SAR TEST REPORT

No. 2009SAR00046

For

TCT Mobile Limited

GSM850/PCS1900 dualband mobile phone

U10CA

OT-222A

With

Hardware Version: Proto

Software Version: V110

FCCID: RAD118

Issued Date: 2009-07-21

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:

TMC Beijing, Telecommunication Metrology Center of Ministry of Information Industry

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TABLE OF CONTENT

1 Test Laboratory

1.1 Testing Location

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Postal Code:	100083
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:	July 15, 2009
Testing End Date:	July 17, 2009

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:	TCT Mobile Limited
Address /Post:	4/F, South Building,No.2966, Jinke Road, Zhangjiang High-Tech Park, Pudong,Shanghai, 201203, P.R.China
City:	Shanghai
Postal Code:	201203
Country:	P. R. China
Telephone:	0086 21 6146 0883
Fax:	0086 21 6146 0602

2.2 Manufacturer Information

Company Name:	TCT Mobile Limited
Address /Post:	4/F, South Building,No.2966, Jinke Road, Zhangjiang High-Tech Park, Pudong,Shanghai, 201203, P.R.China
City:	Shanghai
Postal Code:	201203
Country:	P. R. China
Telephone:	0086 21 6146 0883
Fax:	0086 21 6146 0602

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

3.1 About EUT

EUT Description:	GSM850/PCS1900 dualband mobile phone
Model Name:	U10CA
Marketing Name:	OT-222A
GSM Frequency Band:	GSM 850/PCS1900

Picture 1: Constituents of the sample

3.2 Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	012003000005017	Proto	V110

*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	T5002684AGAC	\	BYD
	Travel Adapter	T5002684AGAA	\	Tenpao
AE2	Battery	CAB30M0000C1	B1549658CCA	BYD
AE3	Headset	CCA30B4010C0	\	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 50360–2006: Product standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones.

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

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

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

4.2 Applicable Measurement Standards

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

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

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

IEC 62209-1-2005: Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures –Part 1:Procedure to determine the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)

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

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

5 OPERATIONAL CONDITIONS DURING TEST

5.1 Schematic Test Configuration

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

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

5.2 SAR Measurement Set-up

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

A cell controller system contains the power supply, robot controller, teaches pendant (Joystick), and remote control, is used to drive the robot motors. The PC consists of the Micron Pentium III 800 MHz computer with Windows 2000 system and SAR Measurement Software DASY4 Professional, A/D interface card, monitor, mouse, and keyboard. The Stäubli Robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card.
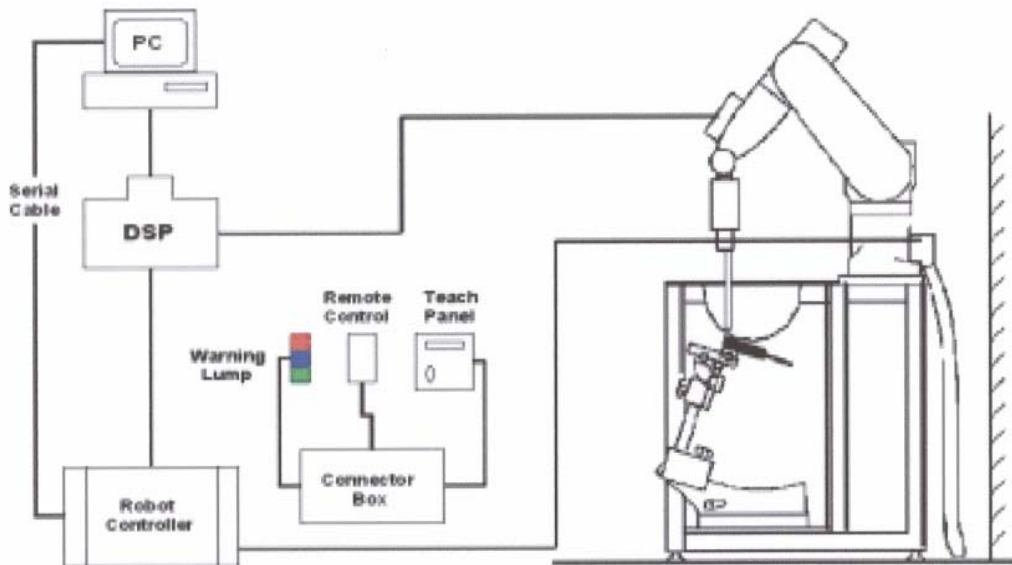
Picture 2: SAR Lab Test Measurement Set-up

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

5.3 Dasy4 E-field Probe System

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

ES3DV3 Probe Specification

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

Picture 3: ES3DV3 E-field

Calibration	Basic Broad Band Calibration in air
	Conversion Factors (CF) for HSL 900 and HSL 1810
	Additional CF for other liquids and frequencies upon request

Frequency	10 MHz to 4 GHz; Linearity: ± 0.2 dB (30 MHz to 4 GHz)

Directivity	± 0.2 dB in HSL (rotation around probe axis)
	± 0.3 dB in tissue material (rotation normal to probe axis)
Dynamic Range	5 µW/g to > 100 mW/g; Linearity: ± 0.2 dB
Dimensions	Overall length: 330 mm (Tip: 20 mm)
	Tip diameter: 3.9 mm (Body: 12 mm)
	Distance from probe tip to dipole centers: 2.0 mm
Application	General dosimetry up to 4 GHz
	Dosimetry in strong gradient fields
	Compliance tests of mobile phones

Picture4:ES3DV3 E-field probe

5.4 E-field Probe Calibration

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

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

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

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

Where: Δt = Exposure time (30 seconds),

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

ΔT = Temperature increase due to RF exposure.

Or

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

Where:

σ = Simulated tissue conductivity,

ρ = Tissue density (kg/m^3).

Picture 5: Device Holder

5.5 Other Test Equipment

5.5.1 Device Holder for Transmitters

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

5.5.2 Phantom

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

Shell Thickness   2±0. l mm

Filling Volume   Approx. 20 liters

Dimensions   810 x l000 x 500 mm (H x L x W)

Available   Special

Picture 6: Generic Twin Phantom

5.6 Equivalent Tissues

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

Table 1. Composition of the Head Tissue Equivalent Matter

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

Table 2. Composition of the Body Tissue Equivalent Matter

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

5.7 System Specifications

5.7.1 Robotic System Specifications

Specifications

Positioner: Stäubli Unimation Corp. Robot Model: RX90L

Repeatability: ±0.02 mm

No. of Axis: 6

Data Acquisition Electronic (DAE) System

Cell Controller

Processor: Pentium III

Clock Speed: 800 MHz

Operating System: Windows 2000

Data Converter

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

Software: DASY4 software

Connecting Lines: Optical downlink for data and status info.

Optical uplink for commands and clock

6 LABORATORY ENVIRONMENT

Table 3: The Ambient Conditions during EMF Test

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 30%, Max. = 70%
Ground system resistance	< 0.5 Ω
Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of 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 and ERP for the EUT. In all cases, the measured peak output power should be greater and within 5% than EMI measurement.

7.2 Conducted Power

7.2.1 Measurement Methods

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

7.2.2 Measurement result

Table 4: Conducted Power Measurement Results

850MHZ	Conducted Power (dBm)		
	Channel 251(848.8MHz)	**Channel 190(836.6MHz)**	**Channel 128(824.2MHz)**
GSM	31.90	31.87	31.85
1900MHZ	Conducted Power (dBm)		
	Channel 810(1909.8MHz)	**Channel 661(1880MHz)**	**Channel 512(1850.2MHz)**
GSM	29.58	29.52	29.58

7.2.3 Power Drift

To control the output power stability during the SAR test, DASY4 system calculates the power drift by measuring the E-field at the same location at the beginning and at the end of the measurement for each test position. These drift values can be found in Table 8 to Table 11 labeled as: (Power Drift [dB]). This ensures that the power drift during one measurement is within 5%.

8 TEST RESULTS

8.1 Dielectric Performance

Table 5: Dielectric Performance of Head Tissue Simulating Liquid

Measurement is made at temperature 23.3 °C and relative humidity 49%.			
Liquid temperature during the test: 22.5°C			
Measurement Date : 850 MHz **July 15,2009** 1900 MHz **July 17,2009**			
/	**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	0.92
	1900 MHz	40.4	1.39

Table 6: Dielectric Performance of Body Tissue Simulating Liquid

Measurement is made at temperature 23.3 °C and relative humidity 49%. Liquid temperature during the test: 22.5°C Measurement Date : 850 MHz **July 15,2009** 1900 MHz **July 17,2009**			
/	**Frequency**	**Permittivity ε**	**Conductivity σ (S/m)**
Target value	850 MHz	55.2	0.97
	1900 MHz	53.3	1.52
Measurement value (Average of 10 tests)	850 MHz	53.7	1.01
	1900 MHz	52.3	1.56

8.2 System Validation

Table 7: System Validation

Measurement is made at temperature 23.3 °C and relative humidity 49%.

Liquid temperature during the test: 22.5°C

Measurement Date : 850 MHz **July 15,2009**   1900 MHz **July 17,2009**

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	
	Actual Measurement value	835 MHz	40.4		0.90	
		1900 MHz	40.4		1.39	
Verification results	**Frequency**	**Target value (W/kg)**		**Measured value (W/kg)**		**Deviation**
		10 g Average	**1 g Average**	**10 g Average**	**1 g Average**	**10 g Average**	**1 g Average**
	835 MHz	1.60	2.48	1.62	2.50	1.25%	0.81%
	1900 MHz	5.09	9.73	5.27	9.91	3.54%	1.85%

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

8.3 Summary of Measurement Results (850MHz)

Table 8: SAR Values (850MHz-Head)

Limit of SAR (W/kg)	10 g Average	1 g Average	Power Drift (dB)
	2.0	1.6	
Test Case	**Measurement Result (W/kg)**		
	10 g Average	1 g Average	
Left hand, Touch cheek, Top frequency(See Fig.1)	0.558	0.801	0.160
Left hand, Touch cheek, Mid frequency(See Fig.2)	0.597	0.852	-0.170
Left hand, Touch cheek, Bottom frequency(See Fig.3)	0.592	0.832	-0.132
Left hand, Tilt 15 Degree, Top frequency(See Fig.4)	0.384	0.540	-0.112
Left hand, Tilt 15 Degree, Mid frequency(See Fig.5)	0.373	0.524	-0.014
Left hand, Tilt 15 Degree, Bottom frequency(See Fig.6)	0.319	0.448	-0.122
Right hand, Touch cheek, Top frequency(See Fig.7)	0.553	0.892	-0.107
Right hand, Touch cheek, Mid frequency(See Fig.8)	0.642	1.02	-0.156
Right hand, Touch cheek, Bottom frequency(See Fig.9)	0.598	0.948	-0.104
Right hand, Tilt 15 Degree, Top frequency(See Fig.10)	0.221	0.304	-0.001
Right hand, Tilt 15 Degree, Mid frequency(See Fig.11)	0.230	0.316	-0.111
Right hand, Tilt 15 Degree, Bottom frequency(See Fig.12)	0.215	0.293	0.019

Table 9: SAR Values (850MHz-Body)

Limit of SAR (W/kg)	10 g Average	1g Average	Power Drift (dB)
	2.0	1.6	
Test Case	**Measurement Result (W/kg)**		
	10 g Average	1 g Average	
Body, Towards Ground, Top frequency (See Fig.13)	0.384	0.537	-0.001
Body, Towards Ground, Mid frequency (See Fig.14)	0.416	0.582	-0.038
Body, Towards Ground, Bottom frequency (See Fig.15)	0.437	0.607	-0.035
Body, Towards Ground, Bottom frequency with Headset(See Fig.16)	0.402	0.571	-0.073

8.4 Summary of Measurement Results (1900MHz)

Table 10: SAR Values (1900MHz-Head)

Limit of SAR (W/kg)	10 g Average	1 g Average	Power Drift (dB)
	2.0	1.6	
Test Case	Measurement Result (W/kg)		
	10 g Average	1 g Average	
Left hand, Touch cheek, Top frequency(See Fig.17)	0.630	1.09	-0.167
Left hand, Touch cheek, Mid frequency(See Fig.18)	0.557	0.951	0.004
Left hand, Touch cheek, Bottom frequency(See Fig.19)	0.473	0.799	0.011
Left hand, Tilt 15 Degree, Top frequency(See Fig.20)	0.094	0.188	-0.112
Left hand, Tilt 15 Degree, Mid frequency(See Fig.21)	0.116	0.228	-0.017
Left hand, Tilt 15 Degree, Bottom frequency(See Fig.22)	0.134	0.257	-0.032
Right hand, Touch cheek, Top frequency(See Fig.23)	0.503	0.823	0.119
Right hand, Touch cheek, Mid frequency(See Fig.24)	0.458	0.749	-0.018
Right hand, Touch cheek, Bottom frequency(See Fig.25)	0.418	0.680	-0.008
Right hand, Tilt 15 Degree, Top frequency(See Fig.26)	0.130	0.280	-0.030
Right hand, Tilt 15 Degree, Mid frequency(See Fig.27)	0.155	0.326	-0.006
Right hand, Tilt 15 Degree, Bottom frequency(See Fig.28)	0.179	0.368	0.143

Table 11: SAR Values (1900MHz-Body)

Limit of SAR (W/kg)	10 g Average	1g Average	Power Drift (dB)
	2.0	1.6	
Test Case	Measurement Result (W/kg)		
	10 g Average	1 g Average	
Body, Towards Ground, Top frequency (See Fig.29)	0.326	0.532	-0.087
Body, Towards Ground, Mid frequency (See Fig.30)	0.303	0.491	0.020
Body, Towards Ground, Bottom frequency (See Fig.31)	0.263	0.424	-0.049
Body, Towards Ground, Top frequency with Headset (See Fig.32)	0.311	0.504	-0.039

8.5 Conclusion

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

9 Measurement Uncertainty

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

10 MAIN TEST INSTRUMENTS

Table 12: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	HP 8753E	US38433212	August 30,2008	One year
02	Power meter	NRVD	101253	June 19, 2009	One year
03	Power sensor	NRV-Z5	100333		
04	Power sensor	NRV-Z6	100011	September 2, 2008	One year
05	Signal Generator	E4433B	US37230472	September 4, 2008	One Year
06	Amplifier	VTL5400	0505	No Calibration Requested	
07	BTS	CMU 200	105948	August 15, 2008	One year
08	E-field Probe	SPEAG ES3DV3	3149	October 1, 2008	One year
09	DAE	SPEAG DAE4	771	November 20, 2008	One year
10	Dipole Validation Kit	SPEAG D835V2	443	February 18, 2009	Two years
11	Dipole Validation Kit	SPEAG D1900V2	541	February 19, 2009	Two years

END OF REPORT BODY

ANNEX A   MEASUREMENT PROCESS

The evaluation was performed with the following procedure:

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

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

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

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

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

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

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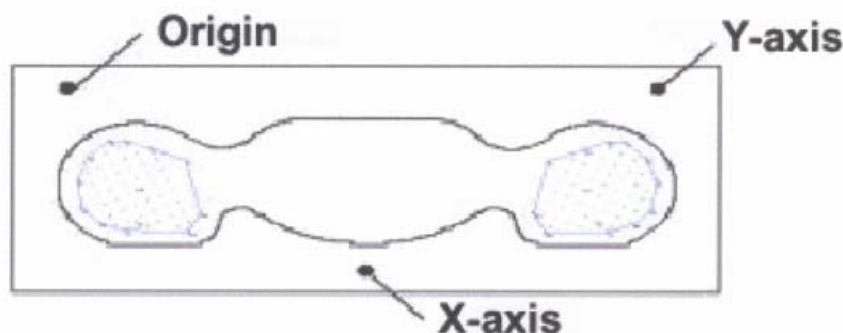
Picture A: SAR Measurement Points in Area Scan

ANNEX B   TEST LAYOUT
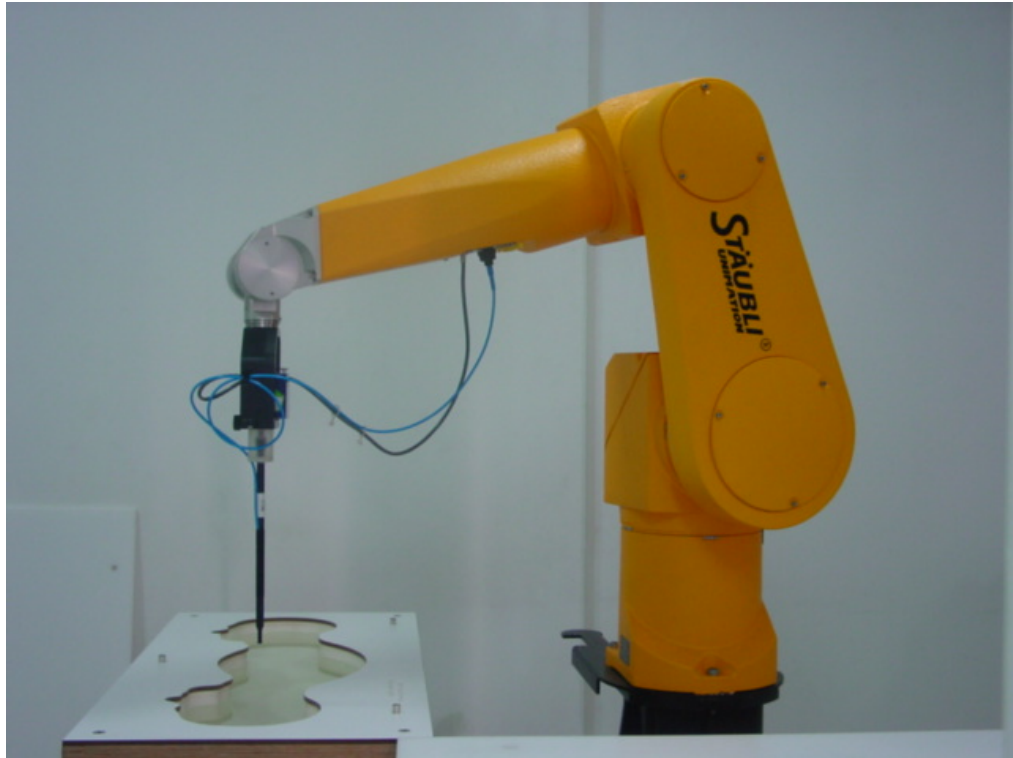
Picture B1: Specific Absorption Rate Test Layout
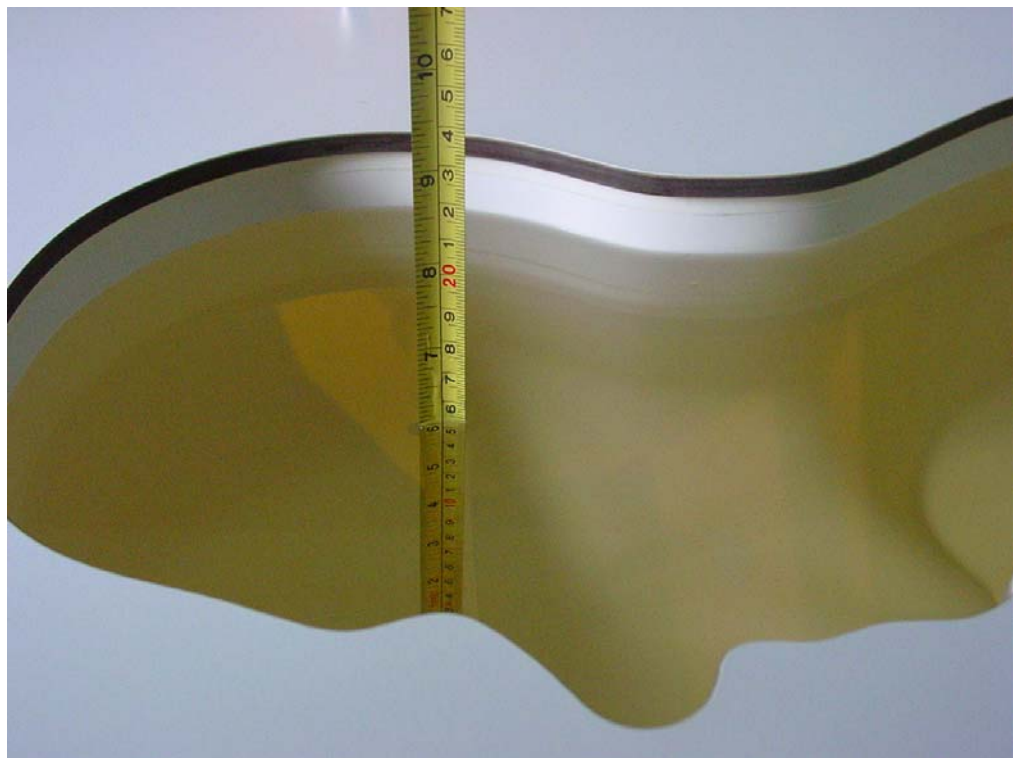
Picture B2: Liquid depth in the Flat Phantom (850 MHz)

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

Picture B4: Left Hand Touch Cheek Position
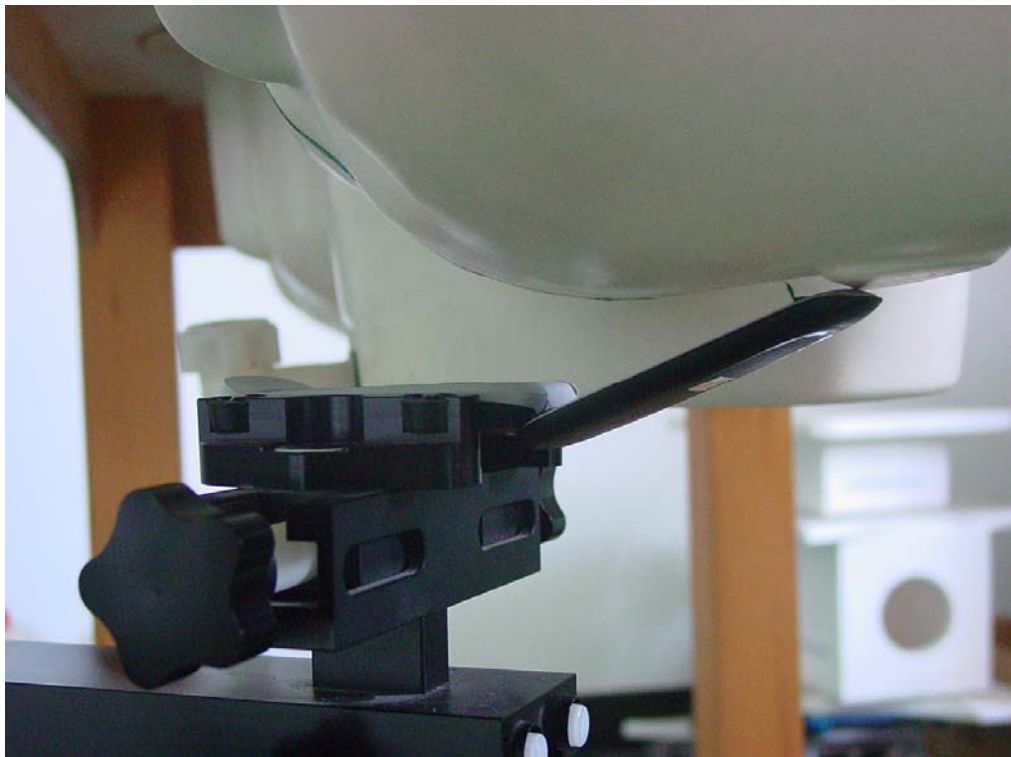
Picture B5: Left Hand Tilt 15° Position
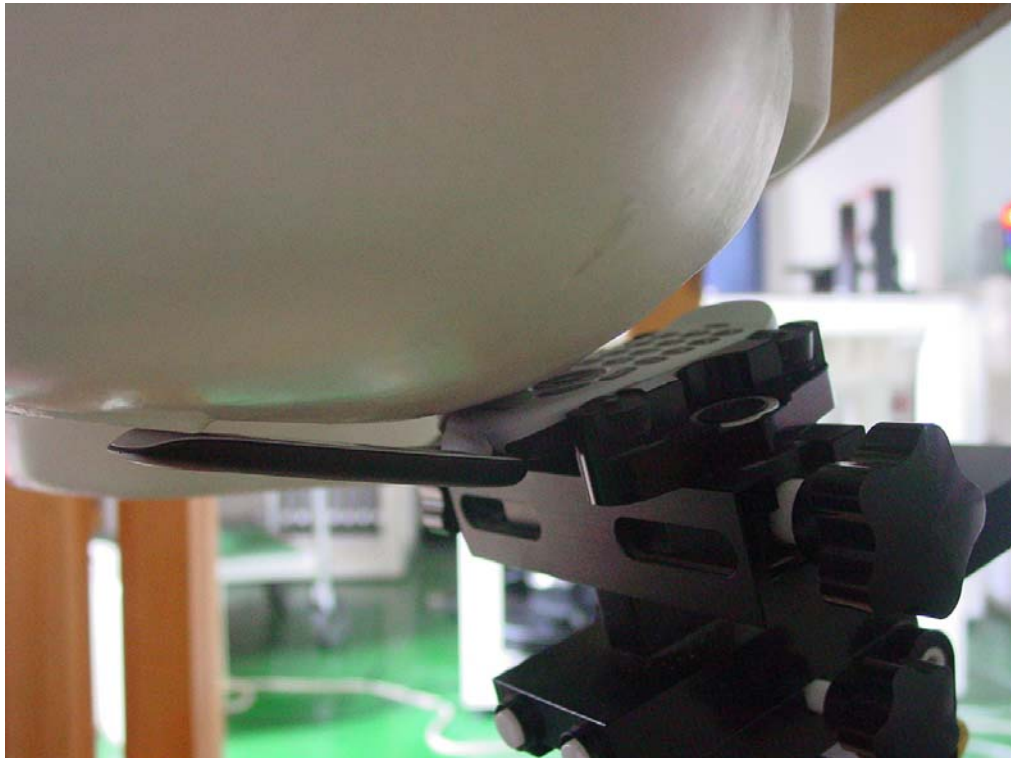
Picture B6: Right Hand Touch Cheek Position

Picture B7: Right Hand Tilt 15° Position
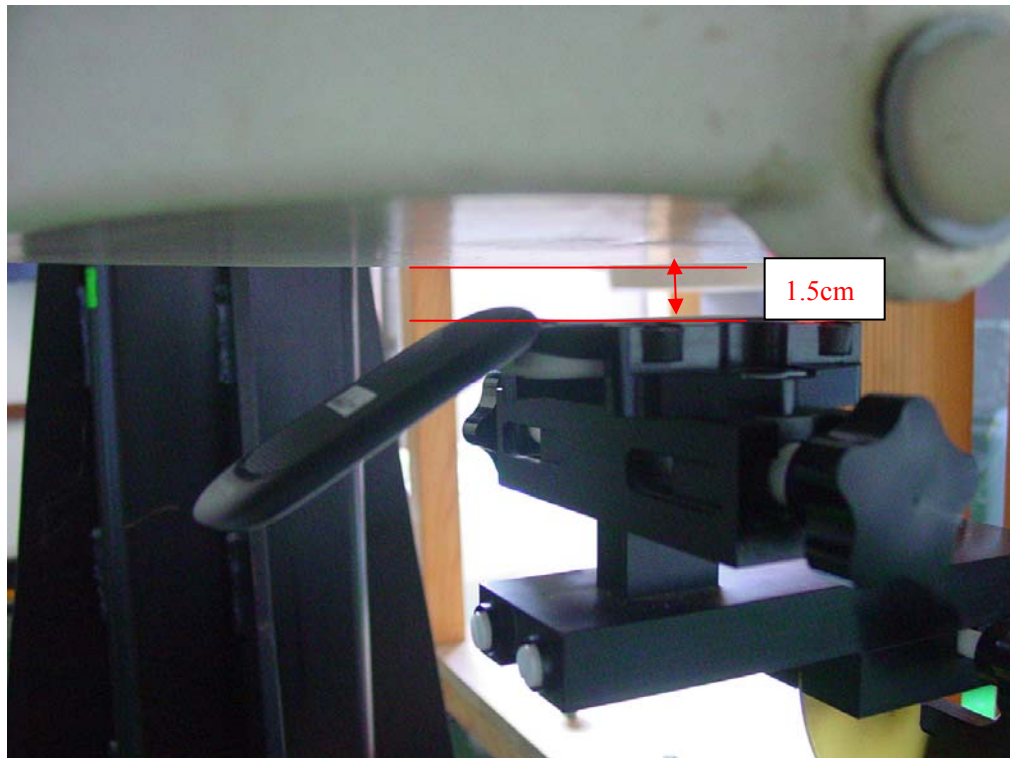
Picture B8: Body-worn Position (towards ground, the distance from handset to the bottom of the Phantom is 1.5cm)
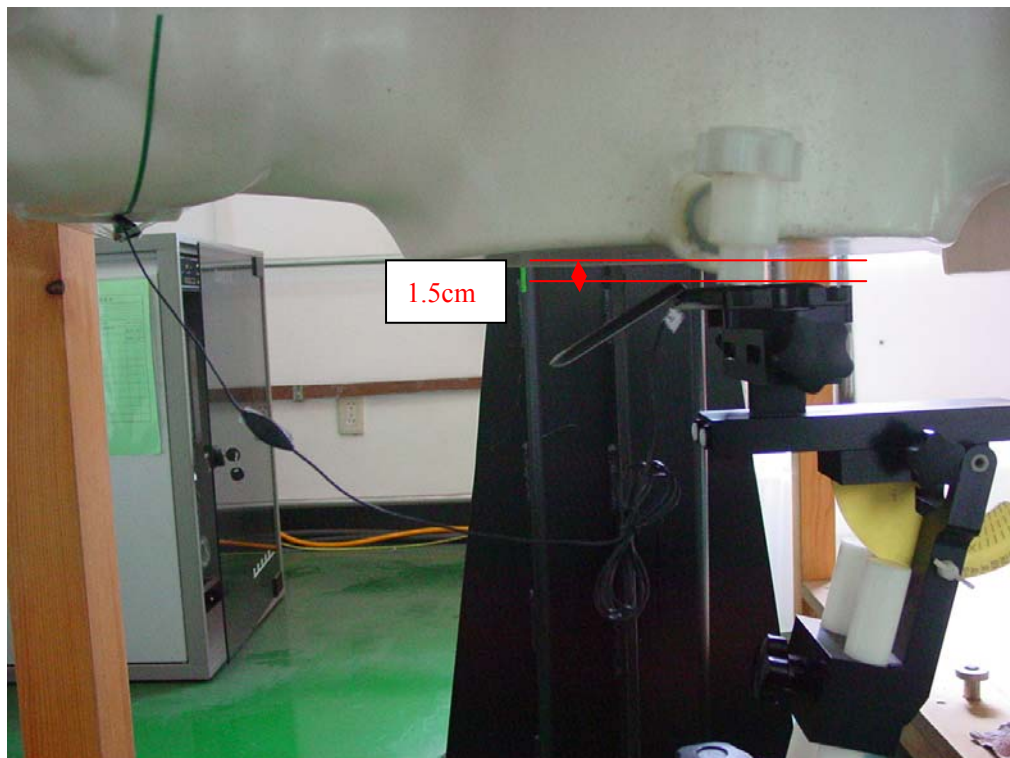
Picture B9: Body-worn Position with Headset (towards ground, the distance from handset to the bottom of the Phantom is 1.5cm)

ANNEX C   GRAPH RESULTS

850 Left Cheek High

Date/Time: 2009-7-15 8:14:20

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.92 mho/m; ε_r = 40.3; ρ = 1000 kg/m^3

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

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

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

Cheek High/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm
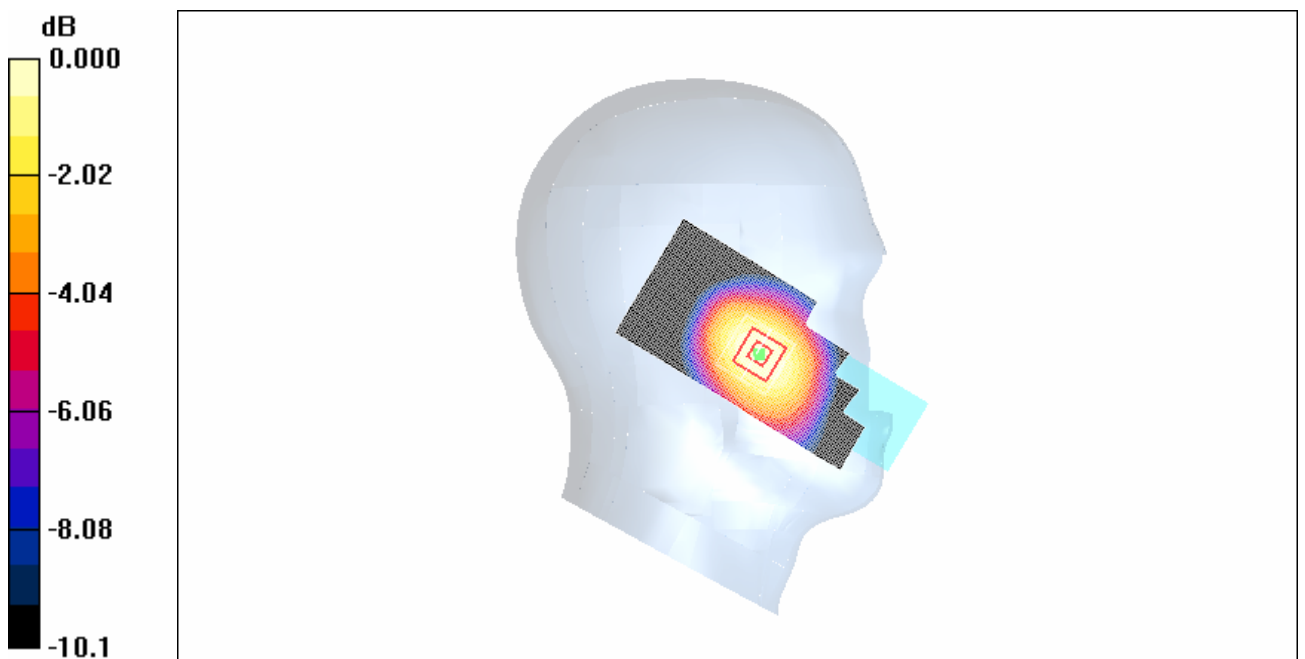
Maximum value of SAR (interpolated) = 0.902 mW/g

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

Reference Value = 2.08 V/m; Power Drift = 0.160 dB

Peak SAR (extrapolated) = 1.28 W/kg

SAR(1 g) = 0.801 mW/g; SAR(10 g) = 0.558 mW/g

Maximum value of SAR (measured) = 0.861 mW/g

0 dB = 0.861mW/g
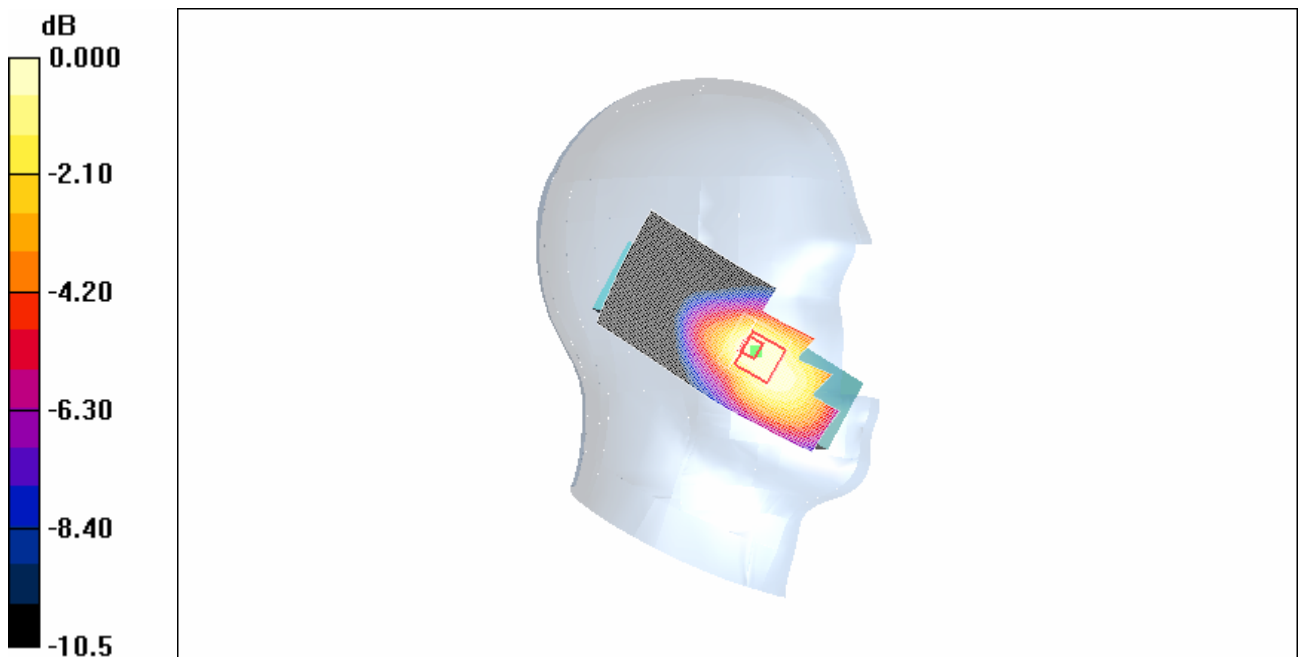
Fig. 1   850MHz CH251

850 Left Cheek Middle

Date/Time: 2009-7-15 8:28:31

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.908 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3

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

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

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

Cheek Middle/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.954 mW/g

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

Reference Value = 2.44 V/m; Power Drift = -0.170 dB

Peak SAR (extrapolated) = 1.38 W/kg

SAR(1 g) = 0.852 mW/g; SAR(10 g) = 0.597 mW/g

Maximum value of SAR (measured) = 0.892 mW/g
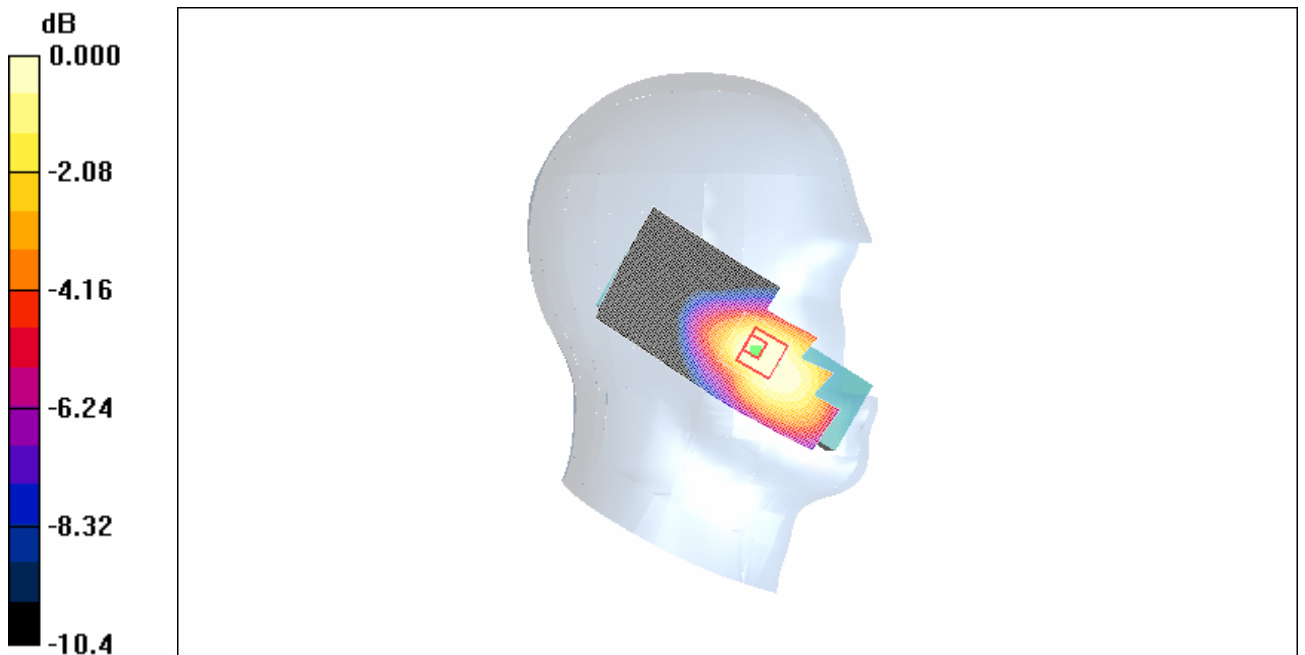
0 dB = 0.892mW/g

Fig. 2 850 MHz CH190

850 Left Cheek Low

Date/Time: 2009-7-15 8:42:08

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used: f = 825 MHz; σ = 0.896 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3

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

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

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

Cheek Low/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.937 mW/g

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

Reference Value = 2.47 V/m; Power Drift = -0.132 dB

Peak SAR (extrapolated) = 1.28 W/kg

SAR(1 g) = 0.832 mW/g; SAR(10 g) = 0.592 mW/g

Maximum value of SAR (measured) = 0.881 mW/g
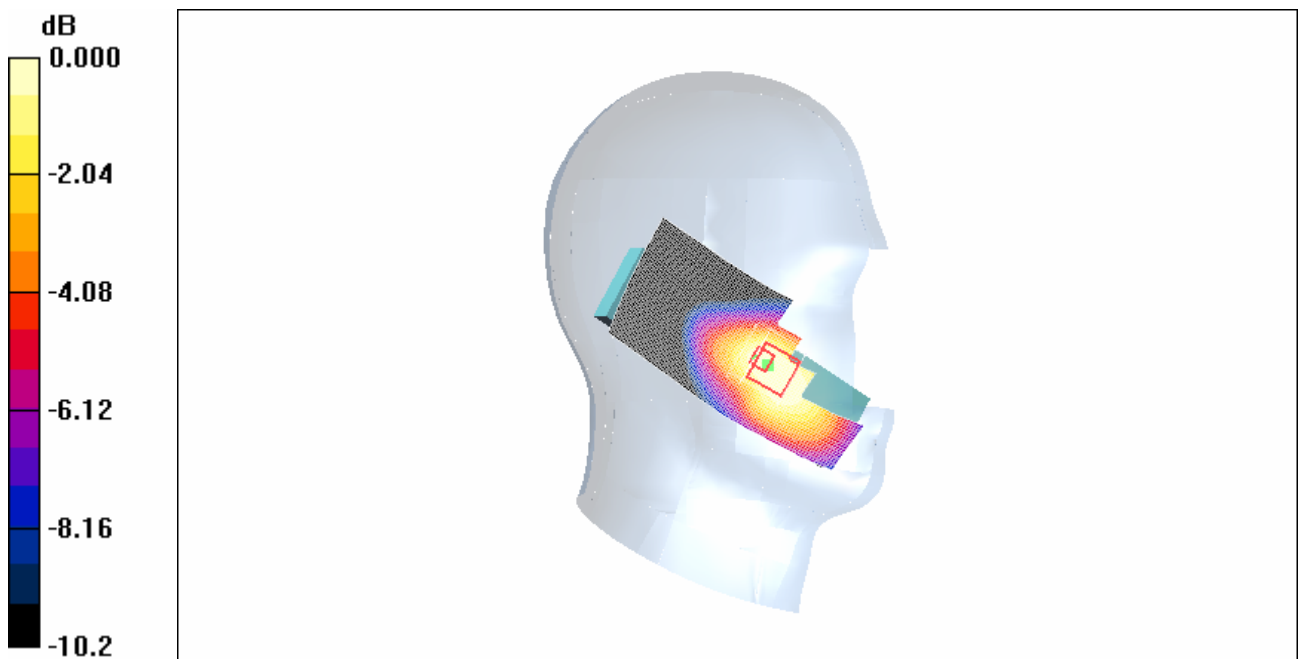
0 dB = 0.881mW/g

Fig. 3   850 MHz CH128

850 Left Tilt High

Date/Time: 2009-7-15 9:42:24

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.92 mho/m; ε_r = 40.3; ρ = 1000 kg/m^3

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

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

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

Tilt High/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.584 mW/g

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

Reference Value = 5.34 V/m; Power Drift = -0.112 dB

Peak SAR (extrapolated) = 0.702 W/kg

SAR(1 g) = 0.540 mW/g; SAR(10 g) = 0.384 mW/g
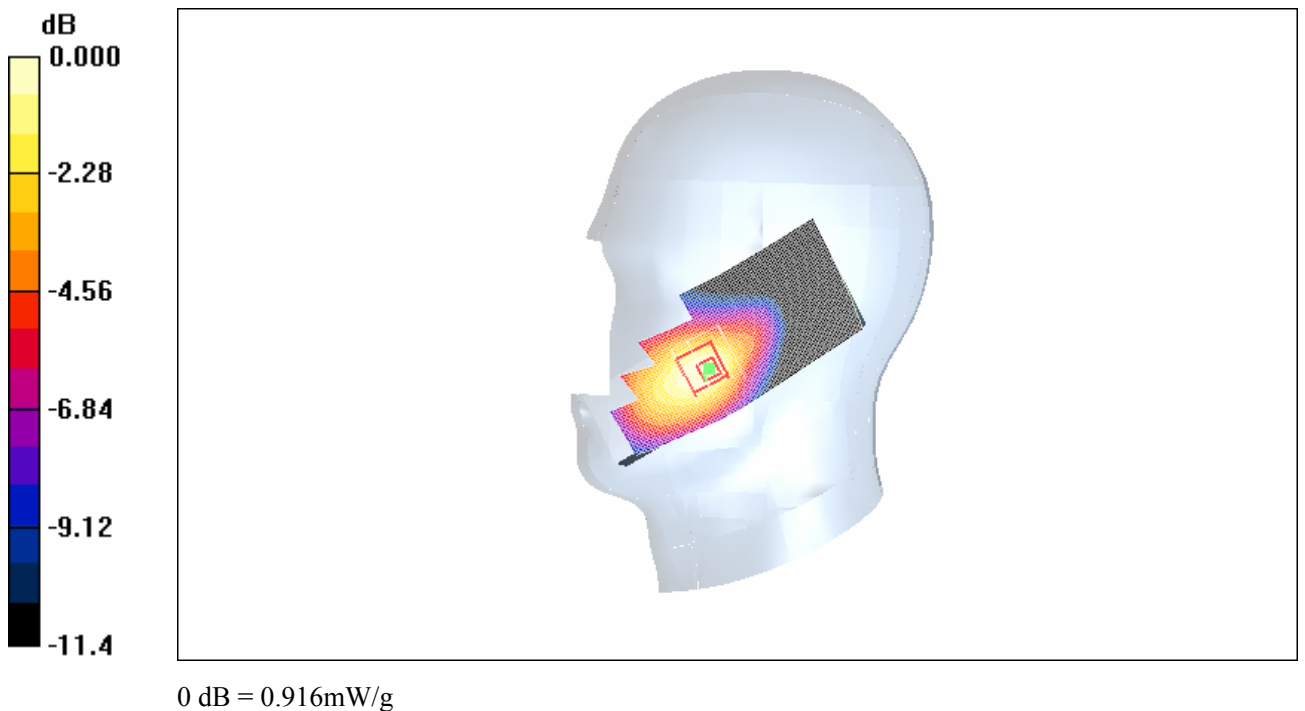
Maximum value of SAR (measured) = 0.568 mW/g

0 dB = 0.568mW/g

Fig.4 850 MHz CH251

850 Left Tilt Middle

Date/Time: 2009-7-15 9:28:51

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.908 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3

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

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

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

Tilt Middle/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm

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

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

Reference Value = 5.06 V/m; Power Drift = -0.014 dB

Peak SAR (extrapolated) = 0.680 W/kg

SAR(1 g) = 0.524 mW/g; SAR(10 g) = 0.373 mW/g

Maximum value of SAR (measured) = 0.557 mW/g
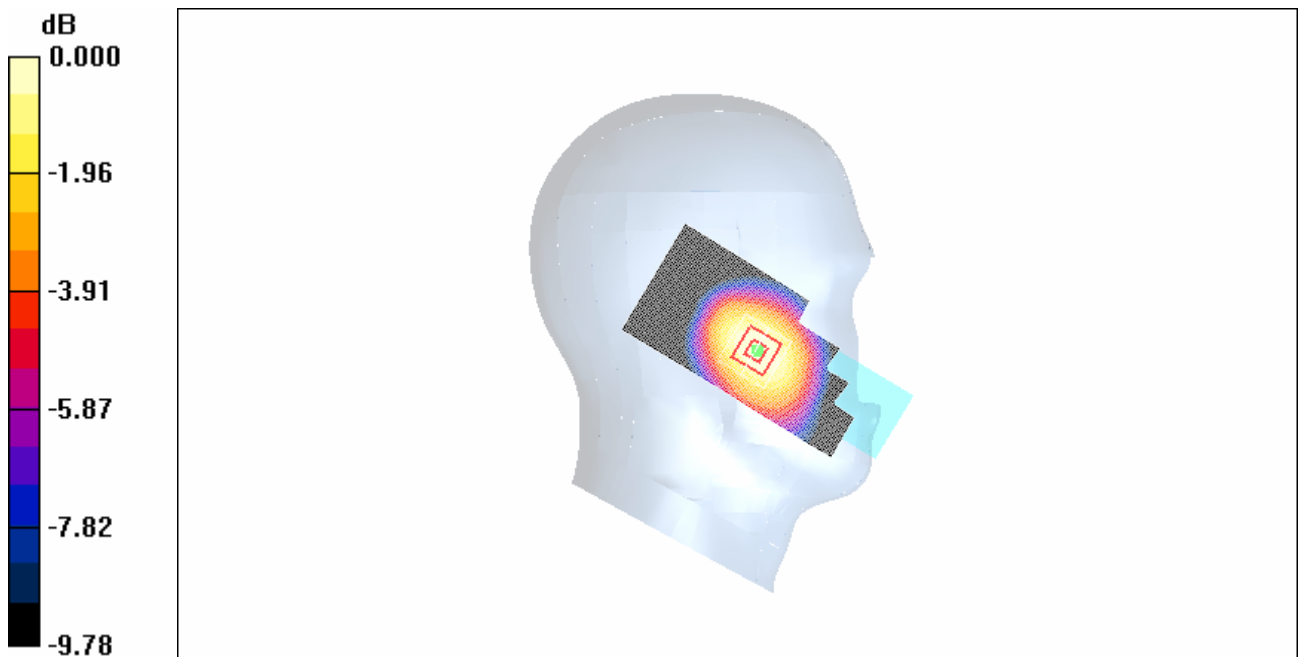
0 dB = 0.557mW/g

Fig.5   850 MHz CH190

850 Left Tilt Low

Date/Time: 2009-7-15 9:58:57

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used: f = 825 MHz; σ = 0.896 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3

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

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

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

Tilt Low/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.485 mW/g

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

Reference Value = 4.73 V/m; Power Drift = -0.122 dB

Peak SAR (extrapolated) = 0.583 W/kg

SAR(1 g) = 0.448 mW/g; SAR(10 g) = 0.319 mW/g

Maximum value of SAR (measured) = 0.478 mW/g
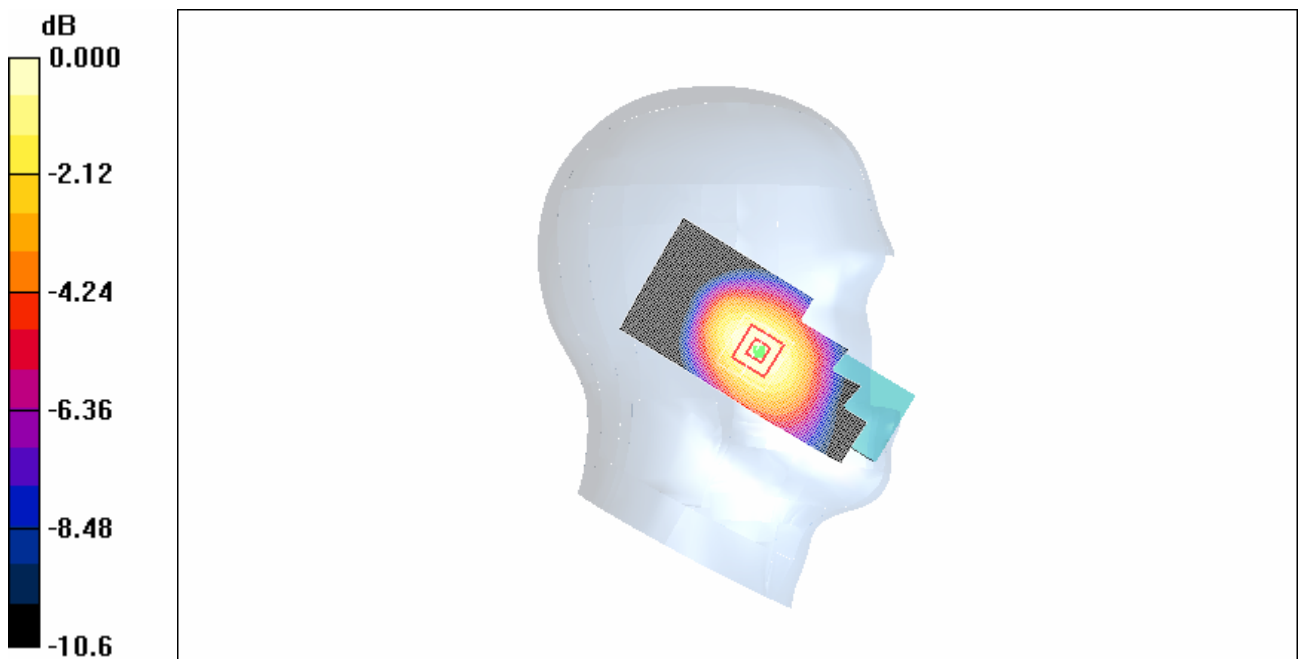
0 dB = 0.478mW/g

Fig. 6   850 MHz CH128

850 Right Cheek High

Date/Time: 2009-7-15 11:50:20

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.92 mho/m; ε_r = 40.3; ρ = 1000 kg/m^3

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

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

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

Cheek High/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm

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

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

Reference Value = 2.65 V/m; Power Drift = -0.107 dB

Peak SAR (extrapolated) = 1.58 W/kg

SAR(1 g) = 0.892 mW/g; SAR(10 g) = 0.553 mW/g

Maximum value of SAR (measured) = 0.916 mW/g
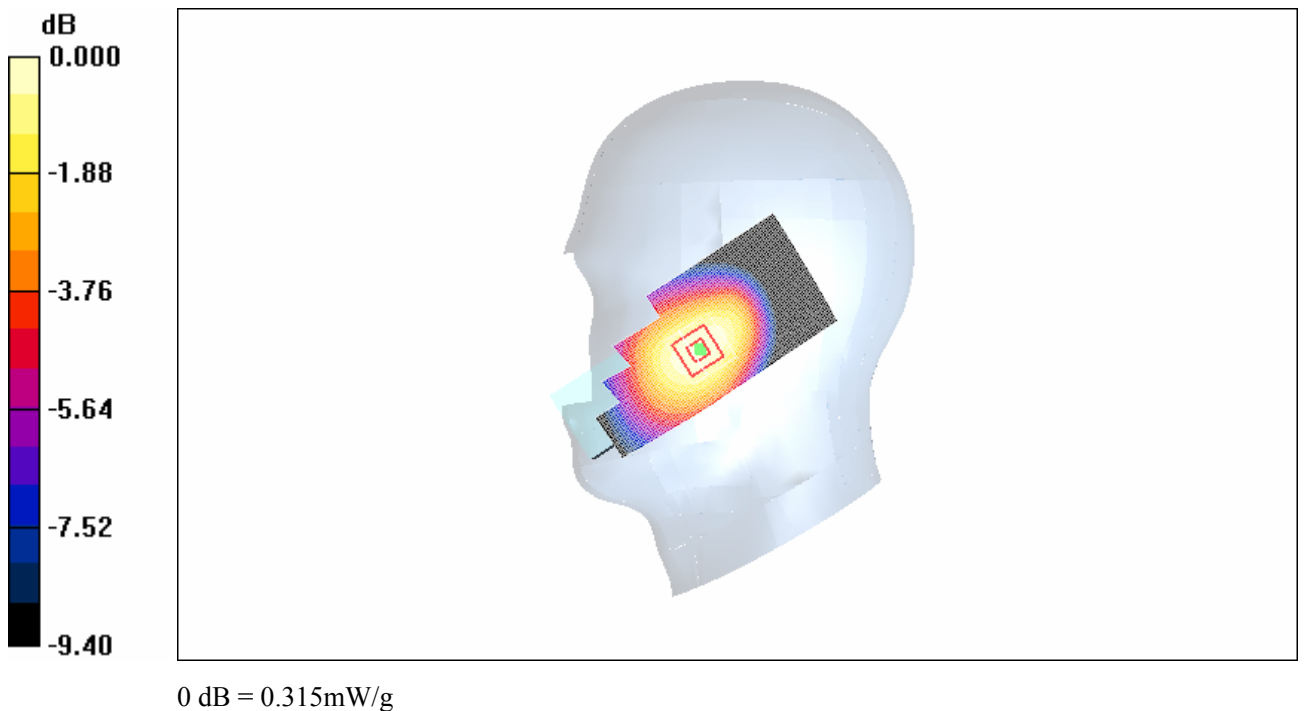

0 dB = 0.916mW/g

Fig. 7   850 MHz CH251

850 Right Cheek Middle

Date/Time: 2009-7-15 10:38:09

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.908 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3

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

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

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

Cheek Middle/Area Scan (51x121x1): 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 = 2.90 V/m; Power Drift = -0.156 dB

Peak SAR (extrapolated) = 1.73 W/kg

SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.642 mW/g

Maximum value of SAR (measured) = 1.07 mW/g
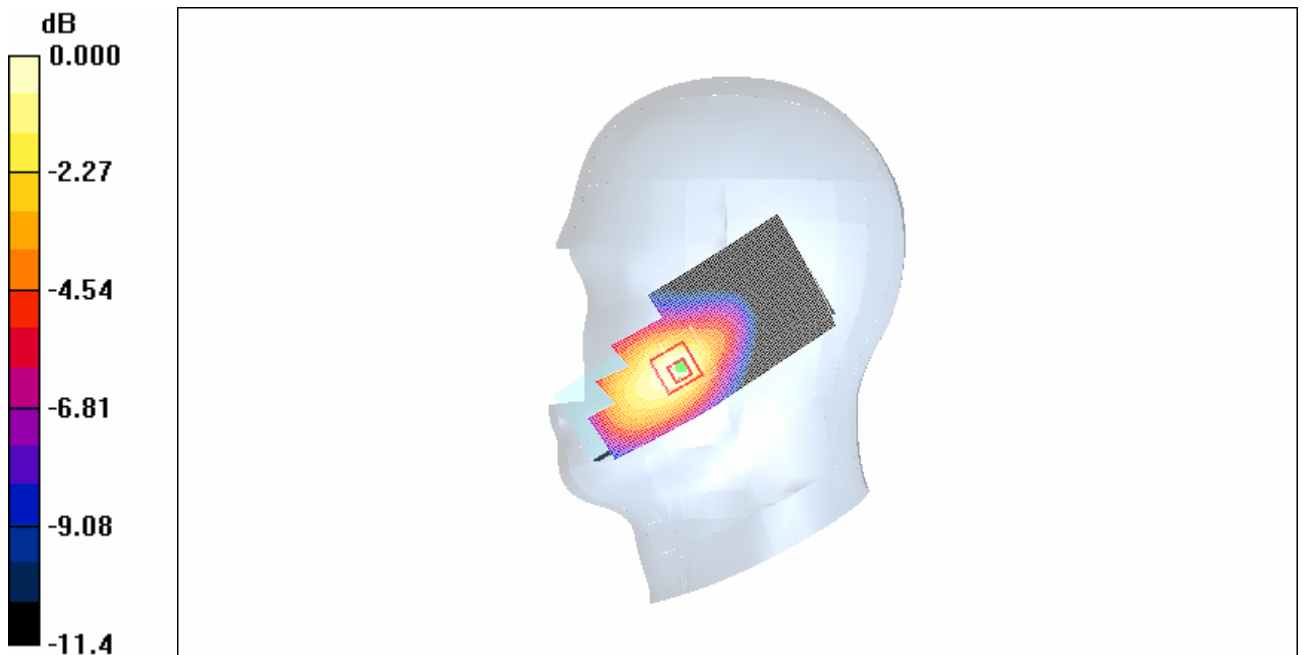
0 dB = 1.07mW/g

Fig. 8-1   850 MHz CH128
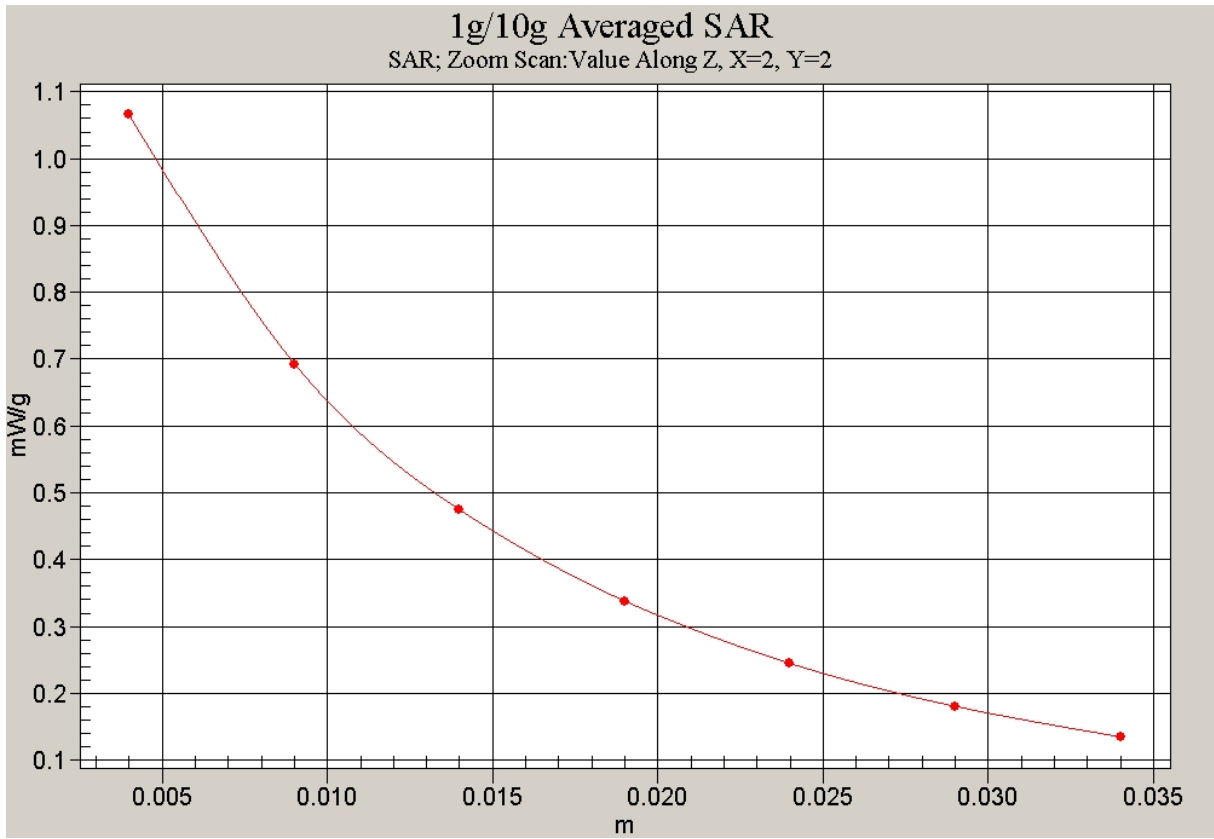
Fig. 8-2 Z-Scan at power reference point (850 MHz CH128)

850 Right Cheek Low

Date/Time: 2009-7-15 10:49:15

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used: f = 825 MHz; σ = 0.896 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3

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

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

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

Cheek Low/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.04 mW/g

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

Reference Value = 2.67 V/m; Power Drift = -0.104 dB

Peak SAR (extrapolated) = 1.63 W/kg

SAR(1 g) = 0.948 mW/g; SAR(10 g) = 0.598 mW/g

Maximum value of SAR (measured) = 0.998 mW/g
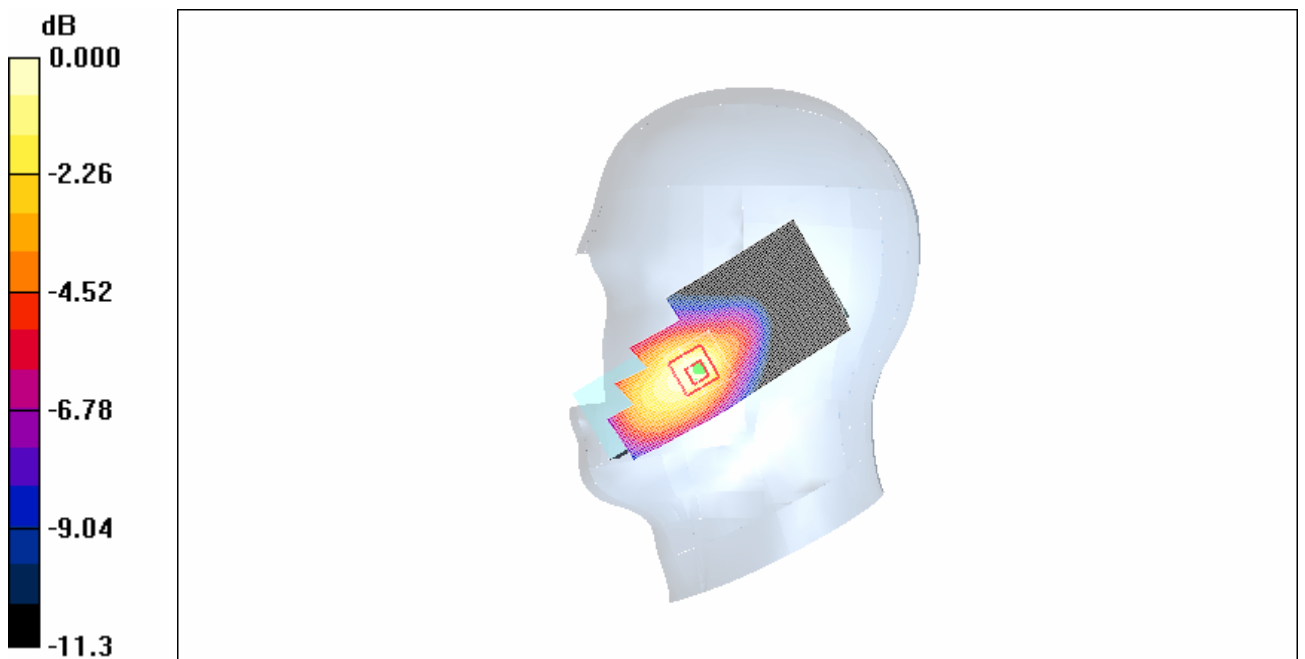
0 dB = 0.998mW/g

Fig. 9   850 MHz CH128

850 Right Tilt High

Date/Time: 2009-7-15 11:38:25

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.92 mho/m; ε_r = 40.3; ρ = 1000 kg/m^3

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

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

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

Tilt High/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.324 mW/g

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

Reference Value = 4.45 V/m; Power Drift = -0.001 dB

Peak SAR (extrapolated) = 0.392 W/kg

SAR(1 g) = 0.304 mW/g; SAR(10 g) = 0.221 mW/g

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

0 dB = 0.315mW/g

Fig.10   850 MHz CH251

850 Right Tilt Middle

Date/Time: 2009-7-15 11:27:12

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.908 mho/m; $ε_r$ = 40.4; ρ = 1000 kg/m^3

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

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

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

Tilt Middle/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.337 mW/g

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

Reference Value = 4.61 V/m; Power Drift = -0.111 dB

Peak SAR (extrapolated) = 0.406 W/kg

SAR(1 g) = 0.316 mW/g; SAR(10 g) = 0.230 mW/g

Maximum value of SAR (measured) = 0.324 mW/g
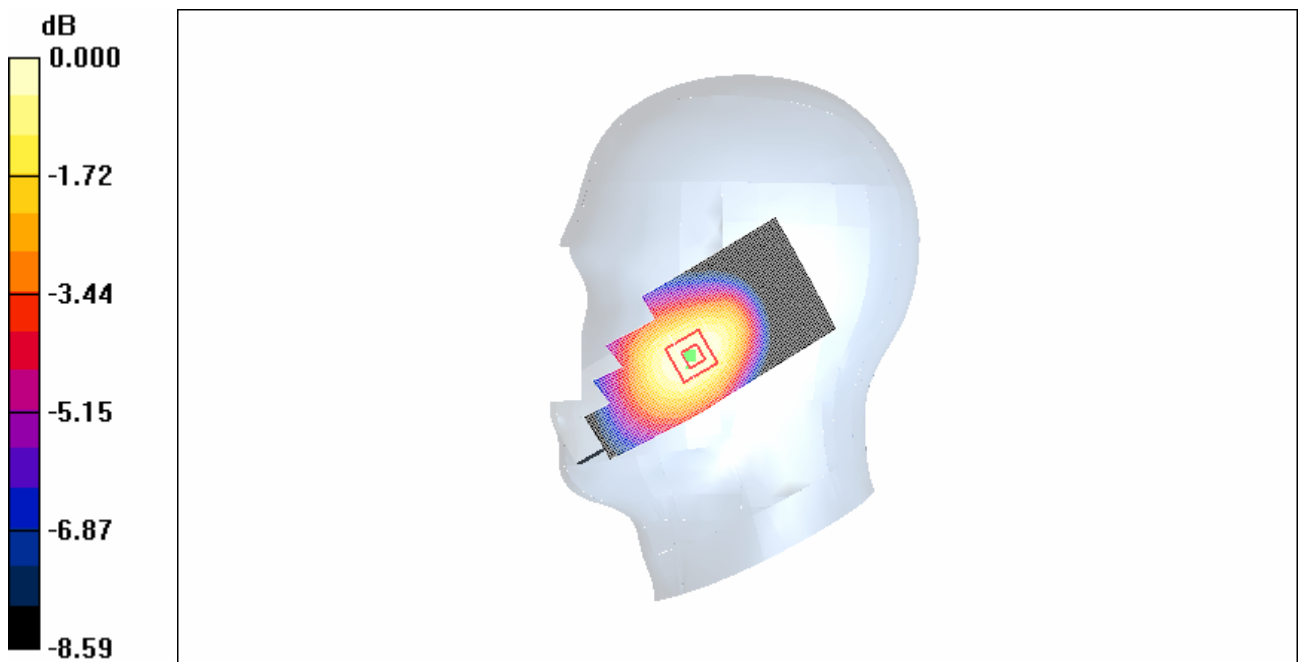
0 dB = 0.324mW/g

Fig.11   850 MHz CH190

850 Right Tilt Low

Date/Time: 2009-7-15 11:01:24

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used: f = 825 MHz; σ = 0.896 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3

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

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

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

Tilt Low/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.306 mW/g

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

Reference Value = 4.21 V/m; Power Drift = 0.019 dB

Peak SAR (extrapolated) = 0.374 W/kg

SAR(1 g) = 0.293 mW/g; SAR(10 g) = 0.215 mW/g

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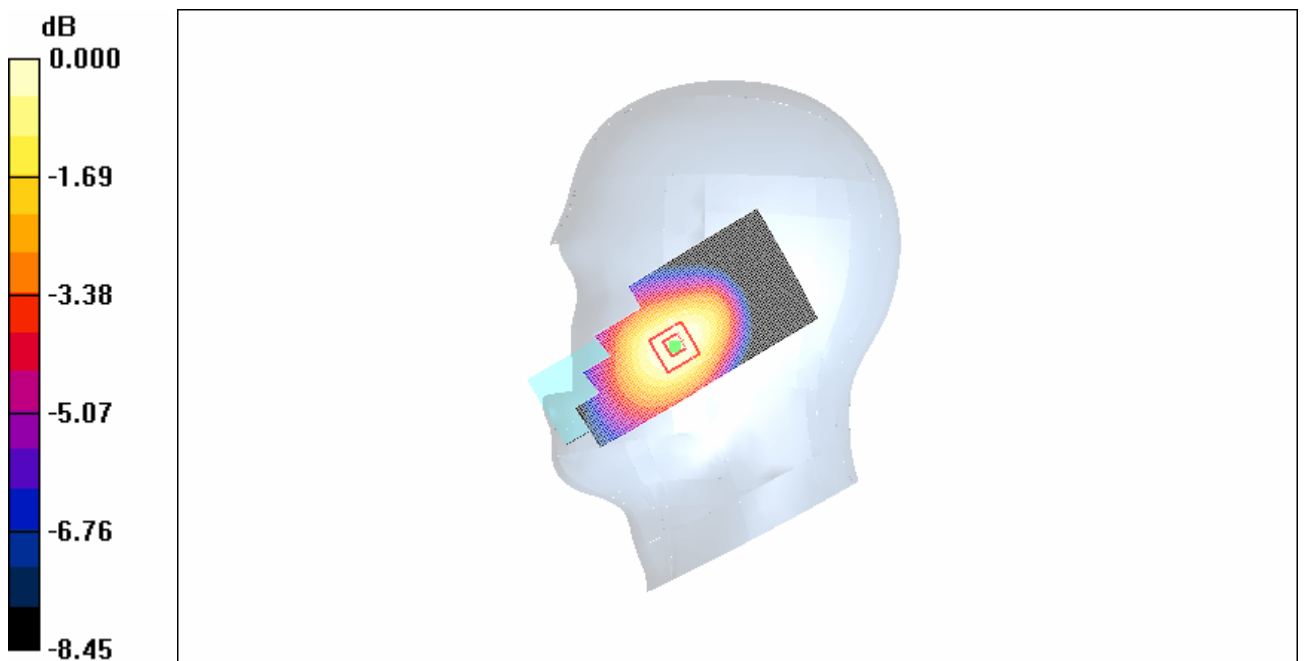
0 dB = 0.301mW/g

Fig. 12   850 MHz CH128

850 Body Towards Ground High

Date/Time: 2009-7-15 15:01:31

Electronics: DAE4 Sn771

Medium: 850 Body

Medium parameters used (interpolated): f = 848.8 MHz; σ = 1.01 mho/m; ε_r = 53.7; ρ = 1000 kg/m^3

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

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

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

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

Maximum value of SAR (interpolated) = 0.579 mW/g

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

Reference Value = 22.1 V/m; Power Drift = -0.001 dB

Peak SAR (extrapolated) = 0.708 W/kg

SAR(1 g) = 0.537 mW/g; SAR(10 g) = 0.384 mW/g

Maximum value of SAR (measured) = 0.569 mW/g

0 dB = 0.569mW/g
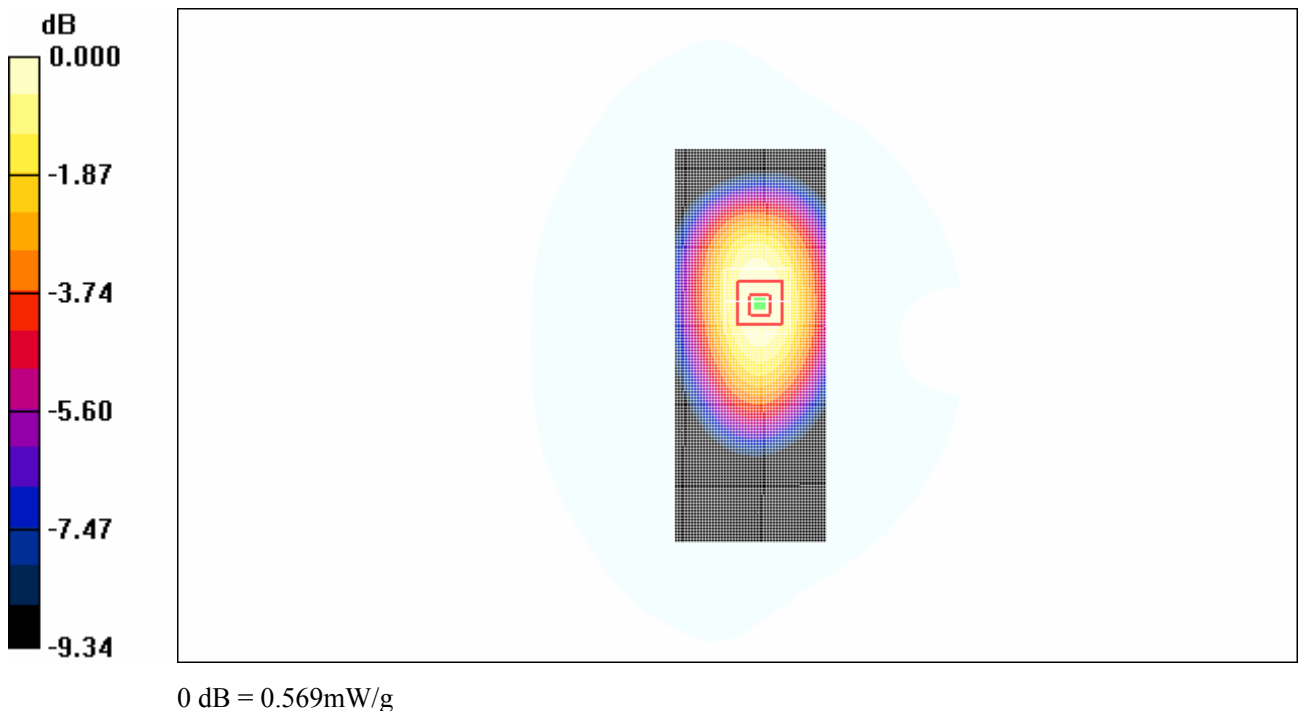
Fig. 13   850 MHz CH251

850 Body Towards Ground Middle

Date/Time: 2009-7-15 15:21:29

Electronics: DAE4 Sn771

Medium: 850 Body

Medium parameters used (interpolated): f = 836.6 MHz; σ = 1.00 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3

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

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

Maximum value of SAR (interpolated) = 0.617 mW/g

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

Reference Value = 22.8 V/m; Power Drift = -0.038 dB

Peak SAR (extrapolated) = 0.772 W/kg

SAR(1 g) = 0.582 mW/g; SAR(10 g) = 0.416 mW/g

Maximum value of SAR (measured) = 0.617 mW/g

0 dB = 0.617mW/g
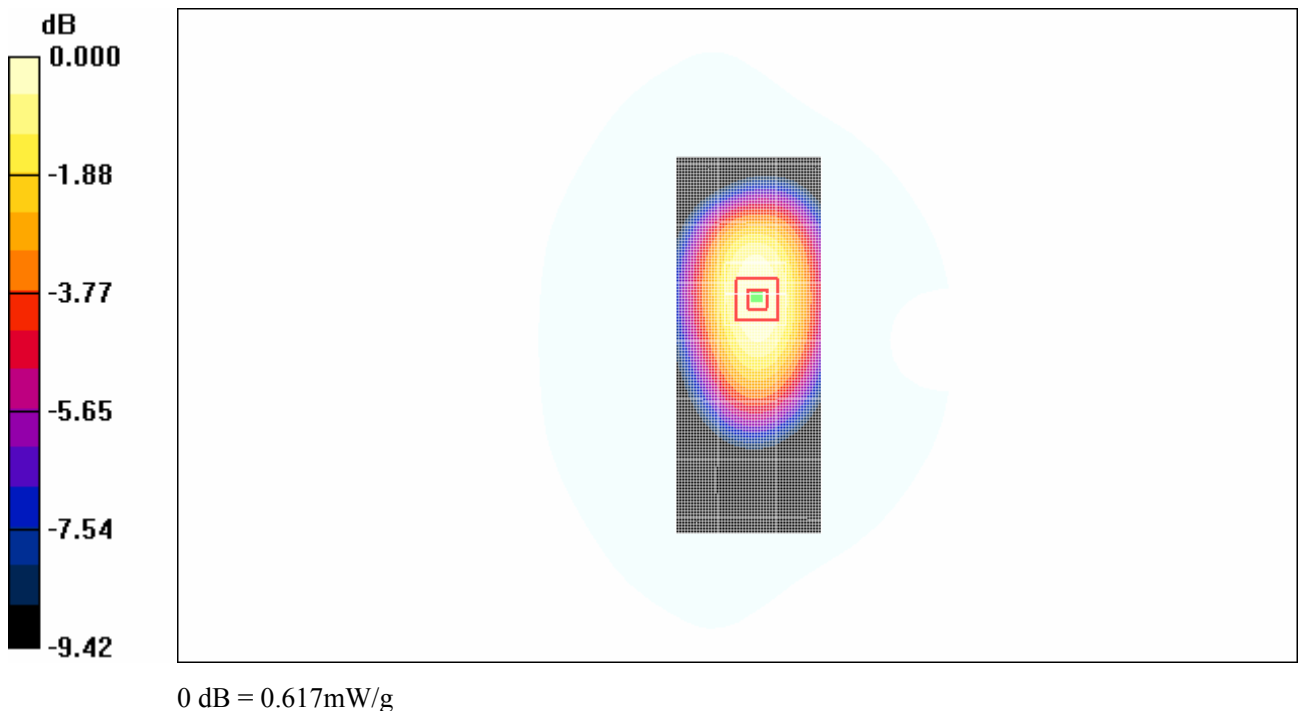
Fig. 14   850 MHz CH190

850 Body Towards Ground Low

Date/Time: 2009-7-15 15:40:06

Electronics: DAE4 Sn771

Medium: 850 Body

Medium parameters used: f = 825 MHz; σ = 0.983 mho/m; ε_r = 53.9; ρ = 1000 kg/m^3

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

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

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

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

Maximum value of SAR (interpolated) = 0.649 mW/g

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

Reference Value = 22.9 V/m; Power Drift = -0.035 dB

Peak SAR (extrapolated) = 0.799 W/kg

SAR(1 g) = 0.607 mW/g; SAR(10 g) = 0.437 mW/g

Maximum value of SAR (measured) = 0.641 mW/g

0 dB = 0.641mW/g
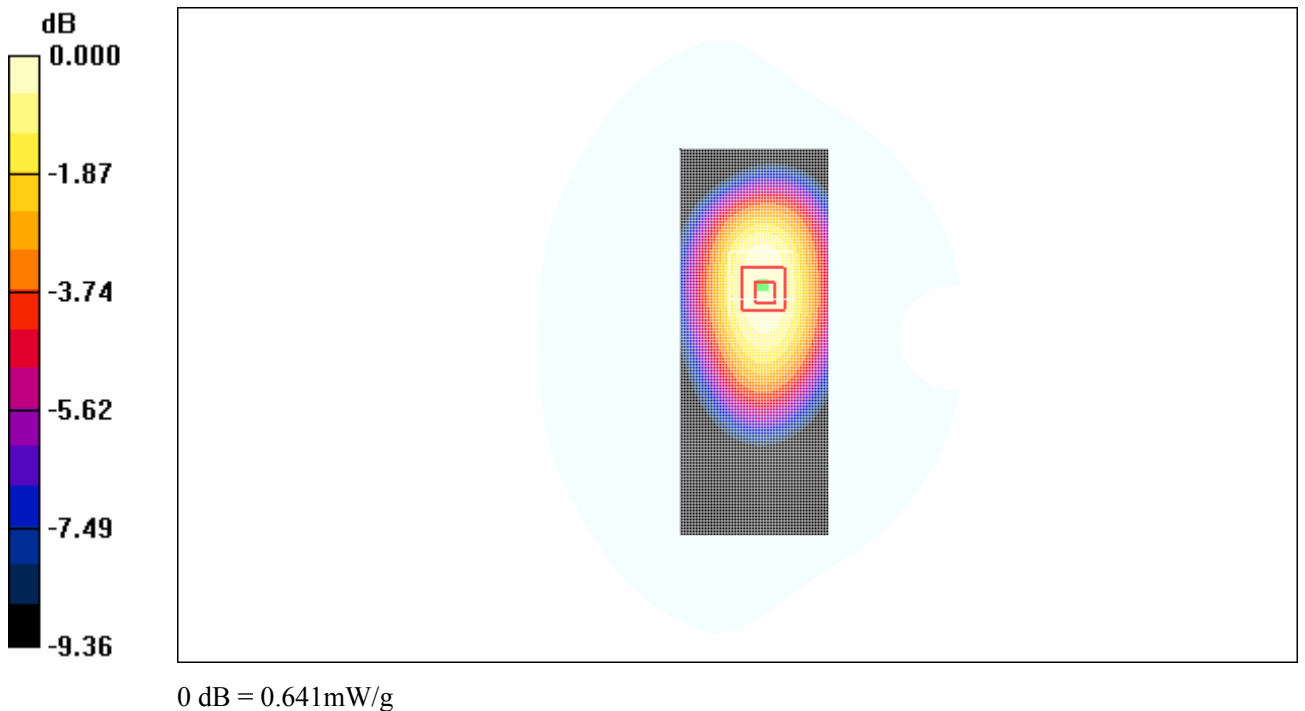
Fig. 15-1   850 MHz CH128
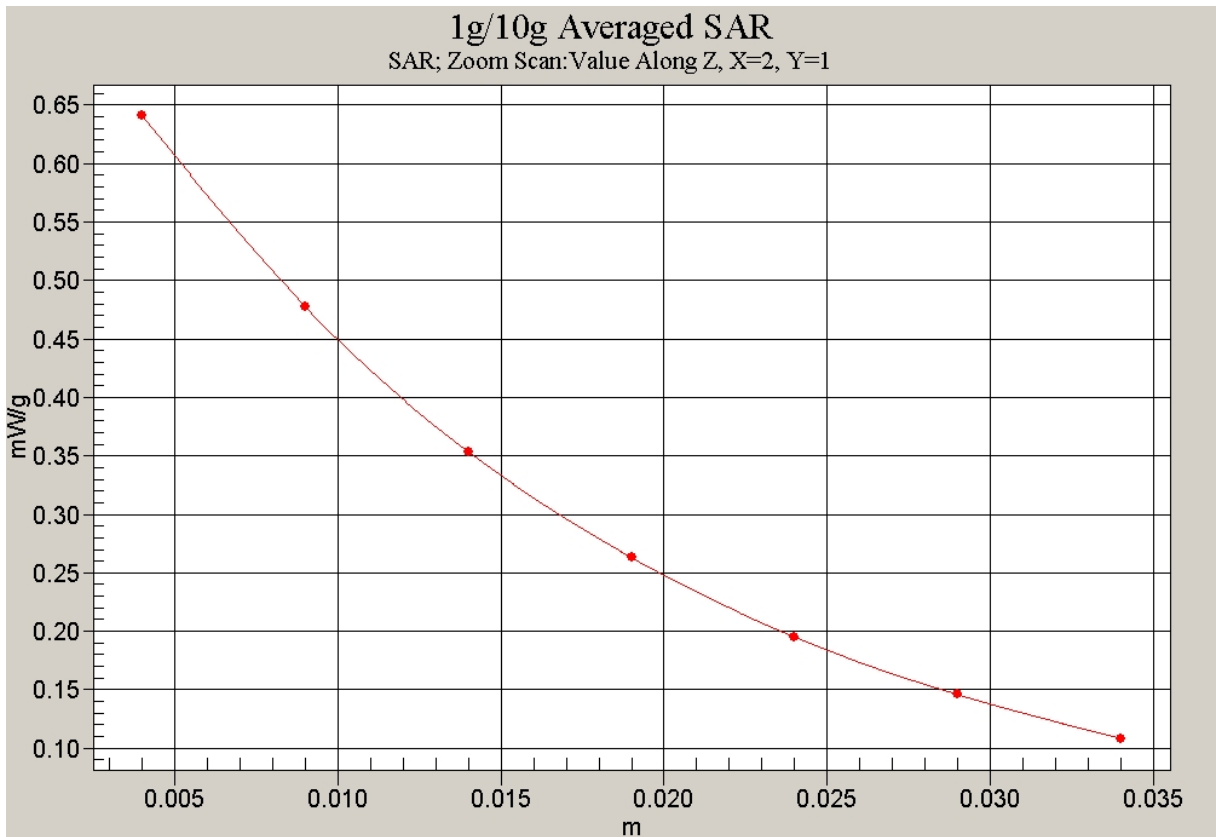
Fig. 15-2 Z-Scan at power reference point (850 MHz CH128)

850 Body Towards Ground Low with Headset

Date/Time: 2009-7-15 15:56:29

Electronics: DAE4 Sn771

Medium: 850 Body

Medium parameters used: f = 825 MHz; σ = 0.983 mho/m; $ε_r$ = 53.9; ρ = 1000 kg/m³

Ambient Temperature:23.3°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)

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

Maximum value of SAR (interpolated) = 0.605 mW/g

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

Reference Value = 23.6 V/m; Power Drift = -0.073 dB

Peak SAR (extrapolated) = 0.739 W/kg

SAR(1 g) = 0.571 mW/g; SAR(10 g) = 0.402 mW/g

Maximum value of SAR (measured) = 0.605 mW/g

0 dB = 0.605mW/g
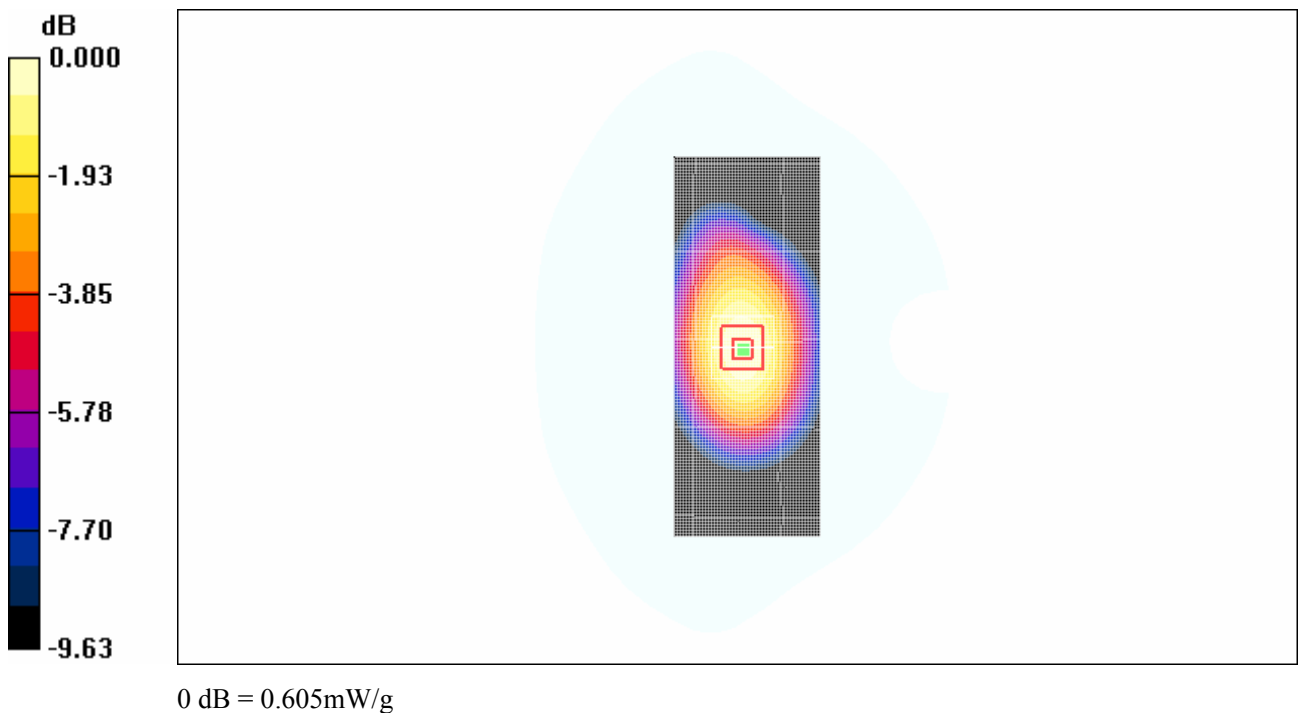
Fig. 16   850 MHz CH128

1900 Left Cheek High

Date/Time: 2009-7-17 10:50:03

Electronics: DAE4 Sn771

Medium: Head 1900

Medium parameters used: f = 1910 MHz; σ = 1.4 mho/m; ε_r = 40.3; ρ = 1000 kg/m^3

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

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

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

Cheek High/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.17 mW/g

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

Reference Value = 7.81 V/m; Power Drift = -0.167 dB

Peak SAR (extrapolated) = 1.70 W/kg

SAR(1 g) = 1.09 mW/g; SAR(10 g) = 0.630 mW/g

Maximum value of SAR (measured) = 1.22 mW/g
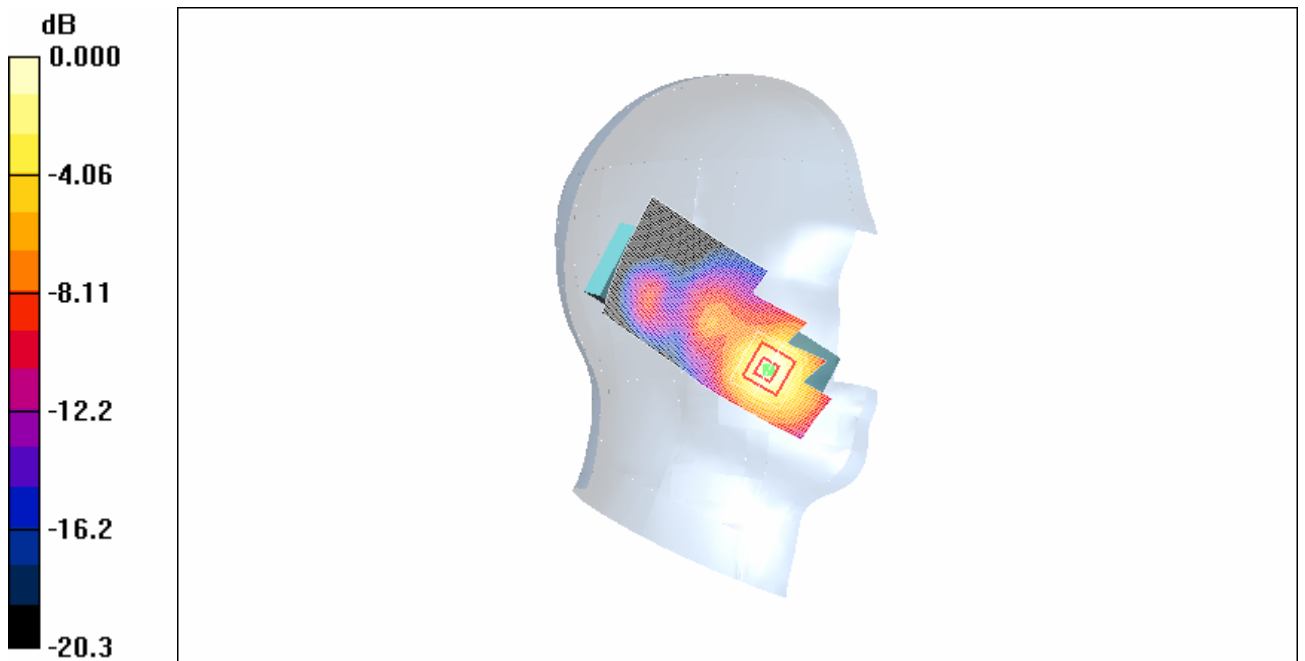
0 dB = 1.22mW/g

Fig. 17-1   1900 MHz CH810
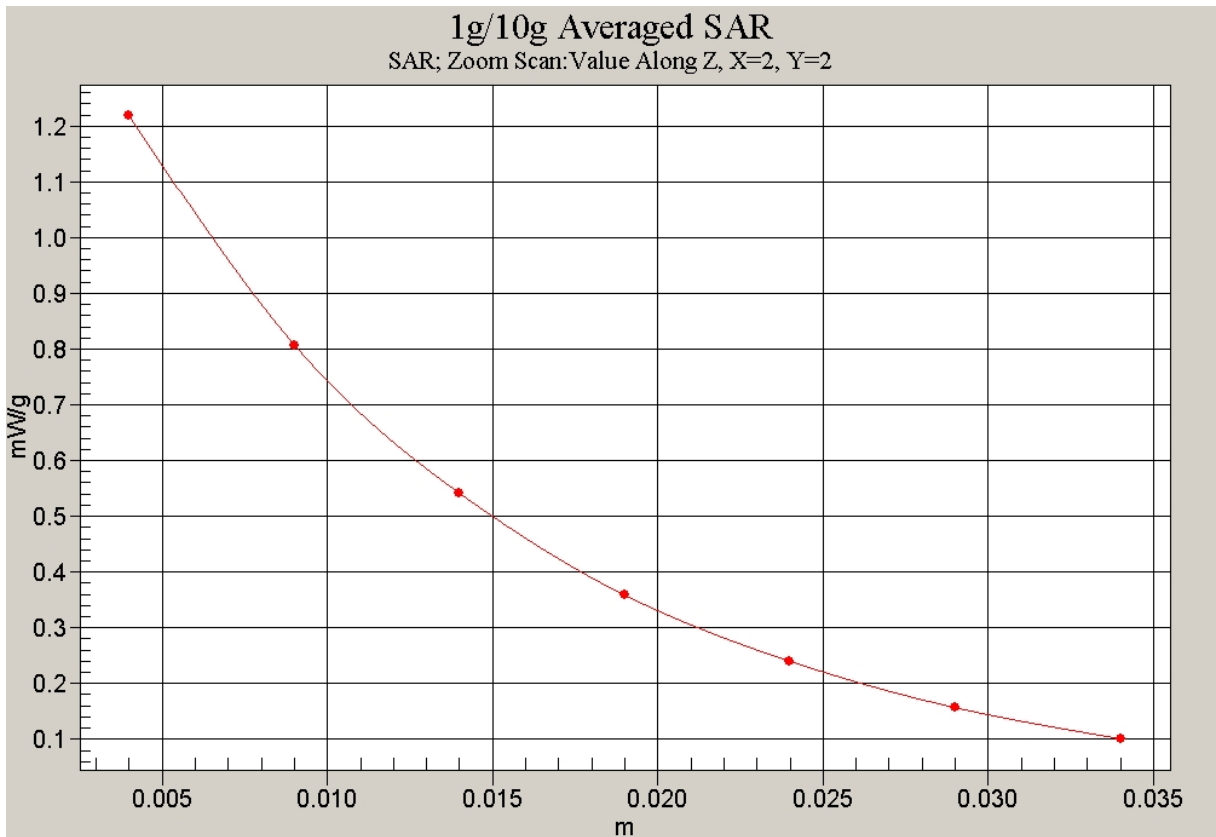
Fig. 17-2 Z-Scan at power reference point (1900 MHz CH810)

1900 Left Cheek Middle

Date/Time: 2009-7-17 11:04:40

Electronics: DAE4 Sn771

Medium: Head 1900

Medium parameters used: f = 1880 MHz; σ = 1.37 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3

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

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

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

Cheek Middle/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm

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

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

Reference Value = 7.78 V/m; Power Drift = 0.004 dB

Peak SAR (extrapolated) = 1.44 W/kg

SAR(1 g) = 0.951 mW/g; SAR(10 g) = 0.557 mW/g

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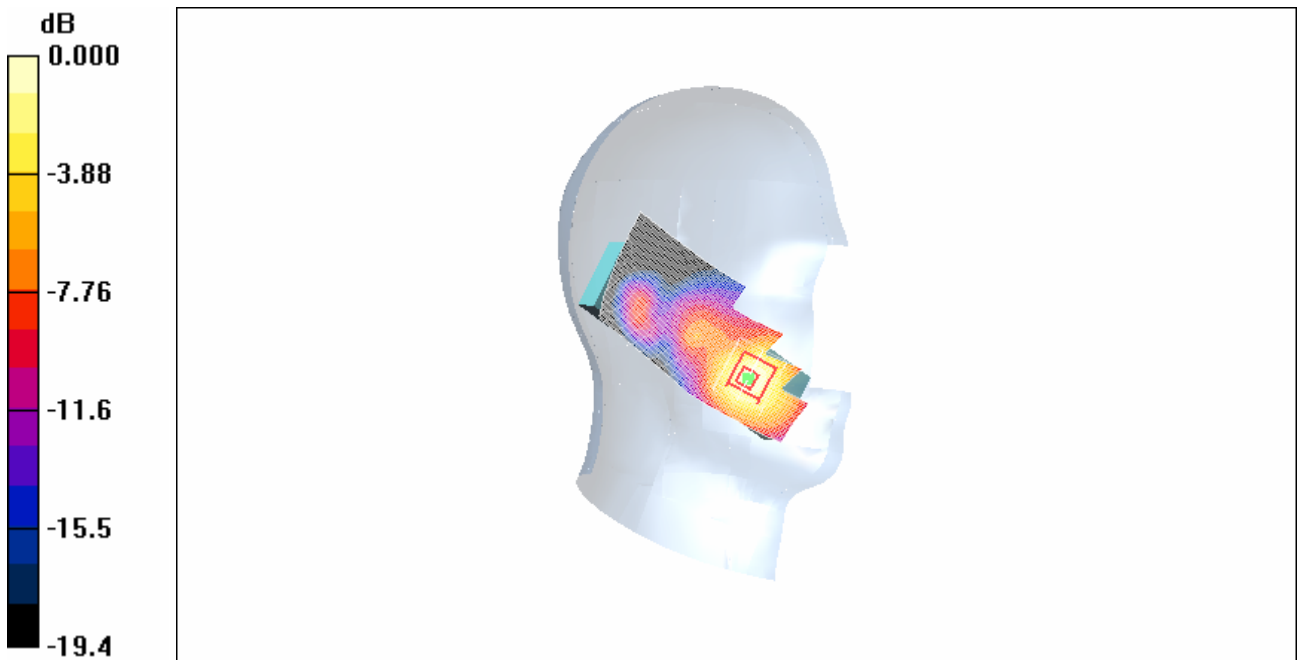
0 dB = 1.06mW/g

Fig. 18 1900 MHz CH661

1900 Left Cheek Low

Date/Time: 2009-7-17 11:32:06

Electronics: DAE4 Sn771

Medium: Head 1900

Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.35 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3

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

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

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

Cheek Low/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm
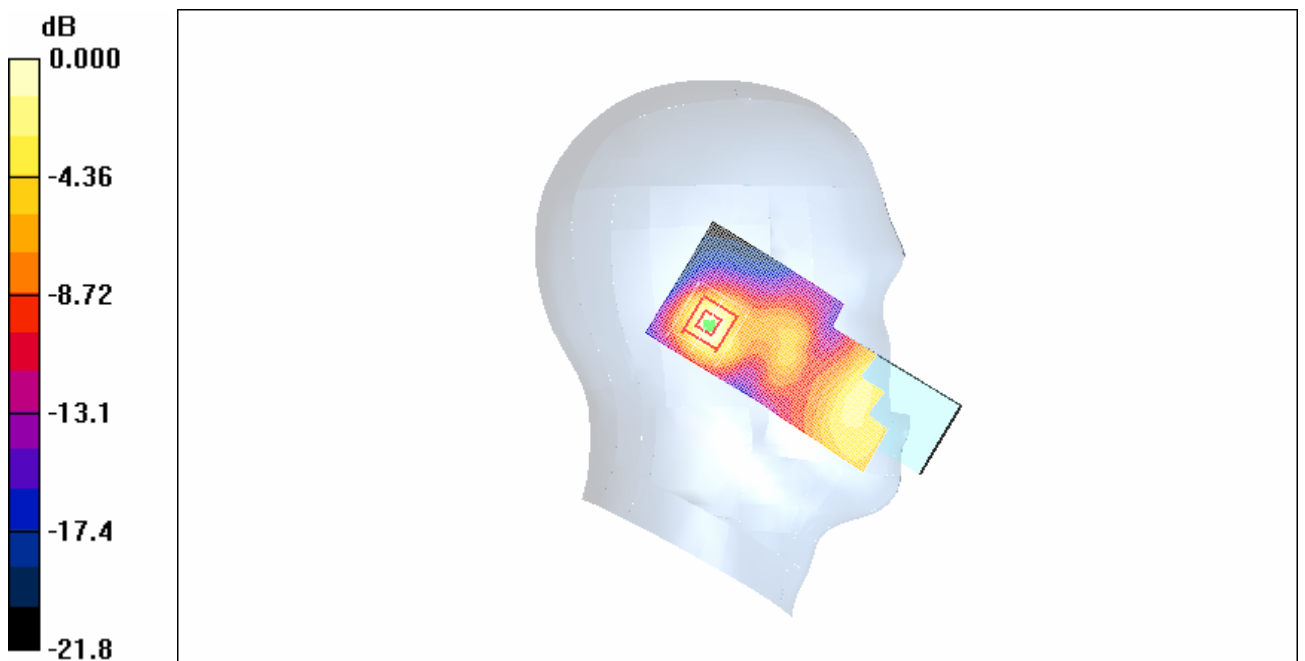
Maximum value of SAR (interpolated) = 0.835 mW/g

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

Reference Value = 8.04 V/m; Power Drift = 0.011 dB

Peak SAR (extrapolated) = 1.22 W/kg

SAR(1 g) = 0.799 mW/g; SAR(10 g) = 0.473 mW/g

Maximum value of SAR (measured) = 0.890 mW/g
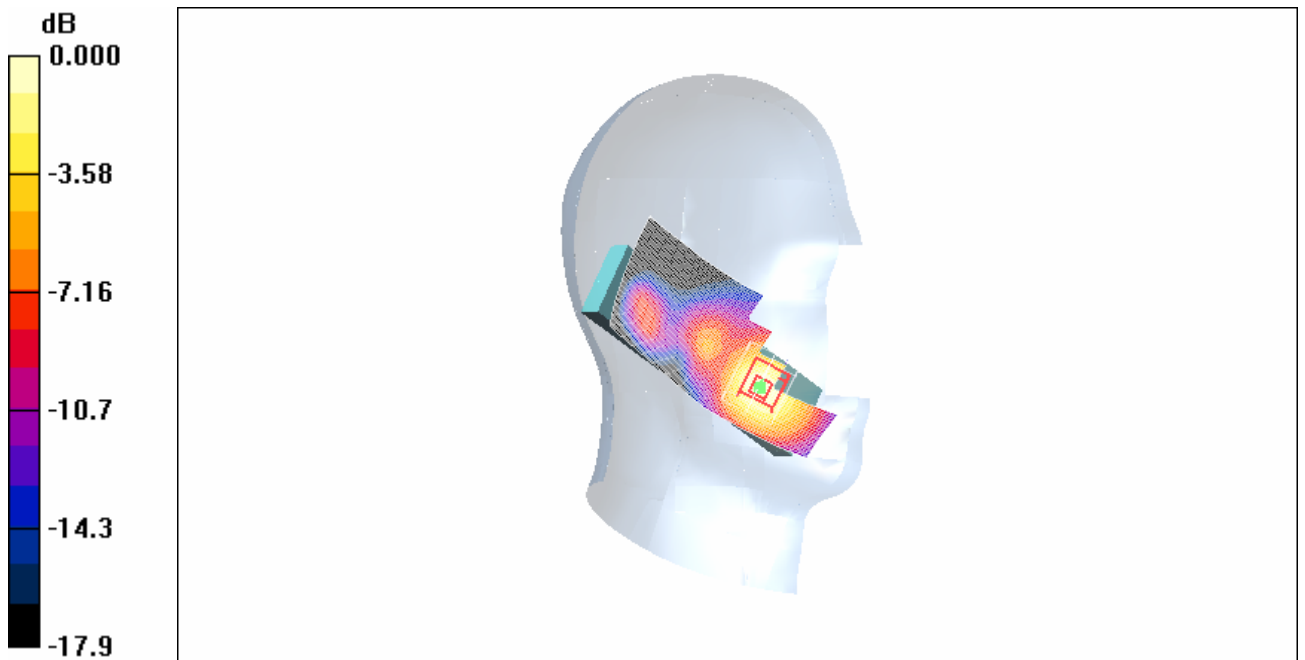
0 dB = 0.890mW/g

Fig. 19 1900 MHz CH512

1900 Left Tilt High

Date/Time: 2009-7-17 10:36:27

Electronics: DAE4 Sn771

Medium: Head 1900

Medium parameters used: f = 1910 MHz; σ = 1.4 mho/m; ε_r = 40.3; ρ = 1000 kg/m^3

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

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

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

Tilt High/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm

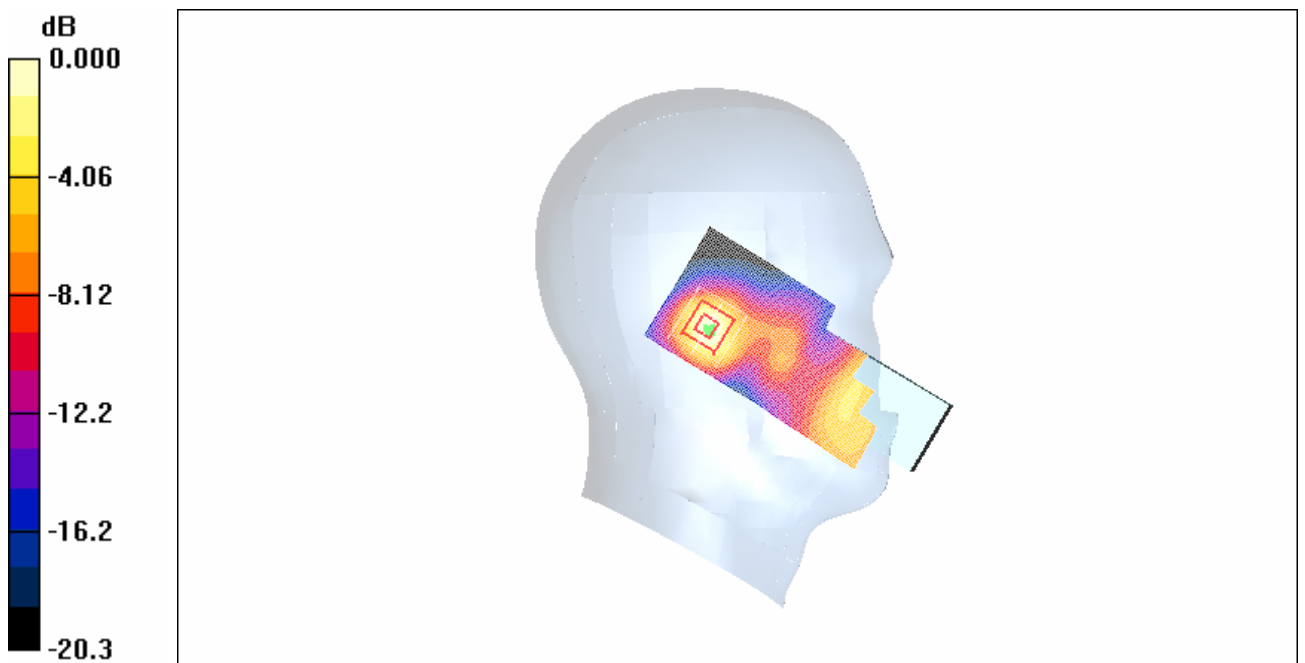Maximum value of SAR (interpolated) = 0.213 mW/g

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

Reference Value = 8.85 V/m; Power Drift = -0.112 dB

Peak SAR (extrapolated) = 0.344 W/kg

SAR(1 g) = 0.188 mW/g; SAR(10 g) = 0.094 mW/g

Maximum value of SAR (measured) = 0.211 mW/g

0 dB = 0.211mW/g

Fig.20 1900 MHz CH810

1900 Left Tilt Middle

Date/Time: 2009-7-17 10:22:50

Electronics: DAE4 Sn771

Medium: Head 1900

Medium parameters used: f = 1880 MHz; σ = 1.37 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3

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

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

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

Tilt Middle/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm
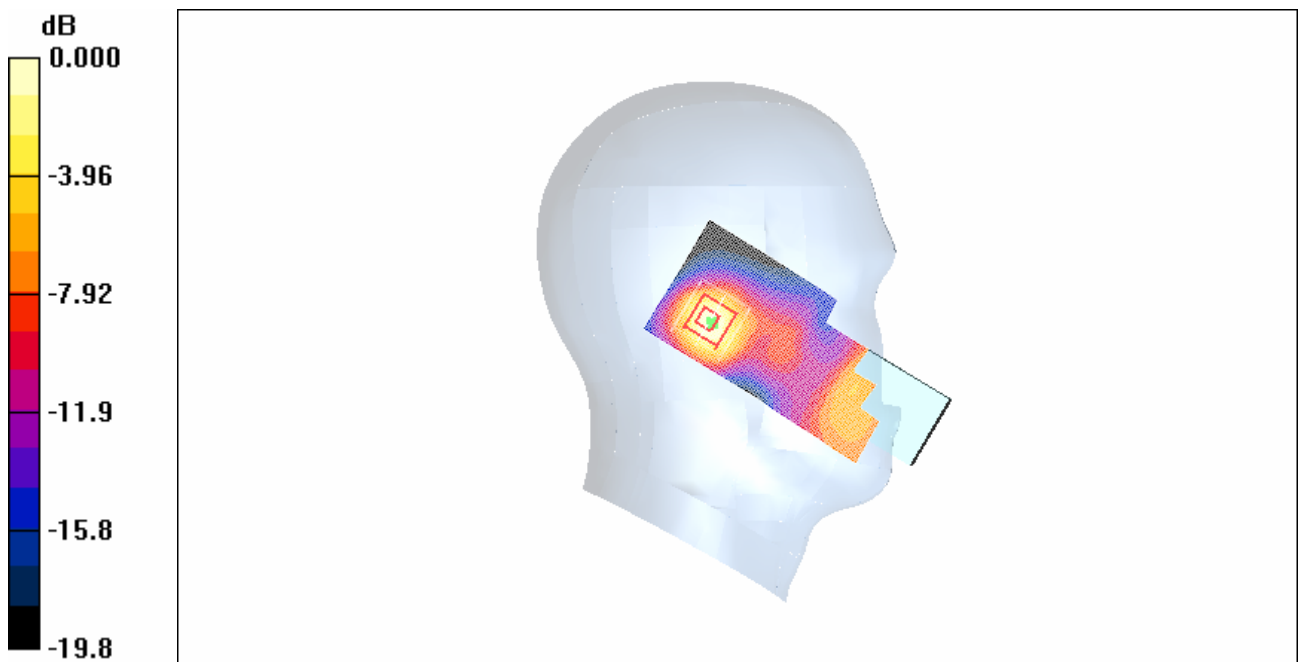
Maximum value of SAR (interpolated) = 0.265 mW/g

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

Reference Value = 9.73 V/m; Power Drift = -0.017 dB

Peak SAR (extrapolated) = 0.407 W/kg

SAR(1 g) = 0.228 mW/g; SAR(10 g) = 0.116 mW/g

Maximum value of SAR (measured) = 0.253 mW/g

0 dB = 0.253mW/g

Fig. 21 1900 MHz CH661

1900 Left Tilt Low

Date/Time: 2009-7-17 10:09:32

Electronics: DAE4 Sn771

Medium: Head 1900

Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.35 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3

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

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

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

Tilt Low/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.303 mW/g

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

Reference Value = 10.4 V/m; Power Drift = -0.032 dB

Peak SAR (extrapolated) = 0.446 W/kg

SAR(1 g) = 0.257 mW/g; SAR(10 g) = 0.134 mW/g

Maximum value of SAR (measured) = 0.287 mW/g

0 dB = 0.287mW/g

Fig. 22 1900 MHz CH512

1900 Right Cheek High

Date/Time: 2009-7-17 13:03:12

Electronics: DAE4 Sn771

Medium: Head 1900

Medium parameters used: f = 1910 MHz; σ = 1.4 mho/m; ε_r = 40.3; ρ = 1000 kg/m^3

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

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

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

Cheek High/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.901 mW/g

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

Reference Value = 6.95 V/m; Power Drift = 0.119 dB

Peak SAR (extrapolated) = 1.18 W/kg

SAR(1 g) = 0.823 mW/g; SAR(10 g) = 0.503 mW/g

Maximum value of SAR (measured) = 0.815 mW/g
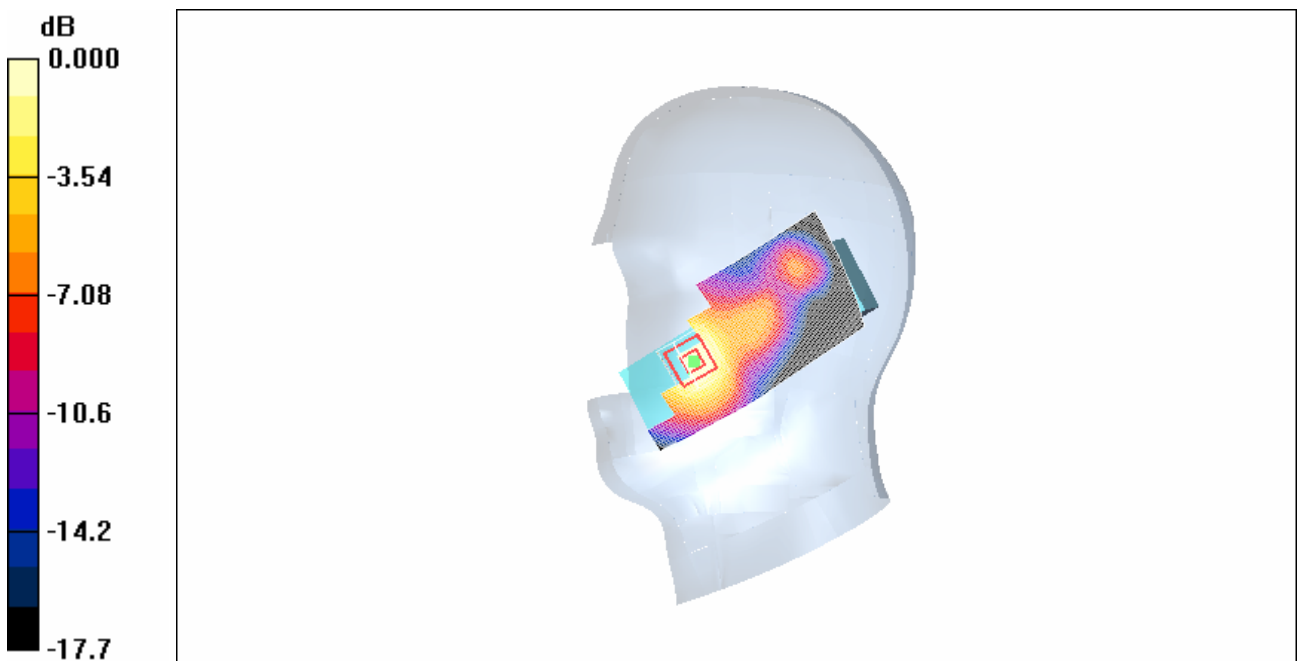
0 dB = 0.815mW/g

Fig. 23 1900 MHz CH810

1900 Right Cheek Middle

Date/Time: 2009-7-17 13:15:12

Electronics: DAE4 Sn771

Medium: Head 1900

Medium parameters used: f = 1880 MHz; σ = 1.37 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3

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

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

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

Cheek Middle/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm

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

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

Reference Value = 7.39 V/m; Power Drift = -0.018 dB

Peak SAR (extrapolated) = 1.07 W/kg

SAR(1 g) = 0.749 mW/g; SAR(10 g) = 0.458 mW/g

Maximum value of SAR (measured) = 0.734 mW/g

0 dB = 0.734mW/g
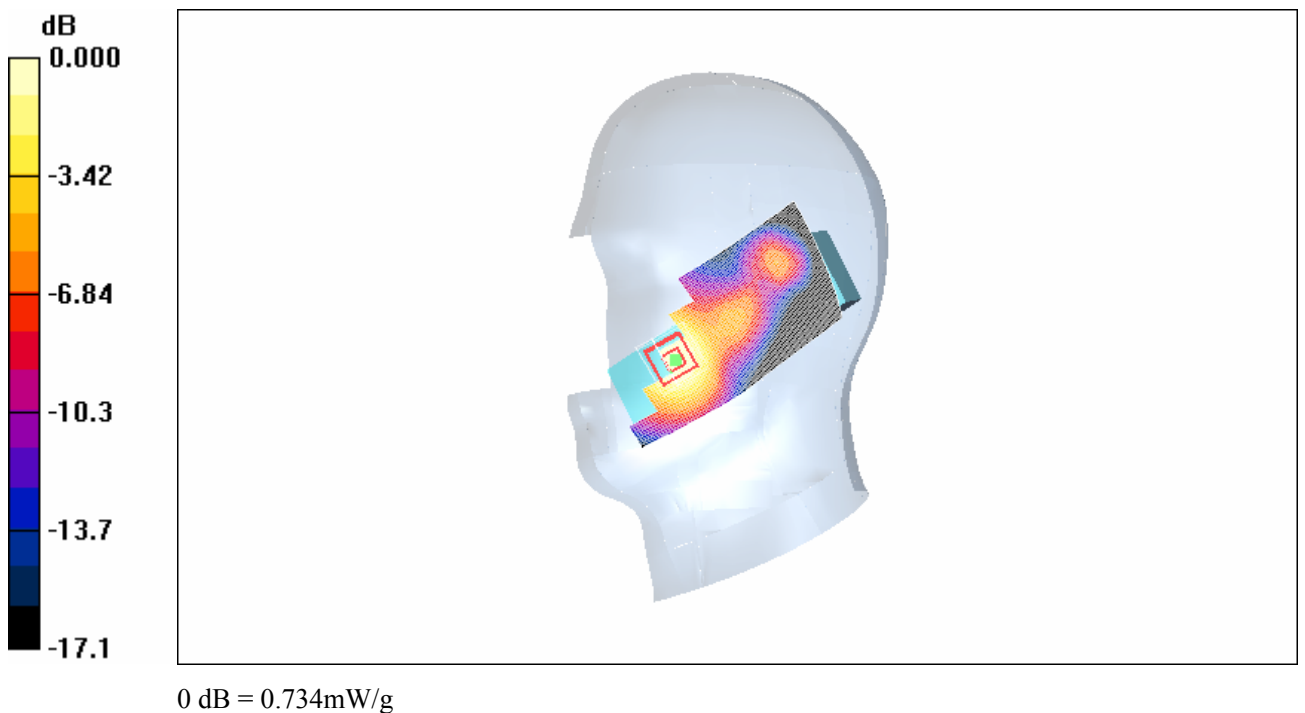
Fig. 24 1900 MHz CH661

1900 Right Cheek Low

Date/Time: 2009-7-17 13:28:12

Electronics: DAE4 Sn771

Medium: Head 1900

Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.35 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3

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

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

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

Cheek Low/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.723 mW/g

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

Reference Value = 7.78 V/m; Power Drift = -0.008 dB

Peak SAR (extrapolated) = 0.987 W/kg

SAR(1 g) = 0.680 mW/g; SAR(10 g) = 0.418 mW/g

Maximum value of SAR (measured) = 0.706 mW/g
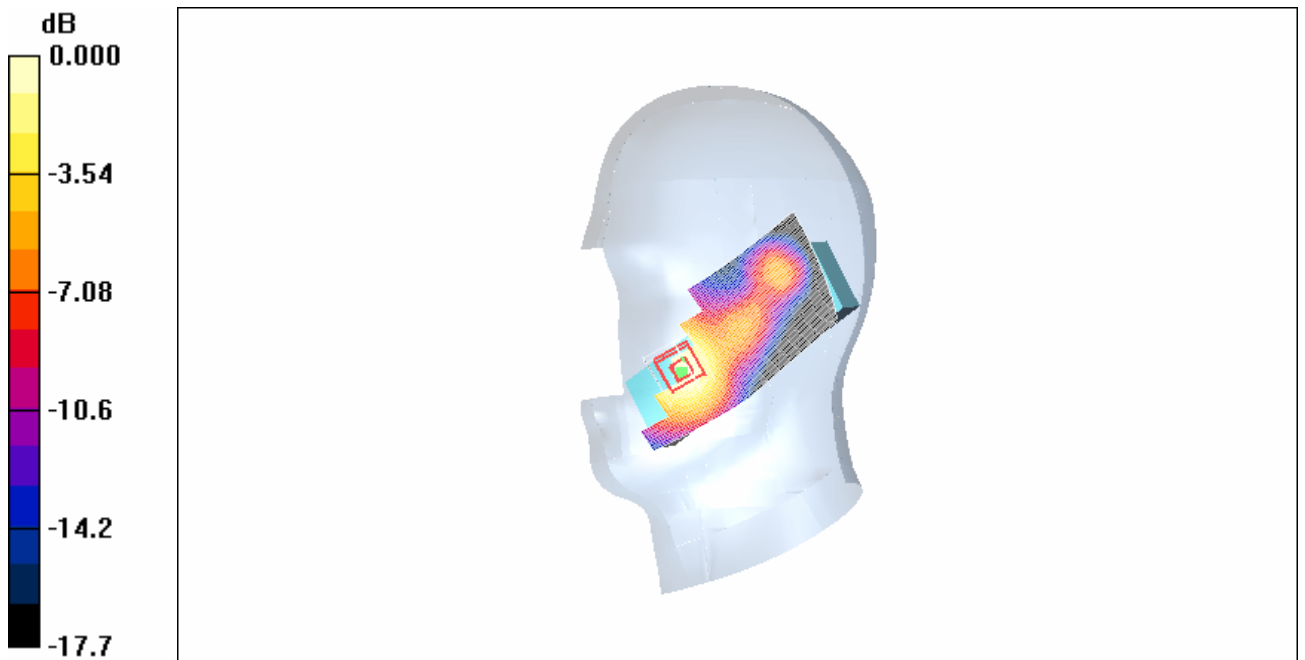
0 dB = 0.706mW/g

Fig. 25 1900 MHz CH512

1900 Right Tilt High

Date/Time: 2009-7-17 14:06:51

Electronics: DAE4 Sn771

Medium: Head 1900

Medium parameters used: f = 1910 MHz; σ = 1.4 mho/m; ε_r = 40.3; ρ = 1000 kg/m^3

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

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

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

Tilt High/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.325 mW/g

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

Reference Value = 8.69 V/m; Power Drift = -0.030 dB

Peak SAR (extrapolated) = 0.539 W/kg

SAR(1 g) = 0.280 mW/g; SAR(10 g) = 0.130 mW/g

Maximum value of SAR (measured) = 0.269 mW/g
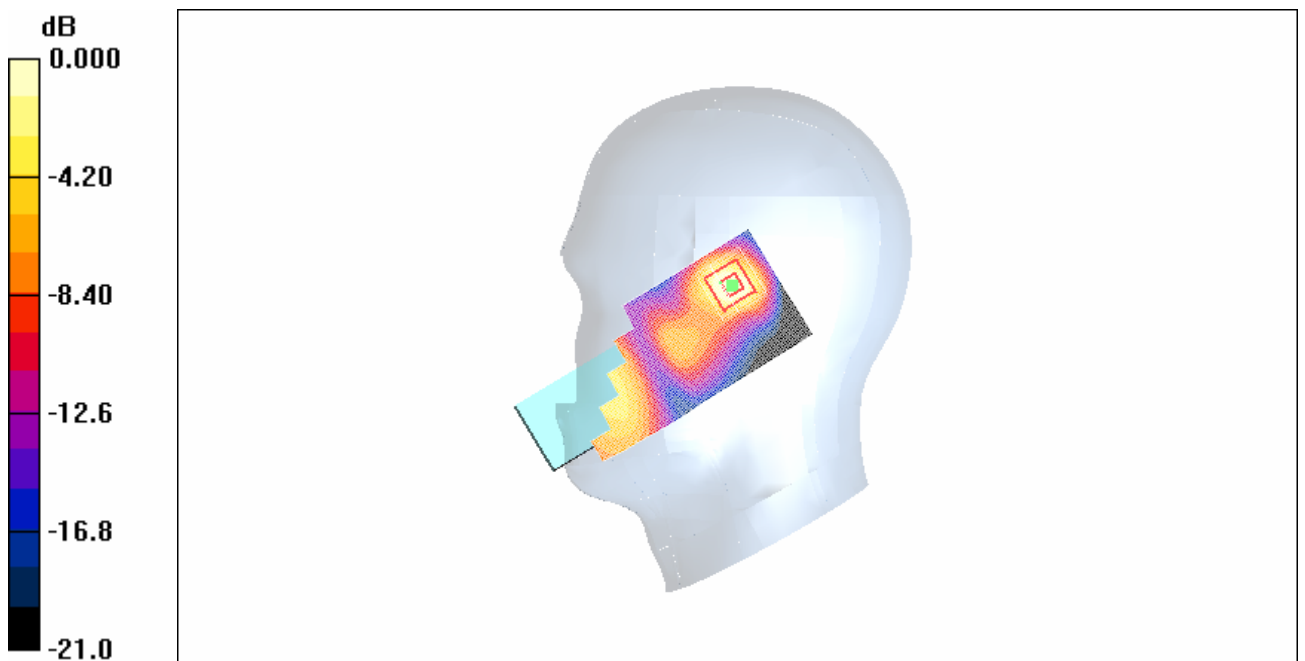
0 dB = 0.269mW/g

Fig. 26 1900 MHz CH810

1900 Right Tilt Middle

Date/Time: 2009-7-17 13:54:22

Electronics: DAE4 Sn771

Medium: Head 1900

Medium parameters used: f = 1880 MHz; σ = 1.37 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3

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

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

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

Tilt Middle/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.386 mW/g

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

Reference Value = 9.46 V/m; Power Drift = -0.006 dB

Peak SAR (extrapolated) = 0.614 W/kg

SAR(1 g) = 0.326 mW/g; SAR(10 g) = 0.155 mW/g
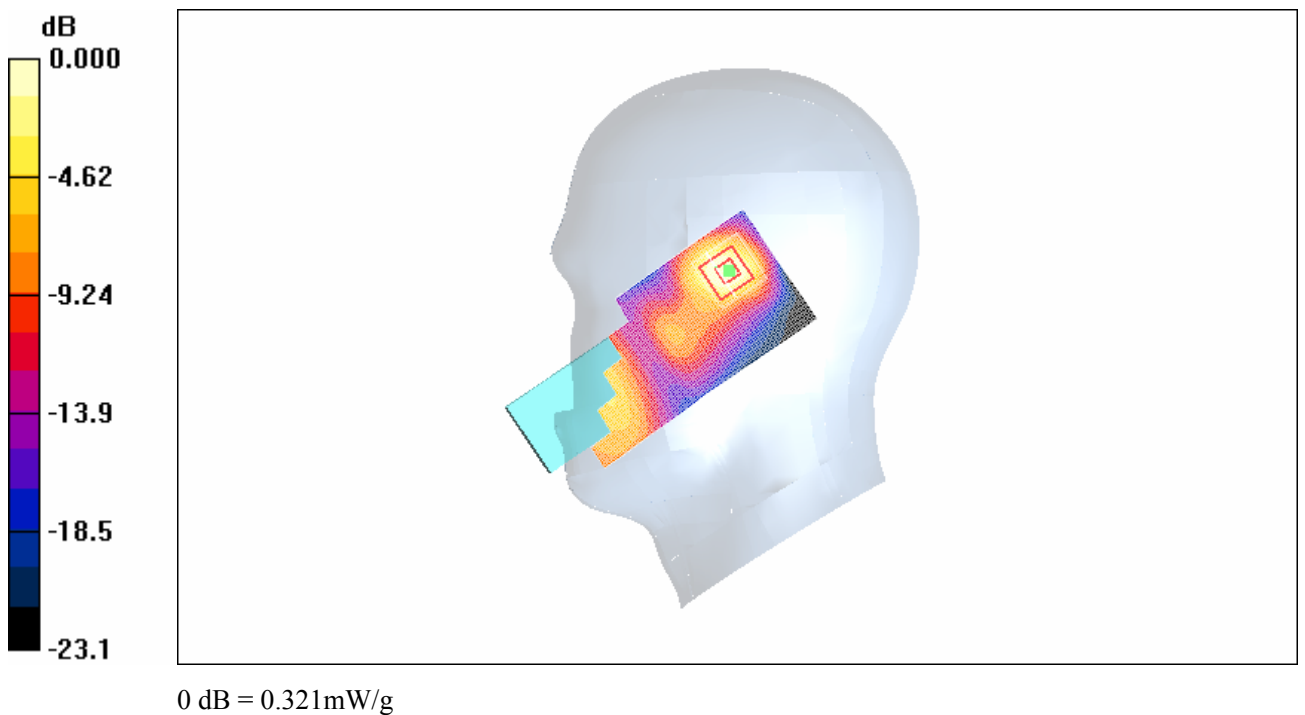
Maximum value of SAR (measured) = 0.321 mW/g

0 dB = 0.321mW/g

Fig.27 1900 MHz CH661

1900 Right Tilt Low

Date/Time: 2009-7-17 13:41:22

Electronics: DAE4 Sn771

Medium: Head 1900

Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.35 mho/m; $ε_r$ = 40.4; ρ = 1000 kg/m^3

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

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

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

Tilt Low/Area Scan (51x121x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.437 mW/g

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

Reference Value = 9.76 V/m; Power Drift = 0.143 dB

Peak SAR (extrapolated) = 0.685 W/kg

SAR(1 g) = 0.368 mW/g; SAR(10 g) = 0.179 mW/g

Maximum value of SAR (measured) = 0.389 mW/g
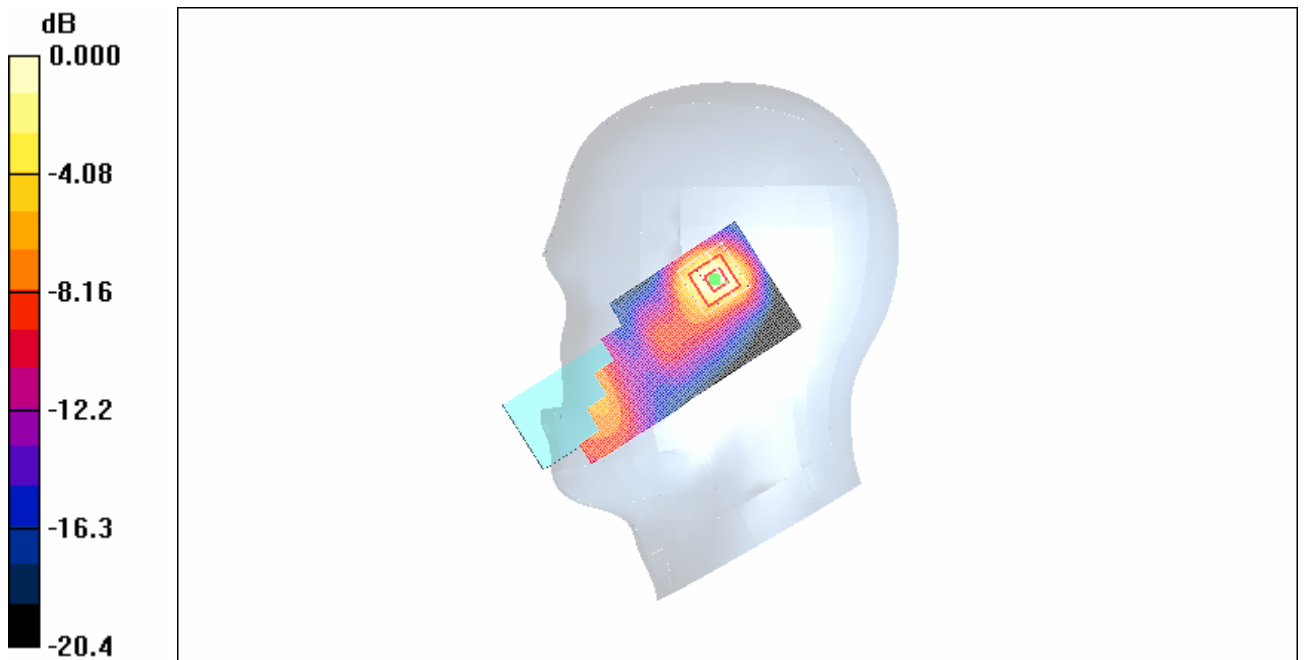
0 dB = 0.389mW/g

Fig.28 1900 MHz CH512

1900 Body Towards Ground High

Date/Time: 2009-7-17 17:35:37

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used: f = 1910 MHz; σ = 1.57 mho/m; ε_r = 52.3; ρ = 1000 kg/m^3

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

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

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

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

Maximum value of SAR (interpolated) = 0.591 mW/g

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

Reference Value = 5.28 V/m; Power Drift = -0.087 dB

Peak SAR (extrapolated) = 0.848 W/kg

SAR(1 g) = 0.532 mW/g; SAR(10 g) = 0.326 mW/g
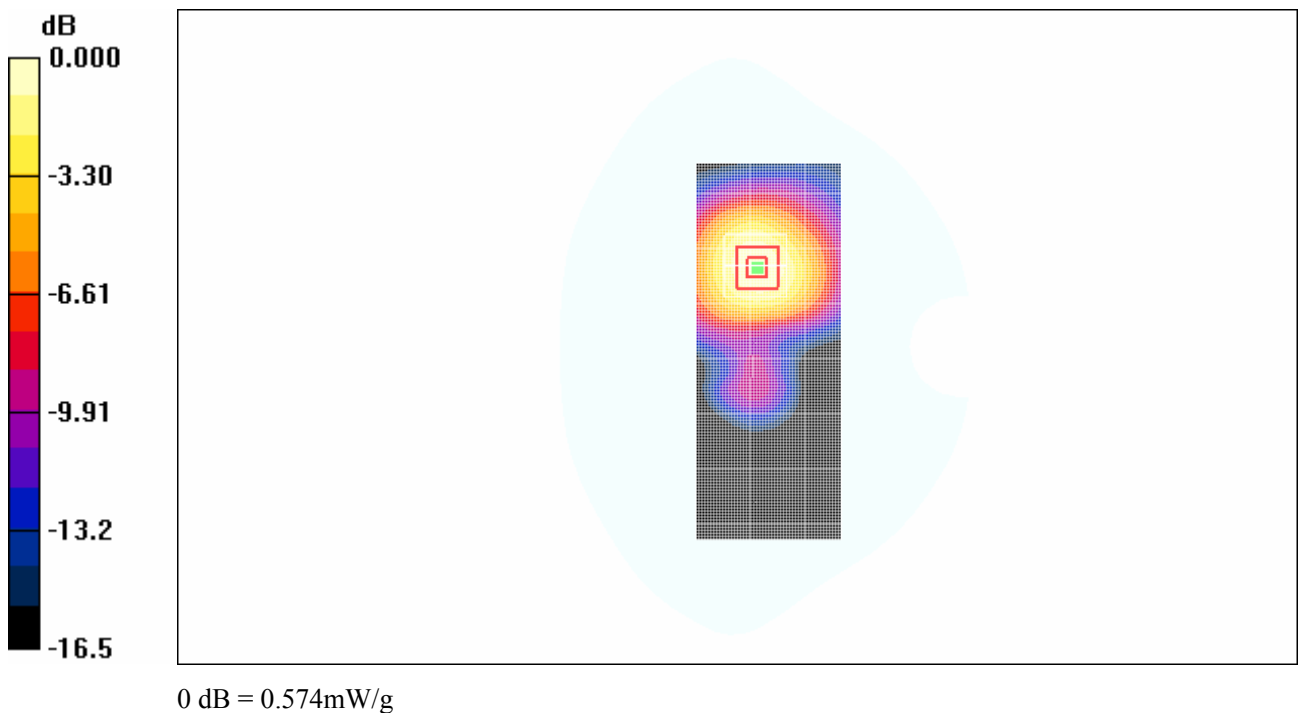
Maximum value of SAR (measured) = 0.574 mW/g

0 dB = 0.574mW/g
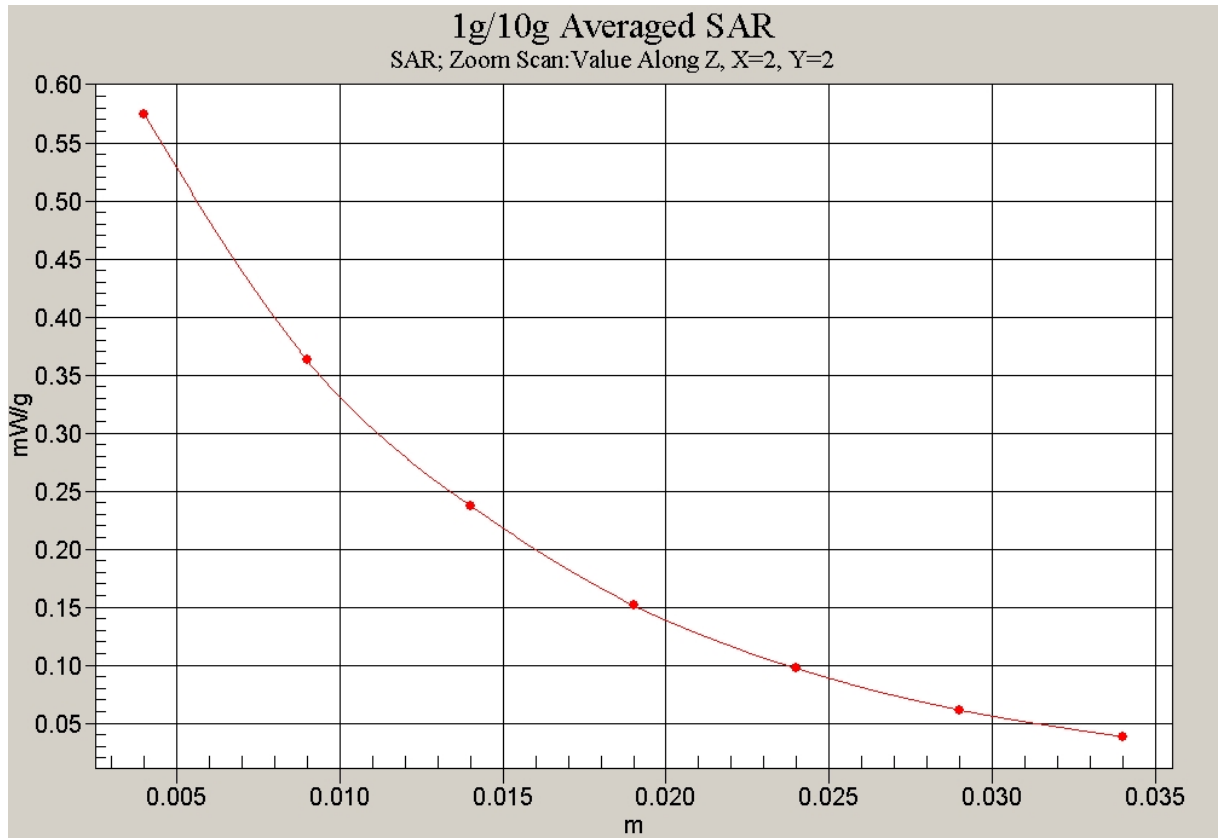
Fig. 29-1 1900 MHz CH810

Fig. 29-2 Z-Scan at power reference point (1900 MHz CH810)

1900 Body Towards Ground Middle

Date/Time: 2009-7-17 17:50:20

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used: f = 1880 MHz; σ = 1.54 mho/m; $ε_r$ = 52.4; ρ = 1000 kg/m³

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

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

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

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

Maximum value of SAR (interpolated) = 0.549 mW/g

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

Reference Value = 5.78 V/m; Power Drift = 0.020 dB

Peak SAR (extrapolated) = 0.774 W/kg

SAR(1 g) = 0.491 mW/g; SAR(10 g) = 0.303 mW/g
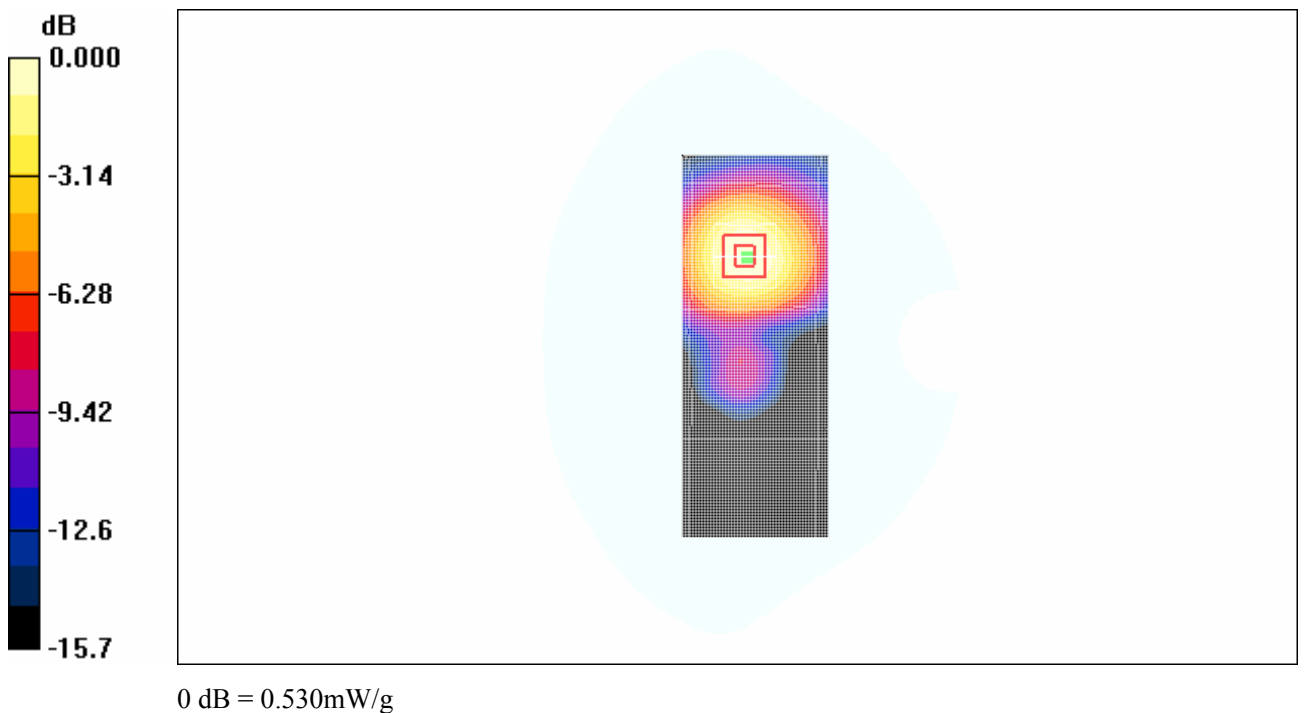
Maximum value of SAR (measured) = 0.530 mW/g

0 dB = 0.530mW/g

Fig. 30 1900 MHz CH661

1900 Body Towards Ground Low

Date/Time: 2009-7-17 18:05:15

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.52 mho/m; ε_r = 52.4; ρ = 1000 kg/m^3

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

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

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

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

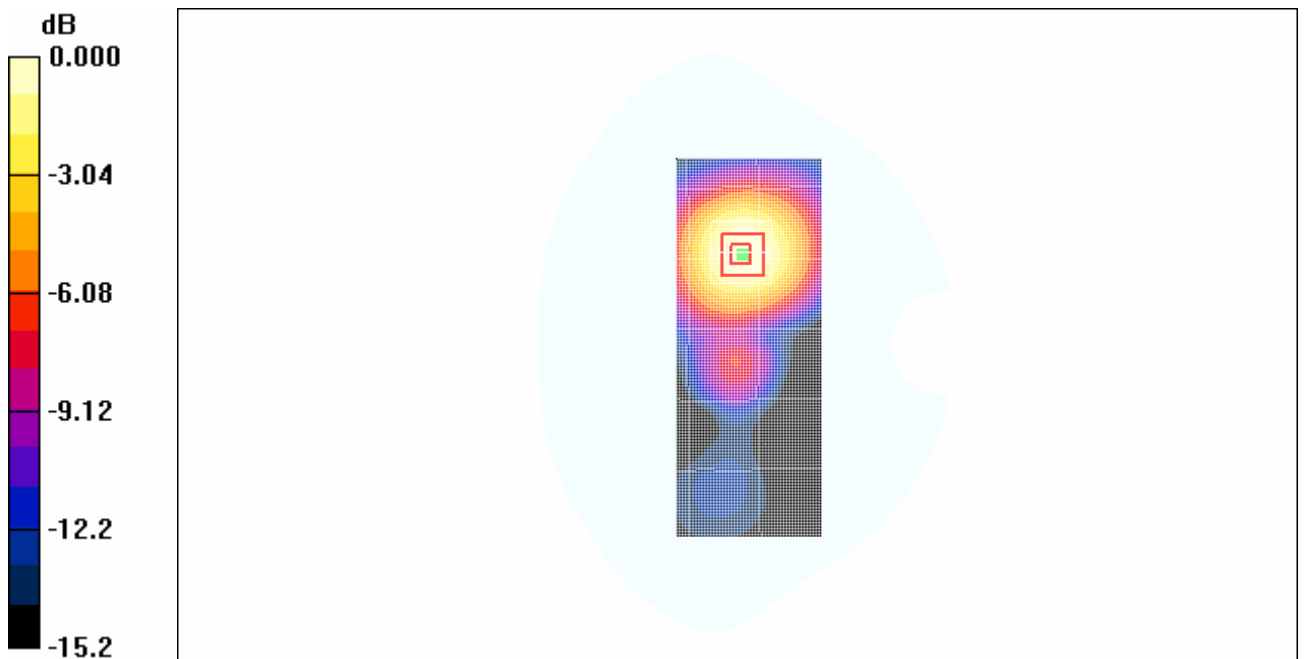Maximum value of SAR (interpolated) = 0.469 mW/g

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

Reference Value = 6.84 V/m; Power Drift = -0.049 dB

Peak SAR (extrapolated) = 0.669 W/kg

SAR(1 g) = 0.424 mW/g; SAR(10 g) = 0.263 mW/g

Maximum value of SAR (measured) = 0.458 mW/g

0 dB = 0.458mW/g

Fig. 31 1900 MHz CH512

1900 Body Towards Ground High with Headset

Date/Time: 2009-7-17 18:20:57

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used: f = 1910 MHz; σ = 1.57 mho/m; ε_r = 52.3; ρ = 1000 kg/m^3

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

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

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

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

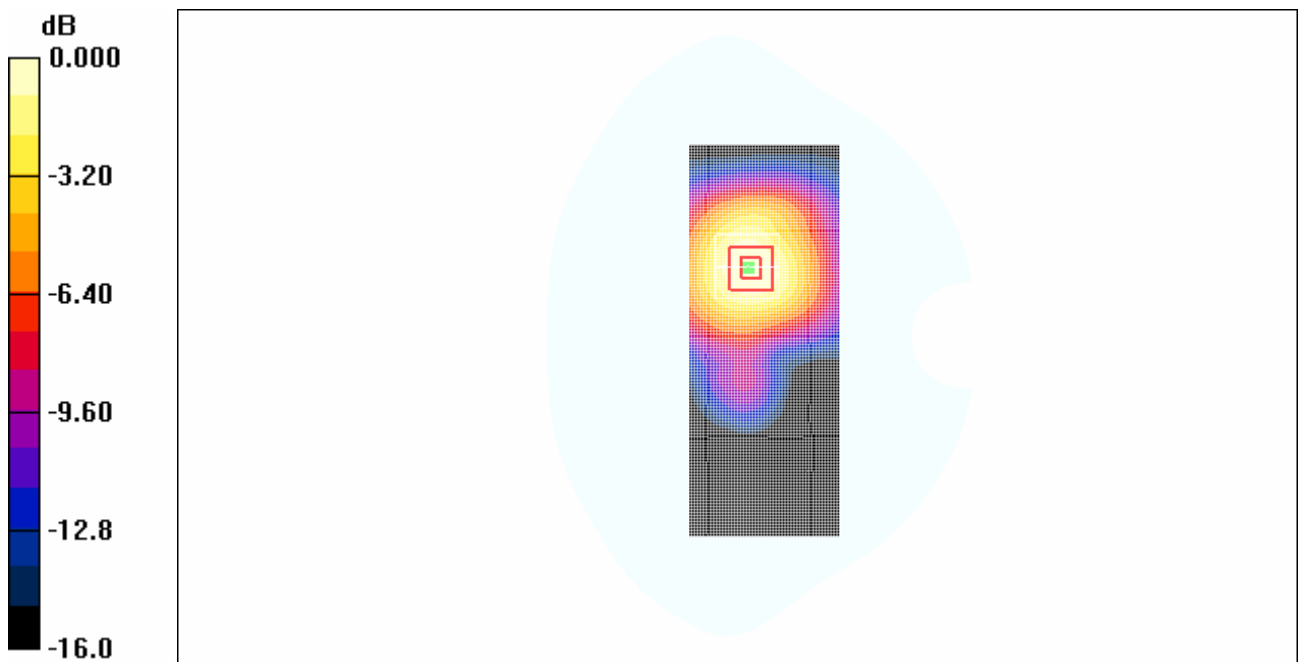Maximum value of SAR (interpolated) = 0.540 mW/g

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

Reference Value = 6.98 V/m; Power Drift = -0.039 dB

Peak SAR (extrapolated) = 0.736 W/kg

SAR(1 g) = 0.504 mW/g; SAR(10 g) = 0.311 mW/g

Maximum value of SAR (measured) = 0.532 mW/g

0 dB = 0.532mW/g

Fig. 32 1900 MHz CH810

ANNEX D   SYSTEM VALIDATION RESULTS

835MHz

Date/Time: 2009-7-15 7:37:43
Electronics: DAE4 Sn771
Medium: Head 835
Medium parameters used: f = 835 MHz; σ = 0.90 mho/m; ε_r = 40.4; ρ = 1000 kg/m³
Ambient Temperature:23.3°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)

835MHz/Area Scan (101x101x1): Measurement grid: dx=10mm, dy=10mm
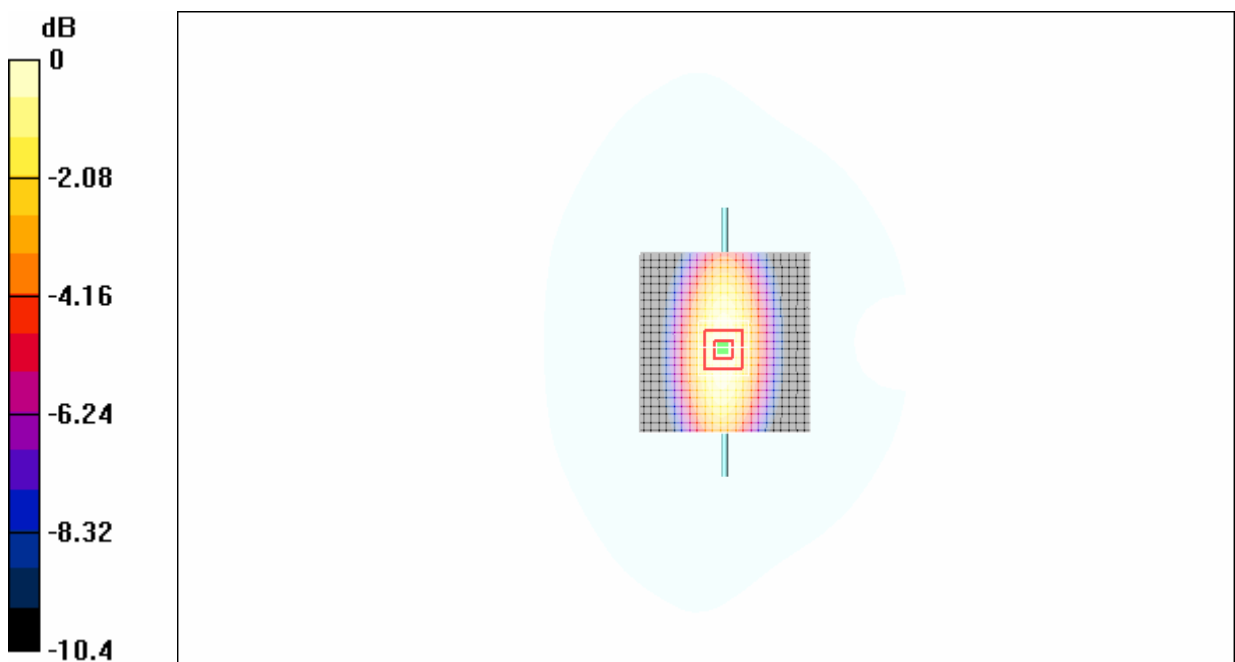Maximum value of SAR (interpolated) = 2.68 mW/g

835MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.8 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 3.67 W/kg
SAR(1 g) = 2.50 mW/g; SAR(10 g) = 1.62 mW/g
Maximum value of SAR (measured) = 2.69 mW/g

0 dB = 2.69mW/g

Fig.33 validation 835MHz 250mW