# SAR TEST REPORT

| | |
|---|---|
| **Product Name** | RP8-J01 |
| **Company Name** | Toshiba Corporation, Mobile Communications Co., Quality Management Division |
| **Company Address** | 1-1,Asahigaoka 3-Chome,Hine-Shi, Tokyo, 191-8555,Japan |
| **Date of Receipt** | 2010.03.25 |
| **Date of Test(s)** | 2010.04.06~2010.04.08 |
| **Date of Issue** | 2010.04.22 |

Standards:

**FCC OET 65 supplement C,**
**IEEE/ANSI C95.1, C95.3, IEEE 1528**

In the configuration tested, the EUT complied with the standards specified above.

**Remarks:**

This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS Taiwan Electronic & Communication Laboratory or testing done by SGS Taiwan Electronic & Communication Laboratory in connection with distribution or use of the product described in this report must be approved by SGS Taiwan Electronic & Communication Laboratory in writing.

**Tested by** : **Antony Wu** **Date** : **2010.04.22**
**Engineer**

**Approved by** : **Robert Chang** **Date** : **2010.04.22**
**Tech Manager**

# Contents

# 1. General Information

## 1.1 Testing Laboratory

| | |
|---|---|
| SGS Taiwan Ltd. Electronics & Communication Laboratory | |
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| Taipei county, Taiwan, R.O.C. | |
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| Internet | http://www.tw.sgs.com/ |

## 1.2 Details of Applicant

| | |
|---|---|
| Company Name | Toshiba Corporation, Mobile Communications Co., Quality Management Division |
| Company Address | 1-1,Asahigaoka 3-Chome,Hine-Shi, Tokyo, 191-8555,Japan |
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| Website | http://www.toshiba.co.jp/ |

## 1.3 Description of EUT

| | |
|---|---|
| Product Name | RP8-J01 |
| Marketing Name | TSI01 |
| Model Name | RP8-J01 |
| Brand Name | Toshiba |
| MEID Code | 0×A1000007020308 |
| FCC ID | WVS-RP8-J01 |

| | | |
|---|---|---|
| Mode of Operation | CDMA/EVDO /WLAN802.11b&g band | |
| Modulation mode | QPSK/CCK/OFDM | |
| Duty Cycle | CDMA Cellular | WLAN802.11b&g |
| | 1 | |
| Maximum RF Conducted Power (Average) | CDMA Cellular | WLAN802.11b&g |
| | 25dBm | 13.95dBm |
| TX Frequency Range (MHz) | CDMA Cellular | WLAN802.11b&g |
| | 824.7 – 848.31MHz | 2412-2462MHz |
| Channel Number (ARFCN) | CDMA Cellular | WLAN802.11b&g |
| | 1013 -777 | 1-11 |
| Battery Type | 3.7 V Lithium-Ion | |
| Antenna Type | Internal Antenna | |
| VOIP Function | No | |
| Max. SAR Measured (1 g) | **CDMA Cellular** | |
| | Head | Body |
| | **0.881 mW/g** (At CDMA Cellular Band_Right Head Cheek Position 1013 Channel_Slider on | **0.658 mW/g** (At CDMA Cellular Band_Body Position 1013 Channel_Slider off_repeated with headset) |
| | **WLAN 802.11b** | |
| | Body | |
| | **0.025 mW/g** (At WLAN802.11b Band_Body Position 1 Channel ) | |
| | **WLAN 802.11g** | |
| | Body | |
| | **0.016 mW/g** (At WLAN802.11g Band_Body Position 1 Channel) | |

**Note: Conducted power:**

| | WLAN802.11b | | | WLAN802.11g | | |
|---|---|---|---|---|---|---|
| | 1 | 6 | 11 | 1 | 6 | 11 |
| Peak | 16.5 | 15.86 | 16.63 | 20.05 | 20.6 | 13.95 |
| Average | 13.81 | 13.02 | 13.95 | 11.39 | 10.89 | 12.06 |

## 1.4 Test Environment

Ambient Temperature: 22±2° C
Tissue Simulating Liquid: 22±2° C

## 1.5 Operation description

**General:**

1. The EUT is controlled by using a Radio Communication Tester (Agilent 8960), and the communication between the EUT and the tester is established by air link. Measurements are performed respectively on the lowest, middle and highest channels of the operating band(s). The EUT is set to maximum power level during all tests, and at the beginning of each test the battery is fully charged.
2. During the SAR testing, the DASY5 system checks power drift by comparing the e-field strength of one specific location measured at the beginning with that measured at the end of the SAR testing.
3. Testing Head SAR at lowest, middle and highest channel for all bands with LET/LEC/RET/REC conditions.
4. Testing body-worn SAR by separating **1.5cm** between back side of EUT to flat phantom.

5. Use chipset specific software to control the EUT, and makes it transmit in maximum power. Measurements are performed respectively on the lowest, middle and highest channels of the operating band(s). The EUT is set to maximum power level during all tests, and at the beginning of each test the battery is fully charged.

**Additional configuration (Head) :**

6. For highest SAR configuration in this band repeated with external Memory card inside.
7. For highest SAR configuration in this band repeated with external Bluetooth active.

**Additional configuration (Body) :**

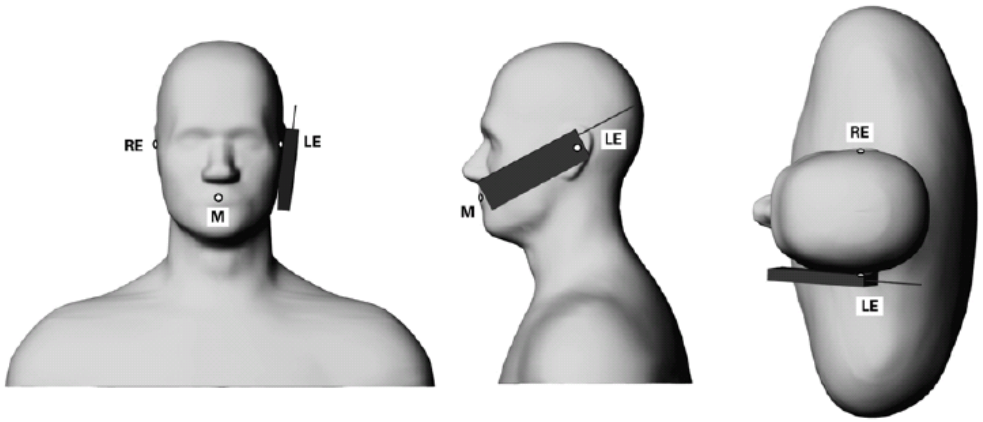
8. Testing body-worn SAR with Handset and Bluetooth transmitter OFF by separating **1.5cm** between front side of EUT to flat phantom.
9. For highest SAR configuration in this band repeated with external Memory card inside.
10. For highest SAR configuration in this band repeated with external Bluetooth active.
11. For highest SAR configuration in this band repeated with headset.

**SAR evaluation considerations for handsets with multiple transmitters:**

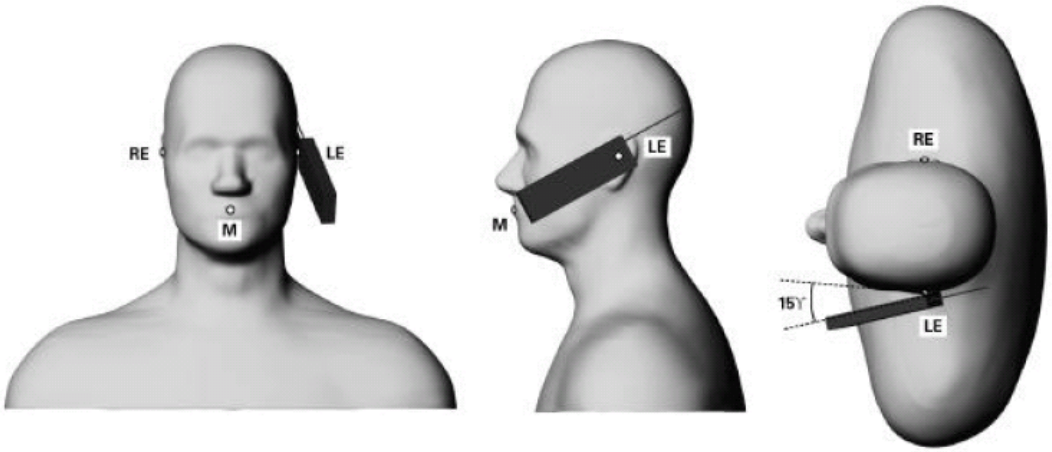
12. Since the WLAN function of this device does NOT support VoIP function. Users will not use it close to head. SAR evaluation of head adjacent is unnecessary, only Body condition will be considered for WLAN stand-alone situation.
13. The maximum SAR value for licensed transmitter happens on CDMA Cellular band, Head Right side(Cheek Position)_Slider on , channel 1013. the value is **0.881W/kg(1g)**. And the max SAR value for un-licensed transmitter WLAN 802.11b happens on Body worn, channel 1 with headset The SAR value is **0.025W/kg (1g)** . The summation of the 1g SAR is 0.881+0.025 = **0.906 W/kg, which lower than the limit 1.6W/kg. No simultaneous transmission SAR evaluation is necessary.**

13. For the SAR report, We follow FCC guidance **KDB 447498, 248227** and **647484**, etc.evaluated procedure for this product

## 1.6 Positioning Procedure




Phone position 1, “cheek” or “touch” position. The reference points for the right ear (RE), left ear (LE) and mouth (M), which define the reference plane for phone positioning




Phone position 2, “tilted position.” The reference points for the right ear (RE), left ear (LE) and mouth (M), which define the reference plane for phone positioning Cheek/Touch Position:

the handset was brought toward the mouth of the head phantom by pivoting against the ear reference point until any point of the mouthpiece or keypad touched the phantom.

Ear/Tilt Position:

With the phone aligned in the Cheek/Touch position, the handset was tilted away from the mouth with respect to the test device reference point by 15 degrees.

## 1.7 Evaluation Procedures

The entire evaluation of the spatial peak values is performed within the Post-processing engine (SEMCAD). The system always gives the maximum values for the 1 g and 10 g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

1. The extraction of the measured data (grid and values) from the Zoom Scan.
2. The calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
3. The generation of a high-resolution mesh within the measured volume
4. The interpolation of all measured values from the measurement grid to the high-resolution grid
5. The extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
6. The calculation of the averaged SAR within masses of 1g and 10g.The probe is calibrated at the center of the dipole sensors that is located 1 to 2.7mm away from the probe tip. During measurements, the probe stops shortly above the phantom surface, depending on the probe and the surface detecting system. Both distances are included as parameters in the probe configuration file. The software always knows exactly how far away the measured point is from the surface. As the probe cannot directly measure at the surface, the values between the deepest measured point and the surface must be extrapolated. The angle between the probe axis and the surface normal line is less than 30 degree.

   In the Area Scan, the gradient of the interpolation function is evaluated to find all the extreme of the SAR distribution. The uncertainty on the locations of the extreme is less than 1/20 of the grid size. Only local maximum within –2 dB of the global maximum are searched and passed for the Cube Scan measurement. In the Cube Scan, the interpolation function is used to extrapolate the Peak SAR from the lowest measurement points to the inner phantom surface (the extrapolation distance). The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5mm.

The maximum search is automatically performed after each area scan measurement. It is based on splines in two or three dimensions. The procedure can find the maximum for most SAR distributions even with relatively large grid spacing. After the area scanning measurement, the probe is automatically moved to a position at the interpolated maximum. The following scan can directly use this position for reference, e.g., for a finer resolution grid or the cube evaluations. The 1g and 10g peak evaluations are only available for the predefined cube 7x7x7 scans. The routines are verified and optimized for the grid dimensions used in these cube measurements. The measured volume of 30x30x30mm contains about 30g of tissue. The first procedure is an extrapolation (incl. Boundary correction) to get the points between the lowest measured plane and the surface. The next step uses 3D interpolation to get all points within the measured volume. In the last step, a 1g cube is placed numerically into the volume and its averaged SAR is calculated. This cube is the moved around until the highest averaged SAR is found. If the highest SAR is found at the edge of the measured volume, the system will issue a warning: higher SAR values might be found outside of the measured volume. In that case the cube measurement can be repeated, using the new interpolated maximum as the center.

## 1.8 The SAR Measurement System

A photograph of the SAR measurement System is given in Fig. a. This SAR Measurement System uses a Computer-controlled 3-D stepper motor system (SPEAG DASY 5 professional system ). A Model ES3DV3 field probe is used to determine the internal electric fields. The SAR can be obtained from the equation $SAR = \sigma (|Ei|^2)/ \rho$ where σ and ρ are the conductivity and mass density of the tissue-simulant. A photograph of the SAR measurement System is given in Fig. a. This SAR Measurement

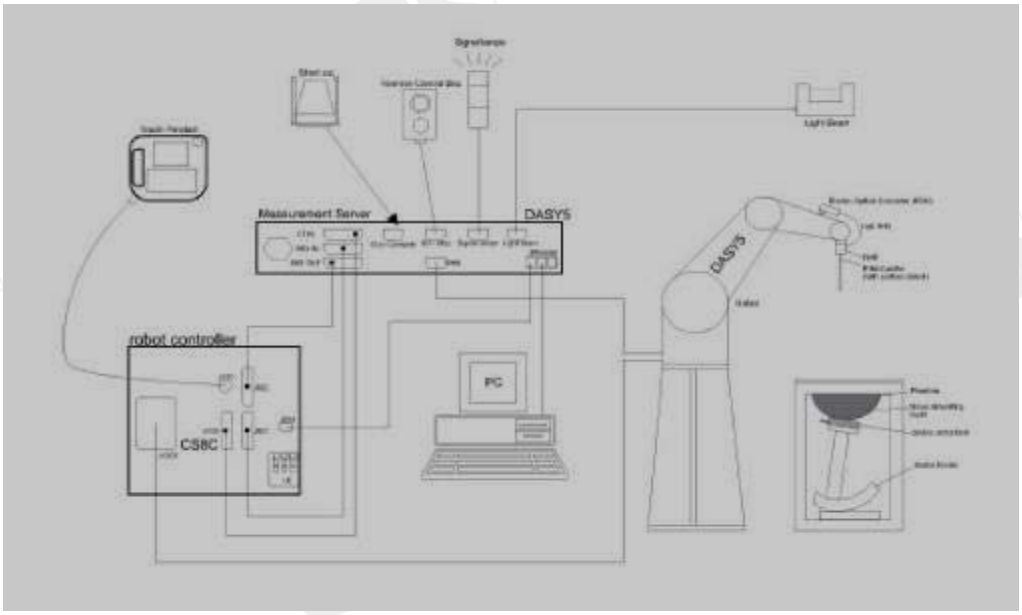



Fig.a The block diagram of SAR system

The DASY5 system for performing compliance tests consists of the following items:

- A standard high precision 6-axis robot (Staubli RX family) with controller, teach pendant and software.

  An arm extension is for accommodating the data acquisition electronics (DAE).
- A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to the DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.

- A computer operating Windows 2000 or Windows XP.
- DASY5 software.
- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing to validate the proper functioning of the system.

## 1.9 System Components

### ES3DV3 E-Field Probe

| | | |
|---|---|---|
| Construction: | Symmetrical design with triangular core<br>Built-in shielding against static charges<br>PEEK enclosure material (resistant to organic solvents, e.g., DGBE) |  <br>ES3DV3 E-Field Probe |
| Calibration: | Basic Broad Band Calibration in air<br>Conversion Factors (CF) for HSL850 & HSL2450 Additional CF for other liquids and frequencies upon request | |
| Frequency: | 10 MHz to > 6 GHz; Linearity: ± 0.2 dB (30 MHz to 3 GHz) | |
| Directivity: | ± 0.3 dB in HSL (rotation around probe axis)<br>± 0.5 dB in tissue material (rotation normal to probe axis) | |
| Dynamic Range: | 10 µW/g to > 100 mW/g;<br>Linearity: ± 0.2 dB (noise: typically < 1 µW/g) | |
| Dimensions: | Overall length: 330 mm (Tip: 20 mm)<br>Tip diameter: 2.5 mm (Body: 12 mm)<br>Typical distance from probe tip to dipole centers: 1 mm | |
| Application: | High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%. | |

## SAM PHANTOM V4.0C

| | |
|---|---|
| Construction: | The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528-200X, CENELEC 50361 and IEC 62209.<br>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 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 with the robot. |
| Shell Thickness: | 2 ± 0.2 mm |
| Filling Volume: | Approx. 25 liters |
| Dimensions: | Height: 251 mm;<br>Length: 1000 mm;<br>Width: 500 mm |

## DEVICE HOLDER

| | |
|---|---|
| Construction | In combination with the Twin SAM Phantom V4.0/V4.0C or Twin SAM, the Mounting Device (made from POM) enables the rotation of the mounted transmitter in spherical coordinates, whereby the rotation point is the ear opening. The devices can be easily and accurately positioned according to IEC, IEEE, CENELEC, FCC or other specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom). |

Device Holder

## 1.10 SAR System Verification

The microwave circuit arrangement for system verification is sketched in Fig. b. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within +/- 5% from the target SAR values. These tests were done at 850/2450MHz. The tests were conducted on the same days as the measurement of the DUT. The obtained results from the system accuracy verification are displayed in the table 1. During the tests, the ambient temperature of the laboratory was in the range 22.1°C, the relative humidity was in the range 62% and the liquid depth above the ear reference points was above 15 cm in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.

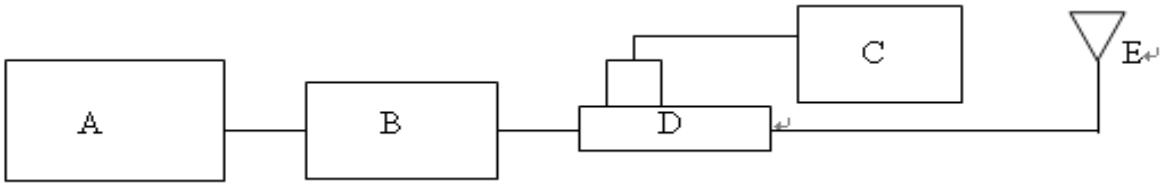



Fig.b The block diagram for SAR system verification

A. Agilent Model 8648D Signal Generator
B. Mini circuits Model ZHL-42 Amplifier
C. Agilent Model U2001B Power Sensor
D. Agilent Model 778D&777D Dual directional coupling
E. Reference dipole antenna

Photograph of the dipole Antenna

| Validation Kit | Frequency (MHz) | Target SAR (1g) (Pin=250mW) | Measured SAR (1g) | Variation | Measured Date |
|---|---|---|---|---|---|
| D835V2 S/N: 4d063 | 835 MHz (Head) | 2.38 mW/g | 2.27 mW/g | 4.6% | 2010/04/06 |
| D835V2 S/N: 4d063 | 835 MHz (Body) | 2.55 mW/g | 2.53 mW/g | 0.7% | 2010/04/08 |
| D2450V2 S/N: 727 | 2450 MHz (Body) | 13.2 mW/g | 13.6 mW/g | 3% | 2010/04/08 |

Table 1. Result of System validation

## 1.11 Tissue Simulant Fluid for the Frequency Band

The dielectric properties for this Head-simulant fluid were measured by using the HP Model 85070D Dielectric Probe (rates frequency band 200 MHz to 20 GHz) in conjuncation with HP 8753D Network Analyzer (30 KHz-6000MHz) by using a procedure detailed in Section V.

All dielectric parameters of tissue simulates were measured within 24 hours of SAR measurements. The depth of the tissue simulant in the ear reference point of the phantom was 15cm±5mm during all tests. (Appendix Fig .2)

| Frequency (MHz) | Tissue type | Measurement date/ Limits | Dielectric Parameters | | |
|---|---|---|---|---|---|
| | | | ρ | σ (S/m) | Simulated Tissue Temperature(° C) |
| 850 | Head | Measured, 2010.04.06 | 40.4 | 0.878 | 21.7 |
| | | Recommended Limits | 38.76-42.84 | 0.85-0.93 | 20-24 |
| 850 | Body | Measured, 2010.04.08 | 54 | 1 | 21.7 |
| | | Recommended Limits | 51.11-56.49 | 0.96-1.06 | 20-24 |
| 2450 | Body | Measured, 2010.04.08 | 52.2 | 2.07 | 21.7 |
| | | Recommended Limits | 51.68-57.12 | 1.88-2.08 | 20-24 |

Table 2. Dielectric Parameters of Tissue Simulant Fluid

The composition of the brain tissue simulating liquid for 850 & 2450 band:

| Ingredient | 850MHz (Head) | 850MHz (Body) | 2450Mhz (Body) |
|---|---|---|---|
| DGMBE | X | X | 301.7 ml |
| Water | 532.98 g | 631.68 g | 698.3 ml |
| Salt | 18.3 g | 11.72 g | X |
| Preventol D-7 | 2.4 g | 1.2 g | X |
| Cellulose | 3.2 g | X | X |
| Sugar | 766.0 g | 600 g | X |
| Total amount | 1 L (1.0kg) | 1 L (1.0kg) | 1 L (1.0kg) |

Table 3. Recipes for tissue simulating liquid

## 1.12 Test Standards and Limits

According to FCC 47CFR §2.1093(d) The limits to be used for evaluation are based generally on criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate ("SAR") in Section 4.2 of ''IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz,'' ANSI/IEEE C95.1–1992, Copyright 1992 by the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017.

These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in ''Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields,'' NCRP Report No. 86, Section 17.4.5. Copyright NCRP, 1986, Bethesda, Maryland 20814. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards. The criteria to be used are specified in paragraphs (d)(1) and (d)(2) of this section and shall apply for portable devices transmitting in the frequency range from 100 kHz to 6 GHz. Portable devices that transmit at frequencies above 6 GHz are to be evaluated in terms of the MPE limits specified in § 1.1310 of this chapter. Measurements and calculations to demonstrate compliance with MPE field strength or power density limits for devices

operating above 6 GHz should be made at a minimum distance of 5 cm from the radiating source.

(1) Limits for Occupational/Controlled exposure: 0.4 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 8 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 20 W/kg, as averaged over an 10 grams of tissue (defined as a tissue volume in the shape of a cube). Occupational/Controlled limits apply when persons are exposed as a consequence of their employment provided these persons are fully aware of and exercise control over their exposure. Awareness of exposure can be accomplished by use of warning labels or by specific training or education through appropriate means, such as an RF safety program in a work environment.

(2) Limits for General Population/Uncontrolled exposure: 0.08 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 1.6 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 4 W/kg, as averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). General Population/Uncontrolled limits apply when the general public may be exposed, or when persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or do not exercise control over their exposure. Warning labels placed on consumer devices such as cellular telephones will not be sufficient reason to allow these devices to be evaluated subject to limits for occupational/controlled exposure in paragraph (d)(1) of this section.(Table .6)

| Human Exposure | Uncontrolled Environment General Population | Controlled Environment Occupational |
|---|---|---|
| Spatial Peak SAR (Brain) | 1.60 m W/g | 8.00 m W/g |
| Spatial Average SAR (Whole Body) | 0.08 m W/g | 0.40 m W/g |
| Spatial Peak SAR (Hands/Feet/Ankle/Wrist) | 4.00 m W/g | 20.00 m W/g |

Table 4. RF exposure limits

Notes:
1. Uncontrolled environments are defined as locations where there is potential exposure of individuals who have no knowledge or control of their potential exposure.
2. Controlled environments are defined as locations where there is potential exposure of individuals who have knowledge of their potential exposure and can exercise control over their exposure.

## 2. Summary of Results

# CDMA Cellular

| Right Head (Cheek Position)_Slider off | | | | | | |
|---|---|---|---|---|---|---|
| Frequency | Channel | MHz | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[˚C] | Liquid Temp[˚C] |
| CDMA Cellular | 1013 | 824.70 | 25.2dBm | 0.475 | 22.1 | 21.7 |
| | 384 | 836.52 | 25.18dBm | 0.214 | 22.1 | 21.7 |
| | 777 | 848.31 | 24.95dBm | 0.27 | 22.1 | 21.7 |
| **Left Head (Cheek Position) _Slider off** | | | | | | |
| Frequency | Channel | MHz | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[˚C] | Liquid Temp[˚C] |
| CDMA Cellular | 1013 | 824.70 | 25.2dBm | 0.523 | 22.1 | 21.7 |
| | 384 | 836.52 | 25.18dBm | 0.26 | 22.1 | 21.7 |
| | 777 | 848.31 | 24.95dBm | 0.335 | 22.1 | 21.7 |
| **Right Head (15° Tilt Position) _Slider off** | | | | | | |
| Frequency | Channel | MHz | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[˚C] | Liquid Temp[˚C] |
| CDMA Cellular | 1013 | 824.70 | 25.2dBm | 0.389 | 22.1 | 21.7 |
| | 384 | 836.52 | 25.18dBm | 0.179 | 22.1 | 21.7 |
| | 777 | 848.31 | 24.95dBm | 0.236 | 22.1 | 21.7 |
| **Left Head (15° Tilt Position) _Slider off** | | | | | | |
| Frequency | Channel | MHz | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[˚C] | Liquid Temp[˚C] |
| CDMA Cellular | 1013 | 824.70 | 25.2dBm | 0.541 | 22.1 | 21.7 |
| | 384 | 836.52 | 25.18dBm | 0.232 | 22.1 | 21.7 |
| | 777 | 848.31 | 24.95dBm | 0.284 | 22.1 | 21.7 |
| **Right Head (Cheek Position)_Slider on** | | | | | | |
| Frequency | Channel | MHz | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[˚C] | Liquid Temp[˚C] |
| CDMA Cellular | 1013 | 824.70 | 25.2dBm | **0.881** | 22.1 | 21.7 |
| | 384 | 836.52 | 25.18dBm | 0.388 | 22.1 | 21.7 |
| | 777 | 848.31 | 24.95dBm | 0.488 | 22.1 | 21.7 |

| Right Head (Cheek Position)_Slider on _repeated with Memory card | | | | | | |
|---|---|---|---|---|---|---|
| Frequency | Channel | MHz | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[˚C] | Liquid Temp[˚C] |
| CDMA Cellular | 1013 | 824.70 | 25.2dBm | 0.87 | 22.1 | 21.7 |
| **Left Head (Cheek Position)_Slider on** | | | | | | |
| Frequency | Channel | MHz | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[˚C] | Liquid Temp[˚C] |
| CDMA Cellular | 1013 | 824.70 | 25.2dBm | 0.608 | 22.1 | 21.7 |
| | 384 | 836.52 | 25.18dBm | 0.282 | 22.1 | 21.7 |
| | 777 | 848.31 | 24.95dBm | 0.359 | 22.1 | 21.7 |
| **Right Head (15° Tilt Position)_Slider on** | | | | | | |
| Frequency | Channel | MHz | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[˚C] | Liquid Temp[˚C] |
| CDMA Cellular | 1013 | 824.70 | 25.2dBm | 0.875 | 22.1 | 21.7 |
| | 384 | 836.52 | 25.18dBm | 0.395 | 22.1 | 21.7 |
| | 777 | 848.31 | 24.95dBm | 0.499 | 22.1 | 21.7 |
| **Left Head (15° Tilt Position)_Slider on** | | | | | | |
| Frequency | Channel | MHz | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[˚C] | Liquid Temp[˚C] |
| CDMA Cellular | 1013 | 824.70 | 25.2dBm | 0.427 | 22.1 | 21.7 |
| | 384 | 836.52 | 25.18dBm | 0.181 | 22.1 | 21.7 |
| | 777 | 848.31 | 24.95dBm | 0.226 | 22.1 | 21.7 |
| **Body worn** | | | | | | |
| Frequency | Channel | MHz | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[˚C] | Liquid Temp[˚C] |
| CDMA Cellular | 1013 | 824.70 | 25.2dBm | 0.656 | 22.1 | 21.7 |
| | 384 | 836.52 | 25.18dBm | 0.323 | 22.1 | 21.7 |
| | 777 | 848.31 | 24.95dBm | 0.372 | 22.1 | 21.7 |

| Body worn _repeated for EUT front to phantom | | | | | | |
|---|---|---|---|---|---|---|
| Frequency | Channel | MHz | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[˚C] | Liquid Temp[˚C] |
| CDMA Cellular | 1013 | 824.70 | 25.2dBm | 0.311 | 22.1 | 21.7 |
| **Body worn _repeated with Memory card** | | | | | | |
| Frequency | Channel | MHz | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[˚C] | Liquid Temp[˚C] |
| CDMA Cellular | 1013 | 824.70 | 25.2dBm | 0.646 | 22.1 | 21.7 |
| **Body worn _repeated with headset** | | | | | | |
| Frequency | Channel | MHz | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[˚C] | Liquid Temp[˚C] |
| CDMA Cellular | 1013 | 824.70 | 25.2dBm | **0.658** | 22.1 | 21.7 |

# WLAN802.11 b

| Body worn | | | | | | |
|---|---|---|---|---|---|---|
| Frequency | Channel | MHz | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[˚C] | Liquid Temp[˚C] |
| WLAN 802.11 b | 1 | 2412 | 13.81dBm | **0.025** | 22.1 | 21.7 |
| | 6 | 2437 | 13.02dBm | 0.015 | 22.1 | 21.7 |
| | 11 | 2462 | 13.95dBm | 0.018 | 22.1 | 21.7 |
| **Body worn _repeated for EUT front to phantom** | | | | | | |
| Frequency | Channel | MHz | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[˚C] | Liquid Temp[˚C] |
| WLAN 802.11 b | 1 | 2412 | 13.81dBm | 0.00692 | 22.1 | 21.7 |
| **Body worn _repeated with Memory card** | | | | | | |
| Frequency | Channel | MHz | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[˚C] | Liquid Temp[˚C] |
| WLAN 802.11 b | 1 | 2412 | 13.81dBm | 0.024 | 22.1 | 21.7 |
| **Body worn _repeated with Bluetooth active** | | | | | | |
| Frequency | Channel | MHz | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[˚C] | Liquid Temp[˚C] |
| WLAN 802.11 b | 1 | 2412 | 13.81dBm | 0.022 | 22.1 | 21.7 |
| **Body worn _repeated with headset** | | | | | | |
| Frequency | Channel | MHz | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[˚C] | Liquid Temp[˚C] |
| WLAN 802.11 b | 1 | 2412 | 13.81dBm | 0.024 | 22.1 | 21.7 |

# WLAN 802.11 g

| Body worn | | | | | | |
|---|---|---|---|---|---|---|
| Frequency | Channel | MHz | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[˚C] | Liquid Temp[˚C] |
| WLAN 802.11 g | 1 | 2412 | 11.39dBm | 0.016 | 22.1 | 21.7 |
| | 6 | 2437 | 10.89dBm | 0.00866 | 22.1 | 21.7 |
| | 11 | 2462 | 12.06dBm | 0.00974 | 22.1 | 21.7 |

Note: SAR measurement results for the Mobile Phone at maximum output power.

# 3. Instruments List

| Manufacturer | Device | Type | Serial number | Date of last calibration |
|---|---|---|---|---|
| Schmid & Partner Engineering AG | Dosimetric E-FieldProbe | ESDV3 | 3172 | May.27.2009 |
| Schmid & Partner Engineering AG | 850/2450MHz System Validation Dipole | D835V2 | 4d063 | May.25.2009 |
| | | D2450V2 | 727 | Apr.27.2009 |
| Schmid & Partner Engineering AG | Data acquisition Electronics | DAE4 | 856 | May.26.2009 |
| Schmid & Partner Engineering AG | Software | DASY 5 V5.0 Build125 | N/A | Calibration not required |
| Schmid & Partner Engineering AG | Phantom | SAM | N/A | Calibration not required |
| Agilent | Network Analyzer | 8753D | 3410A05662 | Mar.31.2010 |
| Agilent | Dielectric Probe Kit | 85070D | US01440168 | Calibration not required |
| Agilent | Dual-directional coupler | 778D | 50313 | Aug.26.2009 |
| | | 777D | 50114 | Aug.26.2009 |
| Agilent | RF Signal Generator | 8648D | 3847M00432 | May.25.2009 |
| Agilent | Power Sensor | U2001B | MY48100169 | Apr.23.2009 |
| Agilent | Radio Communication Test | E5515c | GB44051912 | Nov.05 .2008 |

# 4. Measurements

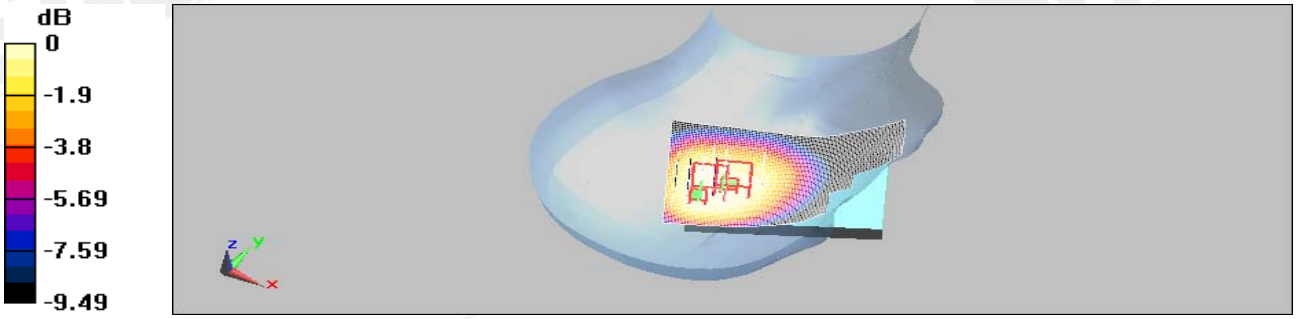
Date: 2010/4/6

## RE_Cheek_CH1013_Slider off

**DUT: RP8-J01;**
Communication System: CDMA_Cellular; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used: f = 825 MHz; $\sigma$ = 0.869 mho/m; $\varepsilon_r$ = 40.6; $\rho$ = 1000 kg/$m^3$

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**RE_Cheek/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.528 mW/g
**RE_Cheek/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.9 V/m; Power Drift = 0.132 dB
Peak SAR (extrapolated) = 0.809 W/kg
**SAR(1 g) = 0.475 mW/g; SAR(10 g) = 0.336 mW/g**
Maximum value of SAR (measured) = 0.513 mW/g
**RE_Cheek/Zoom Scan (7x7x7) (5x5x7)/Cube 1:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.9 V/m; Power Drift = 0.132 dB
Peak SAR (extrapolated) = 0.672 W/kg
**SAR(1 g) = 0.464 mW/g; SAR(10 g) = 0.322 mW/g**
Maximum value of SAR (measured) = 0.509 mW/g




0 dB = 0.509mW/g

Date: 2010/4/6

## RE_Cheek_CH384_Slider off

**DUT: RP8-J01;**

Communication System: CDMA_Cellular; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used: f = 837 MHz; $\sigma$ = 0.88 mho/m; $\varepsilon_r$ = 40.4; $\rho$ = 1000 kg/$m^3$
Phantom section: Right Section

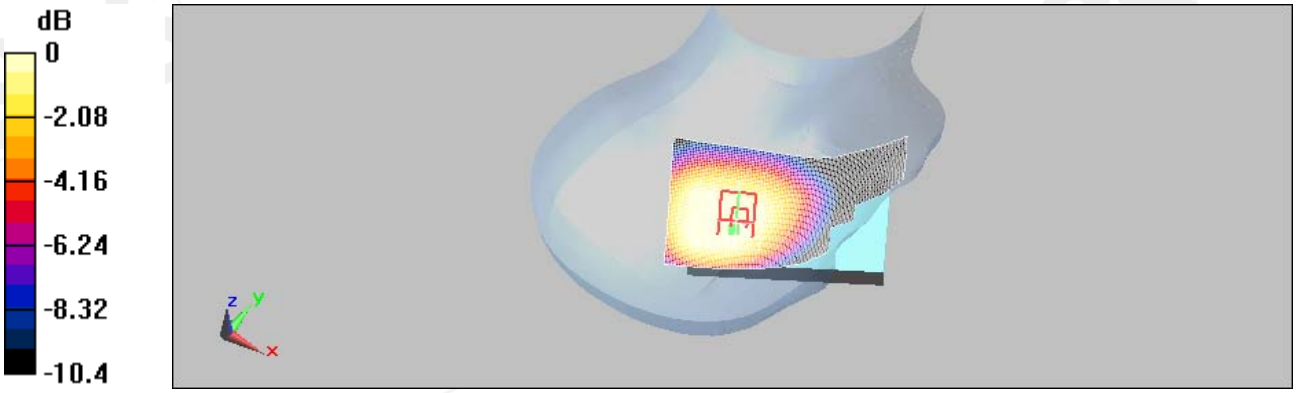
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**RE_Cheek/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.229 mW/g

**RE_Cheek/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.6 V/m; Power Drift = 0.191 dB
Peak SAR (extrapolated) = 0.308 W/kg

**SAR(1 g) = 0.214 mW/g; SAR(10 g) = 0.161 mW/g**
Maximum value of SAR (measured) = 0.223 mW/g




0 dB = 0.223mW/g

Date: 2010/4/6

## RE_Cheek_CH777_Slider off

**DUT: RP8-J01;**

Communication System: CDMA_Cellular; Frequency: 848.31 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used (interpolated): f = 848.31 MHz; $\sigma$ = 0.893 mho/m; $\varepsilon_r$ = 40.2; $\rho$ = 1000 kg/$m^3$
Phantom section: Right Section

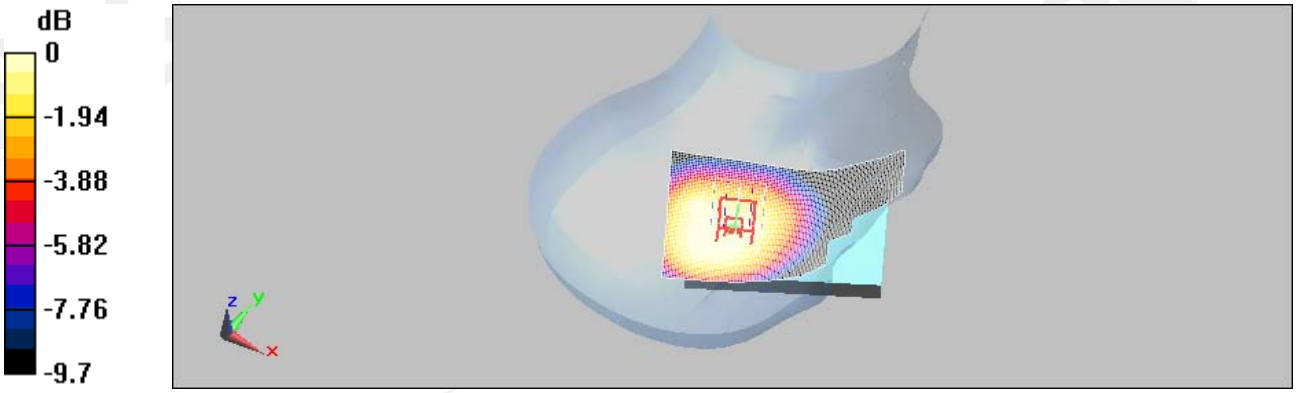
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**RE_Cheek/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.287 mW/g

**RE_Cheek/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.2 V/m; Power Drift = 0.087 dB
Peak SAR (extrapolated) = 0.357 W/kg

**SAR(1 g) = 0.270 mW/g; SAR(10 g) = 0.201 mW/g**
Maximum value of SAR (measured) = 0.285 mW/g




0 dB = 0.285mW/g

Date: 2010/4/6

## LE_Cheek_CH1013_Slider off

**DUT: RP8-J01;**

Communication System: CDMA_Cellular; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used: f = 825 MHz; $\sigma$ = 0.869 mho/m; $\varepsilon_r$ = 40.6; $\rho$ = 1000 kg/$m^3$
Phantom section: Left Section

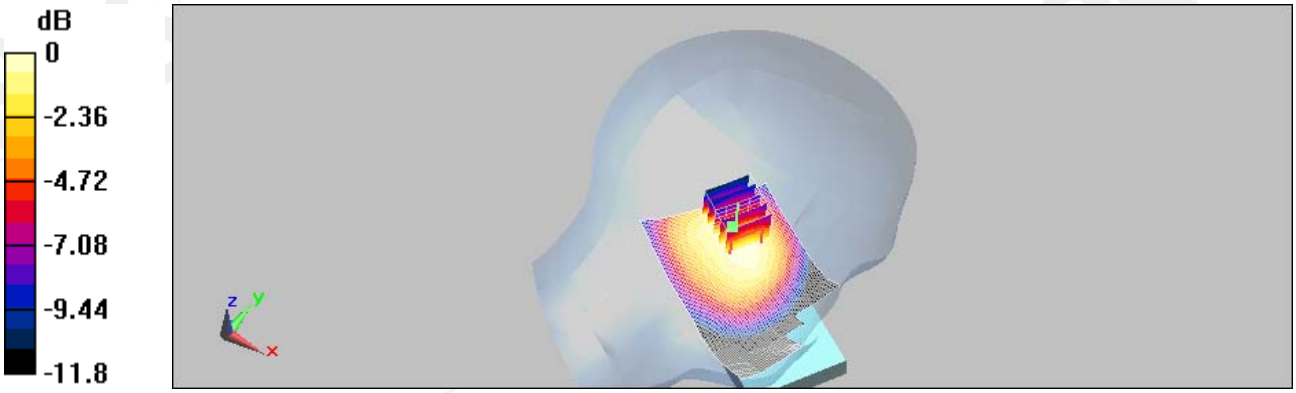
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**LE Cheek/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.583 mW/g

**LE Cheek/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.6 V/m; Power Drift = -0.050 dB
Peak SAR (extrapolated) = 0.794 W/kg

**SAR(1 g) = 0.523 mW/g; SAR(10 g) = 0.371 mW/g**
Maximum value of SAR (measured) = 0.559 mW/g




0 dB = 0.559mW/g

Date: 2010/4/6

## LE_Cheek_CH384_Slider off

**DUT: RP8-J01;**

Communication System: CDMA_Cellular; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used: f = 837 MHz; $\sigma$ = 0.88 mho/m; $\varepsilon_r$ = 40.4; $\rho$ = 1000 kg/$m^3$
Phantom section: Left Section

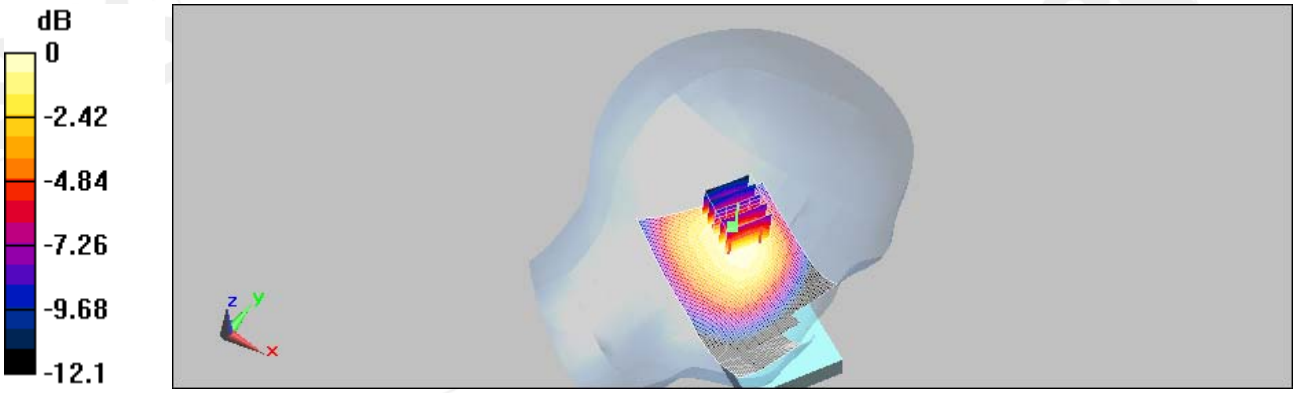
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**LE Cheek/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.284 mW/g

**LE Cheek/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.8 V/m; Power Drift = -0.044 dB
Peak SAR (extrapolated) = 0.410 W/kg

**SAR(1 g) = 0.260 mW/g; SAR(10 g) = 0.181 mW/g**
Maximum value of SAR (measured) = 0.283 mW/g




0 dB = 0.283mW/g

Date: 2010/4/6

## LE_Cheek_CH777_Slider off

**DUT: RP8-J01;**

Communication System: CDMA_Cellular; Frequency: 848.31 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used (interpolated): f = 848.31 MHz; $\sigma$ = 0.893 mho/m; $\varepsilon_r$ = 40.2; $\rho$ = 1000 kg/m$^3$
Phantom section: Left Section

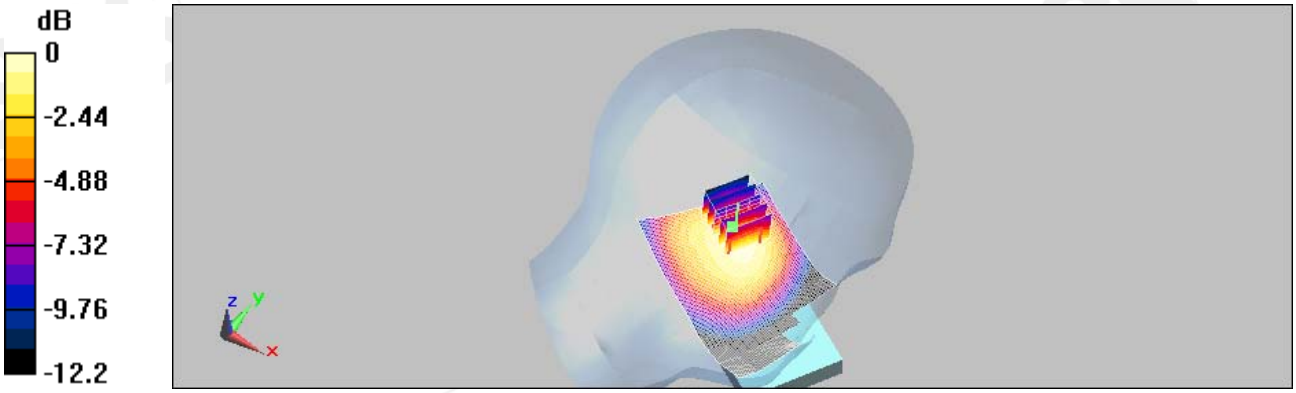
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**LE Cheek/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.356 mW/g

**LE Cheek/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.4 V/m; Power Drift = 0.00503 dB
Peak SAR (extrapolated) = 0.498 W/kg

**SAR(1 g) = 0.335 mW/g; SAR(10 g) = 0.230 mW/g**
Maximum value of SAR (measured) = 0.360 mW/g




0 dB = 0.360mW/g

Date: 2010/4/6

## RE_Tilt_CH1013_Slider off

**DUT: RP8-J01;**

Communication System: CDMA_Cellular; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used: f = 825 MHz; $\sigma$ = 0.869 mho/m; $\varepsilon_r$ = 40.6; $\rho$ = 1000 kg/$m^3$
Phantom section: Right Section

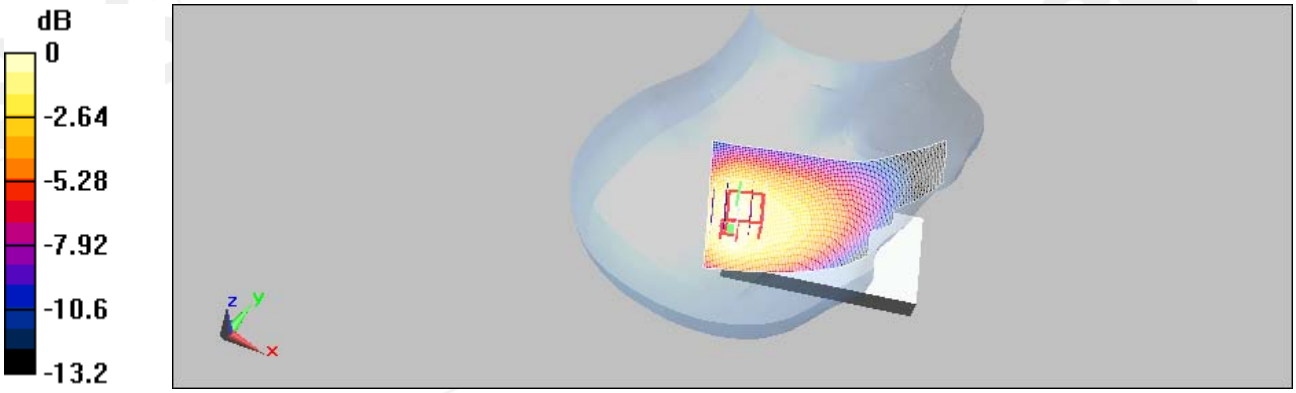
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**RE Tilt/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.433 mW/g

**RE Tilt/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.7 V/m; Power Drift = 0.013 dB
Peak SAR (extrapolated) = 0.715 W/kg

**SAR(1 g) = 0.389 mW/g; SAR(10 g) = 0.254 mW/g**
Maximum value of SAR (measured) = 0.425 mW/g




0 dB = 0.425mW/g

Date: 2010/4/6

## RE_Tilt_CH384_Slider off

**DUT: RP8-J01;**

Communication System: CDMA_Cellular; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used: f = 837 MHz; $\sigma$ = 0.88 mho/m; $\varepsilon_r$ = 40.4; $\rho$ = 1000 kg/$m^3$
Phantom section: Right Section

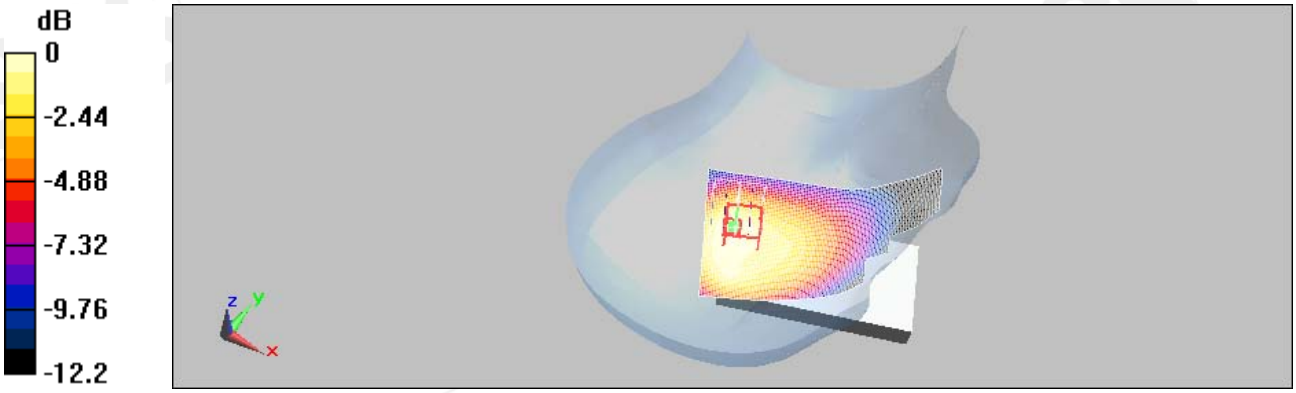
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**RE Tilt/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.201 mW/g

**RE Tilt/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.6 V/m; Power Drift = -0.161 dB
Peak SAR (extrapolated) = 0.294 W/kg

**SAR(1 g) = 0.179 mW/g; SAR(10 g) = 0.118 mW/g**
Maximum value of SAR (measured) = 0.190 mW/g




0 dB = 0.190mW/g

Date: 2010/4/6

## RE_Tilt_CH777_Slider off

**DUT: RP8-J01;**

Communication System: CDMA_Cellular; Frequency: 848.31 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used (interpolated): f = 848.31 MHz; $\sigma$ = 0.893 mho/m; $\varepsilon_r$ = 40.2; $\rho$ = 1000 kg/$m^3$
Phantom section: Right Section

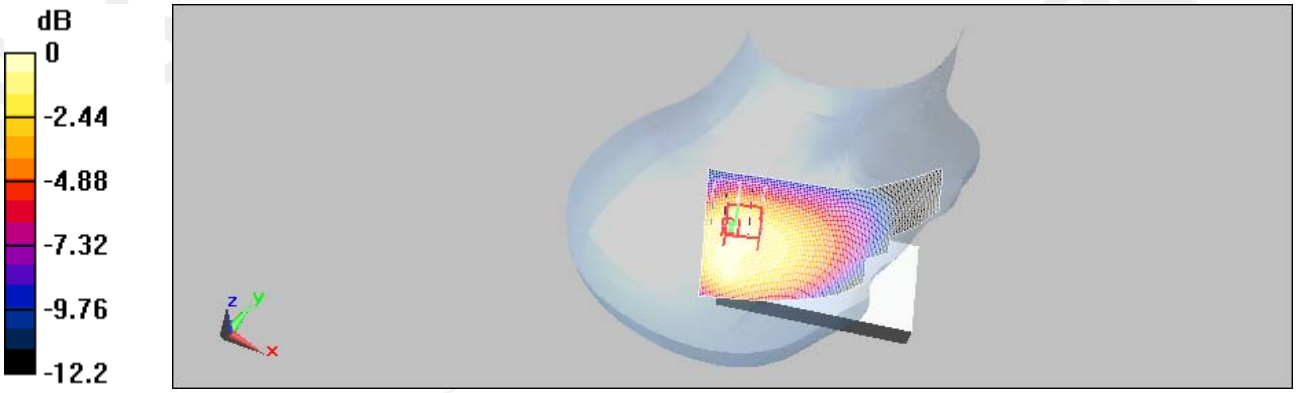
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**RE Tilt/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.245 mW/g

**RE Tilt/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.8 V/m; Power Drift = 0.070 dB
Peak SAR (extrapolated) = 0.388 W/kg

**SAR(1 g) = 0.236 mW/g; SAR(10 g) = 0.155 mW/g**
Maximum value of SAR (measured) = 0.250 mW/g




0 dB = 0.250mW/g

Date: 2010/4/6

## LE_Tilt_CH1013_Slider off

**DUT: RP8-J01;**

Communication System: CDMA_Cellular; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used: f = 825 MHz; $\sigma$ = 0.869 mho/m; $\varepsilon_r$ = 40.6; $\rho$ = 1000 kg/$m^3$
Phantom section: Left Section

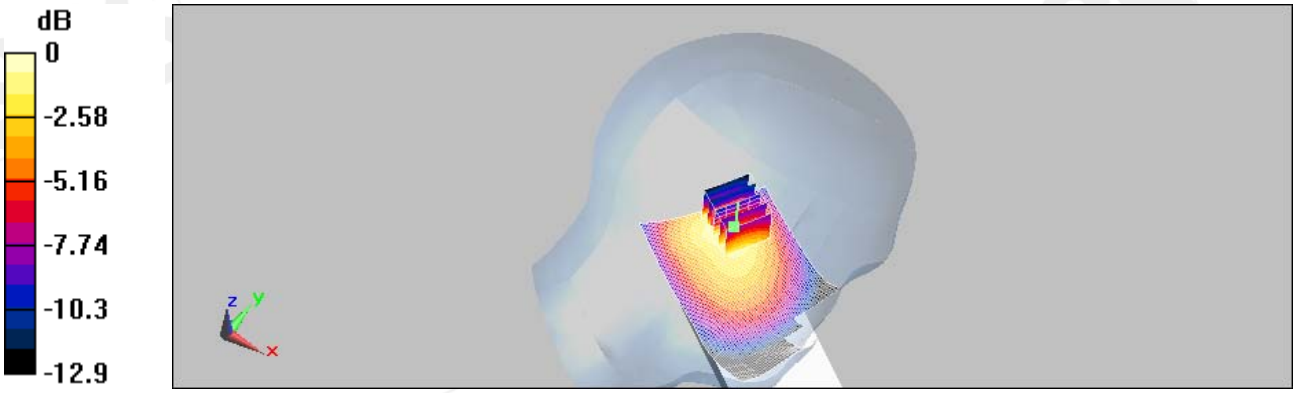
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**LE Tilt/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.617 mW/g

**LE Tilt/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23 V/m; Power Drift = -0.062 dB
Peak SAR (extrapolated) = 0.995 W/kg

**SAR(1 g) = 0.541 mW/g; SAR(10 g) = 0.335 mW/g**
Maximum value of SAR (measured) = 0.587 mW/g




0 dB = 0.587mW/g

Date: 2010/4/6

## LE_Tilt_CH384_Slider off

**DUT: RP8-J01;**

Communication System: CDMA_Cellular; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used: f = 837 MHz; $\sigma$ = 0.88 mho/m; $\varepsilon_r$ = 40.4; $\rho$ = 1000 kg/$m^3$
Phantom section: Left Section

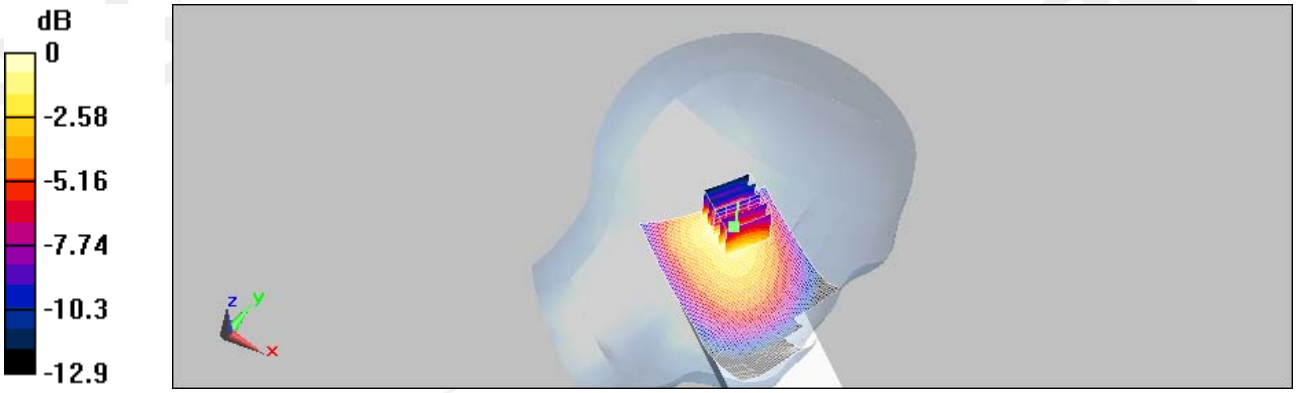
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**LE Tilt/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.461 mW/g

**LE Tilt/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.9 V/m; Power Drift = 0.184 dB
Peak SAR (extrapolated) = 0.420 W/kg

**SAR(1 g) = 0.232 mW/g; SAR(10 g) = 0.142 mW/g**
Maximum value of SAR (measured) = 0.242 mW/g




0 dB = 0.242mW/g

Date: 2010/4/6

## LE_Tilt_CH777_Slider off

**DUT: RP8-J01;**

Communication System: CDMA_Cellular; Frequency: 848.31 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used (interpolated): f = 848.31 MHz; $\sigma$ = 0.893 mho/m; $\varepsilon_r$ = 40.2; $\rho$ = 1000 kg/m$^3$
Phantom section: Left Section

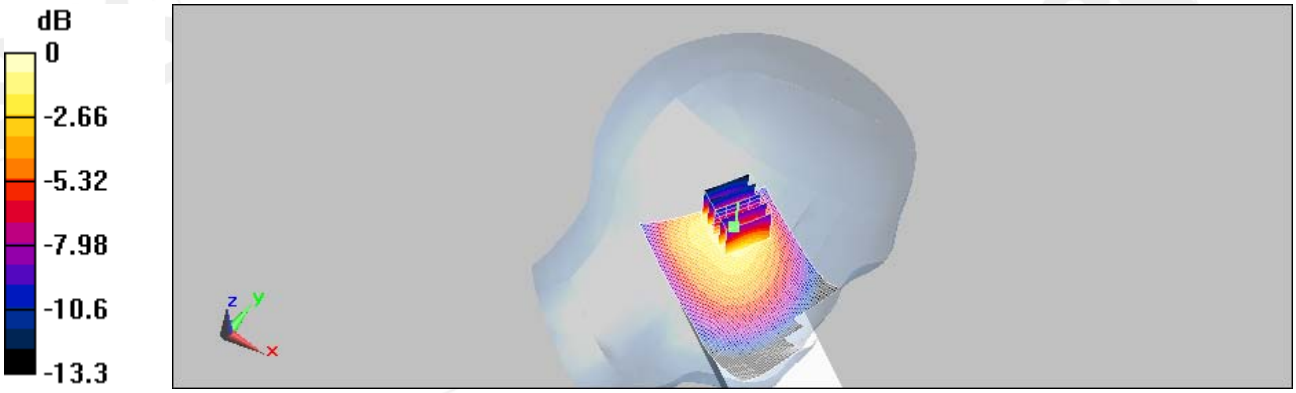
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**LE Tilt/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.322 mW/g

**LE Tilt/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.8 V/m; Power Drift = -0.174 dB
Peak SAR (extrapolated) = 0.524 W/kg

**SAR(1 g) = 0.284 mW/g; SAR(10 g) = 0.172 mW/g**
Maximum value of SAR (measured) = 0.312 mW/g




0 dB = 0.312mW/g

Date: 2010/4/6

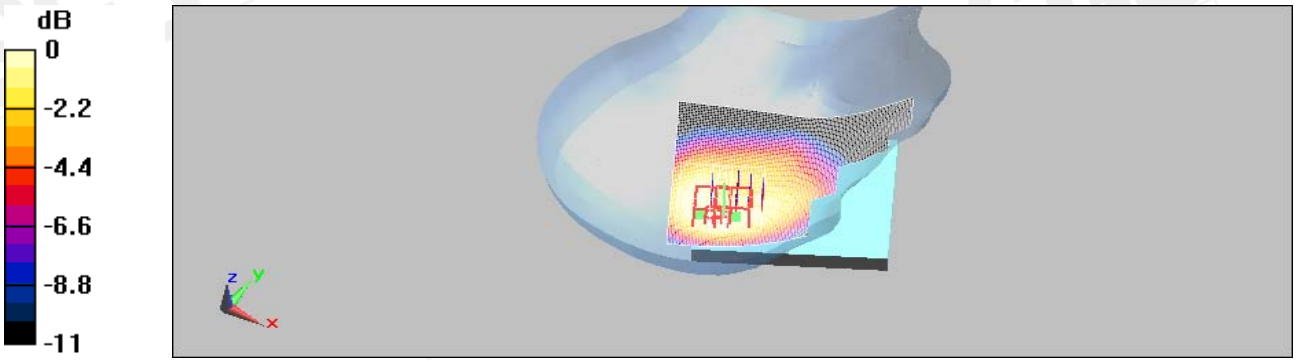
## RE_Cheek_CH1013_Slider on

**DUT: RP8-J01;**

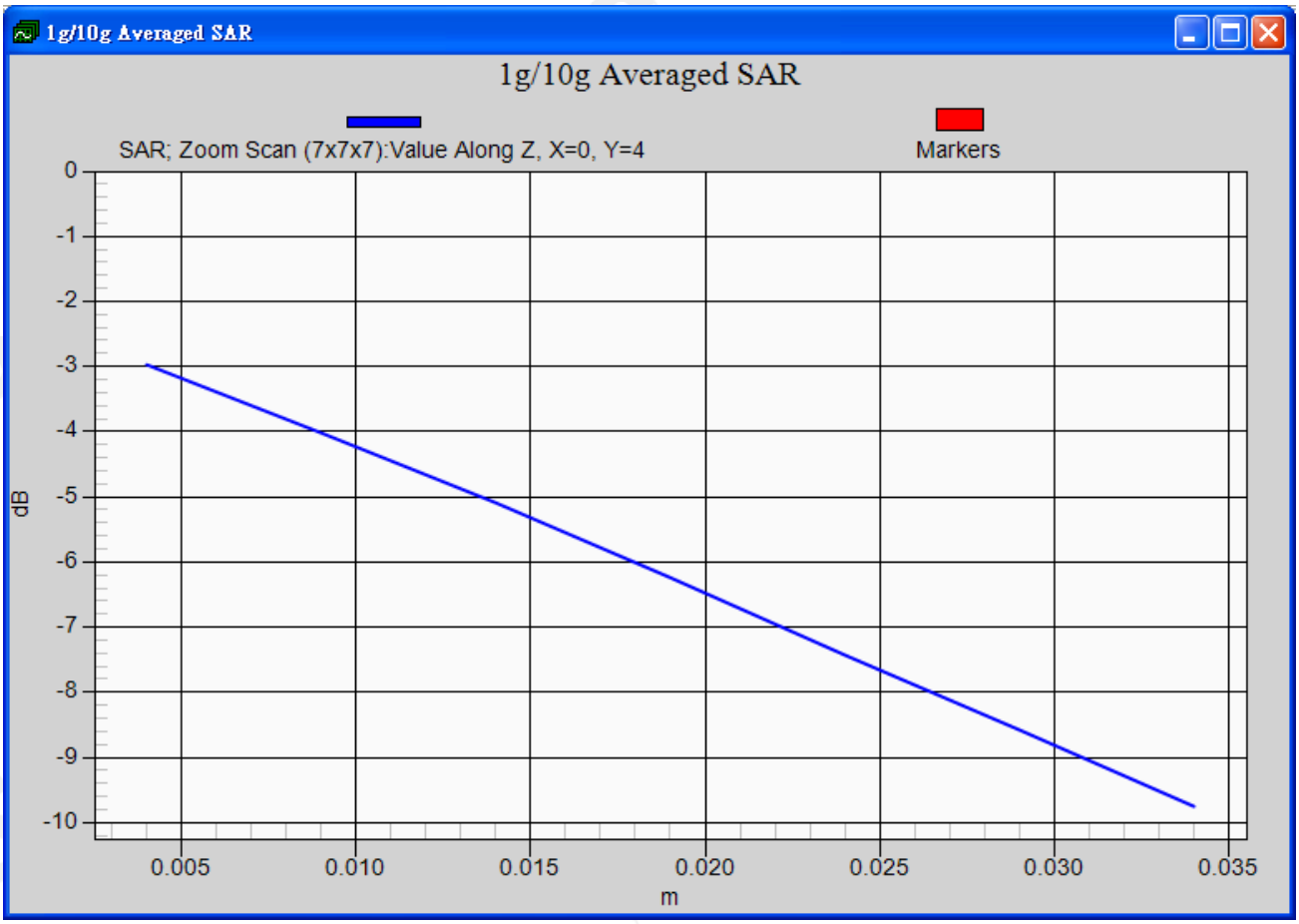
Communication System: CDMA_Cellular; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used: f = 825 MHz; $\sigma$ = 0.869 mho/m; $\varepsilon_r$ = 40.6; $\rho$ = 1000 kg/$m^3$
Phantom section: Right Section

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**RE Cheek/Area Scan (81x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.953 mW/g
**RE Cheek/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.1 V/m; Power Drift = -0.031 dB
Peak SAR (extrapolated) = 1.51 W/kg
**SAR(1 g) = 0.881 mW/g; SAR(10 g) = 0.549 mW/g**
Maximum value of SAR (measured) = 0.916 mW/g
**RE Cheek/Zoom Scan (7x7x7) (5x5x7)/Cube 1:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.1 V/m; Power Drift = -0.031 dB
Peak SAR (extrapolated) = 1.48 W/kg
**SAR(1 g) = 0.870 mW/g; SAR(10 g) = 0.554 mW/g**
Maximum value of SAR (measured) = 0.924 mW/g




0 dB = 0.924mW/g



Date: 2010/4/6

## RE_Cheek_CH384_Slider on

**DUT: RP8-J01;**

Communication System: CDMA_Cellular; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used: f = 837 MHz; $\sigma$ = 0.88 mho/m; $\varepsilon_r$ = 40.4; $\rho$ = 1000 kg/$m^3$
Phantom section: Right Section

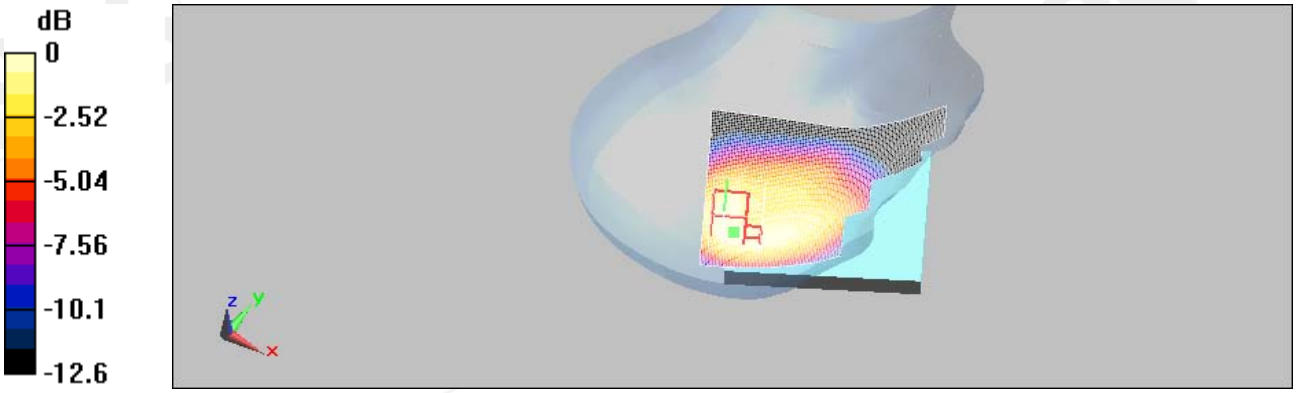
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**RE Cheek/Area Scan (81x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.449 mW/g

**RE Cheek/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.4 V/m; Power Drift = -0.174 dB
Peak SAR (extrapolated) = 0.682 W/kg

**SAR(1 g) = 0.388 mW/g; SAR(10 g) = 0.243 mW/g**
Maximum value of SAR (measured) = 0.423 mW/g




0 dB = 0.423mW/g

Date: 2010/4/6

## RE_Cheek_CH777_Slider on

**DUT: RP8-J01;**

Communication System: CDMA_Cellular; Frequency: 848.31 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used (interpolated): f = 848.31 MHz; $\sigma$ = 0.893 mho/m; $\varepsilon_r$ = 40.2; $\rho$ = 1000 kg/$m^3$
Phantom section: Right Section

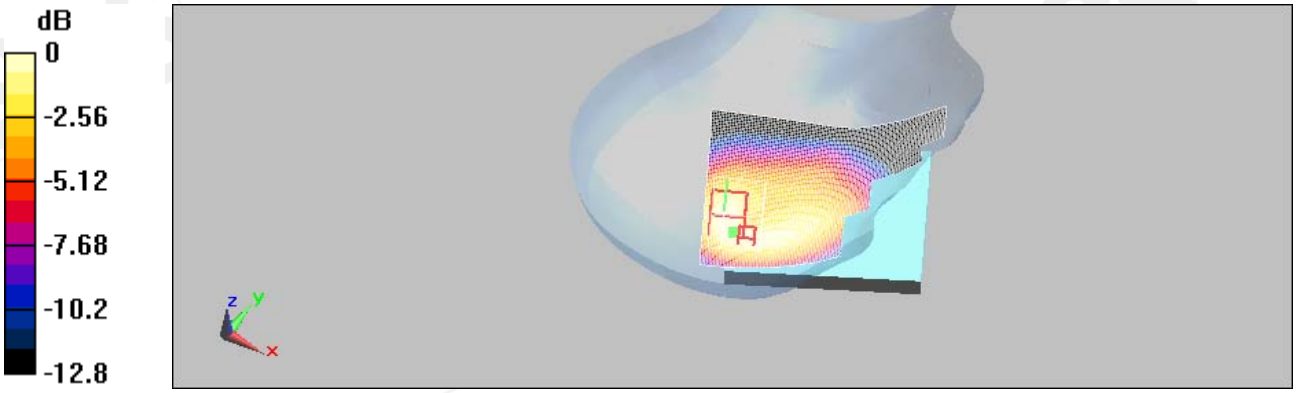
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**RE Cheek/Area Scan (81x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.525 mW/g

**RE Cheek/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.7 V/m; Power Drift = -0.116 dB
Peak SAR (extrapolated) = 0.846 W/kg

**SAR(1 g) = 0.488 mW/g; SAR(10 g) = 0.300 mW/g**
Maximum value of SAR (measured) = 0.539 mW/g




0 dB = 0.539mW/g

Date: 2010/4/6

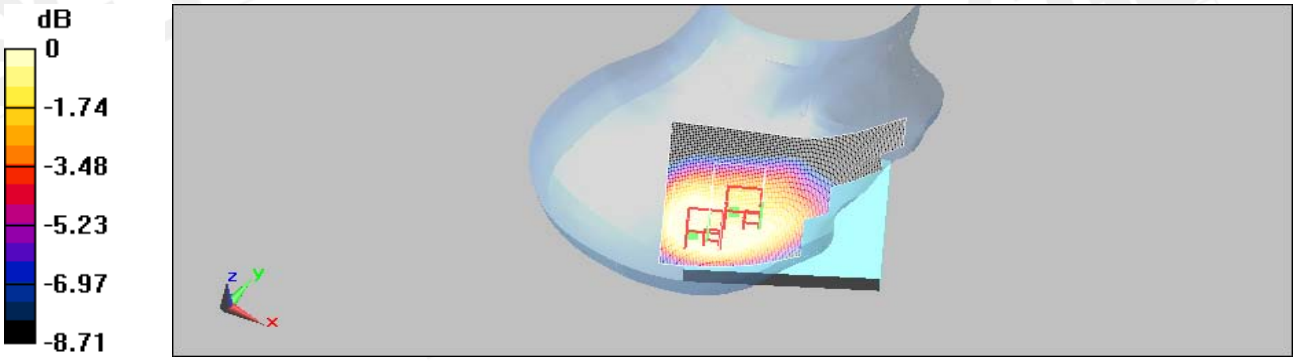
## RE_Cheek_CH1013_Slider on_repeated with Memory card

**DUT: RP8-J01;**

Communication System: CDMA_Cellular; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used: f = 825 MHz; $\sigma$ = 0.869 mho/m; $\varepsilon_r$ = 40.6; $\rho$ = 1000 kg/$m^3$
Phantom section: Right Section

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**RE Cheek/Area Scan (81x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.971 mW/g
**RE Cheek/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.1 V/m; Power Drift = -0.192 dB
Peak SAR (extrapolated) = 1.49 W/kg
**SAR(1 g) = 0.870 mW/g; SAR(10 g) = 0.541 mW/g**
Maximum value of SAR (measured) = 0.941 mW/g
**RE Cheek/Zoom Scan (7x7x7) (5x5x7)/Cube 1:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.1 V/m; Power Drift = -0.192 dB
Peak SAR (extrapolated) = 1.06 W/kg
**SAR(1 g) = 0.666 mW/g; SAR(10 g) = 0.468 mW/g**
Maximum value of SAR (measured) = 0.764 mW/g




0 dB = 0.764mW/g

Date: 2010/4/6

## LE_Cheek_CH1013_Slider on

**DUT: RP8-J01;**

Communication System: CDMA_Cellular; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used: f = 825 MHz; $\sigma$ = 0.869 mho/m; $\varepsilon_r$ = 40.6; $\rho$ = 1000 kg/$m^3$
Phantom section: Left Section

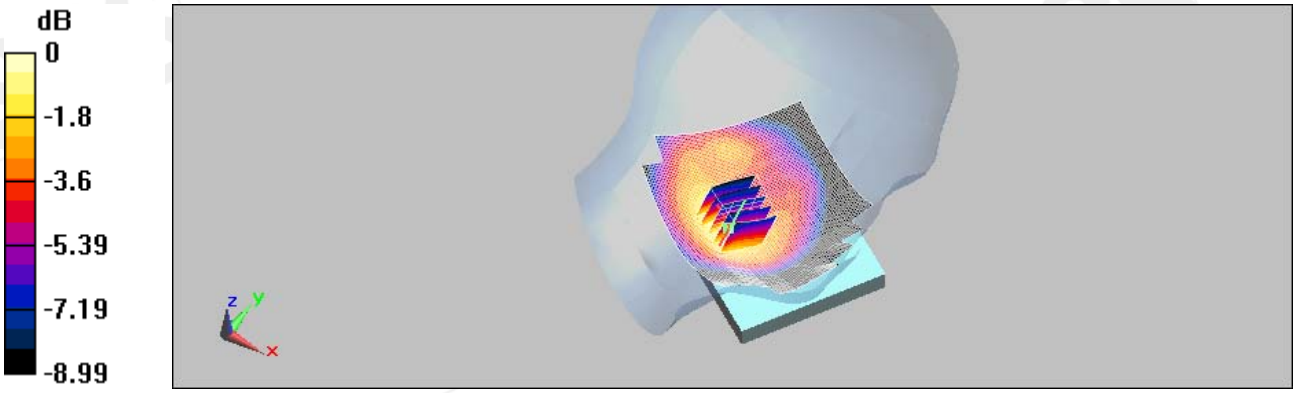
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**LE Cheek/Area Scan (81x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.663 mW/g

**LE Cheek/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.8 V/m; Power Drift = -0.121 dB
Peak SAR (extrapolated) = 0.880 W/kg

**SAR(1 g) = 0.608 mW/g; SAR(10 g) = 0.415 mW/g**
Maximum value of SAR (measured) = 0.649 mW/g




0 dB = 0.649mW/g

Date: 2010/4/6

## LE_Cheek_CH384_Slider on

**DUT: RP8-J01;**

Communication System: CDMA_Cellular; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used: f = 837 MHz; $\sigma$ = 0.88 mho/m; $\varepsilon_r$ = 40.4; $\rho$ = 1000 kg/$m^3$
Phantom section: Left Section

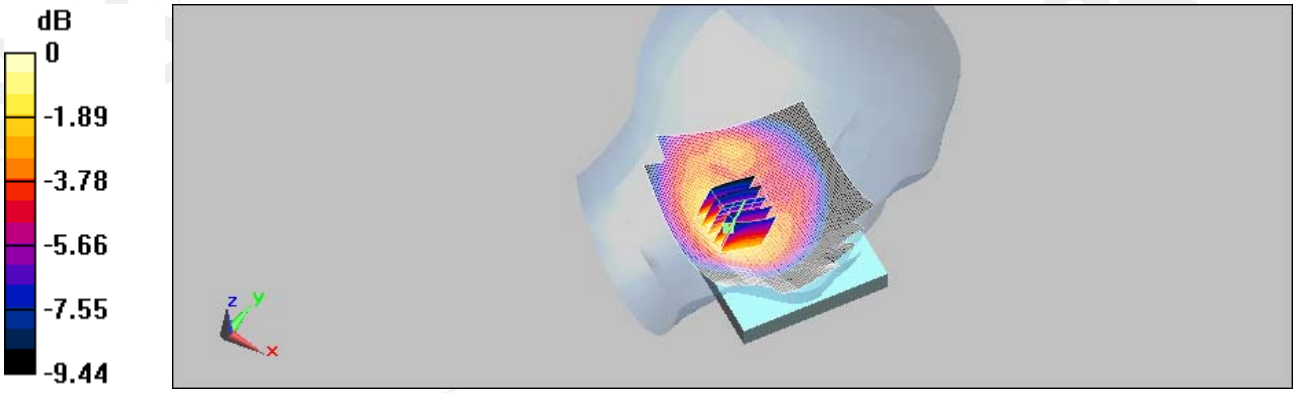
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**LE Cheek/Area Scan (81x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.295 mW/g

**LE Cheek/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.6 V/m; Power Drift = -0.037 dB
Peak SAR (extrapolated) = 0.435 W/kg

**SAR(1 g) = 0.282 mW/g; SAR(10 g) = 0.187 mW/g**
Maximum value of SAR (measured) = 0.305 mW/g




0 dB = 0.305mW/g

Date: 2010/4/6

## LE_Cheek_CH777_Slider on

**DUT: RP8-J01;**

Communication System: CDMA_Cellular; Frequency: 848.31 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used (interpolated): f = 848.31 MHz; $\sigma$ = 0.893 mho/m; $\varepsilon_r$ = 40.2; $\rho$ = 1000 kg/m$^3$
Phantom section: Left Section

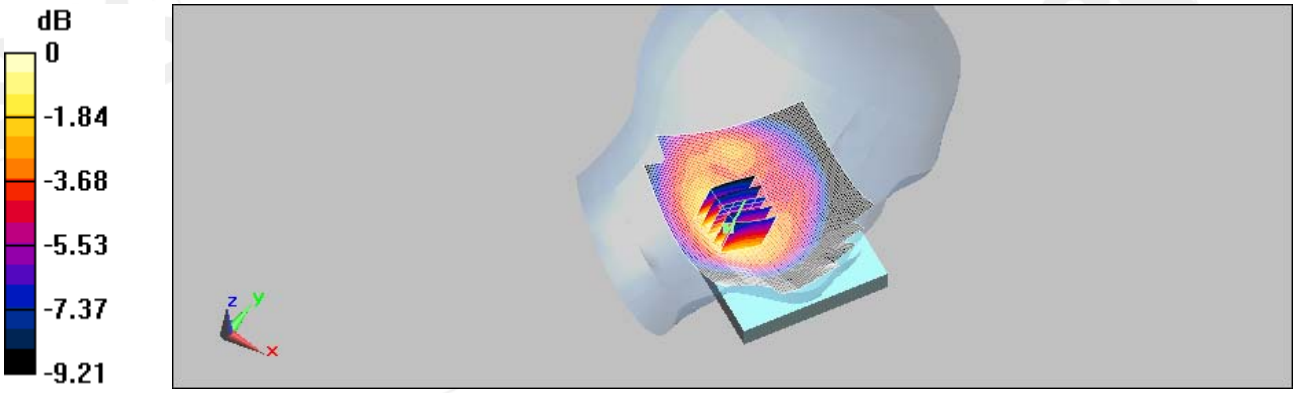
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**LE Cheek/Area Scan (81x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.588 mW/g

**LE Cheek/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.8 V/m; Power Drift = 0.145 dB
Peak SAR (extrapolated) = 0.520 W/kg

**SAR(1 g) = 0.359 mW/g; SAR(10 g) = 0.244 mW/g**
Maximum value of SAR (measured) = 0.386 mW/g




0 dB = 0.386mW/g

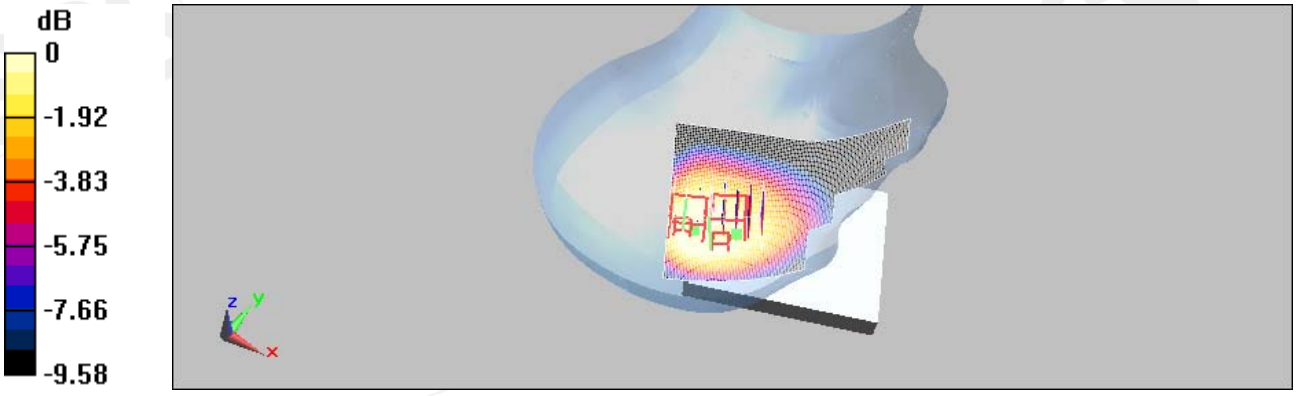
Date: 2010/4/6

## RE_Tilt_CH1013_Slider on

**DUT: RP8-J01;**
Communication System: CDMA_Cellular; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used: f = 825 MHz; $\sigma$ = 0.869 mho/m; $\varepsilon_r$ = 40.6; $\rho$ = 1000 kg/m$^3$
Phantom section: Right Section

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**RE Tilt/Area Scan (81x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.904 mW/g
**RE Tilt/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.8 V/m; Power Drift = 0.010 dB
Peak SAR (extrapolated) = 1.48 W/kg
**SAR(1 g) = 0.875 mW/g; SAR(10 g) = 0.558 mW/g**
Maximum value of SAR (measured) = 0.956 mW/g
**RE Tilt/Zoom Scan (7x7x7) (5x5x7)/Cube 1:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.8 V/m; Power Drift = 0.010 dB
Peak SAR (extrapolated) = 1.22 W/kg
**SAR(1 g) = 0.739 mW/g; SAR(10 g) = 0.507 mW/g**
Maximum value of SAR (measured) = 0.799 mW/g




0 dB = 0.799mW/g

Date: 2010/4/6

## RE_Tilt_CH384_Slider on

**DUT: RP8-J01;**

Communication System: CDMA_Cellular; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used: f = 837 MHz; $\sigma$ = 0.88 mho/m; $\varepsilon_r$ = 40.4; $\rho$ = 1000 kg/$m^3$
Phantom section: Right Section

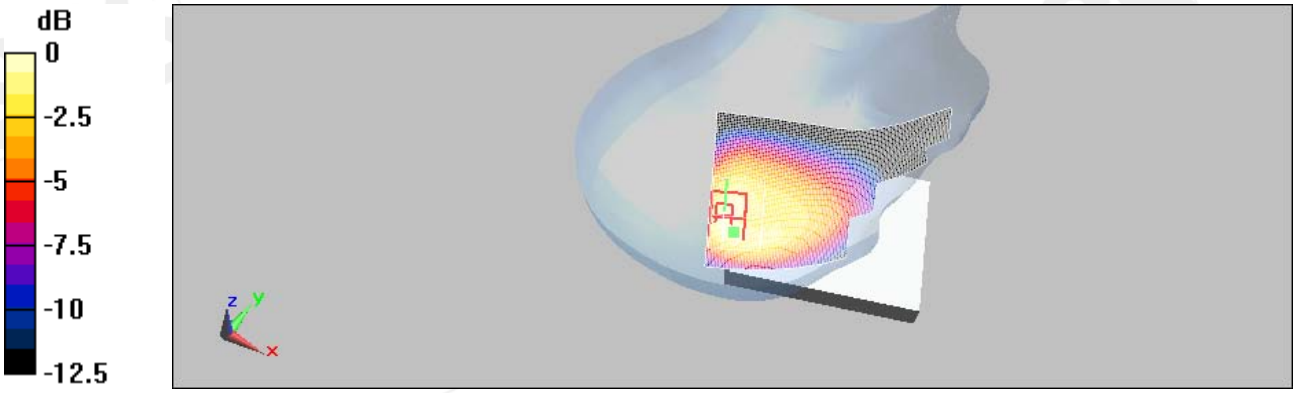
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**RE Tilt/Area Scan (81x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.404 mW/g

**RE Tilt/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.6 V/m; Power Drift = 0.099 dB
Peak SAR (extrapolated) = 0.649 W/kg

**SAR(1 g) = 0.395 mW/g; SAR(10 g) = 0.241 mW/g**
Maximum value of SAR (measured) = 0.433 mW/g




0 dB = 0.433mW/g

Date: 2010/4/6

## RE_Tilt_CH777_Slider on

**DUT: RP8-J01;**

Communication System: CDMA_Cellular; Frequency: 848.31 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used (interpolated): f = 848.31 MHz; $\sigma$ = 0.893 mho/m; $\varepsilon_r$ = 40.2; $\rho$ = 1000 kg/$m^3$
Phantom section: Right Section

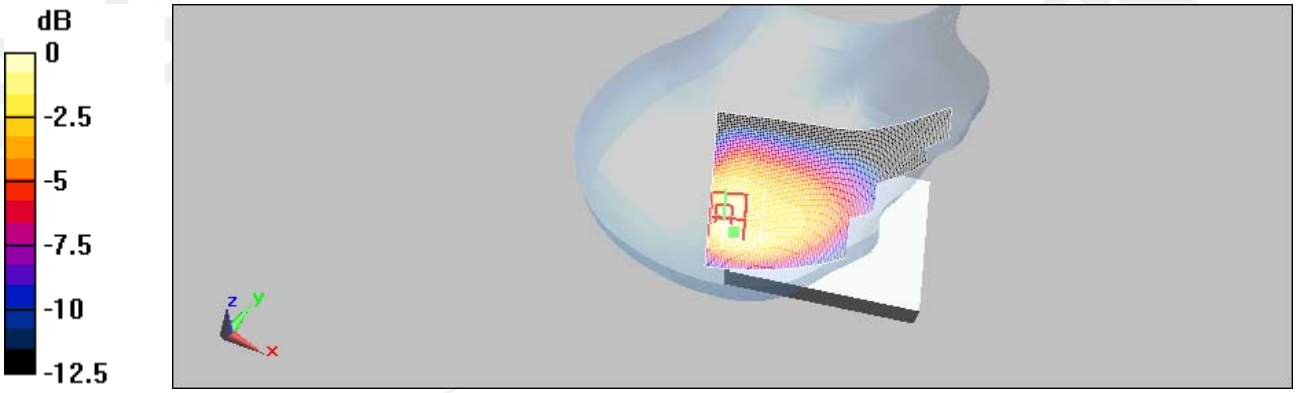
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**RE Tilt/Area Scan (81x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.505 mW/g

**RE Tilt/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.1 V/m; Power Drift = 0.079 dB
Peak SAR (extrapolated) = 0.820 W/kg

**SAR(1 g) = 0.499 mW/g; SAR(10 g) = 0.301 mW/g**
Maximum value of SAR (measured) = 0.553 mW/g




0 dB = 0.553mW/g

Date: 2010/4/6

## LE_Tilt_CH1013_Slider on

**DUT: RP8-J01;**

Communication System: CDMA_Cellular; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used: f = 825 MHz; $\sigma$ = 0.869 mho/m; $\varepsilon_r$ = 40.6; $\rho$ = 1000 kg/$m^3$
Phantom section: Left Section

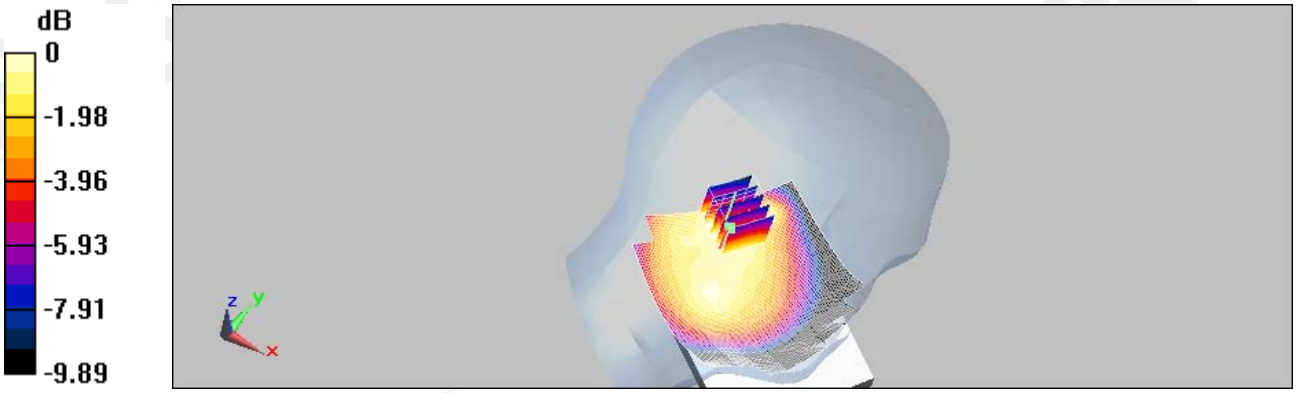
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**LE Tilt/Area Scan (81x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.444 mW/g

**LE Tilt/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.9 V/m; Power Drift = -0.110 dB
Peak SAR (extrapolated) = 0.622 W/kg

**SAR(1 g) = 0.427 mW/g; SAR(10 g) = 0.296 mW/g**
Maximum value of SAR (measured) = 0.443 mW/g




0 dB = 0.443mW/g

Date: 2010/4/6

## LE_Tilt_CH384_Slider on

**DUT: RP8-J01;**

Communication System: CDMA_Cellular; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used: f = 837 MHz; $\sigma$ = 0.88 mho/m; $\varepsilon_r$ = 40.4; $\rho$ = 1000 kg/$m^3$
Phantom section: Left Section

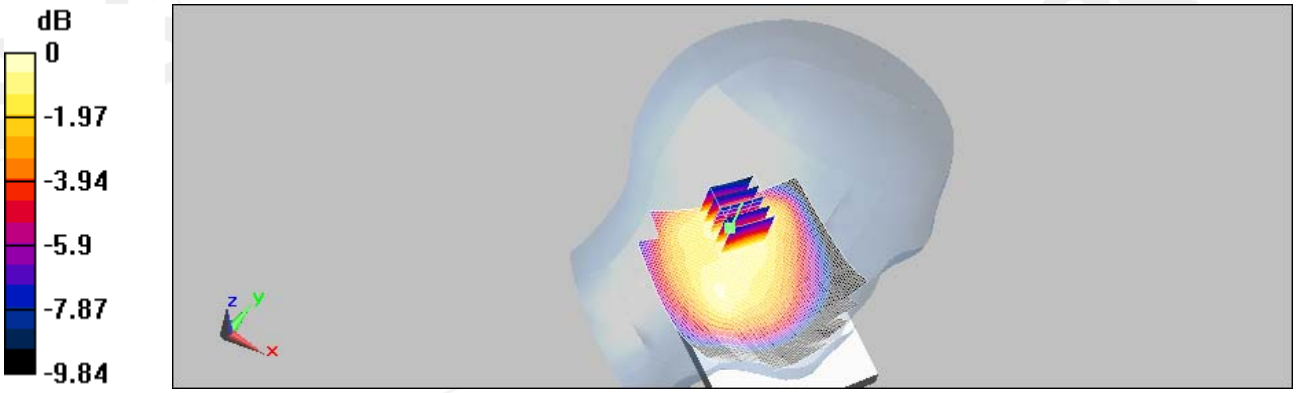
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**LE Tilt/Area Scan (81x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.193 mW/g

**LE Tilt/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.9 V/m; Power Drift = 0.083 dB
Peak SAR (extrapolated) = 0.271 W/kg

**SAR(1 g) = 0.181 mW/g; SAR(10 g) = 0.125 mW/g**
Maximum value of SAR (measured) = 0.194 mW/g




0 dB = 0.194mW/g

Date: 2010/4/6

## LE_Tilt_CH777_Slider on

**DUT: RP8-J01;**

Communication System: CDMA_Cellular; Frequency: 848.31 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used (interpolated): f = 848.31 MHz; $\sigma$ = 0.893 mho/m; $\varepsilon_r$ = 40.2; $\rho$ = 1000 kg/m$^3$
Phantom section: Left Section

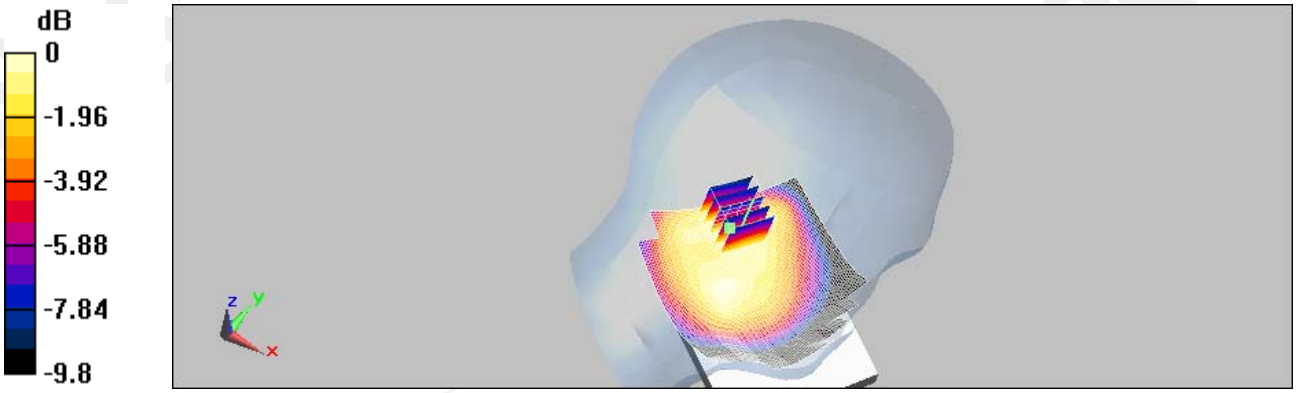
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**LE Tilt/Area Scan (81x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.249 mW/g

**LE Tilt/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.1 V/m; Power Drift = -0.177 dB
Peak SAR (extrapolated) = 0.331 W/kg

**SAR(1 g) = 0.226 mW/g; SAR(10 g) = 0.154 mW/g**
Maximum value of SAR (measured) = 0.239 mW/g




0 dB = 0.239mW/g

Date: 2010/4/8

## BODY_CH1013

**DUT: RP8-J01;**

Communication System: CDMA_Cellular; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium: Body 900 Medium parameters used: f = 825 MHz; $\sigma$ = 0.99 mho/m; $\varepsilon_r$ = 54.1; $\rho$ = 1000 kg/$m^3$
Phantom section: Flat Section

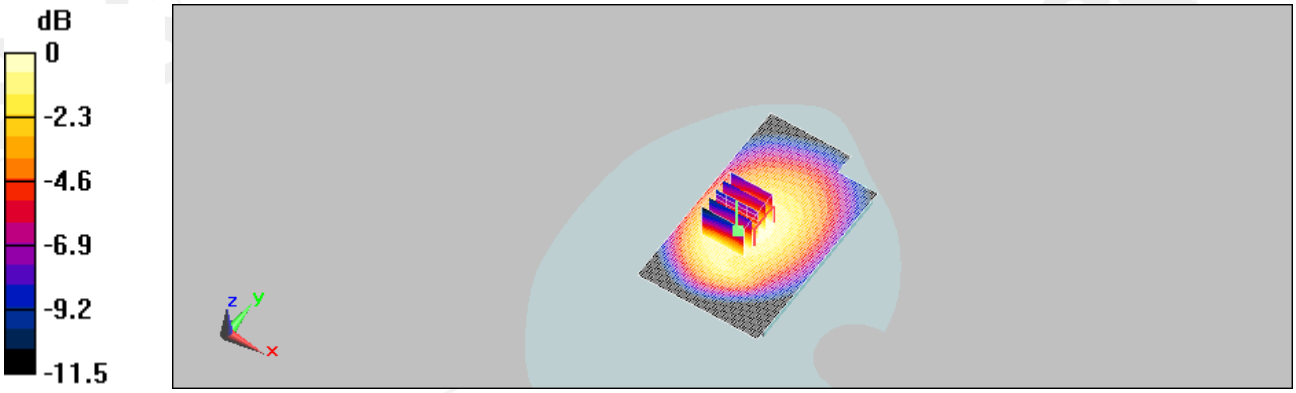
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.81, 5.81, 5.81); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**Body/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.692 mW/g

**Body/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.8 V/m; Power Drift = 0.016 dB
Peak SAR (extrapolated) = 0.896 W/kg

**SAR(1 g) = 0.656 mW/g; SAR(10 g) = 0.474 mW/g**
Maximum value of SAR (measured) = 0.696 mW/g




0 dB = 0.696mW/g

Date: 2010/4/8

## BODY_CH384

**DUT: RP8-J01;**

Communication System: CDMA_Cellular; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: Body 900 Medium parameters used: f = 837 MHz; $\sigma$ = 1 mho/m; $\varepsilon_r$ = 54; $\rho$ = 1000 kg/$m^3$
Phantom section: Flat Section

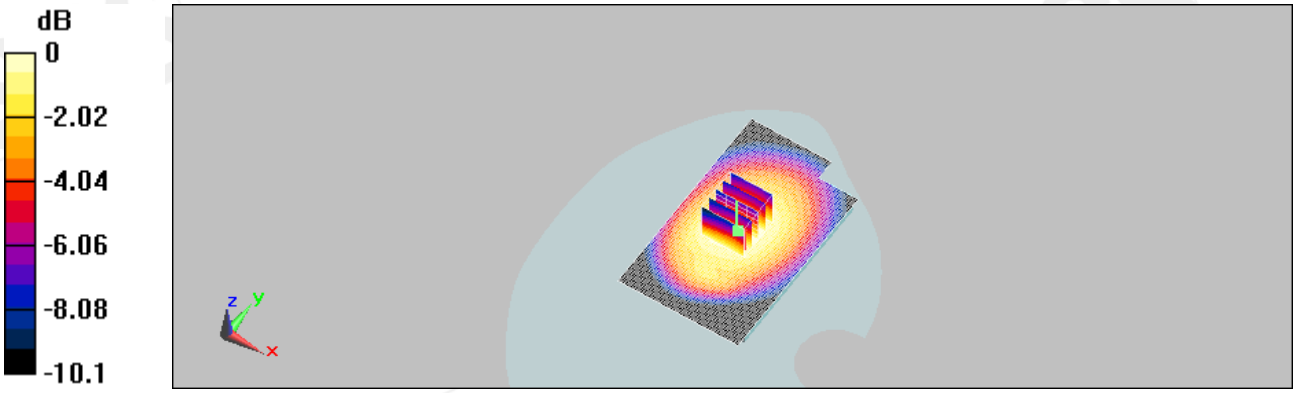
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.81, 5.81, 5.81); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**Body/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.332 mW/g

**Body/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.5 V/m; Power Drift = 0.085 dB
Peak SAR (extrapolated) = 0.425 W/kg

**SAR(1 g) = 0.323 mW/g; SAR(10 g) = 0.238 mW/g**
Maximum value of SAR (measured) = 0.341 mW/g




0 dB = 0.341mW/g

Date: 2010/4/8

## BODY_CH777

**DUT: RP8-J01;**

Communication System: CDMA_Cellular; Frequency: 848.31 MHz;Duty Cycle: 1:1
Medium: Body 900 Medium parameters used (interpolated): f = 848.31 MHz; $\sigma$ = 1.01 mho/m; $\varepsilon_r$ = 53.9; $\rho$ = 1000 kg/$m^3$
Phantom section: Flat Section

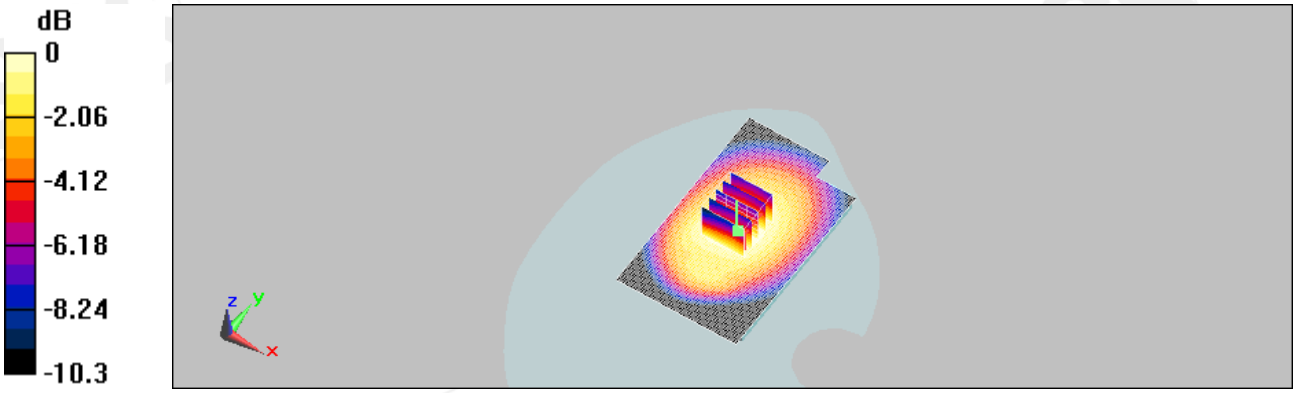
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.81, 5.81, 5.81); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**Body/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.397 mW/g

**Body/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.1 V/m; Power Drift = 0.072 dB
Peak SAR (extrapolated) = 0.498 W/kg

**SAR(1 g) = 0.372 mW/g; SAR(10 g) = 0.272 mW/g**
Maximum value of SAR (measured) = 0.391 mW/g




0 dB = 0.391mW/g

Date: 2010/4/8

## BODY_CH1013_repeated for EUT front to phantom

**DUT: RP8-J01;**

Communication System: CDMA_Cellular; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium: Body 900 Medium parameters used: f = 825 MHz; $\sigma$ = 0.99 mho/m; $\varepsilon_r$ = 54.1; $\rho$ = 1000 kg/$m^3$
Phantom section: Flat Section

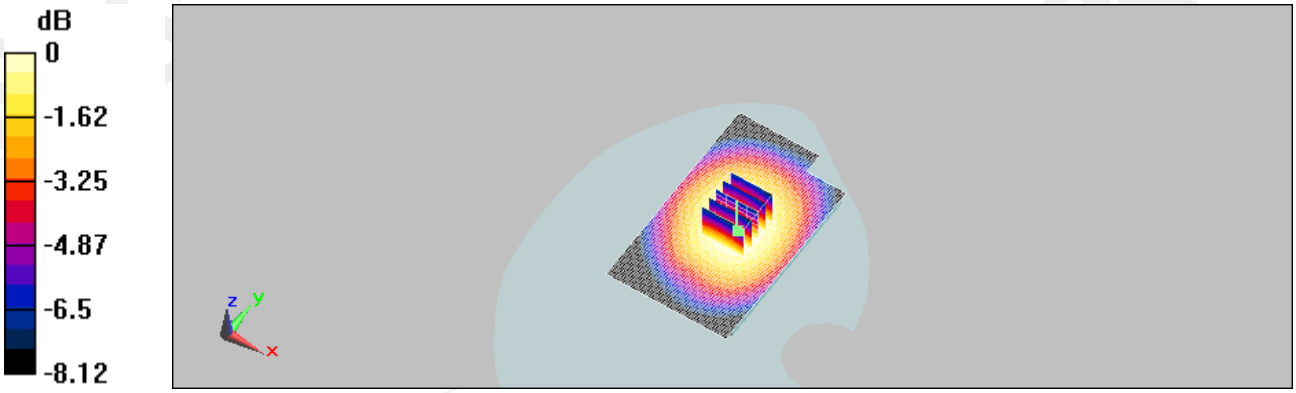
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.81, 5.81, 5.81); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**Body/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.333 mW/g

**Body/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.1 V/m; Power Drift = 0.031 dB
Peak SAR (extrapolated) = 0.398 W/kg

**SAR(1 g) = 0.311 mW/g; SAR(10 g) = 0.237 mW/g**
Maximum value of SAR (measured) = 0.326 mW/g




0 dB = 0.326mW/g

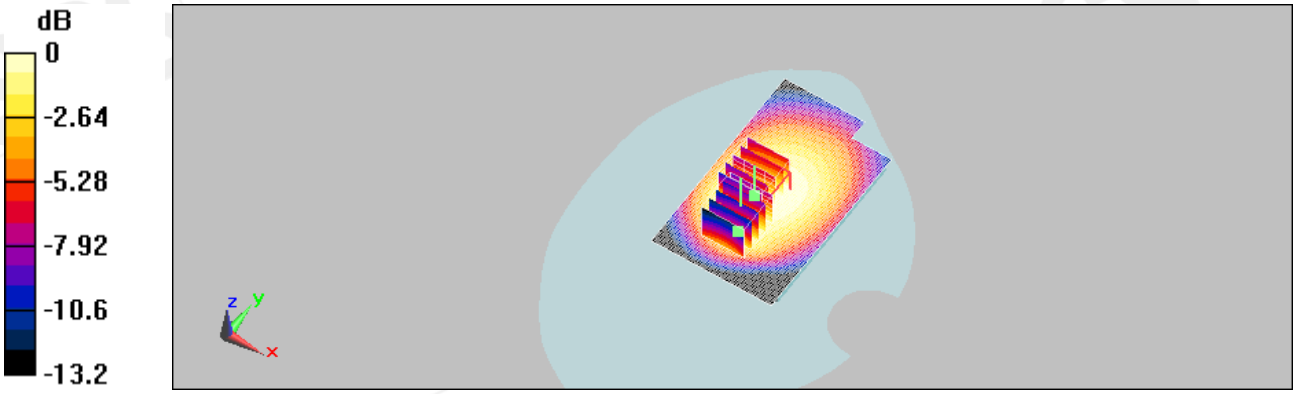
Date: 2010/4/8

## BODY_CH1013_repeated with Memory card

**DUT: RP8-J01;**
Communication System: CDMA_Cellular; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium: Body 900 Medium parameters used: f = 825 MHz; $\sigma$ = 0.99 mho/m; $\varepsilon_r$ = 54.1; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section

- Probe: ES3DV3 - SN3172; ConvF(5.81, 5.81, 5.81); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**Body/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.710 mW/g
**Body/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.4 V/m; Power Drift = 0.033 dB
Peak SAR (extrapolated) = 0.881 W/kg
**SAR(1 g) = 0.646 mW/g; SAR(10 g) = 0.465 mW/g**
Maximum value of SAR (measured) = 0.685 mW/g
**Body/Zoom Scan (7x7x7) (5x5x7)/Cube 1:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.4 V/m; Power Drift = 0.033 dB
Peak SAR (extrapolated) = 1.29 W/kg
**SAR(1 g) = 0.549 mW/g; SAR(10 g) = 0.303 mW/g**
Maximum value of SAR (measured) = 0.633 mW/g




0 dB = 0.633mW/g

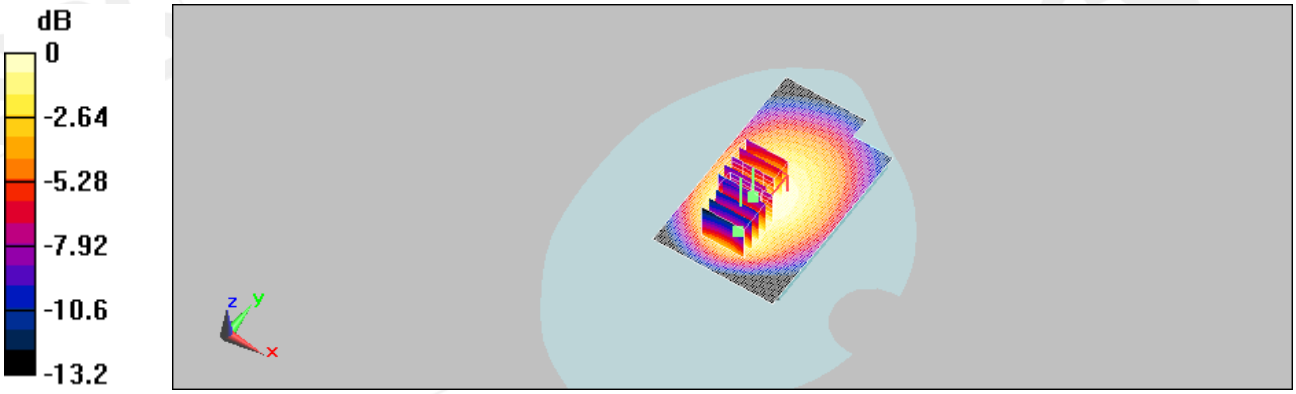
Date: 2010/4/8

## BODY_CH1013_repeated with headset

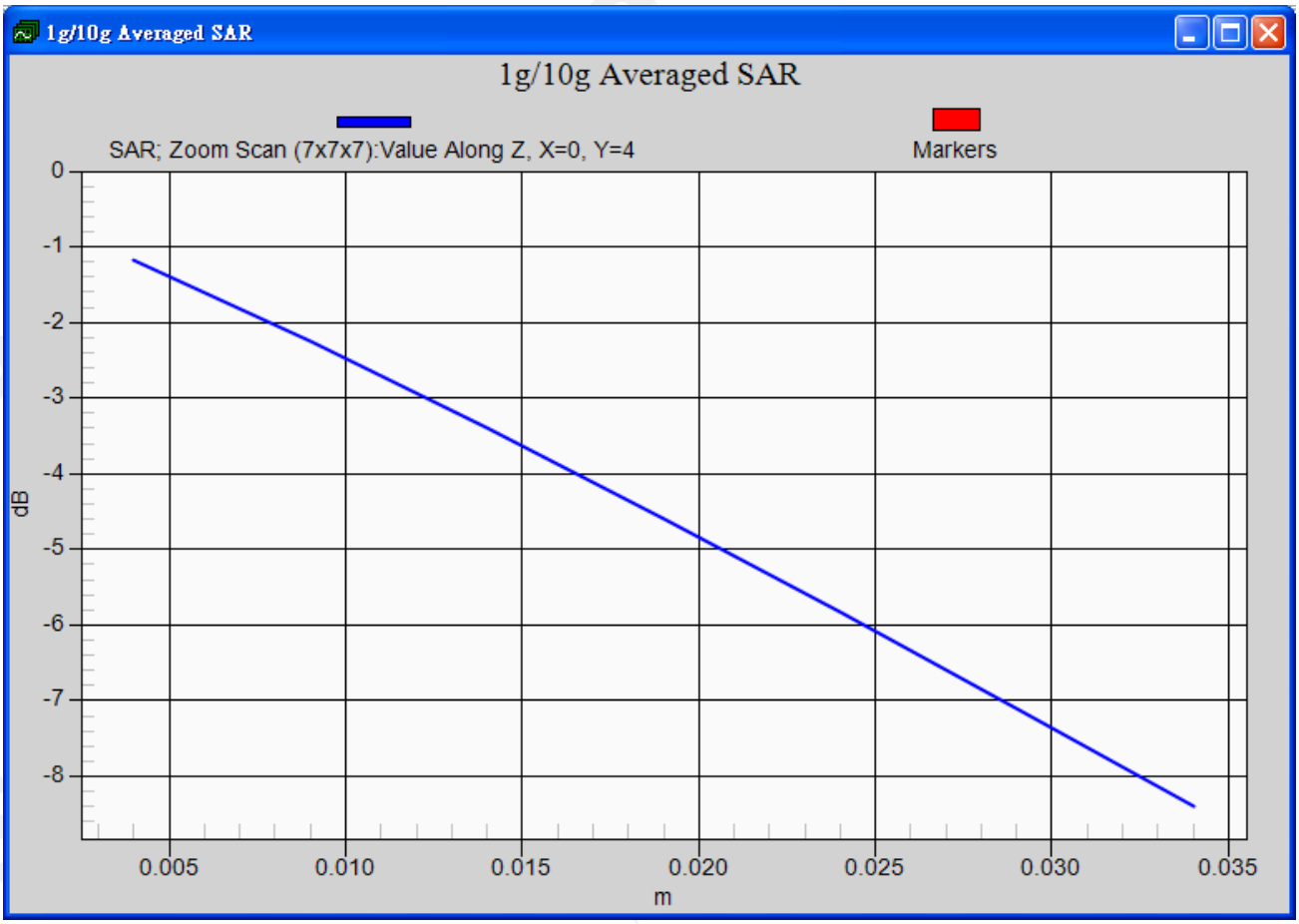
**DUT: RP8-J01;**
Communication System: CDMA_Cellular; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium: Body 900 Medium parameters used: f = 825 MHz; $\sigma$ = 0.99 mho/m; $\varepsilon_r$ = 54.1; $\rho$ = 1000 kg/$m^3$
Phantom section: Flat Section

- Probe: ES3DV3 - SN3172; ConvF(5.81, 5.81, 5.81); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**Body/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.704 mW/g
**Body/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.4 V/m; Power Drift = -0.072 dB
Peak SAR (extrapolated) = 0.920 W/kg
**SAR(1 g) = 0.658 mW/g; SAR(10 g) = 0.477 mW/g**
Maximum value of SAR (measured) = 0.687 mW/g
**Body/Zoom Scan (7x7x7) (5x5x7)/Cube 1:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.4 V/m; Power Drift = -0.072 dB
Peak SAR (extrapolated) = 0.871 W/kg
**SAR(1 g) = 0.568 mW/g; SAR(10 g) = 0.359 mW/g**
Maximum value of SAR (measured) = 0.645 mW/g




0 dB = 0.645mW/g



Date: 2010/4/8

## BODY_WLAN802.11 b_CH1

**DUT: RP8-J01;**

Communication System: Wireless LAN; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: Body 2450 Medium parameters used: f = 2412 MHz; $\sigma$ = 2.03 mho/m; $\varepsilon_r$ = 52.1; $\rho$ = 1000 kg/$m^3$
Phantom section: Flat Section

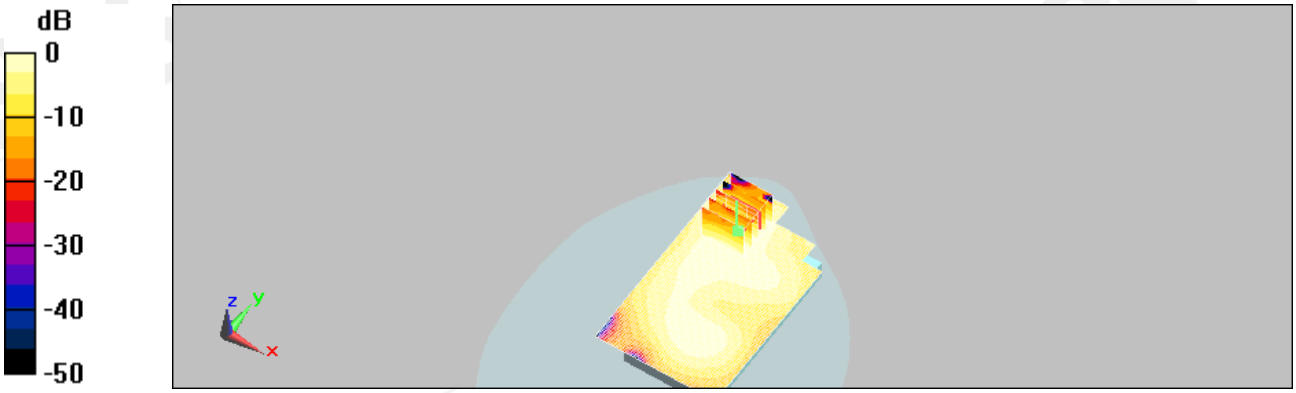
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.02, 4.02, 4.02); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**Body/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.028 mW/g

**Body/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.72 V/m; Power Drift = 0.188 dB
Peak SAR (extrapolated) = 0.048 W/kg

**SAR(1 g) = 0.025 mW/g; SAR(10 g) = 0.014 mW/g**
Maximum value of SAR (measured) = 0.028 mW/g




0 dB = 0.028mW/g

Date: 2010/4/8

## BODY_WLAN802.11 b_CH6

**DUT: RP8-J01;**

Communication System: Wireless LAN; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: Body 2450 Medium parameters used: f = 2437 MHz; $\sigma$ = 2.05 mho/m; $\varepsilon_r$ = 52.3; $\rho$ = 1000 kg/$m^3$
Phantom section: Flat Section

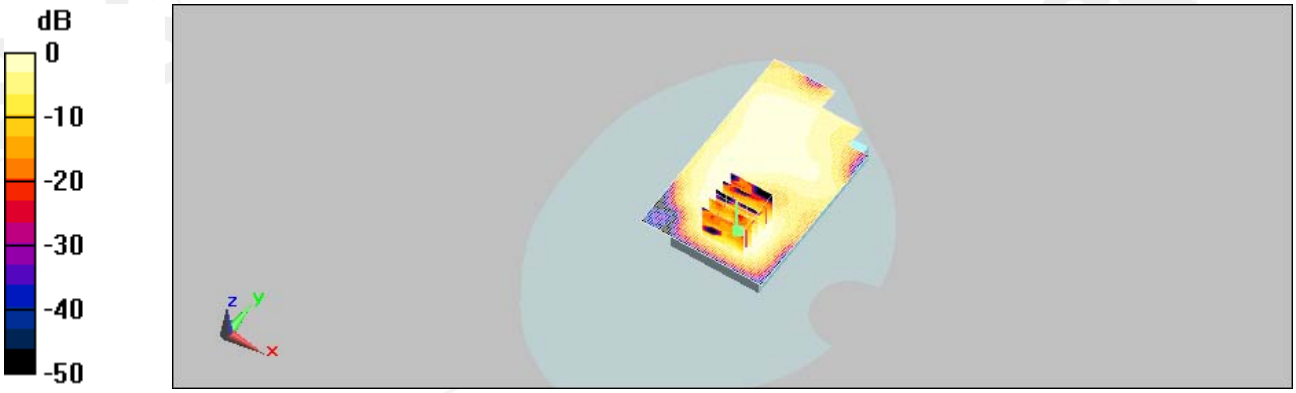
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.02, 4.02, 4.02); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**Body/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.018 mW/g

**Body/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.6 V/m; Power Drift = 0.105 dB
Peak SAR (extrapolated) = 0.024 W/kg

**SAR(1 g) = 0.015 mW/g; SAR(10 g) = 0.00771 mW/g**
Maximum value of SAR (measured) = 0.016 mW/g




0 dB = 0.016mW/g

Date/Time: 2010/4/8

## BODY_WLAN802.11 b_CH11

**DUT: RP8-J01;**

Communication System: Wireless LAN; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium: Body 2450 Medium parameters used: f = 2462 MHz; $\sigma$ = 2.08 mho/m; $\varepsilon_r$ = 52.1; $\rho$ = 1000 kg/$m^3$
Phantom section: Flat Section

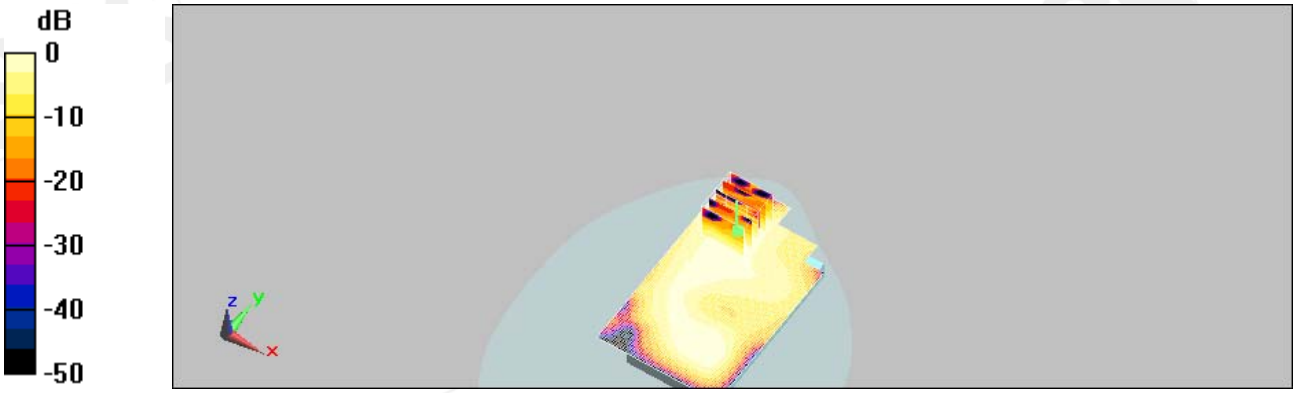
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.02, 4.02, 4.02); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**Body/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.021 mW/g

**Body/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.4 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 0.032 W/kg

**SAR(1 g) = 0.018 mW/g; SAR(10 g) = 0.00916 mW/g**
Maximum value of SAR (measured) = 0.021 mW/g




0 dB = 0.021mW/g

Date: 2010/4/8

## BODY_WLAN802.11b_CH1_repeated for EUT front to phantom

**DUT: RP8-J01;**

Communication System: Wireless LAN; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: Body 2450 Medium parameters used: f = 2412 MHz; $\sigma$ = 2.03 mho/m; $\varepsilon_r$ = 52.1; $\rho$ = 1000 kg/$m^3$
Phantom section: Flat Section

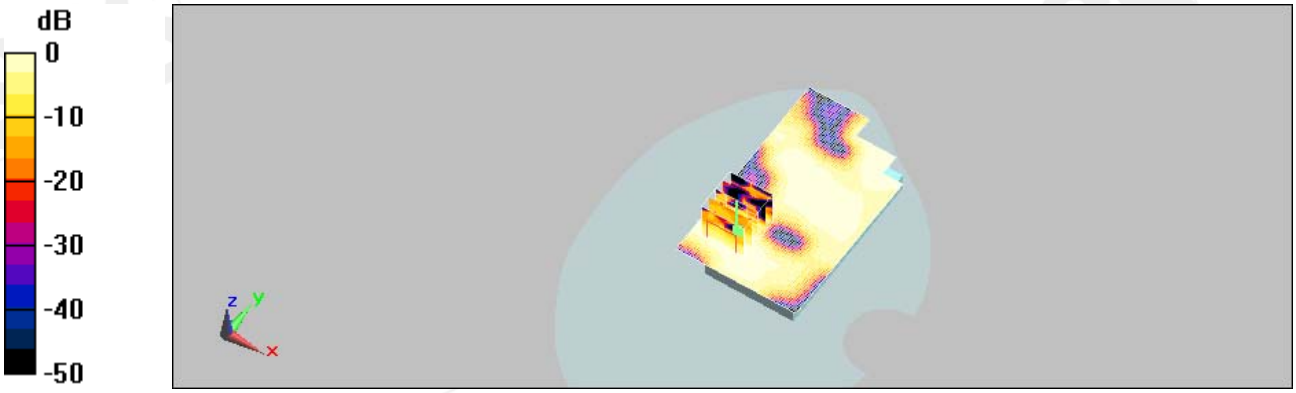
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.02, 4.02, 4.02); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**Body/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.011 mW/g

**Body/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.56 V/m; Power Drift = -0.140 dB
Peak SAR (extrapolated) = 0.011 W/kg

**SAR(1 g) = 0.00692 mW/g; SAR(10 g) = 0.00345 mW/g**
Maximum value of SAR (measured) = 0.00771 mW/g




0 dB = 0.00771mW/g

Date: 2010/4/8

## BODY_WLAN802.11b_CH1_repeated with Memory card

**DUT: RP8-J01;**

Communication System: Wireless LAN; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: Body 2450 Medium parameters used: f = 2412 MHz; $\sigma$ = 2.03 mho/m; $\varepsilon_r$ = 52.1; $\rho$ = 1000 kg/$m^3$
Phantom section: Flat Section

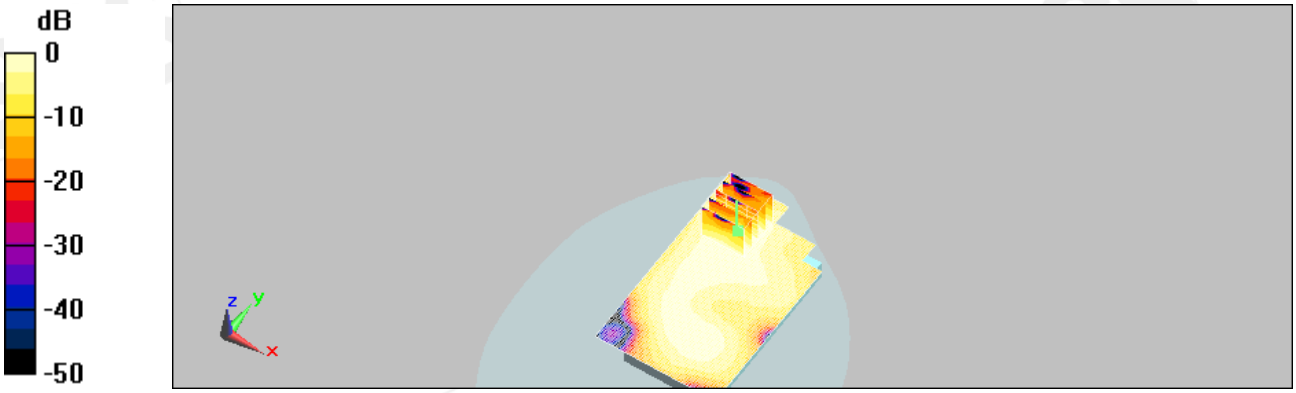
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.02, 4.02, 4.02); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**Body/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.027 mW/g

**Body/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.95 V/m; Power Drift = 0.118 dB
Peak SAR (extrapolated) = 0.046 W/kg

**SAR(1 g) = 0.024 mW/g; SAR(10 g) = 0.013 mW/g**
Maximum value of SAR (measured) = 0.027 mW/g




0 dB = 0.027mW/g

Date: 2010/4/8

## BODY_WLAN802.11b_CH1_repeated with Bluetooth active

**DUT: RP8-J01;**

Communication System: Wireless LAN; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: Body 2450 Medium parameters used: f = 2412 MHz; $\sigma$ = 2.03 mho/m; $\varepsilon_r$ = 52.1; $\rho$ = 1000 kg/$m^3$
Phantom section: Flat Section

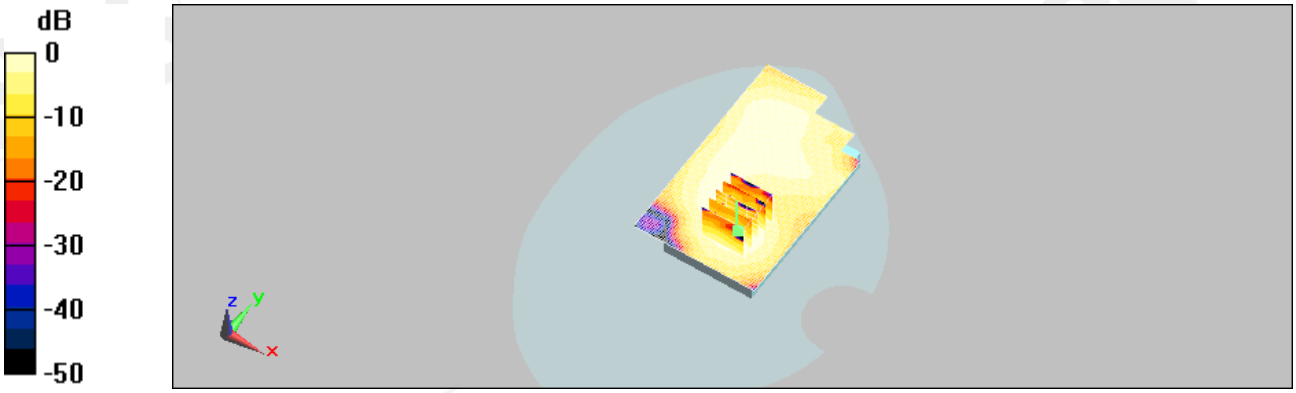
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.02, 4.02, 4.02); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**Body/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.026 mW/g

**Body/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.93 V/m; Power Drift = 0.143 dB
Peak SAR (extrapolated) = 0.039 W/kg

**SAR(1 g) = 0.022 mW/g; SAR(10 g) = 0.012 mW/g**
Maximum value of SAR (measured) = 0.024 mW/g




0 dB = 0.024mW/g

Date/Time: 2010/4/8

## BODY_WLAN802.11b_CH1_repeated with headset

**DUT: RP8-J01;**

Communication System: Wireless LAN; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: Body 2450 Medium parameters used: f = 2412 MHz; $\sigma$ = 2.03 mho/m; $\varepsilon_r$ = 52.1; $\rho$ = 1000 kg/$m^3$
Phantom section: Flat Section

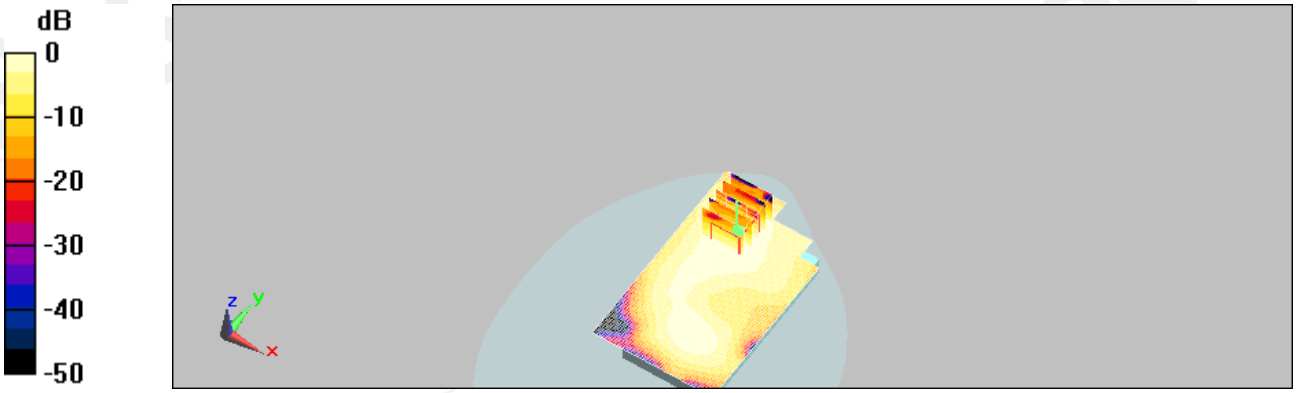
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.02, 4.02, 4.02); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**Body/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.028 mW/g

**Body/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.6 V/m; Power Drift = 0.192 dB
Peak SAR (extrapolated) = 0.045 W/kg

**SAR(1 g) = 0.024 mW/g; SAR(10 g) = 0.014 mW/g**
Maximum value of SAR (measured) = 0.027 mW/g




0 dB = 0.027mW/g

Date: 2010/4/8

## BODY_WLAN802.11g_CH1

**DUT: RP8-J01;**

Communication System: Wireless LAN; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: Body 2450 Medium parameters used: f = 2412 MHz; $\sigma$ = 2.03 mho/m; $\varepsilon_r$ = 52.1; $\rho$ = 1000 kg/$m^3$
Phantom section: Flat Section

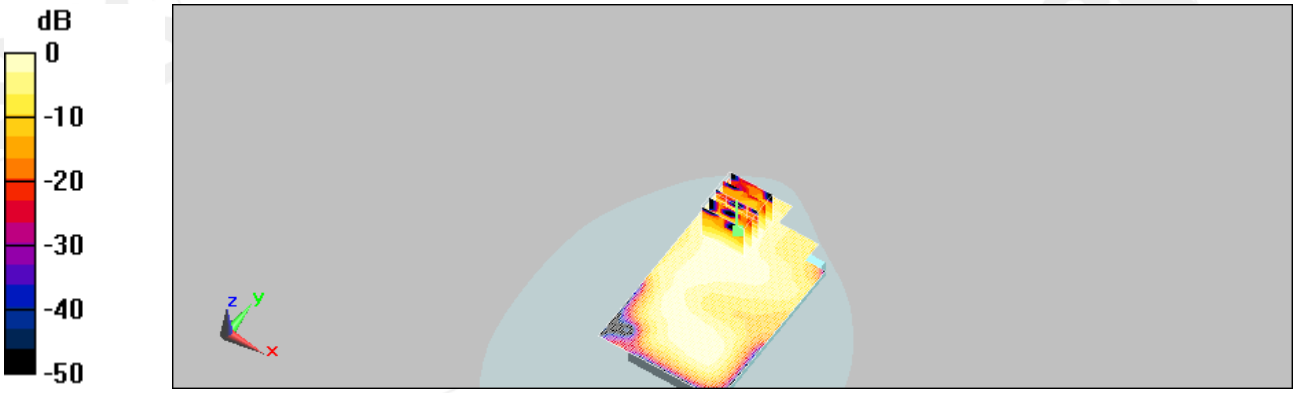
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.02, 4.02, 4.02); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**Body/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.017 mW/g

**Body/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.61 V/m; Power Drift = -0.121 dB
Peak SAR (extrapolated) = 0.029 W/kg

**SAR(1 g) = 0.016 mW/g; SAR(10 g) = 0.00838 mW/g**
Maximum value of SAR (measured) = 0.018 mW/g




0 dB = 0.018mW/g

Date: 2010/4/8

## BODY_WLAN802.11g_CH6

**DUT: RP8-J01;**

Communication System: Wireless LAN; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: Body 2450 Medium parameters used: f = 2437 MHz; $\sigma$ = 2.05 mho/m; $\varepsilon_r$ = 52.3; $\rho$ = 1000 kg/$m^3$
Phantom section: Flat Section

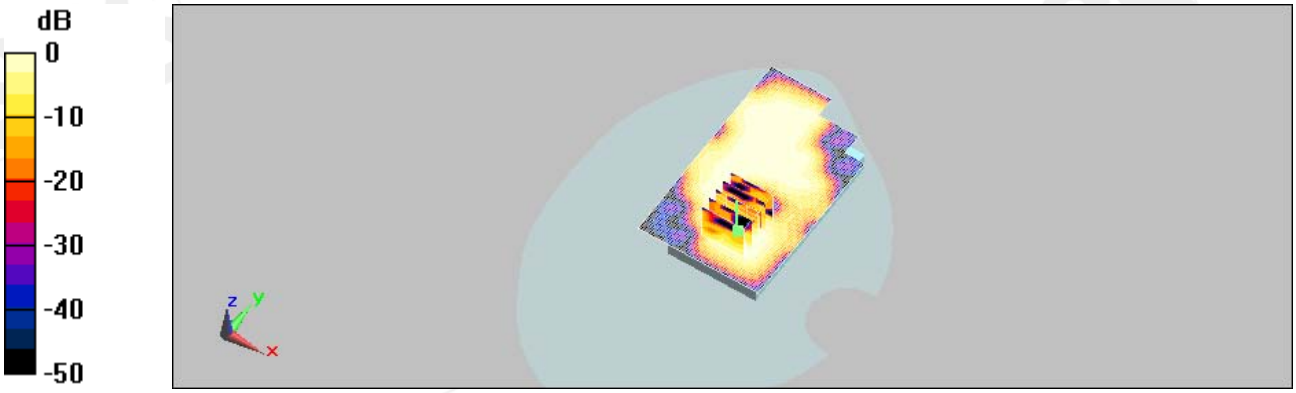
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.02, 4.02, 4.02); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**Body/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.012 mW/g

**Body/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.12 V/m; Power Drift = 0.155 dB
Peak SAR (extrapolated) = 0.015 W/kg

**SAR(1 g) = 0.00866 mW/g; SAR(10 g) = 0.00404 mW/g**
Maximum value of SAR (measured) = 0.00994 mW/g




0 dB = 0.00994mW/g

Date: 2010/4/8

## BODY_WLAN802.11g_CH11

**DUT: RP8-J01;**

Communication System: Wireless LAN; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium: Body 2450 Medium parameters used: f = 2462 MHz; $\sigma$ = 2.08 mho/m; $\varepsilon_r$ = 52.1; $\rho$ = 1000 kg/$m^3$
Phantom section: Flat Section

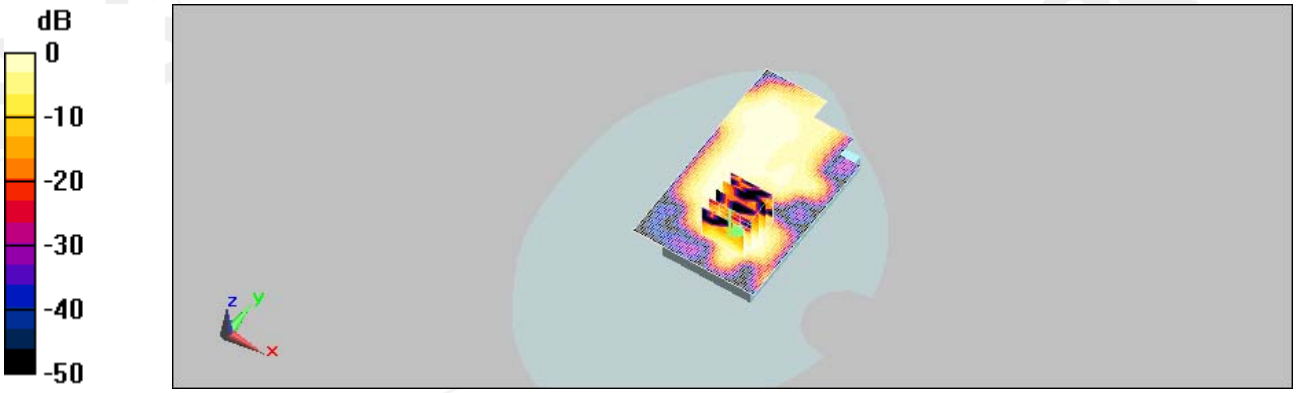
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.02, 4.02, 4.02); Calibrated: 2009/5/27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**Body/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.021 mW/g

**Body/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0.933 V/m; Power Drift = 0.076dB
Peak SAR (extrapolated) = 0.016 W/kg

**SAR(1 g) = 0.00974 mW/g; SAR(10 g) = 0.00445 mW/g**
Maximum value of SAR (measured) = 0.012 mW/g




0 dB = 0.012mW/g

# 5. System Verification

Date: 2010/4/6

**DUT: Dipole 835 MHz;**

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: HSL900 Medium parameters used: f = 835 MHz; $\sigma$ = 0.878 mho/m; $\varepsilon_r$ = 40.4; $\rho$ = 1000 kg/$m^3$
Phantom section: Flat Section

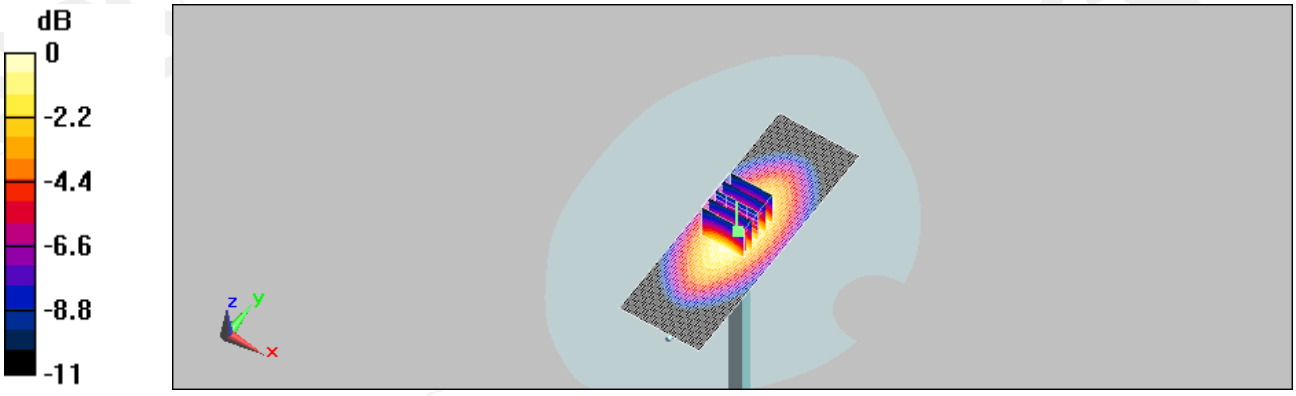
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2009/5/27
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**d=15mm, Pin=250mW, dist=3.4mm :** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.59 mW/g

**d=15mm, Pin=250mW, dist=3.4mm :** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 55.2 V/m; Power Drift = 0.00645 dB
Peak SAR (extrapolated) = 3.47 W/kg

**SAR(1 g) = 2.27 mW/g; SAR(10 g) = 1.47 mW/g**
Maximum value of SAR (measured) = 2.57 mW/g




0 dB = 2.57mW/g

Date: 2010/4/8

**DUT: Dipole 835 MHz;**

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: BODY900 Medium parameters used: f = 835 MHz; $\sigma$ = 1 mho/m; $\varepsilon_r$ = 54; $\rho$ = 1000 kg/$m^3$
Phantom section: Flat Section

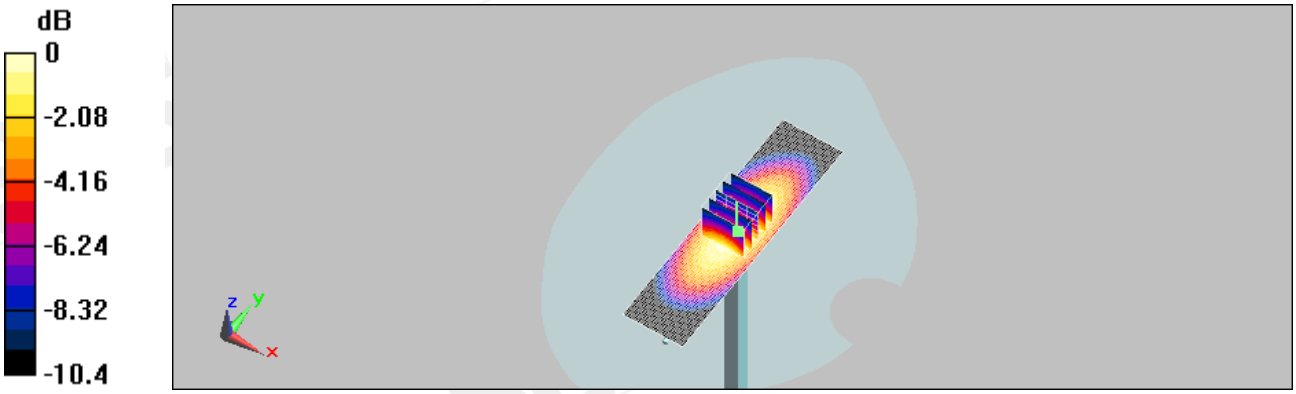
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.81, 5.81, 5.81); Calibrated: 2009/5/27
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**d=15mm, Pin=250mW, dist=3.4mm :** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.81 mW/g

**d=15mm, Pin=250mW, dist=3.4mm :** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 54.7 V/m; Power Drift = -0.052 dB
Peak SAR (extrapolated) = 3.78 W/kg

**SAR(1 g) = 2.53 mW/g; SAR(10 g) = 1.66 mW/g**
Maximum value of SAR (measured) = 2.87 mW/g




0 dB = 2.87mW/g

Date: 2010/4/8

**DUT: Dipole 2450 MHz;**

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: Body2450 Medium parameters used: f = 2450 MHz; $\sigma$ = 2.07 mho/m; $\varepsilon_r$ = 52.2; $\rho$ = 1000 kg/$m^3$
Phantom section: Flat Section

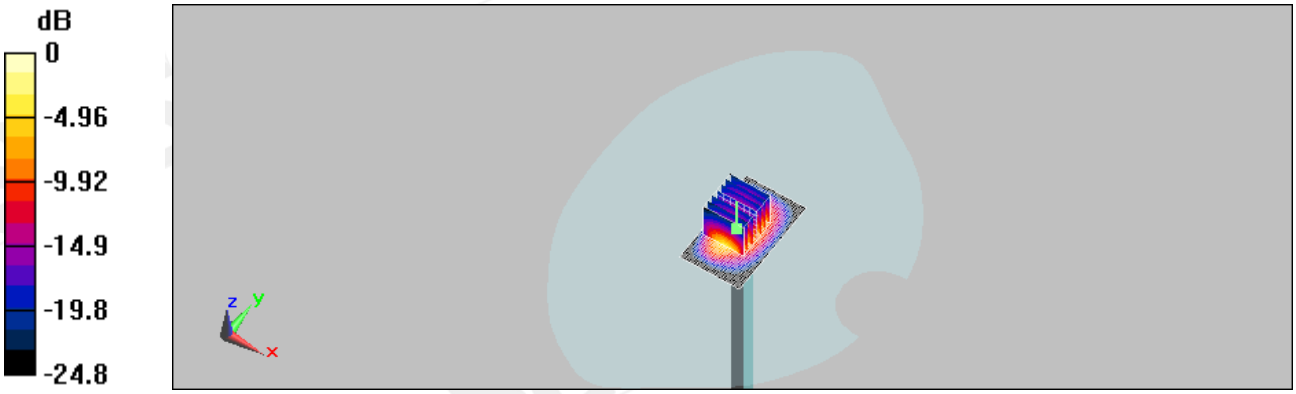
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.02, 4.02, 4.02); Calibrated: 2009/5/27
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2009/5/26
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

**d=10mm, Pin=250mW, dist=3.4mm :** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 19.5 mW/g

**d=10mm, Pin=250mW, dist=3.4mm :** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 94.6 V/m; Power Drift = 0.000251 dB
Peak SAR (extrapolated) = 36.9 W/kg

**SAR(1 g) = 13.6 mW/g; SAR(10 g) = 5.52 mW/g**
Maximum value of SAR (measured) = 17.7 mW/g




0 dB = 17.7mW/g

# 6. DAE & Probe Calibration certificate

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

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Accreditation No.: SCS 108

Client SGS (Auden)

Certificate No: DAE4-856_May09

## CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | DAE4 - SD 000 D04 BJ - SN: 856 |
| Calibration procedure(s) | QA CAL-06.v12<br>Calibration procedure for the data acquisition electronics (DAE) |
| Calibration date: | May 26, 2009 |
| Condition of the calibrated item | In Tolerance |

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date (Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Fluke Process Calibrator Type 702 | SN: 6295803 | 30-Sep-08 (No: 7673) | Sep-09 |
| Keithley Multimeter Type 2001 | SN: 0810278 | 30-Sep-08 (No: 7670) | Sep-09 |
| **Secondary Standards** | **ID #** | **Check Date (in house)** | **Scheduled Check** |
| Calibrator Box V1.1 | SE UMS 006 AB 1004 | 06-Jun-08 (in house check) | In house check: Jun-09 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Dominique Steffen | Technician | |
| Approved by: | Fin Bomholt | R&D Director | |

Issued: May 26, 2009

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Certificate No: DAE4-856_May09 Page 1 of 5

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Accreditation No.: SCS 108

Client SGS (Auden)

Certificate No: ES3-3172_May09

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | ES3DV3 - SN:3172 |
| Calibration procedure(s) | QA CAL-01.v6 and QA CAL-23.v3<br>Calibration procedure for dosimetric E-field probes |
| Calibration date: | May 27, 2009 |
| Condition of the calibrated item | In Tolerance |

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date (Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Power meter E4419B | GB41293874 | 1-Apr-09 (No. 217-01030) | Apr-10 |
| Power sensor E4412A | MY41495277 | 1-Apr-09 (No. 217-01030) | Apr-10 |
| Power sensor E4412A | MY41498087 | 1-Apr-09 (No. 217-01030) | Apr-10 |
| Reference 3 dB Attenuator | SN: S5054 (3c) | 31-Mar-09 (No. 217-01026) | Mar-10 |
| Reference 20 dB Attenuator | SN: S5086 (20b) | 31-Mar-09 (No. 217-01028) | Mar-10 |
| Reference 30 dB Attenuator | SN: S5129 (30b) | 31-Mar-09 (No. 217-01027) | Mar-10 |
| Reference Probe ES3DV2 | SN: 3013 | 2-Jan-09 (No. ES3-3013_Jan09) | Jan-10 |
| DAE4 | SN: 660 | 9-Sep-08 (No. DAE4-660_Sep08) | Sep-09 |

| Secondary Standards | ID # | Check Date (in house) | Scheduled Check |
|---|---|---|---|
| RF generator HP 8648C | US3642U01700 | 4-Aug-99 (in house check Oct-07) | In house check: Oct-09 |
| Network Analyzer HP 8753E | US37390585 | 18-Oct-01 (in house check Oct-08) | In house check: Oct-09 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Jeton Kastrati | Laboratory Technician | |
| Approved by: | Katja Pokovic | Technical Manager | |

Issued: May 27, 2009

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Accreditation No.: SCS 108

**Glossary:**

| | |
|---|---|
| TSL | tissue simulating liquid |
| NORMx,y,z | sensitivity in free space |
| ConvF | sensitivity in TSL / NORMx,y,z |
| DCP | diode compression point |
| Polarization φ | φ rotation around probe axis |
| Polarization ϑ | ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis |

**Calibration is Performed According to the Following Standards:**

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

**Methods Applied and Interpretation of Parameters:**

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the $E^2$-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

# Probe ES3DV3

## SN:3172

| | |
|---|---|
| Manufactured: | January 23, 2008 |
| Last calibrated: | June 23, 2008 |
| Recalibrated: | May 27, 2009 |

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

ES3DV3 SN:3172 May 27, 2009

# DASY - Parameters of Probe: ES3DV3 SN:3172

## Sensitivity in Free Space[A] Diode Compression[B]

| | | | | |
|---|---|---|---|---|
| NormX | **1.41** ± 10.1% | $\mu V/(V/m)^2$ | DCP X | **94** mV |
| NormY | **1.17** ± 10.1% | $\mu V/(V/m)^2$ | DCP Y | **93** mV |
| NormZ | **0.96** ± 10.1% | $\mu V/(V/m)^2$ | DCP Z | **94** mV |

## Sensitivity in Tissue Simulating Liquid (Conversion Factors)

**Please see Page 8.**

## Boundary Effect

**TSL 900 MHz Typical SAR gradient: 5 % per mm**

| Sensor Center to Phantom Surface Distance | | **3.0 mm** | **4.0 mm** |
|---|---|---|---|
| $SAR_{be}$ [%] | Without Correction Algorithm | 9.6 | 5.4 |
| $SAR_{be}$ [%] | With Correction Algorithm | 0.9 | 0.7 |

**TSL 1810 MHz Typical SAR gradient: 10 % per mm**

| Sensor Center to Phantom Surface Distance | | **3.0 mm** | **4.0 mm** |
|---|---|---|---|
| $SAR_{be}$ [%] | Without Correction Algorithm | 9.2 | 5.4 |
| $SAR_{be}$ [%] | With Correction Algorithm | 0.7 | 0.4 |

## 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 $E^2$-field uncertainty inside TSL (see Page 8).

[B] Numerical linearization parameter: uncertainty not required.





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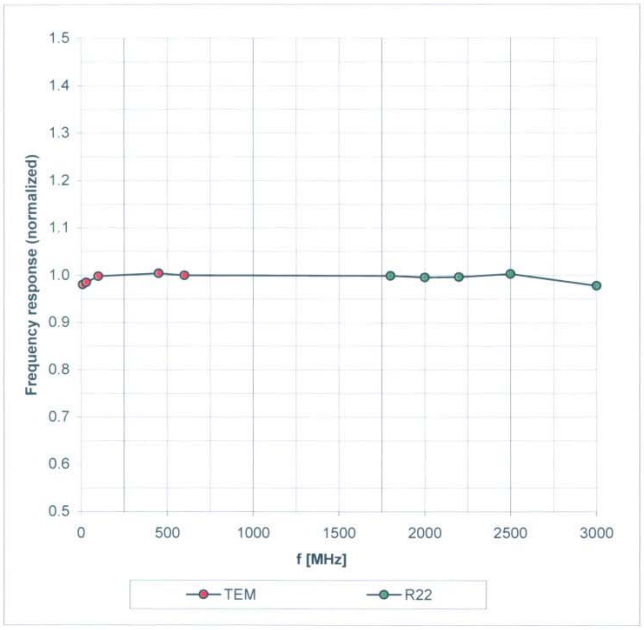
ES3DV3 SN:3172 May 27, 2009

## Frequency Response of E-Field

(TEM-Cell:ifi110 EXX, Waveguide: R22)




Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)





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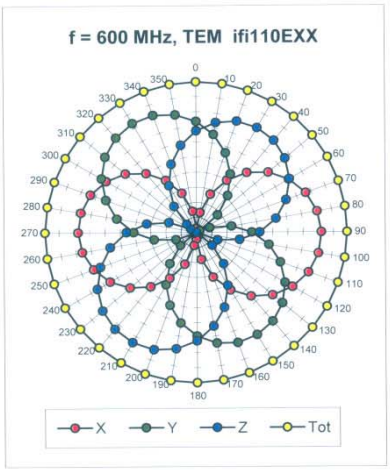
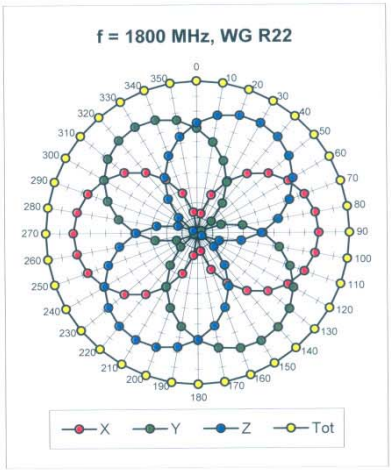
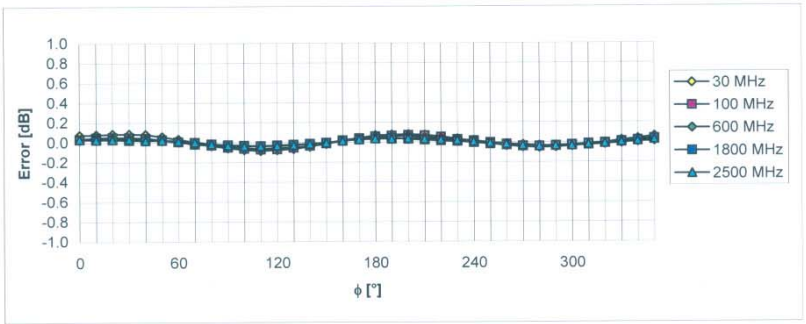
ES3DV3 SN:3172 May 27, 2009

## Receiving Pattern (ϕ), ϑ = 0°




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





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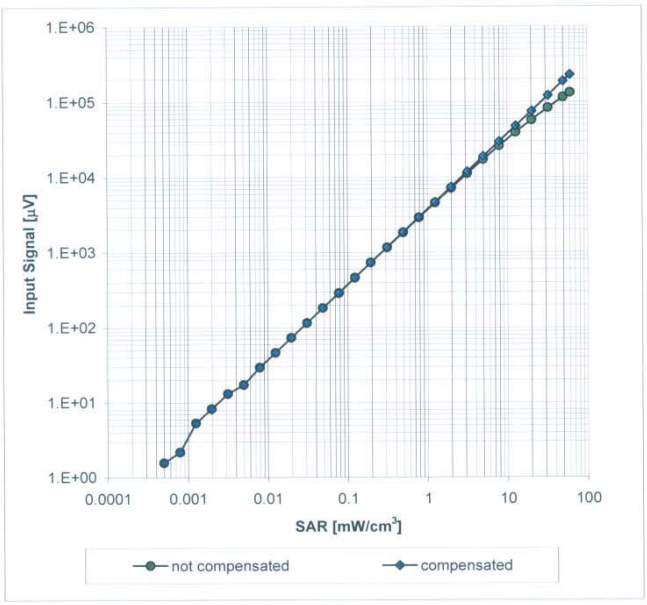
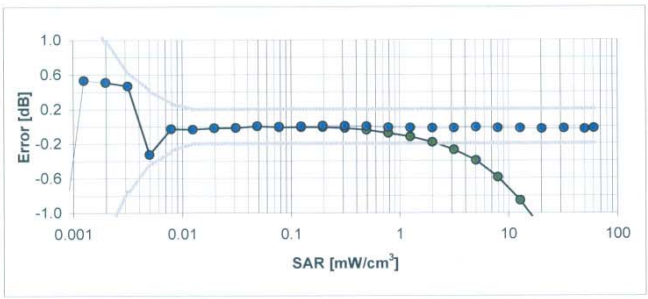
ES3DV3 SN:3172 May 27, 2009

## Dynamic Range f($SAR_{head}$)

(Waveguide R22, f = 1800 MHz)




Uncertainty of Linearity Assessment: ± 0.6% (k=2)





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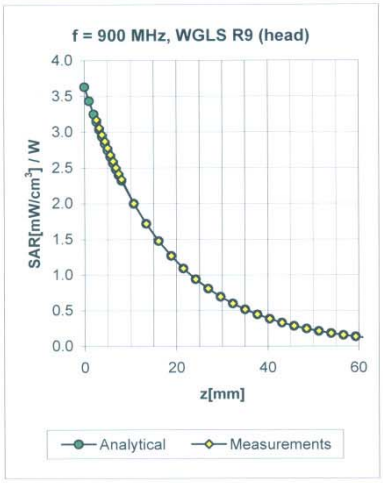
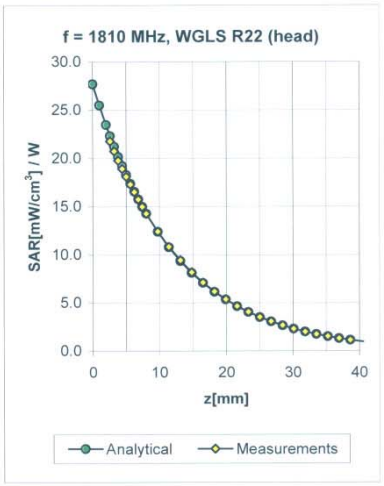
ES3DV3 SN:3172 May 27, 2009

## Conversion Factor Assessment



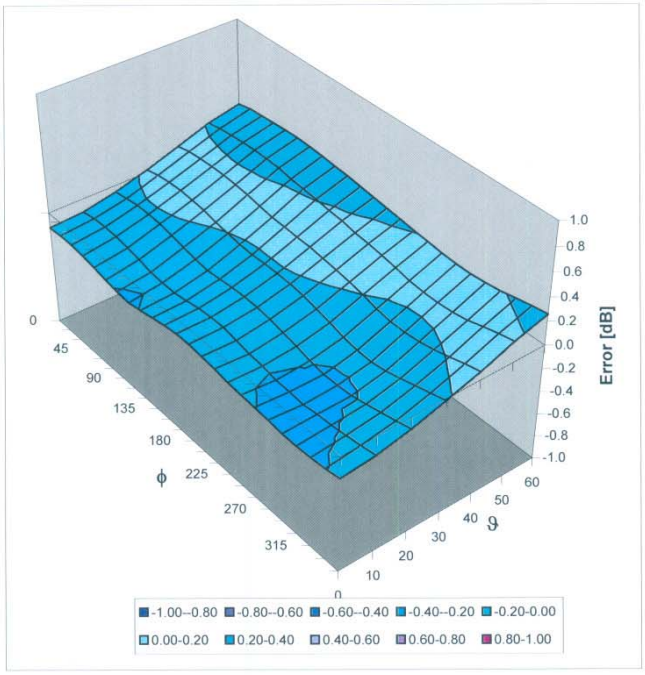

| f [MHz] | Validity [MHz][C] | TSL | Permittivity | Conductivity | Alpha | Depth | ConvF Uncertainty |
|---|---|---|---|---|---|---|---|
| 835 | ± 50 / ± 100 | Head | 41.5 ± 5% | 0.90 ± 5% | 0.86 | 1.08 | 5.83 ± 11.0% (k=2) |
| 900 | ± 50 / ± 100 | Head | 41.5 ± 5% | 0.97 ± 5% | 0.87 | 1.08 | 5.65 ± 11.0% (k=2) |
| 1750 | ± 50 / ± 100 | Head | 40.1 ± 5% | 1.37 ± 5% | 0.35 | 1.81 | 4.99 ± 11.0% (k=2) |
| 1810 | ± 50 / ± 100 | Head | 40.0 ± 5% | 1.40 ± 5% | 0.38 | 1.73 | 4.86 ± 11.0% (k=2) |
| 1950 | ± 50 / ± 100 | Head | 40.0 ± 5% | 1.40 ± 5% | 0.48 | 1.51 | 4.71 ± 11.0% (k=2) |
| 2450 | ± 50 / ± 100 | Head | 39.2 ± 5% | 1.80 ± 5% | 0.41 | 1.78 | 4.33 ± 11.0% (k=2) |
| 835 | ± 50 / ± 100 | Body | 55.2 ± 5% | 0.97 ± 5% | 0.78 | 1.15 | 5.81 ± 11.0% (k=2) |
| 900 | ± 50 / ± 100 | Body | 55.0 ± 5% | 1.05 ± 5% | 0.78 | 1.15 | 5.67 ± 11.0% (k=2) |
| 1750 | ± 50 / ± 100 | Body | 53.4 ± 5% | 1.49 ± 5% | 0.45 | 1.75 | 4.69 ± 11.0% (k=2) |
| 1810 | ± 50 / ± 100 | Body | 53.3 ± 5% | 1.52 ± 5% | 0.33 | 2.23 | 4.54 ± 11.0% (k=2) |
| 1950 | ± 50 / ± 100 | Body | 53.3 ± 5% | 1.52 ± 5% | 0.27 | 2.99 | 4.53 ± 11.0% (k=2) |
| 2450 | ± 50 / ± 100 | Body | 52.7 ± 5% | 1.95 ± 5% | 0.40 | 1.40 | 4.02 ± 11.0% (k=2) |

[C] The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

ES3DV3 SN:3172 May 27, 2009

## Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz




Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

# 7. Uncertainty Analysis

## DASY5 Uncertainty Budget
According to IEEE 1528 [1]

| Error Description | Uncertainty value | Prob. Dist. | Div. | ($c_i$) 1g | ($c_i$) 10g | Std. Unc. (1g) | Std. Unc. (10g) | ($v_i$) $v_{eff}$ |
|---|---|---|---|---|---|---|---|---|
| Measurement System | | | | | | | | |
| Probe Calibration | ±5.9% | N | 1 | 1 | 1 | ±5.9% | ±5.9% | ∞ |
| Axial Isotropy | ±4.7% | R | $\sqrt{3}$ | 0.7 | 0.7 | ±1.9% | ±1.9% | ∞ |
| Hemispherical Isotropy | ±9.6% | R | $\sqrt{3}$ | 0.7 | 0.7 | ±3.9% | ±3.9% | ∞ |
| Boundary Effects | ±1.0% | R | $\sqrt{3}$ | 1 | 1 | ±0.6% | ±0.6% | ∞ |
| Linearity | ±4.7% | R | $\sqrt{3}$ | 1 | 1 | ±2.7% | ±2.7% | ∞ |
| System Detection Limits | ±1.0% | R | $\sqrt{3}$ | 1 | 1 | ±0.6% | ±0.6% | ∞ |
| Readout Electronics | ±0.3% | N | 1 | 1 | 1 | ±0.3% | ±0.3% | ∞ |
| Response Time | ±0.8% | R | $\sqrt{3}$ | 1 | 1 | ±0.5% | ±0.5% | ∞ |
| Integration Time | ±2.6% | R | $\sqrt{3}$ | 1 | 1 | ±1.5% | ±1.5% | ∞ |
| RF Ambient Noise | ±3.0% | R | $\sqrt{3}$ | 1 | 1 | ±1.7% | ±1.7% | ∞ |
| RF Ambient Reflections | ±3.0% | R | $\sqrt{3}$ | 1 | 1 | ±1.7% | ±1.7% | ∞ |
| Probe Positioner | ±0.4% | R | $\sqrt{3}$ | 1 | 1 | ±0.2% | ±0.2% | ∞ |
| Probe Positioning | ±2.9% | R | $\sqrt{3}$ | 1 | 1 | ±1.7% | ±1.7% | ∞ |
| Max. SAR Eval. | ±1.0% | R | $\sqrt{3}$ | 1 | 1 | ±0.6% | ±0.6% | ∞ |
| Test Sample Related | | | | | | | | |
| Device Positioning | ±2.9% | N | 1 | 1 | 1 | ±2.9% | ±2.9% | 145 |
| Device Holder | ±3.6% | N | 1 | 1 | 1 | ±3.6% | ±3.6% | 5 |
| Power Drift | ±5.0% | R | $\sqrt{3}$ | 1 | 1 | ±2.9% | ±2.9% | ∞ |
| Phantom and Setup | | | | | | | | |
| Phantom Uncertainty | ±4.0% | R | $\sqrt{3}$ | 1 | 1 | ±2.3% | ±2.3% | ∞ |
| Liquid Conductivity (target) | ±5.0% | R | $\sqrt{3}$ | 0.64 | 0.43 | ±1.8% | ±1.2% | ∞ |
| Liquid Conductivity (meas.) | ±2.5% | N | 1 | 0.64 | 0.43 | ±1.6% | ±1.1% | ∞ |
| Liquid Permittivity (target) | ±5.0% | R | $\sqrt{3}$ | 0.6 | 0.49 | ±1.7% | ±1.4% | ∞ |
| Liquid Permittivity (meas.) | ±2.5% | N | 1 | 0.6 | 0.49 | ±1.5% | ±1.2% | ∞ |
| Combined Std. Uncertainty | | | | | | ±10.9% | ±10.7% | 387 |
| Expanded STD Uncertainty | | | | | | ±21.9% | ±21.4% | |

Table 19.6: Worst-Case uncertainty budget for DASY5 assessed according to IEEE 1528 [1]. The budget is valid for the frequency range 300 MHz - 3 GHz and represents a worst-case analysis. For specific tests and configurations, the uncertainty could be considerable smaller.

# 8. Phantom description

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s p e a g

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Phone +41 1 245 9700, Fax +41 1 245 9779
info@speag.com, http://www.speag.com

## Certificate of Conformity / First Article Inspection

| | |
|---|---|
| Item | SAM Twin Phantom V4.0 |
| Type No | QD 000 P40 C |
| Series No | TP-1150 and higher |
| Manufacturer | SPEAG<br>Zeughausstrasse 43<br>CH-8004 Zürich<br>Switzerland |

**Tests**
The series production process used allows the limitation to test of first articles.
Complete tests were made on the pre-series Type No. QD 000 P40 AA, Serial No. TP-1001 and on the series first article Type No. QD 000 P40 BA, Serial No. TP-1006. Certain parameters have been retested using further series items (called samples) or are tested at each item.

| Test | Requirement | Details | Units tested |
|---|---|---|---|
| Dimensions | Compliant with the geometry according to the CAD model. | IT'IS CAD File (*) | First article, Samples |
| Material thickness of shell | Compliant with the requirements according to the standards | 2mm +/- 0.2mm in flat and specific areas of head section | First article, Samples, TP-1314 ff. |
| Material thickness at ERP | Compliant with the requirements according to the standards | 6mm +/- 0.2mm at ERP | First article, All items |
| Material parameters | Dielectric parameters for required frequencies | 300 MHz – 6 GHz: Relative permittivity < 5, Loss tangent < 0.05 | Material samples |
| Material resistivity | The material has been tested to be compatible with the liquids defined in the standards if handled and cleaned according to the instructions. Observe technical Note for material compatibility. | DEGMBE based simulating liquids | Pre-series, First article, Material samples |
| Sagging | Compliant with the requirements according to the standards. Sagging of the flat section when filled with tissue simulating liquid. | < 1% typical < 0.8% if filled with 155mm of HSL900 and without DUT below | Prototypes, Sample testing |

**Standards**
[1] CENELEC EN 50361
[2] IEEE Std 1528-2003
[3] IEC 62209 Part I
[4] FCC OET Bulletin 65, Supplement C, Edition 01-01
(*) The IT'IS CAD file is derived from [2] and is also within the tolerance requirements of the shapes of the other documents.

**Conformity**
Based on the sample tests above, we certify that this item is in compliance with the uncertainty requirements of SAR measurements specified in standards [1] to [4].

**Date** 07.07.2005

**Signature / Stamp**

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Doc No 881 – QD 000 P40 C – F Page 1 (1)

# 9. System Validation from Original equipment supplier

**Calibration Laboratory of**
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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 SGS (Auden)

Certificate No: D835V2-4d063_May09

## CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | D835V2 - SN: 4d063 |
| Calibration procedure(s) | QA CAL-05.v7<br>Calibration procedure for dipole validation kits |
| Calibration date: | May 25, 2009 |
| Condition of the calibrated item | In Tolerance |

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date (Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Power meter EPM-442A | GB37480704 | 08-Oct-08 (No. 217-00898) | Oct-09 |
| Power sensor HP 8481A | US37292783 | 08-Oct-08 (No. 217-00898) | Oct-09 |
| Reference 20 dB Attenuator | SN: 5086 (20g) | 31-Mar-09 (No. 217-01025) | Mar-10 |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 31-Mar-09 (No. 217-01029) | Mar-10 |
| Reference Probe ES3DV2 | SN: 3025 | 30-Apr-09 (No. ES3-3025_Apr09) | Apr-10 |
| DAE4 | SN: 601 | 07-Mar-09 (No. DAE4-601_Mar09) | Mar-10 |

| Secondary Standards | ID # | Check Date (in house) | Scheduled Check |
|---|---|---|---|
| Power sensor HP 8481A | MY41092317 | 18-Oct-02 (in house check Oct-07) | In house check: Oct-09 |
| RF generator R&S SMT-06 | 100005 | 4-Aug-99 (in house check Oct-07) | In house check: Oct-09 |
| Network Analyzer HP 8753E | US37390585 S4206 | 18-Oct-01 (in house check Oct-08) | In house check: Oct-09 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Jeton Kastrati | Laboratory Technician | |
| Approved by: | Katja Pokovic | Technical Manager | |

Issued: May 25, 2009

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

Certificate No: D835V2-4d063_May09 Page 1 of 9

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Swiss Calibration Service

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

Accreditation No.: SCS 108

**Glossary:**

| | |
|---|---|
| TSL | tissue simulating liquid |
| ConvF | sensitivity in TSL / NORM x,y,z |
| N/A | not applicable or not measured |

**Calibration is Performed According to the Following Standards:**

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

**Additional Documentation:**

d) DASY4/5 System Handbook

**Methods Applied and Interpretation of Parameters:**

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

## Measurement Conditions

DASY system configuration, as far as not given on page 1.

| | | |
|---|---|---|
| **DASY Version** | DASY5 | V5.0 |
| **Extrapolation** | Advanced Extrapolation | |
| **Phantom** | Modular Flat Phantom V4.9 | |
| **Distance Dipole Center - TSL** | 15 mm | with Spacer |
| **Zoom Scan Resolution** | dx, dy, dz = 5 mm | |
| **Frequency** | 835 MHz ± 1 MHz | |

## Head TSL parameters

The following parameters and calculations were applied.

| | **Temperature** | **Permittivity** | **Conductivity** |
|---|---|---|---|
| **Nominal Head TSL parameters** | 22.0 °C | 41.5 | 0.90 mho/m |
| **Measured Head TSL parameters** | (22.0 ± 0.2) °C | 40.8 ± 6 % | 0.89 mho/m ± 6 % |
| **Head TSL temperature during test** | (21.6 ± 0.2) °C | ---- | ---- |

## SAR result with Head TSL

| **SAR averaged over 1 cm$^3$ (1 g) of Head TSL** | Condition | |
|---|---|---|
| SAR measured | 250 mW input power | 2.38 mW / g |
| SAR normalized | normalized to 1W | 9.52 mW / g |
| SAR for nominal Head TSL parameters [1] | normalized to 1W | **9.56 mW /g ± 17.0 % (k=2)** |

| **SAR averaged over 10 cm$^3$ (10 g) of Head TSL** | condition | |
|---|---|---|
| SAR measured | 250 mW input power | 1.56 mW / g |
| SAR normalized | normalized to 1W | 6.24 mW / g |
| SAR for nominal Head TSL parameters [1] | normalized to 1W | **6.26 mW /g ± 16.5 % (k=2)** |

[1] Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"





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## Body TSL parameters

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---|---|---|
| **Nominal Body TSL parameters** | 22.0 °C | 55.2 | 0.97 mho/m |
| **Measured Body TSL parameters** | (22.0 ± 0.2) °C | 53.8 ± 6 % | 1.01 mho/m ± 6 % |
| **Body TSL temperature during test** | (22.0 ± 0.2) °C | ---- | ---- |

## SAR result with Body TSL

| **SAR averaged over 1 cm$^3$ (1 g) of Body TSL** | Condition | |
|---|---|---|
| SAR measured | 250 mW input power | 2.55 mW / g |
| SAR normalized | normalized to 1W | 10.2 mW / g |
| SAR for nominal Body TSL parameters [2] | normalized to 1W | **9.84 mW / g ± 17.0 % (k=2)** |

| **SAR averaged over 10 cm$^3$ (10 g) of Body TSL** | condition | |
|---|---|---|
| SAR measured | 250 mW input power | 1.68 mW / g |
| SAR normalized | normalized to 1W | 6.72 mW / g |
| SAR for nominal Body TSL parameters [2] | normalized to 1W | **6.55 mW / g ± 16.5 % (k=2)** |

[2] Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"





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## Appendix

### Antenna Parameters with Head TSL

| | |
|---|---|
| Impedance, transformed to feed point | 51.9 Ω - 3.0 jΩ |
| Return Loss | - 29.2 dB |

### Antenna Parameters with Body TSL

| | |
|---|---|
| Impedance, transformed to feed point | 47.7 Ω - 4.3 jΩ |
| Return Loss | - 26.0 dB |

### General Antenna Parameters and Design

| | |
|---|---|
| Electrical Delay (one direction) | 1.392 ns |

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

### Additional EUT Data

| | |
|---|---|
| Manufactured by | SPEAG |
| Manufactured on | November 27, 2006 |





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## DASY5 Validation Report for Head TSL

Date/Time: 25.05.2009 10:53:04

Test Laboratory: SPEAG, Zurich, Switzerland

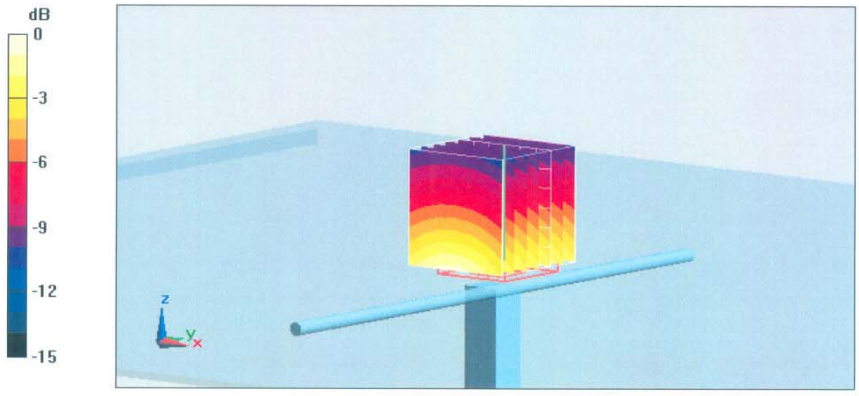
**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d063**

Communication System: CW-835; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL 900 MHz
Medium parameters used: f = 835 MHz; $\sigma$ = 0.89 mho/m; $\varepsilon_r$ = 40.7; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

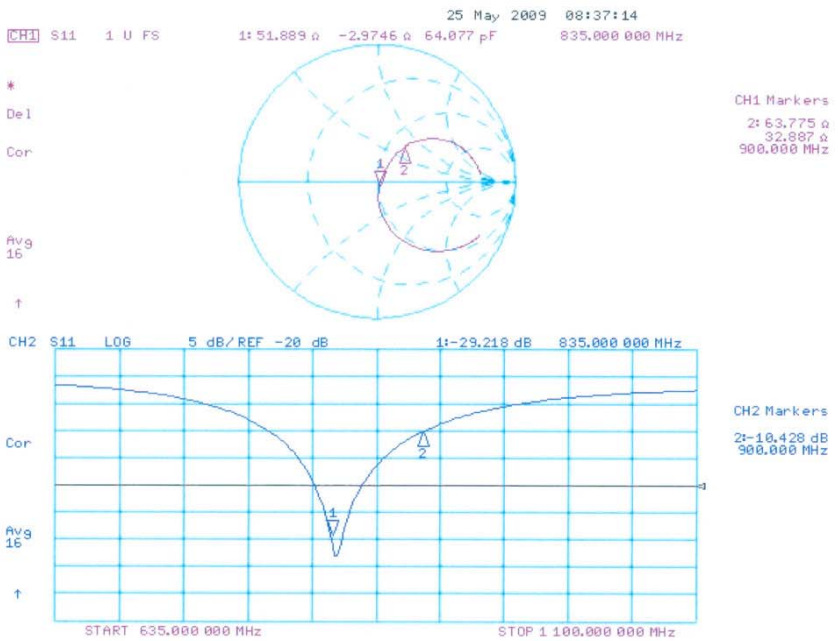
- Probe: ES3DV2 - SN3025; ConvF(5.86, 5.86, 5.86); Calibrated: 30.04.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.03.2009
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

**Pin=250mW; dip=15mm/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57 V/m; Power Drift = 0.028 dB
Peak SAR (extrapolated) = 3.54 W/kg
**SAR(1 g) = 2.38 mW/g; SAR(10 g) = 1.56 mW/g**
Maximum value of SAR (measured) = 2.77 mW/g




0 dB = 2.77mW/g

## Impedance Measurement Plot for Head TSL





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## DASY5 Validation Report for Body TSL

Date/Time: 25.05.2009 14:01:33

Test Laboratory: SPEAG, Zurich, Switzerland

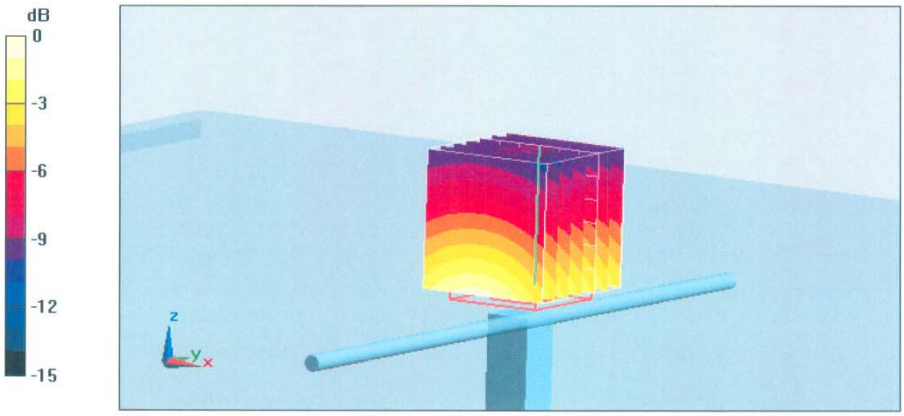
**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d063**

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: MSL900
Medium parameters used: f = 835 MHz; $\sigma$ = 1.01 mho/m; $\varepsilon_r$ = 53.8; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(5.79, 5.79, 5.79); Calibrated: 30.04.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.03.2009
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

**Pin = 250mW, d = 15mm/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.6 V/m; Power Drift = 0.024 dB
Peak SAR (extrapolated) = 3.74 W/kg
**SAR(1 g) = 2.55 mW/g; SAR(10 g) = 1.68 mW/g**
Maximum value of SAR (measured) = 2.94 mW/g




0 dB = 2.94mW/g





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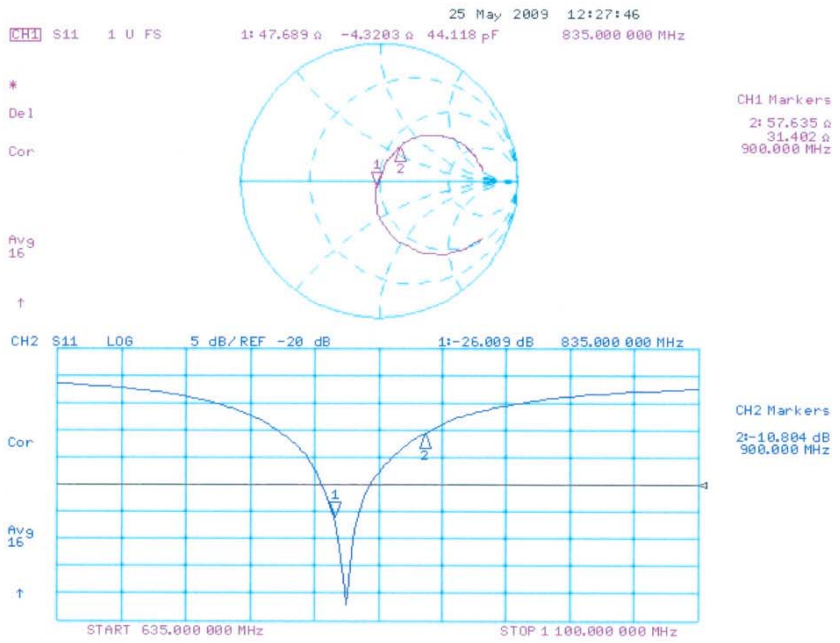
## Impedance Measurement Plot for Body TSL





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Accreditation No.: **SCS 108**

Client **SGS (Auden)** Certificate No: **D2450V2-727_Apr09**

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | D2450V2 - SN: 727 |
| Calibration procedure(s) | QA CAL-05.v7<br>Calibration procedure for dipole validation kits |
| Calibration date: | April 27, 2009 |
| Condition of the calibrated item | In Tolerance |

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Power meter EPM-442A | GB37480704 | 08-Oct-08 (No. 217-00898) | Oct-09 |
| Power sensor HP 8481A | US37292783 | 08-Oct-08 (No. 217-00898) | Oct-09 |
| Reference 20 dB Attenuator | SN: 5086 (20g) | 31-Mar-09 (No. 217-01025) | Mar-10 |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 31-Mar-09 (No. 217-01029) | Mar-10 |
| Reference Probe ES3DV2 | SN: 3025 | 28-Apr-08 (No. ES3-3025_Apr08) | Apr-09 |
| DAE4 | SN: 601 | 07-Mar-09 (No. DAE4-601_Mar09) | Mar-10 |

| Secondary Standards | ID # | Check Date (in house) | Scheduled Check |
|---|---|---|---|
| Power sensor HP 8481A | MY41092317 | 18-Oct-02 (in house check Oct-07) | In house check: Oct-09 |
| RF generator R&S SMT-06 | 100005 | 4-Aug-99 (in house check Oct-07) | In house check: Oct-09 |
| Network Analyzer HP 8753E | US37390585 S4206 | 18-Oct-01 (in house check Oct-08) | In house check: Oct-09 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Jeton Kastrati | Laboratory Technician | |
| Approved by: | Katja Pokovic | Technical Manager | |

Issued: April 28, 2009

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Accreditation No.: SCS 108

**Glossary:**

| | |
|---|---|
| TSL | tissue simulating liquid |
| ConvF | sensitivity in TSL / NORM x,y,z |
| N/A | not applicable or not measured |

**Calibration is Performed According to the Following Standards:**

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

**Additional Documentation:**

d) DASY4/5 System Handbook

**Methods Applied and Interpretation of Parameters:**

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

## Measurement Conditions

DASY system configuration, as far as not given on page 1.

| | | |
|---|---|---|
| **DASY Version** | DASY5 | V5.0 |
| **Extrapolation** | Advanced Extrapolation | |
| **Phantom** | Modular Flat Phantom V5.0 | |
| **Distance Dipole Center - TSL** | 10 mm | with Spacer |
| **Zoom Scan Resolution** | dx, dy, dz = 5 mm | |
| **Frequency** | 2450 MHz ± 1 MHz | |

## Head TSL parameters

The following parameters and calculations were applied.

| | **Temperature** | **Permittivity** | **Conductivity** |
|---|---|---|---|
| **Nominal Head TSL parameters** | 22.0 °C | 39.2 | 1.80 mho/m |
| **Measured Head TSL parameters** | (22.0 ± 0.2) °C | 38.0 ± 6 % | 1.82 mho/m ± 6 % |
| **Head TSL temperature during test** | (21.6 ± 0.2) °C | ---- | ---- |

## SAR result with Head TSL

| **SAR averaged over 1 $cm^3$ (1 g) of Head TSL** | Condition | |
|---|---|---|
| SAR measured | 250 mW input power | 13.5 mW / g |
| SAR normalized | normalized to 1W | 54.0 mW / g |
| SAR for nominal Head TSL parameters [1] | normalized to 1W | **53.3 mW /g ± 17.0 % (k=2)** |

| **SAR averaged over 10 $cm^3$ (10 g) of Head TSL** | condition | |
|---|---|---|
| SAR measured | 250 mW input power | 6.28 mW / g |
| SAR normalized | normalized to 1W | 25.1 mW / g |
| SAR for nominal Head TSL parameters [1] | normalized to 1W | **24.9 mW /g ± 16.5 % (k=2)** |

[1] Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"





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## Body TSL parameters

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---|---|---|
| **Nominal Body TSL parameters** | 22.0 °C | 52.7 | 1.95 mho/m |
| **Measured Body TSL parameters** | (22.0 ± 0.2) °C | 54.4 ± 6 % | 1.98 mho/m ± 6 % |
| **Body TSL temperature during test** | (22.0 ± 0.2) °C | ---- | ---- |

## SAR result with Body TSL

| **SAR averaged over 1 cm³ (1 g) of Body TSL** | Condition | |
|---|---|---|
| SAR measured | 250 mW input power | 13.2 mW / g |
| SAR normalized | normalized to 1W | 52.8 mW / g |
| SAR for nominal Body TSL parameters [2] | normalized to 1W | **52.8 mW /g ± 17.0 % (k=2)** |

| **SAR averaged over 10 cm³ (10 g) of Body TSL** | condition | |
|---|---|---|
| SAR measured | 250 mW input power | 6.18 mW / g |
| SAR normalized | normalized to 1W | 24.7 mW / g |
| SAR for nominal Body TSL parameters [2] | normalized to 1W | **24.8 mW /g ± 16.5 % (k=2)** |

[2] Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"





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## Appendix

### Antenna Parameters with Head TSL

| | |
|---|---|
| Impedance, transformed to feed point | 55.1 Ω + 1.2 jΩ |
| Return Loss | - 26.1 dB |

### Antenna Parameters with Body TSL

| | |
|---|---|
| Impedance, transformed to feed point | 49.5 Ω + 3.3 jΩ |
| Return Loss | - 29.6 dB |

### General Antenna Parameters and Design

| | |
|---|---|
| Electrical Delay (one direction) | 1.149 ns |

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

### Additional EUT Data

| | |
|---|---|
| Manufactured by | SPEAG |
| Manufactured on | January 09, 2003 |





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## DASY5 Validation Report for Head TSL

Date/Time: 27.04.2009 13:40:04

Test Laboratory: SPEAG, Zurich, Switzerland

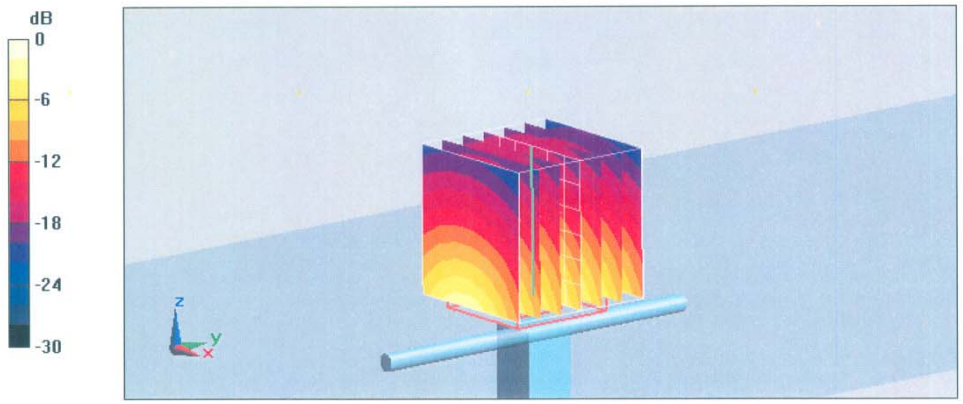
**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN727**

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: HSL U10 BB
Medium parameters used: f = 2450 MHz; $\sigma$ = 1.82 mho/m; $\varepsilon_r$ = 38; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(4.4, 4.4, 4.4); Calibrated: 28.04.2008
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.03.2009
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

**Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 100.3 V/m; Power Drift = 0.036 dB
Peak SAR (extrapolated) = 28.3 W/kg
**SAR(1 g) = 13.5 mW/g; SAR(10 g) = 6.28 mW/g**
Maximum value of SAR (measured) = 17.2 mW/g




0 dB = 17.2mW/g





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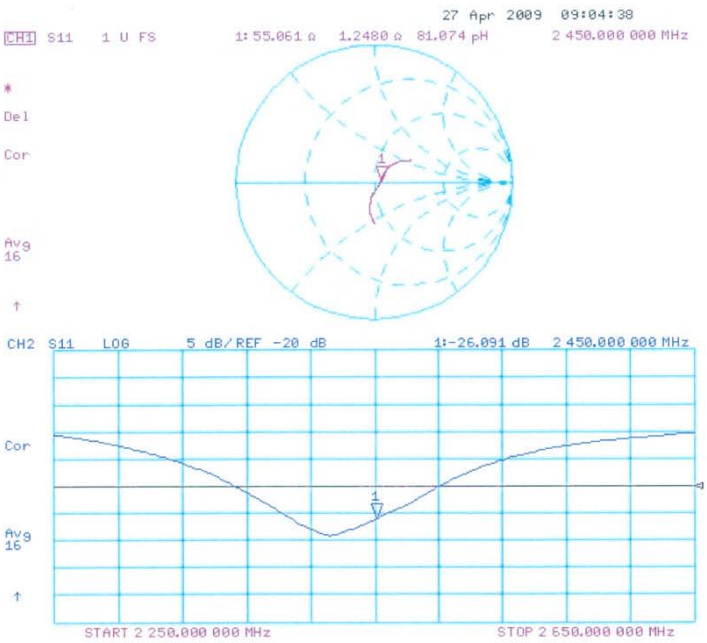
## Impedance Measurement Plot for Head TSL





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## DASY5 Validation Report for Body TSL

Date/Time: 22.04.2009 13:12:14

Test Laboratory: SPEAG, Zurich, Switzerland

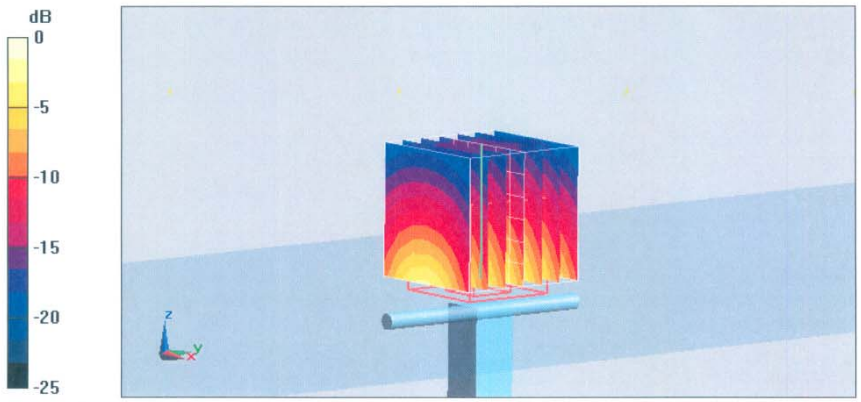
**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:727**

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: MSL U10 BB
Medium parameters used: f = 2450 MHz; $\sigma$ = 1.98 mho/m; $\varepsilon_r$ = 54.4; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(4.07, 4.07, 4.07); Calibrated: 28.04.2008
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.03.2009
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

**Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.9 V/m; Power Drift = 0.031 dB
Peak SAR (extrapolated) = 26.5 W/kg
**SAR(1 g) = 13.2 mW/g; SAR(10 g) = 6.18 mW/g**
Maximum value of SAR (measured) = 17.3 mW/g




0 dB = 17.3mW/g





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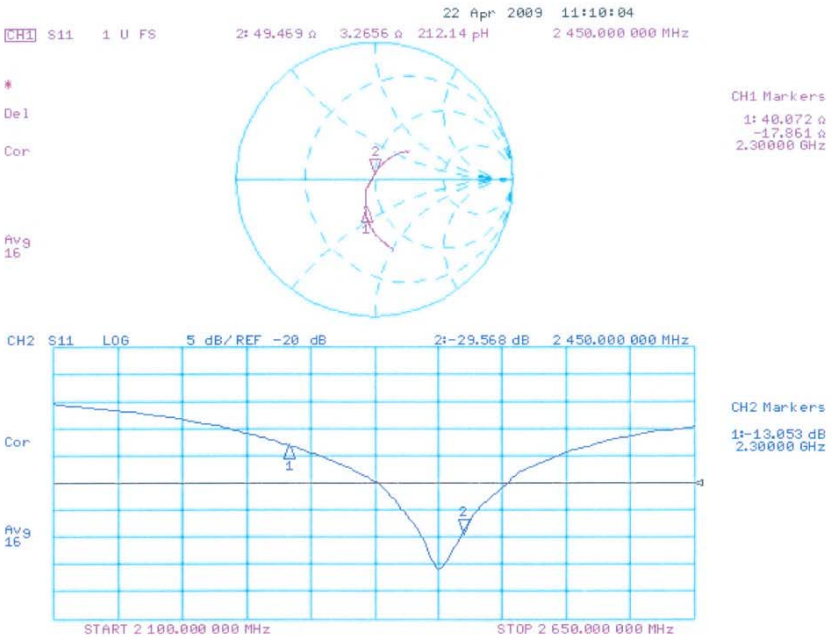
## Impedance Measurement Plot for Body TSL






**End of 1st part of report**