



SAR TEST REPORT

No. 2011SAR00131

For

ZTE CORPORATION

CDMA 1x-EVDO Digital Mobile Phone

Sean

With

Hardware Version: c5kC

Software Version: N850V1.0.0B04

FCCID: Q78-ZTEN850

Issued Date: 2011-11-30



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
Fax: +86-10-62304793

1.2 Testing Environment

Temperature: 18°C~25 °C,
Relative humidity: 30%~ 70%
Ground system resistance: < 0.5 Ω

Ambient noise is checked and found very low and in compliance with requirement of standards.
Reflection of surrounding objects is minimized and in compliance with requirement of standards.

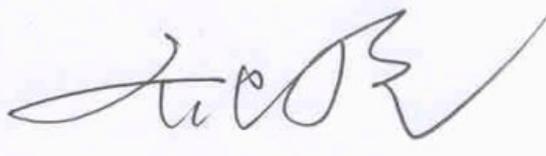
1.3 Project Data

Project Leader: Qi Dianyuan
Test Engineer: Lin Xiaojun
Testing Start Date: November 8, 2011
Testing End Date: November 10, 2011

1.4 Signature



Lin Xiaojun
(Prepared this test report)



Qi Dianyuan
(Reviewed this test report)



Xiao Li
Deputy Director of the laboratory
(Approved this test report)

2 Client Information

2.1 Applicant Information

Company Name: ZTE CORPORATION
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City: Nanjing
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Country: P. R. China
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2.2 Manufacturer Information

Company Name: ZTE CORPORATION
Address /Post: #68 Zijin Hua Road, Nanjing,Jiangsu Province, China
City: Nanjing
Postal Code: /
Country: P. R. China
Telephone: +8613813893560
Fax: /

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

3.1 About EUT

EUT Description:	CDMA 1x-EVDO Digital Mobile Phone
Model Name:	Sean
Tested Frequency Band:	CDMA 835 / CDMA 1900 / BC10 / Wifi
Hotspot mode:	Support simultaneous transmission of hotspot and voice(or data)
Form factor:	11.7cm×6.2cm

3.2 Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	A10000207D9471	c5kC	N850V1.0.0B04

*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	Battery	Li3715T42P3h415266	/	ZTE

*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 62209-1-2005: 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)

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

KDB248227: SAR measurement procedures for 802.112abg transmitters.

KDB941225 D06 Hot Spot SAR v01: SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities.

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 CDMA 835 MHz, or to 512, 661 and 810 respectively in the case of CDMA 1900 MHz, or to 476, 580 and 684 respectively in the case of BC10. The EUT is commanded to operate at maximum transmitting power.

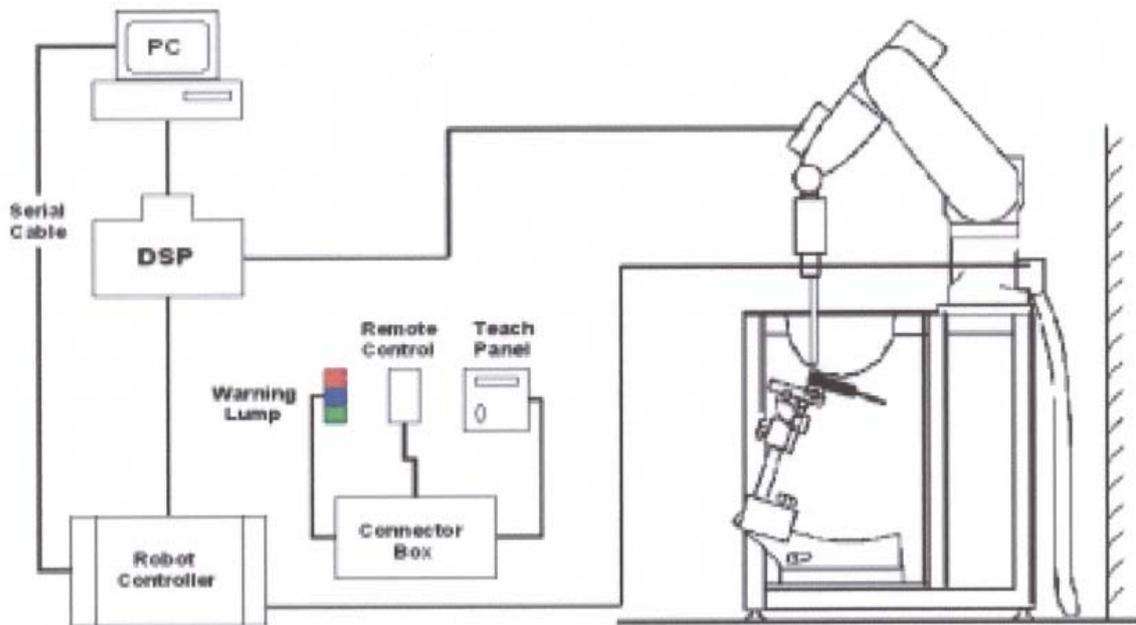
The EUT shall use its internal transmitter. The antenna(s), battery and accessories shall be those specified by the manufacturer. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output. If a wireless link is used, the antenna connected to the 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 1: SAR Lab Test Measurement Set-up

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

5.3 Dasy4 E-field Probe System

The SAR measurements were conducted with the dosimetric probe ES3DV3 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe has been calibrated according to the standard procedure with an accuracy of better than $\pm 10\%$. 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 2: ES3DV3 E-field



Picture3:ES3DV3 E-field probe

5.4 E-field Probe Calibration

Each probe is calibrated according to a dosimetric assessment procedure with accuracy better than $\pm 10\%$. 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 4: Device Holder

5.5 Other Test Equipment

5.5.1 Device Holder for Transmitters

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

5.5.2 Phantom

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

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



Picture 5: Generic Twin Phantom

5.6 Equivalent Tissues

The liquid used for the frequency range of 800-3000 MHz consisted of water, sugar, salt, preventol, glycol monobutyl 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 835MHz
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 $\epsilon=40.0$ $\sigma=1.40$
MIXTURE %	FREQUENCY 2450MHz
Water	58.79
Glycol monobutyl	41.15
Salt	0.06
Dielectric Parameters Target Value	f=2450MHz $\epsilon=39.2$ $\sigma=1.80$

Table 2. Composition of the Body Tissue Equivalent Matter

MIXTURE %	FREQUENCY 835MHz
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 $\epsilon=53.3$ $\sigma=1.52$
MIXTURE %	FREQUENCY 2450MHz
Water	72.60
Glycol monobutyl	27.22
Salt	0.18
Dielectric Parameters Target Value	f=2450MHz $\epsilon=52.7$ $\sigma=1.95$

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 CONDUCTED OUTPUT POWER MEASUREMENT

6.1 Summary

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

6.2 Conducted Power

6.2.1 Measurement Methods

The EUT was set up for the maximum output power. The channel power was measured with CMU-200. These measurements were done at low, middle and high channels.

6.2.2 Measurement result

Table 3: The conducted power for CDMA 835/1900/BC10

	Conducted Power (dBm)		
CDMA(RC3) 835MHz	Channel 777(848.31MHz)	Channel 384(836.52MHz)	Channel 1013(824.7MHz)
	25.20	25.55	25.42
CDMA(RC1) 835MHz	Channel 777(848.31MHz)	Channel 384(836.52MHz)	Channel 1013(824.7MHz)
	25.08	25.32	25.32
EVDO 835 Rev0	Channel 777(848.31MHz)	Channel 384(836.52MHz)	Channel 1013(824.7MHz)
	25.31	25.60	25.52
EVDO 835 RevA	Channel 777(848.31MHz)	Channel 384(836.52MHz)	Channel 1013(824.7MHz)
	25.28	25.58	25.49
	Conducted Power (dBm)		
CDMA(RC3) 1900MHz	Channel 1175(1908.75MHz)	Channel 600(1880MHz)	Channel 25(1851.25MHz)
	23.83	23.93	24.13

CDMA(RC1) 1900MHz	Channel 1175(1908.75MHz)	Channel 600(1880MHz)	Channel 25(1851.25MHz)
	23.72	23.70	23.97
EVDO 1900 Rev0	Channel 1175(1908.75MHz)	Channel 600(1880MHz)	Channel 25(1851.25MHz)
	23.79	23.81	24.08
EVDO 1900 RevA	Channel 1175(1908.75MHz)	Channel 600(1880MHz)	Channel 25(1851.25MHz)
	23.74	23.78	24.01
Conducted Power (dBm)			
CDMA(RC3) BC10	Channel 684(823.1MHz)	Channel 580(820.5MHz)	Channel 476(817.9MHz)
	25.41	25.45	25.39
CDMA(RC1) BC10	Channel 684(823.1MHz)	Channel 580(820.5MHz)	Channel 476(817.9MHz)
	25.47	25.20	25.32
EVDO BC10 Rev0	Channel 684(823.1MHz)	Channel 580(820.5MHz)	Channel 476(817.9MHz)
	25.38	25.41	25.38
EVDO BC10 RevA	Channel 684(823.1MHz)	Channel 580(820.5MHz)	Channel 476(817.9MHz)
	25.42	25.43	25.38

According to the KDB 941225 D01, the SAR for RC1 and EVDO are not required. Because the maximum average output of each channel in RC1 and EVDO is less than 0.25dB higher than that measured in RC3.

6.2.3 Power Drift

To control the output power stability during the SAR test, DASY4 system calculates the power drift by measuring the E-field at the same location at the beginning and at the end of the measurement for each test position. These drift values can be found in Table 8 to Table 15 labeled as: (Power Drift [dB]). This ensures that the power drift during one measurement is within 5%.

7 TEST RESULTS

7.1 Dielectric Performance

Table 4: Dielectric Performance of Head Tissue Simulating Liquid

Measurement is made at temperature 23.0 °C and relative humidity 40%.			
Liquid temperature during the test: 22.5°C			
Measurement Date : 835 MHz Nov 8, 2011 1900 MHz Nov 9, 2011 2450 MHz Nov 10, 2011			
/	Frequency	Permittivity ϵ	Conductivity σ (S/m)
Target value	835 MHz	41.5	0.90
	1900 MHz	40.0	1.40
	2450 MHz	39.2	1.80
Measurement value (Average of 10 tests)	835 MHz	41.0	0.88
	1900 MHz	39.5	1.39
	2450 MHz	39.5	1.82

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 : 835 MHz <u>Nov 8, 2011</u> 1900 MHz <u>Nov 9, 2011</u> 2450 MHz <u>Nov 10, 2011</u>			
/	Frequency	Permittivity ϵ	Conductivity σ (S/m)
Target value	835 MHz	55.2	0.97
	1900 MHz	53.3	1.52
	2450 MHz	52.7	1.95
Measurement value (Average of 10 tests)	835 MHz	54.2	0.95
	1900 MHz	53.5	1.53
	2450 MHz	52.3	1.93

7.2 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 : 835 MHz <u>Nov 8, 2011</u> 1900 MHz <u>Nov 9, 2011</u> 2450 MHz <u>Nov 10, 2011</u>							
Liquid parameters	Dipole calibration Target value	Frequency		Permittivity ϵ		Conductivity σ (S/m)	
		835 MHz		41.6		0.92	
		1900 MHz		39.6		1.40	
		2450 MHz		39.0		1.74	
	Actural Measurement value	835 MHz		41.0		0.88	
		1900 MHz		39.5		1.39	
2450 MHz		39.5		1.82			
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	6.12	9.41	5.96	9.24	-2.61%	-1.81%
	1900 MHz	20.1	39.4	19.6	39.08	-2.49%	-0.81%
	2450 MHz	24.6	52.4	23.84	51.6	-3.09%	-1.53%

Note: The forward power is 250mW. Target values are the data of the dipole validation results, please check Annex F for the Dipole Calibration Certificate.

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 : 835 MHz Nov 8, 2011 1900 MHz Nov 9, 2011 2450 MHz Nov 10, 2011							
Liquid parameters	Dipole calibration Target value	Frequency		Permittivity ϵ		Conductivity σ (S/m)	
		835 MHz		54.5		0.97	
		1900 MHz		52.5		1.51	
	Actual Measurement value	2450 MHz		52.5		1.95	
		835 MHz		54.2		0.95	
		1900 MHz		53.5		1.53	
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	6.24	9.57	6.12	9.40	-1.92%	-1.78%
	1900 MHz	20.9	41.4	20.64	40.4	-1.24%	-2.42%
	2450 MHz	23.9	51.6	23.52	51.2	-1.59%	-0.78%

Note: The forward power is 250mW. Target values are the data of the dipole validation results, please check Annex F for the Dipole Calibration Certificate.

7.3 Summary of Measurement Results

Table 8: SAR Values (835MHz-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, High frequency (See Fig.1)	0.344	0.502	0.130
Left hand, Touch cheek, Mid frequency (See Fig.2)	0.390	0.564	0.148
Left hand, Touch cheek, Low frequency (See Fig.3)	0.305	0.439	0.123
Left hand, Tilt 15 Degree, High frequency (See Fig.4)	0.224	0.297	0.013
Left hand, Tilt 15 Degree, Mid frequency (See Fig.5)	0.250	0.330	0.033
Left hand, Tilt 15 Degree, Low frequency (See Fig.6)	0.217	0.287	0.090
Right hand, Touch cheek, High frequency (See Fig.7)	0.382	0.506	-0.029
Right hand, Touch cheek, Mid frequency (See Fig.8)	0.428	0.571	0.131
Right hand, Touch cheek, Low frequency (See Fig.9)	0.348	0.458	0.024
Right hand, Tilt 15 Degree, High frequency (See Fig.10)	0.216	0.283	0.057

Right hand, Tilt 15 Degree, Mid frequency (See Fig.11)	0.229	0.305	0.195
Right hand, Tilt 15 Degree, Low frequency (See Fig.12)	0.205	0.266	-0.034

Table 9: SAR Values (1900MHz-Head)

Limit of SAR (W/kg)	10 g Average	1 g Average	Power Drift (dB)
	2.0	1.6	
Test Case	Measurement Result (W/kg)		Power Drift (dB)
	10 g Average	1 g Average	
Left hand, Touch cheek, High frequency (See Fig.13)	0.527	0.906	-0.118
Left hand, Touch cheek, Mid frequency (See Fig.14)	0.637	1.08	0.198
Left hand, Touch cheek, Low frequency (See Fig.15)	0.656	1.11	-0.089
Left hand, Tilt 15 Degree, High frequency (See Fig.16)	0.232	0.393	-0.175
Left hand, Tilt 15 Degree, Mid frequency (See Fig.17)	0.264	0.441	-0.113
Left hand, Tilt 15 Degree, Low frequency (See Fig.18)	0.266	0.436	0.068
Right hand, Touch cheek, High frequency (See Fig.19)	0.557	0.899	-0.123
Right hand, Touch cheek, Mid frequency (See Fig.20)	0.706	1.14	-0.003
Right hand, Touch cheek, Low frequency (See Fig.21)	0.687	1.1	0.051
Right hand, Tilt 15 Degree, High frequency (See Fig.22)	0.226	0.389	-0.101
Right hand, Tilt 15 Degree, Mid frequency (See Fig.23)	0.330	0.556	0.102
Right hand, Tilt 15 Degree, Low frequency(See Fig.24)	0.316	0.528	0.096

Table 10: SAR Values (BC10-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)		Power Drift (dB)
	10 g Average	1 g Average	
Left hand, Touch cheek, High frequency (See Fig.25)	0.316	0.442	-0.103
Left hand, Touch cheek, Mid frequency (See Fig.26)	0.348	0.489	-0.005
Left hand, Touch cheek, Low frequency (See Fig.27)	0.273	0.381	0.130
Left hand, Tilt 15 Degree, High frequency (See Fig.28)	0.227	0.300	-0.120
Left hand, Tilt 15 Degree, Mid frequency (See Fig.29)	0.253	0.332	0.077
Left hand, Tilt 15 Degree, Low frequency (See Fig.30)	0.204	0.267	0.126
Right hand, Touch cheek, High frequency (See Fig.31)	0.356	0.470	-0.143
Right hand, Touch cheek, Mid frequency (See Fig.32)	0.355	0.466	0.163
Right hand, Touch cheek, Low frequency (See Fig.33)	0.278	0.364	0.115
Right hand, Tilt 15 Degree, High frequency (See Fig.34)	0.200	0.259	0.164
Right hand, Tilt 15 Degree, Mid frequency (See Fig.35)	0.225	0.291	0.129
Right hand, Tilt 15 Degree, Low frequency(See Fig.36)	0.181	0.235	0.171

Table 11: SAR Values (835MHz-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	1g Average	
Body, Towards Ground, High frequency (See Fig.37)	0.796	1.11	-0.100
Body, Towards Ground, Mid frequency (See Fig.38)	0.829	1.16	-0.102
Body, Towards Ground, Low frequency (See Fig.39)	0.741	1.04	0.049
Body, Towards Phantom, Mid frequency (See Fig.40)	0.547	0.769	-0.135
Body, Left Side, Mid frequency (See Fig.41)	0.440	0.641	-0.127
Body, Right Side, Mid frequency (See Fig.42)	0.461	0.668	-0.158
Body, Bottom Side, Mid frequency (See Fig.43)	0.045	0.077	0.174

Table 12: 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	1g Average	
Body, Towards Ground, High frequency (See Fig.44)	0.473	0.842	0.067
Body, Towards Ground, Mid frequency (See Fig.45)	0.633	1.13	-0.001
Body, Towards Ground, Low frequency (See Fig.46)	0.658	1.19	0.069
Body, Towards Phantom, High frequency (See Fig.47)	0.428	0.723	-0.095
Body, Towards Phantom, Mid frequency (See Fig.48)	0.583	0.984	0.011
Body, Towards Phantom, Low frequency (See Fig.49)	0.584	0.987	-0.123
Body, Left Side, Low frequency (See Fig.50)	0.234	0.400	0.086
Body, Right Side, Low frequency (See Fig.51)	0.154	0.258	-0.002
Body, Bottom Side, High frequency (See Fig.52)	0.365	0.657	-0.098
Body, Bottom Side, Mid frequency (See Fig.53)	0.532	0.950	0.001
Body, Bottom Side, Low frequency (See Fig.54)	0.496	0.885	-0.019

Table 13: SAR Values (BC10-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	1g Average	
Body, Towards Ground, High frequency (See Fig.55)	0.779	1.09	-0.062
Body, Towards Ground, Mid frequency (See Fig.56)	0.817	1.13	-0.027
Body, Towards Ground, Low frequency (See Fig.57)	0.675	0.942	0.048

Body, Towards Phantom, Mid frequency (See Fig.58)	0.507	0.715	0.075
Body, Left Side, Mid frequency (See Fig.59)	0.379	0.564	0.003
Body, Right Side, Mid frequency (See Fig.60)	0.406	0.584	0.109
Body, Bottom Side, Mid frequency (See Fig.61)	0.052	0.086	0.045

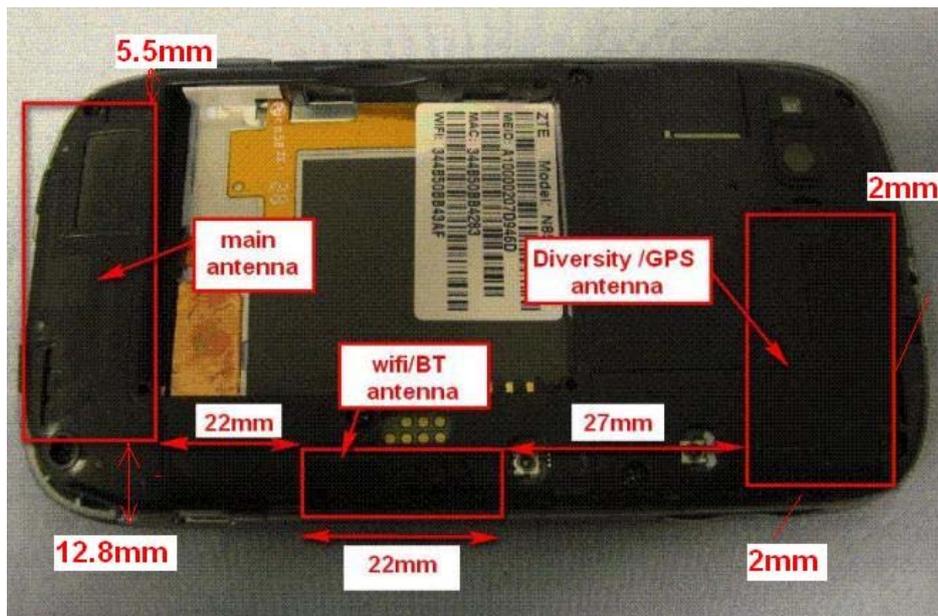
7.4 Simultaneous TX SAR Considerations

For this device, BT/WiFi transmitter can transmit simultaneously with the main transmitter (data and voice). See below for simultaneous transmission logic table:

/	CDMA	WiFi	BT
CDMA	/	Yes	Yes
WiFi	Yes	/	/
BT	Yes	/	/

The BT and WiFi will be evaluated separately to determine simultaneous transmission SAR test exclusion with GSM/WCDMA results according to the procedures in KDB 648474.

The distance between BT/WiFi antenna and main antenna is <2.5cm. 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)	1.89	2.89	3.22

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 $< P_{Ref}$, its antenna is $< 2.5\text{cm}$ from other antenna and the 1g SAR of main antenna is $< 1.2\text{W/kg}$.

Note: Power thresholds (P_{Ref}) is derived from multiples of $0.5 \times 60/f_{(GHz)}$, that is 12mW (10.79dBm) for BT frequency.

The average conducted power for WiFi is as following:

802.11b (dBm)

Channel\data rate	1Mbps	2Mbps	5.5Mbps	11Mbps
1	14.42	14.53	14.52	14.42
6	15.08	15.15	15.22	14.95
11	14.81	14.79	14.81	14.60

802.11g (dBm)

Channel\data rate	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
1	12.73	12.71	12.60	12.59	12.41	11.92	11.66	11.53
6	13.52	13.42	13.18	13.02	12.83	12.56	12.23	12.10
11	12.97	13.05	12.74	12.65	12.53	12.12	11.80	11.58

802.11n (dBm)

Channel\data rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
1	10.60	10.40	10.19	10.04	9.65	9.46	9.44	9.24
6	11.19	10.97	10.76	10.70	10.35	10.16	9.97	9.90
11	10.93	10.51	10.50	10.26	9.94	9.62	9.66	9.51

The peak conducted power for WiFi is as following:

802.11b (dBm)

Channel\data rate	1Mbps	2Mbps	5.5Mbps	11Mbps
1	18.01	18.22	19.70	21.09
6	/	/	/	21.89
11	/	/	/	21.58

802.11g (dBm)

Channel\data rate	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
1	21.59	21.71	21.24	21.25	21.76	21.79	21.88	21.80
6	/	/	/	/	/	/	22.39	/
11	/	/	/	/	/	/	22.05	/

802.11n (dBm)

Channel\data rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
1	19.32	19.05	19.08	19.48	19.47	19.47	19.56	19.49
6	/	/	/	/	/	/	20.19	/
11	/	/	/	/	/	/	19.86	/

According to the conducted power measurement result, we can draw the conclusion that: stand-alone SAR for WiFi should be performed. Then, simultaneous transmission SAR for WiFi is considered with measurement results of RF and WiFi.

SAR is not required for 802.11g/n channels if the output power is less than 0.25dB higher than that measured on the corresponding 802.11b channels, and for each frequency band, testing at higher data rates and higher order modulations is not required when the maximum average output power for each of these configurations is less than 0.25dB higher than those measured at the lowest data rate. According to the above conducted power, the EUT should be tested for “802.11b, 1Mbps, channel 6”.

Table 14: SAR Values (WIFI 802.b -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, 1Mbps,channel 6 (See Fig.62)	0.019	0.038	-0.117
Left hand, Tilt 15 Degree, 1Mbps,channel 6 (See Fig.63)	0.00496	0.011	0.135
Right hand, Touch cheek, 1Mbps,channel 6 (See Fig.64)	0.019	0.033	0.151
Right hand, Tilt 15 Degree, 1Mbps,channel 6 (See Fig.65)	0.00638	0.014	-0.107

Table 15: SAR Values (WIFI 802.b -Body)

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	
Toward Phantom, 1Mbps,channel 6 (See Fig.66)	0.00641	0.028	-0.141
Toward Ground, 1Mbps,channel 6 (See Fig.67)	0.024	0.048	0.145
Left Side, 1Mbps,channel 6 (See Fig.68)	0.019	0.038	0.108

Table 16: The sum of SAR values for CDMA and WiFi

	Position	CDMA	WiFi	Sum
Maximum SAR value for Head	Left hand, Touch cheek	1.11	0.038	1.148
	Right hand, Touch cheek	1.14	0.033	1.173
Maximum SAR value for Body	Toward Ground	1.19	0.048	1.238

According to the above tables, the sum of SAR values for CDMA and WiFi is <1.6W/kg. So simultaneous transmission SAR are not required for WiFi transmitter.

7.5 Conclusion

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

The maximum SAR values are obtained at the case of **CDMA 1900 Body, Towards Ground, Low frequency (Table 12)**, and the value are: **0.658(10g), 1.19(1g)**.

8 Measurement Uncertainty

No.	Error Description	Type	Uncertainty value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement system										
1	Probe calibration	B	5.5	N	1	1	1	5.5	5.5	∞
2	Isotropy	B	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
4	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	N	1	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	$\sqrt{3}$	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	$\sqrt{3}$	1	1	0	0	∞
10	RF ambient conditions-reflection	B	0	R	$\sqrt{3}$	1	1	0	0	∞
11	Probe positioned mech. restrictions	B	0.4	R	$\sqrt{3}$	1	1	0.2	0.2	∞
12	Probe positioning with respect to phantom shell	B	2.9	R	$\sqrt{3}$	1	1	1.7	1.7	∞
13	Post-processing	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
Test sample related										
14	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	71
15	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
16	Drift of output power	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
Phantom and set-up										
17	Phantom uncertainty	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
18	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
19	Liquid conductivity (meas.)	A	2.06	N	1	0.64	0.43	1.32	0.89	43
20	Liquid permittivity (target)	B	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
21	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521
Combined standard uncertainty			$u_c = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$					9.25	9.12	257

Expanded uncertainty (confidence interval of 95 %)	$u_e = 2u_c$					18.5	18.2	
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9 MAIN TEST INSTRUMENTS

Table 17: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	E5071C	MY46110673	February 15, 2011	One year
02	Power meter	NRVD	102083	September 11, 2011	One year
03	Power sensor	NRV-Z5	100595		
04	Signal Generator	E4438C	MY49070393	November 13, 2010	One Year
05	Amplifier	VTL5400	0505	No Calibration Requested	
06	BTS	8960	MY48365192	November 18, 2010	One year
07	E-field Probe	SPEAG ES3DV3	3149	September 24, 2011	One year
08	DAE	SPEAG DAE4	771	November 21, 2010	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
11	Dipole Validation Kit	SPEAG D2450V2	853	September 27, 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.

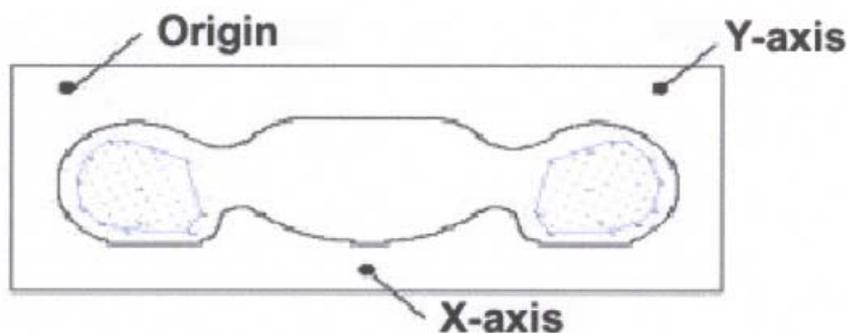
Step 3: Around this point, a volume of 30 mm x 30 mm x 30 mm was assessed by measuring 7 x 7 x 7 points. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

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.

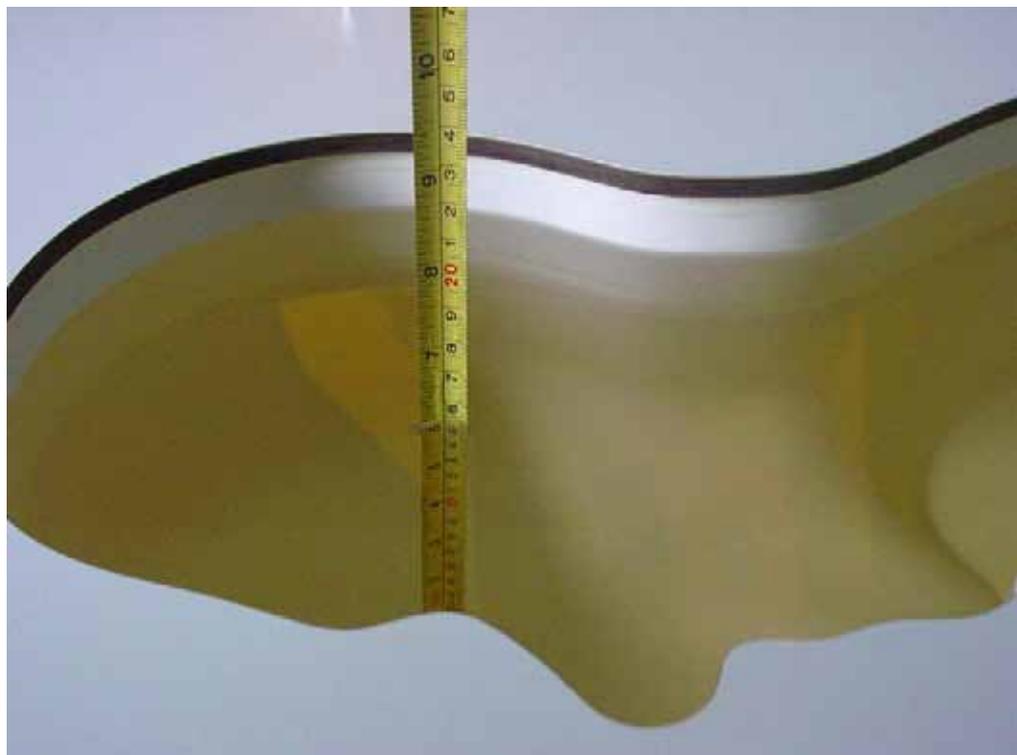


Picture A: SAR Measurement Points in Area Scan

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 Liquid depth in the Flat Phantom (2450MHz)

ANNEX C GRAPH RESULTS

835 Left Cheek High

Date/Time: 2011-11-8 8:08:13

Electronics: DAE4 Sn771

Medium: Head 835 MHz

Medium parameters used (interpolated): $f = 848.31$ MHz; $\sigma = 0.91$ mho/m; $\epsilon_r = 40.5$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 835 Frequency: 848.31 MHz Duty Cycle: 1:1

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

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

Maximum value of SAR (interpolated) = 0.533 mW/g

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

Reference Value = 7.92 V/m; Power Drift = 0.130 dB

Peak SAR (extrapolated) = 0.747 W/kg

SAR(1 g) = 0.502 mW/g; SAR(10 g) = 0.344 mW/g

Maximum value of SAR (measured) = 0.533 mW/g

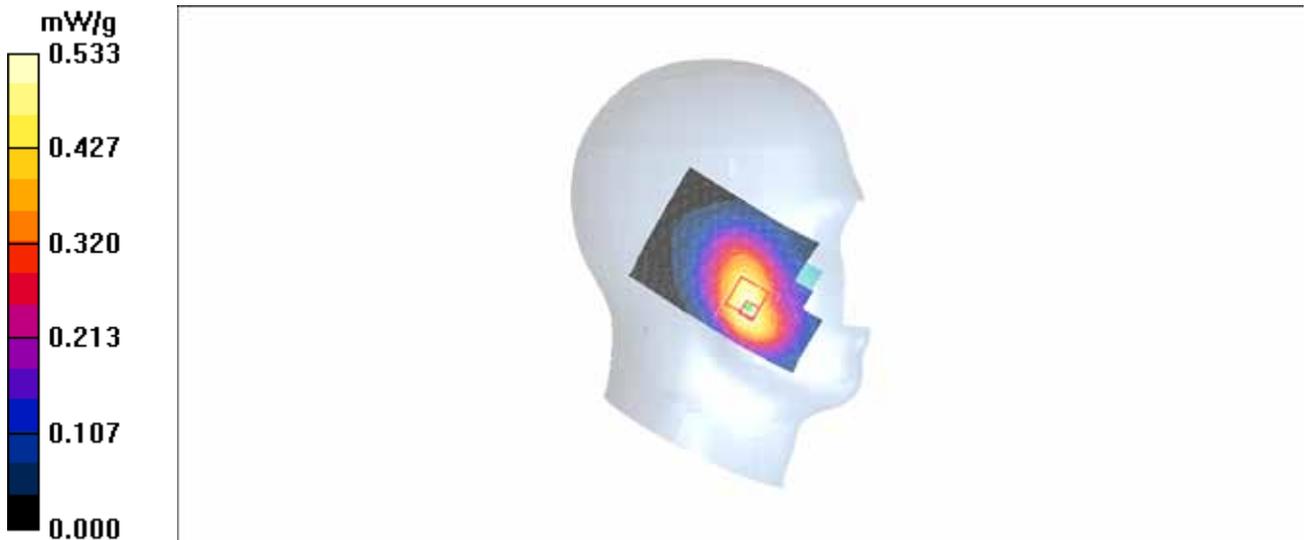


Fig. 1 835MHz CH777

835 Left Cheek Middle

Date/Time: 2011-11-8 8:22:31

Electronics: DAE4 Sn771

Medium: Head 835 MHz

Medium parameters used (interpolated): $f = 836.52$ MHz; $\sigma = 0.88$ mho/m; $\epsilon_r = 41.0$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 835 Frequency: 836.52 MHz Duty Cycle: 1:1

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

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

Maximum value of SAR (interpolated) = 0.597 mW/g

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

Reference Value = 8.70 V/m; Power Drift = -0.148 dB

Peak SAR (extrapolated) = 0.790 W/kg

SAR(1 g) = 0.564 mW/g; SAR(10 g) = 0.390 mW/g

Maximum value of SAR (measured) = 0.604 mW/g

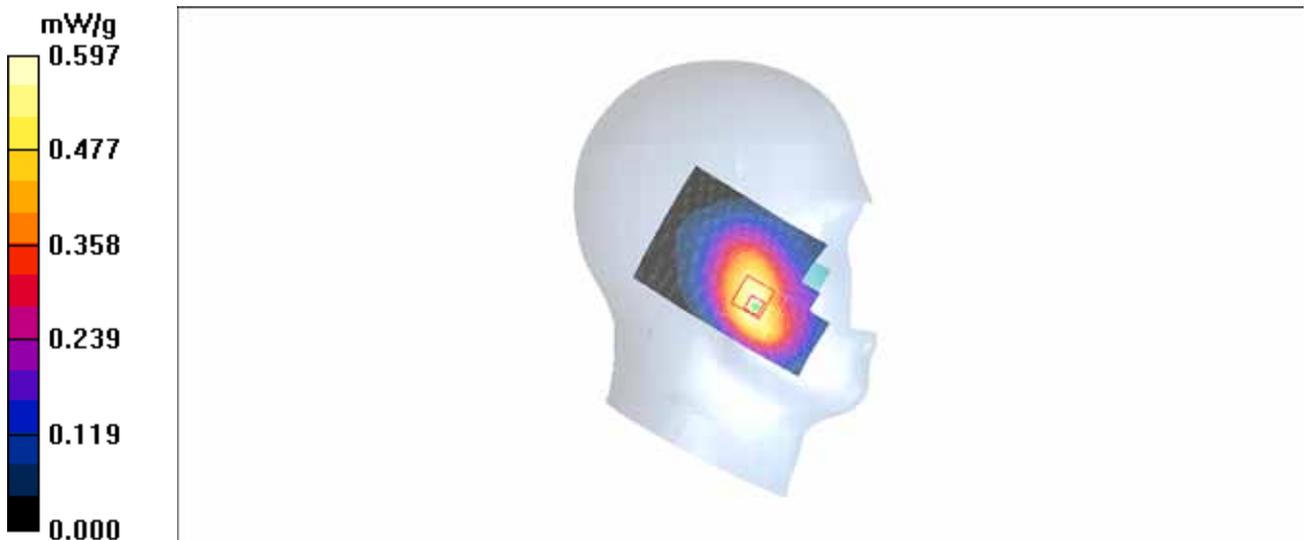


Fig. 2 835 MHz CH384

835 Left Cheek Low

Date/Time: 2011-11-8 8:36:50

Electronics: DAE4 Sn771

Medium: Head 835 MHz

Medium parameters used: $f = 824.7$ MHz; $\sigma = 0.87$ mho/m; $\epsilon_r = 41.1$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 835 Frequency: 824.7 MHz Duty Cycle: 1:1

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

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

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

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

Reference Value = 7.63 V/m; Power Drift = 0.123 dB

Peak SAR (extrapolated) = 0.642 W/kg

SAR(1 g) = 0.439 mW/g; SAR(10 g) = 0.305 mW/g

Maximum value of SAR (measured) = 0.464 mW/g

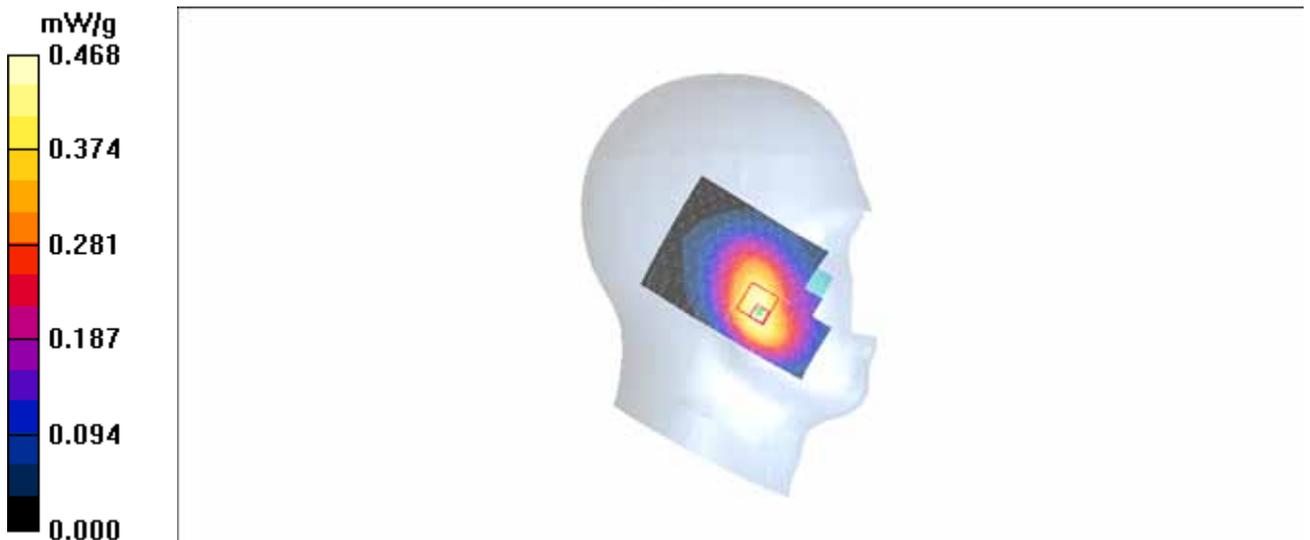


Fig. 3 835 MHz CH1013

835 Left Tilt High

Date/Time: 2011-11-8 8:51:18

Electronics: DAE4 Sn771

Medium: Head 835 MHz

Medium parameters used (interpolated): $f = 848.31$ MHz; $\sigma = 0.91$ mho/m; $\epsilon_r = 40.5$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 835 Frequency: 848.31 MHz Duty Cycle: 1:1

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

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

Maximum value of SAR (interpolated) = 0.310 mW/g

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

Reference Value = 13.8 V/m; Power Drift = 0.013 dB

Peak SAR (extrapolated) = 0.364 W/kg

SAR(1 g) = 0.297 mW/g; SAR(10 g) = 0.224 mW/g

Maximum value of SAR (measured) = 0.311 mW/g

Tilit High/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.8 V/m; Power Drift = 0.013 dB

Peak SAR (extrapolated) = 0.281 W/kg

SAR(1 g) = 0.200 mW/g; SAR(10 g) = 0.128 mW/g

Maximum value of SAR (measured) = 0.238 mW/g

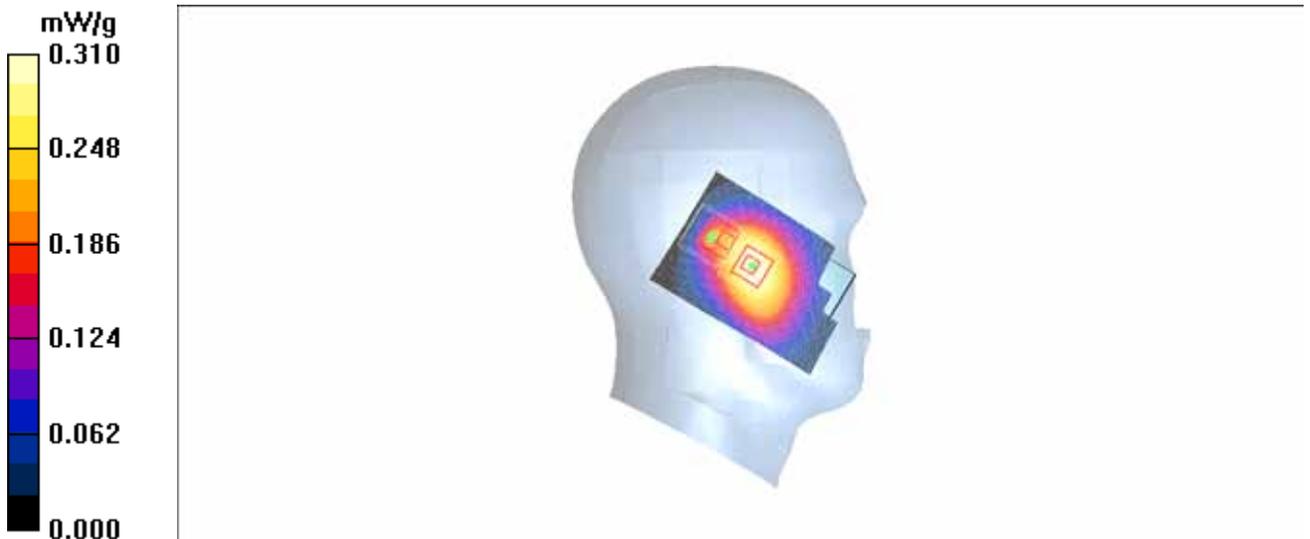


Fig.4 835MHz CH777

835 Left Tilt Middle

Date/Time: 2011-11-8 9:05:37

Electronics: DAE4 Sn771

Medium: Head 835 MHz

Medium parameters used (interpolated): $f = 836.52$ MHz; $\sigma = 0.88$ mho/m; $\epsilon_r = 41.0$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 835 Frequency: 836.52 MHz Duty Cycle: 1:1

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

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

Maximum value of SAR (interpolated) = 0.349 mW/g

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

Reference Value = 14.7 V/m; Power Drift = 0.033 dB

Peak SAR (extrapolated) = 0.410 W/kg

SAR(1 g) = 0.330 mW/g; SAR(10 g) = 0.250 mW/g

Maximum value of SAR (measured) = 0.345 mW/g

Tilt Middle/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 14.7 V/m; Power Drift = 0.033 dB

Peak SAR (extrapolated) = 0.319 W/kg

SAR(1 g) = 0.224 mW/g; SAR(10 g) = 0.145 mW/g

Maximum value of SAR (measured) = 0.267 mW/g

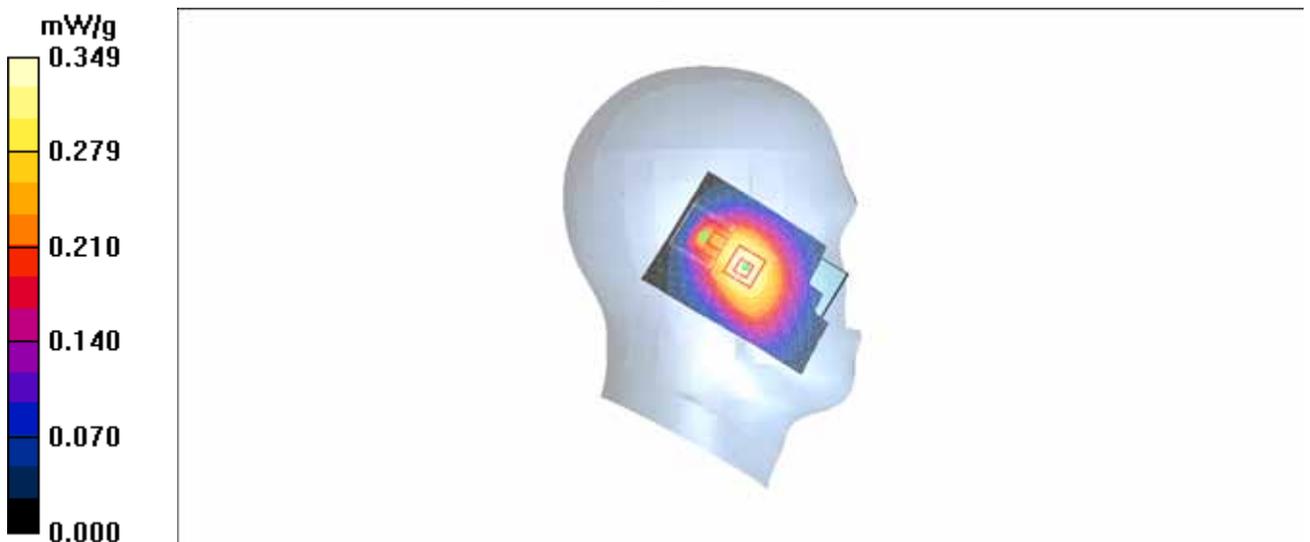


Fig.5 835 MHz CH384

835 Left Tilt Low

Date/Time: 2011-11-8 9:19:55

Electronics: DAE4 Sn771

Medium: Head 835 MHz

Medium parameters used: $f = 824.7$ MHz; $\sigma = 0.87$ mho/m; $\epsilon_r = 41.1$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 835 Frequency: 824.7 MHz Duty Cycle: 1:1

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

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

Maximum value of SAR (interpolated) = 0.300 mW/g

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

Reference Value = 13.7 V/m; Power Drift = 0.090 dB

Peak SAR (extrapolated) = 0.360 W/kg

SAR(1 g) = 0.287 mW/g; SAR(10 g) = 0.217 mW/g

Maximum value of SAR (measured) = 0.300 mW/g

Tilt Low/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.7 V/m; Power Drift = 0.090 dB

Peak SAR (extrapolated) = 0.269 W/kg

SAR(1 g) = 0.191 mW/g; SAR(10 g) = 0.124 mW/g

Maximum value of SAR (measured) = 0.228 mW/g

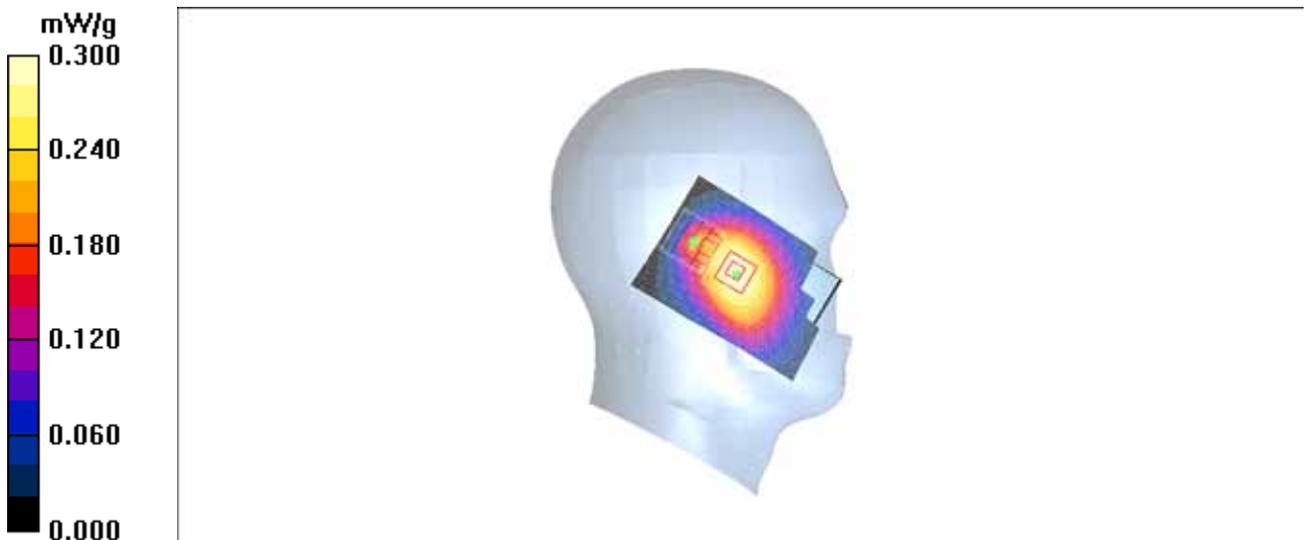


Fig. 6 835 MHz CH1013

835 Right Cheek High

Date/Time: 2011-11-8 9:34:36

Electronics: DAE4 Sn771

Medium: Head 835 MHz

Medium parameters used (interpolated): $f = 848.31$ MHz; $\sigma = 0.91$ mho/m; $\epsilon_r = 40.5$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 835 Frequency: 848.31 MHz Duty Cycle: 1:1

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

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

Maximum value of SAR (interpolated) = 0.534 mW/g

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

Reference Value = 8.10 V/m; Power Drift = -0.029 dB

Peak SAR (extrapolated) = 0.629 W/kg

SAR(1 g) = 0.506 mW/g; SAR(10 g) = 0.382 mW/g

Maximum value of SAR (measured) = 0.528 mW/g

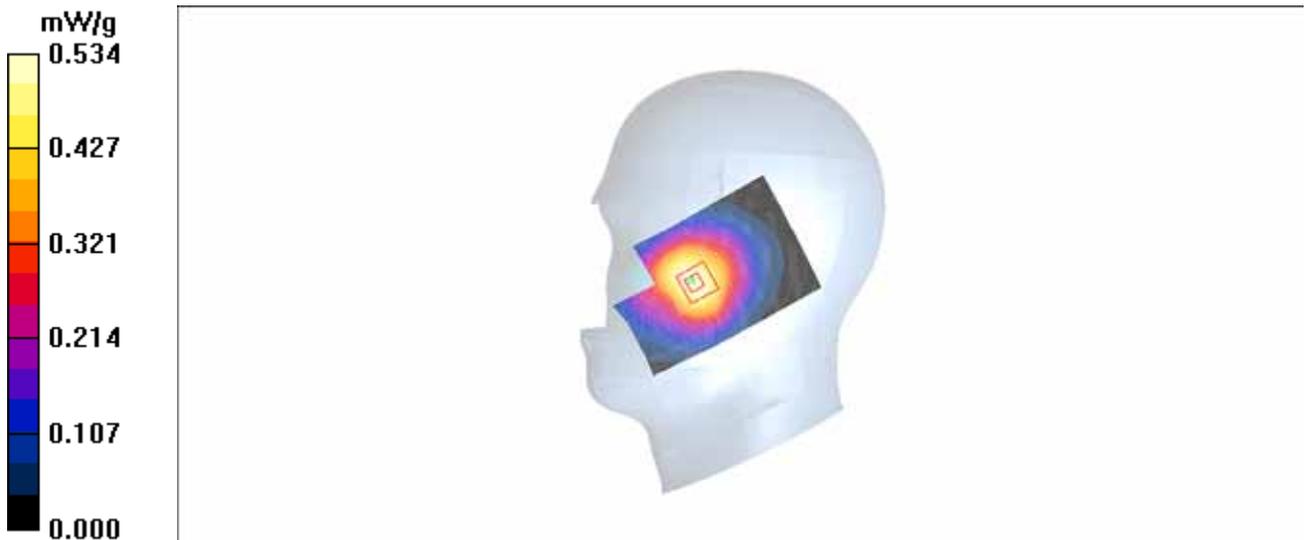


Fig. 7 835MHz CH777

835 Right Cheek Middle

Date/Time: 2011-11-8 9:48:54

Electronics: DAE4 Sn771

Medium: Head 835 MHz

Medium parameters used (interpolated): $f = 836.52$ MHz; $\sigma = 0.88$ mho/m; $\epsilon_r = 41.0$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 835 Frequency: 836.52 MHz Duty Cycle: 1:1

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

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

Maximum value of SAR (interpolated) = 0.611 mW/g

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

Reference Value = 8.63 V/m; Power Drift = 0.131 dB

Peak SAR (extrapolated) = 0.736 W/kg

SAR(1 g) = 0.571 mW/g; SAR(10 g) = 0.428 mW/g

Maximum value of SAR (measured) = 0.609 mW/g

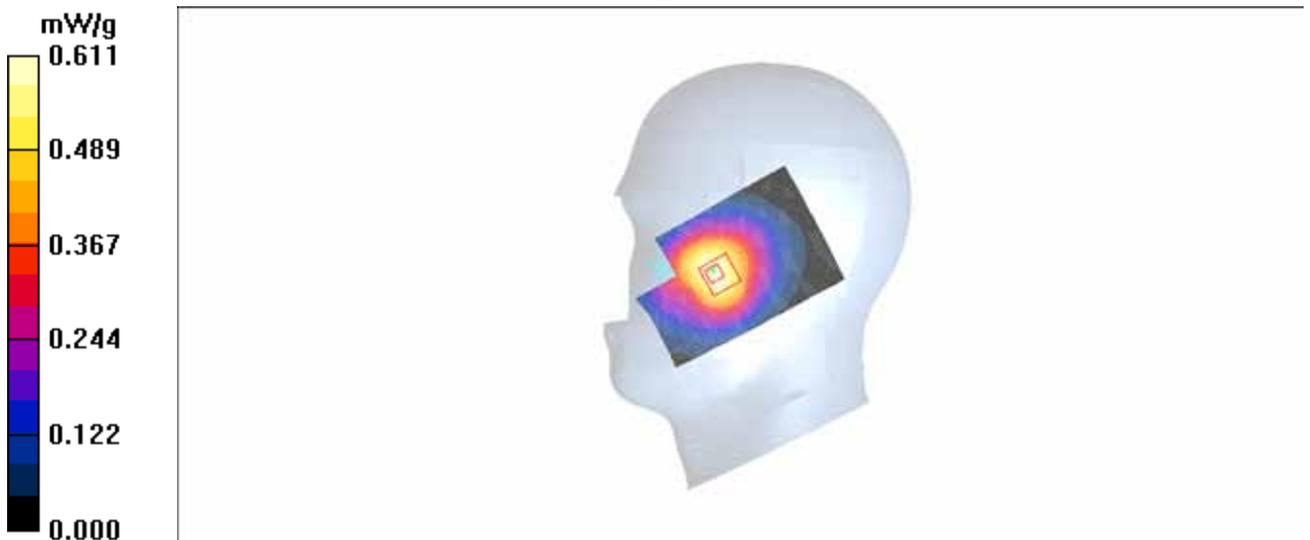


Fig. 8 835 MHz CH384

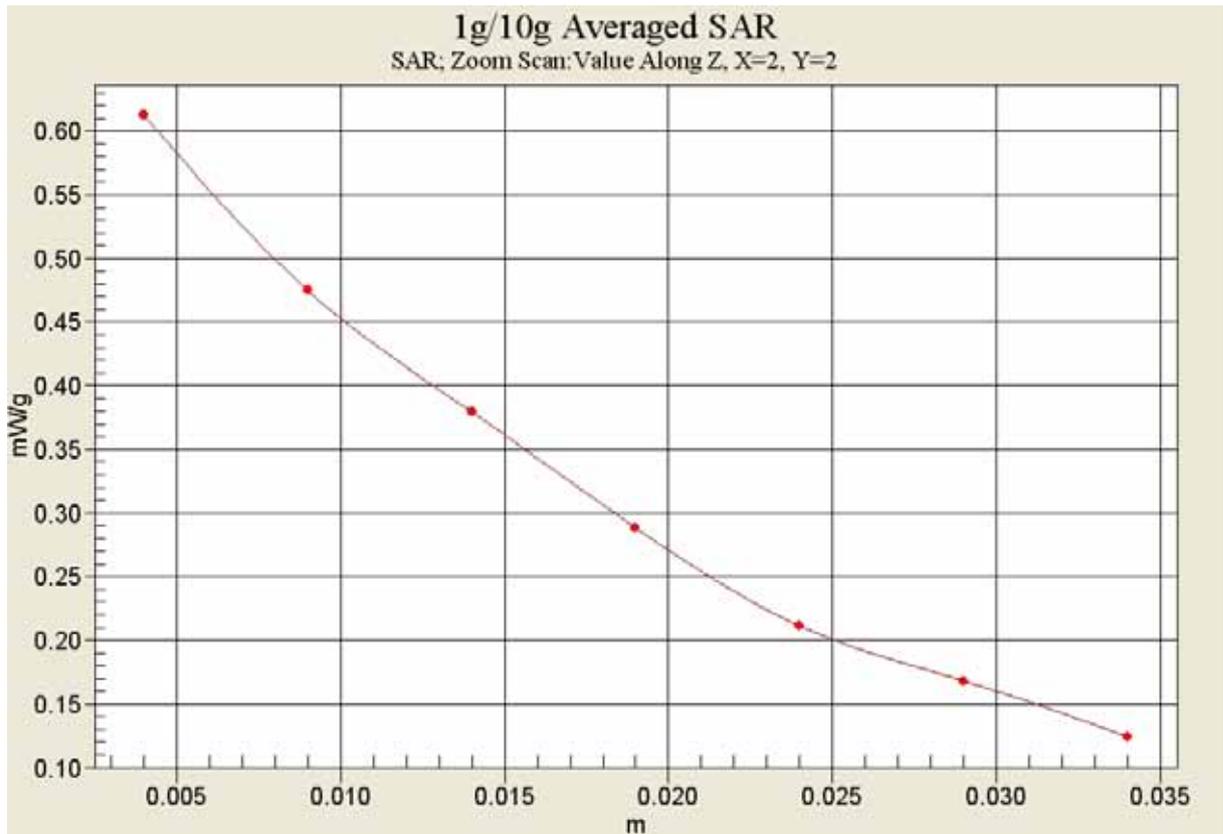


Fig. 8-1 Z-Scan at power reference point (835 MHz CH384)

835 Right Cheek Low

Date/Time: 2011-11-8 10:03:14

Electronics: DAE4 Sn771

Medium: Head 835 MHz

Medium parameters used: $f = 824.7$ MHz; $\sigma = 0.87$ mho/m; $\epsilon_r = 41.1$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 835 Frequency: 824.7 MHz Duty Cycle: 1:1

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

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

Maximum value of SAR (interpolated) = 0.484 mW/g

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

Reference Value = 8.00 V/m; Power Drift = 0.024 dB

Peak SAR (extrapolated) = 0.570 W/kg

SAR(1 g) = 0.458 mW/g; SAR(10 g) = 0.348 mW/g

Maximum value of SAR (measured) = 0.481 mW/g



Fig. 9 835 MHz CH1013

835 Right Tilt High

Date/Time: 2011-11-8 10:17:53

Electronics: DAE4 Sn771

Medium: Head 835 MHz

Medium parameters used (interpolated): $f = 848.31$ MHz; $\sigma = 0.91$ mho/m; $\epsilon_r = 40.5$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 835 Frequency: 848.31 MHz Duty Cycle: 1:1

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

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

Maximum value of SAR (interpolated) = 0.298 mW/g

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

Reference Value = 13.2 V/m; Power Drift = 0.057 dB

Peak SAR (extrapolated) = 0.351 W/kg

SAR(1 g) = 0.283 mW/g; SAR(10 g) = 0.216 mW/g

Maximum value of SAR (measured) = 0.297 mW/g

Tilt High/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.2 V/m; Power Drift = 0.057 dB

Peak SAR (extrapolated) = 0.297 W/kg

SAR(1 g) = 0.211 mW/g; SAR(10 g) = 0.138 mW/g

Maximum value of SAR (measured) = 0.251 mW/g

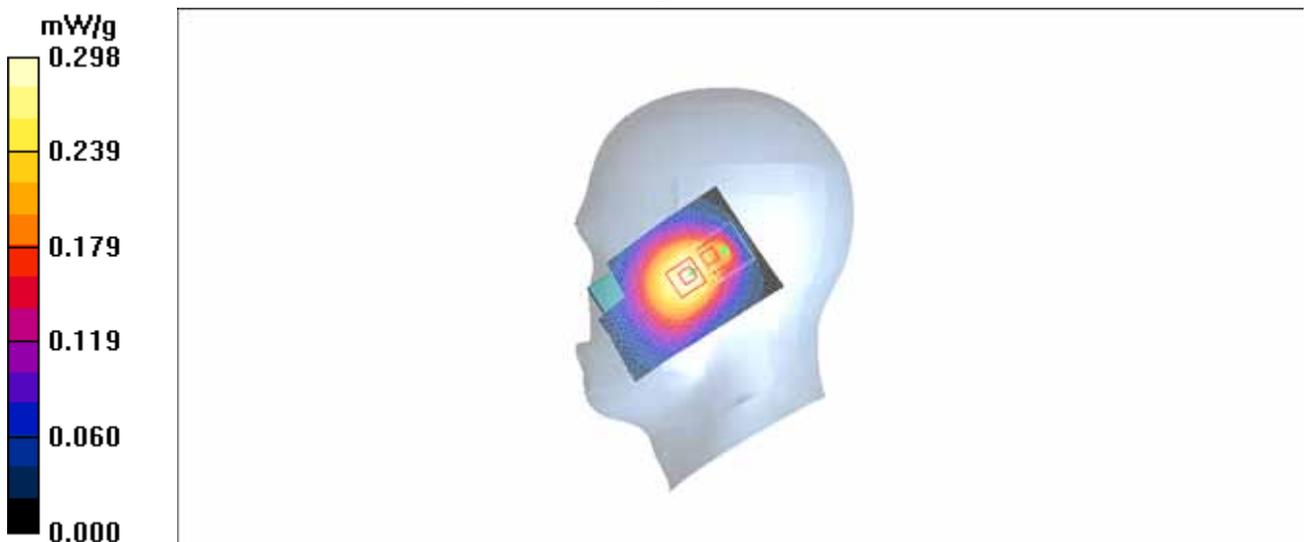


Fig.10 835MHz CH777

835 Right Tilt Middle

Date/Time: 2011-11-8 10:32:16

Electronics: DAE4 Sn771

Medium: Head 835 MHz

Medium parameters used (interpolated): $f = 836.52$ MHz; $\sigma = 0.88$ mho/m; $\epsilon_r = 41.0$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 835 Frequency: 836.52 MHz Duty Cycle: 1:1

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

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

Maximum value of SAR (interpolated) = 0.307 mW/g

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

Reference Value = 13.6 V/m; Power Drift = 0.195 dB

Peak SAR (extrapolated) = 0.382 W/kg

SAR(1 g) = 0.305 mW/g; SAR(10 g) = 0.229 mW/g

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

Tilt Middle/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.6 V/m; Power Drift = 0.195 dB

Peak SAR (extrapolated) = 0.311 W/kg

SAR(1 g) = 0.219 mW/g; SAR(10 g) = 0.146 mW/g

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

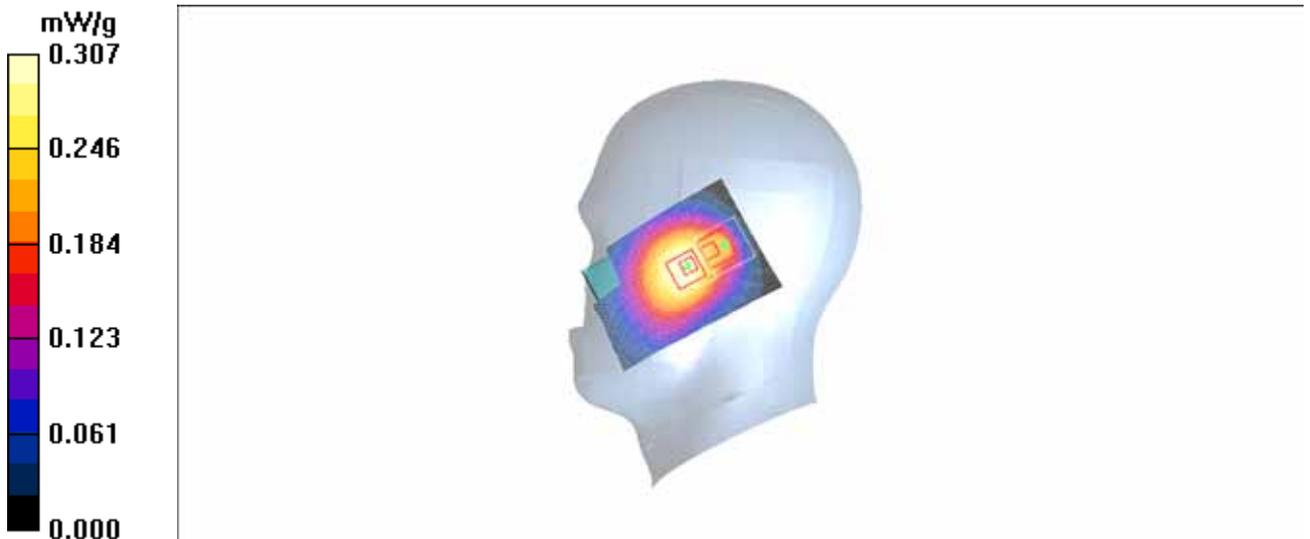


Fig.11 835 MHz CH384

835 Right Tilt Low

Date/Time: 2011-11-8 10:46:38

Electronics: DAE4 Sn771

Medium: Head 835 MHz

Medium parameters used: $f = 824.7$ MHz; $\sigma = 0.87$ mho/m; $\epsilon_r = 41.1$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 835 Frequency: 824.7 MHz Duty Cycle: 1:1

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

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

Maximum value of SAR (interpolated) = 0.282 mW/g

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

Reference Value = 13.2 V/m; Power Drift = -0.034 dB

Peak SAR (extrapolated) = 0.326 W/kg

SAR(1 g) = 0.266 mW/g; SAR(10 g) = 0.205 mW/g

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

Tilt Low/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.2 V/m; Power Drift = -0.034 dB

Peak SAR (extrapolated) = 0.290 W/kg

SAR(1 g) = 0.204 mW/g; SAR(10 g) = 0.134 mW/g

Maximum value of SAR (measured) = 0.242 mW/g

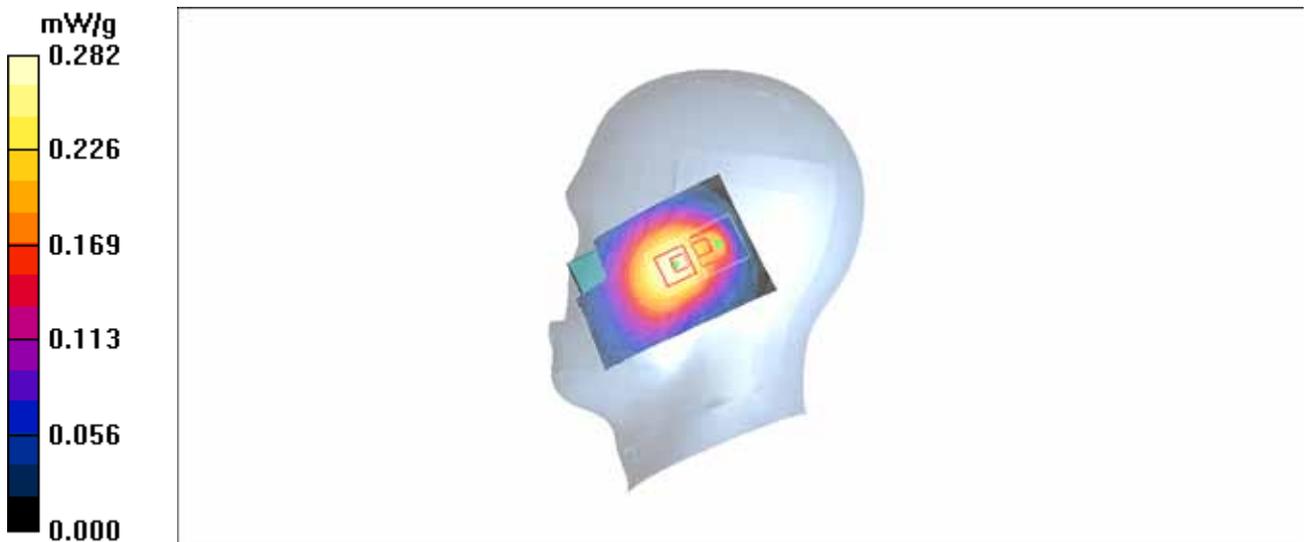


Fig. 12 835 MHz CH1013

1900 Left Cheek High

Date/Time: 2011-11-9 8:11:24

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used: $f = 1908.75$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 39.5$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 1900MHz Frequency: 1908.75 MHz Duty Cycle: 1:1

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

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

Maximum value of SAR (interpolated) = 0.993 mW/g

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

Reference Value = 9.74 V/m; Power Drift = -0.118 dB

Peak SAR (extrapolated) = 1.43 W/kg

SAR(1 g) = 0.906 mW/g; SAR(10 g) = 0.527 mW/g

Maximum value of SAR (measured) = 0.986 mW/g

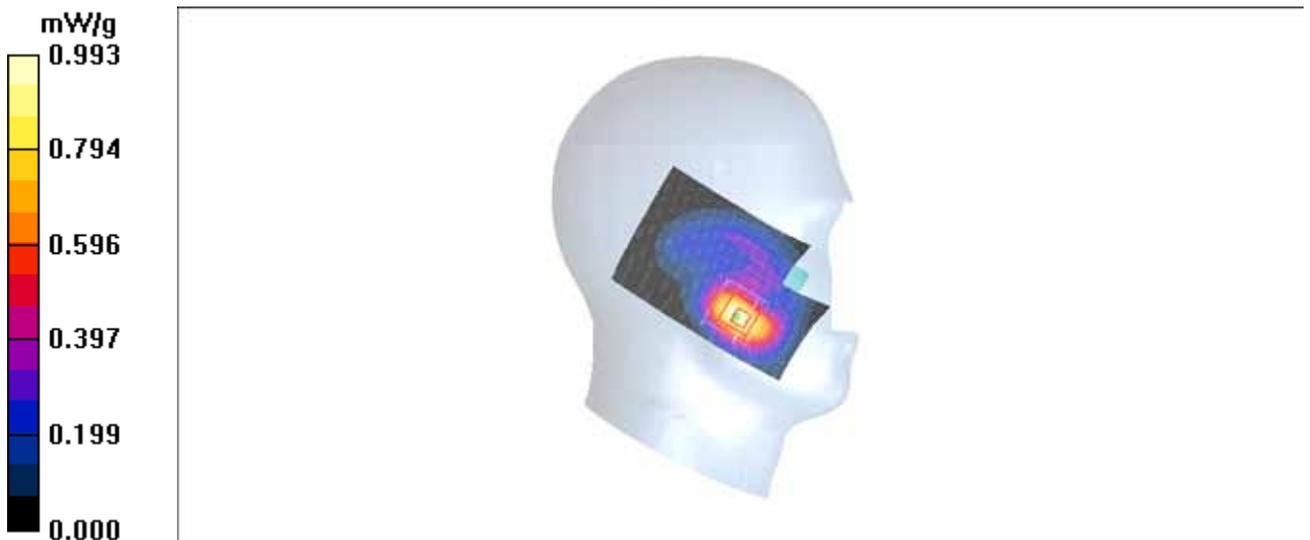


Fig. 13 1900 MHz CH1175

1900 Left Cheek Middle

Date/Time: 2011-11-9 8:25:42

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 39.5$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 1900MHz Frequency: 1880 MHz Duty Cycle: 1:1

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

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

Maximum value of SAR (interpolated) = 1.15 mW/g

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

Reference Value = 9.67 V/m; Power Drift = 0.198 dB

Peak SAR (extrapolated) = 1.70 W/kg

SAR(1 g) = 1.08 mW/g; SAR(10 g) = 0.637 mW/g

Maximum value of SAR (measured) = 1.19 mW/g

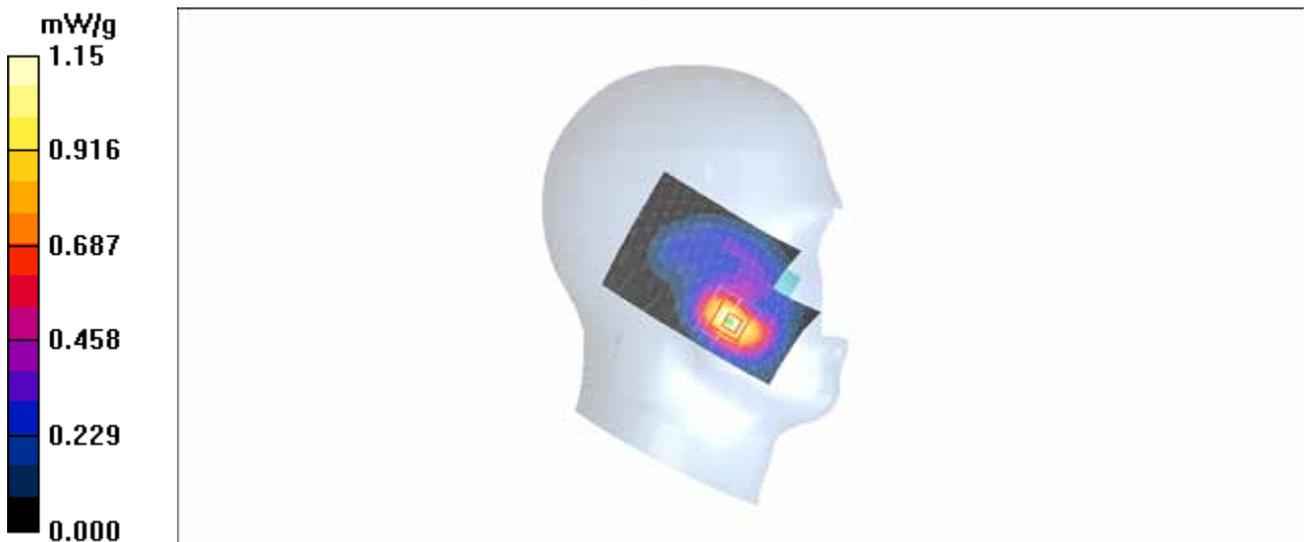


Fig. 14 1900 MHz CH600

1900 Left Cheek Low

Date/Time: 2011-11-9 8:40:00

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used (interpolated): $f = 1851.25$ MHz; $\sigma = 1.38$ mho/m; $\epsilon_r = 39.6$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 1900MHz Frequency: 1851.25 MHz Duty Cycle: 1:1

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

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

Maximum value of SAR (interpolated) = 1.18 mW/g

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

Reference Value = 9.38 V/m; Power Drift = -0.089 dB

Peak SAR (extrapolated) = 1.72 W/kg

SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.656 mW/g

Maximum value of SAR (measured) = 1.21 mW/g

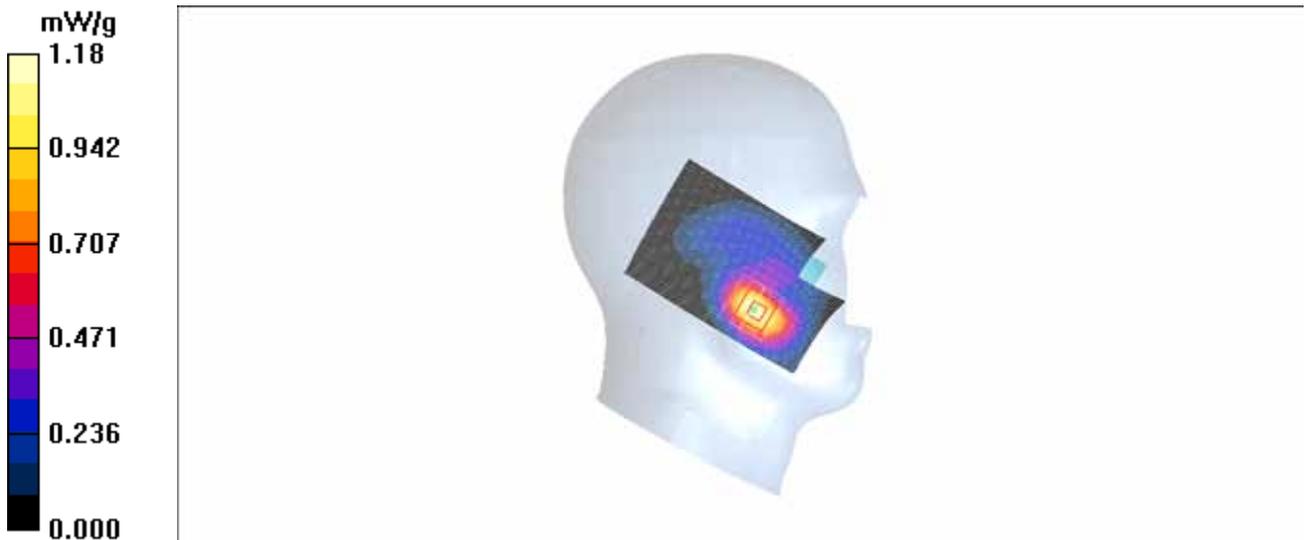


Fig. 15 1900 MHz CH25

1900 Left Tilt High

Date/Time: 2011-11-9 8:54:34

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used: $f = 1908.75$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 39.5$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 1900MHz Frequency: 1908.75 MHz Duty Cycle: 1:1

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

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

Maximum value of SAR (interpolated) = 0.461 mW/g

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

Reference Value = 15.7 V/m; Power Drift = -0.175 dB

Peak SAR (extrapolated) = 0.610 W/kg

SAR(1 g) = 0.393 mW/g; SAR(10 g) = 0.232 mW/g

Maximum value of SAR (measured) = 0.429 mW/g

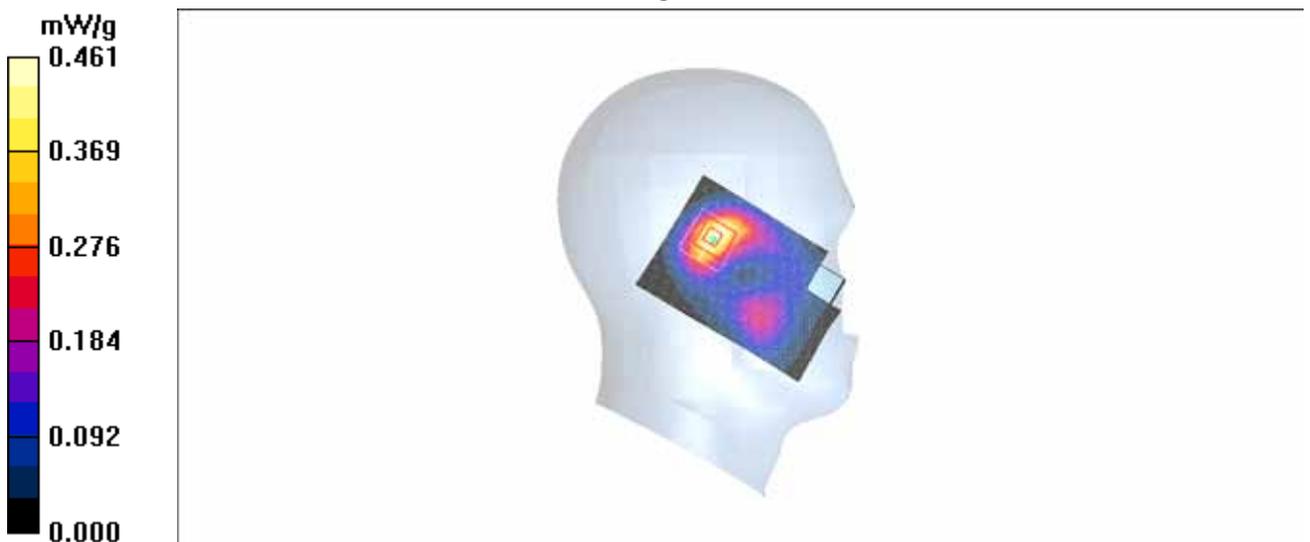


Fig.16 1900 MHz CH1175

1900 Left Tilt Middle

Date/Time: 2011-11-9 9:08:51

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 39.5$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 1900MHz Frequency: 1880 MHz Duty Cycle: 1:1

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

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

Maximum value of SAR (interpolated) = 0.521 mW/g

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

Reference Value = 16.2 V/m; Power Drift = -0.113 dB

Peak SAR (extrapolated) = 0.674 W/kg

SAR(1 g) = 0.441 mW/g; SAR(10 g) = 0.264 mW/g

Maximum value of SAR (measured) = 0.488 mW/g

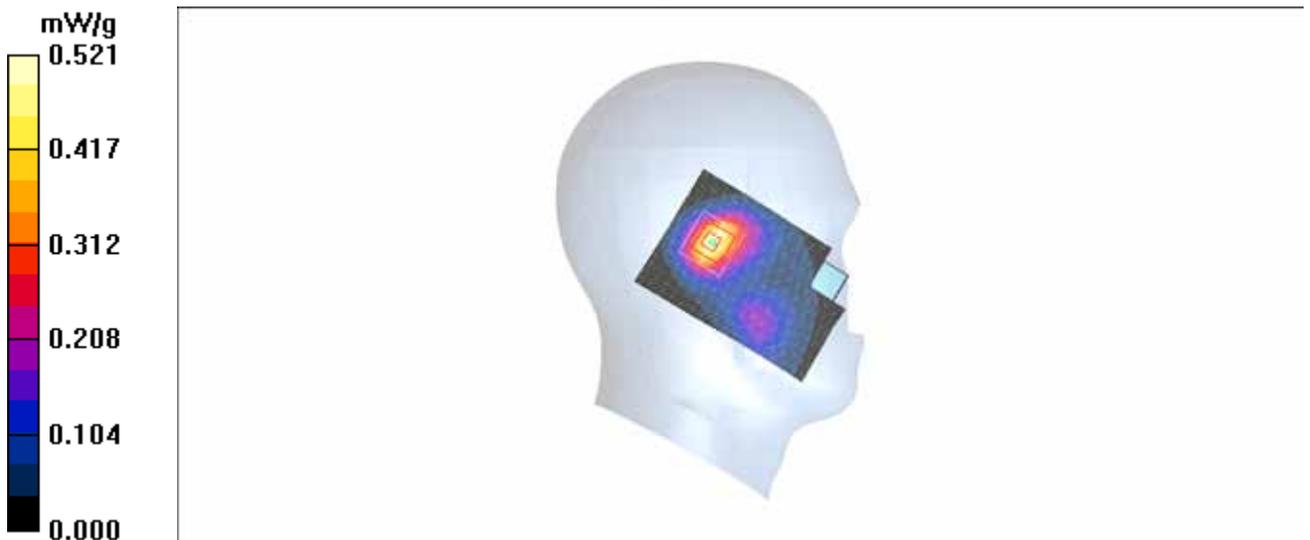


Fig. 17 1900 MHz CH600

1900 Left Tilt Low

Date/Time: 2011-11-9 9:23:11

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used (interpolated): $f = 1851.25$ MHz; $\sigma = 1.38$ mho/m; $\epsilon_r = 39.6$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 1900MHz Frequency: 1851.25 MHz Duty Cycle: 1:1

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

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

Maximum value of SAR (interpolated) = 0.466 mW/g

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

Reference Value = 16.0 V/m; Power Drift = 0.068 dB

Peak SAR (extrapolated) = 0.659 W/kg

SAR(1 g) = 0.436 mW/g; SAR(10 g) = 0.266 mW/g

Maximum value of SAR (measured) = 0.480 mW/g

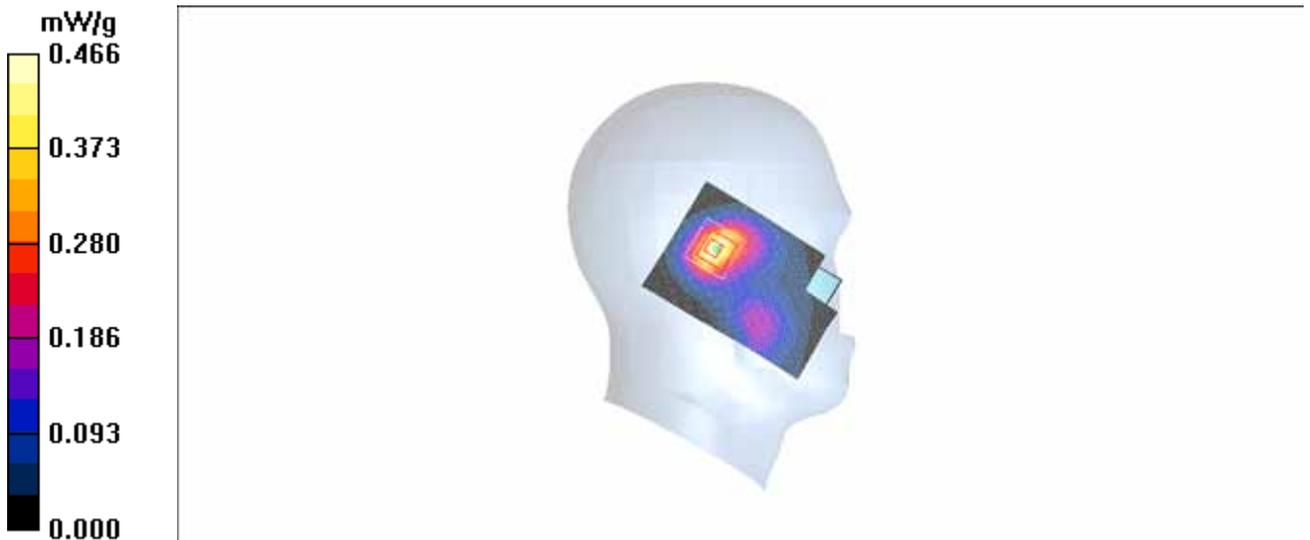


Fig. 18 1900 MHz CH25

1900 Right Cheek High

Date/Time: 2011-11-9 9:38:04

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used: $f = 1908.75$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 39.5$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 1900MHz Frequency: 1908.75 MHz Duty Cycle: 1:1

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

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

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

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

Reference Value = 13.0 V/m; Power Drift = -0.123 dB

Peak SAR (extrapolated) = 1.30 W/kg

SAR(1 g) = 0.899 mW/g; SAR(10 g) = 0.557 mW/g

Maximum value of SAR (measured) = 0.975 mW/g

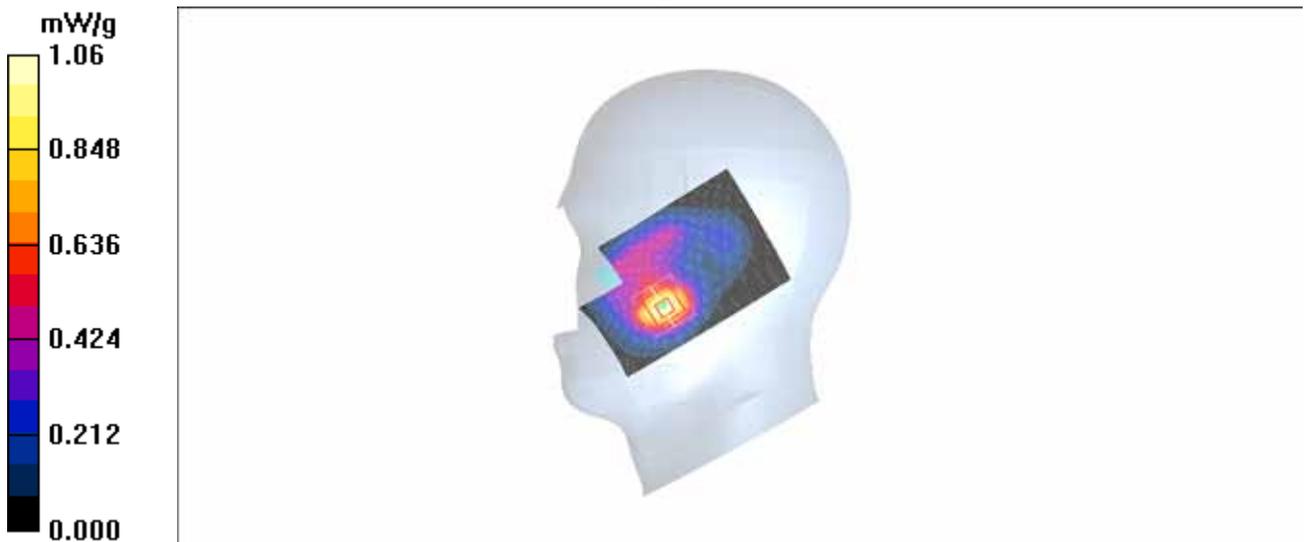


Fig. 19 1900 MHz CH1175

1900 Right Cheek Middle

Date/Time: 2011-11-9 9:52:21

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 39.5$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 1900MHz Frequency: 1880 MHz Duty Cycle: 1:1

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

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

Maximum value of SAR (interpolated) = 1.23 mW/g

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

Reference Value = 12.2 V/m; Power Drift = -0.003 dB

Peak SAR (extrapolated) = 1.66 W/kg

SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.706 mW/g

Maximum value of SAR (measured) = 1.24 mW/g

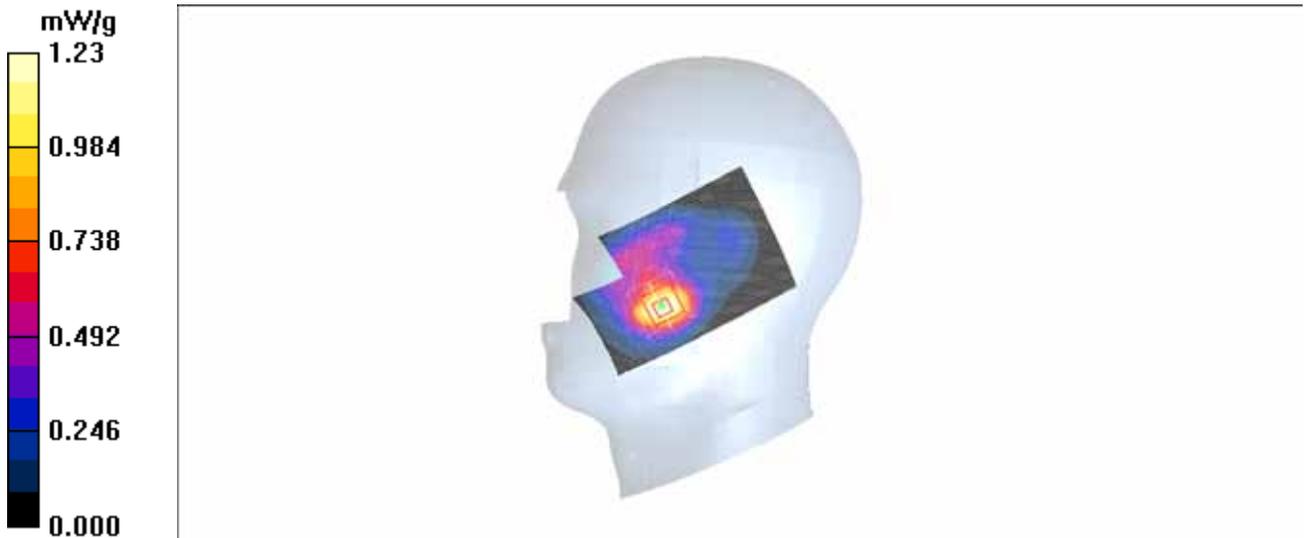


Fig. 20 1900 MHz CH600

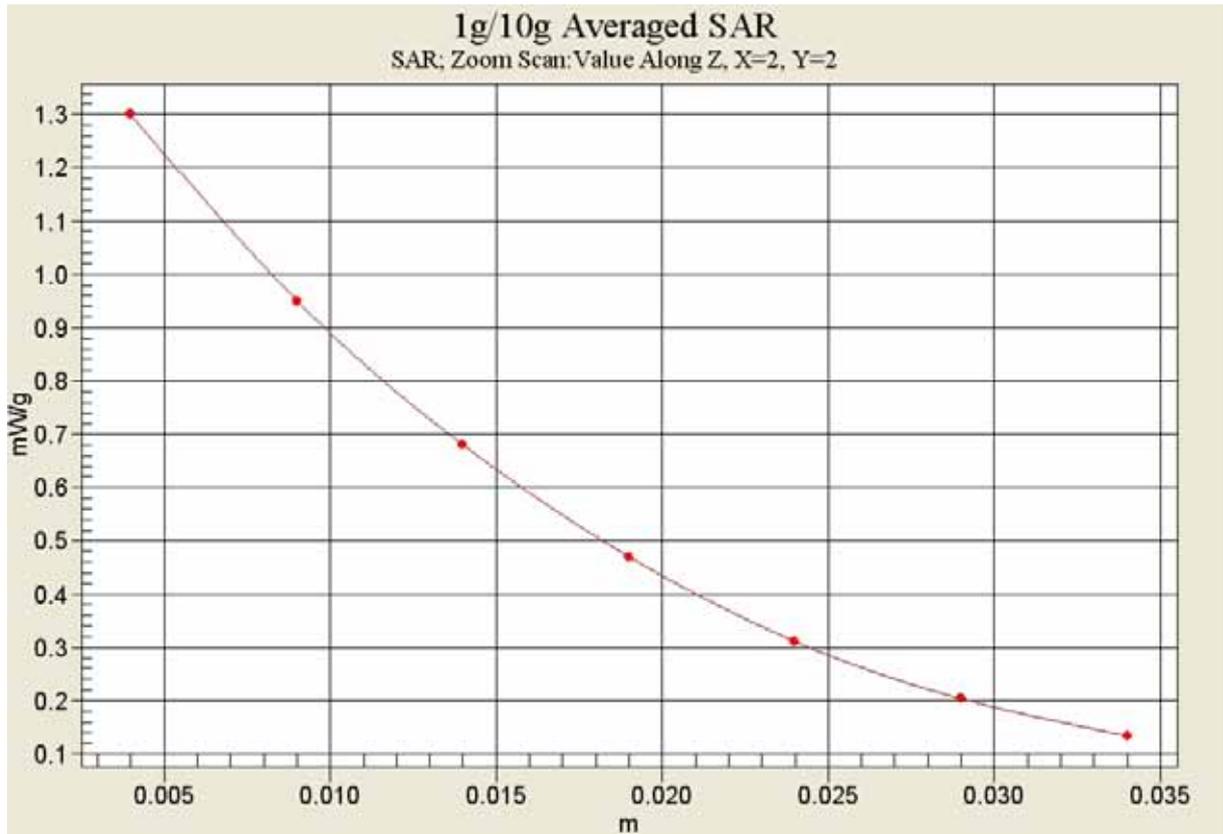


Fig. 20-1 Z-Scan at power reference point (1900 MHz CH600)

1900 Right Cheek Low

Date/Time: 2011-11-9 10:06:44

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used (interpolated): $f = 1851.25$ MHz; $\sigma = 1.38$ mho/m; $\epsilon_r = 39.6$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 1900MHz Frequency: 1851.25 MHz Duty Cycle: 1:1

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

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

Maximum value of SAR (interpolated) = 1.19 mW/g

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

Reference Value = 12.3 V/m; Power Drift = 0.051 dB

Peak SAR (extrapolated) = 1.54 W/kg

SAR(1 g) = 1.1 mW/g; SAR(10 g) = 0.687 mW/g

Maximum value of SAR (measured) = 1.19 mW/g

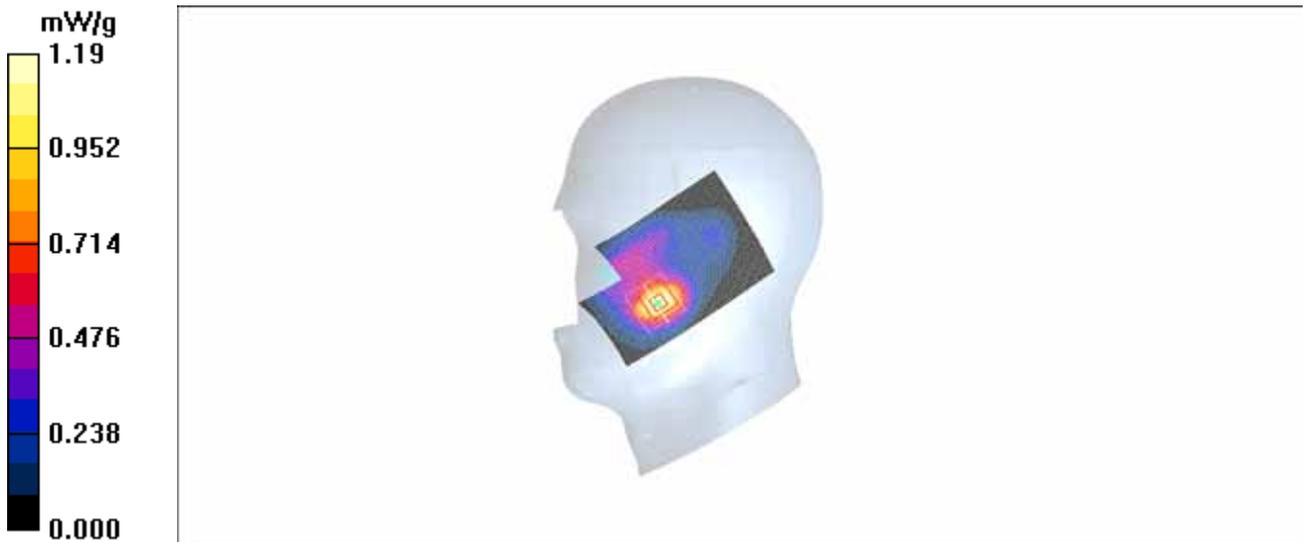


Fig. 21 1900 MHz CH25

1900 Right Tilt High

Date/Time: 2011-11-9 10:21:19

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used: $f = 1908.75$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 39.5$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 1900MHz Frequency: 1908.75 MHz Duty Cycle: 1:1

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

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

Maximum value of SAR (interpolated) = 0.445 mW/g

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

Reference Value = 17.0 V/m; Power Drift = -0.101 dB

Peak SAR (extrapolated) = 0.600 W/kg

SAR(1 g) = 0.389 mW/g; SAR(10 g) = 0.226 mW/g

Maximum value of SAR (measured) = 0.429 mW/g

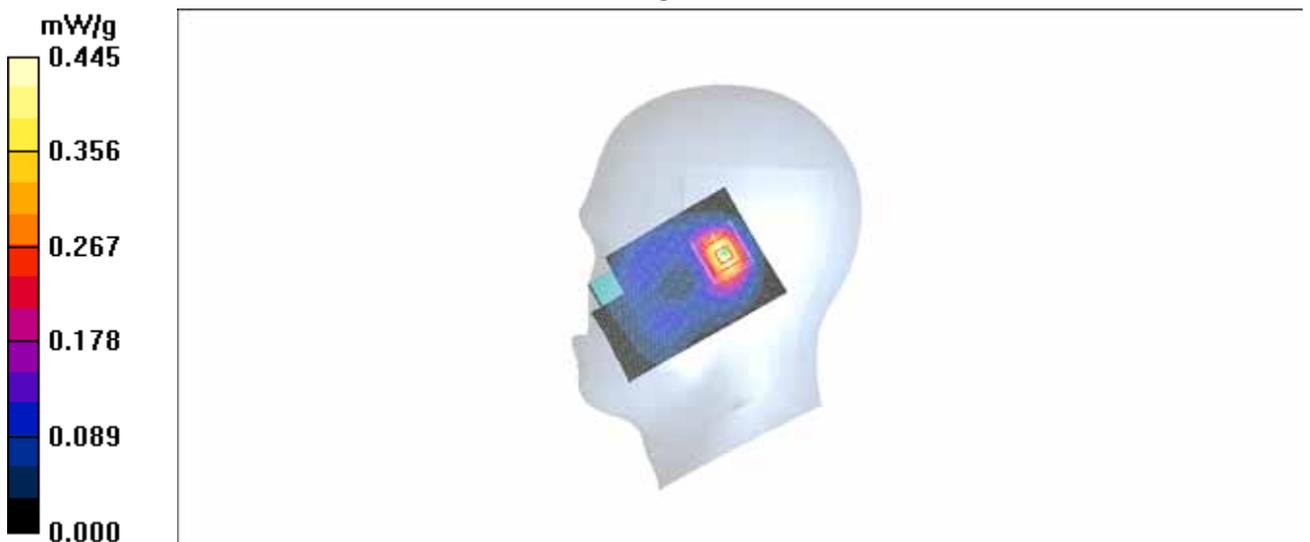


Fig. 22 1900 MHz CH1175

1900 Right Tilt Middle

Date/Time: 2011-11-9 10:35:36

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 39.5$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 1900MHz Frequency: 1880 MHz Duty Cycle: 1:1

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

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

Maximum value of SAR (interpolated) = 0.618 mW/g

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

Reference Value = 20.2 V/m; Power Drift = 0.102 dB

Peak SAR (extrapolated) = 0.842 W/kg

SAR(1 g) = 0.556 mW/g; SAR(10 g) = 0.330 mW/g

Maximum value of SAR (measured) = 0.607 mW/g

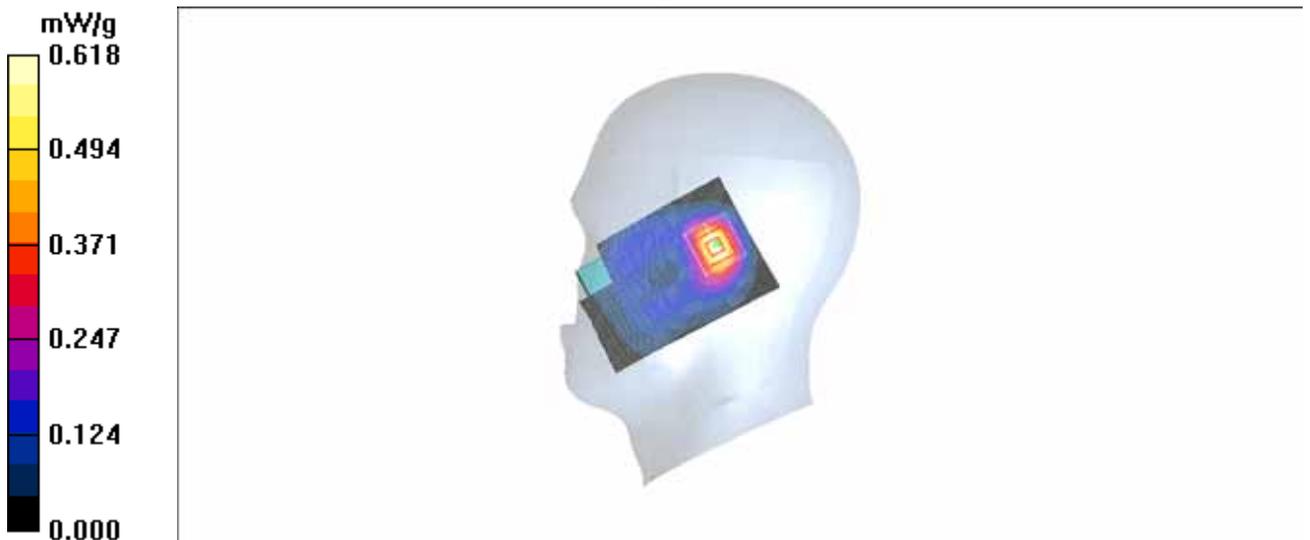


Fig.23 1900 MHz CH600

1900 Right Tilt Low

Date/Time: 2011-11-9 10:49:55

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used (interpolated): $f = 1851.25$ MHz; $\sigma = 1.38$ mho/m; $\epsilon_r = 39.6$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 1900MHz Frequency: 1851.25 MHz Duty Cycle: 1:1

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

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

Maximum value of SAR (interpolated) = 0.586 mW/g

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

Reference Value = 19.7 V/m; Power Drift = 0.096 dB

Peak SAR (extrapolated) = 0.795 W/kg

SAR(1 g) = 0.528 mW/g; SAR(10 g) = 0.316 mW/g

Maximum value of SAR (measured) = 0.578 mW/g

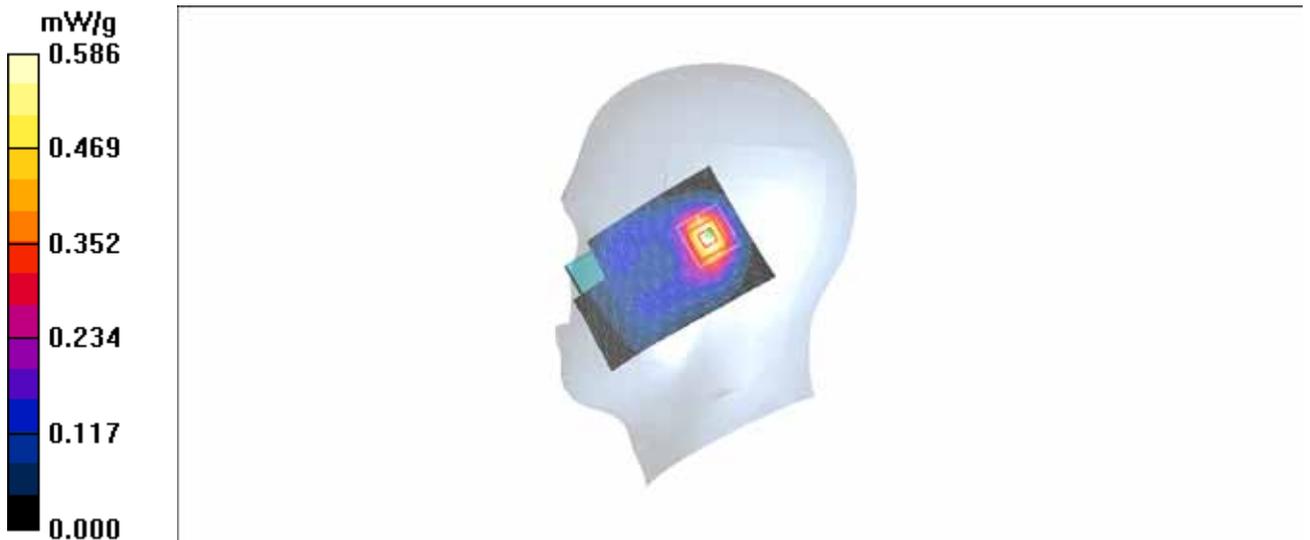


Fig.24 1900 MHz CH25

BC10 Left Cheek High

Date/Time: 2011-11-8 11:15:22

Electronics: DAE4 Sn771

Medium: Head 835 MHz

Medium parameters used (interpolated): $f = 823.1$ MHz; $\sigma = 0.875$ mho/m; $\epsilon_r = 41.2$; $\rho = 1000$ kg/m³

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

Communication System: BC10 Frequency: 823.975 MHz Duty Cycle: 1:1

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

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

Maximum value of SAR (interpolated) = 0.484 mW/g

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

Reference Value = 8.07 V/m; Power Drift = -0.103 dB

Peak SAR (extrapolated) = 0.654 W/kg

SAR(1 g) = 0.442 mW/g; SAR(10 g) = 0.316 mW/g

Maximum value of SAR (measured) = 0.481 mW/g

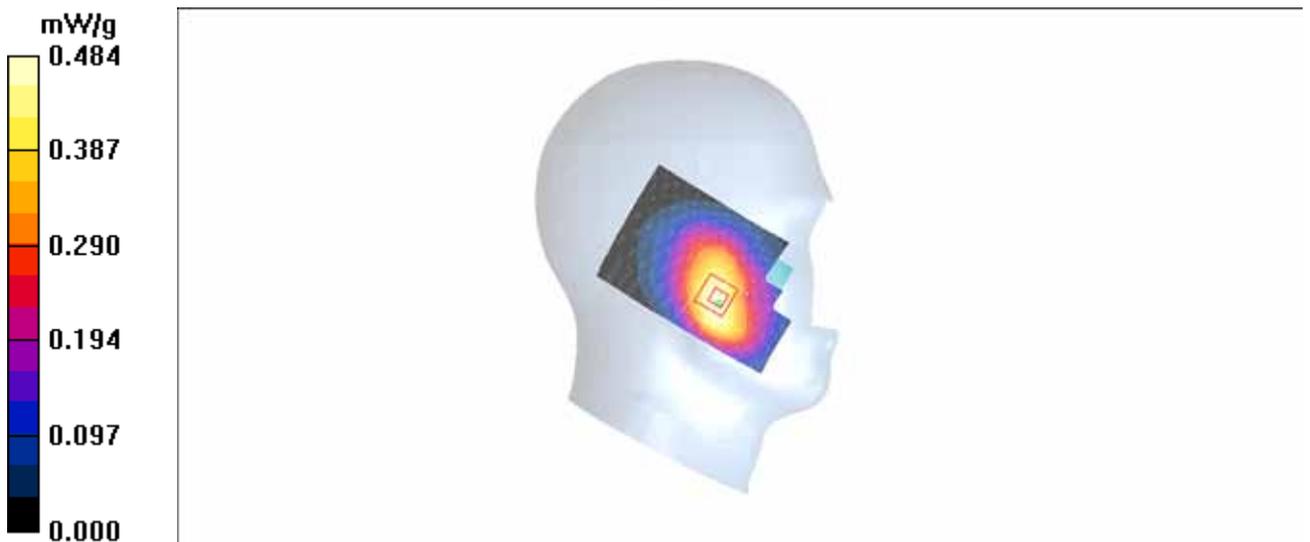


Fig. 25 BC10 CH684

BC10 Left Cheek Middle

Date/Time: 2011-11-8 11:29:41

Electronics: DAE4 Sn771

Medium: Head 835 MHz

Medium parameters used (interpolated): $f = 820.5$ MHz; $\sigma = 0.871$ mho/m; $\epsilon_r = 41.3$; $\rho = 1000$ kg/m³

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

Communication System: BC10 Frequency: 820.5 MHz Duty Cycle: 1:1

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

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

Maximum value of SAR (interpolated) = 0.516 mW/g

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

Reference Value = 8.39 V/m; Power Drift = -0.005 dB

Peak SAR (extrapolated) = 0.717 W/kg

SAR(1 g) = 0.489 mW/g; SAR(10 g) = 0.348 mW/g

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

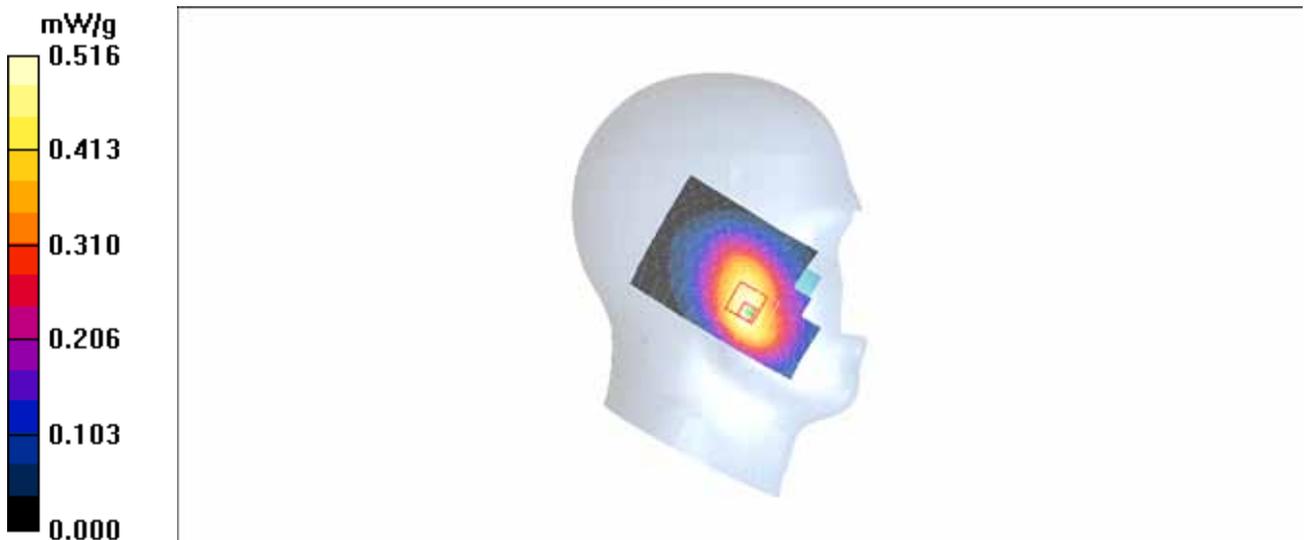


Fig. 26 BC10 CH580

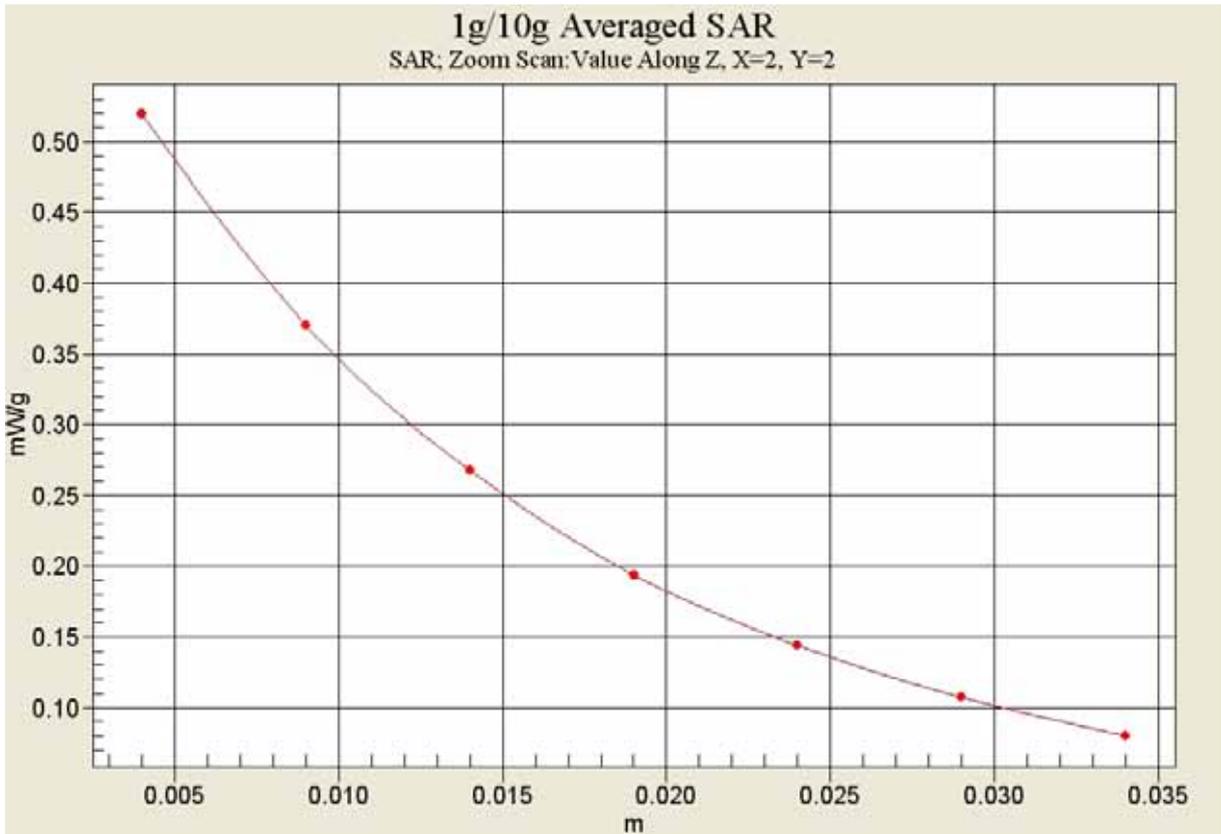


Fig. 26-1 Z-Scan at power reference point (BC10 CH580)

BC10 Left Cheek Low

Date/Time: 2011-11-8 11:44:02

Electronics: DAE4 Sn771

Medium: Head 835 MHz

Medium parameters used (interpolated): $f = 817.9$ MHz; $\sigma = 0.868$ mho/m; $\epsilon_r = 41.3$; $\rho = 1000$ kg/m³

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

Communication System: BC10 Frequency: 817 MHz Duty Cycle: 1:1

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

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

Maximum value of SAR (interpolated) = 0.407 mW/g

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

Reference Value = 7.57 V/m; Power Drift = 0.130 dB

Peak SAR (extrapolated) = 0.548 W/kg

SAR(1 g) = 0.381 mW/g; SAR(10 g) = 0.273 mW/g

Maximum value of SAR (measured) = 0.404 mW/g

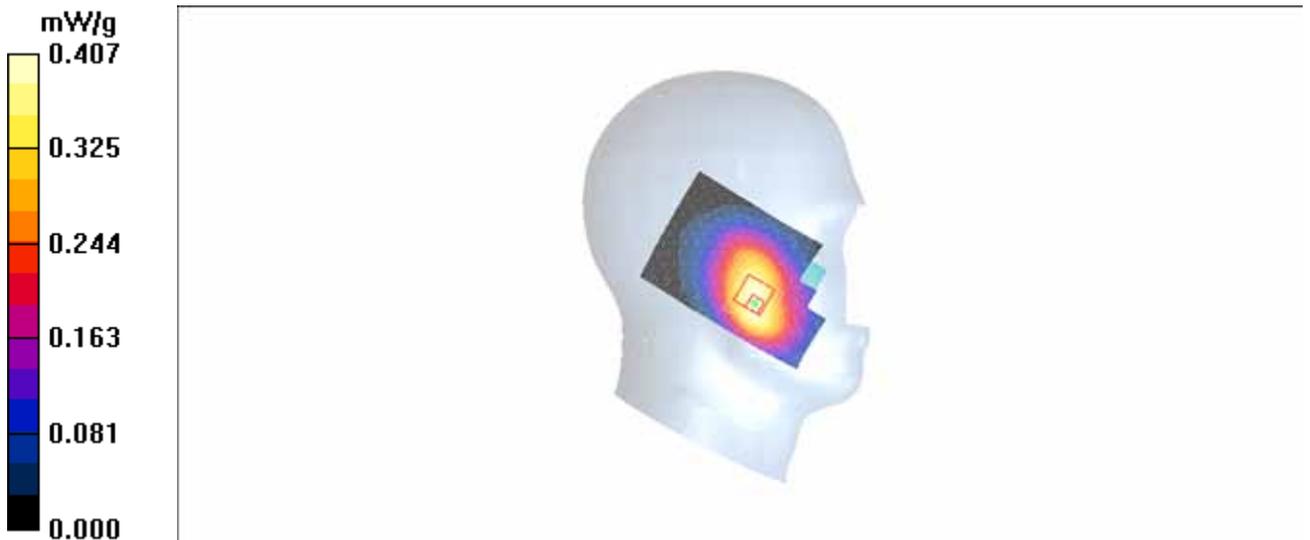


Fig. 27 BC10 CH476

BC10 Left Tilt High

Date/Time: 2011-11-8 11:58:39

Electronics: DAE4 Sn771

Medium: Head 835 MHz

Medium parameters used (interpolated): $f = 823.1$ MHz; $\sigma = 0.875$ mho/m; $\epsilon_r = 41.2$; $\rho = 1000$ kg/m³

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

Communication System: BC10 Frequency: 823.975 MHz Duty Cycle: 1:1

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

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

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

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

Reference Value = 13.9 V/m; Power Drift = -0.120 dB

Peak SAR (extrapolated) = 0.375 W/kg

SAR(1 g) = 0.300 mW/g; SAR(10 g) = 0.227 mW/g

Maximum value of SAR (measured) = 0.317 mW/g

Tilt High/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.9 V/m; Power Drift = -0.120 dB

Peak SAR (extrapolated) = 0.284 W/kg

SAR(1 g) = 0.202 mW/g; SAR(10 g) = 0.130 mW/g

Maximum value of SAR (measured) = 0.242 mW/g

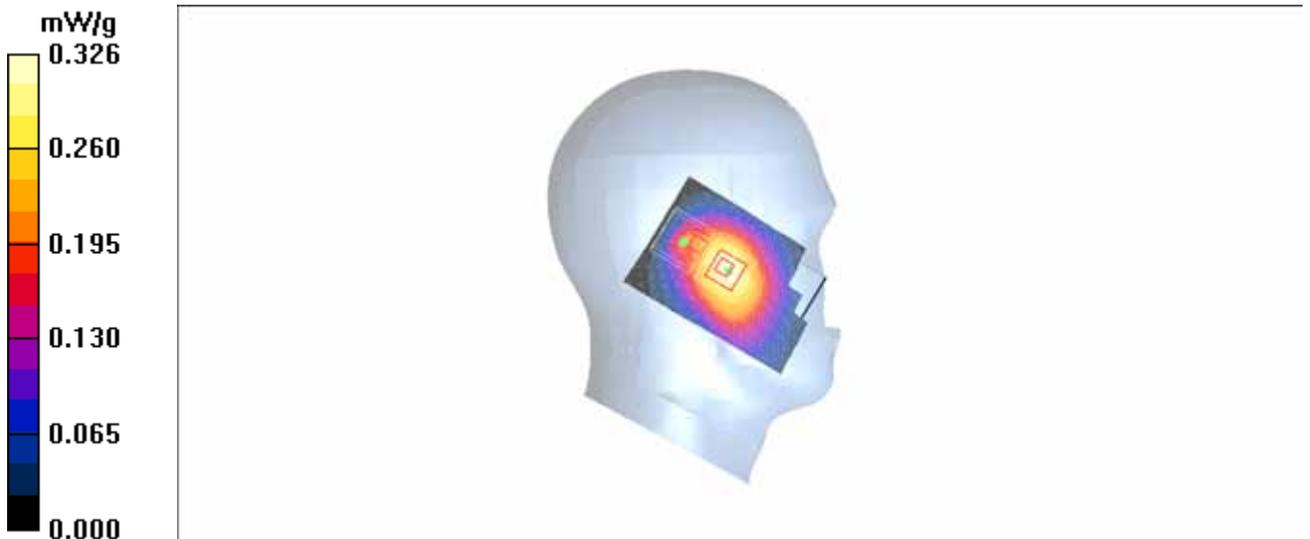


Fig. 28 BC10 CH684

BC10 Left Tilt Middle

Date/Time: 2011-11-8 12:13:00

Electronics: DAE4 Sn771

Medium: Head 835 MHz

Medium parameters used (interpolated): $f = 820.5$ MHz; $\sigma = 0.871$ mho/m; $\epsilon_r = 41.3$; $\rho = 1000$ kg/m³

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

Communication System: BC10 Frequency: 820.5 MHz Duty Cycle: 1:1

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

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

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

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

Reference Value = 14.6 V/m; Power Drift = 0.077 dB

Peak SAR (extrapolated) = 0.409 W/kg

SAR(1 g) = 0.332 mW/g; SAR(10 g) = 0.253 mW/g

Maximum value of SAR (measured) = 0.350 mW/g

Tilt Middle/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 14.6 V/m; Power Drift = 0.077 dB

Peak SAR (extrapolated) = 0.312 W/kg

SAR(1 g) = 0.224 mW/g; SAR(10 g) = 0.145 mW/g

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

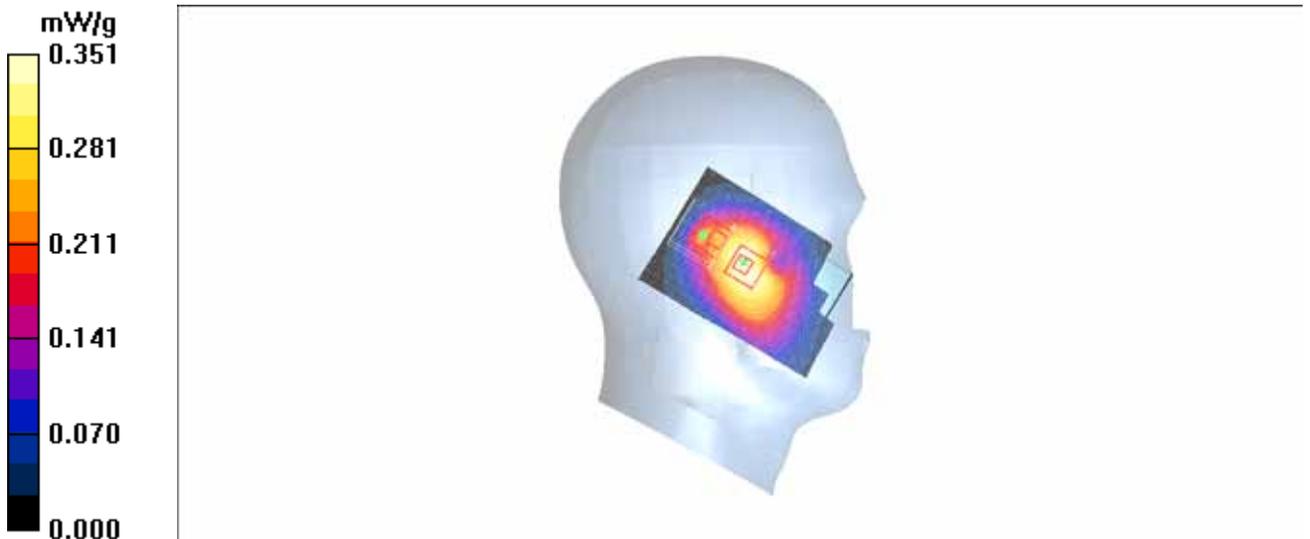


Fig. 29 BC10 CH580

BC10 Left Tilt Low

Date/Time: 2011-11-8 12:27:19

Electronics: DAE4 Sn771

Medium: Head 835 MHz

Medium parameters used (interpolated): $f = 817.9$ MHz; $\sigma = 0.868$ mho/m; $\epsilon_r = 41.3$; $\rho = 1000$ kg/m³

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

Communication System: BC10 Frequency: 817 MHz Duty Cycle: 1:1

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

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

Maximum value of SAR (interpolated) = 0.273 mW/g

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

Reference Value = 13.1 V/m; Power Drift = 0.126 dB

Peak SAR (extrapolated) = 0.333 W/kg

SAR(1 g) = 0.267 mW/g; SAR(10 g) = 0.204 mW/g

Maximum value of SAR (measured) = 0.280 mW/g

Tilt Low/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.1 V/m; Power Drift = 0.126 dB

Peak SAR (extrapolated) = 0.247 W/kg

SAR(1 g) = 0.180 mW/g; SAR(10 g) = 0.118 mW/g

Maximum value of SAR (measured) = 0.215 mW/g

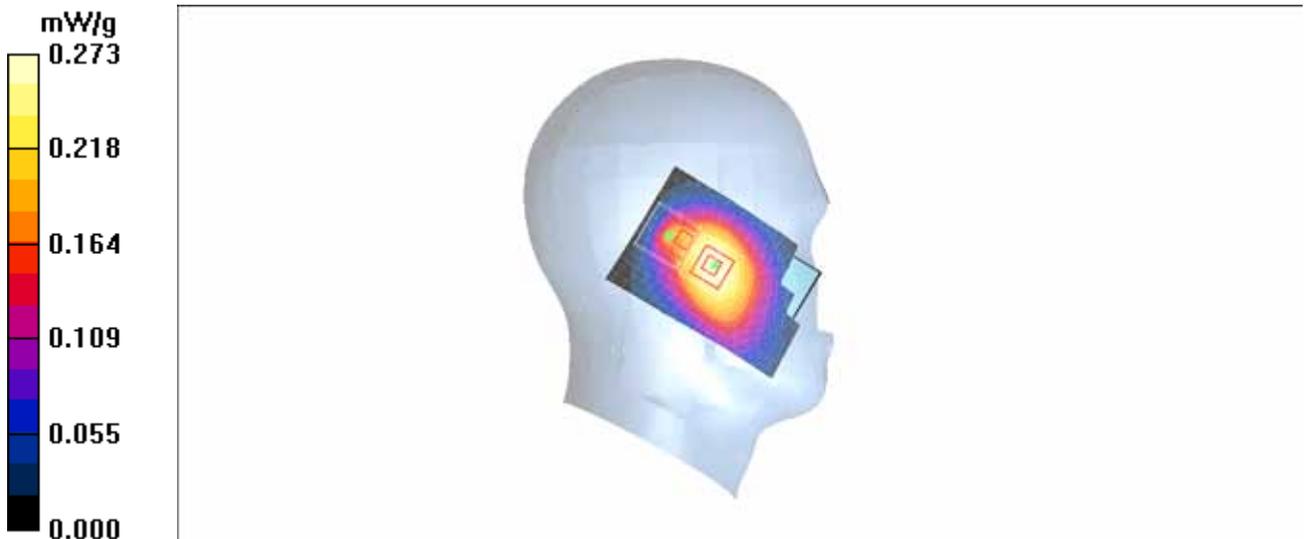


Fig. 30 BC10 CH476

BC10 Right Cheek High

Date/Time: 2011-11-8 12:42:01

Electronics: DAE4 Sn771

Medium: Head 835 MHz

Medium parameters used (interpolated): $f = 823.1$ MHz; $\sigma = 0.875$ mho/m; $\epsilon_r = 41.2$; $\rho = 1000$ kg/m³

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

Communication System: BC10 Frequency: 823.975 MHz Duty Cycle: 1:1

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

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

Maximum value of SAR (interpolated) = 0.524 mW/g

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

Reference Value = 8.02 V/m; Power Drift = -0.143 dB

Peak SAR (extrapolated) = 0.585 W/kg

SAR(1 g) = 0.470 mW/g; SAR(10 g) = 0.356 mW/g

Maximum value of SAR (measured) = 0.497 mW/g

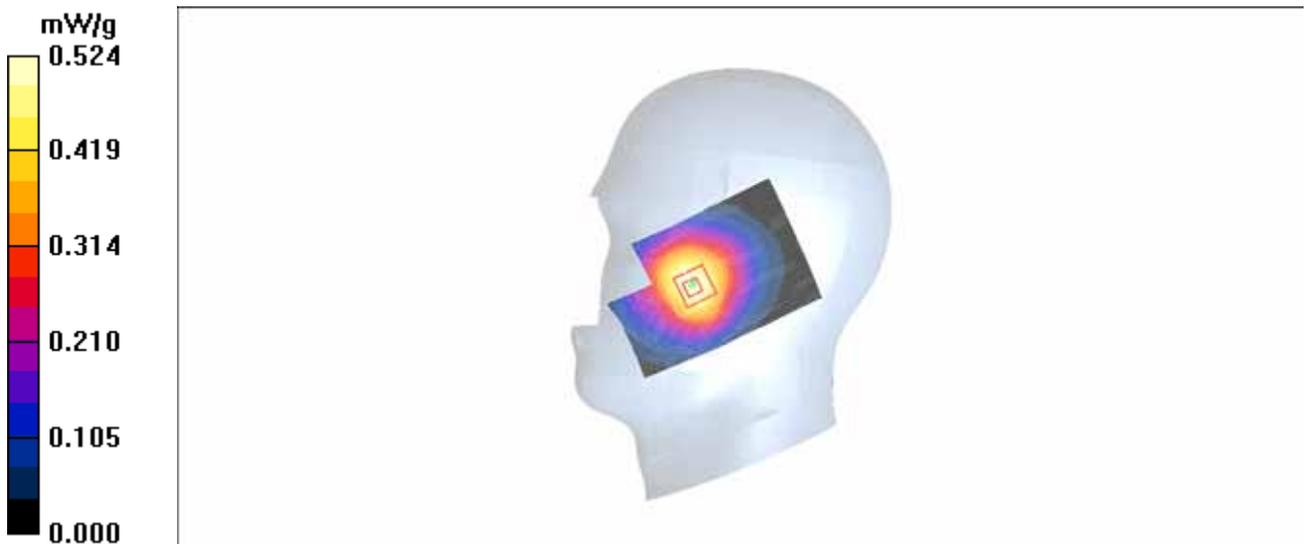


Fig. 31 BC10 CH684

BC10 Right Cheek Middle

Date/Time: 2011-11-8 12:56:23

Electronics: DAE4 Sn771

Medium: Head 835 MHz

Medium parameters used (interpolated): $f = 820.5$ MHz; $\sigma = 0.871$ mho/m; $\epsilon_r = 41.3$; $\rho = 1000$ kg/m³

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

Communication System: BC10 Frequency: 820.5 MHz Duty Cycle: 1:1

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

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

Maximum value of SAR (interpolated) = 0.486 mW/g

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

Reference Value = 7.71 V/m; Power Drift = 0.163 dB

Peak SAR (extrapolated) = 0.567 W/kg

SAR(1 g) = 0.466 mW/g; SAR(10 g) = 0.355 mW/g

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



Fig. 32 BC10 CH580

BC10 Right Cheek Low

Date/Time: 2011-11-8 13:10:46

Electronics: DAE4 Sn771

Medium: Head 835 MHz

Medium parameters used (interpolated): $f = 817.9$ MHz; $\sigma = 0.868$ mho/m; $\epsilon_r = 41.3$; $\rho = 1000$ kg/m³

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

Communication System: BC10 Frequency: 817 MHz Duty Cycle: 1:1

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

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

Maximum value of SAR (interpolated) = 0.384 mW/g

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

Reference Value = 6.92 V/m; Power Drift = 0.115 dB

Peak SAR (extrapolated) = 0.442 W/kg

SAR(1 g) = 0.364 mW/g; SAR(10 g) = 0.278 mW/g

Maximum value of SAR (measured) = 0.380 mW/g

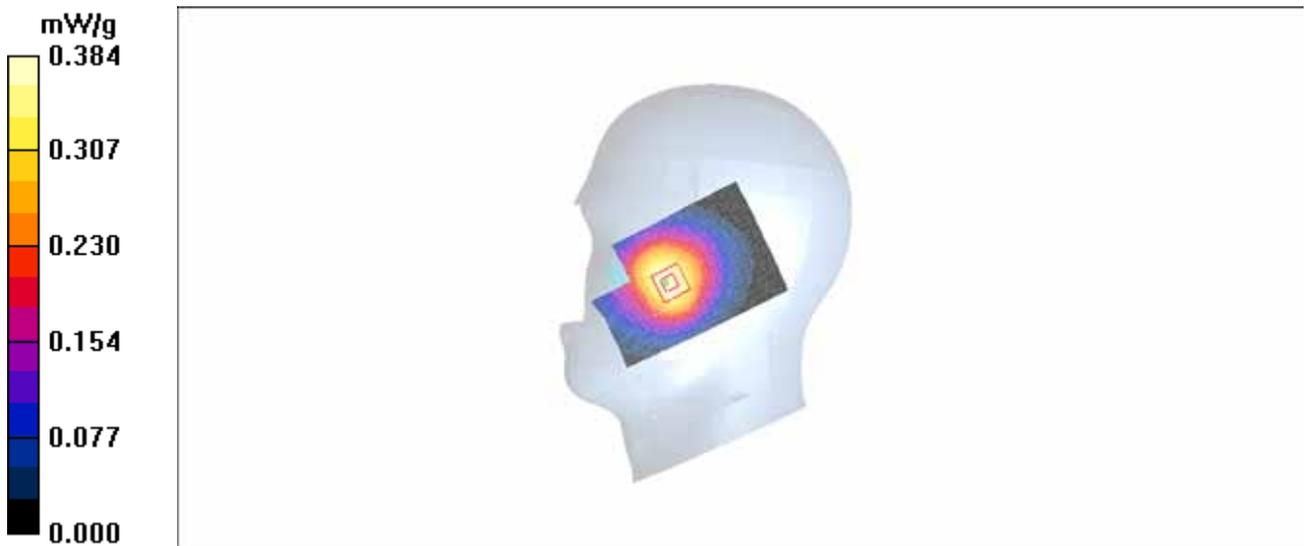


Fig. 33 BC10 CH476

BC10 Right Tilt High

Date/Time: 2011-11-8 13:25:10

Electronics: DAE4 Sn771

Medium: Head 835 MHz

Medium parameters used (interpolated): $f = 823.1$ MHz; $\sigma = 0.875$ mho/m; $\epsilon_r = 41.2$; $\rho = 1000$ kg/m³

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

Communication System: BC10 Frequency: 823.975 MHz Duty Cycle: 1:1

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

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

Maximum value of SAR (interpolated) = 0.278 mW/g

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

Reference Value = 13.0 V/m; Power Drift = 0.164 dB

Peak SAR (extrapolated) = 0.323 W/kg

SAR(1 g) = 0.259 mW/g; SAR(10 g) = 0.200 mW/g

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

Tilt High/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.0 V/m; Power Drift = 0.164 dB

Peak SAR (extrapolated) = 0.282 W/kg

SAR(1 g) = 0.206 mW/g; SAR(10 g) = 0.136 mW/g

Maximum value of SAR (measured) = 0.240 mW/g

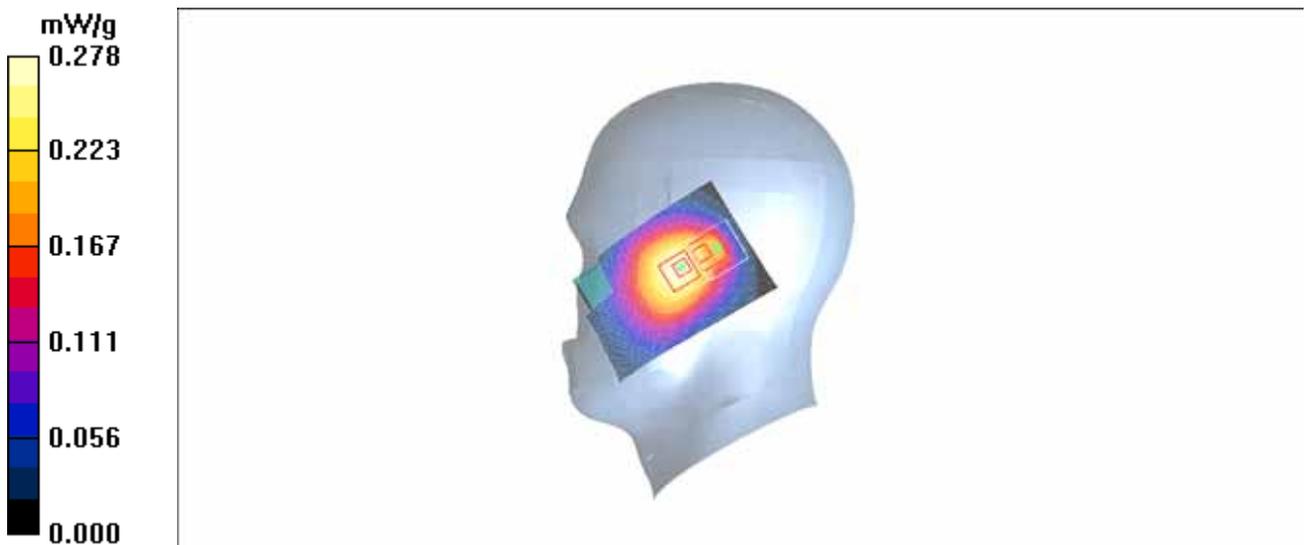


Fig. 34 BC10 CH684

BC10 Right Tilt Middle

Date/Time: 2011-11-8 13:39:31

Electronics: DAE4 Sn771

Medium: Head 835 MHz

Medium parameters used (interpolated): $f = 820.5$ MHz; $\sigma = 0.871$ mho/m; $\epsilon_r = 41.3$; $\rho = 1000$ kg/m³

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

Communication System: BC10 Frequency: 820.5 MHz Duty Cycle: 1:1

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

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

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

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

Reference Value = 14.0 V/m; Power Drift = 0.129 dB

Peak SAR (extrapolated) = 0.355 W/kg

SAR(1 g) = 0.291 mW/g; SAR(10 g) = 0.225 mW/g

Maximum value of SAR (measured) = 0.305 mW/g

Tilt Middle/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 14.0 V/m; Power Drift = 0.129 dB

Peak SAR (extrapolated) = 0.323 W/kg

SAR(1 g) = 0.231 mW/g; SAR(10 g) = 0.154 mW/g

Maximum value of SAR (measured) = 0.271 mW/g

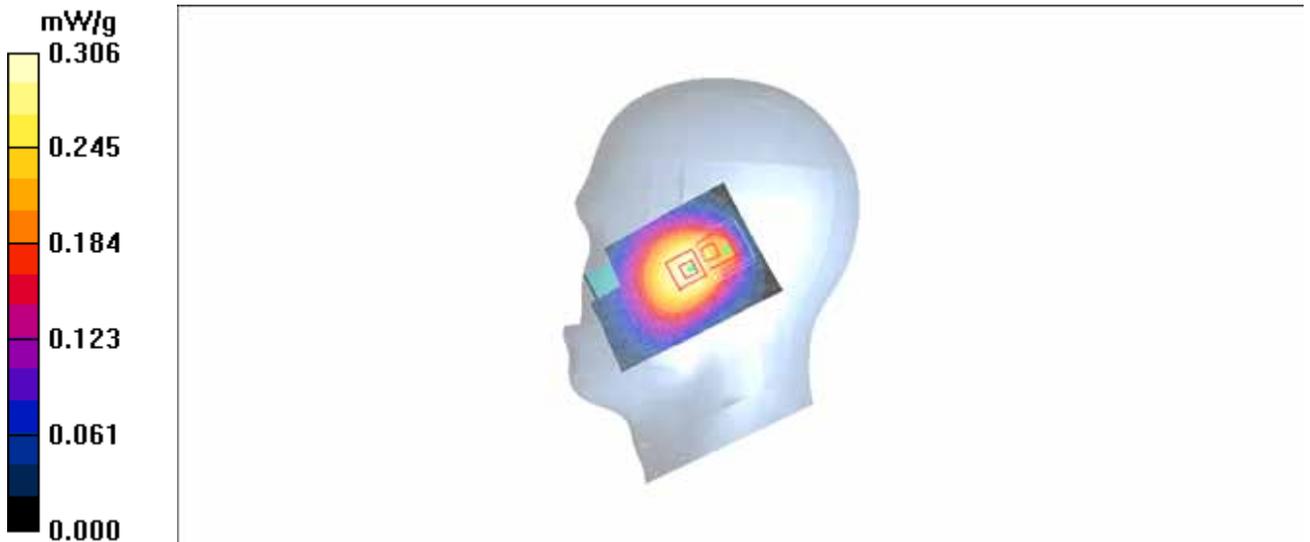


Fig. 35 BC10 CH580

BC10 Right Tilt Low

Date/Time: 2011-11-8 13:53:57

Electronics: DAE4 Sn771

Medium: Head 835 MHz

Medium parameters used (interpolated): $f = 817.9$ MHz; $\sigma = 0.868$ mho/m; $\epsilon_r = 41.3$; $\rho = 1000$ kg/m³

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

Communication System: BC10 Frequency: 817 MHz Duty Cycle: 1:1

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

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

Maximum value of SAR (interpolated) = 0.246 mW/g

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

Reference Value = 12.5 V/m; Power Drift = 0.171 dB

Peak SAR (extrapolated) = 0.287 W/kg

SAR(1 g) = 0.235 mW/g; SAR(10 g) = 0.181 mW/g

Maximum value of SAR (measured) = 0.248 mW/g

Tilt Low/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.5 V/m; Power Drift = 0.171 dB

Peak SAR (extrapolated) = 0.256 W/kg

SAR(1 g) = 0.187 mW/g; SAR(10 g) = 0.125 mW/g

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

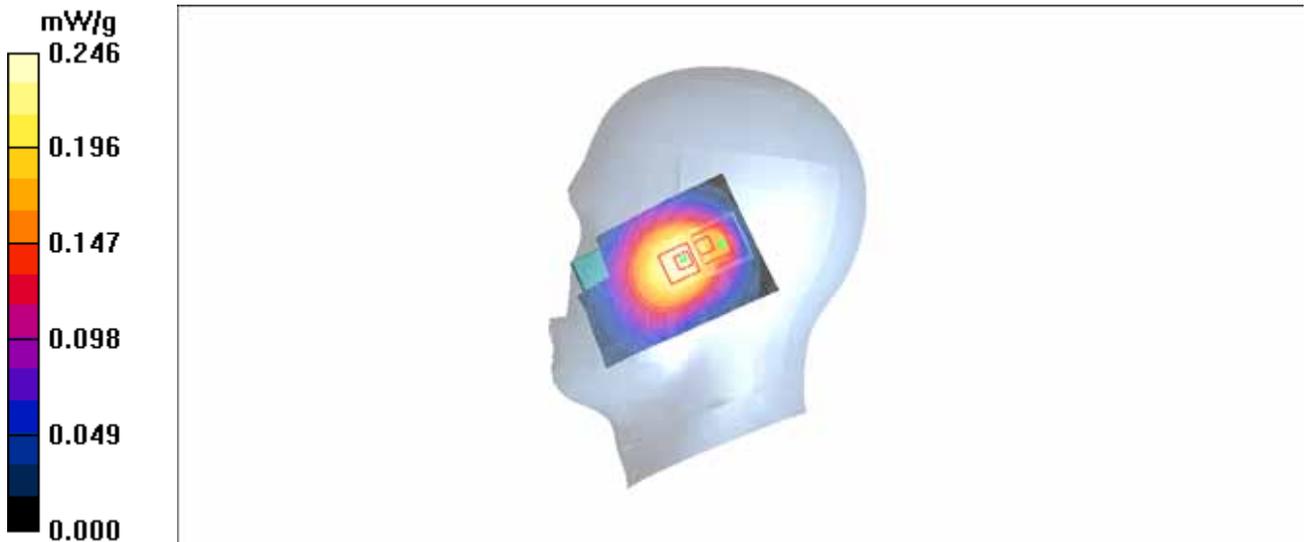


Fig. 36 BC10 CH476

835 Body Towards Ground High

Date/Time: 2011-11-8 15:12:37

Electronics: DAE4 Sn771

Medium: Body 835 MHz

Medium parameters used (interpolated): $f = 848.31$ MHz; $\sigma = 0.96$ mho/m; $\epsilon_r = 53.5$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 835 Frequency: 848.31 MHz Duty Cycle: 1:1

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

Toward Ground High/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.19 mW/g

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

Reference Value = 32.8 V/m; Power Drift = -0.100 dB

Peak SAR (extrapolated) = 1.49 W/kg

SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.796 mW/g

Maximum value of SAR (measured) = 1.19 mW/g

Toward Ground High/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 32.8 V/m; Power Drift = -0.100 dB

Peak SAR (extrapolated) = 1.39 W/kg

SAR(1 g) = 0.949 mW/g; SAR(10 g) = 0.613 mW/g

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

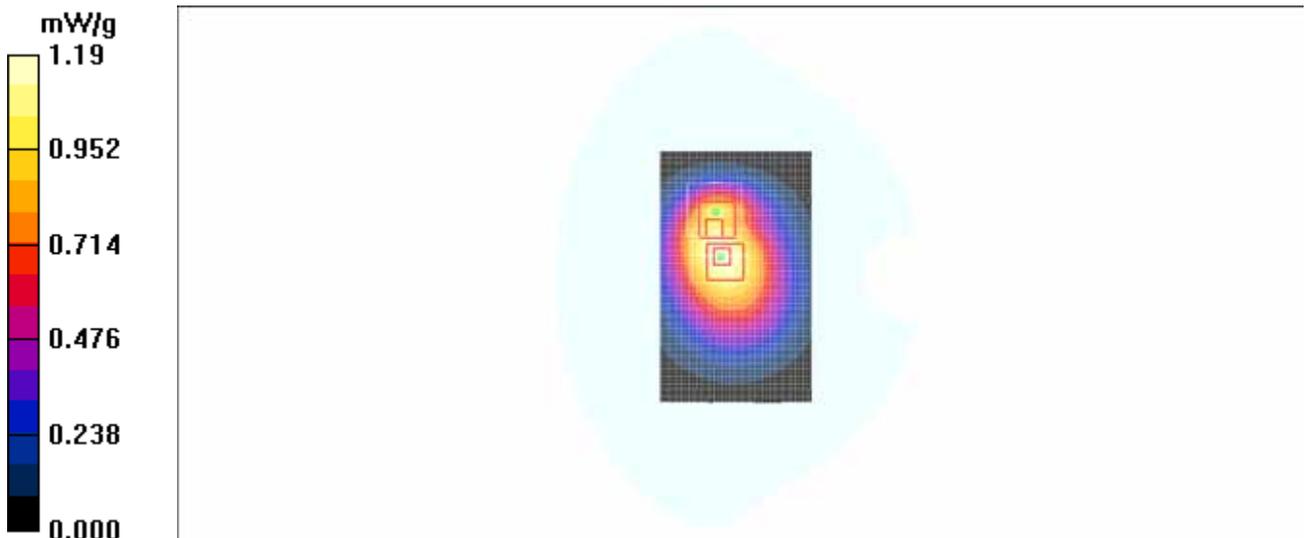


Fig. 37 835MHz CH777

835 Body Towards Ground Middle

Date/Time: 2011-11-8 14:57:11

Electronics: DAE4 Sn771

Medium: Body 835 MHz

Medium parameters used (interpolated): $f = 836.52$ MHz; $\sigma = 0.95$ mho/m; $\epsilon_r = 54.2$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 835 Frequency: 836.52 MHz Duty Cycle: 1:1

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

Toward Ground Middle/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.25 mW/g

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

Reference Value = 34.7 V/m; Power Drift = -0.102 dB

Peak SAR (extrapolated) = 1.51 W/kg

SAR(1 g) = 1.16 mW/g; SAR(10 g) = 0.829 mW/g

Maximum value of SAR (measured) = 1.24 mW/g

Toward Ground Middle/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 34.7 V/m; Power Drift = -0.102 dB

Peak SAR (extrapolated) = 1.55 W/kg

SAR(1 g) = 0.991 mW/g; SAR(10 g) = 0.655 mW/g

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



Fig. 38 835 MHz CH384

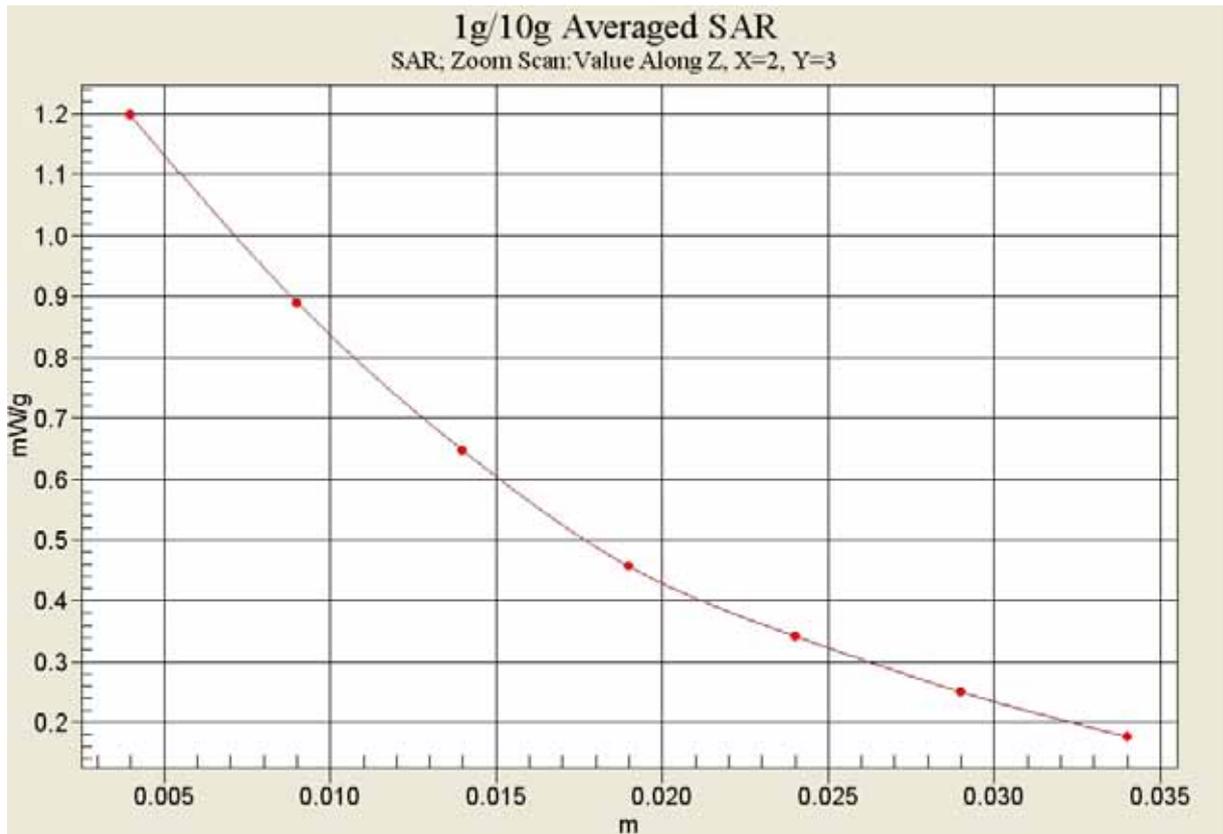


Fig. 38-1 Z-Scan at power reference point (835 MHz CH384)

835 Body Towards Ground Low

Date/Time: 2011-11-8 15:27:58

Electronics: DAE4 Sn771

Medium: Body 835 MHz

Medium parameters used: $f = 824.7$ MHz; $\sigma = 0.94$ mho/m; $\epsilon_r = 54.3$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 835 Frequency: 824.7 MHz Duty Cycle: 1:1

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

Toward Ground Low/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

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

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

Reference Value = 31.2 V/m; Power Drift = 0.049 dB

Peak SAR (extrapolated) = 1.40 W/kg

SAR(1 g) = 1.04 mW/g; SAR(10 g) = 0.741 mW/g

Maximum value of SAR (measured) = 1.12 mW/g

Toward Ground Low/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 31.2 V/m; Power Drift = 0.049 dB

Peak SAR (extrapolated) = 1.34 W/kg

SAR(1 g) = 0.912 mW/g; SAR(10 g) = 0.597 mW/g

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

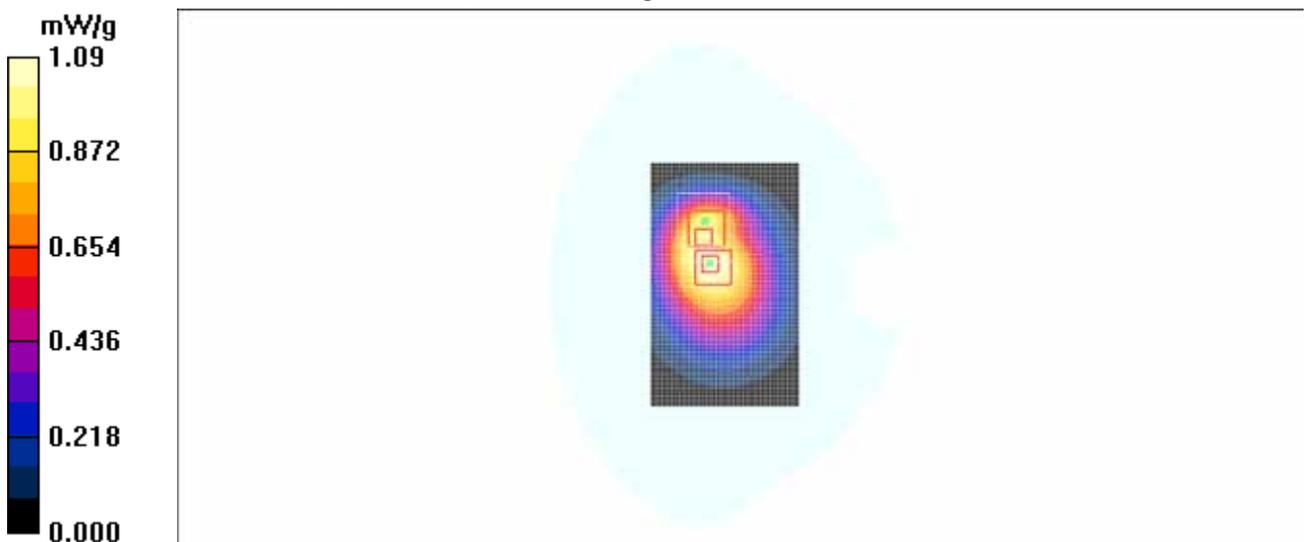


Fig. 39 835 MHz CH1013

835 Body Towards Phantom Middle

Date/Time: 2011-11-8 15:43:36

Electronics: DAE4 Sn771

Medium: Body 835 MHz

Medium parameters used (interpolated): $f = 836.52$ MHz; $\sigma = 0.95$ mho/m; $\epsilon_r = 54.2$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 835 Frequency: 836.52 MHz Duty Cycle: 1:1

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

Toward Phantom Middle/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.870 mW/g

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

Reference Value = 26.5 V/m; Power Drift = -0.135 dB

Peak SAR (extrapolated) = 1.05 W/kg

SAR(1 g) = 0.769 mW/g; SAR(10 g) = 0.547 mW/g

Maximum value of SAR (measured) = 0.819 mW/g

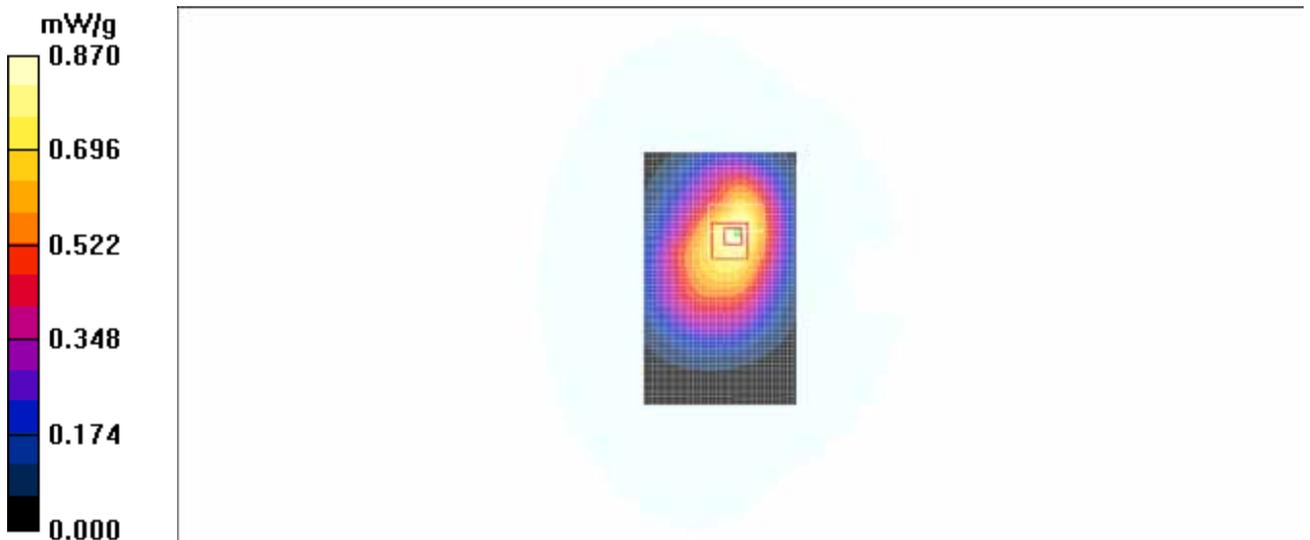


Fig. 40 835 MHz CH384

835 Body Left Side Middle

Date/Time: 2011-11-8 16:00:05

Electronics: DAE4 Sn771

Medium: Body 835 MHz

Medium parameters used (interpolated): $f = 836.52$ MHz; $\sigma = 0.95$ mho/m; $\epsilon_r = 54.2$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 835 Frequency: 824.7 MHz Duty Cycle: 1:1

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

Left Side Middle/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.712 mW/g

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

Reference Value = 23.2 V/m; Power Drift = -0.127 dB

Peak SAR (extrapolated) = 0.912 W/kg

SAR(1 g) = 0.641 mW/g; SAR(10 g) = 0.440 mW/g

Maximum value of SAR (measured) = 0.695 mW/g

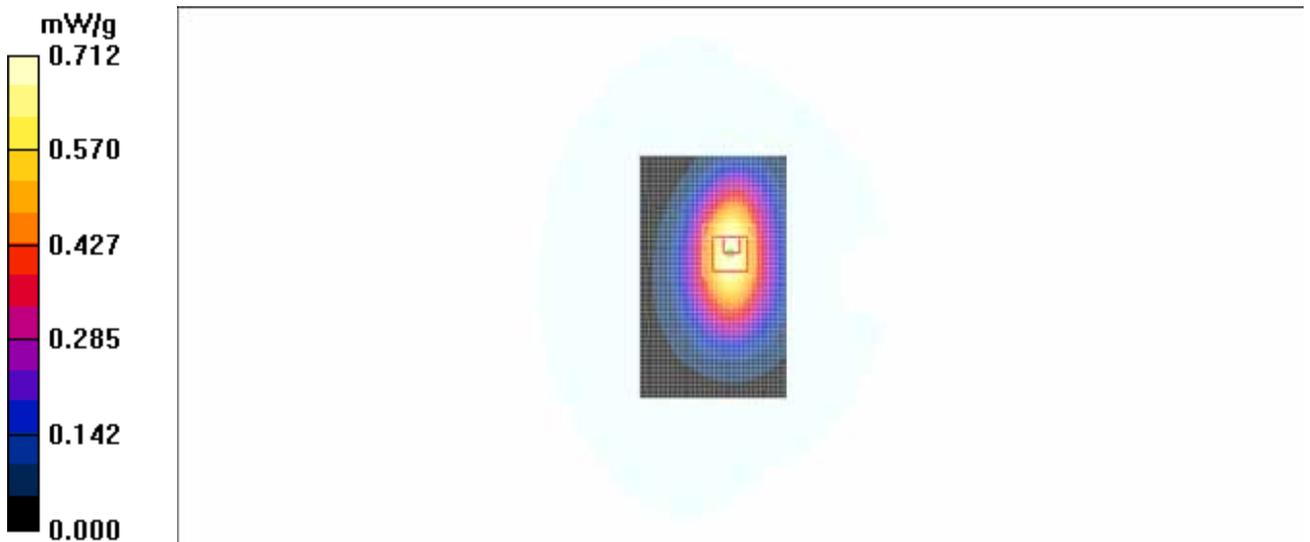


Fig. 41 835 MHz CH384

835 Body Right Side Middle

Date/Time: 2011-11-8 16:16:14

Electronics: DAE4 Sn771

Medium: Body 835 MHz

Medium parameters used (interpolated): $f = 836.52$ MHz; $\sigma = 0.95$ mho/m; $\epsilon_r = 54.2$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 835 Frequency: 824.7 MHz Duty Cycle: 1:1

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

Right Side Middle/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.725 mW/g

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

Reference Value = 27.0 V/m; Power Drift = -0.158 dB

Peak SAR (extrapolated) = 0.947 W/kg

SAR(1 g) = 0.668 mW/g; SAR(10 g) = 0.461 mW/g

Maximum value of SAR (measured) = 0.715 mW/g

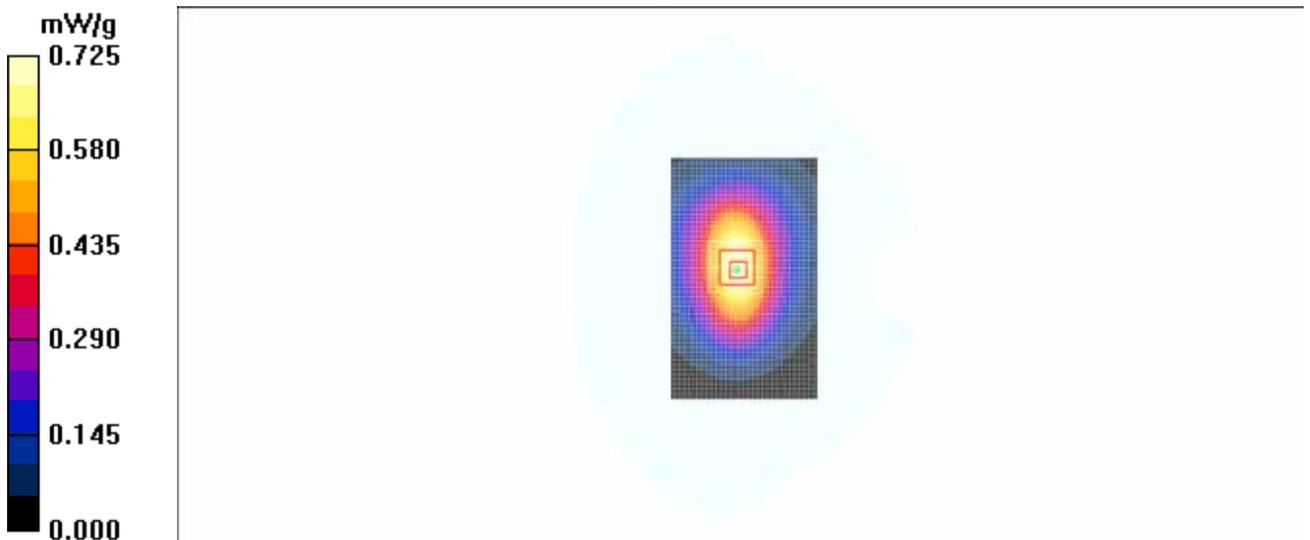


Fig. 42 835 MHz CH384

835 Body Bottom Side Middle

Date/Time: 2011-11-8 16:32:26

Electronics: DAE4 Sn771

Medium: Body 835 MHz

Medium parameters used (interpolated): $f = 836.52$ MHz; $\sigma = 0.95$ mho/m; $\epsilon_r = 54.2$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 835 Frequency: 824.7 MHz Duty Cycle: 1:1

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

Bottom Side Middle/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.082 mW/g

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

Reference Value = 7.94 V/m; Power Drift = 0.174 dB

Peak SAR (extrapolated) = 0.134 W/kg

SAR(1 g) = 0.077 mW/g; SAR(10 g) = 0.045 mW/g

Maximum value of SAR (measured) = 0.083 mW/g

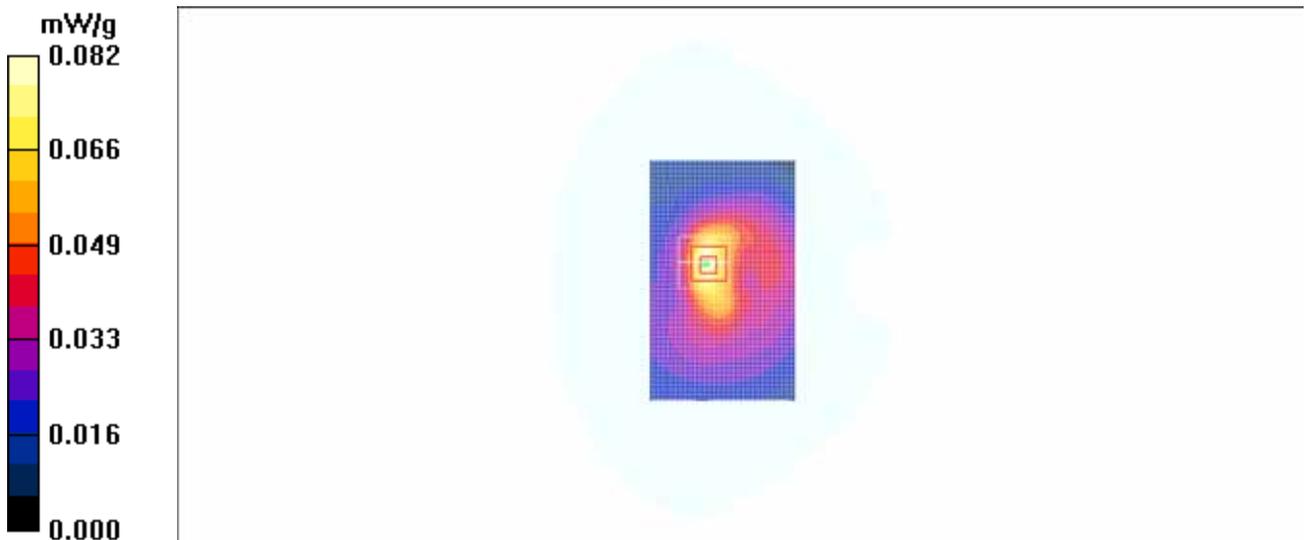


Fig. 43 835 MHz CH384

1900 Body Towards Ground High

Date/Time: 2011-11-9 13:47:33

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used: $f = 1908.75$ MHz; $\sigma = 1.54$ mho/m; $\epsilon_r = 52.85$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 1900MHz Frequency: 1908.75 MHz Duty Cycle: 1:1

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

Toward Ground High/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.961 mW/g

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

Reference Value = 11.1 V/m; Power Drift = 0.067 dB

Peak SAR (extrapolated) = 1.45 W/kg

SAR(1 g) = 0.842 mW/g; SAR(10 g) = 0.473 mW/g

Maximum value of SAR (measured) = 0.882 mW/g

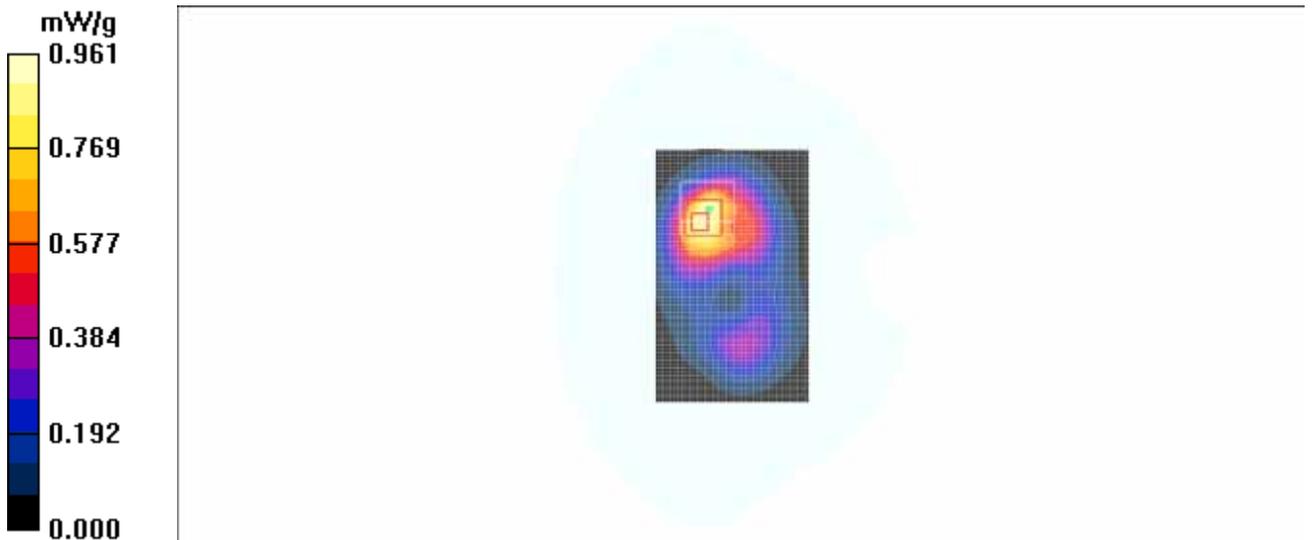


Fig. 44 1900 MHz CH1175

1900 Body Towards Ground Middle

Date/Time: 2011-11-9 14:02:58

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 53.5$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 1900MHz Frequency: 1880 MHz Duty Cycle: 1:1

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

Toward Ground Middle/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.31 mW/g

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

Reference Value = 12.3 V/m; Power Drift = -0.001 dB

Peak SAR (extrapolated) = 1.97 W/kg

SAR(1 g) = 1.13 mW/g; SAR(10 g) = 0.633 mW/g

Maximum value of SAR (measured) = 1.20 mW/g

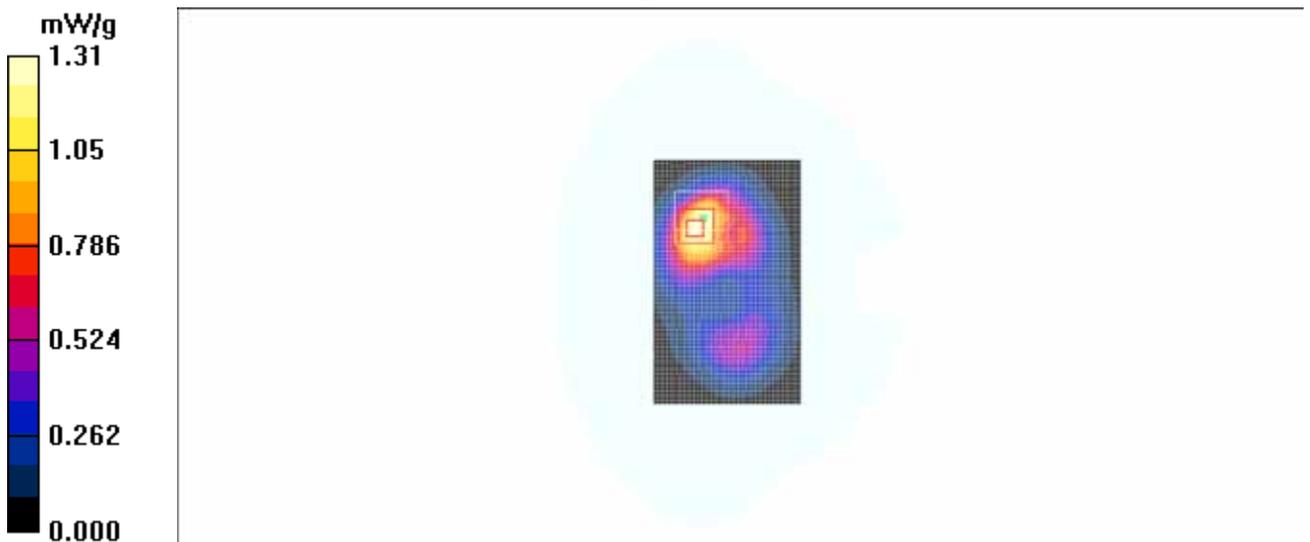


Fig. 45 1900 MHz CH600

1900 Body Towards Ground Low

Date/Time: 2011-11-9 13:32:02

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used (interpolated): $f = 1851.25$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 53.61$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 1900MHz Frequency: 1851.25 MHz Duty Cycle: 1:1

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

Toward Ground Low/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.35 mW/g

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

Reference Value = 13.1 V/m; Power Drift = 0.069 dB

Peak SAR (extrapolated) = 2.11 W/kg

SAR(1 g) = 1.19 mW/g; SAR(10 g) = 0.658 mW/g

Maximum value of SAR (measured) = 1.26 mW/g

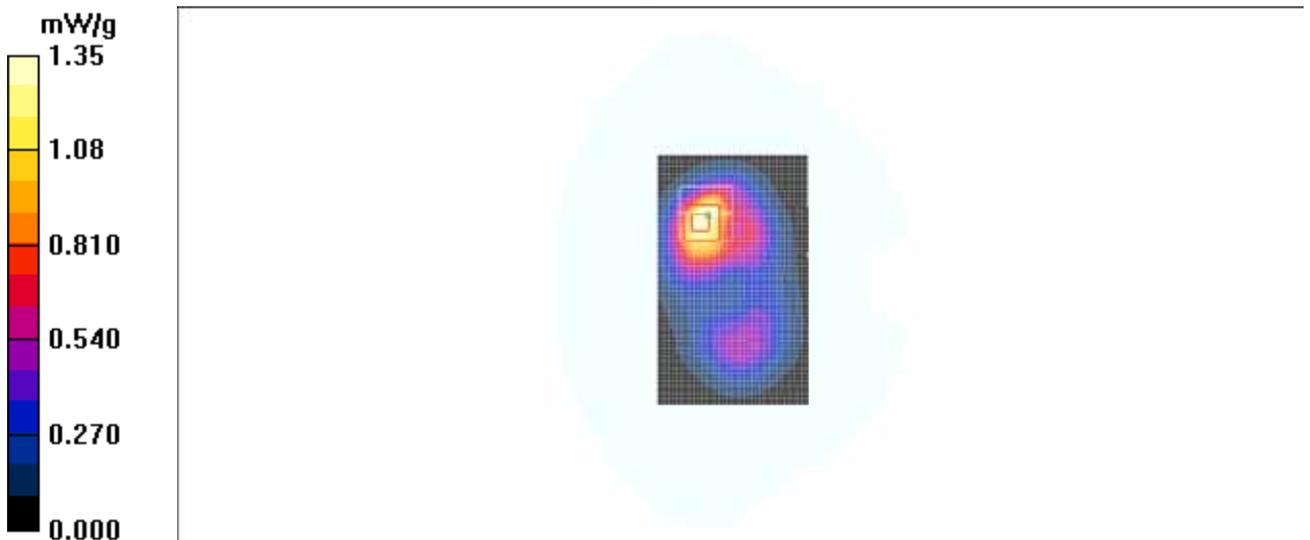


Fig. 46 1900 MHz CH25

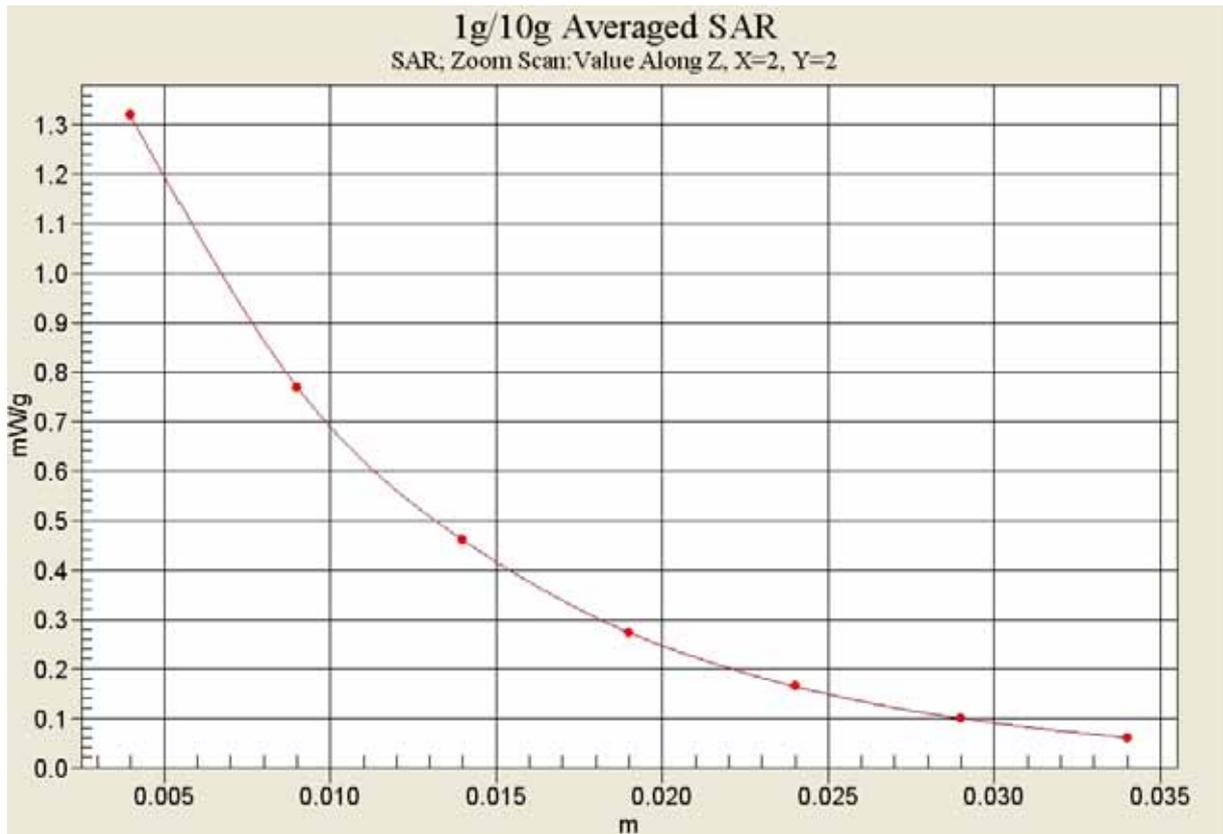


Fig. 46-1 Z-Scan at power reference point (1900 MHz CH25)

1900 Body Towards Phantom High

Date/Time: 2011-11-9 14:34:10

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used: $f = 1908.75$ MHz; $\sigma = 1.54$ mho/m; $\epsilon_r = 52.85$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 1900MHz Frequency: 1908.75 MHz Duty Cycle: 1:1

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

Toward Phantom High/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.807 mW/g

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

Reference Value = 9.10 V/m; Power Drift = -0.095 dB

Peak SAR (extrapolated) = 1.21 W/kg

SAR(1 g) = 0.723 mW/g; SAR(10 g) = 0.428 mW/g

Maximum value of SAR (measured) = 0.784 mW/g

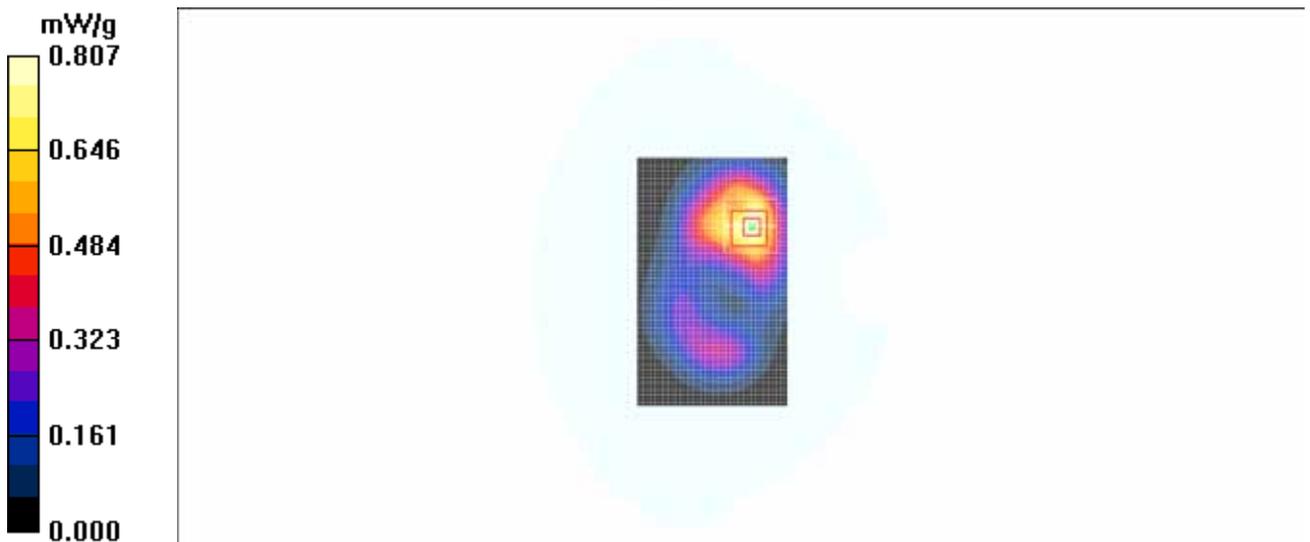


Fig. 47 1900 MHz CH1175

1900 Body Towards Phantom Middle

Date/Time: 2011-11-9 14:49:35

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 53.5$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 1900MHz Frequency: 1880 MHz Duty Cycle: 1:1

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

Toward Phantom Middle/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

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

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

Reference Value = 10.8 V/m; Power Drift = 0.011 dB

Peak SAR (extrapolated) = 1.63 W/kg

SAR(1 g) = 0.984 mW/g; SAR(10 g) = 0.583 mW/g

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



Fig. 48 1900 MHz CH600

1900 Body Towards Phantom Low

Date/Time: 2011-11-9 14:18:40

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used (interpolated): $f = 1851.25$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 53.61$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 1900MHz Frequency: 1851.25 MHz Duty Cycle: 1:1

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

Toward Phantom Low/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

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

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

Reference Value = 12.0 V/m; Power Drift = -0.123 dB

Peak SAR (extrapolated) = 1.64 W/kg

SAR(1 g) = 0.987 mW/g; SAR(10 g) = 0.584 mW/g

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

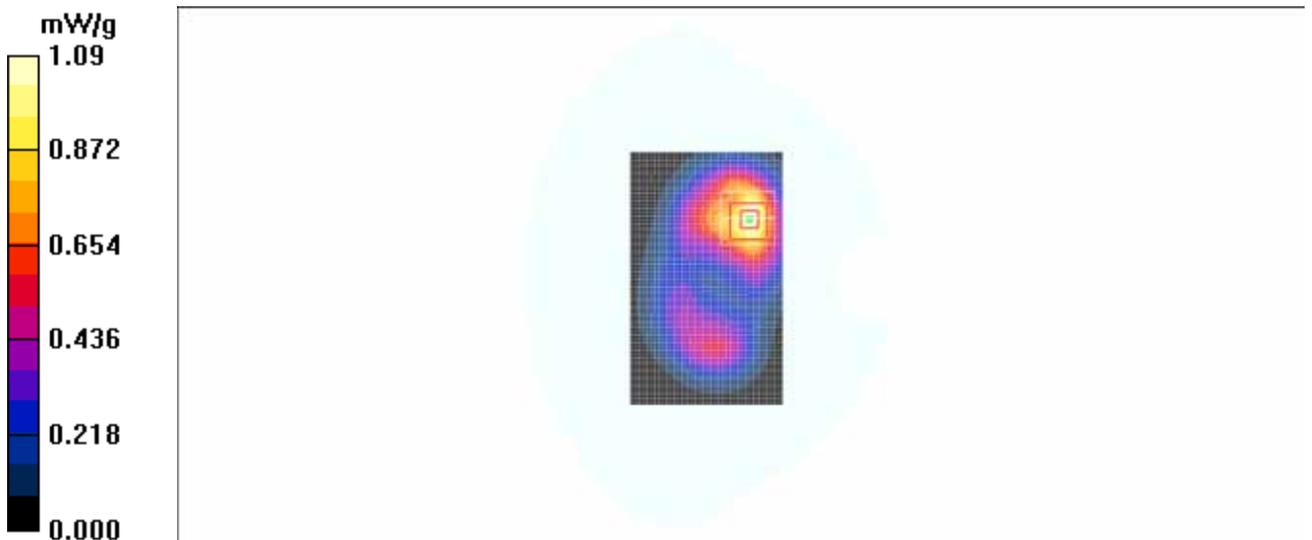


Fig. 49 1900 MHz CH25

1900 Body Left Side Low

Date/Time: 2011-11-9 15:05:14

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used (interpolated): $f = 1851.25$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 53.61$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 1900MHz Frequency: 1851.25 MHz Duty Cycle: 1:1

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

Left Side Low/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.456 mW/g

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

Reference Value = 15.2 V/m; Power Drift = 0.086 dB

Peak SAR (extrapolated) = 0.661 W/kg

SAR(1 g) = 0.400 mW/g; SAR(10 g) = 0.234 mW/g

Maximum value of SAR (measured) = 0.432 mW/g

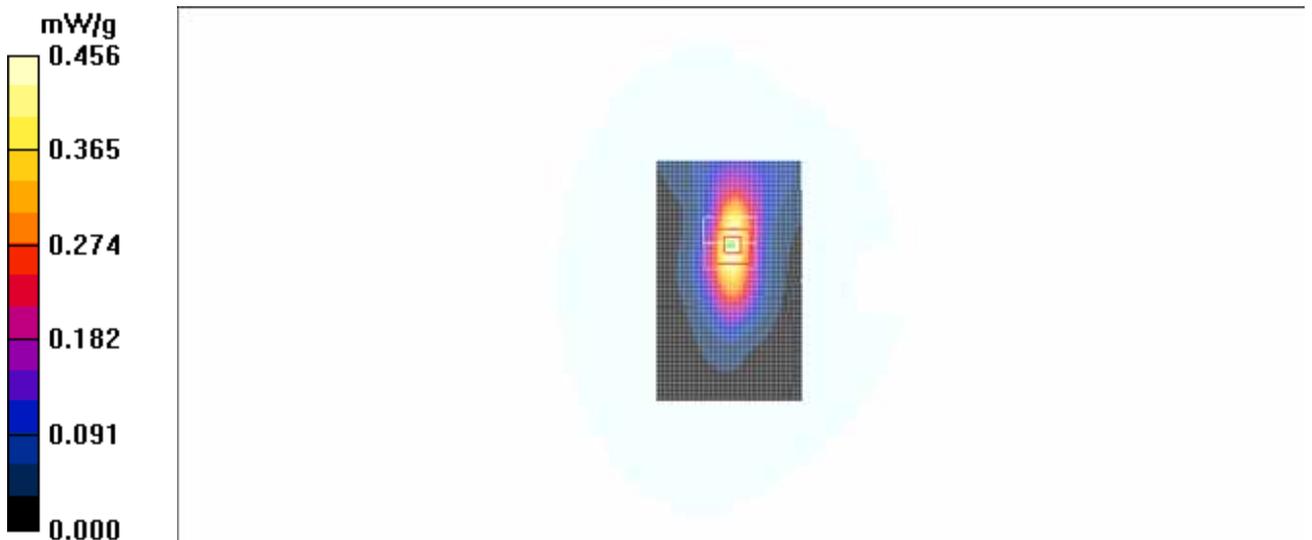


Fig. 50 1900 MHz CH25

1900 Body Right Side Low

Date/Time: 2011-11-9 15:21:05

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used (interpolated): $f = 1851.25$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 53.61$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 1900MHz Frequency: 1851.25 MHz Duty Cycle: 1:1

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

Right Side Low/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.288 mW/g

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

Reference Value = 13.0 V/m; Power Drift = -0.002 dB

Peak SAR (extrapolated) = 0.417 W/kg

SAR(1 g) = 0.258 mW/g; SAR(10 g) = 0.154 mW/g

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

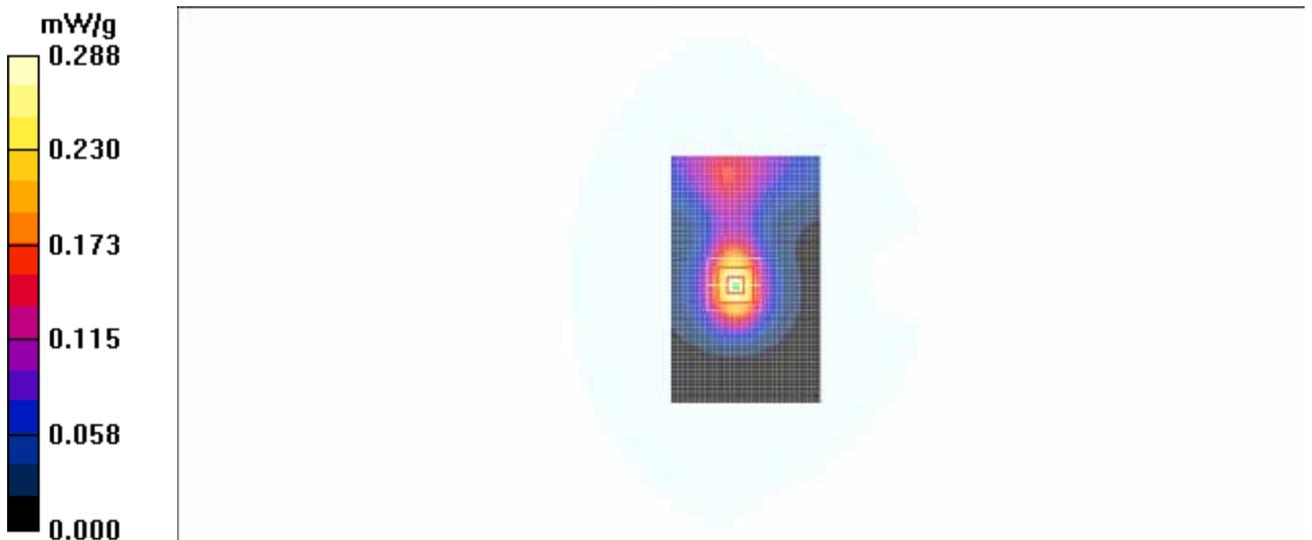


Fig. 51 1900 MHz CH25

1900 Body Bottom Side High

Date/Time: 2011-11-9 15:52:46

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used: $f = 1908.75$ MHz; $\sigma = 1.54$ mho/m; $\epsilon_r = 52.85$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 1900 Frequency: 1908.75 MHz Duty Cycle: 1:1

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

Bottom Side High/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.726 mW/g

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

Reference Value = 19.4 V/m; Power Drift = -0.098 dB

Peak SAR (extrapolated) = 1.13 W/kg

SAR(1 g) = 0.657 mW/g; SAR(10 g) = 0.365 mW/g

Maximum value of SAR (measured) = 0.731 mW/g

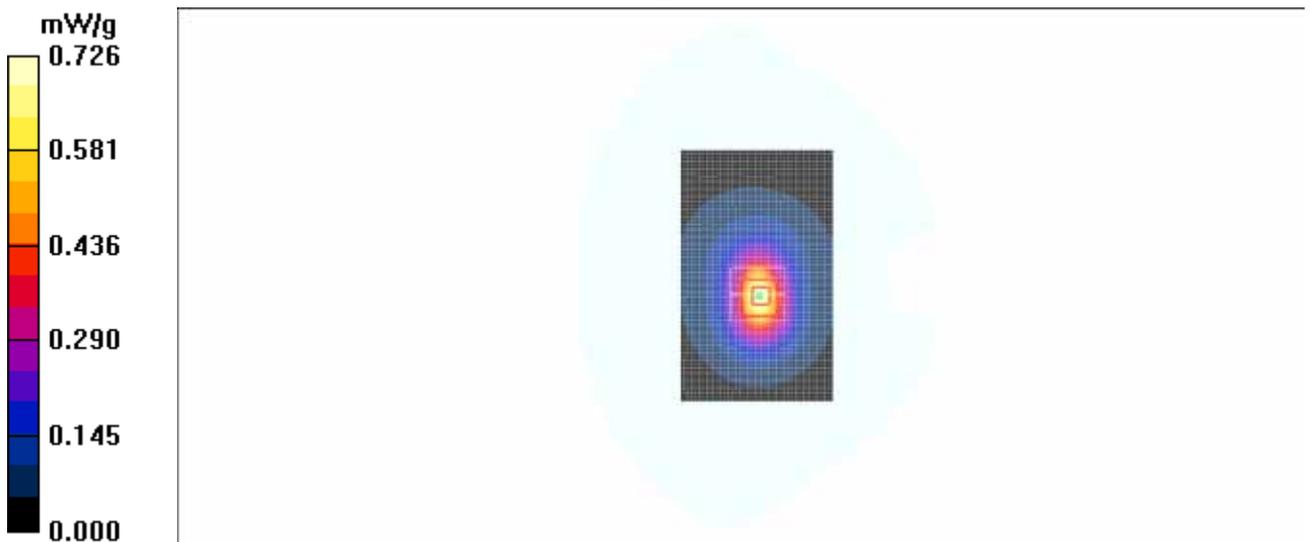


Fig. 52 1900 MHz CH1175

1900 Body Bottom Side Middle

Date/Time: 2011-11-9 16:09:30

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 53.5$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 1900MHz Frequency: 1880 MHz Duty Cycle: 1:1

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

Bottom Side Middle/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.03 mW/g

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

Reference Value = 23.4 V/m; Power Drift = 0.001 dB

Peak SAR (extrapolated) = 1.59 W/kg

SAR(1 g) = 0.950 mW/g; SAR(10 g) = 0.532 mW/g

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

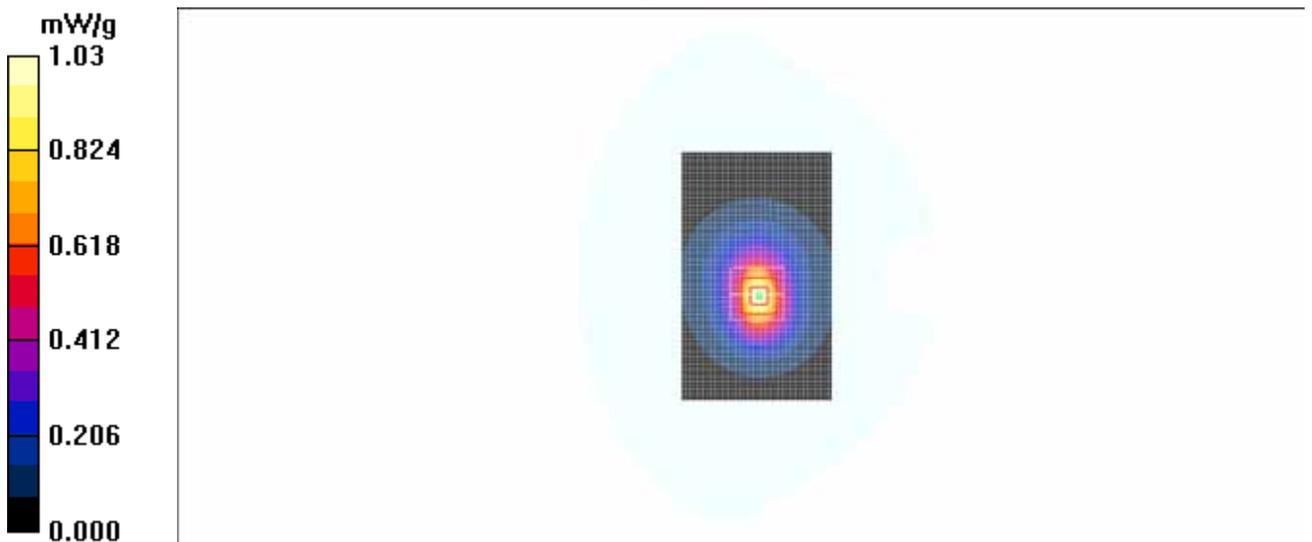


Fig. 53 1900 MHz CH600

1900 Body Bottom Side Low

Date/Time: 2011-11-9 15:37:22

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used (interpolated): $f = 1851.25$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 53.61$; $\rho = 1000$ kg/m³

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

Communication System: CDMA 1900MHz Frequency: 1851.25 MHz Duty Cycle: 1:1

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

Bottom Side Low/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.964 mW/g

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

Reference Value = 22.7 V/m; Power Drift = -0.019 dB

Peak SAR (extrapolated) = 1.48 W/kg

SAR(1 g) = 0.885 mW/g; SAR(10 g) = 0.496 mW/g

Maximum value of SAR (measured) = 0.992 mW/g

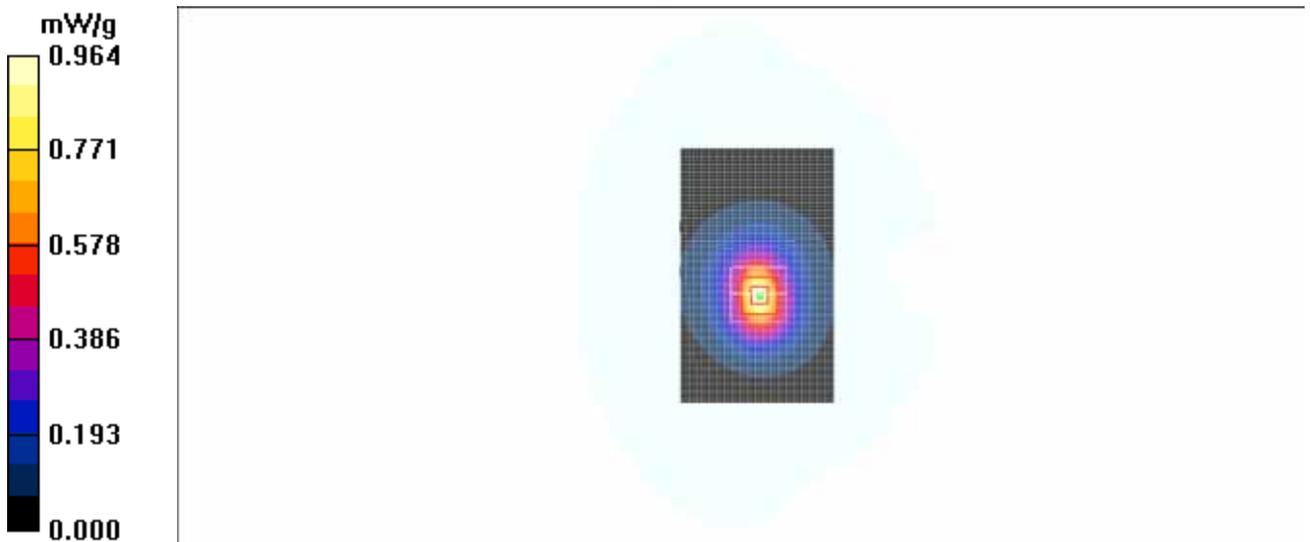


Fig. 54 1900 MHz CH25

BC10 Body Towards Ground High

Date/Time: 2011-11-8 17:09:37

Electronics: DAE4 Sn771

Medium: Body 835 MHz

Medium parameters used (interpolated): $f = 823.1$ MHz; $\sigma = 0.942$ mho/m; $\epsilon_r = 54.3$; $\rho = 1000$ kg/m³

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

Communication System: BC10 Frequency: 823.975 MHz Duty Cycle: 1:1

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

Toward Ground High/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.22 mW/g

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

Reference Value = 30.7 V/m; Power Drift = -0.062 dB

Peak SAR (extrapolated) = 1.52 W/kg

SAR(1 g) = 1.09 mW/g; SAR(10 g) = 0.779 mW/g

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

Toward Ground High/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 30.7 V/m; Power Drift = -0.062 dB

Peak SAR (extrapolated) = 1.43 W/kg

SAR(1 g) = 0.917 mW/g; SAR(10 g) = 0.608 mW/g

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

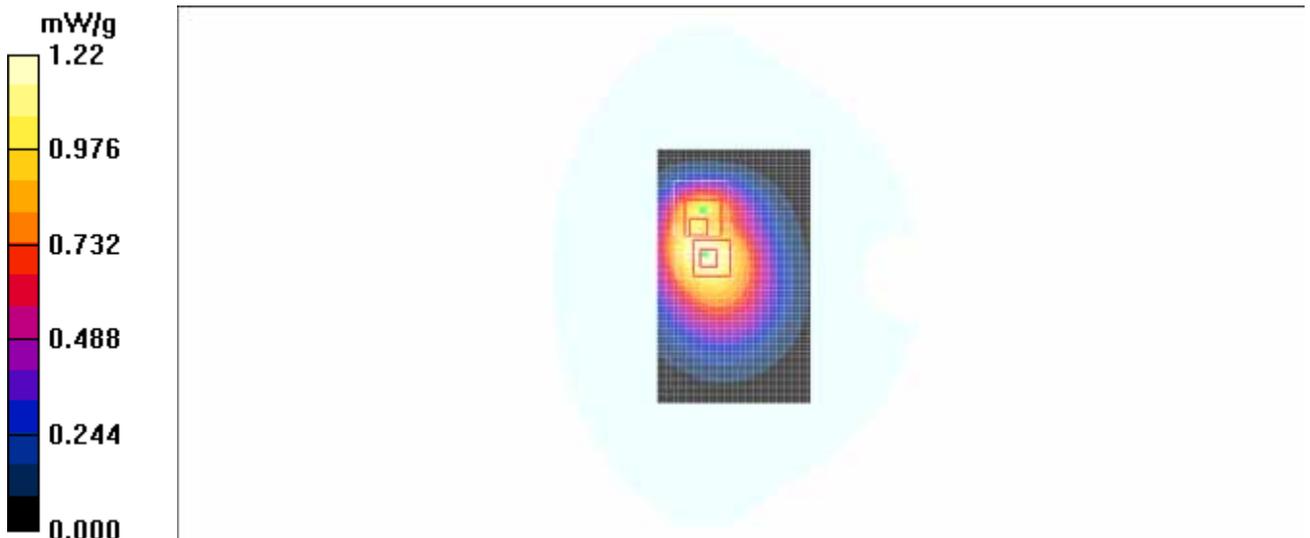


Fig. 55 BC10 CH684

BC10 Body Towards Ground Middle

Date/Time: 2011-11-8 16:54:13

Electronics: DAE4 Sn771

Medium: Body 835 MHz

Medium parameters used (interpolated): $f = 820.5$ MHz; $\sigma = 0.938$ mho/m; $\epsilon_r = 54.4$; $\rho = 1000$ kg/m³

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

Communication System: BC10 Frequency: 820.5 MHz Duty Cycle: 1:1

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

Toward Ground Middle/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.21 mW/g

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

Reference Value = 33.1 V/m; Power Drift = -0.027 dB

Peak SAR (extrapolated) = 1.50 W/kg

SAR(1 g) = 1.13 mW/g; SAR(10 g) = 0.817 mW/g

Maximum value of SAR (measured) = 1.20 mW/g

Toward Ground Middle/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 33.1 V/m; Power Drift = -0.027 dB

Peak SAR (extrapolated) = 1.48 W/kg

SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.664 mW/g

Maximum value of SAR (measured) = 1.12 mW/g

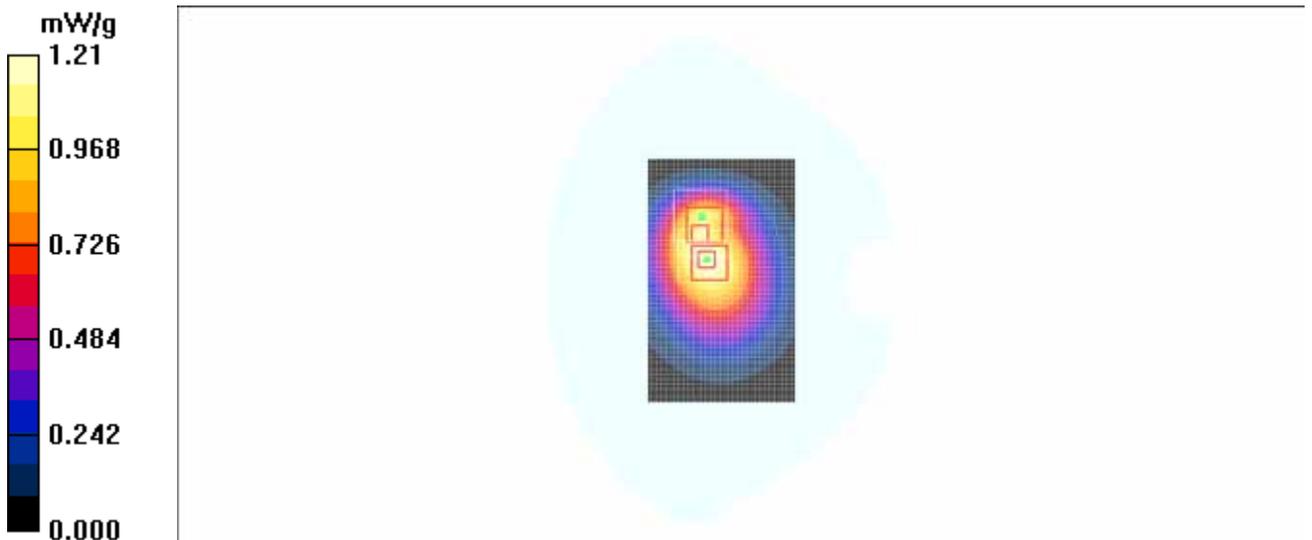


Fig. 56 BC10 CH580

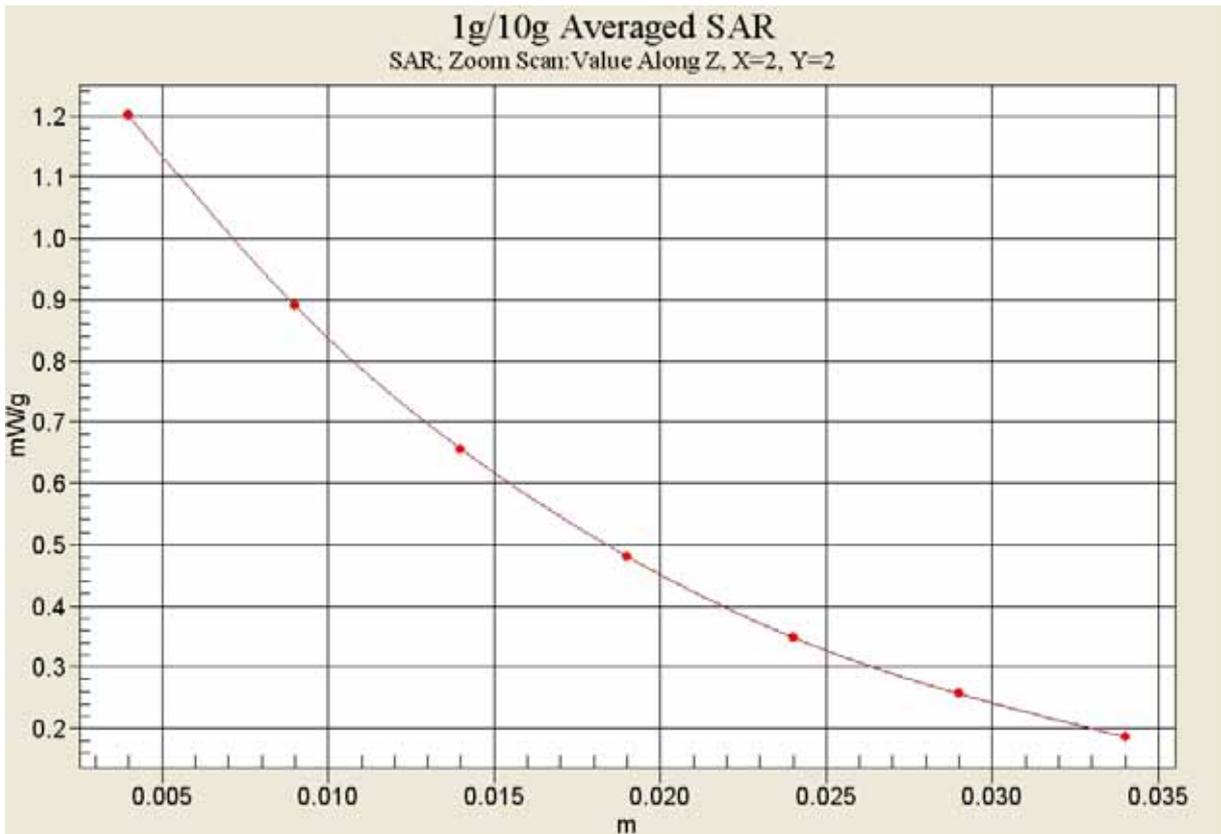


Fig. 56-1 Z-Scan at power reference point (BC10 CH580)

BC10 Body Towards Ground Low

Date/Time: 2011-11-8 17:24:57

Electronics: DAE4 Sn771

Medium: Body 835 MHz

Medium parameters used (interpolated): $f = 817.9$ MHz; $\sigma = 0.934$ mho/m; $\epsilon_r = 54.4$; $\rho = 1000$ kg/m³

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

Communication System: BC10 Frequency: 817 MHz Duty Cycle: 1:1

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

Toward Ground Low/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.991 mW/g

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

Reference Value = 28.4 V/m; Power Drift = 0.048 dB

Peak SAR (extrapolated) = 1.25 W/kg

SAR(1 g) = 0.942 mW/g; SAR(10 g) = 0.675 mW/g

Maximum value of SAR (measured) = 0.999 mW/g

Toward Ground Low/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 28.4 V/m; Power Drift = 0.048 dB

Peak SAR (extrapolated) = 1.23 W/kg

SAR(1 g) = 0.830 mW/g; SAR(10 g) = 0.548 mW/g

Maximum value of SAR (measured) = 0.917 mW/g

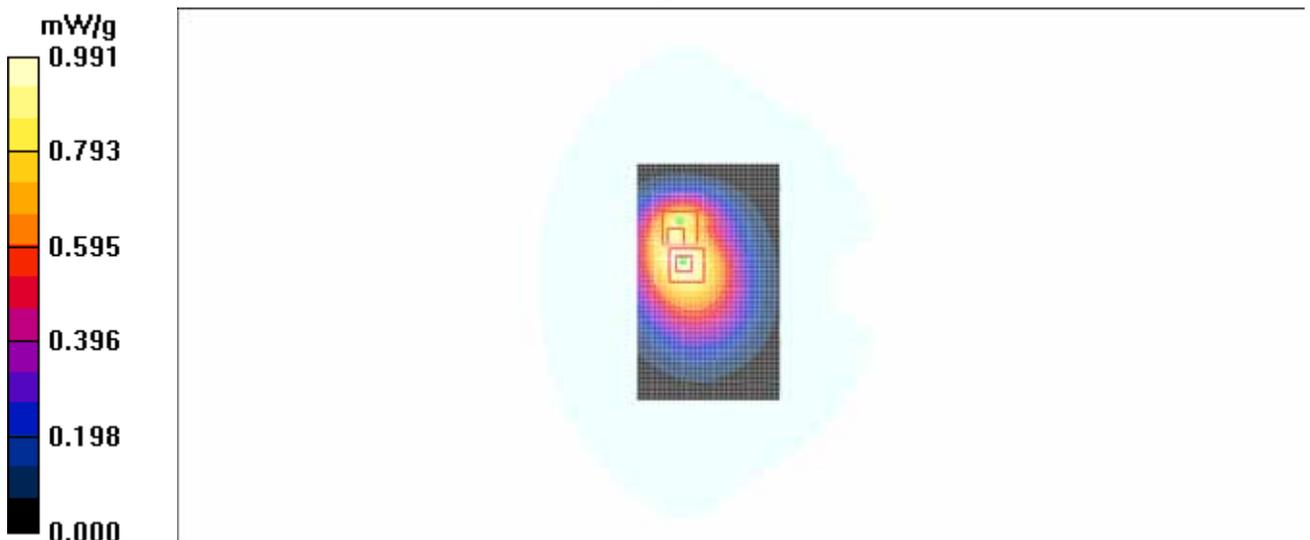


Fig. 57 BC10 CH476

BC10 Body Towards Phantom Middle

Date/Time: 2011-11-8 17:40:31

Electronics: DAE4 Sn771

Medium: Body 835 MHz

Medium parameters used (interpolated): $f = 820.5$ MHz; $\sigma = 0.938$ mho/m; $\epsilon_r = 54.4$; $\rho = 1000$ kg/m³

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

Communication System: BC10 Frequency: 820.5 MHz Duty Cycle: 1:1

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

Toward Phantom Middle/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.762 mW/g

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

Reference Value = 25.2 V/m; Power Drift = 0.075 dB

Peak SAR (extrapolated) = 1.00 W/kg

SAR(1 g) = 0.715 mW/g; SAR(10 g) = 0.507 mW/g

Maximum value of SAR (measured) = 0.761 mW/g

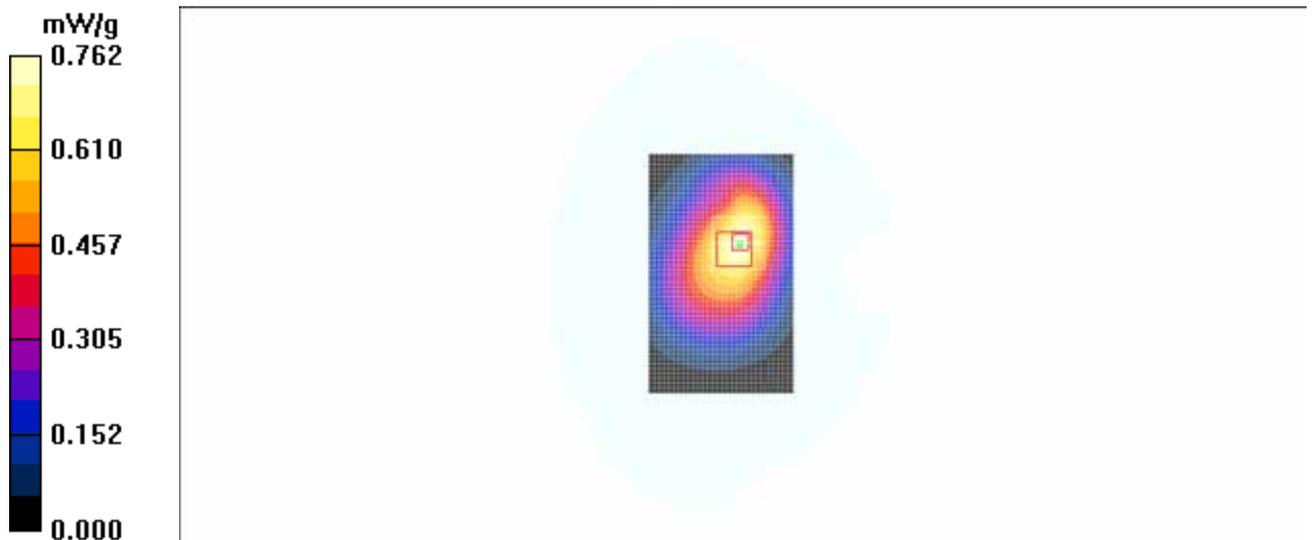


Fig. 58 BC10 CH580

BC10 Body Left Side Middle

Date/Time: 2011-11-8 17:56:42

Electronics: DAE4 Sn771

Medium: Body 835 MHz

Medium parameters used (interpolated): $f = 820.5$ MHz; $\sigma = 0.938$ mho/m; $\epsilon_r = 54.4$; $\rho = 1000$ kg/m³

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

Communication System: BC10 Frequency: 820.5 MHz Duty Cycle: 1:1

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

Left Side Middle/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.604 mW/g

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

Reference Value = 21.2 V/m; Power Drift = 0.003 dB

Peak SAR (extrapolated) = 0.806 W/kg

SAR(1 g) = 0.564 mW/g; SAR(10 g) = 0.379 mW/g

Maximum value of SAR (measured) = 0.604 mW/g

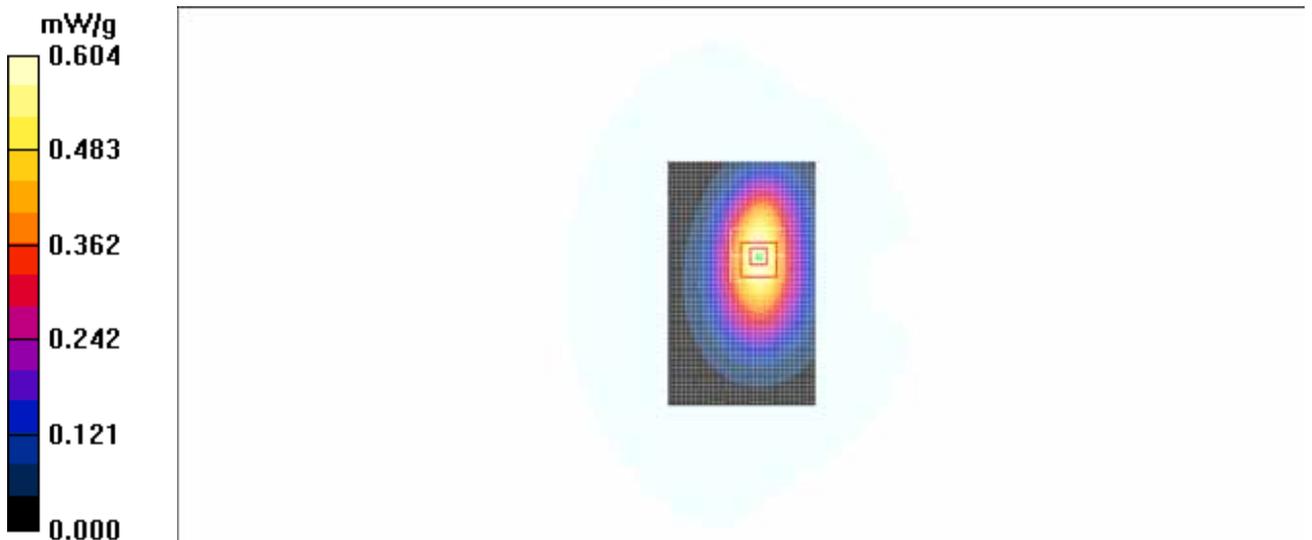


Fig. 59 BC10 CH580

BC10 Body Right Side Middle

Date/Time: 2011-11-8 18:12:55

Electronics: DAE4 Sn771

Medium: Body 835 MHz

Medium parameters used (interpolated): $f = 820.5$ MHz; $\sigma = 0.938$ mho/m; $\epsilon_r = 54.4$; $\rho = 1000$ kg/m³

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

Communication System: BC10 Frequency: 820.5 MHz Duty Cycle: 1:1

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

Right Side Middle/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.621 mW/g

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

Reference Value = 24.6 V/m; Power Drift = 0.109 dB

Peak SAR (extrapolated) = 0.798 W/kg

SAR(1 g) = 0.584 mW/g; SAR(10 g) = 0.406 mW/g

Maximum value of SAR (measured) = 0.625 mW/g

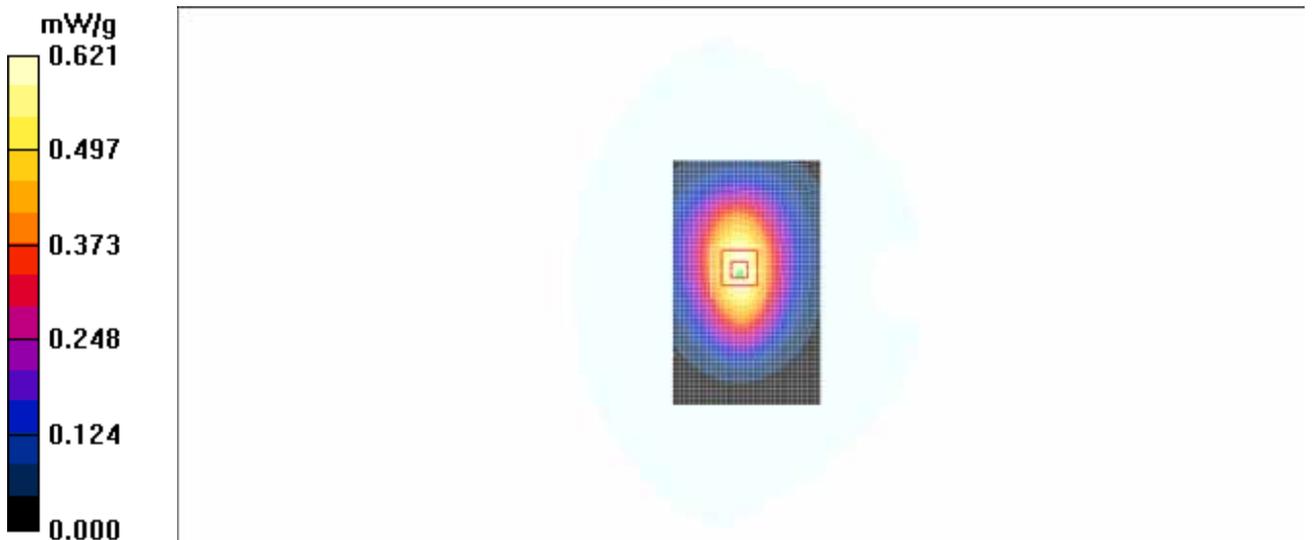


Fig. 60 BC10 CH580

BC10 Body Bottom Side Middle

Date/Time: 2011-11-8 18:29:12

Electronics: DAE4 Sn771

Medium: Body 835 MHz

Medium parameters used (interpolated): $f = 820.5$ MHz; $\sigma = 0.938$ mho/m; $\epsilon_r = 54.4$; $\rho = 1000$ kg/m³

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

Communication System: BC10 Frequency: 820.5 MHz Duty Cycle: 1:1

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

Bottom Side Middle/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.092 mW/g

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

Reference Value = 8.60 V/m; Power Drift = 0.045 dB

Peak SAR (extrapolated) = 0.149 W/kg

SAR(1 g) = 0.086 mW/g; SAR(10 g) = 0.052 mW/g

Maximum value of SAR (measured) = 0.092 mW/g

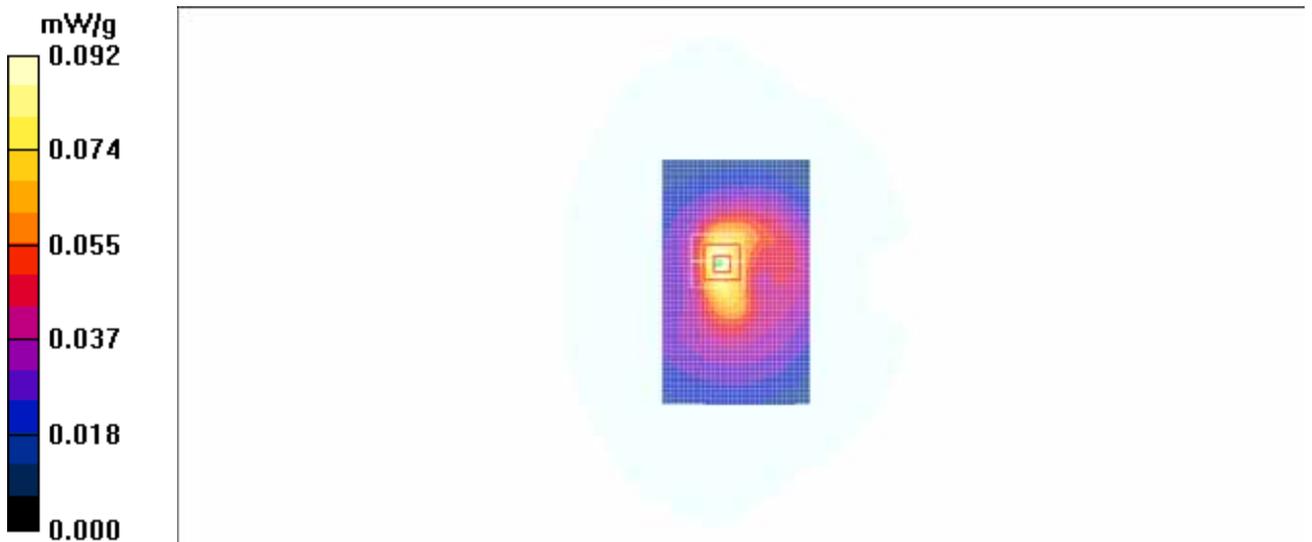


Fig. 61 BC10 CH580

WiFi 802.11b 1Mbps Left Cheek Channel 6

Date/Time: 2011-11-10 17:42:04

Electronics: DAE4 Sn771

Medium: Head 2450 MHz

Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 1.83$ mho/m; $\epsilon_r = 39.4$; $\rho = 1000$ kg/m³

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

Communication System: WLAN 2450 Frequency: 2437 MHz Duty Cycle: 1:1

Probe: ES3DV3 - SN3149 ConvF(4.35, 4.35, 4.35)

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

Maximum value of SAR (interpolated) = 0.040 mW/g

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

Reference Value = 1.85 V/m; Power Drift = -0.117 dB

Peak SAR (extrapolated) = 0.078 W/kg

SAR(1 g) = 0.038 mW/g; SAR(10 g) = 0.019 mW/g

Maximum value of SAR (measured) = 0.043 mW/g

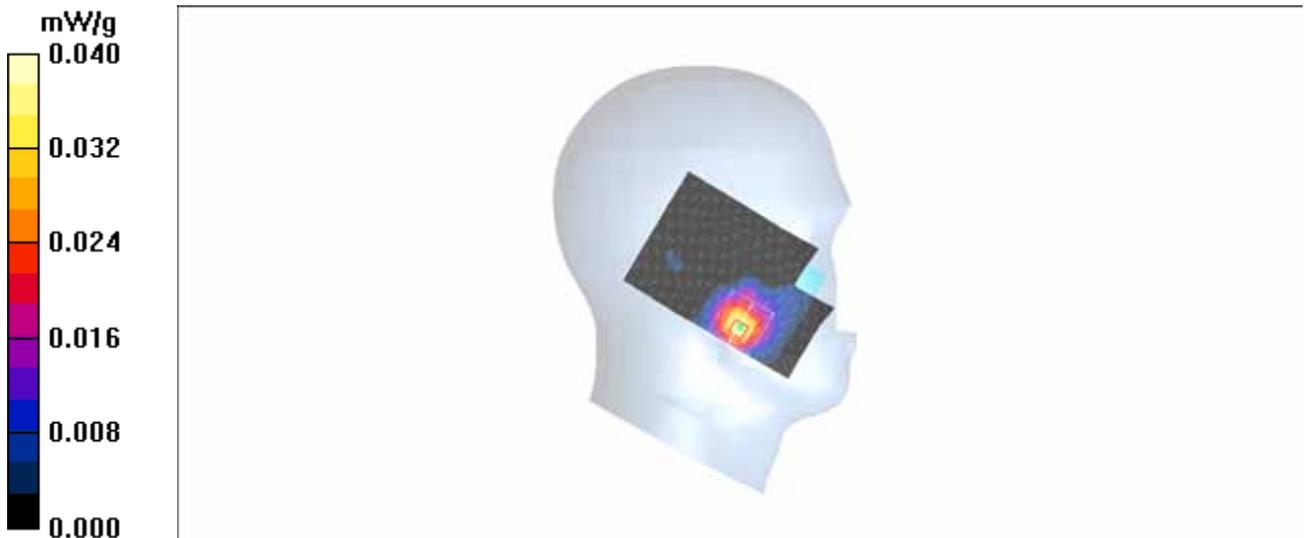


Fig.62 802.11b 1Mbps CH6

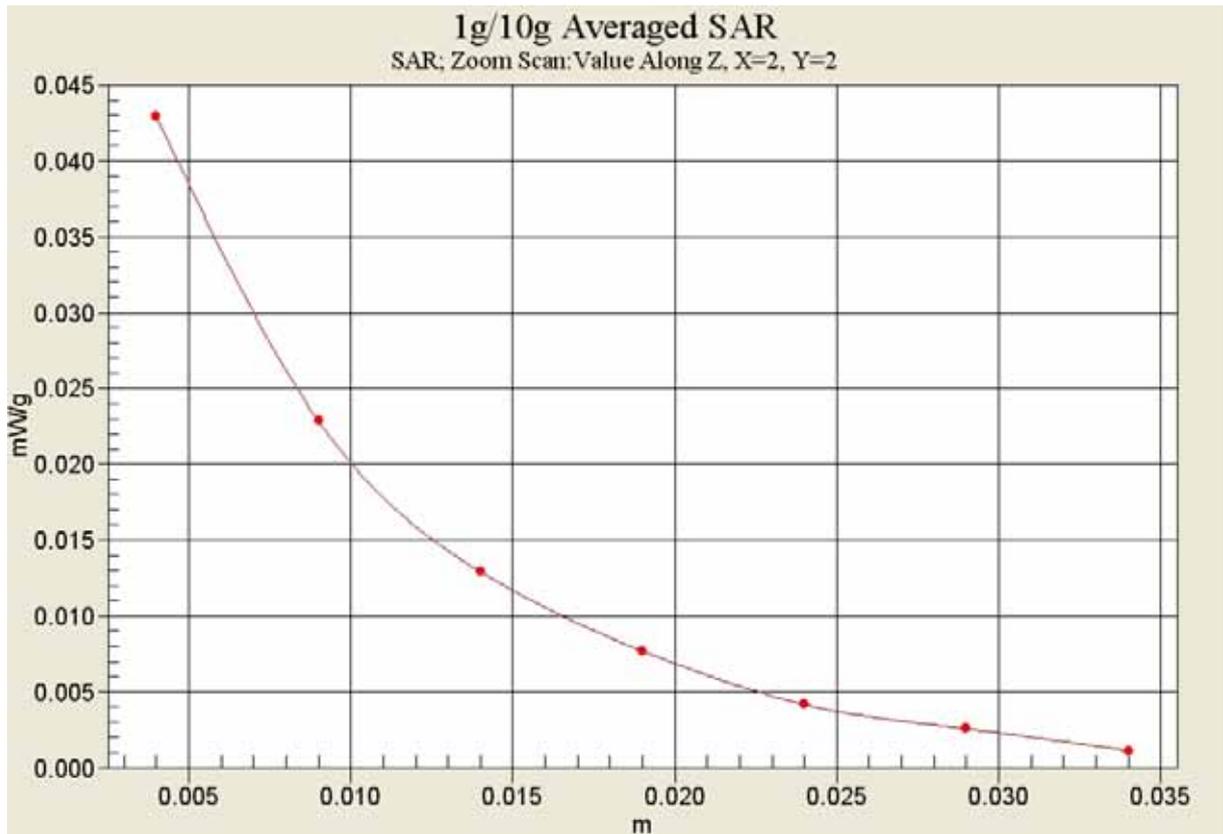


Fig. 62-1 Z-Scan at power reference point (802.11b 1Mbps CH6)

WiFi 802.11b 1Mbps Left Tilt Channel 6

Date/Time: 2011-11-10 17:56:29

Electronics: DAE4 Sn771

Medium: Head 2450 MHz

Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 1.83$ mho/m; $\epsilon_r = 39.4$; $\rho = 1000$ kg/m³

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

Communication System: WLAN 2450 Frequency: 2437 MHz Duty Cycle: 1:1

Probe: ES3DV3 - SN3149 ConvF(4.35, 4.35, 4.35)

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

Maximum value of SAR (interpolated) = 0.017 mW/g

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

Reference Value = 2.51 V/m; Power Drift = 0.135 dB

Peak SAR (extrapolated) = 0.019 W/kg

SAR(1 g) = 0.011 mW/g; SAR(10 g) = 0.00496 mW/g

Maximum value of SAR (measured) = 0.012 mW/g

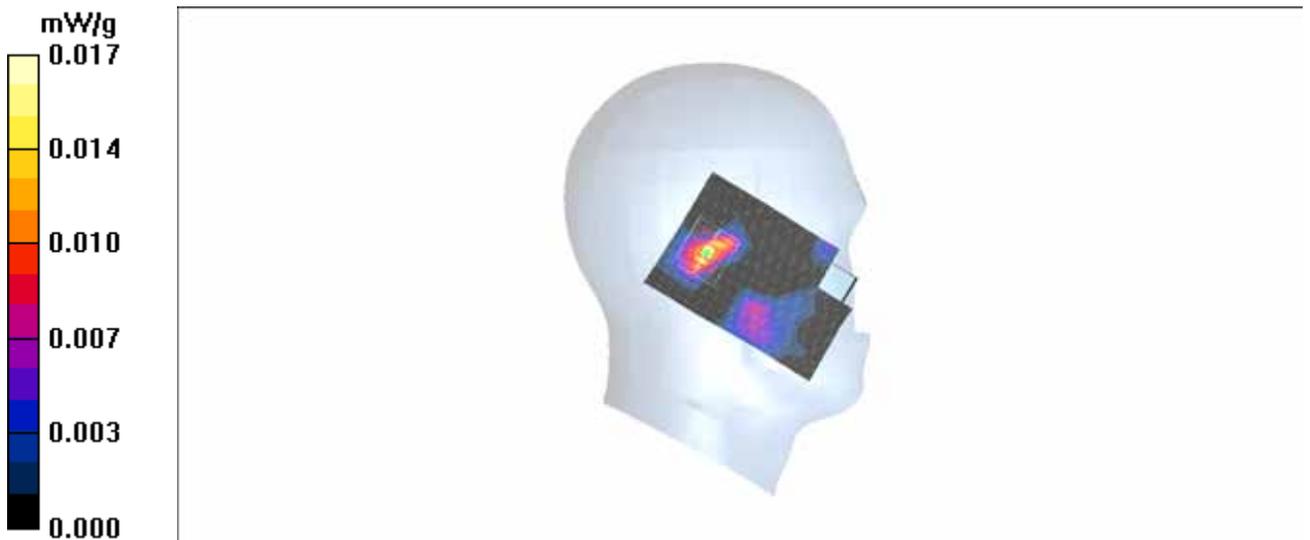


Fig.63 802.11b 1Mbps CH6

WiFi 802.11b 1Mbps Right Cheek Channel 6

Date/Time: 2011-11-10 18:11:46

Electronics: DAE4 Sn771

Medium: Head 2450 MHz

Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 1.83$ mho/m; $\epsilon_r = 39.4$; $\rho = 1000$ kg/m³

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

Communication System: WLAN 2450 Frequency: 2437 MHz Duty Cycle: 1:1

Probe: ES3DV3 - SN3149 ConvF(4.35, 4.35, 4.35)

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

Maximum value of SAR (interpolated) = 0.034 mW/g

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

Reference Value = 0.856 V/m; Power Drift = 0.151 dB

Peak SAR (extrapolated) = 0.064 W/kg

SAR(1 g) = 0.033 mW/g; SAR(10 g) = 0.019 mW/g

Maximum value of SAR (measured) = 0.035 mW/g

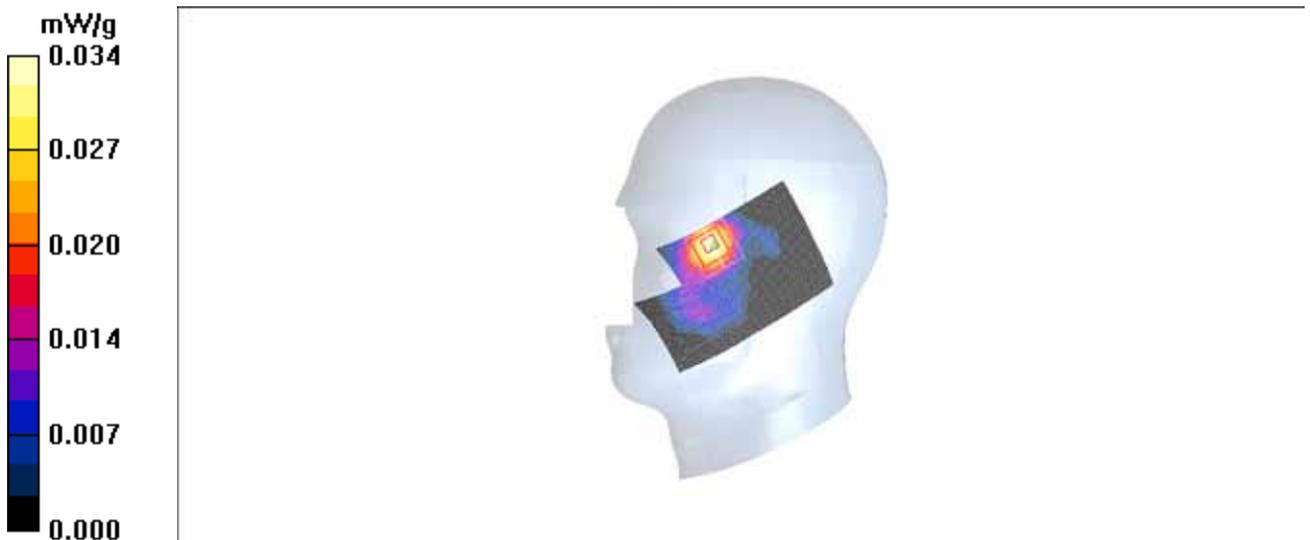


Fig.64 802.11b 1Mbps CH6

WiFi 802.11b 1Mbps Right Tilt Channel 6

Date/Time: 2011-11-10 18:26:05

Electronics: DAE4 Sn771

Medium: Head 2450 MHz

Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 1.83$ mho/m; $\epsilon_r = 39.4$; $\rho = 1000$ kg/m³

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

Communication System: WLAN 2450 Frequency: 2437 MHz Duty Cycle: 1:1

Probe: ES3DV3 - SN3149 ConvF(4.35, 4.35, 4.35)

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

Maximum value of SAR (interpolated) = 0.028 mW/g

Tilt Middle/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.40 V/m; Power Drift = -0.107 dB

Peak SAR (extrapolated) = 0.025 W/kg

SAR(1 g) = 0.014 mW/g; SAR(10 g) = 0.00638 mW/g

Maximum value of SAR (measured) = 0.015 mW/g

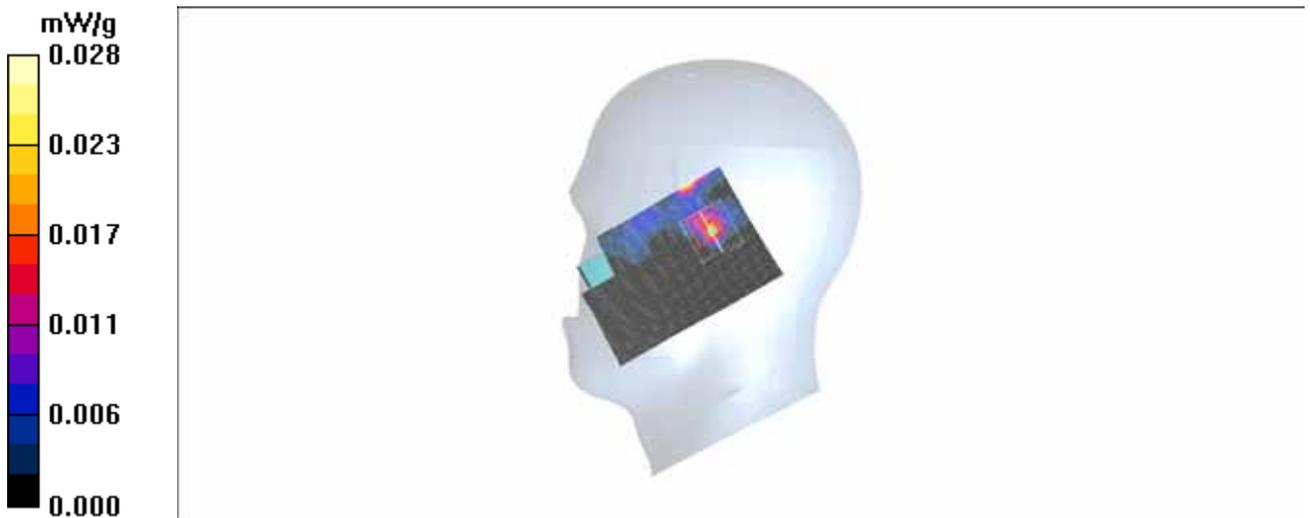


Fig.65 802.11b 1Mbps CH6

WiFi 802.11b 1Mbps Toward Phantom Channel 6

Date/Time: 2011-11-10 19:28:15

Electronics: DAE4 Sn771

Medium: Body 2450 MHz

Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 1.99$ mho/m; $\epsilon_r = 52.3$; $\rho = 1000$ kg/m³

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

Communication System: WLAN 2450 Frequency: 2437 MHz Duty Cycle: 1:1

Probe: ES3DV3 - SN3149 ConvF(4.13, 4.13, 4.13)

Toward Phantom Middle/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

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

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

Reference Value = 0.928 V/m; Power Drift = -0.141 dB

Peak SAR (extrapolated) = 0.400 W/kg

SAR(1 g) = 0.028 mW/g; SAR(10 g) = 0.00641 mW/g

Maximum value of SAR (measured) = 0.400 mW/g

Toward Phantom Middle/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 0.928 V/m; Power Drift = -0.141 dB

Peak SAR (extrapolated) = 0.079 W/kg

SAR(1 g) = 0.0029 mW/g; SAR(10 g) = 0.000508 mW/g

Maximum value of SAR (measured) = 0.079 mW/g

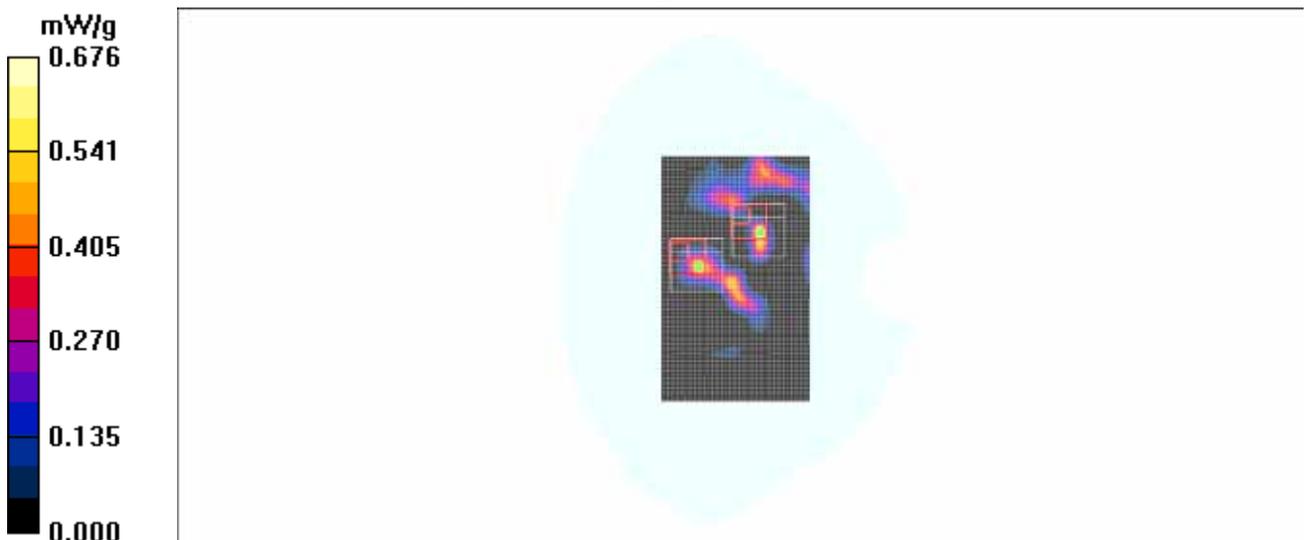


Fig.66 802.11b 1Mbps CH6

WiFi 802.11b 1Mbps Toward Ground Channel 6

Date/Time: 2011-11-10 19:44:59

Electronics: DAE4 Sn771

Medium: Body 2450 MHz

Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 1.99$ mho/m; $\epsilon_r = 52.3$; $\rho = 1000$ kg/m³

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

Communication System: WLAN 2450 Frequency: 2437 MHz Duty Cycle: 1:1

Probe: ES3DV3 - SN3149 ConvF(4.13, 4.13, 4.13)

Toward Ground Middle/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.059 mW/g

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

Reference Value = 2.90 V/m; Power Drift = 0.145 dB

Peak SAR (extrapolated) = 0.093 W/kg

SAR(1 g) = 0.048 mW/g; SAR(10 g) = 0.024 mW/g

Maximum value of SAR (measured) = 0.056 mW/g

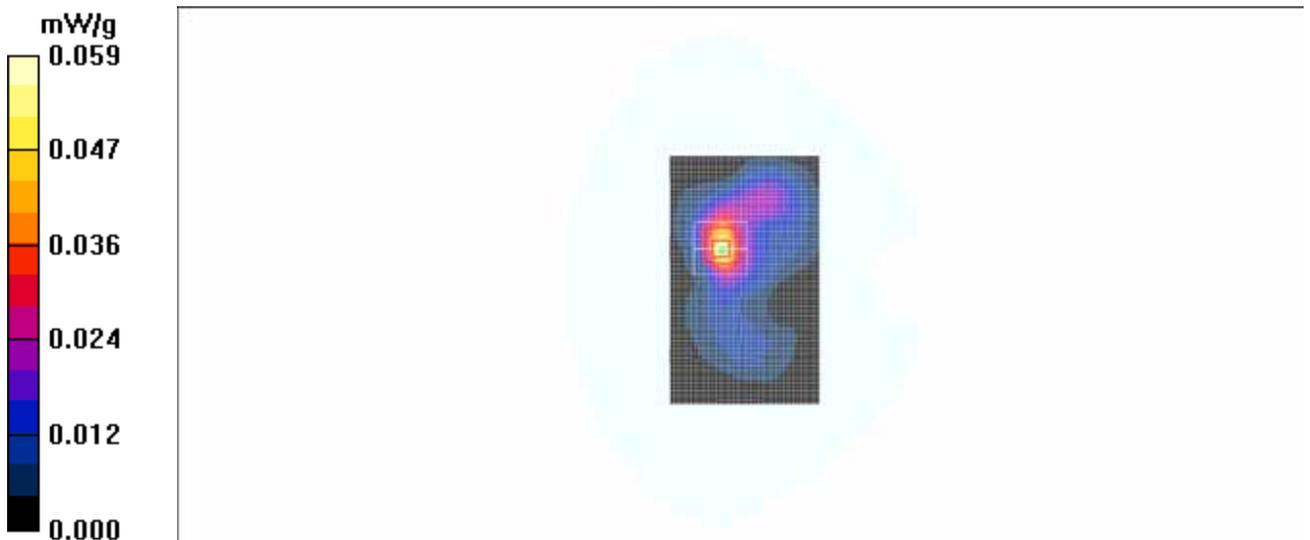


Fig.67 802.11b 1Mbps CH6

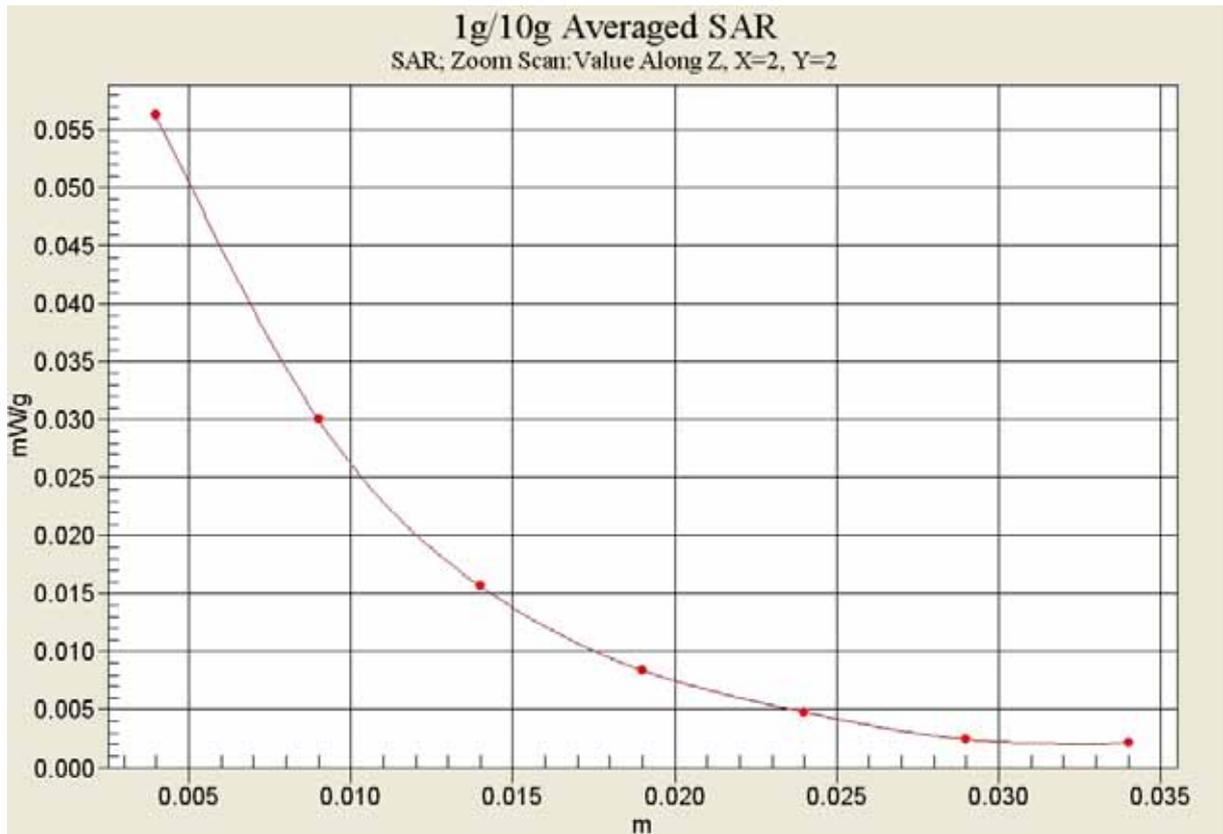


Fig. 67-1 Z-Scan at power reference point (802.11b 1Mbps CH6)

WiFi 802.11b 1Mbps Left Side Channel 6

Date/Time: 2011-11-10 20:02:13

Electronics: DAE4 Sn771

Medium: Body 2450 MHz

Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 1.99$ mho/m; $\epsilon_r = 52.3$; $\rho = 1000$ kg/m³

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

Communication System: WLAN 2450 Frequency: 2437 MHz Duty Cycle: 1:1

Probe: ES3DV3 - SN3149 ConvF(4.13, 4.13, 4.13)

Left Side Middle/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.046 mW/g

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

Reference Value = 2.17 V/m; Power Drift = 0.108 dB

Peak SAR (extrapolated) = 0.070 W/kg

SAR(1 g) = 0.038 mW/g; SAR(10 g) = 0.019 mW/g

Maximum value of SAR (measured) = 0.044 mW/g

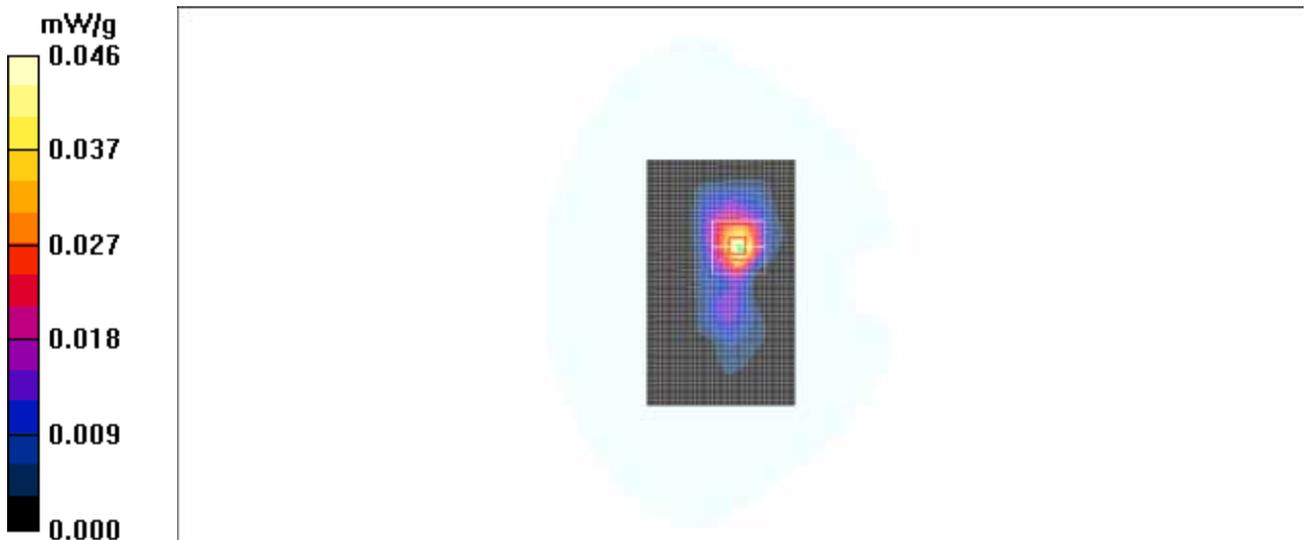


Fig.68 802.11b 1Mbps CH6

ANNEX D SYSTEM VALIDATION RESULTS

835MHz

Date/Time: 2011-11-8 7:29:35

Electronics: DAE4 Sn771

Medium: Head 835 MHz

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.88 \text{ mho/m}$; $\epsilon_r = 41.0$; $\rho = 1000 \text{ kg/m}^3$

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) = 2.52 mW/g

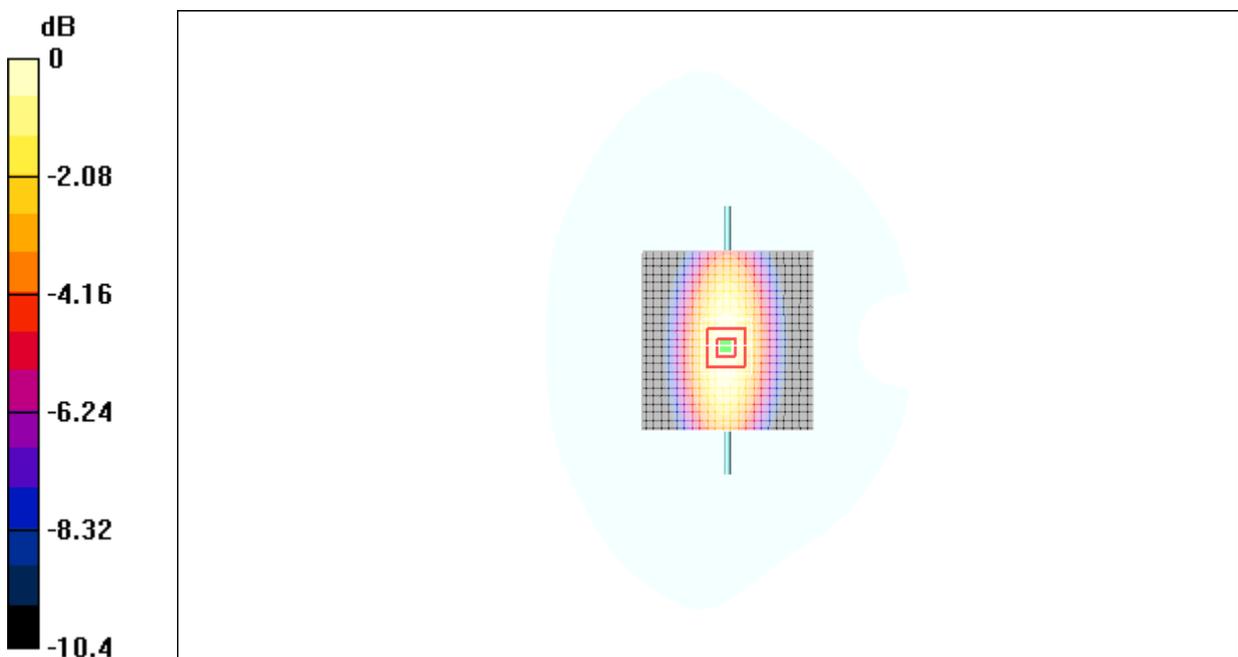
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 54.8 V/m ; Power Drift = -0.094 dB

Peak SAR (extrapolated) = 3.30 W/kg

SAR(1 g) = 2.31 mW/g ; SAR(10 g) = 1.49 mW/g

Maximum value of SAR (measured) = 2.44 mW/g



0 dB = 2.44mW/g

Fig.69 validation 835MHz 250mW

835MHz

Date/Time: 2011-11-8 14:38:26

Electronics: DAE4 Sn771

Medium: Body 835 MHz

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.95 \text{ mho/m}$; $\epsilon_r = 54.2$; $\rho = 1000 \text{ kg/m}^3$

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) = 2.58 mW/g

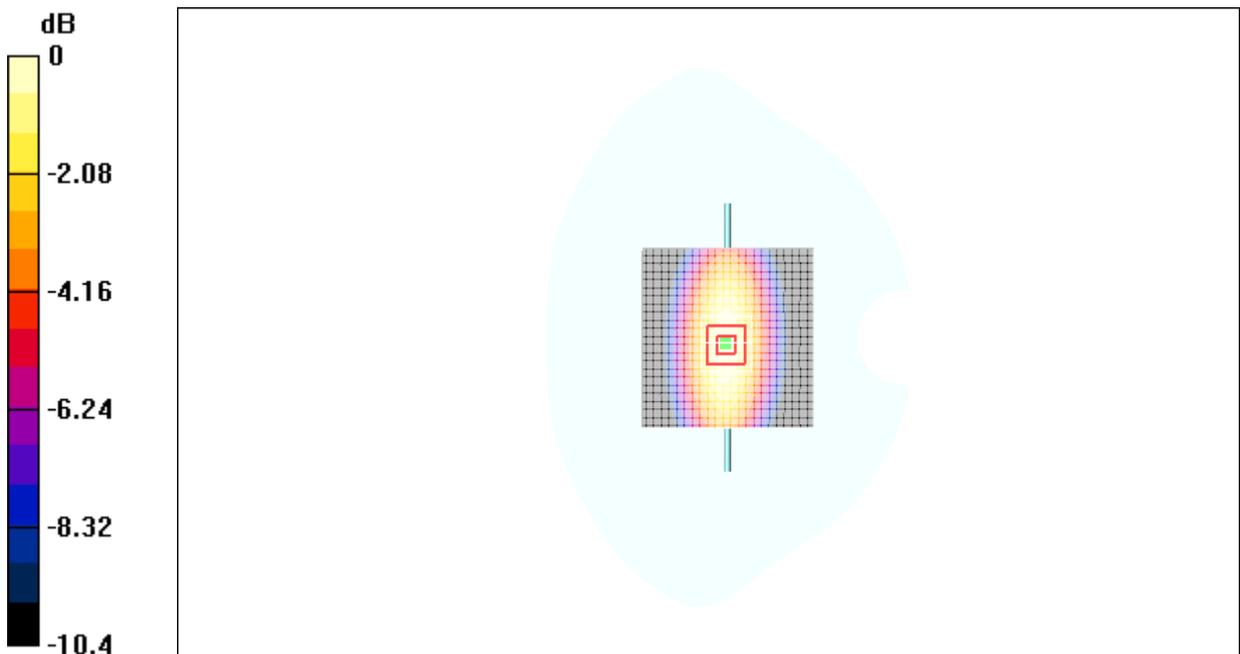
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$,
 $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 52.2 V/m ; Power Drift = -0.079 dB

Peak SAR (extrapolated) = 3.37 W/kg

SAR(1 g) = 2.35 mW/g ; SAR(10 g) = 1.53 mW/g

Maximum value of SAR (measured) = 2.44 mW/g



0 dB = 2.44mW/g

Fig.70 validation 835MHz 250mW

1900MHz

Date/Time: 2011-11-9 7:30:17

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.39 \text{ mho/m}$; $\epsilon_r = 39.5$; $\rho = 1000 \text{ kg/m}^3$

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) = 11.5 mW/g

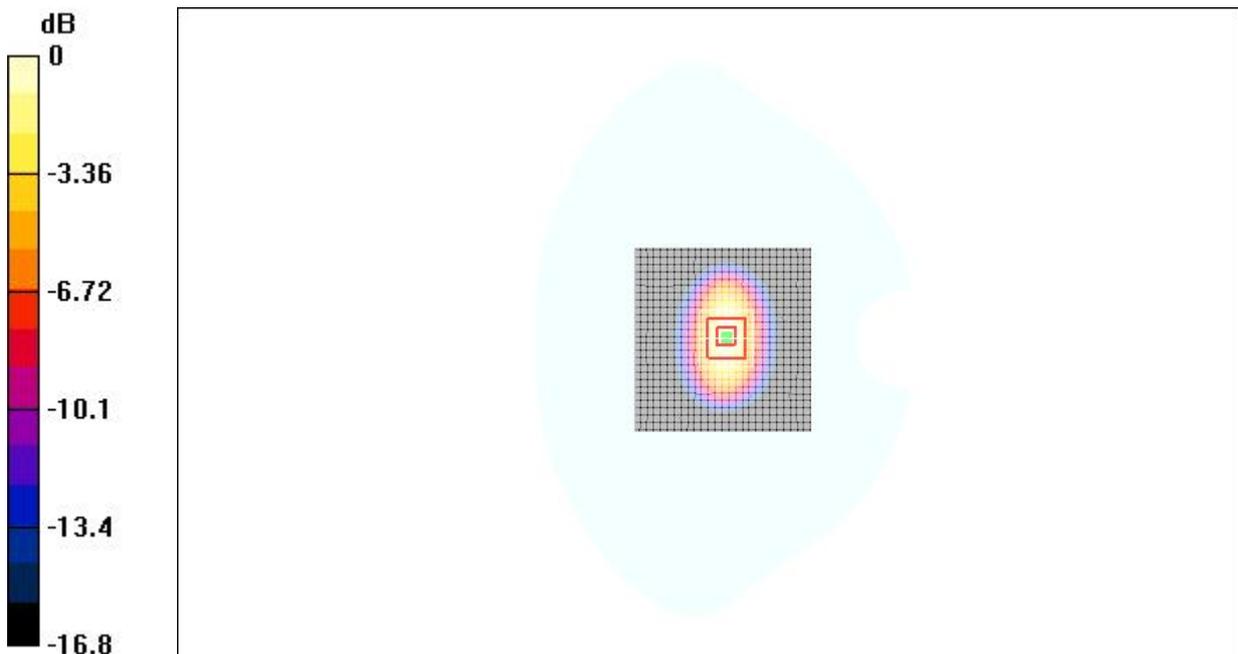
System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$,
 $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 88.7 V/m ; Power Drift = -0.067 dB

Peak SAR (extrapolated) = 14.6 W/kg

SAR(1 g) = 9.77 mW/g ; SAR(10 g) = 4.90 mW/g

Maximum value of SAR (measured) = 10.5 mW/g



0 dB = 10.5mW/g

Fig.71 validation 1900MHz 250mW

1900MHz

Date/Time: 2011-11-9 13:08:42

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 53.5$; $\rho = 1000 \text{ kg/m}^3$

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) = 11.7 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 = 91.5 V/m ; Power Drift = -0.058 dB

Peak SAR (extrapolated) = 14.8 W/kg

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

Maximum value of SAR (measured) = 10.8 mW/g

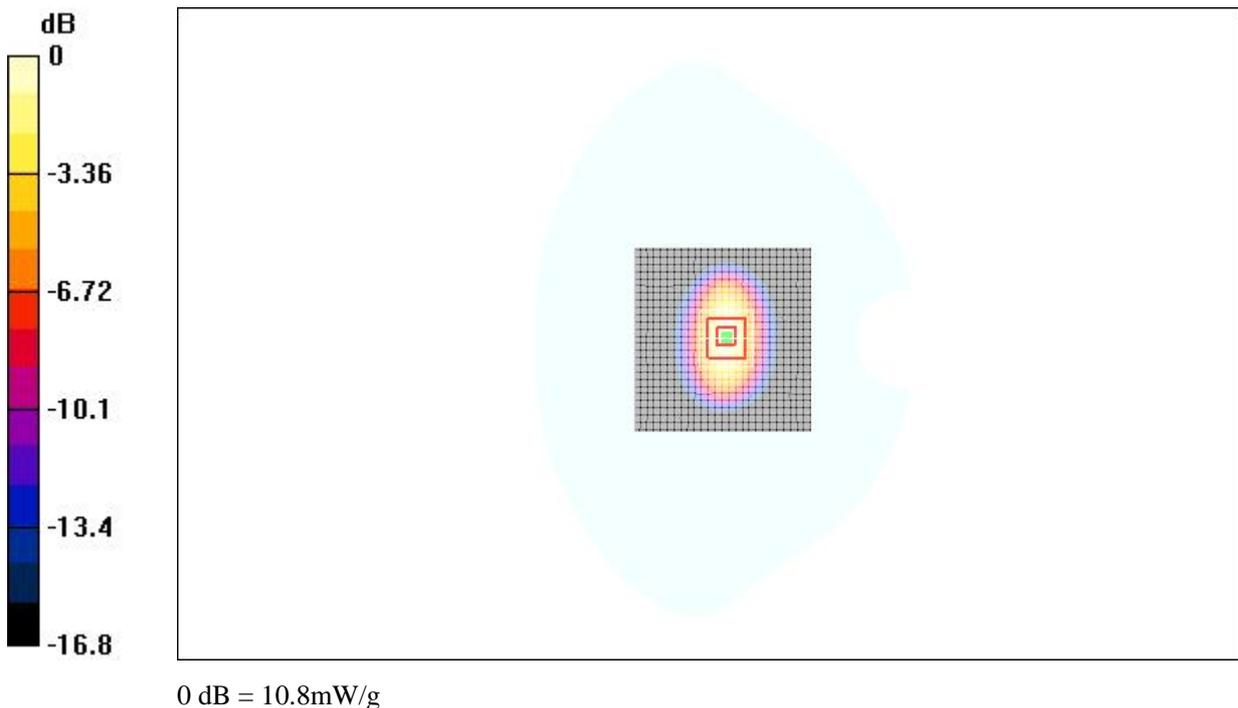


Fig.72 validation 1900MHz 250mW

2450MHz

Date/Time: 2011-11-10 17:18:32

Electronics: DAE4 Sn771

Medium: Head 2450 MHz

Medium parameters used: $f = 2450 \text{ MHz}$; $\sigma = 1.82 \text{ mho/m}$; $\epsilon_r = 39.5$; $\rho = 1000 \text{ kg/m}^3$

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

Communication System: CW Frequency: 2450 MHz Duty Cycle: 1:1

Probe: ES3DV3 - SN3149 ConvF(4.35, 4.35, 4.35)

System Validation/Area Scan (101x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$
Maximum value of SAR (interpolated) = 14.5 mW/g

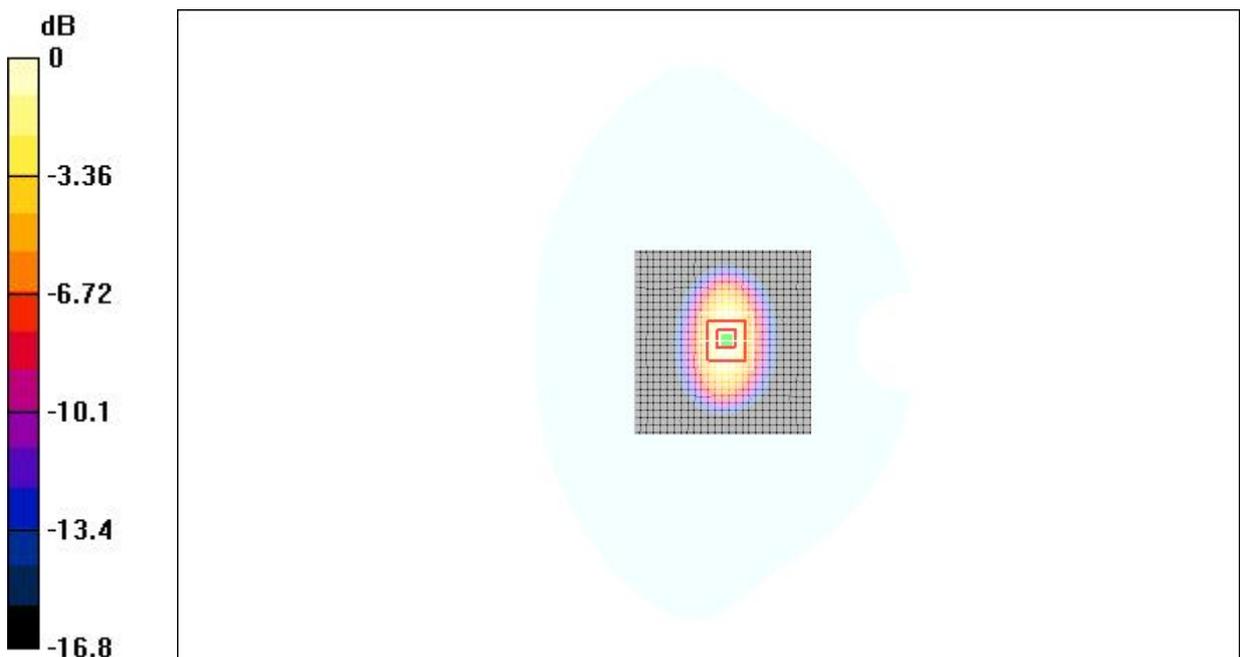
System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$,
 $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 87.5 V/m ; Power Drift = -0.058 dB

Peak SAR (extrapolated) = 18.7 W/kg

SAR(1 g) = 12.9 mW/g ; SAR(10 g) = 5.96 mW/g

Maximum value of SAR (measured) = 14.0 mW/g



0 dB = 14.0mW/g

Fig.73 validation 2450MHz 250mW

2450MHz

Date/Time: 2011-11-10 18:57:24

Electronics: DAE4 Sn771

Medium: Body 2450 MHz

Medium parameters used: $f = 2450 \text{ MHz}$; $\sigma = 1.93 \text{ mho/m}$; $\epsilon_r = 52.3$; $\rho = 1000 \text{ kg/m}^3$

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

Communication System: CW Frequency: 2450 MHz Duty Cycle: 1:1

Probe: ES3DV3 - SN3149 ConvF(4.13, 4.13, 4.13)

System Validation/Area Scan (101x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$
Maximum value of SAR (interpolated) = 14.7 mW/g

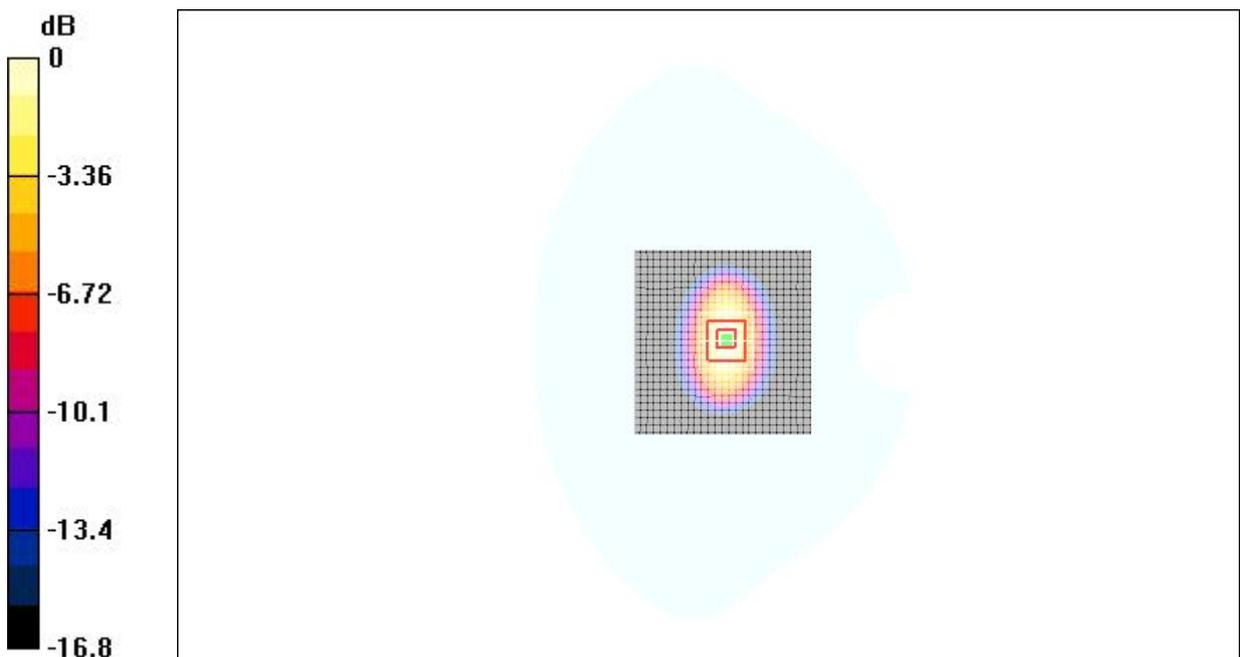
System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$,
 $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 85.6 V/m ; Power Drift = 0.061 dB

Peak SAR (extrapolated) = 22.3 W/kg

SAR(1 g) = 12.8 mW/g ; SAR(10 g) = 5.88 mW/g

Maximum value of SAR (measured) = 14.0 mW/g



0 dB = 14.0 mW/g

Fig.74 validation 2450MHz 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_Sep11**

CALIBRATION CERTIFICATE

Object	ES3DV3-SN: 3149
Calibration procedure(s)	QA CAL-01.v6 Calibration procedure for dosimetric E-field probes
Calibration date:	September 24, 2011
Condition of the calibrated item	In Tolerance

This calibration certify documents the traceability to national standards, which realize the physical units of measurements(SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.
All calibrations have been conducted at an environment temperature (22±3)°C and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID#	Cal Data (Calibrated by, Certification NO.)	Scheduled Calibration
Power meter E4419B	GB41293874	5-May-11 (METAS, NO. 251-00388)	May-12
Power sensor E4412A	MY41495277	5-May-11 (METAS, NO. 251-00388)	May-12
Reference 3 dB Attenuator	SN:S5054 (3c)	11-Aug-11 (METAS, NO. 251-00403)	Aug-12
Reference 20 dB Attenuator	SN:S5086 (20b)	3-May-11 (METAS, NO. 251-00389)	May-12
Reference 30 dB Attenuator	SN:S5129 (30b)	11-Aug-11 (METAS, NO. 251-00404)	Aug-12
DAE4	SN:617	10-Jun-11 (SPEAG, NO.DAE4-907_Jun11)	Jun-12
Reference Probe ES3DV2	SN: 3013	12-Jan-11 (SPEAG, NO. ES3-3013_Jan11)	Jan-12

Secondary Standards	ID#	Check Data (in house)	Scheduled Calibration
RF generator HP8648C	US3642U01700	4-Aug-99(SPEAG, in house check Oct-10)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01(SPEAG, in house check Nov-10)	In house check: Nov-11

Name	Function	Signature
Calibrated by: Katja Pokovic	Technical Manager	

Approved by: Niels Kuster	Quality Manager	
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Issued: **September 24, 2011**

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 E^2 -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.

ES3DV3 SN: 3149

September 24, 2011

Probe ES3DV3

SN: 3149

Manufactured: June 12, 2007

Calibrated: September 24, 2011

Calibrated for DASY/EASY System

(Note: non-compatible with DASY2 system!)

ES3DV3 SN: 3149

September 24, 2011

DASY/EASY – Parameters of Probe: ES3DV3 - SN:3149

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$) ^A	1.14	1.23	1.29	$\pm 10.1\%$
DCP (mV) ^B	94	95	91	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dBuV	C	VR mV	Unc ^E (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	300.0	$\pm 1.5\%$
			Y	0.00	0.00	1.00	300.0	
			Z	0.00	0.00	1.00	300.0	

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

^A The uncertainties of NormX, Y, Z do not affect the E²-field uncertainty inside TSL (see Page 5 and 6).

^B Numerical linearization parameter: uncertainty not required.

^E Uncertainty is determined using the maximum deviation from linear response applying recatangular distribution and is expressed for the square of the field value.

ES3DV3 SN: 3149

September 24, 2011

DASY/EASY – Parameters of Probe: ES3DV3 - SN:3149

Calibration Parameter Determined in Head Tissue Simulating Media

f[MHz] ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
850	41.5	0.90	6.56	6.56	6.56	0.91	1.13	±12.0%
900	41.5	0.97	6.34	6.34	6.34	0.83	1.26	±12.0%
1800	40.0	1.40	5.18	5.18	5.18	0.69	1.47	±12.0%
1900	40.0	1.40	5.03	5.03	5.03	0.72	1.38	±12.0%
2100	39.8	1.49	4.58	4.58	4.58	0.66	1.34	±12.0%
2450	39.2	1.80	4.35	4.35	4.35	0.67	1.36	±12.0%

^C Frequency validity of ±100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ±50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ±5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

ES3DV3 SN: 3149

September 24, 2011

DASY/EASY – Parameters of Probe: ES3DV3 - SN:3149

Calibration Parameter Determined in Body Tissue Simulating Media

f[MHz] ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
850	55.2	0.97	6.22	6.22	6.22	0.76	1.26	±12.0%
900	55.0	1.05	6.02	6.02	6.02	0.99	1.06	±12.0%
1800	53.3	1.52	4.97	4.97	4.97	0.75	1.34	±12.0%
1900	53.3	1.52	4.68	4.68	4.68	0.62	1.33	±12.0%
2100	53.5	1.57	4.35	4.35	4.35	0.68	1.34	±12.0%
2450	52.7	1.95	4.13	4.13	4.13	0.71	1.35	±12.0%

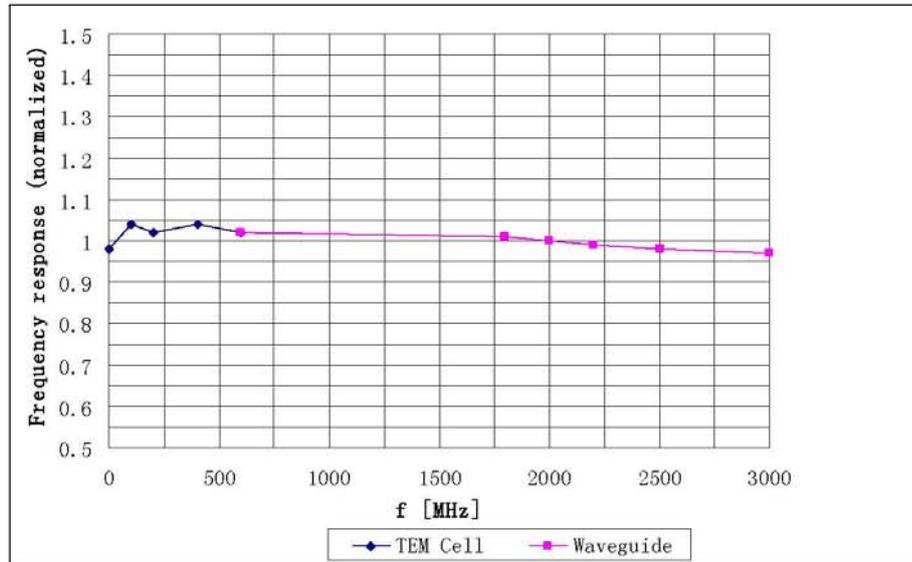
^C Frequency validity of ±100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ±50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ±5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

ES3DV3 SN: 3149

September 24, 2011

Frequency Response of E-Field (TEM-Cell: ifi110 EXX, Waveguide: R22)

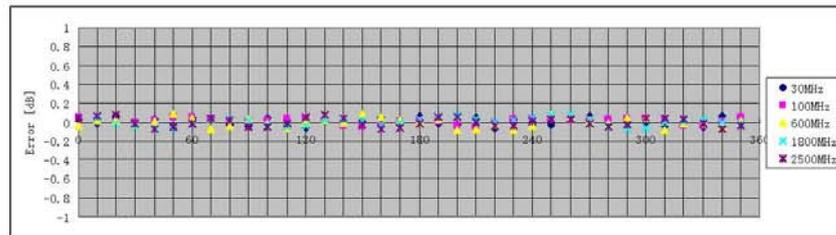
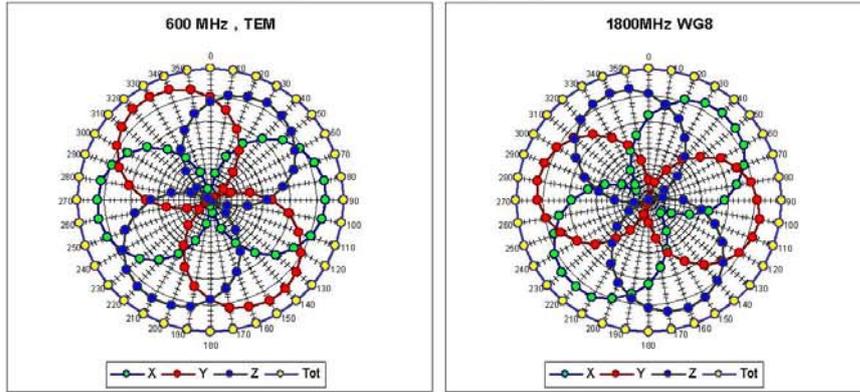


Uncertainty of Frequency Response of E-field: $\pm 5.0\%$ (k=2)

ES3DV3 SN: 3149

September 24, 2011

Receiving Pattern (ϕ), $\theta = 0^\circ$

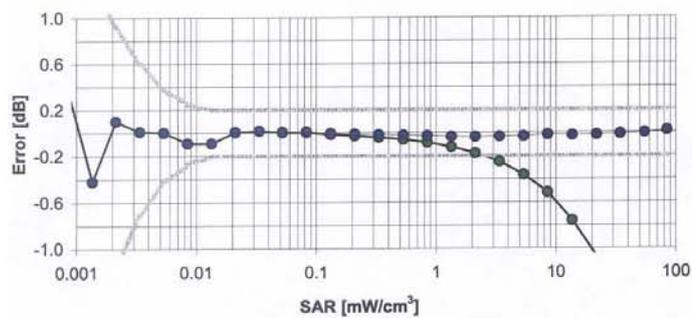
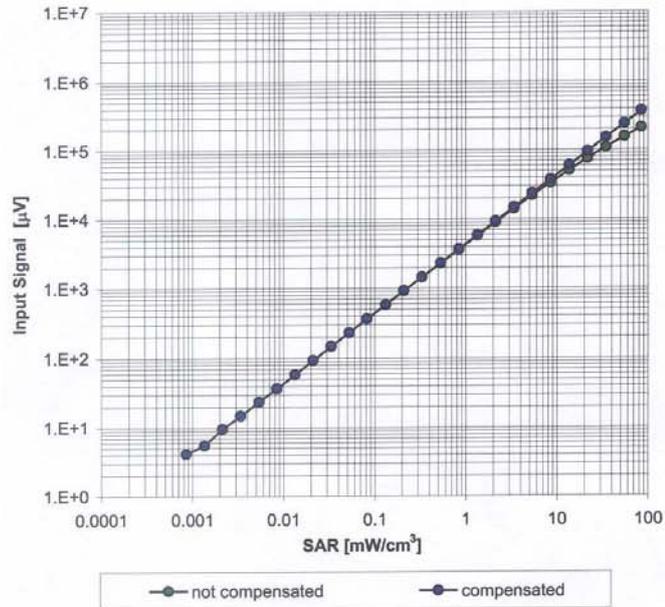


Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ (k=2)

ES3DV3 SN: 3149

September 24, 2011

Dynamic Range f(SAR_{head}) (Waveguide: WG8, f = 1800 MHz)

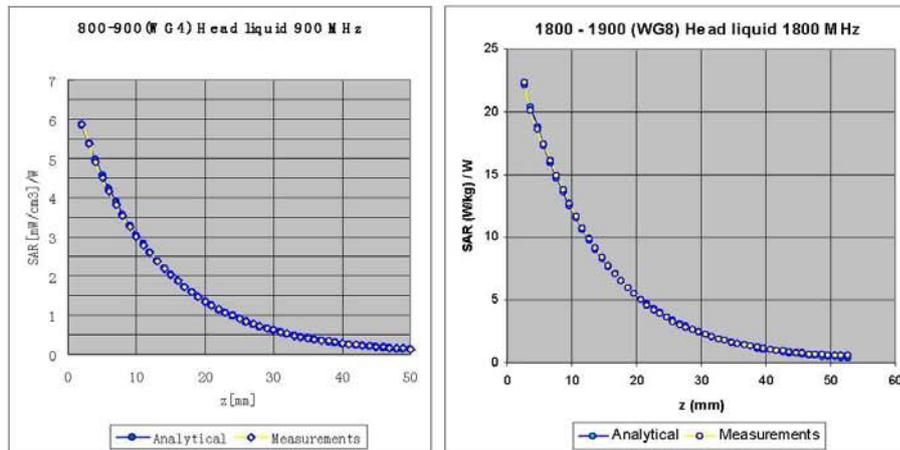


Uncertainty of Linearity Assessment: $\pm 0.5\%$ (k=2)

ES3DV3 SN: 3149

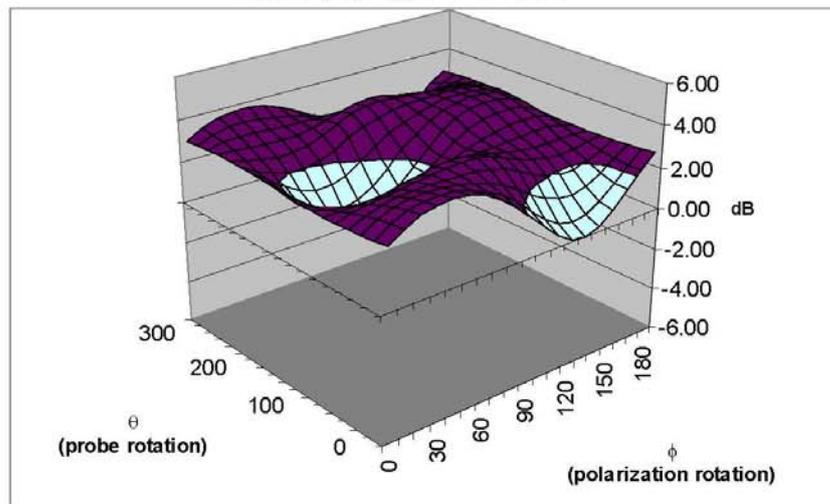
September 24, 2011

Conversion Factor Assessment



Deviation from Isotropy

Error (ϕ, θ), $f = 900$ MHz



Uncertainty of Spherical Isotropy Assessment: $\pm 2.5\%$ ($k=2$)

ES3DV3 SN: 3149

September 24, 2011

DASY/EASY – Parameters of Probe: ES3DV3 - SN:3149

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	2 mm

ANNEX F DIPOLE CALIBRATION CERTIFICATE

835 MHz Dipole Calibration Certificate

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Telecommunication Metrology Center of MIIT







校准
CNAS L0442

Client **TMC** Certificate No: **D835V2-443_Feb10**

CALIBRATION CERTIFICATE

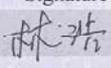
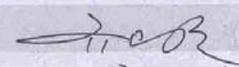
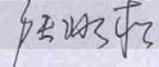
Object	D835V2 - SN: 443
Calibration Procedure(s)	TMC-XZ-01-027 Calibration procedure for dipole validation kits
Calibration date:	February 26, 2010
Condition of the calibrated item	In Tolerance

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements(SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)°C and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRVD	101253	04-Sep-09 (TMC, No.JZ09-248)	Jun-10
Power sensor NRV-Z5	100333	04-Sep-09 (TMC, No. JZ09-248)	Jun-10
Reference Probe ES3DV3	SN 3149	25-Sep-09(SPEAG, No.ES3-3149_Sep09)	Sep-10
DAE4	SN 771	19-Nov-09(SPEAG, No.DAE4-771_Nov09)	Nov-10
RF generator E4438C	MY45092879	18-Jun-09(TMC, No.JZ09-302)	Jun-10
Network Analyzer 8753E	US38433212	29-Aug-09(TMC, No.JZ09-056)	Aug-10

	Name	Function	Signature
Calibrated by:	Lin Hao	SAR Test Engineer	
Reviewed by:	Qi Dianyuan	SAR Project Leader	
Approved by:	Lu Bingsong	Deputy Director of the laboratory	

Issued: February 26, 2010

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

Certificate No: D835V2-443_Feb10

Page 1 of 9

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Telecommunication Metrology Center of MIIT



Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM _{x,y,z}
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- b) 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 300MHz to 3GHz)", February 2005
- c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

- d) DASY System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay: One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V5.0
Extrapolation	Advanced Extrapolation	
Phantom	2mm Oval Phantom ELI4	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz \pm 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 \pm 0.2) °C	41.6 \pm 6 %	0.92mho/m \pm 6 %
Head TSL temperature during test	(21.7 \pm 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.38 mW / g
SAR normalized	normalized to 1W	9.52 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	9.41 mW / g \pm 17.0 % (k=2)

SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	1.54 mW / g
SAR normalized	normalized to 1W	6.16 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	6.12 mW / g \pm 16.5 % (k=2)

¹ Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.5 ± 6%	0.97mho/m ± 6 %
Body TSL temperature during test	(21.9 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.41 mW / g
SAR normalized	normalized to 1W	9.64 mW / g
SAR for nominal Body TSL parameters ²	normalized to 1W	9.57 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	1.57 mW / g
SAR normalized	normalized to 1W	6.28 mW / g
SAR for nominal Body TSL parameters ²	normalized to 1W	6.24 mW / g ± 16.5 % (k=2)

² Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.7Ω - 3.7 jΩ
Return Loss	- 25.9dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	49.4Ω - 5.1 jΩ
Return Loss	-25.6dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.387 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	September 3, 2001

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Telecommunication Metrology Center of MIIT



DASY5 Validation Report for Head TSL

Date/Time: 2010-2-26 14:31:40

Test Laboratory: TMC, Beijing, China

DUT: Dipole 835 MHz; Type: D835V2; Serial: SN: 443

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

Medium: Head 835MHz

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.92 \text{ mho/m}$; $\epsilon_r = 41.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

- Probe: ES3DV3 - SN3149; ConvF(6.56, 6.56, 6.56); Calibrated: 25.09.09
- Electronics: DAE4 Sn771; Calibration: 19.11.09
- Phantom: 2mm Oval Phantom ELI4; Type: QDOVA001BB
- Measurement SW: DASY5, V5.0 Build 119.9; Postprocessing SW: SEMCAD, V13.2 Build 87

Pin=250mW; d=15mm/Zoom Scan (7x7x7)/Cube 0:

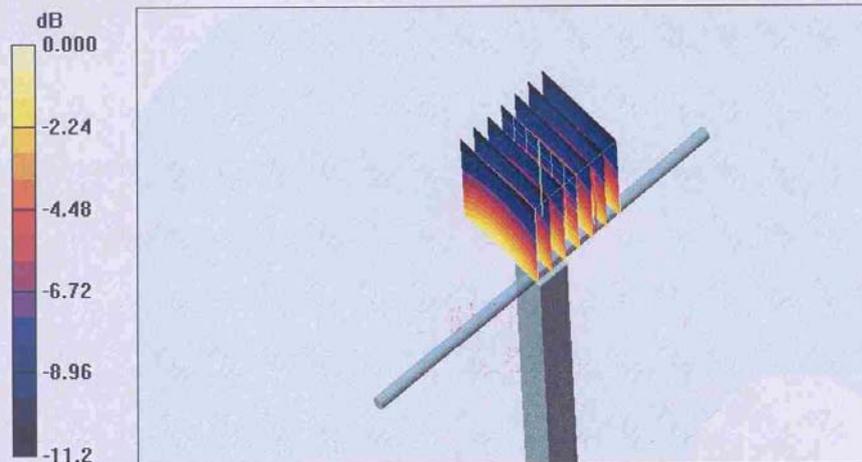
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 54.8 V/m; Power Drift = -0.037 dB

Peak SAR (extrapolated) = 3.11 W/kg

SAR(1 g) = 2.38 mW/g; SAR(10 g) = 1.54 mW/g

Maximum value of SAR (measured) = 2.71 mW/g

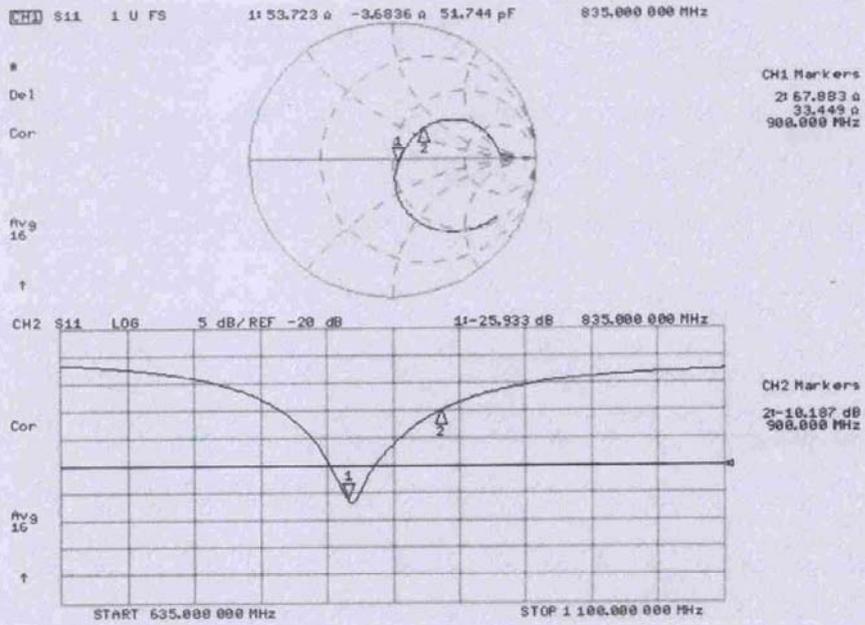


0 dB = 2.71mW/g

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Telecommunication Metrology Center of MIIT



Impedance Measurement Plot for Head TSL



工业和信息化部通信计量中心
Telecommunication Metrology Center of MIIT



DASY5 Validation Report for Body TSL

Date/Time: 2010-2-26 9:52:36

Test Laboratory: TMC, Beijing, China

DUT: Dipole 835 MHz; Type: D835V2; Serial: SN: 443

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

Medium: Body 835MHz

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.97 \text{ mho/m}$; $\epsilon_r = 54.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

- Probe: ES3DV3 - SN3149; ConvF(6.22, 6.22, 6.22); Calibrated: 25.09.09
- Electronics: DAE4 Sn771; Calibration: 19.11.09
- Phantom: 2mm Oval Phantom ELI4; Type: QDOVA001BB
- Measurement SW: DASY5, V5.0 Build 119.9; Postprocessing SW: SEMCAD, V13.2 Build 87

Pin=250mW; d=15mm/Zoom Scan (7x7x7)/Cube 0:

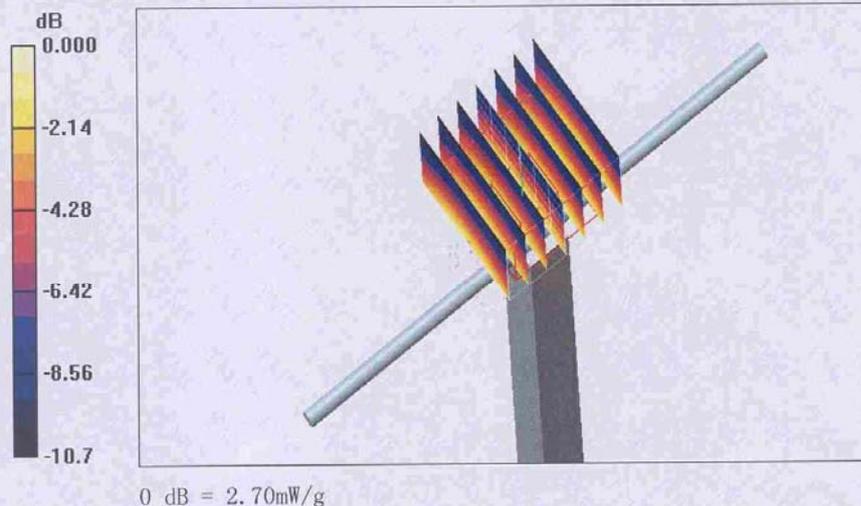
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 54.0 V/m; Power Drift = -0.025 dB

Peak SAR (extrapolated) = 3.78 W/kg

SAR(1 g) = 2.41 mW/g; SAR(10 g) = 1.57 mW/g

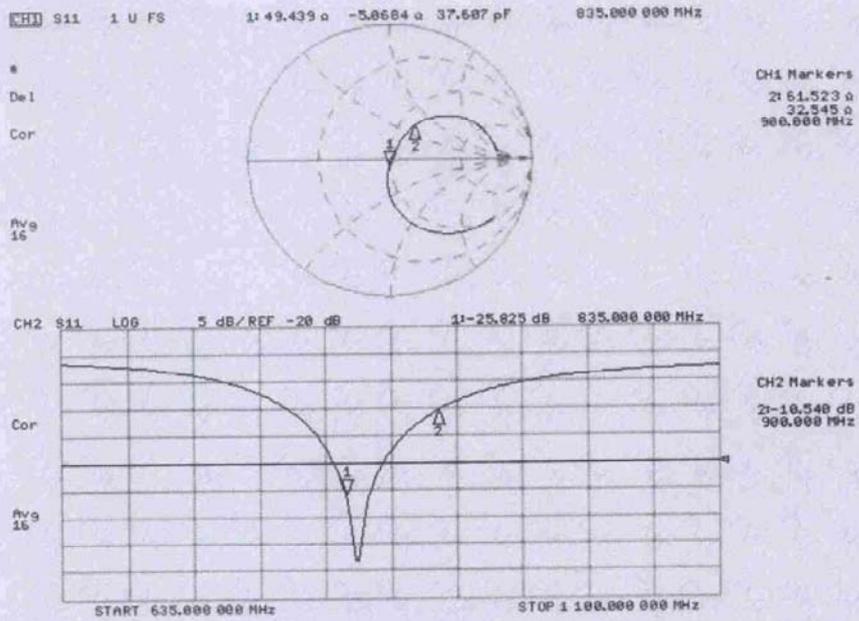
Maximum value of SAR (measured) = 2.70 mW/g



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Impedance Measurement Plot for Body TSL



1900 MHz Dipole Calibration Certificate

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Telecommunication Metrology Center of MIIT

校准
CNAS L0442

Client **TMC** Certificate No: **D1900V2-541_Feb10**

CALIBRATION CERTIFICATE

Object: D1900V2 - SN: 541

Calibration Procedure(s): TMC-XZ-01-027
Calibration procedure for dipole validation kits

Calibration date: February 26, 2010

Condition of the calibrated item: In Tolerance

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements(SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)°C and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRVD	101253	04-Sep-09 (TMC, No. JZ09-248)	Sep-10
Power sensor NRV-Z5	100333	04-Sep-09 (TMC, No. JZ09-248)	Sep-10
Reference Probe ES3DV3	SN 3149	25-Sep-09(SPEAG, No.ES3-3149_Sep09)	Sep-10
DAE4	SN 771	19-Nov-09(SPEAG, No.DAE4-771_Nov09)	Nov-10
RF generator E4438C	MY45092879	18-Jun-09(TMC, No.JZ09-302)	Jun-10
Network Analyzer 8753E	US38433212	29-Aug-09(TMC, No.JZ09-056)	Aug-10

	Name	Function	Signature
Calibrated by:	Lin Hao	SAR Test Engineer	
Reviewed by:	Qi Dianyuan	SAR Project Leader	
Approved by:	Lu Bingsong	Deputy Director of the laboratory	

Issued: February 26, 2010

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

Certificate No: D1900V2-541_Feb10

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Telecommunication Metrology Center of MIIT



Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM _{x,y,z}
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- b) 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 300MHz to 3GHz)", February 2005
- c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

- d) DASY System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay: One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V5.0
Extrapolation	Advanced Extrapolation	
Phantom	2mm Oval Phantom EL14	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz \pm 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 \pm 0.2) °C	39.6 \pm 6 %	1.40mho/m \pm 6 %
Head TSL temperature during test	(21.9 \pm 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.91 mW / g
SAR normalized	normalized to 1W	39.6 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	39.4 mW /g \pm 17.0 % (k=2)

SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	5.05 mW / g
SAR normalized	normalized to 1W	20.2 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	20.1 mW /g \pm 16.5 % (k=2)

¹ Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.5 ± 6%	1.51 mho/m ± 6 %
Body TSL temperature during test	(21.8 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	10.4 mW / g
SAR normalized	normalized to 1W	41.6 mW / g
SAR for nominal Body TSL parameters ²	normalized to 1W	41.4 mW /g ± 17.0 % (k=2)

SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	5.24 mW / g
SAR normalized	normalized to 1W	21.0 mW / g
SAR for nominal Body TSL parameters ²	normalized to 1W	20.9 mW /g ± 16.5 % (k=2)

² Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	$54.8\Omega + 4.0 j\Omega$
Return Loss	- 23.7dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	$47.9\Omega + 7.1 j\Omega$
Return Loss	- 22.6dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.201 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	October 4, 2001

工业和信息化部通信计量中心
Telecommunication Metrology Center of MIIT



DASY5 Validation Report for Head TSL

Date/Time: 2010-2-26 15:20:47

Test Laboratory: TMC, Beijing, China

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: SN: 541

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

Medium: Head 1900MHz

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.40$ mho/m; $\epsilon_r = 39.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: ES3DV3 - SN3149; ConvF(5.03, 5.03, 5.03); Calibrated: 25.09.09
- Electronics: DAE4 Sn771; Calibration: 19.11.09
- Phantom: 2mm Oval Phantom ELI4; Type: QDOVA001BB
- Measurement SW: DASY5, V5.0 Build 119.9; Postprocessing SW: SEMCAD, V13.2 Build 87

Pin=250mW; d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 85.1 V/m; Power Drift = -0.057 dB

Peak SAR (extrapolated) = 18.8 W/kg

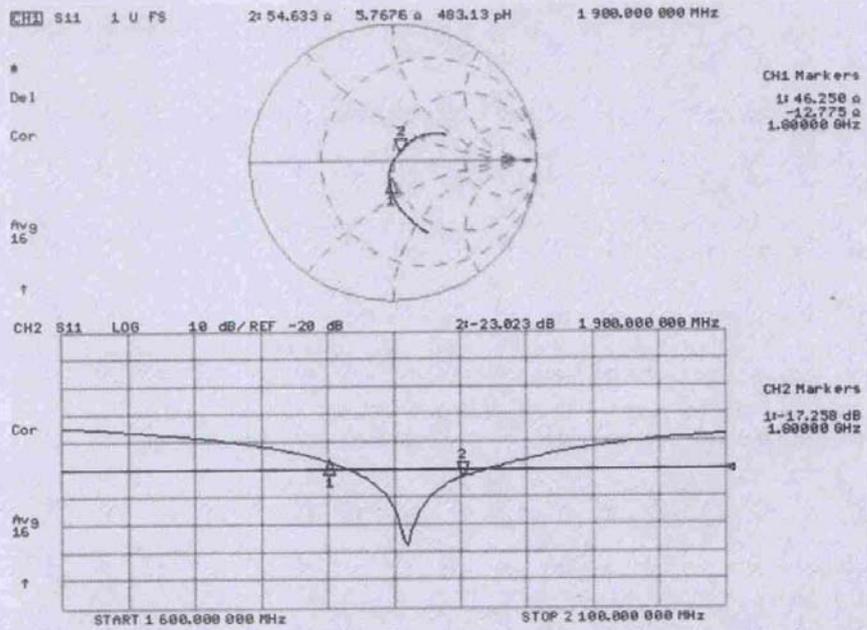
SAR(1 g) = 9.91 mW/g; SAR(10 g) = 5.05 mW/g

Maximum value of SAR (measured) = 11.5 mW/g



0 dB = 11.5mW/g

Impedance Measurement Plot for Head TSL



工业和信息化部通信计量中心
Telecommunication Metrology Center of MIIT



DASY5 Validation Report for Body TSL

Date/Time: 2010-2-26 10:41:08

Test Laboratory: TMC, Beijing, China

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: SN: 541

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

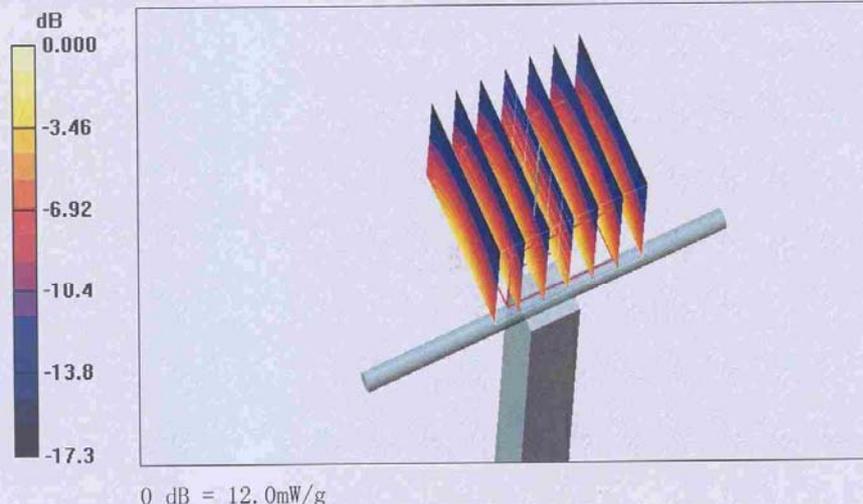
Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.51 \text{ mho/m}$; $\epsilon_r = 52.5$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section

DASY5 Configuration:

- Probe: ES3DV3 - SN3149; ConvF(4.68, 4.68, 4.68); Calibrated: 25.09.09
- Electronics: DAE4 Sn771; Calibration: 19.11.09
- Phantom: 2mm Oval Phantom ELI4; Type: QDOVA001BB
- Measurement SW: DASY5, V5.0 Build 119.9; Postprocessing SW: SEMCAD, V13.2 Build 87

Pin=250mW; d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 80.2 V/m; Power Drift = -0.009 dB
Peak SAR (extrapolated) = 19.1 W/kg
SAR(1 g) = 10.4 mW/g; SAR(10 g) = 5.24 mW/g
Maximum value of SAR (measured) = 12.0 mW/g



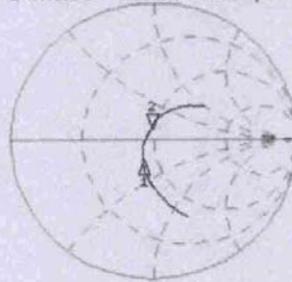
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Impedance Measurement Plot for Body TSL

CH1 S11 1 U FS 2r 47.564 α 7.0098 α 507.18 pH 1 900.000 000 MHz

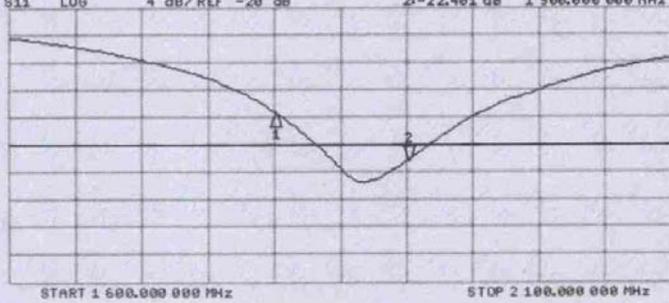
De1
Cor
Avg
16



CH1 Markers
1r 41.211 α
-13.982 α
1.90000 GHz

CH2 S11 LOG 4 dB/REF -20 dB 2r -22.401 dB 1 900.000 000 MHz

Cor
Avg
16



CH2 Markers
1r -15.338 dB
1.90000 GHz

2450 MHz Dipole Calibration Certificate

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



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
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 (Auden)**

Certificate No: **D2450V2-853_Sep10**

CALIBRATION CERTIFICATE

Object: **D2450V2 - SN: 853**

Calibration procedure(s): **QA CAL-05 v7
Calibration procedure for dipole validation kits**

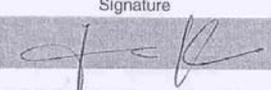
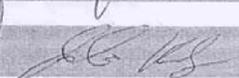
Calibration date: **September 27, 2010**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility; environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-09 (No. 217-01086)	Oct-10
Power sensor HP 8481A	US37292783	06-Oct-09 (No. 217-01086)	Oct-10
Reference 20 dB Attenuator	SN: 5088 (20g)	30-Mar-10 (No. 217-01150)	Mar-11
Type-N mismatch combination	SN: 5047.2 / 06327	30-Mar-10 (No. 217-01162)	Mar-11
Reference Probe ES3DV3	SN: 3205	30-Apr-10 (No. ES3-3205_Apr10)	Apr-11
DAE4	SN: 801	10-Jun-10 (No. DAE4-601_Jun10)	Jun-11
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 94200	18-Oct-01 (in house check Oct-09)	In house check: Oct-10

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: September 29, 2010

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

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



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

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

Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- b) 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
- c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

- d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.0 ± 6 %	1.74 mho/m ± 6 %
Head TSL temperature during test	(21.5 ± 0.2) °C	---	---

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.1 mW / g
SAR normalized	normalized to 1W	52.4 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	53.2 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.16 mW / g
SAR normalized	normalized to 1W	24.6 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	24.8 mW / g ± 16.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.5 ± 6 %	1.95 mho/m ± 6 %
Body TSL temperature during test	(21.6 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	12.9 mW / g
SAR normalized	normalized to 1W	51.6 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	51.5 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.98 mW / g
SAR normalized	normalized to 1W	23.9 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	23.9 mW / g ± 16.5 % (k=2)

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	54.6 Ω + 2.8 j Ω
Return Loss	- 25.8 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	49.4 Ω + 4.4 j Ω
Return Loss	- 27.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.164 ns
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After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	November 10, 2009

DASY5 Validation Report for Head TSL

Date/Time: 24.09.2010 14:10:17

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:853

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: HSL U12 BB

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.74$ mho/m; $\epsilon_r = 39$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: E53DV3 - SN3205; ConvF(4.53, 4.53, 4.53); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY52, V52.2 Build 0, Version 52.2.0 (163)
- Postprocessing SW: SEMCAD X, V14.2 Build 2, Version 14.2.2 (1685)

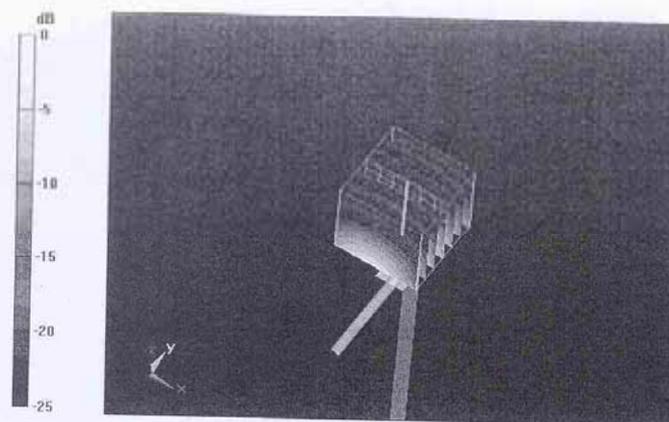
Pin=250 mW/d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement
grid; dx=5mm, dy=5mm, dz=5mm

Reference Value = 101.7 V/m; Power Drift = 0.028 dB

Peak SAR (extrapolated) = 26.7 W/kg

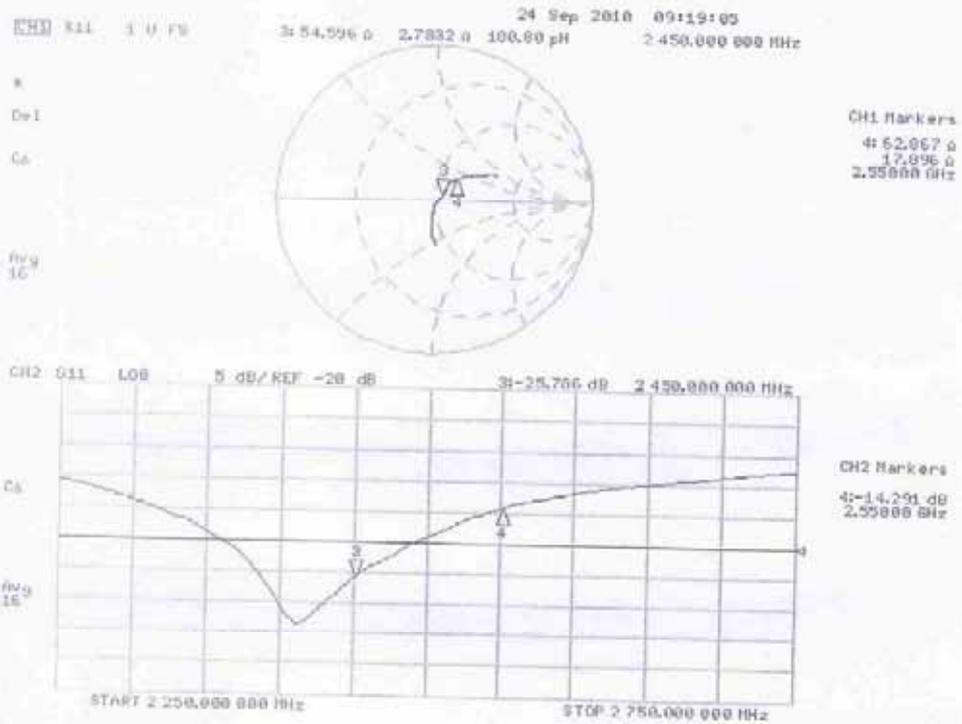
SAR(1 g) = 13.1 mW/g; SAR(10 g) = 6.16 mW/g

Maximum value of SAR (measured) = 16.7 mW/g



0 dB = 16.7mW/g

Impedance Measurement Plot for Head TSL



Validation Report for Body

Date/Time: 27.09.2010 13:39:49

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:853

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: MSL U12 BB

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.95$ mho/m; $\epsilon_r = 52.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.31, 4.31, 4.31); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASYS2, V52.2 Build 0, Version 52.2.0 (163)
- Postprocessing SW: SEMCAD X, V14.2 Build 2, Version 14.2.2 (1685)

Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7)/Cube 0; Measurement

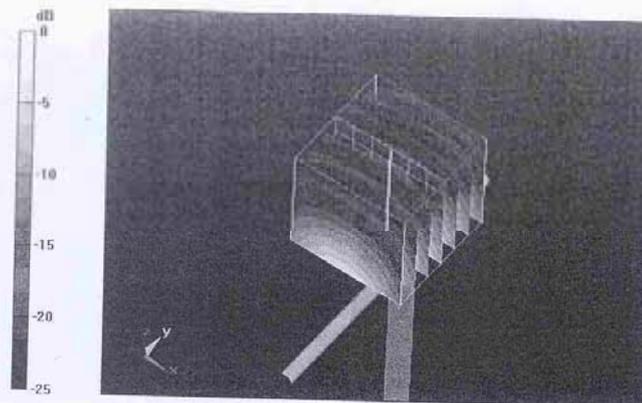
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 95.7 V/m; Power Drift = 0.045 dB

Peak SAR (extrapolated) = 27 W/kg

SAR(1 g) = 12.9 mW/g; SAR(10 g) = 5.98 mW/g

Maximum value of SAR (measured) = 16.9 mW/g



0 dB = 16.9mW/g

Impedance Measurement Plot for Body TSL

