



SAR TEST REPORT

No. 2010SAR00011

For

Motorola, Inc. (Mobile Devices Business)

GSM 850/1900 mobile phone

WX181

With

Hardware Version: Proto

Software Version: V523

FCCID: IHDT56LX1

Issued Date: 2010-03-09



No. DAT-P-114/01-01

Note:

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

Test Laboratory:

TMC Beijing, Telecommunication Metrology Center of MIIT

No. 52, Huayuan Bei Road, Haidian District, Beijing, P. R. China 100191.

Tel:+86(0)10-62304633-2079, Fax:+86(0)10-62304793 Email:welcme@emcite.com. www.emcite.com

©Copyright. All rights reserved by TMC Beijing.

TABLE OF CONTENT

| | |
|--|-----------|
| 1 TEST LABORATORY | 3 |
| 1.1 TESTING LOCATION | 3 |
| 1.2 TESTING ENVIRONMENT..... | 3 |
| 1.3 PROJECT DATA | 3 |
| 1.4 SIGNATURE..... | 3 |
| 2 CLIENT INFORMATION | 4 |
| 2.1 APPLICANT INFORMATION | 4 |
| 2.2 MANUFACTURER INFORMATION | 4 |
| 3 EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE) | 5 |
| 3.1 ABOUT EUT | 5 |
| 3.2 INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST | 5 |
| 3.3 INTERNAL IDENTIFICATION OF AE USED DURING THE TEST..... | 5 |
| 4 CHARACTERISTICS OF THE TEST | 5 |
| 4.1 APPLICABLE LIMIT REGULATIONS | 5 |
| 4.2 APPLICABLE MEASUREMENT STANDARDS..... | 5 |
| 5 OPERATIONAL CONDITIONS DURING TEST | 6 |
| 5.1 SCHEMATIC TEST CONFIGURATION..... | 6 |
| 5.2 SAR MEASUREMENT SET-UP..... | 6 |
| 5.3 DASY4 E-FIELD PROBE SYSTEM..... | 7 |
| 5.4 E-FIELD PROBE CALIBRATION | 8 |
| 5.5 OTHER TEST EQUIPMENT | 9 |
| 5.6 EQUIVALENT TISSUES..... | 10 |
| 5.7 SYSTEM SPECIFICATIONS..... | 10 |
| 6 LABORATORY ENVIRONMENT | 11 |
| 7 CONDUCTED OUTPUT POWER MEASUREMENT..... | 11 |
| 7.1 SUMMARY | 11 |
| 7.2 CONDUCTED POWER | 11 |
| 8 TEST RESULTS | 12 |
| 8.1 DIELECTRIC PERFORMANCE | 12 |
| 8.2 SYSTEM VALIDATION..... | 12 |
| 8.3 EVALUATION OF MULTI-BATTERIES..... | 13 |
| 8.4 SUMMARY OF MEASUREMENT RESULTS | 14 |
| 8.5 CONCLUSION..... | 16 |
| 9 MEASUREMENT UNCERTAINTY | 16 |
| 10 MAIN TEST INSTRUMENTS | 18 |
| ANNEX A MEASUREMENT PROCESS..... | 19 |
| ANNEX B TEST LAYOUT | 20 |
| ANNEX C GRAPH RESULTS..... | 25 |
| ANNEX D SYSTEM VALIDATION RESULTS | 71 |
| ANNEX E PROBE CALIBRATION CERTIFICATE..... | 75 |
| ANNEX F DIPOLE CALIBRATION CERTIFICATE | 84 |

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: Sun Qian
Test Engineer: Lin Xiaojun
Testing Start Date: March 7, 2010
Testing End Date: March 8, 2010

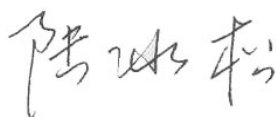
1.4 Signature



Lin Xiaojun
(Prepared this test report)



Sun Qian
(Reviewed this test report)



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

2 Client Information

2.1 Applicant Information

Company Name: Motorola, Inc. (Mobile Devices Business)
Address /Post: 600 N. US Highway 45 Libertyville IL 60048-1286 U.S.A.
Contact: Mike Roper (Mr)
Email: Mike.ropер@motorala.com
Telephone: +44 (0)1926 411371
Fax: +44 (0)1926 411371

2.2 Manufacturer Information

Company Name: TCT Mobile Limited
Address /Post: 4/F, South Building, No.2966, Jinke Road, Zhangjiang High-Tech Park,
Pudong, Shanghai, 201203, P.R.China
Contact: Gong Zhizhou
Email: zhizhou.gong@jrđcom.com
Telephone: 0086-21-61460890
Fax: 0086-21-61460602

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

3.1 About EUT

EUT Description: GSM 850/1900 mobile phone
Marketing Name: WX181
GSM Frequency Band: GSM 850/PCS 1900

3.2 Internal Identification of EUT used during the test

| EUT ID* | SN or IMEI | HW Version | SW Version |
|---------|-----------------|------------|------------|
| EUT1 | 012245000000064 | Proto | V523 |

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

3.3 Internal Identification of AE used during the test

| AE ID* | Description | Model | SN | Manufacturer |
|--------|----------------|--------------|-------------|----------------|
| AE1 | Travel Adapter | CBA31B0AG0C1 | \ | BYD |
| AE2 | Battery | CAB3130000C1 | B3459642B5A | BYD |
| AE3 | Battery | CAB3130010C1 | \ | BYD |
| AE4 | Headset | CCB31B0A10C0 | \ | Shunda & Juwei |
| AE5 | Headset | CCB31B0A11C0 | \ | Shunda |

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

4 CHARACTERISTICS OF THE TEST

4.1 Applicable Limit Regulations

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

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

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

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

4.2 Applicable Measurement Standards

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

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

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

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

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

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

5 OPERATIONAL CONDITIONS DURING TEST

5.1 Schematic Test Configuration

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

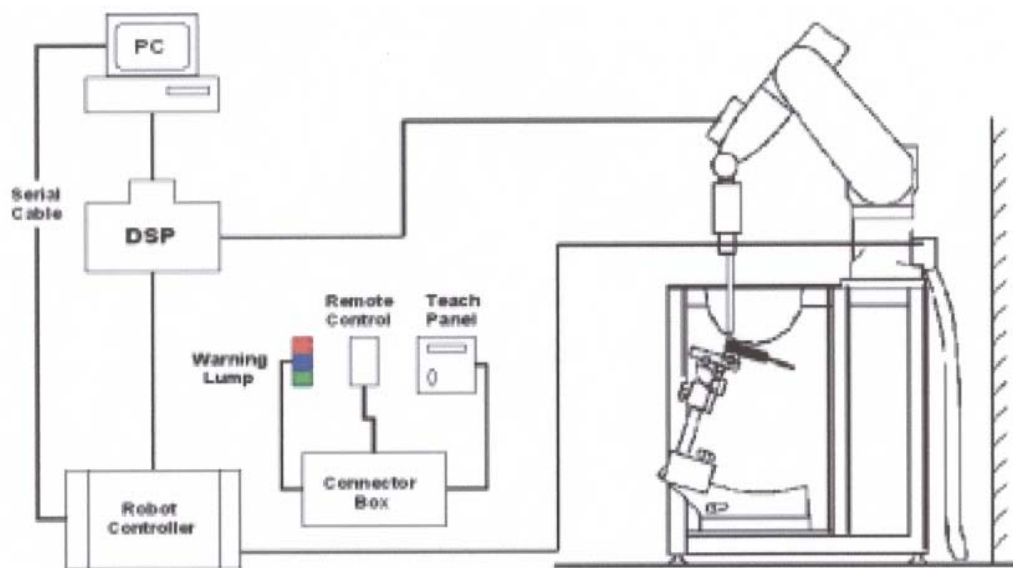
The EUT shall use its internal transmitter. The antenna(s), battery and accessories shall be those specified by the manufacturer. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output. If a wireless link is used, the antenna connected to the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

5.2 SAR Measurement Set-up

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

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

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



Picture 2: SAR Lab Test Measurement Set-up

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

5.3 Dasy4 E-field Probe System

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

ES3DV3 Probe Specification

| | |
|--------------|---|
| Construction | Symmetrical design with triangular core |
| | Interleaved sensors |
| | Built-in shielding against static charges |

| | |
|-------------|---|
| | PEEK enclosure material (resistant to organic solvents, e.g., DGBE) |
| Calibration | Basic Broad Band Calibration in air Conversion Factors (CF) for HSL 900 and HSL 1810 |
| | Additional CF for other liquids and frequencies upon request |



Picture 3: ES3DV3 E-field

| | |
|---------------|--|
| 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 |



Picture4:ES3DV3 E-field probe

5.4 E-field Probe Calibration

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

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

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

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

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

Or

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

Where:

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



Picture 5: Device Holder

5.5 Other Test Equipment

5.5.1 Device Holder for Transmitters

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

5.5.2 Phantom

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

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



Picture 6: Generic Twin Phantom

5.6 Equivalent Tissues

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

Table 1. Composition of the Head Tissue Equivalent Matter

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

Table 2. Composition of the Body Tissue Equivalent Matter

| MIXTURE % | FREQUENCY 850MHz |
|------------------------------------|---|
| Water | 52.5 |
| Sugar | 45.0 |
| Salt | 1.4 |
| Preventol | 0.1 |
| Cellulose | 1.0 |
| Dielectric Parameters Target Value | f=850MHz $\epsilon=55.2$ $\sigma=0.97$ |
| MIXTURE % | FREQUENCY 1900MHz |
| Water | 69.91 |
| Glycol monobutyl | 29.96 |
| Salt | 0.13 |
| Dielectric Parameters Target Value | f=1900MHz $\epsilon=53.3$ $\sigma=1.52$ |

5.7 System Specifications

5.7.1 Robotic System Specifications

Specifications

Positioner: Stäubli Unimation Corp. Robot Model: RX90L

Repeatability: ± 0.02 mm

No. of Axis: 6

Data Acquisition Electronic (DAE) System

Cell Controller

Processor: Pentium III

Clock Speed: 800 MHz

Operating System: Windows 2000

Data Converter

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

Software: DASY4 software

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

6 LABORATORY ENVIRONMENT

Table 3: The Ambient Conditions during EMF Test

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

7 CONDUCTED OUTPUT POWER MEASUREMENT

7.1 Summary

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

7.2 Conducted Power

7.2.1 Measurement Methods

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

7.2.2 Measurement result

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

| GSM 850 | Measured Power (dBm) | | |
|---------|----------------------|-------|-----|
| | 128 | 190 | 251 |
| 32.32 | 32.18 | 32.12 | |
| PCS1900 | Measured Power (dBm) | | |
| | 512 | 661 | 810 |
| 30.02 | 30.09 | 30.06 | |

7.2.3 Power Drift

To control the output power stability during the SAR test, DASY4 system calculates the power drift by measuring the E-field at the same location at the beginning and at the end of the measurement for each test position. These drift values can be found in Table 10 to Table 15 labeled as: (Power Drift [dB]). This ensures that the power drift during one measurement is within 5%.

8 TEST RESULTS

8.1 Dielectric Performance

Table 4: Dielectric Performance of Head Tissue Simulating Liquid

| Measurement is made at temperature 23.0 °C and relative humidity 41%. | | | |
|---|-----------|-------------------------|-----------------------------|
| Liquid temperature during the test: 22.5°C | | | |
| Measurement Date : 850 MHz March 7, 2010 1900 MHz March 8, 2010 | | | |
| / | Frequency | Permittivity ϵ | Conductivity σ (S/m) |
| Target value | 850 MHz | 41.5 | 0.90 |
| | 1900 MHz | 40.0 | 1.40 |
| Measurement value (Average of 10 tests) | 850 MHz | 40.6 | 0.92 |
| | 1900 MHz | 39.5 | 1.43 |

Table 5: Dielectric Performance of Body Tissue Simulating Liquid

| Measurement is made at temperature 23.0 °C and relative humidity 41%. | | | |
|---|-----------|-------------------------|-----------------------------|
| Liquid temperature during the test: 22.5°C | | | |
| Measurement Date : 850 MHz March 7, 2010 1900 MHz March 8, 2010 | | | |
| / | Frequency | Permittivity ϵ | Conductivity σ (S/m) |
| Target value | 850 MHz | 55.2 | 0.97 |
| | 1900 MHz | 53.3 | 1.52 |
| Measurement value (Average of 10 tests) | 850 MHz | 54.1 | 0.95 |
| | 1900 MHz | 51.8 | 1.53 |

8.2 System Validation

Table 6: System Validation of Head

| | | | | | | | | |
|---|---------------------------------|-----------|--------------|-------------------------|--------------|-----------------------------|--------------|-------------|
| Measurement is made at temperature 23.0 °C and relative humidity 41%. | | | | | | | | |
| Liquid temperature during the test: 22.5°C | | | | | | | | |
| Measurement Date : 850 MHz March 7, 2010 1900 MHz March 8, 2010 | | | | | | | | |
| Liquid parameters | Dipole calibration Target value | Frequency | | Permittivity ϵ | | Conductivity σ (S/m) | | |
| | | 835 MHz | 1900 MHz | 41.6 | 39.6 | 0.92 | 1.40 | |
| | Actual Measurement value | 835 MHz | 1900 MHz | 40.7 | 39.5 | 0.90 | 1.43 | |
| | | Frequency | | Target value (W/kg) | | Measured value (W/kg) | | Deviation |
| | Verification results | | 10 g Average | 1 g Average | 10 g Average | 1 g Average | 10 g Average | 1 g Average |
| 835 MHz | | 1.54 | 2.38 | 1.59 | 2.48 | 3.25% | 4.20% | |
| 1900 MHz | | 5.05 | 9.91 | 5.14 | 9.81 | 1.78% | -1.01% | |

Note: 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 41%. | | | | | | | | |
| Liquid temperature during the test: 22.5°C | | | | | | | | |
| Measurement Date : 850 MHz March 7, 2010 1900 MHz March 8, 2010 | | | | | | | | |
| Liquid parameters | Dipole calibration | Frequency | | Permittivity ϵ | | Conductivity σ (S/m) | | |
| | | 835 MHz | | 54.5 | | 0.97 | | |
| | Target value | 1900 MHz | | 52.5 | | 1.51 | | |
| | | Actural Measurement value | 835 MHz | | 54.2 | | 0.93 | |
| 1900 MHz | | | 51.8 | | 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 | | 1.57 | 2.41 | 1.52 | 2.48 | -3.18% | 2.90% |
| | 1900 MHz | | 5.24 | 10.4 | 5.35 | 10.3 | 2.10% | -0.96% |

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

8.3 Evaluation of Multi-Batteries

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

| | | |
|---|----------------------------------|--------------------|
| Limit of SAR (W/kg) | 10 g Average | 1 g Average |
| | 2.0 | 1.6 |
| Test Case | Measurement Result (W/kg) | |
| | 10 g Average | 1 g Average |
| Right hand, Touch cheek, Top frequency (CAB3130000C1) | 0.695 | 1.01 |
| Right hand, Touch cheek, Top frequency (CAB3130010C1) | 0.717 | 1.05 |

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

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

| | | |
|--|----------------------------------|--------------------|
| Limit of SAR (W/kg) | 10 g Average | 1 g Average |
| | 2.0 | 1.6 |
| Test Case | Measurement Result (W/kg) | |
| | 10 g Average | 1 g Average |
| Body, Towards Ground, Mid frequency (CAB3130000C1) | 0.475 | 0.695 |
| Body, Towards Ground, Mid frequency (CAB3130010C1) | 0.497 | 0.720 |

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

8.4 Summary of Measurement Results

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

| Limit of SAR (W/kg) | 10 g Average | 1 g Average | Power Drift (dB) |
|---|---------------------------|-------------|------------------|
| | 2.0 | 1.6 | |
| Test Case | Measurement Result (W/kg) | | Power Drift (dB) |
| | 10 g Average | 1 g Average | |
| Left hand, Touch cheek, Top frequency (See Fig.1) | 0.696 | 1 | -0.158 |
| Left hand, Touch cheek, Mid frequency (See Fig.2) | 0.768 | 1.1 | -0.056 |
| Left hand, Touch cheek, Bottom frequency (See Fig.3) | 0.716 | 1.02 | -0.048 |
| Left hand, Tilt 15 Degree, Top frequency (See Fig.4) | 0.282 | 0.391 | -0.013 |
| Left hand, Tilt 15 Degree, Mid frequency (See Fig.5) | 0.306 | 0.423 | -0.101 |
| Left hand, Tilt 15 Degree, Bottom frequency (See Fig.6) | 0.298 | 0.409 | -0.041 |
| Right hand, Touch cheek, Top frequency (See Fig.7) | 0.717 | 1.05 | -0.095 |
| Right hand, Touch cheek, Mid frequency (See Fig.8) | 0.764 | 1.11 | -0.142 |
| Right hand, Touch cheek, Bottom frequency (See Fig.9) | 0.706 | 1.02 | -0.007 |
| Right hand, Tilt 15 Degree, Top frequency (See Fig.10) | 0.307 | 0.431 | -0.024 |
| Right hand, Tilt 15 Degree, Mid frequency (See Fig.11) | 0.337 | 0.470 | -0.041 |
| Right hand, Tilt 15 Degree, Bottom frequency (See Fig.12) | 0.322 | 0.447 | 0.000 |

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

| Limit of SAR (W/kg) | 10 g Average | 1 g Average | Power Drift (dB) |
|--|---------------------------|-------------|------------------|
| | 2.0 | 1.6 | |
| Test Case | Measurement Result (W/kg) | | Power Drift (dB) |
| | 10 g Average | 1 g Average | |
| Left hand, Touch cheek, Top frequency (See Fig.13) | 0.382 | 0.613 | -0.075 |
| Left hand, Touch cheek, Mid frequency (See Fig.14) | 0.417 | 0.668 | -0.059 |
| Left hand, Touch cheek, Bottom frequency (See Fig.15) | 0.450 | 0.715 | -0.091 |
| Left hand, Tilt 15 Degree, Top frequency (See Fig.16) | 0.256 | 0.415 | 0.039 |
| Left hand, Tilt 15 Degree, Mid frequency (See Fig.17) | 0.272 | 0.436 | 0.036 |
| Left hand, Tilt 15 Degree, Bottom frequency (See Fig.18) | 0.282 | 0.448 | -0.007 |
| Right hand, Touch cheek, Top frequency (See Fig.19) | 0.398 | 0.649 | 0.146 |
| Right hand, Touch cheek, Mid frequency (See Fig.20) | 0.439 | 0.711 | 0.084 |
| Right hand, Touch cheek, Bottom frequency (See Fig.21) | 0.466 | 0.752 | -0.027 |
| Right hand, Tilt 15 Degree, Top frequency (See Fig.22) | 0.245 | 0.401 | 0.065 |
| Right hand, Tilt 15 Degree, Mid frequency (See Fig.23) | 0.254 | 0.411 | 0.012 |
| Right hand, Tilt 15 Degree, Bottom frequency(See Fig.24) | 0.263 | 0.424 | -0.037 |

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

| Limit of SAR (W/kg) | 10 g Average | 1 g Average | Power Drift (dB) |
|---|---------------------------|-------------|------------------|
| | 2.0 | 1.6 | |
| Test Case | Measurement Result (W/kg) | | |
| | 10 g Average | 1 g Average | |
| Right hand, Touch cheek, Mid frequency (See Fig.25) | 0.744 | 1.08 | -0.091 |

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

| Limit of SAR (W/kg) | 10 g Average | 1g Average | Power Drift (dB) |
|--|---------------------------|-------------|------------------|
| | 2.0 | 1.6 | |
| Test Case | Measurement Result (W/kg) | | |
| | 10 g Average | 1 g Average | |
| Body, Towards Ground, Top frequency (See Fig.26) | 0.449 | 0.657 | -0.122 |
| Body, Towards Ground, Mid frequency (See Fig.27) | 0.497 | 0.720 | -0.037 |
| Body, Towards Ground, Bottom frequency (See Fig.28) | 0.473 | 0.687 | 0.005 |
| Body, Towards Phantom, Top frequency (See Fig.29) | 0.385 | 0.558 | 0.021 |
| Body, Towards Phantom, Mid frequency (See Fig.30) | 0.417 | 0.603 | -0.048 |
| Body, Towards Phantom, Bottom frequency (See Fig.31) | 0.399 | 0.578 | -0.015 |
| Body, Towards Ground, Mid frequency with Headset_CCB31B0A11C0 (See Fig.32) | 0.486 | 0.703 | -0.091 |
| Body, Towards Ground, Mid frequency with Headset_CCB31B0A10C0 (See Fig.33) | 0.477 | 0.691 | -0.008 |

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

| Limit of SAR (W/kg) | 10 g Average | 1g Average | Power Drift (dB) |
|--|---------------------------|-------------|------------------|
| | 2.0 | 1.6 | |
| Test Case | Measurement Result (W/kg) | | |
| | 10 g Average | 1 g Average | |
| Body, Towards Ground, Top frequency (See Fig.34) | 0.297 | 0.507 | -0.100 |
| Body, Towards Ground, Mid frequency (See Fig.35) | 0.280 | 0.478 | 0.087 |

| | | | |
|--|-------|-------|-------|
| Body, Towards Ground, Bottom frequency (See Fig.36) | 0.277 | 0.474 | 0.144 |
| Body, Towards Phantom, Top frequency (See Fig.37) | 0.144 | 0.235 | 0.039 |
| Body, Towards Phantom, Mid frequency (See Fig.38) | 0.163 | 0.262 | 0.014 |
| Body, Towards Phantom, Bottom frequency (See Fig.39) | 0.188 | 0.301 | 0.038 |
| Body, Towards Ground, Top frequency with Headset_CCB31B0A11C0 (See Fig.40) | 0.225 | 0.386 | 0.104 |
| Body, Towards Ground, Top frequency with Headset_CCB31B0A10C0 (See Fig.41) | 0.229 | 0.392 | 0.092 |

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

| Limit of SAR (W/kg) | 10 g Average | 1g Average | Power Drift (dB) |
|--|---------------------------|-------------|------------------|
| | 2.0 | 1.6 | |
| Test Case | Measurement Result (W/kg) | | |
| | 10 g Average | 1 g Average | |
| Body, Towards Ground, Mid frequency (See Fig.42) | 0.487 | 0.705 | -0.084 |

8.5 Conclusion

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

9 Measurement Uncertainty

| No. | Error source | Type | Uncertainty Value (%) | Probability Distribution | k | c _i | Standard Uncertainty (%) u _i (%) | Degree of freedom V _{eff} or v _i |
|--------------------|------------------------------------|------|-----------------------|--------------------------|------------|----------------|---|--|
| 1 | System repeatability | A | 0.5 | N | 1 | 1 | 0.5 | 9 |
| Measurement system | | | | | | | | |
| 2 | – probe calibration | B | 7 | N | 2 | 1 | 3.5 | ∞ |
| 3 | – axial isotropy of the probe | B | 4.7 | R | $\sqrt{3}$ | 0.5 | 4.3 | ∞ |
| 4 | – hemisphere isotropy of the probe | B | 9.4 | R | $\sqrt{3}$ | | | |

| | | | | | | | | |
|--------------------------------------|---|---|------|---|------------|-----|------|----------|
| 5 | – space resolution | B | 0 | R | $\sqrt{3}$ | 1 | 0 | ∞ |
| 6 | – boundary effect | B | 11.0 | R | $\sqrt{3}$ | 1 | 6.4 | ∞ |
| 7 | – probe linearity | B | 4.7 | R | $\sqrt{3}$ | 1 | 2.7 | ∞ |
| 8 | – detection limit | B | 1.0 | R | $\sqrt{3}$ | 1 | 0.6 | ∞ |
| 9 | – readout electronics | B | 1.0 | N | 1 | 1 | 1.0 | ∞ |
| 10 | – RF Ambient Conditions | B | 3.0 | R | $\sqrt{3}$ | 1 | 1.73 | ∞ |
| 11 | – Probe Positioner Mechanical Tolerance | B | 0.4 | R | $\sqrt{3}$ | 1 | 0.2 | ∞ |
| 12 | – Probe Positioning with respect to Phantom Shell | B | 2.9 | R | $\sqrt{3}$ | 1 | 1.7 | ∞ |
| 13 | – Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation | B | 3.9 | R | $\sqrt{3}$ | 1 | 2.3 | ∞ |
| Test sample Related | | | | | | | | |
| 14 | – Test Sample Positioning | A | 4.9 | N | 1 | 1 | 4.9 | 5 |
| 15 | – Device Holder | A | 6.1 | N | 1 | 1 | 6.1 | 5 |
| 16 | – Output Power Variation - SAR drift measurement | B | 5.0 | R | $\sqrt{3}$ | 1 | 2.9 | ∞ |
| Phantom and Tissue Parameters | | | | | | | | |
| 17 | – Phantom Uncertainty (shape and thickness tolerances) | B | 1.0 | R | $\sqrt{3}$ | 1 | 0.6 | ∞ |
| 18 | – liquid conductivity (deviation from target) | B | 5.0 | R | $\sqrt{3}$ | 0.6 | 1.7 | ∞ |
| 19 | – liquid conductivity (measurement error) | A | 0.23 | N | 1 | 1 | 0.23 | 9 |
| 20 | -liquid permittivity (deviation from target) | B | 5.0 | R | $\sqrt{3}$ | 0.6 | 1.7 | ∞ |
| 21 | – liquid permittivity (measurement error) | A | 0.46 | N | 1 | 1 | 0.46 | 9 |

| | | | | | |
|---|--|---|-----|------|------|
| Combined standard uncertainty | $u_c = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$ | / | | 12.2 | 88.7 |
| Expanded uncertainty (confidence interval of 95 %) | $u_e = 2u_c$ | N | k=2 | 24.4 | / |

10 MAIN TEST INSTRUMENTS

Table 16: List of Main Instruments

| No. | Name | Type | Serial Number | Calibration Date | Valid Period |
|-----|-----------------------|---------------|---------------|--------------------------|--------------|
| 01 | Network analyzer | HP 8753E | US38433212 | August 29,2009 | One year |
| 02 | Power meter | NRVD | 101253 | September 4, 2009 | One year |
| 03 | Power sensor | NRV-Z5 | 100333 | | |
| 04 | Signal Generator | E4433B | US37230472 | September 3, 2009 | One Year |
| 05 | Amplifier | VTL5400 | 0505 | No Calibration Requested | |
| 06 | BTS | CMU 200 | 113312 | August 10, 2009 | One year |
| 07 | E-field Probe | SPEAG ES3DV3 | 3149 | September 25, 2009 | One year |
| 08 | DAE | SPEAG DAE4 | 771 | November 19, 2009 | One year |
| 09 | Dipole Validation Kit | SPEAG D835V2 | 443 | February 26, 2010 | Two years |
| 10 | Dipole Validation Kit | SPEAG D1900V2 | 541 | February 26, 2010 | Two years |

END OF REPORT BODY

ANNEX A MEASUREMENT PROCESS

The evaluation was performed with the following procedure:

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

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

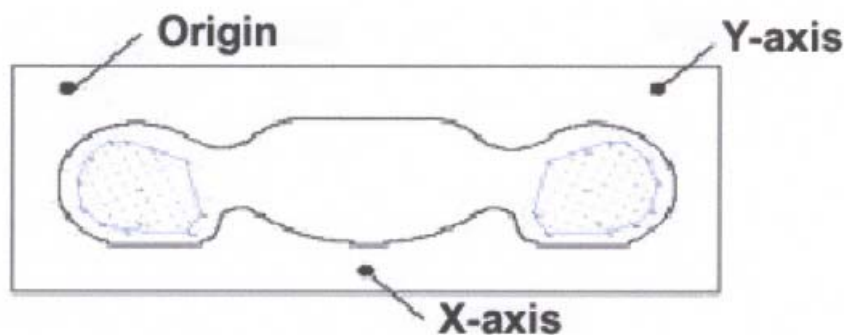
Step 3: Around this point, a volume of 30 mm x 30 mm x 30 mm was assessed by measuring 7 x 7x 7 points. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

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

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

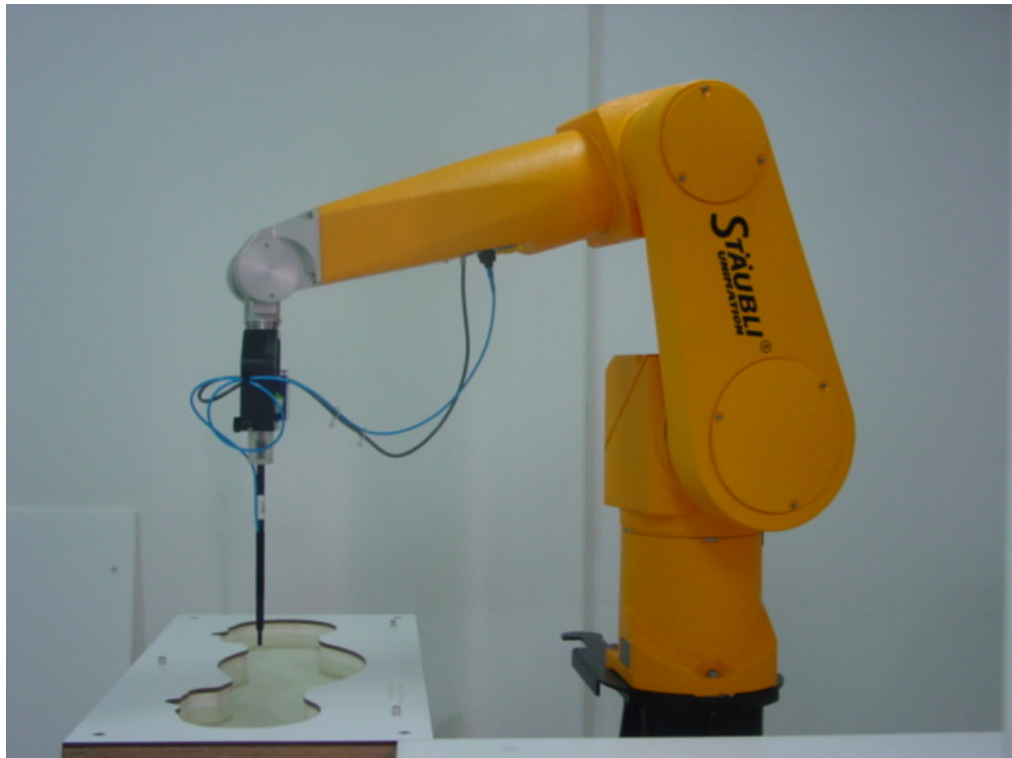
c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

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

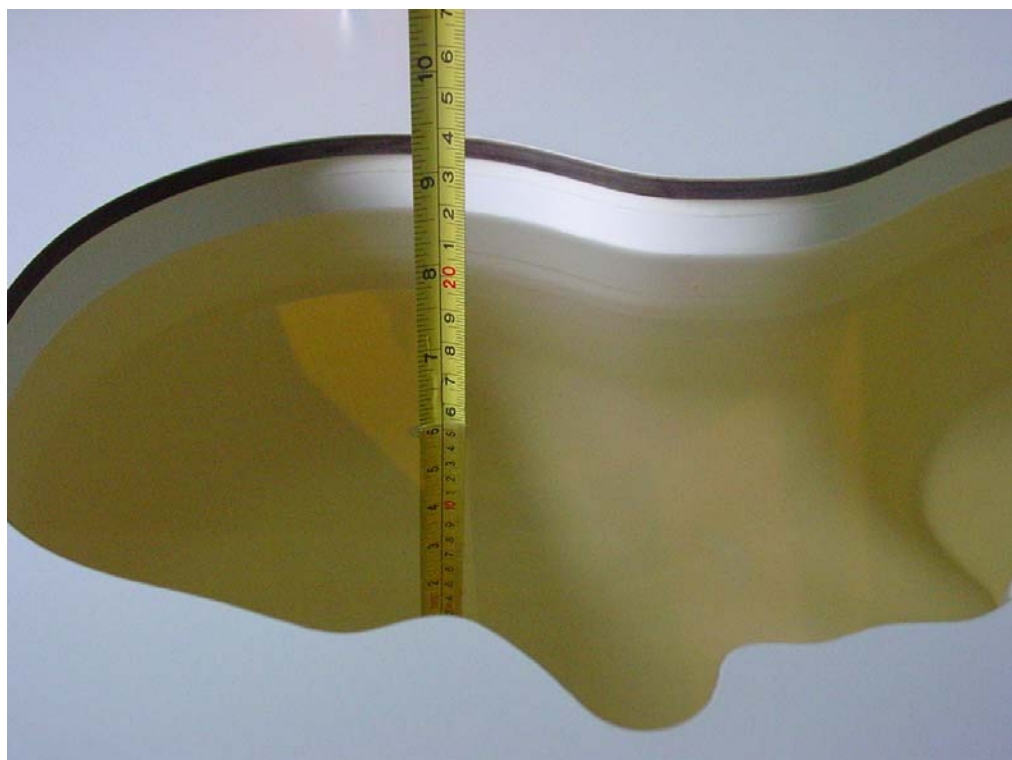


Picture A: SAR Measurement Points in Area Scan

ANNEX B TEST LAYOUT



Picture B1: Specific Absorption Rate Test Layout



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



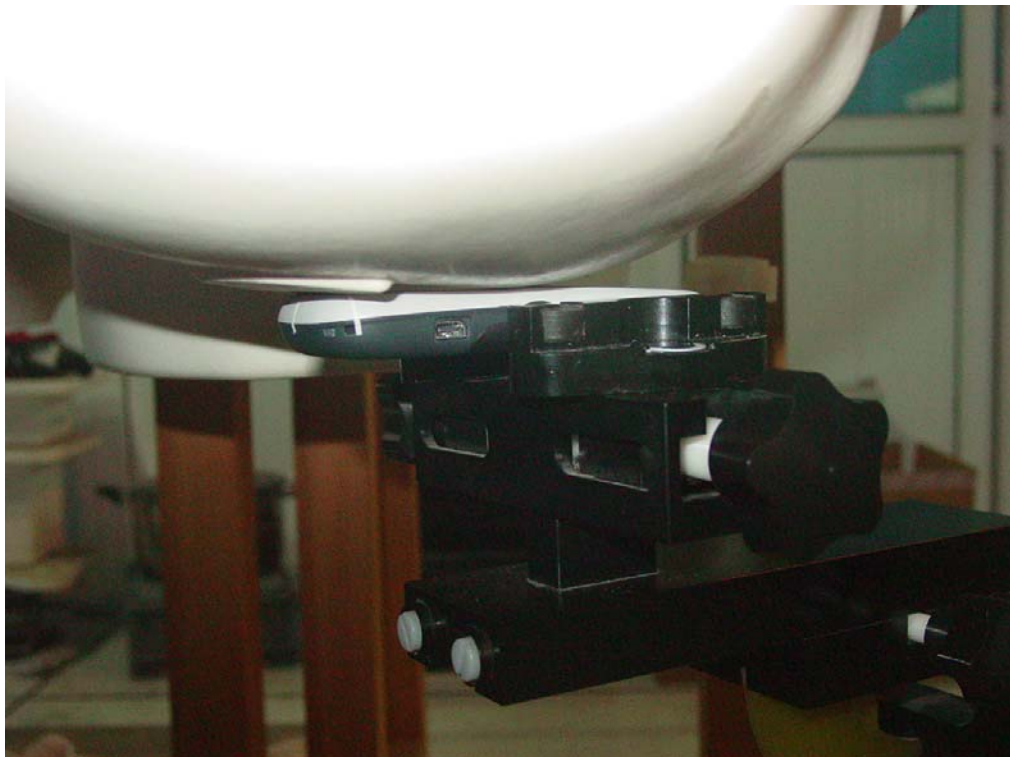
Picture B3 Liquid depth in the Flat Phantom (1900MHz)



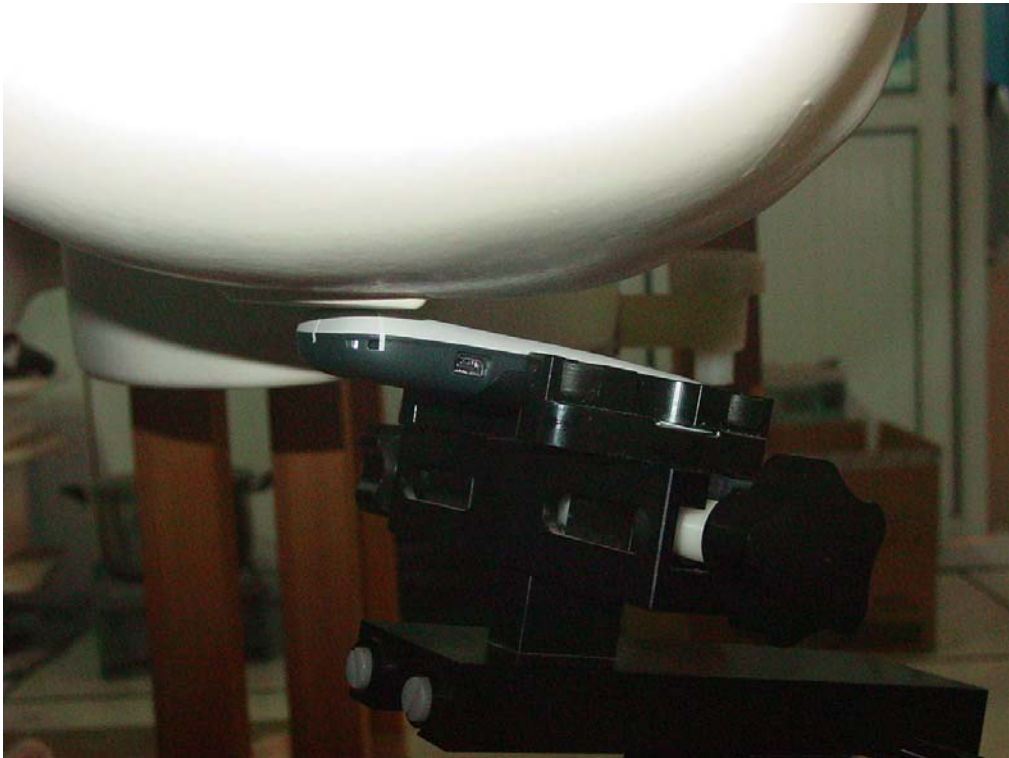
Picture B4: Left Hand Touch Cheek Position



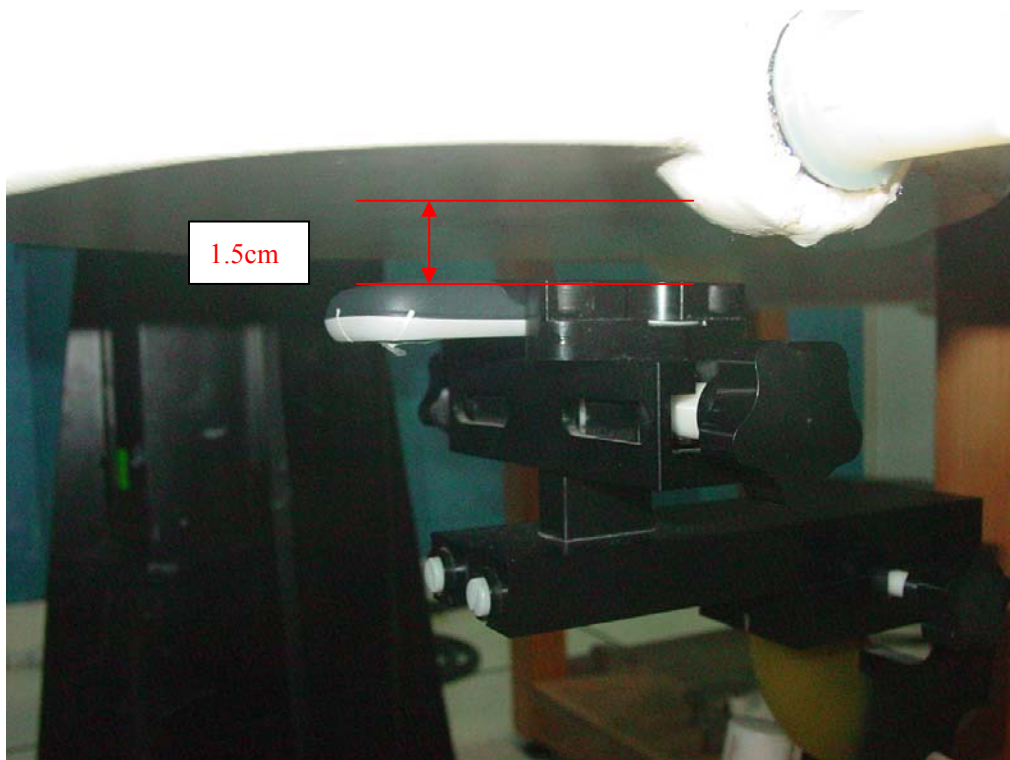
Picture B5: Left Hand Tilt 15° Position



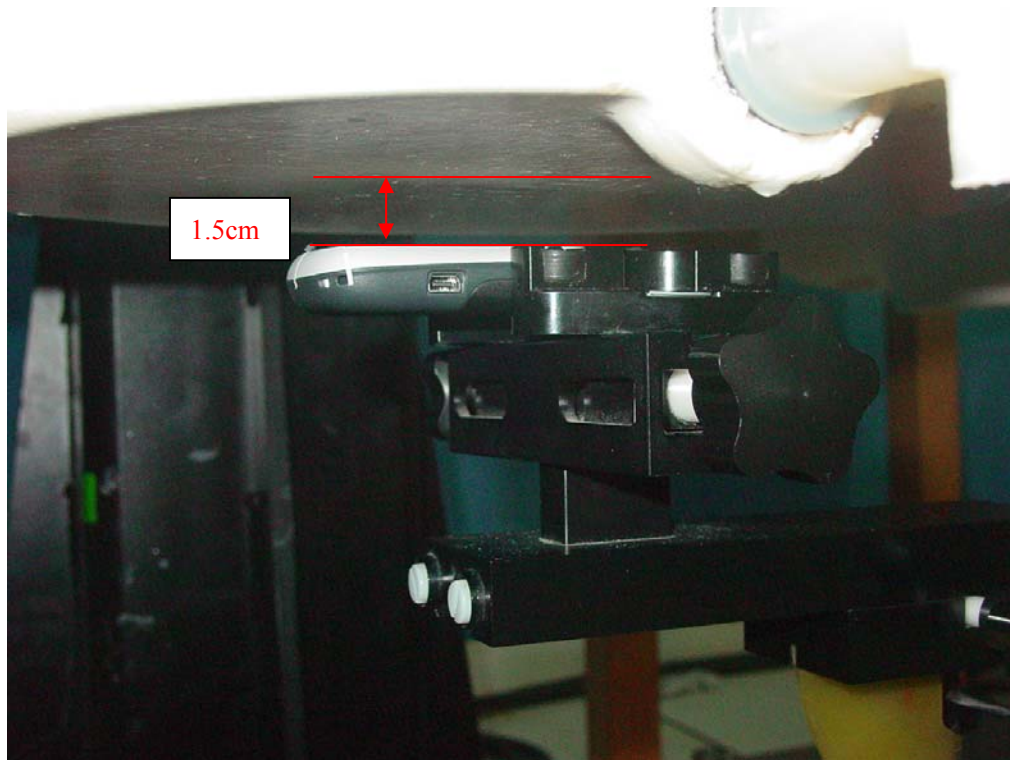
Picture B6: Right Hand Touch Cheek Position



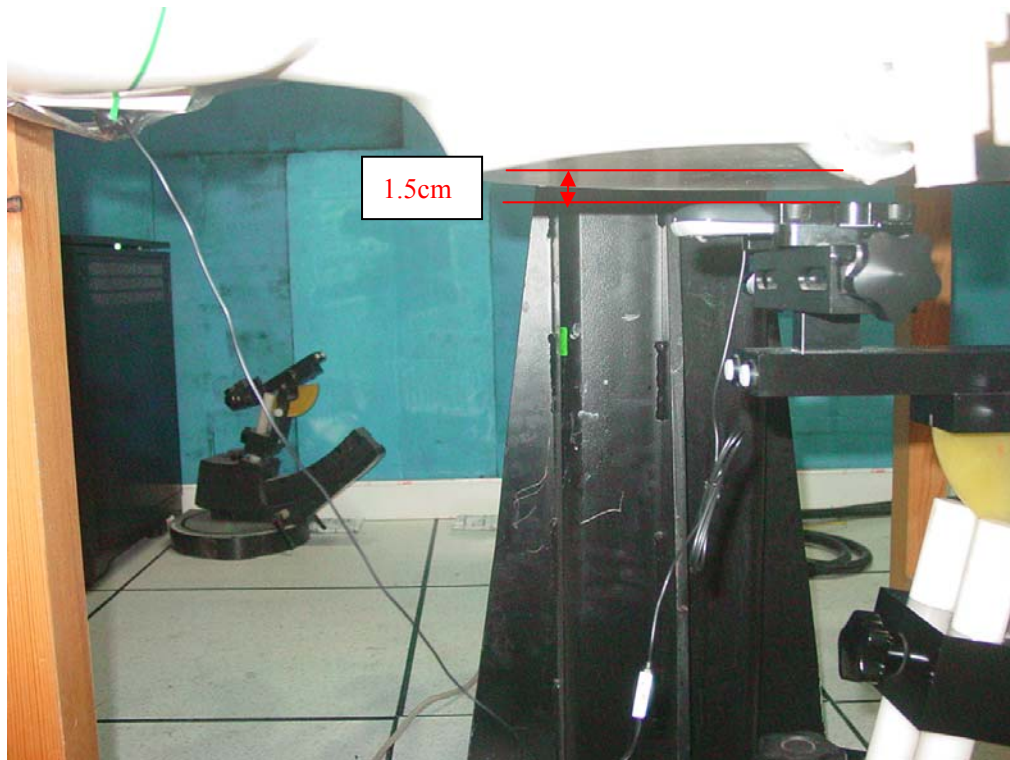
Picture B7: Right Hand Tilt 15° Position



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



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



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

ANNEX C GRAPH RESULTS

850 Left Cheek High

Date/Time: 2010-3-7 8:15:32

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used (interpolated): $f = 848.8$ MHz; $\sigma = 0.92$ mho/m; $\epsilon_r = 40.6$; $\rho = 1000$ kg/m³

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

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

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

Cheek High/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.11 mW/g

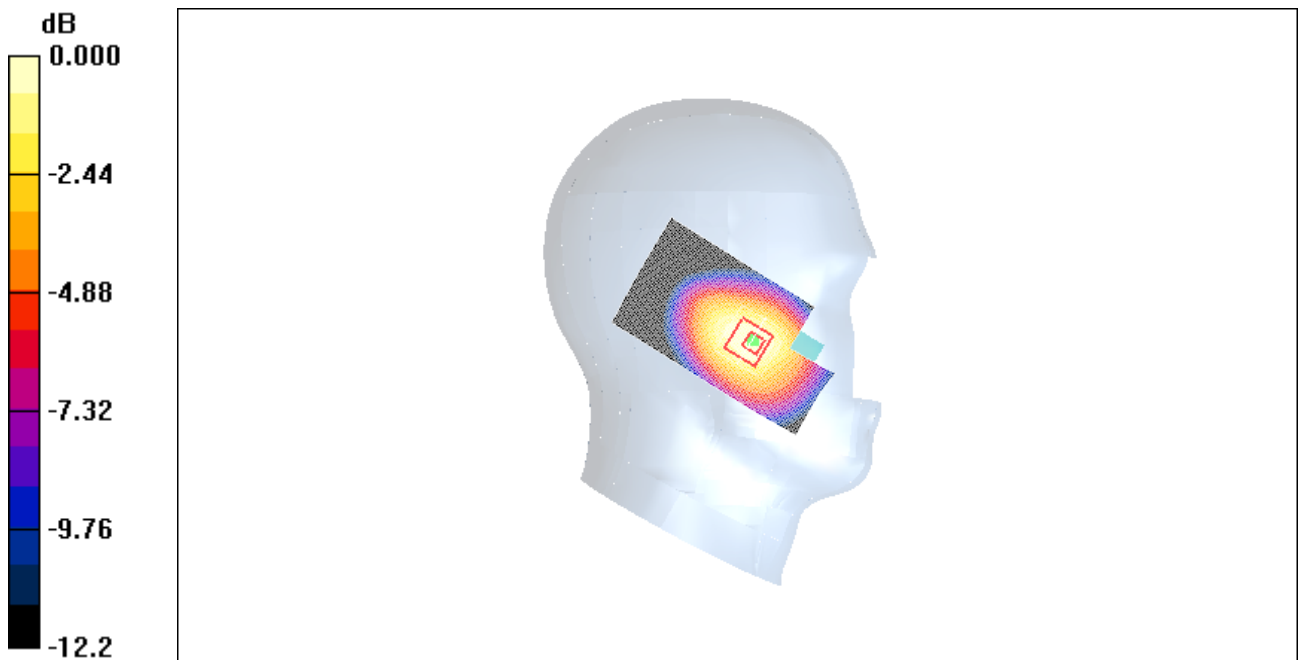
Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.1 V/m; Power Drift = -0.158 dB

Peak SAR (extrapolated) = 1.36 W/kg

SAR(1 g) = 1 mW/g; SAR(10 g) = 0.696 mW/g

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



0 dB = 1.08mW/g

Fig. 1 850MHz CH251

850 Left Cheek Middle

Date/Time: 2010-3-7 8:29:48

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.908$ mho/m; $\epsilon_r = 40.7$; $\rho = 1000$ kg/m³

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

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

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

Cheek Middle/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

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

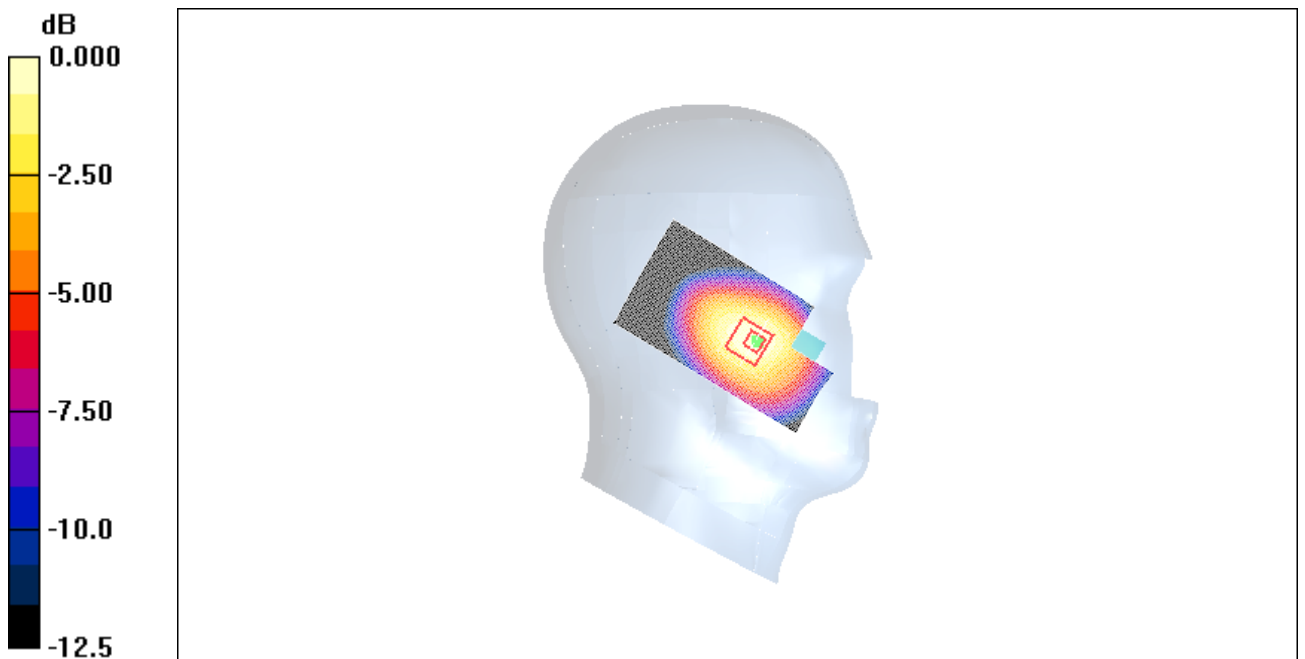
Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.4 V/m; Power Drift = -0.056 dB

Peak SAR (extrapolated) = 1.51 W/kg

SAR(1 g) = 1.1 mW/g; SAR(10 g) = 0.768 mW/g

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



0 dB = 1.19mW/g

Fig. 2 850 MHz CH190

850 Left Cheek Low

Date/Time: 2010-3-7 8:43:56

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used: $f = 825$ MHz; $\sigma = 0.896$ mho/m; $\epsilon_r = 40.7$; $\rho = 1000$ kg/m³

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

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

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

Cheek Low/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

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

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

Reference Value = 11.2 V/m; Power Drift = -0.048 dB

Peak SAR (extrapolated) = 1.40 W/kg

SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.716 mW/g

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

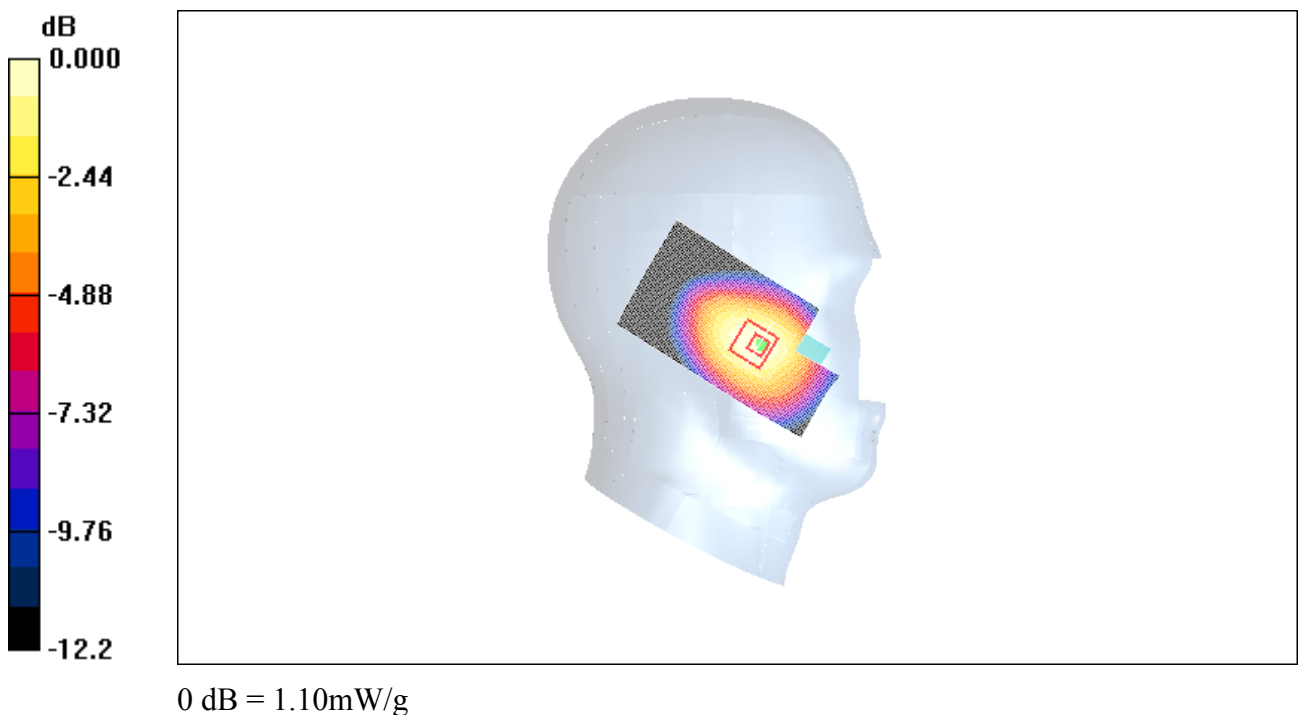


Fig. 3 850 MHz CH128

850 Left Tilt High

Date/Time: 2010-3-7 8:58:11

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used (interpolated): $f = 848.8$ MHz; $\sigma = 0.92$ mho/m; $\epsilon_r = 40.6$; $\rho = 1000$ kg/m³

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

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

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

Tilt High/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

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

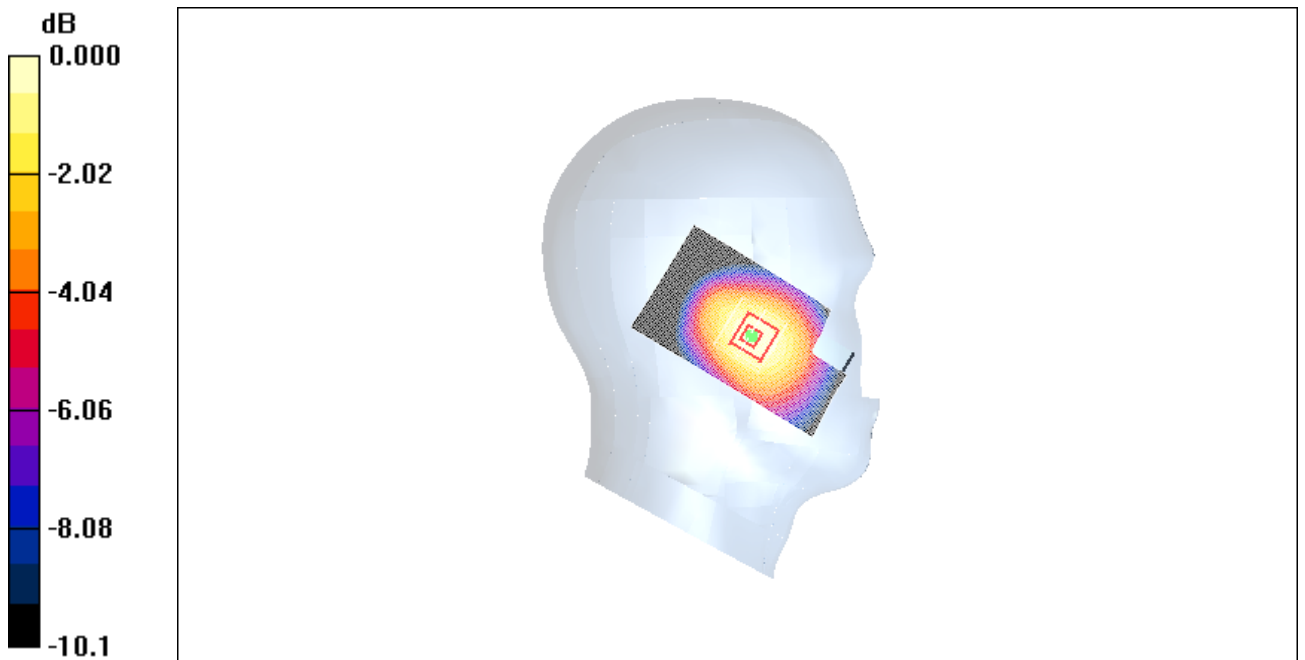
Tilt High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.6 V/m; Power Drift = -0.013 dB

Peak SAR (extrapolated) = 0.511 W/kg

SAR(1 g) = 0.391 mW/g; SAR(10 g) = 0.282 mW/g

Maximum value of SAR (measured) = 0.417 mW/g



0 dB = 0.417mW/g

Fig.4 850 MHz CH251

850 Left Tilt Middle

Date/Time: 2010-3-7 9:12:25

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.908$ mho/m; $\epsilon_r = 40.7$; $\rho = 1000$ kg/m³

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

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

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

Tilt Middle/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.455 mW/g

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

Reference Value = 12.3 V/m; Power Drift = -0.101 dB

Peak SAR (extrapolated) = 0.554 W/kg

SAR(1 g) = 0.423 mW/g; SAR(10 g) = 0.306 mW/g

Maximum value of SAR (measured) = 0.452 mW/g

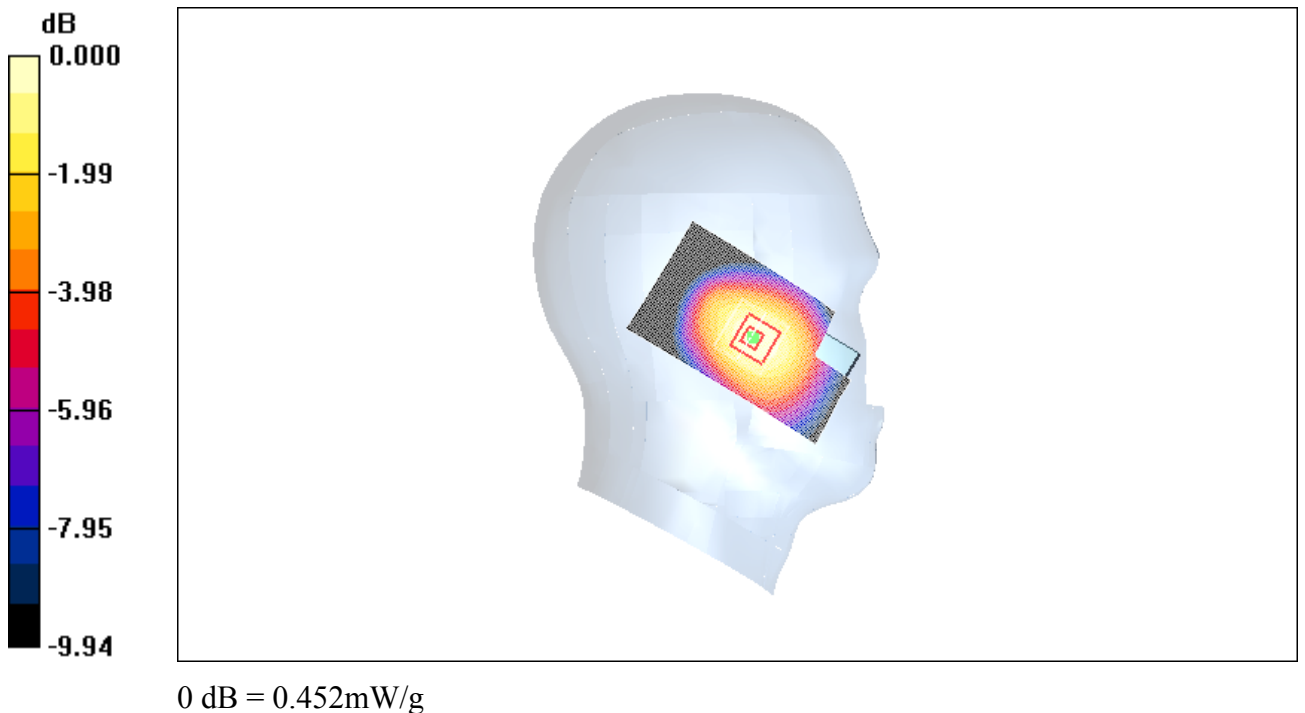


Fig.5 850 MHz CH190

850 Left Tilt Low

Date/Time: 2010-3-7 9:26:37

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used: $f = 825$ MHz; $\sigma = 0.896$ mho/m; $\epsilon_r = 40.7$; $\rho = 1000$ kg/m³

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

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

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

Tilt Low/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

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

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

Reference Value = 12.2 V/m; Power Drift = -0.041 dB

Peak SAR (extrapolated) = 0.532 W/kg

SAR(1 g) = 0.409 mW/g; SAR(10 g) = 0.298 mW/g

Maximum value of SAR (measured) = 0.433 mW/g

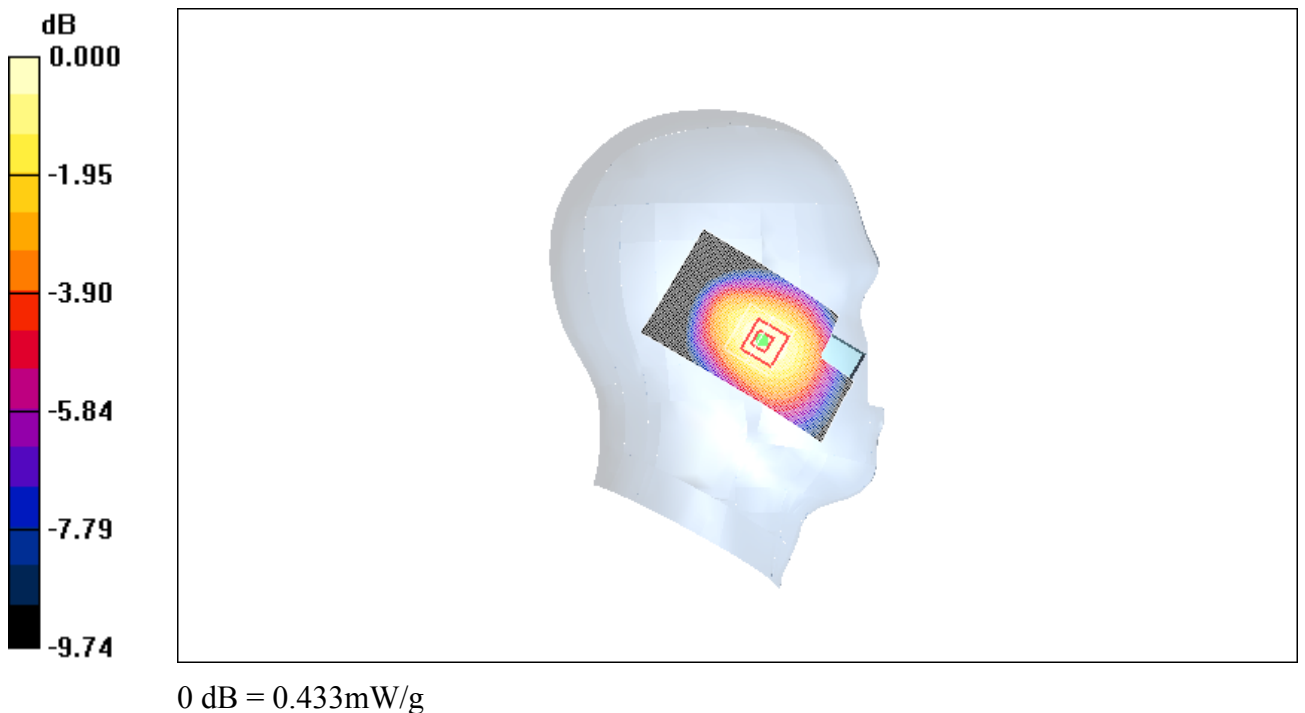


Fig. 6 850 MHz CH128

850 Right Cheek High

Date/Time: 2010-3-7 9:40:55

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used (interpolated): $f = 848.8$ MHz; $\sigma = 0.92$ mho/m; $\epsilon_r = 40.6$; $\rho = 1000$ kg/m³

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

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

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

Cheek High/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

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

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

Reference Value = 11.7 V/m; Power Drift = -0.095 dB

Peak SAR (extrapolated) = 1.48 W/kg

SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.717 mW/g

Maximum value of SAR (measured) = 1.11 mW/g



0 dB = 1.11mW/g

Fig. 7 850 MHz CH251

850 Right Cheek Middle

Date/Time: 2010-3-7 9:55:08

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.908$ mho/m; $\epsilon_r = 40.7$; $\rho = 1000$ kg/m³

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

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

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

Cheek Middle/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

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

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

Reference Value = 12.3 V/m; Power Drift = -0.142 dB

Peak SAR (extrapolated) = 1.52 W/kg

SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.764 mW/g

Maximum value of SAR (measured) = 1.16 mW/g

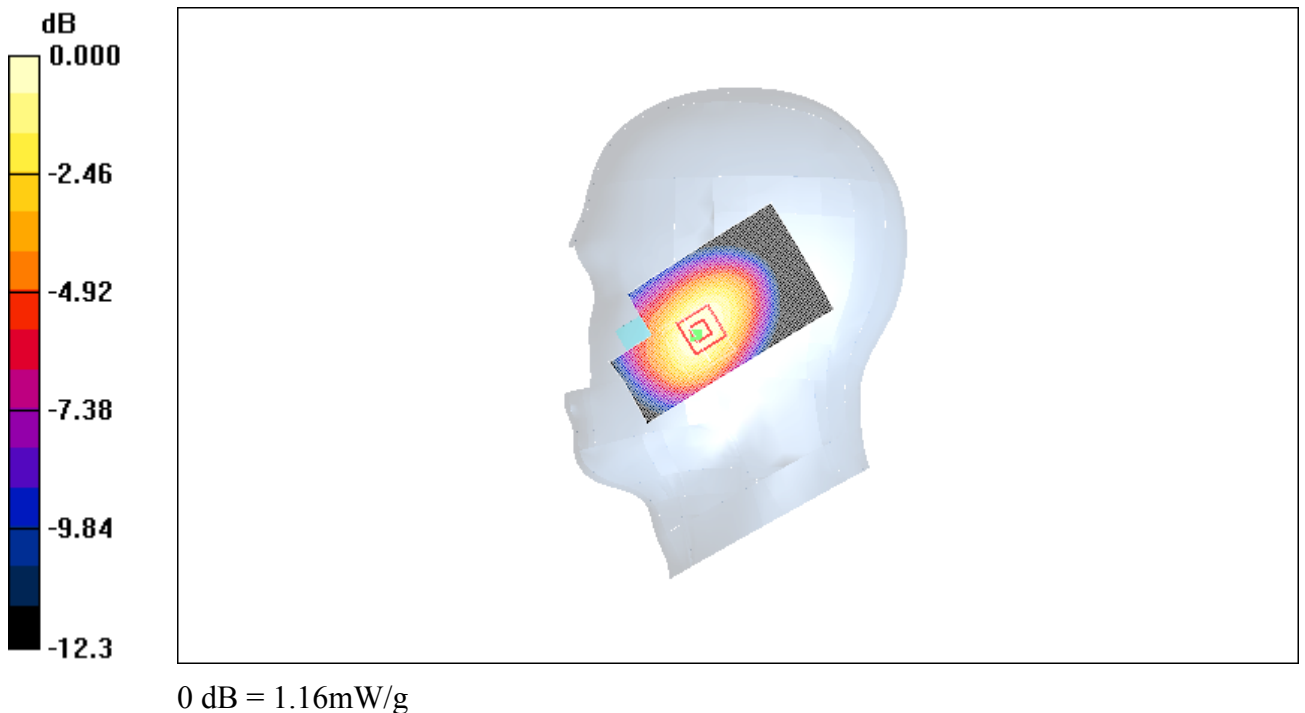


Fig. 8 850 MHz CH190

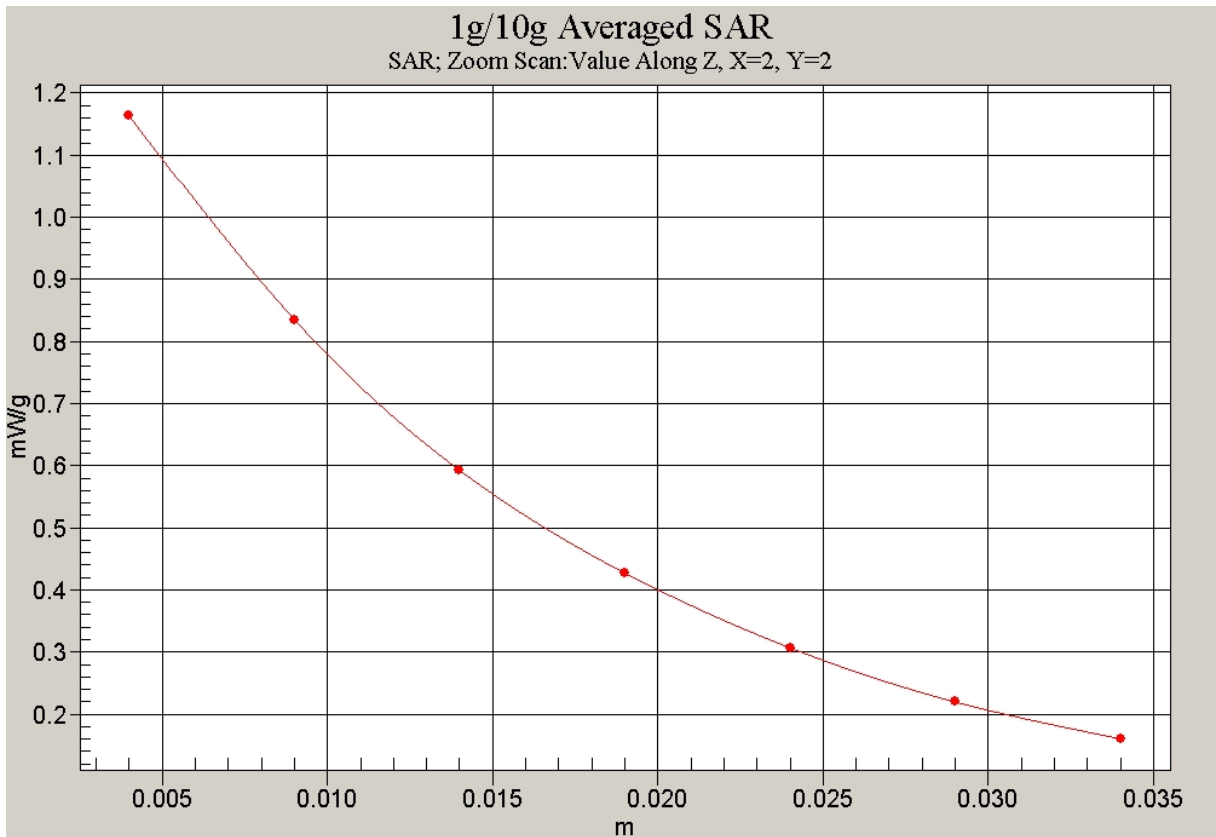


Fig. 8-1 Z-Scan at power reference point (850 MHz CH190)

850 Right Cheek Low

Date/Time: 2010-3-7 10:09:20

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used: $f = 825$ MHz; $\sigma = 0.896$ mho/m; $\epsilon_r = 40.7$; $\rho = 1000$ kg/m³

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

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

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

Cheek Low/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.11 mW/g

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

Reference Value = 11.9 V/m; Power Drift = -0.007 dB

Peak SAR (extrapolated) = 1.42 W/kg

SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.706 mW/g

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



0 dB = 1.07mW/g

Fig. 9 850 MHz CH128

850 Right Tilt High

Date/Time: 2010-3-7 10:23:37

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used (interpolated): $f = 848.8$ MHz; $\sigma = 0.92$ mho/m; $\epsilon_r = 40.6$; $\rho = 1000$ kg/m³

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

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

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

Tilt High/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.460 mW/g

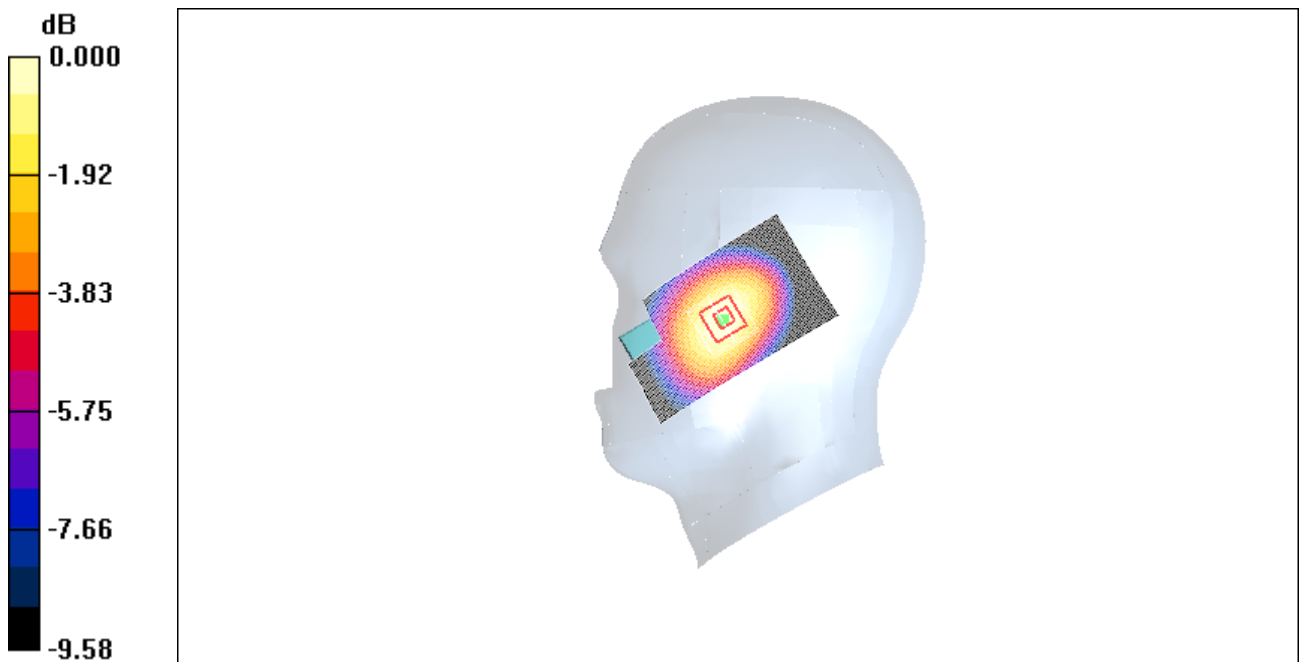
Tilt High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.8 V/m; Power Drift = -0.024 dB

Peak SAR (extrapolated) = 0.571 W/kg

SAR(1 g) = 0.431 mW/g; SAR(10 g) = 0.307 mW/g

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



0 dB = 0.456mW/g

Fig.10 850 MHz CH251

850 Right Tilt Middle

Date/Time: 2010-3-7 10:37:53

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.908$ mho/m; $\epsilon_r = 40.7$; $\rho = 1000$ kg/m³

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

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

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

Tilt Middle/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.507 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 = -0.041 dB

Peak SAR (extrapolated) = 0.611 W/kg

SAR(1 g) = 0.470 mW/g; SAR(10 g) = 0.337 mW/g

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



0 dB = 0.495mW/g

Fig.11 850 MHz CH190

850 Right Tilt Low

Date/Time: 2010-3-7 10:52:19

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used: $f = 825$ MHz; $\sigma = 0.896$ mho/m; $\epsilon_r = 40.7$; $\rho = 1000$ kg/m³

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

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

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

Tilt Low/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

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

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

Reference Value = 14.5 V/m; Power Drift = 0.000 dB

Peak SAR (extrapolated) = 0.578 W/kg

SAR(1 g) = 0.447 mW/g; SAR(10 g) = 0.322 mW/g

Maximum value of SAR (measured) = 0.475 mW/g

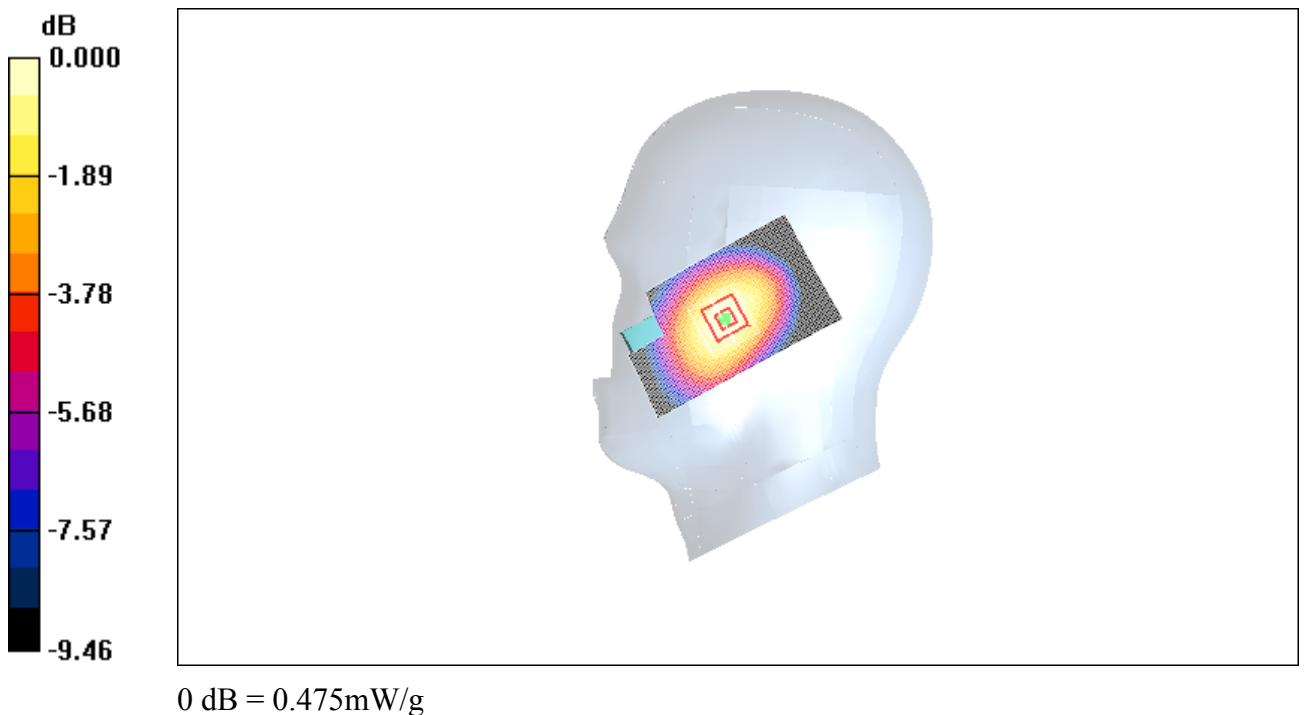


Fig. 12 850 MHz CH128

1900 Left Cheek High

Date/Time: 2010-3-8 8:16:41

Electronics: DAE4 Sn771

Medium: 1900 Head

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.44$ mho/m; $\epsilon_r = 39.4$; $\rho = 1000$ kg/m³

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

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

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

Cheek High/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.718 mW/g

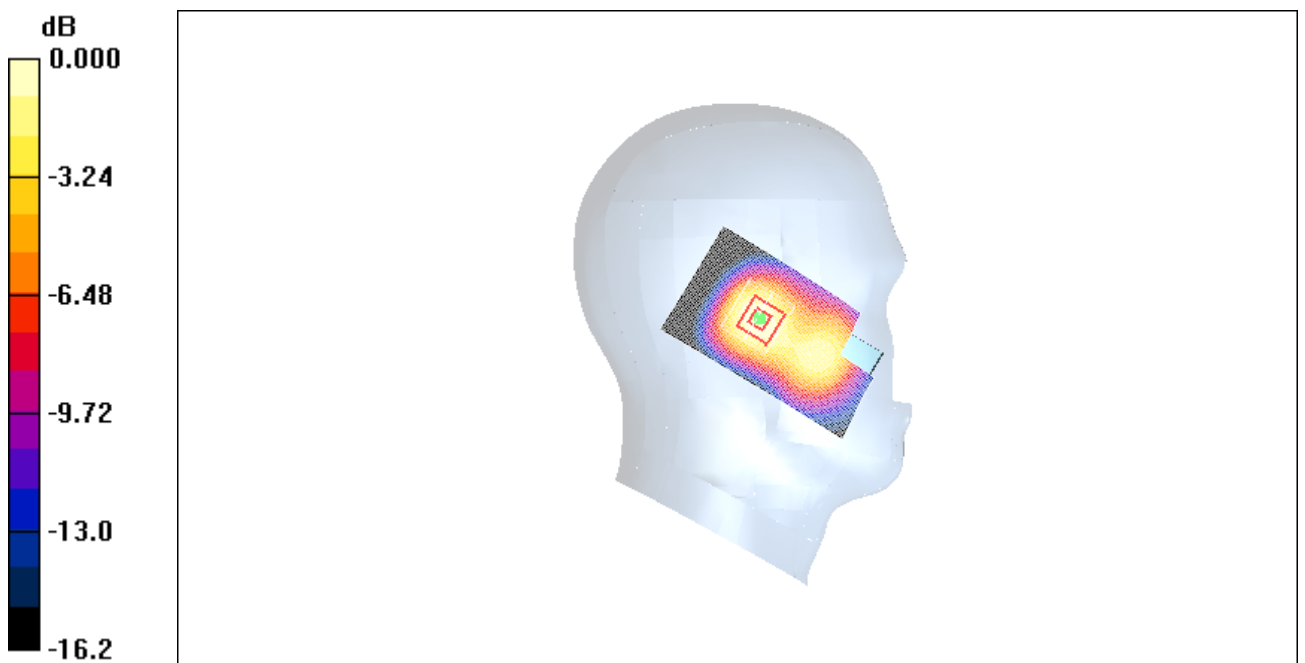
Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.7 V/m; Power Drift = -0.075 dB

Peak SAR (extrapolated) = 0.871 W/kg

SAR(1 g) = 0.613 mW/g; SAR(10 g) = 0.382 mW/g

Maximum value of SAR (measured) = 0.662 mW/g



0 dB = 0.662mW/g

Fig. 13 1900 MHz CH810

1900 Left Cheek Middle

Date/Time: 2010-3-8 8:30:59

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.42$ mho/m; $\epsilon_r = 39.5$; $\rho = 1000$ kg/m³

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

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

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

Cheek Middle/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.766 mW/g

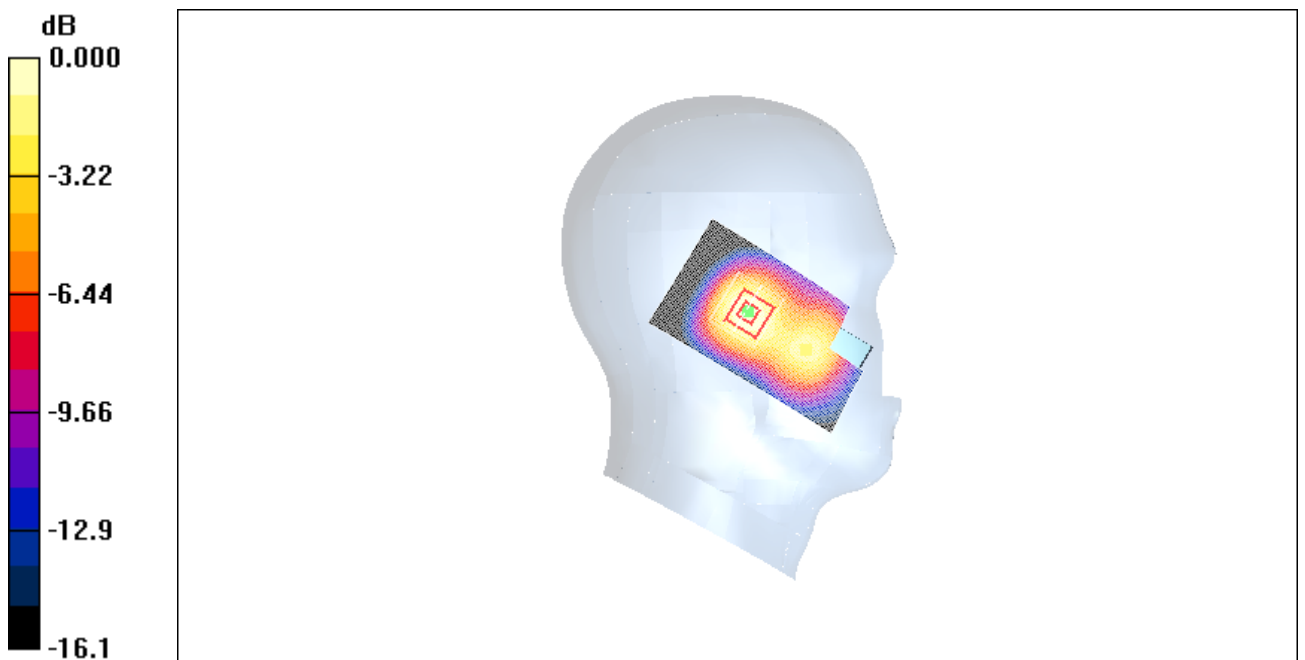
Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.0 V/m; Power Drift = -0.059 dB

Peak SAR (extrapolated) = 0.953 W/kg

SAR(1 g) = 0.668 mW/g; SAR(10 g) = 0.417 mW/g

Maximum value of SAR (measured) = 0.721 mW/g



0 dB = 0.721mW/g

Fig. 14 1900 MHz CH661

1900 Left Cheek Low

Date/Time: 2010-3-8 8:45:16

Electronics: DAE4 Sn771

Medium: 1900 Head

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 39.6$; $\rho = 1000$ kg/m³

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

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

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

Cheek Low/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

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

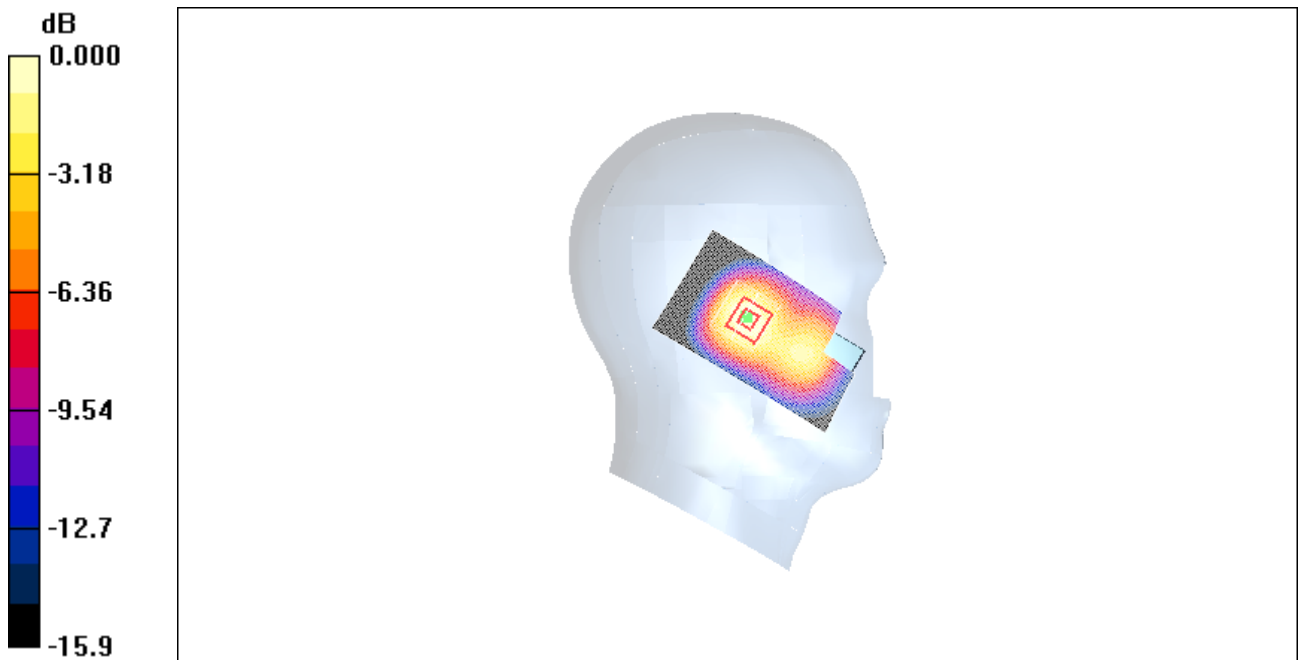
Cheek Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.2 V/m; Power Drift = -0.091 dB

Peak SAR (extrapolated) = 1.01 W/kg

SAR(1 g) = 0.715 mW/g; SAR(10 g) = 0.450 mW/g

Maximum value of SAR (measured) = 0.768 mW/g



0 dB = 0.768mW/g

Fig. 15 1900 MHz CH512

1900 Left Tilt High

Date/Time: 2010-3-8 8:59:37

Electronics: DAE4 Sn771

Medium: 1900 Head

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.44$ mho/m; $\epsilon_r = 39.4$; $\rho = 1000$ kg/m³

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

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

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

Tilt High/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.504 mW/g

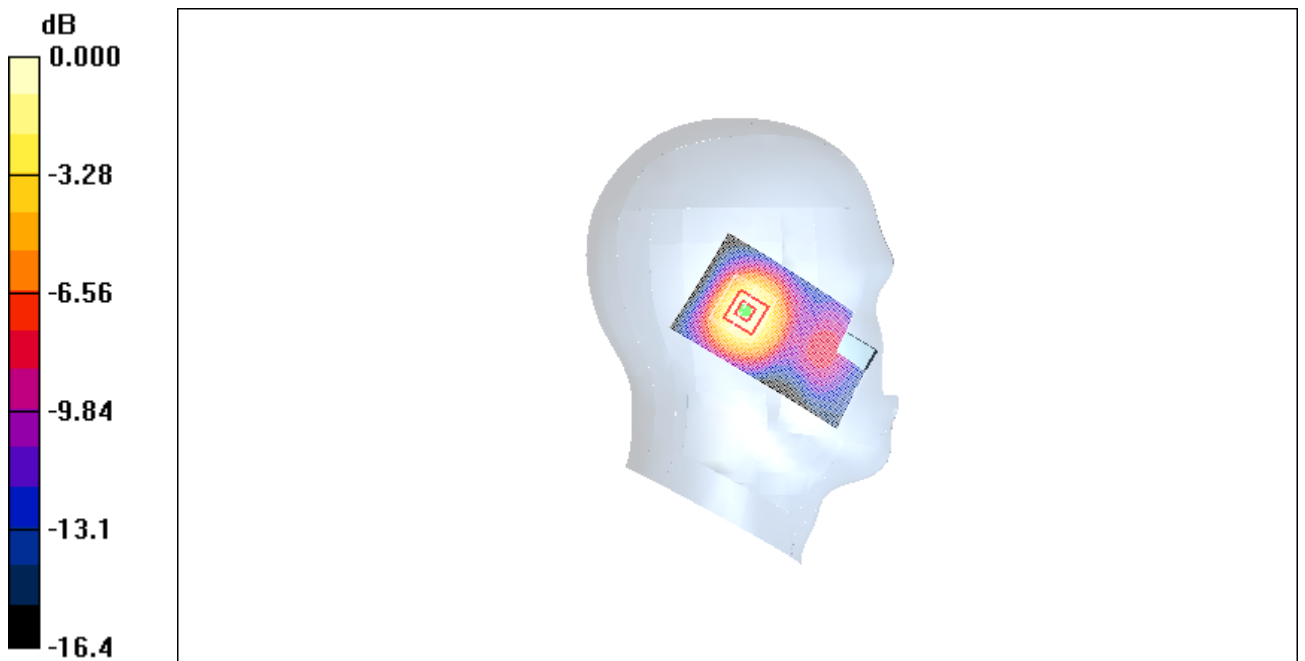
Tilt High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.3 V/m; Power Drift = 0.039 dB

Peak SAR (extrapolated) = 0.610 W/kg

SAR(1 g) = 0.415 mW/g; SAR(10 g) = 0.256 mW/g

Maximum value of SAR (measured) = 0.451 mW/g



0 dB = 0.451mW/g

Fig.16 1900 MHz CH810

1900 Left Tilt Middle

Date/Time: 2010-3-8 9:13:52

Electronics: DAE4 Sn771

Medium: 1900 Head

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.42$ mho/m; $\epsilon_r = 39.5$; $\rho = 1000$ kg/m³

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

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

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

Tilt Middle/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

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

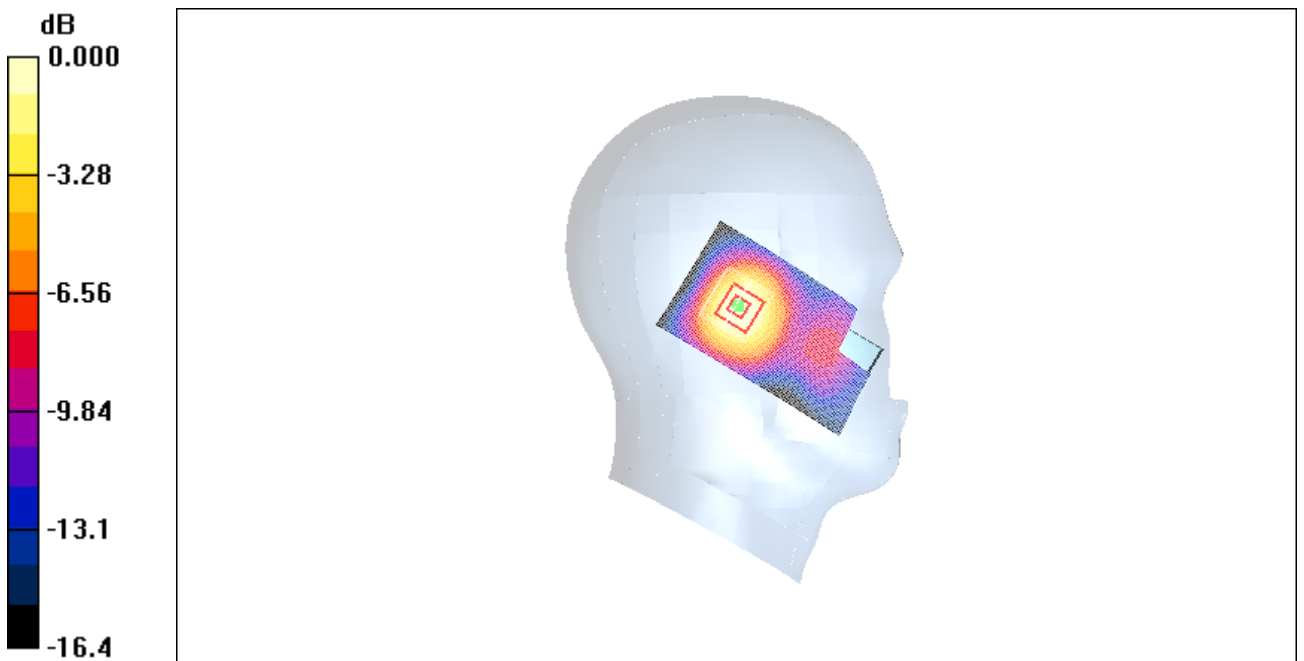
Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.5 V/m; Power Drift = 0.036 dB

Peak SAR (extrapolated) = 0.635 W/kg

SAR(1 g) = 0.436 mW/g; SAR(10 g) = 0.272 mW/g

Maximum value of SAR (measured) = 0.470 mW/g



0 dB = 0.470mW/g

Fig. 17 1900 MHz CH661

1900 Left Tilt Low

Date/Time: 2010-3-8 9:28:17

Electronics: DAE4 Sn771

Medium: 1900 Head

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 39.6$; $\rho = 1000$ kg/m³

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

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

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

Tilt Low/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.544 mW/g

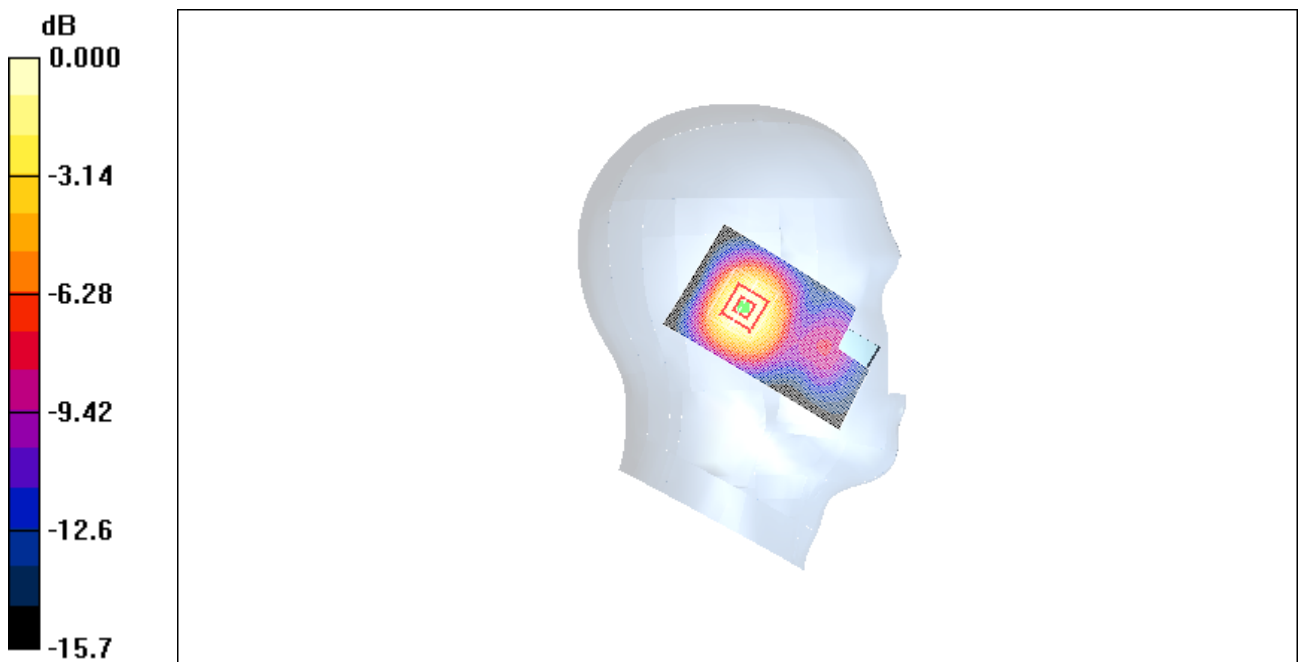
Tilt Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.9 V/m; Power Drift = -0.007 dB

Peak SAR (extrapolated) = 0.647 W/kg

SAR(1 g) = 0.448 mW/g; SAR(10 g) = 0.282 mW/g

Maximum value of SAR (measured) = 0.482 mW/g



0 dB = 0.482mW/g

Fig. 18 1900 MHz CH512

1900 Right Cheek High

Date/Time: 2010-3-8 9:42:31

Electronics: DAE4 Sn771

Medium: 1900 Head

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.44$ mho/m; $\epsilon_r = 39.4$; $\rho = 1000$ kg/m³

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

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

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

Cheek High/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.791 mW/g

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

Reference Value = 7.72 V/m; Power Drift = 0.146 dB

Peak SAR (extrapolated) = 0.929 W/kg

SAR(1 g) = 0.649 mW/g; SAR(10 g) = 0.398 mW/g

Maximum value of SAR (measured) = 0.701 mW/g



0 dB = 0.701mW/g

Fig. 19 1900 MHz CH810

1900 Right Cheek Middle

Date/Time: 2010-3-8 9:56:39

Electronics: DAE4 Sn771

Medium: 1900 Head

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.42$ mho/m; $\epsilon_r = 39.5$; $\rho = 1000$ kg/m³

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

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

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

Cheek Middle/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.849 mW/g

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

Reference Value = 8.20 V/m; Power Drift = 0.084 dB

Peak SAR (extrapolated) = 1.01 W/kg

SAR(1 g) = 0.711 mW/g; SAR(10 g) = 0.439 mW/g

Maximum value of SAR (measured) = 0.766 mW/g



0 dB = 0.766mW/g

Fig. 20 1900 MHz CH661

1900 Right Cheek Low

Date/Time: 2010-3-8 10:10:47

Electronics: DAE4 Sn771

Medium: 1900 Head

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 39.6$; $\rho = 1000$ kg/m³

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

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

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

Cheek Low/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.893 mW/g

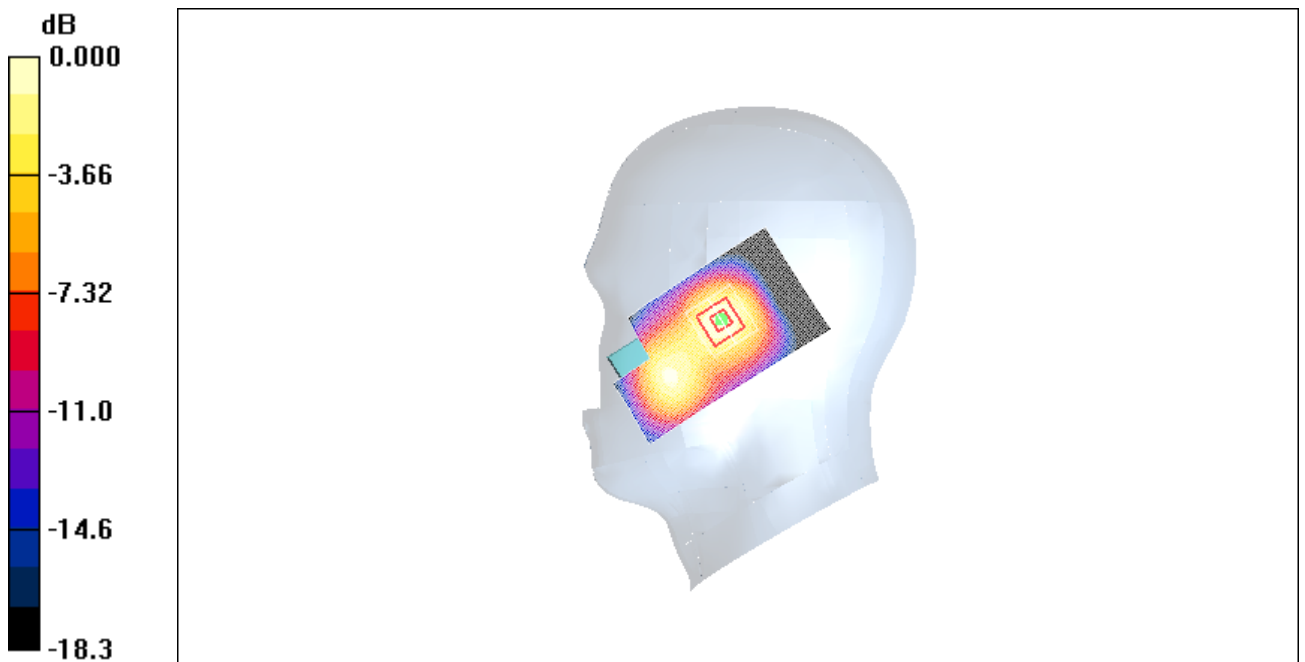
Cheek Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.71 V/m; Power Drift = -0.027 dB

Peak SAR (extrapolated) = 1.07 W/kg

SAR(1 g) = 0.752 mW/g; SAR(10 g) = 0.466 mW/g

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



0 dB = 0.819mW/g

Fig. 21 1900 MHz CH512

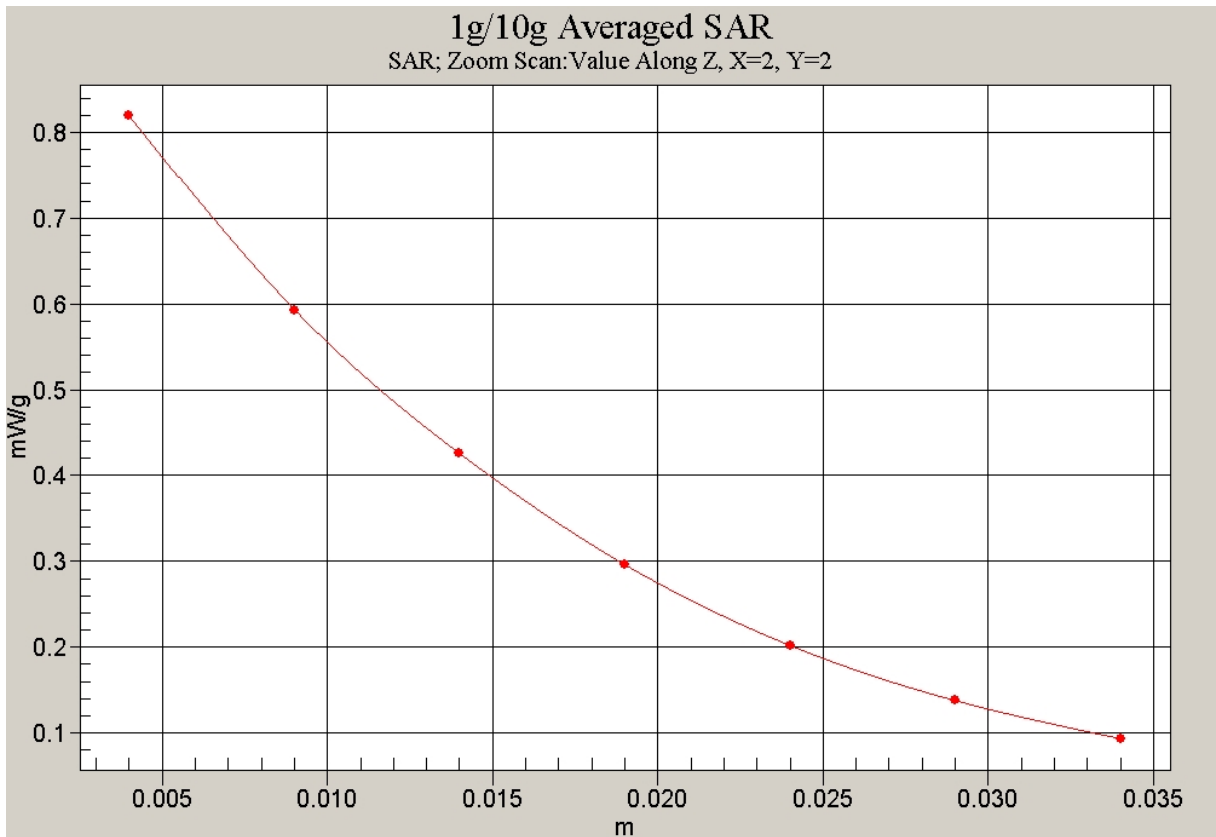


Fig. 21-1 Z-Scan at power reference point (1900 MHz CH512)

1900 Right Tilt High

Date/Time: 2010-3-8 10:25:04

Electronics: DAE4 Sn771

Medium: 1900 Head

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.44$ mho/m; $\epsilon_r = 39.4$; $\rho = 1000$ kg/m³

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

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

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

Tilt High/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

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

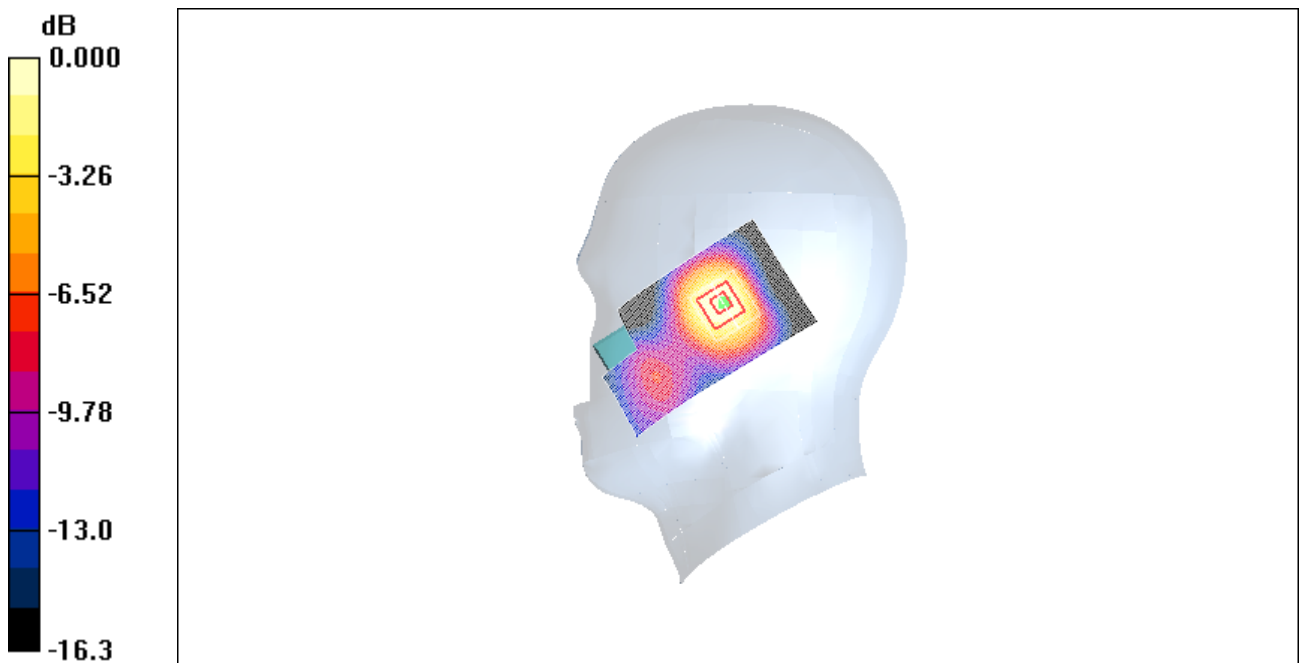
Tilt High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.3 V/m; Power Drift = 0.065 dB

Peak SAR (extrapolated) = 0.590 W/kg

SAR(1 g) = 0.401 mW/g; SAR(10 g) = 0.245 mW/g

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



0 dB = 0.426mW/g

Fig. 22 1900 MHz CH810

1900 Right Tilt Middle

Date/Time: 2010-3-8 10:39:11

Electronics: DAE4 Sn771

Medium: 1900 Head

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.42$ mho/m; $\epsilon_r = 39.5$; $\rho = 1000$ kg/m³

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

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

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

Tilt Middle/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.492 mW/g

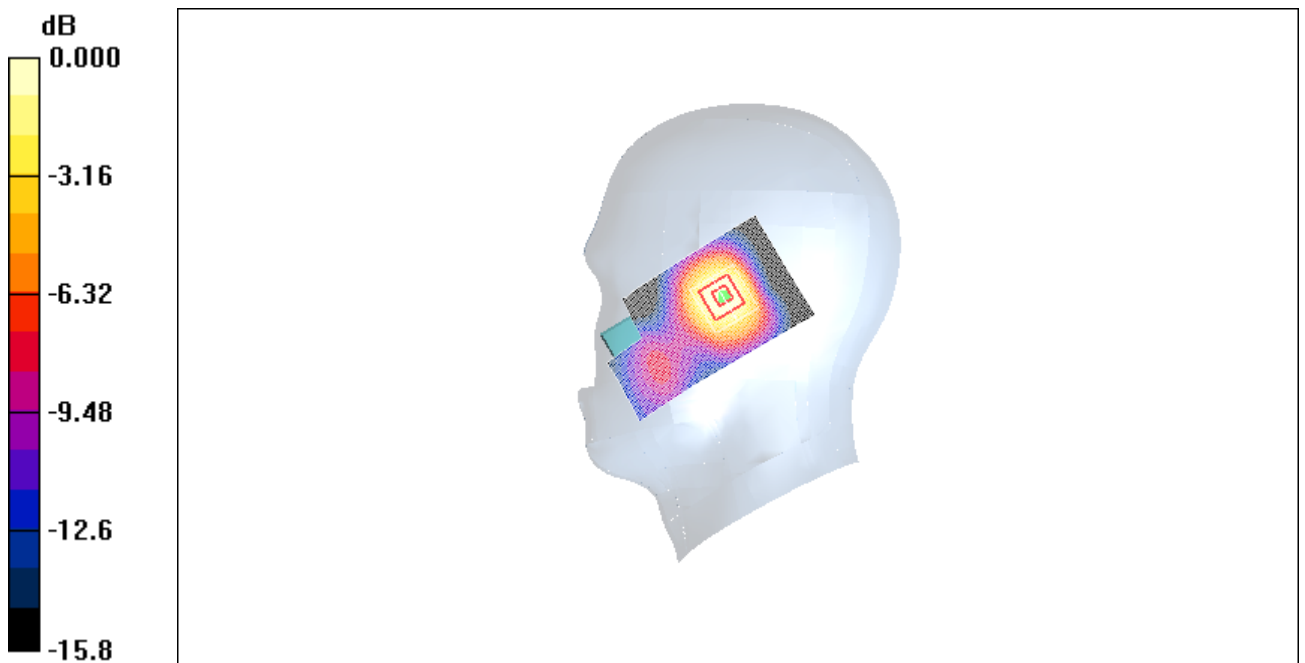
Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.5 V/m; Power Drift = 0.012 dB

Peak SAR (extrapolated) = 0.603 W/kg

SAR(1 g) = 0.411 mW/g; SAR(10 g) = 0.254 mW/g

Maximum value of SAR (measured) = 0.435 mW/g



0 dB = 0.435mW/g

Fig.23 1900 MHz CH661

1900 Right Tilt Low

Date/Time: 2010-3-8 10:53:30

Electronics: DAE4 Sn771

Medium: 1900 Head

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 39.6$; $\rho = 1000$ kg/m³

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

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

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

Tilt Low/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.501 mW/g

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

Reference Value = 10.7 V/m; Power Drift = -0.037 dB

Peak SAR (extrapolated) = 0.611 W/kg

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

Maximum value of SAR (measured) = 0.451 mW/g



0 dB = 0.451mW/g

Fig.24 1900 MHz CH512

850 Right Cheek Middle With Battery CAB3130000C1

Date/Time: 2010-3-7 11:13:22

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.908$ mho/m; $\epsilon_r = 40.7$; $\rho = 1000$ kg/m³

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

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

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

Cheek Middle/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.16 mW/g

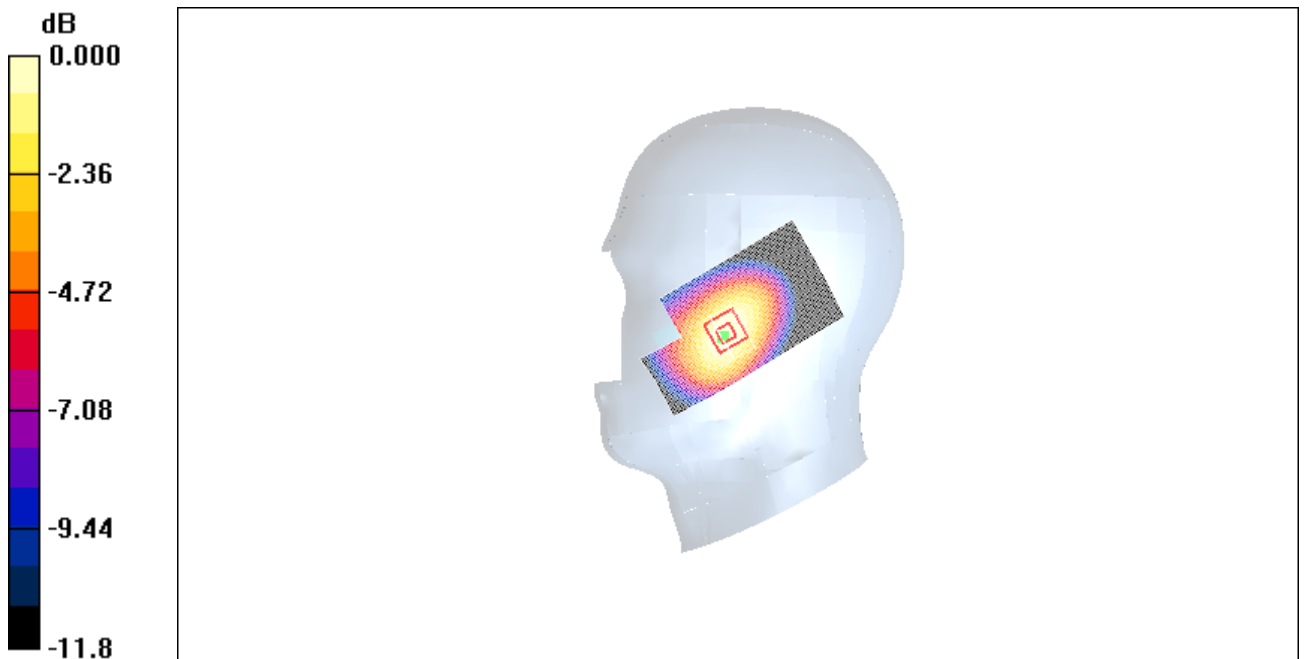
Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.2 V/m; Power Drift = -0.091 dB

Peak SAR (extrapolated) = 1.49 W/kg

SAR(1 g) = 1.08 mW/g; SAR(10 g) = 0.744 mW/g

Maximum value of SAR (measured) = 1.14 mW/g



0 dB = 1.14mW/g

Fig. 25 850 MHz CH190

850 Body Towards Ground High

Date/Time: 2010-3-7 13:49:03

Electronics: DAE4 Sn771

Medium: 850 Body

Medium parameters used (interpolated): $f = 848.8$ MHz; $\sigma = 0.95$ mho/m; $\epsilon_r = 54.1$; $\rho = 1000$ kg/m³

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

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

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

Toward Ground High/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.710 mW/g

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

Reference Value = 24.1 V/m; Power Drift = -0.122 dB

Peak SAR (extrapolated) = 0.908 W/kg

SAR(1 g) = 0.657 mW/g; SAR(10 g) = 0.449 mW/g

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

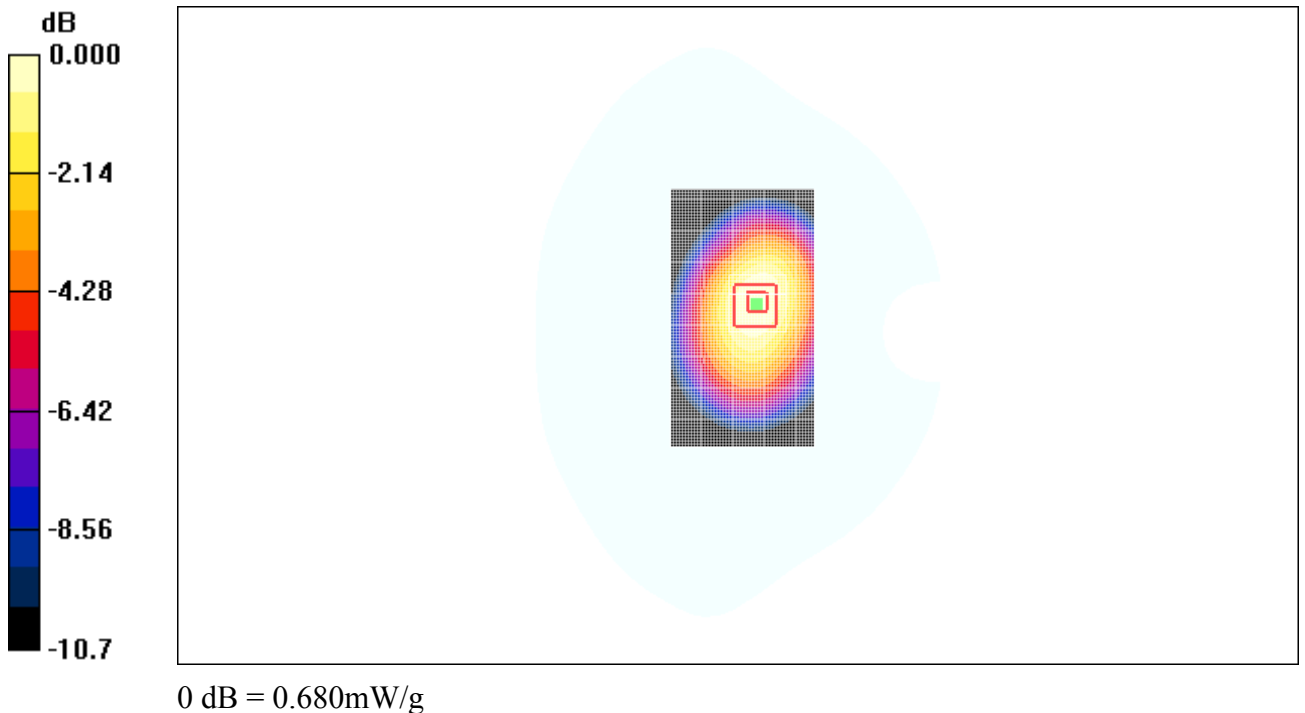


Fig. 26 850 MHz CH251

850 Body Towards Ground Middle

Date/Time: 2010-3-7 14:04:23

Electronics: DAE4 Sn771

Medium: 850 Body

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.94$ mho/m; $\epsilon_r = 54.2$; $\rho = 1000$ kg/m³

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

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

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

Toward Ground Middle/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.772 mW/g

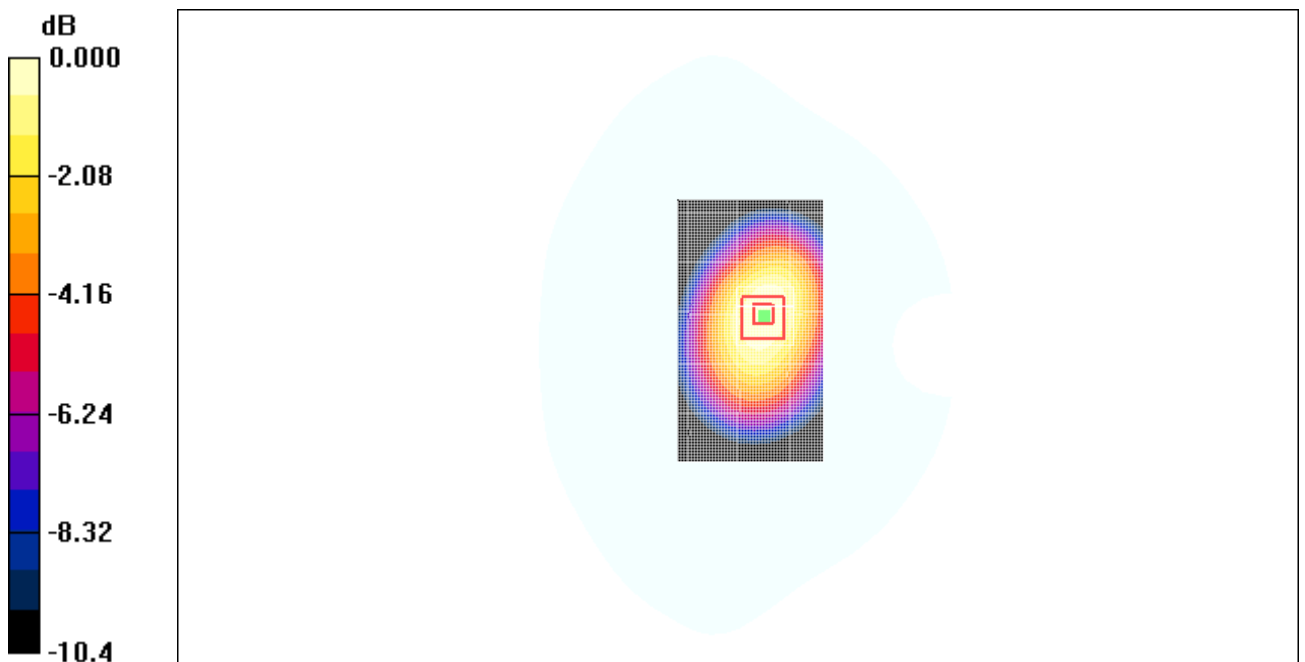
Toward Ground Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 25.3 V/m; Power Drift = -0.037 dB

Peak SAR (extrapolated) = 0.988 W/kg

SAR(1 g) = 0.720 mW/g; SAR(10 g) = 0.497 mW/g

Maximum value of SAR (measured) = 0.742 mW/g



0 dB = 0.742mW/g

Fig. 27 850 MHz CH190

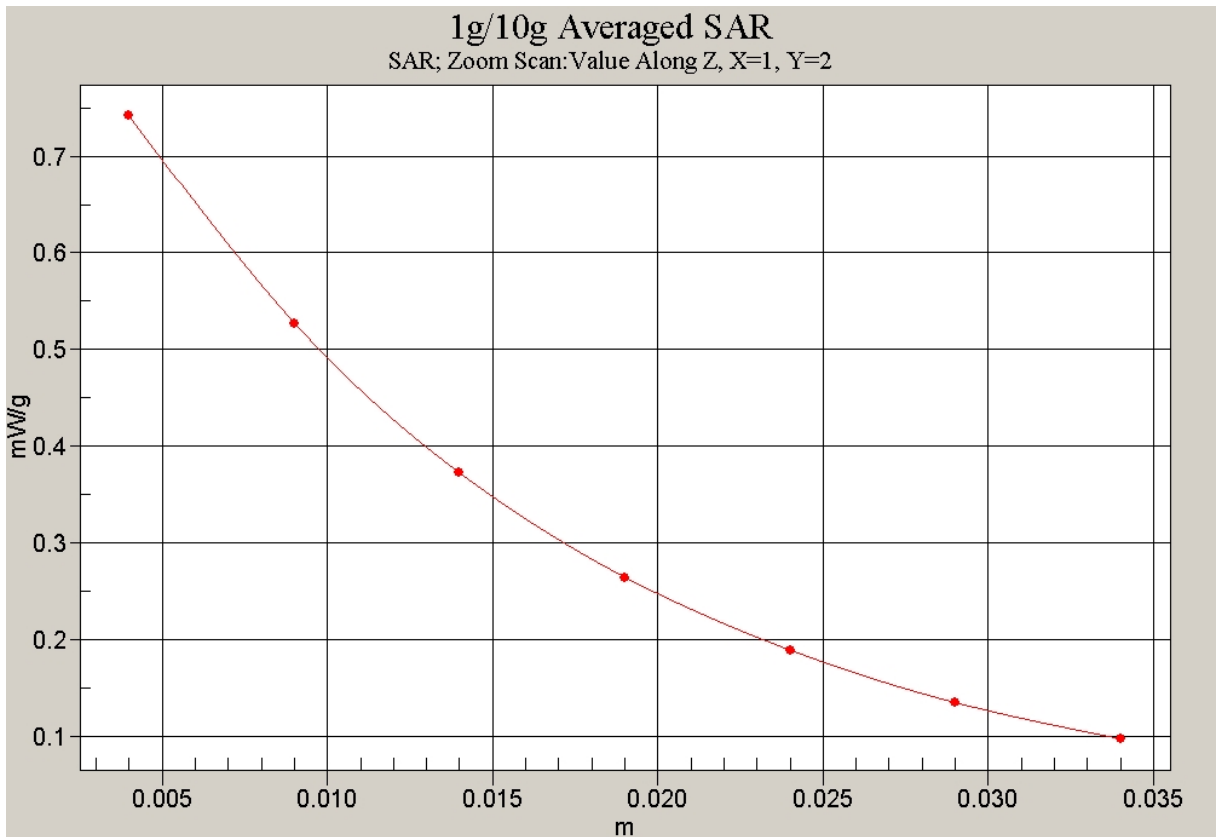


Fig. 27-1 Z-Scan at power reference point (850 MHz CH190)

850 Body Towards Ground Low

Date/Time: 2010-3-7 14:19:40

Electronics: DAE4 Sn771

Medium: 850 Body

Medium parameters used: $f = 825$ MHz; $\sigma = 0.923$ mho/m; $\epsilon_r = 54.3$; $\rho = 1000$ kg/m³

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

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

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

Toward Ground Low/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.735 mW/g

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

Reference Value = 24.5 V/m; Power Drift = 0.005 dB

Peak SAR (extrapolated) = 0.940 W/kg

SAR(1 g) = 0.687 mW/g; SAR(10 g) = 0.473 mW/g

Maximum value of SAR (measured) = 0.709 mW/g

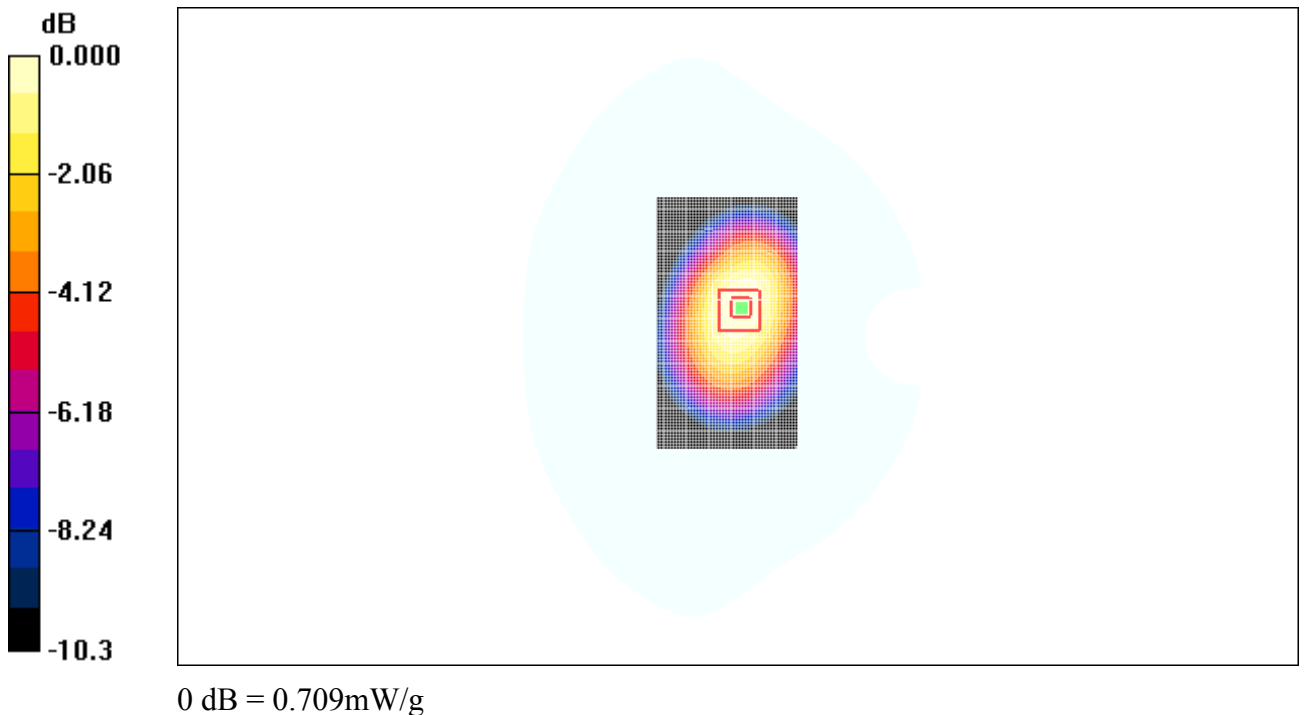


Fig. 28 850 MHz CH128

850 Body Towards Phantom High

Date/Time: 2010-3-7 14:35:31

Electronics: DAE4 Sn771

Medium: 850 Body

Medium parameters used (interpolated): $f = 848.8$ MHz; $\sigma = 0.95$ mho/m; $\epsilon_r = 54.1$; $\rho = 1000$ kg/m³

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

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

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

Toward Phantom High/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.598 mW/g

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

Reference Value = 23.1 V/m; Power Drift = 0.021 dB

Peak SAR (extrapolated) = 0.766 W/kg

SAR(1 g) = 0.558 mW/g; SAR(10 g) = 0.385 mW/g

Maximum value of SAR (measured) = 0.583 mW/g

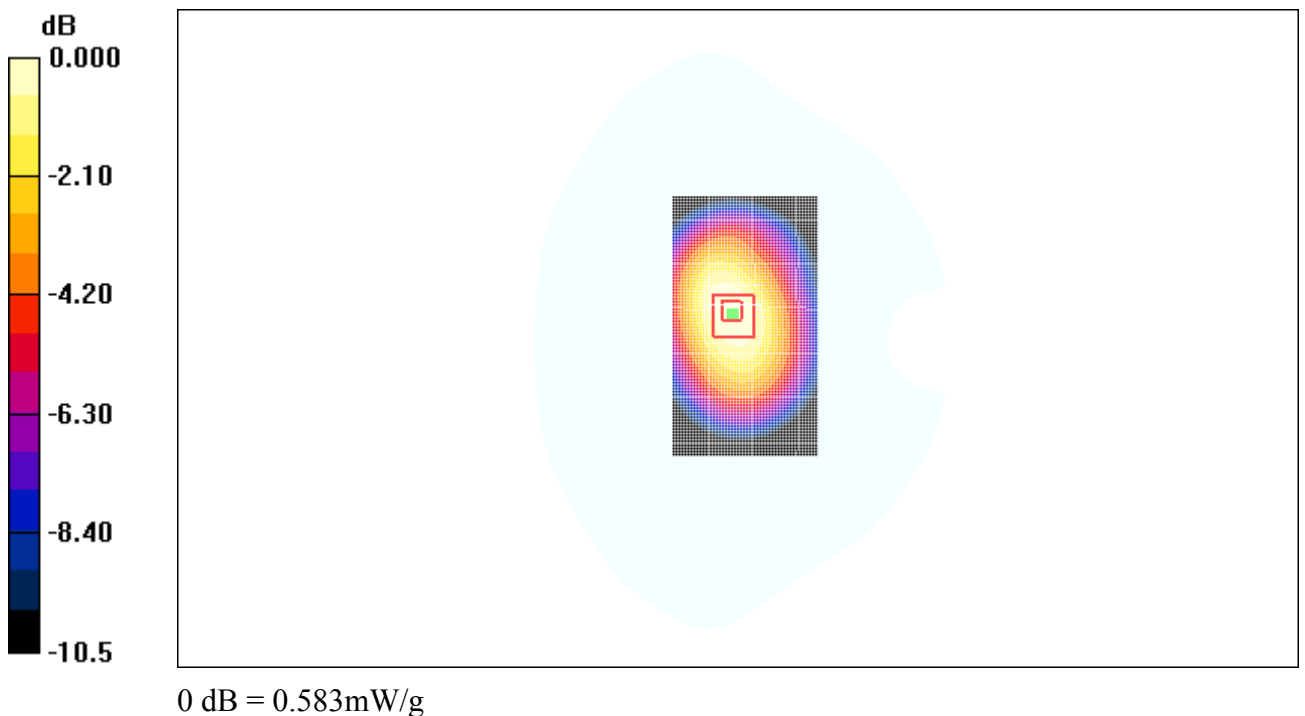


Fig. 29 850 MHz CH251

850 Body Towards Phantom Middle

Date/Time: 2010-3-7 14:50:44

Electronics: DAE4 Sn771

Medium: 850 Body

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.94$ mho/m; $\epsilon_r = 54.2$; $\rho = 1000$ kg/m³

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

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

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

Toward Phantom Middle/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

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

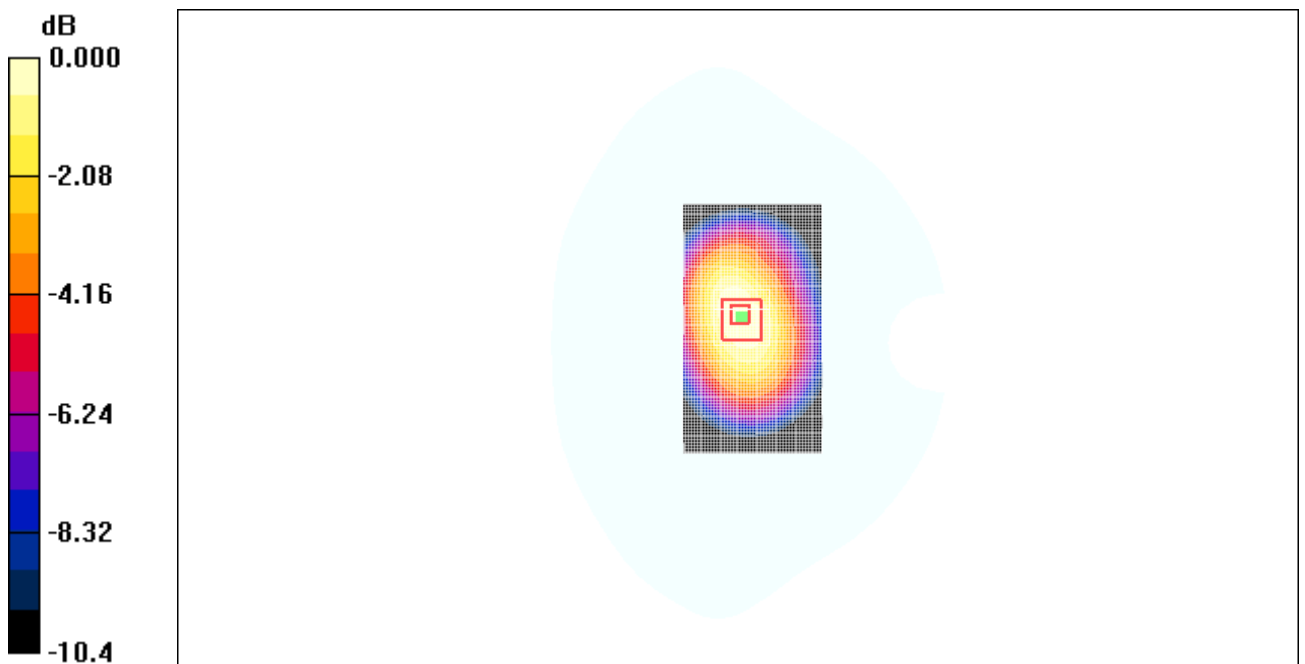
Toward Phantom Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 24.1 V/m; Power Drift = -0.048 dB

Peak SAR (extrapolated) = 0.837 W/kg

SAR(1 g) = 0.603 mW/g; SAR(10 g) = 0.417 mW/g

Maximum value of SAR (measured) = 0.631 mW/g



0 dB = 0.631mW/g

Fig. 30 850 MHz CH190

850 Body Towards Phantom Low

Date/Time: 2010-3-7 15:06:12

Electronics: DAE4 Sn771

Medium: 850 Body

Medium parameters used: $f = 825$ MHz; $\sigma = 0.923$ mho/m; $\epsilon_r = 54.3$; $\rho = 1000$ kg/m³

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

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

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

Toward Phantom Low/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

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

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

Reference Value = 23.6 V/m; Power Drift = -0.015 dB

Peak SAR (extrapolated) = 0.795 W/kg

SAR(1 g) = 0.578 mW/g; SAR(10 g) = 0.399 mW/g

Maximum value of SAR (measured) = 0.606 mW/g

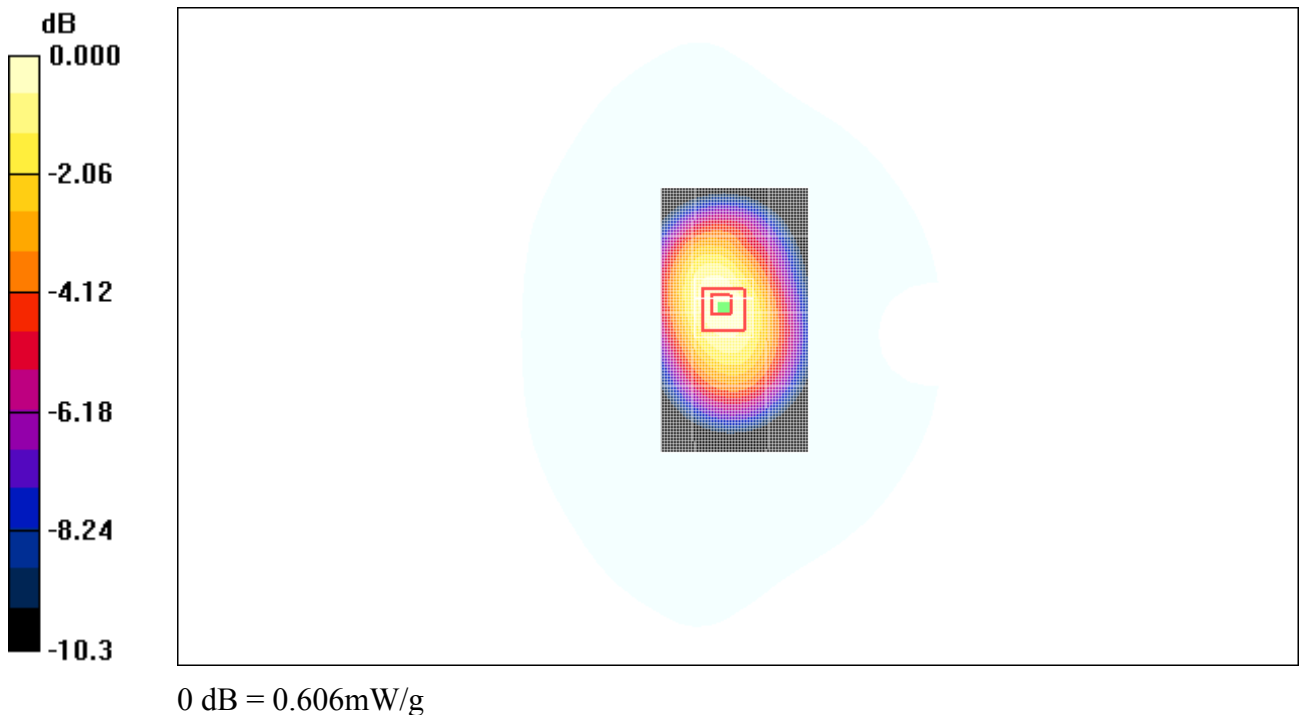


Fig. 31 850 MHz CH128

850 Body Towards Ground Middle With Headset__CCB31B0A11C0

Date/Time: 2010-3-7 15:25:01

Electronics: DAE4 Sn771

Medium: 850 Body

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.94$ mho/m; $\epsilon_r = 54.2$; $\rho = 1000$ kg/m³

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

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

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

Toward Ground Middle/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.763 mW/g

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

Reference Value = 26.1 V/m; Power Drift = -0.091 dB

Peak SAR (extrapolated) = 0.953 W/kg

SAR(1 g) = 0.703 mW/g; SAR(10 g) = 0.486 mW/g

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

0 dB = 0.734mW/g

Fig. 32 850 MHz CH190

850 Body Towards Ground Middle With Headset__CCB31B0A10C0

Date/Time: 2010-3-7 15:43:25

Electronics: DAE4 Sn771

Medium: 850 Body

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.94$ mho/m; $\epsilon_r = 54.2$; $\rho = 1000$ kg/m³

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

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

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

Toward Ground Middle/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

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

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

Reference Value = 25.5 V/m; Power Drift = -0.008 dB

Peak SAR (extrapolated) = 0.945 W/kg

SAR(1 g) = 0.691 mW/g; SAR(10 g) = 0.477 mW/g

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

0 dB = 0.712mW/g

Fig. 33 850 MHz CH190

1900 Body Towards Ground High

Date/Time: 2010-3-8 13:34:05

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.54$ mho/m; $\epsilon_r = 51.8$; $\rho = 1000$ kg/m³

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

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

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

Toward Ground High/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

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

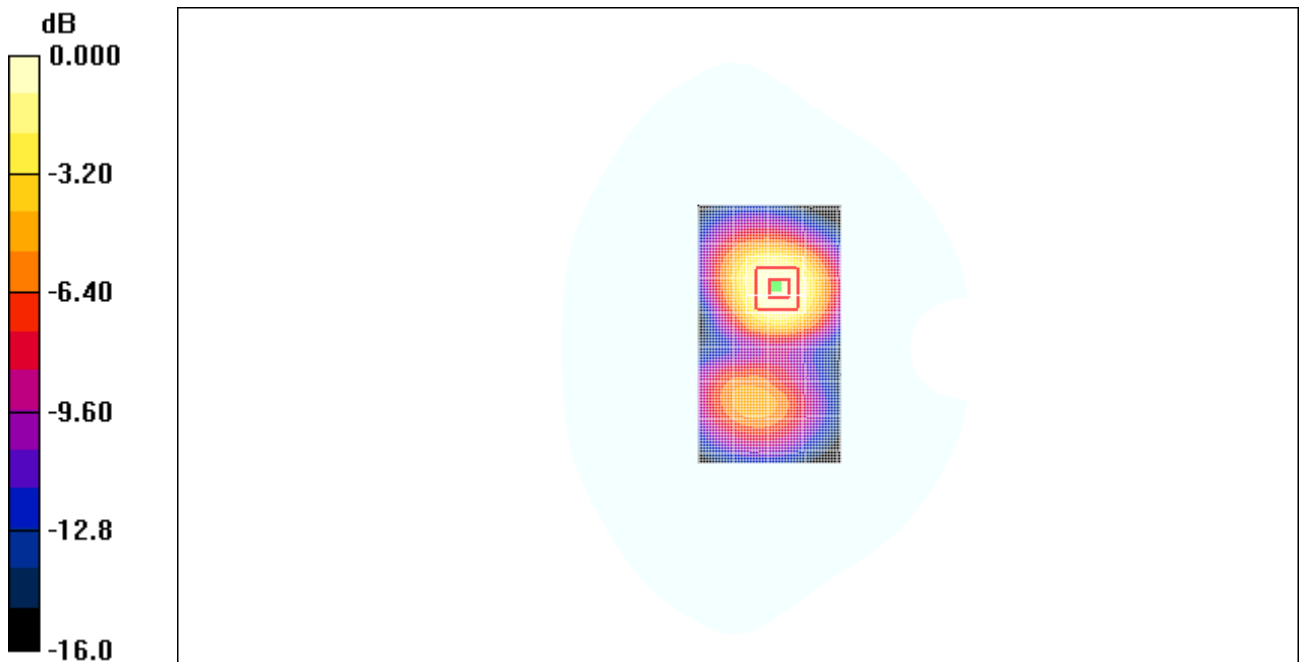
Toward Ground High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.33 V/m; Power Drift = -0.100 dB

Peak SAR (extrapolated) = 0.846 W/kg

SAR(1 g) = 0.507 mW/g; SAR(10 g) = 0.297 mW/g

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



0 dB = 0.532mW/g

Fig. 34 1900 MHz CH810

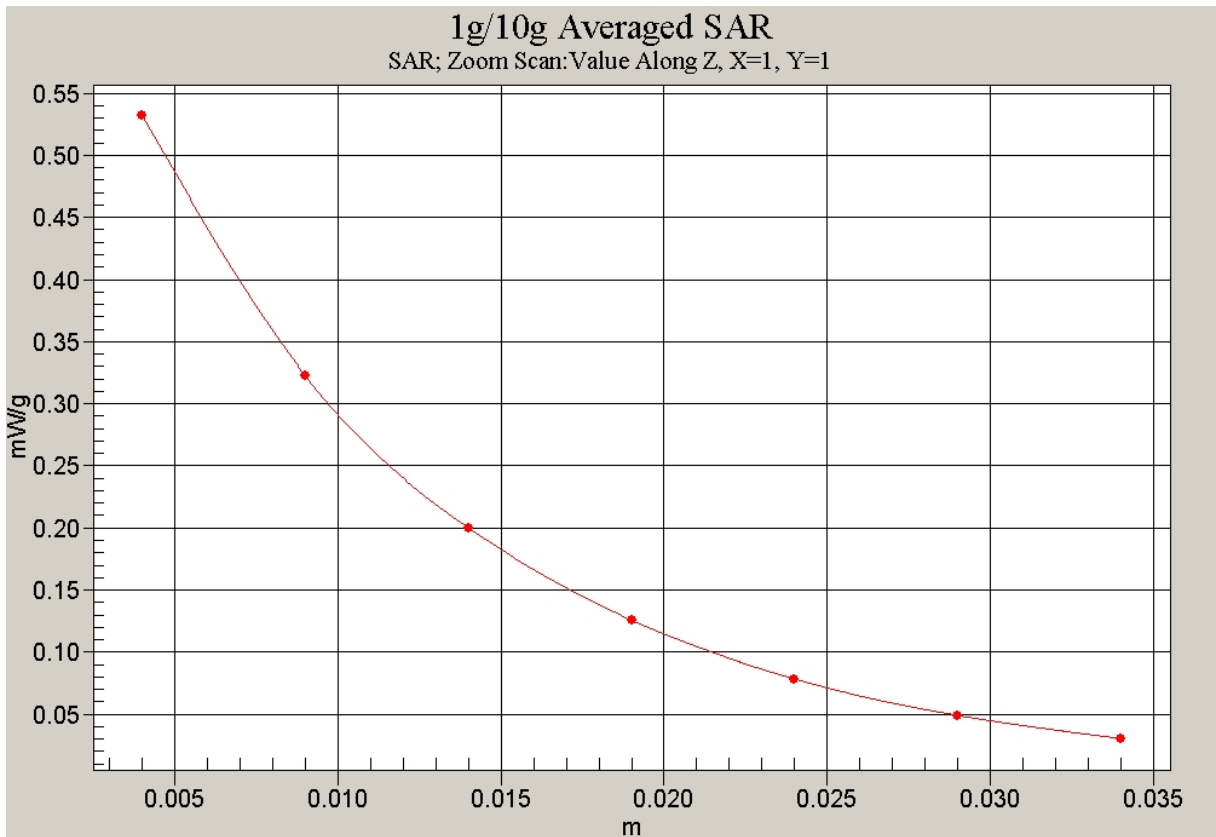


Fig. 34-1 Z-Scan at power reference point (1900 MHz CH810)

1900 Body Towards Ground Middle

Date/Time: 2010-3-8 13:49:19

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.51$ mho/m; $\epsilon_r = 51.9$; $\rho = 1000$ kg/m³

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

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

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

Toward Ground Middle/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

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

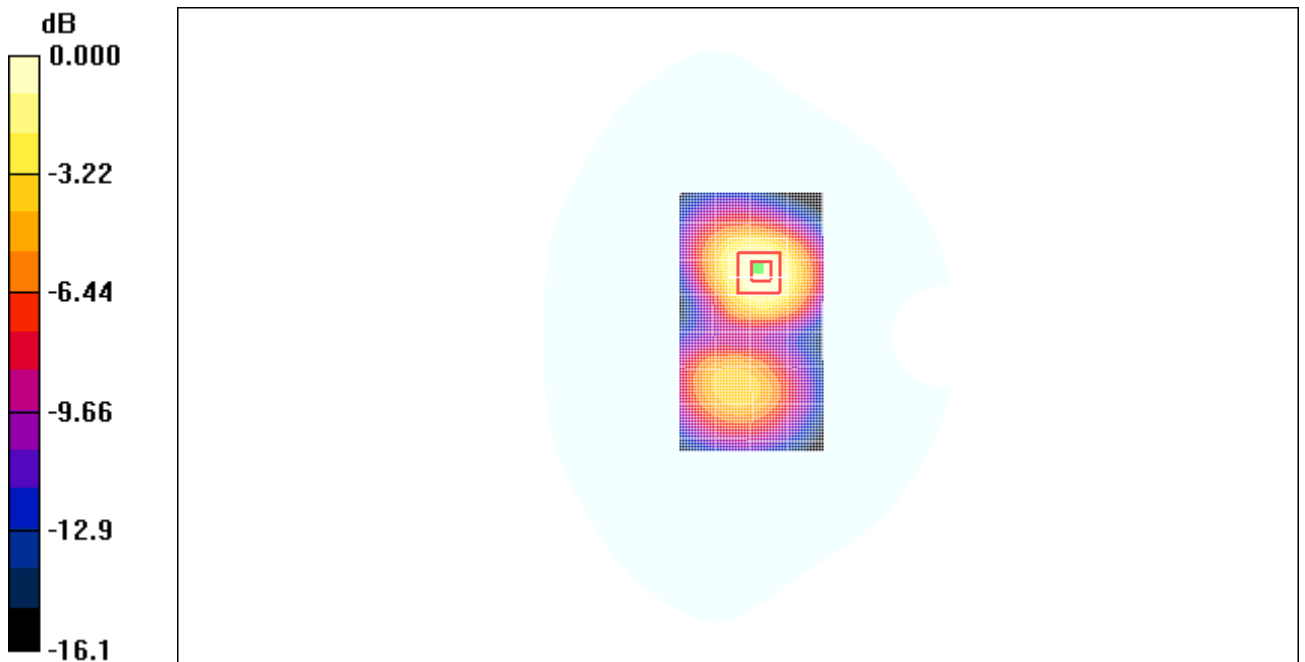
Toward Ground Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.12 V/m; Power Drift = 0.087 dB

Peak SAR (extrapolated) = 0.793 W/kg

SAR(1 g) = 0.478 mW/g; SAR(10 g) = 0.280 mW/g

Maximum value of SAR (measured) = 0.507 mW/g



0 dB = 0.507mW/g

Fig. 35 1900 MHz CH661

1900 Body Towards Ground Low

Date/Time: 2010-3-8 14:04:32

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.49$ mho/m; $\epsilon_r = 51.9$; $\rho = 1000$ kg/m³

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

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

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

Toward Ground Low/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.553 mW/g

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

Reference Value = 7.12 V/m; Power Drift = 0.144 dB

Peak SAR (extrapolated) = 0.781 W/kg

SAR(1 g) = 0.474 mW/g; SAR(10 g) = 0.277 mW/g

Maximum value of SAR (measured) = 0.494 mW/g

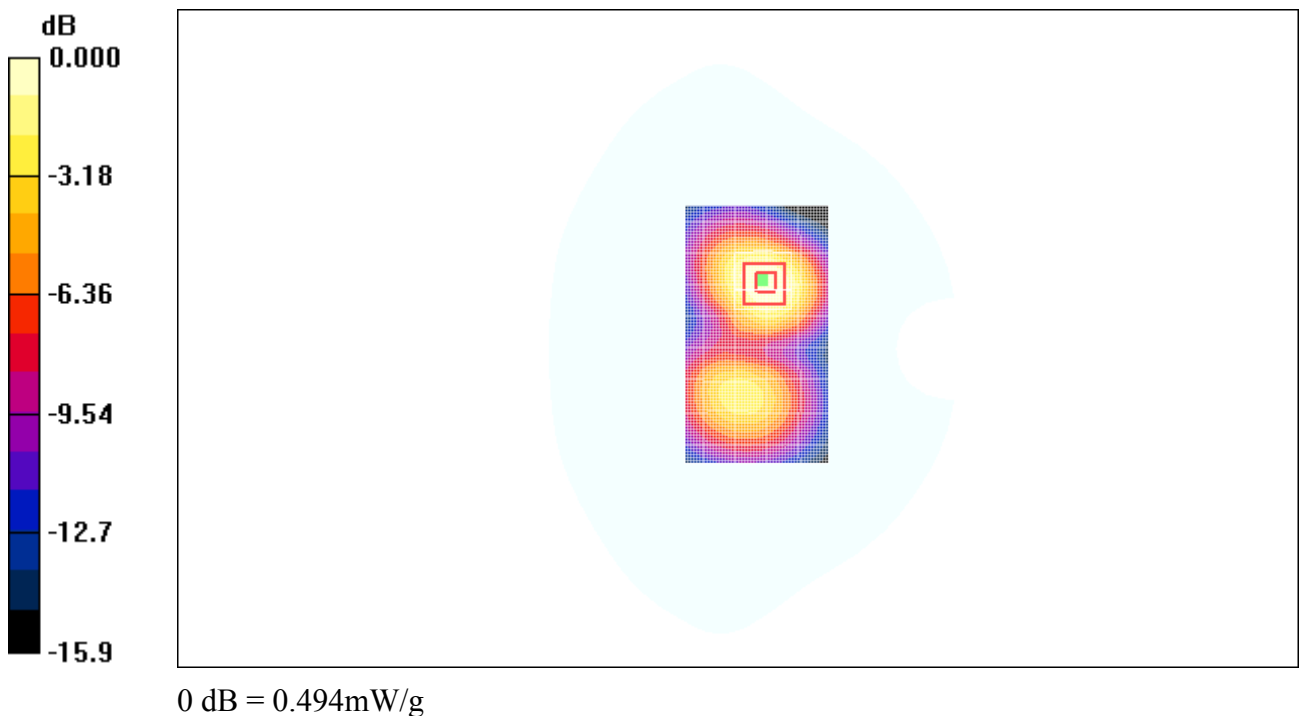


Fig. 36 1900 MHz CH512

1900 Body Towards Phantom High

Date/Time: 2010-3-8 14:20:00

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.54$ mho/m; $\epsilon_r = 51.8$; $\rho = 1000$ kg/m³

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

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

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

Toward Phantom High/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.265 mW/g

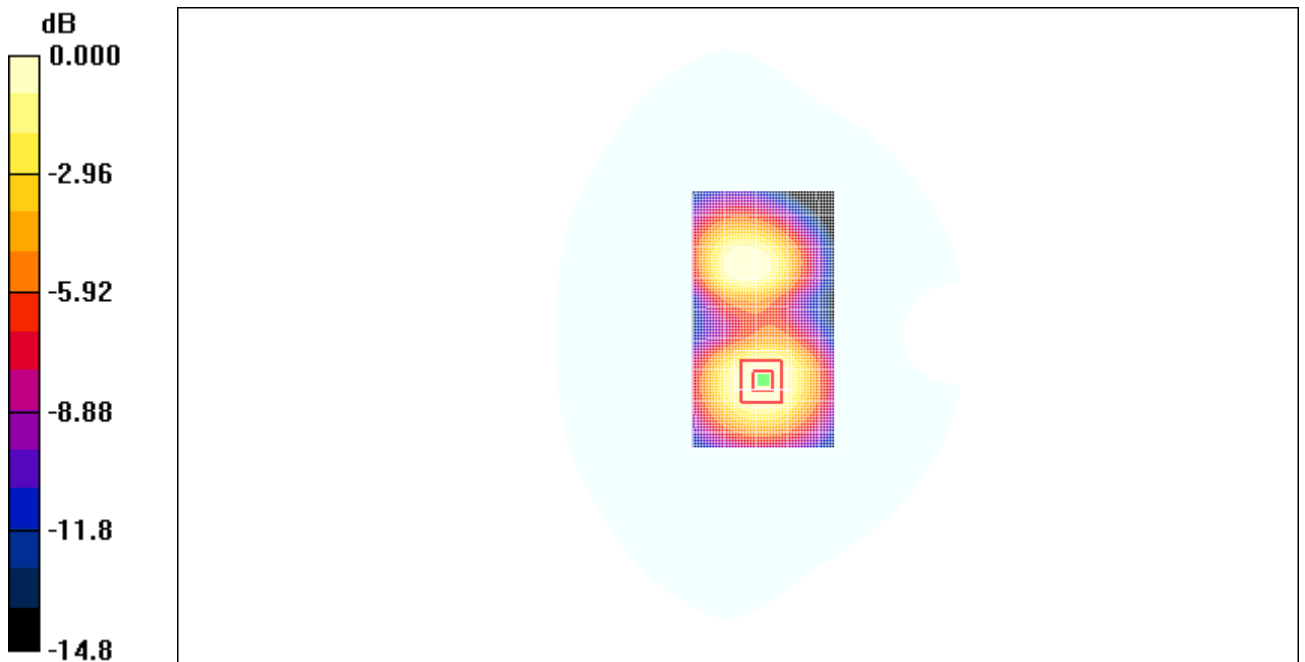
Toward Phantom High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.54 V/m; Power Drift = 0.039 dB

Peak SAR (extrapolated) = 0.371 W/kg

SAR(1 g) = 0.235 mW/g; SAR(10 g) = 0.144 mW/g

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



0 dB = 0.238mW/g

Fig. 37 1900 MHz CH810

1900 Body Towards Phantom Middle

Date/Time: 2010-3-8 14:35:14

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.51$ mho/m; $\epsilon_r = 51.9$; $\rho = 1000$ kg/m³

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

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

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

Toward Phantom Middle/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

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

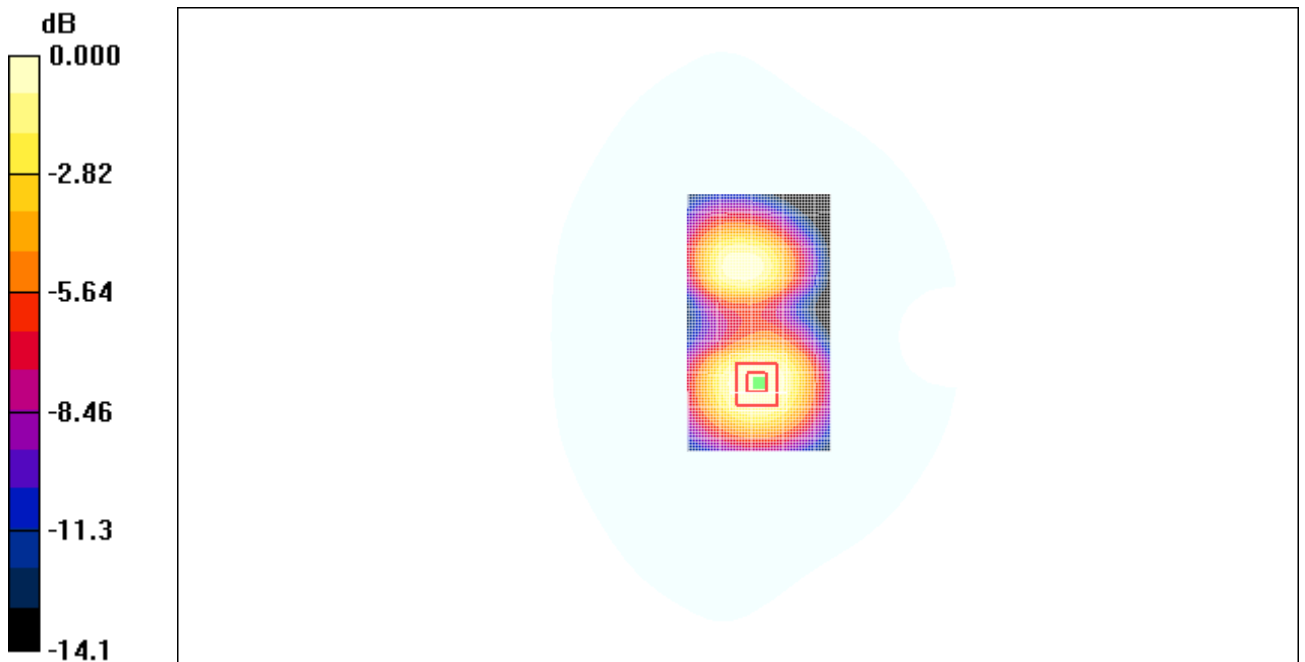
Toward Phantom Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.32 V/m; Power Drift = 0.014 dB

Peak SAR (extrapolated) = 0.403 W/kg

SAR(1 g) = 0.262 mW/g; SAR(10 g) = 0.163 mW/g

Maximum value of SAR (measured) = 0.265 mW/g



0 dB = 0.265mW/g

Fig. 38 1900 MHz CH661

1900 Body Towards Phantom Low

Date/Time: 2010-3-8 14:50:37

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.49$ mho/m; $\epsilon_r = 51.9$; $\rho = 1000$ kg/m³

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

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

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

Toward Phantom Low/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.339 mW/g

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

Reference Value = 8.29 V/m; Power Drift = 0.038 dB

Peak SAR (extrapolated) = 0.463 W/kg

SAR(1 g) = 0.301 mW/g; SAR(10 g) = 0.188 mW/g

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

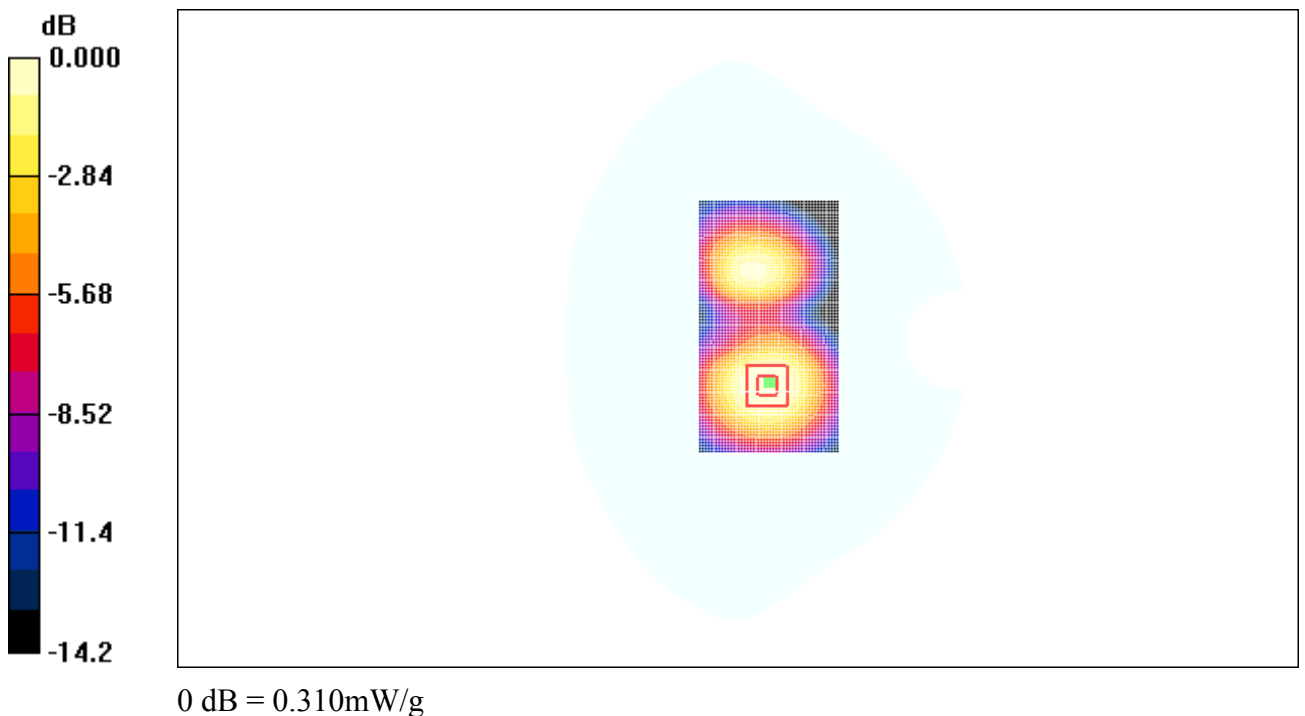


Fig. 39 1900 MHz CH512

1900 Body Towards Ground High With Headset__CCB31B0A11C0

Date/Time: 2010-3-8 15:08:42

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.54$ mho/m; $\epsilon_r = 51.8$; $\rho = 1000$ kg/m³

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

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

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

Toward Ground High/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.449 mW/g

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

Reference Value = 7.75 V/m; Power Drift = 0.104 dB

Peak SAR (extrapolated) = 0.648 W/kg

SAR(1 g) = 0.386 mW/g; SAR(10 g) = 0.225 mW/g

Maximum value of SAR (measured) = 0.390 mW/g

$$0 \text{ dB} = 0.390 \text{ mW/g}$$

Fig. 40 1900 MHz CH810

1900 Body Towards Ground High With Headset__CCB31B0A10C0

Date/Time: 2010-3-8 15:27:09

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.54$ mho/m; $\epsilon_r = 51.8$; $\rho = 1000$ kg/m³

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

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

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

Toward Ground High/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

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

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

Reference Value = 7.25 V/m; Power Drift = 0.092 dB

Peak SAR (extrapolated) = 0.655 W/kg

SAR(1 g) = 0.392 mW/g; SAR(10 g) = 0.229 mW/g

Maximum value of SAR (measured) = 0.400 mW/g

0 dB = 0.400mW/g

Fig. 41 1900 MHz CH810

850 Body Towards Ground Middle With Battery CAB3130000C1

Date/Time: 2010-3-7 16:01:43

Electronics: DAE4 Sn771

Medium: 850 Body

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.94$ mho/m; $\epsilon_r = 54.2$; $\rho = 1000$ kg/m³

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

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

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

Toward Ground Middle/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.757 mW/g

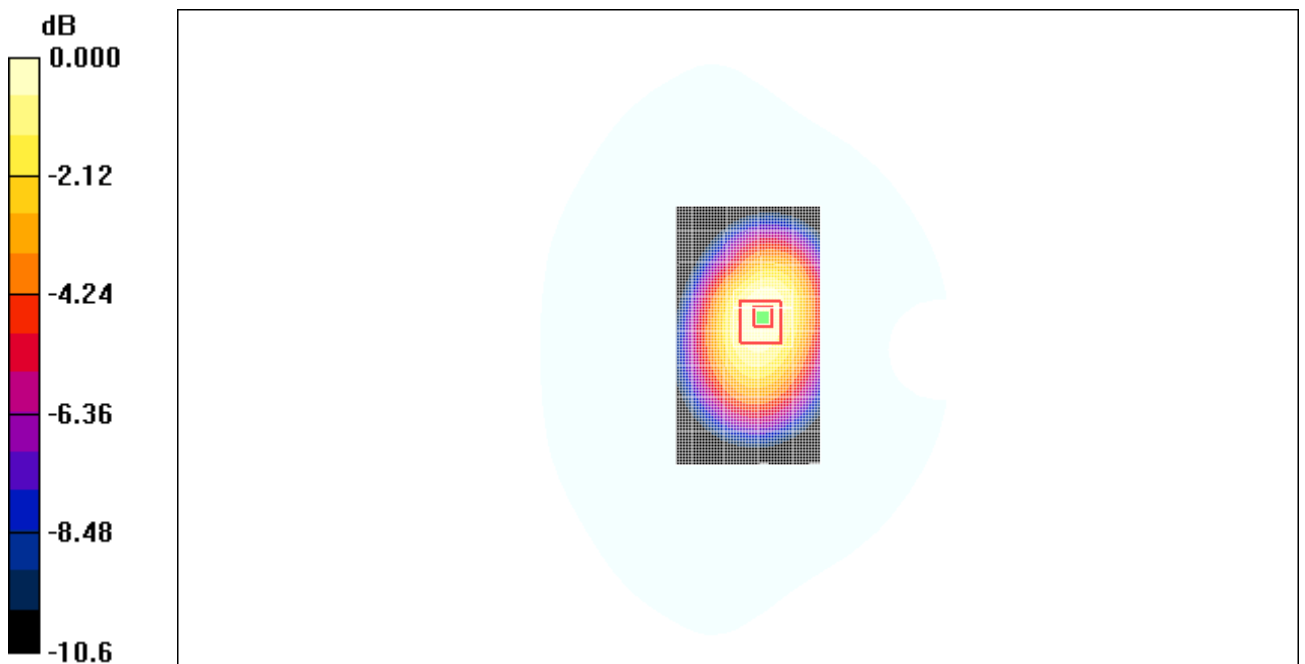
Toward Ground Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 25.0 V/m; Power Drift = -0.084 dB

Peak SAR (extrapolated) = 0.980 W/kg

SAR(1 g) = 0.705 mW/g; SAR(10 g) = 0.487 mW/g

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



0 dB = 0.723mW/g

Fig. 42 850 MHz CH190

ANNEX D SYSTEM VALIDATION RESULTS

835MHz

Date/Time: 2010-3-7 7:22:19

Electronics: DAE4 Sn771

Medium: Head 850

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.90 \text{ mho/m}$; $\epsilon_r = 40.7$; $\rho = 1000 \text{ kg/m}^3$

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) = 2.70 mW/g

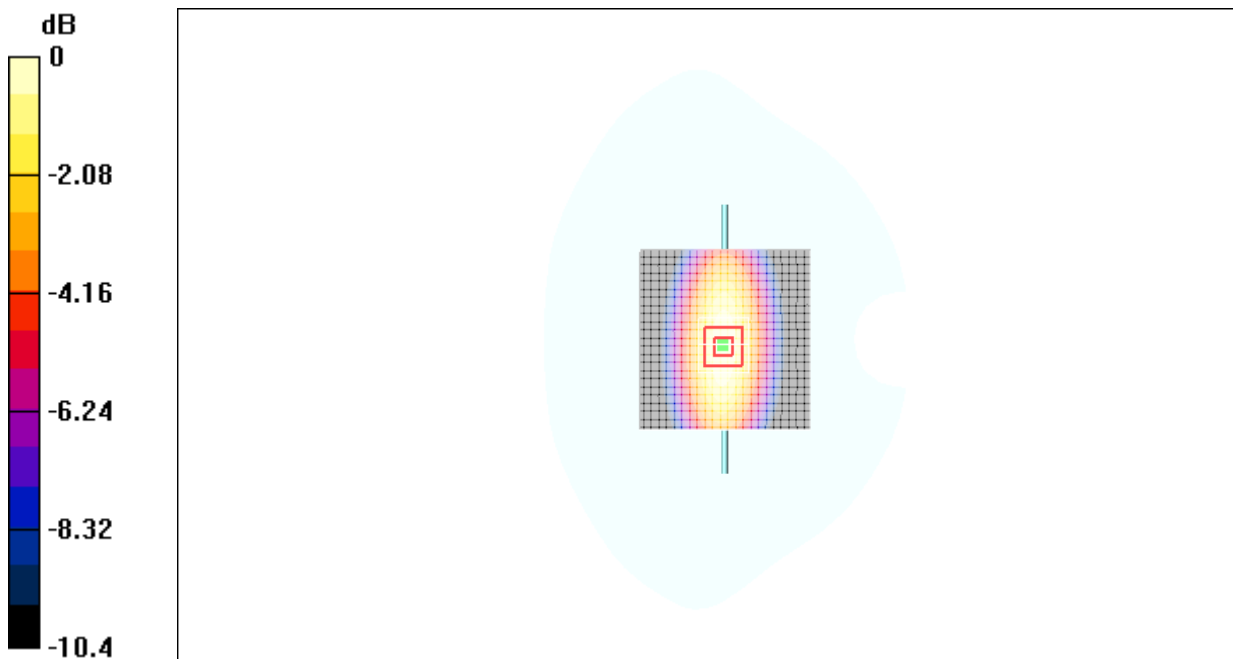
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 55.9 V/m; Power Drift = -0.019 dB

Peak SAR (extrapolated) = 3.58 W/kg

SAR(1 g) = 2.48 mW/g; SAR(10 g) = 1.59 mW/g

Maximum value of SAR (measured) = 2.61 mW/g



0 dB = 2.61mW/g

Fig.43 validation 835MHz 250mW

835MHz

Date/Time: 2010-3-7 13:17:35

Electronics: DAE4 Sn771

Medium: 850 Body

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.93 \text{ mho/m}$; $\epsilon_r = 54.2$; $\rho = 1000 \text{ kg/m}^3$

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) = 2.67 mW/g

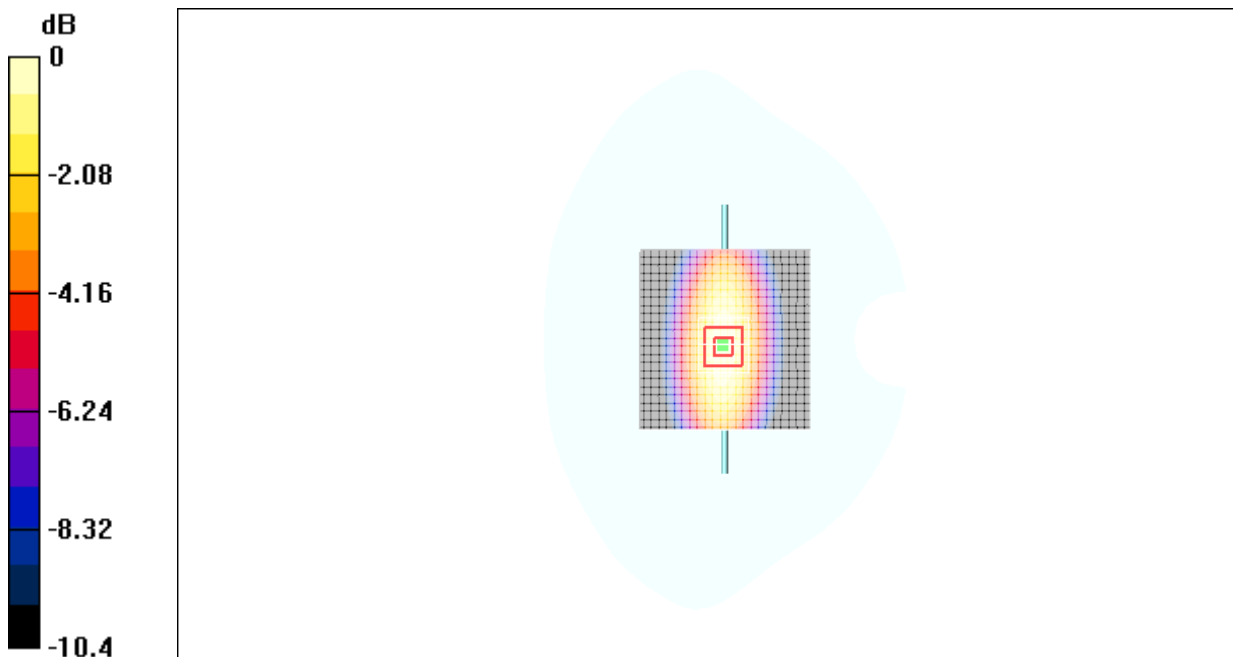
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$,
 $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 52.8 V/m ; Power Drift = 0.055 dB

Peak SAR (extrapolated) = 3.52 W/kg

SAR(1 g) = 2.48 mW/g ; SAR(10 g) = 1.52 mW/g

Maximum value of SAR (measured) = 2.55 mW/g



0 dB = 2.55mW/g

Fig.43 validation 835MHz 250mW

1900MHz

Date/Time: 2010-3-8 7:19:32

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.43 \text{ mho/m}$; $\epsilon_r = 39.5$; $\rho = 1000 \text{ kg/m}^3$

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) = 11.3 mW/g

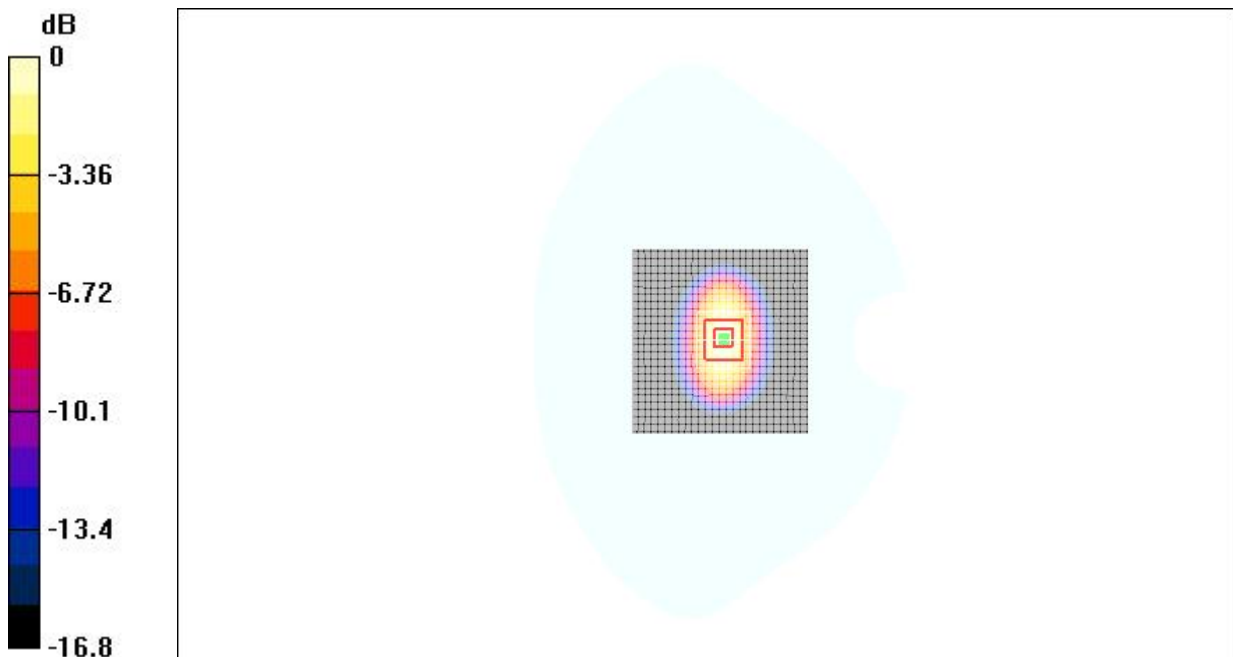
System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$,
 $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 91.5 V/m ; Power Drift = 0.036 dB

Peak SAR (extrapolated) = 16.0 W/kg

SAR(1 g) = 9.81 mW/g ; SAR(10 g) = 5.14 mW/g

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



0 dB = 10.7 mW/g

Fig.44 validation 1900MHz 250mW

1900MHz

Date/Time: 2010-3-8 13:18:54

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 51.8$; $\rho = 1000 \text{ kg/m}^3$

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

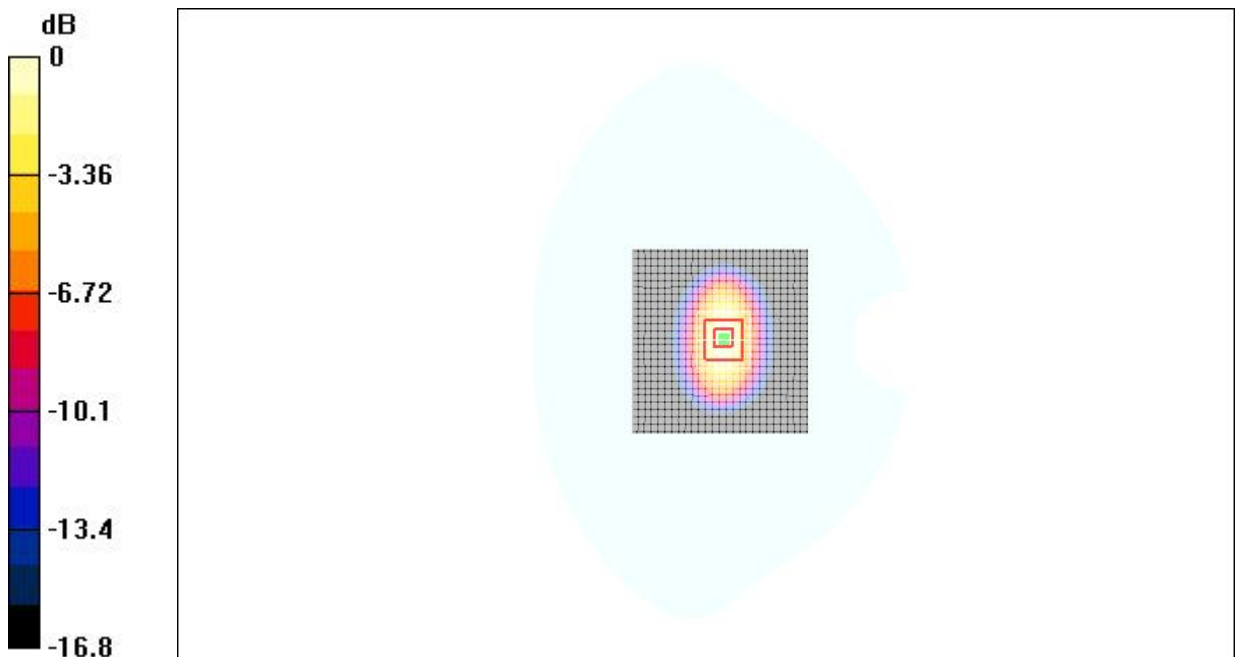
System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 93.0 V/m ; Power Drift = 0.081 dB

Peak SAR (extrapolated) = 16.5 W/kg

SAR(1 g) = 10.3 mW/g ; SAR(10 g) = 5.35 mW/g

Maximum value of SAR (measured) = 11.2 mW/g



0 dB = 11.2mW/g

Fig.44 validation 1900MHz 250mW

ANNEX E PROBE CALIBRATION CERTIFICATE

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



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

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

Accreditation No.: **SCS 108**

Client **TMC China**

Certificate No: **ES3DV3-3149_Sep09**

CALIBRATION CERTIFICATE


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


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-09 (METAS, NO. 251-00388) | May-10 |
| Power sensor E4412A | MY41495277 | 5-May-09 (METAS, NO. 251-00388) | May-10 |
| Reference 3 dB Attenuator | SN:S5054 (3c) | 10-Aug-09 (METAS, NO. 251-00403) | Aug-10 |
| Reference 20 dB Attenuator | SN:S5086 (20b) | 3-May-09 (METAS, NO. 251-00389) | May-10 |
| Reference 30 dB Attenuator | SN:S5129 (30b) | 10-Aug-09 (METAS, NO. 251-00404) | Aug-10 |
| DAE4 | SN:617 | 10-Jun-09 (SPEAG, NO.DAE4-907_Jun09) | Jun-10 |
| Reference Probe ES3DV2 | SN: 3013 | 12-Jan-09 (SPEAG, NO. ES3-3013_Jan09) | Jan-10 |

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

| Name | Function | Signature |
|------------------------------|-------------------|---|
| Calibrated by: Katja Pokovic | Technical Manager |  |

| | | |
|---------------------------|-----------------|--|
| Approved by: Niels Kuster | Quality Manager |  |
|---------------------------|-----------------|--|

Issued: September 25, 2009

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

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



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

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

Accreditation No.: **SCS 108**

Glossary:

| | |
|--------------------------|--|
| TSL | tissue simulating liquid |
| NORM _{x,y,z} | sensitivity in free space |
| ConF | sensitivity in TSL / NORM _{x,y,z} |
| DCP | diode compression point |
| Polarization φ | φ rotation around probe axis |
| Polarization ϑ | ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis |

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- **NORM_{x,y,z}**: Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not effect the E²-field uncertainty inside TSL (see below *ConvF*).
- **NORM(f)_{x,y,z} = NORM_{x,y,z} * frequency_response** (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- **DCP_{x,y,z}**: DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- **ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM_{x,y,z} * *ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- **Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- **Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

ES3DV3 SN: 3149

September 25, 2009

Probe ES3DV3

SN: 3149

Manufactured: June 12, 2007

Calibrated: September 25, 2009

Calibrated for DASY4 System

ES3DV3 SN: 3149

September 25, 2009

DASY – Parameters of Probe: ES3DV3 SN:3149

Sensitivity in Free Space^A

Diode Compression^B

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

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8

Boundary Effect

TSL 900MHz Typical SAR gradient: 5% per mm

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

TSL 1810MHz Typical SAR gradient: 10% per mm

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

Sensor Offset

Probe Tip to Sensor Center 2.0 mm

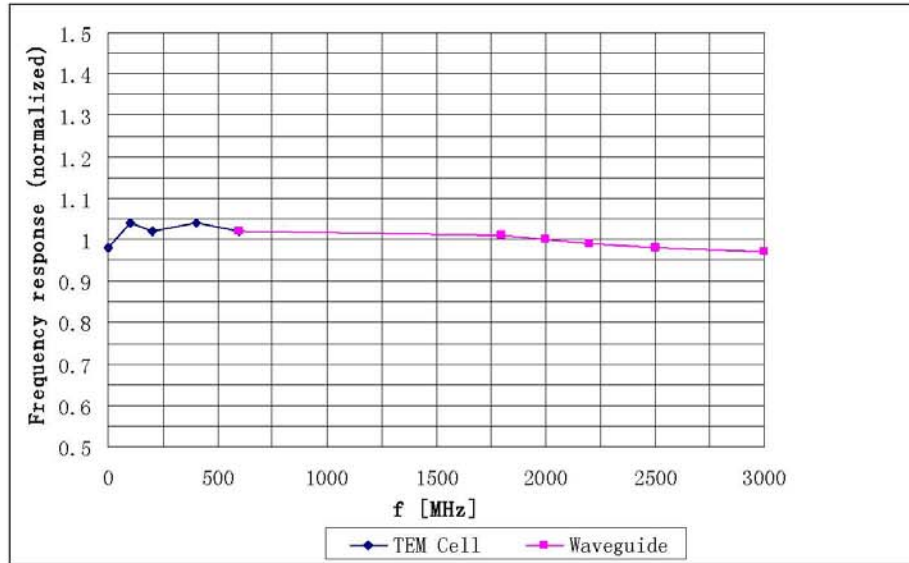
The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor k=2, which for a normal distribution Corresponds to a coverage probability of approximately 95%.

^A The uncertainties of NormX,Y,Z do not affect the E²-field uncertainty inside TSL (see Page 8).
^B Numerical linearization parameter: uncertainty not required.

ES3DV3 SN: 3149

September 25, 2009

Frequency Response of E-Field

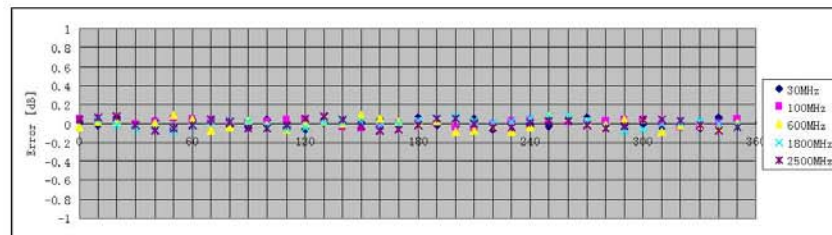
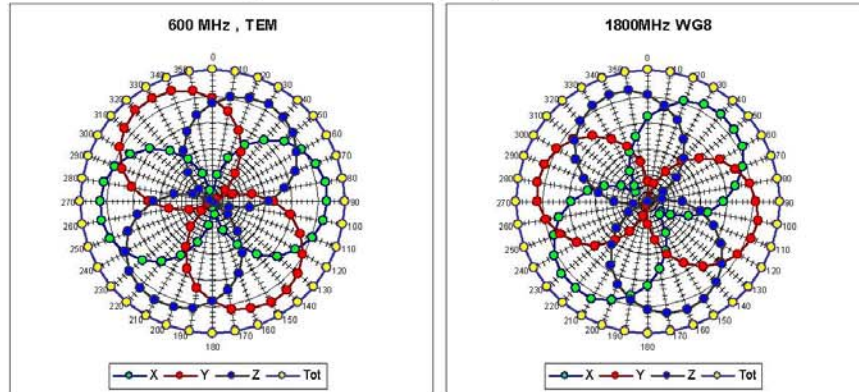


Uncertainty of Frequency Response of E-field: $\pm 5.0\%$ (k=2)

ES3DV3 SN: 3149

September 25, 2009

Receiving Pattern (ϕ), $\theta = 0^\circ$



Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ (k=2)