limit of SAR (W/kg)	10 g Average	1g Average	Power Drift (dB)
	2.0	1.6	
Test Case	Measurement Result (W/kg)		
	10 g Average	1 g Average	
Body, Towards Ground, Top frequency with GPRS (See Fig.26)	0.373	0.526	-0.009
Body, Towards Ground, Mid frequency with GPRS (See Fig.27)	0.391	0.547	0.024
Body, Towards Ground, Bottom frequency with GPRS (See Fig.28)	0.389	0.537	0.004
Body, Towards Ground, Mid frequency with Headset_CCB31B0A10C0 (See Fig.29)	0.315	0.438	-0.101
Body, Towards Ground, Mid frequency with Headset_CCB31B0A11C0 (See Fig.30)	0.302	0.423	0.018

Table 14: SAR Values (1900MHz-Body) - with battery CAB3130010C1

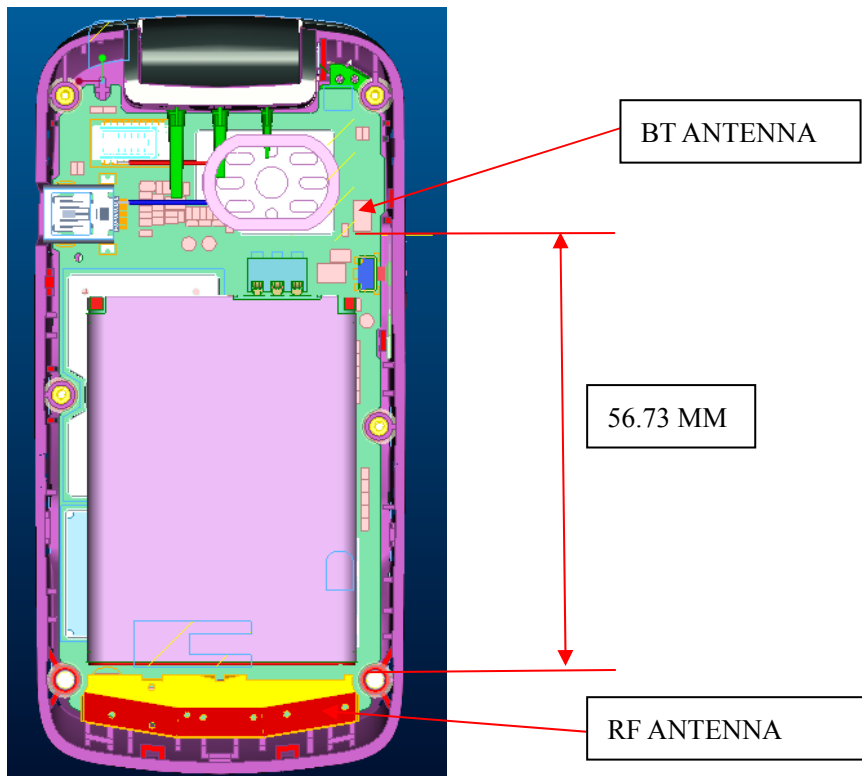
Limit of SAR (W/kg)	10 g Average	1g Average	Power Drift (dB)
	2.0	1.6	
Test Case	Measurement Result (W/kg)		
	10 g Average	1 g Average	
Body, Towards Ground, Top frequency with GPRS (See Fig.31)	0.158	0.250	-0.045
Body, Towards Ground, Mid frequency with GPRS (See Fig.32)	0.166	0.260	-0.035
Body, Towards Ground, Bottom frequency with GPRS (See Fig.33)	0.161	0.254	-0.022
Body, Towards Ground, Mid frequency with Headset_CCB31B0A10C0 (See Fig.34)	0.129	0.203	0.018
Body, Towards Ground, Mid frequency with Headset_CCB31B0A11C0 (See Fig.35)	0.121	0.189	0.027

Table 15: SAR Values (850MHz-Body) - with battery CAB3130000C1

Limit of SAR (W/kg)	10 g Average	1g Average	Power Drift (dB)
	2.0	1.6	
Test Case	Measurement Result (W/kg)		
	10 g Average	1 g Average	
Body, Towards Ground, Mid frequency (See Fig.36)	0.375	0.522	-0.050

8.5 Summary of Measurement Results (Bluetooth function)

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



The output power of BT antenna is as following:

Channel	Ch 0 2402 MHz	Ch 39 2441 Mhz	Ch 78 2480 MHz
Peak Conducted Output Power(dBm)	-4.62	-3.73	-1.00

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

8.6 Conclusion

Localized Specific Absorption Rate (SAR) of this portable wireless device has been measured in all cases requested by the relevant standards cited in Clause 4.2 of this report. Maximum localized SAR is below exposure limits specified in the relevant standards cited in Clause 4.1 of this test report.

9 Measurement Uncertainty

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	/

10 MAIN TEST INSTRUMENTS

Table 16: 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 26, 2010	Two years
10	Dipole Validation Kit	SPEAG D1900V2	541	February 26, 2010	Two years

END OF REPORT BODY

ANNEX A MEASUREMENT PROCESS

The evaluation was performed with the following procedure:

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

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

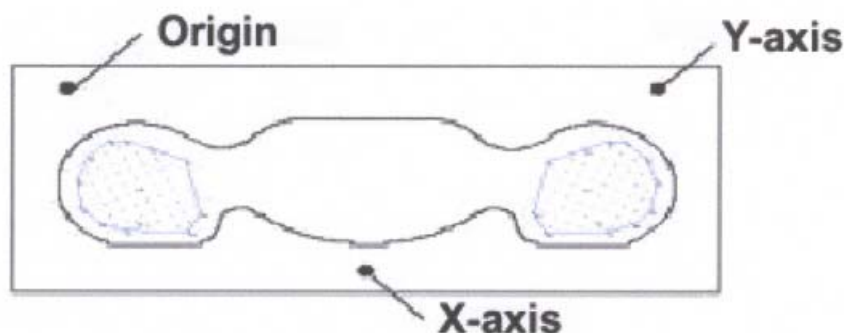
Step 3: Around this point, a volume of 30 mm x 30 mm x 30 mm was assessed by measuring 7 x 7x 7 points. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

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

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

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

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

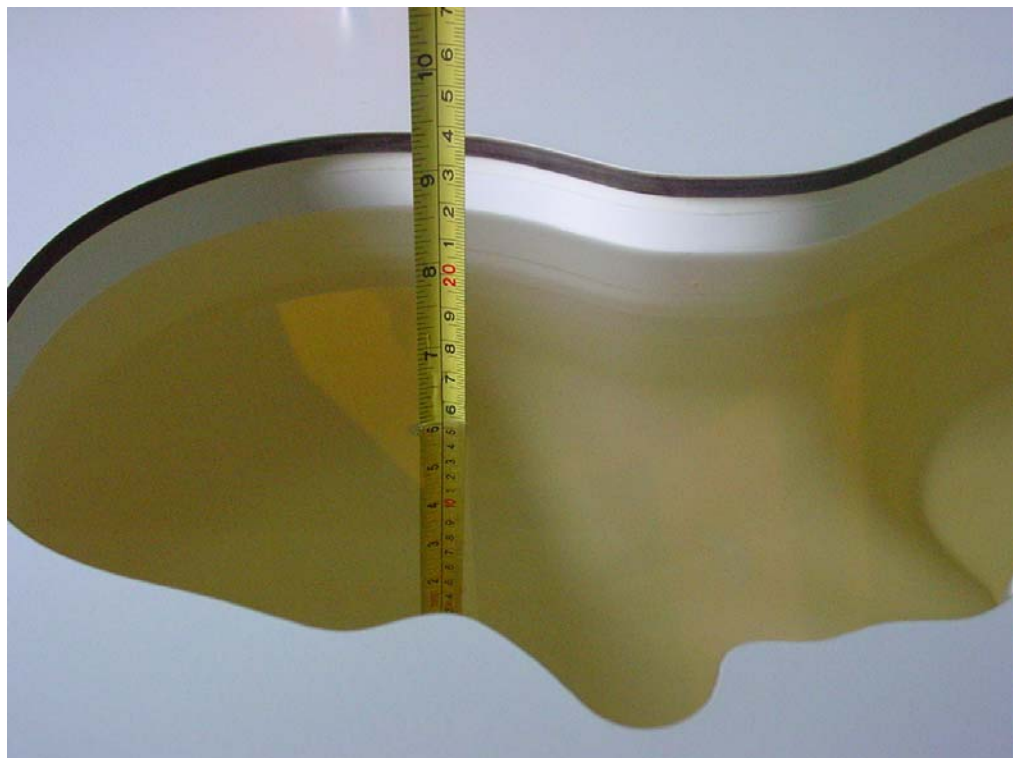


Picture A: SAR Measurement Points in Area Scan

ANNEX B TEST LAYOUT



Picture B1: Specific Absorption Rate Test Layout



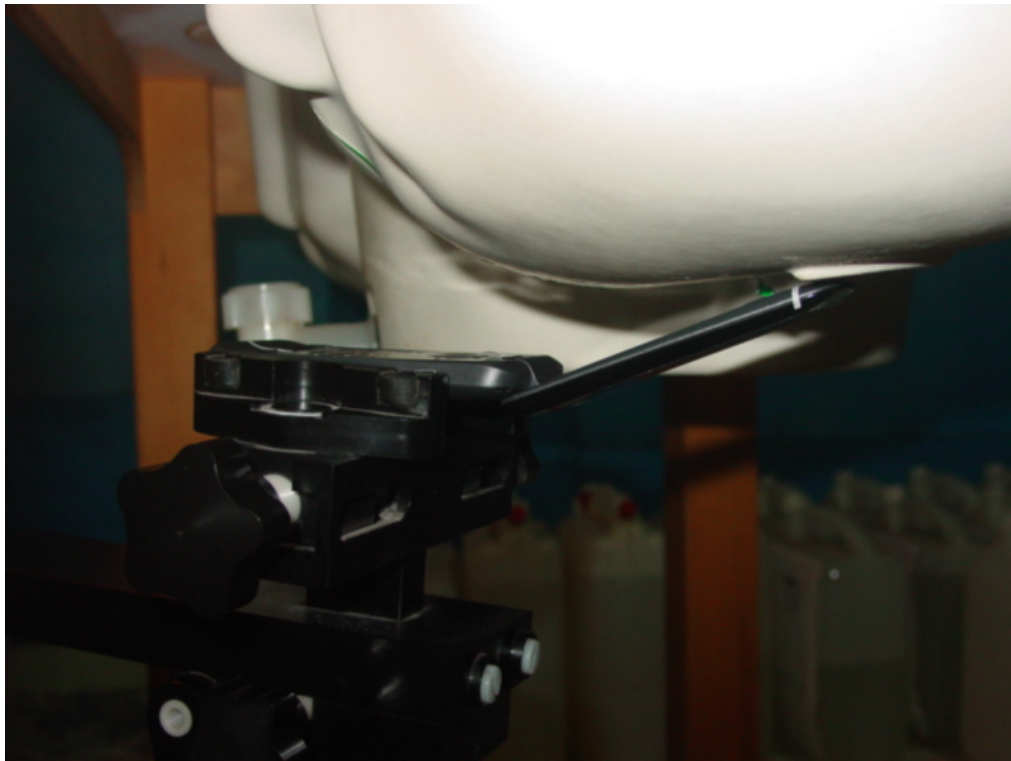
Picture B2: Liquid depth in the Flat Phantom (850 MHz)



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



Picture B4: Left Hand Touch Cheek Position



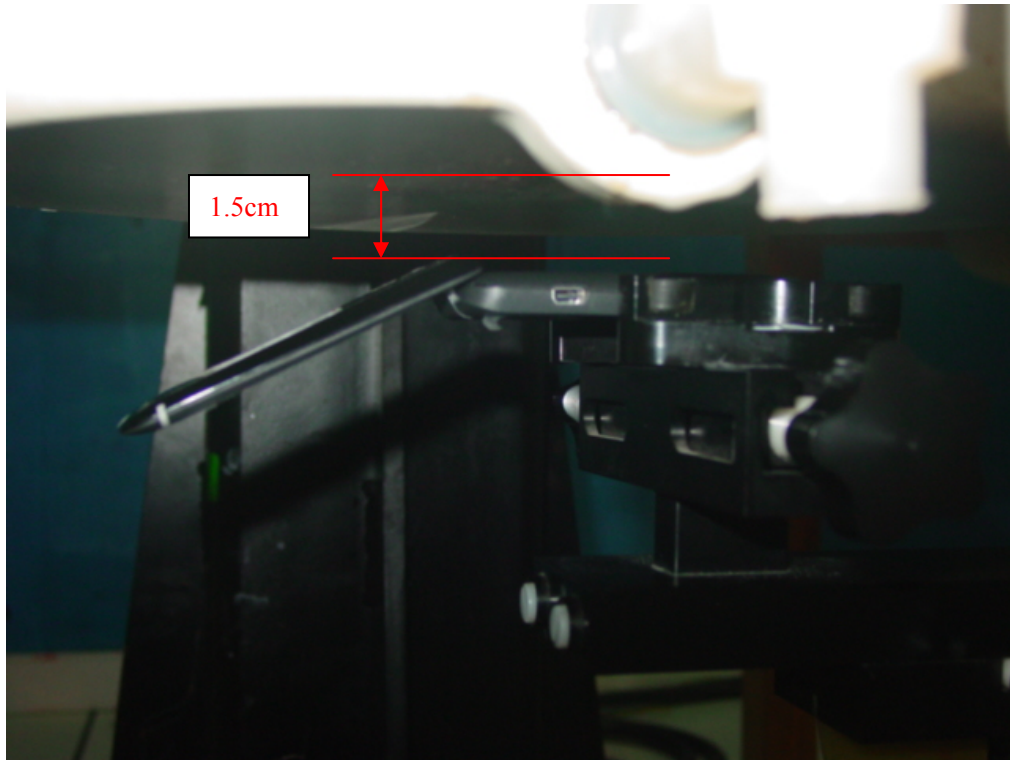
Picture B5: Left Hand Tilt 15° Position



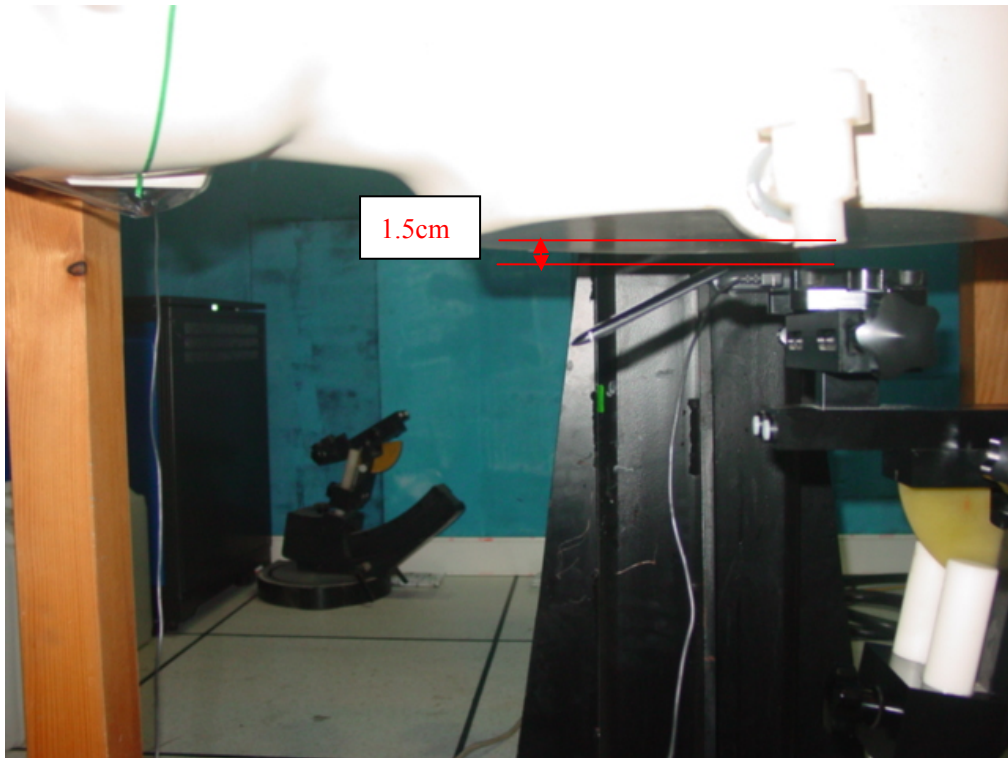
Picture B6: Right Hand Touch Cheek Position



Picture B7: Right Hand Tilt 15° Position



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



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

ANNEX C GRAPH RESULTS

850 Left Cheek High

Date/Time: 2010-4-23 8:07:43

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used (interpolated): $f = 848.8$ MHz; $\sigma = 0.89$ mho/m; $\epsilon_r = 40.7$; $\rho = 1000$ kg/m³

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

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

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

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

Maximum value of SAR (interpolated) = 0.907 mW/g

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

Reference Value = 8.74 V/m; Power Drift = -0.051 dB

Peak SAR (extrapolated) = 2.43 W/kg

SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.573 mW/g

Maximum value of SAR (measured) = 1.13 mW/g

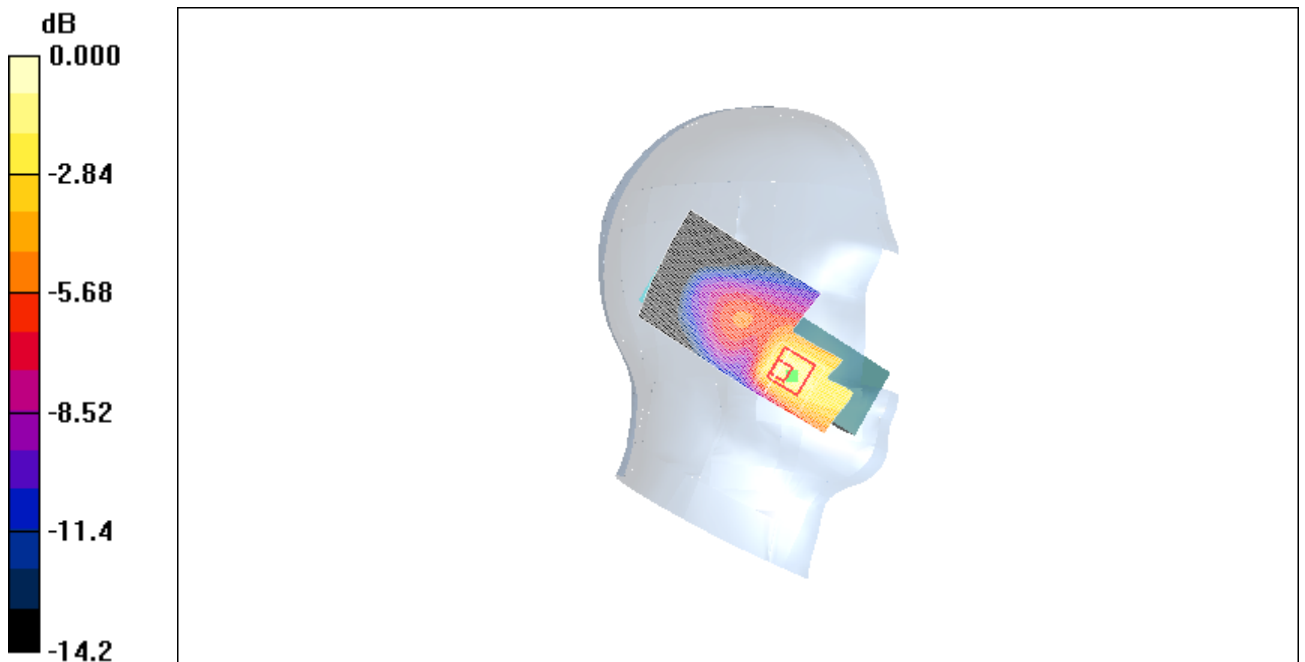


Fig. 1 850MHz CH251

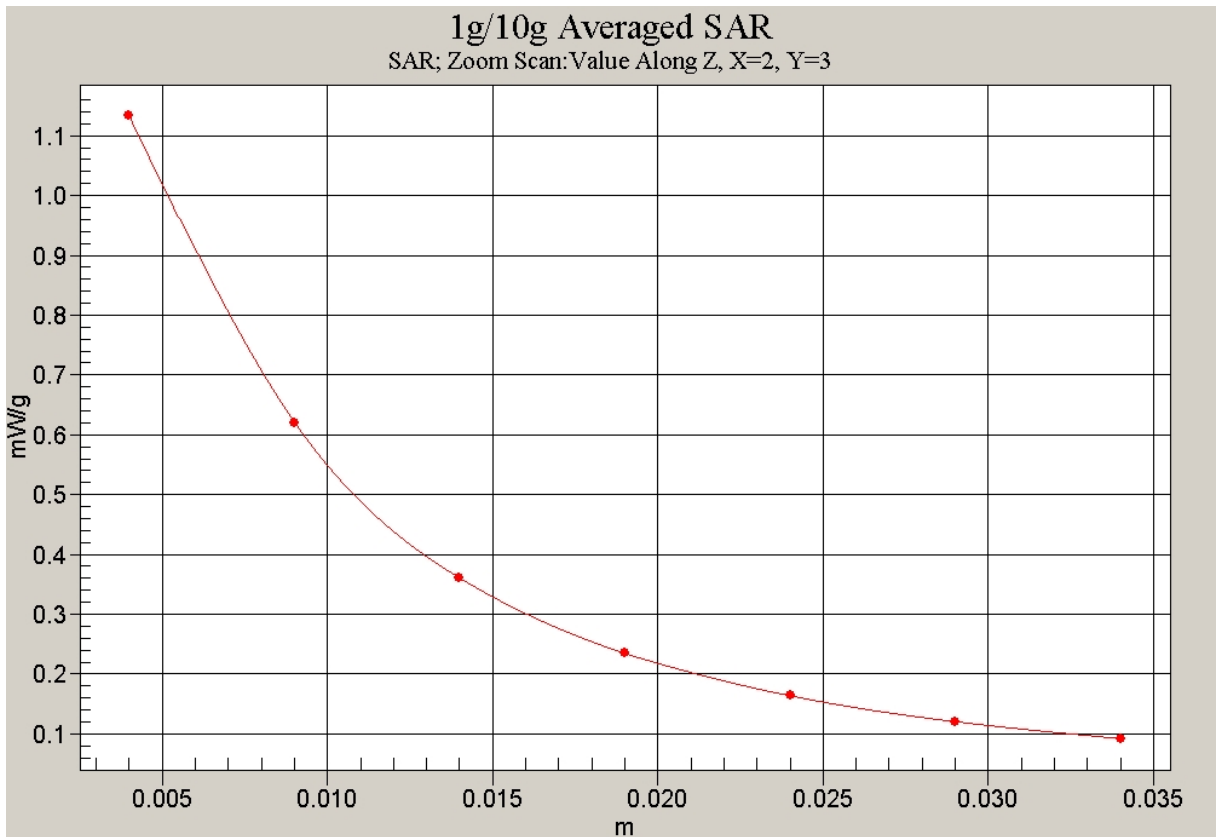


Fig. 1-1 Z-Scan at power reference point (850 MHz CH251)

850 Left Cheek Middle

Date/Time: 2010-4-23 8:21:57

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.878$ mho/m; $\epsilon_r = 40.8$; $\rho = 1000$ kg/m³

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

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

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

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

Maximum value of SAR (interpolated) = 0.900 mW/g

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

Reference Value = 8.52 V/m; Power Drift = -0.177 dB

Peak SAR (extrapolated) = 2.38 W/kg

SAR(1 g) = 0.992 mW/g; SAR(10 g) = 0.559 mW/g

Maximum value of SAR (measured) = 1.10 mW/g

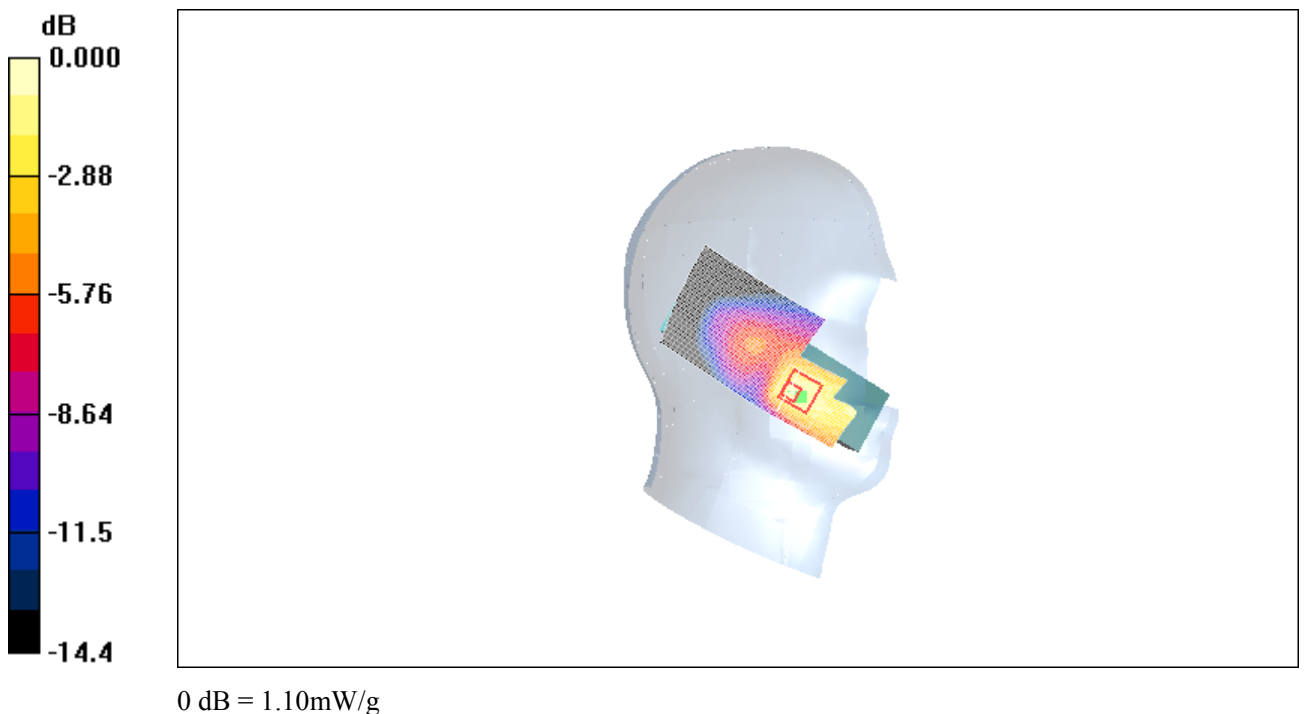


Fig. 2 850 MHz CH190

850 Left Cheek Low

Date/Time: 2010-4-23 8:36:12

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used: $f = 825 \text{ MHz}$; $\sigma = 0.866 \text{ mho/m}$; $\epsilon_r = 40.8$; $\rho = 1000 \text{ kg/m}^3$

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

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

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

Cheek Low/Area Scan (51x131x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.847 mW/g

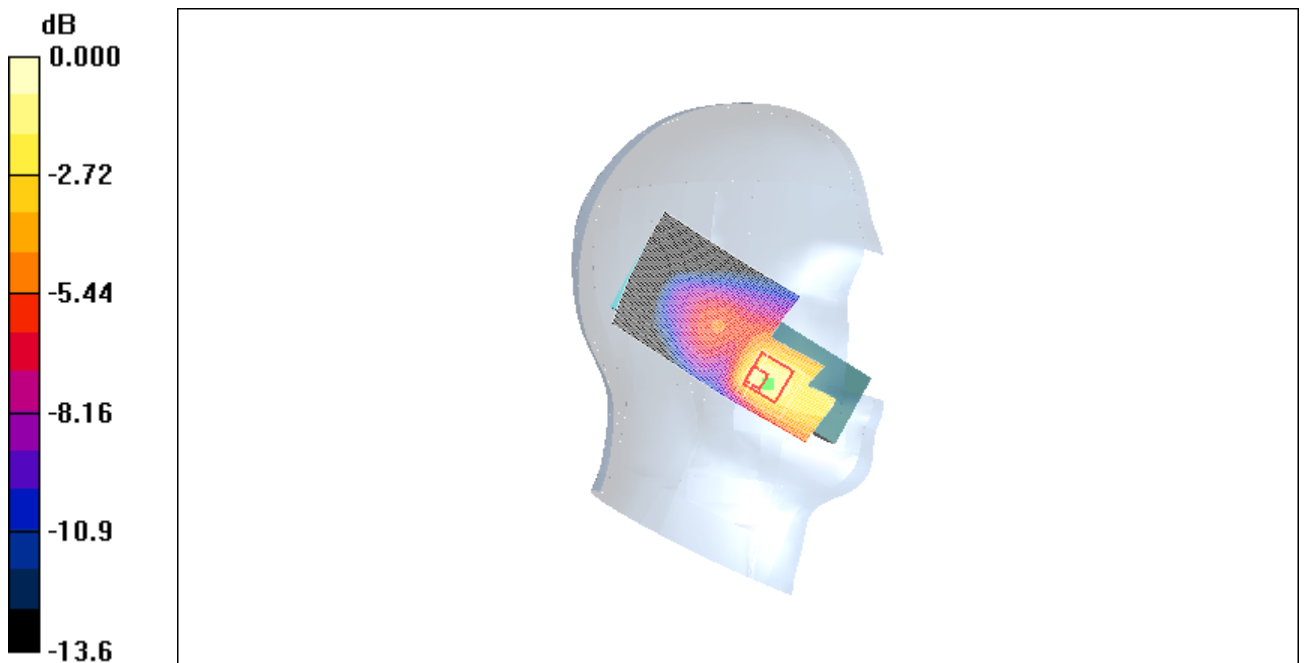
Cheek Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 8.73 V/m ; Power Drift = -0.189 dB

Peak SAR (extrapolated) = 2.93 W/kg

SAR(1 g) = 0.957 mW/g ; SAR(10 g) = 0.533 mW/g

Maximum value of SAR (measured) = 1.05 mW/g



0 dB = 1.05mW/g

Fig. 3 850 MHz CH128

850 Left Tilt High

Date/Time: 2010-4-23 8:50:36

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used (interpolated): $f = 848.8$ MHz; $\sigma = 0.89$ mho/m; $\epsilon_r = 40.7$; $\rho = 1000$ kg/m³

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

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

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

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

Maximum value of SAR (interpolated) = 0.502 mW/g

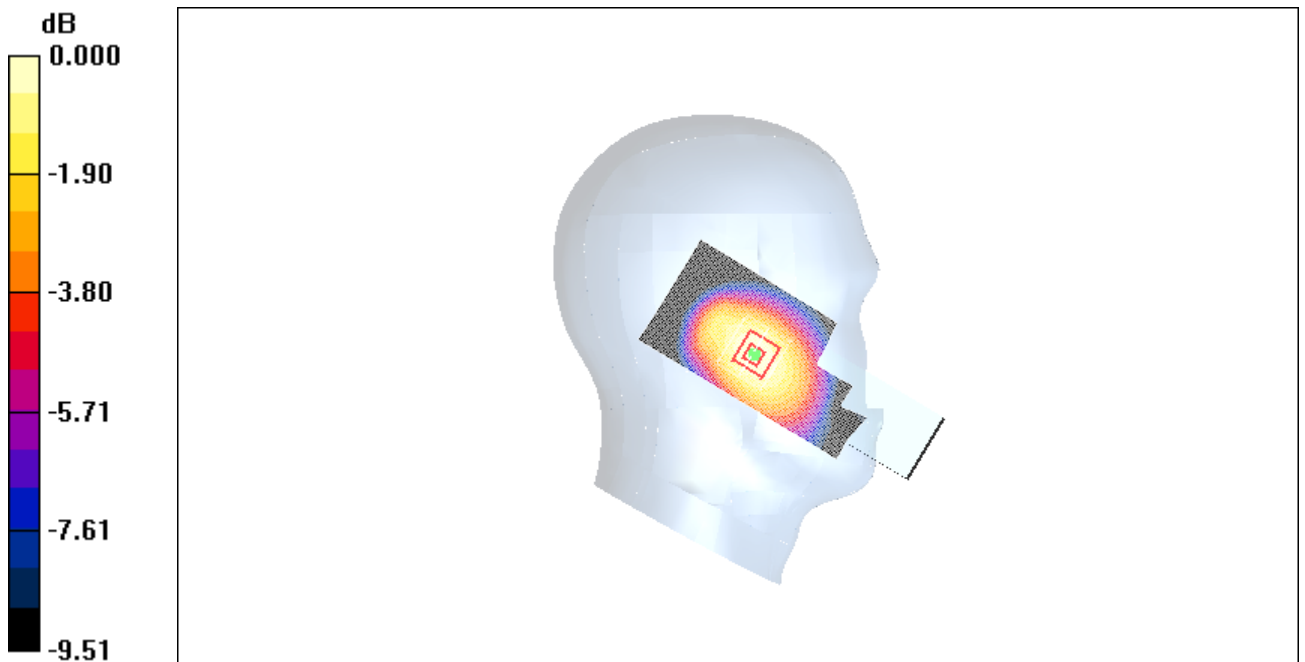
Tilt High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.3 V/m; Power Drift = -0.038 dB

Peak SAR (extrapolated) = 0.614 W/kg

SAR(1 g) = 0.466 mW/g; SAR(10 g) = 0.336 mW/g

Maximum value of SAR (measured) = 0.495 mW/g



0 dB = 0.495mW/g

Fig.4 850 MHz CH251

850 Left Tilt Middle

Date/Time: 2010-4-23 9:04:45

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.878$ mho/m; $\epsilon_r = 40.8$; $\rho = 1000$ kg/m³

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

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

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

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

Maximum value of SAR (interpolated) = 0.479 mW/g

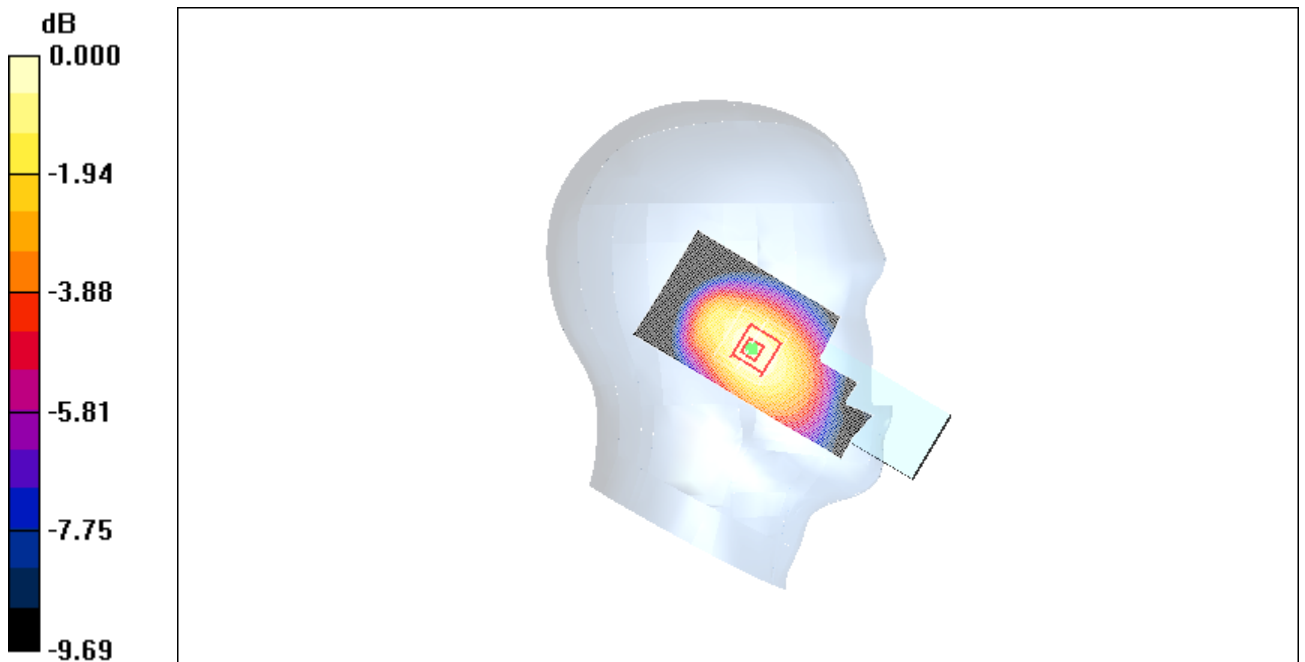
Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.1 V/m; Power Drift = -0.034 dB

Peak SAR (extrapolated) = 0.587 W/kg

SAR(1 g) = 0.444 mW/g; SAR(10 g) = 0.321 mW/g

Maximum value of SAR (measured) = 0.472 mW/g



0 dB = 0.472mW/g

Fig.5 850 MHz CH190

850 Left Tilt Low

Date/Time: 2010-4-23 9:19:02

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used: $f = 825$ MHz; $\sigma = 0.866$ mho/m; $\epsilon_r = 40.8$; $\rho = 1000$ kg/m³

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

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

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

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

Maximum value of SAR (interpolated) = 0.424 mW/g

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

Reference Value = 14.5 V/m; Power Drift = 0.039 dB

Peak SAR (extrapolated) = 0.518 W/kg

SAR(1 g) = 0.398 mW/g; SAR(10 g) = 0.292 mW/g

Maximum value of SAR (measured) = 0.420 mW/g

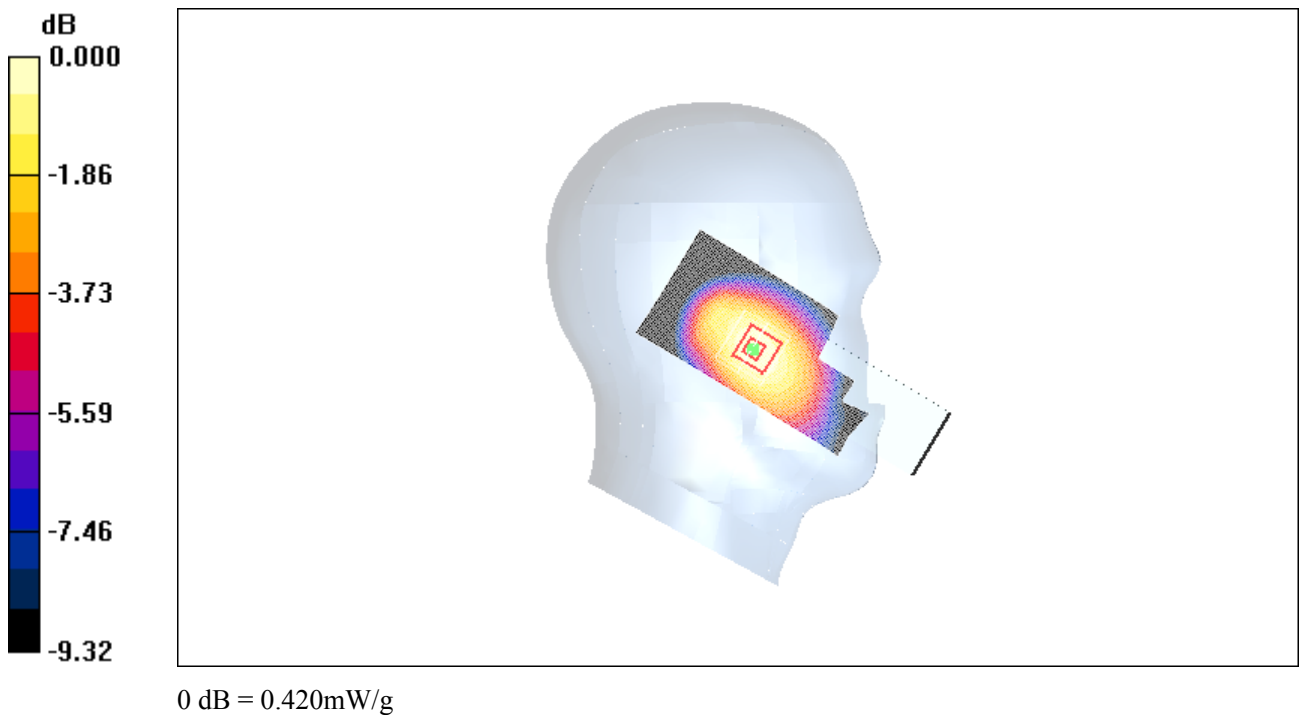


Fig. 6 850 MHz CH128

850 Right Cheek High

Date/Time: 2010-4-23 9:34:27

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used (interpolated): $f = 848.8$ MHz; $\sigma = 0.89$ mho/m; $\epsilon_r = 40.7$; $\rho = 1000$ kg/m³

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

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

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

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

Maximum value of SAR (interpolated) = 0.995 mW/g

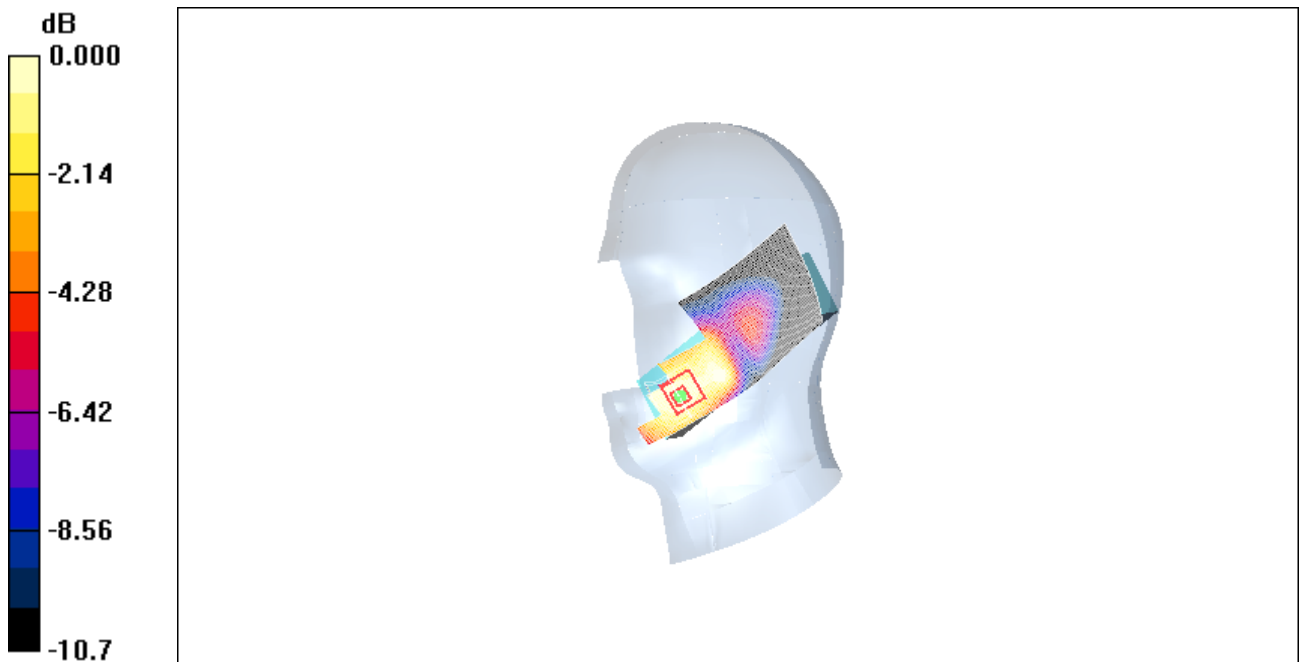
Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.94 V/m; Power Drift = -0.176 dB

Peak SAR (extrapolated) = 1.37 W/kg

SAR(1 g) = 0.897 mW/g; SAR(10 g) = 0.594 mW/g

Maximum value of SAR (measured) = 0.950 mW/g



0 dB = 0.950mW/g

Fig. 7 850 MHz CH251

850 Right Cheek Middle

Date/Time: 2010-4-23 9:48:39

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.878$ mho/m; $\epsilon_r = 40.8$; $\rho = 1000$ kg/m³

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

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

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

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

Maximum value of SAR (interpolated) = 0.919 mW/g

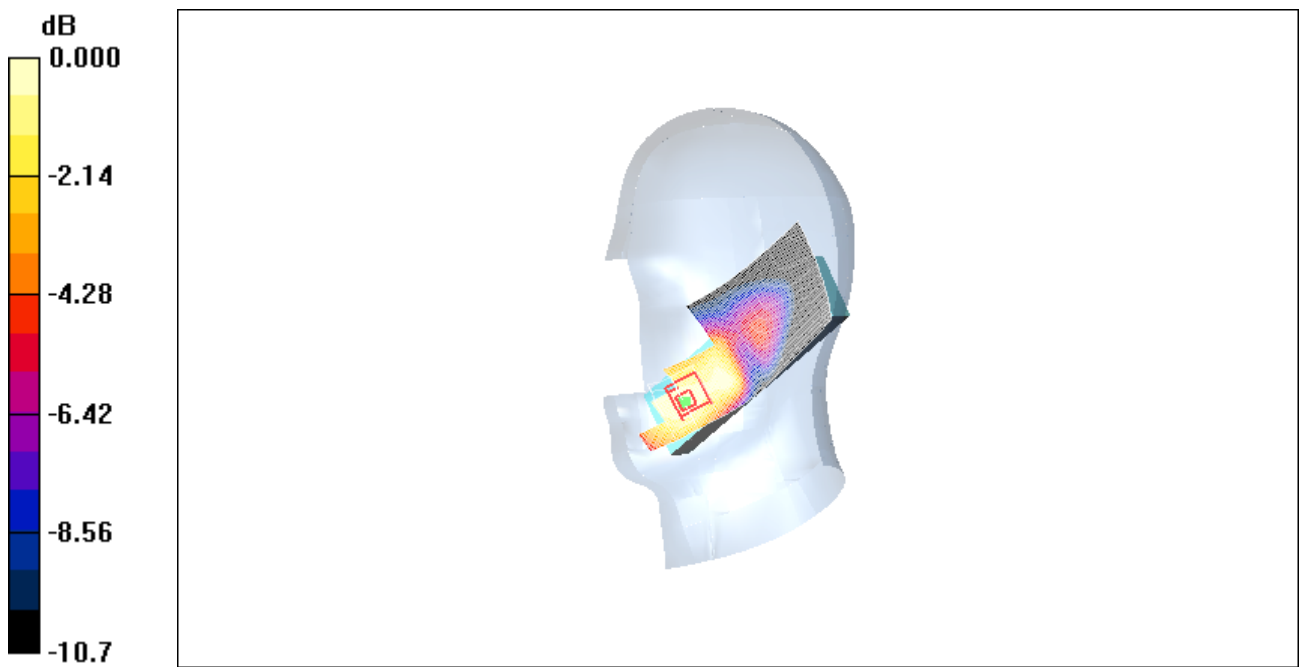
Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.54 V/m; Power Drift = -0.124 dB

Peak SAR (extrapolated) = 1.28 W/kg

SAR(1 g) = 0.835 mW/g; SAR(10 g) = 0.554 mW/g

Maximum value of SAR (measured) = 0.885 mW/g



0 dB = 0.885mW/g

Fig. 8 850 MHz CH190

850 Right Cheek Low

Date/Time: 2010-4-23 10:02:55

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used: $f = 825 \text{ MHz}$; $\sigma = 0.866 \text{ mho/m}$; $\epsilon_r = 40.8$; $\rho = 1000 \text{ kg/m}^3$

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

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

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

Cheek Low/Area Scan (51x131x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.828 mW/g

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

Reference Value = 7.85 V/m ; Power Drift = -0.013 dB

Peak SAR (extrapolated) = 1.15 W/kg

SAR(1 g) = 0.760 mW/g ; SAR(10 g) = 0.507 mW/g

Maximum value of SAR (measured) = 0.811 mW/g

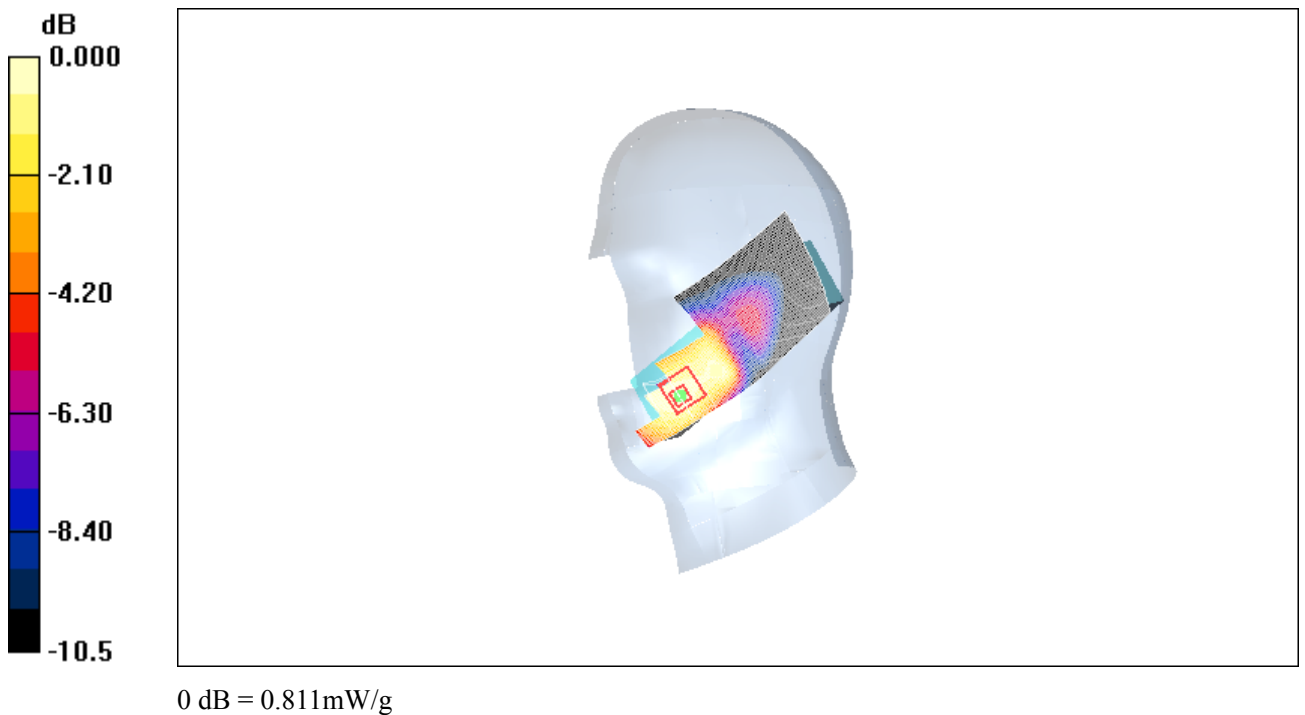


Fig. 9 850 MHz CH128

850 Right Tilt High

Date/Time: 2010-4-23 10:17:22

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used (interpolated): $f = 848.8$ MHz; $\sigma = 0.89$ mho/m; $\epsilon_r = 40.7$; $\rho = 1000$ kg/m³

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

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

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

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

Maximum value of SAR (interpolated) = 0.519 mW/g

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

Reference Value = 16.7 V/m; Power Drift = -0.028 dB

Peak SAR (extrapolated) = 0.638 W/kg

SAR(1 g) = 0.487 mW/g; SAR(10 g) = 0.353 mW/g

Maximum value of SAR (measured) = 0.513 mW/g

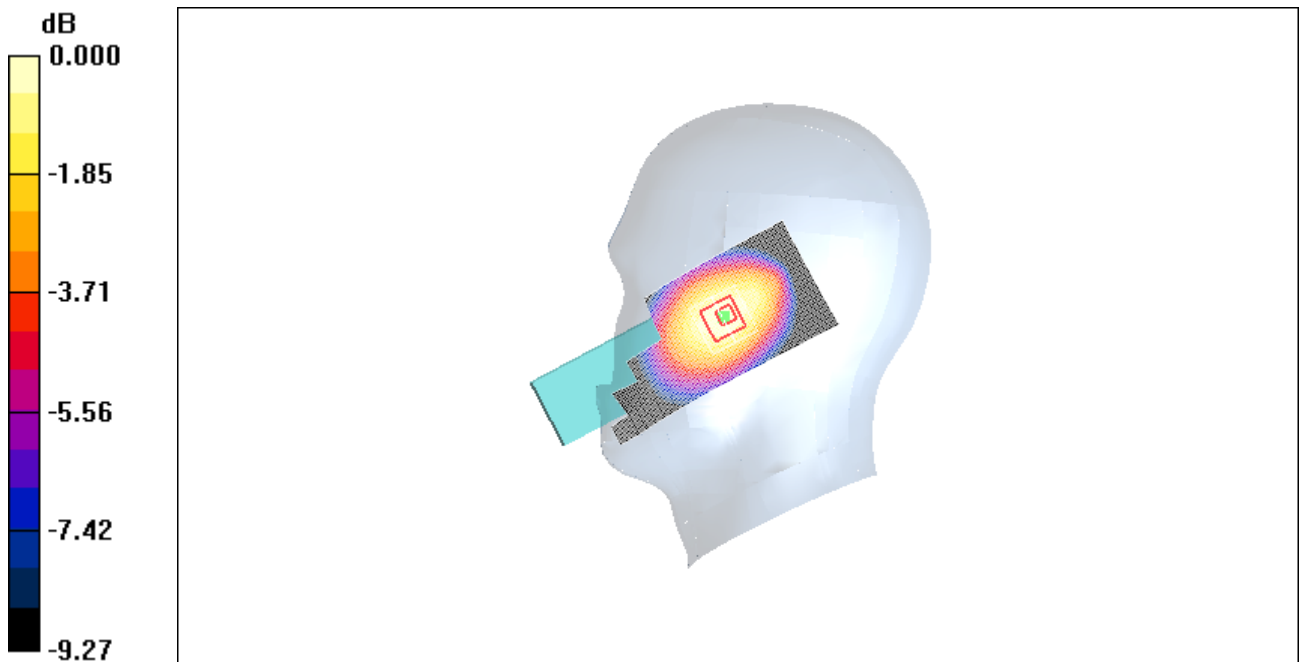


Fig.10 850 MHz CH251

850 Right Tilt Middle

Date/Time: 2010-4-23 10:31:35

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.878$ mho/m; $\epsilon_r = 40.8$; $\rho = 1000$ kg/m³

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

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

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

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

Maximum value of SAR (interpolated) = 0.503 mW/g

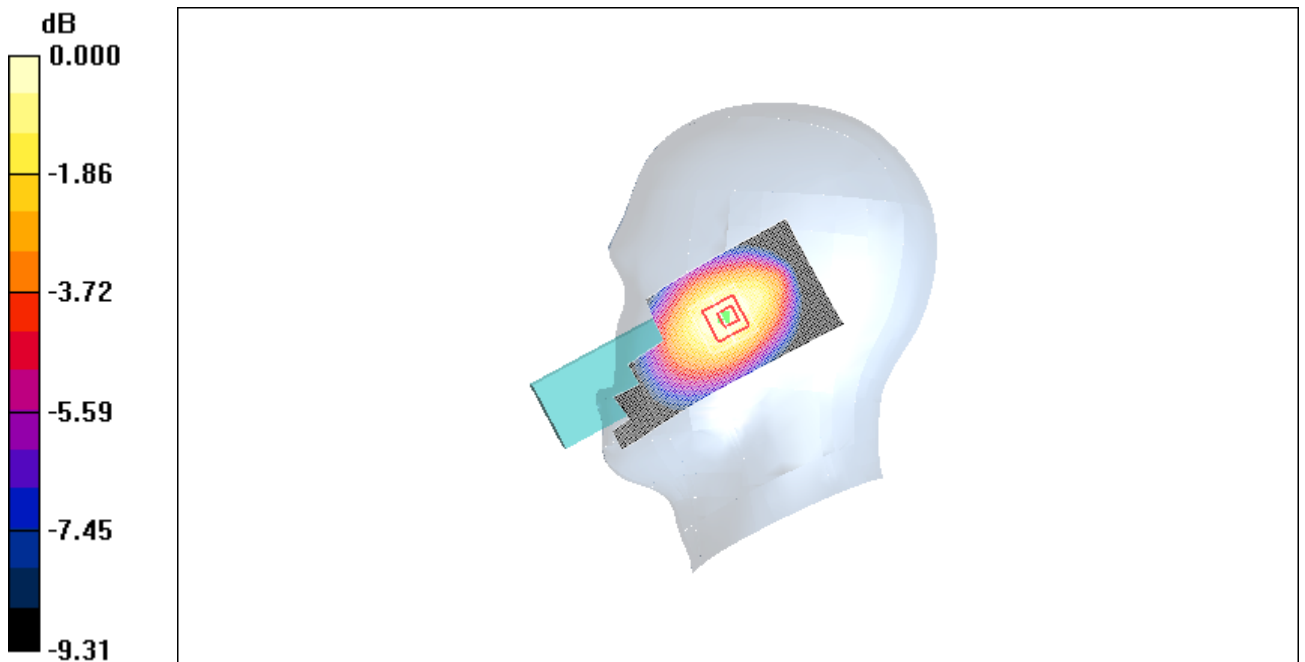
Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 16.6 V/m; Power Drift = -0.014 dB

Peak SAR (extrapolated) = 0.615 W/kg

SAR(1 g) = 0.471 mW/g; SAR(10 g) = 0.343 mW/g

Maximum value of SAR (measured) = 0.496 mW/g



0 dB = 0.496mW/g

Fig.11 850 MHz CH190

850 Right Tilt Low

Date/Time: 2010-4-23 10:45:51

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used: $f = 825 \text{ MHz}$; $\sigma = 0.866 \text{ mho/m}$; $\epsilon_r = 40.8$; $\rho = 1000 \text{ kg/m}^3$

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

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

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

Tilt Low/Area Scan (51x131x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.436 mW/g

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

Reference Value = 15.5 V/m ; Power Drift = -0.012 dB

Peak SAR (extrapolated) = 0.526 W/kg

SAR(1 g) = 0.408 mW/g ; SAR(10 g) = 0.299 mW/g

Maximum value of SAR (measured) = 0.427 mW/g

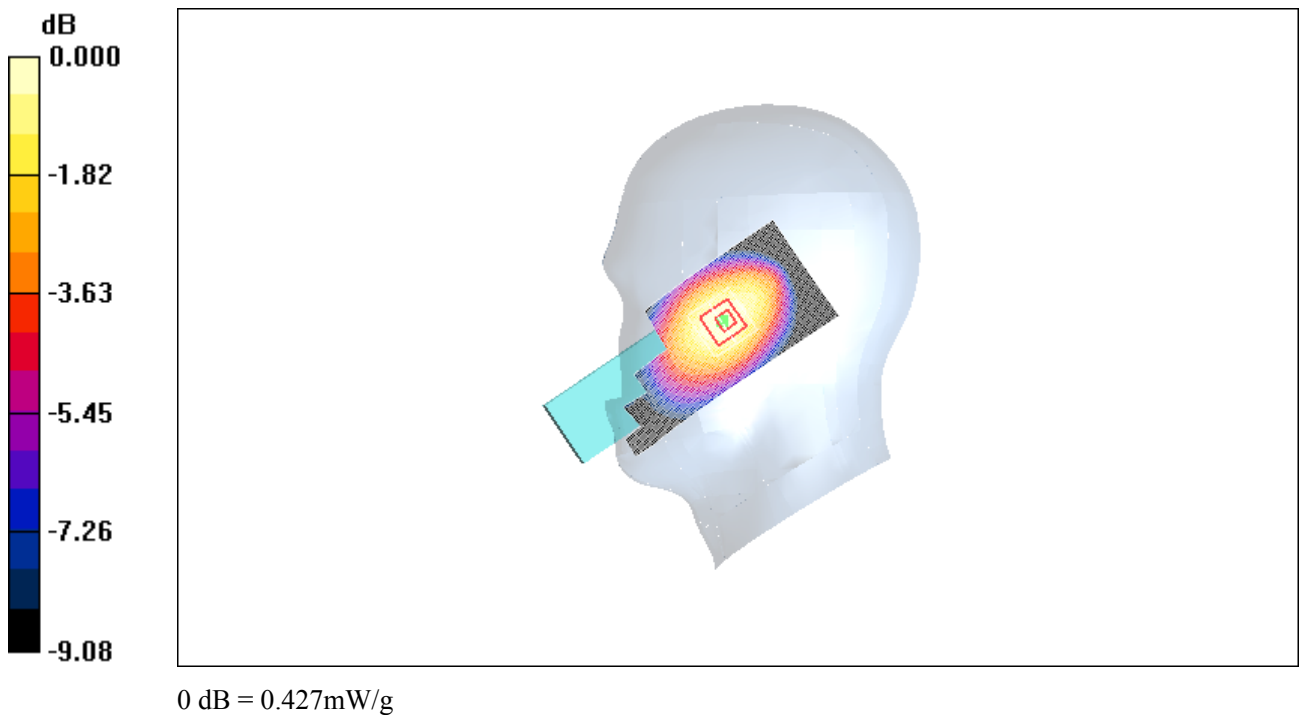


Fig. 12 850 MHz CH128

1900 Left Cheek High

Date/Time: 2010-4-26 8:11:24

Electronics: DAE4 Sn771

Medium: 1900 Head

Medium parameters used: $f = 1910 \text{ MHz}$; $\sigma = 1.40 \text{ mho/m}$; $\epsilon_r = 38.9$; $\rho = 1000 \text{ kg/m}^3$

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

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

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

Cheek High/Area Scan (51x131x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 1.13 mW/g

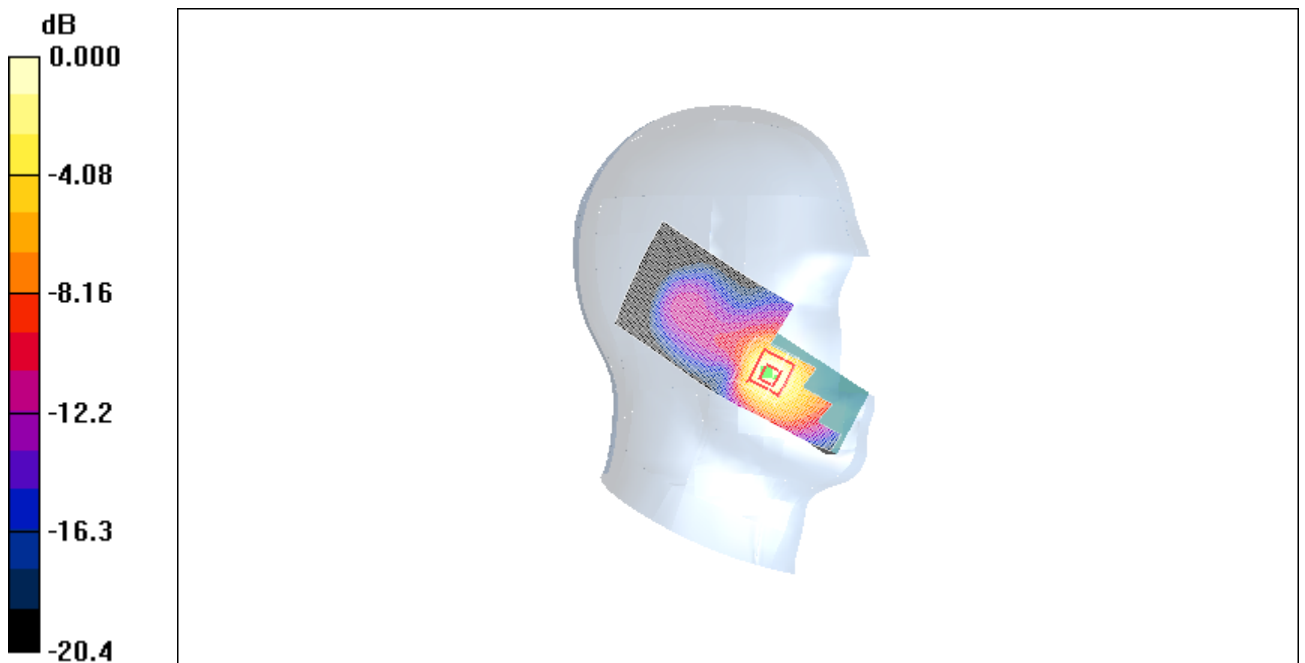
Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 5.12 V/m; Power Drift = -0.195 dB

Peak SAR (extrapolated) = 1.58 W/kg

SAR(1 g) = 0.975 mW/g; SAR(10 g) = 0.547 mW/g

Maximum value of SAR (measured) = 1.06 mW/g



0 dB = 1.06mW/g

Fig. 13 1900 MHz CH810

1900 Left Cheek Middle

Date/Time: 2010-4-26 8:25:40

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.38$ mho/m; $\epsilon_r = 39.0$; $\rho = 1000$ kg/m³

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

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

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

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

Maximum value of SAR (interpolated) = 1.13 mW/g

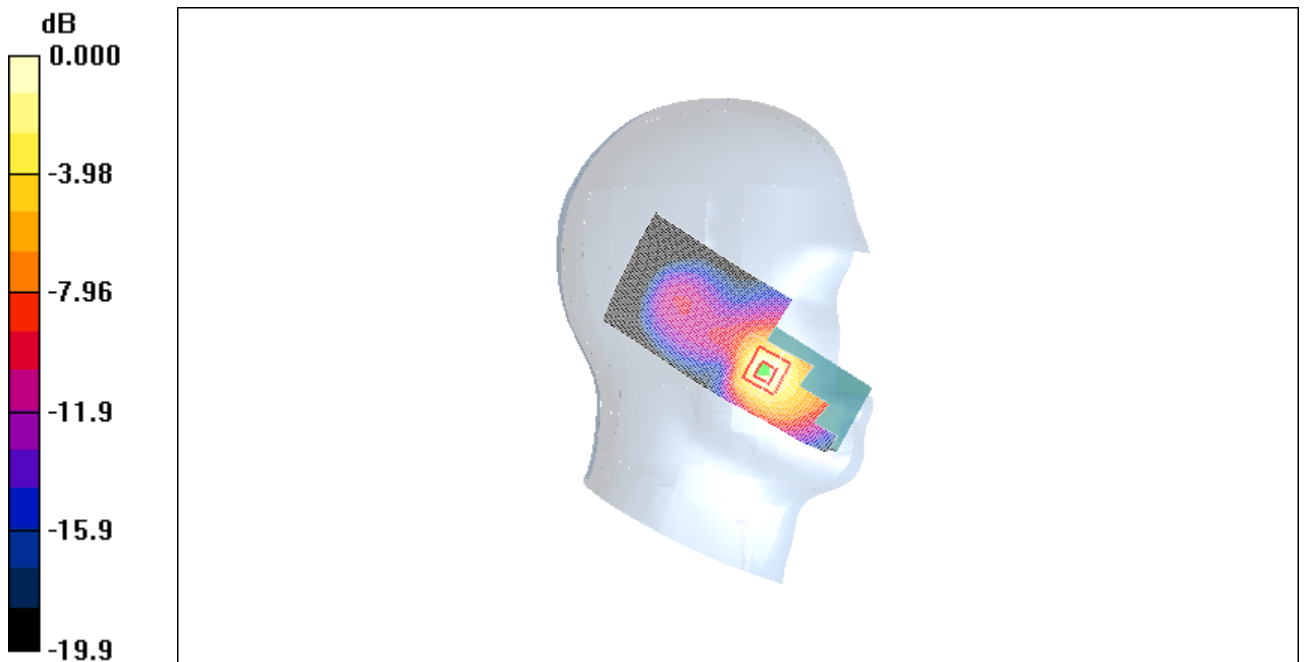
Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.28 V/m; Power Drift = -0.043 dB

Peak SAR (extrapolated) = 1.57 W/kg

SAR(1 g) = 0.988 mW/g; SAR(10 g) = 0.562 mW/g

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



0 dB = 1.08mW/g

Fig. 14 1900 MHz CH661

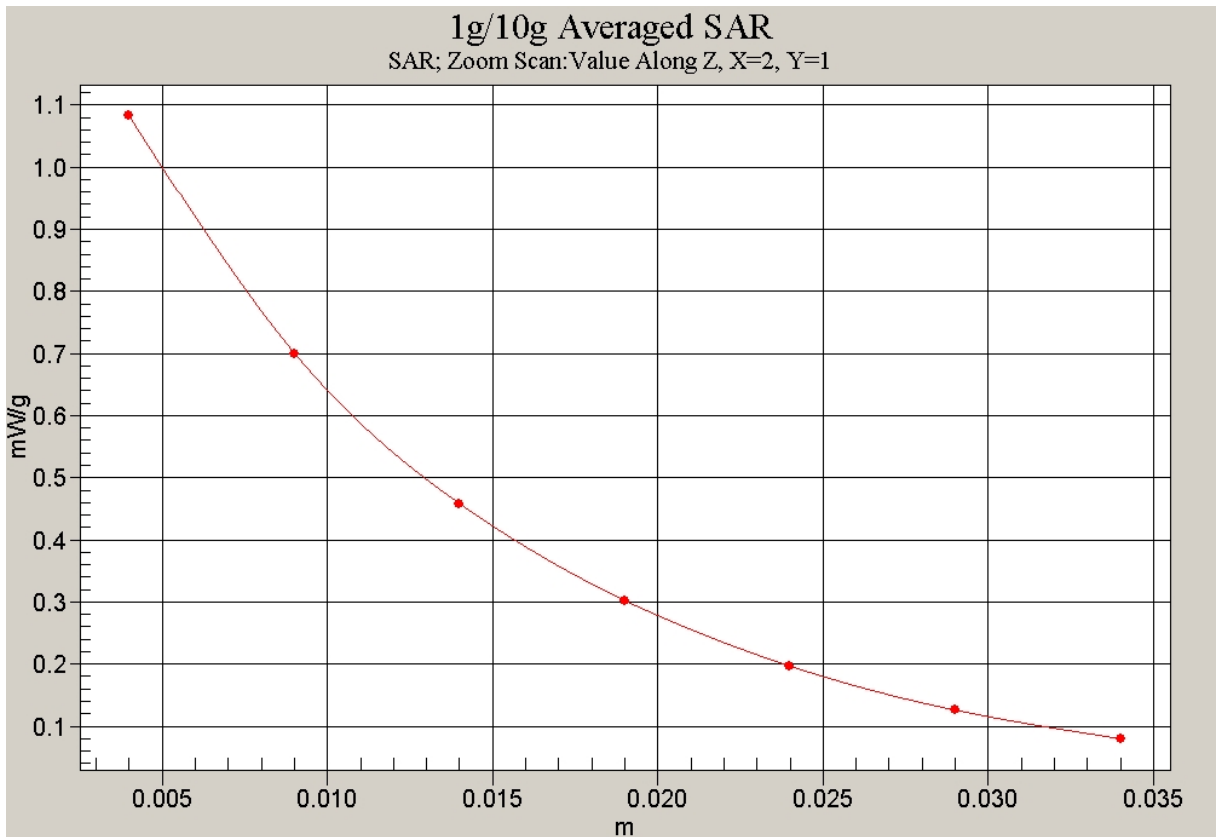


Fig. 14-1 Z-Scan at power reference point (1900 MHz CH661)

1900 Left Cheek Low

Date/Time: 2010-4-26 8:39:56

Electronics: DAE4 Sn771

Medium: 1900 Head

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.35$ mho/m; $\epsilon_r = 39.1$; $\rho = 1000$ kg/m³

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

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

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

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

Maximum value of SAR (interpolated) = 1.02 mW/g

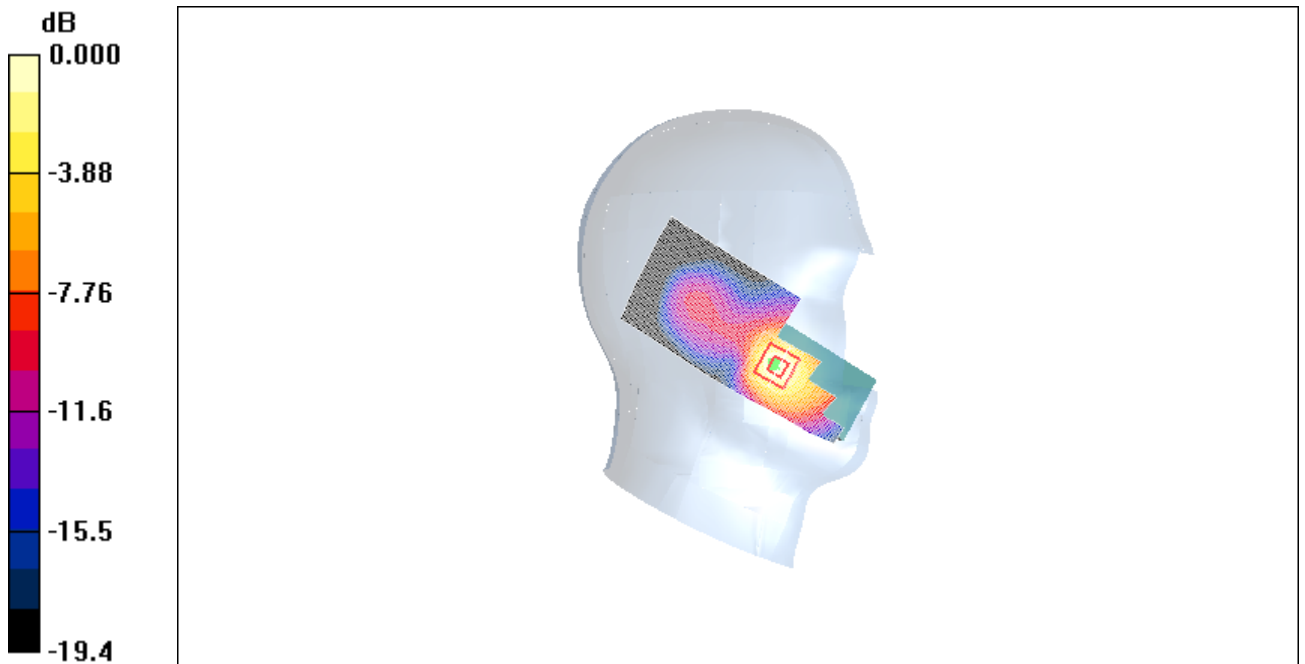
Cheek Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.27 V/m; Power Drift = 0.108 dB

Peak SAR (extrapolated) = 1.43 W/kg

SAR(1 g) = 0.899 mW/g; SAR(10 g) = 0.516 mW/g

Maximum value of SAR (measured) = 1.01 mW/g



0 dB = 1.01mW/g

Fig. 15 1900 MHz CH512

1900 Left Tilt High

Date/Time: 2010-4-26 8:54:17

Electronics: DAE4 Sn771

Medium: 1900 Head

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.40$ mho/m; $\epsilon_r = 38.9$; $\rho = 1000$ kg/m³

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

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

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

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

Maximum value of SAR (interpolated) = 0.321 mW/g

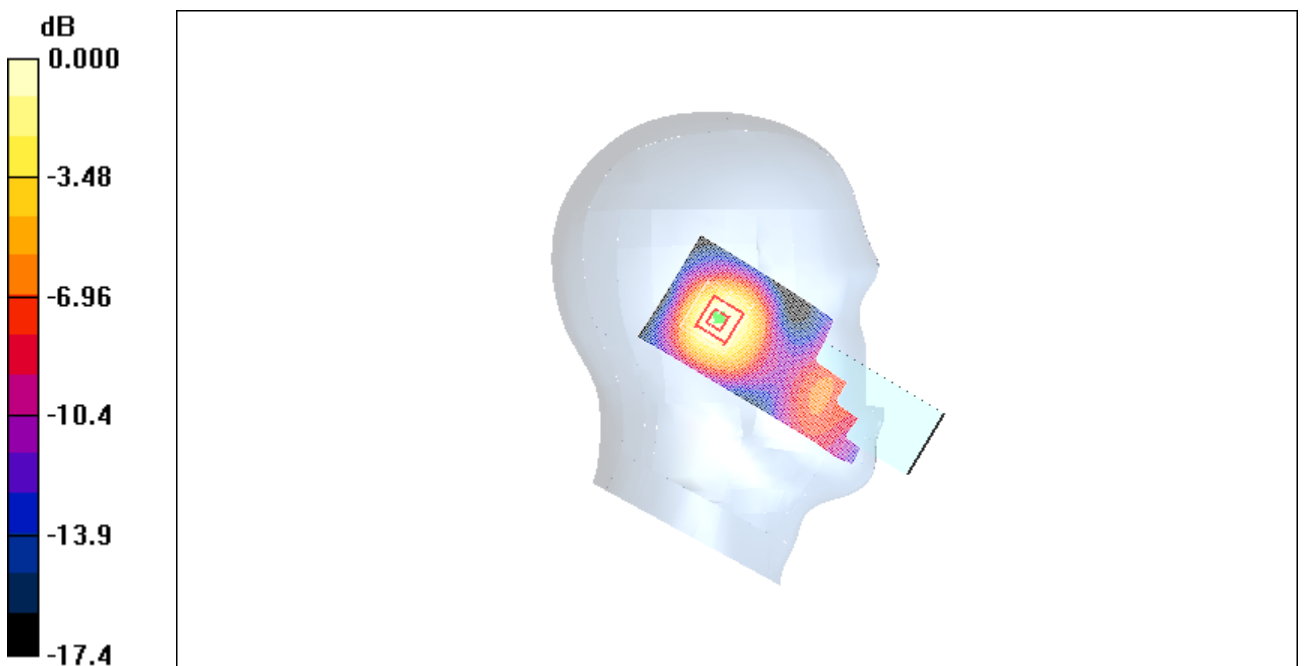
Tilt High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.1 V/m; Power Drift = -0.035 dB

Peak SAR (extrapolated) = 0.388 W/kg

SAR(1 g) = 0.264 mW/g; SAR(10 g) = 0.162 mW/g

Maximum value of SAR (measured) = 0.285 mW/g



0 dB = 0.285mW/g

Fig.16 1900 MHz CH810

1900 Left Tilt Middle

Date/Time: 2010-4-26 9:08:33

Electronics: DAE4 Sn771

Medium: 1900 Head

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.38 \text{ mho/m}$; $\epsilon_r = 39.0$; $\rho = 1000 \text{ kg/m}^3$

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

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

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

Tilt Middle/Area Scan (51x131x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.351 mW/g

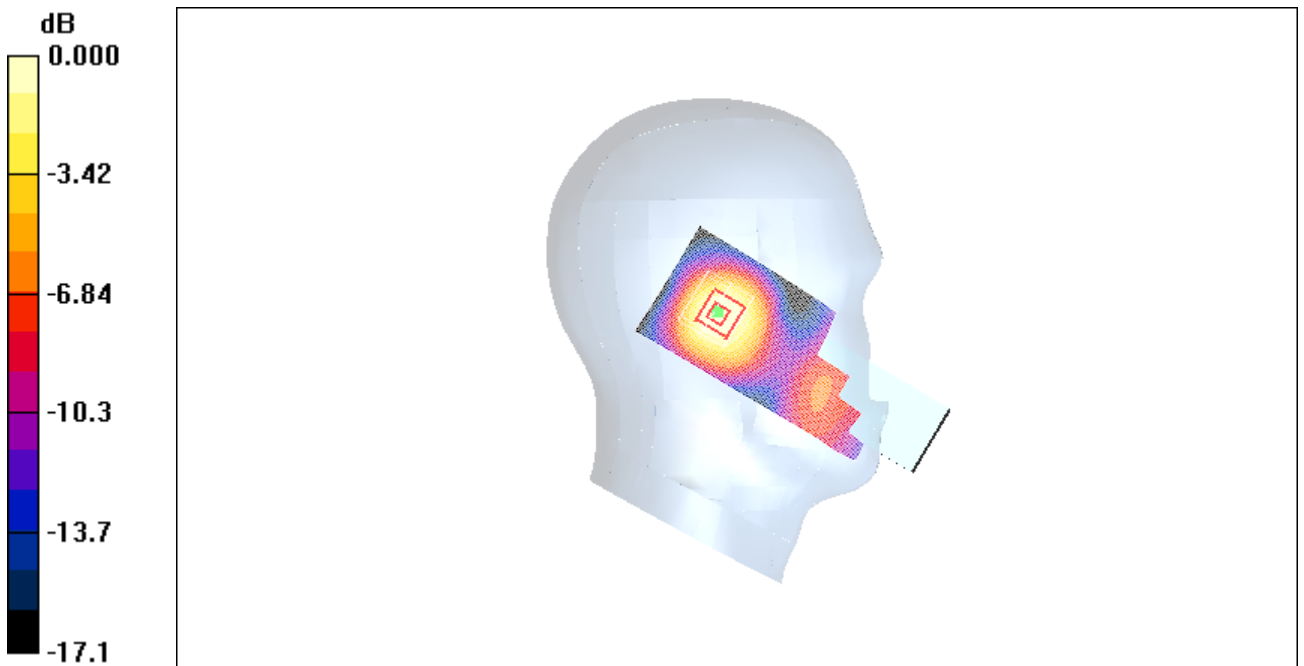
Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 12.4 V/m; Power Drift = 0.015 dB

Peak SAR (extrapolated) = 0.425 W/kg

SAR(1 g) = 0.291 mW/g; SAR(10 g) = 0.181 mW/g

Maximum value of SAR (measured) = 0.312 mW/g



0 dB = 0.312mW/g

Fig. 17 1900 MHz CH661

1900 Left Tilt Low

Date/Time: 2010-4-26 9:22:53

Electronics: DAE4 Sn771

Medium: 1900 Head

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.35$ mho/m; $\epsilon_r = 39.1$; $\rho = 1000$ kg/m³

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

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

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

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

Maximum value of SAR (interpolated) = 0.338 mW/g

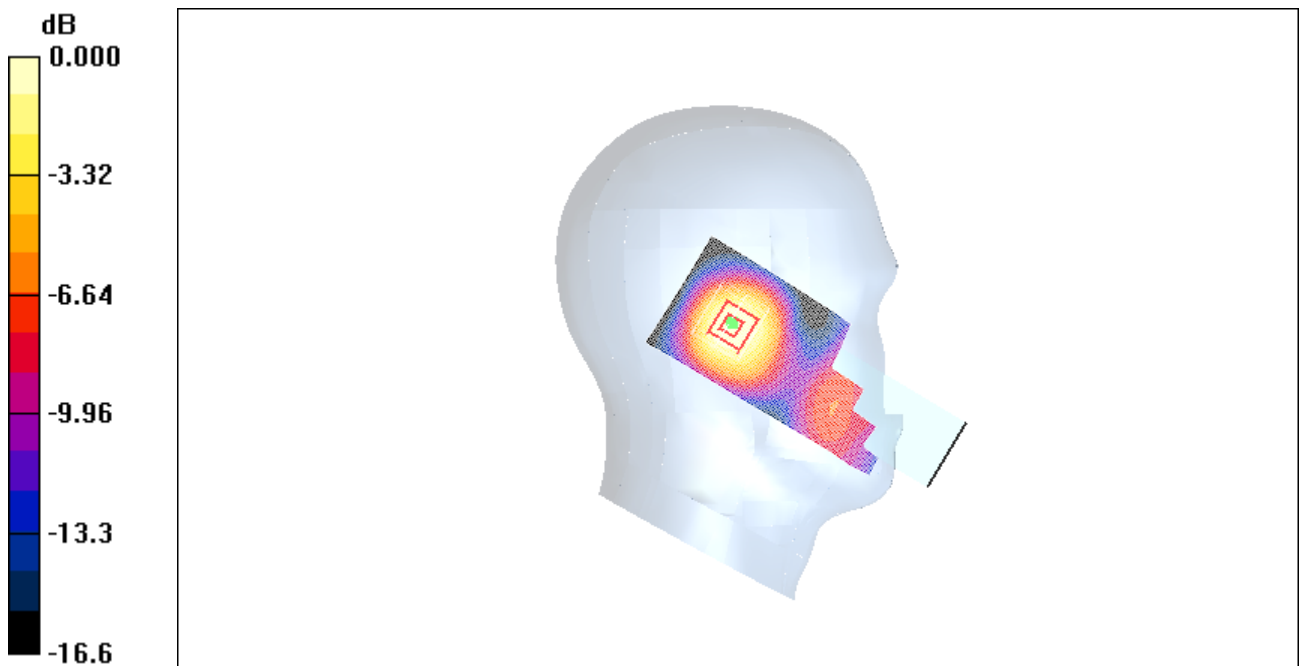
Tilt Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.1 V/m; Power Drift = 0.082 dB

Peak SAR (extrapolated) = 0.405 W/kg

SAR(1 g) = 0.279 mW/g; SAR(10 g) = 0.175 mW/g

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



0 dB = 0.301mW/g

Fig. 18 1900 MHz CH512

1900 Right Cheek High

Date/Time: 2010-4-26 9:37:25

Electronics: DAE4 Sn771

Medium: 1900 Head

Medium parameters used: $f = 1910 \text{ MHz}$; $\sigma = 1.40 \text{ mho/m}$; $\epsilon_r = 38.9$; $\rho = 1000 \text{ kg/m}^3$

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

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

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

Cheek High/Area Scan (51x131x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.724 mW/g

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

Reference Value = 4.44 V/m; Power Drift = -0.140 dB

Peak SAR (extrapolated) = 0.862 W/kg

SAR(1 g) = 0.623 mW/g; SAR(10 g) = 0.383 mW/g

Maximum value of SAR (measured) = 0.656 mW/g

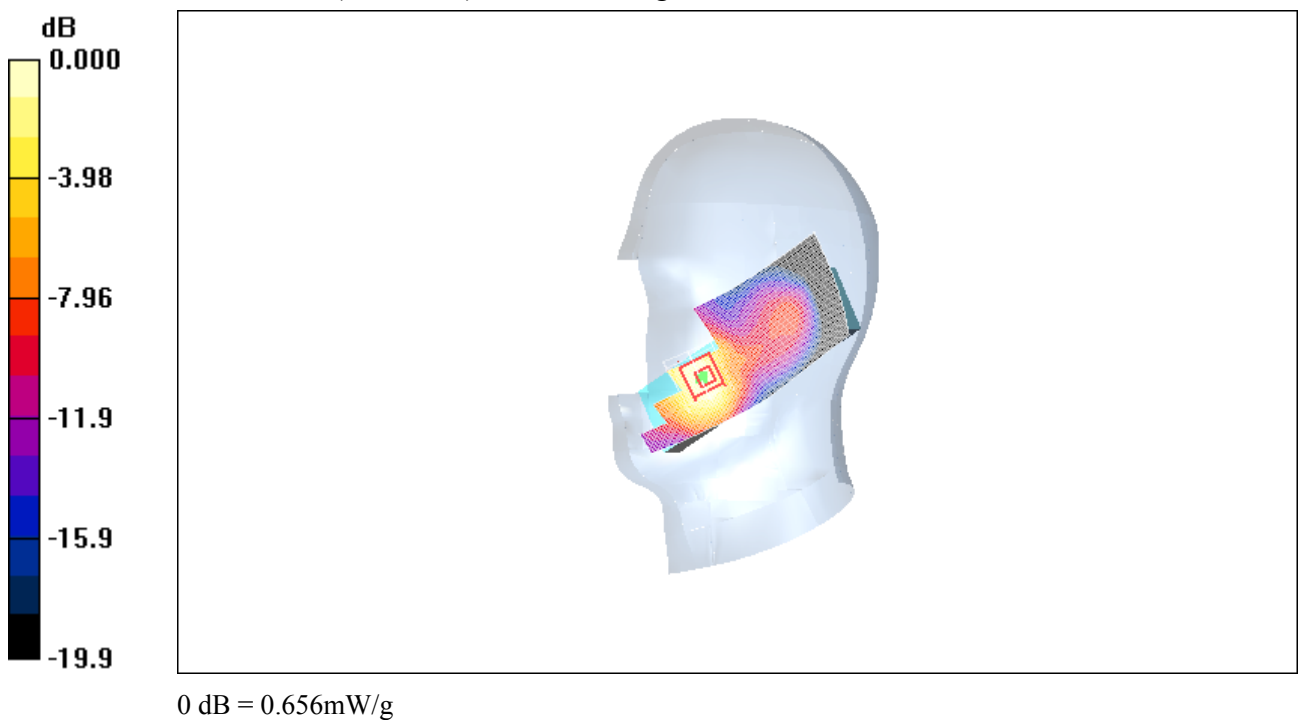


Fig. 19 1900 MHz CH810

1900 Right Cheek Middle

Date/Time: 2010-4-26 9:51:41

Electronics: DAE4 Sn771

Medium: 1900 Head

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.38 \text{ mho/m}$; $\epsilon_r = 39.0$; $\rho = 1000 \text{ kg/m}^3$

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

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

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

Cheek Middle/Area Scan (51x131x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.749 mW/g

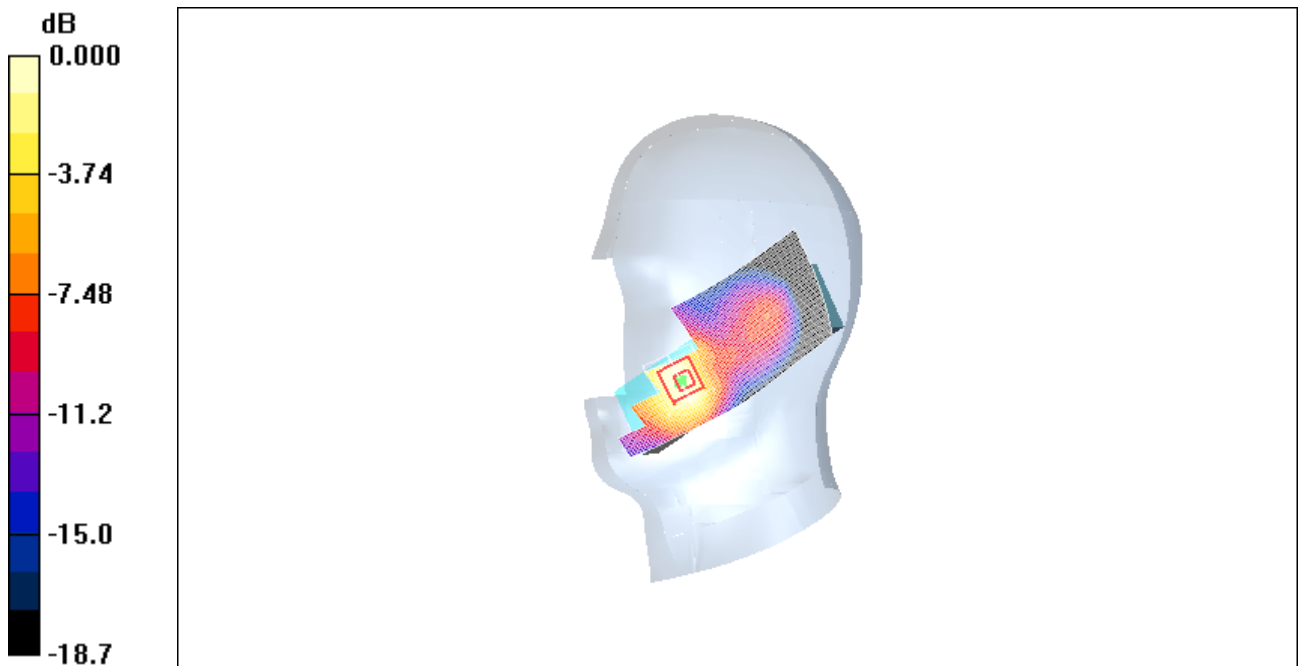
Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 4.20 V/m; Power Drift = 0.016 dB

Peak SAR (extrapolated) = 0.878 W/kg

SAR(1 g) = 0.642 mW/g; SAR(10 g) = 0.401 mW/g

Maximum value of SAR (measured) = 0.681 mW/g



0 dB = 0.681mW/g

Fig. 20 1900 MHz CH661

1900 Right Cheek Low

Date/Time: 2010-4-26 10:05:58

Electronics: DAE4 Sn771

Medium: 1900 Head

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.35$ mho/m; $\epsilon_r = 39.1$; $\rho = 1000$ kg/m³

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

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

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

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

Maximum value of SAR (interpolated) = 0.727 mW/g

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

Reference Value = 4.32 V/m; Power Drift = -0.090 dB

Peak SAR (extrapolated) = 0.863 W/kg

SAR(1 g) = 0.627 mW/g; SAR(10 g) = 0.393 mW/g

Maximum value of SAR (measured) = 0.672 mW/g

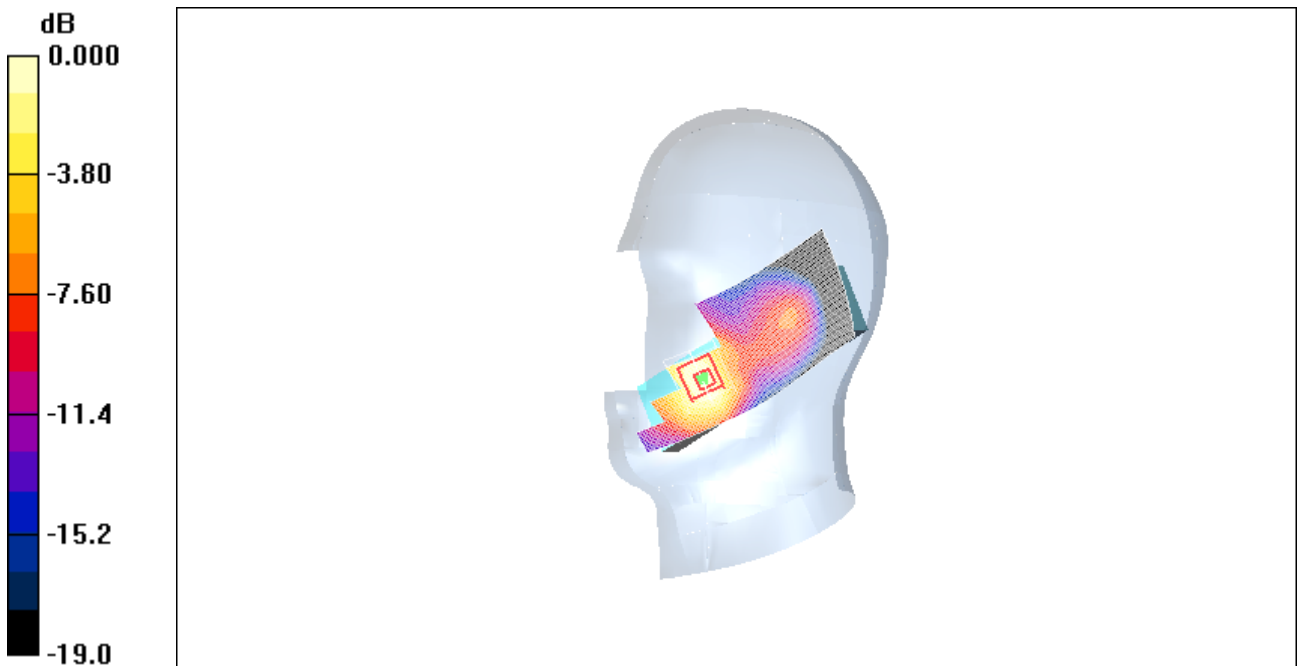


Fig. 21 1900 MHz CH512

1900 Right Tilt High

Date/Time: 2010-4-26 10:20:12

Electronics: DAE4 Sn771

Medium: 1900 Head

Medium parameters used: $f = 1910 \text{ MHz}$; $\sigma = 1.40 \text{ mho/m}$; $\epsilon_r = 38.9$; $\rho = 1000 \text{ kg/m}^3$

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

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

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

Tilt High/Area Scan (51x131x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.315 mW/g

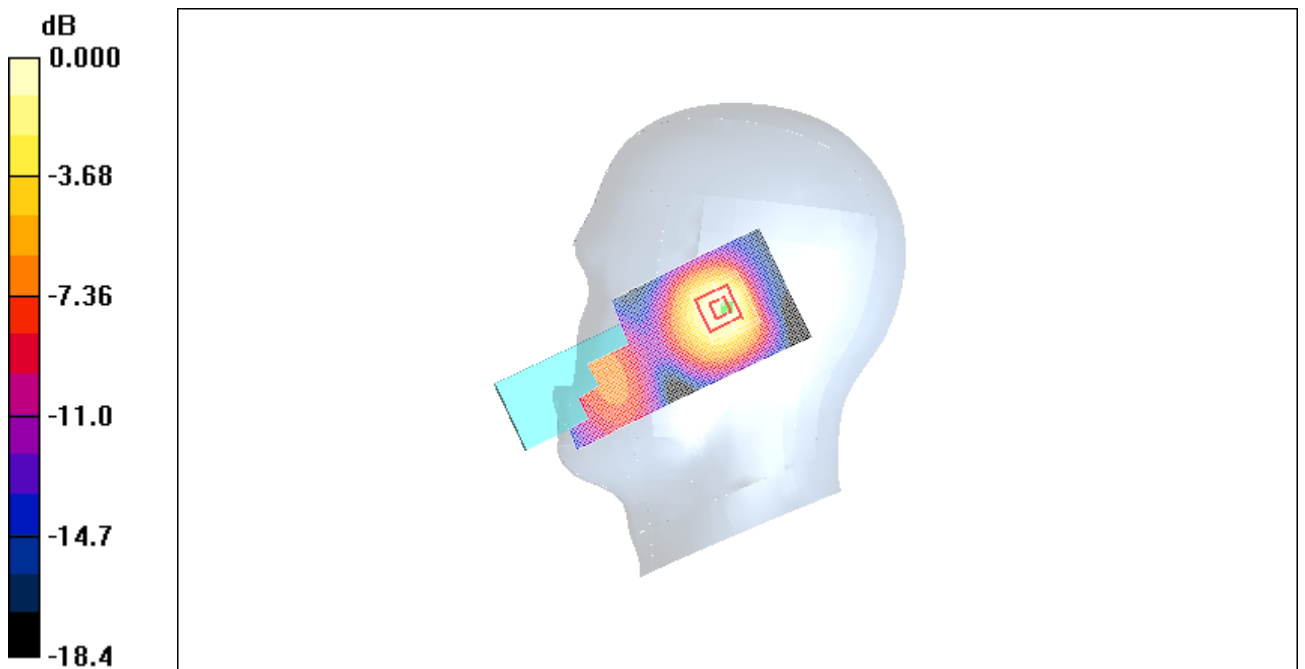
Tilt High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 9.03 V/m; Power Drift = 0.001 dB

Peak SAR (extrapolated) = 0.393 W/kg

SAR(1 g) = 0.262 mW/g; SAR(10 g) = 0.157 mW/g

Maximum value of SAR (measured) = 0.281 mW/g



0 dB = 0.281mW/g

Fig. 22 1900 MHz CH810

1900 Right Tilt Middle

Date/Time: 2010-4-26 10:34:30

Electronics: DAE4 Sn771

Medium: 1900 Head

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.38 \text{ mho/m}$; $\epsilon_r = 39.0$; $\rho = 1000 \text{ kg/m}^3$

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

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

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

Tilt Middle/Area Scan (51x131x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.359 mW/g

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

Reference Value = 9.69 V/m; Power Drift = -0.019 dB

Peak SAR (extrapolated) = 0.453 W/kg

SAR(1 g) = 0.302 mW/g; SAR(10 g) = 0.184 mW/g

Maximum value of SAR (measured) = 0.326 mW/g

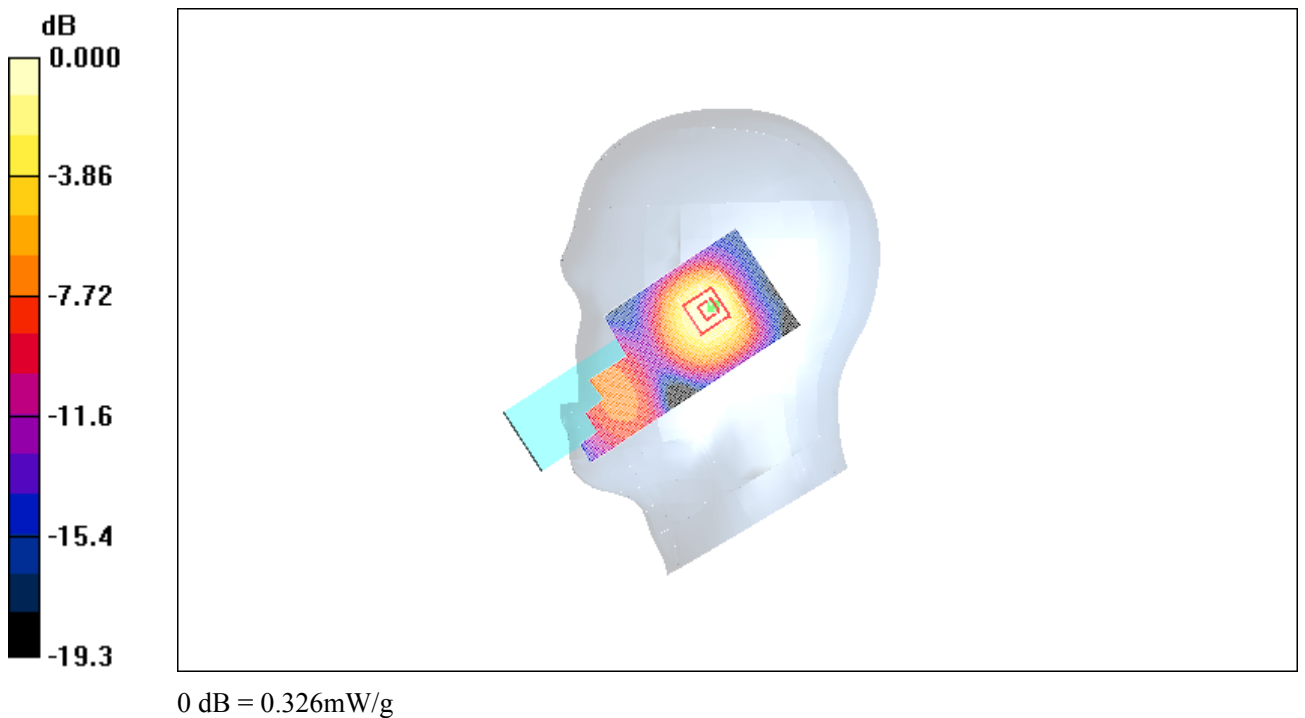


Fig.23 1900 MHz CH661

1900 Right Tilt Low

Date/Time: 2010-4-26 10:48:49

Electronics: DAE4 Sn771

Medium: 1900 Head

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.35$ mho/m; $\epsilon_r = 39.1$; $\rho = 1000$ kg/m³

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

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

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

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

Maximum value of SAR (interpolated) = 0.315 mW/g

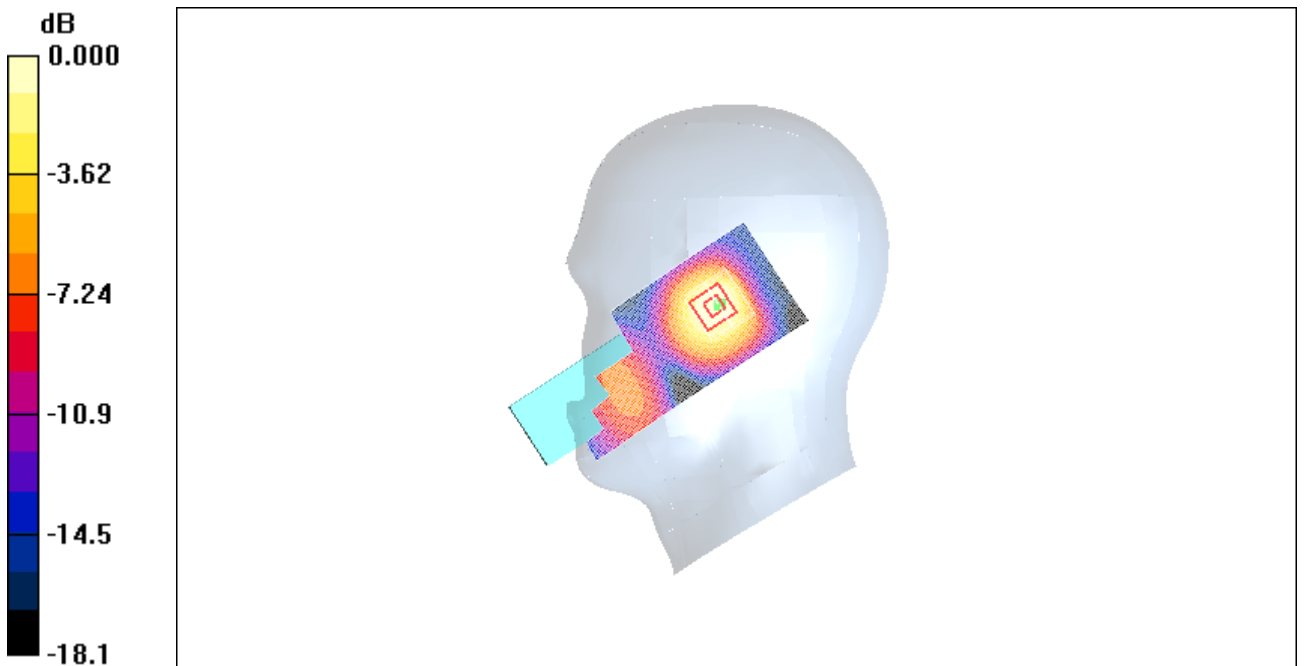
Tilt Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.06 V/m; Power Drift = 0.127 dB

Peak SAR (extrapolated) = 0.404 W/kg

SAR(1 g) = 0.271 mW/g; SAR(10 g) = 0.167 mW/g

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



0 dB = 0.291mW/g

Fig.24 1900 MHz CH512

850 Left Cheek High with battery CAB3130000C1

Date/Time: 2010-4-23 11:03:14

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used (interpolated): $f = 848.8$ MHz; $\sigma = 0.89$ mho/m; $\epsilon_r = 40.7$; $\rho = 1000$ kg/m³

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

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

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

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

Maximum value of SAR (interpolated) = 0.854 mW/g

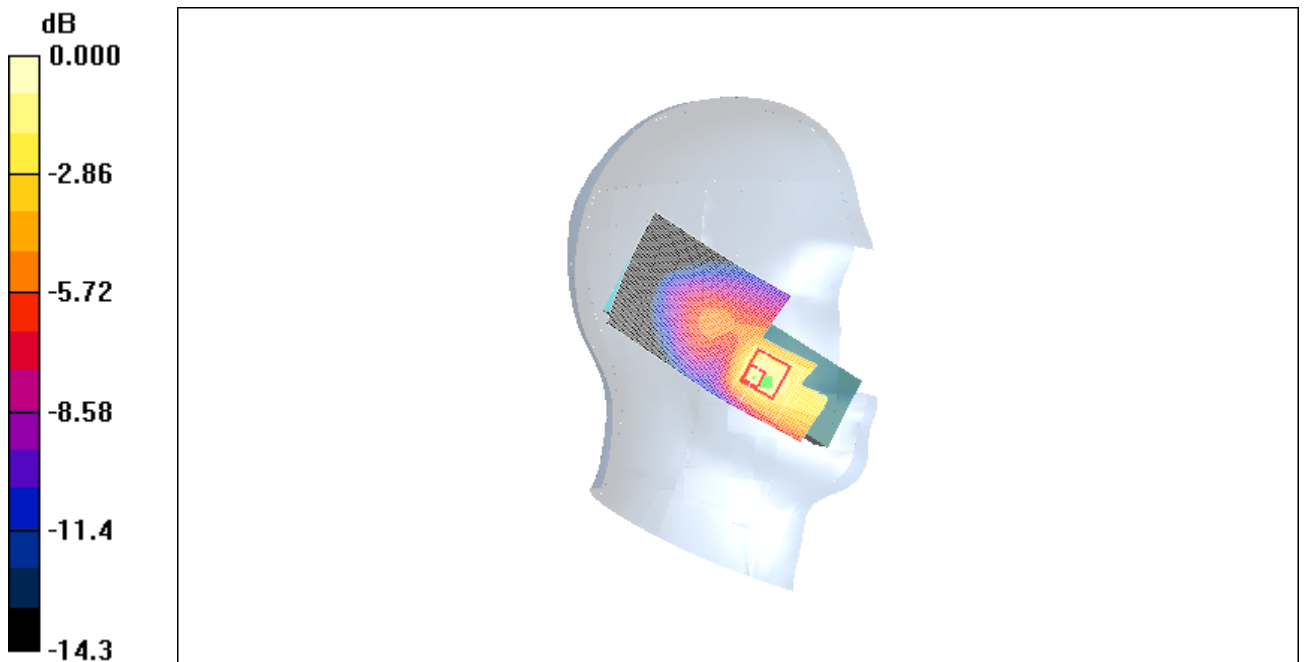
Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.99 V/m; Power Drift = -0.150 dB

Peak SAR (extrapolated) = 2.52 W/kg

SAR(1 g) = 0.981 mW/g; SAR(10 g) = 0.540 mW/g

Maximum value of SAR (measured) = 1.09 mW/g



0 dB = 1.09mW/g

Fig. 25 850MHz CH251

850 Body Towards Ground High with GPRS

Date/Time: 2010-4-23 13:50:04

Electronics: DAE4 Sn771

Medium: 850 Body

Medium parameters used (interpolated): $f = 848.8$ MHz; $\sigma = 0.95$ mho/m; $\epsilon_r = 53.7$; $\rho = 1000$ kg/m³

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

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

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

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

Maximum value of SAR (interpolated) = 0.560 mW/g

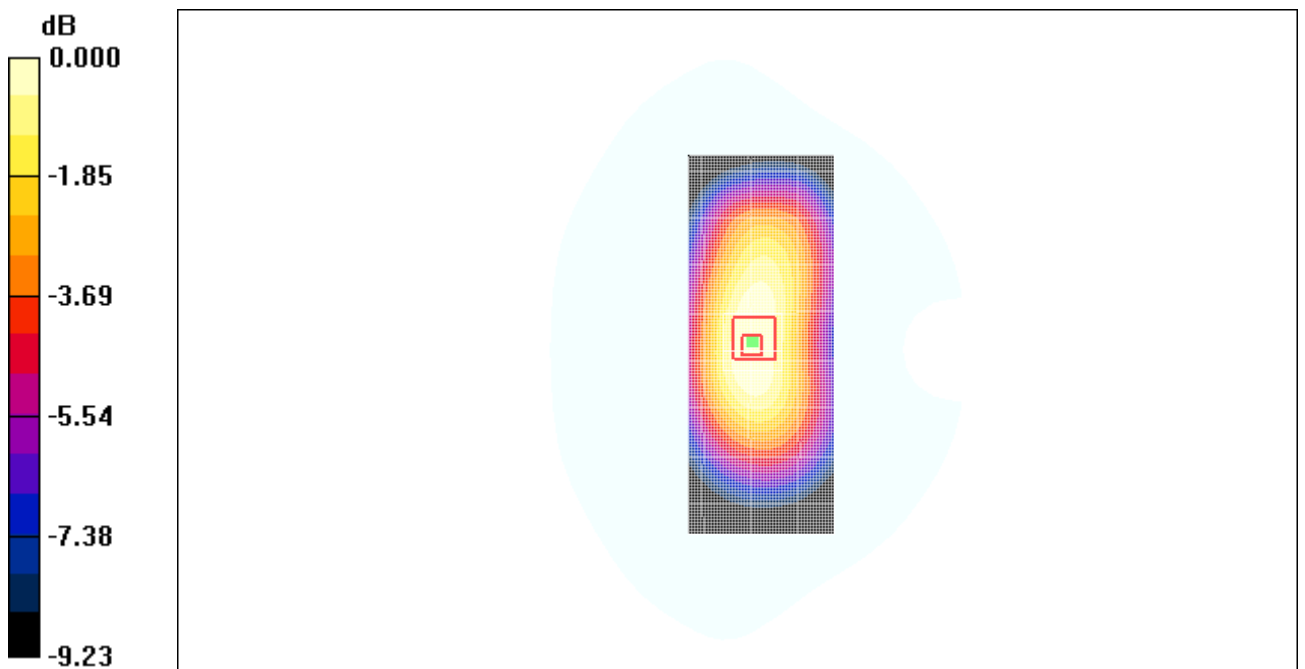
Toward Ground High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 23.8 V/m; Power Drift = -0.009 dB

Peak SAR (extrapolated) = 0.720 W/kg

SAR(1 g) = 0.526 mW/g; SAR(10 g) = 0.373 mW/g

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



0 dB = 0.548mW/g

Fig. 26 850 MHz CH251

850 Body Towards Ground Middle with GPRS

Date/Time: 2010-4-23 14:05:21

Electronics: DAE4 Sn771

Medium: 850 Body

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.94$ mho/m; $\epsilon_r = 53.8$; $\rho = 1000$ kg/m³

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

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

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

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

Maximum value of SAR (interpolated) = 0.581 mW/g

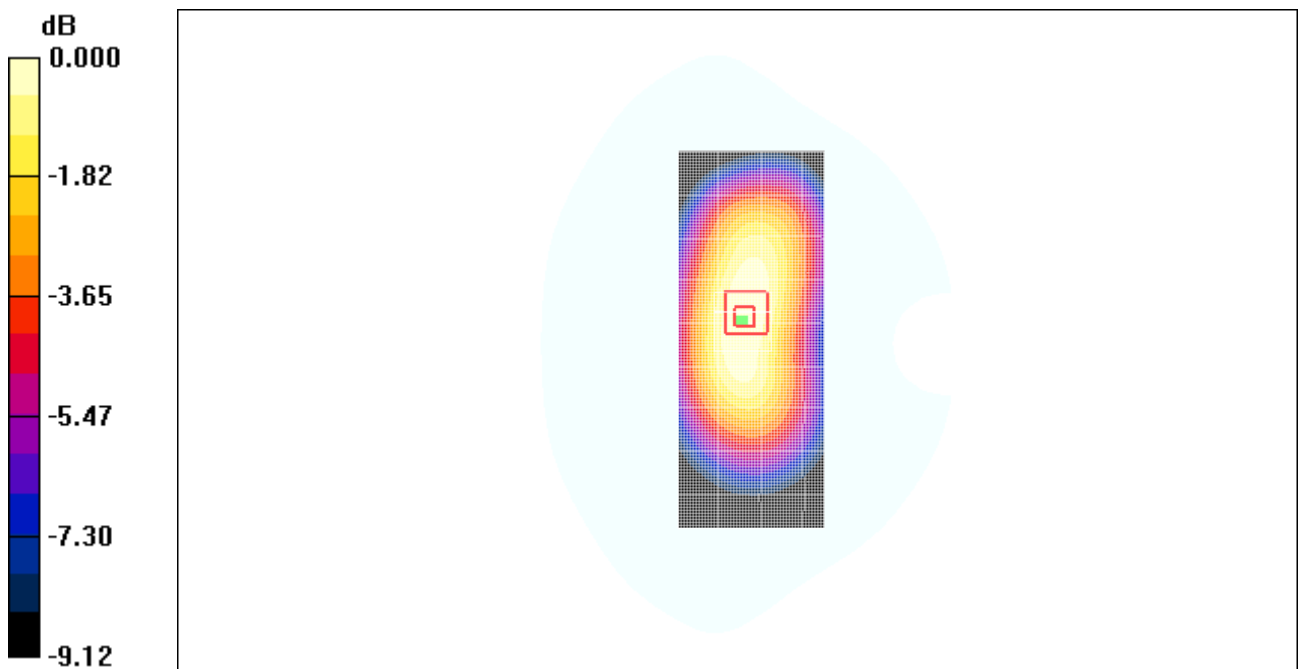
Toward Ground Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 24.0 V/m; Power Drift = 0.024 dB

Peak SAR (extrapolated) = 0.734 W/kg

SAR(1 g) = 0.547 mW/g; SAR(10 g) = 0.391 mW/g

Maximum value of SAR (measured) = 0.571 mW/g



0 dB = 0.571mW/g

Fig. 27 850 MHz CH190

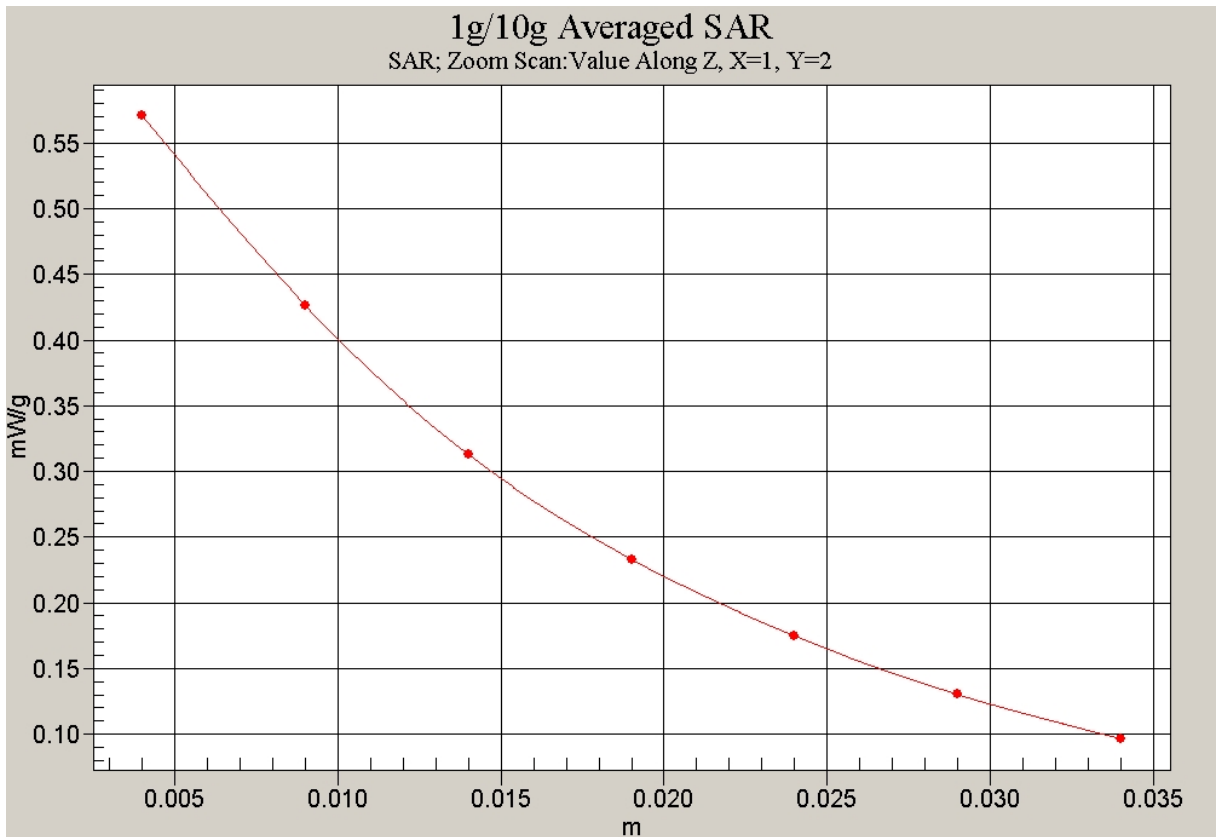


Fig. 27-1 Z-Scan at power reference point (850 MHz CH190)

850 Body Towards Ground Low with GPRS

Date/Time: 2010-4-23 14:20:39

Electronics: DAE4 Sn771

Medium: 850 Body

Medium parameters used: $f = 825 \text{ MHz}$; $\sigma = 0.923 \text{ mho/m}$; $\epsilon_r = 53.9$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: 23.0°C Liquid 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 (51x131x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.570 mW/g

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

Reference Value = 23.5 V/m ; Power Drift = 0.004 dB

Peak SAR (extrapolated) = 0.707 W/kg

SAR(1 g) = 0.537 mW/g ; SAR(10 g) = 0.389 mW/g

Maximum value of SAR (measured) = 0.565 mW/g

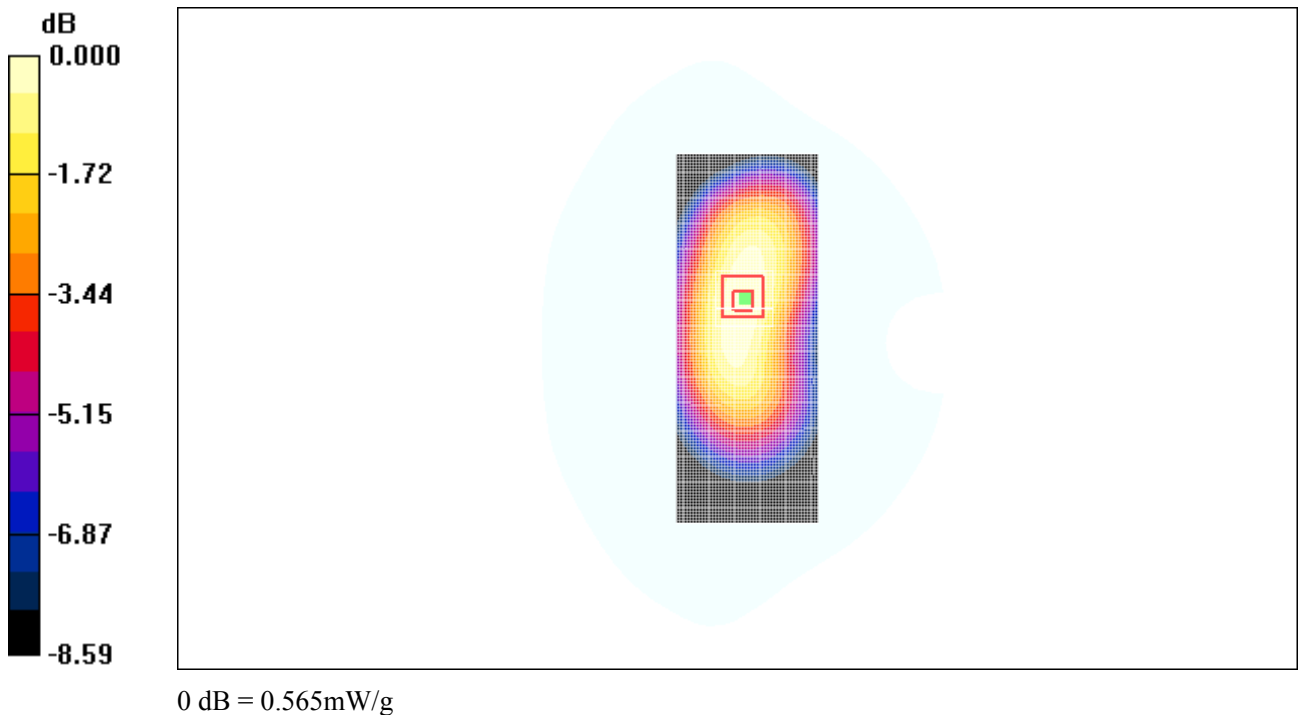


Fig. 28 850 MHz CH128

850 Body Towards Ground Middle with Headset__CCB31B0A10C0

Date/Time: 2010-4-23 14:37:22

Electronics: DAE4 Sn771

Medium: 850 Body

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.94$ mho/m; $\epsilon_r = 53.8$; $\rho = 1000$ kg/m³

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

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

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

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

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

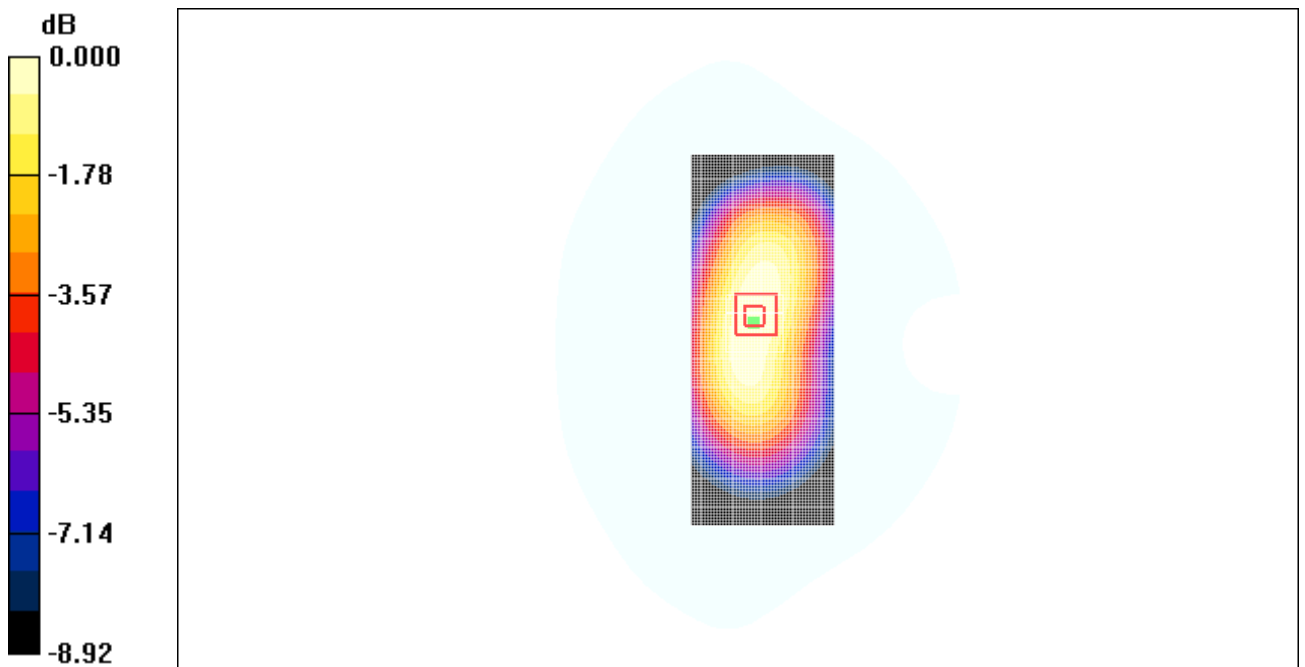
Toward Ground Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 21.4 V/m; Power Drift = -0.101 dB

Peak SAR (extrapolated) = 0.580 W/kg

SAR(1 g) = 0.438 mW/g; SAR(10 g) = 0.315 mW/g

Maximum value of SAR (measured) = 0.454 mW/g



0 dB = 0.454mW/g

Fig. 29 850 MHz CH190

850 Body Towards Ground Middle with Headset__CCB31B0A11C0

Date/Time: 2010-4-23 14:53:42

Electronics: DAE4 Sn771

Medium: 850 Body

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.94$ mho/m; $\epsilon_r = 53.8$; $\rho = 1000$ kg/m³

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

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

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

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

Maximum value of SAR (interpolated) = 0.453 mW/g

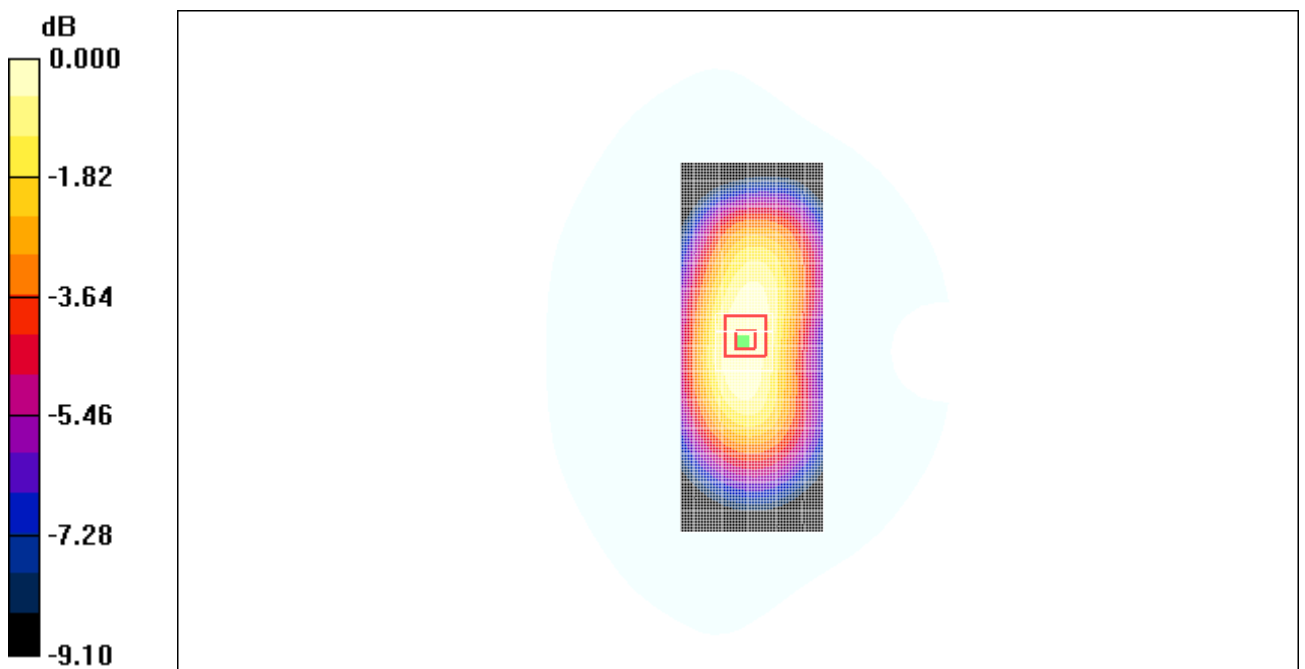
Toward Ground Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 21.3 V/m; Power Drift = 0.018 dB

Peak SAR (extrapolated) = 0.573 W/kg

SAR(1 g) = 0.423 mW/g; SAR(10 g) = 0.302 mW/g

Maximum value of SAR (measured) = 0.441 mW/g



0 dB = 0.441mW/g

Fig. 30 850 MHz CH190

1900 Body Towards Ground High with GPRS

Date/Time: 2010-4-26 13:48:16

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.55$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

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

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

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

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

Maximum value of SAR (interpolated) = 0.269 mW/g

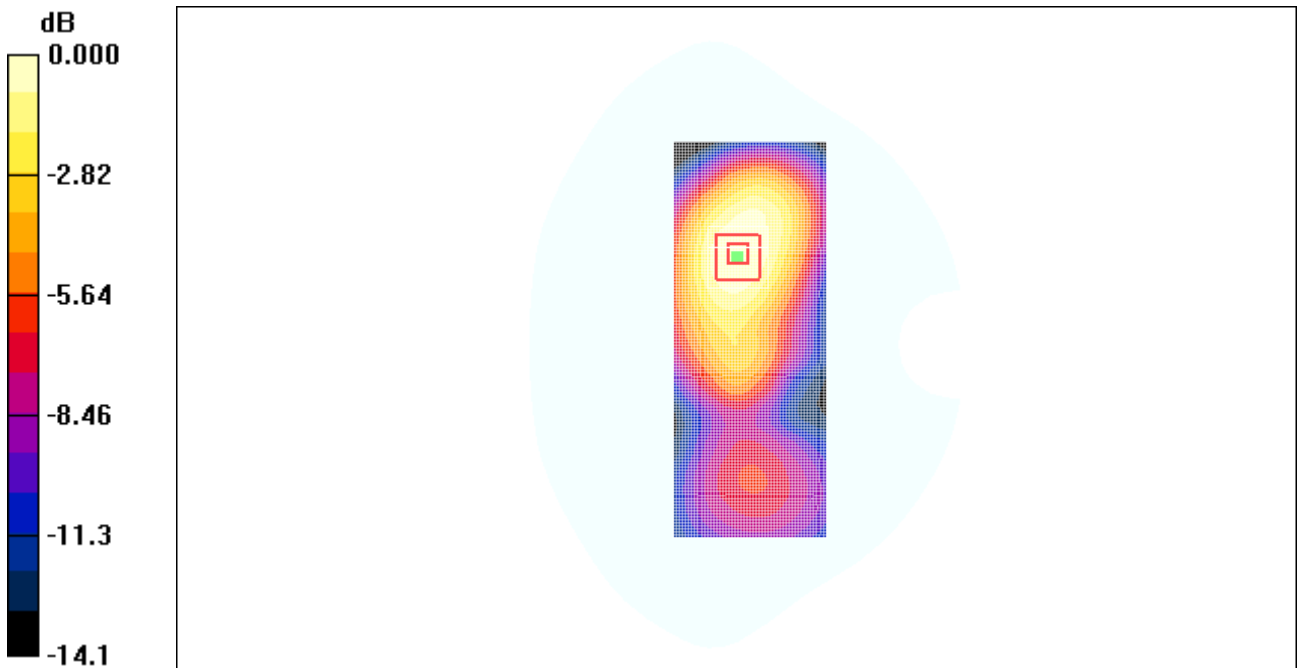
Toward Ground High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.97 V/m; Power Drift = -0.045 dB

Peak SAR (extrapolated) = 0.387 W/kg

SAR(1 g) = 0.250 mW/g; SAR(10 g) = 0.158 mW/g

Maximum value of SAR (measured) = 0.257 mW/g



0 dB = 0.257mW/g

Fig. 31 1900 MHz CH810

1900 Body Towards Ground Middle with GPRS

Date/Time: 2010-4-26 14:03:31

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³

Ambient Temperature: 23.0°C Liquid Temperature: 22.5°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 (51x131x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.277 mW/g

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

Reference Value = 9.36 V/m; Power Drift = -0.035 dB

Peak SAR (extrapolated) = 0.394 W/kg

SAR(1 g) = 0.260 mW/g; SAR(10 g) = 0.166 mW/g

Maximum value of SAR (measured) = 0.266 mW/g

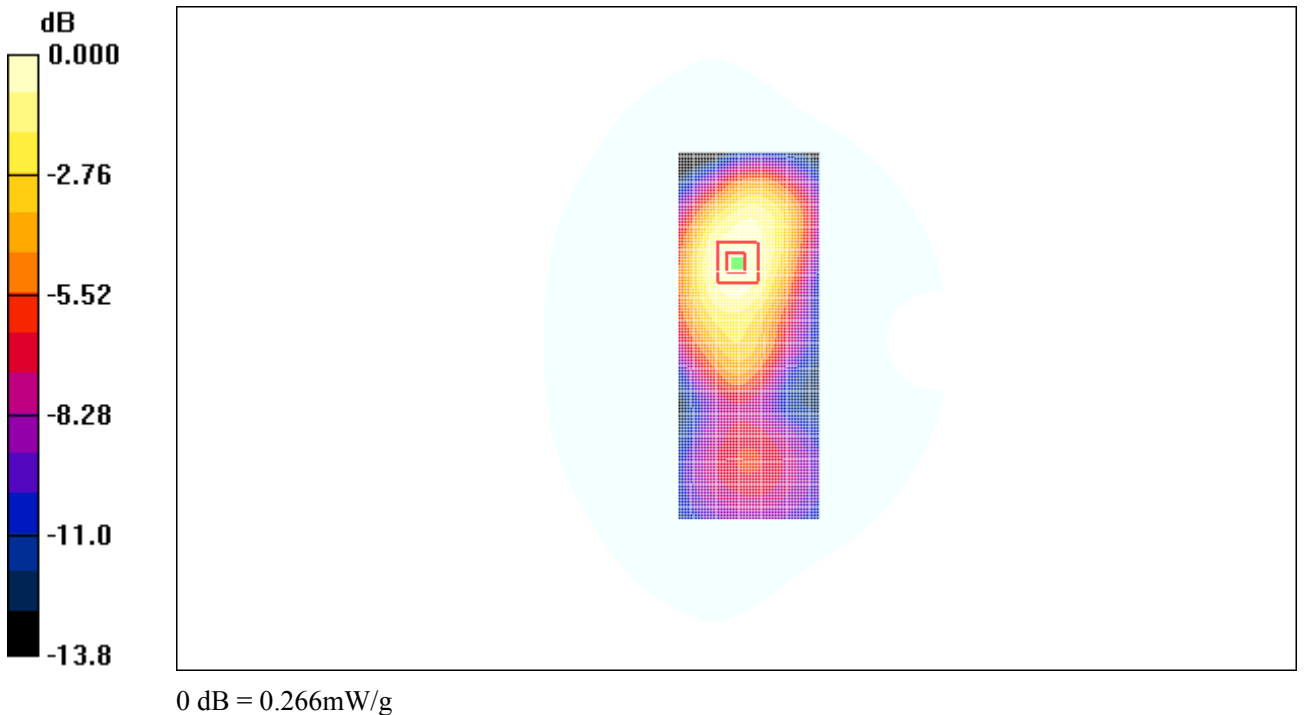


Fig. 32 1900 MHz CH661

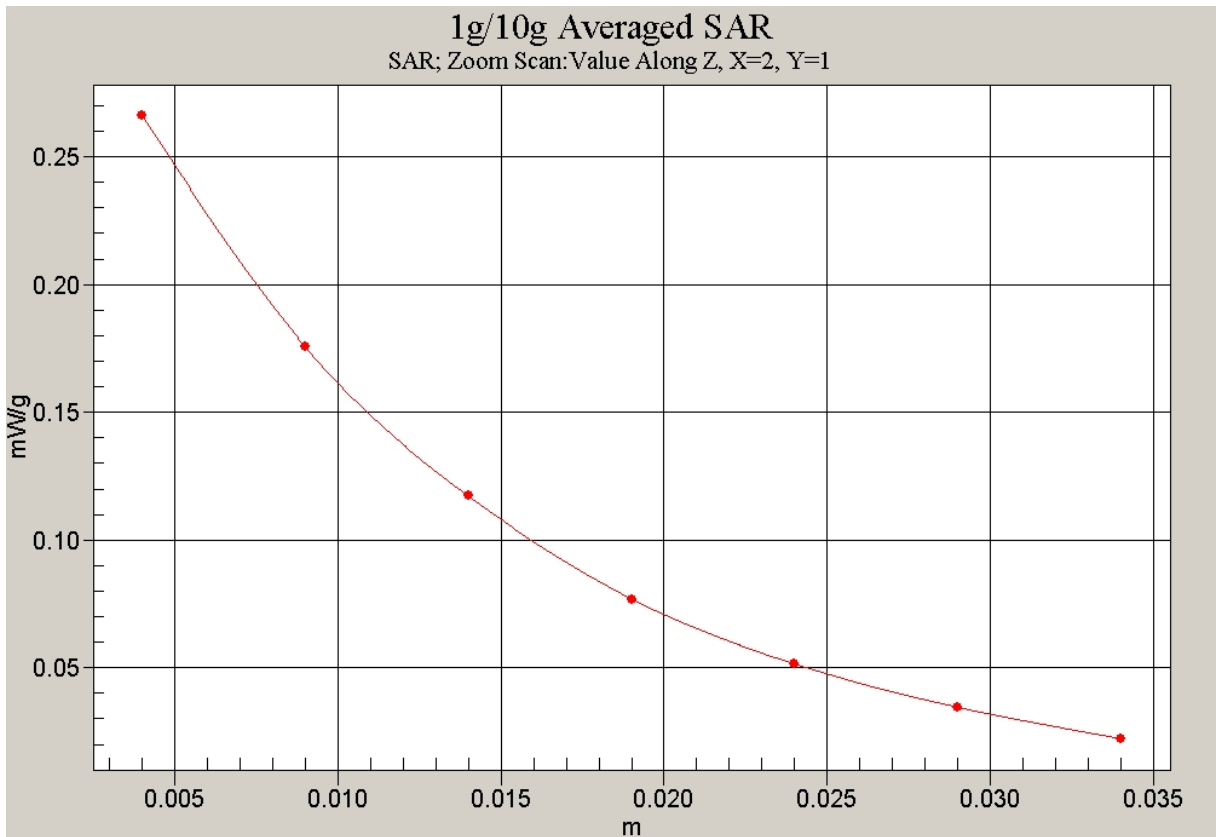


Fig. 32-1 Z-Scan at power reference point (1900 MHz CH661)

1900 Body Towards Ground Low with GPRS

Date/Time: 2010-4-26 14:18:49

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.50$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³

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

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

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

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

Maximum value of SAR (interpolated) = 0.274 mW/g

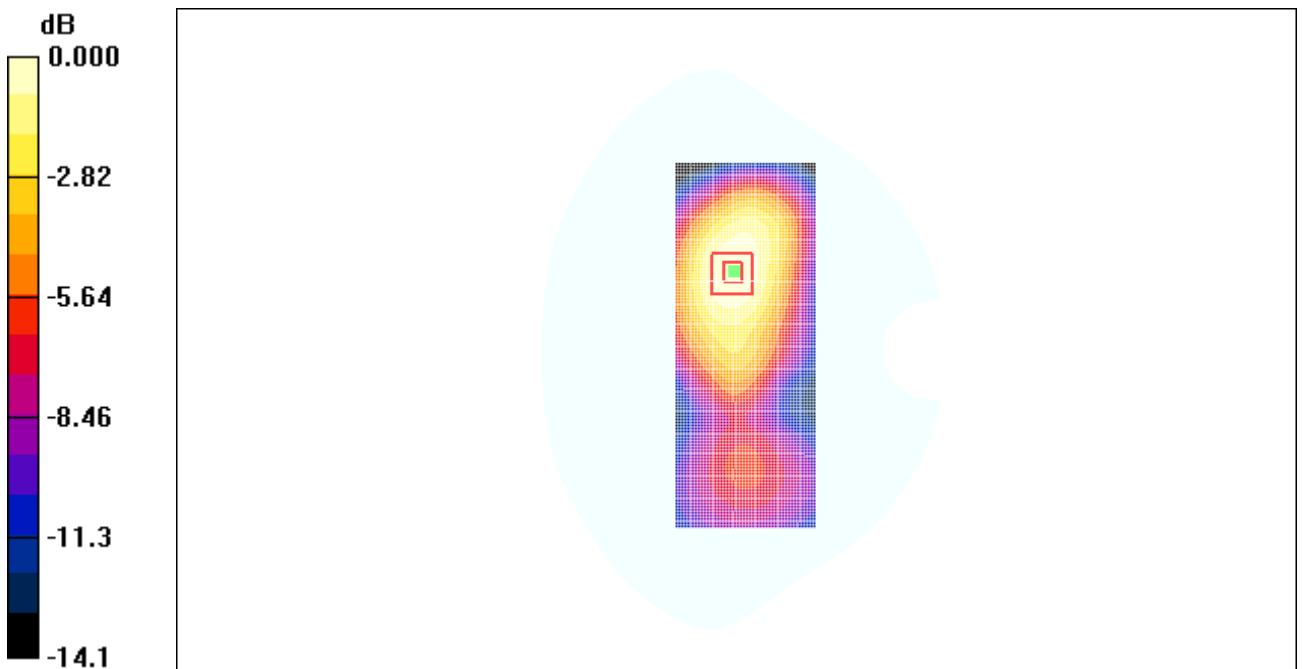
Toward Ground Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.41 V/m; Power Drift = -0.022 dB

Peak SAR (extrapolated) = 0.385 W/kg

SAR(1 g) = 0.254 mW/g; SAR(10 g) = 0.161 mW/g

Maximum value of SAR (measured) = 0.264 mW/g



0 dB = 0.264mW/g

Fig. 33 1900 MHz CH512

1900 Body Towards Ground Middle with Headset__CCB31B0A10C0

Date/Time: 2010-4-26 14:36:11

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³

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

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

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

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

Maximum value of SAR (interpolated) = 0.216 mW/g

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

Reference Value = 8.25 V/m; Power Drift = 0.018 dB

Peak SAR (extrapolated) = 0.311 W/kg

SAR(1 g) = 0.203 mW/g; SAR(10 g) = 0.129 mW/g

Maximum value of SAR (measured) = 0.210 mW/g

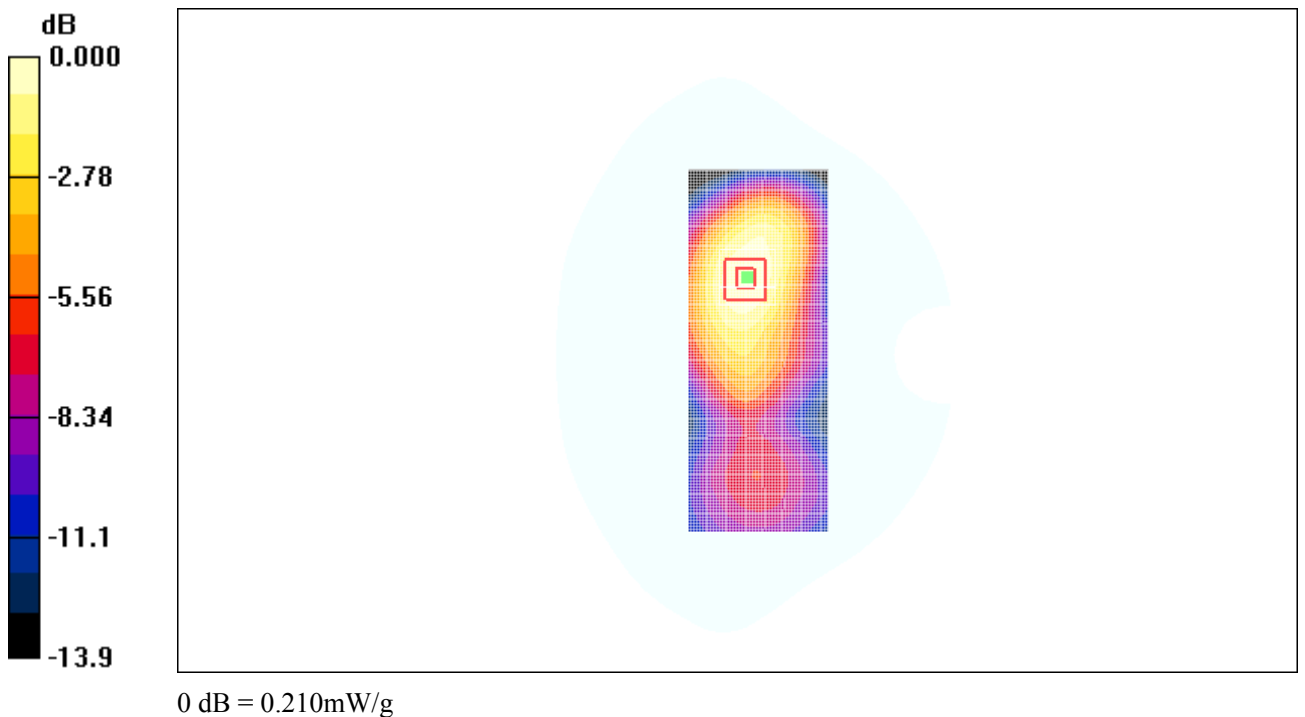


Fig. 34 1900 MHz CH661

1900 Body Towards Ground Middle with Headset__CCB31B0A11C0

Date/Time: 2010-4-26 14:53:20

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³

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

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

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

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

Maximum value of SAR (interpolated) = 0.205 mW/g

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

Reference Value = 7.91 V/m; Power Drift = 0.027 dB

Peak SAR (extrapolated) = 0.289 W/kg

SAR(1 g) = 0.189 mW/g; SAR(10 g) = 0.121 mW/g

Maximum value of SAR (measured) = 0.197 mW/g

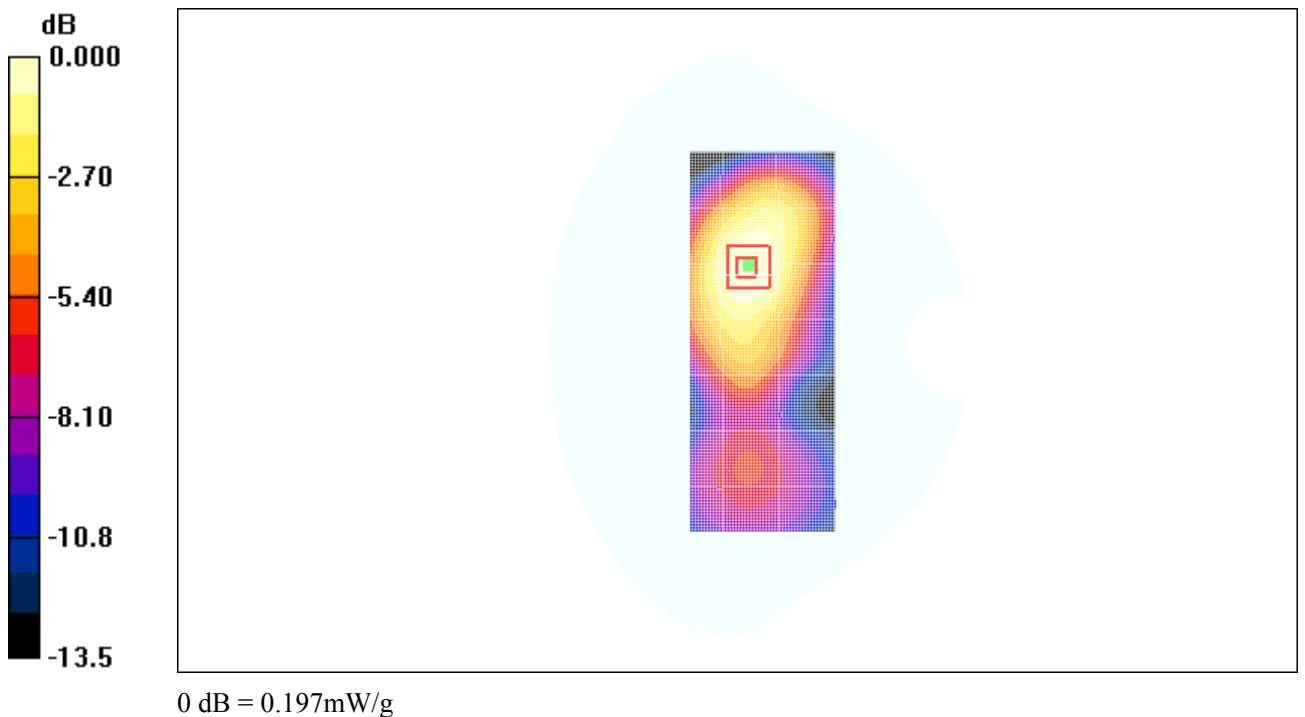


Fig. 35 1900 MHz CH661

850 Body Towards Ground Middle with GPRS with battery CAB3130000C1

Date/Time: 2010-4-23 15:12:34

Electronics: DAE4 Sn771

Medium: 850 Body

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.94$ mho/m; $\epsilon_r = 53.8$; $\rho = 1000$ kg/m³

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

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

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

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

Maximum value of SAR (interpolated) = 0.558 mW/g

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

Reference Value = 24.1 V/m; Power Drift = -0.050 dB

Peak SAR (extrapolated) = 0.727 W/kg

SAR(1 g) = 0.522 mW/g; SAR(10 g) = 0.375 mW/g

Maximum value of SAR (measured) = 0.545 mW/g

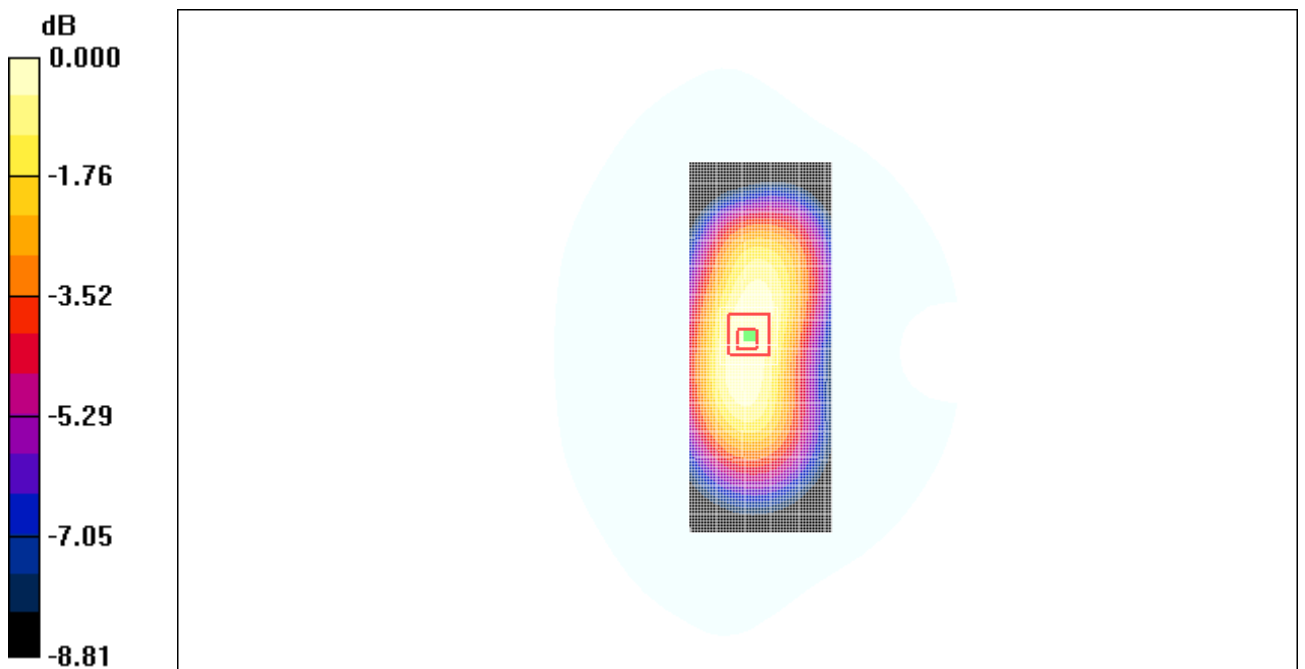


Fig. 36 850 MHz CH190

ANNEX D SYSTEM VALIDATION RESULTS

835MHz

Date/Time: 2010-4-23 7:24:09

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.87 \text{ mho/m}$; $\epsilon_r = 40.8$; $\rho = 1000 \text{ kg/m}^3$

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

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

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

System Validation /Area Scan (101x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$
Maximum value of SAR (interpolated) = 2.51 mW/g

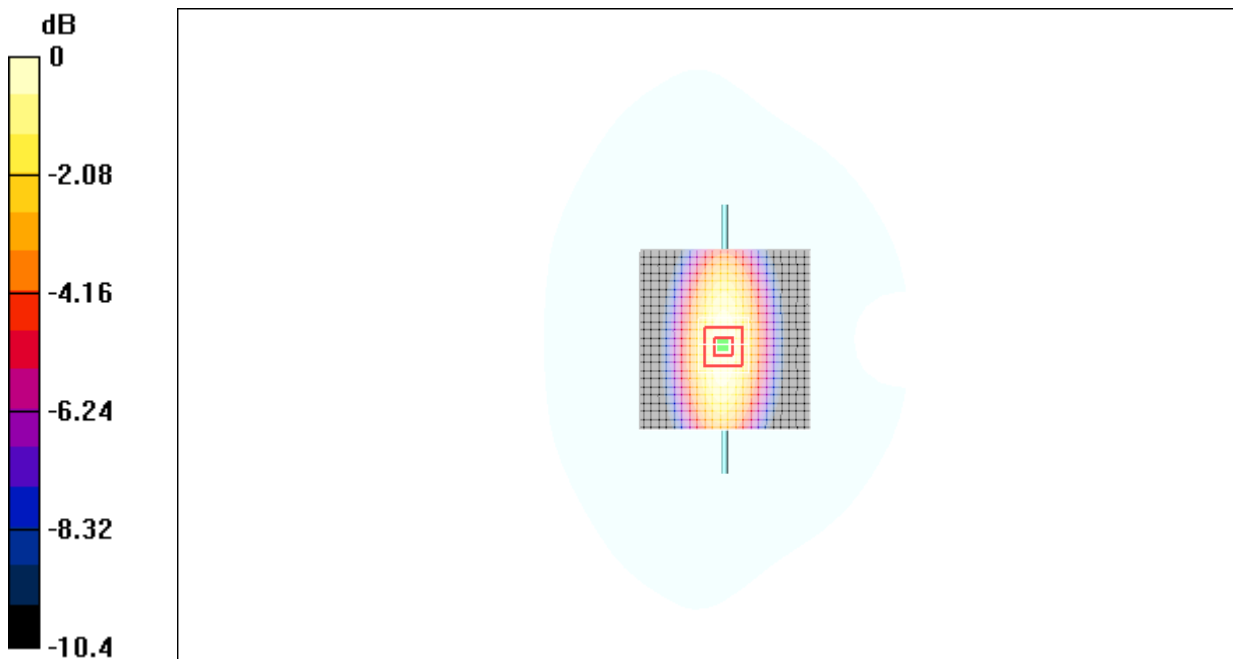
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 54.0 V/m; Power Drift = 0.078 dB

Peak SAR (extrapolated) = 3.34 W/kg

SAR(1 g) = 2.29 mW/g; SAR(10 g) = 1.51 mW/g

Maximum value of SAR (measured) = 2.43 mW/g



0 dB = 2.43mW/g

Fig.37 validation 835MHz 250mW

835MHz

Date/Time: 2010-4-23 13:12:35

Electronics: DAE4 Sn771

Medium: 850 Body

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.93 \text{ mho/m}$; $\epsilon_r = 53.8$; $\rho = 1000 \text{ kg/m}^3$

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

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

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

System Validation /Area Scan (101x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$
Maximum value of SAR (interpolated) = 2.56 mW/g

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$,
 $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 52.0 V/m; Power Drift = 0.039 dB

Peak SAR (extrapolated) = 3.38 W/kg

SAR(1 g) = 2.37 mW/g; SAR(10 g) = 1.51 mW/g

Maximum value of SAR (measured) = 2.45 mW/g

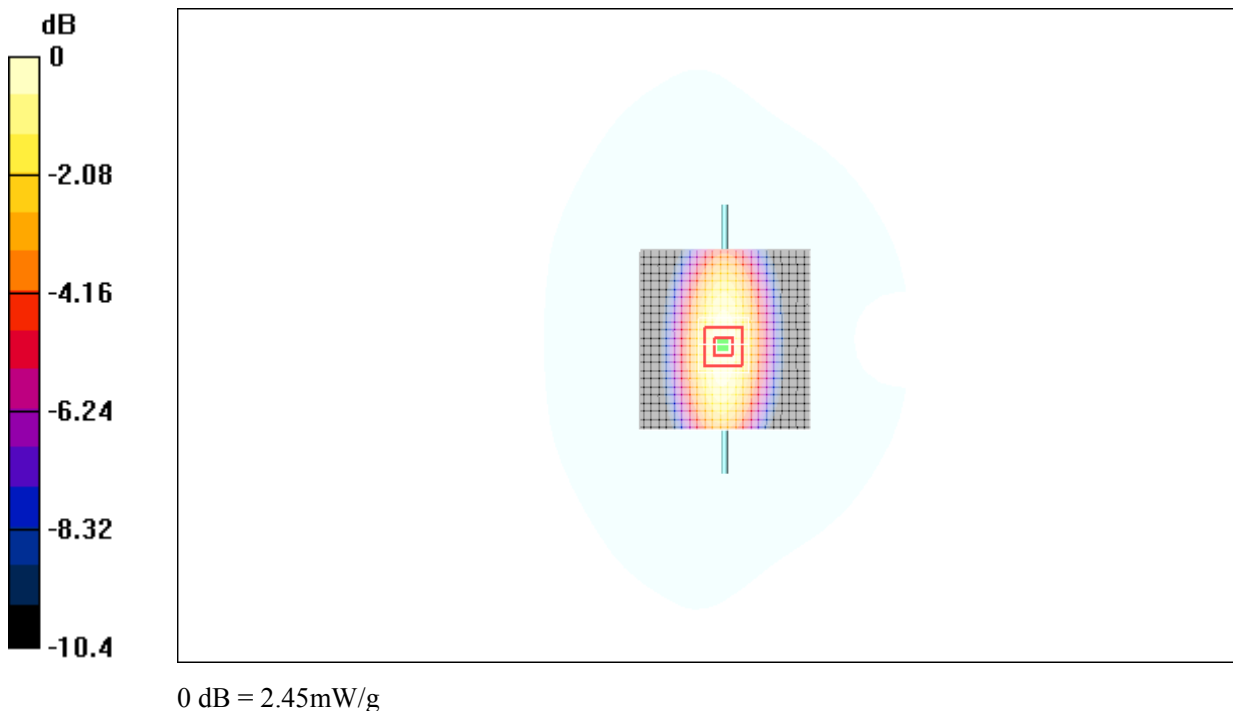


Fig.38 validation 835MHz 250mW

1900MHz

Date/Time: 2010-4-26 7:30:12

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.39 \text{ mho/m}$; $\epsilon_r = 39.0$; $\rho = 1000 \text{ kg/m}^3$

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

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

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

System Validation/Area Scan (101x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$
Maximum value of SAR (interpolated) = 11.4 mW/g

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 89.7 V/m ; Power Drift = -0.051 dB

Peak SAR (extrapolated) = 15.0 W/kg

SAR(1 g) = 9.72 mW/g ; SAR(10 g) = 4.87 mW/g

Maximum value of SAR (measured) = 10.4 mW/g

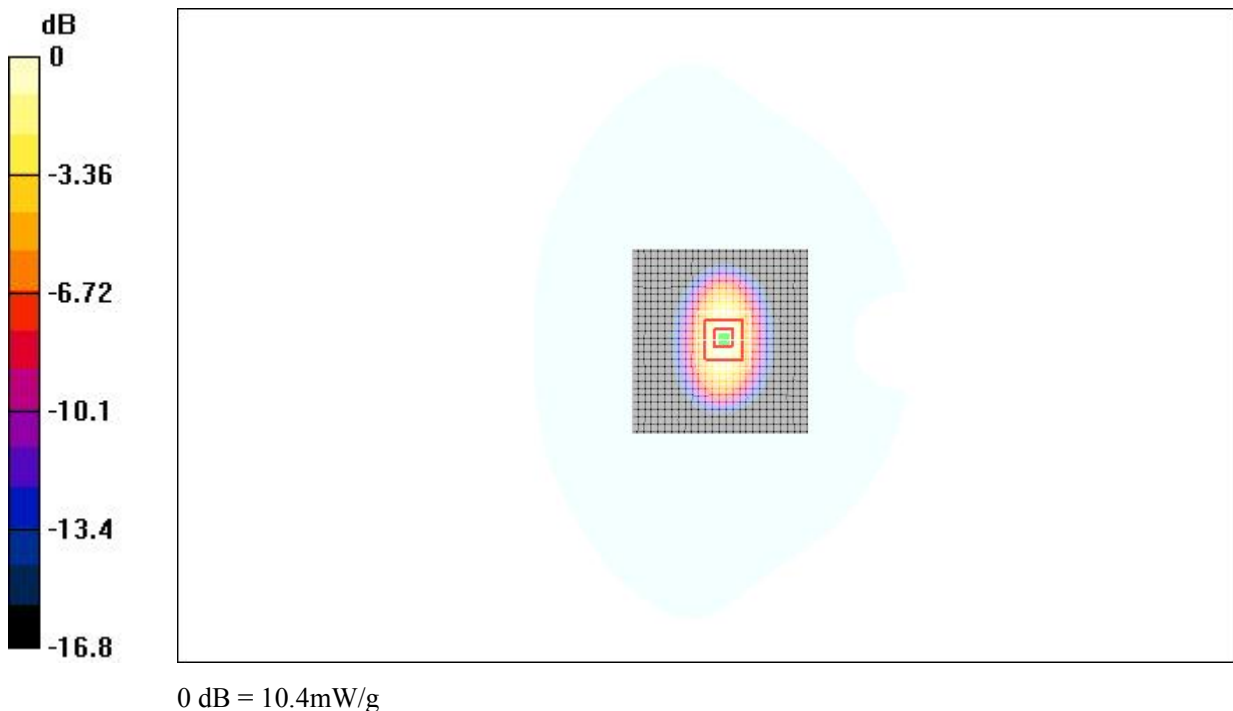


Fig.39 validation 1900MHz 250mW

1900MHz

Date/Time: 2010-4-26 13:19:04

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.54 \text{ mho/m}$; $\epsilon_r = 52.1$; $\rho = 1000 \text{ kg/m}^3$

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

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

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

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

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$,
 $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 91.0 V/m ; Power Drift = -0.044 dB

Peak SAR (extrapolated) = 16.0 W/kg

SAR(1 g) = 10.1 mW/g ; SAR(10 g) = 5.16 mW/g

Maximum value of SAR (measured) = 10.7 mW/g

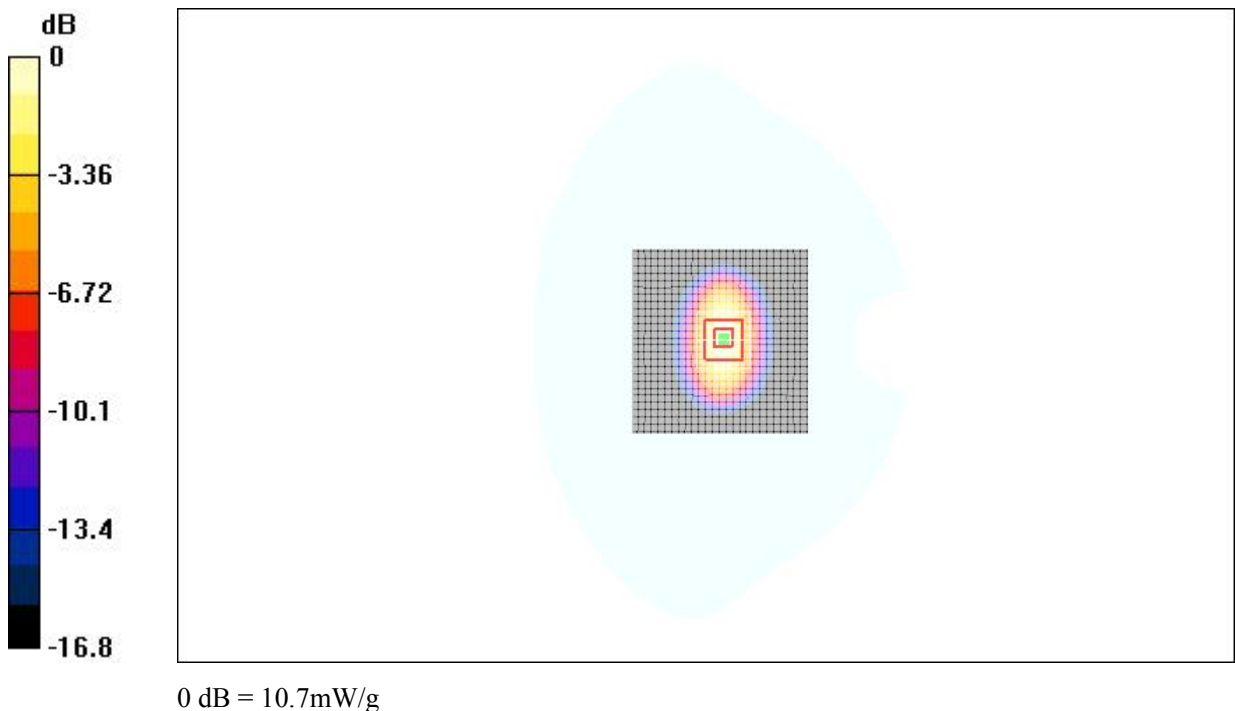


Fig.40 validation 1900MHz 250mW

ANNEX E PROBE CALIBRATION CERTIFICATE

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





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

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

Accreditation No.: **SCS 108**

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		
<p>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)°C and humidity<70%</p>			
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
Calibrated by:	Name	Function	Signature
	Katja Pokovic	Technical Manager	
Approved by:	Niels Kuster	Quality Manager	
Issued: September 25, 2009			
This calibration certificate shall not be reported except in full without written approval of the laboratory.			

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



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

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

Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConF	sensitivity in TSL / NORM _{x,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., $\vartheta = 0$ 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:

- **NORM_{x,y,z}**: Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not effect the E²-field uncertainty inside TSL (see below *ConvF*).
- **NORM(f)_{x,y,z} = NORM_{x,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*.
- **DCP_{x,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 $f \leq 800$ 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 **NORM_{x,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.