

## SAR Test Report

Product Name : HUAWEI U8520, U8520, U8520-51, HUAWEI  
U8520-51, HSDPA/ UMTS/ GPRS/ GSM/ EDGE  
Mobile Phone with Bluetooth  
Model No. : HUAWEI U8520-51, U8520-51  
FCC ID : QISU8520-51

Applicant : Huawei Technologies Co., Ltd.  
Address : Administration Building, Huawei Base, Bantian, Longgang  
District, Shenzhen 518129

Date of Receipt : 27/06/2011  
Date of Test : 12/07/2011~14/08/2011  
Issued Date : 22/08/2011  
Report No. : 116S074R-HP-US-P03V01  
Report Version : V1.3

The test results relate only to the samples tested.

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# Test Report Certification

Issued Date: 18/07/2011

Report No: 116S074R-HP-US-P03V01



Product Name : HUAWEI U8520, U8520, U8520-51, HUAWEI U8520-51,  
HSDPA/ UMTS/ GPRS/ GSM/ EDGE Mobile Phone with  
Bluetooth

Applicant : Huawei Technologies Co., Ltd.

Address : Administration Building, Huawei Base, Bantian, Longgang  
District, Shenzhen 518129

Manufacturer : Huawei Technologies Co., Ltd.

Address : Administration Building, Huawei Base, Bantian, Longgang  
District, Shenzhen 518129

Model No. : HUAWEI U8520-51, U8520-51

FCC ID : QISU8520-51

Brand Name : HUAWEI

EUT Voltage : DC 3.7V

Applicable Standard : FCC Oet65 Supplement C June 2001  
IEEE Std. 1528-2003,47CFR § 2.1093

Test Result : Max. SAR Measurement (1g)  
Head: 1.090 W/kg, Body: 0.781 W/kg

Performed Location : Suzhou EMC Laboratory  
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## 1. General Information

### 1.1. EUT Description

|                         |                                                                                                          |
|-------------------------|----------------------------------------------------------------------------------------------------------|
| Product Name            | HUAWEI U8520, U8520, U8520-51, HUAWEI U8520-51, HSDPA/ UMTS/ GPRS/ GSM/ EDGE Mobile Phone with Bluetooth |
| Model No.               | HUAWEI U8520-51, U8520-51                                                                                |
| IMEI 1                  | 866854000013501                                                                                          |
| IMEI 2                  | 866854000126501                                                                                          |
| Hardware Version        | S041M001P200                                                                                             |
| Software Version        | U8520V100R001C17B110                                                                                     |
| Device Category         | Portable                                                                                                 |
| RF Exposure Environment | Uncontrolled                                                                                             |
| Antenna Type            | Internal                                                                                                 |
| <b>GPS</b>              |                                                                                                          |
| Operate Frequency       | 1575.42MHz                                                                                               |
| Type of modulation      | BPSK                                                                                                     |
| <b>2G</b>               |                                                                                                          |
| Support Band            | GSM850/GSM900/DCS1800/PCS1900                                                                            |
| GPRS Type               | Class B                                                                                                  |
| GPRS Class              | Class 12                                                                                                 |
| Tx Frequency Range      | GSM 850: 824~849MHz<br>PCS 1900: 1850~1910MHz                                                            |
| Rx Frequency Range      | GSM 850: 869~894MHz<br>PCS 1900: 1930~1990MHz                                                            |
| Release Version         | GSM: R99                                                                                                 |
| Type of modulation      | GMSK for GSM/GPRS; 8PSK for EDGE                                                                         |
| Antenna Gain            | 1dBi                                                                                                     |
| <b>3G</b>               |                                                                                                          |
| Support Band            | WCDMA Band I/WCDMA Band II/WCDMA Band V                                                                  |
| Frequency Range Tx      | WCDMA Band V: 824~849MHz<br>WCDMA Band II: 1850~1910MHz                                                  |
| Frequency Range Rx      | WCDMA Band V: 869~894MHz<br>WCDMA Band II: 1930~1990MHz                                                  |
| Release Version         | UMTS FDD: Rel-5                                                                                          |
| Type of modulation      | QPSK for WCDMA; 16QAM for HSDPA                                                                          |
| Antenna Gain            | 1dBi                                                                                                     |

| Bluetooth                         |                                                  |
|-----------------------------------|--------------------------------------------------|
| Bluetooth Frequency               | 2402~2480MHz                                     |
| Bluetooth Version                 | V2.1 + EDR                                       |
| Type of modulation                | FHSS                                             |
| Data Rate                         | 1Mbps(GFSK), 2Mbps(Pi/4 DQPSK), 3Mbps (8DPSK)    |
| Antenna Gain                      | 1dBi                                             |
| Wi-Fi                             |                                                  |
| Wi-Fi Frequency                   | 2412~2462MHz                                     |
| Hotspots Function                 | YES                                              |
| Type of modulation                | 802.11b: DSSS; 802.11g/n: OFDM                   |
| Data Rate                         | 802.11b: 1/2/5.5/11 Mbps                         |
|                                   | 802.11g: 6/9/12/18/24/36/48/54 Mbps              |
|                                   | 802.11n: up to 65 Mbps                           |
| Antenna Gain                      | 1dBi                                             |
| Components                        |                                                  |
| Headset Model Number              | 22040059                                         |
| Battery #1<br>(LG)                | Brand Name: HUAWEI                               |
|                                   | M/N: HB4F1                                       |
|                                   | Rated Voltage and Capacitance: 3.7V/1500mAh      |
| Battery #2<br>(Sony)              | Brand Name: HUAWEI                               |
|                                   | M/N: HB4F1                                       |
|                                   | Rated Voltage and Capacitance: 3.7V/1500mAh      |
| Adapter #1                        | Manufacturer: SHENZHEN HUNTKEY ELECTRIC CO., LTD |
|                                   | M/N: HW-050100U1W                                |
|                                   | Input: 100-240V~50/60Hz 0.2A                     |
|                                   | Output: 5Vdc, 1.0A                               |
| Adapter #2                        | Manufacturer: TECH-POWER INTERNATIONAL CO., LTD. |
|                                   | M/N: HW-050100U1W                                |
|                                   | Input: 100-240V~50/60Hz 0.2A                     |
|                                   | Output: 5Vdc, 1.0A                               |
| Max. Output Power<br>(Avg. Power) | GSM850: 32.17 dBm <SIM 1>                        |
|                                   | PCS1900: 29.98 dBm <SIM 1>                       |
|                                   | WCDMA Band II: 21.52dBm                          |
|                                   | WCDMA Band V: 21.87 dBm                          |
|                                   | Wi-Fi: 11.58 dBm                                 |
| Max. Output Power<br>(Radiated)   | GSM850: 29.60 dBm- ERP                           |
|                                   | PCS1900: 29.08 dBm- EIRP                         |

|  |                                                                |
|--|----------------------------------------------------------------|
|  | WCDMA Band II: 19.97 dBm- EIRP<br>WCDMA Band V: 19.93 dBm- ERP |
|--|----------------------------------------------------------------|

Note: SIM1 equal to GSM Slot, SIM 2 equal to WCDMA Slot. WCDMA compatible with GSM. So the mobile phone support two SIM card.

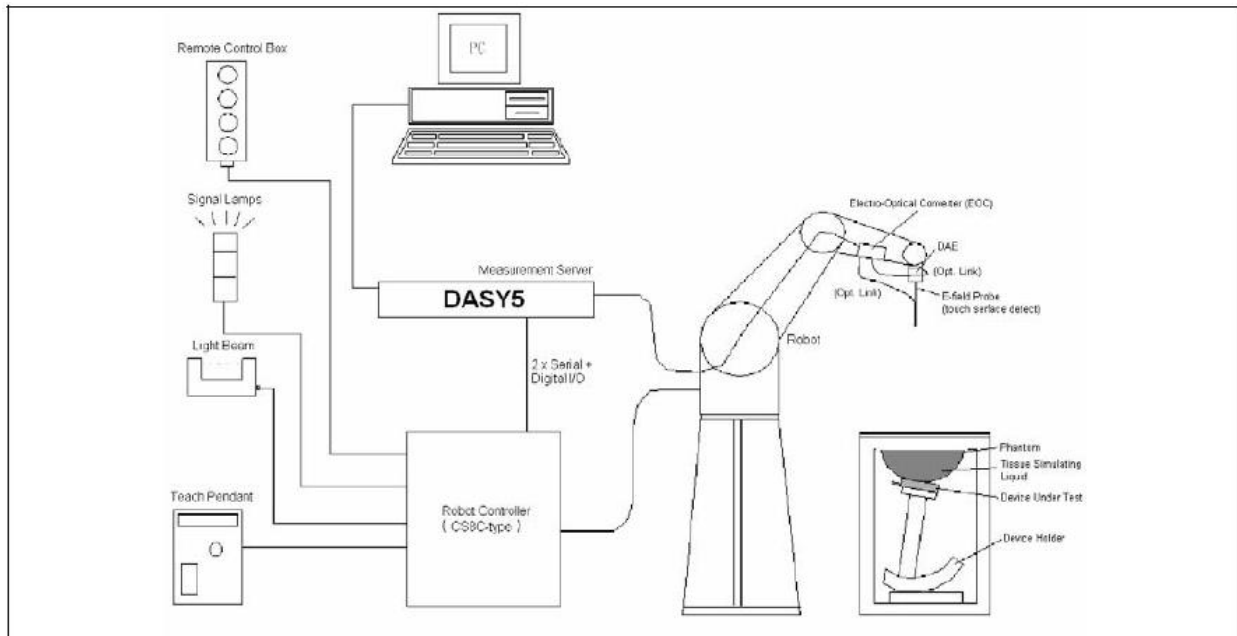
## 1.2. Test Environment

Ambient conditions in the laboratory:

| Items            | Required | Actual  |
|------------------|----------|---------|
| Temperature (°C) | 18-25    | 21.5± 2 |
| Humidity (%RH)   | 30-70    | 52      |

## 2. SAR Measurement System

### 2.1. DASY5 System Description



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

- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- 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 from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

### **2.1.1. Applications**

Predefined procedures and evaluations for automated compliance testing with all worldwide standards, e.g., IEEE 1528, OET 65, IEC 62209-1, IEC 62209-2, EN 50360, EN 50383 and others.

### **2.1.2. Area Scans**

Area scans are defined prior to the measurement process being executed with a user defined variable spacing between each measurement point (integral) allowing low uncertainty measurements to be conducted. Scans defined for FCC applications utilize a  $10\text{mm}^2$  step integral, with 1mm interpolation used to locate the peak SAR area used for zoom scan assessments.

When an Area Scan has measured all reachable points, it computes the field maxima found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE 1528-2003, EN 50361 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan).

### **2.1.3. Zoom Scan (Cube Scan Averaging)**

Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. A density of  $1000\text{ kg/m}^3$  is used to represent the head and body tissue density and not the phantom liquid density, in order to be consistent with the definition of the liquid dielectric properties, i.e. the side length of the 1 g cube is 10mm, with the side length of the 10 g cube 21,5mm.

The zoom scan integer steps can be user defined so as to reduce uncertainty, but normal practice for typical test applications utilize a physical step of  $7\times 7\times 7$  (5mmx5mmx5mm) providing a volume of 30mm in the X & Y axis, and 30mm in the Z axis.

### **2.1.4. Uncertainty of Inter-/Extrapolation and Averaging**

In order to evaluate the uncertainty of the interpolation, extrapolation and averaged SAR calculation algorithms of the Postprocessor, DASY5 allows the generation of measurement grids which are artificially predefined by analytically based test functions. Therefore, the grids of area scans and zoom scans can be filled with uncertainty test data, according to the SAR benchmark functions of IEEE 1528. The three analytical functions shown in equations as below are used to describe the possible range of the expected SAR distributions for the tested handsets. The field gradients are covered by the spatially flat distribution f1, the spatially steep distribution f3 and f2 accounts for H-field cancellation on the phantom/tissue surface.

$$f_1(x, y, z) = Ae^{-\frac{z}{2a}} \cos^2 \left( \frac{\pi}{2} \frac{\sqrt{x'^2 + y'^2}}{5a} \right)$$

$$f_2(x, y, z) = Ae^{-\frac{z}{a}} \frac{a^2}{a^2 + x'^2} \left( 3 - e^{-\frac{2z}{a}} \right) \cos^2 \left( \frac{\pi}{2} \frac{y'}{3a} \right)$$

$$f_3(x, y, z) = A \frac{a^2}{\frac{a^2}{4} + x'^2 + y'^2} \left( e^{-\frac{2z}{a}} + \frac{a^2}{2(a + 2z)^2} \right)$$

## 2.2. DASY5 E-Field Probe

The SAR measurement is conducted with the dosimetric probe manufactured by SPEAG. The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency.

SPEAG conducts the probe calibration in compliance with international and national standards (e.g. IEEE 1528, EN 62209-1, IEC 62209, etc.) under ISO 17025. The calibration data are in Appendix D.

### 2.2.1. Isotropic E-Field Probe Specification

| Model         | EX3DV4                                                                                                                                                                                                     |                                                                                       |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Construction  | Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)                                                      |                                                                                       |
| Frequency     | 10 MHz to 6 GHz<br>Linearity: $\pm 0.2$ dB (30 MHz to 6 GHz)                                                                                                                                               |  |
| Directivity   | $\pm 0.3$ dB in HSL (rotation around probe axis)<br>$\pm 0.5$ dB in tissue material (rotation normal to probe axis)                                                                                        |                                                                                       |
| Dynamic Range | 10 $\mu$ W/g to 100 mW/g<br>Linearity: $\pm 0.2$ dB (noise: typically $< 1$ $\mu$ W/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%. |                                                                                       |

### 2.3. Boundary Detection Unit and Probe Mounting Device

The DASY probes use a precise connector and an additional holder for the probe, consisting of a plastic tube and a flexible silicon ring to center the probe. The connector at the DAE is flexibly mounted and held in the default position with magnets and springs. Two switching systems in the connector mount detect frontal and lateral probe collisions and trigger the necessary software response.



### 2.4. DATA Acquisition Electronics (DAE) and Measurement Server

The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit.

Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.

The input impedance of the DAE4 is 200M Ohm; the inputs are symmetrical and floating. Common mode rejection is above 80dB.



The DASY5 measurement server is based on a PC/104 CPU board with a 400MHz intel ULV Celeron, 128MB chipdisk and 128MB RAM. The necessary circuits for communication with the DAE electronics box, as well as the 16 bit AD converter system for optical detection and digital I/O interface are contained on the DASY5 I/O board, which is directly connected to the PC/104 bus of the CPU board.



## 2.5. Robot

The DASY5 system uses the high precision robots TX90 XL type out of the newer series from Stäubli SA (France). For the 6-axis controller DASY5 system, the CS8C robot controller version from Stäubli is used.

The XL robot series have many features that are important for our application:

- High precision (repeatability 0.02 mm)
- High reliability (industrial design)
- Jerk-free straight movements
- Low ELF interference (the closed metallic construction shields against motor control fields)
- 6-axis controller



## 2.6. Light Beam Unit

The light beam switch allows automatic "tooling" of the probe. During the process, the actual position of the probe tip with respect to the robot arm is measured, as well as the probe length and the horizontal probe offset. The software then corrects all movements, such that the robot coordinates are valid for the probe tip.

The repeatability of this process is better than 0.1 mm. If a position has been taught with an aligned probe, the same position will be reached with another aligned probe within 0.1 mm, even if the other probe has different dimensions. During probe rotations, the probe tip will keep its actual position.



## 2.7. Device Holder

The DASY5 device holder is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation center for both scales is the ear reference point (EPR).

Thus the device needs no repositioning when changing the angles.

The DASY5 device holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity  $\epsilon_r \approx 3$  and loss tangent  $\delta = 0.02$ . The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.



## 2.8. SAM Twin Phantom

The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region where shell thickness increases to 6mm). It has three measurement areas:

- Left head
- Right head
- Flat phantom



The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

### 3. Tissue Simulating Liquid

#### 3.1. The composition of the tissue simulating liquid

| INGREDIENT<br>(% Weight) | 835MHz<br>Head | 835MHz<br>Body | 1900MHz<br>Head | 1900MHz<br>Body | 2450MHz<br>Head | 2450MHz<br>Body |
|--------------------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|
| <b>Water</b>             | 40.45          | 52.4           | 54.90           | 40.5            | 46.7            | 73.2            |
| <b>Salt</b>              | 1.45           | 1.40           | 0.18            | 0.50            | 0.00            | 0.04            |
| <b>Sugar</b>             | 57.6           | 45.0           | 0.00            | 58.0            | 0.00            | 0.00            |
| <b>HEC</b>               | 0.40           | 1.00           | 0.00            | 0.50            | 0.00            | 0.00            |
| <b>Preventol</b>         | 0.10           | 0.20           | 0.00            | 0.50            | 0.00            | 0.00            |
| <b>DGBE</b>              | 0.00           | 0.00           | 44.92           | 0.00            | 53.3            | 26.7            |

### 3.2. Tissue Calibration Result

The dielectric parameters of the liquids were verified prior to the SAR evaluation using DASY5 Dielectric Probe Kit and Agilent Vector Network Analyzer E5071C

| Head Tissue Simulant Measurement |                                 |                         |                      |                   |
|----------------------------------|---------------------------------|-------------------------|----------------------|-------------------|
| Frequency [MHz]                  | Description                     | Dielectric Parameters   |                      | Tissue Temp. [°C] |
|                                  |                                 | $\epsilon_r$            | $\sigma$ [S/m]       |                   |
| 835 MHz                          | Reference result<br>± 5% window | 42.54<br>40.41 to 44.67 | 0.91<br>0.86 to 0.96 | N/A               |
|                                  | 12-07-2011                      | 41.12                   | 0.89                 | 21.0              |

| Body Tissue Simulant Measurement |                                 |                        |                      |                   |
|----------------------------------|---------------------------------|------------------------|----------------------|-------------------|
| Frequency [MHz]                  | Description                     | Dielectric Parameters  |                      | Tissue Temp. [°C] |
|                                  |                                 | $\epsilon_r$           | $\sigma$ [S/m]       |                   |
| 835 MHz                          | Reference result<br>± 5% window | 55.2<br>52.44 to 57.96 | 0.97<br>0.92 to 1.02 | N/A               |
|                                  | 14-08-2011                      | 54.54                  | 1.00                 | 21.0              |

| Head Tissue Simulant Measurement |                                 |                        |                      |                   |
|----------------------------------|---------------------------------|------------------------|----------------------|-------------------|
| Frequency [MHz]                  | Description                     | Dielectric Parameters  |                      | Tissue Temp. [°C] |
|                                  |                                 | $\epsilon_r$           | $\sigma$ [S/m]       |                   |
| 1900 MHz                         | Reference result<br>± 5% window | 39.9<br>37.91 to 41.90 | 1.42<br>1.35 to 1.49 | N/A               |
|                                  | 14-07-2011                      | 38.98                  | 1.45                 | 21.0              |

| Body Tissue Simulant Measurement |                                 |                        |                      |                   |
|----------------------------------|---------------------------------|------------------------|----------------------|-------------------|
| Frequency [MHz]                  | Description                     | Dielectric Parameters  |                      | Tissue Temp. [°C] |
|                                  |                                 | $\epsilon_r$           | $\sigma$ [S/m]       |                   |
| 1900 MHz                         | Reference result<br>± 5% window | 53.3<br>50.64 to 55.97 | 1.52<br>1.44 to 1.60 | N/A               |
|                                  | 14-08-2011                      | 51.77                  | 1.52                 | 21.0              |

| Head Tissue Simulant Measurement |                                 |                        |                      |                      |
|----------------------------------|---------------------------------|------------------------|----------------------|----------------------|
| Frequency<br>[MHz]               | Description                     | Dielectric Parameters  |                      | Tissue Temp.<br>[°C] |
|                                  |                                 | $\epsilon_r$           | $\sigma$ [s/m]       |                      |
| 2450MHz                          | Reference result<br>± 5% window | 39.2<br>37.24 to 41.16 | 1.80<br>1.71 to 1.89 | N/A                  |
|                                  | 14-08-2011                      | 28.15                  | 1.85                 | 21.0                 |

| Body Tissue Simulant Measurement |                                 |                        |                      |                      |
|----------------------------------|---------------------------------|------------------------|----------------------|----------------------|
| Frequency<br>[MHz]               | Description                     | Dielectric Parameters  |                      | Tissue Temp.<br>[°C] |
|                                  |                                 | $\epsilon_r$           | $\sigma$ [s/m]       |                      |
| 2450MHz                          | Reference result<br>± 5% window | 52.7<br>50.07 to 55.34 | 1.95<br>1.85 to 2.05 | N/A                  |
|                                  | 14-08-2011                      | 50.89                  | 1.96                 | 21.0                 |

### 3.3. Tissue Dielectric Parameters for Head and Body Phantoms

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in P1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in a human head. Other head and body tissue parameters that have not been specified in P1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations described in Reference [12] and extrapolated according to the head parameters specified in P1528.

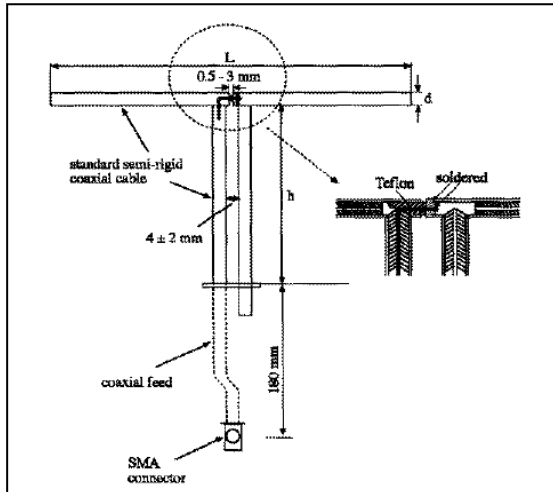
| Target Frequency   | Head         |                | Body         |                |
|--------------------|--------------|----------------|--------------|----------------|
| (MHz)              | $\epsilon_r$ | $\sigma$ (S/m) | $\epsilon_r$ | $\sigma$ (S/m) |
| 150                | 52.3         | 0.76           | 61.9         | 0.80           |
| 300                | 45.3         | 0.87           | 58.2         | 0.92           |
| 450                | 43.5         | 0.87           | 56.7         | 0.94           |
| <b>835</b>         | <b>41.5</b>  | <b>0.90</b>    | <b>55.2</b>  | <b>0.97</b>    |
| 900                | 41.5         | 0.97           | 55.0         | 1.05           |
| 915                | 41.5         | 0.98           | 55.0         | 1.06           |
| 1450               | 40.5         | 1.20           | 54.0         | 1.30           |
| 1610               | 40.3         | 1.29           | 53.8         | 1.40           |
| <b>1800 – 2000</b> | <b>40.0</b>  | <b>1.40</b>    | <b>53.3</b>  | <b>1.52</b>    |
| <b>2450</b>        | <b>39.2</b>  | <b>1.80</b>    | <b>52.7</b>  | <b>1.95</b>    |
| 3000               | 38.5         | 2.40           | 52.0         | 2.73           |
| 5800               | 35.3         | 5.27           | 48.2         | 6.00           |

( $\epsilon_r$  = relative permittivity,  $\sigma$  = conductivity and  $\rho = 1000 \text{ kg/m}^3$ )

## 4. SAR Measurement Procedure

### 4.1. SAR System Validation

#### 4.1.1. Validation Dipoles



The dipoles used is based on the IEEE-1528 standard, and is complied with mechanical and electrical specifications in line with the requirements of both IEEE and FCC Supplement C. the table below provides details for the mechanical and electrical specifications for the dipoles.

| Frequency | L (mm) | h (mm) | d (mm) |
|-----------|--------|--------|--------|
| 835MHz    | 161.0  | 89.9   | 3.6    |
| 1900MHz   | 68.0   | 39.5   | 3.6    |
| 2450MHz   | 51.5   | 30.4   | 3.6    |

#### 4.1.2. Validation Result

| System Performance Check at 835MHz &1900MHz for Head     |                                  |                        |                        |                   |
|----------------------------------------------------------|----------------------------------|------------------------|------------------------|-------------------|
| Validation Kit: D835V2-SN 4d094                          |                                  |                        |                        |                   |
| Frequency [MHz]                                          | Description                      | SAR [w/kg] 1g          | SAR [w/kg] 10g         | Tissue Temp. [°C] |
| 835 MHz                                                  | Reference result<br>± 10% window | 9.70<br>8.73 to 10.67  | 6.30<br>5.67 to 6.93   | N/A               |
|                                                          | 12-07-2011                       | 9.92                   | 6.48                   | 21.0              |
| Validation Kit: D1900V2-SN 5d121                         |                                  |                        |                        |                   |
| Frequency [MHz]                                          | Description                      | SAR [w/kg] 1g          | SAR [w/kg] 10g         | Tissue Temp. [°C] |
| 1900 MHz                                                 | Reference result<br>± 10% window | 39.8<br>35.82 to 43.78 | 21.1<br>18.99 to 23.21 | N/A               |
|                                                          | 14-07-2011                       | 42.00                  | 21.48                  | 21.0              |
| Note: All SAR values are normalized to 1W forward power. |                                  |                        |                        |                   |
| System Performance Check at 835MHz &1900MHz for Body     |                                  |                        |                        |                   |
| Validation Kit: D835V2-SN 4d094                          |                                  |                        |                        |                   |
| Frequency [MHz]                                          | Description                      | SAR [w/kg] 1g          | SAR [w/kg] 10g         | Tissue Temp. [°C] |
| 835 MHz                                                  | Reference result<br>± 10% window | 9.90<br>8.91 to 10.89  | 6.53<br>5.88 to 7.18   | N/A               |
|                                                          | 14-08-2011                       | 9.80                   | 6.32                   | 21.0              |
| Validation Kit: D1900V2-SN 5d121                         |                                  |                        |                        |                   |
| Frequency [MHz]                                          | Description                      | SAR [w/kg] 1g          | SAR [w/kg] 10g         | Tissue Temp. [°C] |
| 1900 MHz                                                 | Reference result<br>± 10% window | 41.4<br>37.26 to 45.54 | 22.3<br>20.07 to 24.53 | N/A               |
|                                                          | 14-08-2011                       | 38.88                  | 20.16                  | 21.0              |
| Note: All SAR values are normalized to 1W forward power. |                                  |                        |                        |                   |

### System Performance Check at 2450MHz for Head

Validation Dipole: D2450V2, SN: 839

| Frequency [MHz] | Description                      | SAR [w/kg] 1g          | SAR [w/kg] 10g         | Tissue Temp. [°C] |
|-----------------|----------------------------------|------------------------|------------------------|-------------------|
| 2450 MHz        | Reference result<br>± 10% window | 52.3<br>47.07 to 57.53 | 24.5<br>22.05 to 26.95 | N/A               |
|                 | 14-08-2011                       | 52.40                  | 23.28                  | 21.0              |

### System Performance Check at 2450MHz for Body

Validation Dipole: D2450V2, SN: 839

| Frequency [MHz] | Description                      | SAR [w/kg] 1g          | SAR [w/kg] 10g         | Tissue Temp. [°C] |
|-----------------|----------------------------------|------------------------|------------------------|-------------------|
| 2450 MHz        | Reference result<br>± 10% window | 51.6<br>46.44 to 56.76 | 24.2<br>21.78 to 26.62 | N/A               |
|                 | 14-08-2011                       | 48.80                  | 22.36                  | 21.0              |

Note: All SAR values are normalized to 1W forward power.

#### 4.2. SAR Measurement Procedure

The ALSAS-10U calculates SAR using the following equation,

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

$\sigma$ : represents the simulated tissue conductivity

$\rho$ : represents the tissue density

The EUT is set to transmit at the required power in line with product specification, at each frequency relating to the LOW, MID, and HIGH channel settings.

Pre-scans are made on the device to establish the location for the transmitting antenna, using a large area scan in either air or tissue simulation fluid.

The EUT is placed against the Universal Phantom where the maximum area scan dimensions are larger than the physical size of the resonating antenna. When the scan size is not large enough to cover the peak SAR distribution, it is modified by either extending the area scan size in both the X and Y directions, or the device is shifted within the predefined area.

The area scan is then run to establish the peak SAR location (interpolated resolution set at  $1\text{mm}^2$ ) which is then used to orient the center of the zoom scan. The zoom scan is then executed and the 1g and 10g averages are derived from the zoom scan volume (interpolated resolution set at  $1\text{mm}^3$ ).

## 5. SAR Exposure Limits

SAR assessments have been made in line with the requirements of IEEE-1528, FCC Supplement C, and comply with ANSI/IEEE C95.1-1992 “Uncontrolled Environments” limits. These limits apply to a location which is deemed as “Uncontrolled Environment” which can be described as a situation where the general public may be exposed to an RF source with no prior knowledge or control over their exposure.

### Limits for General Population/Uncontrolled Exposure (W/kg)

| Type Exposure                                            | Uncontrolled Environment Limit |
|----------------------------------------------------------|--------------------------------|
| Spatial Peak SAR (1g cube tissue for brain or body)      | 1.60 W/kg                      |
| Spatial Average SAR (whole body)                         | 0.08 W/kg                      |
| Spatial Peak SAR (10g for hands, feet, ankles and wrist) | 4.00 W/kg                      |

## 6. Test Equipment List

| Instrument                           | Manufacturer | Model No.     | Serial No.      | Cali. Due Date |
|--------------------------------------|--------------|---------------|-----------------|----------------|
| Stäubli Robot TX60L                  | Stäubli      | TX60L         | F10/5C90A1/A/01 | only once      |
| Controller                           | Stäubli      | SP1           | S-0034          | only once      |
| Dipole Validation Kits               | Speag        | D835V2        | 4d094           | 2012.03.15     |
| Dipole Validation Kits               | Speag        | D1900V2       | 5d121           | 2012.03.23     |
| Dipole Validation Kits               | Speag        | D2450V2       | 839             | 2012.03.12     |
| SAM Twin Phantom                     | Speag        | SAM           | TP-1561/1562    | N/A            |
| Device Holder                        | Speag        | SD 000 H01 HA | N/A             | N/A            |
| Data Acquisition Electronic          | Speag        | DAE4          | 1220            | 2012.12.03     |
| E-Field Probe                        | Speag        | EX3DV4        | 3710            | 2012.02.25     |
| SAR Software                         | Speag        | DASY5         | V5.2 Build 162  | N/A            |
| Power Amplifier                      | Mini-Circuit | ZVA-183-S+    | N657400950      | N/A            |
| Directional Coupler                  | Agilent      | 778D          | 20160           | N/A            |
| Universal Radio Communication Tester | R&S          | CMU 200       | 117088          | 2012.04.29     |
| Vector Network                       | Agilent      | E5071C        | MY48367267      | 2012.04.10     |
| Signal Generator                     | Agilent      | E4438C        | MY49070163      | 2012.04.23     |
| Power Meter                          | Anritsu      | ML2495A       | 0905006         | 2012.01.12     |
| Wide Bandwidth Sensor                | Anritsu      | MA2411B       | 0846014         | 2012.01.12     |

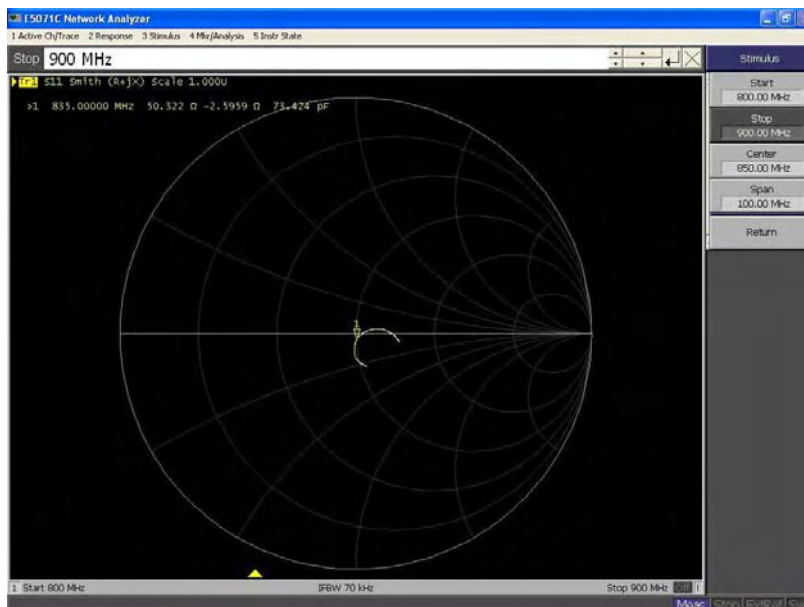
Note: Per KDB 450824 D02 requirements for dipole calibration, Quietek Lab has adopted two years calibration intervals. On annual basis, every measurement dipole has been evaluated and is in compliance with the following criteria:

1. There is no physical damage on the dipole;
2. System validation with specific dipole is within 10% of calibrated value;
3. Return-loss is within 20% of calibrated measurement (Show below);
4. Impedance is within 5Ω of calibrated measurement (Show below).

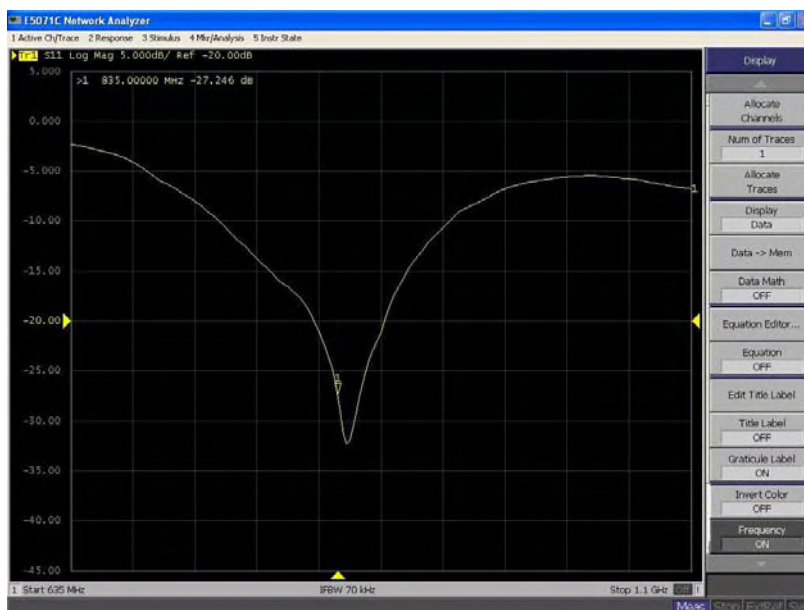
## Impedance Plot for D835V2

### 835 Head

Calibrated impedance: 52.2  $\Omega$ ; Measured impedance: 50.322  $\Omega$  (within 5 $\Omega$ )

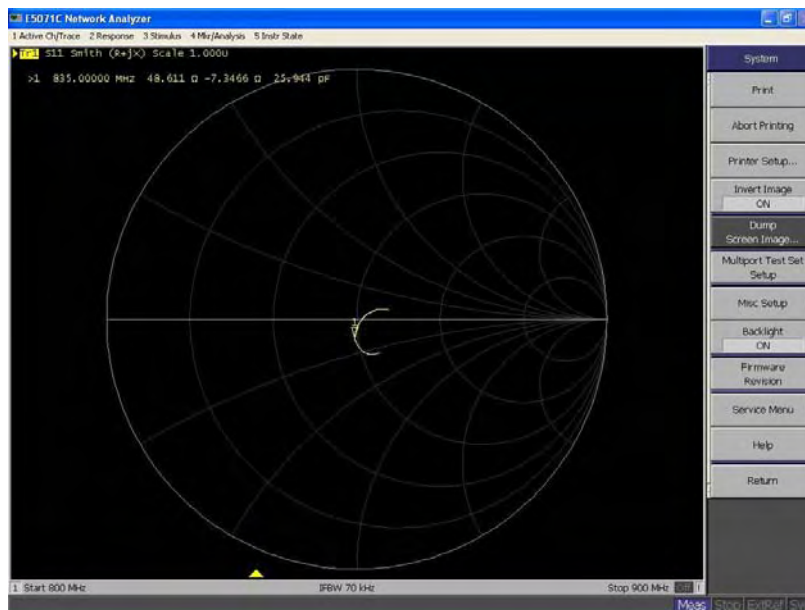


Calibrated return loss: -29.4 dB; Measured impedance: -27.246 dB (within 20%)

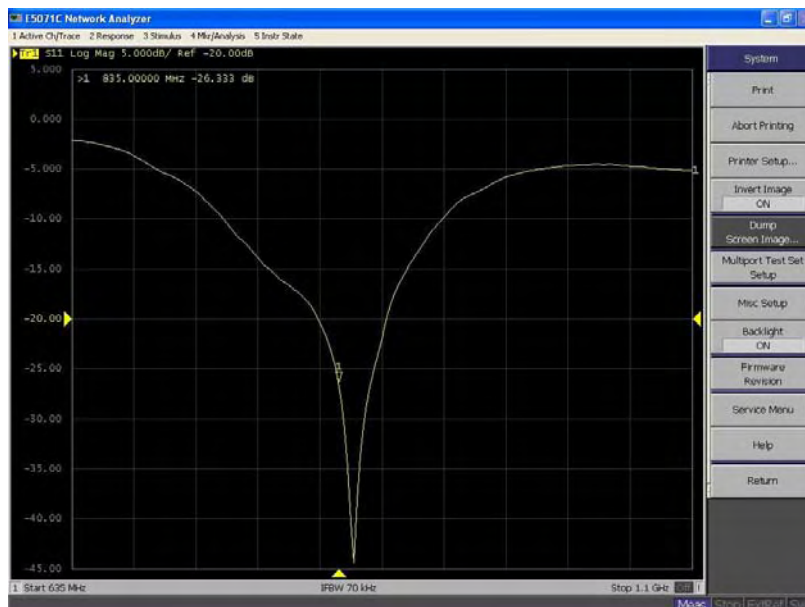


### 835 Body

Calibrated impedance: 48.0  $\Omega$ ; Measured impedance: 48.611  $\Omega$  (within 5 $\Omega$ )



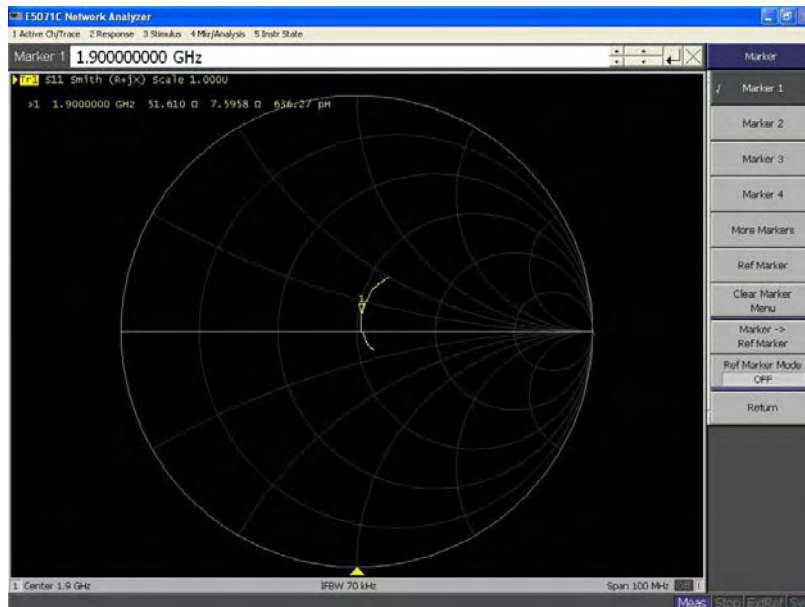
Calibrated return loss: -25.5 dB; Measured impedance: -26.333 dB (within 20%)



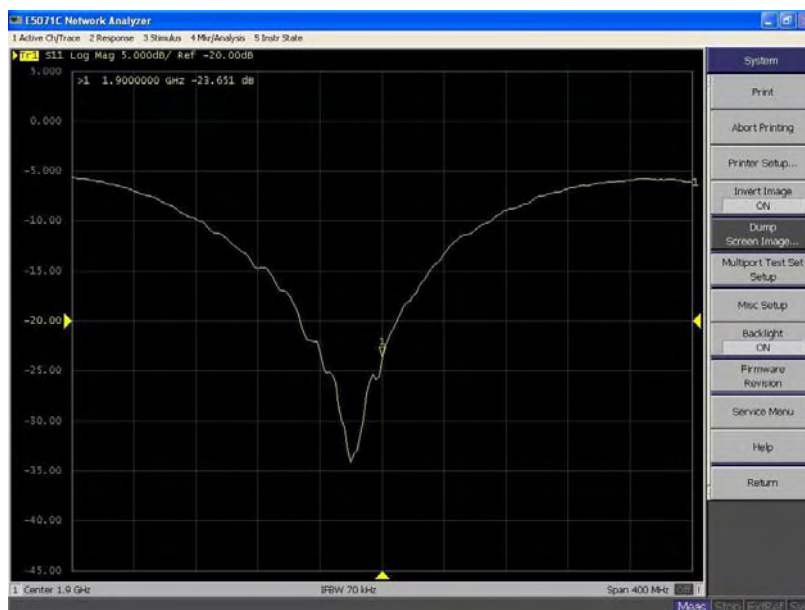
## Impedance Plot for D1900V2

### 1900 Head

Calibrated impedance: 50.6  $\Omega$ ; Measured impedance: 51.610  $\Omega$  (within 5 $\Omega$ )

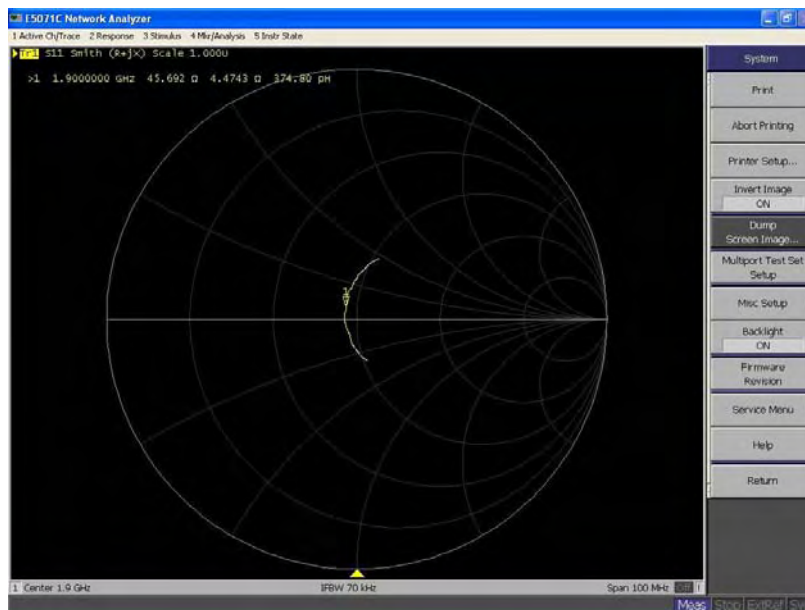


Calibrated return loss: -22.7 dB; Measured impedance: -23.651 dB (within 20%)

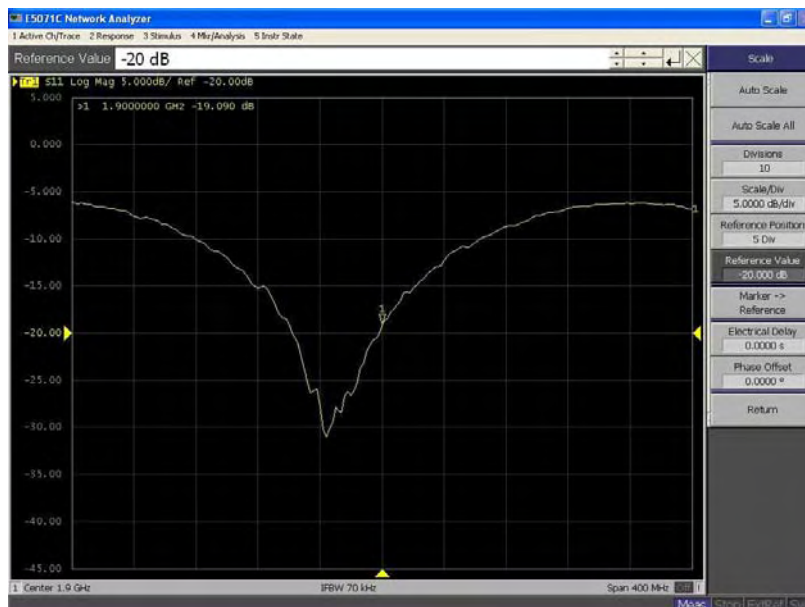


### 1900 Body

Calibrated impedance: 46.1  $\Omega$ ; Measured impedance: 45.692  $\Omega$  (within 5 $\Omega$ )



Calibrated return loss: -21.5 dB; Measured impedance: -19.090 dB (within 20%)



## 7. Measurement Uncertainty

| DASY5 Uncertainty                                                            |                  |                |            |            |             |                      |                       |                          |
|------------------------------------------------------------------------------|------------------|----------------|------------|------------|-------------|----------------------|-----------------------|--------------------------|
| Measurement uncertainty for 300 MHz to 3 GHz averaged over 1 gram / 10 gram. |                  |                |            |            |             |                      |                       |                          |
| Error Description                                                            | Uncert.<br>value | Prob.<br>Dist. | Div.       | (ci)<br>1g | (ci)<br>10g | Std.<br>Unc.<br>(1g) | Std.<br>Unc.<br>(10g) | (vi)<br>V <sub>eff</sub> |
| <b>Measurement System</b>                                                    |                  |                |            |            |             |                      |                       |                          |
| Probe Calibration                                                            | ±6.5%            | N              | 1          | 1          | 1           | ±6.5%                | ±6.5%                 | ∞                        |
| 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%                 | ∞                        |
| <b>Test Sample Related</b>                                                   |                  |                |            |            |             |                      |                       |                          |
| 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%                 | ∞                        |
| <b>Phantom and Setup</b>                                                     |                  |                |            |            |             |                      |                       |                          |
| Phantom Uncertainty                                                          | ±4.0%            | R              | $\sqrt{3}$ | 1          | 1           | ±2.3%                | ±2.3%                 | ∞                        |
| Liquid Conductivity<br>(target)                                              | ±5.0%            | R              | $\sqrt{3}$ | 0.64       | 0.43        | ±1.8%                | ±1.2%                 | ∞                        |
| Liquid Conductivity<br>(meas.)                                               | ±2.5%            | N              | 1          | 0.64       | 0.43        | ±1.6%                | ±1.1%                 | ∞                        |
| Liquid Permittivity<br>(target)                                              | ±5.0%            | R              | $\sqrt{3}$ | 0.6        | 0.49        | ±1.7%                | ±1.4%                 | ∞                        |
| Liquid Permittivity<br>(meas.)                                               | ±2.5%            | N              | 1          | 0.6        | 0.49        | ±1.5%                | ±1.2%                 | ∞                        |
| <b>Combined Std. Uncertainty</b>                                             |                  |                |            |            |             | ±11.3%               | ±11.0%                | 387                      |
| <b>Expanded STD Uncertainty</b>                                              |                  |                |            |            |             | ±22.5%               | ±22.1%                |                          |

## 8. Conducted Power Measurement

| Mode                  | Frequency (MHz) | Avg. Burst Power (dBm) | Duty Cycle Factor (dB) | Frame Power (dBm) |
|-----------------------|-----------------|------------------------|------------------------|-------------------|
| Maximum Power <SIM 1> |                 |                        |                        |                   |
| GSM850                | 824.2           | <b>32.17</b>           | -9                     | 23.17             |
|                       | 836.4           | 32.03                  | -9                     | 23.03             |
|                       | 848.8           | 31.94                  | -9                     | 22.94             |
| PCS1900               | 1850.2          | 29.75                  | -9                     | 20.75             |
|                       | 1880.0          | <b>29.98</b>           | -9                     | 20.98             |
|                       | 1909.8          | 29.84                  | -9                     | 20.84             |
| GPRS850(2 Slot)       | 824.2           | 29.50                  | -6                     | 23.50             |
|                       | 836.4           | 29.30                  | -6                     | 23.30             |
|                       | 848.8           | 29.11                  | -6                     | 23.11             |
| GPRS850(3 Slot)       | 824.2           | 27.57                  | -4.25                  | 23.32             |
|                       | 836.4           | 27.33                  | -4.25                  | 23.08             |
|                       | 848.8           | 27.14                  | -4.25                  | 22.89             |
| GPRS850(4 Slot)       | 824.2           | 25.52                  | -3                     | 22.52             |
|                       | 836.4           | 25.29                  | -3                     | 22.29             |
|                       | 848.8           | 25.12                  | -3                     | 22.12             |
| GPRS1900(2 Slot)      | 1850.2          | 28.42                  | -6                     | 22.42             |
|                       | 1880.0          | 28.48                  | -6                     | 22.48             |
|                       | 1909.8          | 28.22                  | -6                     | 22.22             |
| GPRS1900(3 Slot)      | 1850.2          | 26.95                  | -4.25                  | 22.70             |
|                       | 1880.0          | 27.00                  | -4.25                  | 22.75             |
|                       | 1909.8          | 26.75                  | -4.25                  | 22.50             |
| GPRS1900(4 Slot)      | 1850.2          | 25.92                  | -3                     | 22.92             |
|                       | 1880.0          | 26.00                  | -3                     | 23.00             |
|                       | 1909.8          | 25.72                  | -3                     | 22.72             |
| EDGE850 (2slot)       | 824.2           | 23.92                  | -6                     | 17.92             |
|                       | 836.4           | 23.66                  | -6                     | 17.66             |
|                       | 848.8           | 23.25                  | -6                     | 17.25             |
| EDGE 850 (3slot)      | 824.2           | 23.77                  | -4.25                  | 19.52             |
|                       | 836.4           | 23.28                  | -4.25                  | 19.03             |
|                       | 848.8           | 22.92                  | -4.25                  | 18.67             |
| EDGE 850 (4slot)      | 824.2           | 22.80                  | -3                     | 19.80             |
|                       | 836.4           | 22.06                  | -3                     | 19.06             |
|                       | 848.8           | 21.90                  | -3                     | 18.90             |

|                       |        |       |       |       |
|-----------------------|--------|-------|-------|-------|
| EDGE 1900 (2slot)     | 1850.2 | 24.45 | -6    | 18.45 |
|                       | 1880.0 | 24.50 | -6    | 18.50 |
|                       | 1909.8 | 24.28 | -6    | 18.28 |
| EDGE 1900 (3slot)     | 1850.2 | 23.60 | -4.25 | 19.35 |
|                       | 1880.0 | 23.93 | -4.25 | 19.68 |
|                       | 1909.8 | 23.75 | -4.25 | 19.50 |
| EDGE 1900 (4slot)     | 1850.2 | 22.59 | -3    | 19.59 |
|                       | 1880.0 | 22.92 | -3    | 19.92 |
|                       | 1909.8 | 22.86 | -3    | 19.86 |
| Maximum Power <SIM 2> |        |       |       |       |
| GSM850                | 836.4  | 32.01 | -9    | 23.01 |
| PCS1900               | 1880.0 | 29.96 | -9    | 20.96 |

Note 1: All SAR testing was done in SIM 1.

Note 2: SIM1 equal to GSM Slot, SIM 2 equal to WCDMA Slot. WCDMA compatible with GSM. So the mobile phone support two SIM card.

Note 3: According to the output value listed above, the EDGE mode was not determined for SAR testing, refer to KDB 941225.

| Mode       | 3GPP Subtest | Band II (1900MHz) Channel |       |       |            |       |       | MPR |
|------------|--------------|---------------------------|-------|-------|------------|-------|-------|-----|
|            |              | Conducted Power (dBm)     |       |       | EIRP (dBm) |       |       |     |
|            |              | 9262                      | 9400  | 9538  | 9262       | 9400  | 9538  |     |
| WCDMA R99  | 1            | 21.52                     | 21.32 | 20.51 | 19.63      | 19.97 | 18.97 | N/A |
| Rel5 HSDPA | 1            | 21.40                     | 21.23 | 20.32 | 19.03      | 19.31 | 18.95 | 0   |
|            | 2            | 21.38                     | 21.22 | 20.30 | ---        | ---   | ---   | 0   |
|            | 3            | 21.01                     | 20.81 | 20.88 | ---        | ---   | ---   | 0.5 |
|            | 4            | 20.97                     | 20.80 | 20.86 | ---        | ---   | ---   | 0.5 |
| Mode       | 3GPP Subtest | Band V (850MHz) Channel   |       |       |            |       |       | MPR |
|            |              | Conducted Power (dBm)     |       |       | ERP (dBm)  |       |       |     |
|            |              | 4132                      | 4182  | 4233  | 4132       | 4182  | 4233  |     |
| WCDMA R99  | 1            | 21.83                     | 21.82 | 21.87 | 19.11      | 19.20 | 19.93 | N/A |
| Rel5 HSDPA | 1            | 21.81                     | 21.79 | 21.80 | 18.98      | 19.10 | 19.88 | 0   |
|            | 2            | 21.79                     | 21.78 | 21.76 | ---        | ---   | ---   | 0   |
|            | 3            | 21.34                     | 21.30 | 21.36 | ---        | ---   | ---   | 0.5 |
|            | 4            | 21.33                     | 21.27 | 21.34 | ---        | ---   | ---   | 0.5 |

Note : According to the output value listed above, the HSDPA mode was not determined for SAR testing, refer to KDB 941225.

## WLAN output power

| Test Mode       | Data Rate (Mbps) | Channel No. | Frequency (MHz) | Peak Power (dBm) | Average Power (dBm) |
|-----------------|------------------|-------------|-----------------|------------------|---------------------|
| 802.11b         | 11               | 01          | 2412            | 16.87            | 11.58               |
|                 |                  | 06          | 2437            | 15.83            | 9.62                |
|                 |                  | 11          | 2462            | 15.17            | 9.67                |
| 802.11g         | 6                | 01          | 2412            | 17.49            | 10.8                |
|                 |                  | 06          | 2437            | 16.71            | 9.64                |
|                 |                  | 11          | 2462            | 15.62            | 9.42                |
| 802.11n (20MHz) | 6.5              | 01          | 2412            | 16.58            | 9.53                |
|                 |                  | 06          | 2437            | 15.23            | 8.56                |
|                 |                  | 11          | 2462            | 14.99            | 8.24                |

Note : According to the KDB 248227. SAR is not required for 802.11g channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11b channels

## 9. Test Results

### 9.1. SAR Test Results Summary

#### 9.1.1. Test position and configuration

Head SAR was performed with the device configured in the positions according to IEEE1528, and Body SAR was performed with the device 10mm from the phantom. Body SAR was also performed with the headset attached and without.

#### 9.1.2. Body SAR with Headset

Testing with the headset was performed at the position and channels that resulted in the highest body SAR. This testing was performed with GPRS transmitting with 2/3/4 uplink timeslots. This operation mode represents the maximum SAR situation, when downloading data via GPRS and listening to music by headset. SAR without the headset attached was significantly higher than with the headset, and also was verified several times and confirmed, so the final test data shown were the worst case without headset.

In the Body SAR test result table, body-worn means display of device down, body-front means display of device up.

#### 9.1.3. GPRS Operation Mode

This is a multislot class 12 device capable of 4 uplink timeslots. During the head SAR test, the device was transmitting with 1 uplink timeslot; during the body SAR test, it was transmitting with 2/3/4 uplink timeslots. Additionally, this device doesn't support dual transfer mode (DTM).

#### 9.1.4. Simultaneous Transmission Configure

| Configure mode | Bluetooth | WWAN | WLAN |
|----------------|-----------|------|------|
| 1              | X         | X    | X    |
| 2              | X         | X    |      |
| 3              |           | X    | X    |
| 4              | X         |      | X    |

Note : Bluetooth output power is -3.28dBm. Referring to KDB 648474

- 1, The power is less than Pref.
- 2, 8.9cm away from GSM antenna.
- 3, 2mm away from WLAN antenna, WLAN SAR value is less than 1.2W/kg.

Therefore, standalone SAR and simultaneous SAR for Bluetooth is not required.

### 9.1.5. Simultaneous Transmission SAR Analysis

Reference document: KDB 447498 and KDB 648474, KDB 248227.

Head Max SAR value and the sum of the 1-g SAR for WLAN & WWAN.

| Max 1-g SAR (W/kg) |       | $\Sigma$ 1-g SAR (W/kg) |
|--------------------|-------|-------------------------|
| WLAN               | WWAN  |                         |
| 0.208              | 1.366 | 1.574                   |

Body SAR value and the sum of the 1-g SAR for WLAN & WWAN.

| Max 1-g SAR (W/kg) |       | $\Sigma$ 1-g SAR (W/kg) |
|--------------------|-------|-------------------------|
| WLAN               | WWAN  |                         |
| 0.103              | 1.326 | 1.429                   |

#### Conclusion:

Simultaneous Transmission

WLAN & WWAN

Require for Simultaneous Transmission SAR with Volume Scans

No (The sum of the 1-g SAR is < 1.6 W/kg)

### 9.1.6. Hot Spot test requirement

Referring to KDB 941225 D06 v01, the EUT size > 9cm x 5cm, thus, test separation of 10 mm is required. GSM/WCDMA antenna is less than 25 mm away from mobile phone bottom and side, WLAN antenna is less than 25 mm away from mobile phone top and right side, so SAR should be measured these sides.

### 9.1.7. Test Result

|                                                                                                            |                  |           |       |                           |                     |               |              |
|------------------------------------------------------------------------------------------------------------|------------------|-----------|-------|---------------------------|---------------------|---------------|--------------|
| SAR MEASUREMENT                                                                                            |                  |           |       |                           |                     |               |              |
| Ambient Temperature (°C): 21.5 ±2                                                                          |                  |           |       | Relative Humidity (%): 52 |                     |               |              |
| Liquid Temperature (°C): 21.0 ±2                                                                           |                  |           |       | Depth of Liquid (cm):>15  |                     |               |              |
| Product: Mobile Phone                                                                                      |                  |           |       |                           |                     |               |              |
| Test Mode: GSM850 (LG Battery) <SIM 1>                                                                     |                  |           |       |                           |                     |               |              |
| Test Position Head                                                                                         | Antenna Position | Frequency |       | Frame Power (dBm)         | Power Drift (<±0.2) | SAR 1g (W/kg) | Limit (W/kg) |
|                                                                                                            |                  | Channel   | MHz   |                           |                     |               |              |
| Left-Cheek                                                                                                 | Fixed            | 128       | 824.2 | 23.17                     | --                  | --            | 1.6          |
| Left-Cheek                                                                                                 | Fixed            | 189       | 836.4 | 23.03                     | -0.049              | 0.531         | 1.6          |
| Left-Cheek                                                                                                 | Fixed            | 251       | 848.8 | 22.94                     | --                  | --            | 1.6          |
| Left-Tilted                                                                                                | Fixed            | 189       | 836.4 | 23.03                     | 0.004               | 0.257         | 1.6          |
| Right-Cheek                                                                                                | Fixed            | 128       | 824.2 | 23.17                     | --                  | --            | 1.6          |
| Right-Cheek                                                                                                | Fixed            | 189       | 836.4 | 23.03                     | 0.177               | 0.449         | 1.6          |
| Right-Cheek                                                                                                | Fixed            | 251       | 848.8 | 22.94                     | --                  | --            | 1.6          |
| Right-Tilted                                                                                               | Fixed            | 189       | 836.4 | 23.03                     | 0.011               | 0.277         | 1.6          |
| Test Mode: GSM850 (LG Battery) <SIM 2>                                                                     |                  |           |       |                           |                     |               |              |
| Left-Cheek                                                                                                 | Fixed            | 189       | 836.4 | 23.01                     | 0.037               | 0.526         | 1.6          |
| Test Mode: GSM850 (SONY Battery)                                                                           |                  |           |       |                           |                     |               |              |
| Left-Cheek                                                                                                 | Fixed            | 189       | 836.4 | 23.03                     | -0.122              | 0.491         | 1.6          |
| Note 1: when the 1-g SAR is ≤ 0.8 W/kg, testing for low and high channel is optional, refer to KDB 447498. |                  |           |       |                           |                     |               |              |
| Note 2: According to tune up procedure, the max SAR scaled value is 0.695W/kg.                             |                  |           |       |                           |                     |               |              |

|                                                                                                                               |                     |           |       |                           |                        |                  |                 |
|-------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------|-------|---------------------------|------------------------|------------------|-----------------|
| SAR MEASUREMENT                                                                                                               |                     |           |       |                           |                        |                  |                 |
| Ambient Temperature (°C): 21.5 ±2                                                                                             |                     |           |       | Relative Humidity (%): 52 |                        |                  |                 |
| Liquid Temperature (°C): 21.0 ±2                                                                                              |                     |           |       | Depth of Liquid (cm):>15  |                        |                  |                 |
| Product: Mobile Phone                                                                                                         |                     |           |       |                           |                        |                  |                 |
| Test Mode: GSM850                                                                                                             |                     |           |       |                           |                        |                  |                 |
| Test Position<br>Body<br>(1cm Gap)                                                                                            | Antenna<br>Position | Frequency |       | Frame Power<br>(dBm)      | Power Drift<br>(<±0.2) | SAR 1g<br>(W/kg) | Limit<br>(W/kg) |
|                                                                                                                               |                     | Channel   | MHz   |                           |                        |                  |                 |
| Body-worn                                                                                                                     | Fixed               | 128       | 824.2 | 23.17                     | --                     | --               | 1.6             |
| Body-worn                                                                                                                     | Fixed               | 189       | 836.4 | 23.03                     | 0.011                  | 0.780            | 1.6             |
| Body-worn                                                                                                                     | Fixed               | 251       | 848.8 | 22.94                     | --                     | --               | 1.6             |
| Test Mode: GPRS850-2slot                                                                                                      |                     |           |       |                           |                        |                  |                 |
| Body-worn                                                                                                                     | Fixed               | 128       | 824.2 | 23.50                     | --                     | --               | 1.6             |
| Body-worn                                                                                                                     | Fixed               | 189       | 836.4 | 23.30                     | -0.044                 | 0.772            | 1.6             |
| Body-worn                                                                                                                     | Fixed               | 251       | 848.8 | 23.11                     | --                     | --               | 1.6             |
| Body-front                                                                                                                    | Fixed               | 189       | 836.4 | 23.30                     | -0.016                 | 0.494            | 1.6             |
| Body-worn<br>(With Headset)                                                                                                   | Fixed               | 189       | 836.4 | 23.30                     | -0.028                 | 0.480            | 1.6             |
| Body-bottom                                                                                                                   | Fixed               | 189       | 836.4 | 23.30                     | 0.084                  | 0.083            | 1.6             |
| Body-right side                                                                                                               | Fixed               | 189       | 836.4 | 23.30                     | -0.104                 | 0.238            | 1.6             |
| Body-left side                                                                                                                | Fixed               | 189       | 836.4 | 23.30                     | -0.098                 | 0.284            | 1.6             |
| Test Mode: GPRS850-3slot                                                                                                      |                     |           |       |                           |                        |                  |                 |
| Body-worn                                                                                                                     | Fixed               | 189       | 836.4 | 23.08                     | -0.036                 | 0.737            | 1.6             |
| Test Mode: GPRS850-4slot                                                                                                      |                     |           |       |                           |                        |                  |                 |
| Body-worn                                                                                                                     | Fixed               | 189       | 836.4 | 22.29                     | -0.111                 | 0.623            | 1.6             |
| Note 1: when the 1-g SAR is $\leq 0.8$ W/kg, testing for low and high channel is optional, refer to KDB 447498.               |                     |           |       |                           |                        |                  |                 |
| Note 2: GSM antenna is less than 25 mm away from mobile phone bottom and side, so that should be tested, refer to KDB 941225. |                     |           |       |                           |                        |                  |                 |
| Note 3: According to tune up procedure, the max SAR scaled value is 1.02W/kg.                                                 |                     |           |       |                           |                        |                  |                 |

|                                                                                                            |                  |           |        |                           |                     |               |              |
|------------------------------------------------------------------------------------------------------------|------------------|-----------|--------|---------------------------|---------------------|---------------|--------------|
| SAR MEASUREMENT                                                                                            |                  |           |        |                           |                     |               |              |
| Ambient Temperature (°C): 21.5 ±2                                                                          |                  |           |        | Relative Humidity (%): 52 |                     |               |              |
| Liquid Temperature (°C): 21.0 ±2                                                                           |                  |           |        | Depth of Liquid (cm):>15  |                     |               |              |
| Product: Mobile Phone                                                                                      |                  |           |        |                           |                     |               |              |
| Test Mode: PCS1900 (LG Battery) <SIM 1>                                                                    |                  |           |        |                           |                     |               |              |
| Test Position Head                                                                                         | Antenna Position | Frequency |        | Frame Power (dBm)         | Power Drift (<±0.2) | SAR 1g (W/kg) | Limit (W/kg) |
|                                                                                                            |                  | Channel   | MHz    |                           |                     |               |              |
| Left-Cheek                                                                                                 | Fixed            | 512       | 1850.2 | 20.75                     | -0.009              | 0.870         | 1.6          |
| Left-Cheek                                                                                                 | Fixed            | 661       | 1880.0 | 20.98                     | 0.011               | 1.050         | 1.6          |
| Left-Cheek                                                                                                 | Fixed            | 810       | 1909.8 | 20.84                     | -0.006              | 0.912         | 1.6          |
| Left-Tilted                                                                                                | Fixed            | 661       | 1880.0 | 20.98                     | 0.056               | 0.313         | 1.6          |
| Right-Cheek                                                                                                | Fixed            | 512       | 1850.2 | 20.75                     | --                  | --            | 1.6          |
| Right-Cheek                                                                                                | Fixed            | 661       | 1880.0 | 20.98                     | -0.029              | 0.790         | 1.6          |
| Right-Cheek                                                                                                | Fixed            | 810       | 1909.8 | 20.84                     | --                  | --            | 1.6          |
| Right-Tilted                                                                                               | Fixed            | 661       | 1880.0 | 20.98                     | -0.019              | 0.319         | 1.6          |
| Test Mode: PCS1900 (LG Battery) <SIM 2>                                                                    |                  |           |        |                           |                     |               |              |
| Left-Cheek                                                                                                 | Fixed            | 661       | 1880.0 | 20.96                     | -0.088              | 0.995         | 1.6          |
| Test Mode: PCS1900 (SONY Battery)                                                                          |                  |           |        |                           |                     |               |              |
| Left-Cheek                                                                                                 | Fixed            | 661       | 1880.0 | 20.98                     | 0.069               | 1.020         | 1.6          |
| Note 1: when the 1-g SAR is ≤ 0.8 W/kg, testing for low and high channel is optional, refer to KDB 447498. |                  |           |        |                           |                     |               |              |
| Note 2: According to tune up procedure, the max SAR scaled value is 1.05W/kg.                              |                  |           |        |                           |                     |               |              |

|                                                                                                                               |                     |           |        |                           |                        |                  |                 |
|-------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------|--------|---------------------------|------------------------|------------------|-----------------|
| SAR MEASUREMENT                                                                                                               |                     |           |        |                           |                        |                  |                 |
| Ambient Temperature (°C): 21.5 ±2                                                                                             |                     |           |        | Relative Humidity (%): 52 |                        |                  |                 |
| Liquid Temperature (°C): 21.0 ±2                                                                                              |                     |           |        | Depth of Liquid (cm):>15  |                        |                  |                 |
| Product: Mobile Phone                                                                                                         |                     |           |        |                           |                        |                  |                 |
| Test Mode: PCS1900                                                                                                            |                     |           |        |                           |                        |                  |                 |
| Test Position<br>Body<br>(1cm Gap)                                                                                            | Antenna<br>Position | Frequency |        | Frame<br>Power (dBm)      | Power Drift<br>(<±0.2) | SAR 1g<br>(W/kg) | Limit<br>(W/kg) |
|                                                                                                                               |                     | Channel   | MHz    |                           |                        |                  |                 |
| Body-worn                                                                                                                     | Fixed               | 512       | 1850.2 | 20.75                     | --                     | --               | 1.6             |
| Body-worn                                                                                                                     | Fixed               | 661       | 1880.0 | 20.98                     | 0.077                  | 0.418            | 1.6             |
| Body-worn                                                                                                                     | Fixed               | 810       | 1909.8 | 20.84                     | --                     | --               | 1.6             |
| Test Mode: GPRS1900-2slot                                                                                                     |                     |           |        |                           |                        |                  |                 |
| Body-worn                                                                                                                     | Fixed               | 661       | 1880.0 | 22.48                     | 0.015                  | 0.585            | 1.6             |
| Test Mode: GPRS1900-3slot                                                                                                     |                     |           |        |                           |                        |                  |                 |
| Body-worn                                                                                                                     | Fixed               | 661       | 1880.0 | 22.75                     | 0.073                  | 0.653            | 1.6             |
| Test Mode: GPRS1900-4slot                                                                                                     |                     |           |        |                           |                        |                  |                 |
| Body-worn                                                                                                                     | Fixed               | 512       | 1850.2 | 22.92                     | --                     | --               | 1.6             |
| Body-worn                                                                                                                     | Fixed               | 661       | 1880.0 | 23.00                     | -0.014                 | 0.781            | 1.6             |
| Body-worn                                                                                                                     | Fixed               | 810       | 1909.8 | 22.72                     | --                     | --               | 1.6             |
| Body-front                                                                                                                    | Fixed               | 661       | 1880.0 | 23.00                     | -0.079                 | 0.649            | 1.6             |
| Body-worn<br>(With Headset)                                                                                                   | Fixed               | 661       | 1880.0 | 23.00                     | -0.088                 | 0.598            | 1.6             |
| Body-bottom                                                                                                                   | Fixed               | 661       | 1880.0 | 23.00                     | -0.127                 | 0.559            | 1.6             |
| Body-right side                                                                                                               | Fixed               | 661       | 1880.0 | 23.00                     | -0.105                 | 0.268            | 1.6             |
| Body-left side                                                                                                                | Fixed               | 661       | 1880.0 | 23.00                     | -0.160                 | 0.331            | 1.6             |
| Note 1: when the 1-g SAR is $\leq 0.8$ W/kg, testing for low and high channel is optional, refer to KDB 447498.               |                     |           |        |                           |                        |                  |                 |
| Note 2: GSM antenna is less than 25 mm away from mobile phone bottom and side, so that should be tested, refer to KDB 941225. |                     |           |        |                           |                        |                  |                 |
| Note 3: According to tune up procedure, the max SAR scaled value is 1.326W/kg.                                                |                     |           |        |                           |                        |                  |                 |

| SAR MEASUREMENT                                                                                            |                     |           |        |                         |                           |                  |                 |
|------------------------------------------------------------------------------------------------------------|---------------------|-----------|--------|-------------------------|---------------------------|------------------|-----------------|
| Ambient Temperature (°C): 21.5 ±2                                                                          |                     |           |        |                         | Relative Humidity (%): 52 |                  |                 |
| Liquid Temperature (°C): 21.0 ±2                                                                           |                     |           |        |                         | Depth of Liquid (cm):>15  |                  |                 |
| Product: Mobile Phone                                                                                      |                     |           |        |                         |                           |                  |                 |
| Test Mode: WCDMA Band II (LG Battery)                                                                      |                     |           |        |                         |                           |                  |                 |
| Test Position<br>Head                                                                                      | Antenna<br>Position | Frequency |        | Frame<br>Power<br>(dBm) | Power Drift<br>(<±0.2)    | SAR 1g<br>(W/kg) | Limit<br>(W/kg) |
|                                                                                                            |                     | Channel   | MHz    |                         |                           |                  |                 |
| Left-Cheek                                                                                                 | Fixed               | 9262      | 1852.4 | 21.52                   | -0.109                    | 1.090            | 1.6             |
| Left-Cheek                                                                                                 | Fixed               | 9400      | 1880.0 | 21.32                   | -0.169                    | 0.905            | 1.6             |
| Left-Cheek                                                                                                 | Fixed               | 9538      | 1907.6 | 20.51                   | 0.037                     | 0.618            | 1.6             |
| Left-Tilt                                                                                                  | Fixed               | 9400      | 1880.0 | 21.32                   | -0.047                    | 0.254            | 1.6             |
| Right-Cheek                                                                                                | Fixed               | 9262      | 1852.4 | 21.52                   | --                        | --               | 1.6             |
| Right-Cheek                                                                                                | Fixed               | 9400      | 1880.0 | 21.32                   | -0.185                    | 0.647            | 1.6             |
| Right-Cheek                                                                                                | Fixed               | 9538      | 1907.6 | 20.51                   | --                        | --               | 1.6             |
| Right-Tilt                                                                                                 | Fixed               | 9400      | 1880.0 | 21.32                   | 0.032                     | 0.261            | 1.6             |
| Note 1: when the 1-g SAR is ≤ 0.8 W/kg, testing for low and high channel is optional, refer to KDB 447498. |                     |           |        |                         |                           |                  |                 |
| Note 2: According to tune up procedure, the max SAR scaled value is 1.366W/kg.                             |                     |           |        |                         |                           |                  |                 |

| SAR MEASUREMENT                                                                                                                 |                     |           |        |                           |                        |                  |                 |
|---------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------|--------|---------------------------|------------------------|------------------|-----------------|
| Ambient Temperature (°C): 21.5 ±2                                                                                               |                     |           |        | Relative Humidity (%): 52 |                        |                  |                 |
| Liquid Temperature (°C): 21.0 ±2                                                                                                |                     |           |        | Depth of Liquid (cm):>15  |                        |                  |                 |
| Product: Mobile Phone                                                                                                           |                     |           |        |                           |                        |                  |                 |
| Test Mode: WCDMA Band II                                                                                                        |                     |           |        |                           |                        |                  |                 |
| Test Position<br>Body<br>(1cm Gap)                                                                                              | Antenna<br>Position | Frequency |        | Frame<br>Power<br>(dBm)   | Power Drift<br>(<±0.2) | SAR 1g<br>(W/kg) | Limit<br>(W/kg) |
|                                                                                                                                 |                     | Channel   | MHz    |                           |                        |                  |                 |
| Body-worn                                                                                                                       | Fixed               | 9262      | 1852.4 | 21.52                     | --                     | --               | 1.6             |
| Body-worn                                                                                                                       | Fixed               | 9400      | 1880.0 | 21.32                     | -0.105                 | 0.374            | 1.6             |
| Body-worn                                                                                                                       | Fixed               | 9538      | 1907.6 | 20.51                     | --                     | --               | 1.6             |
| Body-front                                                                                                                      | Fixed               | 9400      | 1880.0 | 21.32                     | 0.062                  | 0.345            | 1.6             |
| Body- front<br>(With Headset)                                                                                                   | Fixed               | 9400      | 1880.0 | 21.32                     | 0.121                  | 0.311            | 1.6             |
| Body-bottom                                                                                                                     | Fixed               | 9400      | 1880.0 | 21.32                     | -0.118                 | 0.284            | 1.6             |
| Body-right side                                                                                                                 | Fixed               | 9400      | 1880.0 | 21.32                     | -0.181                 | 0.183            | 1.6             |
| Body-left side                                                                                                                  | Fixed               | 9400      | 1880.0 | 21.32                     | -0.115                 | 0.197            | 1.6             |
| Note 1: when the 1-g SAR is ≤ 0.8 W/kg, testing for low and high channel is optional, refer to KDB 447498.                      |                     |           |        |                           |                        |                  |                 |
| Note 2: WCDMA antenna is less than 25 mm away from mobile phone bottom and side, so that should be tested, refer to KDB 941225. |                     |           |        |                           |                        |                  |                 |
| Note 3: According to tune up procedure, the max SAR scaled value is 0.469W/kg.                                                  |                     |           |        |                           |                        |                  |                 |

| SAR MEASUREMENT                                                                                            |                     |           |       |                         |                           |                  |                 |
|------------------------------------------------------------------------------------------------------------|---------------------|-----------|-------|-------------------------|---------------------------|------------------|-----------------|
| Ambient Temperature (°C): 21.5 ±2                                                                          |                     |           |       |                         | Relative Humidity (%): 52 |                  |                 |
| Liquid Temperature (°C): 21.0 ±2                                                                           |                     |           |       |                         | Depth of Liquid (cm):>15  |                  |                 |
| Product: Mobile Phone                                                                                      |                     |           |       |                         |                           |                  |                 |
| Test Mode: WCDMA Band V (LG Battery)                                                                       |                     |           |       |                         |                           |                  |                 |
| Test Position<br>Head                                                                                      | Antenna<br>Position | Frequency |       | Frame<br>Power<br>(dBm) | Power Drift<br>(<±0.2)    | SAR 1g<br>(W/kg) | Limit<br>(W/kg) |
|                                                                                                            |                     | Channel   | MHz   |                         |                           |                  |                 |
| Left-Cheek                                                                                                 | Fixed               | 4132      | 826.4 | 21.83                   | --                        | --               | 1.6             |
| Left-Cheek                                                                                                 | Fixed               | 4180      | 836.0 | 21.82                   | -0.080                    | 0.421            | 1.6             |
| Left-Cheek                                                                                                 | Fixed               | 4233      | 846.6 | 21.87                   | --                        | --               | 1.6             |
| Left-Tilt                                                                                                  | Fixed               | 4180      | 836.0 | 21.82                   | -0.023                    | 0.228            | 1.6             |
| Right-Cheek                                                                                                | Fixed               | 4132      | 826.4 | 21.83                   | --                        | --               | 1.6             |
| Right-Cheek                                                                                                | Fixed               | 4180      | 836.0 | 21.82                   | -0.103                    | 0.363            | 1.6             |
| Right-Cheek                                                                                                | Fixed               | 4233      | 846.6 | 21.87                   | --                        | --               | 1.6             |
| Right-Tilt                                                                                                 | Fixed               | 4180      | 836.0 | 21.82                   | -0.023                    | 0.208            | 1.6             |
| Note 1: when the 1-g SAR is ≤ 0.8 W/kg, testing for low and high channel is optional, refer to KDB 447498. |                     |           |       |                         |                           |                  |                 |
| Note 2: According to tune up procedure, the max SAR scaled value is 0.634W/kg.                             |                     |           |       |                         |                           |                  |                 |

| SAR MEASUREMENT                                                                                                                 |                     |           |       |                           |                        |                  |                 |
|---------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------|-------|---------------------------|------------------------|------------------|-----------------|
| Ambient Temperature (°C): 21.5 ±2                                                                                               |                     |           |       | Relative Humidity (%): 52 |                        |                  |                 |
| Liquid Temperature (°C): 21.0 ±2                                                                                                |                     |           |       | Depth of Liquid (cm):>15  |                        |                  |                 |
| Product: Mobile Phone                                                                                                           |                     |           |       |                           |                        |                  |                 |
| Test Mode: WCDMA Band V                                                                                                         |                     |           |       |                           |                        |                  |                 |
| Test Position<br>Body<br>(1cm Gap)                                                                                              | Antenna<br>Position | Frequency |       | Frame<br>Power<br>(dBm)   | Power Drift<br>(<±0.2) | SAR 1g<br>(W/kg) | Limit<br>(W/kg) |
|                                                                                                                                 |                     | Channel   | MHz   |                           |                        |                  |                 |
| Body-worn                                                                                                                       | Fixed               | 4132      | 826.4 | 21.83                     | --                     | --               | 1.6             |
| Body-worn                                                                                                                       | Fixed               | 4180      | 836.0 | 21.82                     | 0.187                  | 0.615            | 1.6             |
| Body-worn                                                                                                                       | Fixed               | 4233      | 846.6 | 21.87                     | --                     | --               | 1.6             |
| Body-front                                                                                                                      | Fixed               | 4180      | 836.0 | 21.82                     | -0.067                 | 0.416            | 1.6             |
| Body-worn<br>(With Headset)                                                                                                     | Fixed               | 4180      | 836.0 | 21.82                     | -0.026                 | 0.405            | 1.6             |
| Body-bottom                                                                                                                     | Fixed               | 4180      | 836.0 | 21.82                     | -0.042                 | 0.071            | 1.6             |
| Body-right side                                                                                                                 | Fixed               | 4180      | 836.0 | 21.82                     | -0.139                 | 0.241            | 1.6             |
| Body-left side                                                                                                                  | Fixed               | 4180      | 836.0 | 21.82                     | -0.127                 | 0.275            | 1.6             |
| Note 1: when the 1-g SAR is $\leq 0.8$ W/kg, testing for low and high channel is optional, refer to KDB 447498.                 |                     |           |       |                           |                        |                  |                 |
| Note 2: WCDMA antenna is less than 25 mm away from mobile phone bottom and side, so that should be tested, refer to KDB 941225. |                     |           |       |                           |                        |                  |                 |
| Note 3: According to tune up procedure, the max SAR scaled value is 0.927W/kg.                                                  |                     |           |       |                           |                        |                  |                 |

| SAR MEASUREMENT                                                                                                                                                                                                                                                                         |                     |           |      |                           |                        |                  |                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------|------|---------------------------|------------------------|------------------|-----------------|
| Ambient Temperature (°C): 21.5 ±2                                                                                                                                                                                                                                                       |                     |           |      | Relative Humidity (%): 52 |                        |                  |                 |
| Liquid Temperature (°C): 21.0 ±2                                                                                                                                                                                                                                                        |                     |           |      | Depth of Liquid (cm):>15  |                        |                  |                 |
| Product: Mobile Phone                                                                                                                                                                                                                                                                   |                     |           |      |                           |                        |                  |                 |
| Test Mode: 802.11b                                                                                                                                                                                                                                                                      |                     |           |      |                           |                        |                  |                 |
| Test Position<br>Head                                                                                                                                                                                                                                                                   | Antenna<br>Position | Frequency |      | Average<br>Power (dBm)    | Power Drift<br>(<±0.2) | SAR 1g<br>(W/kg) | Limit<br>(W/kg) |
|                                                                                                                                                                                                                                                                                         |                     | Channel   | MHz  |                           |                        |                  |                 |
| Left-Cheek                                                                                                                                                                                                                                                                              | Fixed               | 1         | 2412 | 11.58                     | -0.197                 | 0.100            | 1.6             |
| Left-Cheek                                                                                                                                                                                                                                                                              | Fixed               | 6         | 2437 | 9.62                      | --                     | --               | 1.6             |
| Left-Cheek                                                                                                                                                                                                                                                                              | Fixed               | 11        | 2462 | 9.67                      | --                     | --               | 1.6             |
| Right-Cheek                                                                                                                                                                                                                                                                             | Fixed               | 1         | 2412 | 11.58                     | -0.179                 | 0.208            | 1.6             |
| Right-Cheek                                                                                                                                                                                                                                                                             | Fixed               | 6         | 2437 | 9.62                      | --                     | --               | 1.6             |
| Right-Cheek                                                                                                                                                                                                                                                                             | Fixed               | 11        | 2462 | 9.67                      | --                     | --               | 1.6             |
| Note: When the SAR procedures require multiple channels to be tested and the 1-g SAR for the highest output channel is less than 0.8 W/kg, where the transmission band corresponding to all channels is ≤ 100 MHz, testing for the other channels is not required, refer to KDB 447498. |                     |           |      |                           |                        |                  |                 |

| SAR MEASUREMENT                                                                                                                                                                                                                                                                           |                     |           |      |                           |                        |                  |                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------|------|---------------------------|------------------------|------------------|-----------------|
| Ambient Temperature (°C): 21.5 ±2                                                                                                                                                                                                                                                         |                     |           |      | Relative Humidity (%): 52 |                        |                  |                 |
| Liquid Temperature (°C): 21.0 ±2                                                                                                                                                                                                                                                          |                     |           |      | Depth of Liquid (cm):>15  |                        |                  |                 |
| Product: Mobile Phone                                                                                                                                                                                                                                                                     |                     |           |      |                           |                        |                  |                 |
| Test Mode: 802.11b                                                                                                                                                                                                                                                                        |                     |           |      |                           |                        |                  |                 |
| Test Position<br>Body<br>(1cm Gap)                                                                                                                                                                                                                                                        | Antenna<br>Position | Frequency |      | Average<br>Power (dBm)    | Power Drift<br>(<±0.2) | SAR 1g<br>(W/kg) | Limit<br>(W/kg) |
|                                                                                                                                                                                                                                                                                           |                     | Channel   | MHz  |                           |                        |                  |                 |
| Body-worn                                                                                                                                                                                                                                                                                 | Fixed               | 1         | 2412 | 11.58                     | -0.177                 | 0.103            | 1.6             |
| Body-worn                                                                                                                                                                                                                                                                                 | Fixed               | 6         | 2437 | 9.62                      | --                     | --               | 1.6             |
| Body-worn                                                                                                                                                                                                                                                                                 | Fixed               | 11        | 2462 | 9.67                      | --                     | --               | 1.6             |
| Body-front                                                                                                                                                                                                                                                                                | Fixed               | 1         | 2412 | 11.58                     | -0.152                 | 0.044            | 1.6             |
| Body-top                                                                                                                                                                                                                                                                                  | Fixed               | 1         | 2412 | 11.58                     | -0.149                 | 0.037            | 1.6             |
| Body-left side                                                                                                                                                                                                                                                                            | Fixed               | 1         | 2412 | 11.58                     | -0.197                 | 0.036            | 1.6             |
| Note 1: When the SAR procedures require multiple channels to be tested and the 1-g SAR for the highest output channel is less than 0.8 W/kg, where the transmission band corresponding to all channels is ≤ 100 MHz, testing for the other channels is not required, refer to KDB 447498. |                     |           |      |                           |                        |                  |                 |
| Note 2: WLAN antenna is less than 25 mm away from mobile phone top and right side, so that should be tested, refer to KDB 941225.                                                                                                                                                         |                     |           |      |                           |                        |                  |                 |

## Appendix A. SAR System Validation Data

Date/Time: 12-07-2011

Test Laboratory: QuieTek Lab

System Check Head 835MHz

**DUT: Dipole 835 MHz D835V2; Type: D835V2**

Communication System: CW; Communication System Band: D835 (835.0 MHz); Duty Cycle: 1:1;

Frequency: 835 MHz; Medium parameters used:  $f = 835$  MHz;  $\sigma = 0.89$  mho/m;  $\epsilon_r = 41.1$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;

Phantom section: Flat Section ; Input Power=250mW

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

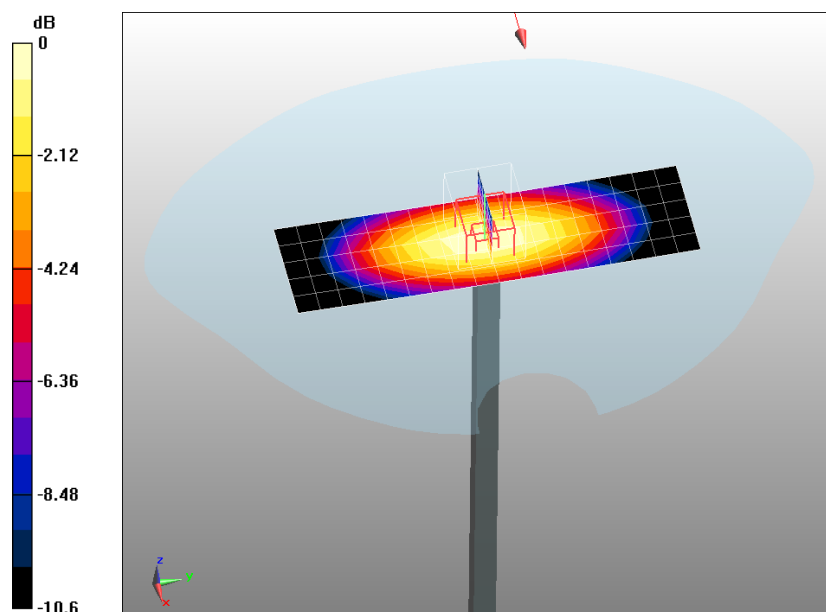
- Probe: EX3DV4 - SN3710; ConvF(3.843, 4.303, 4.435); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/System Check GSM850 Head/Area Scan (6x19x1):** Measurement grid: dx=10mm, dy=10mm, Maximum value of SAR (measured) = 2.55 mW/g

**Configuration/System Check GSM850 Head/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm, Reference Value = 55 V/m; Power Drift = -0.059 dB

Peak SAR (extrapolated) = 3.71 W/kg

**SAR(1 g) = 2.48 mW/g; SAR(10 g) = 1.62 mW/g** Maximum value of SAR (measured) = 2.67 mW/g



0 dB = 2.67mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

System Check Body 835MHz

**DUT: Dipole 835 MHz D835V2; Type: D835V2**

Communication System: CW; Communication System Band: D835 (835.0 MHz); Duty Cycle: 1:1;

Frequency: 835 MHz; Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 1 \text{ mho/m}$ ;  $\epsilon_r = 54.5$ ;  $\rho = 1000 \text{ kg/m}^3$  ;

Phantom section: Flat Section ; Input Power=250mW

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

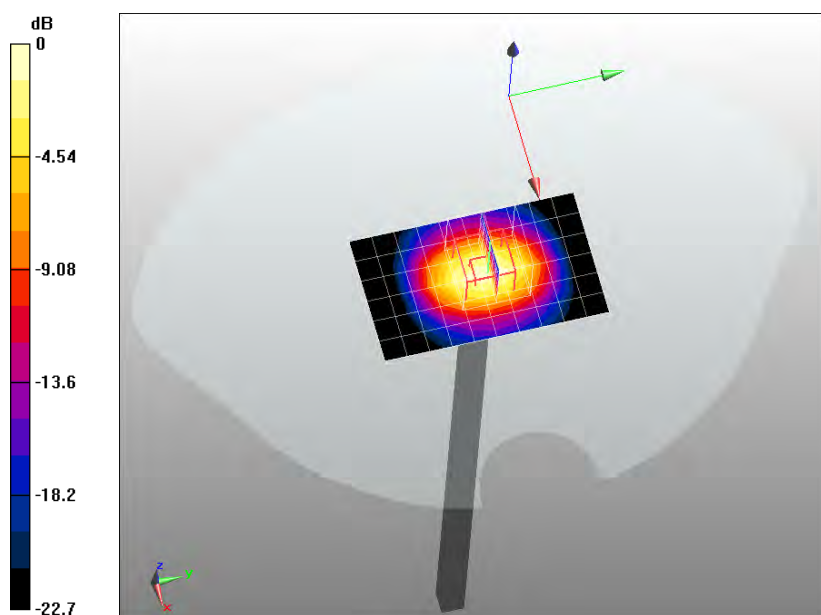
- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/System Check GSM835 Body/Area Scan (8x16x1):** Measurement grid:  $dx=10\text{mm}$ ,  $dy=10\text{mm}$ , Maximum value of SAR (measured) = 2.58 mW/g

**Configuration/System Check GSM835 Body/Zoom Scan (7x7x7)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$ , Reference Value = 51.8 V/m; Power Drift = -0.076 dB

Peak SAR (extrapolated) = 3.72 W/kg

**SAR(1 g) = 2.45 mW/g; SAR(10 g) = 1.58 mW/g** Maximum value of SAR (measured) = 2.64 mW/g



0 dB = 2.64mW/g

Date/Time: 14-07-2011

Test Laboratory: QuieTek Lab

System Check Head 1900MHz

**DUT: Dipole 1900 MHz D1900V2; Type: D1900V2**

Communication System: CW; Communication System Band: D1900 (1900.0 MHz); Duty Cycle: 1:1;

Frequency: 1900 MHz; Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.45$  mho/m;  $\epsilon_r = 39$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;

Phantom section: Flat Section ; Input Power=250mW

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.609, 4.015, 4.146); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

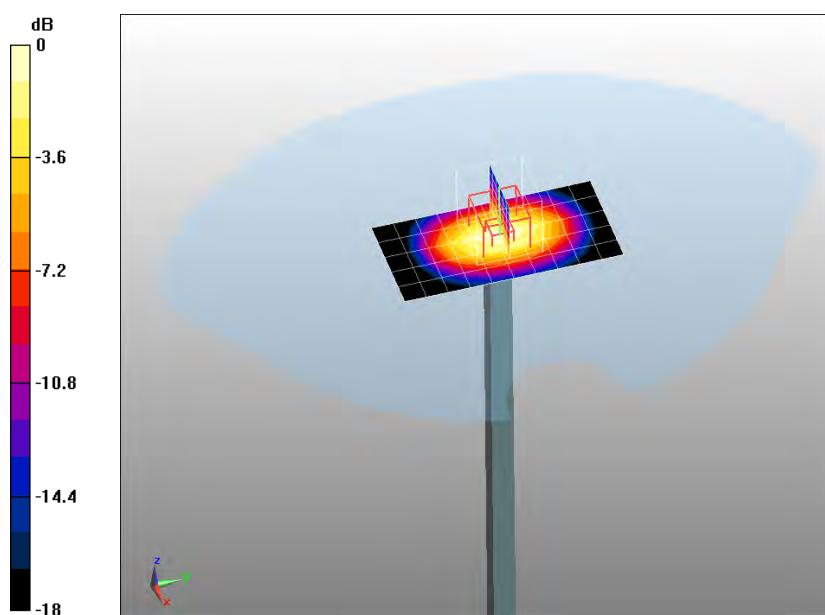
**Configuration/System Check PCS1900 Head/Area Scan (6x11x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 11.4 mW/g

**Configuration/System Check PCS1900 Head/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm, Reference Value = 88.4 V/m; Power Drift = 0.069 dB

Peak SAR (extrapolated) = 19.8 W/kg

**SAR(1 g) = 10.5 mW/g; SAR(10 g) = 5.37 mW/g** Maximum value of SAR (measured) = 11.9 mW/g



0 dB = 11.9mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

System Check Body 1900MHz

**DUT: Dipole 1900 MHz D1900V2; Type: D1900V2**

Communication System: CW; Communication System Band: D1900 (1900.0 MHz); Duty Cycle: 1:1;

Frequency: 1900 MHz; Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.52$  mho/m;  $\epsilon_r = 51.8$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;

Phantom section: Flat Section ; Input Power=250mW

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

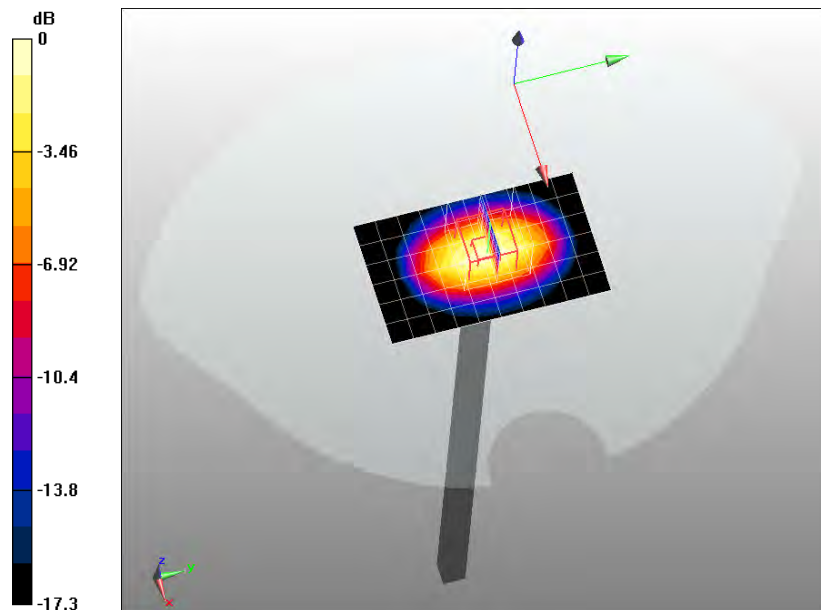
- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/System Check PCS1900 Body/Area Scan (7x11x1):** Measurement grid: dx=10mm, dy=10mm, Maximum value of SAR (measured) = 10.7 mW/g

**Configuration/System Check PCS1900 Body/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm, Reference Value = 84.3 V/m; Power Drift = 0.059 dB

Peak SAR (extrapolated) = 17.8 W/kg

**SAR(1 g) = 9.72 mW/g; SAR(10 g) = 5.04 mW/g** Maximum value of SAR (measured) = 11 mW/g



0 dB = 11mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

System Check Head 2450MHz

**DUT: Dipole 2450 MHz D2450V2; Type: D2450V2**

Communication System: CW; Communication System Band: D2450 (2450.0 MHz); Duty Cycle: 1:1;

Frequency: 2450 MHz; Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.85$  mho/m;  $\epsilon_r = 38.1$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;

Phantom section: Flat Section ; Input Power=250mW

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.214, 3.653, 3.661); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

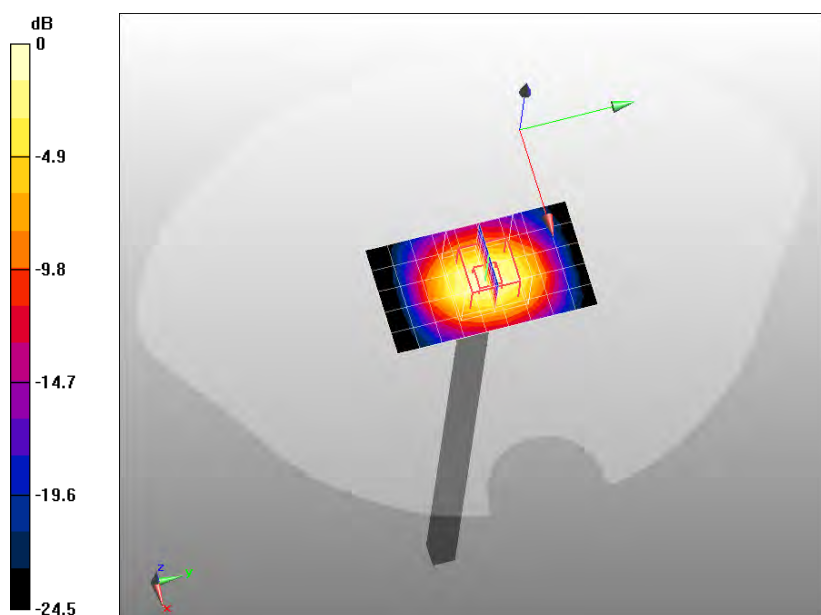
**Configuration/Head 2450MHz/Area Scan (6x10x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 13.5 mW/g

**Configuration/Head 2450MHz/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm, Reference Value = 89.4 V/m; Power Drift = -0.024 dB

Peak SAR (extrapolated) = 28.9 W/kg

**SAR(1 g) = 13.1 mW/g; SAR(10 g) = 5.82 mW/g** Maximum value of SAR (measured) = 15 mW/g



0 dB = 15mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

System Check Body 2450MHz

**DUT: Dipole 2450 MHz D2450V2; Type: D2450V2**

Communication System: CW; Communication System Band: D2450 (2450.0 MHz); Duty Cycle: 1:1;

Frequency: 2450 MHz; Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.96$  mho/m;  $\epsilon_r = 50.9$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;

Phantom section: Flat Section ; Input Power=250mW

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.702, 4.126, 4.265); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

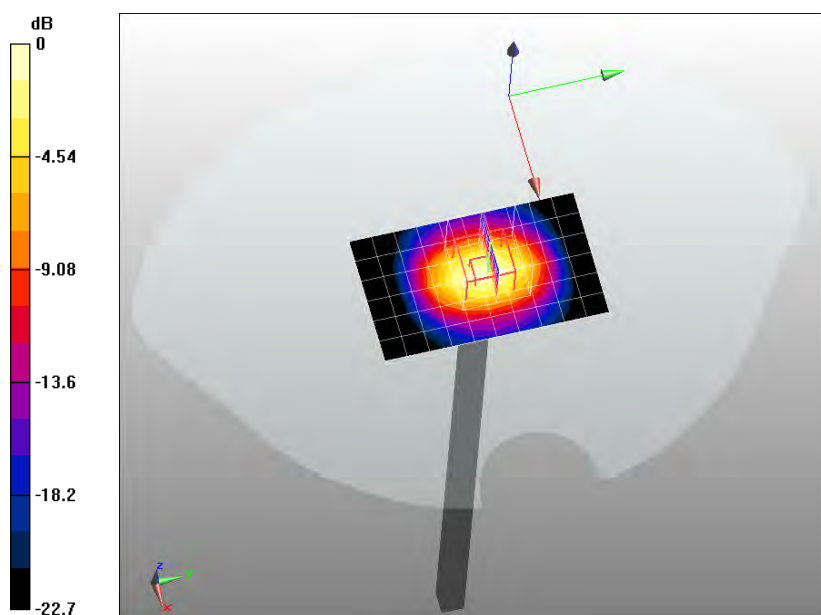
**Configuration/Body 2450MHz/Area Scan (7x11x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 13.7 mW/g

**Configuration/Body 2450MHz/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm, Reference Value = 84.2 V/m; Power Drift = 0.029 dB

Peak SAR (extrapolated) = 25 W/kg

**SAR(1 g) = 12.2 mW/g; SAR(10 g) = 5.59 mW/g** Maximum value of SAR (measured) = 14 mW/g



0 dB = 14mW/g

## Appendix B. SAR measurement Data

Date/Time: 12-07-2011

Test Laboratory: QuieTek Lab

GSM850 Mid Touch-Left

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: Generic GSM; Communication System Band: GSM 850 (824.0 - 849.0 MHz); Duty Cycle: 1:8.3; Frequency: 836.4 MHz; Medium parameters used:  $f = 836.4$  MHz;  $\sigma = 0.89$  mho/m;  $\epsilon_r = 41.1$ ;  $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Left Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.843, 4.303, 4.435); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

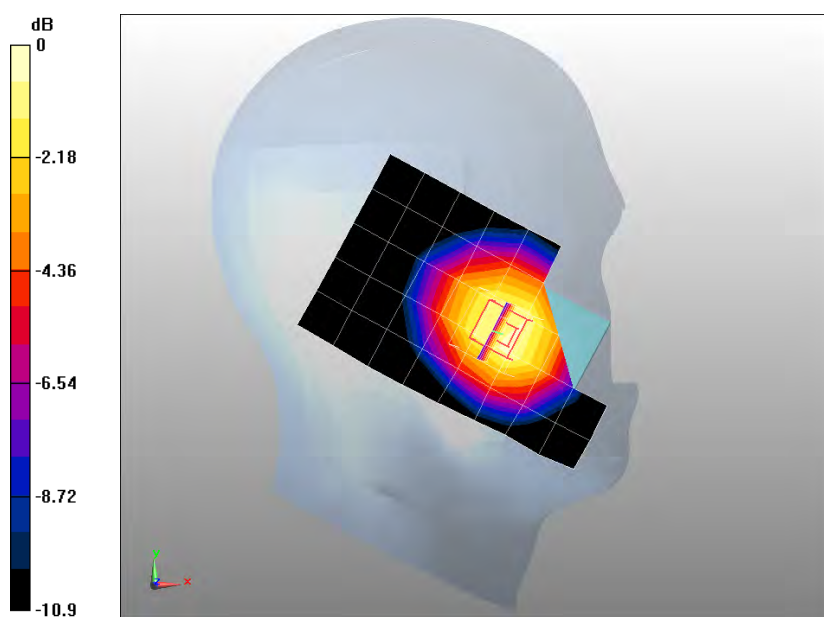
**Configuration/GSM850 Mid Touch-Left/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

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

**Configuration/GSM850 Mid Touch-Left/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 6.56 V/m; Power Drift = -0.049 dB

Peak SAR (extrapolated) = 0.665 W/kg

**SAR(1 g) = 0.531 mW/g; SAR(10 g) = 0.386 mW/g** Maximum value of SAR (measured) = 0.562 mW/g



0 dB = 0.562mW/g

Date/Time: 12-07-2011

Test Laboratory: QuieTek Lab

GSM850 Mid Tilt-Left

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: Generic GSM; Communication System Band: GSM 850 (824.0 - 849.0 MHz); Duty Cycle: 1:8.3; Frequency: 836.4 MHz; Medium parameters used:  $f = 836.4$  MHz;  $\sigma = 0.89$  mho/m;  $\epsilon_r = 41.1$ ;  $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Left Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.843, 4.303, 4.435); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

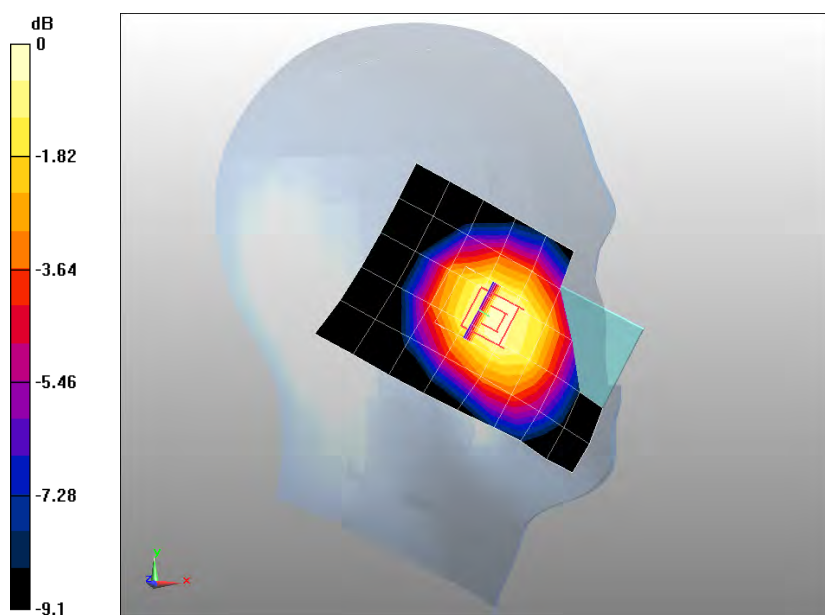
**Configuration/GSM850 Mid Tilt-Left/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

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

**Configuration/GSM850 Mid Tilt-Left/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 10.1 V/m; Power Drift = 0.004 dB

Peak SAR (extrapolated) = 0.316 W/kg

**SAR(1 g) = 0.257 mW/g; SAR(10 g) = 0.195 mW/g** Maximum value of SAR (measured) = 0.269 mW/g



0 dB = 0.269mW/g

Date/Time: 12-07-2011

Test Laboratory: QuieTek Lab

GSM850 Mid Touch-Right

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: Generic GSM; Communication System Band: GSM 850 (824.0 - 849.0 MHz); Duty Cycle: 1:8.3; Frequency: 836.4 MHz; Medium parameters used:  $f = 836.4$  MHz;  $\sigma = 0.89$  mho/m;  $\epsilon_r = 41.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>; Phantom section: Right Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.843, 4.303, 4.435); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

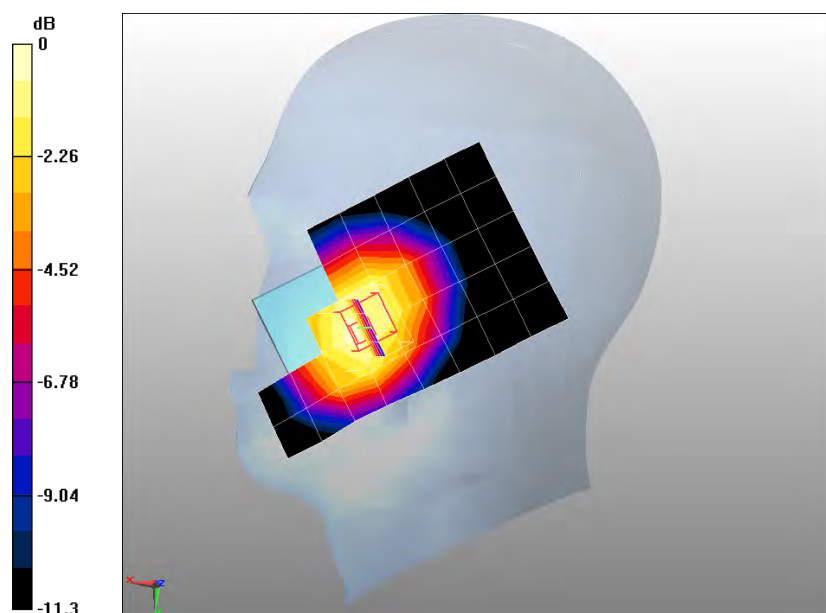
**Configuration/GSM850 Mid Touch-Right/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

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

**Configuration/GSM850 Mid Touch-Right/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 6.03 V/m; Power Drift = 0.177 dB

Peak SAR (extrapolated) = 0.656 W/kg

**SAR(1 g) = 0.449 mW/g; SAR(10 g) = 0.320 mW/g** Maximum value of SAR (measured) = 0.474 mW/g



0 dB = 0.474mW/g

Date/Time: 12-07-2011

Test Laboratory: QuieTek Lab

GSM850 Mid Tilt-Right

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: Generic GSM; Communication System Band: GSM 850 (824.0 - 849.0 MHz); Duty Cycle: 1:8.3; Frequency: 836.4 MHz; Medium parameters used:  $f = 836.4$  MHz;  $\sigma = 0.89$  mho/m;  $\epsilon_r = 41.1$ ;  $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Right Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.843, 4.303, 4.435); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

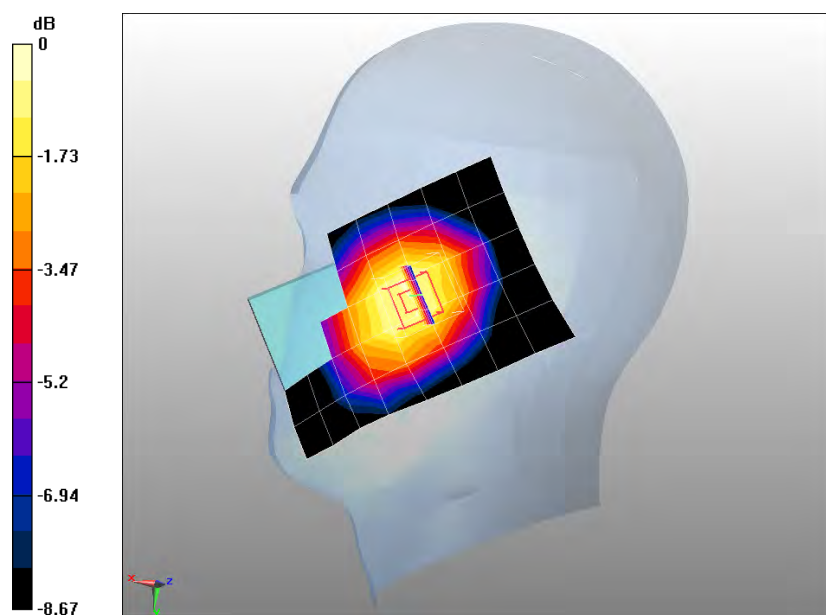
**Configuration/GSM850 Mid Tilt-Right/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

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

**Configuration/GSM850 Mid Tilt-Right/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 12.7 V/m; Power Drift = 0.011 dB

Peak SAR (extrapolated) = 0.350 W/kg

**SAR(1 g) = 0.277 mW/g; SAR(10 g) = 0.206 mW/g** Maximum value of SAR (measured) = 0.291 mW/g



0 dB = 0.291mW/g

Date/Time: 12-07-2011

Test Laboratory: QuieTek Lab

GSM850 Mid Touch-Left <SIM 2>

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: Generic GSM; Communication System Band: GSM 850 (824.0 - 849.0 MHz); Duty Cycle: 1:8.3; Frequency: 836.4 MHz; Medium parameters used:  $f = 836.4$  MHz;  $\sigma = 0.89$  mho/m;  $\epsilon_r = 41.1$ ;  $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Left Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.843, 4.303, 4.435); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

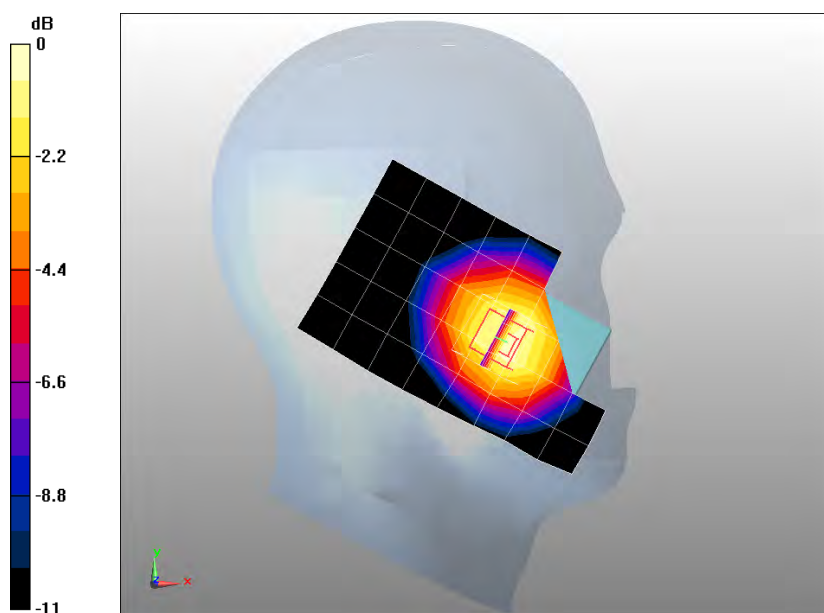
**Configuration/GSM850 Mid Touch-Left/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

Maximum value of SAR (measured) = 0.517 mW/g

**Configuration/GSM850 Mid Touch-Left/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 5.56 V/m; Power Drift = 0.037 dB

Peak SAR (extrapolated) = 0.656 W/kg

**SAR(1 g) = 0.526 mW/g; SAR(10 g) = 0.386 mW/g** Maximum value of SAR (measured) = 0.558 mW/g



0 dB = 0.558mW/g

Date/Time: 12-07-2011

Test Laboratory: QuieTek Lab

GSM850 Mid Touch-Left (SONY Battery)

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: Generic GSM; Communication System Band: GSM 850 (824.0 - 849.0 MHz); Duty Cycle: 1:8.3; Frequency: 836.4 MHz; Medium parameters used:  $f = 836.4$  MHz;  $\sigma = 0.89$  mho/m;  $\epsilon_r = 41.1$ ;  $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Left Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.843, 4.303, 4.435); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

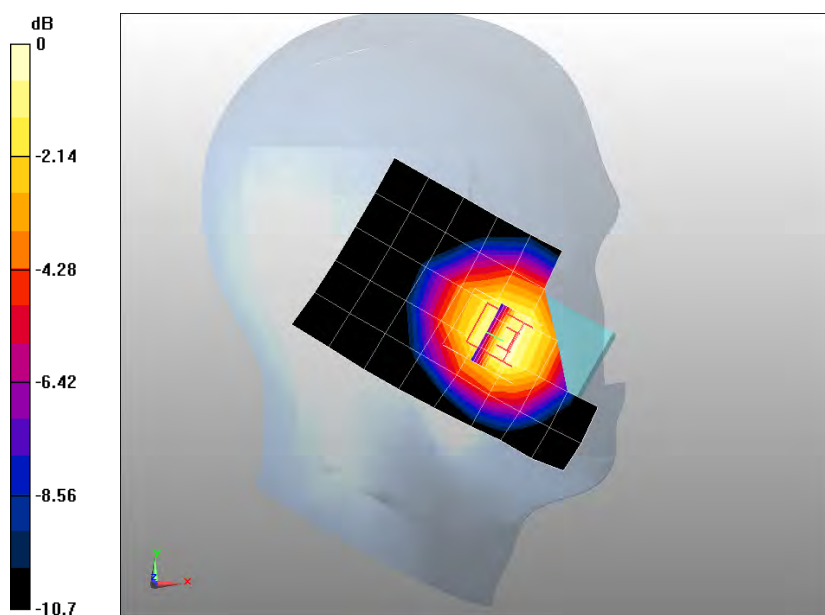
**Configuration/GSM850 Mid Touch-Left/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

Maximum value of SAR (measured) = 0.463 mW/g

**Configuration/GSM850 Mid Touch-Left/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 5.77 V/m; Power Drift = -0.122 dB

Peak SAR (extrapolated) = 0.613 W/kg

**SAR(1 g) = 0.491 mW/g; SAR(10 g) = 0.360 mW/g** Maximum value of SAR (measured) = 0.520 mW/g



0 dB = 0.520mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

GSM850 Mid Body-Back

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: Generic GSM; Communication System Band: GSM 850 (824.0 - 849.0 MHz); Duty Cycle: 1:8.3; Frequency: 836.4 MHz; Medium parameters used:  $f = 836.4$  MHz;  $\sigma = 1$  mho/m;  $\epsilon_r = 54.5$ ;  $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

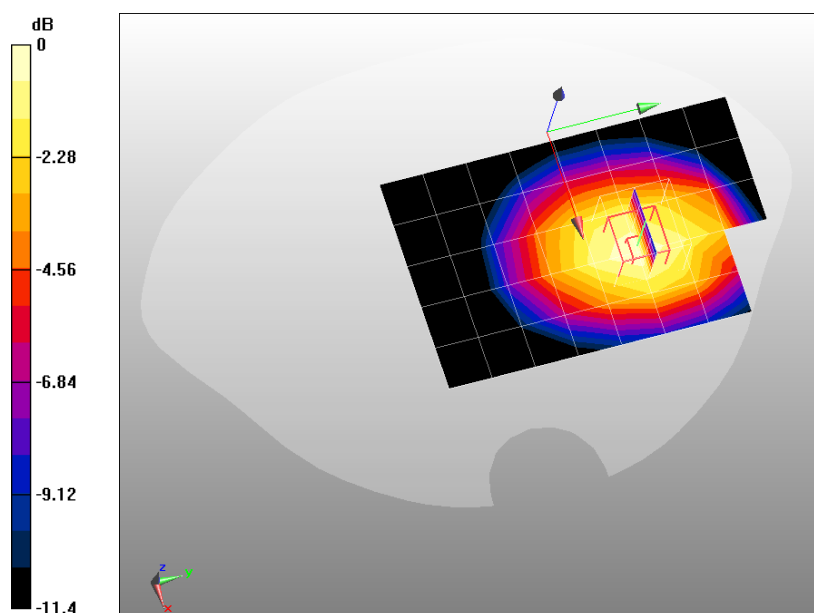
**Configuration/GSM850 Mid Body-Back/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

Maximum value of SAR (measured) = 0.831 mW/g

**Configuration/GSM850 Mid Body-Back/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 8.01 V/m; Power Drift = 0.011 dB

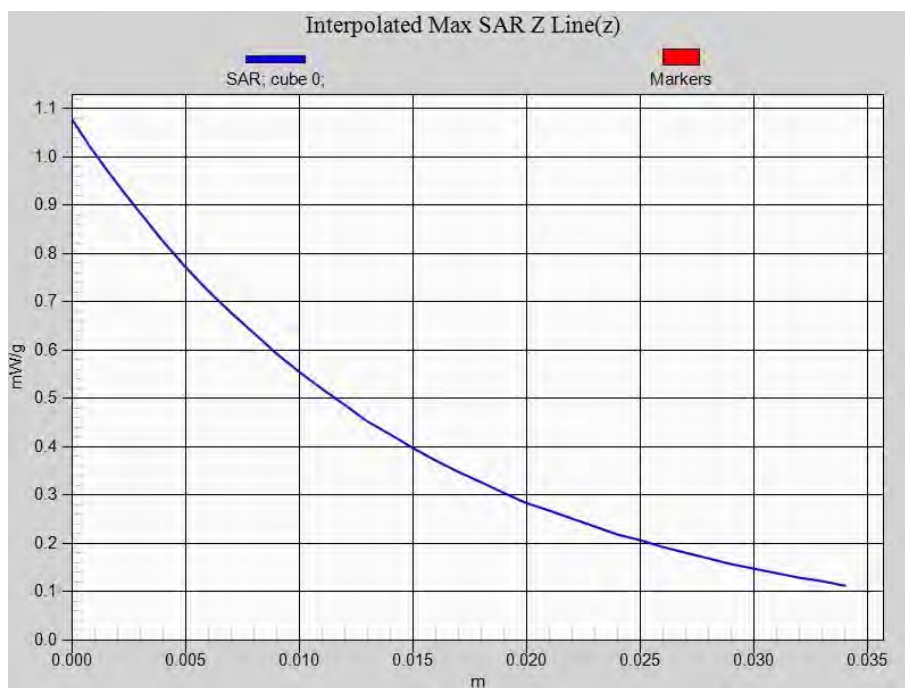
Peak SAR (extrapolated) = 1.08 W/kg

**SAR(1 g) = 0.780 mW/g; SAR(10 g) = 0.545 mW/g** Maximum value of SAR (measured) = 0.826 mW/g



0 dB = 0.826mW/g

# Z-Axis Plot



Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

GPRS850 Mid Body-Back(2up)

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: GPRS/EGPRS-2 Slot; Communication System Band: GSM850; Duty Cycle: 1:4.2 ;

Frequency: 836.4 MHz; Medium parameters used:  $f = 836.4$  MHz;  $\sigma = 1$  mho/m;  $\epsilon_r = 54.5$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;

Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/GPRS850 Mid Body-Back/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

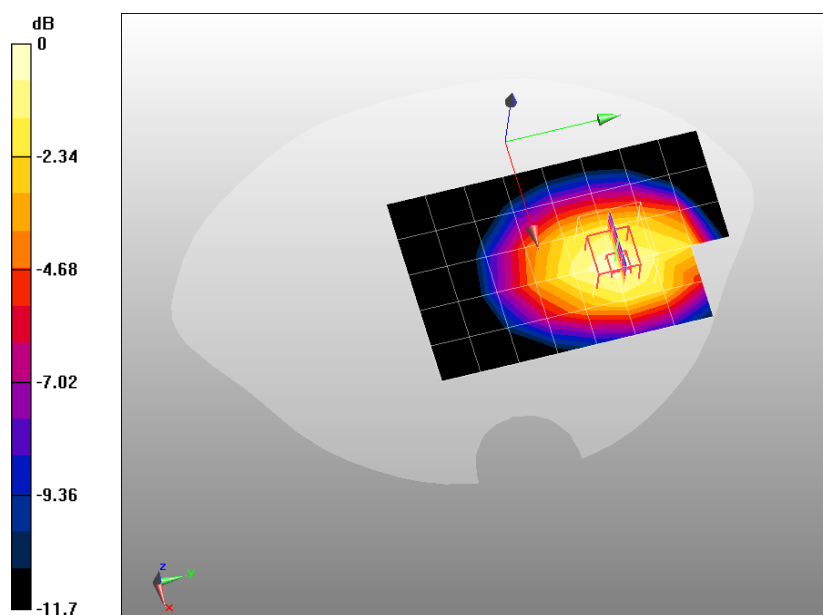
Maximum value of SAR (measured) = 0.819 mW/g

**Configuration/GPRS850 Mid Body-Back/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm,

dy=8mm, dz=5mm, Reference Value = 7.64 V/m; Power Drift = -0.044 dB

Peak SAR (extrapolated) = 1.1 W/kg

**SAR(1 g) = 0.772 mW/g; SAR(10 g) = 0.538 mW/g** Maximum value of SAR (measured) = 0.814 mW/g



0 dB = 0.814mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

GPRS850 Mid Body-Front(2up)

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: GPRS/EGPRS-2 Slot; Communication System Band: GSM850; Duty Cycle: 1:4.2 ;

Frequency: 836.4 MHz; Medium parameters used:  $f = 836.4$  MHz;  $\sigma = 1$  mho/m;  $\epsilon_r = 54.5$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;

Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/GPRS850 Mid Body-Front/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

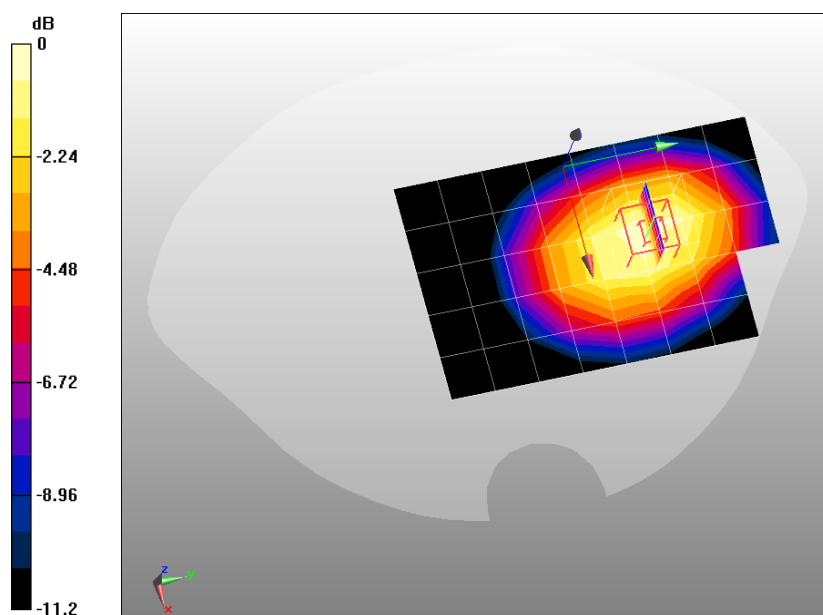
Maximum value of SAR (measured) = 0.507 mW/g

**Configuration/GPRS850 Mid Body-Front/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm,

dy=8mm, dz=5mm, Reference Value = 6.52 V/m; Power Drift = -0.016 dB

Peak SAR (extrapolated) = 0.697 W/kg

**SAR(1 g) = 0.494 mW/g; SAR(10 g) = 0.348 mW/g** Maximum value of SAR (measured) = 0.523 mW/g



0 dB = 0.523mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

GPRS850 Mid Body-Back(2up)(With headset)

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: GPRS/EGPRS-2 Slot; Communication System Band: GSM850; Duty Cycle: 1:4.2 ;

Frequency: 836.4 MHz; Medium parameters used:  $f = 836.4$  MHz;  $\sigma = 1$  mho/m;  $\epsilon_r = 54.5$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;

Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/GPRS850 Mid Body-Back/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

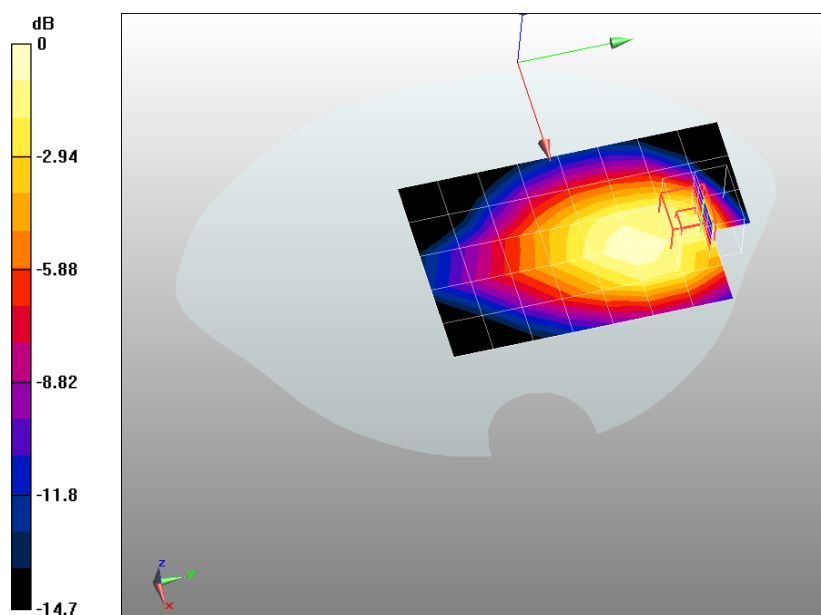
Maximum value of SAR (measured) = 0.520 mW/g

**Configuration/GPRS850 Mid Body-Back/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm,

dy=8mm, dz=5mm, Reference Value = 9.5 V/m; Power Drift = -0.028 dB

Peak SAR (extrapolated) = 0.788 W/kg

**SAR(1 g) = 0.480 mW/g; SAR(10 g) = 0.293 mW/g** Maximum value of SAR (measured) = 0.501 mW/g



0 dB = 0.501mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

GPRS850 Mid Body-Bottom(2up)

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: GPRS/EGPRS-2 Slot; Communication System Band: GSM850; Duty Cycle: 1:4.2 ;  
Frequency: 836.4 MHz; Medium parameters used:  $f = 836.4$  MHz;  $\sigma = 1$  mho/m;  $\epsilon_r = 54.5$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;  
Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

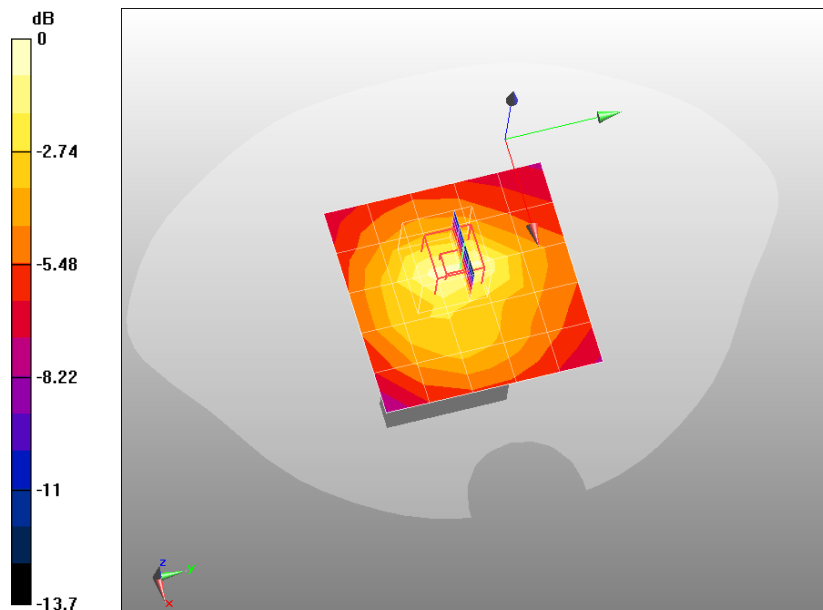
**Configuration/GPRS850 Mid Body-Bottom/Area Scan (6x6x1):** Measurement grid: dx=20mm, dy=20mm

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

**Configuration/GPRS850 Mid Body-Bottom/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 7.86 V/m; Power Drift = 0.084 dB

Peak SAR (extrapolated) = 0.149 W/kg

**SAR(1 g) = 0.083 mW/g; SAR(10 g) = 0.048 mW/g** Maximum value of SAR (measured) = 0.091 mW/g



0 dB = 0.091mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

GPRS850 Mid Body-Right Side(2up)

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: GPRS/EGPRS-2 Slot; Communication System Band: GSM850; Duty Cycle: 1:4.2 ;

Frequency: 836.4 MHz; Medium parameters used:  $f = 836.4$  MHz;  $\sigma = 1$  mho/m;  $\epsilon_r = 54.5$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;

Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

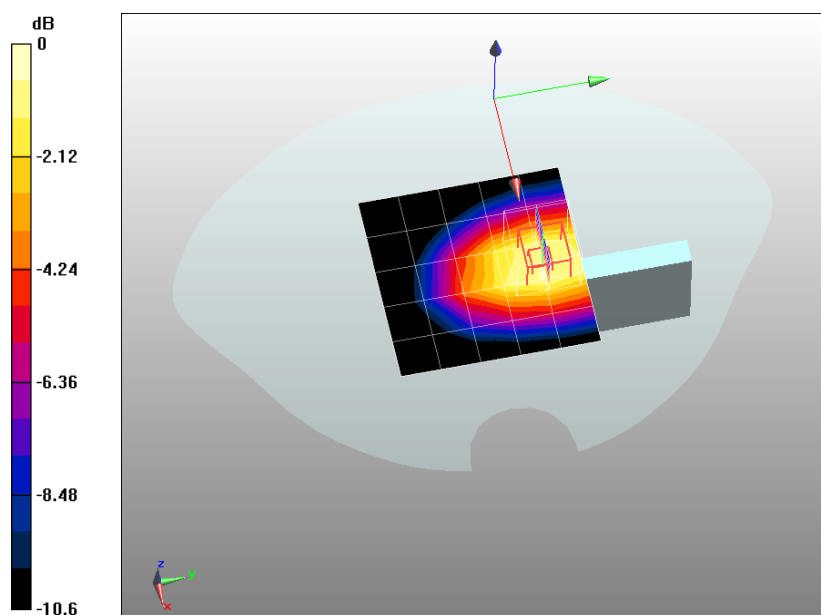
- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/GPRS850 Mid Body-Right Side/Area Scan (6x6x1):** Measurement grid: dx=20mm, dy=20mm, Maximum value of SAR (measured) = 0.224 mW/g

**Configuration/GPRS850 Mid Body-Right Side/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 12.8 V/m; Power Drift = -0.104 dB

Peak SAR (extrapolated) = 0.344 W/kg

**SAR(1 g) = 0.238 mW/g; SAR(10 g) = 0.161 mW/g** Maximum value of SAR (measured) = 0.255 mW/g



0 dB = 0.255mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

GPRS850 Mid Body-Left Side(2up)

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: GPRS/EGPRS-2 Slot; Communication System Band: GSM850; Duty Cycle: 1:4.2 ;

Frequency: 836.4 MHz; Medium parameters used:  $f = 836.4$  MHz;  $\sigma = 1$  mho/m;  $\epsilon_r = 54.5$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;

Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

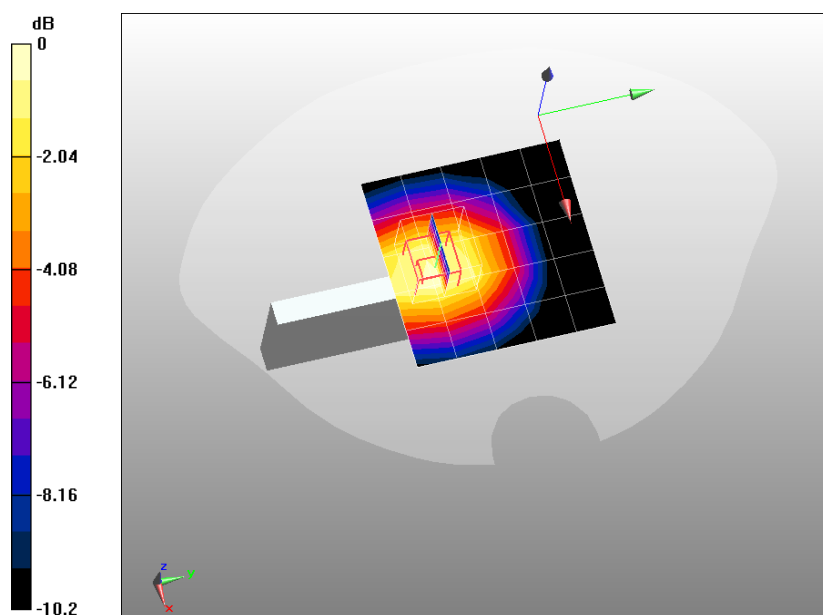
- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/GPRS850 Mid Body-Left Side/Area Scan (6x6x1):** Measurement grid: dx=20mm, dy=20mm, Maximum value of SAR (measured) = 0.277 mW/g

**Configuration/GPRS850 Mid Body-Left Side/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 13.8 V/m; Power Drift = -0.098 dB

Peak SAR (extrapolated) = 0.406 W/kg

**SAR(1 g) = 0.284 mW/g; SAR(10 g) = 0.196 mW/g** Maximum value of SAR (measured) = 0.300 mW/g



0 dB = 0.300mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

GPRS850 Mid Body-Back(3up)

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: GPRS/EGPRS-3 Slot; Communication System Band: GSM 850; Duty Cycle: 1:2.8 ;

Frequency: 836.4 MHz; Medium parameters used:  $f = 836.4$  MHz;  $\sigma = 1$  mho/m;  $\epsilon_r = 54.5$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;

Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/GPRS850 Mid Body-Back/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

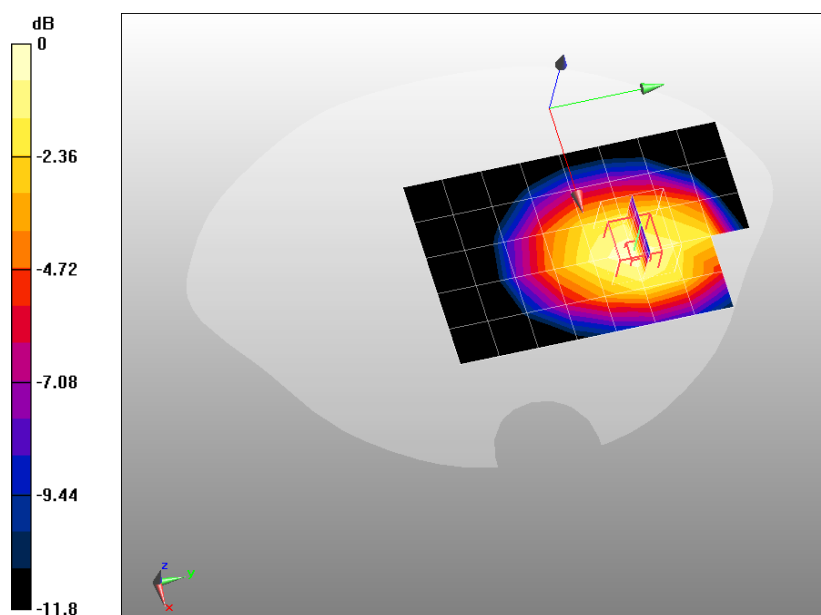
Maximum value of SAR (measured) = 0.784 mW/g

**Configuration/GPRS850 Mid Body-Back/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm,

dy=8mm, dz=5mm, Reference Value = 7.45 V/m; Power Drift = -0.036 dB

Peak SAR (extrapolated) = 1.03 W/kg

**SAR(1 g) = 0.737 mW/g; SAR(10 g) = 0.513 mW/g** Maximum value of SAR (measured) = 0.782 mW/g



0 dB = 0.782mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

GPRS850 Mid Body-Back(4up)

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: GPRS/EGPRS-4 Slot; Communication System Band: GSM 850; Duty Cycle: 1:2.1 ;

Frequency: 836.4 MHz; Medium parameters used:  $f = 836.4$  MHz;  $\sigma = 1$  mho/m;  $\epsilon_r = 54.5$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;

Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

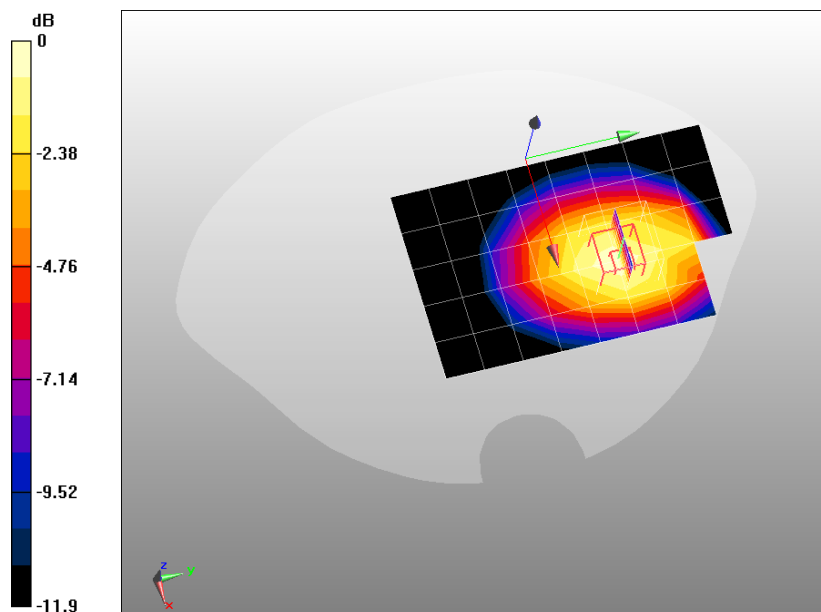
**Configuration/GPRS850 Mid Body-Back/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

Maximum value of SAR (measured) = 0.663 mW/g

**Configuration/GPRS850 Mid Body-Back/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 6.85 V/m; Power Drift = -0.111 dB

Peak SAR (extrapolated) = 0.868 W/kg

**SAR(1 g) = 0.623 mW/g; SAR(10 g) = 0.433 mW/g** Maximum value of SAR (measured) = 0.662 mW/g



0 dB = 0.662mW/g

Date/Time: 14-07-2011

Test Laboratory: QuieTek Lab

PCS 1900 Low Touch-Left

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: Generic GSM; Communication System Band: PCS 1900 (1850.0 - 1910.0 MHz);

Duty Cycle: 1:8.3; Frequency: 1850.2 MHz; Medium parameters used:  $f = 1850.2$  MHz;  $\sigma = 1.41$  mho/m;  $\epsilon_r = 39.1$ ;  $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Left Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.609, 4.015, 4.146); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

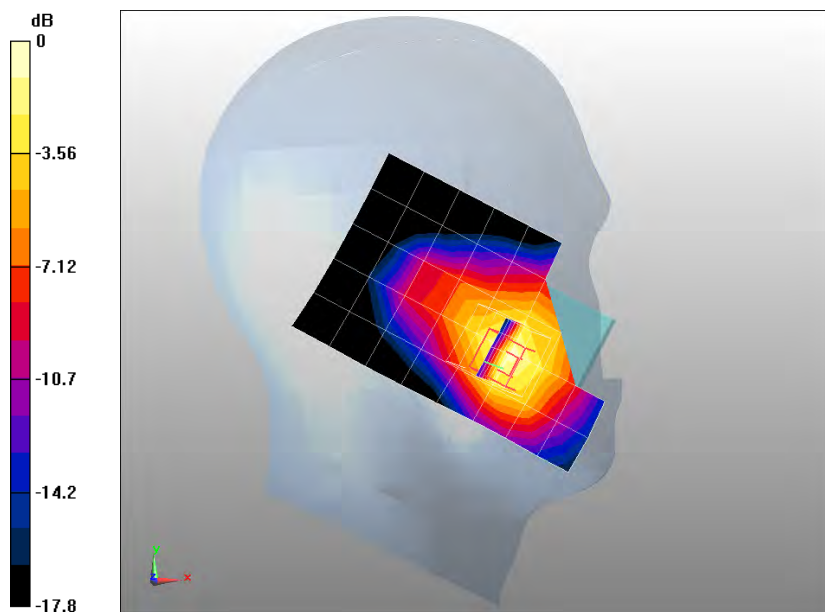
**Configuration/PCS1900 Low Touch-Left/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

Maximum value of SAR (measured) = 0.848 mW/g

**Configuration/PCS1900 Low Touch-Left/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 6.86 V/m; Power Drift = -0.009 dB

Peak SAR (extrapolated) = 1.38 W/kg

**SAR(1 g) = 0.870 mW/g; SAR(10 g) = 0.490 mW/g** Maximum value of SAR (measured) = 0.917 mW/g



0 dB = 0.917mW/g

Date/Time: 14-07-2011

Test Laboratory: QuieTek Lab

PCS 1900 Mid Touch-Left

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: Generic GSM; Communication System Band: PCS 1900 (1850.0 - 1910.0 MHz);

Duty Cycle: 1:8.3; Frequency: 1880 MHz; Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.43$  mho/m;  $\epsilon_r = 39$ ;

$\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Left Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.609, 4.015, 4.146); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/PCS1900 Mid Touch-Left/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

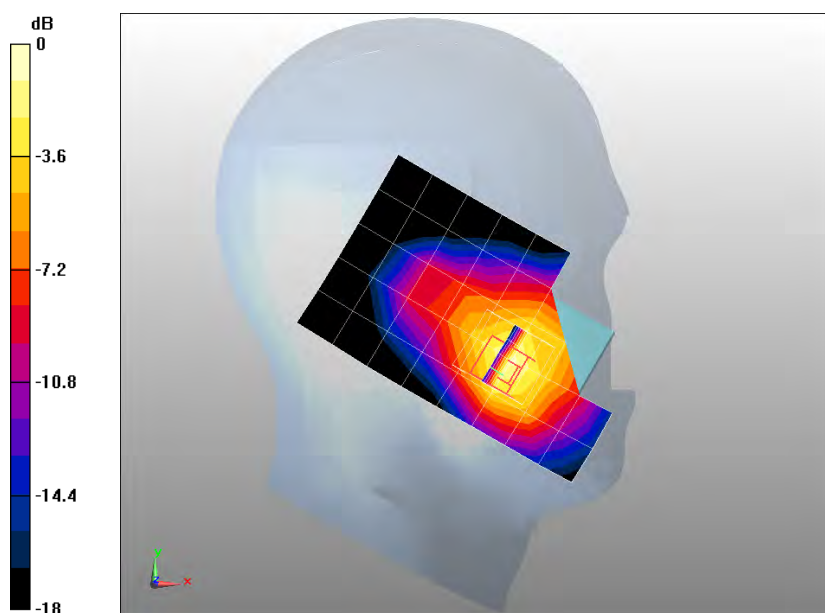
Maximum value of SAR (measured) = 0.984 mW/g

**Configuration/PCS1900 Mid Touch-Left/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm,

dy=8mm, dz=5mm, Reference Value = 7.8 V/m; Power Drift = 0.011 dB

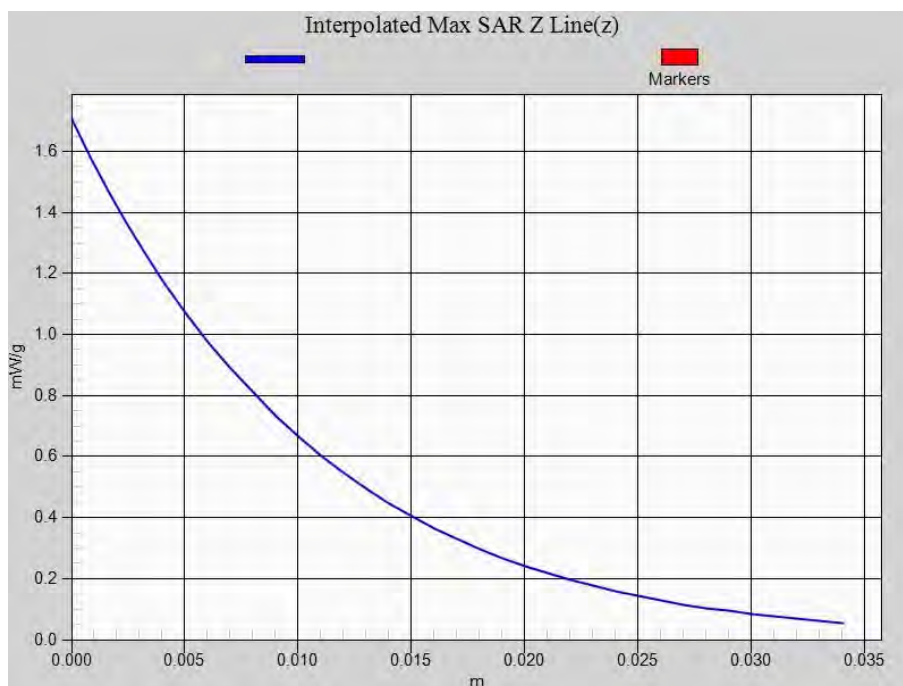
Peak SAR (extrapolated) = 1.7 W/kg

**SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.579 mW/g** Maximum value of SAR (measured) = 1.14 mW/g



0 dB = 1.14mW/g

# Z-Axis Plot



Date/Time: 14-07-2011

Test Laboratory: QuieTek Lab

PCS 1900 High Touch-Left

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: Generic GSM; Communication System Band: PCS 1900 (1850.0 - 1910.0 MHz);

Duty Cycle: 1:8.3; Frequency: 1909.8 MHz; Medium parameters used:  $f = 1909.8$  MHz;  $\sigma = 1.46$  mho/m;  $\epsilon_r = 39$ ;  $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Left Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.609, 4.015, 4.146); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

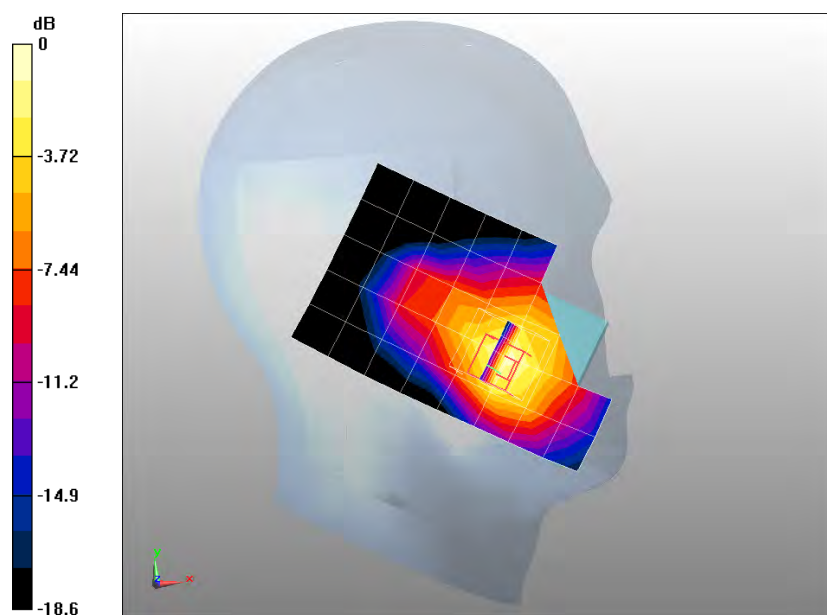
**Configuration/PCS1900 High Touch-Left/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

Maximum value of SAR (measured) = 0.872 mW/g

**Configuration/PCS1900 High Touch-Left/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 7.25 V/m; Power Drift = -0.006 dB

Peak SAR (extrapolated) = 1.47 W/kg

**SAR(1 g) = 0.912 mW/g; SAR(10 g) = 0.505 mW/g** Maximum value of SAR (measured) = 0.966 mW/g



0 dB = 0.966mW/g

Date/Time: 14-07-2011

Test Laboratory: QuieTek Lab

PCS 1900 Mid Tilt-Left

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: Generic GSM; Communication System Band: PCS 1900 (1850.0 - 1910.0 MHz);

Duty Cycle: 1:8.3; Frequency: 1880 MHz; Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.43$  mho/m;  $\epsilon_r = 39$ ;

$\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Left Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.609, 4.015, 4.146); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/PCS1900 Mid Tilt-Left/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

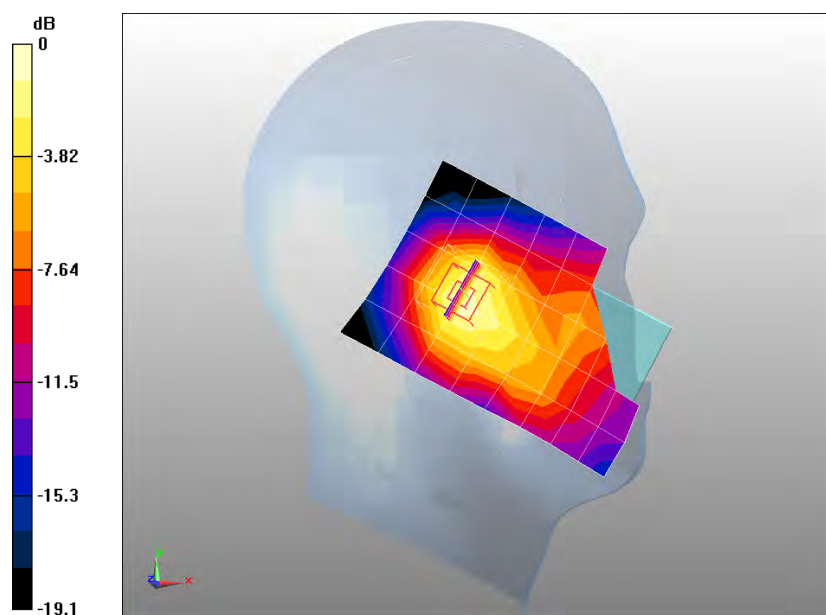
Maximum value of SAR (measured) = 0.328 mW/g

**Configuration/PCS1900 Mid Tilt-Left/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm,

dz=5mm, Reference Value = 13.2 V/m; Power Drift = 0.056 dB

Peak SAR (extrapolated) = 0.502 W/kg

**SAR(1 g) = 0.313 mW/g; SAR(10 g) = 0.182 mW/g** Maximum value of SAR (measured) = 0.335 mW/g



0 dB = 0.335mW/g

Date/Time: 14-07-2011

Test Laboratory: QuieTek Lab

PCS 1900 Mid Touch-Right

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: Generic GSM; Communication System Band: PCS 1900 (1850.0 - 1910.0 MHz);

Duty Cycle: 1:8.3; Frequency: 1880 MHz; Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.43$  mho/m;  $\epsilon_r = 39$ ;

$\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Right Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.609, 4.015, 4.146); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/PCS1900 Mid Touch-Right/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

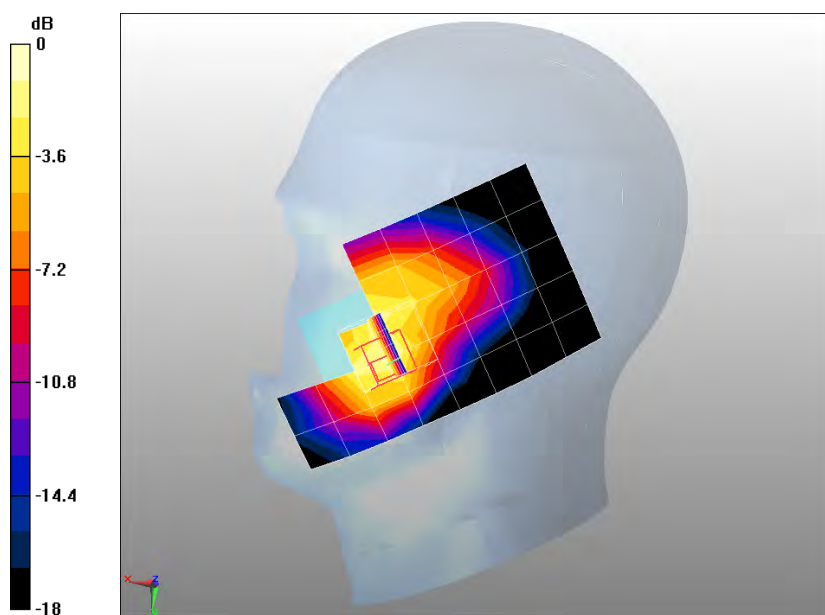
Maximum value of SAR (measured) = 0.706 mW/g

**Configuration/PCS1900 Mid Touch-Right/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm,

dy=8mm, dz=5mm, Reference Value = 6.08 V/m; Power Drift = -0.029 dB

Peak SAR (extrapolated) = 1.41 W/kg

**SAR(1 g) = 0.790 mW/g; SAR(10 g) = 0.415 mW/g** Maximum value of SAR (measured) = 0.857 mW/g



0 dB = 0.857mW/g

Date/Time: 14-07-2011

Test Laboratory: QuieTek Lab

PCS 1900 Mid Tilt-Right

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: Generic GSM; Communication System Band: PCS 1900 (1850.0 - 1910.0 MHz);

Duty Cycle: 1:8.3; Frequency: 1880 MHz; Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.43$  mho/m;  $\epsilon_r = 39$ ;

$\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Right Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.609, 4.015, 4.146); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/PCS1900 Mid Tilt-Right/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

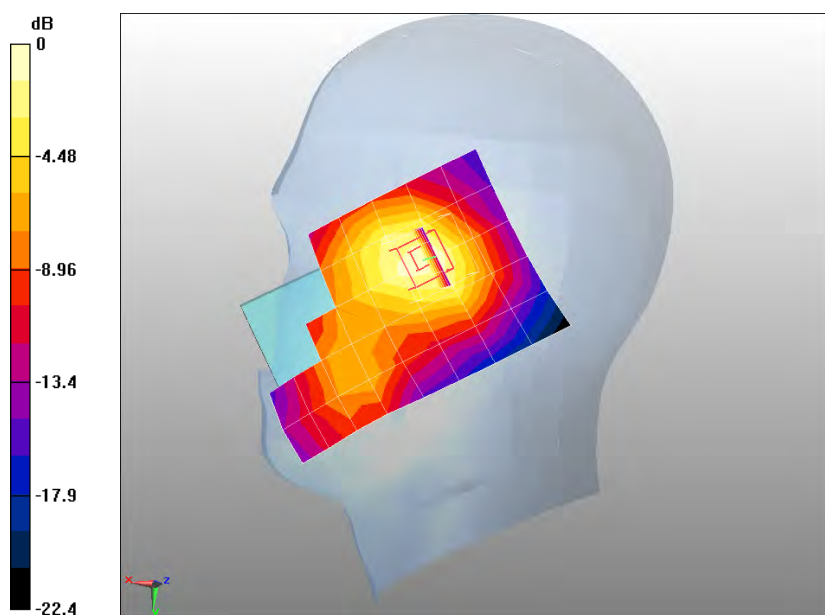
Maximum value of SAR (measured) = 0.318 mW/g

**Configuration/PCS1900 Mid Tilt-Right/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm,

dy=8mm, dz=5mm, Reference Value = 11.1 V/m; Power Drift = -0.019 dB

Peak SAR (extrapolated) = 0.503 W/kg

**SAR(1 g) = 0.319 mW/g; SAR(10 g) = 0.190 mW/g** Maximum value of SAR (measured) = 0.345 mW/g



0 dB = 0.345mW/g

Date/Time: 14-07-2011

Test Laboratory: QuieTek Lab

PCS 1900 Mid Touch-Left <SIM 2>

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: Generic GSM; Communication System Band: PCS 1900 (1850.0 - 1910.0 MHz);

Duty Cycle: 1:8.3; Frequency: 1880 MHz; Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.43$  mho/m;  $\epsilon_r = 39$ ;

$\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Left Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.609, 4.015, 4.146); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/PCS1900 Mid Touch-Left/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

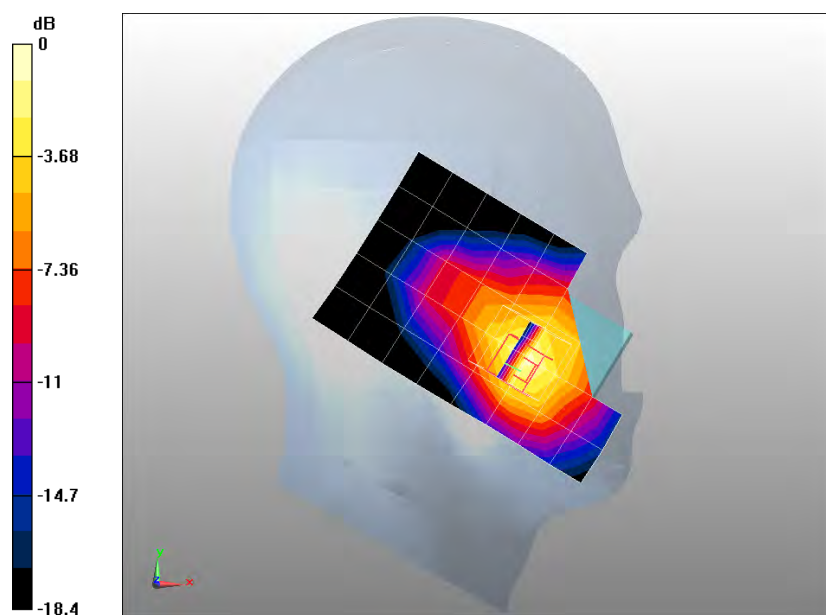
Maximum value of SAR (measured) = 0.979 mW/g

**Configuration/PCS1900 Mid Touch-Left/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm,

dy=8mm, dz=5mm, Reference Value = 7.67 V/m; Power Drift = -0.088 dB

Peak SAR (extrapolated) = 1.63 W/kg

**SAR(1 g) = 0.995 mW/g; SAR(10 g) = 0.546 mW/g** Maximum value of SAR (measured) = 1.09 mW/g



0 dB = 1.09mW/g

Date/Time: 14-07-2011

Test Laboratory: QuieTek Lab

PCS 1900 Mid Touch-Left (SONY Battery)

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: Generic GSM; Communication System Band: PCS 1900 (1850.0 - 1910.0 MHz);

Duty Cycle: 1:8.3; Frequency: 1880 MHz; Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.43$  mho/m;  $\epsilon_r = 39$ ;

$\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Left Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.609, 4.015, 4.146); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/PCS1900 Mid Touch-Left/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

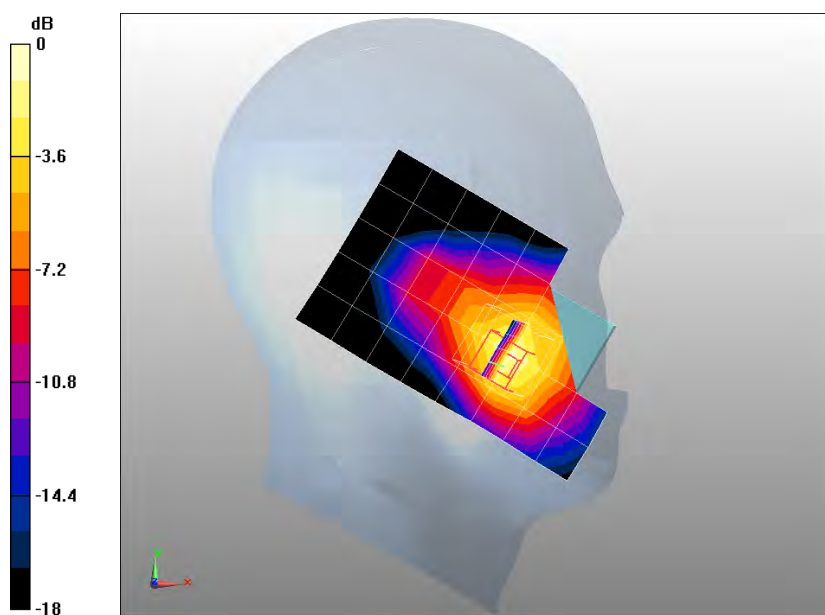
Maximum value of SAR (measured) = 0.981 mW/g

**Configuration/PCS1900 Mid Touch-Left/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm,

dy=8mm, dz=5mm, Reference Value = 7.95 V/m; Power Drift = 0.069 dB

Peak SAR (extrapolated) = 1.63 W/kg

**SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.563 mW/g** Maximum value of SAR (measured) = 1.11 mW/g



0 dB = 1.11mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

PCS1900 Mid Body-Back

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: Generic GSM; Communication System Band: PCS 1900 (1850.0 - 1910.0 MHz);

Duty Cycle: 1:8.3; Frequency: 1880 MHz; Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.5$  mho/m;  $\epsilon_r = 51.8$ ;

$\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/PCS1900 Mid Body-Back/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

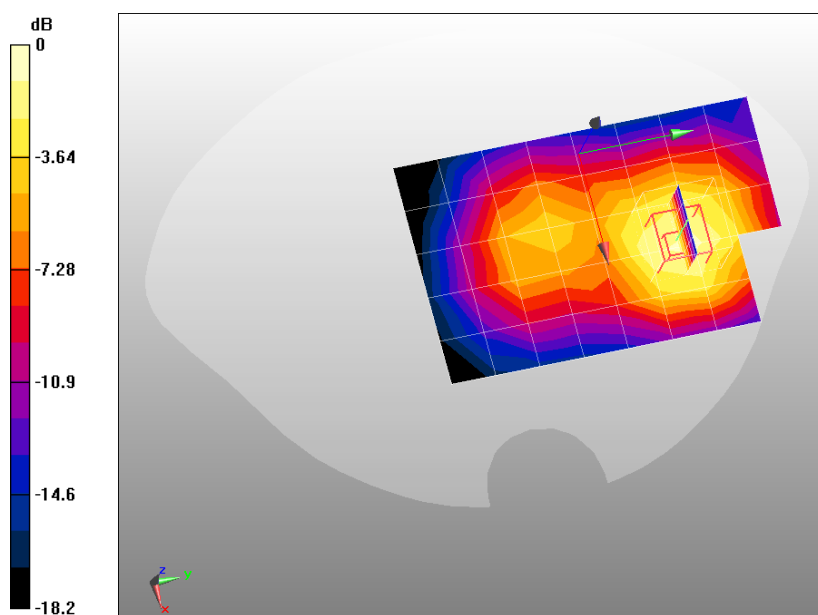
Maximum value of SAR (measured) = 0.385 mW/g

**Configuration/PCS1900 Mid Body-Back/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm,

dy=8mm, dz=5mm, Reference Value = 7.72 V/m; Power Drift = 0.077 dB

Peak SAR (extrapolated) = 0.707 W/kg

**SAR(1 g) = 0.418 mW/g; SAR(10 g) = 0.241 mW/g** Maximum value of SAR (measured) = 0.453 mW/g



0 dB = 0.453mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

GPRS1900 Mid Body-Back(2up)

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: GPRS/EGPRS-2 Slot; Communication System Band: PCS1900; Duty Cycle: 1:4.2 ;

Frequency: 1880 MHz; Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.5$  mho/m;  $\epsilon_r = 51.8$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;

Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/GPRS1900 Mid Body-Back/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

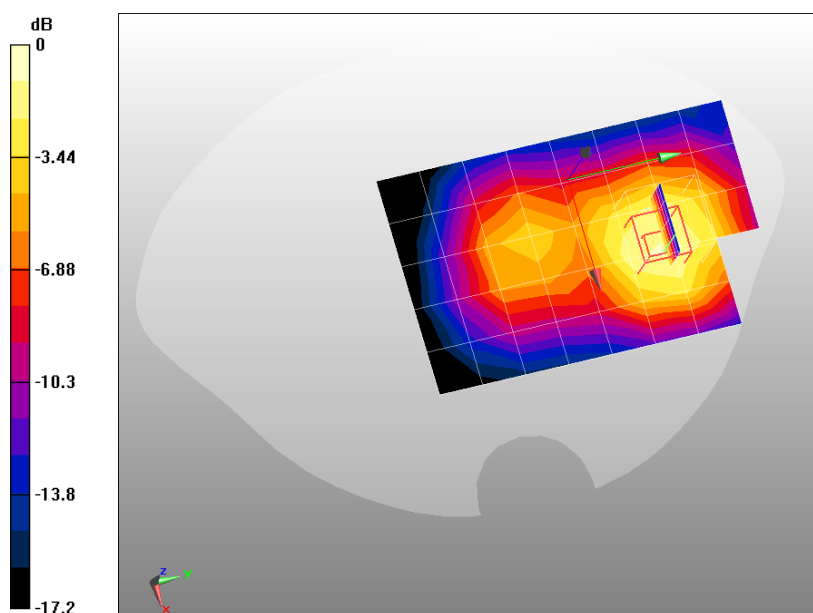
Maximum value of SAR (measured) = 0.538 mW/g

**Configuration/GPRS1900 Mid Body-Back/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm,

dy=8mm, dz=5mm, Reference Value = 8.67 V/m; Power Drift = 0.015 dB

Peak SAR (extrapolated) = 0.979 W/kg

**SAR(1 g) = 0.585 mW/g; SAR(10 g) = 0.339 mW/g** Maximum value of SAR (measured) = 0.622 mW/g



0 dB = 0.622mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

GPRS1900 Mid Body-Back(3up)

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: GPRS/EGPRS-3 Slot; Communication System Band: PCS 1900; Duty Cycle:

1:2.8 ; Frequency: 1880 MHz; Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.5$  mho/m;  $\epsilon_r = 51.8$ ;  $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

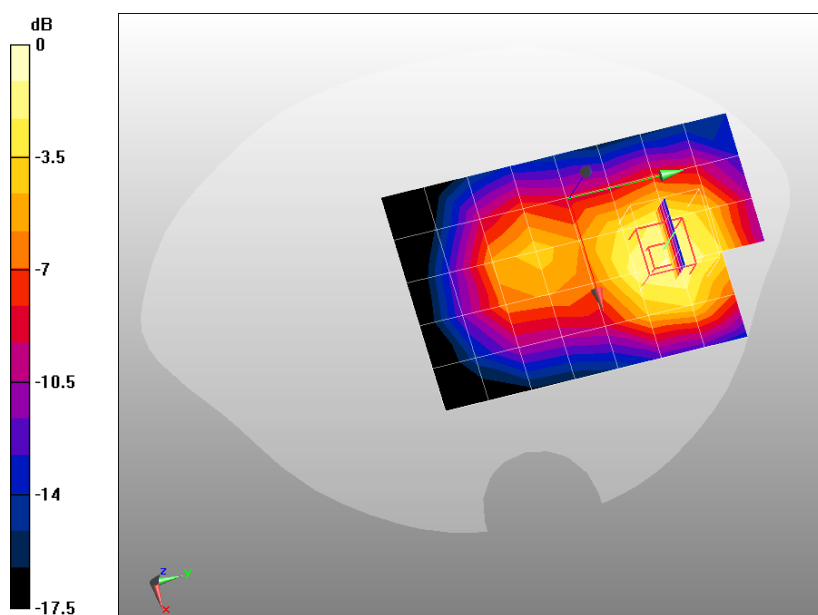
**Configuration/GPRS1900 Mid Body-Back/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

Maximum value of SAR (measured) = 0.599 mW/g

**Configuration/GPRS1900 Mid Body-Back/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 8.49 V/m; Power Drift = 0.073 dB

Peak SAR (extrapolated) = 1.09 W/kg

**SAR(1 g) = 0.653 mW/g; SAR(10 g) = 0.376 mW/g** Maximum value of SAR (measured) = 0.700 mW/g



0 dB = 0.700mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

GPRS1900 Mid Body-Back(4up)

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: GPRS/EGPRS-4 Slot; Communication System Band: PCS 1900; Duty Cycle:

1:2.1 ; Frequency: 1880 MHz; Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.5$  mho/m;  $\epsilon_r = 51.8$ ;  $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

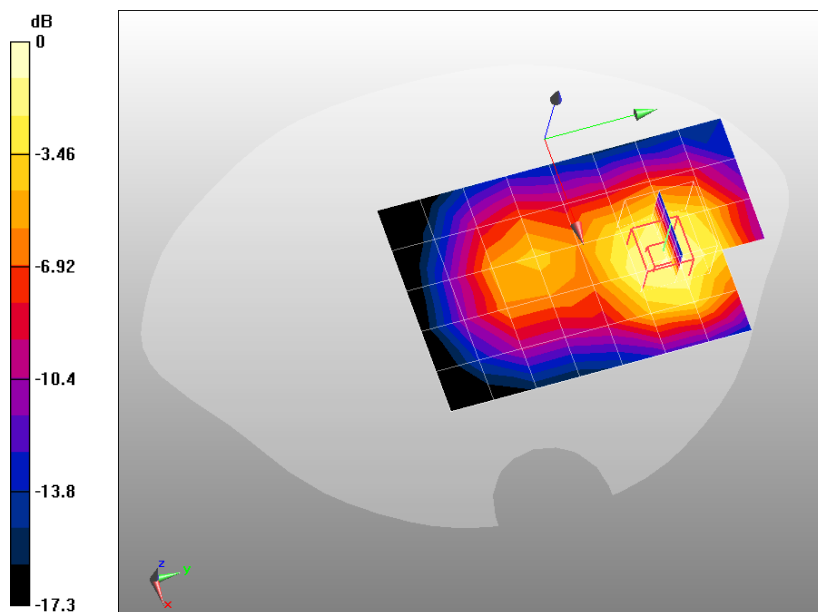
**Configuration/GPRS1900 Mid Body-Back/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

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

**Configuration/GPRS1900 Mid Body-Back/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 9.98 V/m; Power Drift = -0.014 dB

Peak SAR (extrapolated) = 1.3 W/kg

**SAR(1 g) = 0.781 mW/g; SAR(10 g) = 0.452 mW/g** Maximum value of SAR (measured) = 0.832 mW/g



0 dB = 0.832mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

GPRS1900 Mid Body-Front(4up)

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: GPRS/EGPRS-4 Slot; Communication System Band: PCS 1900; Duty Cycle:

1:2.1 ; Frequency: 1880 MHz; Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.5$  mho/m;  $\epsilon_r = 51.8$ ;  $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

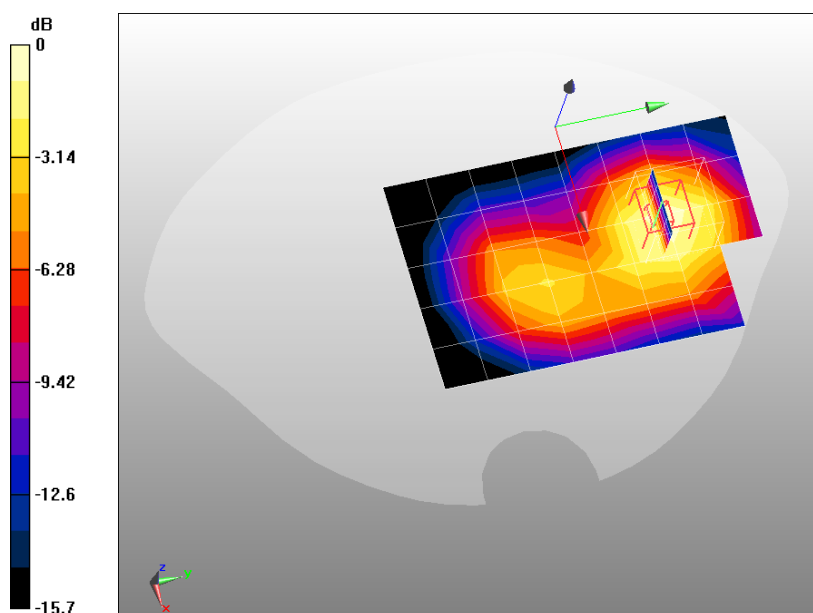
**Configuration/GPRS1900 Mid Body-Front/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

Maximum value of SAR (measured) = 0.692 mW/g

**Configuration/GPRS1900 Mid Body-Front/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 10.9 V/m; Power Drift = -0.079 dB

Peak SAR (extrapolated) = 1.09 W/kg

**SAR(1 g) = 0.649 mW/g; SAR(10 g) = 0.382 mW/g** Maximum value of SAR (measured) = 0.685 mW/g



0 dB = 0.685mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

GPRS1900 Mid Body-Back(4up) <with headset>

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: GPRS/EGPRS-4 Slot; Communication System Band: PCS 1900; Duty Cycle:

1:2.1 ; Frequency: 1880 MHz; Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.5$  mho/m;  $\epsilon_r = 51.8$ ;  $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

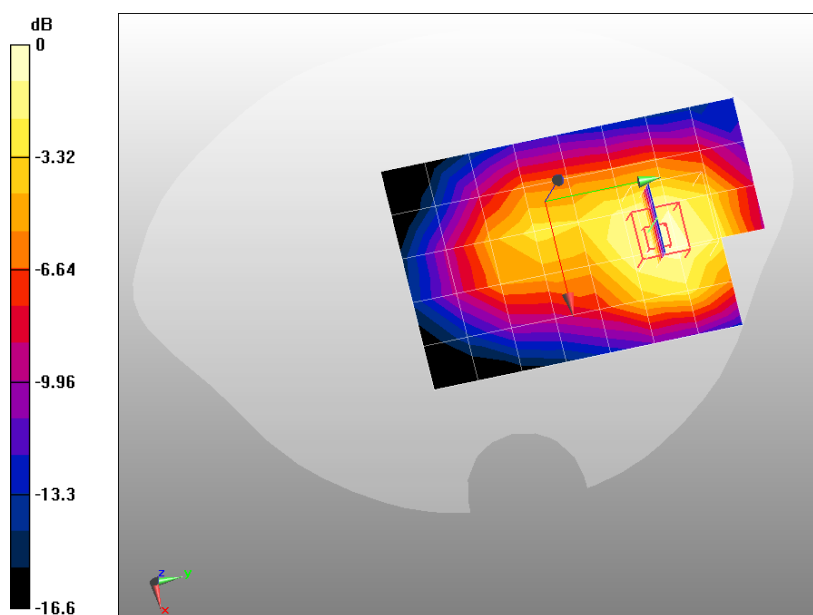
**Configuration/GPRS1900 Mid Body-Back/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

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

**Configuration/GPRS1900 Mid Body-Back/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 9.94 V/m; Power Drift = -0.088 dB

Peak SAR (extrapolated) = 0.987 W/kg

**SAR(1 g) = 0.598 mW/g; SAR(10 g) = 0.350 mW/g** Maximum value of SAR (measured) = 0.631 mW/g



0 dB = 0.631mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

GPRS1900 Mid Body-Bottom(4up)

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: GPRS/EGPRS-4 Slot; Communication System Band: PCS 1900; Duty Cycle:

1:2.1 ; Frequency: 1880 MHz; Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.5$  mho/m;  $\epsilon_r = 51.8$ ;  $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

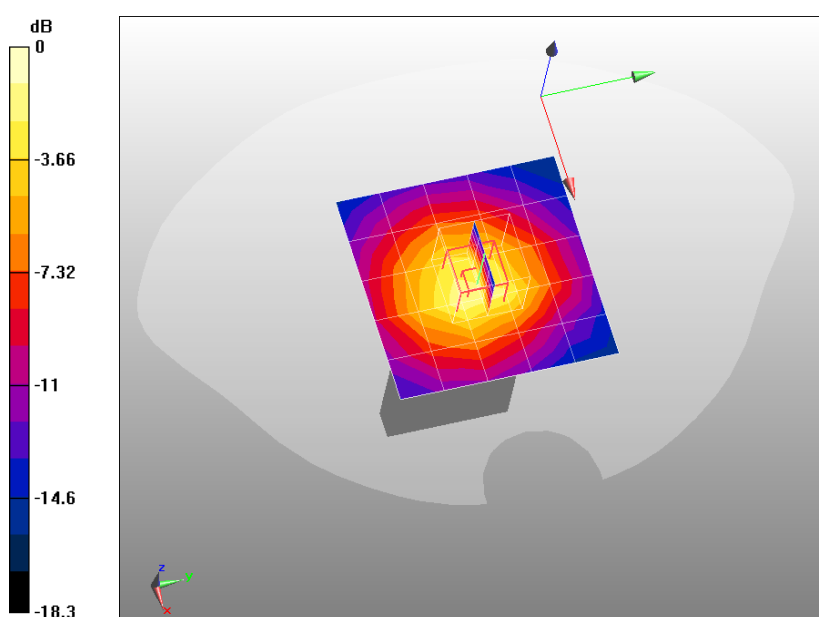
**Configuration/GPRS1900 Mid Body-Bottom/Area Scan (6x6x1):** Measurement grid: dx=20mm, dy=20mm

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

**Configuration/GPRS1900 Mid Body-Bottom/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 20.2 V/m; Power Drift = -0.127 dB

Peak SAR (extrapolated) = 0.927 W/kg

**SAR(1 g) = 0.559 mW/g; SAR(10 g) = 0.311 mW/g** Maximum value of SAR (measured) = 0.637 mW/g



0 dB = 0.637mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

GPRS1900 Mid Body-Right Side(4up)

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: GPRS/EGPRS-4 Slot; Communication System Band: PCS 1900; Duty Cycle:

1:2.1 ; Frequency: 1880 MHz; Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.5$  mho/m;  $\epsilon_r = 51.8$ ;  $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/GPRS1900 Mid Body-Right Side/Area Scan (6x6x1):** Measurement grid: dx=20mm, dy=20mm

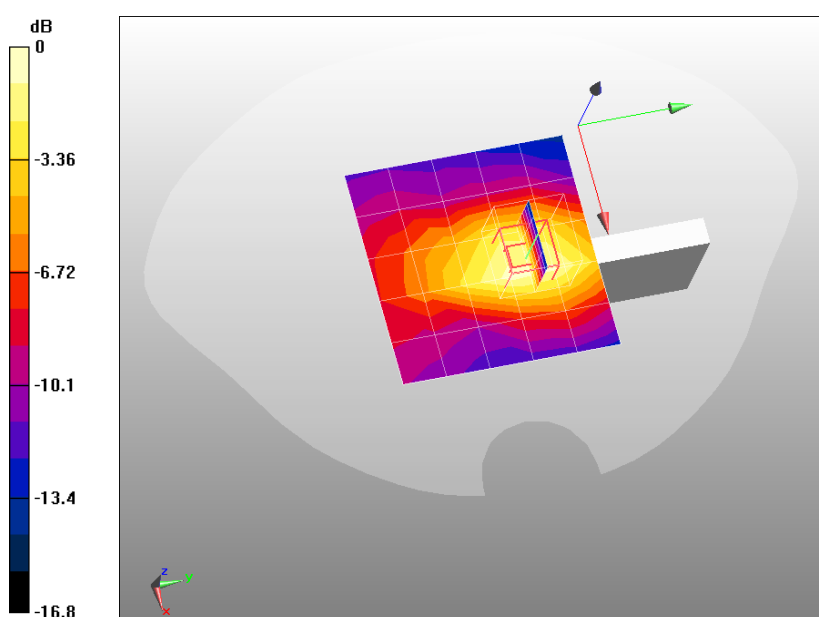
Maximum value of SAR (measured) = 0.251 mW/g

**Configuration/GPRS1900 Mid Body-Right Side/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

dx=8mm, dy=8mm, dz=5mm, Reference Value = 12.8 V/m; Power Drift = -0.105 dB

Peak SAR (extrapolated) = 0.442 W/kg

**SAR(1 g) = 0.268 mW/g; SAR(10 g) = 0.157 mW/g** Maximum value of SAR (measured) = 0.291 mW/g



0 dB = 0.291mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

GPRS1900 Mid Body-Left Side(4up)

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: GPRS/EGPRS-4 Slot; Communication System Band: PCS 1900; Duty Cycle:

1:2.1 ; Frequency: 1880 MHz; Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.5$  mho/m;  $\epsilon_r = 51.8$ ;  $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

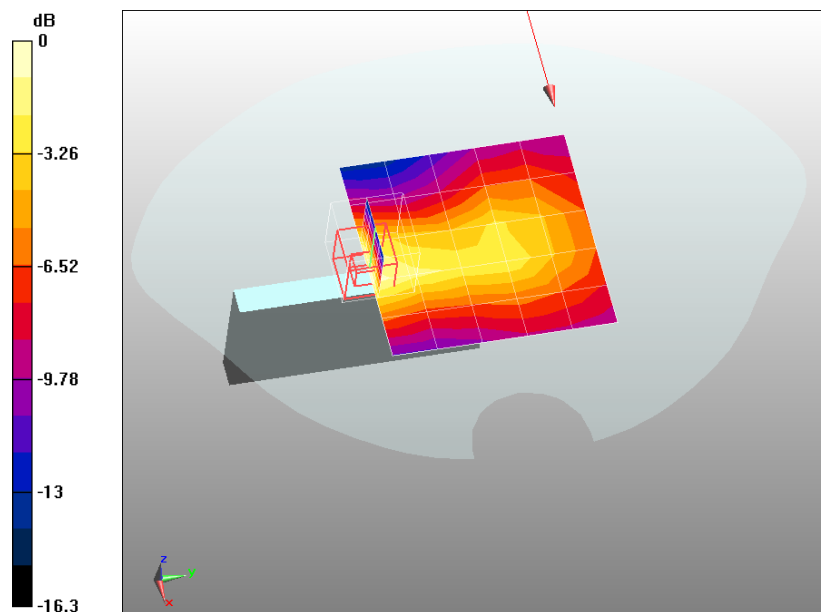
- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/GPRS1900 Mid Body-Left Side/Area Scan (6x6x1):** Measurement grid: dx=20mm, dy=20mm, Maximum value of SAR (measured) = 0.319 mW/g

**Configuration/GPRS1900 Mid Body-Left Side/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 12.8 V/m; Power Drift = -0.160 dB

Peak SAR (extrapolated) = 0.535 W/kg

**SAR(1 g) = 0.331 mW/g; SAR(10 g) = 0.196 mW/g** Maximum value of SAR (measured) = 0.359 mW/g



0 dB = 0.359mW/g

Date/Time: 14-07-2011

Test Laboratory: QuieTek Lab

WCDMA Band II Low Touch-Left

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: UMTS; Communication System Band: Band II, UTRA/FDD (1850.0-1910.0MHz);

Duty Cycle: 1:1; Frequency: 1852.4 MHz; Medium parameters used:  $f = 1852.4$  MHz;  $\sigma = 1.41$  mho/m;  $\epsilon_r = 39.1$ ;  $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Left Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.609, 4.015, 4.146); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/WCDMA BandII Low Touch-Left/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

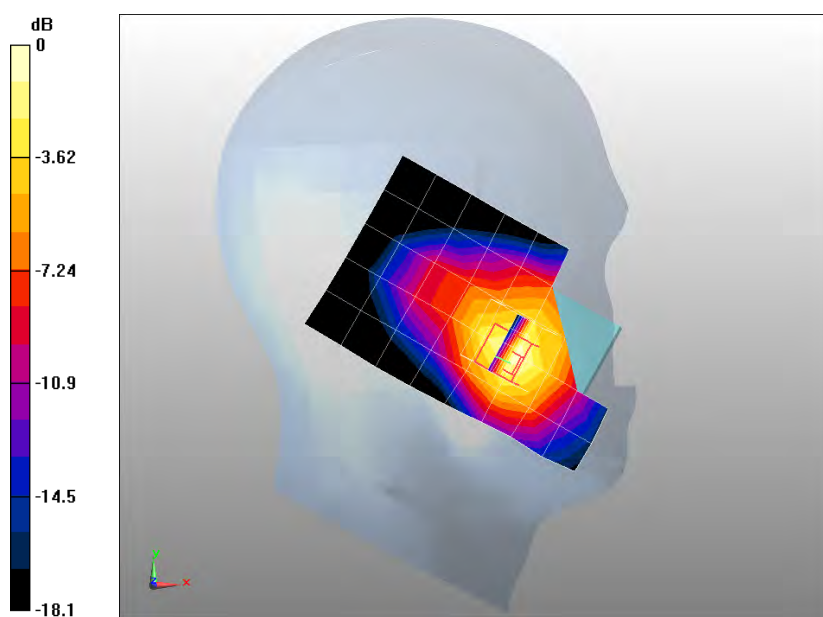
Maximum value of SAR (measured) = 1.16 mW/g

**Configuration/WCDMA BandII Low Touch-Left/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

dx=8mm, dy=8mm, dz=5mm, Reference Value = 9.43 V/m; Power Drift = -0.109 dB

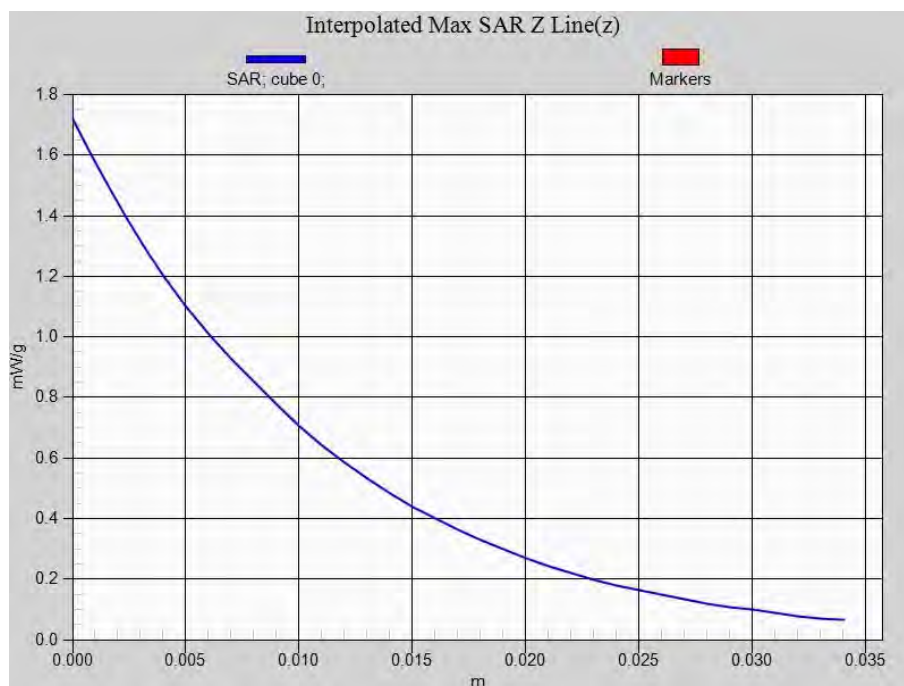
Peak SAR (extrapolated) = 1.72 W/kg

**SAR(1 g) = 1.09 mW/g; SAR(10 g) = 0.608 mW/g** Maximum value of SAR (measured) = 1.21 mW/g



0 dB = 1.21mW/g

# Z-Axis Plot



Date/Time: 14-07-2011

Test Laboratory: QuieTek Lab

WCDMA Band II Mid Touch-Left

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: UMTS; Communication System Band: Band II, UTRA/FDD (1850.0-1910.0MHz);

Duty Cycle: 1:1; Frequency: 1880 MHz; Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.43$  mho/m;  $\epsilon_r = 39$ ;  $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Left Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.609, 4.015, 4.146); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/WCDMA Band II Mid Touch-Left/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

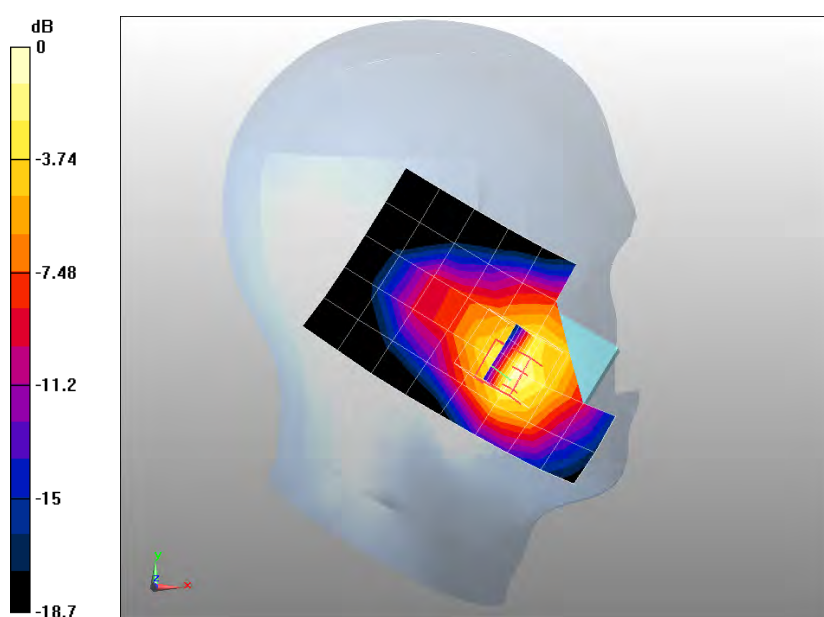
Maximum value of SAR (measured) = 0.928 mW/g

**Configuration/WCDMA Band II Mid Touch-Left/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

dx=8mm, dy=8mm, dz=5mm, Reference Value = 7.73 V/m; Power Drift = -0.169 dB

Peak SAR (extrapolated) = 1.47 W/kg

**SAR(1 g) = 0.905 mW/g; SAR(10 g) = 0.499 mW/g** Maximum value of SAR (measured) = 0.996 mW/g



0 dB = 0.996mW/g

Date/Time: 14-07-2011

Test Laboratory: QuieTek Lab

WCDMA Band II High Touch-Left

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: UMTS; Communication System Band: Band II, UTRA/FDD (1850.0-1910.0MHz);

Duty Cycle: 1:1; Frequency: 1907.6 MHz; Medium parameters used:  $f = 1907.6$  MHz;  $\sigma = 1.46$  mho/m;  $\epsilon_r = 39$ ;  $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Left Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.609, 4.015, 4.146); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/WCDMA BandII High Touch-Left/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

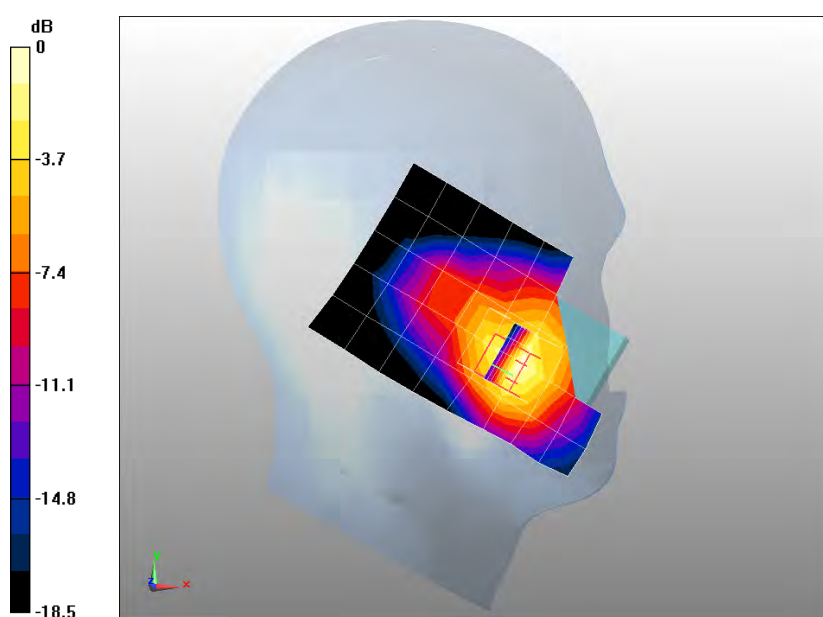
Maximum value of SAR (measured) = 0.628 mW/g

**Configuration/WCDMA BandII High Touch-Left/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

dx=8mm, dy=8mm, dz=5mm, Reference Value = 7.17 V/m; Power Drift = 0.037 dB

Peak SAR (extrapolated) = 0.990 W/kg

**SAR(1 g) = 0.618 mW/g; SAR(10 g) = 0.343 mW/g** Maximum value of SAR (measured) = 0.670 mW/g



0 dB = 0.670mW/g

Date/Time: 14-07-2011

Test Laboratory: QuieTek Lab

WCDMA Band II Mid Tilt-Left

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: UMTS; Communication System Band: Band II, UTRA/FDD (1850.0-1910.0MHz);

Duty Cycle: 1:1; Frequency: 1880 MHz; Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.43$  mho/m;  $\epsilon_r = 39$ ;  $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Left Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.609, 4.015, 4.146); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

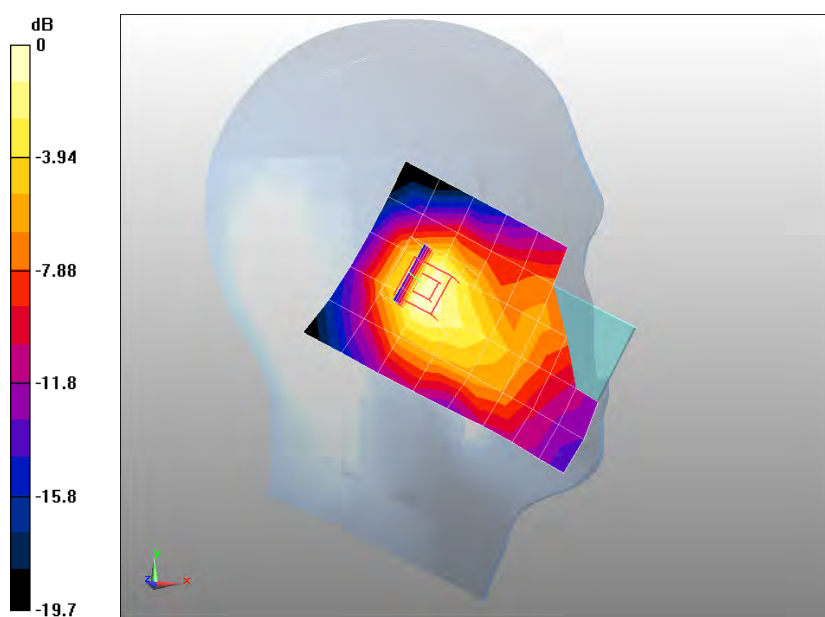
**Configuration/WCDMA Band II Mid Tilt-Left/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

Maximum value of SAR (measured) = 0.256 mW/g

**Configuration/WCDMA Band II Mid Tilt-Left/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 12.7 V/m; Power Drift = -0.047 dB

Peak SAR (extrapolated) = 0.413 W/kg

**SAR(1 g) = 0.254 mW/g; SAR(10 g) = 0.146 mW/g** Maximum value of SAR (measured) = 0.269 mW/g



0 dB = 0.269mW/g

Date/Time: 14-07-2011

Test Laboratory: QuieTek Lab

WCDMA Band II Mid Touch-Right

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: UMTS; Communication System Band: Band II, UTRA/FDD (1850.0-1910.0MHz);

Duty Cycle: 1:1; Frequency: 1880 MHz; Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.43$  mho/m;  $\epsilon_r = 39$ ;  $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Right Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.609, 4.015, 4.146); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/WCDMA Band II Mid Touch-Right/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

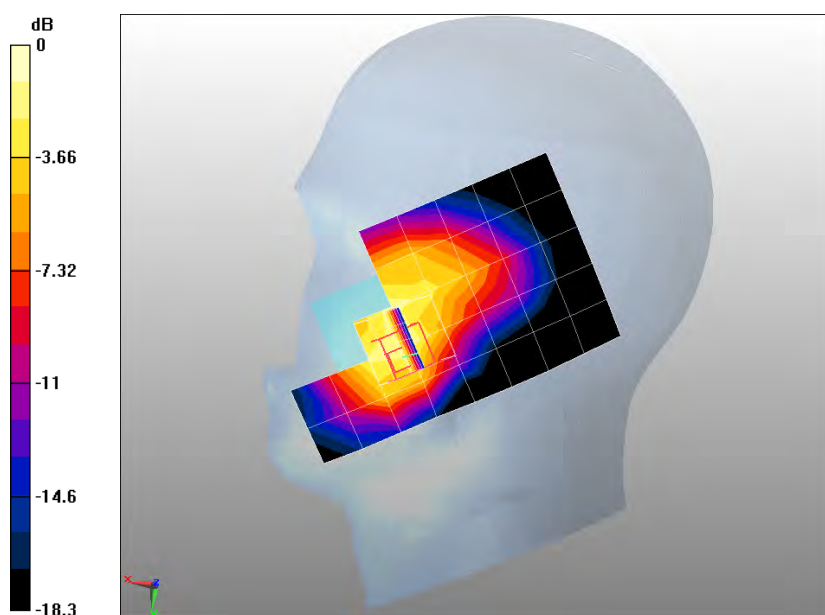
Maximum value of SAR (measured) = 0.582 mW/g

**Configuration/WCDMA Band II Mid Touch-Right/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

dx=8mm, dy=8mm, dz=5mm, Reference Value = 5.94 V/m; Power Drift = -0.185 dB

Peak SAR (extrapolated) = 1.17 W/kg

**SAR(1 g) = 0.647 mW/g; SAR(10 g) = 0.342 mW/g** Maximum value of SAR (measured) = 0.709 mW/g



0 dB = 0.709mW/g

Date/Time: 14-07-2011

Test Laboratory: QuieTek Lab

WCDMA Band II Mid Tilt-Right

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: UMTS; Communication System Band: Band II, UTRA/FDD (1850.0-1910.0MHz);

Duty Cycle: 1:1; Frequency: 1880 MHz; Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.43$  mho/m;  $\epsilon_r = 39$ ;  $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Right Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.609, 4.015, 4.146); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

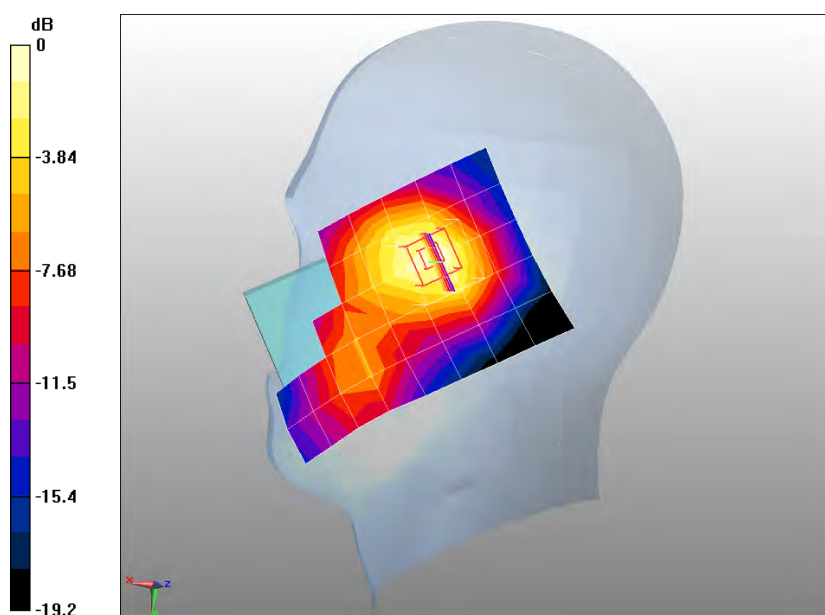
**Configuration/WCDMA Band II Mid Tilt-Right/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

Maximum value of SAR (measured) = 0.258 mW/g

**Configuration/WCDMA Band II Mid Tilt-Right/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 10.2 V/m; Power Drift = 0.032 dB

Peak SAR (extrapolated) = 0.414 W/kg

**SAR(1 g) = 0.261 mW/g; SAR(10 g) = 0.154 mW/g** Maximum value of SAR (measured) = 0.275 mW/g



0 dB = 0.275mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

WCDMA Band II Mid Body-Back

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: UMTS; Communication System Band: Band II, UTRA/FDD (1850.0-1910.0MHz);  
Duty Cycle: 1:1; Frequency: 1880 MHz; Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.5$  mho/m;  $\epsilon_r = 51.8$ ;  
 $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/WCDMA Band II Mid Body-Back/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

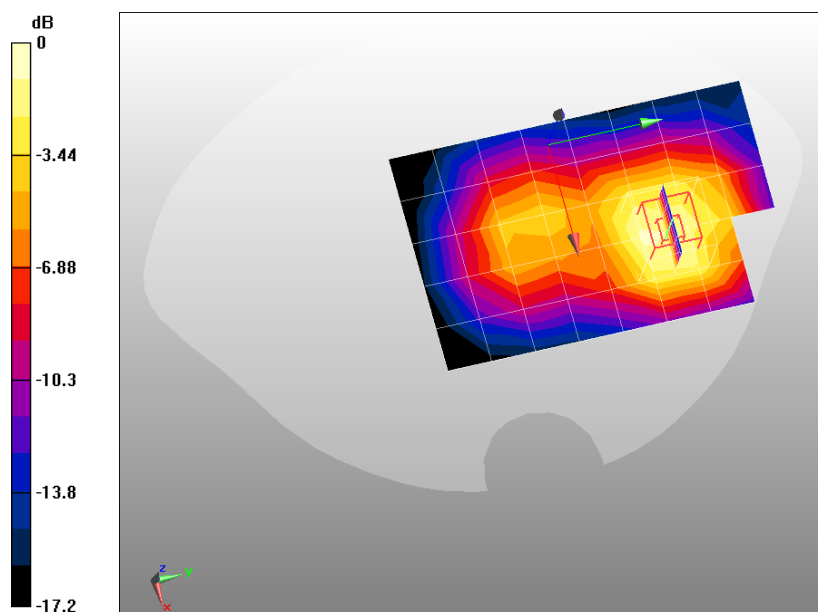
Maximum value of SAR (measured) = 0.338 mW/g

**Configuration/WCDMA Band II Mid Body-Back/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

dx=8mm, dy=8mm, dz=5mm, Reference Value = 8.21 V/m; Power Drift = -0.105 dB

Peak SAR (extrapolated) = 0.635 W/kg

**SAR(1 g) = 0.374 mW/g; SAR(10 g) = 0.217 mW/g** Maximum value of SAR (measured) = 0.400 mW/g



0 dB = 0.400mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

WCDMA Band II Mid Body-Front

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: UMTS; Communication System Band: Band II, UTRA/FDD (1850.0-1910.0MHz);

Duty Cycle: 1:1; Frequency: 1880 MHz; Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.5$  mho/m;  $\epsilon_r = 51.8$ ;

$\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/WCDMA Band II Mid Body-Front/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

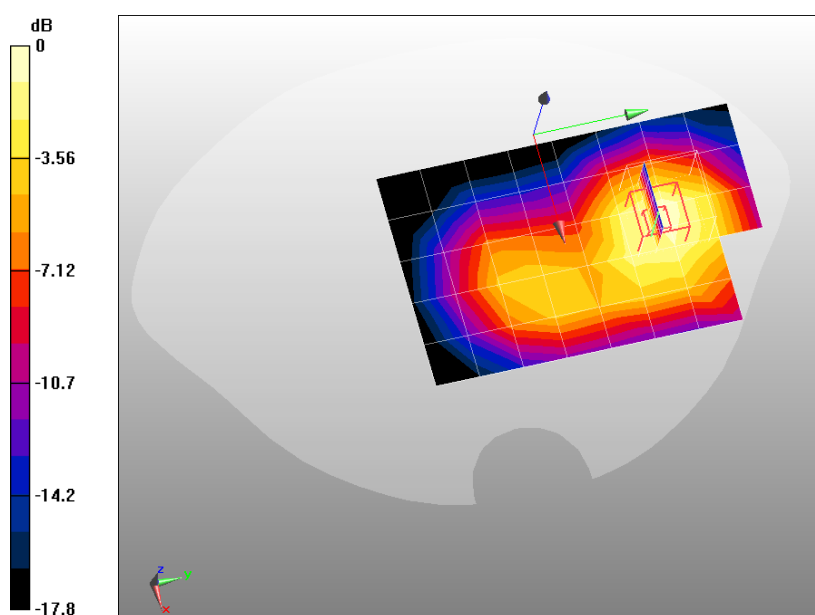
Maximum value of SAR (measured) = 0.344 mW/g

**Configuration/WCDMA Band II Mid Body-Front/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

dx=8mm, dy=8mm, dz=5mm, Reference Value = 7.21 V/m; Power Drift = 0.062 dB

Peak SAR (extrapolated) = 0.581 W/kg

**SAR(1 g) = 0.345 mW/g; SAR(10 g) = 0.203 mW/g** Maximum value of SAR (measured) = 0.364 mW/g



0 dB = 0.364mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

WCDMA Band II Mid Body-Back <with headset>

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: UMTS; Communication System Band: Band II, UTRA/FDD (1850.0-1910.0MHz);

Duty Cycle: 1:1; Frequency: 1880 MHz; Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.5$  mho/m;  $\epsilon_r = 51.8$ ;

$\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/WCDMA Band II Mid Body-Back/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

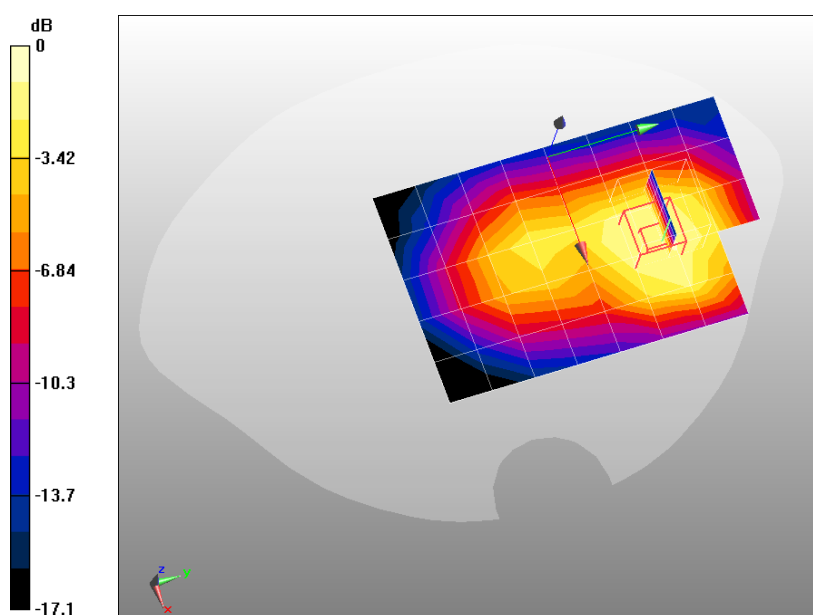
Maximum value of SAR (measured) = 0.263 mW/g

**Configuration/WCDMA Band II Mid Body-Back/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

dx=8mm, dy=8mm, dz=5mm, Reference Value = 7.72 V/m; Power Drift = -0.121 dB

Peak SAR (extrapolated) = 0.524 W/kg

**SAR(1 g) = 0.311 mW/g; SAR(10 g) = 0.179 mW/g** Maximum value of SAR (measured) = 0.329 mW/g



0 dB = 0.329mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

WCDMA Band II Mid Body-Bottom

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: UMTS; Communication System Band: Band II, UTRA/FDD (1850.0-1910.0MHz);

Duty Cycle: 1:1; Frequency: 1880 MHz; Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.5$  mho/m;  $\epsilon_r = 51.8$ ;

$\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/WCDMA Band II Mid Body-Bottom/Area Scan (6x6x1):** Measurement grid: dx=20mm, dy=20mm

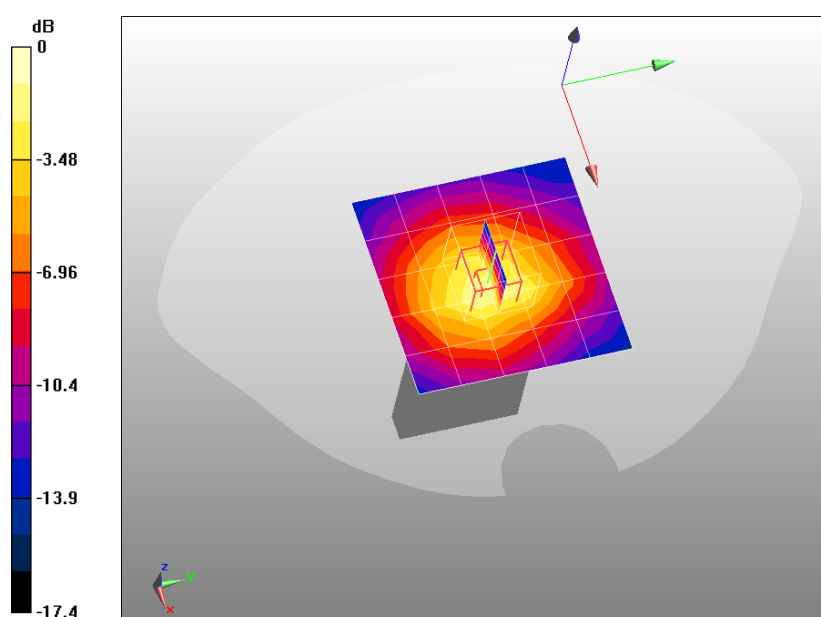
Maximum value of SAR (measured) = 0.242 mW/g

**Configuration/WCDMA Band II Mid Body-Bottom/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

dx=8mm, dy=8mm, dz=5mm, Reference Value = 14.1 V/m; Power Drift = -0.118 dB

Peak SAR (extrapolated) = 0.460 W/kg

**SAR(1 g) = 0.284 mW/g; SAR(10 g) = 0.162 mW/g** Maximum value of SAR (measured) = 0.316 mW/g



0 dB = 0.316mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

WCDMA Band II Mid Body-Right Side

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: UMTS; Communication System Band: Band II, UTRA/FDD (1850.0-1910.0MHz);

Duty Cycle: 1:1; Frequency: 1880 MHz; Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.5$  mho/m;  $\epsilon_r = 51.8$ ;

$\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/WCDMA Band II Mid Body-Right Side/Area Scan (6x6x1):** Measurement grid: dx=20mm, dy=20mm

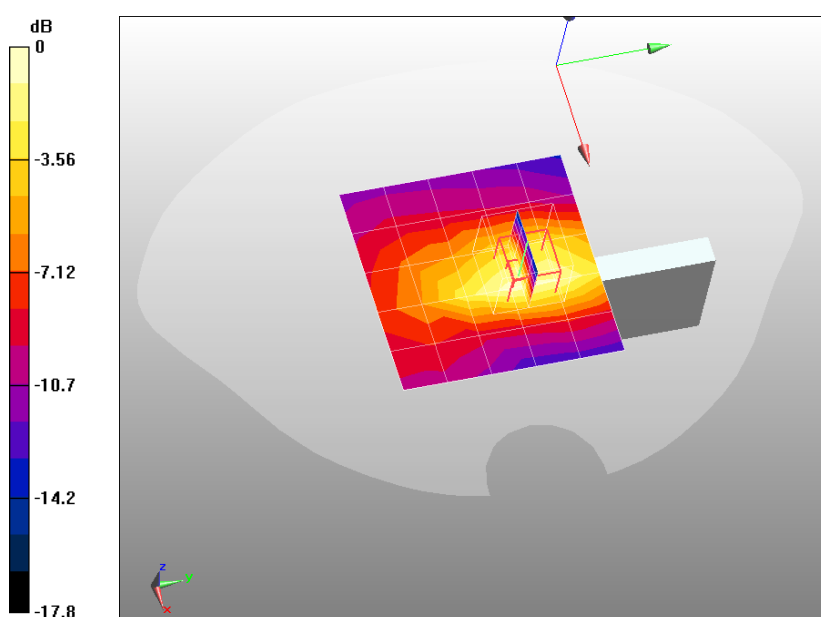
Maximum value of SAR (measured) = 0.177 mW/g

**Configuration/WCDMA Band II Mid Body-Right Side/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

dx=8mm, dy=8mm, dz=5mm, Reference Value = 9.8 V/m; Power Drift = -0.181 dB

Peak SAR (extrapolated) = 0.314 W/kg

**SAR(1 g) = 0.183 mW/g; SAR(10 g) = 0.104 mW/g** Maximum value of SAR (measured) = 0.203 mW/g



0 dB = 0.203mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

WCDMA Band II Mid Body-Left Side

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: UMTS; Communication System Band: Band II, UTRA/FDD (1850.0-1910.0MHz);  
Duty Cycle: 1:1; Frequency: 1880 MHz; Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.5$  mho/m;  $\epsilon_r = 51.8$ ;  
 $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

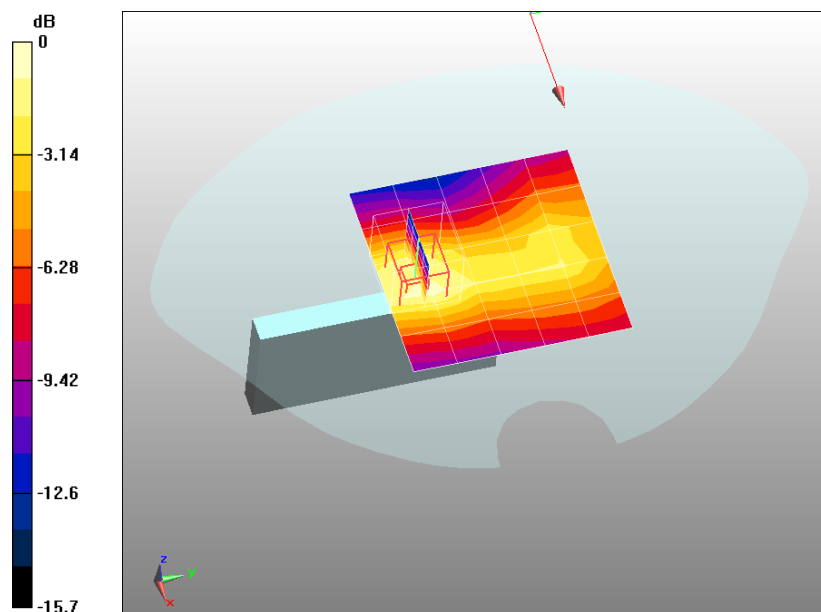
**Configuration/WCDMA Band II Mid Body-Left Side/Area Scan (6x6x1):** Measurement grid: dx=20mm, dy=20mm

Maximum value of SAR (measured) = 0.188 mW/g

**Configuration/WCDMA Band II Mid Body-Left Side/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 9.2 V/m; Power Drift = -0.115 dB

Peak SAR (extrapolated) = 0.318 W/kg

**SAR(1 g) = 0.197 mW/g; SAR(10 g) = 0.118 mW/g** Maximum value of SAR (measured) = 0.213 mW/g



0 dB = 0.213mW/g

Date/Time: 14-07-2011

Test Laboratory: QuieTek Lab

WCDMA Band V Mid Touch-Left

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: UMTS; Communication System Band: Band V, UTRA/FDD (824.0-849.0MHz);

Duty Cycle: 1:1; Frequency: 836 MHz; Medium parameters used:  $f = 836 \text{ MHz}$ ;  $\sigma = 0.89 \text{ mho/m}$ ;  $\epsilon_r = 41.1$ ;  $\rho = 1000 \text{ kg/m}^3$ ; Phantom section: Left Section

Ambient temperature ( $^{\circ}\text{C}$ ): 21.5, Liquid temperature ( $^{\circ}\text{C}$ ): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.843, 4.303, 4.435); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/WCDMA Band V Mid Touch-Left/Area Scan (6x9x1):** Measurement grid:  $dx=20\text{mm}$ ,  $dy=20\text{mm}$

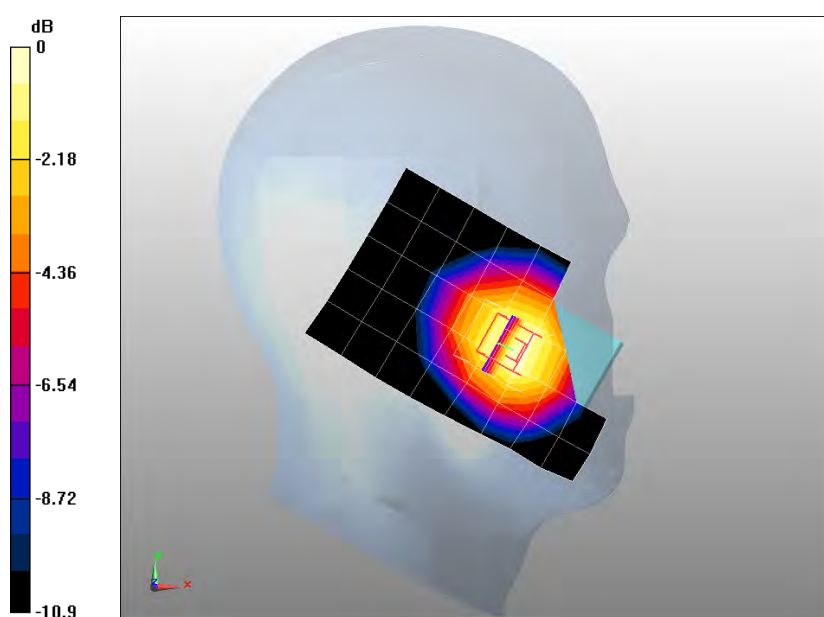
Maximum value of SAR (measured) = 0.405 mW/g

**Configuration/WCDMA Band V Mid Touch-Left/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$ , Reference Value = 5.25 V/m; Power Drift = -0.080 dB

Peak SAR (extrapolated) = 0.523 W/kg

**SAR(1 g) = 0.421 mW/g; SAR(10 g) = 0.309 mW/g** Maximum value of SAR (measured) = 0.446 mW/g



0 dB = 0.446mW/g

Date/Time: 14-07-2011

Test Laboratory: QuieTek Lab

WCDMA Band V Mid Tilt-Left

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: UMTS; Communication System Band: Band V, UTRA/FDD (824.0-849.0MHz);

Duty Cycle: 1:1; Frequency: 836 MHz; Medium parameters used:  $f = 836 \text{ MHz}$ ;  $\sigma = 0.89 \text{ mho/m}$ ;  $\epsilon_r = 41.1$ ;  $\rho = 1000 \text{ kg/m}^3$ ; Phantom section: Left Section

Ambient temperature ( $^{\circ}\text{C}$ ): 21.5, Liquid temperature ( $^{\circ}\text{C}$ ): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.843, 4.303, 4.435); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

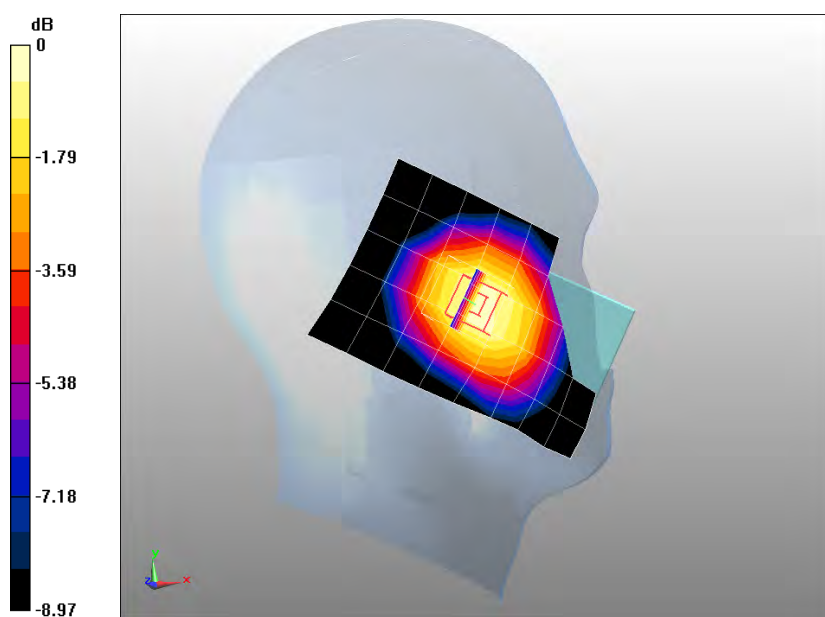
**Configuration/WCDMA Band V Mid Tilt-Left/Area Scan (6x9x1):** Measurement grid:  $dx=20\text{mm}$ ,  $dy=20\text{mm}$

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

**Configuration/WCDMA Band V Mid Tilt-Left/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$ , Reference Value = 10.8 V/m; Power Drift = -0.023 dB

Peak SAR (extrapolated) = 0.286 W/kg

**SAR(1 g) = 0.228 mW/g; SAR(10 g) = 0.173 mW/g** Maximum value of SAR (measured) = 0.240 mW/g



0 dB = 0.240mW/g

Date/Time: 14-07-2011

Test Laboratory: QuieTek Lab

WCDMA Band V Mid Touch-Right

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: UMTS; Communication System Band: Band V, UTRA/FDD (824.0-849.0MHz);

Duty Cycle: 1:1; Frequency: 836 MHz; Medium parameters used:  $f = 836$  MHz;  $\sigma = 0.89$  mho/m;  $\epsilon_r = 41.1$ ;  $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Right Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.843, 4.303, 4.435); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/WCDMA Band V Mid Touch-Right/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

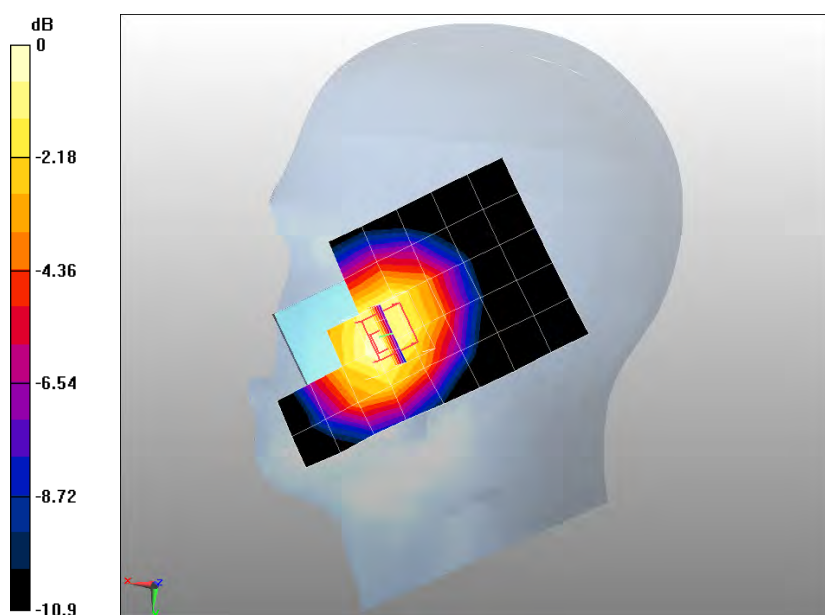
Maximum value of SAR (measured) = 0.376 mW/g

**Configuration/WCDMA Band V Mid Touch-Right/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

dx=8mm, dy=8mm, dz=5mm, Reference Value = 5.23 V/m; Power Drift = -0.103 dB

Peak SAR (extrapolated) = 0.507 W/kg

**SAR(1 g) = 0.363 mW/g; SAR(10 g) = 0.260 mW/g** Maximum value of SAR (measured) = 0.383 mW/g



0 dB = 0.383mW/g

Date/Time: 14-07-2011

Test Laboratory: QuieTek Lab

WCDMA Band V Mid Tilt-Right

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: UMTS; Communication System Band: Band V, UTRA/FDD (824.0-849.0MHz);

Duty Cycle: 1:1; Frequency: 836 MHz; Medium parameters used:  $f = 836 \text{ MHz}$ ;  $\sigma = 0.89 \text{ mho/m}$ ;  $\epsilon_r = 41.1$ ;  $\rho = 1000 \text{ kg/m}^3$ ; Phantom section: Right Section

Ambient temperature ( $^{\circ}\text{C}$ ): 21.5, Liquid temperature ( $^{\circ}\text{C}$ ): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.843, 4.303, 4.435); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

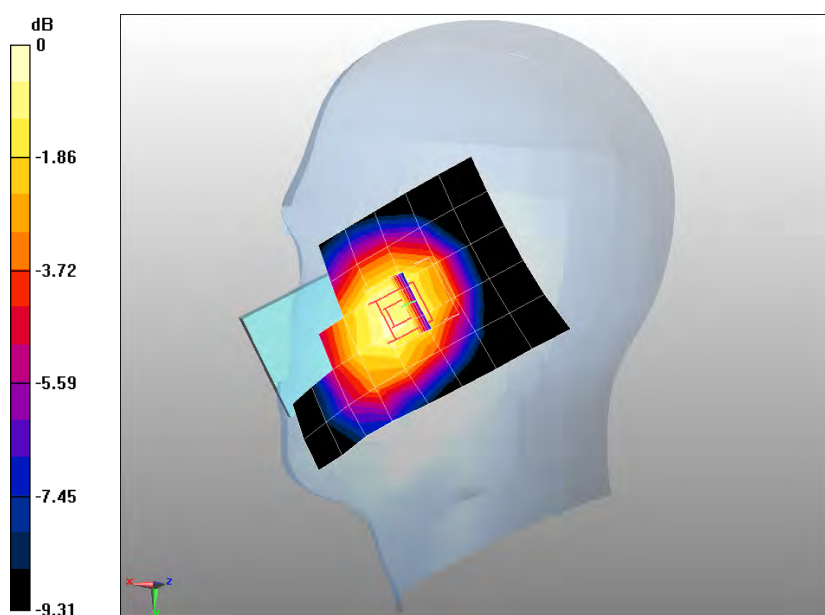
**Configuration/WCDMA Band V Mid Tilt-Right/Area Scan (6x9x1):** Measurement grid:  $dx=20\text{mm}$ ,  $dy=20\text{mm}$

Maximum value of SAR (measured) = 0.198 mW/g

**Configuration/WCDMA Band V Mid Tilt-Right/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$ , Reference Value = 9.24 V/m; Power Drift = -0.023 dB

Peak SAR (extrapolated) = 0.261 W/kg

**SAR(1 g) = 0.208 mW/g; SAR(10 g) = 0.156 mW/g** Maximum value of SAR (measured) = 0.218 mW/g



0 dB = 0.218mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

WCDMA Band V Mid Body-Back

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: UMTS; Communication System Band: Band V, UTRA/FDD (824.0-849.0MHz);

Duty Cycle: 1:1; Frequency: 836 MHz; Medium parameters used:  $f = 836 \text{ MHz}$ ;  $\sigma = 1 \text{ mho/m}$ ;  $\epsilon_r = 54.5$ ;  $\rho = 1000 \text{ kg/m}^3$ ; Phantom section: Flat Section

Ambient temperature ( $^{\circ}\text{C}$ ): 21.5, Liquid temperature ( $^{\circ}\text{C}$ ): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/WCDMA Band V Mid Body-Back/Area Scan (6x9x1):** Measurement grid:  $dx=20\text{mm}$ ,  $dy=20\text{mm}$

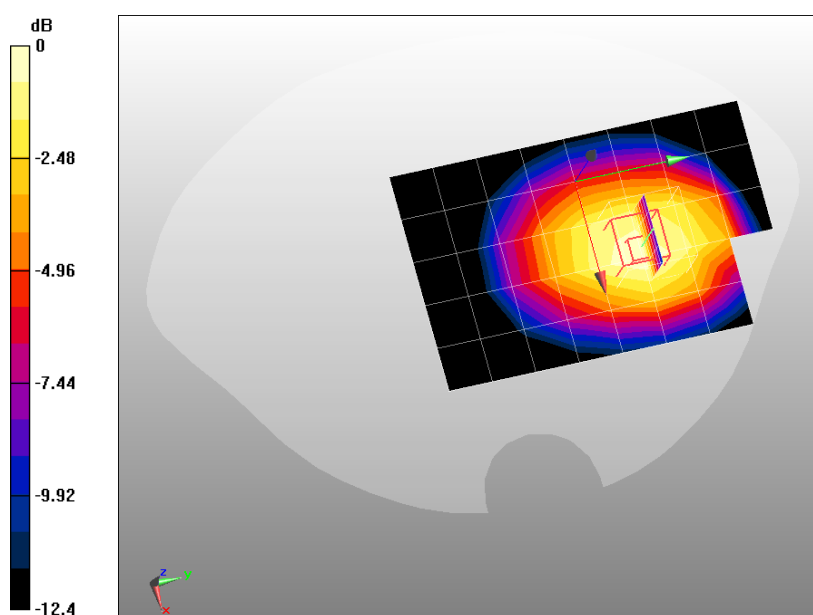
Maximum value of SAR (measured) = 0.661 mW/g

**Configuration/WCDMA Band V Mid Body-Back/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$ , Reference Value = 7.46 V/m; Power Drift = 0.187 dB

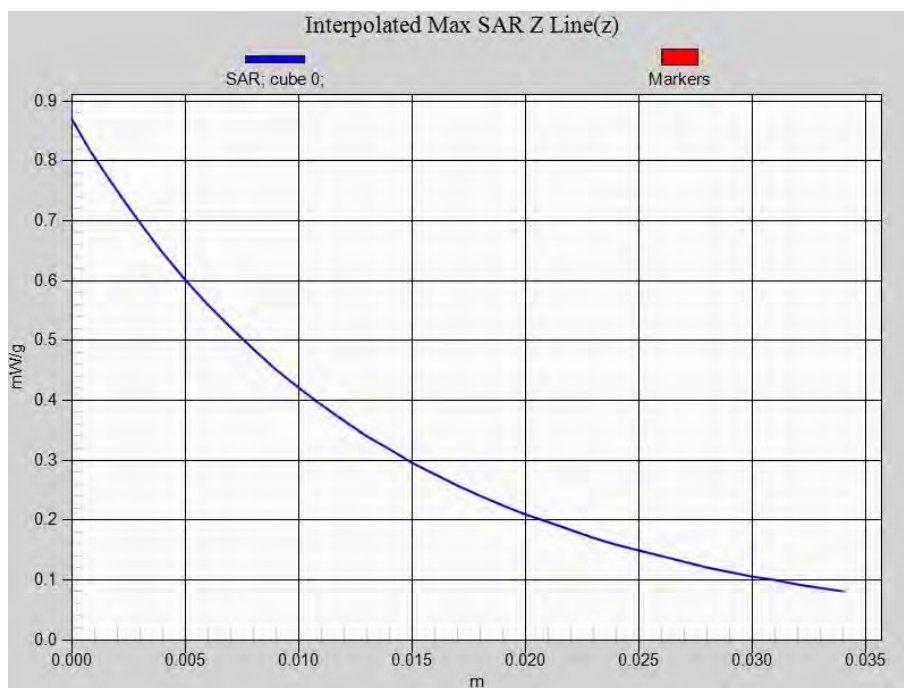
Peak SAR (extrapolated) = 0.868 W/kg

**SAR(1 g) = 0.615 mW/g; SAR(10 g) = 0.427 mW/g** Maximum value of SAR (measured) = 0.654 mW/g



0 dB = 0.654mW/g

# Z-Axis Plot



Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

WCDMA Band V Mid Body-Front

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: UMTS; Communication System Band: Band V, UTRA/FDD (824.0-849.0MHz);

Duty Cycle: 1:1; Frequency: 836 MHz; Medium parameters used:  $f = 836$  MHz;  $\sigma = 1$  mho/m;  $\epsilon_r = 54.5$ ;  $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/WCDMA Band V Mid Body-Front/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

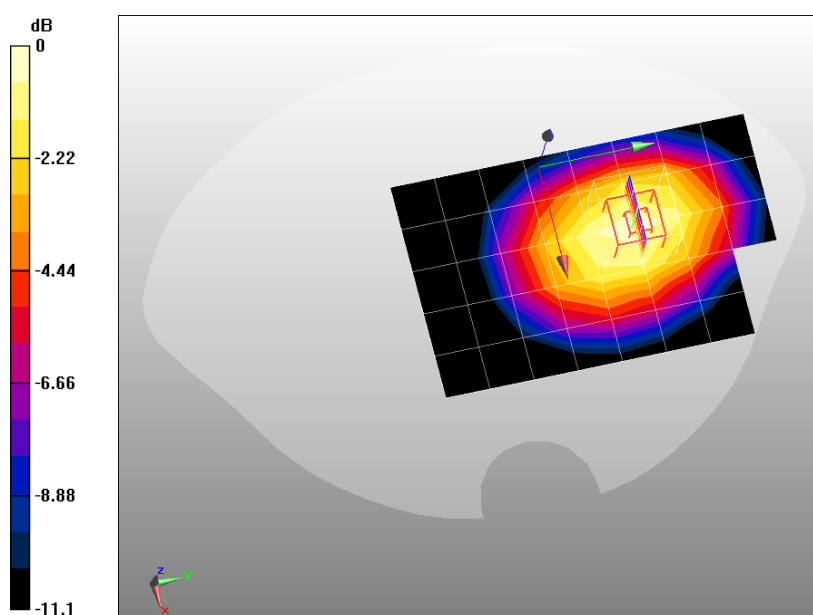
Maximum value of SAR (measured) = 0.440 mW/g

**Configuration/WCDMA Band V Mid Body-Front/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

dx=8mm, dy=8mm, dz=5mm, Reference Value = 6.88 V/m; Power Drift = -0.067 dB

Peak SAR (extrapolated) = 0.583 W/kg

**SAR(1 g) = 0.416 mW/g; SAR(10 g) = 0.293 mW/g** Maximum value of SAR (measured) = 0.438 mW/g



0 dB = 0.438mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

WCDMA Band V Mid Body-Back <with headset>

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: UMTS; Communication System Band: Band V, UTRA/FDD (824.0-849.0MHz);

Duty Cycle: 1:1; Frequency: 836 MHz; Medium parameters used:  $f = 836 \text{ MHz}$ ;  $\sigma = 1 \text{ mho/m}$ ;  $\epsilon_r = 54.5$ ;  $\rho = 1000 \text{ kg/m}^3$ ; Phantom section: Flat Section

Ambient temperature ( $^{\circ}\text{C}$ ): 21.5, Liquid temperature ( $^{\circ}\text{C}$ ): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/WCDMA Band V Mid Body-Back/Area Scan (6x9x1):** Measurement grid:  $dx=20\text{mm}$ ,  $dy=20\text{mm}$

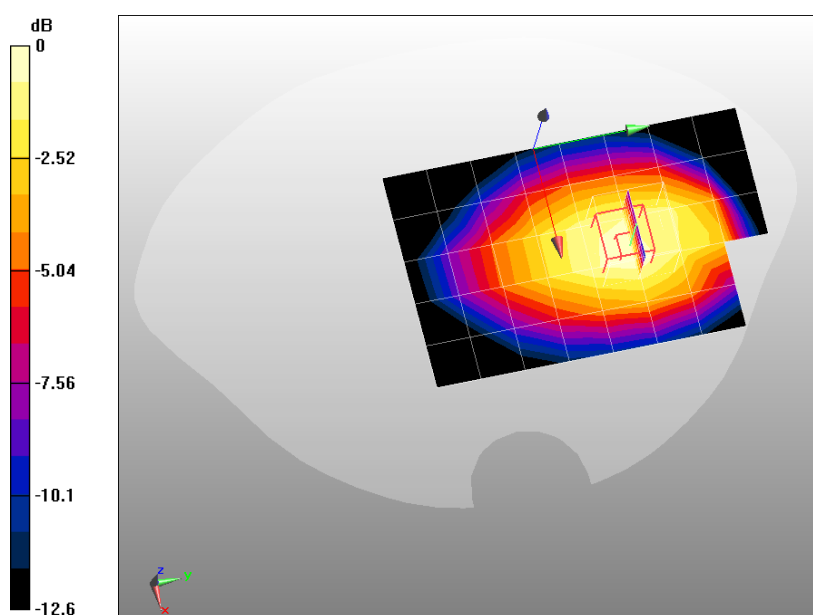
Maximum value of SAR (measured) = 0.417 mW/g

**Configuration/WCDMA Band V Mid Body-Back/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$ , Reference Value = 10.7 V/m; Power Drift = -0.026 dB

Peak SAR (extrapolated) = 0.561 W/kg

**SAR(1 g) = 0.405 mW/g; SAR(10 g) = 0.285 mW/g** Maximum value of SAR (measured) = 0.431 mW/g



0 dB = 0.431mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

WCDMA Band V Mid Body-Bottom

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: UMTS; Communication System Band: Band V, UTRA/FDD (824.0-849.0MHz);

Duty Cycle: 1:1; Frequency: 836 MHz; Medium parameters used:  $f = 836$  MHz;  $\sigma = 1$  mho/m;  $\epsilon_r = 54.5$ ;  $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/WCDMA Band V Mid Body-Bottom/Area Scan (6x6x1):** Measurement grid: dx=20mm, dy=20mm

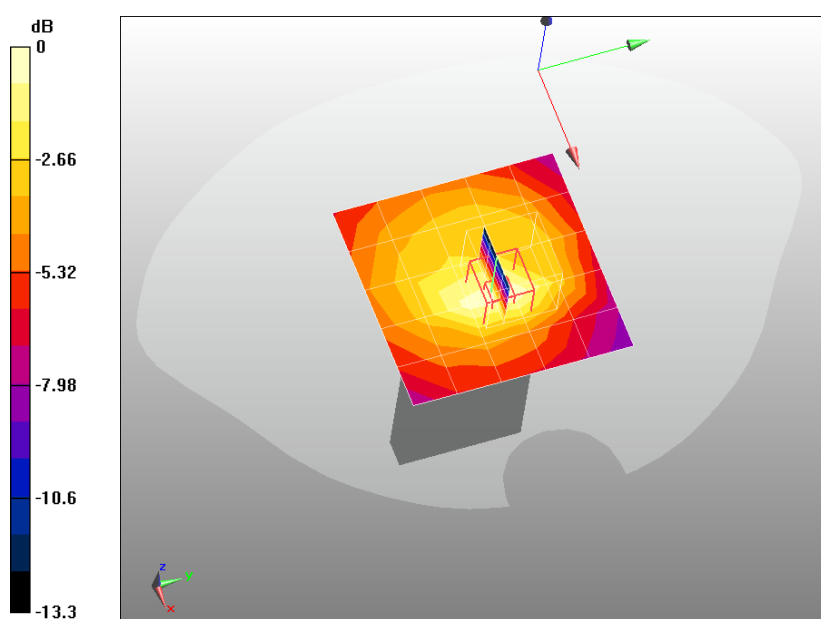
Maximum value of SAR (measured) = 0.076 mW/g

**Configuration/WCDMA Band V Mid Body-Bottom/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

dx=8mm, dy=8mm, dz=5mm, Reference Value = 7.62 V/m; Power Drift = -0.042 dB

Peak SAR (extrapolated) = 0.124 W/kg

**SAR(1 g) = 0.071 mW/g; SAR(10 g) = 0.041 mW/g** Maximum value of SAR (measured) = 0.075 mW/g



0 dB = 0.075mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

WCDMA Band V Mid Body-Right Side

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: UMTS; Communication System Band: Band V, UTRA/FDD (824.0-849.0MHz);

Duty Cycle: 1:1; Frequency: 836 MHz; Medium parameters used:  $f = 836$  MHz;  $\sigma = 1$  mho/m;  $\epsilon_r = 54.5$ ;  $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/WCDMA Band V Mid Body-Right Side/Area Scan (6x6x1):** Measurement grid: dx=20mm, dy=20mm

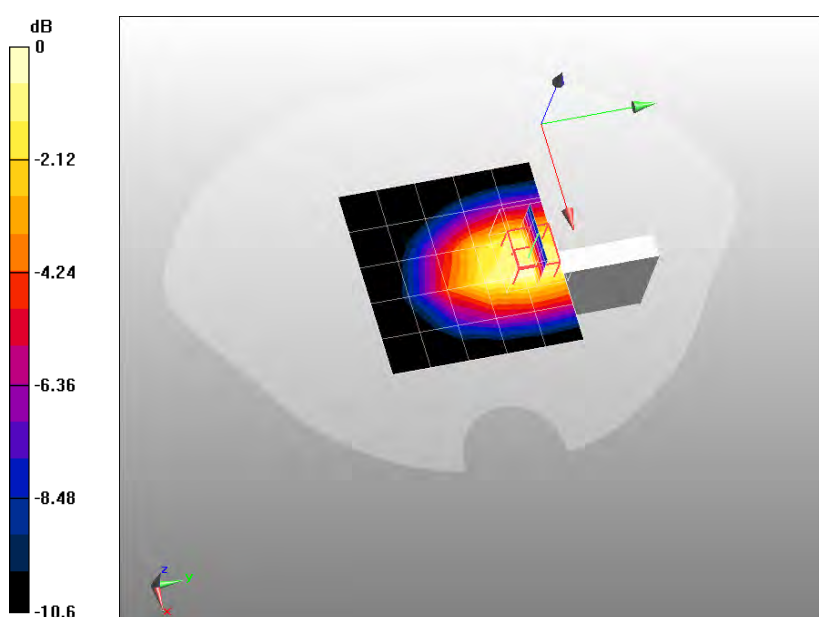
Maximum value of SAR (measured) = 0.233 mW/g

**Configuration/WCDMA Band V Mid Body-Right Side/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

dx=8mm, dy=8mm, dz=5mm, Reference Value = 12.4 V/m; Power Drift = -0.139 dB

Peak SAR (extrapolated) = 0.349 W/kg

**SAR(1 g) = 0.241 mW/g; SAR(10 g) = 0.161 mW/g** Maximum value of SAR (measured) = 0.256 mW/g



0 dB = 0.256mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

WCDMA Band V Mid Body-Left Side

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: UMTS; Communication System Band: Band V, UTRA/FDD (824.0-849.0MHz);

Duty Cycle: 1:1; Frequency: 836 MHz; Medium parameters used:  $f = 836 \text{ MHz}$ ;  $\sigma = 1 \text{ mho/m}$ ;  $\epsilon_r = 54.5$ ;  $\rho = 1000 \text{ kg/m}^3$ ; Phantom section: Flat Section

Ambient temperature ( $^{\circ}\text{C}$ ): 21.5, Liquid temperature ( $^{\circ}\text{C}$ ): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

**Configuration/WCDMA Band V Mid Body-Left Side/Area Scan (6x6x1):** Measurement grid:  $dx=20\text{mm}$ ,  $dy=20\text{mm}$

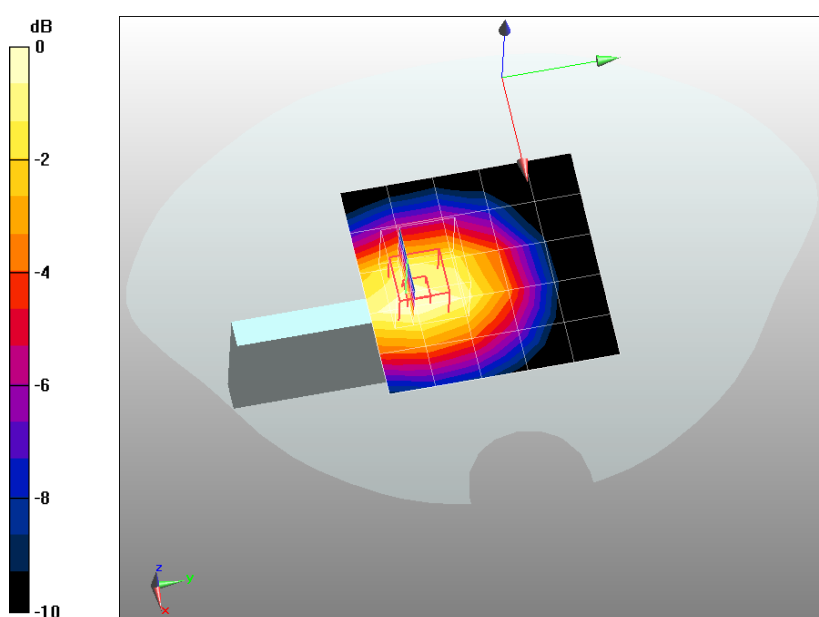
Maximum value of SAR (measured) = 0.294 mW/g

**Configuration/WCDMA Band V Mid Body-Left Side/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$ , Reference Value = 14.3 V/m; Power Drift = -0.127 dB

Peak SAR (extrapolated) = 0.390 W/kg

**SAR(1 g) = 0.275 mW/g; SAR(10 g) = 0.190 mW/g** Maximum value of SAR (measured) = 0.290 mW/g



0 dB = 0.290mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

802.11b 2412MHz Touch-Left

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: Wi-Fi; Communication System Band: 802.11b; Duty Cycle: 1:1; Frequency: 2412 MHz; Medium parameters used:  $f = 2412$  MHz;  $\sigma = 1.8$  mho/m;  $\epsilon_r = 38.3$ ;  $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Left Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.214, 3.653, 3.661); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

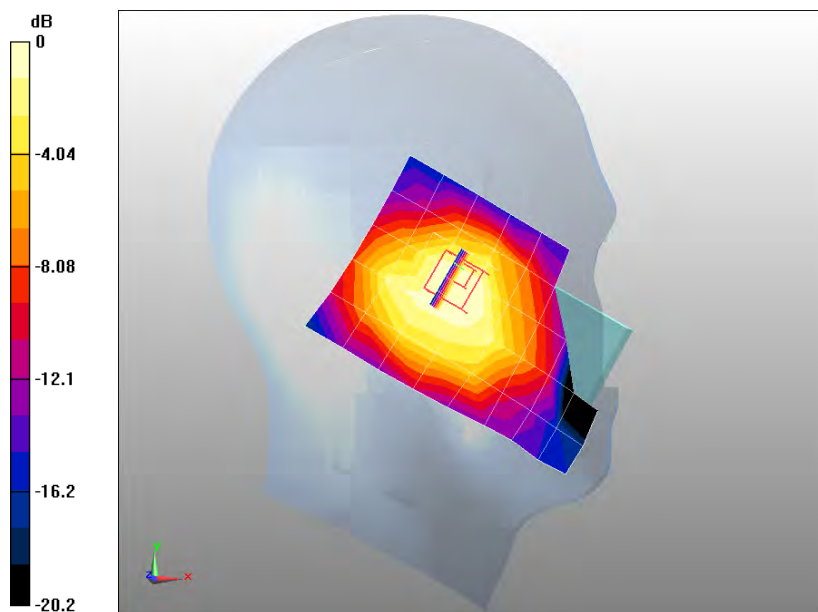
**Configuration/802.11b Low Touch-Left/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

Maximum value of SAR (measured) = 0.102 mW/g

**Configuration/802.11b Low Touch-Left/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 6.83 V/m; Power Drift = -0.197 dB

Peak SAR (extrapolated) = 0.181 W/kg

**SAR(1 g) = 0.100 mW/g; SAR(10 g) = 0.056 mW/g** Maximum value of SAR (measured) = 0.108 mW/g



0 dB = 0.108mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

802.11b 2412MHz Touch-Right

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: Wi-Fi; Communication System Band: 802.11b; Duty Cycle: 1:1; Frequency: 2412 MHz; Medium parameters used:  $f = 2412$  MHz;  $\sigma = 1.8$  mho/m;  $\epsilon_r = 38.3$ ;  $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Right Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.214, 3.653, 3.661); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

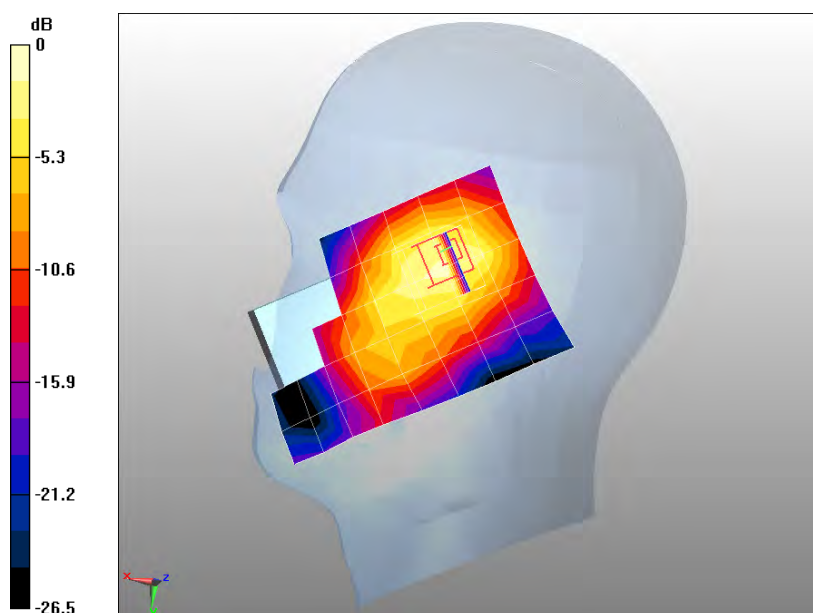
**Configuration/802.11b Low Touch-Right/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

Maximum value of SAR (measured) = 0.182 mW/g

**Configuration/802.11b Low Touch-Right/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 7.71 V/m; Power Drift = -0.179 dB

Peak SAR (extrapolated) = 0.460 W/kg

**SAR(1 g) = 0.208 mW/g; SAR(10 g) = 0.096 mW/g** Maximum value of SAR (measured) = 0.227 mW/g



0 dB = 0.227mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

802.11b 2412MHz Body-Back

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: Wi-Fi; Communication System Band: 802.11b; Duty Cycle: 1:1; Frequency: 2412 MHz; Medium parameters used:  $f = 2412$  MHz;  $\sigma = 1.9$  mho/m;  $\epsilon_r = 51$ ;  $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.702, 4.126, 4.265); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

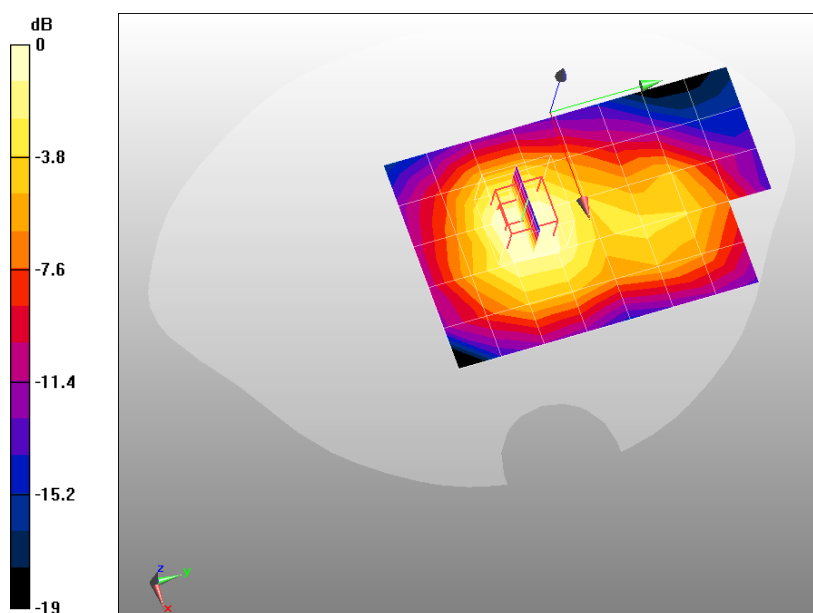
**Configuration/802.11b Low Body-Back/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

Maximum value of SAR (measured) = 0.103 mW/g

**Configuration/802.11b Low Body-Back/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 4.79 V/m; Power Drift = -0.177 dB

Peak SAR (extrapolated) = 0.193 W/kg

**SAR(1 g) = 0.103 mW/g; SAR(10 g) = 0.060 mW/g** Maximum value of SAR (measured) = 0.106 mW/g



0 dB = 0.106mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

802.11b 2412MHz Body-Front

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: Wi-Fi; Communication System Band: 802.11b; Duty Cycle: 1:1; Frequency: 2412 MHz; Medium parameters used:  $f = 2412$  MHz;  $\sigma = 1.9$  mho/m;  $\epsilon_r = 51$ ;  $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.702, 4.126, 4.265); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

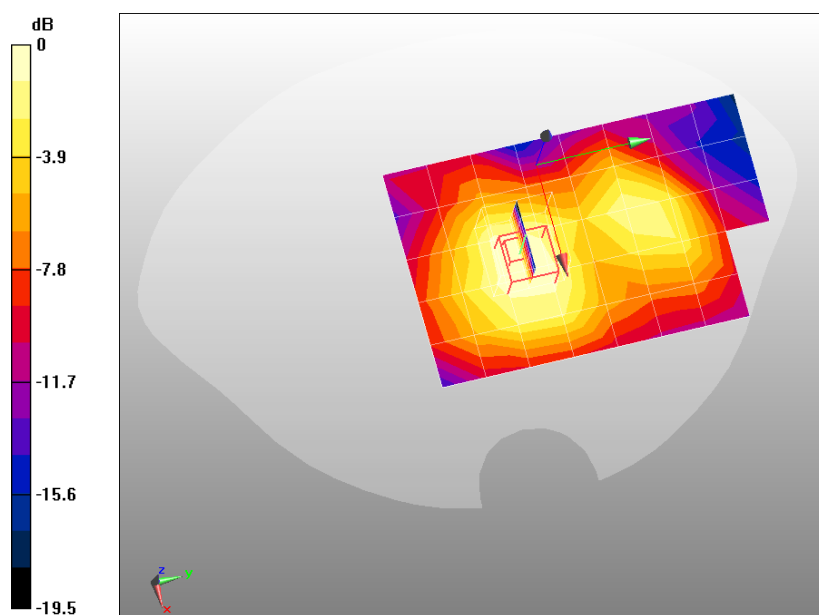
**Configuration/802.11b Low Body-Front/Area Scan (6x9x1):** Measurement grid: dx=20mm, dy=20mm

Maximum value of SAR (measured) = 0.042 mW/g

**Configuration/802.11b Low Body-Front/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 3.92 V/m; Power Drift = -0.152 dB

Peak SAR (extrapolated) = 0.084 W/kg

**SAR(1 g) = 0.044 mW/g; SAR(10 g) = 0.025 mW/g** Maximum value of SAR (measured) = 0.046 mW/g



0 dB = 0.046mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

802.11b 2412MHz Body-Top

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: Wi-Fi; Communication System Band: 802.11b; Duty Cycle: 1:1; Frequency: 2412 MHz; Medium parameters used:  $f = 2412$  MHz;  $\sigma = 1.9$  mho/m;  $\epsilon_r = 51$ ;  $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.702, 4.126, 4.265); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

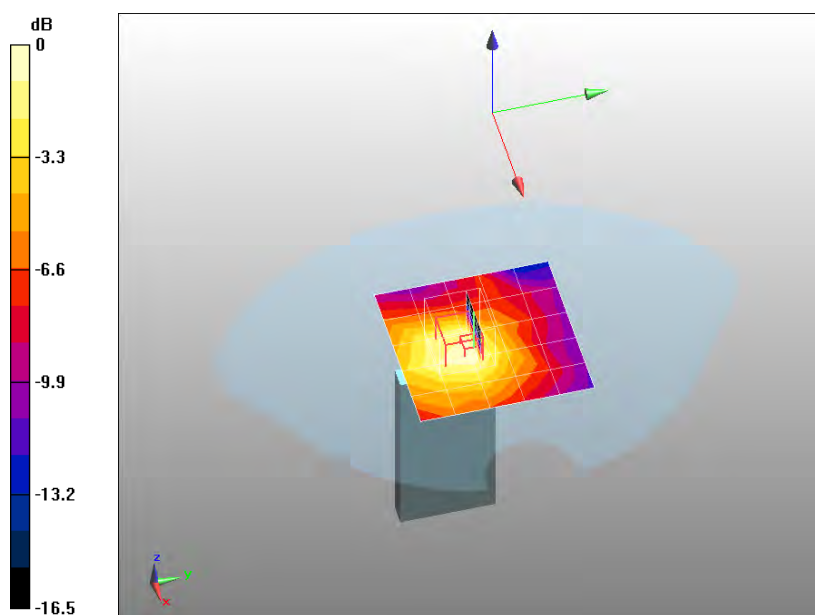
**Configuration/802.11b Low Body-Top/Area Scan (6x6x1):** Measurement grid: dx=20mm, dy=20mm

Maximum value of SAR (measured) = 0.039 mW/g

**Configuration/802.11b Low Body-Top/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 4.24 V/m; Power Drift = -0.149 dB

Peak SAR (extrapolated) = 0.076 W/kg

**SAR(1 g) = 0.037 mW/g; SAR(10 g) = 0.020 mW/g** Maximum value of SAR (measured) = 0.041 mW/g



0 dB = 0.041mW/g

Date/Time: 14-08-2011

Test Laboratory: QuieTek Lab

802.11b 2412MHz Body-Left Side

**DUT: Mobile Phone ; Type: U8520-51**

Communication System: Wi-Fi; Communication System Band: 802.11b; Duty Cycle: 1:1; Frequency: 2412 MHz; Medium parameters used:  $f = 2412$  MHz;  $\sigma = 1.9$  mho/m;  $\epsilon_r = 51$ ;  $\rho = 1000$  kg/m<sup>3</sup> ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(3.702, 4.126, 4.265); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

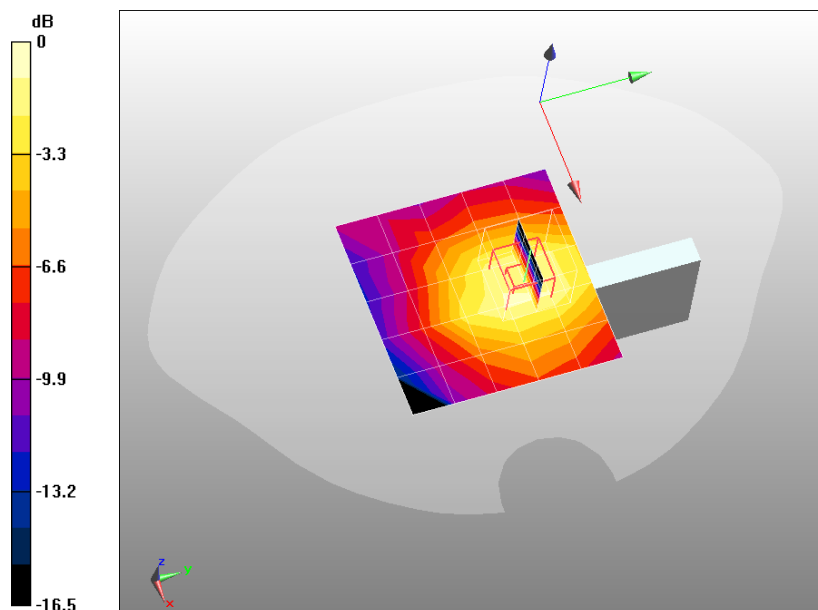
**Configuration/802.11b Low Body-Left Side/Area Scan (6x6x1):** Measurement grid: dx=20mm, dy=20mm

Maximum value of SAR (measured) = 0.032 mW/g

**Configuration/802.11b Low Body-Left Side/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 3.96 V/m; Power Drift = -0.197 dB

Peak SAR (extrapolated) = 0.071 W/kg

**SAR(1 g) = 0.036 mW/g; SAR(10 g) = 0.019 mW/g** Maximum value of SAR (measured) = 0.039 mW/g



0 dB = 0.039mW/g

## Appendix D. Probe Calibration Data

国家无线电监测中心检测中心  
The State Radio\_monitoring\_center Testing Center

### 校准证书

#### Calibration Certificate



器具名称 电场探头 E-Field Probe  
Instrument \_\_\_\_\_

型号/规格 EX3DV4  
Type/Model \_\_\_\_\_

生产厂家 Schmid & Partner Engineering AG  
Manufacturer \_\_\_\_\_

出厂编号 SN:3710  
Serial No \_\_\_\_\_

客户名称 快特电波科技（苏州）有限公司  
Name of Client \_\_\_\_\_

客户地址 苏州工业园区娄葑高新技术开发区宏业路 99 号  
Address of Client \_\_\_\_\_

校准日期 2011.2.25  
Calibration Date \_\_\_\_\_

所有的校准工作都是在屏蔽实验室中完成: 环境温度 (22±3) °C 湿度<70%  
All calibrations have been conducted in the closed laboratory facility: environment temperature (22±3) °C and humidity<70%

授权签字人:

Approved by



地址: 北京市西城区北礼士路 80 号  
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证书编号 Certificate No.SRTC2011-CAL002-001

国家无线电监测中心检测中心  
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|                                                              |                    |
|--------------------------------------------------------------|--------------------|
| 校准规范 Reference documents of the measurement(Code, Name)      |                    |
| SRMC3003-V2.0.0 比吸收率 (SAR) 测试系统校准规范                          |                    |
| 校准环境及地点 Place and environmental condition of the measurement |                    |
| 温度 Temperature 23.2℃                                         | 湿度 Humidity 32.5 % |
| 地点 Location SRTC room 226                                    |                    |

| 主要校准设备<br>Primary Calibration Equipment used | 型号<br>Model/Type | 序列号<br>ID#     | 校准日期<br>Cal Date | 校准有效期至<br>Scheduled Calibration |
|----------------------------------------------|------------------|----------------|------------------|---------------------------------|
| 功率计 Power meter                              | E4417A           | SN: MY45101004 | 2010.8           | 2011.8                          |
| 功率传感器 Power sensor                           | E9300B           | SN: MY41496001 | 2010.8           | 2011.8                          |
| 功率传感器 Power sensor                           | E9300B           | SN: MY41496003 | 2010.8           | 2011.8                          |
| 参考 DAE Reference DAE                         | DAE4             | SN: 720        | 2011.1           | 2012.1                          |
| 信号源 Signal generator                         | SML03            | SN:103514      | 2010.8           | 2011.8                          |
| 网络分析仪 Network analyzer                       | 8714ET           | SN:US40372083  | 2010.8           | 2011.8                          |
| 次要校准设备<br>Secondary Calibration Equipment    | 型号<br>Model/Type | 序列号<br>ID#     |                  |                                 |
| 波导 Waveguide                                 | WGLS R9          | SN:1006        |                  |                                 |
| 波导 Waveguide                                 | WGLS R14         | SN:1003        |                  |                                 |
| 波导 Waveguide                                 | WGLS R22         | SN:1006        |                  |                                 |

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注:

1. 所使用的校准系统和计量标准可溯源到国家基准或标准。

测量和置信区间的不确定度都是证书的一部分，并将在以下内容中给出。

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.

2. 除非拥有本实验室的书面许可，否则不得复制该校准证书。

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

3. 我中心仅对加盖“国家无线电监测中心检验中心”章的完整证书负责

SRTC is responsible for the whole of certificate only with stamp of SRTC.

4. 本证书的校准结果仅对所校准的计量器具有效

The calibration results would be valid only for the items calibration.

5. 本证书中英文两种语言表达，准确含义以中文为准。

The certification is written by Chinese and English. Exact meaning should be explained only on Chinese version.

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备注

Glossary

|              |                                                                                                                                                                                                       |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TSL          | 模拟组织液 tissue simulating liquid                                                                                                                                                                        |
| NORMx, y, z  | 自由空间灵敏度 sensitivity in free space                                                                                                                                                                     |
| ConvF        | 模拟组织液中的灵敏度/自由空间的灵敏度 sensitivity in TSL/NORM x, y, z                                                                                                                                                   |
| DCP          | 二极管压缩点 diode compression point                                                                                                                                                                        |
| 角度 $\varphi$ | 沿探头轴向旋转 $\varphi$ $\varphi$ rotation around probe axis                                                                                                                                                |
| 角度 $\theta$  | 沿探头法平面中的一个轴旋转 $\theta$ , 例如 $\theta=0$ , 代表垂直于探头轴向<br>$\theta$ rotation around an axis that is in the plane normal to probe axis (at measurement center),<br>i.e., $\theta=0$ is normal to probe axis |

本校准证书中使用的方法参考如下标准

Calibration is preformed according to the Following Standards

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

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方法及参数介绍

Methods Applied and Interpretation of Parameters

- NORM<sub>x, y, z</sub>: NORM<sub>x, y, z</sub> 是中间变量, 其不确定度不影响 TSL 中电场强度的不确定性。  
NORM <sub>x, y, z</sub> are only intermediate valve, i.e., the uncertainties of NORM <sub>x, y, z</sub> does not effect the E<sup>2</sup>-field uncertainty inside TSL (see below ConvF)
- NORM(f)<sub>x, y, z</sub>= NORM<sub>x, y, z</sub>\*频率响应。在 DASY4.2 以后的版本中, 这项工作由软件完成, 频率响应的不确定度包含在 ConvF 的不确定度中。  
NORM(f) <sub>x, y, z</sub>= NORM <sub>x, y, z</sub>\*frequency response (see Frequency Response Chart ). This linearization is implemented in DASY4 software version later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCP<sub>x, y, z</sub>: DCP 是与探头的线性度相关的参数, 其测试是基于功率扫描的方法进行的, 另外 DCP 既不依赖于频率也不依赖于介质。  
DCP <sub>x, y, z</sub>: 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 和边界效应: 当频率大于 800MHz 时, 利用平坦模型中的电场或是波导中的人工电场进行测试。我们也利用相同的配置来得到边界效应的相关参数 (alpha, depth)。DASY 软件的这项功能可以用来补偿测试中发生的边界效应, 使在边界附近测试的时候能够更加准确。而 ConvF<sub>x, y, z</sub>=NORM<sub>x, y, z</sub>\*ConvF。DASY4.4 以后的版本允许的频率扩展范围为±50MHz 到 ±100MHz。  
ConvF and Boundary Effect Parameters: Assessed in flat phantom using E-field (or Temperature Transfer Stand for f≤800MHz) and inside waveguide using analytical field distributions based on power measurement for f>800MHz .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 that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ±50MHz to ±100 MHz.
- 各向同性: 探头暴露在平板天线和一个平面模型产生的电场中, 这个电场的梯度较低。  
Spherical isotropy (3D deviation from isotropy): in a field of low gradients realized using a flat phantom exposed by a patch antenna.

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测试条件

Measurement Conditions

|                      |              |             |
|----------------------|--------------|-------------|
| DASY 版本 DASY Version | DSAY 5       | V52.2.0.163 |
| 模型 Phantom           | Flat phantom |             |

探头敏感度参数

Probe Sensitivity Parameters

|     | 数值 Value | 单位 Unit         |
|-----|----------|-----------------|
| X 轴 | 1.00     | $\mu V/(V/m)^2$ |
| Y 轴 | 1.00     | $\mu V/(V/m)^2$ |
| Z 轴 | 1.00     | $\mu V/(V/m)^3$ |

1. 二极管压缩点

Diode Compression Point

|     | 数值 Value | 单位 Unit | 不确定度 Uncertainty<br>(k = 2) |
|-----|----------|---------|-----------------------------|
| X 轴 | 98.60    | mV      | 10.82%                      |
| Y 轴 | 97.38    | mV      | 10.82%                      |
| Z 轴 | 99.74    | mV      | 10.82%                      |

2. 转换因子: 头部 TSL

Probe Conversion Factors: Head Tissue Liquid

| 频率(MHz)<br>Frequency | 频率范围<br>Validity<br>(MHz) | 介电常数<br>Permittivity | 导电率<br>Conductivity | Alpha | Depth | ConvFx/ ConvFy/<br>ConvFz<br>$\mu V/(V/m)^2$ |       |       | 不确定度<br>Uncertainty<br>(k = 2) |
|----------------------|---------------------------|----------------------|---------------------|-------|-------|----------------------------------------------|-------|-------|--------------------------------|
| 850                  | ±100                      | 41.56                | 0.9106              | 0.395 | 0.882 | 3.843                                        | 4.303 | 4.435 | 13.02%                         |
| 900                  | ±100                      | 41.24                | 0.9487              | 0.337 | 0.974 | 3.913                                        | 4.377 | 4.502 | 13.02%                         |
| 1800                 | ±100                      | 39.21                | 1.348               | 0.156 | 1.648 | 3.784                                        | 4.193 | 4.328 | 13.02%                         |
| 1900                 | ±100                      | 38.75                | 1.450               | 0.178 | 1.515 | 3.609                                        | 4.015 | 4.146 | 13.02%                         |
| 2450                 | ±100                      | 38.23                | 1.982               | 0.126 | 1.725 | 3.214                                        | 3.653 | 3.661 | 13.02%                         |

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3. 转换因子：腰部 TSL

Probe Conversion Factors: Body Tissue Liquid

| 频率(MHz)<br>Frequency | 频率范围<br>Validity<br>(MHz) | 介电常数<br>Permittivity | 导电率<br>Conductivity | Alpha | Depth | ConvFx/ ConvFy/<br>ConvFz<br>$\mu V/(V/m)^2$ |       |       | 不确定度<br>Uncertainty<br>(k = 2) |
|----------------------|---------------------------|----------------------|---------------------|-------|-------|----------------------------------------------|-------|-------|--------------------------------|
| 850                  | ±100                      | 55.36                | 1.004               | 0.459 | 0.807 | 4.438                                        | 4.985 | 5.123 | 13.02%                         |
| 900                  | ±100                      | 54.48                | 1.055               | 0.378 | 0.863 | 4.530                                        | 5.101 | 5.229 | 13.02%                         |
| 1800                 | ±100                      | 52.83                | 1.501               | 0.152 | 1.732 | 4.333                                        | 4.832 | 4.991 | 13.02%                         |
| 1900                 | ±100                      | 52.43                | 1.615               | 0.183 | 1.491 | 4.193                                        | 4.677 | 4.833 | 13.02%                         |
| 2450                 | ±100                      | 52.95                | 1.911               | 0.137 | 1.758 | 3.702                                        | 4.126 | 4.265 | 13.02%                         |

4. 各向同性

Probe Isotropy

|                           | 数值 Value | 单位 Unit | 不确定度<br>Uncertainty<br>(k = 2) |
|---------------------------|----------|---------|--------------------------------|
| 轴向各向同性 Axial Isotropy     | 0.157    | dB      | 10.18%                         |
| 球面各向同性 Spherical Isotropy | 0.125    | dB      | 10.18%                         |

校准员

Calibrated by

张明远

核验员

Checked by

刘鹏

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## Appendix E. Dipole Calibration Data

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



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

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

Accreditation No.: **SCS 108**

Client **Quietek (Auden)**

Certificate No: **D835V2-4d094\_Mar10**

### CALIBRATION CERTIFICATE

Object **D835V2 - SN: 4d094**

Calibration procedure(s) **QA CAL-05.v7**  
**Calibration procedure for dipole validation kits**

Calibration date: **March 15, 2010**

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

All calibrations have been conducted in the closed laboratory facility: environment temperature ( $22 \pm 3^\circ\text{C}$ ) and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards           | ID #               | Cal Date (Certificate No.)        | Scheduled Calibration  |
|-----------------------------|--------------------|-----------------------------------|------------------------|
| Power meter EPM-442A        | GB37480704         | 06-Oct-09 (No. 217-01086)         | Oct-10                 |
| Power sensor HP 8481A       | US37292783         | 06-Oct-09 (No. 217-01086)         | Oct-10                 |
| Reference 20 dB Attenuator  | SN: 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 ES3DV3      | SN: 3205           | 26-Jun-09 (No. ES3-3205_Jun09)    | Jun-10                 |
| DAE4                        | SN: 601            | 02-Mar-10 (No. DAE4-601_Mar10)    | Mar-11                 |
| Secondary Standards         | ID #               | Check Date (in house)             | Scheduled Check        |
| Power sensor HP 8481A       | MY41092317         | 18-Oct-02 (in house check Oct-09) | In house check: Oct-11 |
| RF generator R&S SMT-06     | 100005             | 4-Aug-99 (in house check Oct-09)  | In house check: Oct-11 |
| Network Analyzer HP 8753E   | US37390585 S4206   | 18-Oct-01 (in house check Oct-09) | In house check: Oct-10 |

|                |                     |                                   |               |
|----------------|---------------------|-----------------------------------|---------------|
| Calibrated by: | Name<br>Dimce Iliev | Function<br>Laboratory Technician | Signature<br> |
| Approved by:   | Katja Pokovic       | Technical Manager                 |               |

Issued: March 15, 2010

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



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

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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:

- 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
- 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
- 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:

- 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                     | V5.2        |
| 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 $\pm$ 1 MHz       |             |

### Head TSL parameters

The following parameters and calculations were applied.

|                                  | Temperature         | Permittivity   | Conductivity         |
|----------------------------------|---------------------|----------------|----------------------|
| Nominal Head TSL parameters      | 22.0 °C             | 41.5           | 0.90 mho/m           |
| Measured Head TSL parameters     | (22.0 $\pm$ 0.2) °C | 42.9 $\pm$ 6 % | 0.91 mho/m $\pm$ 6 % |
| Head TSL temperature during test | (21.5 $\pm$ 0.2) °C | ----           | ----                 |

### SAR result with Head TSL

| SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL | Condition          |                                |
|-------------------------------------------------------|--------------------|--------------------------------|
| SAR measured                                          | 250 mW input power | 2.43 mW / g                    |
| SAR normalized                                        | normalized to 1W   | 9.72 mW / g                    |
| SAR for nominal Head TSL parameters                   | normalized to 1W   | 9.70 mW / g $\pm$ 17.0 % (k=2) |

| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | condition          |                                |
|---------------------------------------------------------|--------------------|--------------------------------|
| SAR measured                                            | 250 mW input power | 1.58 mW / g                    |
| SAR normalized                                          | normalized to 1W   | 6.32 mW / g                    |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 6.30 mW / g $\pm$ 16.5 % (k=2) |

### 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 | 55.3 ± 6 %   | 1.01 mho/m ± 6 % |
| Body TSL temperature during test | (21.3 ± 0.2) °C | ----         | ----             |

### SAR result with Body TSL

| SAR averaged over 1 cm <sup>3</sup> (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                   | normalized to 1W   | 9.90 mW / g ± 17.0 % (k=2) |

| SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL | condition          |                            |
|---------------------------------------------------------|--------------------|----------------------------|
| SAR measured                                            | 250 mW input power | 1.67 mW / g                |
| SAR normalized                                          | normalized to 1W   | 6.68 mW / g                |
| SAR for nominal Body TSL parameters                     | normalized to 1W   | 6.53 mW / g ± 16.5 % (k=2) |

## Appendix

### Antenna Parameters with Head TSL

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 52.2 $\Omega$ - 2.7 j $\Omega$ |
| Return Loss                          | - 29.4 dB                      |

### Antenna Parameters with Body TSL

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 48.0 $\Omega$ - 4.8 j $\Omega$ |
| Return Loss                          | - 25.5 dB                      |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.388 ns |
|----------------------------------|----------|

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

### Additional EUT Data

|                 |                    |
|-----------------|--------------------|
| Manufactured by | SPEAG              |
| Manufactured on | September 15, 2009 |

## DASY5 Validation Report for Head TSL

Date/Time: 08.03.2010 10:52:27

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d094**

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

Medium: HSL900

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.91 \text{ mho/m}$ ;  $\epsilon_r = 42.7$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.04, 6.04, 6.04); Calibrated: 26.06.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.03.2010
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

**Pin=250 mW /d=15mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement**

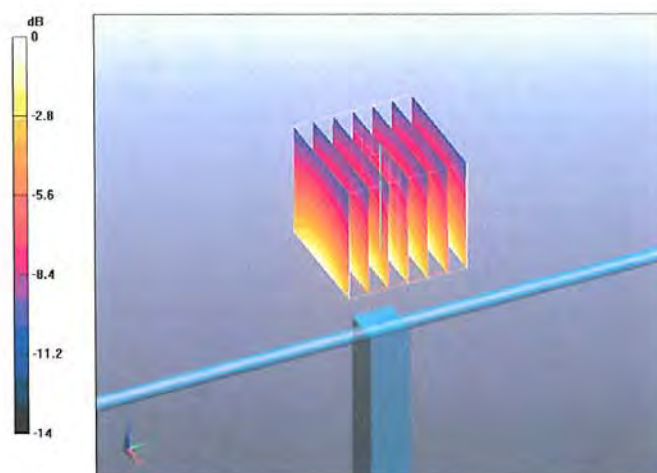
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 57.3 V/m; Power Drift = 0.00297 dB

Peak SAR (extrapolated) = 3.65 W/kg

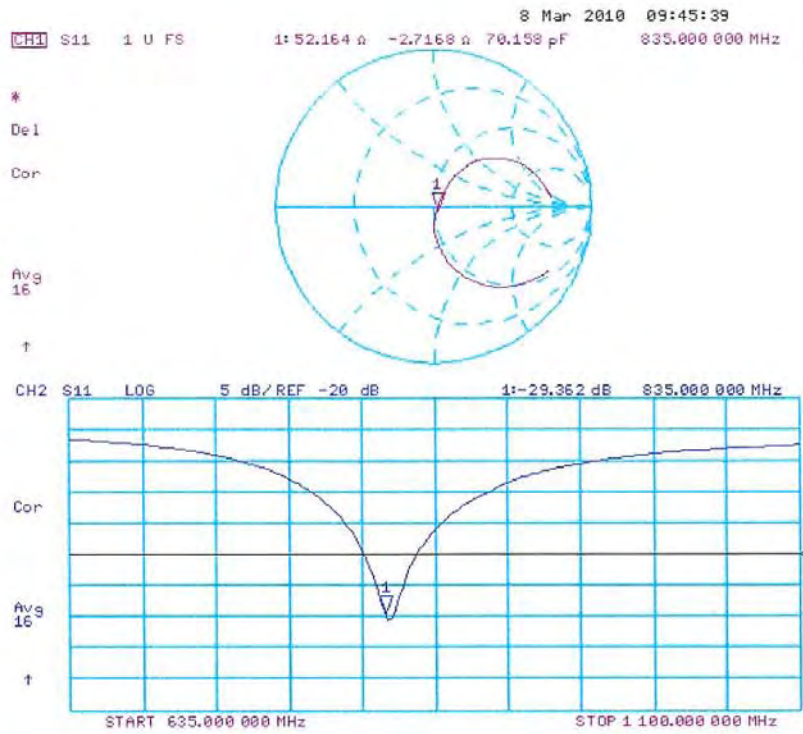
**SAR(1 g) = 2.43 mW/g; SAR(10 g) = 1.58 mW/g**

Maximum value of SAR (measured) = 2.84 mW/g



0 dB = 2.84mW/g

# Impedance Measurement Plot for Head TSL



## DASY5 Validation Report for Body

Date/Time: 15.03.2010 11:52:53

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d094**

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

Medium: MSL900

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 1.01 \text{ mho/m}$ ;  $\epsilon_r = 55.3$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.97, 5.97, 5.97); Calibrated: 26.06.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.03.2010
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

**Pin250 mW /d=15mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement**

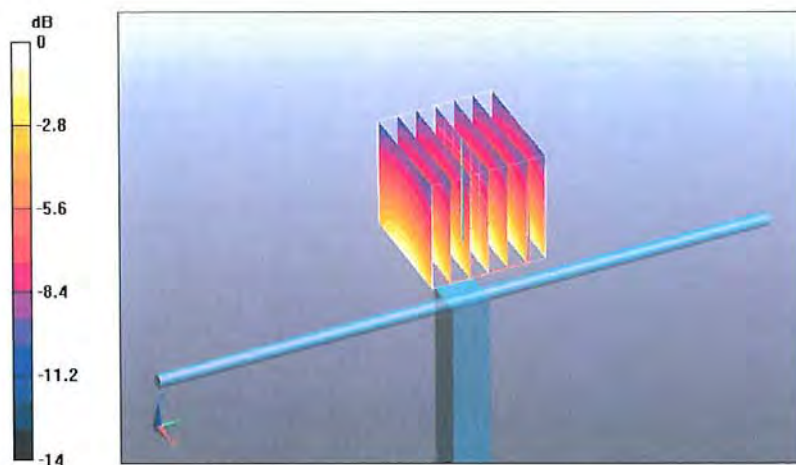
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.9 V/m; Power Drift = -0.00975 dB

Peak SAR (extrapolated) = 3.77 W/kg

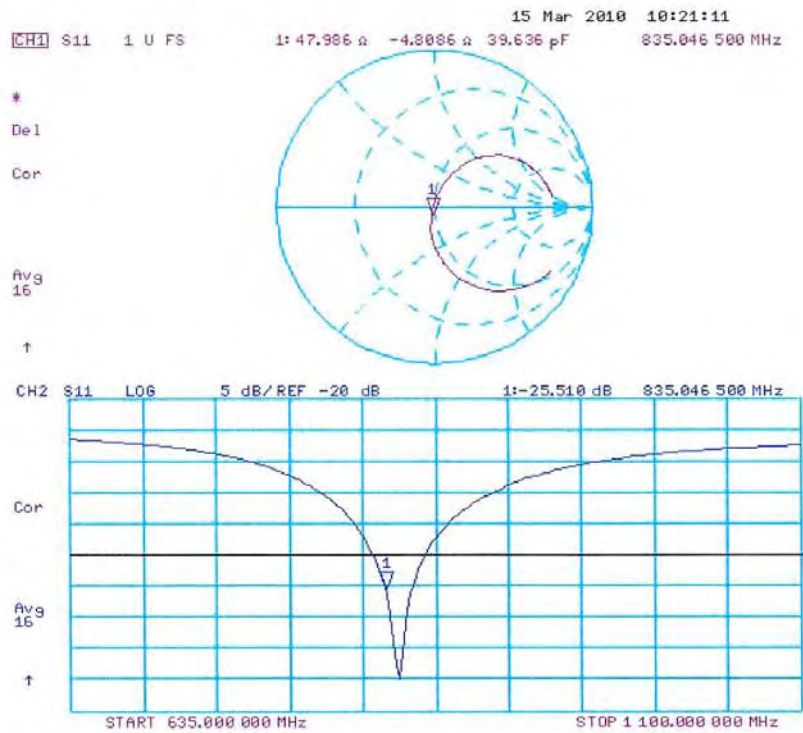
**SAR(1 g) = 2.55 mW/g; SAR(10 g) = 1.67 mW/g**

Maximum value of SAR (measured) = 2.98 mW/g



0 dB = 2.98mW/g

# Impedance Measurement Plot for Body TSL



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Accreditation No.: **SCS 108**

Client **Quietek (Auden)**

Certificate No: **D1900V2-5d121\_Mar10**

## CALIBRATION CERTIFICATE

Object **D1900V2 - SN: 5d121**

Calibration procedure(s) **QA CAL-05.v7**  
**Calibration procedure for dipole validation kits**

Calibration date: **March 23, 2010**

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

All calibrations have been conducted in the closed laboratory facility: environment temperature  $(22 \pm 3)^{\circ}\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards           | ID #               | Cal Date (Certificate No.)     | Scheduled Calibration |
|-----------------------------|--------------------|--------------------------------|-----------------------|
| Power meter EPM-442A        | GB37480704         | 06-Oct-09 (No. 217-01086)      | Oct-10                |
| Power sensor HP 8481A       | US37292783         | 06-Oct-09 (No. 217-01086)      | Oct-10                |
| Reference 20 dB Attenuator  | SN: 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 ES3DV3      | SN: 3205           | 26-Jun-09 (No. ES3-3205_Jun09) | Jun-10                |
| DAE4                        | SN: 601            | 02-Mar-10 (No. DAE4-601_Mar10) | Mar-11                |

| Secondary Standards       | ID #             | Check Date (in house)             | Scheduled Check        |
|---------------------------|------------------|-----------------------------------|------------------------|
| Power sensor HP 8481A     | MY41092317       | 18-Oct-02 (in house check Oct-09) | In house check: Oct-11 |
| RF generator R&S SMT-06   | 100005           | 4-Aug-99 (in house check Oct-09)  | In house check: Oct-11 |
| Network Analyzer HP 8753E | US37390585 S4206 | 18-Oct-01 (in house check Oct-09) | In house check: Oct-10 |

Calibrated by: **Dimce Iliev** Function: **Laboratory Technician** Signature: *[Signature]*

Approved by: **Katja Pokovic** Technical Manager *[Signature]*

Issued: March 23, 2010

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Certificate No: D1900V2-5d121\_Mar10

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 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:

- 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
- 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
- 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:

- 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                     | V5.2        |
| Extrapolation                | Advanced Extrapolation    |             |
| Phantom                      | Modular Flat Phantom V5.0 |             |
| Distance Dipole Center - TSL | 10 mm                     | with Spacer |
| Zoom Scan Resolution         | dx, dy, dz = 5 mm         |             |
| Frequency                    | 1900 MHz $\pm$ 1 MHz      |             |

### Head TSL parameters

The following parameters and calculations were applied.

|                                  | Temperature         | Permittivity   | Conductivity         |
|----------------------------------|---------------------|----------------|----------------------|
| Nominal Head TSL parameters      | 22.0 °C             | 40.0           | 1.40 mho/m           |
| Measured Head TSL parameters     | (22.0 $\pm$ 0.2) °C | 41.1 $\pm$ 6 % | 1.45 mho/m $\pm$ 6 % |
| Head TSL temperature during test | (21.5 $\pm$ 0.2) °C | ----           | ----                 |

### SAR result with Head TSL

| SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL | Condition          |                                                 |
|-------------------------------------------------------|--------------------|-------------------------------------------------|
| SAR measured                                          | 250 mW input power | 10.1 mW / g                                     |
| SAR normalized                                        | normalized to 1W   | 40.4 mW / g                                     |
| SAR for nominal Head TSL parameters                   | normalized to 1W   | <b>39.8 mW /g <math>\pm</math> 17.0 % (k=2)</b> |

| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | condition          |                                                 |
|---------------------------------------------------------|--------------------|-------------------------------------------------|
| SAR measured                                            | 250 mW input power | 5.30 mW / g                                     |
| SAR normalized                                          | normalized to 1W   | 21.2 mW / g                                     |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | <b>21.1 mW /g <math>\pm</math> 16.5 % (k=2)</b> |

### Body TSL parameters

The following parameters and calculations were applied.

|                                  | Temperature     | Permittivity | Conductivity     |
|----------------------------------|-----------------|--------------|------------------|
| Nominal Body TSL parameters      | 22.0 °C         | 53.3         | 1.52 mho/m       |
| Measured Body TSL parameters     | (22.0 ± 0.2) °C | 54.9 ± 6 %   | 1.58 mho/m ± 6 % |
| Body TSL temperature during test | (21.5 ± 0.2) °C | ----         | ----             |

### SAR result with Body TSL

| SAR averaged over 1 cm <sup>3</sup> (1 g) of Body TSL | Condition          |                            |
|-------------------------------------------------------|--------------------|----------------------------|
| SAR measured                                          | 250 mW input power | 10.5 mW / g                |
| SAR normalized                                        | normalized to 1W   | 42.0 mW / g                |
| SAR for nominal Body TSL parameters                   | normalized to 1W   | 41.4 mW / g ± 17.0 % (k=2) |

| SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL | condition          |                            |
|---------------------------------------------------------|--------------------|----------------------------|
| SAR measured                                            | 250 mW input power | 5.60 mW / g                |
| SAR normalized                                          | normalized to 1W   | 22.4 mW / g                |
| SAR for nominal Body TSL parameters                     | normalized to 1W   | 22.3 mW / g ± 16.5 % (k=2) |

## Appendix

### Antenna Parameters with Head TSL

|                                      |                             |
|--------------------------------------|-----------------------------|
| Impedance, transformed to feed point | $50.6 \Omega + 7.4 j\Omega$ |
| Return Loss                          | - 22.7 dB                   |

### Antenna Parameters with Body TSL

|                                      |                             |
|--------------------------------------|-----------------------------|
| Impedance, transformed to feed point | $46.1 \Omega + 7.1 j\Omega$ |
| Return Loss                          | - 21.5 dB                   |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.205 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 | August 25, 2009 |

## DASY5 Validation Report for Head TSL

Date/Time: 23.03.2010 12:23:06

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d121**

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

Medium: HSL U11 BB

Medium parameters used:  $f = 1900 \text{ MHz}$ ;  $\sigma = 1.45 \text{ mho/m}$ ;  $\epsilon_r = 41.2$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.09, 5.09, 5.09); Calibrated: 26.06.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.03.2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

**Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement**

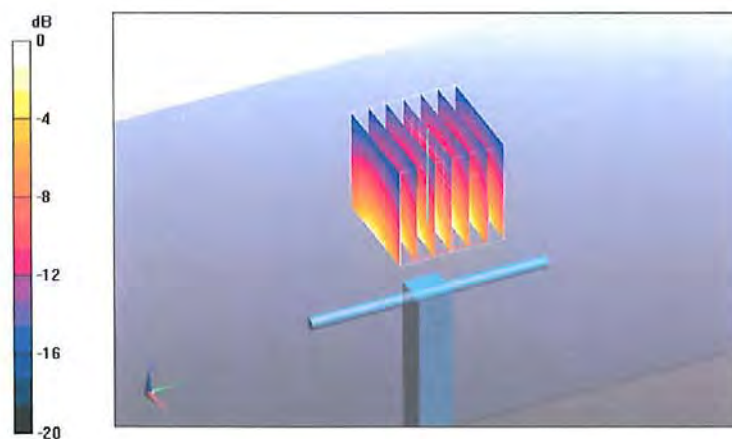
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 97.6 V/m; Power Drift = 0.00658 dB

Peak SAR (extrapolated) = 18.5 W/kg

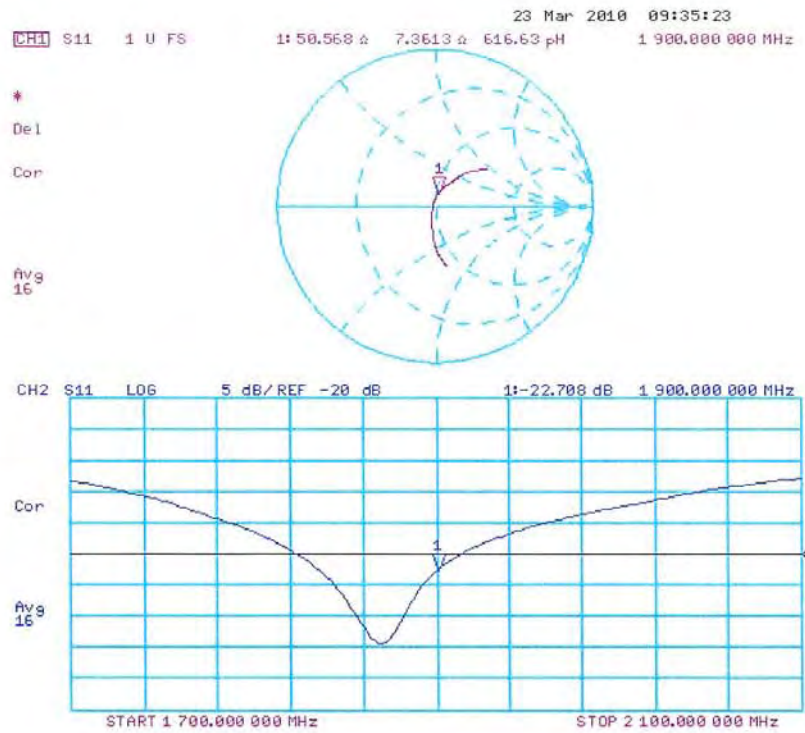
**SAR(1 g) = 10.1 mW/g; SAR(10 g) = 5.3 mW/g**

Maximum value of SAR (measured) = 12.8 mW/g



0 dB = 12.8mW/g

### Impedance Measurement Plot for Head TSL



## DASY5 Validation Report for Body

Date/Time: 17.03.2010 13:29:09

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d121**

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

Medium: MSL U11 BB

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.58$  mho/m;  $\epsilon_r = 55$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.59, 4.59, 4.59); Calibrated: 26.06.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.03.2010
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

**Pin250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement**

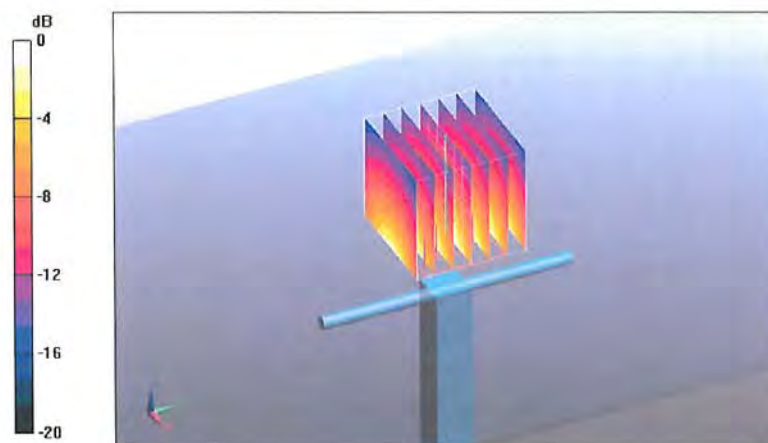
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 97 V/m; Power Drift = 0.00345 dB

Peak SAR (extrapolated) = 17.6 W/kg

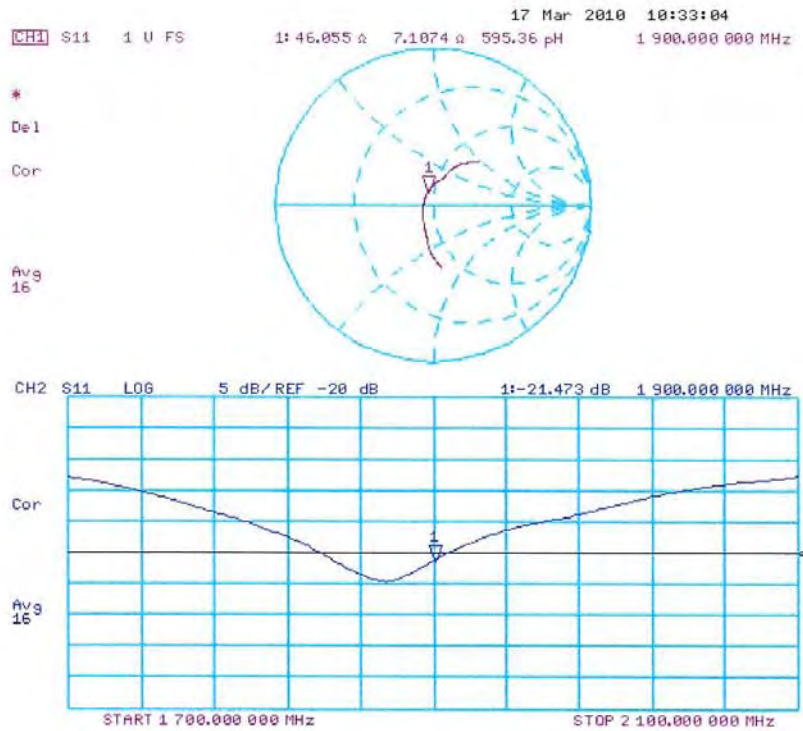
**SAR(1 g) = 10.5 mW/g; SAR(10 g) = 5.6 mW/g**

Maximum value of SAR (measured) = 13.3 mW/g



0 dB = 13.3mW/g

### Impedance Measurement Plot for Body TSL



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Accreditation No.: **SCS 108**

Client **Quietek (Auden)**

Certificate No: **D2450V2-839\_Mar10**

## CALIBRATION CERTIFICATE

Object **D2450V2 - SN: 839**

Calibration procedure(s) **QA CAL-05.v7**  
**Calibration procedure for dipole validation kits**

Calibration date: **March 12, 2010**

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

All calibrations have been conducted in the closed laboratory facility: environment temperature  $(22 \pm 3)^{\circ}\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards           | ID #               | Cal Date (Certificate No.)        | Scheduled Calibration  |
|-----------------------------|--------------------|-----------------------------------|------------------------|
| Power meter EPM-442A        | GB37480704         | 06-Oct-09 (No. 217-01086)         | Oct-10                 |
| Power sensor HP 8481A       | US37292783         | 06-Oct-09 (No. 217-01086)         | Oct-10                 |
| Reference 20 dB Attenuator  | SN: 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 ES3DV3      | SN: 3205           | 26-Jun-09 (No. ES3-3205_Jun09)    | Jun-10                 |
| DAE4                        | SN: 601            | 02-Mar-10 (No. DAE4-601_Mar10)    | Mar-11                 |
| Secondary Standards         | ID #               | Check Date (in house)             | Scheduled Check        |
| Power sensor HP 8481A       | MY41092317         | 18-Oct-02 (in house check Oct-09) | In house check: Oct-11 |
| RF generator R&S SMT-06     | 100005             | 4-Aug-99 (in house check Oct-09)  | In house check: Oct-11 |
| Network Analyzer HP 8753E   | US37390585 S4206   | 18-Oct-01 (in house check Oct-09) | In house check: Oct-10 |

|                |                           |                                          |               |
|----------------|---------------------------|------------------------------------------|---------------|
| Calibrated by: | Name<br><b>Mike Meili</b> | Function<br><b>Laboratory Technician</b> | Signature<br> |
| Approved by:   | <b>Katja Pokovic</b>      | <b>Technical Manager</b>                 |               |

Issued: March 18, 2010

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Certificate No: D2450V2-839\_Mar10

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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:

- 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
- 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
- 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:

- 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                     | V5.2        |
| Extrapolation                | Advanced Extrapolation    |             |
| Phantom                      | Modular Flat Phantom V4.9 |             |
| Distance Dipole Center - TSL | 10 mm                     | with Spacer |
| Zoom Scan Resolution         | dx, dy, dz = 5 mm         |             |
| Frequency                    | 2450 MHz $\pm$ 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 $\pm$ 0.2) °C | 40.4 $\pm$ 6 % | 1.80 mho/m $\pm$ 6 % |
| Head TSL temperature during test | (21.0 $\pm$ 0.2) °C | ----           | ----                 |

### SAR result with Head TSL

| SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL | Condition          |                                                 |
|-------------------------------------------------------|--------------------|-------------------------------------------------|
| SAR measured                                          | 250 mW input power | 13.0 mW / g                                     |
| SAR normalized                                        | normalized to 1W   | 52.0 mW / g                                     |
| SAR for nominal Head TSL parameters                   | normalized to 1W   | <b>52.3 mW /g <math>\pm</math> 17.0 % (k=2)</b> |

| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | condition          |                                                 |
|---------------------------------------------------------|--------------------|-------------------------------------------------|
| SAR measured                                            | 250 mW input power | 6.11 mW / g                                     |
| SAR normalized                                          | normalized to 1W   | 24.4 mW / g                                     |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | <b>24.5 mW /g <math>\pm</math> 16.5 % (k=2)</b> |

### 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 %   | 2.00 mho/m ± 6 % |
| Body TSL temperature during test | (21.0 ± 0.2) °C | ----         | ----             |

### SAR result with Body TSL

| SAR averaged over 1 cm <sup>3</sup> (1 g) of Body TSL | Condition          |                            |
|-------------------------------------------------------|--------------------|----------------------------|
| SAR measured                                          | 250 mW input power | 13.0 mW / g                |
| SAR normalized                                        | normalized to 1W   | 52.0 mW / g                |
| SAR for nominal Body TSL parameters                   | normalized to 1W   | 51.6 mW / g ± 17.0 % (k=2) |

| SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL | condition          |                            |
|---------------------------------------------------------|--------------------|----------------------------|
| SAR measured                                            | 250 mW input power | 6.06 mW / g                |
| SAR normalized                                          | normalized to 1W   | 24.2 mW / g                |
| SAR for nominal Body TSL parameters                     | normalized to 1W   | 24.2 mW / g ± 16.5 % (k=2) |

## Appendix

### Antenna Parameters with Head TSL

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 53.5 $\Omega$ - 0.6 j $\Omega$ |
| Return Loss                          | - 29.4 dB                      |

### Antenna Parameters with Body TSL

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 50.0 $\Omega$ + 0.9 j $\Omega$ |
| Return Loss                          | - 40.8 dB                      |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.134 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 | July 20, 2009 |

## DASY5 Validation Report for Head TSL

Date/Time: 12.03.2010 13:24:52

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:839**

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: HSL U11 BB

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.81$  mho/m;  $\epsilon_r = 40.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.53, 4.53, 4.53); Calibrated: 26.06.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.03.2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

**Head/d=10mm, Pin=250 mW, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0:**

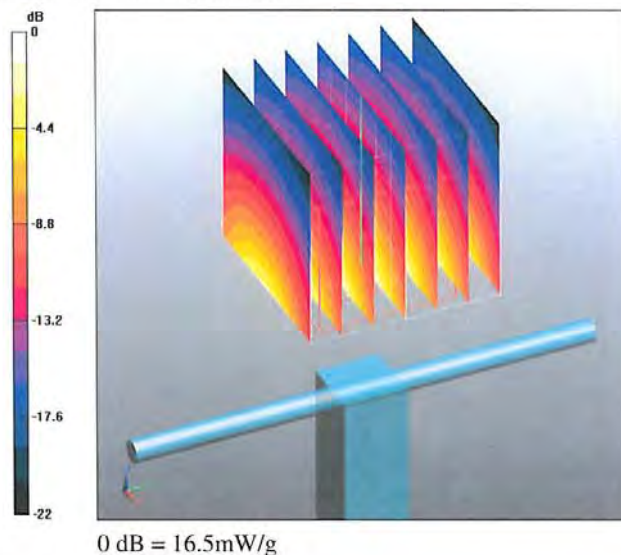
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 99.1 V/m; Power Drift = 0.060 dB

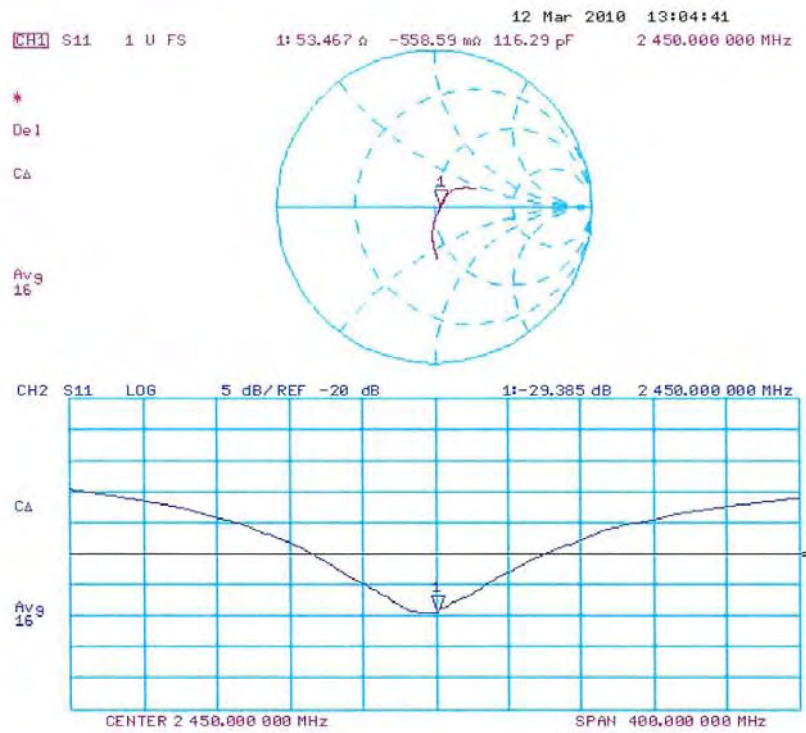
Peak SAR (extrapolated) = 26.5 W/kg

**SAR(1 g) = 13 mW/g; SAR(10 g) = 6.11 mW/g**

Maximum value of SAR (measured) = 16.5 mW/g



### Impedance Measurement Plot for Head TSL



## DASY5 Validation Report for Body

Date/Time: 12.03.2010 15:25:35

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:839**

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: MSL U10 BB

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 2.01$  mho/m;  $\epsilon_r = 54.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.31, 4.31, 4.31); Calibrated: 26.06.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.03.2010
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

**Body/d=10mm, Pin250 mW, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0:**

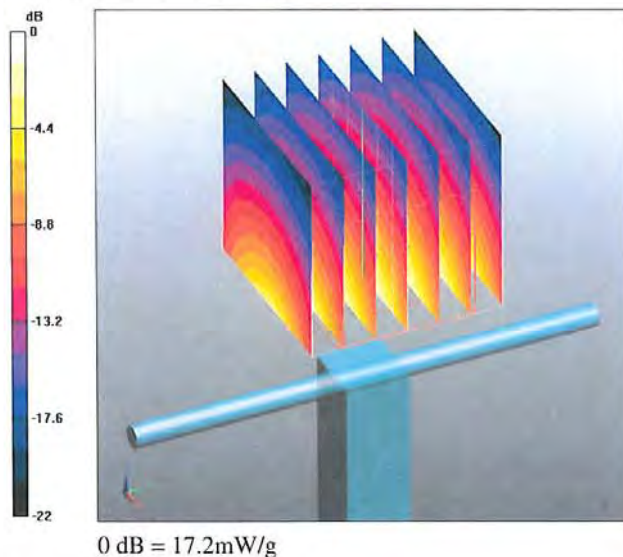
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 94.9 V/m; Power Drift = -0.0047 dB

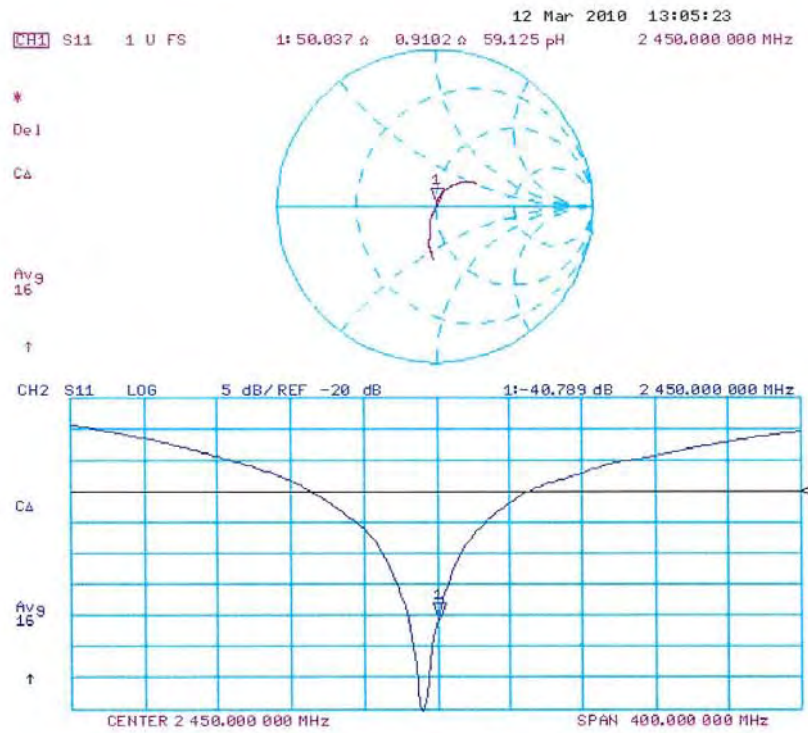
Peak SAR (extrapolated) = 27.1 W/kg

**SAR(1 g) = 13 mW/g; SAR(10 g) = 6.06 mW/g**

Maximum value of SAR (measured) = 17.2 mW/g



# Impedance Measurement Plot for Body TSL



## Appendix F. DAE Calibration Data

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



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

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

Accreditation No.: SCS 108

Client **Quietek (Auden)**

Certificate No: DAE4-1220\_Dec10

### CALIBRATION CERTIFICATE

Object **DAE4 - SD 000 D04 BJ - SN: 1220**

Calibration procedure(s) **QA CAL-06.v22  
Calibration procedure for the data acquisition electronics (DAE)**

Calibration date: **December 3, 2010**

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

All calibrations have been conducted in the closed laboratory facility: environment temperature  $(22 \pm 3)^{\circ}\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards             | ID #               | Cal Date (Certificate No.) | Scheduled Calibration  |
|-------------------------------|--------------------|----------------------------|------------------------|
| Keithley Multimeter Type 2001 | SN: 0810278        | 28-Sep-10 (No:10376)       | Sep-11                 |
| Secondary Standards           | ID #               | Check Date (in house)      | Scheduled Check        |
| Calibrator Box V1.1           | SE UMS 006 AB 1004 | 07-Jun-10 (in house check) | In house check: Jun-11 |

|                |                       |                        |               |
|----------------|-----------------------|------------------------|---------------|
| Calibrated by: | Name<br>Eric Hainfeld | Function<br>Technician | Signature<br> |
| Approved by:   | Fin Bomholt           | R&D Director           |               |

Issued: December 3, 2010

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

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



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

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

Accreditation No.: **SCS 108**

## Glossary

DAE data acquisition electronics  
 Connector angle information used in DASY system to align probe sensor X to the robot coordinate system.

## Methods Applied and Interpretation of Parameters

- *DC Voltage Measurement*: Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle*: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
  - *DC Voltage Measurement Linearity*: Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
  - *Common mode sensitivity*: Influence of a positive or negative common mode voltage on the differential measurement.
  - *Channel separation*: Influence of a voltage on the neighbor channels not subject to an input voltage.
  - *AD Converter Values with inputs shorted*: Values on the internal AD converter corresponding to zero input voltage
  - *Input Offset Measurement*: Output voltage and statistical results over a large number of zero voltage measurements.
  - *Input Offset Current*: Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - *Input resistance*: Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - *Low Battery Alarm Voltage*: Typical value for information. Below this voltage, a battery alarm signal is generated.
  - *Power consumption*: Typical value for information. Supply currents in various operating modes.

### DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1 $\mu$ V, full range = -100...+300 mV

Low Range: 1LSB = 61nV, full range = -1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| Calibration Factors | X                        | Y                        | Z                        |
|---------------------|--------------------------|--------------------------|--------------------------|
| High Range          | 405.229 $\pm$ 0.1% (k=2) | 404.950 $\pm$ 0.1% (k=2) | 404.184 $\pm$ 0.1% (k=2) |
| Low Range           | 3.97007 $\pm$ 0.7% (k=2) | 3.98601 $\pm$ 0.7% (k=2) | 3.99287 $\pm$ 0.7% (k=2) |

### Connector Angle

|                                           |                                     |
|-------------------------------------------|-------------------------------------|
| Connector Angle to be used in DASY system | 177.5 $^{\circ}$ $\pm$ 1 $^{\circ}$ |
|-------------------------------------------|-------------------------------------|

## Appendix

### 1. DC Voltage Linearity

| High Range        | Reading ( $\mu\text{V}$ ) | Difference ( $\mu\text{V}$ ) | Error (%) |
|-------------------|---------------------------|------------------------------|-----------|
| Channel X + Input | 200002.4                  | 1.22                         | 0.00      |
| Channel X + Input | 20001.01                  | 0.91                         | 0.00      |
| Channel X - Input | -19997.57                 | 2.63                         | -0.01     |
| Channel Y + Input | 200008.1                  | -2.52                        | -0.00     |
| Channel Y + Input | 19998.92                  | -1.38                        | -0.01     |
| Channel Y - Input | -20001.39                 | -1.29                        | 0.01      |
| Channel Z + Input | 200011.1                  | 1.59                         | 0.00      |
| Channel Z + Input | 19998.31                  | -1.89                        | -0.01     |
| Channel Z - Input | -20000.79                 | -0.99                        | 0.00      |

| Low Range         | Reading ( $\mu\text{V}$ ) | Difference ( $\mu\text{V}$ ) | Error (%) |
|-------------------|---------------------------|------------------------------|-----------|
| Channel X + Input | 1999.8                    | -0.22                        | -0.01     |
| Channel X + Input | 199.68                    | -0.32                        | -0.16     |
| Channel X - Input | -200.45                   | -0.25                        | 0.12      |
| Channel Y + Input | 1999.6                    | -0.27                        | -0.01     |
| Channel Y + Input | 199.03                    | -1.07                        | -0.54     |
| Channel Y - Input | -200.66                   | -0.76                        | 0.38      |
| Channel Z + Input | 2000.0                    | -0.04                        | -0.00     |
| Channel Z + Input | 198.94                    | -1.26                        | -0.63     |
| Channel Z - Input | -201.36                   | -1.46                        | 0.73      |

### 2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

|           | Common mode Input Voltage (mV) | High Range Average Reading ( $\mu\text{V}$ ) | Low Range Average Reading ( $\mu\text{V}$ ) |
|-----------|--------------------------------|----------------------------------------------|---------------------------------------------|
| Channel X | 200                            | 10.60                                        | 8.62                                        |
|           | - 200                          | -7.59                                        | -9.45                                       |
| Channel Y | 200                            | -9.68                                        | -9.86                                       |
|           | - 200                          | 9.01                                         | 8.51                                        |
| Channel Z | 200                            | 12.06                                        | 12.10                                       |
|           | - 200                          | -13.84                                       | -14.49                                      |

### 3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

|           | Input Voltage (mV) | Channel X ( $\mu\text{V}$ ) | Channel Y ( $\mu\text{V}$ ) | Channel Z ( $\mu\text{V}$ ) |
|-----------|--------------------|-----------------------------|-----------------------------|-----------------------------|
| Channel X | 200                | -                           | 2.85                        | -0.96                       |
| Channel Y | 200                | 1.60                        | -                           | 3.41                        |
| Channel Z | 200                | 2.29                        | -1.66                       | -                           |

#### 4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

|           | High Range (LSB) | Low Range (LSB) |
|-----------|------------------|-----------------|
| Channel X | 15905            | 14404           |
| Channel Y | 16020            | 13780           |
| Channel Z | 15698            | 14978           |

#### 5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Input 10M $\Omega$

|           | Average ( $\mu$ V) | min. Offset ( $\mu$ V) | max. Offset ( $\mu$ V) | Std. Deviation ( $\mu$ V) |
|-----------|--------------------|------------------------|------------------------|---------------------------|
| Channel X | -0.06              | -1.34                  | 1.46                   | 0.43                      |
| Channel Y | -0.85              | -2.00                  | 0.10                   | 0.32                      |
| Channel Z | -0.99              | -2.44                  | 0.46                   | 0.44                      |

#### 6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

#### 7. Input Resistance (Typical values for information)

|           | Zeroing (kOhm) | Measuring (MOhm) |
|-----------|----------------|------------------|
| Channel X | 200            | 200              |
| Channel Y | 200            | 200              |
| Channel Z | 200            | 200              |

#### 8. Low Battery Alarm Voltage (Typical values for information)

| Typical values | Alarm Level (VDC) |
|----------------|-------------------|
| Supply (+ Vcc) | +7.9              |
| Supply (- Vcc) | -7.6              |

#### 9. Power Consumption (Typical values for information)

| Typical values | Switched off (mA) | Stand by (mA) | Transmitting (mA) |
|----------------|-------------------|---------------|-------------------|
| Supply (+ Vcc) | +0.01             | +6            | +14               |
| Supply (- Vcc) | -0.01             | -8            | -9                |