



# SAR TEST REPORT

|                      |                               |
|----------------------|-------------------------------|
| <b>Product Name</b>  | UMTS Mobile Phone             |
| <b>Model Name</b>    | HUAWEI Y625-U43, Y625-U43     |
| <b>Brand Name</b>    | HUAWEI                        |
| <b>FCC ID</b>        | QISY625-U43                   |
| <b>Applicant</b>     | Huawei Technologies Co., Ltd. |
| <b>Manufacturer</b>  | Huawei Technologies Co., Ltd. |
| <b>Date of issue</b> | January 19, 2015              |

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**GENERAL SUMMARY**

|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Reference Standard(s)</b> | <p><b>FCC 47CFR §2.1093</b> Radiofrequency Radiation Exposure Evaluation: Portable Devices</p> <p><b>ANSI C95.1, 1992:</b> Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.(IEEE Std C95.1-1991)</p> <p><b>IEEE Std 1528™-2003:</b> IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques.</p> <p><b>KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r03:</b> SAR Measurement Requirements for 100 MHz to 6 GHz</p> <p><b>KDB 447498 D01 Mobile Portable RF Exposure v05r02:</b> Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies</p> <p><b>KDB 648474 D04 Handset SAR v01r02:</b> SAR Evaluation Considerations for Wireless Handsets.</p> <p><b>KDB 941225 D01 SAR test for 3G devices v03:</b> SAR Measurement Procedures CDMA 20001x RTT, 1x Ev-Do, WCDMA, HSDPA/HSPA</p> <p><b>KDB 941225 D06 Hotspot Mode SAR v02:</b> SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities</p> <p><b>KDB 248227 D01 SAR meas for 802 11 a b g v01r02:</b> SAR Measurement Procedures for 802.11a/b/g Transmitters.</p> |
| <b>Conclusion</b>            | <p>This portable wireless equipment has been measured in all cases requested by the relevant standards. Test results in Chapter 7 of this test report are below limits specified in the relevant standards for the tested bands only.</p> <p>General Judgment: <b>Pass</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Comment</b>               | <p>The test result only responds to the measured sample.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

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## **1. General Information**

### **1.1. Notes of the Test Report**

**TA Technology (Shanghai) Co., Ltd.** has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS), and accreditation number: L2264.

**TA Technology (Shanghai) Co., Ltd.** guarantees the reliability of the data presented in this test report, which is the results of measurements and tests performed for the items under test on the date and under the conditions stated in this test report and is based on the knowledge and technical facilities available at TA Technology (Shanghai) Co., Ltd. at the time of execution of the test.

**TA Technology (Shanghai) Co., Ltd.** is liable to the client for the maintenance by its personnel of the confidentiality of all information related to the items under test and the results of the test. The sample under test was selected by the Client. This report only refers to the item that has undergone the test.

This report alone does not constitute or imply by its own an approval of the product by the certification Bodies or competent Authorities. This report cannot be used partially or in full for publicity and/or promotional purposes without previous written approval of **TA Technology (Shanghai) Co., Ltd.** and the Accreditation Bodies, if it applies.

If the electronic report is inconsistent with the printed one, it should be subject to the latter.

### **1.2. Testing Laboratory**

|            |                                                                     |
|------------|---------------------------------------------------------------------|
| Company:   | TA Technology (Shanghai) Co., Ltd.                                  |
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### 1.3. Applicant Information

Company: Huawei Technologies Co., Ltd.  
Address: Administration Building, Headquarters of Huawei Technologies Co., Ltd.,  
Bantian, Longgang District  
Shenzhen  
518129  
P.R.China

### 1.4. Manufacturer Information

Company: Huawei Technologies Co., Ltd.  
Address: Administration Building, Headquarters of Huawei Technologies Co., Ltd.,  
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P.R.China

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### 1.5. Information of EUT

#### General Information

|                                   |                                                                                       |                 |
|-----------------------------------|---------------------------------------------------------------------------------------|-----------------|
| Device Type:                      | Portable Device                                                                       |                 |
| Exposure Category:                | Uncontrolled Environment / General Population                                         |                 |
| Product IMEI:                     | 004401721777940                                                                       |                 |
| Hardware Version:                 | V2.0                                                                                  |                 |
| Software Version:                 | Y625-U43V100R001C479B005                                                              |                 |
| Antenna Type:                     | Internal Antenna                                                                      |                 |
| Device Operating Configurations : |                                                                                       |                 |
| Test Mode(s):                     | GSM 850/GSM 1900;<br>UMTS Band II/UMTS Band V;<br>802.11b/g/n HT20;<br>Bluetooth 4.0; |                 |
| Test Modulation:                  | (GSM)GMSK; (UMTS)QPSK; (WIFI)CCK;                                                     |                 |
| Device Class:                     | B                                                                                     |                 |
| HSUPA UE Category:                | 6                                                                                     |                 |
| HSDPA UE Category:                | 24                                                                                    |                 |
| DC-HSDPA Category:                | 24                                                                                    |                 |
| GPRS Multislot Class(12):         | Max Number of Timeslots in Uplink                                                     | 4               |
|                                   | Max Number of Timeslots in Downlink                                                   | 4               |
|                                   | Max Total Timeslot                                                                    | 5               |
| EGPRS:                            | Downlink Only                                                                         |                 |
| Test Frequency Range(s):          | Mode                                                                                  | Tx (MHz)        |
|                                   | GSM 850                                                                               | 824.2 ~ 848.8   |
|                                   | GSM 1900                                                                              | 1850.2 ~ 1909.8 |
|                                   | UMTS Band II                                                                          | 1852.4 ~ 1907.6 |
|                                   | UMTS Band V                                                                           | 826.4 ~ 846.6   |
|                                   | WIFI                                                                                  | 2412 ~ 2462     |
|                                   | Bluetooth 4.0                                                                         | 2402 ~ 2480     |
| Power Class:                      | GSM 850: 4                                                                            |                 |
|                                   | GSM 1900: 1                                                                           |                 |
|                                   | UMTS Band II/V: 3                                                                     |                 |
| Power Level:                      | GSM 850: level 5                                                                      |                 |
|                                   | GSM 1900: level 0                                                                     |                 |
|                                   | UMTS Band II/V: all up bits                                                           |                 |

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**Auxiliary Equipment Details**

| Name      | Model       | Manufacturer                  | Capacity | S/N              |
|-----------|-------------|-------------------------------|----------|------------------|
| Battery 1 | HB474284RBC | Huawei Technologies Co., Ltd. | 2000mAh  | 1660LCE614G3C88B |
| Battery 2 | HB474284RBC | Huawei Technologies Co., Ltd. | 2000mAh  | 1660BAE624F03191 |

| Name       | Model                 | Manufacturer                                    |
|------------|-----------------------|-------------------------------------------------|
| Earphone 1 | HA1-3                 | GoerTek                                         |
| Earphone 2 | MEMD1532B528000       | Jiangxi lianchuang hongsheng ELECTRONIC CO.,LTD |
| Earphone 3 | 1293#+3283#+3.5MM-150 | QUANCHENG                                       |

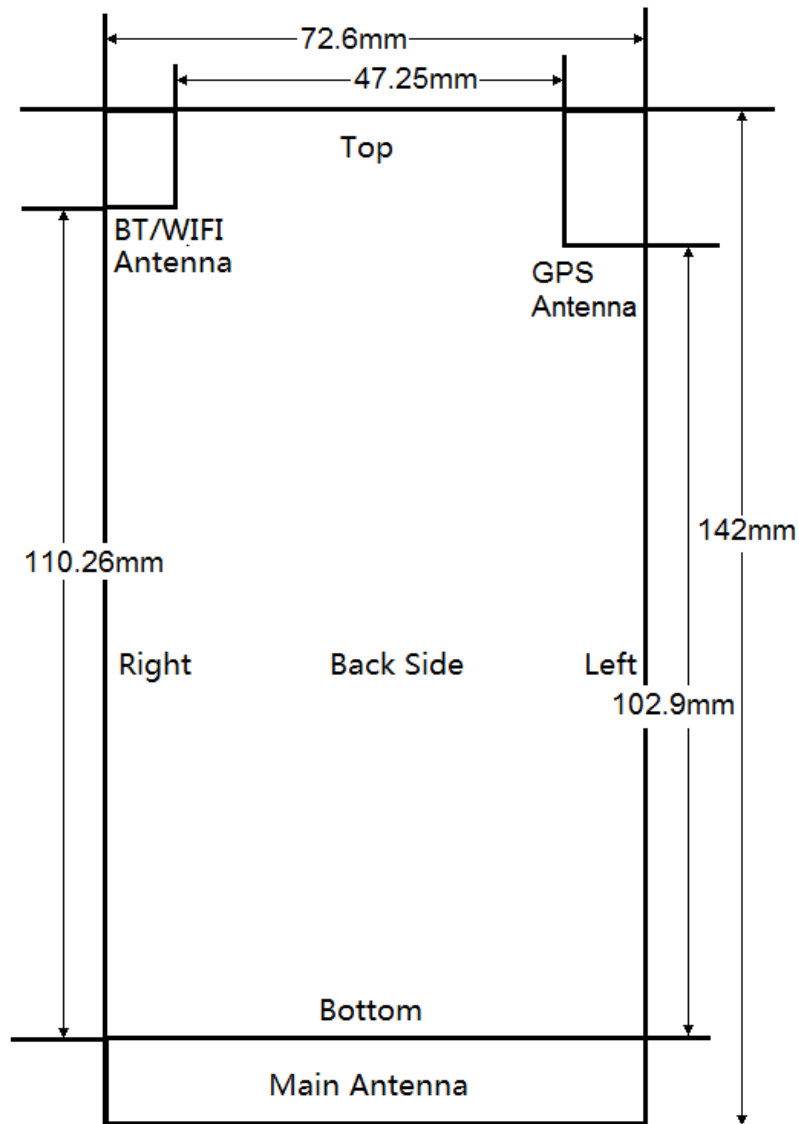
Y625-U43 is a variant model of Y625-U03. SAR values duplicated from Y625-U03 for Y625-U43, the report number of Y625-U03 is RXA1410-0243SAR01R2. This report changes Model Name, Hardware Version and Software Version. The detailed product change description please refers to the ANNEX N.

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**1.6. EUT Antenna Locations**



**Mobile Hotspot Sides for SAR Testing**

| Mode         | Back Side | Front Side | Left Edge | Right Edge | Top Edge | Bottom Edge |
|--------------|-----------|------------|-----------|------------|----------|-------------|
| GSM 850      | Yes       | Yes        | Yes       | Yes        | N/A      | Yes         |
| GSM 1900     | Yes       | Yes        | Yes       | Yes        | N/A      | Yes         |
| UMTS Band II | Yes       | Yes        | Yes       | Yes        | N/A      | Yes         |
| UMTS Band V  | Yes       | Yes        | Yes       | Yes        | N/A      | Yes         |
| 2.4GHz WLAN  | Yes       | Yes        | N/A       | Yes        | Yes      | N/A         |

Note: When the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested.

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### 1.7. The Maximum Reported SAR<sub>1g</sub>

#### Head SAR Configuration

| Mode                              | Test Position | Channel /Frequency(MHz) | Limit SAR <sub>1g</sub> 1.6 W/kg  |                                   |
|-----------------------------------|---------------|-------------------------|-----------------------------------|-----------------------------------|
|                                   |               |                         | Measured SAR <sub>1g</sub> (W/kg) | Reported SAR <sub>1g</sub> (W/kg) |
| GSM 850<br>(Variant Model)        | Right Cheek   | 190/836.6               | 0.084                             | 0.103                             |
| GSM 1900<br>(Original Model)      | Left Cheek    | 661/1880                | 0.130                             | 0.150                             |
| UMTS Band II<br>(Original Model)  | Right Cheek   | 9400/1880               | 0.378                             | 0.395                             |
| UMTS Band V<br>(Original Model)   | Right Cheek   | 4183/836.6              | 0.559                             | 0.571                             |
| WiFi(802.11b)<br>(Original Model) | Left Cheek    | 11/2462                 | 0.290                             | 0.318                             |

#### Body Worn Configuration

| Mode                              | Test Position | Channel /Frequency(MHz) | Limit SAR <sub>1g</sub> 1.6 W/kg  |                                   |
|-----------------------------------|---------------|-------------------------|-----------------------------------|-----------------------------------|
|                                   |               |                         | Measured SAR <sub>1g</sub> (W/kg) | Reported SAR <sub>1g</sub> (W/kg) |
| GSM 850<br>(Original Model)       | Back Side     | 190/836.6               | 0.165                             | 0.196                             |
| GSM 1900<br>(Original Model)      | Back Side     | 661/1880                | 0.259                             | 0.299                             |
| UMTS Band II<br>(Original Model)  | Back Side     | 9400/1880               | 0.739                             | 0.772                             |
| UMTS Band V<br>(Original Model)   | Back Side     | 4233/846.6              | 0.885                             | 0.908                             |
| WiFi(802.11b)<br>(Original Model) | Back Side     | 11/2462                 | 0.093                             | 0.102                             |

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**Hotspot SAR Configuration**

| Mode                                    | Test Position | Channel<br>/Frequency(MHz) | Limit SAR <sub>1g</sub> 1.6 W/kg     |                                      |
|-----------------------------------------|---------------|----------------------------|--------------------------------------|--------------------------------------|
|                                         |               |                            | Measured SAR <sub>1g</sub><br>(W/kg) | Reported SAR <sub>1g</sub><br>(W/kg) |
| GPRS 850, 3 Txslots<br>(Variant Model)  | Back Side     | 190/836.6                  | 0.314                                | 0.445                                |
| GPRS 1900, 4 Txslots<br>(Variant Model) | Bottom Edge   | 661/1880                   | 0.397                                | 0.490                                |
| UMTS Band II<br>(Original Model)        | Bottom Edge   | 9538/1907.6                | 0.935                                | 1.169                                |
| UMTS Band V<br>(Original Model)         | Back Side     | 4233/846.6                 | 0.885                                | 0.908                                |
| WiFi(802.11b)<br>(Original Model)       | Back Side     | 11/2462                    | 0.093                                | 0.102                                |

**1.8. Test Date**

The test performed from December 19, 2014 to January 13, 2015.

## 2. SAR Measurements System Configuration

### 2.1. SAR Measurement Set-up

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

- A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating the data acquisition electronics (DAE).
- A dosimetric probe, i.e. an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- A data acquisition electronic (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.
- A unit to operate the optical surface detector which is connected to the EOC.
- The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY5 measurement server.
- The DASY5 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation. A computer operating Windows 2003
- DASY5 software and SEMCAD data evaluation software.
- Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.
- The generic twin phantom enabling the testing of left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- System validation dipoles allowing to validate the proper functioning of the system.

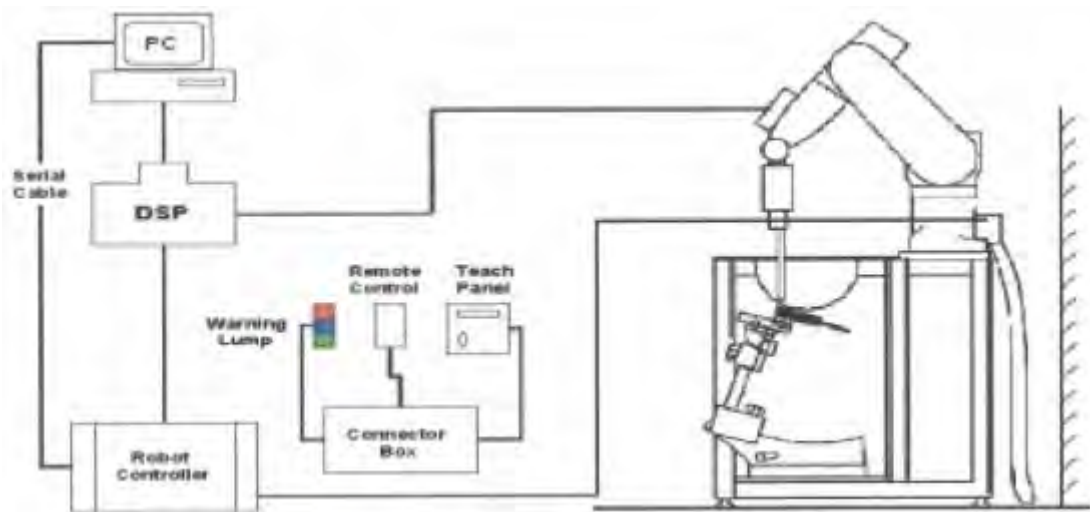


**Figure 1 SAR Lab Test Measurement Set-up**

## 2.2. DASY5 E-field Probe System

The SAR measurements were conducted with the dosimetric probe EX3DV4 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation.

### 2.2.1. EX3DV4 Probe Specification

|               |                                                                                                                                                                                                               |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Construction  | Symmetrical design with triangular core<br>Built-in shielding against static charges<br>PEEK enclosure material (resistant to organic solvents, e.g., DGBE)                                                   |
| Calibration   | ISO/IEC 17025 calibration service available                                                                                                                                                                   |
| Frequency     | 10 MHz to > 6 GHz<br>Linearity: $\pm 0.2$ dB<br>(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 Linearity:<br><br>$\pm 0.2$ 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).<br>Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%. |



Figure 2.EX3DV4 E-field Probe



Figure 3. EX3DV4 E-field probe

### 2.2.2. E-field Probe Calibration

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

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

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

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

Where:  $\Delta t$  = Exposure time (30 seconds),  
 $C$  = Heat capacity of tissue (brain or muscle),  
 $\Delta T$  = Temperature increase due to RF exposure.  
Or

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

Where:  
 $\sigma$  = Simulated tissue conductivity,  
 $\rho$  = Tissue density ( $\text{kg/m}^3$ ).

## 2.3. Other Test Equipment

### 2.3.1. Device Holder for Transmitters

The DASY device holder is designed to cope with the different positions given in the standard.

It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.

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.



**Figure 4 Device Holder**

### 2.3.2. Phantom

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

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



**Figure 5 Generic Twin Phantom**

### 2.4. Scanning Procedure

The DASY5 installation includes predefined files with recommended procedures for measurements and validation. They are read-only document files and destined as fully defined but unmeasured masks. All test positions (head or body-worn) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.

- The “reference” and “drift” measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure. The indicated drift is mainly the variation of the DUT's output power and should vary max.  $\pm 5\%$ .
- The “surface check” measurement tests the optical surface detection system of the DASY5 system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above  $\pm 0.1\text{mm}$ ). To prevent wrong results tests are only executed when the liquid is free of air bubbles. The difference between the optical surface detection and the actual surface depends on the probe and is specified with each probe. (It does not depend on the surface reflectivity or the probe angle to the surface within  $\pm 30^\circ$ .)
- Area Scan  
The Area Scan is used as a fast scan in two dimensions to find the area of high field values before running a detailed measurement around the hot spot. Before starting the area scan a grid

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spacing is set according to FCC KDB Publication 865664. During scan the distance of the probe to the phantom remains unchanged.

After finishing area scan, the field maxima within a range of 2 dB will be ascertained.

- Zoom Scan

After the maximum interpolated values were calculated between the points in the cube, the SAR was averaged over the spatial volume (1g or 10g) using a 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the “Not a knot” condition (in x, y, and z directions). The volume was then integrated with the trapezoidal algorithm.

- Spatial Peak Detection

The procedure for spatial peak SAR evaluation has been implemented and can determine values of masses of 1g and 10g, as well as for user-specific masses. The DASY5 system allows evaluations that combine measured data and robot positions, such as:

- maximum search
- extrapolation
- boundary correction
- peak search for averaged SAR

During a maximum search, global and local maxima searches are automatically performed in 2-D after each Area Scan measurement with at least 6 measurement points. It is based on the evaluation of the local SAR gradient calculated by the Quadratic Shepard's method. The algorithm will find the global maximum and all local maxima within -2 dB of the global maxima for all SAR distributions.

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. Several measurements at different distances are necessary for the extrapolation. Extrapolation routines require at least 10 measurement points in 3-D space. They are used in the Zoom Scan to obtain SAR values between the lowest measurement points and the inner phantom surface. The routine uses the modified Quadratic Shepard's method for extrapolation.

- A Z-axis scan measures the total SAR value at the x-and y-position of the maximum SAR value found during the cube scan. The probe is moved away in z-direction from the bottom of the SAM phantom in 5mm steps.

**Table 1: Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01**

| Frequency    | Maximum Area Scan Resolution (mm)<br>( $\Delta x_{\text{area}}, \Delta y_{\text{area}}$ ) | Maximum Zoom Scan Resolution (mm)<br>( $\Delta x_{\text{zoom}}, \Delta y_{\text{zoom}}$ ) | Maximum Zoom Scan Spatial Resolution (mm)<br>$\Delta z_{\text{zoom}}(n)$ | Minimum Zoom Scan Volume (mm)<br>(x,y,z) |
|--------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|------------------------------------------|
| $\leq 2$ GHz | $\leq 15$                                                                                 | $\leq 8$                                                                                  | $\leq 5$                                                                 | $\geq 30$                                |
| 2-3 GHz      | $\leq 12$                                                                                 | $\leq 5$                                                                                  | $\leq 5$                                                                 | $\geq 30$                                |
| 3-4 GHz      | $\leq 12$                                                                                 | $\leq 5$                                                                                  | $\leq 4$                                                                 | $\geq 28$                                |
| 4-5 GHz      | $\leq 10$                                                                                 | $\leq 4$                                                                                  | $\leq 3$                                                                 | $\geq 25$                                |
| 5-6 GHz      | $\leq 10$                                                                                 | $\leq 4$                                                                                  | $\leq 2$                                                                 | $\geq 22$                                |

## **2.5. Data Storage and Evaluation**

### **2.5.1. Data Storage**

The DASY5 software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension “.DAE4”. The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated.

The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [mW/g], [mW/cm<sup>2</sup>], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

### **2.5.2. Data Evaluation by SEMCAD**

The SEMCAD software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

|                    |                           |                                                                         |
|--------------------|---------------------------|-------------------------------------------------------------------------|
| Probe parameters:  | - Sensitivity             | Norm <sub>i</sub> , a <sub>i0</sub> , a <sub>i1</sub> , a <sub>i2</sub> |
|                    | - Conversion factor       | ConvF <sub>i</sub>                                                      |
|                    | - Diode compression point | Dcp <sub>i</sub>                                                        |
| Device parameters: | - Frequency               | f                                                                       |
|                    | - Crest factor            | cf                                                                      |
| Media parameters:  | - Conductivity            |                                                                         |
|                    | - Density                 |                                                                         |

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY5 components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics.

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If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$V_i = U_i + U_i^2 \cdot c f / d c p_i$$

With  $V_i$  = compensated signal of channel i (i = x, y, z)

$U_i$  = input signal of channel i (i = x, y, z)

$cf$  = crest factor of exciting field (DASY parameter)

$dcp_i$  = diode compression point (DASY parameter)

From the compensated input signals the primary field data for each channel can be evaluated:

E-field probes:  $E_i = (V_i / Norm_i \cdot ConvF)^{1/2}$

H-field probes:  $H_i = (V_i)^{1/2} \cdot (a_{i0} + a_{i1} f + a_{i2} f^2) / f$

With  $V_i$  = compensated signal of channel i (i = x, y, z)

$Norm_i$  = sensor sensitivity of channel i (i = x, y, z)  
[mV/(V/m)<sup>2</sup>] for E-field Probes

$ConvF$  = sensitivity enhancement in solution

$a_{ij}$  = sensor sensitivity factors for H-field probes

$f$  = carrier frequency [GHz]

$E_i$  = electric field strength of channel i in V/m

$H_i$  = magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude):

$$E_{tot} = (E_x^2 + E_y^2 + E_z^2)^{1/2}$$

The primary field data are used to calculate the derived field units.

$$SAR = (E_{tot})^2 \cdot \sigma / (\rho \cdot 1000)$$

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with **SAR** = local specific absorption rate in mW/g

**$E_{tot}$**  = total field strength in V/m

= conductivity in [mho/m]

or [Siemens/m]

= equivalent tissue density

in g/cm<sup>3</sup>

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid. The power flow density is calculated assuming the excitation field to be a free space field.

$$P_{pwe} = E_{tot}^2 / 3770 \quad \text{or} \quad P_{pwe} = H_{tot}^2 \cdot 37.7$$

with  **$P_{pwe}$**  = equivalent power density of a plane wave in mW/cm<sup>2</sup>

**$E_{tot}$**  = total electric field strength in V/m

**$H_{tot}$**  = total magnetic field strength in A/m

### 3. Laboratory Environment

**Table 2: The Requirements of the Ambient Conditions**

|                                                                                                 |                           |
|-------------------------------------------------------------------------------------------------|---------------------------|
| Temperature                                                                                     | Min. = 18°C, Max. = 25 °C |
| Relative humidity                                                                               | Min. = 30%, Max. = 70%    |
| Ground system resistance                                                                        | < 0.5 $\Omega$            |
| Ambient noise is checked and found very low and in compliance with requirement of standards.    |                           |
| Reflection of surrounding objects is minimized and in compliance with requirement of standards. |                           |

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## 4. Tissue-equivalent Liquid

### 4.1. Tissue-equivalent Liquid Ingredients

The liquid is consisted of water, salt, Glycol, Sugar, Preventol and Cellulose. The liquid has previously been proven to be suited for worst-case. The table 3 and table 4 show the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the KDB 865664 D01.

**Table 3: Composition of the Head Tissue Equivalent Matter**

| MIXTURE%                              | FREQUENCY(Brain) 835MHz               |
|---------------------------------------|---------------------------------------|
| Water                                 | 41.45                                 |
| Sugar                                 | 56                                    |
| Salt                                  | 1.45                                  |
| Preventol                             | 0.1                                   |
| Cellulose                             | 1.0                                   |
| Dielectric Parameters<br>Target Value | f=835MHz $\epsilon=41.5$ $\sigma=0.9$ |

| MIXTURE%                              | FREQUENCY(Brain) 1900MHz                |
|---------------------------------------|-----------------------------------------|
| Water                                 | 55.242                                  |
| Glycol monobutyl                      | 44.452                                  |
| Salt                                  | 0.306                                   |
| Dielectric Parameters<br>Target Value | f=1900MHz $\epsilon=40.0$ $\sigma=1.40$ |

| MIXTURE%                              | FREQUENCY(Brain) 2450MHz                |
|---------------------------------------|-----------------------------------------|
| Water                                 | 62.7                                    |
| Glycol                                | 36.8                                    |
| Salt                                  | 0.5                                     |
| Dielectric Parameters<br>Target Value | f=2450MHz $\epsilon=39.2$ $\sigma=1.80$ |

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**Table 4: Composition of the Body Tissue Equivalent Matter**

| MIXTURE%                              | FREQUENCY(Body) 835MHz                 |
|---------------------------------------|----------------------------------------|
| Water                                 | 52.5                                   |
| Sugar                                 | 45                                     |
| Salt                                  | 1.4                                    |
| Preventol                             | 0.1                                    |
| Cellulose                             | 1.0                                    |
| Dielectric Parameters<br>Target Value | f=835MHz $\epsilon=55.2$ $\sigma=0.97$ |

| MIXTURE%                              | FREQUENCY (Body) 1900MHz                |
|---------------------------------------|-----------------------------------------|
| Water                                 | 69.91                                   |
| Glycol monobutyl                      | 29.96                                   |
| Salt                                  | 0.13                                    |
| Dielectric Parameters<br>Target Value | f=1900MHz $\epsilon=53.3$ $\sigma=1.52$ |

| MIXTURE%                              | FREQUENCY(Body) 2450MHz                 |
|---------------------------------------|-----------------------------------------|
| Water                                 | 73.2                                    |
| Glycol                                | 26.7                                    |
| Salt                                  | 0.1                                     |
| Dielectric Parameters<br>Target Value | f=2450MHz $\epsilon=52.7$ $\sigma=1.95$ |

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### 4.2. Tissue-equivalent Liquid Properties

**Table 5: Dielectric Performance of Tissue Simulating Liquid**

Original Model

| Frequency         | Test Date  | Temp<br>℃ | Measured Dielectric Parameters |                | Target Dielectric Parameters |                | Limit<br>(Within ±5%)   |                     |
|-------------------|------------|-----------|--------------------------------|----------------|------------------------------|----------------|-------------------------|---------------------|
|                   |            |           | $\epsilon_r$                   | $\sigma$ (s/m) | $\epsilon_r$                 | $\sigma$ (s/m) | Dev<br>$\epsilon_r$ (%) | Dev<br>$\sigma$ (%) |
| 835MHz<br>(head)  | 2014-11-20 | 21.5      | 41.4                           | 0.93           | 41.5                         | 0.90           | -0.24%                  | 3.33%               |
| 1900MHz<br>(head) | 2014-11-20 | 21.5      | 39.6                           | 1.43           | 40.0                         | 1.40           | -1.00%                  | 2.14%               |
| 2450MHz<br>(head) | 2014-11-04 | 21.5      | 38.6                           | 1.81           | 39.2                         | 1.80           | -1.53%                  | 0.56%               |
| 835MHz<br>(body)  | 2014-11-18 | 21.5      | 55.9                           | 0.99           | 55.2                         | 0.97           | 1.27%                   | 2.06%               |
| 1900MHz<br>(body) | 2014-11-16 | 21.5      | 53.1                           | 1.52           | 53.3                         | 1.52           | -0.38%                  | 0.00%               |
| 2450MHz<br>(body) | 2014-11-04 | 21.5      | 52.1                           | 1.99           | 52.7                         | 1.95           | -1.14%                  | 2.05%               |

Variant Model

| Frequency         | Test Date  | Temp<br>℃ | Measured Dielectric Parameters |                | Target Dielectric Parameters |                | Limit<br>(Within ±5%)   |                     |
|-------------------|------------|-----------|--------------------------------|----------------|------------------------------|----------------|-------------------------|---------------------|
|                   |            |           | $\epsilon_r$                   | $\sigma$ (s/m) | $\epsilon_r$                 | $\sigma$ (s/m) | Dev<br>$\epsilon_r$ (%) | Dev<br>$\sigma$ (%) |
| 835MHz<br>(head)  | 2014-12-20 | 21.5      | 41.4                           | 0.92           | 41.5                         | 0.90           | -0.24%                  | 2.22%               |
| 1900MHz<br>(head) | 2014-12-19 | 21.5      | 39.6                           | 1.43           | 40.0                         | 1.40           | -1.00%                  | 2.14%               |
| 835MHz<br>(body)  | 2014-12-19 | 21.5      | 55.9                           | 0.96           | 55.2                         | 0.97           | 1.27%                   | -1.03%              |
| 1900MHz<br>(body) | 2014-12-19 | 21.5      | 53.3                           | 1.49           | 53.3                         | 1.52           | 0.00%                   | -1.97%              |
|                   | 2015-01-13 | 21.5      | 53.1                           | 1.52           | 53.3                         | 1.52           | -0.38%                  | 0.00%               |

## 5. System Check

### 5.1. Description of System Check

The manufacturer calibrates the probes annually. Dielectric parameters of the tissue simulates were measured every day using the dielectric probe kit and the network analyzer. A system check measurement was made following the determination of the dielectric parameters of the simulates, using the dipole validation kit. A power level of 250 mW was supplied to the dipole antenna, which was placed under the flat section of the twin SAM phantom. The system check results (dielectric parameters and SAR values) are given in the table 6 and table 7.

System check results have to be equal or near the values determined during dipole calibration with the relevant liquids and test system ( $\pm 10\%$ ).

System check is performed regularly on all frequency bands where tests are performed with the DASY5 system.

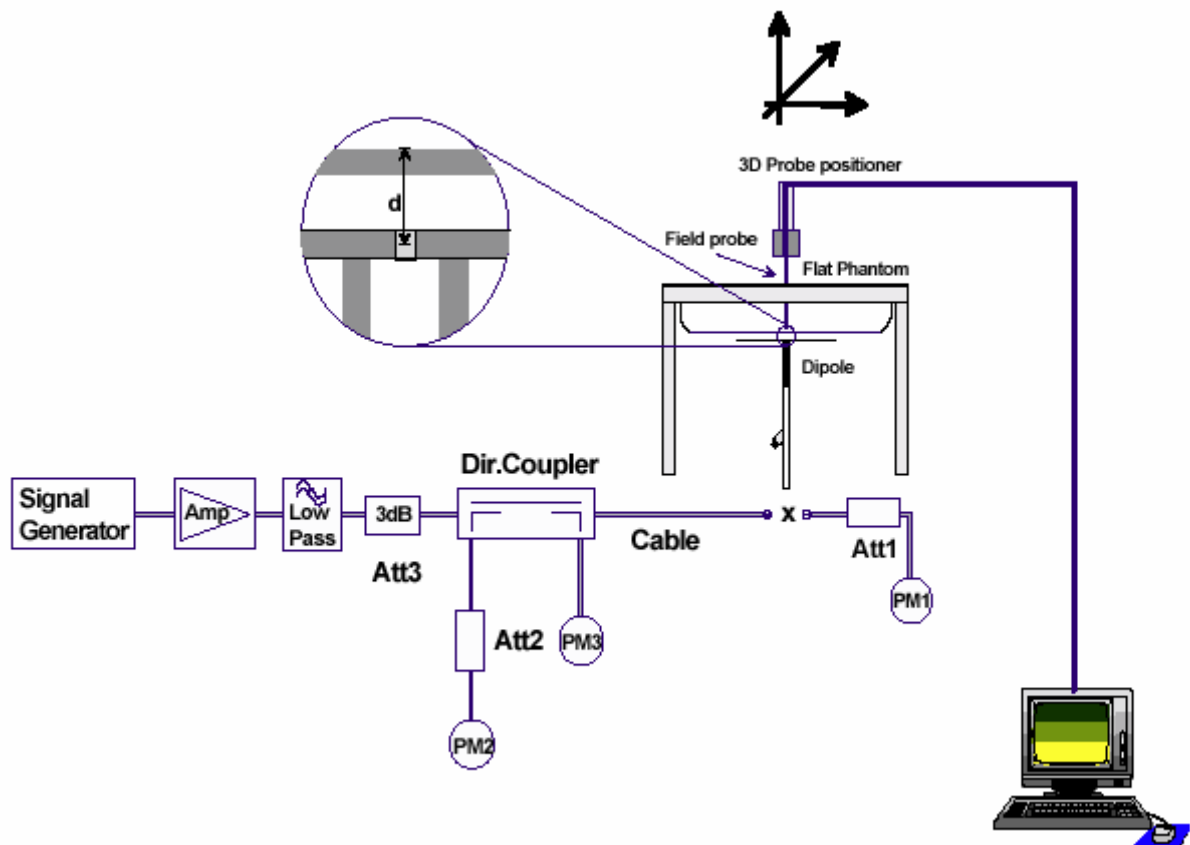


Figure 6 System Check Set-up

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| Frequency | Test Date  | Dielectric Parameters |        | 250mW Measured SAR <sub>1g</sub> | 1W Normalized SAR <sub>1g</sub> | 1W Target SAR <sub>1g</sub> | Limit (±10% Deviation) |
|-----------|------------|-----------------------|--------|----------------------------------|---------------------------------|-----------------------------|------------------------|
|           |            | ε <sub>r</sub>        | σ(s/m) | (W/kg)                           |                                 |                             |                        |
| 835MHz    | 2014-11-20 | 41.4                  | 0.93   | 2.44                             | 9.76                            | 9.54                        | 2.31%                  |
| 1900MHz   | 2014-11-20 | 39.6                  | 1.43   | 9.48                             | 37.92                           | 39.20                       | -3.27%                 |
| 2450MHz   | 2014-11-04 | 38.6                  | 1.81   | 13.70                            | 54.80                           | 52.50                       | 4.38%                  |

Note: 1. The graph results see ANNEX B.  
2. Target Values used derive from the calibration certificate

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Original Model

## Variant Model

| Frequency | Test Date  | Dielectric Parameters |        | 250mW Measured SAR <sub>1g</sub> | 1W Normalized SAR <sub>1g</sub> | 1W Target SAR <sub>1g</sub> | Limit (±10% Deviation) |
|-----------|------------|-----------------------|--------|----------------------------------|---------------------------------|-----------------------------|------------------------|
|           |            | ε <sub>r</sub>        | σ(s/m) | (W/kg)                           |                                 |                             |                        |
| 835MHz    | 2014-12-19 | 55.9                  | 0.96   | 2.45                             | 9.80                            | 9.54                        | 2.73%                  |
| 1900MHz   | 2014-12-19 | 53.3                  | 1.49   | 9.98                             | 39.92                           | 40.00                       | -0.20%                 |
|           | 2015-01-13 | 53.1                  | 1.52   | 10.49                            | 41.96                           | 40.00                       | 4.90%                  |

Note: 1. The graph results see ANNEX B.  
2. Target Values used derive from the calibration certificate

## **6. Operational Conditions during Test**

### **6.1. General Description of Test Procedures**

A communication link is set up with a System Simulator (SS) by air link, and a call is established. The EUT is commanded to operate at maximum transmitting power.

Connection to the EUT is established via air interface with E5515C, and the EUT is set to maximum output power by E5515C. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output. The antenna connected to the output of the base station simulator shall be placed at least 50 cm away from the EUT. The signal transmitted by the simulator to the antenna feeding point shall be lower than the output power level of the EUT by at least 30 dB.

### **6.2. Test Positions**

#### **6.2.1. Against Phantom Head**

Measurements were made in "cheek" and "tilt" positions on both the left hand and right hand sides of the phantom.

The positions used in the measurements were according to IEEE 1528 - 2003 "IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate(SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques".

#### **6.2.2. Body Worn Configuration**

Body-worn operating configurations should be tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in normal use configurations.

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration. Per FCC KDB Publication 648474 D04, Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB Publication 447498 D01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is  $> 1.2$  W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are tested with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-clip used with

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different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

Body-worn accessories may not always be supplied or available as options for some devices intended to be authorized for body-worn use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used. Test position spacing was documented. Transmitters that are designed to operate in front of a person's face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom in head fluid. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessories, including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.

### **6.3. Measurement Variability**

Per FCC KDB Publication 865664 D01, SAR measurement variability was assessed for each frequency band, which was determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media were required for SAR measurements in a frequency band, the variability measurement procedures were applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. These additional measurements were repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device was returned to ambient conditions (normal room temperature) with the battery fully charged before it was re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

SAR Measurement Variability was assessed using the following procedures for each frequency band:

- 1) When the original highest measured SAR is  $\geq 0.80$  W/kg, the measurement was repeated once.
- 2) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was  $> 1.20$  or when the original or repeated measurement was  $\geq 1.45$  W/kg (~ 10% from the 1-g SAR limit).
- 3) A third repeated measurement was performed only if the original, first or second repeated measurement was  $\geq 1.5$  W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is  $> 1.20$ .
- 4) Repeated measurements are not required when the original highest measured SAR is  $< 0.80$  W/kg

The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.

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### 6.4. Test Configuration

#### 6.4.1. GSM Test Configuration

SAR tests for GSM 850 and GSM 1900, a communication link is set up with a System Simulator (SS) by air link. Using E5515C the power level is set to “5” for GSM 850, set to “0” for GSM 1900. Since the GPRS class is 12 for this EUT, it has at most 4 timeslots in uplink and at most 4 timeslots in downlink, the maximum total timeslots is 5.

According to specification 3GPP TS 51.010, the maximum power of the GSM can do the power reduction for the multi-slot. The allowed power reduction in the multi-slot configuration is as following:

Output power of reductions:

**Table 8: The allowed power reduction in the multi-slot configuration**

| <b>Number of timeslots in uplink assignment</b> | <b>Permissible nominal reduction of maximum output power,(dB)</b> |
|-------------------------------------------------|-------------------------------------------------------------------|
| 1                                               | 0                                                                 |
| 2                                               | 0 to 3,0                                                          |
| 3                                               | 1,8 to 4,8                                                        |
| 4                                               | 3,0 to 6,0                                                        |

#### **6.4.2. UMTS Test Configuration**

##### **6.4.2.1. 3G SAR Test Reduction Procedure**

In the following procedures, the mode tested for SAR is referred to as the primary mode. The equivalent modes considered for SAR test reduction are denoted as secondary modes. Both primary and secondary modes must be in the same frequency band. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is  $\leq \frac{1}{4}$  dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is  $\leq 1.2$  W/kg, SAR measurement is not required for the secondary mode.<sup>3</sup> This is referred to as the 3G SAR test reduction procedure in the following SAR test guidance, where the primary mode is identified in the applicable wireless mode test procedures and the secondary mode is wireless mode being considered for SAR test reduction by that procedure. When the 3G SAR test reduction procedure is not satisfied, it is identified as “otherwise” in the applicable procedures; SAR measurement is required for the secondary mode.

##### **6.4.2.2. Output power Verification**

Maximum output power is verified on the high, middle and low channels according to procedures described in section 5.2 of 3GPP TS 34.121, using the appropriate RMC or AMR with TPC (transmit power control) set to all “1’s” for WCDMA/HSDPA or by applying the required inner loop power control procedures to maintain maximum output power while HSUPA is active. Results for all applicable physical channel configurations (DPCCH, DPDCHn and spreading codes, HSDPA, HSPA) are required in the SAR report. All configurations that are not supported by the handset or cannot be measured due to technical or equipment limitations must be clearly identified.

##### **6.4.2.3. Head SAR**

SAR for next to the ear head exposure is measured using a 12.2 kbps RMC with TPC bits configured to all “1’s”. The 3G SAR test reduction procedure is applied to AMR configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for 12.2 kbps AMR in 3.4 kbps SRB (signaling radio bearer) using the highest reported SAR configuration in 12.2 kbps RMC for head exposure.

##### **6.4.2.4. Body-Worn Accessory SAR**

SAR for body-worn accessory configurations is measured using a 12.2 kbps RMC with TPC bits configured to all “1’s”. The 3G SAR test reduction procedure is applied to other spreading codes and multiple DPDCHn configurations supported by the handset with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured using an applicable RMC configuration with the corresponding spreading code or DPDCHn, for the highest reported body-worn accessory exposure SAR configuration in 12.2 kbps RMC. When more than 2 DPDCHn are supported by the handset, it may be necessary to configure additional DPDCHn using FTM (Factory Test Mode) or other chipset based test approaches with parameters similar to those used in 384 kbps and 768 kbps RMC.

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### 6.4.2.5. Handsets with Release 5 HSDPA

The 3G SAR test reduction procedure is applied to HSDPA body-worn accessory configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSDPA using the HSDPA body SAR procedures in the “Release 5 HSDPA Data Devices” section of this document, for the highest reported SAR body-worn accessory exposure configuration in 12.2 kbps RMC. Handsets with both HSDPA and HSUPA are tested according to Release 6 HSPA test procedures.

HSDPA should be configured according to the UE category of a test device. The number of HSDSCH/ HS-PDSCHs, HARQ processes, minimum inter-TTI interval, transport block sizes and RV coding sequence are defined by the H-set. To maintain a consistent test configuration and stable transmission conditions, QPSK is used in the H-set for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 4 ms with a CQI repetition factor of 2 to maintain a constant rate of active CQI slots. DPCCH and DPDCH gain factors ( $\beta_c$ ,  $\beta_d$ ), and HS-DPCCH power offset parameters ( $\Delta_{ACK}$ ,  $\Delta_{NACK}$ ,  $\Delta_{CQI}$ ) should be set according to values indicated in the Table below. The CQI value is determined by the UE category, transport block size, number of HS-PDSCHs and modulation used in the H-set.

**Table 9: Subtests for UMTS Release 5 HSDPA**

| Sub-set                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | $\beta_c$         | $\beta_d$         | $\beta_d$<br>(SF) | $\beta_c/\beta_d$ | $\beta_{hs}$<br>(note 1, note 2) | CM(dB)<br>(note 3) | MPR(dB) |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------|-------------------|-------------------|----------------------------------|--------------------|---------|
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2/15              | 15/15             | 64                | 2/15              | 4/15                             | 0.0                | 0.0     |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 12/15<br>(note 4) | 15/15<br>(note 4) | 64                | 12/15<br>(note 4) | 24/15                            | 1.0                | 0.0     |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 15/15             | 8/15              | 64                | 15/8              | 30/15                            | 1.5                | 0.5     |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 15/15             | 4/15              | 64                | 15/4              | 30/15                            | 1.5                | 0.5     |
| <p>Note1: <math>\Delta_{ACK}</math>, <math>\Delta_{NACK}</math> and <math>\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c</math></p> <p>Note2: CM=1 for <math>\beta_c/\beta_d = 12/15</math>, <math>\beta_{hs}/\beta_c = 24/15</math>.</p> <p>Note3: For subtest 2 the <math>\beta_c/\beta_d</math> ratio of 12/15 for the TFC during the measurement period(TF1,TF0) is achieved by setting the signaled gain factors for the reference TFC (TFC1,TF1) to <math>\beta_c=11/15</math> and <math>\beta_d=15/15</math>.</p> |                   |                   |                   |                   |                                  |                    |         |

### 6.4.3. HSUPA Test Configuration

The 3G SAR test reduction procedure is applied to HSPA (HSUPA/HSDPA with RMC) body-worn accessory configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSPA using the HSPA body SAR procedures in the “Release 6 HSPA Data Devices” section of this document, for the highest reported body-worn accessory exposure SAR configuration in 12.2 kbps RMC. When VOIP is applicable for next to the ear head exposure in HSPA, the 3G SAR test reduction procedure is applied to HSPA with 12.2 kbps RMC as the primary mode; otherwise, the same HSPA configuration used for body-worn accessory measurements is tested for next to the ear head exposure.

Due to inner loop power control requirements in HSPA, a communication test set is required for output power and SAR tests. The 12.2 kbps RMC, FRC H-set 1 and E-DCH configurations for HSPA are configured according to the  $\beta$  values indicated in Table 2 and other applicable procedures

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described in the 'WCDMA Handset' and 'Release 5 HSDPA Data Devices' sections of this document

**Table 10: Sub-Test 5 Setup for Release 6 HSUPA**

| Sub-set | $\beta_c$            | $\beta_d$            | $\beta_d$<br>(SF) | $\beta_c/\beta_d$    | $\beta_{hs}^{(1)}$ | $\beta_{ec}$ | $\beta_{ed}$                                 | $\beta_{ed}$<br>(SF) | $\beta_{ed}$<br>(codes) | CM <sup>(2)</sup><br>(dB) | MPR<br>(dB) | AG <sup>(4)</sup><br>Index | E-TFCI |
|---------|----------------------|----------------------|-------------------|----------------------|--------------------|--------------|----------------------------------------------|----------------------|-------------------------|---------------------------|-------------|----------------------------|--------|
| 1       | 11/15 <sup>(3)</sup> | 15/15 <sup>(3)</sup> | 64                | 11/15 <sup>(3)</sup> | 22/15              | 209/225      | 1039/225                                     | 4                    | 1                       | 1.0                       | 0.0         | 20                         | 75     |
| 2       | 6/15                 | 15/15                | 64                | 6/15                 | 12/15              | 12/15        | 94/75                                        | 4                    | 1                       | 3.0                       | 2.0         | 12                         | 67     |
| 3       | 15/15                | 9/15                 | 64                | 15/9                 | 30/15              | 30/15        | $\beta_{ed1}: 47/15$<br>$\beta_{ed2}: 47/15$ | 4                    | 2                       | 2.0                       | 1.0         | 15                         | 92     |
| 4       | 2/15                 | 15/15                | 64                | 2/15                 | 4/15               | 2/15         | 56/75                                        | 4                    | 1                       | 3.0                       | 2.0         | 17                         | 71     |
| 5       | 15/15 <sup>(4)</sup> | 15/15 <sup>(4)</sup> | 64                | 15/15 <sup>(4)</sup> | 30/15              | 24/15        | 134/15                                       | 4                    | 1                       | 1.0                       | 0.0         | 21                         | 81     |

Note 1:  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$ .

Note 2: CM = 1 for  $\beta_c/\beta_d = 12/15$ ,  $\beta_{hs}/\beta_c = 24/15$ . For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the  $\beta_c/\beta_d$  ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to  $\beta_c = 10/15$  and  $\beta_d = 15/15$ .

Note 4: For subtest 5 the  $\beta_c/\beta_d$  ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to  $\beta_c = 14/15$  and  $\beta_d = 15/15$ .

Note 5: Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Figure 5.1g.

Note 6:  $\beta_{ed}$  can not be set directly; it is set by Absolute Grant Value.

**Table 11: HSUPA UE category**

| UE<br>E-DCH<br>Category | Maximum<br>E-DCH<br>Codes<br>Transmitted | Number<br>of HARQ<br>Processes | E-<br>DCH<br>TTI<br>(ms) | Minimum<br>Spreading<br>Factor | Maximum<br>E-DCH<br>Transport<br>Block Bits | Max<br>Rate<br>(Mbps) |
|-------------------------|------------------------------------------|--------------------------------|--------------------------|--------------------------------|---------------------------------------------|-----------------------|
| 1                       | 1                                        | 4                              | 10                       | 4                              | 7110                                        | 0.7296                |
| 2                       | 2                                        | 8                              | 2                        | 4                              | 2798                                        | 1.4592                |
|                         | 2                                        | 4                              | 10                       | 4                              | 14484                                       |                       |
| 3                       | 2                                        | 4                              | 10                       | 4                              | 14484                                       | 1.4592                |
| 4                       | 2                                        | 8                              | 2                        | 2                              | 5772                                        | 2.9185                |
|                         | 2                                        | 4                              | 10                       | 2                              | 20000                                       | 2.00                  |
| 5                       | 2                                        | 4                              | 10                       | 2                              | 20000                                       | 2.00                  |
| 6<br>(No DPDCH)         | 4                                        | 8                              | 2                        | 2 SF2 & 2 SF4                  | 11484                                       | 5.76                  |
|                         | 4                                        | 4                              | 10                       |                                | 20000                                       | 2.00                  |
| 7<br>(No DPDCH)         | 4                                        | 8                              | 2                        | 2 SF2 & 2 SF4                  | 22996                                       | ?                     |
|                         | 4                                        | 4                              | 10                       |                                | 20000                                       | ?                     |

NOTE: When 4 codes are transmitted in parallel, two codes shall be transmitted with SF2 and two with SF4.  
 UE Categories 1 to 6 supports QPSK only. UE Category 7 supports QPSK and 16QAM.  
 (TS25.306-7.3.0)

#### **6.4.3.1. HSPA, HSPA+ and DC-HSDPA Test Configuration**

measurement is required for HSPA, HSPA+ or DC-HSDPA, a KDB inquiry is required to confirm that the wireless mode configurations in the test setup have remained stable throughout the SAR measurements.<sup>35</sup> Without prior KDB confirmation to determine the SAR results are acceptable, a PBA is required for TCB approval.

SAR test exclusion for HSPA, HSPA+ and DC-HSDPA is determined according to the following:

- 1) The HSPA procedures are applied to configure 3GPP Rel. 6 HSPA devices in the required sub-test mode(s) to determine SAR test exclusion.
- 2) SAR is required for Rel. 7 HSPA+ when SAR is required for Rel. 6 HSPA; otherwise, the 3G SAR test reduction procedure is applied to (uplink) HSPA+ with 12.2 kbps RMC as the primary mode.<sup>36</sup> Power is measured for HSPA+ that supports uplink 16 QAM according to configurations in Table C.11.1.4 of 3GPP TS 34.121-1 to determine SAR test reduction.
- 3) SAR is required for Rel. 8 DC-HSDPA when SAR is required for Rel. 5 HSDPA; otherwise, the 3G SAR test reduction procedure is applied to DC-HSDPA with 12.2 kbps RMC as the primary mode. Power is measured for DC-HSDPA according to the H-Set 12, FRC configuration in Table C.8.1.12 of 3GPP TS 34.121-1 to determine SAR test reduction. A primary and a secondary serving HS-DSCH Cell are required to perform the power measurement and for the results to be acceptable.
- 4) Regardless of whether a PBA is required, the following information must be verified and included in the SAR report for devices supporting HSPA, HSPA+ or DC-HSDPA: a) The output power measurement results and applicable release version(s) of 3GPP TS 34.121.

i) Power measurement difficulties due to test equipment setup or availability must be resolved between the grantee and its test lab.

- b) The power measurement results are in agreement with the individual device implementation and specifications. When Enhanced MPR (E-MPR) applies, the normal MPR targets may be modified according to the Cubic Metric (CM) measured by the device, which must be taken into consideration.
- c) The UE category, operating parameters, such as the  $\beta$  and  $\Delta$  values used to configure the device for testing, power setback procedures described in 3GPP TS 34.121 for the power measurements, and HSPA/HSPA+ channel conditions (active and stable) for the entire duration of the measurement according to the required E-TFCI and AG index values.

5) When SAR measurement is required, the test configurations, procedures and power measurement results must be clearly described to confirm that the required test parameters are used, including E-TFCI and AG index stability and output power conditions.

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**Table 12: HS-DSCH UE category**

**Table 5.1a: FDD HS-DSCH physical layer categories**

| HS-DSCH category      | Maximum number of HS-DSCH codes received | Minimum inter-TTI interval | Maximum number of bits of an HS-DSCH transport block received within an HS-DSCH TTI<br>NOTE 1 | Total number of soft channel bits | Supported modulations without MIMO operation or dual cell operation | Supported modulations with MIMO operation and without dual cell operation | Supported modulations with dual cell operation     |
|-----------------------|------------------------------------------|----------------------------|-----------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------|----------------------------------------------------|
| Category 1            | 5                                        | 3                          | 7298                                                                                          | 19200                             | QPSK, 16QAM                                                         | Not applicable (MIMO not supported)                                       | Not applicable (dual cell operation not supported) |
| Category 2            | 5                                        | 3                          | 7298                                                                                          | 28800                             |                                                                     |                                                                           |                                                    |
| Category 3            | 5                                        | 2                          | 7298                                                                                          | 28800                             |                                                                     |                                                                           |                                                    |
| Category 4            | 5                                        | 2                          | 7298                                                                                          | 38400                             |                                                                     |                                                                           |                                                    |
| Category 5            | 5                                        | 1                          | 7298                                                                                          | 57600                             |                                                                     |                                                                           |                                                    |
| Category 6            | 5                                        | 1                          | 7298                                                                                          | 67200                             |                                                                     |                                                                           |                                                    |
| Category 7            | 10                                       | 1                          | 14411                                                                                         | 115200                            |                                                                     |                                                                           |                                                    |
| Category 8            | 10                                       | 1                          | 14411                                                                                         | 134400                            |                                                                     |                                                                           |                                                    |
| Category 9            | 15                                       | 1                          | 20251                                                                                         | 172800                            |                                                                     |                                                                           |                                                    |
| Category 10           | 15                                       | 1                          | 27952                                                                                         | 172800                            |                                                                     |                                                                           |                                                    |
| Category 11           | 5                                        | 2                          | 3630                                                                                          | 14400                             | QPSK                                                                |                                                                           |                                                    |
| Category 12           | 5                                        | 1                          | 3630                                                                                          | 28800                             | QPSK, 16QAM, 64QAM                                                  |                                                                           |                                                    |
| Category 13           | 15                                       | 1                          | 35280                                                                                         | 259200                            |                                                                     |                                                                           |                                                    |
| Category 14           | 15                                       | 1                          | 42192                                                                                         | 259200                            |                                                                     |                                                                           |                                                    |
| Category 15           | 15                                       | 1                          | 23370                                                                                         | 345600                            | QPSK, 16QAM                                                         |                                                                           |                                                    |
| Category 16           | 15                                       | 1                          | 27952                                                                                         | 345600                            | QPSK, 16QAM                                                         |                                                                           |                                                    |
| Category 17<br>NOTE 2 | 15                                       | 1                          | 35280                                                                                         | 259200                            | QPSK, 16QAM, 64QAM                                                  | –                                                                         |                                                    |
|                       |                                          |                            | 23370                                                                                         | 345600                            | –                                                                   | QPSK, 16QAM                                                               |                                                    |
| Category 18<br>NOTE 3 | 15                                       | 1                          | 42192                                                                                         | 259200                            | QPSK, 16QAM, 64QAM                                                  | –                                                                         |                                                    |
|                       |                                          |                            | 27952                                                                                         | 345600                            | –                                                                   | QPSK, 16QAM                                                               |                                                    |
| Category 19           | 15                                       | 1                          | 35280                                                                                         | 518400                            | QPSK, 16QAM, 64QAM                                                  |                                                                           |                                                    |
| Category 20           | 15                                       | 1                          | 42192                                                                                         | 518400                            | QPSK, 16QAM, 64QAM                                                  |                                                                           |                                                    |
| Category 21           | 15                                       | 1                          | 23370                                                                                         | 345600                            | -                                                                   | -                                                                         | QPSK, 16QAM                                        |
| Category 22           | 15                                       | 1                          | 27952                                                                                         | 345600                            |                                                                     |                                                                           | QPSK, 16QAM, 64QAM                                 |
| Category 23           | 15                                       | 1                          | 35280                                                                                         | 518400                            |                                                                     |                                                                           |                                                    |
| Category 24           | 15                                       | 1                          | 42192                                                                                         | 518400                            |                                                                     |                                                                           |                                                    |

#### **6.4.4. WIFI Test Configuration**

For WLAN SAR testing, WLAN engineering testing software installed on the DUT can provide continuous transmitting RF signal. The Tx power is set to 14.5 for 802.11 b mode by software. This RF signal utilized in SAR measurement has almost 100% duty cycle and its crest factor is 1.

For the 802.11b/g/n SAR tests, a communication link is set up with the test mode software for WIFI mode test. During the test, at the each test frequency channel, the EUT is operated at the RF continuous emission mode. Each channel should be tested at the lowest data rate. Testing at higher data rates is not required when the maximum average output power is less than 0.25dB higher than those measured at the lowest data rate.

802.11b/g/n operating modes are tested independently according to the service requirements in each frequency band. 802.11b/g/n modes are tested on the maximum average output channel.

SAR is not required for 802.11g/n channels when the maximum average output power is less than 0.25dB higher than that measured on the corresponding 802.11b channels.

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## 7. Test Results

### 7.1. Conducted Power Results

**Table 13: Conducted Power Measurement Results (Original Model)**

| GSM 850        |          | Burst Conducted Power(dBm) |           |            | /       | Average power(dBm)     |              |              |
|----------------|----------|----------------------------|-----------|------------|---------|------------------------|--------------|--------------|
|                |          | Channel/Frequency(MHz)     |           |            |         | Channel/Frequency(MHz) |              |              |
|                |          | 128/824.2                  | 190/836.6 | 251/848.8  |         | 128/824.2              | 190/836.6    | 251/848.8    |
| GSM            |          | 27.26                      | 27.25     | 27.23      | -9.03dB | 18.23                  | 18.22        | 18.20        |
| GPRS<br>(GMSK) | 1Txslot  | 27.39                      | 27.33     | 27.13      | -9.03dB | 18.36                  | 18.30        | 18.10        |
|                | 2Txslots | 27.28                      | 27.26     | 27.08      | -6.02dB | 21.26                  | 21.24        | 21.06        |
|                | 3Txslots | 26.31                      | 26.43     | 26.35      | -4.26dB | <b>22.05</b>           | <b>22.17</b> | <b>22.09</b> |
|                | 4Txslots | 25.05                      | 25.12     | 25.09      | -3.01dB | 22.04                  | 22.11        | 22.08        |
| GSM 1900       |          | Burst Conducted Power(dBm) |           |            | /       | Average power(dBm)     |              |              |
|                |          | Channel/Frequency(MHz)     |           |            |         | Channel/Frequency(MHz) |              |              |
|                |          | 512/1850.2                 | 661/1880  | 810/1909.8 |         | 512/1850.2             | 661/1880     | 810/1909.8   |
| GSM            |          | 29.47                      | 29.37     | 29.34      | -9.03dB | 20.44                  | 20.34        | 20.31        |
| GPRS<br>(GMSK) | 1Txslot  | 29.75                      | 29.64     | 29.48      | -9.03dB | 20.72                  | 20.61        | 20.45        |
|                | 2Txslots | 27.67                      | 27.82     | 27.86      | -6.02dB | 21.65                  | 21.80        | 21.84        |
|                | 3Txslots | 26.41                      | 26.51     | 26.49      | -4.26dB | 22.15                  | 22.25        | 22.23        |
|                | 4Txslots | 25.35                      | 25.43     | 25.41      | -3.01dB | <b>22.34</b>           | <b>22.42</b> | <b>22.40</b> |

Note:

#### 1) Division Factors

To average the power, the division factor is as follows:

1Txslot = 1 transmit time slot out of 8 time slots

=> conducted power divided by (8/1) => -9.03 dB

2Txslots = 2 transmit time slots out of 8 time slots

=> conducted power divided by (8/2) => -6.02 dB

3Txslots = 3 transmit time slots out of 8 time slots

=> conducted power divided by (8/3) => -4.26 dB

4Txslots = 4 transmit time slots out of 8 time slots

=> conducted power divided by (8/4) => -3.01 dB

#### 2) Average power numbers

The maximum power numbers are marks in bold.

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| UMTS Band II |              | Conducted Power (dBm)  |            |             |
|--------------|--------------|------------------------|------------|-------------|
|              |              | Channel/Frequency(MHz) |            |             |
|              |              | 9262/1852.4            | 9400/1880  | 9538/1907.6 |
| RMC          | 12.2kbps RMC | 22.67                  | 22.81      | 22.03       |
|              | 64kbps RMC   | 22.65                  | 22.62      | 22.01       |
|              | 144kbps RMC  | 22.61                  | 22.57      | 21.97       |
|              | 384kbps RMC  | 22.55                  | 22.49      | 21.89       |
| HSDPA        | Sub - Test 1 | 22.56                  | 22.70      | 21.92       |
|              | Sub - Test 2 | 22.54                  | 22.51      | 21.90       |
|              | Sub - Test 3 | 22.50                  | 22.46      | 21.86       |
|              | Sub - Test 4 | 22.44                  | 22.38      | 21.78       |
| HSUPA        | Sub - Test 1 | 21.52                  | 21.66      | 20.88       |
|              | Sub - Test 2 | 19.51                  | 19.75      | 18.95       |
|              | Sub - Test 3 | 20.63                  | 20.63      | 19.76       |
|              | Sub - Test 4 | 19.47                  | 19.34      | 18.91       |
|              | Sub - Test 5 | 21.31                  | 21.25      | 20.63       |
| DC-HSDPA     | Sub - Test 1 | 22.53                  | 22.65      | 21.85       |
|              | Sub - Test 2 | 22.49                  | 22.49      | 21.79       |
|              | Sub - Test 3 | 22.37                  | 22.41      | 21.75       |
|              | Sub - Test 4 | 22.31                  | 22.33      | 21.68       |
| UMTS Band V  |              | Conducted Power (dBm)  |            |             |
|              |              | Channel/Frequency(MHz) |            |             |
|              |              | 4132/826.4             | 4183/836.6 | 4233/846.6  |
| RMC          | 12.2kbps RMC | 22.81                  | 22.91      | 22.89       |
|              | 64kbps RMC   | 22.77                  | 22.82      | 22.79       |
|              | 144kbps RMC  | 22.69                  | 22.73      | 22.67       |
|              | 384kbps RMC  | 22.61                  | 22.65      | 22.53       |
| HSDPA        | Sub - Test 1 | 22.70                  | 22.80      | 22.78       |
|              | Sub - Test 2 | 22.66                  | 22.71      | 22.68       |
|              | Sub - Test 3 | 22.58                  | 22.62      | 22.56       |
|              | Sub - Test 4 | 22.50                  | 22.54      | 22.42       |
| HSUPA        | Sub - Test 1 | 21.75                  | 21.79      | 21.71       |
|              | Sub - Test 2 | 19.64                  | 19.83      | 19.78       |
|              | Sub - Test 3 | 20.69                  | 20.76      | 20.69       |
|              | Sub - Test 4 | 19.57                  | 19.75      | 19.23       |
|              | Sub - Test 5 | 21.71                  | 21.76      | 21.35       |
| DC-HSDPA     | Sub - Test 1 | 22.65                  | 22.75      | 22.71       |
|              | Sub - Test 2 | 22.53                  | 22.63      | 22.62       |
|              | Sub - Test 3 | 22.45                  | 22.51      | 22.52       |
|              | Sub - Test 4 | 22.33                  | 22.41      | 22.41       |

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| BT            | AV Conducted Power (dBm) |                |                |
|---------------|--------------------------|----------------|----------------|
|               | Channel/Frequency(MHz)   |                |                |
|               | Ch 0/2402 MHz            | Ch 39/2441 MHz | Ch 78/2480 MHz |
| GFSK          | 5.00                     | 6.80           | 6.70           |
| $\pi/4$ DQPSK | 4.10                     | 4.30           | 4.70           |
| 8DPSK         | 4.40                     | 4.60           | 4.50           |
| <b>BT 4.0</b> | Ch 0/2402 MHz            | Ch 19/2440 MHz | Ch 39/2480 MHz |
| GFSK          | -2.00                    | -0.50          | -0.10          |

| Mode    | Channel/<br>Frequency(MHz) | Data rate<br>(Mbps) | AV Power (dBm) |
|---------|----------------------------|---------------------|----------------|
| 802.11b | 1/2412                     | 1                   | 14.70          |
|         |                            | 2                   | 14.20          |
|         |                            | 5.5                 | 14.00          |
|         |                            | 11                  | 13.70          |
|         | 6/2437                     | 1                   | 15.20          |
|         |                            | 2                   | 14.90          |
|         |                            | 5.5                 | 14.70          |
|         |                            | 11                  | 14.50          |
|         | 11/2462                    | 1                   | 15.60          |
|         |                            | 2                   | 15.50          |
|         |                            | 5.5                 | 15.30          |
|         |                            | 11                  | 15.00          |
| 802.11g | 1/2412                     | 6                   | 13.00          |
|         |                            | 9                   | 12.80          |
|         |                            | 12                  | 12.50          |
|         |                            | 18                  | 12.10          |
|         |                            | 24                  | 11.70          |
|         |                            | 36                  | 11.20          |
|         |                            | 48                  | 10.50          |
|         |                            | 54                  | 10.30          |
|         | 6/2437                     | 6                   | 13.70          |
|         |                            | 9                   | 13.50          |
|         |                            | 12                  | 13.10          |
|         |                            | 18                  | 12.80          |
|         |                            | 24                  | 12.30          |
|         |                            | 36                  | 12.00          |
|         |                            | 48                  | 11.60          |
|         |                            | 54                  | 11.10          |

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|              |         |      |       |
|--------------|---------|------|-------|
|              | 11/2462 | 6    | 14.30 |
|              |         | 9    | 14.00 |
|              |         | 12   | 13.80 |
|              |         | 18   | 13.40 |
|              |         | 24   | 13.00 |
|              |         | 36   | 12.50 |
|              |         | 48   | 11.90 |
|              |         | 54   | 11.70 |
| 802.11n HT20 | 1/2412  | MCS0 | 9.90  |
|              |         | MCS1 | 9.40  |
|              |         | MCS2 | 9.00  |
|              |         | MCS3 | 8.70  |
|              |         | MCS4 | 8.00  |
|              |         | MCS5 | 7.50  |
|              |         | MCS6 | 7.40  |
|              |         | MCS7 | 7.10  |
|              | 6/2437  | MCS0 | 10.70 |
|              |         | MCS1 | 10.20 |
|              |         | MCS2 | 9.70  |
|              |         | MCS3 | 9.40  |
|              |         | MCS4 | 8.70  |
|              |         | MCS5 | 8.30  |
|              |         | MCS6 | 8.10  |
|              |         | MCS7 | 7.90  |
|              | 11/2462 | MCS0 | 11.30 |
|              |         | MCS1 | 10.80 |
|              |         | MCS2 | 10.40 |
|              |         | MCS3 | 9.50  |
|              |         | MCS4 | 9.40  |
|              |         | MCS5 | 8.90  |
|              |         | MCS6 | 8.70  |
|              |         | MCS7 | 8.50  |

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**Table 14: Conducted Power Measurement Results (Variant Model)**

| GSM 850        |          | Burst Conducted Power(dBm) |           |            | /       | Average power(dBm)     |              |              |
|----------------|----------|----------------------------|-----------|------------|---------|------------------------|--------------|--------------|
|                |          | Channel/Frequency(MHz)     |           |            |         | Channel/Frequency(MHz) |              |              |
|                |          | 128/824.2                  | 190/836.6 | 251/848.8  |         | 128/824.2              | 190/836.6    | 251/848.8    |
| GSM            |          | 27.06                      | 27.10     | 27.38      | -9.03dB | 18.03                  | 18.07        | 18.35        |
| GPRS<br>(GMSK) | 1Txslot  | 26.91                      | 27.01     | 27.74      | -9.03dB | 17.88                  | 17.98        | 18.71        |
|                | 2Txslots | 26.83                      | 26.99     | 27.22      | -6.02dB | 20.81                  | 20.97        | 21.20        |
|                | 3Txslots | 25.38                      | 25.49     | 25.66      | -4.26dB | <b>21.12</b>           | <b>21.23</b> | <b>21.40</b> |
|                | 4Txslots | 24.09                      | 24.24     | 24.32      | -3.01dB | 21.08                  | 21.23        | 21.31        |
| GSM 1900       |          | Burst Conducted Power(dBm) |           |            | /       | Average power(dBm)     |              |              |
|                |          | Channel/Frequency(MHz)     |           |            |         | Channel/Frequency(MHz) |              |              |
|                |          | 512/1850.2                 | 661/1880  | 810/1909.8 |         | 512/1850.2             | 661/1880     | 810/1909.8   |
| GSM            |          | 29.01                      | 29.29     | 29.51      | -9.03dB | 19.98                  | 20.26        | 20.48        |
| GPRS<br>(GMSK) | 1Txslot  | 29.33                      | 29.64     | 29.55      | -9.03dB | 20.30                  | 20.61        | 20.52        |
|                | 2Txslots | 26.83                      | 26.97     | 27.28      | -6.02dB | 20.81                  | 20.95        | 21.26        |
|                | 3Txslots | 25.89                      | 26.03     | 26.26      | -4.26dB | 21.63                  | 21.77        | 22.00        |
|                | 4Txslots | 24.92                      | 25.09     | 25.47      | -3.01dB | <b>21.91</b>           | <b>22.08</b> | <b>22.46</b> |

Note:

### 2) Division Factors

To average the power, the division factor is as follows:

1Txslot = 1 transmit time slot out of 8 time slots

=> conducted power divided by (8/1) => -9.03 dB

2Txslots = 2 transmit time slots out of 8 time slots

=> conducted power divided by (8/2) => -6.02 dB

3Txslots = 3 transmit time slots out of 8 time slots

=> conducted power divided by (8/3) => -4.26 dB

4Txslots = 4 transmit time slots out of 8 time slots

=> conducted power divided by (8/4) => -3.01 dB

### 2) Average power numbers

The maximum power numbers are marks in bold.

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| UMTS Band II |              | Conducted Power (dBm)  |            |             |
|--------------|--------------|------------------------|------------|-------------|
|              |              | Channel/Frequency(MHz) |            |             |
|              |              | 9262/1852.4            | 9400/1880  | 9538/1907.6 |
| RMC          | 12.2kbps RMC | 22.97                  | 22.82      | 22.29       |
|              | 64kbps RMC   | 22.86                  | 22.69      | 22.17       |
|              | 144kbps RMC  | 22.97                  | 22.76      | 22.18       |
|              | 384kbps RMC  | 22.84                  | 22.77      | 22.22       |
| HSDPA        | Sub - Test 1 | 22.88                  | 22.90      | 22.29       |
|              | Sub - Test 2 | 22.94                  | 22.69      | 22.35       |
|              | Sub - Test 3 | 22.97                  | 22.91      | 22.29       |
|              | Sub - Test 4 | 22.88                  | 22.97      | 22.30       |
| HSUPA        | Sub - Test 1 | 21.65                  | 21.34      | 21.04       |
|              | Sub - Test 2 | 19.87                  | 19.55      | 19.48       |
|              | Sub - Test 3 | 20.51                  | 20.29      | 20.58       |
|              | Sub - Test 4 | 19.28                  | 19.43      | 19.03       |
|              | Sub - Test 5 | 21.45                  | 21.52      | 21.12       |
| DC-HSDPA     | Sub - Test 1 | 21.85                  | 21.83      | 21.10       |
|              | Sub - Test 2 | 20.53                  | 20.53      | 19.79       |
|              | Sub - Test 3 | 21.27                  | 21.14      | 20.27       |
|              | Sub - Test 4 | 20.56                  | 20.62      | 19.74       |
| UMTS Band V  |              | Conducted Power (dBm)  |            |             |
|              |              | Channel/Frequency(MHz) |            |             |
|              |              | 4132/826.4             | 4183/836.6 | 4233/846.6  |
| RMC          | 12.2kbps RMC | 22.69                  | 22.16      | 22.79       |
|              | 64kbps RMC   | 22.53                  | 22.11      | 22.73       |
|              | 144kbps RMC  | 22.60                  | 22.00      | 22.66       |
|              | 384kbps RMC  | 22.65                  | 22.08      | 22.66       |
| HSDPA        | Sub - Test 1 | 22.69                  | 22.23      | 22.85       |
|              | Sub - Test 2 | 22.60                  | 22.21      | 22.81       |
|              | Sub - Test 3 | 22.73                  | 22.10      | 22.79       |
|              | Sub - Test 4 | 22.72                  | 22.11      | 22.74       |
| HSUPA        | Sub - Test 1 | 21.81                  | 21.69      | 21.42       |
|              | Sub - Test 2 | 19.22                  | 19.64      | 19.06       |
|              | Sub - Test 3 | 20.12                  | 20.77      | 20.25       |
|              | Sub - Test 4 | 19.32                  | 19.85      | 19.47       |
|              | Sub - Test 5 | 21.23                  | 21.34      | 21.26       |
| DC-HSDPA     | Sub - Test 1 | 21.58                  | 21.04      | 21.80       |
|              | Sub - Test 2 | 20.25                  | 19.75      | 20.52       |
|              | Sub - Test 3 | 20.82                  | 20.21      | 21.01       |
|              | Sub - Test 4 | 20.28                  | 19.86      | 20.61       |

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| BT            | AV Conducted Power (dBm) |                |                |
|---------------|--------------------------|----------------|----------------|
|               | Channel/Frequency(MHz)   |                |                |
|               | Ch 0/2402 MHz            | Ch 39/2441 MHz | Ch 78/2480 MHz |
| GFSK          | 5.00                     | 6.80           | 6.70           |
| $\pi/4$ DQPSK | 4.10                     | 4.30           | 4.70           |
| 8DPSK         | 4.40                     | 4.60           | 4.50           |
| <b>BT 4.0</b> | Ch 0/2402 MHz            | Ch 19/2440 MHz | Ch 39/2480 MHz |
| GFSK          | -2.00                    | -0.50          | -0.10          |

| Mode    | Channel/<br>Frequency(MHz) | Data rate<br>(Mbps) | AV Power (dBm) |
|---------|----------------------------|---------------------|----------------|
| 802.11b | 1/2412                     | 1                   | 14.70          |
|         |                            | 2                   | 14.20          |
|         |                            | 5.5                 | 14.00          |
|         |                            | 11                  | 13.70          |
|         | 6/2437                     | 1                   | 15.20          |
|         |                            | 2                   | 14.90          |
|         |                            | 5.5                 | 14.70          |
|         |                            | 11                  | 14.50          |
|         | 11/2462                    | 1                   | 15.60          |
|         |                            | 2                   | 15.50          |
|         |                            | 5.5                 | 15.30          |
|         |                            | 11                  | 15.00          |
| 802.11g | 1/2412                     | 6                   | 13.00          |
|         |                            | 9                   | 12.80          |
|         |                            | 12                  | 12.50          |
|         |                            | 18                  | 12.10          |
|         |                            | 24                  | 11.70          |
|         |                            | 36                  | 11.20          |
|         |                            | 48                  | 10.50          |
|         |                            | 54                  | 10.30          |
|         | 6/2437                     | 6                   | 13.70          |
|         |                            | 9                   | 13.50          |
|         |                            | 12                  | 13.10          |
|         |                            | 18                  | 12.80          |
|         |                            | 24                  | 12.30          |
|         |                            | 36                  | 12.00          |
|         |                            | 48                  | 11.60          |
|         |                            | 54                  | 11.10          |

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|              |         |      |       |
|--------------|---------|------|-------|
|              | 11/2462 | 6    | 14.30 |
|              |         | 9    | 14.00 |
|              |         | 12   | 13.80 |
|              |         | 18   | 13.40 |
|              |         | 24   | 13.00 |
|              |         | 36   | 12.50 |
|              |         | 48   | 11.90 |
|              |         | 54   | 11.70 |
| 802.11n HT20 | 1/2412  | MCS0 | 9.90  |
|              |         | MCS1 | 9.40  |
|              |         | MCS2 | 9.00  |
|              |         | MCS3 | 8.70  |
|              |         | MCS4 | 8.00  |
|              |         | MCS5 | 7.50  |
|              |         | MCS6 | 7.40  |
|              |         | MCS7 | 7.10  |
|              | 6/2437  | MCS0 | 10.70 |
|              |         | MCS1 | 10.20 |
|              |         | MCS2 | 9.70  |
|              |         | MCS3 | 9.40  |
|              |         | MCS4 | 8.70  |
|              |         | MCS5 | 8.30  |
|              |         | MCS6 | 8.10  |
|              |         | MCS7 | 7.90  |
|              | 11/2462 | MCS0 | 11.30 |
|              |         | MCS1 | 10.80 |
|              |         | MCS2 | 10.40 |
|              |         | MCS3 | 9.50  |
|              |         | MCS4 | 9.40  |
|              |         | MCS5 | 8.90  |
|              |         | MCS6 | 8.70  |
|              |         | MCS7 | 8.50  |

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**7.2. Standalone SAR Test Exclusion Considerations**

Per FCC KDB 447498 D01, the SAR exclusion threshold for distances <50mm is defined by the following equation:

$$\frac{(\text{max. power of channel, including tune-up tolerance, mW})}{(\text{min. test separation distance, mm})} * \sqrt{\text{Frequency (GHz)}} \leq 3.0$$

| Band        | Configuration | Frequency (MHz) | Maximum Power (dBm) | Separation Distance (mm) | Calculation Result | SAR Exclusion Thresholds | Standalone SAR |
|-------------|---------------|-----------------|---------------------|--------------------------|--------------------|--------------------------|----------------|
| Bluetooth   | Head          | 2480            | 7                   | 5                        | 1.57               | 3.0                      | No             |
|             | Body          | 2480            | 7                   | 10                       | 0.79               | 3.0                      | No             |
| Wifi 2.4GHz | Head          | 2462            | 16                  | 5                        | 12.55              | 3.0                      | Yes            |
|             | Body          | 2462            | 16                  | 10                       | 6.28               | 3.0                      | Yes            |

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### 7.3. SAR Test Results

#### 7.3.1. GSM 850

**Table 15: SAR Values [GSM 850 (GSM/GPRS)] (Original Model)**

| Test Position                                              | Channel/<br>Frequency<br>(MHz) | Time slot | Duty Cycle | Maximum Allowed Power (dBm) | Conducted Power (dBm) | Drift<br>± 0.21dB | Limit SAR <sub>1g</sub> 1.6 W/kg  |                |                                   |               |
|------------------------------------------------------------|--------------------------------|-----------|------------|-----------------------------|-----------------------|-------------------|-----------------------------------|----------------|-----------------------------------|---------------|
|                                                            |                                |           |            |                             |                       | Drift (dB)        | Measured SAR <sub>1g</sub> (W/kg) | Scaling Factor | Reported SAR <sub>1g</sub> (W/kg) | Graph Results |
| Test Position of Head                                      |                                |           |            |                             |                       |                   |                                   |                |                                   |               |
| Left Cheek                                                 | 190/836.6                      | GSM       | 1:8.3      | 28                          | 27.25                 | -0.022            | 0.066                             | 1.19           | 0.078                             | Figure.13     |
| Left Tilt                                                  | 190/836.6                      | GSM       | 1:8.3      | 28                          | 27.25                 | -0.054            | 0.039                             | 1.19           | 0.046                             | Figure.14     |
| Right Cheek                                                | 190/836.6                      | GSM       | 1:8.3      | 28                          | 27.25                 | -0.032            | 0.074                             | 1.19           | 0.088                             | Figure.15     |
| Right Tilt                                                 | 190/836.6                      | GSM       | 1:8.3      | 28                          | 27.25                 | -0.058            | 0.043                             | 1.19           | 0.051                             | Figure.16     |
| Worst Case Position of Head With Battery 2                 |                                |           |            |                             |                       |                   |                                   |                |                                   |               |
| Right Cheek                                                | 190/836.6                      | GSM       | 1:8.3      | 28                          | 27.25                 | -0.080            | 0.074                             | 1.19           | 0.087                             | Figure.17     |
| Test position of Body (Distance 10mm)                      |                                |           |            |                             |                       |                   |                                   |                |                                   |               |
| Back Side                                                  | 190/836.6                      | GSM       | 1:8.3      | 28                          | 27.25                 | -0.040            | 0.165                             | 1.19           | 0.196                             | Figure.18     |
| Front Side                                                 | 190/836.6                      | GSM       | 1:8.3      | 28                          | 27.25                 | -0.010            | 0.115                             | 1.19           | 0.137                             | Figure.19     |
| Test position of Body (Distance 10mm)                      |                                |           |            |                             |                       |                   |                                   |                |                                   |               |
| Back Side                                                  | 190/836.6                      | 3 Txslots | 1:2.77     | 27                          | 26.43                 | -0.050            | 0.279                             | 1.14           | 0.318                             | Figure.20     |
| Front Side                                                 | 190/836.6                      | 3 Txslots | 1:2.77     | 27                          | 26.43                 | -0.090            | 0.184                             | 1.14           | 0.210                             | Figure.21     |
| Left Edge                                                  | 190/836.6                      | 3 Txslots | 1:2.77     | 27                          | 26.43                 | 0.022             | 0.071                             | 1.14           | 0.081                             | Figure.22     |
| Right Edge                                                 | 190/836.6                      | 3 Txslots | 1:2.77     | 27                          | 26.43                 | 0.060             | 0.091                             | 1.14           | 0.103                             | Figure.23     |
| Top Edge                                                   | N/A                            | N/A       | N/A        | N/A                         | N/A                   | N/A               | N/A                               | N/A            | N/A                               | N/A           |
| Bottom Edge                                                | 190/836.6                      | 3 Txslots | 1:2.77     | 27                          | 26.43                 | -0.010            | 0.036                             | 1.14           | 0.041                             | Figure.24     |
| Worst Case Position of Body With Battery 2 (Distance 10mm) |                                |           |            |                             |                       |                   |                                   |                |                                   |               |
| Back Side                                                  | 190/836.6                      | 3 Txslots | 1:2.77     | 27                          | 26.43                 | -0.010            | 0.294                             | 1.14           | 0.335                             | Figure.25     |

Note: 1.The value with blue color is the maximum SAR Value of each test band.

- Per FCC KDB Publication 447498 D01, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is  $\leq 0.8$  W/kg then testing at the other channels is optional for such test configuration(s).
- When multiple slots are used, SAR should be tested to account for the maximum source-based time-averaged output power.
- Per FCC KDB Publication 648474 D04, SAR was evaluated without a headset connected to the device. Since the reported SAR was  $\leq 1.2$  W/kg, no additional SAR evaluations using a headset cable were required.

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| Test Position                                                                 | Channel/<br>Frequency<br>(MHz) | Time slot | Duty Cycle | Maximum Allowed Power (dBm) | Conducted Power (dBm) | Drift<br>± 0.21dB | Limit SAR <sub>1g</sub> 1.6 W/kg  |                |                                   |               |
|-------------------------------------------------------------------------------|--------------------------------|-----------|------------|-----------------------------|-----------------------|-------------------|-----------------------------------|----------------|-----------------------------------|---------------|
|                                                                               |                                |           |            |                             |                       | Drift (dB)        | Measured SAR <sub>1g</sub> (W/kg) | Scaling Factor | Reported SAR <sub>1g</sub> (W/kg) | Graph Results |
| Test Position of Head                                                         |                                |           |            |                             |                       |                   |                                   |                |                                   |               |
| Right Cheek                                                                   | 190/836.6                      | GSM       | 1:8.3      | 28                          | 27.1                  | -0.130            | 0.080                             | 1.23           | 0.098                             | Figure. 82    |
| Worst Case Position of Head With SIM 2                                        |                                |           |            |                             |                       |                   |                                   |                |                                   |               |
| Right Cheek                                                                   | 190/836.6                      | GSM       | 1:8.3      | 28                          | 27.1                  | 0.024             | 0.084                             | 1.23           | 0.103                             | Figure. 83    |
| Test position of Body (Distance 10mm)                                         |                                |           |            |                             |                       |                   |                                   |                |                                   |               |
| Back Side                                                                     | 190/836.6                      | 3Txslots  | 1:2.77     | 27                          | 25.49                 | 0.016             | 0.297                             | 1.42           | 0.420                             | Figure. 84    |
| Worst Case Position of Body With SIM 2 (Distance 10mm)                        |                                |           |            |                             |                       |                   |                                   |                |                                   |               |
| Back Side                                                                     | 190/836.6                      | 3Txslots  | 1:2.77     | 27                          | 25.49                 | 0.020             | 0.314                             | 1.42           | 0.445                             | Figure. 85    |
| Note: 1.The value with blue color is the maximum SAR Value of each test band. |                                |           |            |                             |                       |                   |                                   |                |                                   |               |

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### 7.3.2. GSM 1900

**Table 17: SAR Values [GSM 1900(GSM/GPRS)] (Original Model)**

| Test Position                                              | Channel/<br>Frequency<br>(MHz) | Time slot | Duty Cycle | Maximum Allowed Power (dBm) | Conducted Power (dBm) | Drift<br>± 0.21dB | Limit SAR <sub>1g</sub> 1.6 W/kg  |                |                                   |               |
|------------------------------------------------------------|--------------------------------|-----------|------------|-----------------------------|-----------------------|-------------------|-----------------------------------|----------------|-----------------------------------|---------------|
|                                                            |                                |           |            |                             |                       | Drift (dB)        | Measured SAR <sub>1g</sub> (W/kg) | Scaling Factor | Reported SAR <sub>1g</sub> (W/kg) | Graph Results |
| Test Position of Head                                      |                                |           |            |                             |                       |                   |                                   |                |                                   |               |
| Left Cheek                                                 | 661/1880                       | GSM       | 1:8.3      | 30                          | 29.37                 | 0.056             | 0.130                             | 1.16           | 0.150                             | Figure.26     |
| Left Tilt                                                  | 661/1880                       | GSM       | 1:8.3      | 30                          | 29.37                 | 0.035             | 0.046                             | 1.16           | 0.054                             | Figure.27     |
| Right Cheek                                                | 661/1880                       | GSM       | 1:8.3      | 30                          | 29.37                 | -0.160            | 0.118                             | 1.16           | 0.136                             | Figure.28     |
| Right Tilt                                                 | 661/1880                       | GSM       | 1:8.3      | 30                          | 29.37                 | 0.170             | 0.040                             | 1.16           | 0.046                             | Figure.29     |
| Worst Case Position of Head With Battery 2                 |                                |           |            |                             |                       |                   |                                   |                |                                   |               |
| Right Cheek                                                | 661/1880                       | GSM       | 1:8.3      | 30                          | 29.37                 | -0.029            | 0.129                             | 1.16           | 0.149                             | Figure.30     |
| Test position of Body (Distance 10mm)                      |                                |           |            |                             |                       |                   |                                   |                |                                   |               |
| Back Side                                                  | 661/1880                       | GSM       | 1:8.3      | 30                          | 29.37                 | -0.070            | 0.259                             | 1.16           | 0.299                             | Figure.31     |
| Front Side                                                 | 661/1880                       | GSM       | 1:8.3      | 30                          | 29.37                 | -0.110            | 0.141                             | 1.16           | 0.163                             | Figure.32     |
| Test position of Body (Distance 10mm)                      |                                |           |            |                             |                       |                   |                                   |                |                                   |               |
| Back Side                                                  | 661/1880                       | 4 Txslots | 1:2.07     | 26                          | 25.43                 | 0.070             | 0.355                             | 1.14           | 0.405                             | Figure.33     |
| Front Side                                                 | 661/1880                       | 4 Txslots | 1:2.07     | 26                          | 25.43                 | 0.020             | 0.225                             | 1.14           | 0.257                             | Figure.34     |
| Left Edge                                                  | 661/1880                       | 4 Txslots | 1:2.07     | 26                          | 25.43                 | 0.023             | 0.114                             | 1.14           | 0.130                             | Figure.35     |
| Right Edge                                                 | 661/1880                       | 4 Txslots | 1:2.07     | 26                          | 25.43                 | 0.050             | 0.068                             | 1.14           | 0.078                             | Figure.36     |
| Top Edge                                                   | N/A                            | N/A       | N/A        | N/A                         | N/A                   | N/A               | N/A                               | N/A            | N/A                               | N/A           |
| Bottom Edge                                                | 661/1880                       | 4 Txslots | 1:2.07     | 26                          | 25.43                 | 0.110             | 0.362                             | 1.14           | 0.413                             | Figure.37     |
| Worst Case Position of Body With Battery 2 (Distance 10mm) |                                |           |            |                             |                       |                   |                                   |                |                                   |               |
| Bottom Edge                                                | 661/1880                       | 4 Txslots | 1:2.07     | 26                          | 25.43                 | -0.030            | 0.377                             | 1.14           | 0.430                             | Figure.38     |

Note: 1.The value with blue color is the maximum SAR Value of each test band.

- Per FCC KDB Publication 447498 D01, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is  $\leq 0.8$  W/kg then testing at the other channels is optional for such test configuration(s).
- When multiple slots are used, SAR should be tested to account for the maximum source-based time-averaged output power.
- Per FCC KDB Publication 648474 D04, SAR was evaluated without a headset connected to the device. Since the reported SAR was  $\leq 1.2$  W/kg, no additional SAR evaluations using a headset cable were required.

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| Test Position                                                                 | Channel/<br>Frequency<br>(MHz) | Time slot   | Duty Cycle | Maximum Allowed Power (dBm) | Conducted Power (dBm) | Drift<br>± 0.21dB | Limit SAR <sub>1g</sub> 1.6 W/kg  |                |                                   |               |
|-------------------------------------------------------------------------------|--------------------------------|-------------|------------|-----------------------------|-----------------------|-------------------|-----------------------------------|----------------|-----------------------------------|---------------|
|                                                                               |                                |             |            |                             |                       | Drift (dB)        | Measured SAR <sub>1g</sub> (W/kg) | Scaling Factor | Reported SAR <sub>1g</sub> (W/kg) | Graph Results |
| Test Position of Head                                                         |                                |             |            |                             |                       |                   |                                   |                |                                   |               |
| Left Cheek                                                                    | 661/1880                       | GSM         | 1:8.3      | 30                          | 29.29                 | -0.044            | 0.116                             | 1.18           | 0.137                             | Figure. 86    |
| Worst Case Position of Head With SIM 2                                        |                                |             |            |                             |                       |                   |                                   |                |                                   |               |
| Left Cheek                                                                    | 661/1880                       | GSM         | 1:8.3      | 30                          | 29.29                 | 0.098             | 0.109                             | 1.18           | 0.128                             | Figure. 87    |
| Test position of Body (Distance 10mm)                                         |                                |             |            |                             |                       |                   |                                   |                |                                   |               |
| Bottom Edge                                                                   | 661/1880                       | 4 Txs slots | 1:2.07     | 26                          | 25.09                 | 0.067             | 0.302                             | 1.23           | 0.372                             | Figure. 88    |
| Worst Case Position of Body With SIM 2 (Distance 10mm)                        |                                |             |            |                             |                       |                   |                                   |                |                                   |               |
| Bottom Edge                                                                   | 661/1880                       | 4 Txs slots | 1:2.07     | 26                          | 25.09                 | 0.056             | 0.397                             | 1.23           | 0.490                             | Figure. 89    |
| Note: 1.The value with blue color is the maximum SAR Value of each test band. |                                |             |            |                             |                       |                   |                                   |                |                                   |               |

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### 7.3.3. UMTS Band II

**Table 19: SAR Values [UMTS Band II (WCDMA/HSDPA/HSUPA)] (Original Model)**

| Test Position                                                            | Channel/<br>Frequency<br>(MHz) | Channel<br>Type | Duty<br>Cycle | Maximum<br>Allowed<br>Power<br>(dBm) | Conducted<br>Power<br>(dBm) | Drift<br>± 0.21dB | Limit SAR <sub>1g</sub> 1.6 W/kg        |                   |                                         |                  |
|--------------------------------------------------------------------------|--------------------------------|-----------------|---------------|--------------------------------------|-----------------------------|-------------------|-----------------------------------------|-------------------|-----------------------------------------|------------------|
|                                                                          |                                |                 |               |                                      |                             | Drift<br>(dB)     | Measured<br>SAR <sub>1g</sub><br>(W/kg) | Scaling<br>Factor | Reported<br>SAR <sub>1g</sub><br>(W/kg) | Graph<br>Results |
| Test Position of Head                                                    |                                |                 |               |                                      |                             |                   |                                         |                   |                                         |                  |
| Left Cheek                                                               | 9400/1880                      | RMC 12.2K       | 1:1           | 23                                   | 22.81                       | 0.070             | 0.344                                   | 1.04              | 0.359                                   | Figure.39        |
| Left Tilt                                                                | 9400/1880                      | RMC 12.2K       | 1:1           | 23                                   | 22.81                       | 0.080             | 0.141                                   | 1.04              | 0.147                                   | Figure.40        |
| Right Cheek                                                              | 9400/1880                      | RMC 12.2K       | 1:1           | 23                                   | 22.81                       | -0.070            | 0.378                                   | 1.04              | 0.395                                   | Figure.41        |
| Right Tilt                                                               | 9400/1880                      | RMC 12.2K       | 1:1           | 23                                   | 22.81                       | -0.170            | 0.119                                   | 1.04              | 0.124                                   | Figure.42        |
| Worst Case Position of Head With Battery 2                               |                                |                 |               |                                      |                             |                   |                                         |                   |                                         |                  |
| Right Cheek                                                              | 9400/1880                      | RMC 12.2K       | 1:1           | 23                                   | 22.81                       | -0.029            | 0.337                                   | 1.04              | 0.352                                   | Figure.43        |
| Test position of Body (Distance 10mm)                                    |                                |                 |               |                                      |                             |                   |                                         |                   |                                         |                  |
| Back Side                                                                | 9400/1880                      | RMC 12.2K       | 1:1           | 23                                   | 22.81                       | 0.030             | 0.739                                   | 1.04              | 0.772                                   | Figure.44        |
| Front Side                                                               | 9400/1880                      | RMC 12.2K       | 1:1           | 23                                   | 22.81                       | -0.080            | 0.702                                   | 1.04              | 0.733                                   | Figure.45        |
| Left Edge                                                                | 9400/1880                      | RMC 12.2K       | 1:1           | 23                                   | 22.81                       | 0.050             | 0.211                                   | 1.04              | 0.220                                   | Figure.46        |
| Right Edge                                                               | 9400/1880                      | RMC 12.2K       | 1:1           | 23                                   | 22.81                       | 0.010             | 0.193                                   | 1.04              | 0.202                                   | Figure.47        |
| Top Edge                                                                 | N/A                            | N/A             | N/A           | N/A                                  | N/A                         | N/A               | N/A                                     | N/A               | N/A                                     | N/A              |
| Bottom Edge                                                              | 9538/1907.6                    | RMC 12.2K       | 1:1           | 23                                   | 22.03                       | -0.080            | 0.935                                   | 1.25              | 1.169                                   | Figure.48        |
|                                                                          | 9400/1880                      | RMC 12.2K       | 1:1           | 23                                   | 22.81                       | -0.020            | 1.050                                   | 1.04              | 1.097                                   | Figure.49        |
|                                                                          | 9262/1852.4                    | RMC 12.2K       | 1:1           | 23                                   | 22.67                       | -0.130            | 0.816                                   | 1.08              | 0.880                                   | Figure.50        |
| Worst Case Position of Body With Battery 2 (Distance 10mm)               |                                |                 |               |                                      |                             |                   |                                         |                   |                                         |                  |
| Bottom Edge                                                              | 9538/1907.6                    | RMC 12.2K       | 1:1           | 23                                   | 22.03                       | -0.022            | 0.907                                   | 1.25              | 1.134                                   | Figure.51        |
| Worst Case Position of SAR (1 <sup>st</sup> Repeated SAR, Distance 10mm) |                                |                 |               |                                      |                             |                   |                                         |                   |                                         |                  |
| Bottom Edge                                                              | 9538/1907.6                    | RMC 12.2K       | 1:1           | 23                                   | 22.03                       | 0.040             | 0.904                                   | 1.25              | 1.130                                   | Figure.52        |

Note: 1. The value with blue color is the maximum SAR Value of each test band.

- Per FCC KDB Publication 447498 D01, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is  $\leq 0.8$  W/kg then testing at the other channels is optional for such test configuration(s).
- Per FCC KDB Publication 648474 D04, SAR was evaluated without a headset connected to the device. Since the reported SAR was  $\leq 1.2$  W/kg, no additional SAR evaluations using a headset cable were required.

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## Rel. 5 HSDPA

## Rel. 6 HSPA

## Rel. 8 DC-HSDPA

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**Table 21: SAR Measurement Variability Results [UMTS Band II (WCDMA/HSDPA/HSUPA)] (Original Model)**

| Test Position | Channel/<br>Frequency<br>(MHz) | Measured<br>SAR (1g) | 1 <sup>st</sup> Repeated<br>SAR (1g) | Ratio | 2 <sup>nd</sup><br>Repeated<br>SAR (1g) | 3 <sup>rd</sup> Repeated<br>SAR (1g) |
|---------------|--------------------------------|----------------------|--------------------------------------|-------|-----------------------------------------|--------------------------------------|
| Bottom Edge   | 9538/1907.6                    | 0.935                | 0.904                                | 1.03  | N/A                                     | N/A                                  |

Note: 1) When the original highest measured SAR is  $\geq 0.80$  W/kg, the measurement was repeated once.  
2) A second repeated measurement was preformed only if the ratio of largest to smallest SAR for the original and first repeated measurements was  $> 1.20$  or when the original or repeated measurement was  $\geq 1.45$  W/kg (~ 10% from the 1-g SAR limit).  
3) A third repeated measurement was performed only if the original, first or second repeated measurement was  $\geq 1.5$  W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is  $> 1.20$ .  
4) Repeated measurements are not required when the original highest measured SAR is  $< 0.80$  W/kg

**Table 22: SAR Values [UMTS Band II (WCDMA/HSDPA/HSUPA)] (Variant Model)**

| Test Position                                                                 | Channel/<br>Frequency<br>(MHz) | Channel Type | Duty Cycle | Maximum Allowed Power (dBm) | Conducted Power (dBm) | Drift<br>± 0.21dB | Limit SAR <sub>1g</sub> 1.6 W/kg  |                |                                   |               |
|-------------------------------------------------------------------------------|--------------------------------|--------------|------------|-----------------------------|-----------------------|-------------------|-----------------------------------|----------------|-----------------------------------|---------------|
|                                                                               |                                |              |            |                             |                       | Drift (dB)        | Measured SAR <sub>1g</sub> (W/kg) | Scaling Factor | Reported SAR <sub>1g</sub> (W/kg) | Graph Results |
| Test Position of Head                                                         |                                |              |            |                             |                       |                   |                                   |                |                                   |               |
| Right Cheek                                                                   | 9400/1880                      | RMC 12.2K    | 1:1        | 23                          | 22.82                 | 0.031             | 0.348                             | 1.04           | 0.363                             | Figure.90     |
| Test position of Body (Distance 10mm)                                         |                                |              |            |                             |                       |                   |                                   |                |                                   |               |
| Bottom Edge                                                                   | 9538/1907.6                    | RMC 12.2K    | 1:1        | 23                          | 22.29                 | 0.096             | 0.906                             | 1.18           | 1.067                             | Figure.91     |
| Worst Case Position of Body (1 <sup>st</sup> Repeated SAR, Distance 10mm)     |                                |              |            |                             |                       |                   |                                   |                |                                   |               |
| Bottom Edge                                                                   | 9538/1907.6                    | RMC 12.2K    | 1:1        | 23                          | 22.29                 | -0.156            | 0.907                             | 1.18           | 1.068                             | Figure.92     |
| Note: 1.The value with blue color is the maximum SAR Value of each test band. |                                |              |            |                             |                       |                   |                                   |                |                                   |               |

**Table 23: SAR Measurement Variability Results [UMTS Band II (WCDMA/HSDPA/HSUPA)] (Variant Model)**

| Test Position | Channel/<br>Frequency<br>(MHz) | Measured<br>SAR (1g) | 1 <sup>st</sup> Repeated<br>SAR (1g) | Ratio | 2 <sup>nd</sup><br>Repeated<br>SAR (1g) | 3 <sup>rd</sup> Repeated<br>SAR (1g) |
|---------------|--------------------------------|----------------------|--------------------------------------|-------|-----------------------------------------|--------------------------------------|
| Bottom Edge   | 9538/1907.6                    | 0.906                | 0.907                                | 1.00  | N/A                                     | N/A                                  |

Note: 1) When the original highest measured SAR is  $\geq 0.80$  W/kg, the measurement was repeated once.  
2) A second repeated measurement was preformed only if the ratio of largest to smallest SAR for the original and first repeated measurements was  $> 1.20$  or when the original or repeated measurement was  $\geq 1.45$  W/kg (~ 10% from the 1-g SAR limit).  
3) A third repeated measurement was performed only if the original, first or second repeated measurement was  $\geq 1.5$  W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is  $> 1.20$ .  
4) Repeated measurements are not required when the original highest measured SAR is  $< 0.80$  W/kg

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### 7.3.4. UMTS Band V

**Table 24: SAR Values [UMTS Band V (WCDMA/HSDPA/HSUPA)] (Original Model)**

| Test Position                                                            | Channel/<br>Frequency<br>(MHz) | Channel Type | Duty Cycle | Maximum Allowed Power (dBm) | Conducted Power (dBm) | Drift<br>± 0.21dB | Limit SAR <sub>1g</sub> 1.6 W/kg  |                |                                   |               |
|--------------------------------------------------------------------------|--------------------------------|--------------|------------|-----------------------------|-----------------------|-------------------|-----------------------------------|----------------|-----------------------------------|---------------|
|                                                                          |                                |              |            |                             |                       | Drift (dB)        | Measured SAR <sub>1g</sub> (W/kg) | Scaling Factor | Reported SAR <sub>1g</sub> (W/kg) | Graph Results |
| Test Position of Head                                                    |                                |              |            |                             |                       |                   |                                   |                |                                   |               |
| Left Cheek                                                               | 4183/836.6                     | RMC 12.2K    | 1:1        | 23                          | 22.91                 | 0.020             | 0.436                             | 1.02           | 0.445                             | Figure.53     |
| Left Tilt                                                                | 4183/836.6                     | RMC 12.2K    | 1:1        | 23                          | 22.91                 | -0.120            | 0.303                             | 1.02           | 0.309                             | Figure.54     |
| Right Cheek                                                              | 4183/836.6                     | RMC 12.2K    | 1:1        | 23                          | 22.91                 | 0.060             | 0.559                             | 1.02           | 0.571                             | Figure.55     |
| Right Tilt                                                               | 4183/836.6                     | RMC 12.2K    | 1:1        | 23                          | 22.91                 | 0.010             | 0.341                             | 1.02           | 0.348                             | Figure.56     |
| Worst Case Position of Head With Battery 2                               |                                |              |            |                             |                       |                   |                                   |                |                                   |               |
| Right Cheek                                                              | 4183/836.6                     | RMC 12.2K    | 1:1        | 23                          | 22.91                 | -0.045            | 0.548                             | 1.02           | 0.559                             | Figure.57     |
| Test position of Body (Distance 10mm)                                    |                                |              |            |                             |                       |                   |                                   |                |                                   |               |
| Back Side                                                                | 4233/846.6                     | RMC 12.2K    | 1:1        | 23                          | 22.89                 | -0.020            | 0.870                             | 1.03           | 0.892                             | Figure.58     |
|                                                                          | 4183/836.6                     | RMC 12.2K    | 1:1        | 23                          | 22.91                 | 0.110             | 0.811                             | 1.02           | 0.828                             | Figure.59     |
|                                                                          | 4132/826.4                     | RMC 12.2K    | 1:1        | 23                          | 22.81                 | 0.090             | 0.839                             | 1.04           | 0.877                             | Figure.60     |
| Front Side                                                               | 4183/836.6                     | RMC 12.2K    | 1:1        | 23                          | 22.91                 | 0.140             | 0.63                              | 1.02           | 0.643                             | Figure.61     |
| Left Edge                                                                | 4183/836.6                     | RMC 12.2K    | 1:1        | 23                          | 22.91                 | -0.020            | 0.346                             | 1.02           | 0.353                             | Figure.62     |
| Right Edge                                                               | 4183/836.6                     | RMC 12.2K    | 1:1        | 23                          | 22.91                 | -0.060            | 0.292                             | 1.02           | 0.298                             | Figure.63     |
| Top Edge                                                                 | N/A                            | N/A          | N/A        | N/A                         | N/A                   | N/A               | N/A                               | N/A            | N/A                               | N/A           |
| Bottom Edge                                                              | 4183/836.6                     | RMC 12.2K    | 1:1        | 23                          | 22.91                 | 0.030             | 0.137                             | 1.02           | 0.140                             | Figure.64     |
| Worst Case Position of Body With Battery 2 (Distance 10mm)               |                                |              |            |                             |                       |                   |                                   |                |                                   |               |
| Back Side                                                                | 4233/846.6                     | RMC 12.2K    | 1:1        | 23                          | 22.89                 | 0.100             | 0.885                             | 1.03           | 0.908                             | Figure.65     |
| Worst Case Position of SAR (1 <sup>st</sup> Repeated SAR, Distance 10mm) |                                |              |            |                             |                       |                   |                                   |                |                                   |               |
| Back Side                                                                | 4233/846.6                     | RMC 12.2K    | 1:1        | 23                          | 22.89                 | 0.020             | 0.885                             | 1.03           | 0.908                             | Figure.66     |

Note: 1. The value with blue color is the maximum SAR Value of each test band.

- Per FCC KDB Publication 447498 D01, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is  $\leq 0.8$  W/kg then testing at the other channels is optional for such test configuration(s).
- Per FCC KDB Publication 648474 D04, SAR was evaluated without a headset connected to the device. Since the reported SAR was  $\leq 1.2$  W/kg, no additional SAR evaluations using a headset cable were required.

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**Table 26: SAR Measurement Variability Results [UMTS Band V (WCDMA/HSDPA/HSUPA)] (Original Model)**

| Test Position | Channel/<br>Frequency<br>(MHz) | Measured<br>SAR (1g) | 1 <sup>st</sup> Repeated<br>SAR (1g) | Ratio | 2 <sup>nd</sup> Repeated<br>SAR (1g) | 3 <sup>rd</sup> Repeated<br>SAR (1g) |
|---------------|--------------------------------|----------------------|--------------------------------------|-------|--------------------------------------|--------------------------------------|
| Back Side     | 4233/846.6                     | 0.885                | 0.885                                | 1.00  | N/A                                  | N/A                                  |

Note: 1) When the original highest measured SAR is  $\geq 0.80$  W/kg, the measurement was repeated once.  
 2) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was  $> 1.20$  or when the original or repeated measurement was  $\geq 1.45$  W/kg ( $\sim 10\%$  from the 1-g SAR limit).  
 3) A third repeated measurement was performed only if the original, first or second repeated measurement was  $\geq 1.5$  W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is  $> 1.20$ .  
 4) Repeated measurements are not required when the original highest measured SAR is  $< 0.80$  W/kg

**Table 27: SAR Values [UMTS Band V (WCDMA/HSDPA/HSUPA)] (Variant Model)**

| Test Position                                                                 | Channel/<br>Frequency<br>(MHz) | Channel Type | Duty Cycle | Maximum Allowed Power (dBm) | Conducted Power (dBm) | Drift<br>± 0.21dB | Limit SAR <sub>1g</sub> 1.6 W/kg  |                |                                   |               |
|-------------------------------------------------------------------------------|--------------------------------|--------------|------------|-----------------------------|-----------------------|-------------------|-----------------------------------|----------------|-----------------------------------|---------------|
|                                                                               |                                |              |            |                             |                       | Drift (dB)        | Measured SAR <sub>1g</sub> (W/kg) | Scaling Factor | Reported SAR <sub>1g</sub> (W/kg) | Graph Results |
| Test Position of Head                                                         |                                |              |            |                             |                       |                   |                                   |                |                                   |               |
| Right Cheek                                                                   | 4183/836.6                     | RMC 12.2K    | 1:1        | 23                          | 22.16                 | -0.066            | 0.384                             | 1.21           | 0.466                             | Figure.93     |
| Test position of Body (Distance 10mm)                                         |                                |              |            |                             |                       |                   |                                   |                |                                   |               |
| Back Side                                                                     | 4233/846.6                     | RMC 12.2K    | 1:1        | 23                          | 22.79                 | 0.146             | 0.72                              | 1.05           | 0.756                             | Figure.94     |
| Note: 1.The value with blue color is the maximum SAR Value of each test band. |                                |              |            |                             |                       |                   |                                   |                |                                   |               |

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### 7.3.5. WIFI

**Table 28: SAR Values(802.11b/g/n) (Original Model)**

| Test Position                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Channel/<br>Frequency<br>(MHz) | Service | Duty<br>Cycle | Maximum<br>Allowed<br>Power<br>(dBm) | Conducted<br>Power<br>(dBm) | Drift<br>± 0.21dB | Limit of SAR 1.6 W/kg                   |                   |                                         |                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------|---------------|--------------------------------------|-----------------------------|-------------------|-----------------------------------------|-------------------|-----------------------------------------|------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                |         |               |                                      |                             | Drift<br>(dB)     | Measured<br>SAR <sub>1g</sub><br>(W/kg) | Scaling<br>Factor | Reported<br>SAR <sub>1g</sub><br>(W/kg) | Graph<br>Results |
| Test Position of Head                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                |         |               |                                      |                             |                   |                                         |                   |                                         |                  |
| Left Cheek                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 11/2462                        | DSSS    | 1:1           | 16                                   | 15.6                        | 0.030             | 0.286                                   | 1.10              | 0.314                                   | Figure.67        |
| Left Tilt                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 11/2462                        | DSSS    | 1:1           | 16                                   | 15.6                        | 0.120             | 0.260                                   | 1.10              | 0.285                                   | Figure.68        |
| Right Cheek                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 11/2462                        | DSSS    | 1:1           | 16                                   | 15.6                        | 0.180             | 0.152                                   | 1.10              | 0.167                                   | Figure.69        |
| Right Tilt                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 11/2462                        | DSSS    | 1:1           | 16                                   | 15.6                        | 0.120             | 0.113                                   | 1.10              | 0.124                                   | Figure.70        |
| Worst Case Position of Head With Battery 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                |         |               |                                      |                             |                   |                                         |                   |                                         |                  |
| Left Cheek                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 11/2462                        | DSSS    | 1:1           | 16                                   | 15.6                        | 0.164             | 0.290                                   | 1.10              | 0.318                                   | Figure.71        |
| Test position of Body (Distance 10mm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                |         |               |                                      |                             |                   |                                         |                   |                                         |                  |
| Back Side                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 11/2462                        | DSSS    | 1:1           | 16                                   | 15.6                        | 0.066             | 0.093                                   | 1.10              | 0.102                                   | Figure.72        |
| Front Side                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 11/2462                        | DSSS    | 1:1           | 16                                   | 15.6                        | 0.080             | 0.069                                   | 1.10              | 0.076                                   | Figure.73        |
| Left Edge                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | N/A                            | N/A     | N/A           | N/A                                  | N/A                         | N/A               | N/A                                     | N/A               | N/A                                     | N/A              |
| Right Edge                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 11/2462                        | DSSS    | 1:1           | 16                                   | 15.6                        | -0.050            | 0.050                                   | 1.10              | 0.055                                   | Figure.74        |
| Top Edge                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 11/2462                        | DSSS    | 1:1           | 16                                   | 15.6                        | 0.123             | 0.008                                   | 1.10              | 0.009                                   | Figure.75        |
| Bottom Edge                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | N/A                            | N/A     | N/A           | N/A                                  | N/A                         | N/A               | N/A                                     | N/A               | N/A                                     | N/A              |
| Worst Case Position of Body With Battery 2 (Distance 10mm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                |         |               |                                      |                             |                   |                                         |                   |                                         |                  |
| Back Side                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 11/2462                        | DSSS    | 1:1           | 16                                   | 15.6                        | -0.020            | 0.044                                   | 1.10              | 0.048                                   | Figure.76        |
| Note: 1. The value with blue color is the maximum SAR Value of each test band.<br>2. Per FCC KDB Publication 447498 D01, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is optional for such test configuration(s).<br>3. KDB 248227-SAR is not required for 802.11g/n channels when the maximum average output power is less than ¼ dB higher than measured on the corresponding 802.11b channels. |                                |         |               |                                      |                             |                   |                                         |                   |                                         |                  |

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**Simultaneous Transmission Conditions**

| Air-Interface  | Band (MHz)                   | Type  | Simultaneous Transmissions Note: Not to be tested | Voice Over Digital Transport (Data) |
|----------------|------------------------------|-------|---------------------------------------------------|-------------------------------------|
| GSM            | 850                          | Voice | Yes<br>WIFI or BT                                 | NA                                  |
|                | 1900                         | Voice |                                                   | NA                                  |
|                | GPRS                         | Data  | Yes<br>WIFI or BT                                 | NA                                  |
| WCDMA          | Band II                      | Voice | Yes<br>WIFI or BT                                 | NA                                  |
|                | Band V                       | Voice | Yes<br>WIFI or BT                                 | NA                                  |
|                | HSDPA/HSUPA/<br>RMC/DC-HSDPA | Data  | Yes<br>WIFI or BT                                 | NA                                  |
| WIFI           | 2450                         | Data  | Yes<br>GSM,GPRS, HSDPA/HSUPA/RMC/<br>DC-HSDPA     | Yes                                 |
| Bluetooth (BT) | 2450                         | Data  | Yes<br>GSM,GPRS, HSDPA/HSUPA/RMC/<br>DC-HSDPA     | NA                                  |

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When standalone SAR is not required to be measured per FCC KDB 447498 D01, the following equation must be used to estimate the standalone 1g SAR for simultaneous transmission assessment involving that transmitter.

$$\text{Estimated SAR} = \frac{(\text{max. power of channel, including tune-up tolerance, mW})}{(\text{min. test separation distance, mm})} * \frac{\sqrt{f \text{ (GHz)}}}{7.5}$$

| Band      | Configuration | Frequency (MHz) | Maximum Power (dBm) | Separation Distance (mm) | Estimated SAR (W/kg) |
|-----------|---------------|-----------------|---------------------|--------------------------|----------------------|
| Bluetooth | Head          | 2480            | 7                   | 5                        | 0.209                |
|           | Body          | 2480            | 7                   | 10                       | 0.105                |

Per FCC KDB 447498 D01, simultaneous transmission SAR test exclusion may be applied when the sum of the 1-g SAR for all the simultaneous transmitting antennas in a specific a physical test configuration is  $\leq 1.6$  W/kg. When the sum is greater than the SAR limit, SAR test exclusion is determined by the SAR to peak location separation ratio.

$$\text{Ratio} = \frac{(\text{SAR}_1 + \text{SAR}_2)^{1.5}}{(\text{peak location separation, mm})} < 0.04$$

### Simultaneous transimition SAR For Bluetooth and GSM/UMTS

| SAR <sub>1g</sub> (W/kg)<br>Test Position | GSM<br>850 | GSM<br>1900 | UMTS<br>Band II | UMTS<br>Band V | Bluetooth    | MAX.<br>ΣSAR <sub>1g</sub> | Peak location<br>separation<br>ratio |
|-------------------------------------------|------------|-------------|-----------------|----------------|--------------|----------------------------|--------------------------------------|
| Left, Touch                               | 0.078      | 0.150       | 0.359           | <b>0.445</b>   | <b>0.209</b> | 0.654                      | No                                   |
| Left, Tilt                                | 0.046      | 0.054       | 0.147           | <b>0.309</b>   | <b>0.209</b> | 0.518                      | No                                   |
| Right, Touch                              | 0.103      | 0.136       | 0.395           | <b>0.571</b>   | <b>0.209</b> | 0.780                      | No                                   |
| Right, Tilt                               | 0.051      | 0.046       | 0.124           | <b>0.348</b>   | <b>0.209</b> | 0.557                      | No                                   |
| Back Side                                 | 0.445      | 0.405       | 0.772           | <b>0.908</b>   | <b>0.105</b> | 1.013                      | No                                   |
| Front Side                                | 0.210      | 0.257       | <b>0.733</b>    | 0.643          | <b>0.105</b> | 0.838                      | No                                   |
| Left Edge                                 | 0.081      | 0.130       | 0.220           | <b>0.353</b>   | <b>0.105</b> | 0.458                      | No                                   |
| Right Edge                                | 0.103      | 0.078       | 0.202           | <b>0.298</b>   | <b>0.105</b> | 0.403                      | No                                   |
| Top Edge                                  | N/A        | N/A         | N/A             | N/A            | <b>0.105</b> | 0.105                      | No                                   |
| Bottom Edge                               | 0.041      | 0.490       | <b>1.169</b>    | 0.140          | <b>0.105</b> | <b>1.274</b>               | No                                   |

Note: 1. The value with blue color is the maximum ΣSAR<sub>1g</sub> Value.

2. MAX. ΣSAR<sub>1g</sub> = Unlicensed SAR<sub>MAX</sub> + Licensed SAR<sub>MAX</sub>

MAX. ΣSAR<sub>1g</sub> = 1.274 W/kg < 1.6 W/kg, So the Simultaneous transimition SAR with volum scan are not required for BT and GSM/UMTS antenna.

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### Simultaneous transimition SAR For WIFI and GSM/UMTS

| <div>SAR<sub>1g</sub>(W/kg)</div> <div>Test Position</div>                                                                                                           | GSM<br>850 | GSM<br>1900 | UMTS<br>Band II | UMTS<br>Band V | WIFI         | MAX.<br>ΣSAR <sub>1g</sub> | Peak location<br>separation<br>ratio |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------|-----------------|----------------|--------------|----------------------------|--------------------------------------|
| Left, Touch                                                                                                                                                          | 0.078      | 0.150       | 0.359           | <b>0.445</b>   | <b>0.318</b> | 0.763                      | No                                   |
| Left, Tilt                                                                                                                                                           | 0.046      | 0.054       | 0.147           | <b>0.309</b>   | <b>0.285</b> | 0.594                      | No                                   |
| Right, Touch                                                                                                                                                         | 0.103      | 0.136       | 0.395           | <b>0.571</b>   | <b>0.167</b> | 0.738                      | No                                   |
| Right, Tilt                                                                                                                                                          | 0.051      | 0.046       | 0.124           | <b>0.348</b>   | <b>0.124</b> | 0.472                      | No                                   |
| Back Side                                                                                                                                                            | 0.445      | 0.405       | 0.772           | <b>0.908</b>   | <b>0.102</b> | 1.010                      | No                                   |
| Front Side                                                                                                                                                           | 0.210      | 0.257       | <b>0.733</b>    | 0.643          | <b>0.076</b> | 0.809                      | No                                   |
| Left Edge                                                                                                                                                            | 0.081      | 0.130       | 0.220           | <b>0.353</b>   | N/A          | 0.353                      | No                                   |
| Right Edge                                                                                                                                                           | 0.103      | 0.078       | 0.202           | <b>0.298</b>   | <b>0.055</b> | 0.353                      | No                                   |
| Top Edge                                                                                                                                                             | N/A        | N/A         | N/A             | N/A            | <b>0.009</b> | 0.009                      | No                                   |
| Bottom Edge                                                                                                                                                          | 0.041      | 0.490       | <b>1.169</b>    | 0.140          | N/A          | <b>1.169</b>               | No                                   |
| Note: 1.The value with blue color is the maximum ΣSAR <sub>1g</sub> Value.<br>2. MAX. ΣSAR <sub>1g</sub> =Unlicensed SAR <sub>MAX</sub> +Licensed SAR <sub>MAX</sub> |            |             |                 |                |              |                            |                                      |

MAX. ΣSAR<sub>1g</sub> = 1.169W/kg <1.6 W/kg, so the Simultaneous transimition SAR with volum scan are not required for WIFI and GSM/UMTS antenna.

## **8. 700MHz to 3GHz Measurement Uncertainty**

The measured SAR were  $<1.5$  W/kg for all frequency bands, therefore per KDB Publication 865664 D01v01r03, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2003 is not required in SAR reports.

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## 9. Main Test Instruments

**Table 29: List of Main Instruments**

| No. | Name                     | Type           | Serial Number | Calibration Date         | Expiration Time | Valid Period |
|-----|--------------------------|----------------|---------------|--------------------------|-----------------|--------------|
| 01  | Network analyzer         | Agilent 8753E  | US37390326    | 2014-9-1                 | 2015-8-30       | 1 year       |
| 02  | Dielectric Probe Kit     | Agilent 85070E | US44020115    | No Calibration Requested |                 |              |
| 03  | Power meter              | Agilent E4417A | GB41291714    | 2014-3-9                 | 2015-3-8        | 1 year       |
| 04  | Power sensor             | Agilent N8481H | MY50350004    | 2014-9-22                | 2015-9-21       | 1 year       |
| 05  | Power sensor             | E9327A         | US40441622    | 2014-1-1                 | 2015-12-31      | 1 year       |
| 06  | Signal Generator         | HP 8341B       | 2730A00804    | 2014-9-1                 | 2015-8-31       | 1 year       |
| 07  | Dual directional coupler | 778D-012       | 50519         | 2014-3-24                | 2015-3-23       | 1 year       |
| 08  | Dual directional coupler | 777D           | 50146         | 2014-3-24                | 2015-3-23       | 1 year       |
| 09  | Amplifier                | IXA-020        | 0401          | No Calibration Requested |                 |              |
| 10  | BTS                      | E5515C         | MY48360988    | 2013-11-30               | 2014-11-29      | 1 year       |
| 11  | BTS                      | E5515C         | MY48360988    | 2014-11-27               | 2015-11-26      | 1 year       |
| 12  | E-field Probe            | EX3DV4         | 3677          | 2013-11-28               | 2014-11-27      | 1 year       |
| 13  | E-field Probe            | EX3DV4         | 3977          | 2014-2-17                | 2015-2-16       | 1 year       |
| 14  | DAE                      | DAE4           | 1317          | 2014-1-16                | 2015-1-15       | 1 year       |
| 15  | Validation Kit 835MHz    | D835V2         | 4d020         | 2014-8-28                | 2017-8-27       | 3 years      |
| 16  | Validation Kit 1900MHz   | D1900V2        | 5d060         | 2014-9-1                 | 2017-8-30       | 3 years      |
| 17  | Validation Kit 2450MHz   | D2450V2        | 786           | 2014-9-1                 | 2017-8-30       | 3 years      |
| 18  | Temperature Probe        | JM222          | AA1009129     | 2014-3-13                | 2015-3-12       | 1 year       |
| 19  | Hygrothermograph         | WS-1           | 64591         | 2014-9-25                | 2015-9-24       | 1 year       |

\*\*\*\*\*END OF REPORT \*\*\*\*\*

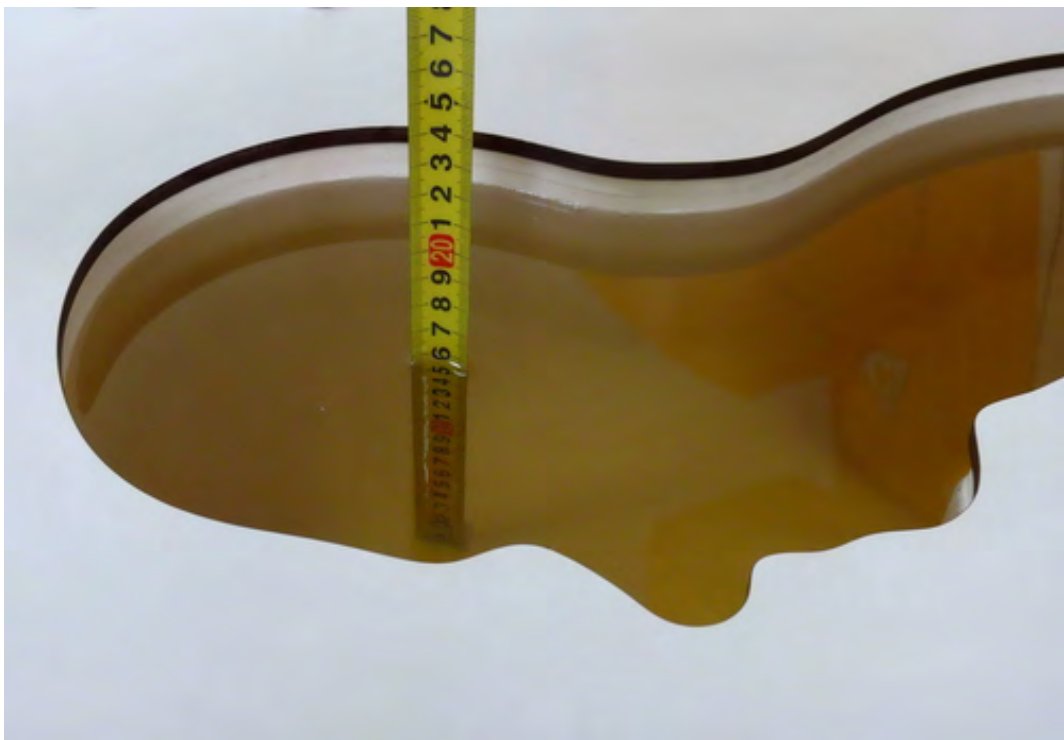
## ANNEX A: Test Layout



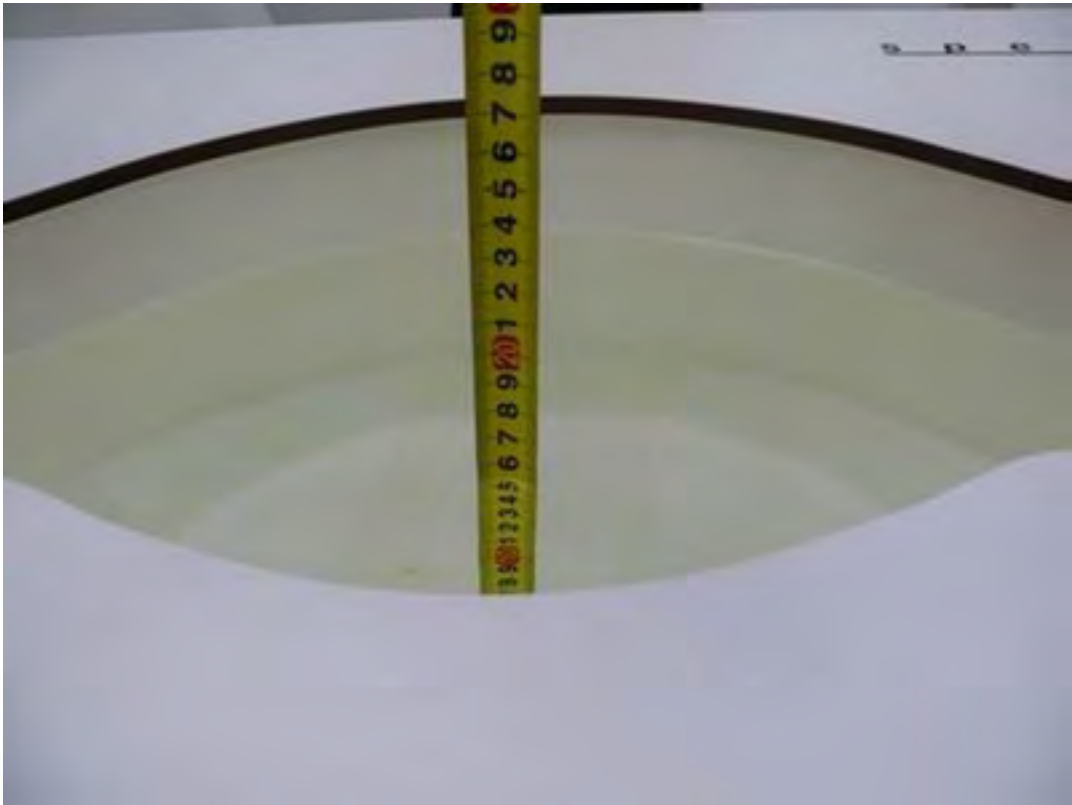
Picture 1: Specific Absorption Rate Test Layout



Picture 2: Liquid depth in the flat Phantom (835MHz, 15.4cm depth)



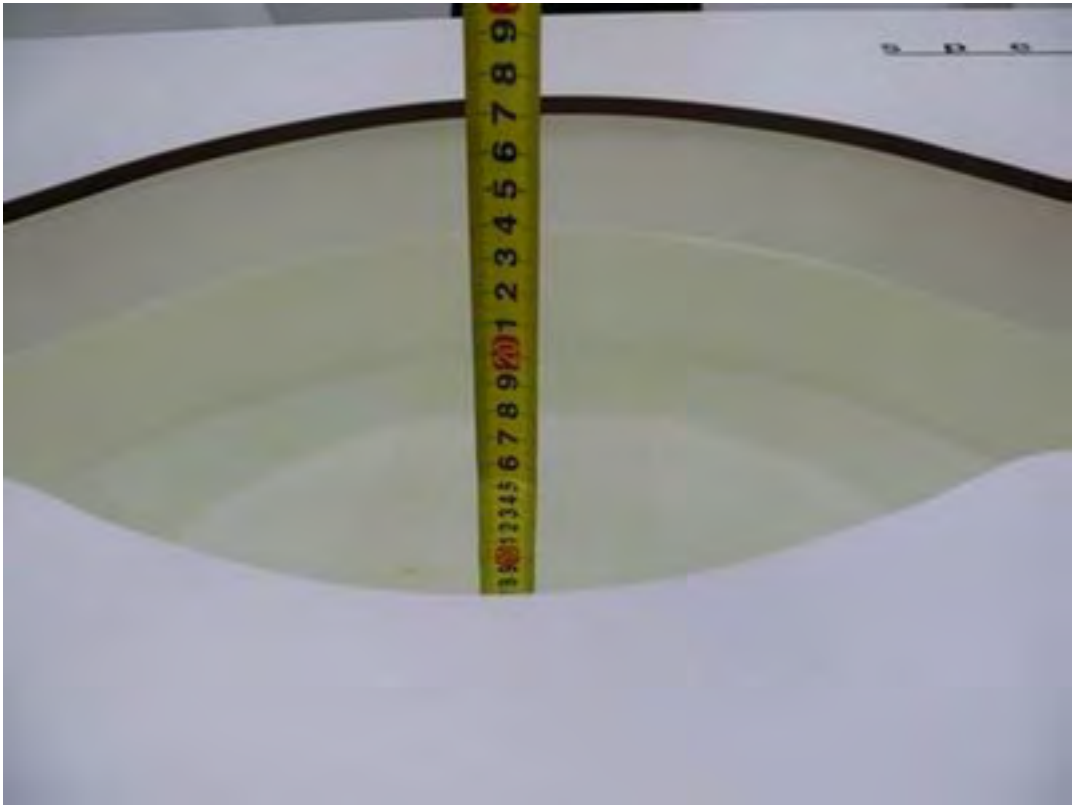
Picture 3: Liquid depth in the head Phantom (835MHz, 15.3cm depth)



Picture 4: Liquid depth in the flat Phantom (1900 MHz, 15.2cm depth)



Picture 5: liquid depth in the head Phantom (1900 MHz, 15.3cm depth)



Picture 6: Liquid depth in the flat Phantom (2450 MHz, 15.3cm depth)



Picture 7: Liquid depth in the head Phantom (2450 MHz, 15.4cm depth)

## ANNEX B: System Check Results (Original Model)

### System Performance Check at 835 MHz Head TSL

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d020**

Date: 11/20/2014

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

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.93 \text{ mho/m}$ ;  $\epsilon_r = 41.4$ ;  $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature:  $22.3^\circ\text{C}$       Liquid Temperature:  $21.5^\circ\text{C}$

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.41, 9.41, 9.41); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 1; Type: QD000P40CD; Serial: TP:1666

Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

**d=15mm, Pin=250mW/Area Scan (41x121x1):** Measurement grid:  $dx=1.500 \text{ mm}$ ,  $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) =  $2.64 \text{ mW/g}$

**d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value =  $54.4 \text{ V/m}$ ; Power Drift =  $-0.076 \text{ dB}$

Peak SAR (extrapolated) =  $3.67 \text{ W/kg}$

**SAR(1 g) =  $2.44 \text{ mW/g}$ ; SAR(10 g) =  $1.6 \text{ mW/g}$**

Maximum value of SAR (measured) =  $2.64 \text{ mW/g}$

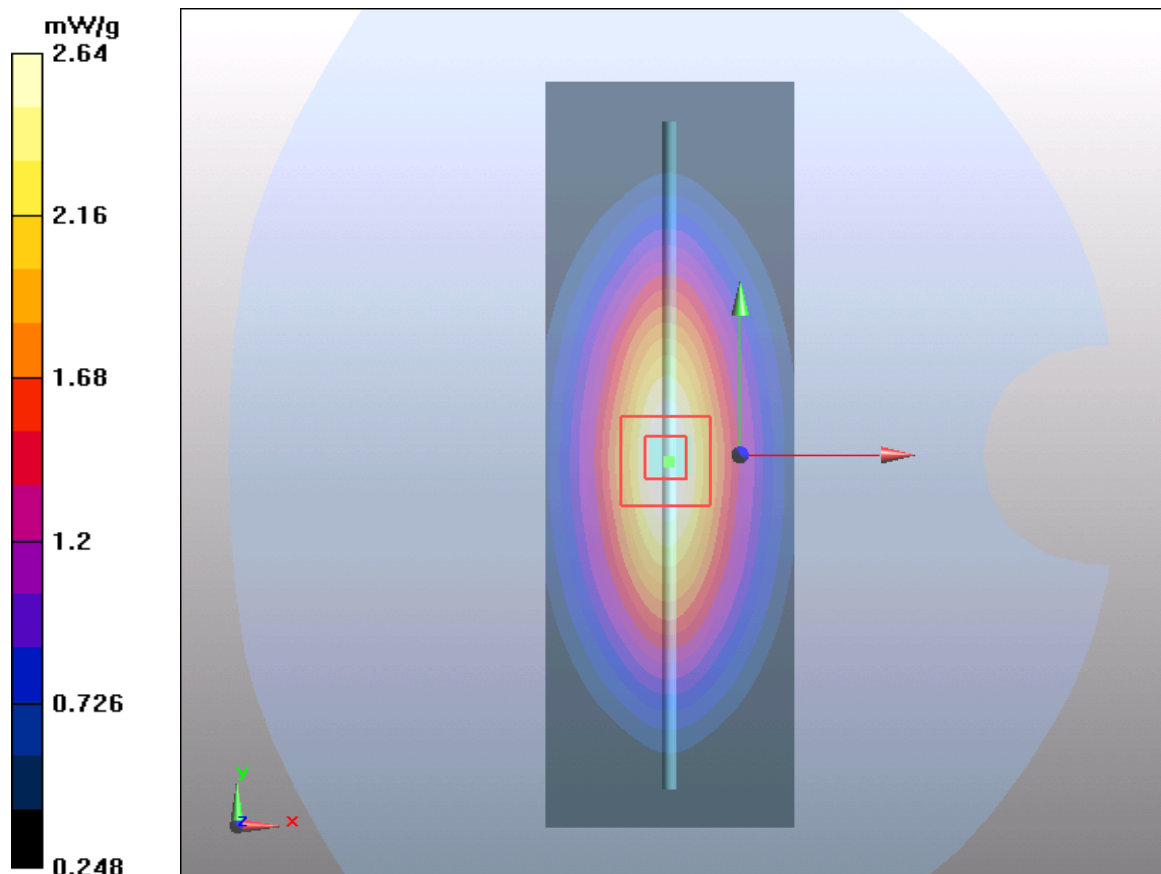


Figure 7 System Performance Check 835MHz 250mW

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### System Performance Check at 835 MHz Body TSL

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d020**

Date: 11/18/2014

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

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.99 \text{ mho/m}$ ;  $\epsilon_r = 55.9$ ;  $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature:  $22.3^\circ\text{C}$       Liquid Temperature:  $21.5^\circ\text{C}$

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.51, 9.51, 9.51); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 1; Type: QD000P40CD; Serial: TP:1666

Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

**d=15mm, Pin=250mW/Area Scan (41x121x1):** Measurement grid:  $dx=1.500 \text{ mm}$ ,  $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) =  $2.58 \text{ mW/g}$

**d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value =  $51.9 \text{ V/m}$ ; Power Drift =  $-0.058 \text{ dB}$

Peak SAR (extrapolated) =  $3.5 \text{ W/kg}$

**SAR(1 g) =  $2.41 \text{ mW/g}$ ; SAR(10 g) =  $1.6 \text{ mW/g}$**

Maximum value of SAR (measured) =  $2.6 \text{ mW/g}$

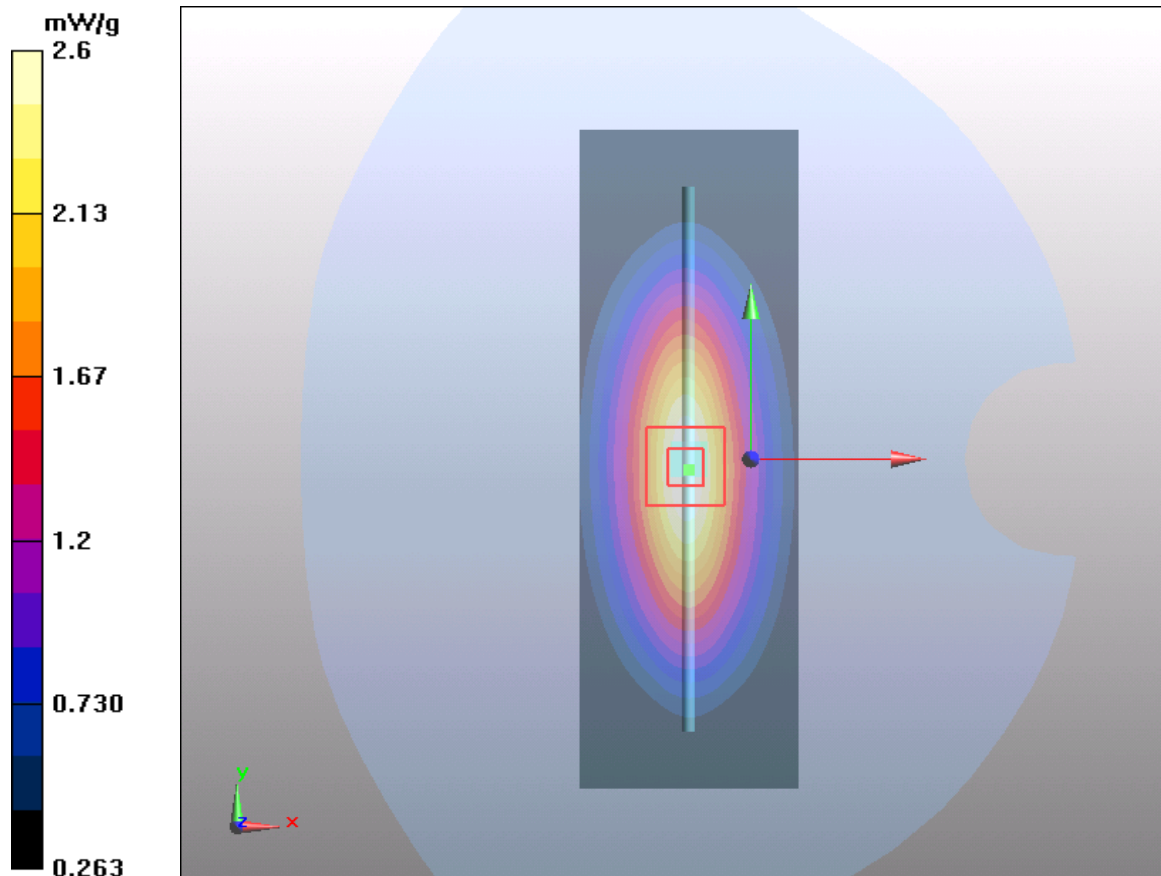


Figure 8 System Performance Check 835MHz 250Mw

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### System Performance Check at 1900 MHz Head TSL

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d060**

Date: 11/20/2014

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.43$  mho/m;  $\epsilon_r = 39.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(8.15, 8.15, 8.15); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: QD000P40CD; Serial: TP1667

Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

**d=10mm, Pin=250mW/Area Scan (41x71x1):** Measurement grid: dx=1.500 mm, dy=1.500 mm  
Maximum value of SAR (interpolated) = 11.3 mW/g

**d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 85.5 V/m; Power Drift = 0.028 dB

Peak SAR (extrapolated) = 17.8 W/kg

**SAR(1 g) = 9.48 mW/g; SAR(10 g) = 4.9 mW/g**

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

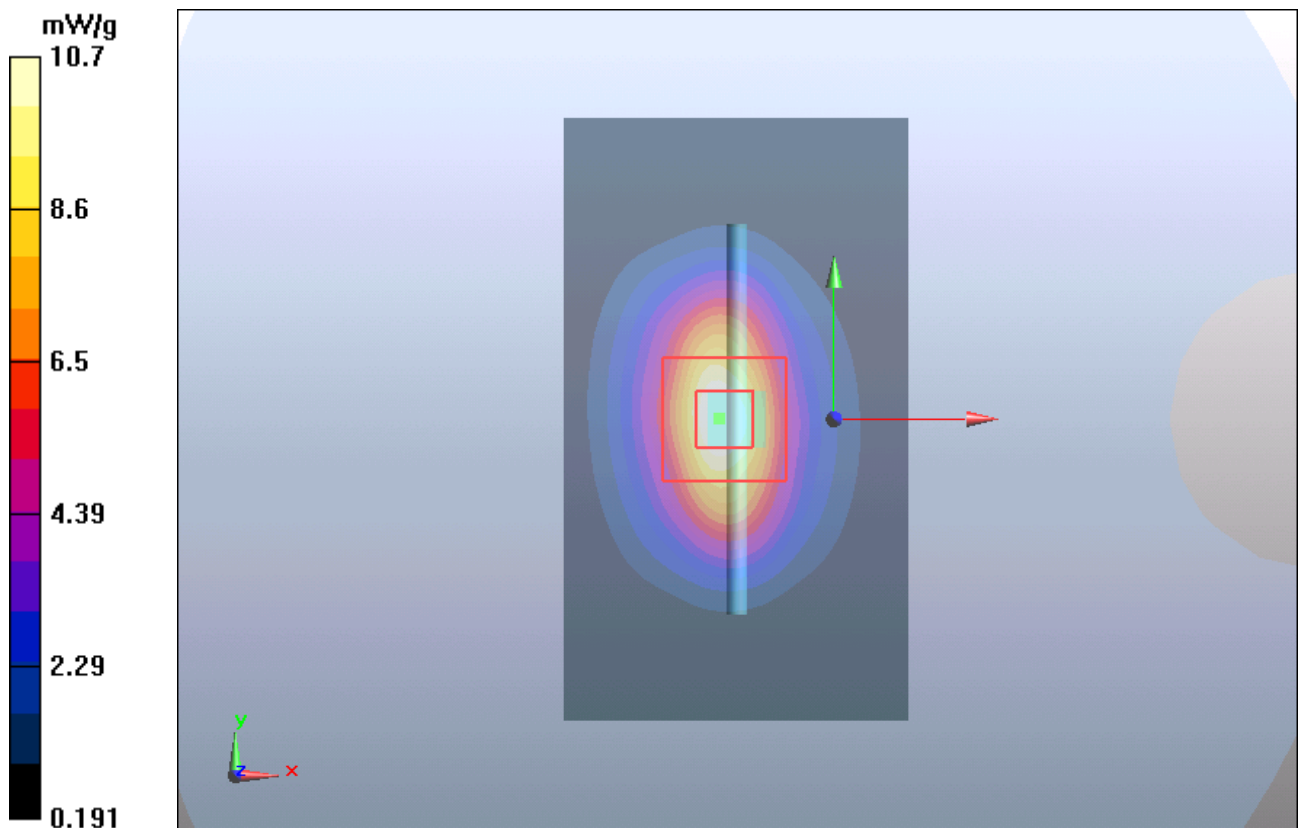


Figure 9 System Performance Check 1900MHz 250mW

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### System Performance Check at 1900 MHz Body TSL

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d060**

Date: 11/16/2014

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.52$  mho/m;  $\epsilon_r = 53.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: QD000P40CD; Serial: TP1667

Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

**d=10mm, Pin=250mW/Area Scan (41x71x1):** Measurement grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 12.2 mW/g

**d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 82.3 V/m; Power Drift = 0.068 dB

Peak SAR (extrapolated) = 17.8 W/kg

**SAR(1 g) = 9.93 mW/g; SAR(10 g) = 5.25 mW/g**

Maximum value of SAR (measured) = 11.3 mW/g

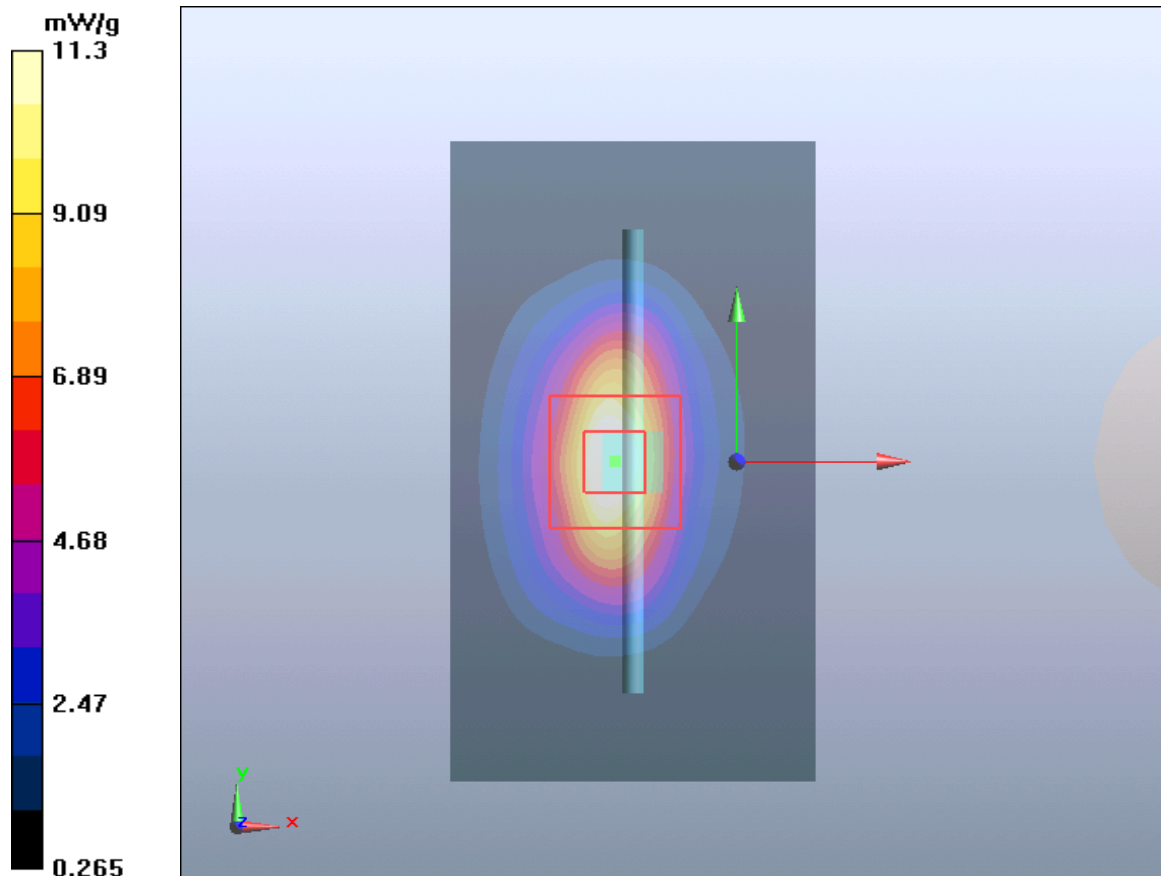


Figure 10 System Performance Check 1900MHz 250mW

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### System Performance Check at 2450 MHz Head TSL

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 786

Date: 11/4/2014

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.81$  mho/m;  $\epsilon_r = 38.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.64, 7.64, 7.64); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: QD000P40CD; Serial: TP1667

Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

**d=10mm, Pin=250mW/Area Scan (41x71x1):** Measurement grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 18.2 mW/g

**d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 88.8 V/m; Power Drift = 0.075 dB

Peak SAR (extrapolated) = 30 W/kg

**SAR(1 g) = 13.7 mW/g; SAR(10 g) = 6.22 mW/g**

Maximum value of SAR (measured) = 15.9 mW/g

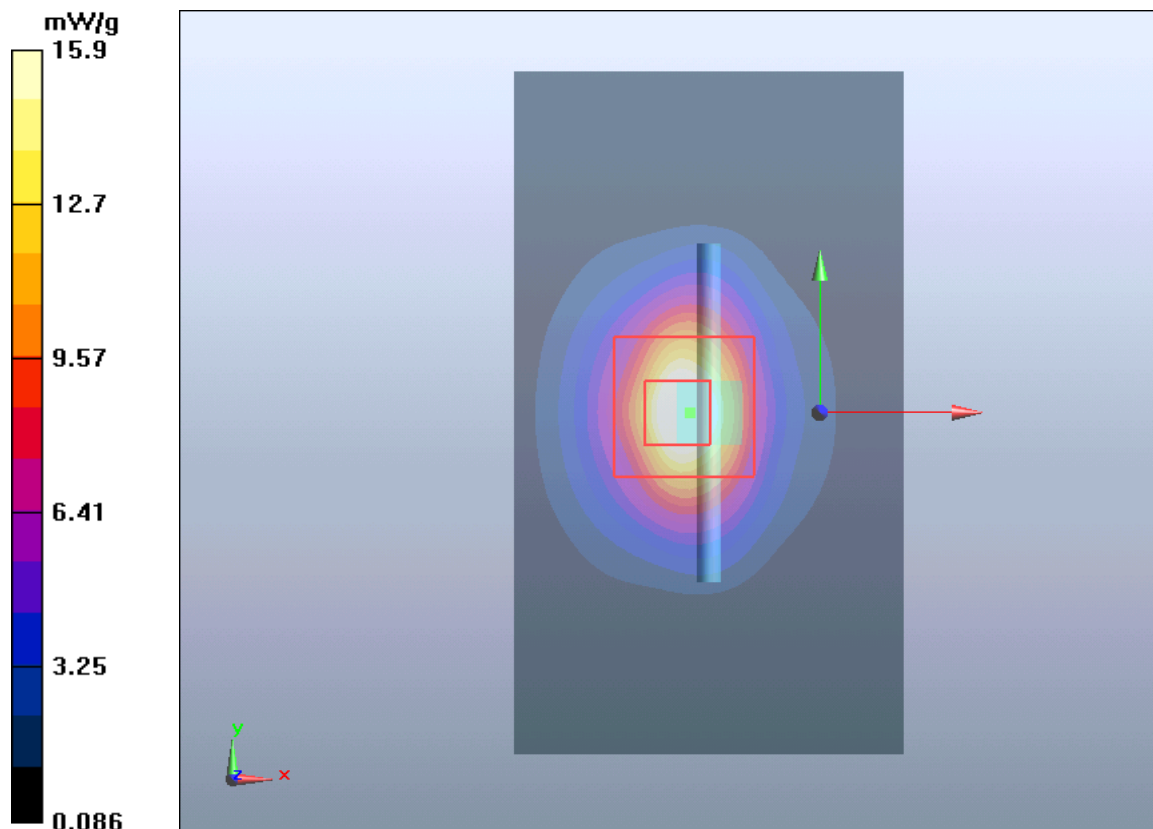


Figure 11 System Performance Check 2450MHz 250mW

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### System Performance Check at 2450 MHz Body TSL

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 786

Date: 11/4/2014

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.99$  mho/m;  $\epsilon_r = 52.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.61, 7.61, 7.61); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: QD000P40CD; Serial: TP1667

Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

**d=10mm, Pin=250mW/Area Scan (41x71x1):** Measurement grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 16 mW/g

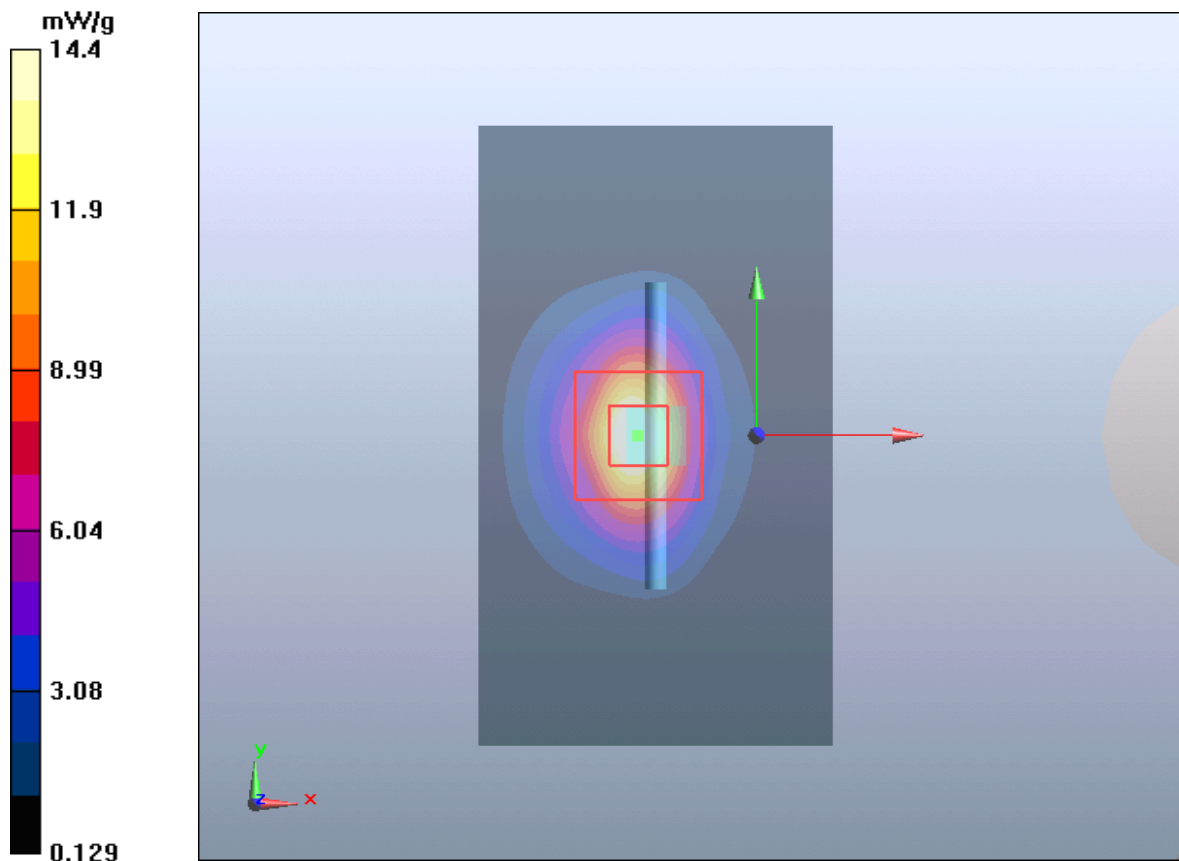
**d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 81.2 V/m; Power Drift = 0.003 dB

Peak SAR (extrapolated) = 25.4 W/kg

**SAR(1 g) = 12.5 mW/g; SAR(10 g) = 6.20 mW/g**

Maximum value of SAR (measured) = 14.4 mW/g



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Figure 12 System Performance Check 2450MHz 250mW

## ANNEX C: Plots Results (Original Model)

### GSM 850 Left Cheek Middle (Battery 1)

Date: 11/20/2014

Communication System: UID 0, GSM (0); Frequency: 836.6 MHz; Duty Cycle: 1:8.30042

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.932$  S/m;  $\epsilon_r = 41.357$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Left Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.41, 9.41, 9.41); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Left Cheek Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.0680 W/kg

**Left Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.270 V/m; Power Drift = -0.022 dB

Peak SAR (extrapolated) = 0.0790 W/kg

**SAR(1 g) = 0.066 W/kg; SAR(10 g) = 0.052 W/kg**

Maximum value of SAR (measured) = 0.0682 W/kg

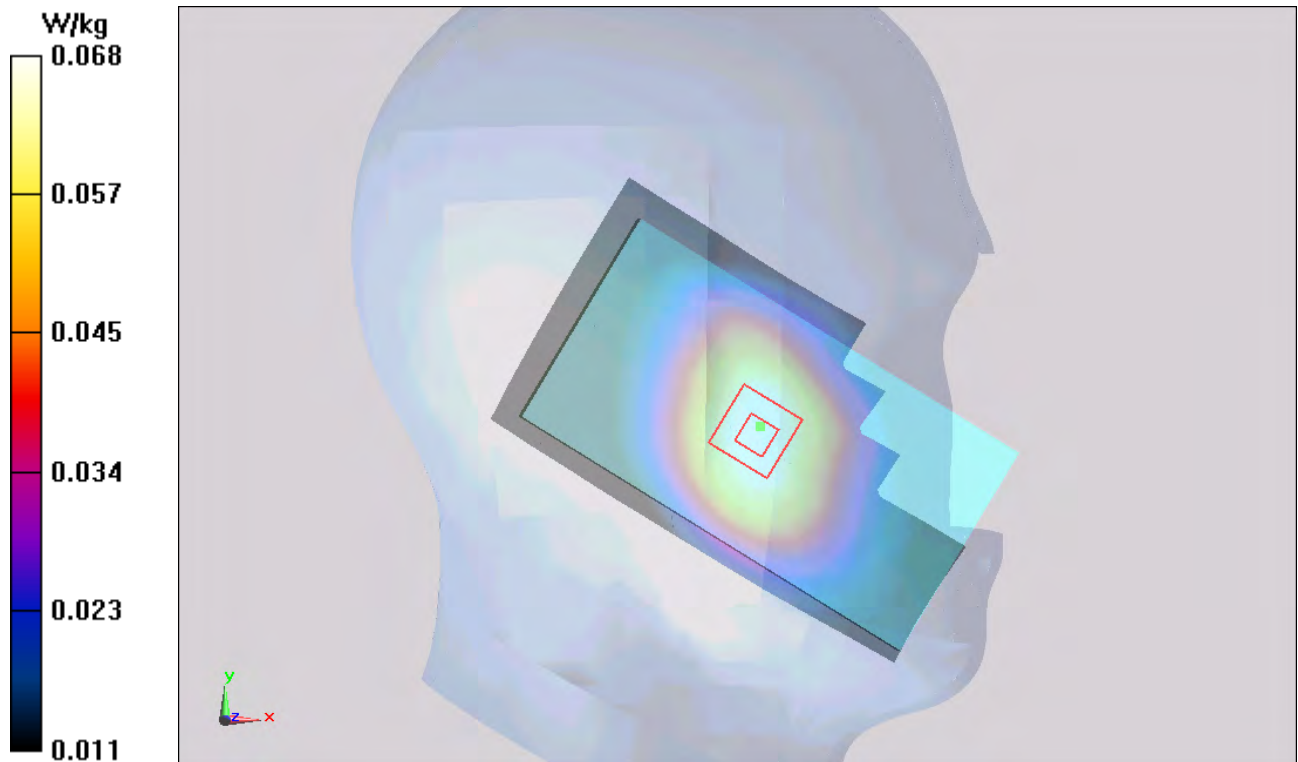


Figure 13 Left Hand Touch Cheek GSM 850 Channel 190

### GSM 850 Left Tilt Middle (Battery 1)

Date: 11/20/2014

Communication System: UID 0, GSM (0); Frequency: 836.6 MHz; Duty Cycle: 1:8.30042

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.932$  S/m;  $\epsilon_r = 41.357$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Left Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.41, 9.41, 9.41); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Left Tilt Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.0396 W/kg

**Left Tilt Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.435 V/m; Power Drift = -0.054 dB

Peak SAR (extrapolated) = 0.0480 W/kg

**SAR(1 g) = 0.039 W/kg; SAR(10 g) = 0.030 W/kg**

Maximum value of SAR (measured) = 0.0407 W/kg

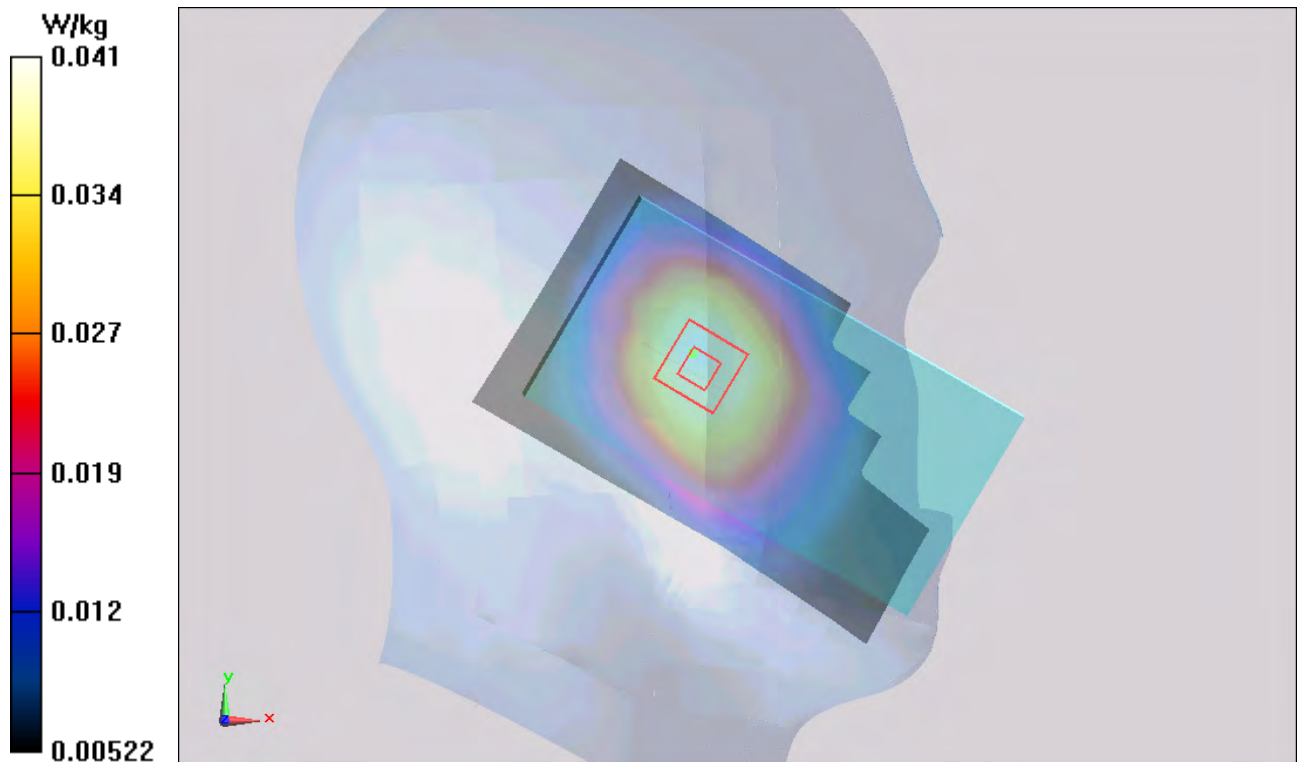


Figure 14 Left Hand Tilt 15° GSM 850 Channel 190

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### GSM 850 Right Cheek Middle (Battery 1)

Date: 11/20/2014

Communication System: UID 0, GSM (0); Frequency: 836.6 MHz; Duty Cycle: 1:8.30042

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.932$  S/m;  $\epsilon_r = 41.357$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Right Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.41, 9.41, 9.41); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Right Cheek Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.0748 W/kg

**Right Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.493 V/m; Power Drift = -0.032 dB

Peak SAR (extrapolated) = 0.0910 W/kg

**SAR(1 g) = 0.074 W/kg; SAR(10 g) = 0.057 W/kg**

Maximum value of SAR (measured) = 0.0765 W/kg

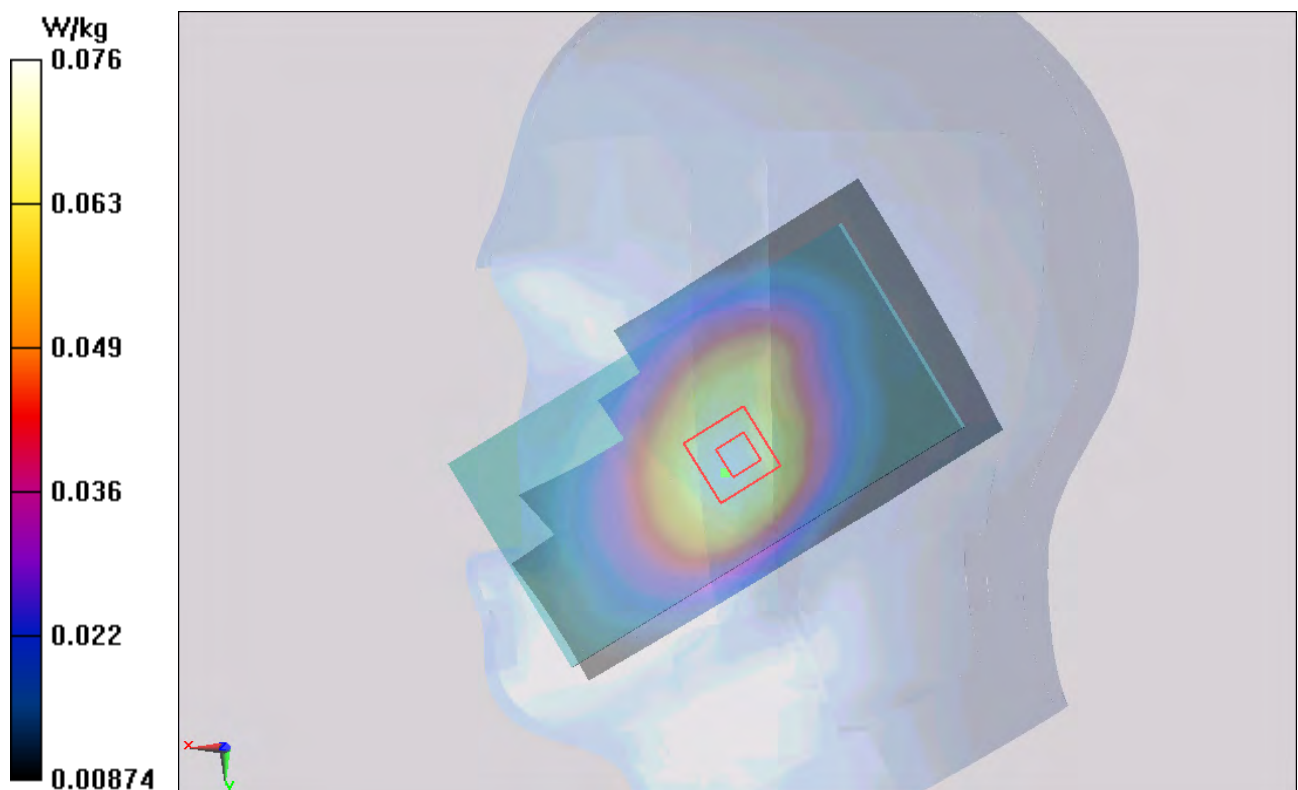


Figure 15 Right Hand Touch Cheek GSM 850 Channel 190

# TA Technology (Shanghai) Co., Ltd.

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### GSM 850 Right Tilt Middle (Battery 1)

Date: 11/20/2014

Communication System: UID 0, GSM (0); Frequency: 836.6 MHz; Duty Cycle: 1:8.30042

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.932$  S/m;  $\epsilon_r = 41.357$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Right Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.41, 9.41, 9.41); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Right Tilt Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.0448 W/kg

**Right Tilt Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.925 V/m; Power Drift = -0.058 dB

Peak SAR (extrapolated) = 0.0540 W/kg

**SAR(1 g) = 0.043 W/kg; SAR(10 g) = 0.034 W/kg**

Maximum value of SAR (measured) = 0.0447 W/kg

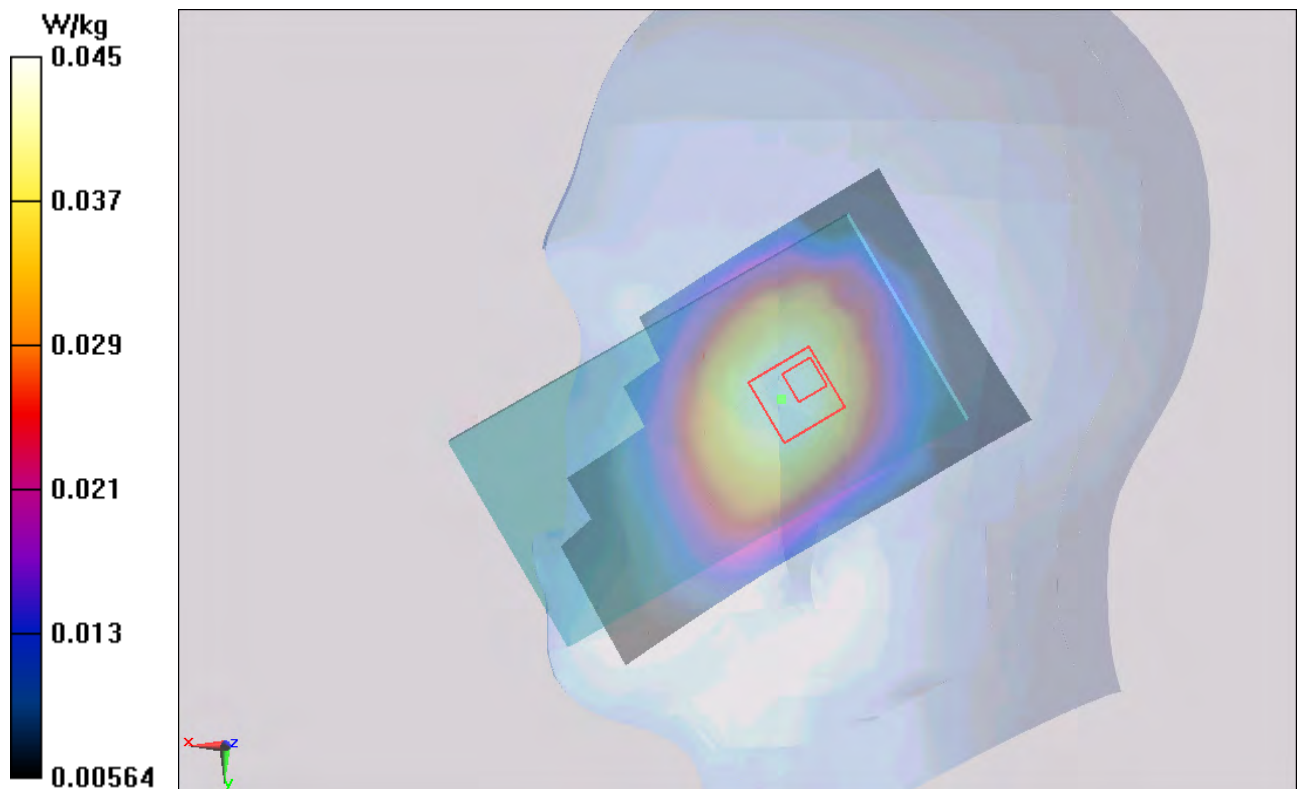


Figure 16 Right Hand Tilt 15° GSM 850 Channel 190

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### GSM 850 Right Cheek Middle (Battery 2)

Date: 11/20/2014

Communication System: UID 0, GSM (0); Frequency: 836.6 MHz; Duty Cycle: 1:8.30042

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.932$  S/m;  $\epsilon_r = 41.357$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Right Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.41, 9.41, 9.41); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Right Cheek Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.0773 W/kg

**Right Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 2.867 V/m; Power Drift = -0.080 dB

Peak SAR (extrapolated) = 0.0880 W/kg

**SAR(1 g) = 0.074 W/kg; SAR(10 g) = 0.058 W/kg**

Maximum value of SAR (measured) = 0.0764 W/kg

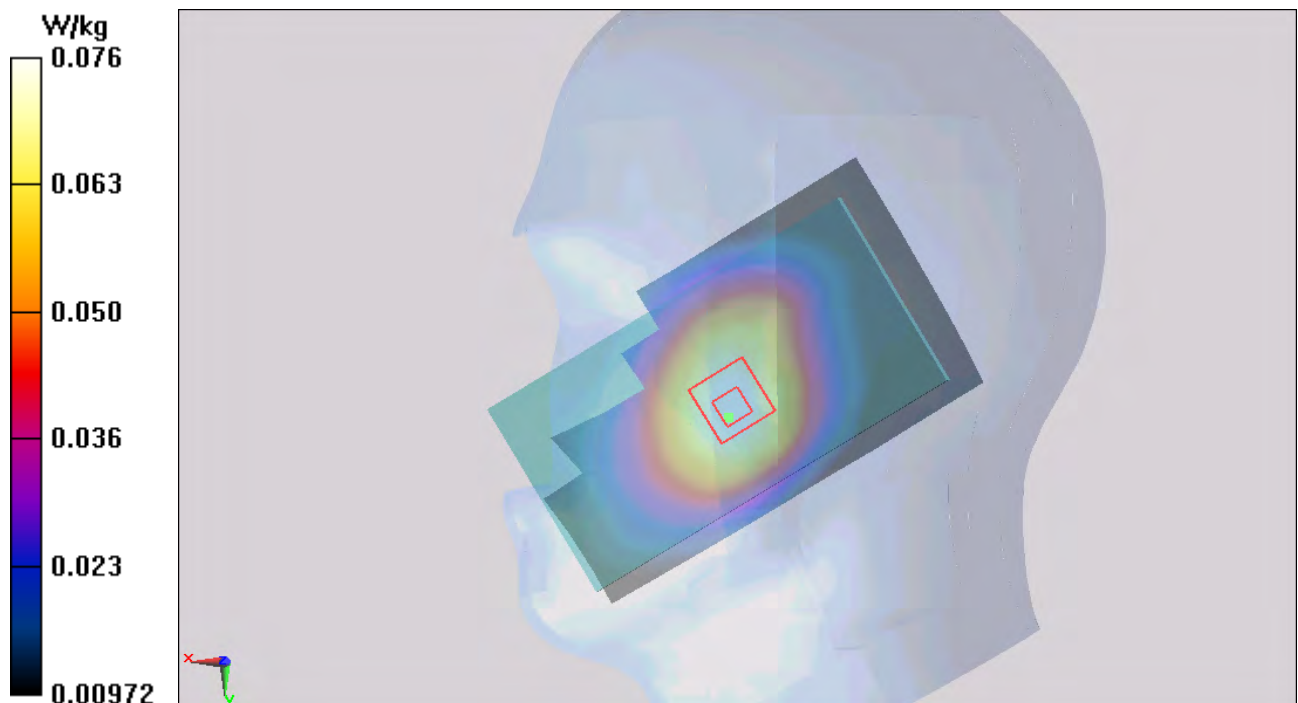


Figure 17 Right Hand Touch Cheek GSM 850 Channel 190

# TA Technology (Shanghai) Co., Ltd.

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### GSM 850 Back Side Middle (Battery 1)

Date: 11/18/2014

Communication System: UID 0, GSM (0); Frequency: 836.6 MHz; Duty Cycle: 1:8.30042

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.992$  S/m;  $\epsilon_r = 55.882$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.51, 9.51, 9.51); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Back Side Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.173 W/kg

**Back Side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 13.264 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.202 W/kg

**SAR(1 g) = 0.165 W/kg; SAR(10 g) = 0.126 W/kg**

Maximum value of SAR (measured) = 0.171 W/kg

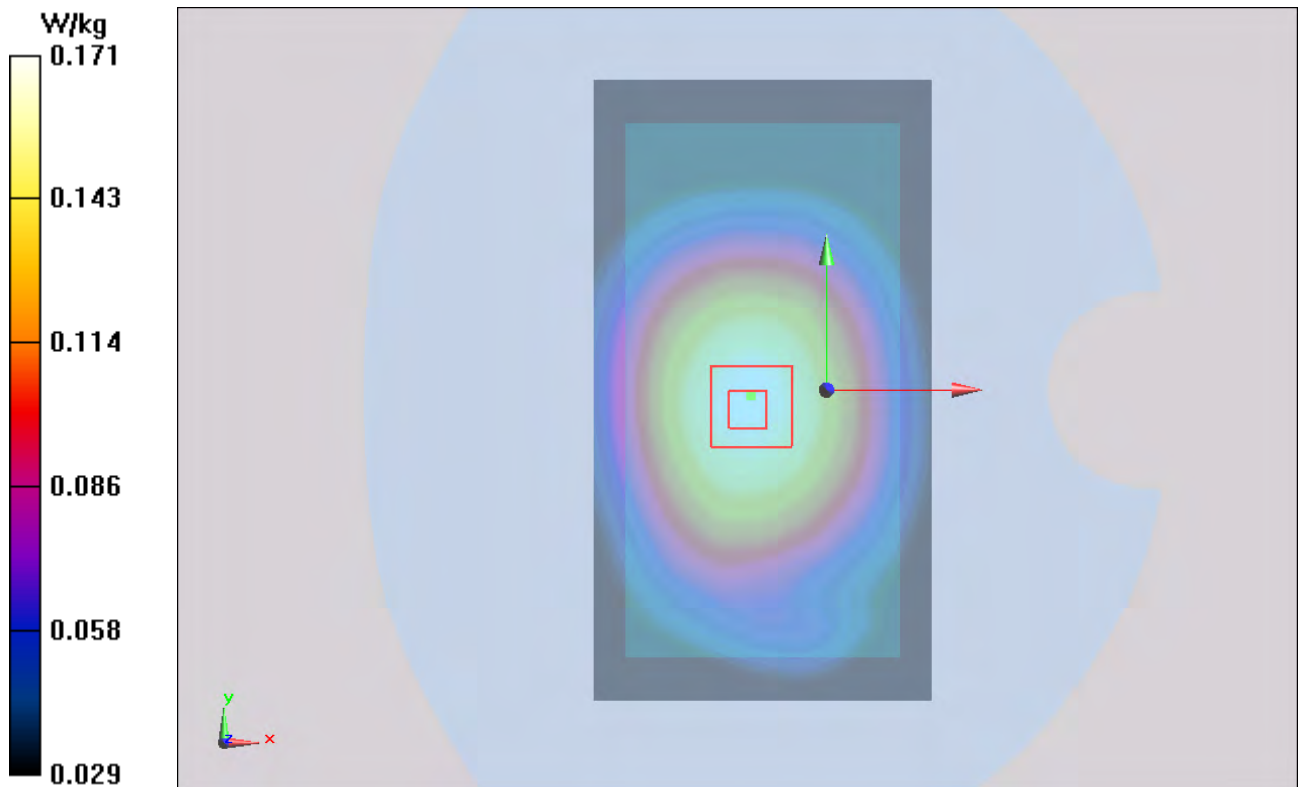


Figure 18 Body, Back Side, GSM 850 Channel 190

### **GSM 850 Front Side Middle (Battery 1)**

Date: 11/18/2014

Communication System: UID 0, GSM (0); Frequency: 836.6 MHz; Duty Cycle: 1:8.30042

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.992$  S/m;  $\epsilon_r = 55.882$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.51, 9.51, 9.51); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Front Side Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.120 W/kg

**Front Side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 11.068 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.141 W/kg

**SAR(1 g) = 0.115 W/kg; SAR(10 g) = 0.090 W/kg**

Maximum value of SAR (measured) = 0.119 W/kg

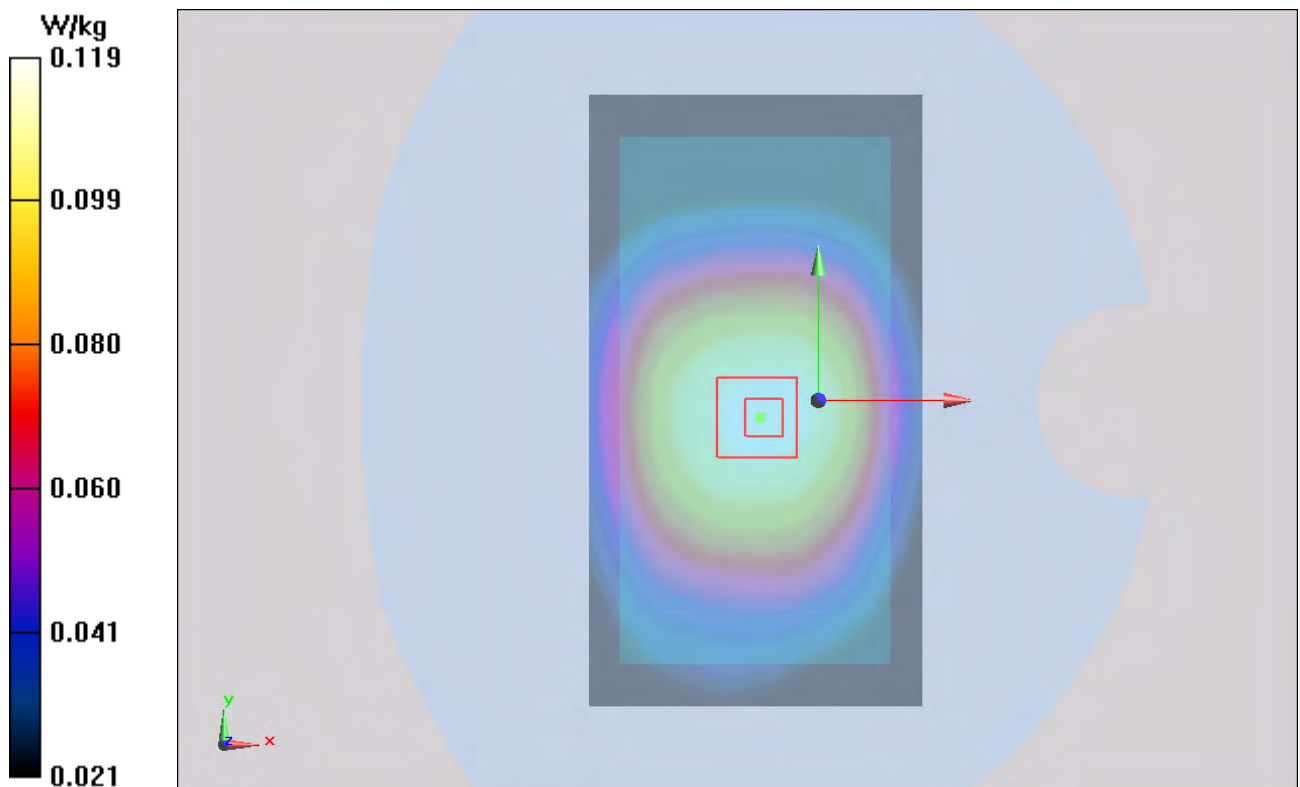


Figure 19 Body, Front Side, GSM 850 Channel 190

### **GSM 850 GPRS (3Txslots) Back Side Middle (Battery 1)**

Date: 11/18/2014

Communication System: UID 0, GPRS 3TX (0); Frequency: 836.6 MHz; Duty Cycle: 1:2.76694

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.992$  S/m;  $\epsilon_r = 55.882$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.51, 9.51, 9.51); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Back Side Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.288 W/kg

**Back Side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 17.118 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 0.516 W/kg

**SAR(1 g) = 0.279 W/kg; SAR(10 g) = 0.212 W/kg**

Maximum value of SAR (measured) = 0.286 W/kg

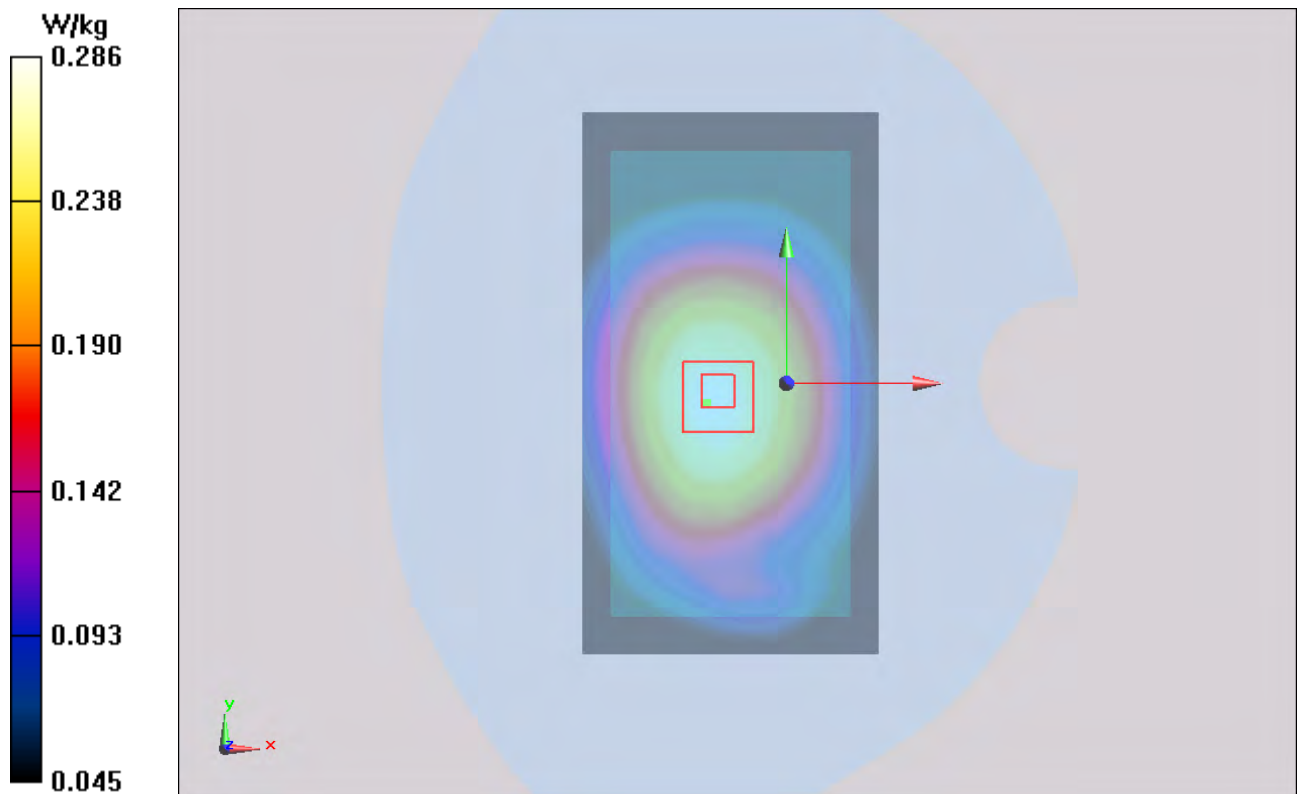


Figure 20 Body, Back Side, GSM 850 GPRS (3Txslots) Channel 190

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### GSM 850 GPRS (3Txslots) Front Side Middle (Battery 1)

Date: 11/18/2014

Communication System: UID 0, GPRS 3TX (0); Frequency: 836.6 MHz; Duty Cycle: 1:2.76694

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.992$  S/m;  $\epsilon_r = 55.882$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.51, 9.51, 9.51); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Front Side Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.191 W/kg

**Front Side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 14.033 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 0.223 W/kg

**SAR(1 g) = 0.184 W/kg; SAR(10 g) = 0.144 W/kg**

Maximum value of SAR (measured) = 0.191 W/kg

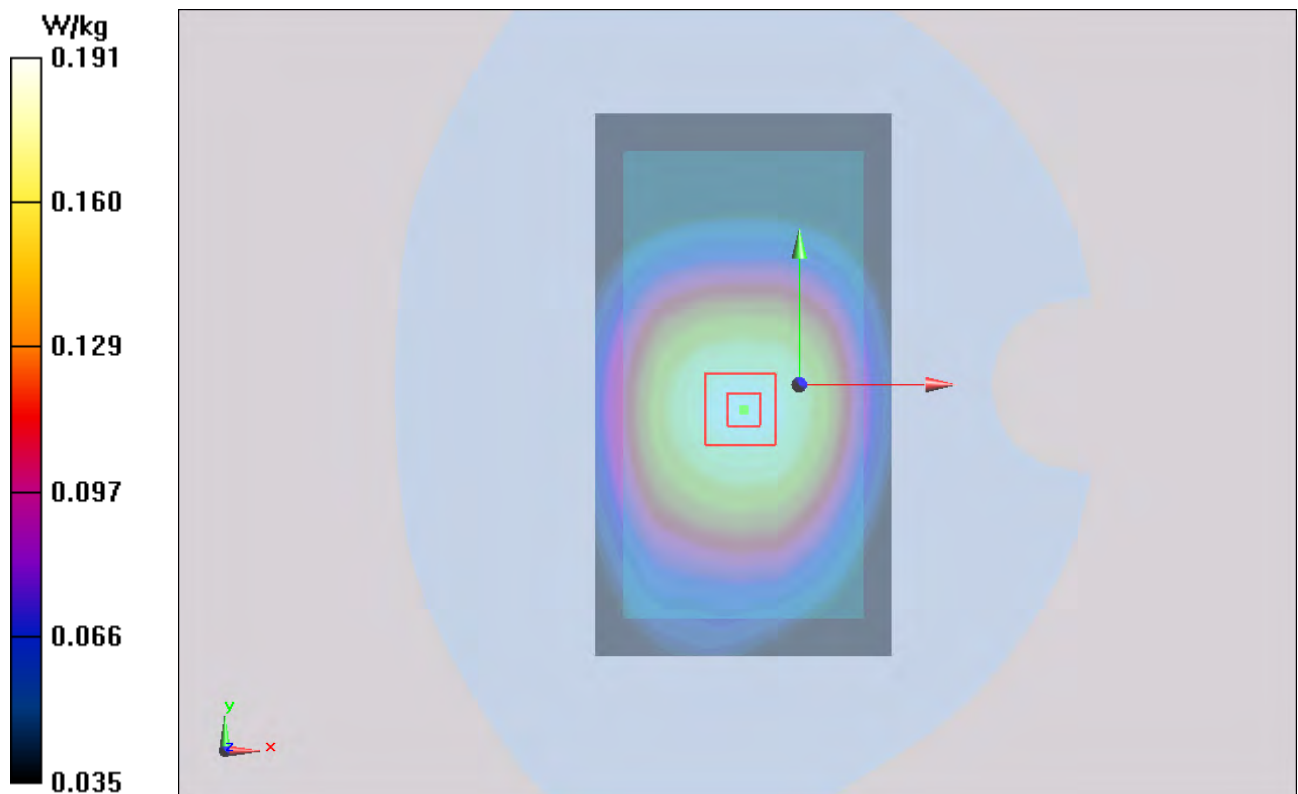


Figure 21 Body, Front Side, GSM 850 GPRS (3Txslots) Channel 190

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### GSM 850 GPRS (3Txslots) Left Edge Middle (Battery 1)

Date: 11/18/2014

Communication System: UID 0, GPRS 3TX (0); Frequency: 836.6 MHz; Duty Cycle: 1:2.76694

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.992$  S/m;  $\epsilon_r = 55.882$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.51, 9.51, 9.51); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Left Edge Middle/Area Scan (51x171x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.0888 W/kg

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

Reference Value = 7.907 V/m; Power Drift = 0.022 dB

Peak SAR (extrapolated) = 0.0970 W/kg

**SAR(1 g) = 0.071 W/kg; SAR(10 g) = 0.050 W/kg**

Maximum value of SAR (measured) = 0.0746 W/kg

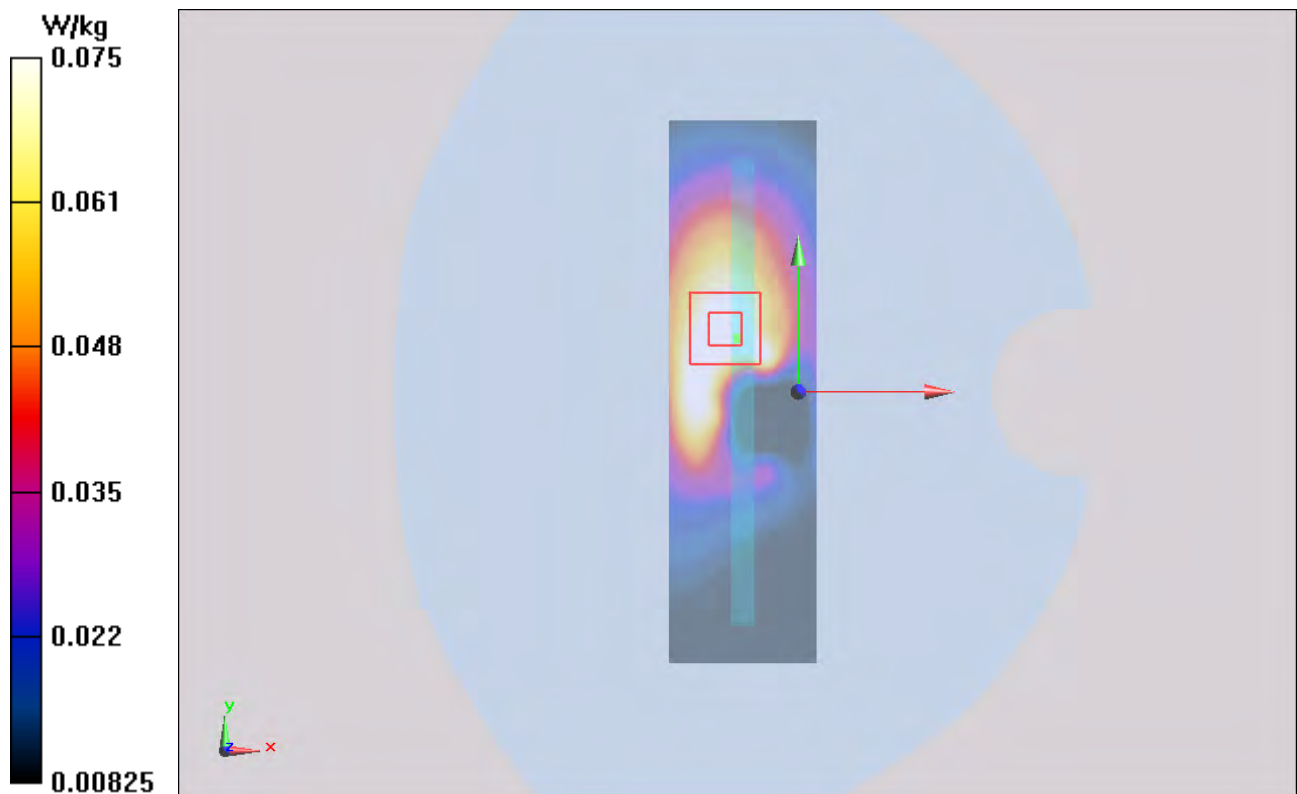


Figure 22 Body, Left Edge, GSM 850 GPRS (3Txslots) Channel 190

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### GSM 850 GPRS (3Txslots) Right Edge Middle (Battery 1)

Date: 11/18/2014

Communication System: UID 0, GPRS 3TX (0); Frequency: 836.6 MHz; Duty Cycle: 1:2.76694

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.992$  S/m;  $\epsilon_r = 55.882$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.51, 9.51, 9.51); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Right Edge Middle/Area Scan (51x171x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.0940 W/kg

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

Reference Value = 9.846 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.134 W/kg

**SAR(1 g) = 0.091 W/kg; SAR(10 g) = 0.064 W/kg**

Maximum value of SAR (measured) = 0.0920 W/kg

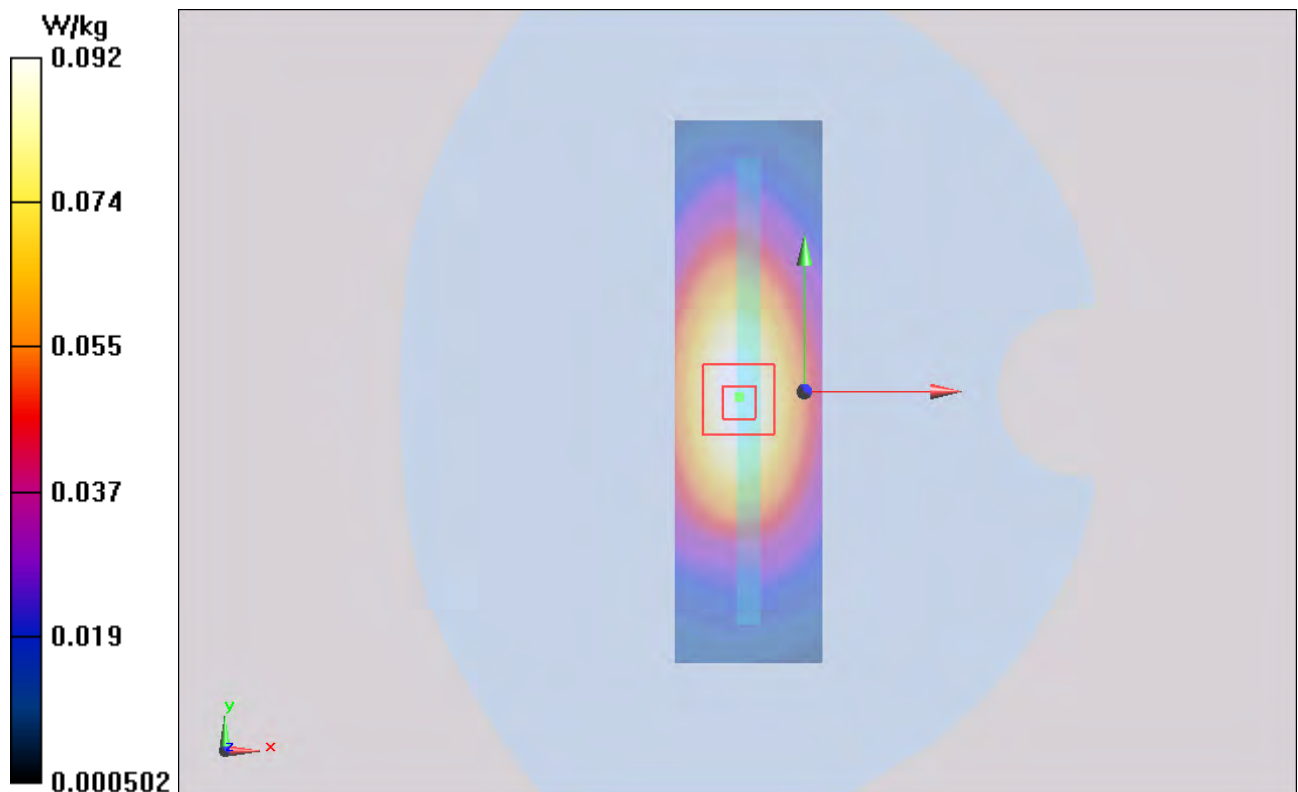


Figure 23 Body, Right Edge, GSM 850 GPRS (3Txslots) Channel 190

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**GSM 850 GPRS (3Txslots) Bottom Edge Middle (Battery 1)**

Date: 11/18/2014

Communication System: UID 0, GPRS 3TX (0); Frequency: 836.6 MHz; Duty Cycle: 1:2.76694

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.992$  S/m;  $\epsilon_r = 55.882$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.51, 9.51, 9.51); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Bottom Edge Middle/Area Scan (51x111x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.0389 W/kg

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

Reference Value = 6.009 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.0560 W/kg

**SAR(1 g) = 0.036 W/kg; SAR(10 g) = 0.021 W/kg**

Maximum value of SAR (measured) = 0.0366 W/kg

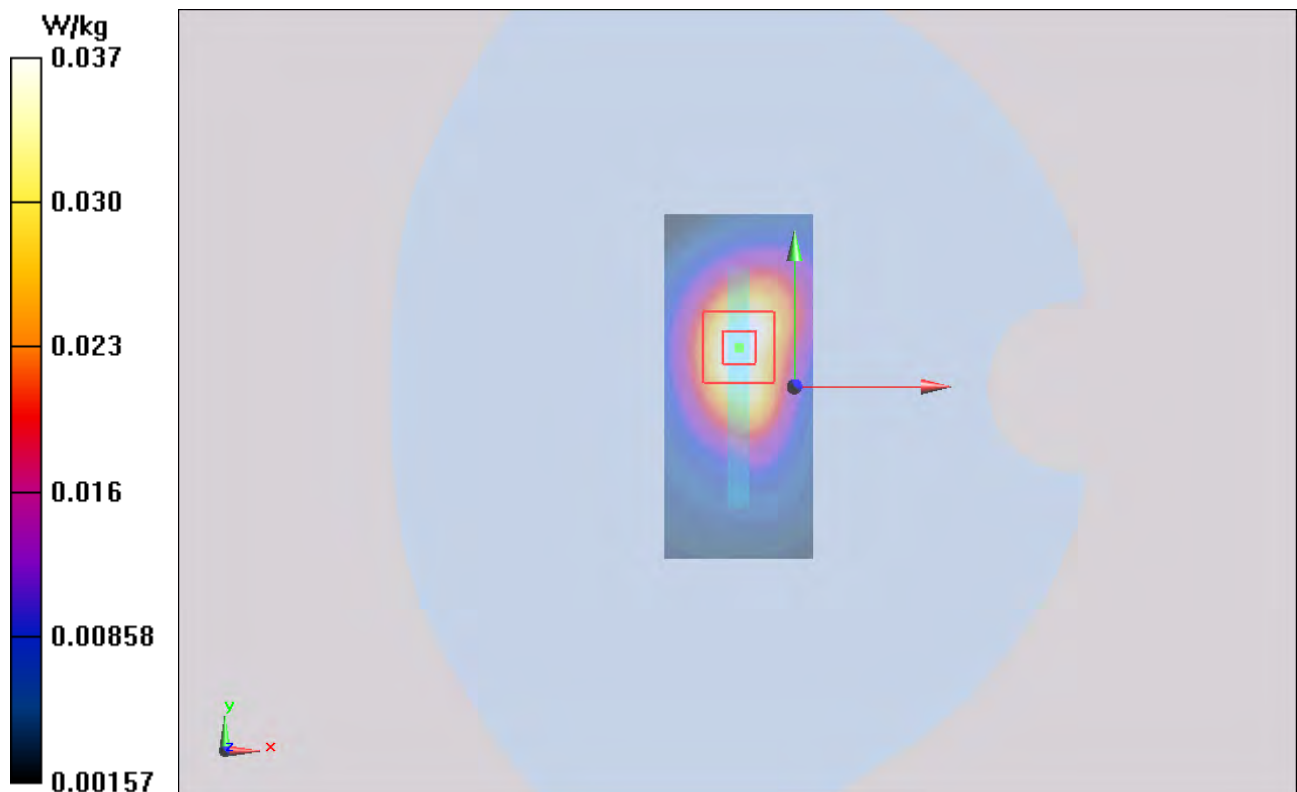


Figure 24 Body, Bottom Edge, GSM 850 GPRS (3Txslots) Channel 190

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### GSM 850 GPRS (3Txslots) Back Side Middle (Battery 2)

Date: 11/18/2014

Communication System: UID 0, GPRS 3TX (0); Frequency: 836.6 MHz; Duty Cycle: 1:2.76694

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.992$  S/m;  $\epsilon_r = 55.882$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.51, 9.51, 9.51); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Back Side Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.296 W/kg

**Back Side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 17.248 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.386 W/kg

**SAR(1 g) = 0.294 W/kg; SAR(10 g) = 0.200 W/kg**

Maximum value of SAR (measured) = 0.298 W/kg

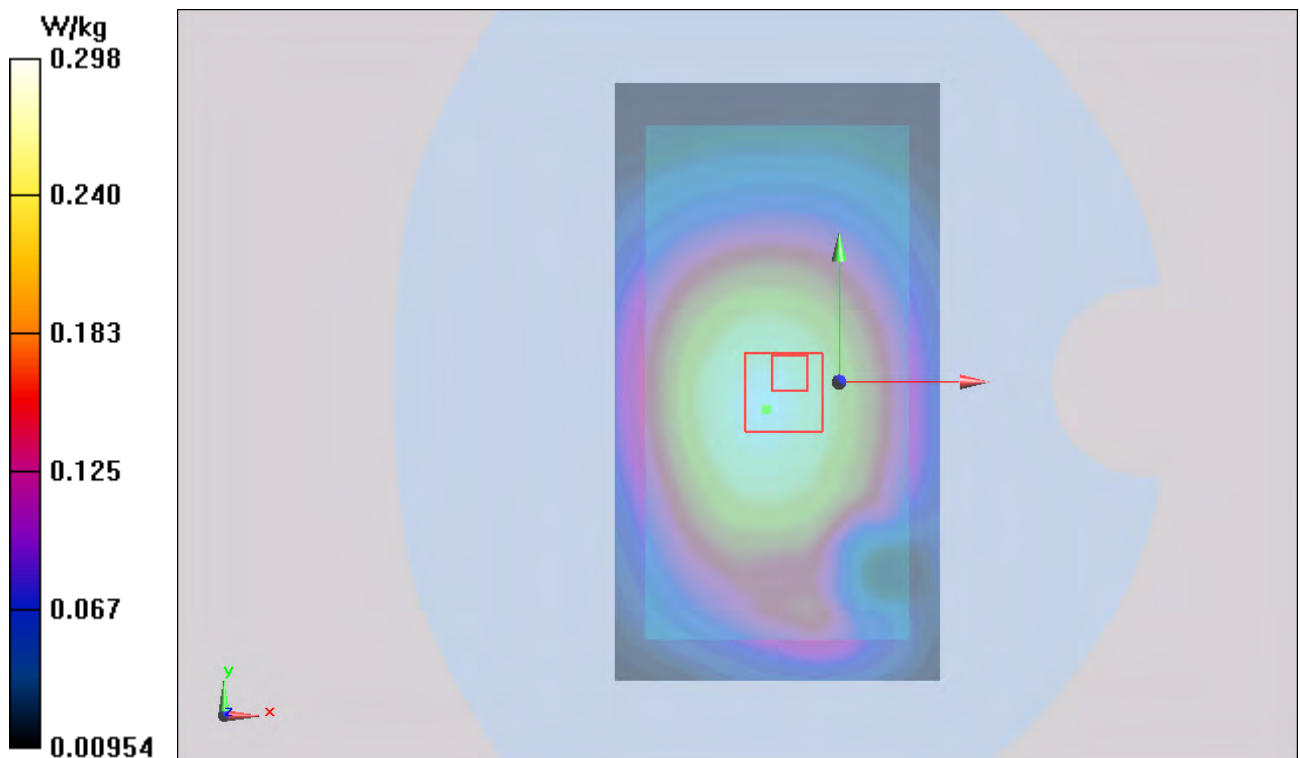


Figure 25 Body, Back Side, GSM 850 GPRS (3Txslots) Channel 190

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### GSM 1900 Left Cheek Middle (Battery 1)

Date: 11/20/2014

Communication System: UID 0, GSM (0); Frequency: 1880 MHz; Duty Cycle: 1:8.30042

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.413$  S/m;  $\epsilon_r = 39.689$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Left Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(8.15, 8.15, 8.15); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Left Cheek Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.133 W/kg

**Left Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 2.043 V/m; Power Drift = 0.056 dB

Peak SAR (extrapolated) = 0.207 W/kg

**SAR(1 g) = 0.130 W/kg; SAR(10 g) = 0.076 W/kg**

Maximum value of SAR (measured) = 0.141 W/kg

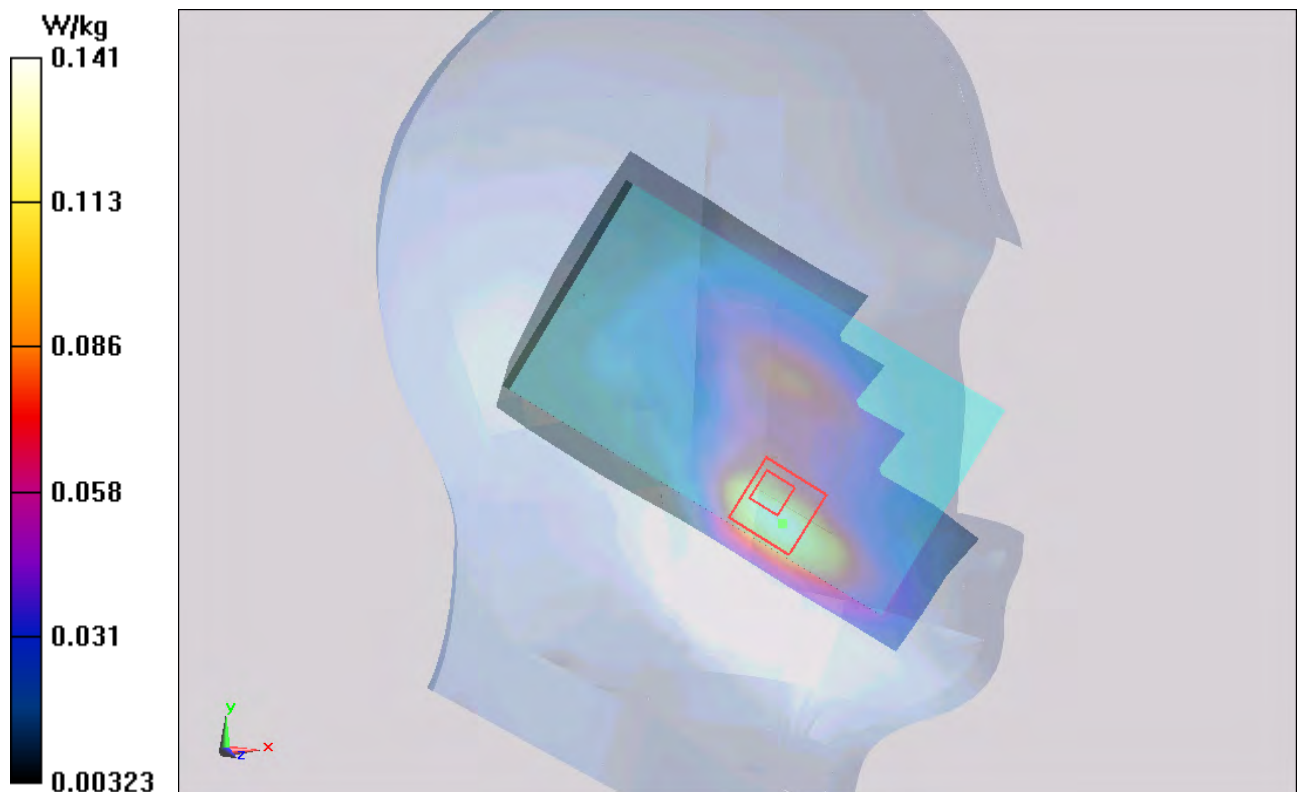


Figure 26 Left Hand Touch Cheek GSM 1900 Channel 661

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### GSM 1900 Left Tilt Middle (Battery 1)

Date: 11/20/2014

Communication System: UID 0, GSM (0); Frequency: 1880 MHz; Duty Cycle: 1:8.30042

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.413$  S/m;  $\epsilon_r = 39.689$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Left Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(8.15, 8.15, 8.15); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Left Tilt Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.0548 W/kg

**Left Tilt Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.020 V/m; Power Drift = 0.035 dB

Peak SAR (extrapolated) = 0.0740 W/kg

**SAR(1 g) = 0.046 W/kg; SAR(10 g) = 0.029 W/kg**

Maximum value of SAR (measured) = 0.0493 W/kg

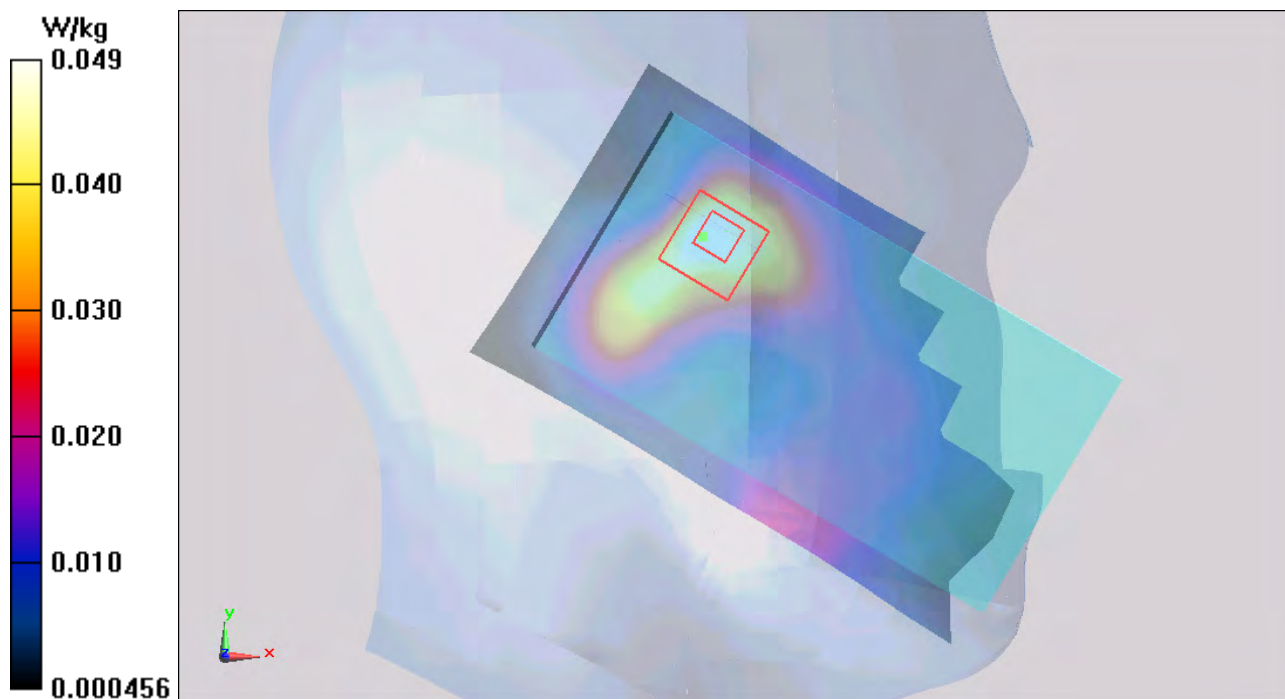


Figure 27 Left Hand Tilt 15° GSM 1900 Channel 661

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**GSM 1900 Right Cheek Middle (Battery 1)**

Date: 11/20/2014

Communication System: UID 0, GSM (0); Frequency: 1880 MHz; Duty Cycle: 1:8.30042

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.413$  S/m;  $\epsilon_r = 39.689$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Right Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(8.15, 8.15, 8.15); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Right Cheek Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.127 W/kg

**Right Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.819 V/m; Power Drift = -0.16 dB

Peak SAR (extrapolated) = 0.178 W/kg

**SAR(1 g) = 0.118 W/kg; SAR(10 g) = 0.072 W/kg**

Maximum value of SAR (measured) = 0.127 W/kg

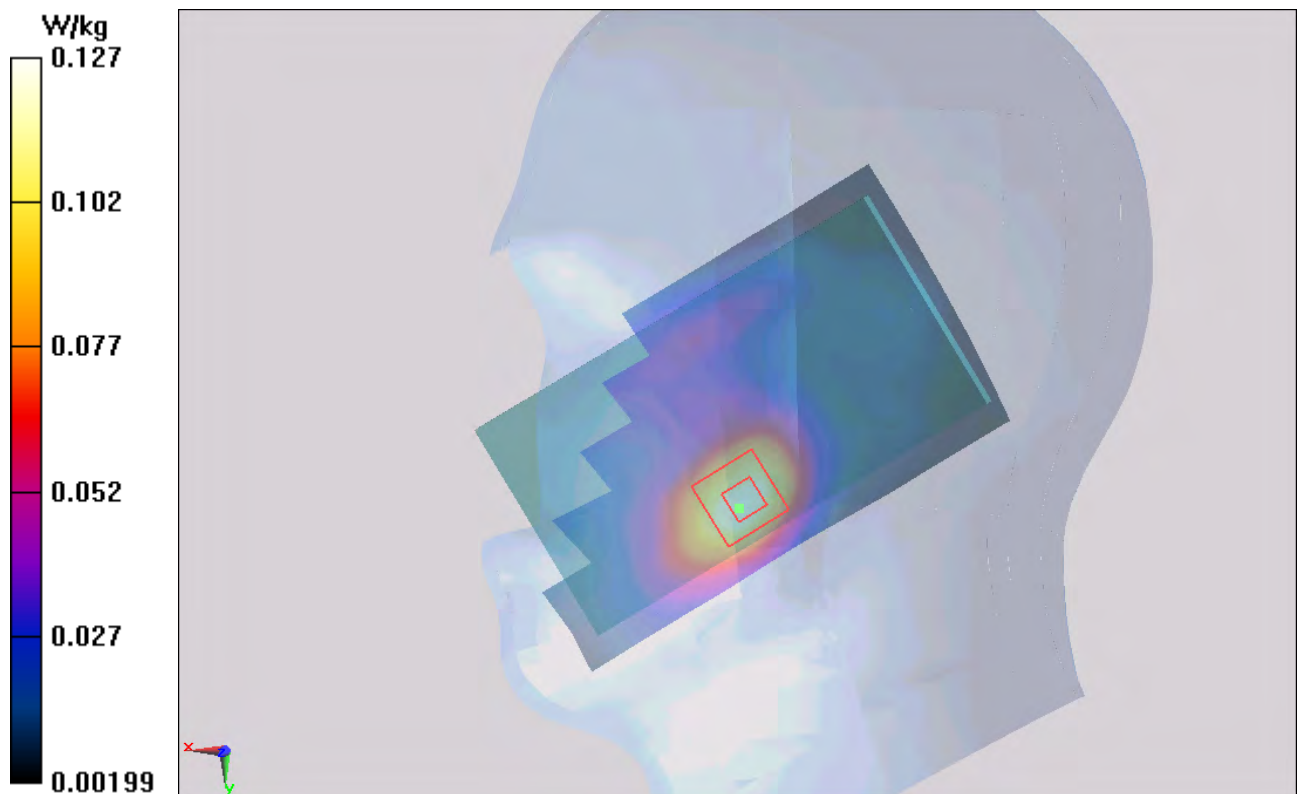


Figure 28 Right Hand Touch Cheek GSM 1900 Channel 661

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### GSM 1900 Right Tilt Middle (Battery 1)

Date: 11/20/2014

Communication System: UID 0, GSM (0); Frequency: 1880 MHz; Duty Cycle: 1:8.30042

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.413$  S/m;  $\epsilon_r = 39.689$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Right Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(8.15, 8.15, 8.15); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Right Tilt Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.0444 W/kg

**Right Tilt Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.536 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 0.0630 W/kg

**SAR(1 g) = 0.040 W/kg; SAR(10 g) = 0.023 W/kg**

Maximum value of SAR (measured) = 0.0443 W/kg

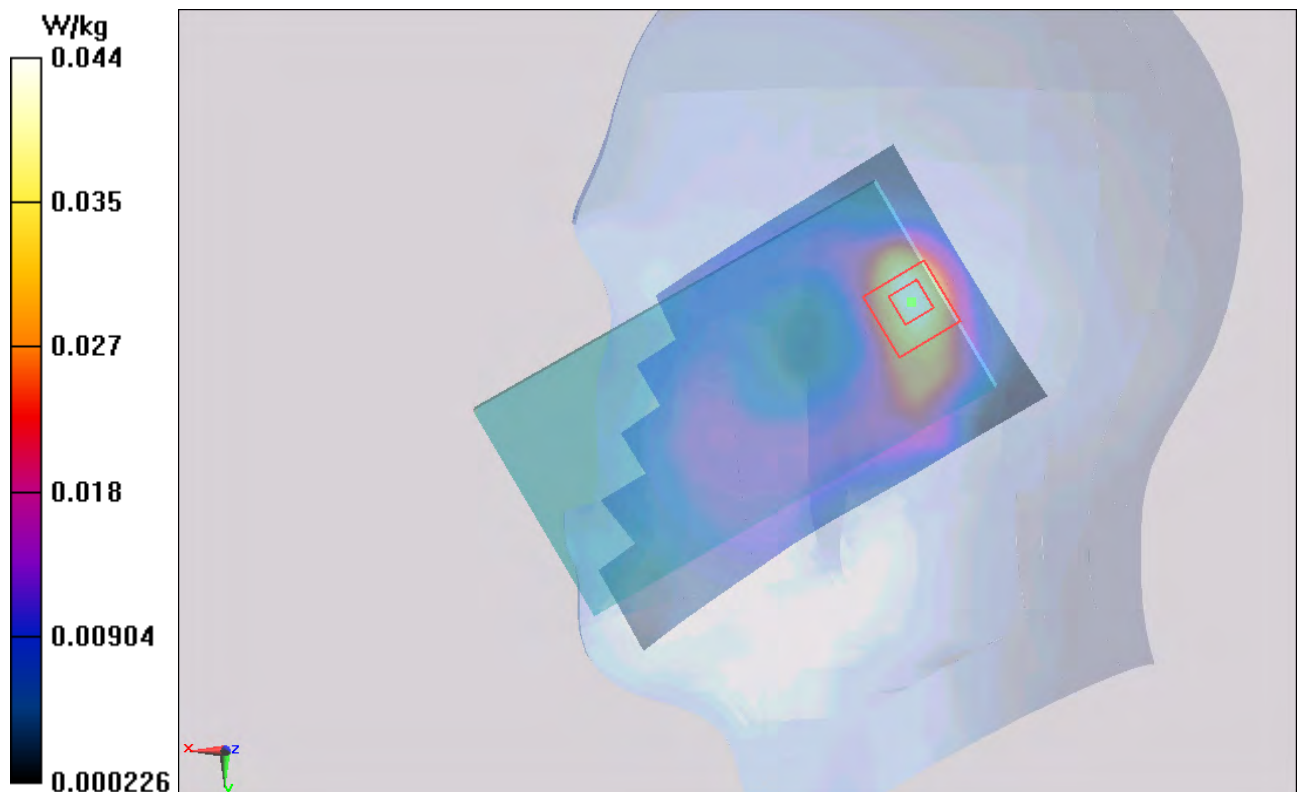


Figure 29 Right Hand Tilt 15° GSM 1900 Channel 661

### GSM 1900 Left Cheek Middle (Battery 2)

Date: 11/20/2014

Communication System: UID 0, GSM (0); Frequency: 1880 MHz; Duty Cycle: 1:8.30042

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.413$  S/m;  $\epsilon_r = 39.689$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Left Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(8.15, 8.15, 8.15); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Left Cheek Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.147 W/kg

**Left Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.572 V/m; Power Drift = -0.029 dB

Peak SAR (extrapolated) = 0.204 W/kg

**SAR(1 g) = 0.129 W/kg; SAR(10 g) = 0.079 W/kg**

Maximum value of SAR (measured) = 0.130 W/kg

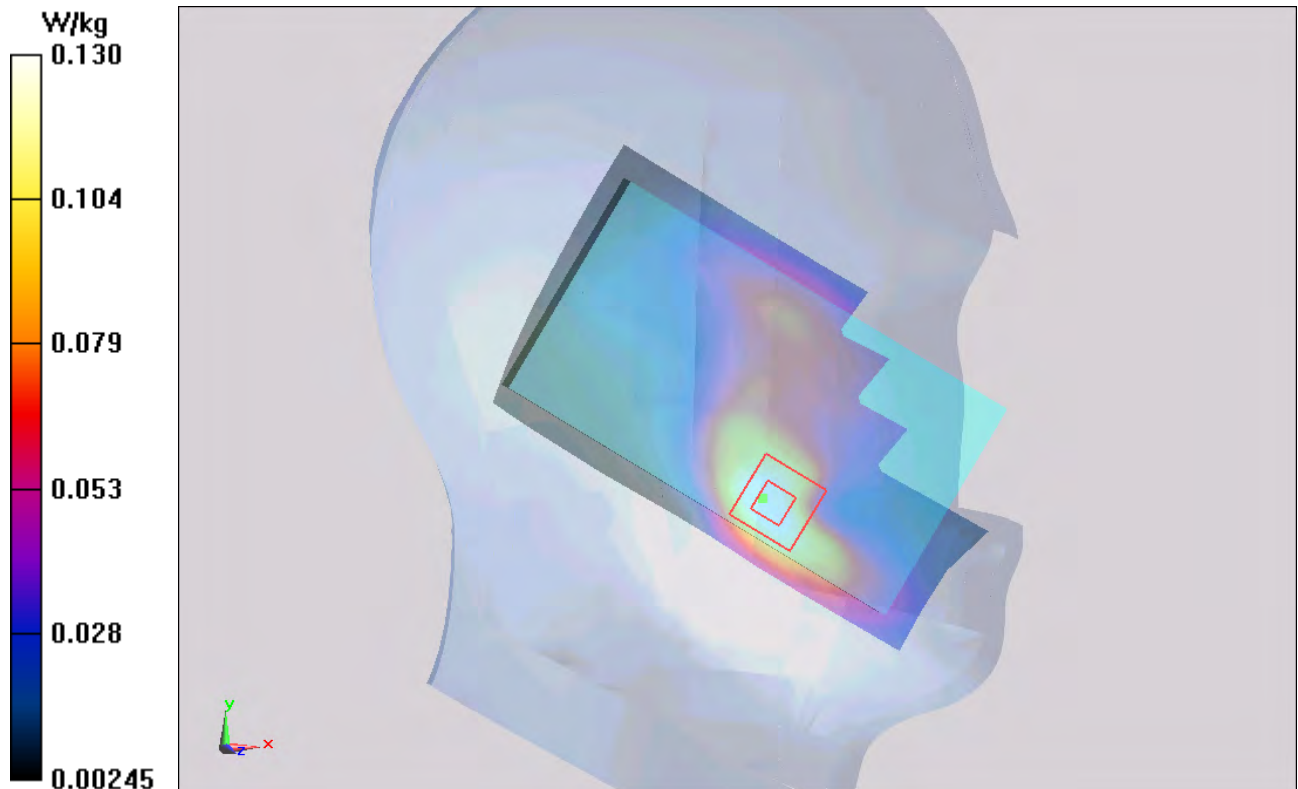


Figure 30 Left Hand Touch Cheek GSM 1900 Channel 661

### GSM 1900 Back Side Middle (Battery 1)

Date: 11/16/2014

Communication System: UID 0, GSM (0); Frequency: 1880 MHz; Duty Cycle: 1:8.30042

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.504$  S/m;  $\epsilon_r = 53.137$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Back Side Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.264 W/kg

**Back Side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 8.162 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 0.418 W/kg

**SAR(1 g) = 0.259 W/kg; SAR(10 g) = 0.145 W/kg**

Maximum value of SAR (measured) = 0.285 W/kg

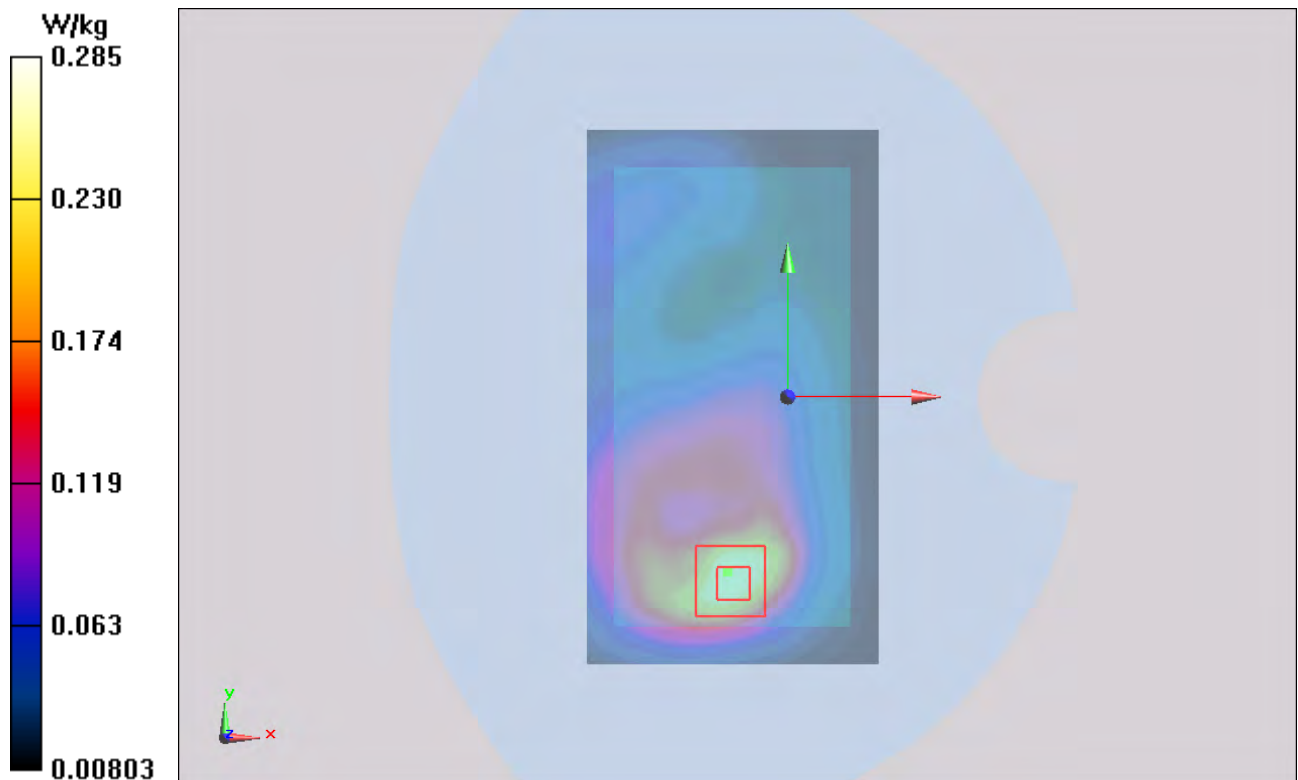


Figure 31 Body, Back Side, GSM 1900 Channel 661

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### GSM 1900 Front Side Middle (Battery 1)

Date: 11/16/2014

Communication System: UID 0, GSM (0); Frequency: 1880 MHz; Duty Cycle: 1:8.30042

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.504$  S/m;  $\epsilon_r = 53.137$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Front Side Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.154 W/kg

**Front Side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.254 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 0.211 W/kg

**SAR(1 g) = 0.141 W/kg; SAR(10 g) = 0.087 W/kg**

Maximum value of SAR (measured) = 0.147 W/kg

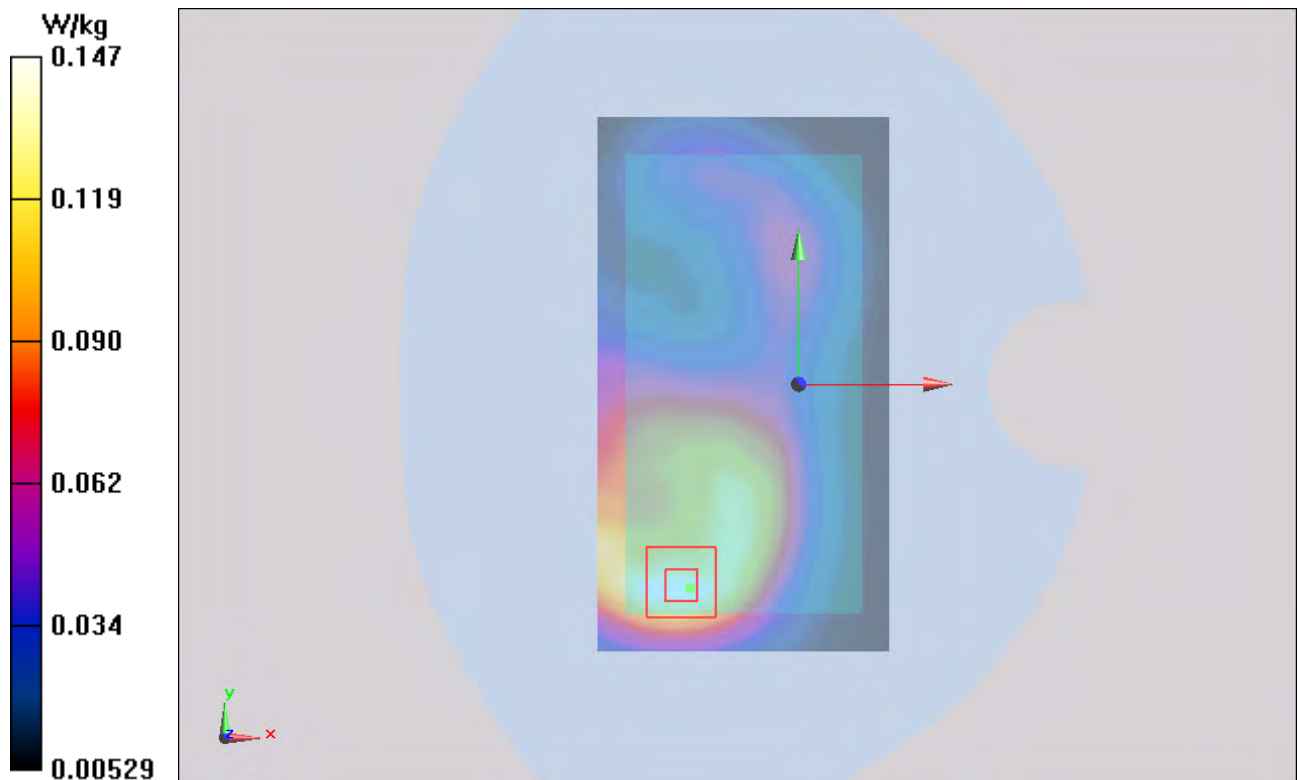


Figure 32 Body, Front Side, GSM 1900 Channel 661

### **GSM 1900 GPRS (4Txslots) Back Side Middle (Battery 1)**

Date: 11/16/2014

Communication System: UID 0, GPRS 4TX (0); Frequency: 1880 MHz; Duty Cycle: 1:2.07491

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.504$  S/m;  $\epsilon_r = 53.137$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Back Side Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.367 W/kg

**Back Side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.498 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.565 W/kg

**SAR(1 g) = 0.355 W/kg; SAR(10 g) = 0.200 W/kg**

Maximum value of SAR (measured) = 0.392 W/kg

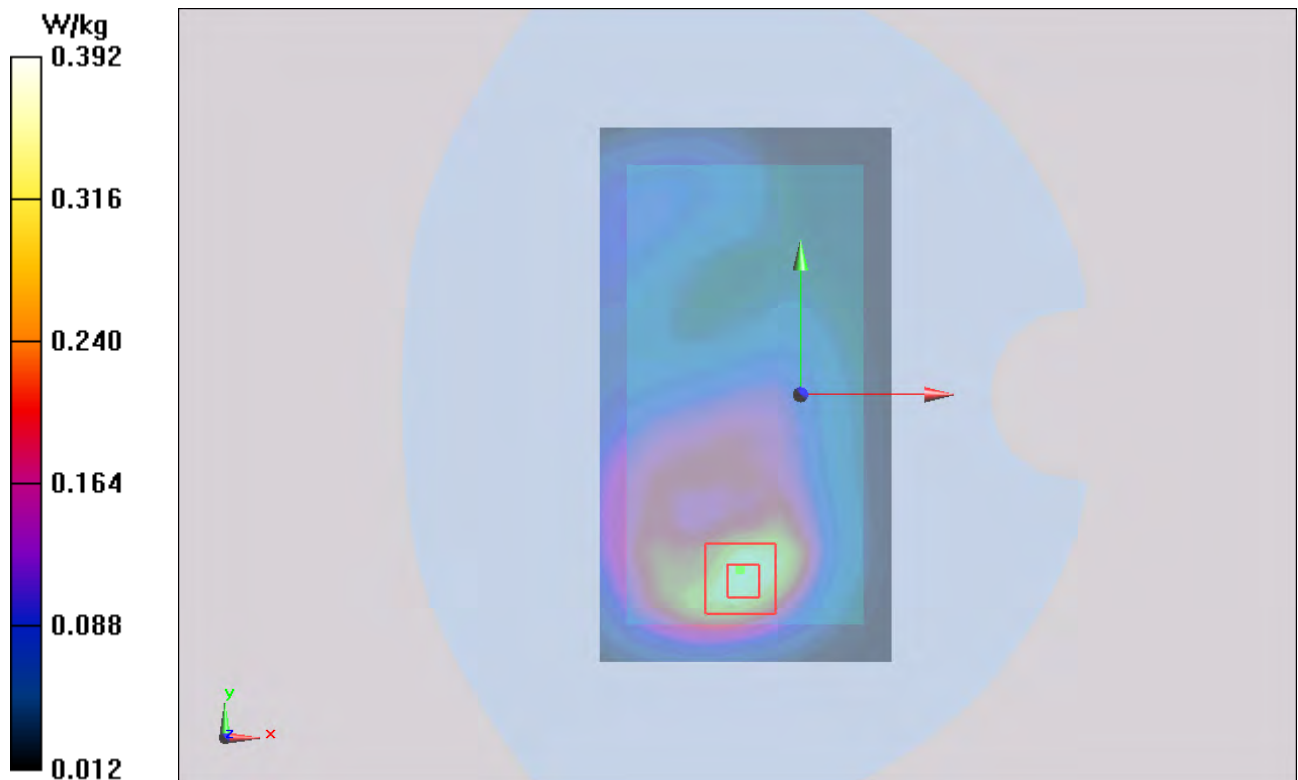


Figure 33 Body, Back Side, GSM 1900 GPRS (4Txslots) Channel 661

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### GSM 1900 GPRS (4Txslots) Front Side Middle (Battery 1)

Date: 11/16/2014

Communication System: UID 0, GPRS 4TX (0); Frequency: 1880 MHz; Duty Cycle: 1:2.07491

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.504$  S/m;  $\epsilon_r = 53.137$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Front Side Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.228 W/kg

**Front Side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 7.396 V/m; Power Drift = 0.020 dB

Peak SAR (extrapolated) = 0.355 W/kg

**SAR(1 g) = 0.225 W/kg; SAR(10 g) = 0.131 W/kg**

Maximum value of SAR (measured) = 0.229 W/kg

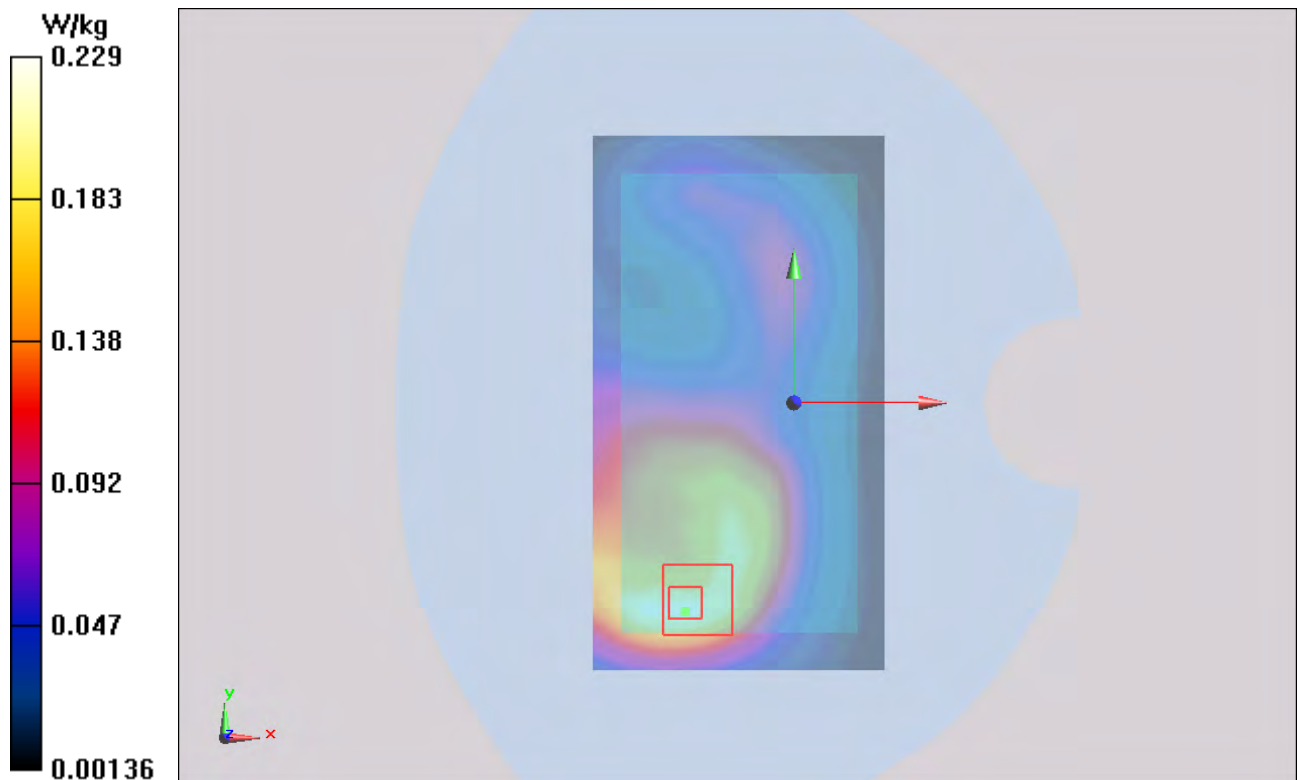


Figure 34 Body, Front Side, GSM 1900 GPRS (4Txslots) Channel 661

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### GSM 1900 GPRS (4Txslots) Left Edge Middle (Battery 1)

Date: 11/16/2014

Communication System: UID 0, GPRS 4TX (0); Frequency: 1880 MHz; Duty Cycle: 1:2.07491

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.504$  S/m;  $\epsilon_r = 53.137$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Left Edge Middle/Area Scan (51x171x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.124 W/kg

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

Reference Value = 5.676 V/m; Power Drift = 0.023 dB

Peak SAR (extrapolated) = 0.177 W/kg

**SAR(1 g) = 0.114 W/kg; SAR(10 g) = 0.066 W/kg**

Maximum value of SAR (measured) = 0.116 W/kg

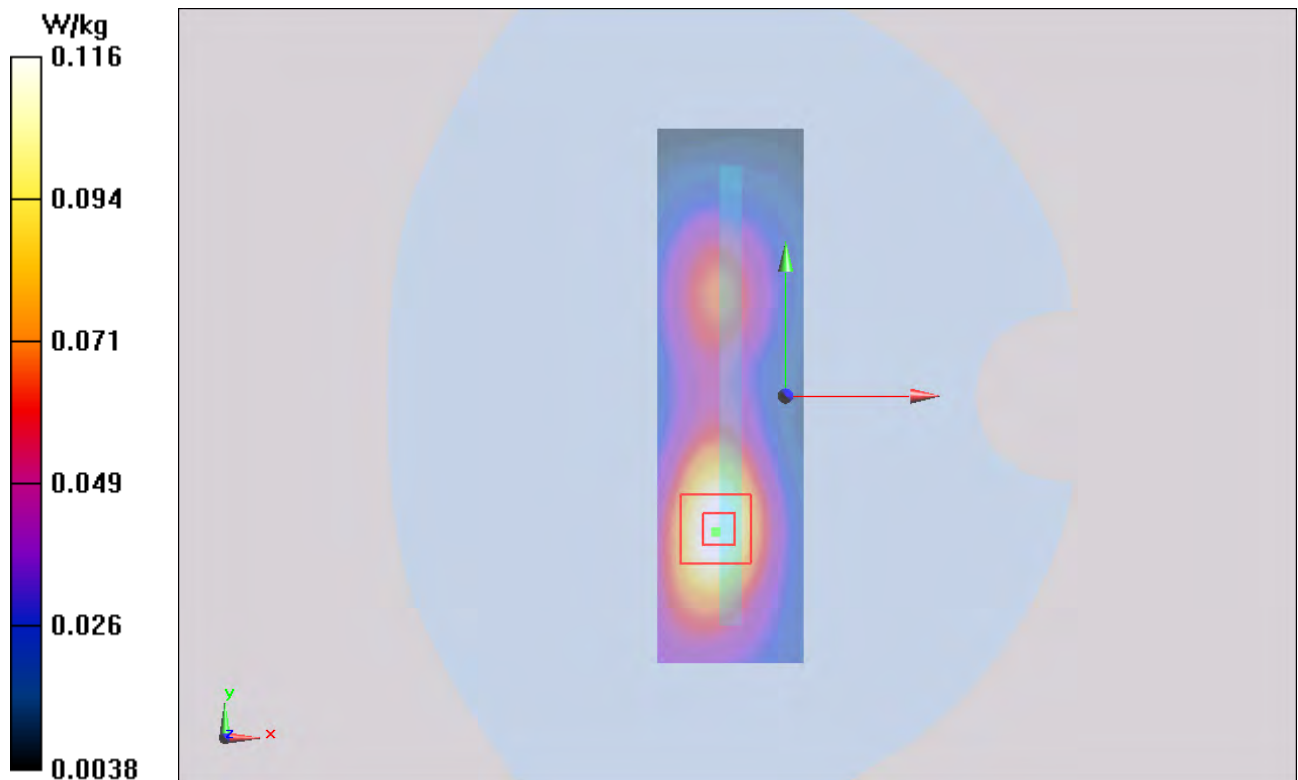


Figure 35 Body, Left Edge, GSM 1900 GPRS (4Txslots) Channel 661

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**GSM 1900 GPRS (4Txslots) Right Edge Middle (Battery 1)**

Date: 11/16/2014

Communication System: UID 0, GPRS 4TX (0); Frequency: 1880 MHz; Duty Cycle: 1:2.07491

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.504$  S/m;  $\epsilon_r = 53.137$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Right Edge Middle/Area Scan (51x171x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.0742 W/kg

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

Reference Value = 3.835 V/m; Power Drift = 0.050 dB

Peak SAR (extrapolated) = 0.102 W/kg

**SAR(1 g) = 0.068 W/kg; SAR(10 g) = 0.042 W/kg**

Maximum value of SAR (measured) = 0.0685 W/kg

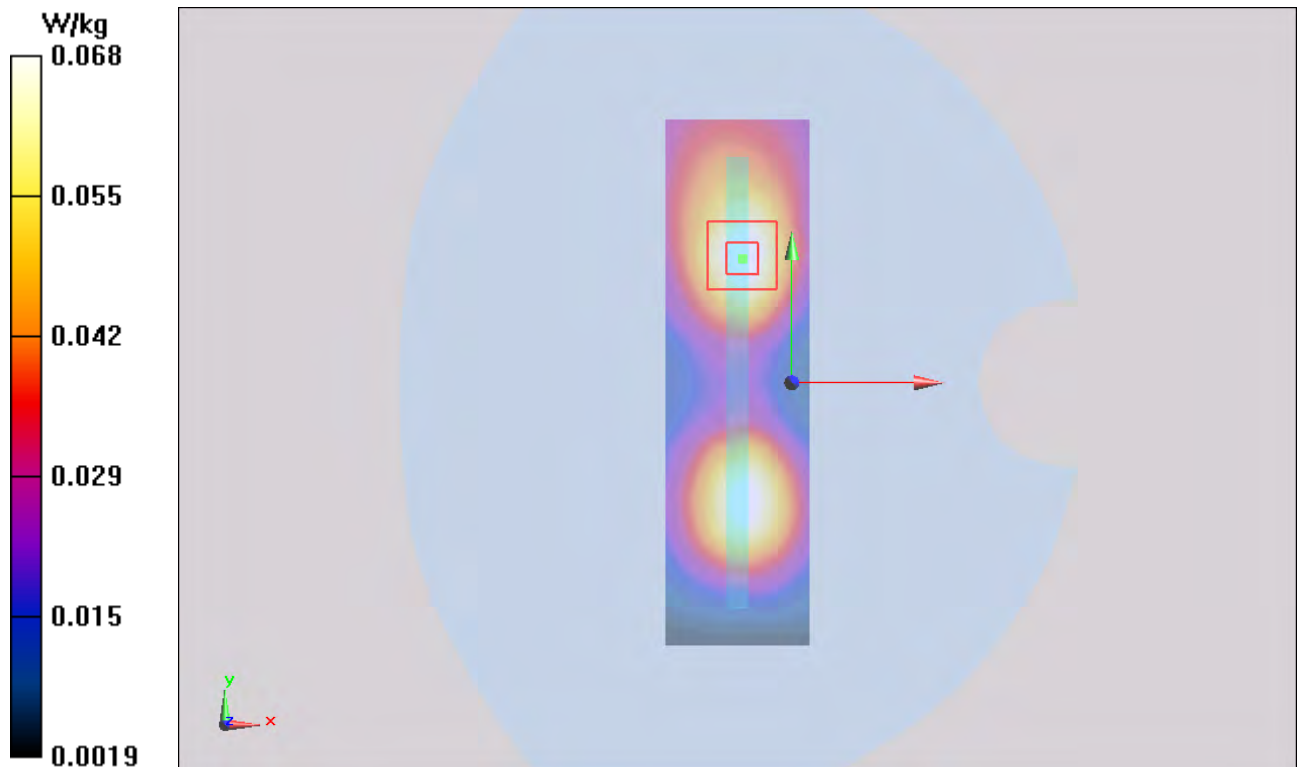


Figure 36 Body, Right Edge, GSM 1900 GPRS (4Txslots) Channel 661

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### GSM 1900 GPRS (4Txslots) Bottom Edge Middle (Battery 1)

Date: 11/16/2014

Communication System: UID 0, GPRS 4TX (0); Frequency: 1880 MHz; Duty Cycle: 1:2.07491

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.504$  S/m;  $\epsilon_r = 53.137$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Bottom Edge Middle/Area Scan (51x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.399 W/kg

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

Reference Value = 16.579 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.586 W/kg

**SAR(1 g) = 0.362 W/kg; SAR(10 g) = 0.201 W/kg**

Maximum value of SAR (measured) = 0.380 W/kg

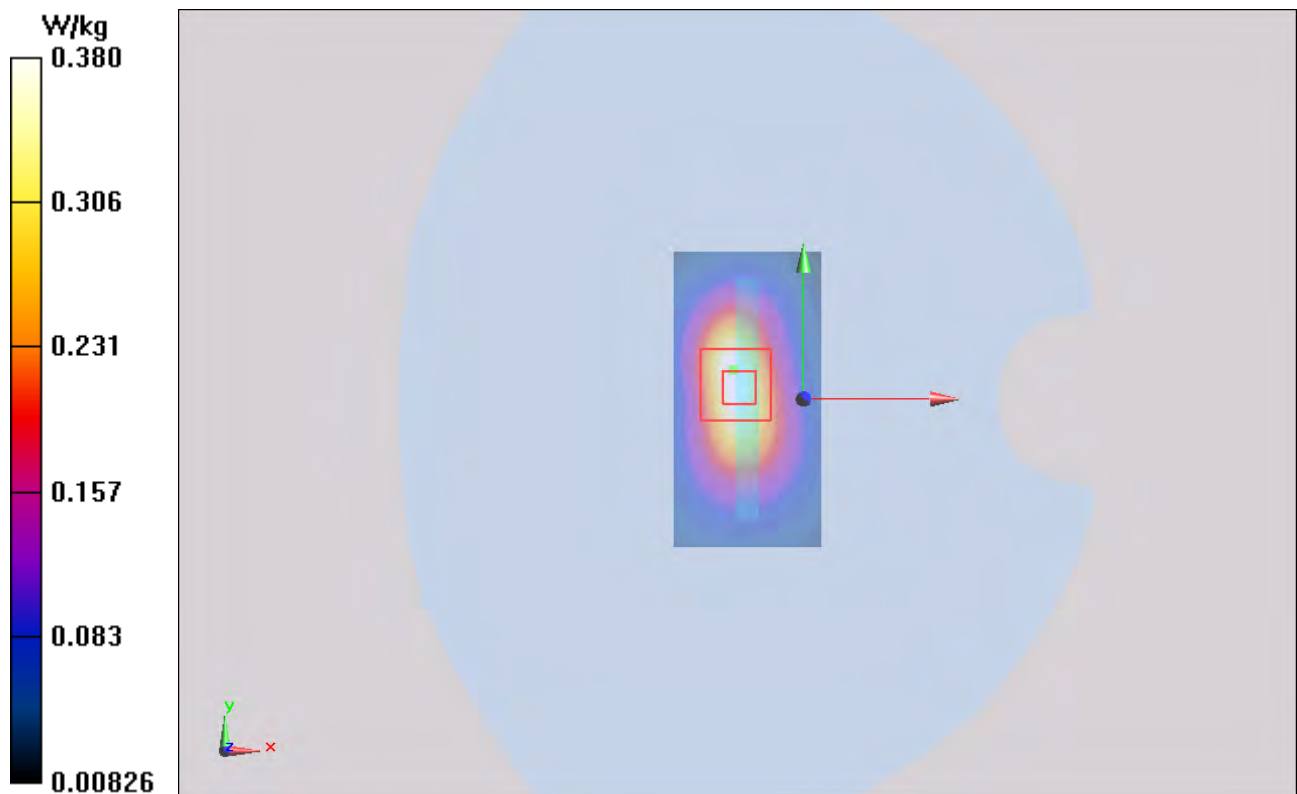


Figure 37 Body, Bottom Edge, GSM 1900 GPRS (4Txslots) Channel 661

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**GSM 1900 GPRS (4Txslots) Bottom Edge Middle (Battery 2)**

Date: 11/16/2014

Communication System: UID 0, GPRS 4TX (0); Frequency: 1880 MHz; Duty Cycle: 1:2.07491

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.504$  S/m;  $\epsilon_r = 53.137$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Bottom Edge Middle/Area Scan (51x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.422 W/kg

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

Reference Value = 16.582 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.610 W/kg

**SAR(1 g) = 0.377 W/kg; SAR(10 g) = 0.209 W/kg**

Maximum value of SAR (measured) = 0.382 W/kg

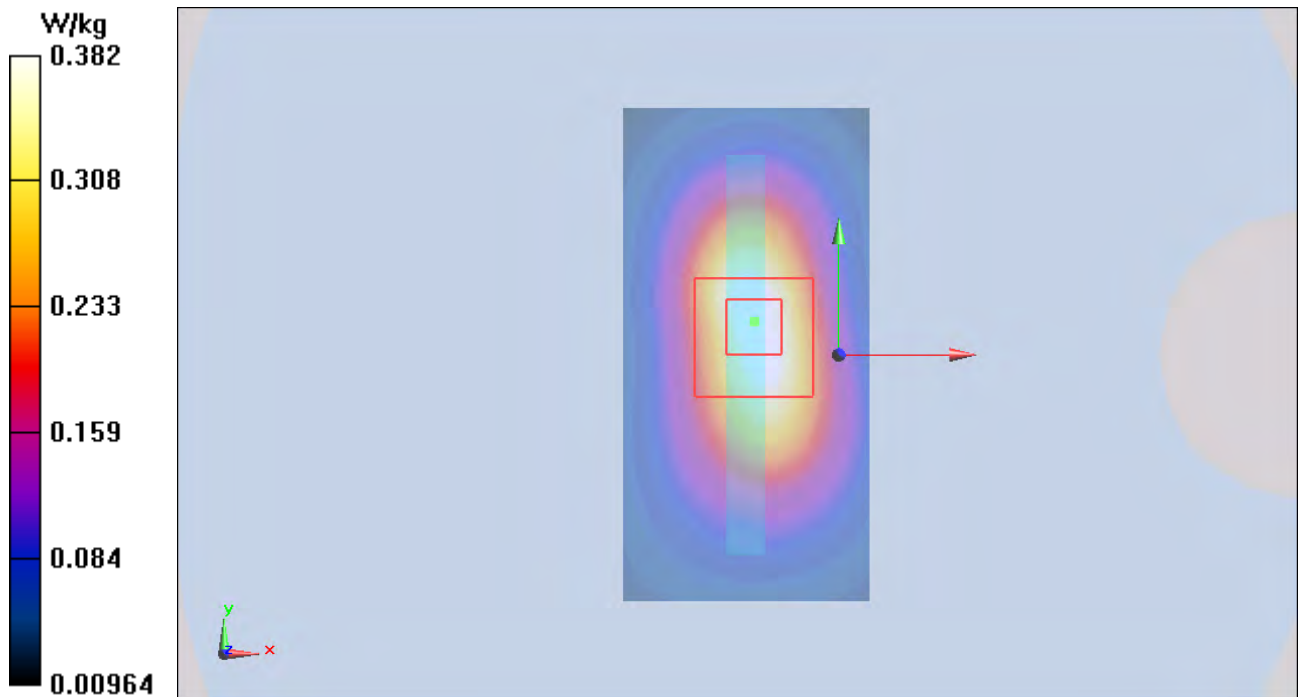


Figure 38 Body, Back Side, GSM 1900 GPRS (4Txslots) Channel 661

### UMTS Band II Left Cheek Middle (Battery 1)

Date: 11/20/2014

Communication System: UID 0, WCDMA (0); Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.413$  S/m;  $\epsilon_r = 39.689$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Left Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(8.15, 8.15, 8.15); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Left Cheek Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.386 W/kg

**Left Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.700 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.560 W/kg

**SAR(1 g) = 0.344 W/kg; SAR(10 g) = 0.206 W/kg**

Maximum value of SAR (measured) = 0.351 W/kg

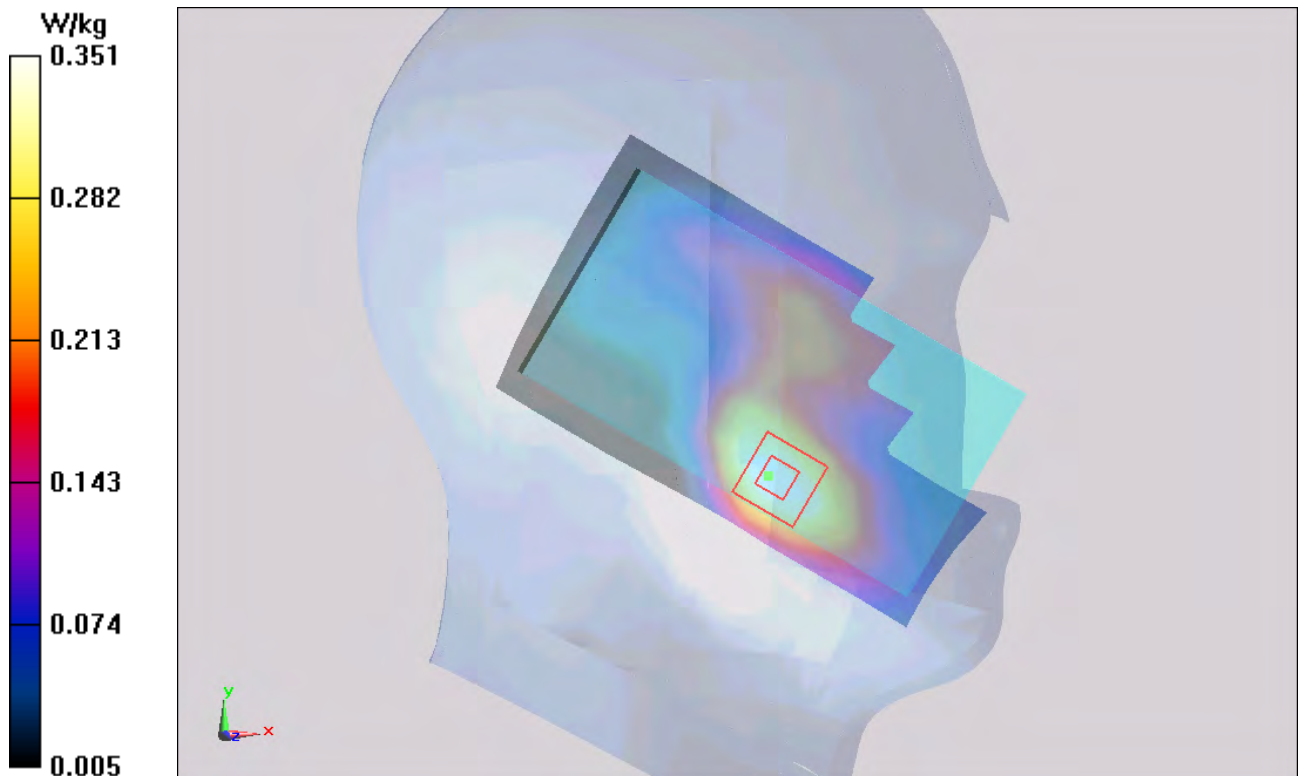


Figure 39 Left Hand Touch Cheek UMTS Band II Channel 9400

### UMTS Band II Left Tilt Middle (Battery 1)

Date: 11/20/2014

Communication System: UID 0, WCDMA (0); Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.413$  S/m;  $\epsilon_r = 39.689$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Left Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(8.15, 8.15, 8.15); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Left Tilt Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.163 W/kg

**Left Tilt Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.190 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 0.232 W/kg

**SAR(1 g) = 0.141 W/kg; SAR(10 g) = 0.082 W/kg**

Maximum value of SAR (measured) = 0.142 W/kg

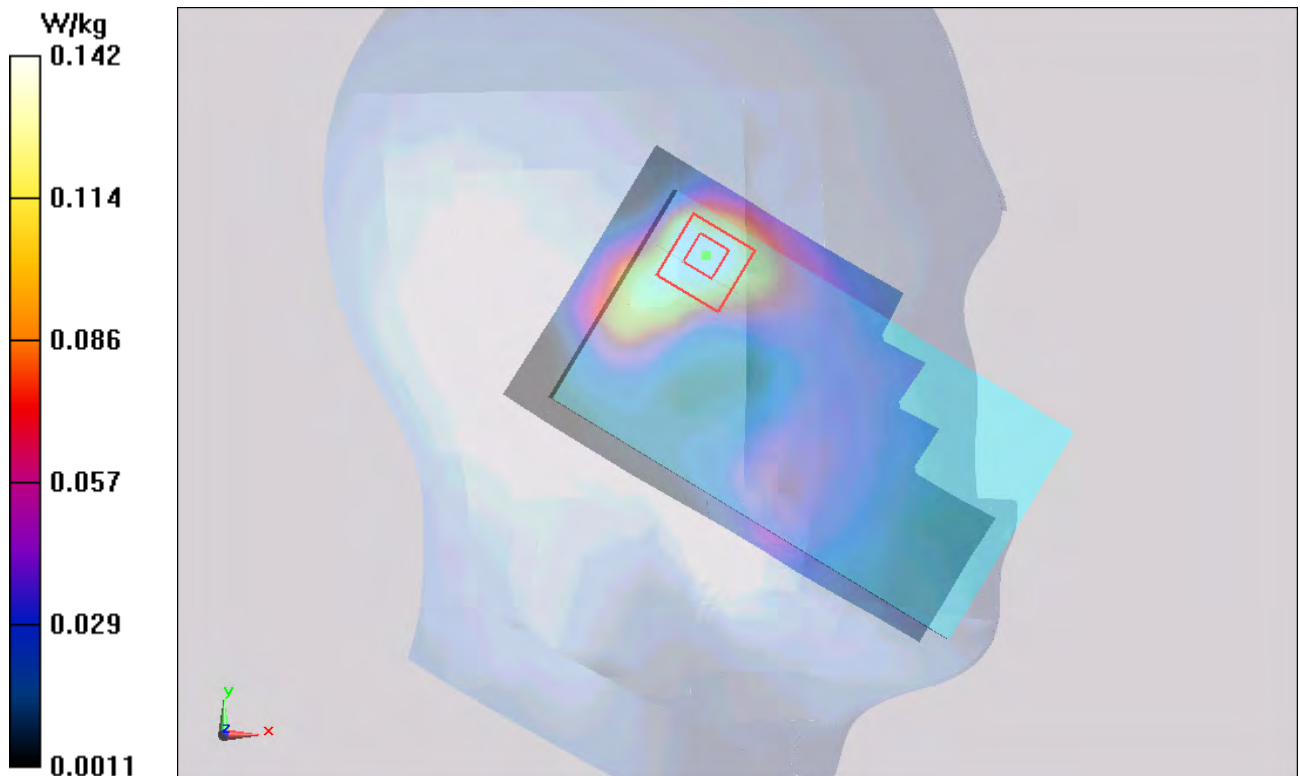


Figure 40 Left Hand Tilt 15° UMTS Band II Channel 9400

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### UMTS Band II Right Cheek Middle (Battery 1)

Date: 11/20/2014

Communication System: UID 0, WCDMA (0); Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.413$  S/m;  $\epsilon_r = 39.689$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Right Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(8.15, 8.15, 8.15); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Right Cheek Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.418 W/kg

**Right Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.558 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 0.576 W/kg

**SAR(1 g) = 0.378 W/kg; SAR(10 g) = 0.229 W/kg**

Maximum value of SAR (measured) = 0.414 W/kg

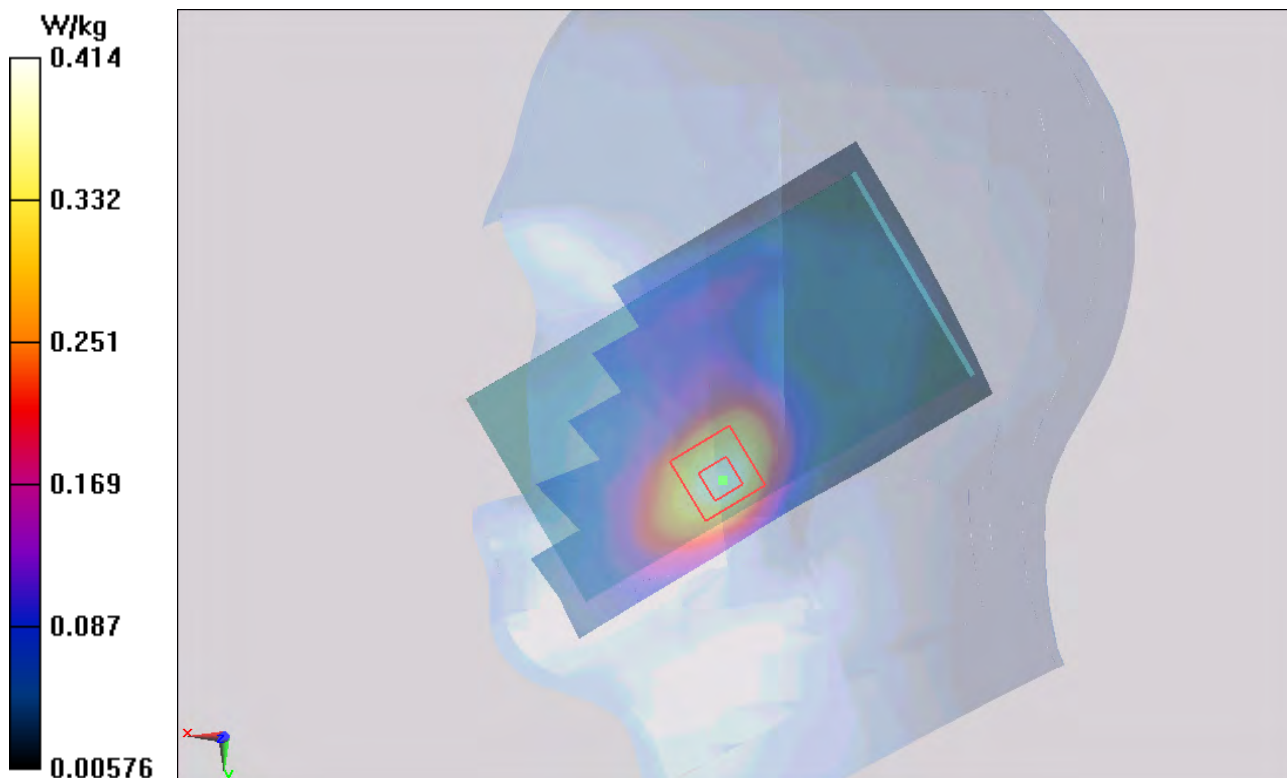


Figure 41 Right Hand Touch Cheek UMTS Band II Channel 9400

### UMTS Band II Right Tilt Middle (Battery 1)

Date: 11/20/2014

Communication System: UID 0, WCDMA (0); Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.413$  S/m;  $\epsilon_r = 39.689$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Right Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(8.15, 8.15, 8.15); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Right Tilt Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.134 W/kg

**Right Tilt Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.442 V/m; Power Drift = -0.17 dB

Peak SAR (extrapolated) = 0.191 W/kg

**SAR(1 g) = 0.119 W/kg; SAR(10 g) = 0.067 W/kg**

Maximum value of SAR (measured) = 0.129 W/kg

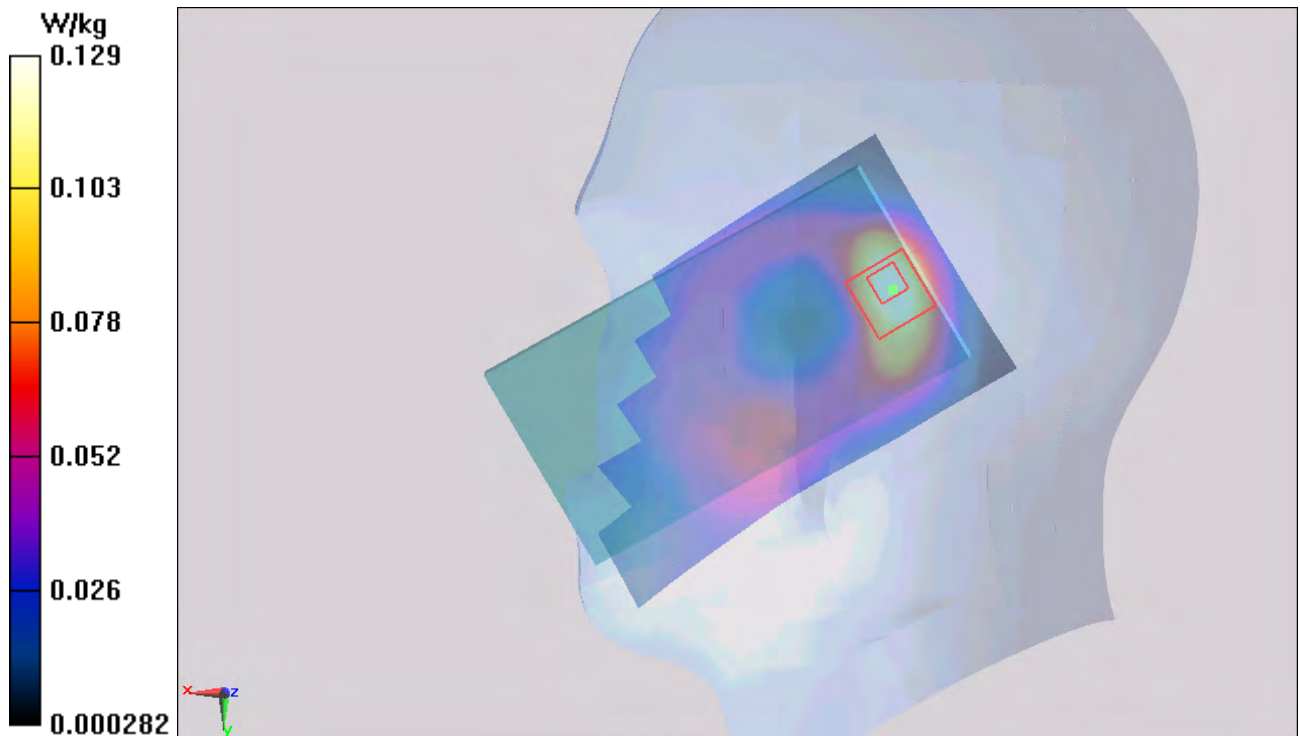


Figure 42 Right Hand Tilt 15° UMTS Band II Channel 9400

### UMTS Band II Right Cheek Middle (Battery 2)

Date: 11/20/2014

Communication System: UID 0, WCDMA (0); Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.413$  S/m;  $\epsilon_r = 39.689$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Right Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(8.15, 8.15, 8.15); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Right Cheek Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.375 W/kg

**Right Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.454 V/m; Power Drift = -0.029 dB

Peak SAR (extrapolated) = 0.503 W/kg

**SAR(1 g) = 0.337 W/kg; SAR(10 g) = 0.209 W/kg**

Maximum value of SAR (measured) = 0.359 W/kg

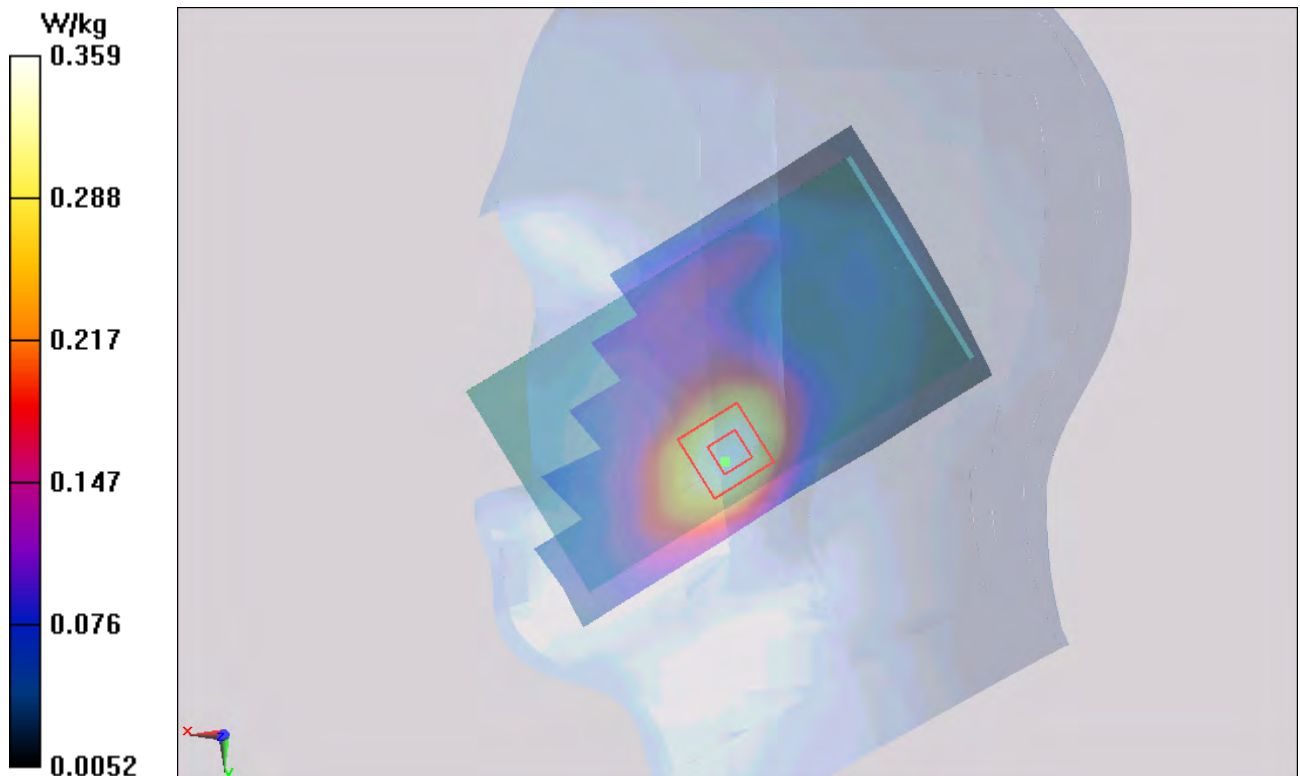


Figure 43 Right Hand Touch Cheek UMTS Band II Channel 9400

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### UMTS Band II Back Side Middle (Battery 1)

Date: 11/16/2014

Communication System: UID 0, WCDMA (0); Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.504$  S/m;  $\epsilon_r = 53.137$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Back Side Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.852 W/kg

**Back Side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 11.423 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 1.20 W/kg

**SAR(1 g) = 0.739 W/kg; SAR(10 g) = 0.418 W/kg**

Maximum value of SAR (measured) = 0.809 W/kg

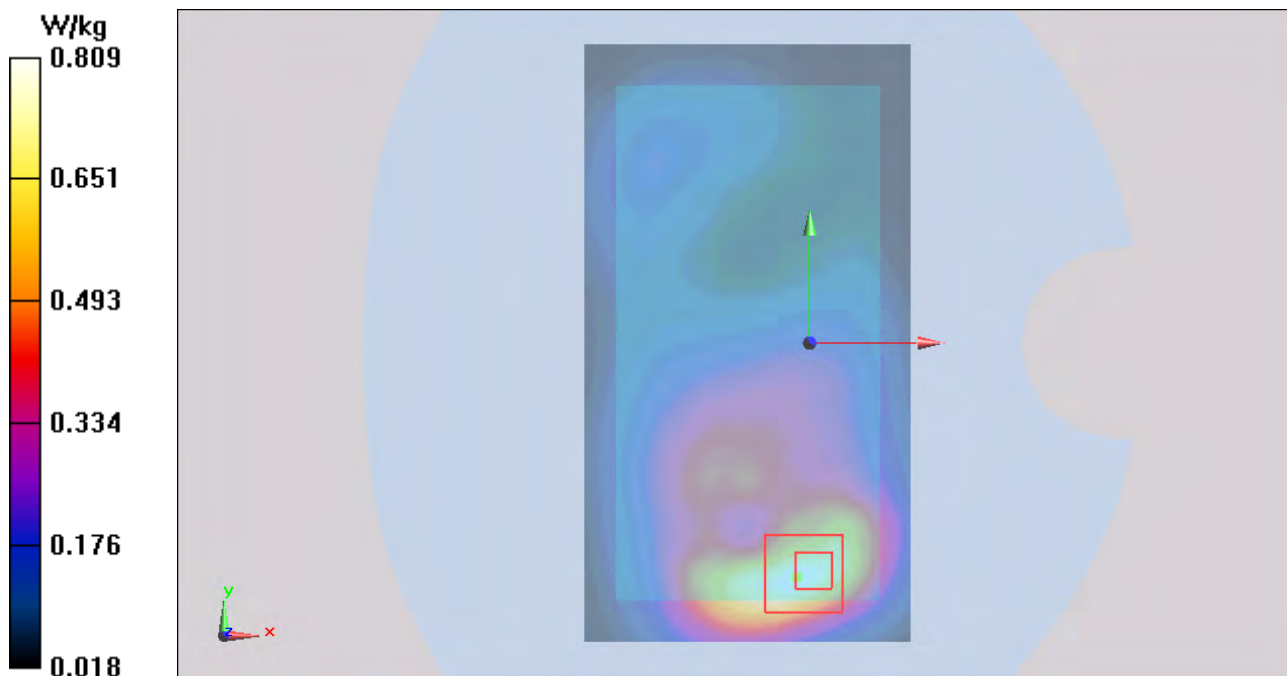


Figure 44 Body, Back Side, UMTS Band II Channel 9400

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### UMTS Band II Front Side Middle (Battery 1)

Date: 11/16/2014

Communication System: UID 0, WCDMA (0); Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.504$  S/m;  $\epsilon_r = 53.137$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Front Side Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.737 W/kg

**Front Side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.803 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 1.08 W/kg

**SAR(1 g) = 0.702 W/kg; SAR(10 g) = 0.400 W/kg**

Maximum value of SAR (measured) = 0.811 W/kg

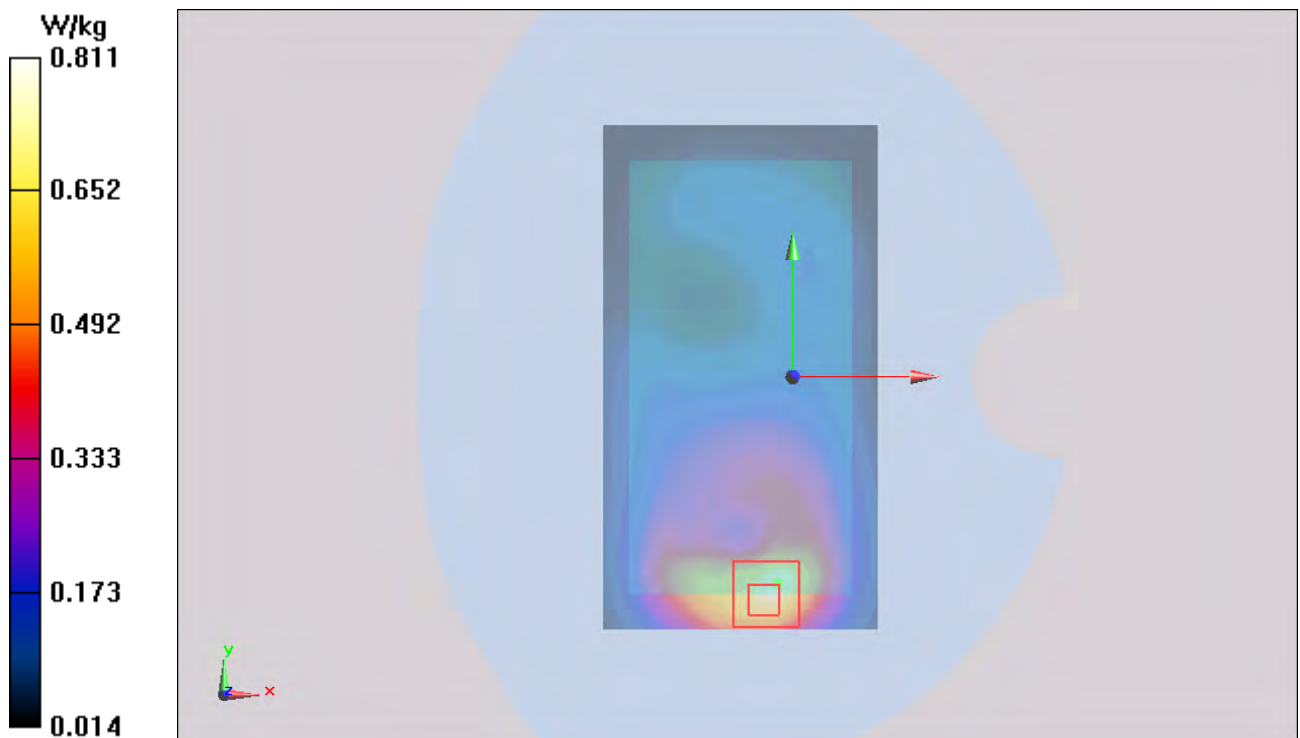


Figure 45 Body, Front Side, UMTS Band II Channel 9400

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### UMTS Band II Left Edge Middle (Battery 1)

Date: 11/16/2014

Communication System: UID 0, WCDMA (0); Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.504$  S/m;  $\epsilon_r = 53.137$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Left Edge Middle/Area Scan (51x171x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.242 W/kg

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

Reference Value = 7.685 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.334 W/kg

**SAR(1 g) = 0.211 W/kg; SAR(10 g) = 0.123 W/kg**

Maximum value of SAR (measured) = 0.211 W/kg

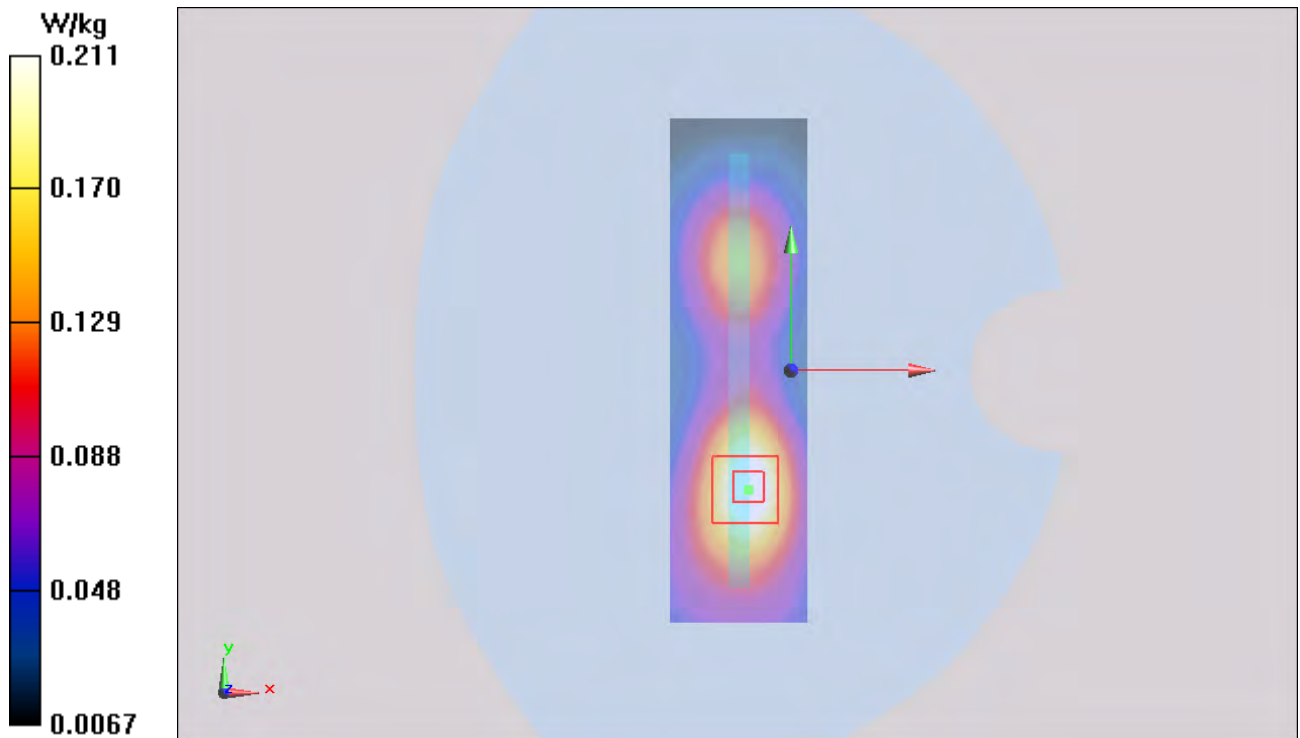


Figure 46 Body, Left Edge, UMTS Band II Channel 9400

# TA Technology (Shanghai) Co., Ltd.

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### UMTS Band II Right Edge Middle (Battery 1)

Date: 11/16/2014

Communication System: UID 0, WCDMA (0); Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.504$  S/m;  $\epsilon_r = 53.137$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Right Edge Middle/Area Scan (51x171x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.211 W/kg

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

Reference Value = 6.229 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.295 W/kg

**SAR(1 g) = 0.193 W/kg; SAR(10 g) = 0.115 W/kg**

Maximum value of SAR (measured) = 0.197 W/kg

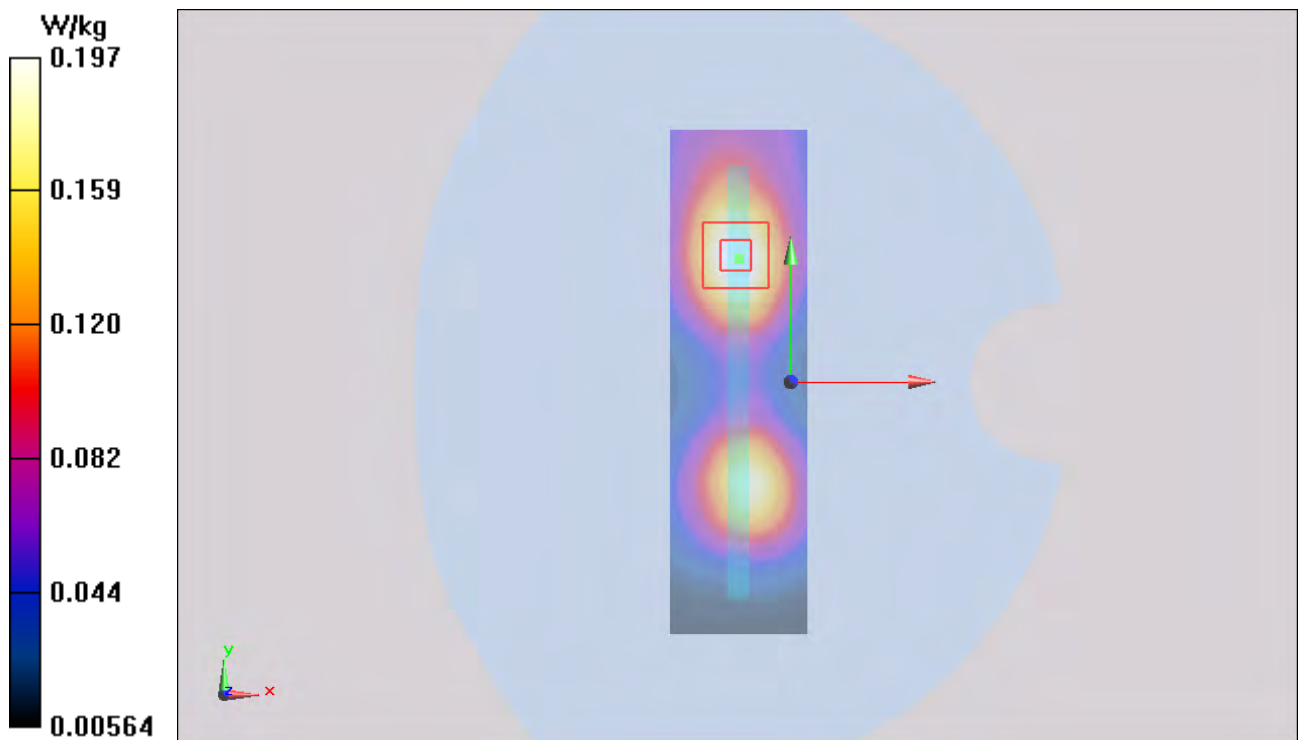


Figure 47 Body, Right Edge, UMTS Band II Channel 9400

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### UMTS Band II Bottom Edge High (Battery 1)

Date: 11/16/2014

Communication System: UID 0, WCDMA (0); Frequency: 1907.6 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1908$  MHz;  $\sigma = 1.532$  S/m;  $\epsilon_r = 53.111$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Bottom Edge High/Area Scan (51x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.04 W/kg

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

Reference Value = 24.837 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 1.54 W/kg

**SAR(1 g) = 0.935 W/kg; SAR(10 g) = 0.494 W/kg**

Maximum value of SAR (measured) = 0.900 W/kg

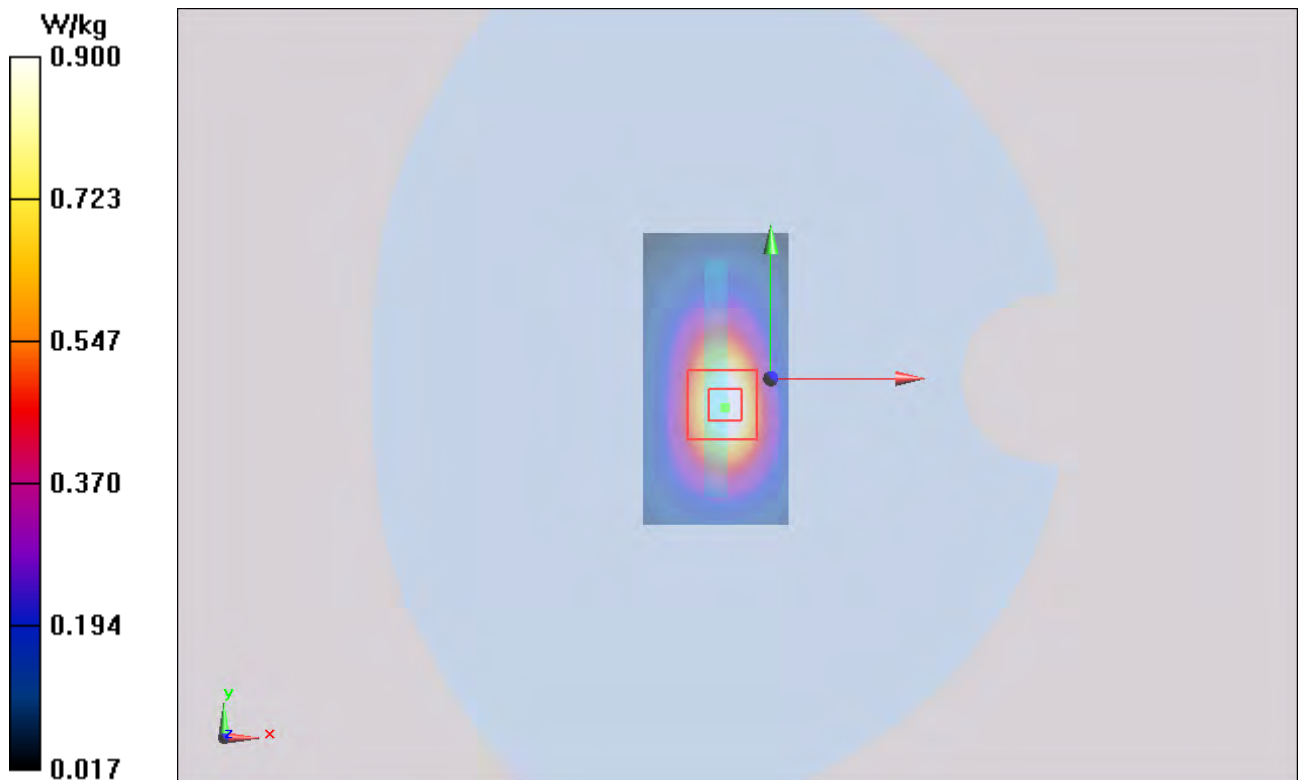


Figure 48 Body, Bottom Edge, UMTS Band II Channel 9538

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### UMTS Band II Bottom Edge Middle (Battery 1)

Date: 11/16/2014

Communication System: UID 0, WCDMA (0); Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.504$  S/m;  $\epsilon_r = 53.137$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Bottom Edge Middle/Area Scan (51x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.18 W/kg

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

Reference Value = 26.952 V/m; Power Drift = -0.020 dB

Peak SAR (extrapolated) = 1.71 W/kg

**SAR(1 g) = 1.05 W/kg; SAR(10 g) = 0.559 W/kg**

Maximum value of SAR (measured) = 1.01 W/kg

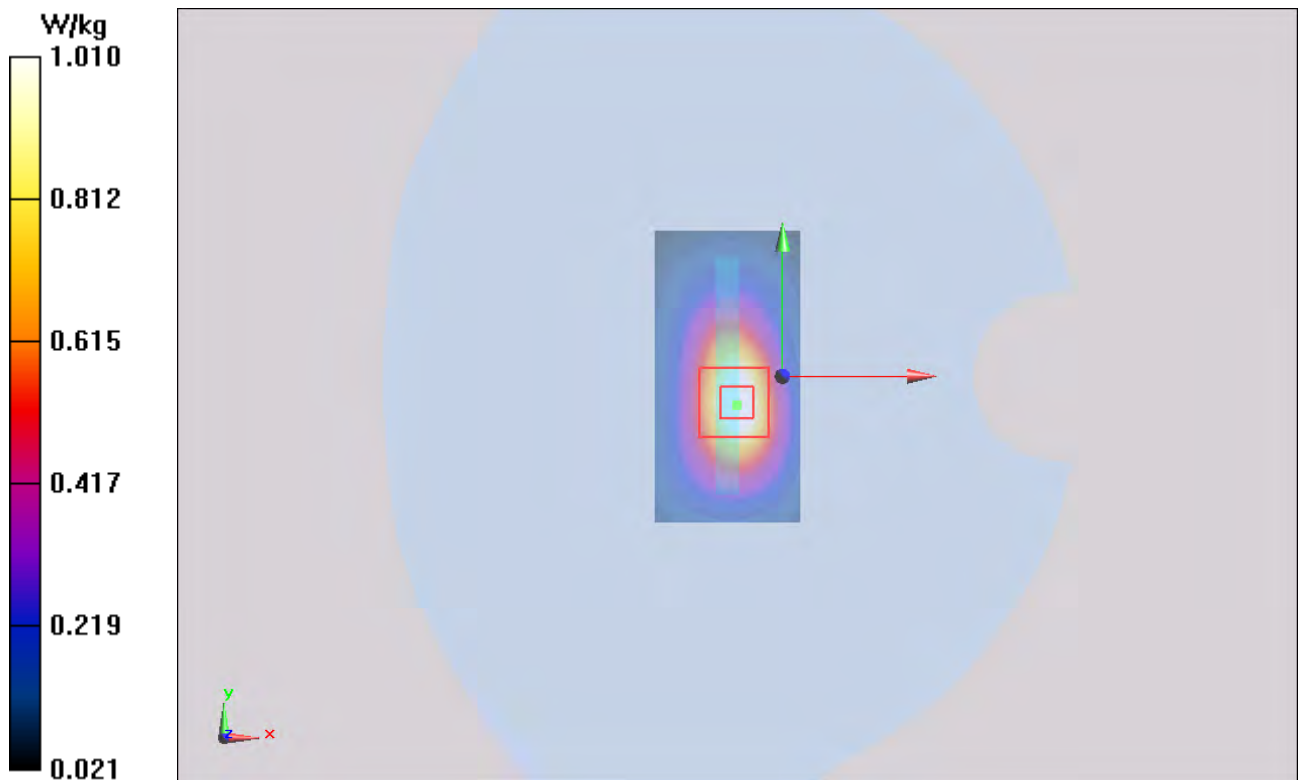


Figure 49 Body, Bottom Edge, UMTS Band II Channel 9400

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### UMTS Band II Bottom Edge Low (Battery 1)

Date: 11/16/2014

Communication System: UID 0, WCDMA (0); Frequency: 1852.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 1852.4$  MHz;  $\sigma = 1.477$  S/m;  $\epsilon_r = 53.168$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Bottom Edge Low/Area Scan (51x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.903 W/kg

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

Reference Value = 23.750 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 1.32 W/kg

**SAR(1 g) = 0.816 W/kg; SAR(10 g) = 0.434 W/kg**

Maximum value of SAR (measured) = 0.758 W/kg

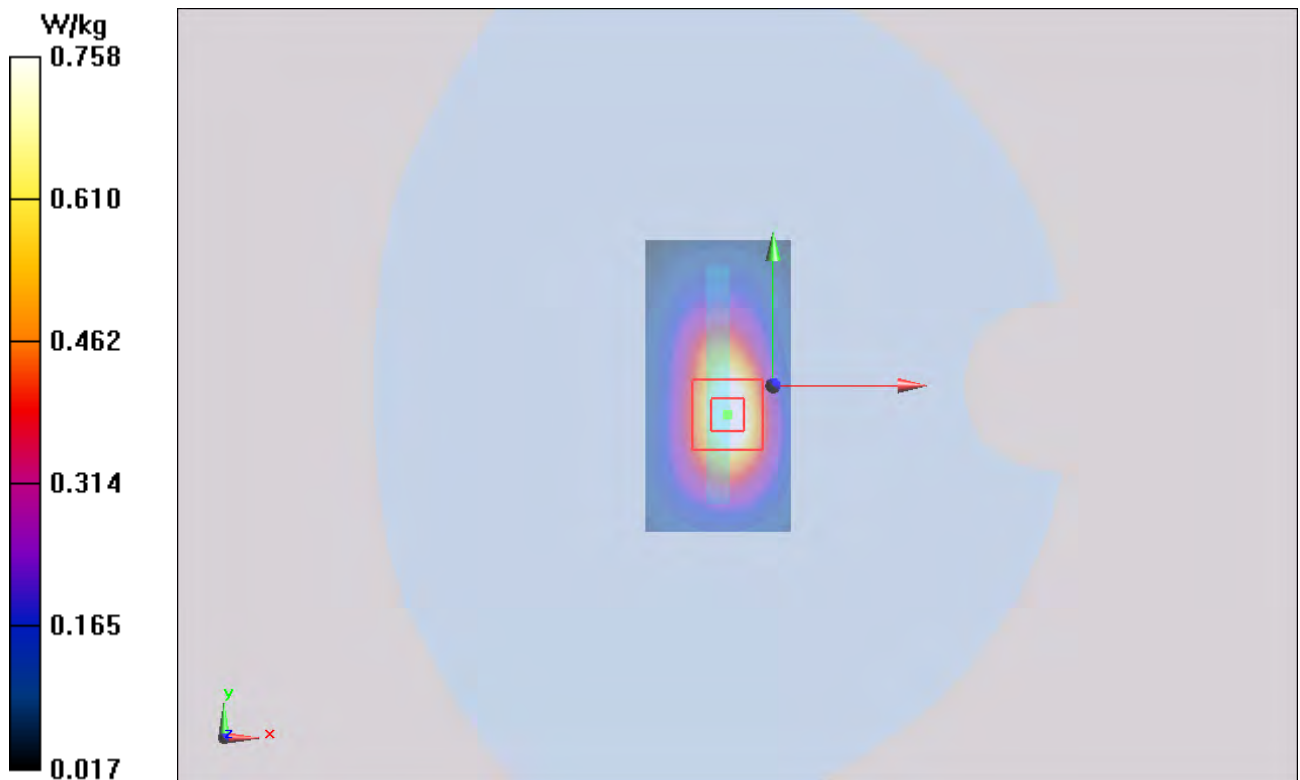


Figure 50 Body, Bottom Edge, UMTS Band II Channel 9262

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### UMTS Band II Bottom Edge High (Battery 2)

Date: 11/16/2014

Communication System: UID 0, WCDMA (0); Frequency: 1907.6 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1908$  MHz;  $\sigma = 1.532$  S/m;  $\epsilon_r = 53.111$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Bottom Edge High/Area Scan (51x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.05 W/kg

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

Reference Value = 25.831 V/m; Power Drift = -0.022 dB

Peak SAR (extrapolated) = 1.48 W/kg

**SAR(1 g) = 0.907 W/kg; SAR(10 g) = 0.481 W/kg**

Maximum value of SAR (measured) = 0.862 W/kg

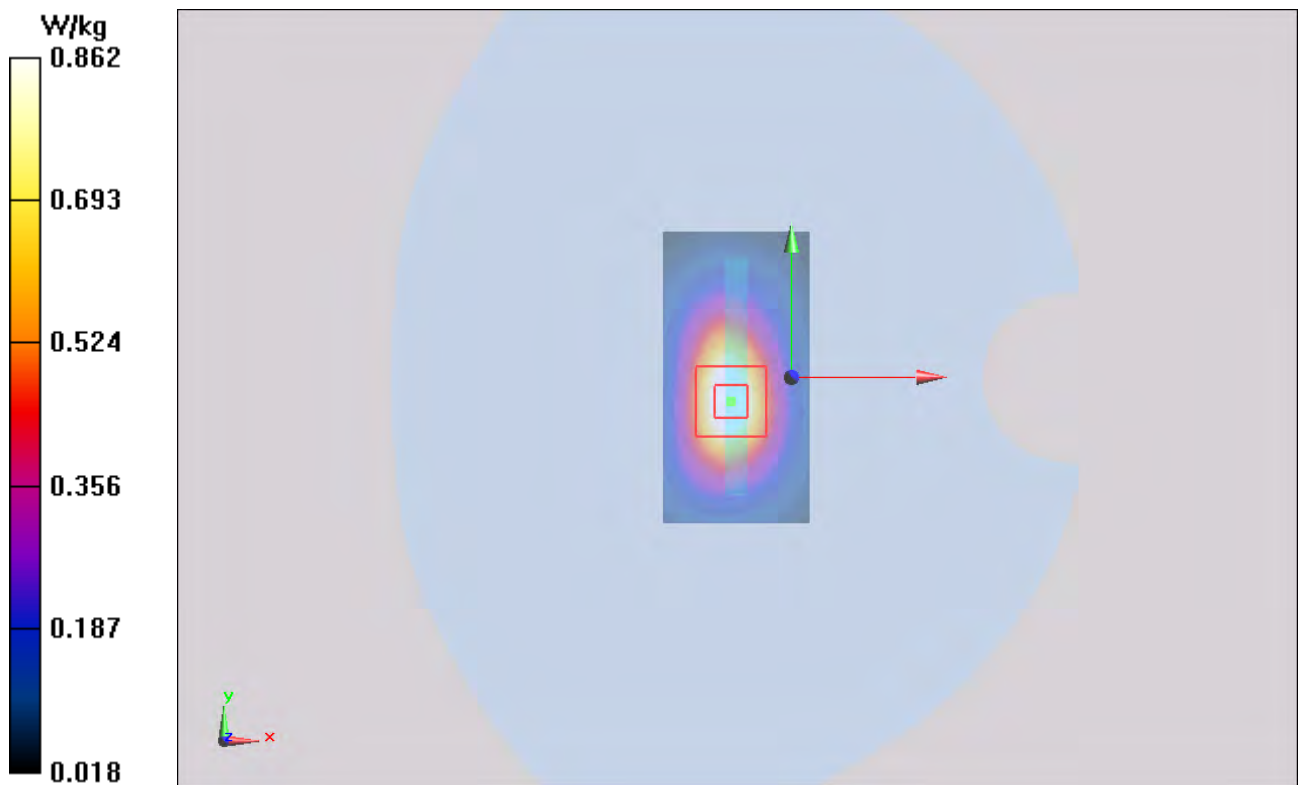


Figure 51 Body, Bottom Edge, UMTS Band II Channel 9538

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### UMTS Band II Bottom Edge High (1<sup>st</sup> repeated SAR)

Date: 11/16/2014

Communication System: UID 0, WCDMA (0); Frequency: 1907.6 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1908$  MHz;  $\sigma = 1.532$  S/m;  $\epsilon_r = 53.111$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(7.63, 7.63, 7.63); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Bottom Edge High/Area Scan (51x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.997 W/kg

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

Reference Value = 24.979 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 1.48 W/kg

**SAR(1 g) = 0.904 W/kg; SAR(10 g) = 0.479 W/kg**

Maximum value of SAR (measured) = 0.856 W/kg

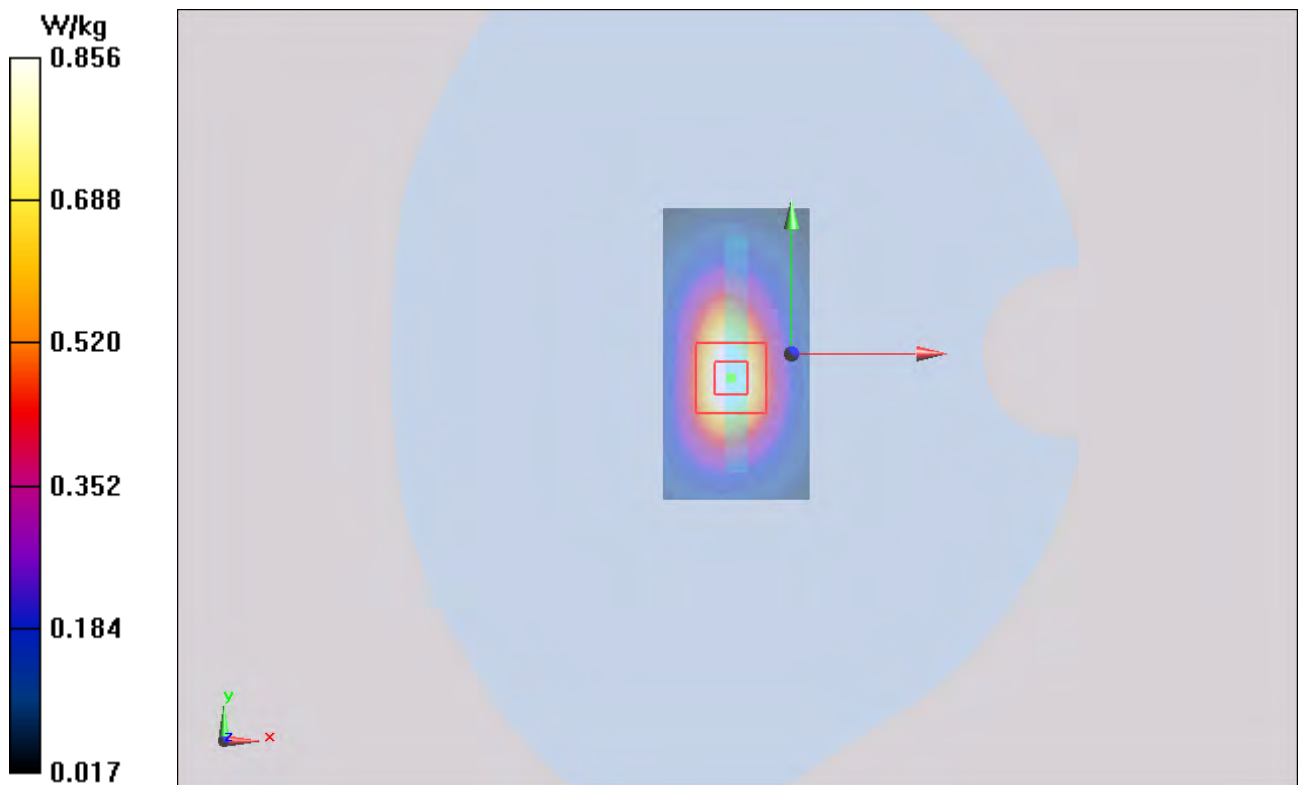


Figure 52 Body, Bottom Edge, UMTS Band II Channel 9538

### UMTS Band V Left Cheek Middle (Battery 1)

Date: 11/20/2014

Communication System: UID 0, WCDMA (0); Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.932$  S/m;  $\epsilon_r = 41.357$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Left Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.41, 9.41, 9.41); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Left Cheek Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.458 W/kg

**Left Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.151 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.519 W/kg

**SAR(1 g) = 0.436 W/kg; SAR(10 g) = 0.336 W/kg**

Maximum value of SAR (measured) = 0.460 W/kg

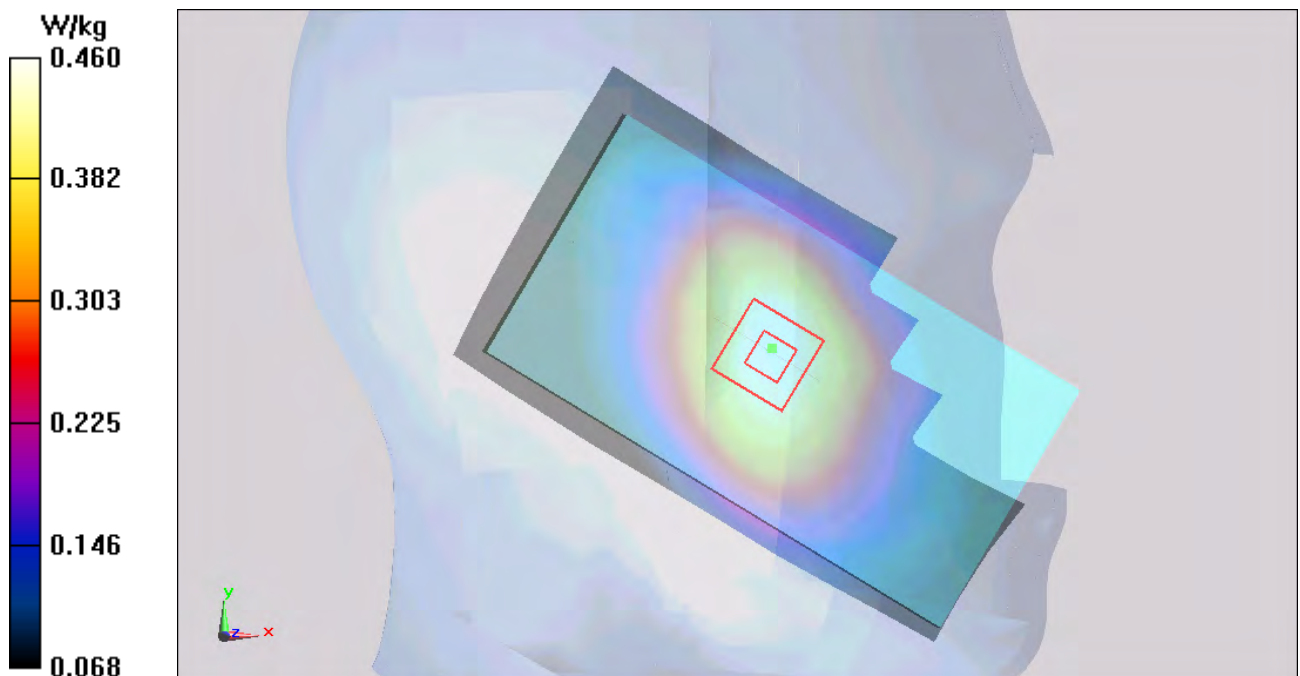


Figure 53 Left Hand Touch Cheek UMTS Band V Channel 4183

### UMTS Band V Left Tilt Middle (Battery 1)

Date: 11/20/2014

Communication System: UID 0, WCDMA (0); Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.932$  S/m;  $\epsilon_r = 41.357$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Left Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.41, 9.41, 9.41); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Left Tilt Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.315 W/kg

**Left Tilt Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 11.867 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 0.367 W/kg

**SAR(1 g) = 0.303 W/kg; SAR(10 g) = 0.235 W/kg**

Maximum value of SAR (measured) = 0.312 W/kg

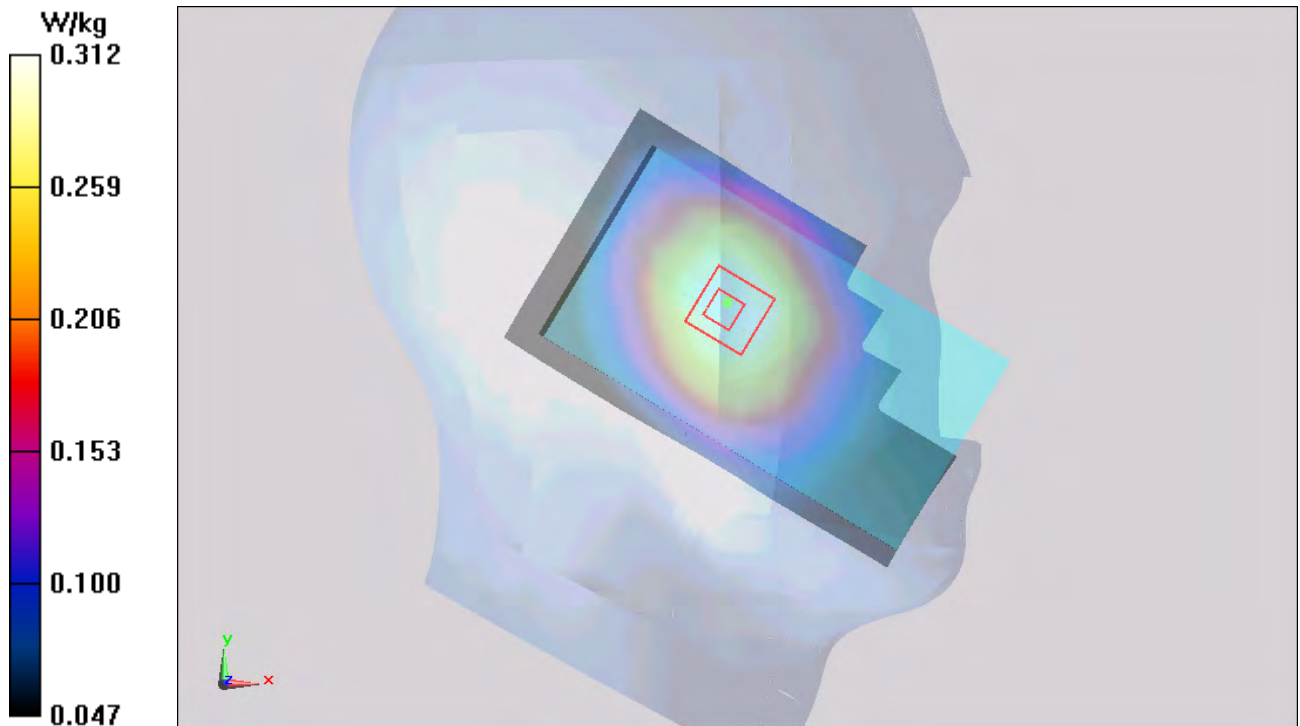


Figure 54 Left Hand Tilt 15° UMTS Band V Channel 4183

### UMTS Band V Right Cheek Middle (Battery 1)

Date: 11/20/2014

Communication System: UID 0, WCDMA (0); Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.932$  S/m;  $\epsilon_r = 41.357$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Right Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.41, 9.41, 9.41); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Right Cheek Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.599 W/kg

**Right Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 8.792 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.674 W/kg

**SAR(1 g) = 0.559 W/kg; SAR(10 g) = 0.434 W/kg**

Maximum value of SAR (measured) = 0.582 W/kg

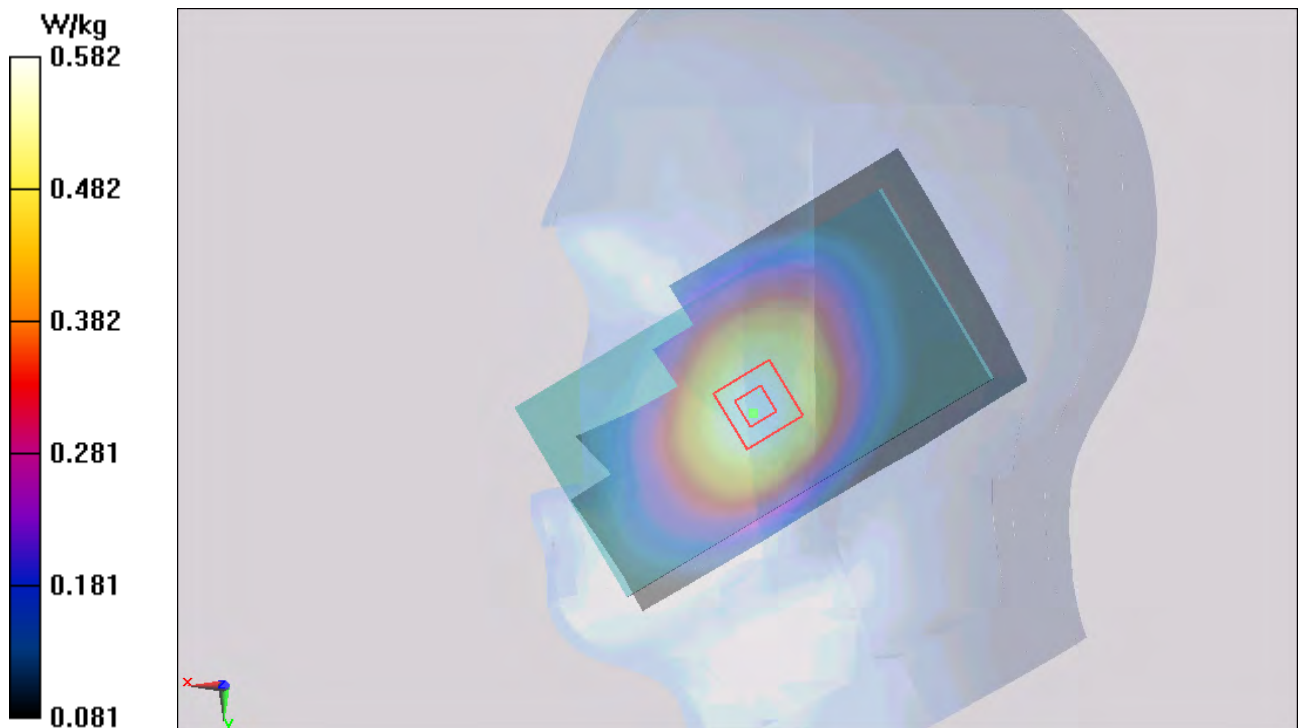


Figure 55 Right Hand Touch Cheek UMTS Band V Channel 4183

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### UMTS Band V Right Tilt Middle (Battery 1)

Date: 11/20/2014

Communication System: UID 0, WCDMA (0); Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.932$  S/m;  $\epsilon_r = 41.357$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Right Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.41, 9.41, 9.41); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Right Tilt Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.359 W/kg

**Right Tilt Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 12.619 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.418 W/kg

**SAR(1 g) = 0.341 W/kg; SAR(10 g) = 0.264 W/kg**

Maximum value of SAR (measured) = 0.352 W/kg

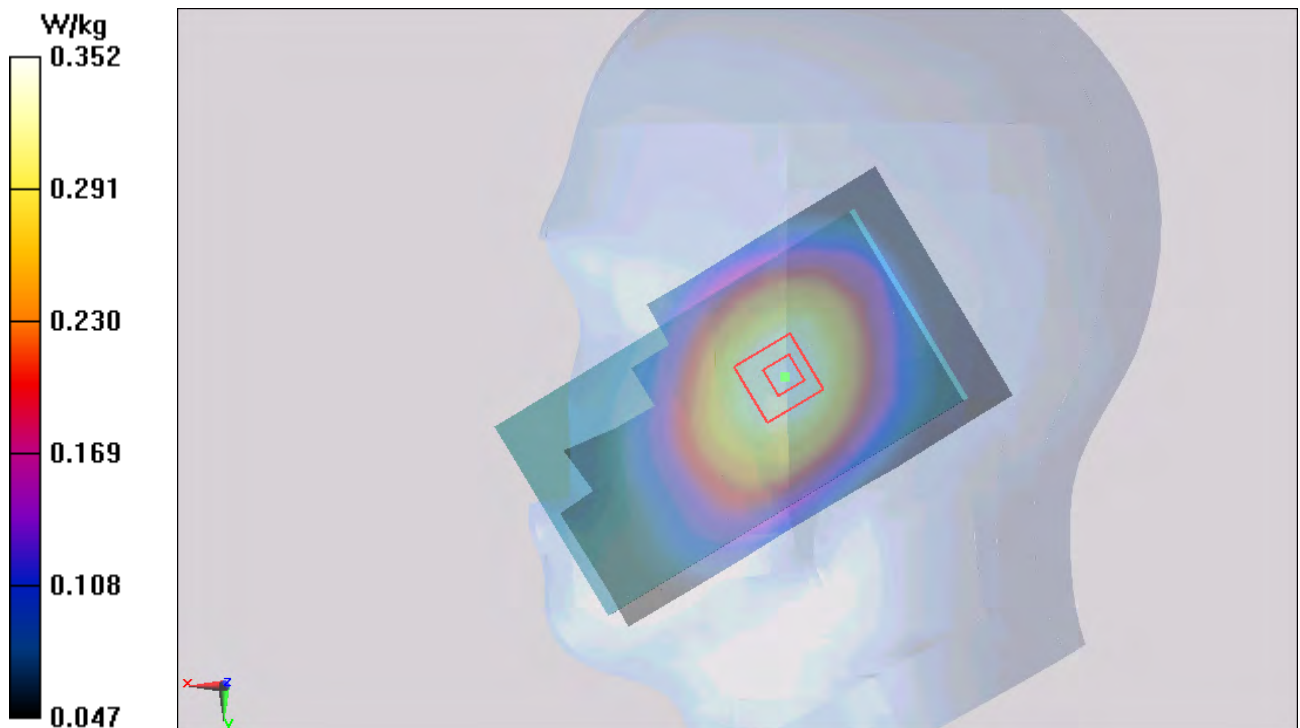


Figure 56 Right Hand Tilt 15° UMTS Band V Channel 4183

### UMTS Band V Right Cheek Middle (Battery 2)

Date: 11/20/2014

Communication System: UID 0, WCDMA (0); Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.932$  S/m;  $\epsilon_r = 41.357$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Right Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.41, 9.41, 9.41); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Right Cheek Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.577 W/kg

**Right Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 8.859 V/m; Power Drift = -0.045 dB

Peak SAR (extrapolated) = 0.660 W/kg

**SAR(1 g) = 0.548 W/kg; SAR(10 g) = 0.425 W/kg**

Maximum value of SAR (measured) = 0.569 W/kg

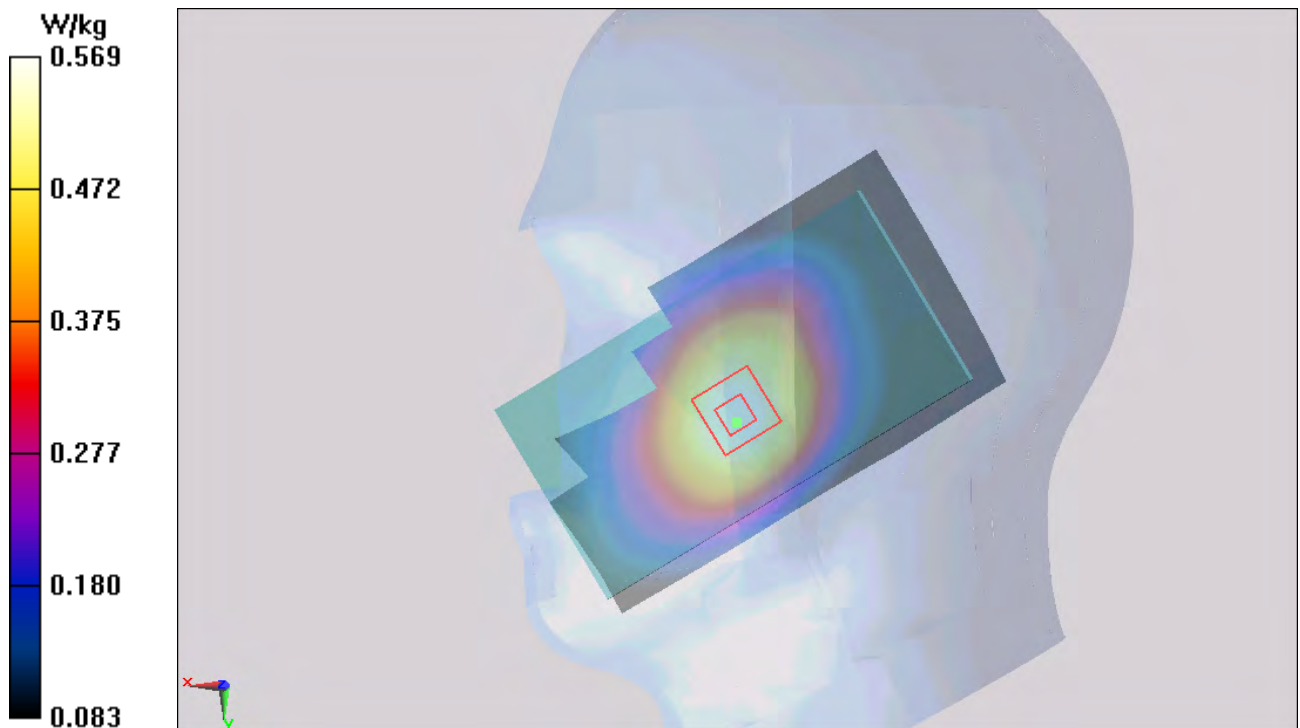


Figure 57 Right Touch Cheek UMTS Band V Channel 4183

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### UMTS Band V Back Side High (Battery 1)

Date: 11/18/2014

Communication System: UID 0, WCDMA (0); Frequency: 846.6 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 847$  MHz;  $\sigma = 1.004$  S/m;  $\epsilon_r = 55.772$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.51, 9.51, 9.51); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Back Side High/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.907 W/kg

**Back Side High/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 30.119 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 1.08 W/kg

**SAR(1 g) = 0.870 W/kg; SAR(10 g) = 0.663 W/kg**

Maximum value of SAR (measured) = 0.903 W/kg

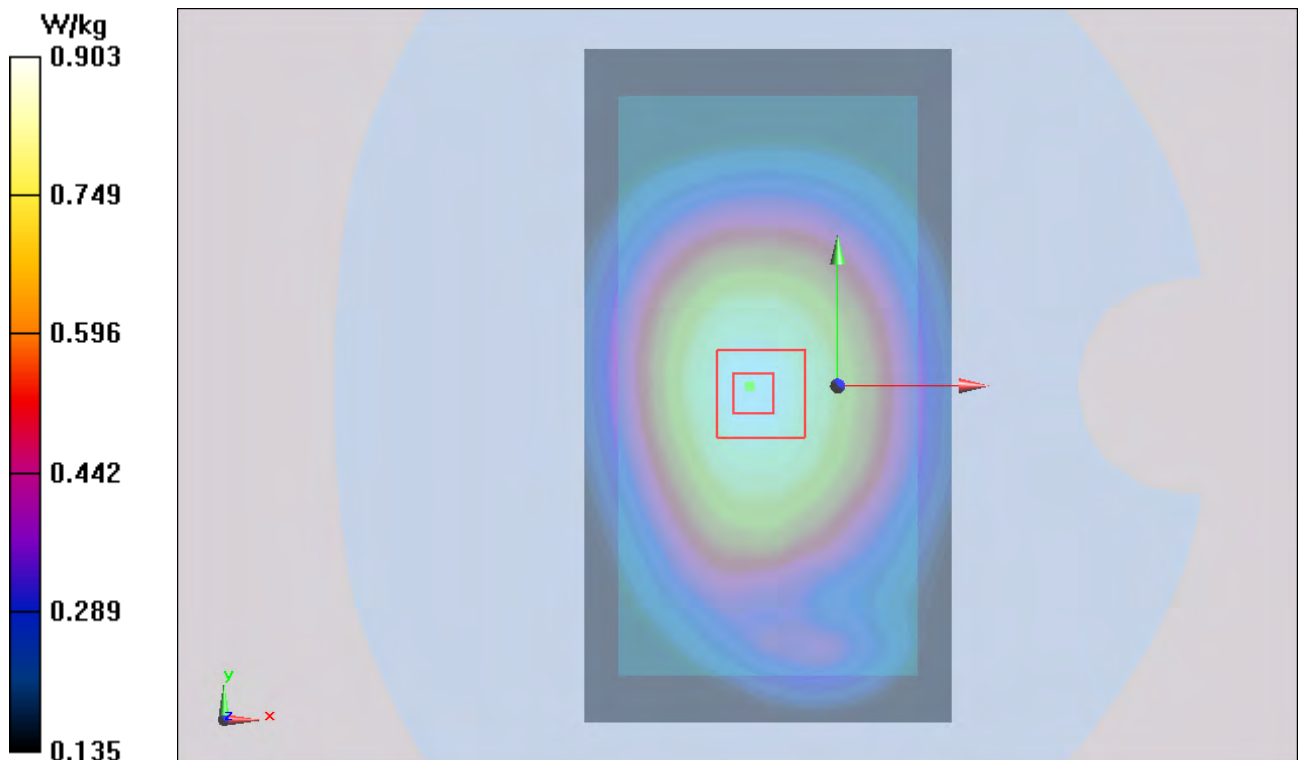


Figure 58 Body, Back Side, UMTS Band V Channel 4233

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### UMTS Band V Back Side Middle (Battery 1)

Date: 11/18/2014

Communication System: UID 0, WCDMA (0); Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.992$  S/m;  $\epsilon_r = 55.882$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.51, 9.51, 9.51); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Back Side Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.844 W/kg

**Back Side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 28.926 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 1.00 W/kg

**SAR(1 g) = 0.811 W/kg; SAR(10 g) = 0.619 W/kg**

Maximum value of SAR (measured) = 0.848 W/kg

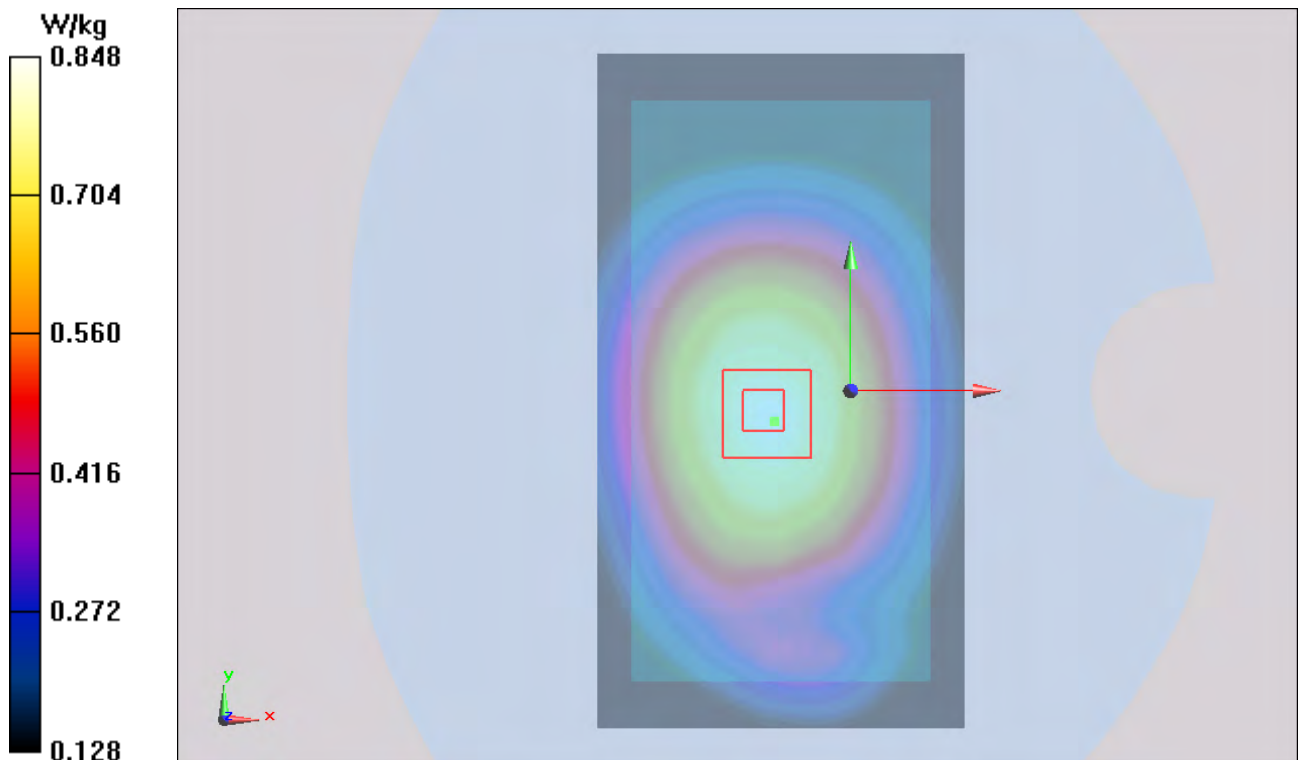


Figure 59 Body, Back Side, UMTS Band V Channel 4183

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### UMTS Band V Back Side Low (Battery 1)

Date: 11/18/2014

Communication System: UID 0, WCDMA (0); Frequency: 826.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 826.4$  MHz;  $\sigma = 0.98$  S/m;  $\epsilon_r = 55.933$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.51, 9.51, 9.51); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Back Side Low/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.882 W/kg

**Back Side Low/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 29.868 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 1.04 W/kg

**SAR(1 g) = 0.839 W/kg; SAR(10 g) = 0.641 W/kg**

Maximum value of SAR (measured) = 0.864 W/kg

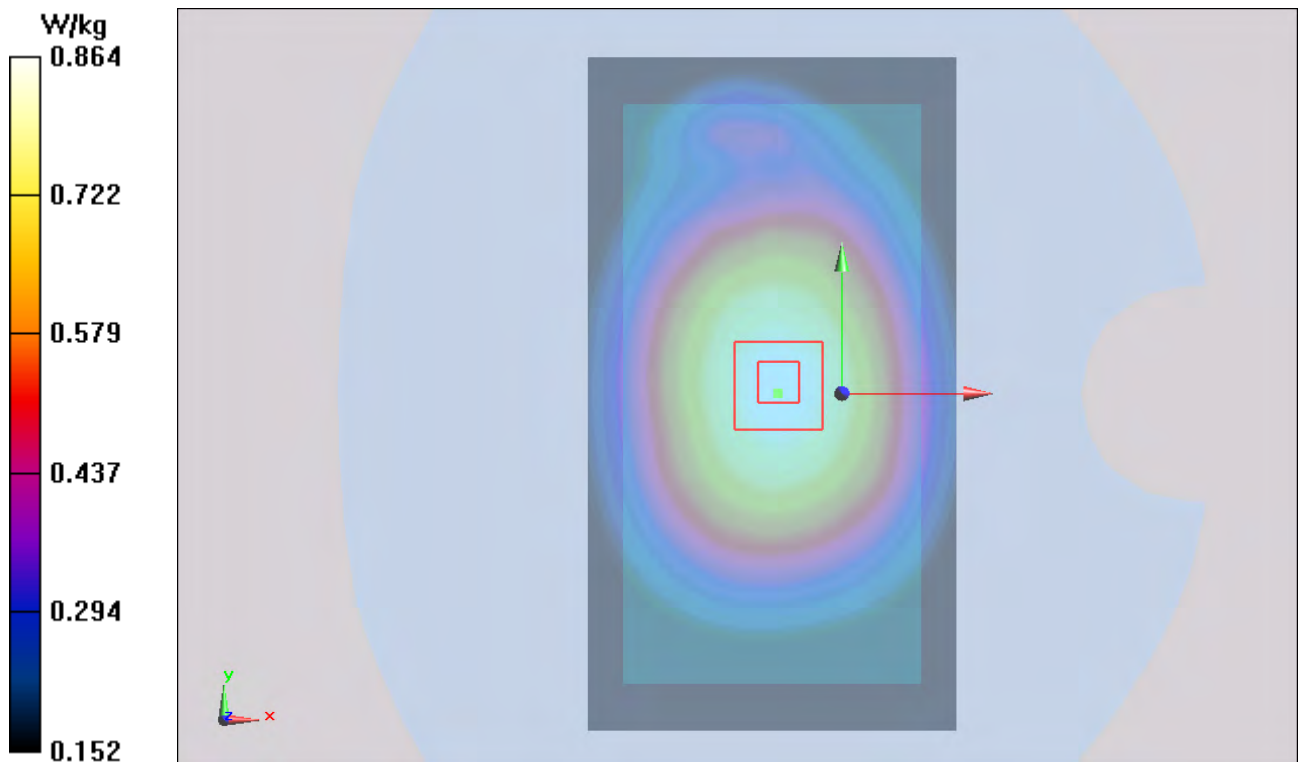


Figure 60 Body, Back Side, UMTS Band V Channel 4132

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### UMTS Band V Front Side Middle (Battery 1)

Date: 11/18/2014

Communication System: UID 0, WCDMA (0); Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.992$  S/m;  $\epsilon_r = 55.882$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.51, 9.51, 9.51); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Front Side Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.659 W/kg

**Front Side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 25.732 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 0.772 W/kg

**SAR(1 g) = 0.630 W/kg; SAR(10 g) = 0.488 W/kg**

Maximum value of SAR (measured) = 0.652 W/kg

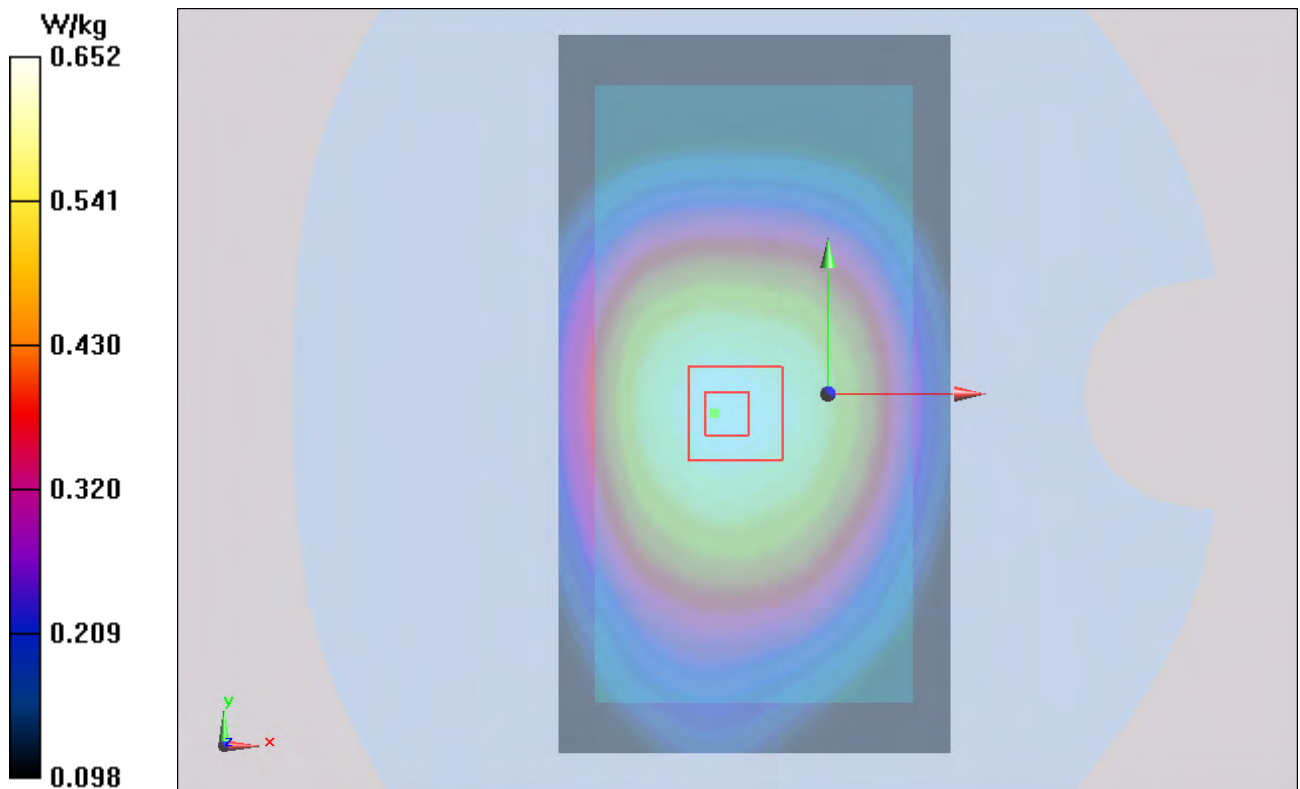


Figure 61 Body, Front Side, UMTS Band V Channel 4183

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### UMTS Band V Left Edge Middle (Battery 1)

Date: 11/18/2014

Communication System: UID 0, WCDMA (0); Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.992$  S/m;  $\epsilon_r = 55.882$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.51, 9.51, 9.51); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Left Edge Middle/Area Scan (51x171x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.359 W/kg

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

Reference Value = 18.570 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.476 W/kg

**SAR(1 g) = 0.346 W/kg; SAR(10 g) = 0.238 W/kg**

Maximum value of SAR (measured) = 0.356 W/kg

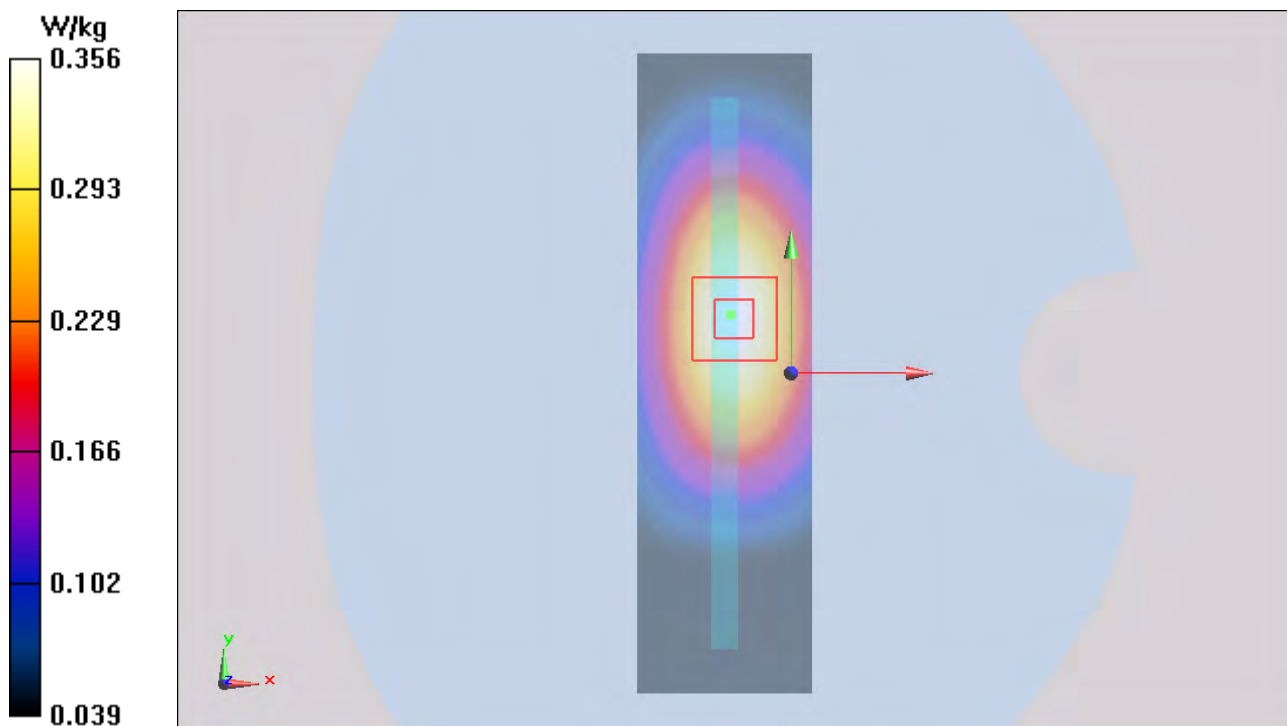


Figure 62 Body, Left Edge, UMTS Band V Channel 4183

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### UMTS Band V Right Edge Middle (Battery 1)

Date: 11/18/2014

Communication System: UID 0, WCDMA (0); Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.992$  S/m;  $\epsilon_r = 55.882$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.51, 9.51, 9.51); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Right Edge Middle/Area Scan (51x171x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.307 W/kg

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

Reference Value = 17.796 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 0.401 W/kg

**SAR(1 g) = 0.292 W/kg; SAR(10 g) = 0.203 W/kg**

Maximum value of SAR (measured) = 0.301 W/kg

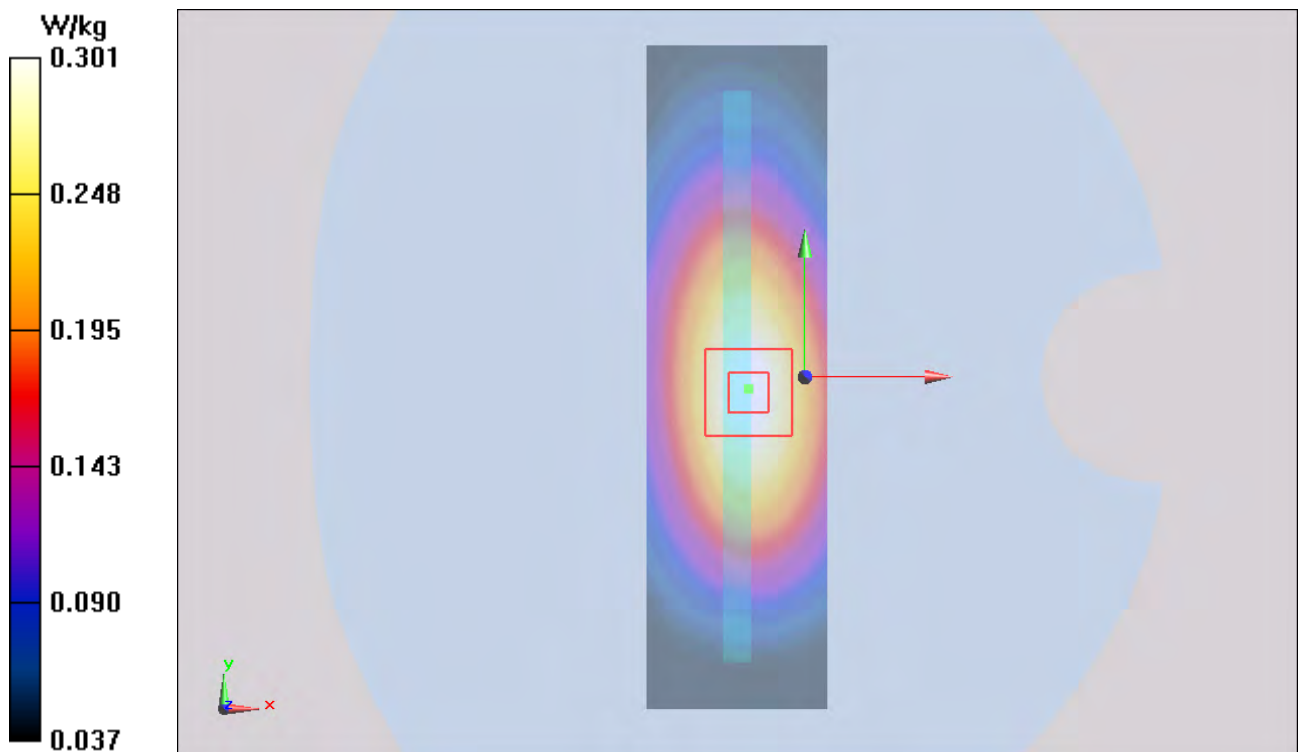


Figure 63 Body, Right Edge, UMTS Band V Channel 4183

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### UMTS Band V Bottom Edge Middle (Battery 1)

Date: 11/18/2014

Communication System: UID 0, WCDMA (0); Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.992$  S/m;  $\epsilon_r = 55.882$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.51, 9.51, 9.51); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Bottom Edge Middle/Area Scan (51x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.153 W/kg

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

Reference Value = 12.243 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.251 W/kg

**SAR(1 g) = 0.137 W/kg; SAR(10 g) = 0.078 W/kg**

Maximum value of SAR (measured) = 0.146 W/kg

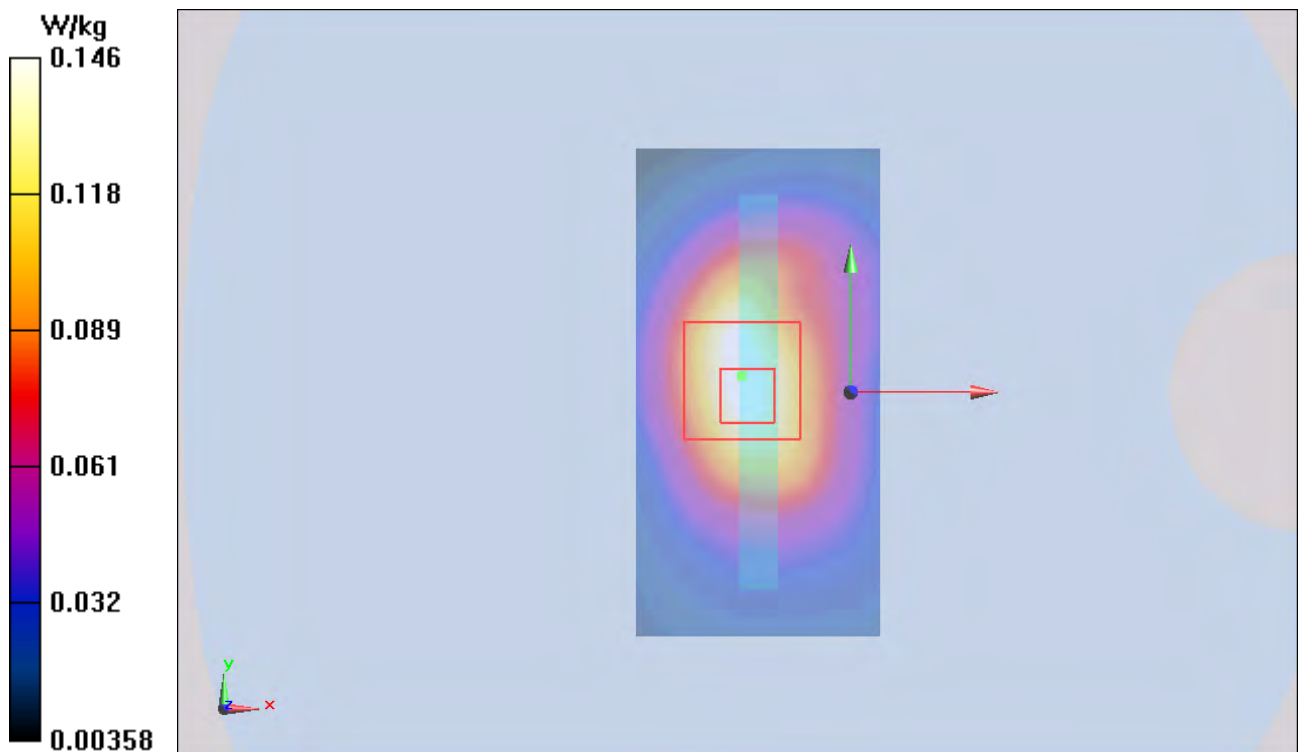


Figure 64 Body, Bottom Edge, UMTS Band V Channel 4183

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### UMTS Band V Back Side High (Battery 2)

Date: 11/18/2014

Communication System: UID 0, WCDMA (0); Frequency: 846.6 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 847$  MHz;  $\sigma = 1.004$  S/m;  $\epsilon_r = 55.772$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.51, 9.51, 9.51); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Back Side High/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.913 W/kg

**Back Side High/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 30.108 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 1.10 W/kg

**SAR(1 g) = 0.885 W/kg; SAR(10 g) = 0.674 W/kg**

Maximum value of SAR (measured) = 0.916 W/kg

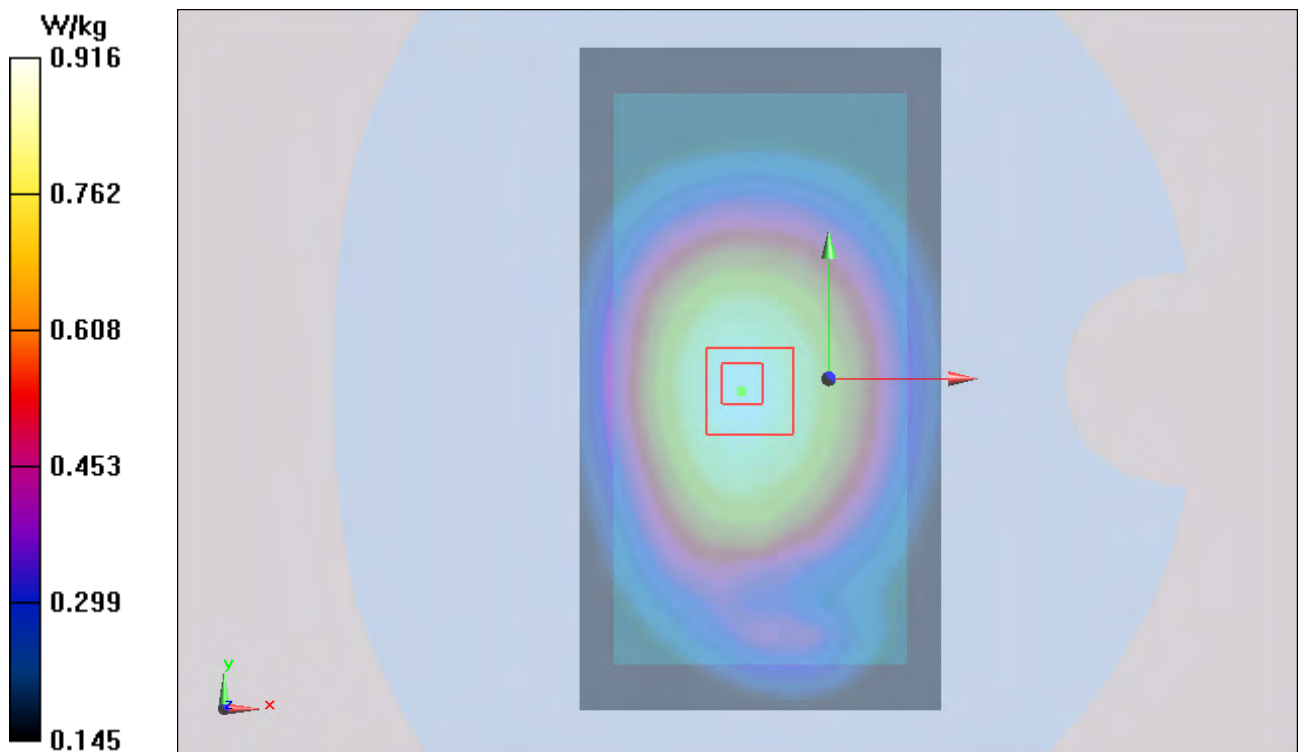


Figure 65 Body, Back Side, UMTS Band V Channel 4233

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### UMTS Band V Back Side High (1<sup>st</sup> Repeated SAR)

Date: 11/18/2014

Communication System: UID 0, WCDMA (0); Frequency: 846.6 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 847$  MHz;  $\sigma = 1.004$  S/m;  $\epsilon_r = 55.772$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(9.51, 9.51, 9.51); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Back Side High/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.930 W/kg

**Back Side High/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 29.748 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 1.11 W/kg

**SAR(1 g) = 0.885 W/kg; SAR(10 g) = 0.672 W/kg**

Maximum value of SAR (measured) = 0.915 W/kg

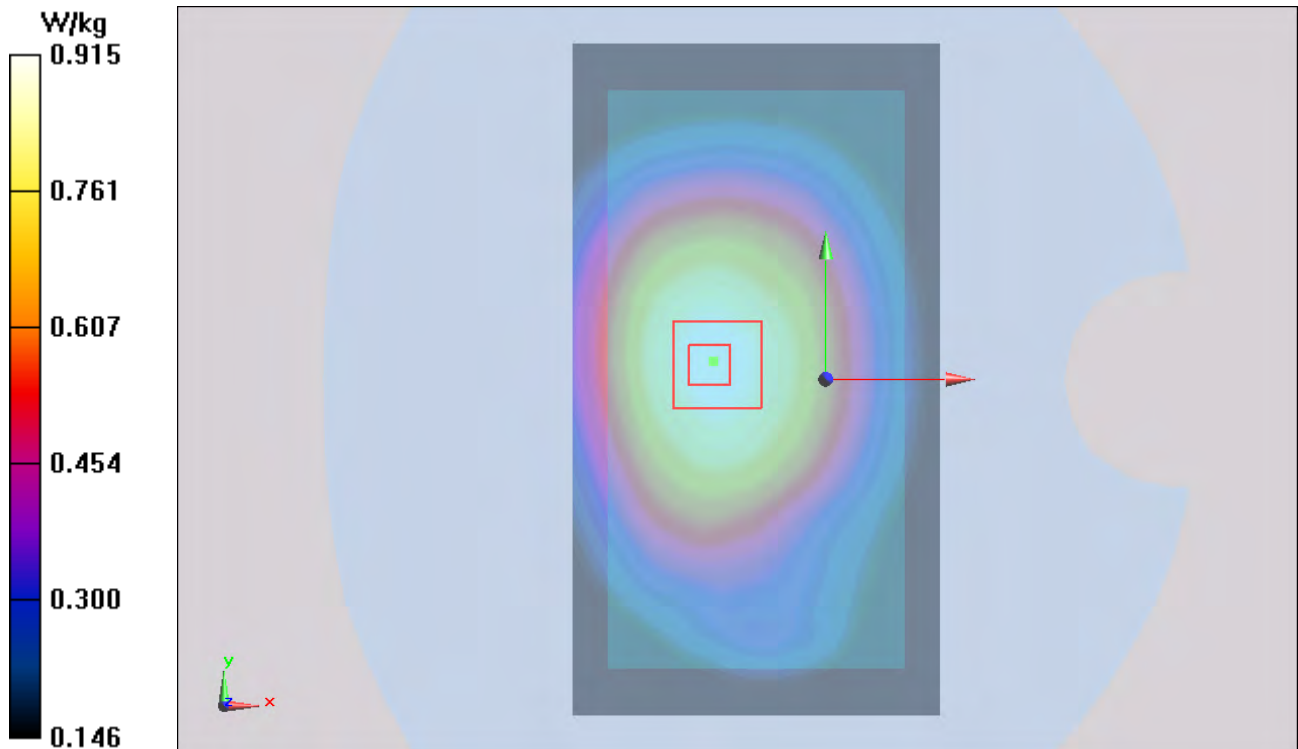


Figure 66 Body, Back Side, UMTS Band V Channel 4233

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**802.11b Left Cheek High (Battery 1)**

Date: 11/4/2014

Communication System: UID 0, 802.11b (0); Frequency: 2462 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2462 \text{ MHz}$ ;  $\sigma = 1.824 \text{ S/m}$ ;  $\epsilon_r = 38.584$ ;  $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature:  $22.3^\circ\text{C}$       Liquid Temperature:  $21.5^\circ\text{C}$

Phantom section: Left Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.64, 7.64, 7.64); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Left Cheek High/Area Scan (81x141x1):** Interpolated grid:  $dx=1.200 \text{ mm}$ ,  $dy=1.200 \text{ mm}$

Maximum value of SAR (interpolated) =  $0.332 \text{ W/kg}$

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

Reference Value =  $7.962 \text{ V/m}$ ; Power Drift =  $0.030 \text{ dB}$

Peak SAR (extrapolated) =  $0.628 \text{ W/kg}$

**SAR(1 g) =  $0.286 \text{ W/kg}$ ; SAR(10 g) =  $0.138 \text{ W/kg}$**

Maximum value of SAR (measured) =  $0.294 \text{ W/kg}$

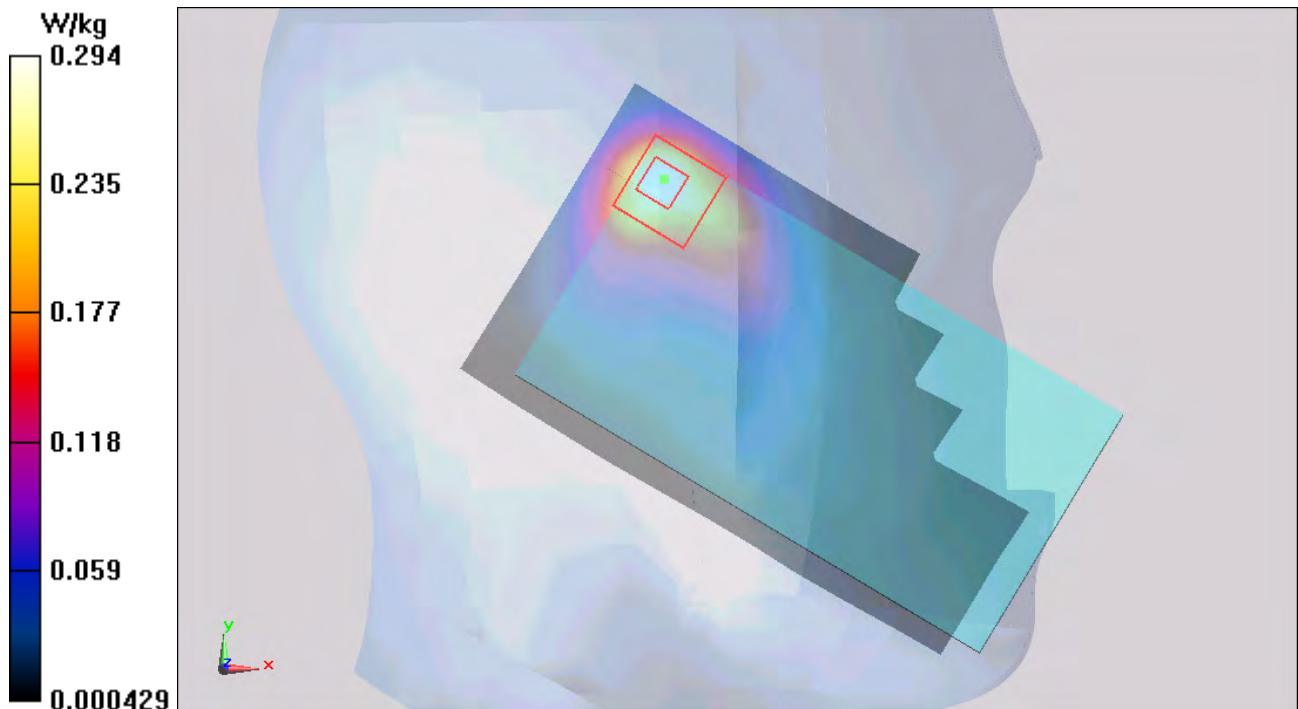


Figure 67 Left Hand Touch Cheek 802.11b Channel 11

### 802.11b Left Tilt High (Battery 1)

Date: 11/4/2014

Communication System: UID 0, 802.11b (0); Frequency: 2462 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2462$  MHz;  $\sigma = 1.824$  S/m;  $\epsilon_r = 38.584$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Left Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.64, 7.64, 7.64); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Left Tilt High/Area Scan (81x141x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.285 W/kg

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

Reference Value = 8.351 V/m; Power Drift = 0.120 dB

Peak SAR (extrapolated) = 0.604 W/kg

**SAR(1 g) = 0.260 W/kg; SAR(10 g) = 0.116 W/kg**

Maximum value of SAR (measured) = 0.271 W/kg

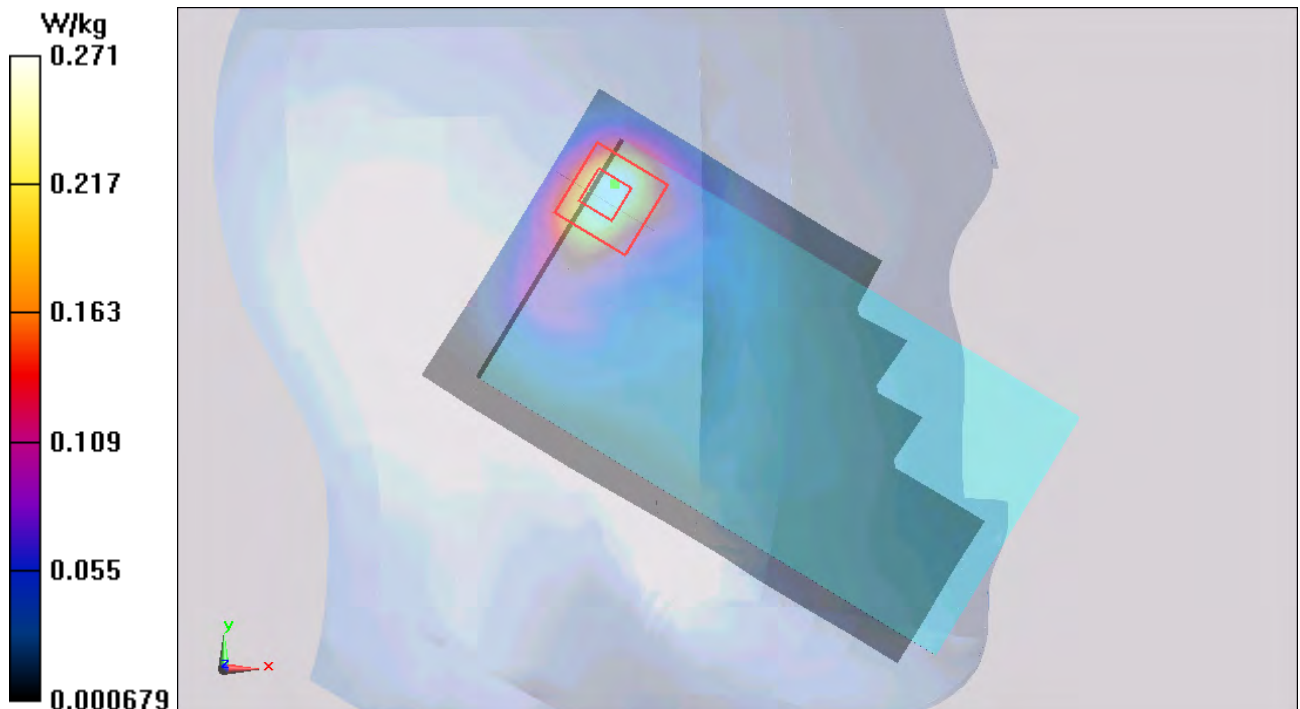


Figure 68 Left Hand Tilt 15° 802.11b Channel 11

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### 802.11b Right Cheek High (Battery 1)

Date: 11/4/2014

Communication System: UID 0, 802.11b (0); Frequency: 2462 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2462$  MHz;  $\sigma = 1.824$  S/m;  $\epsilon_r = 38.584$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Right Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.64, 7.64, 7.64); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Right Cheek High/Area Scan (81x141x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.169 W/kg

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

Reference Value = 8.091 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 0.311 W/kg

**SAR(1 g) = 0.152 W/kg; SAR(10 g) = 0.076 W/kg**

Maximum value of SAR (measured) = 0.161 W/kg

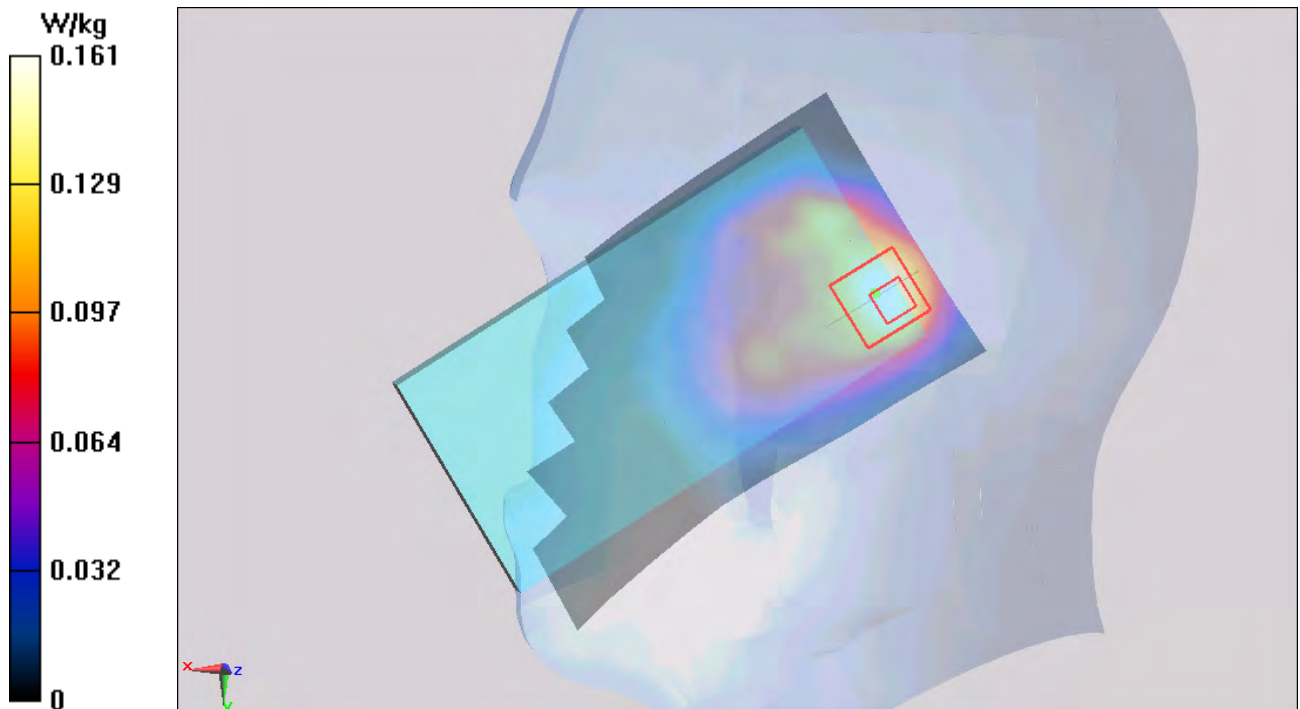


Figure 69 Right Hand Touch Cheek 802.11b Channel 11

### 802.11b Right Tilt High (Battery 1)

Date: 11/4/2014

Communication System: UID 0, 802.11b (0); Frequency: 2462 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2462$  MHz;  $\sigma = 1.824$  S/m;  $\epsilon_r = 38.584$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Right Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.64, 7.64, 7.64); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Right Tilt High/Area Scan (81x141x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.137 W/kg

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

Reference Value = 8.357 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 0.210 W/kg

**SAR(1 g) = 0.113 W/kg; SAR(10 g) = 0.055 W/kg**

Maximum value of SAR (measured) = 0.130 W/kg

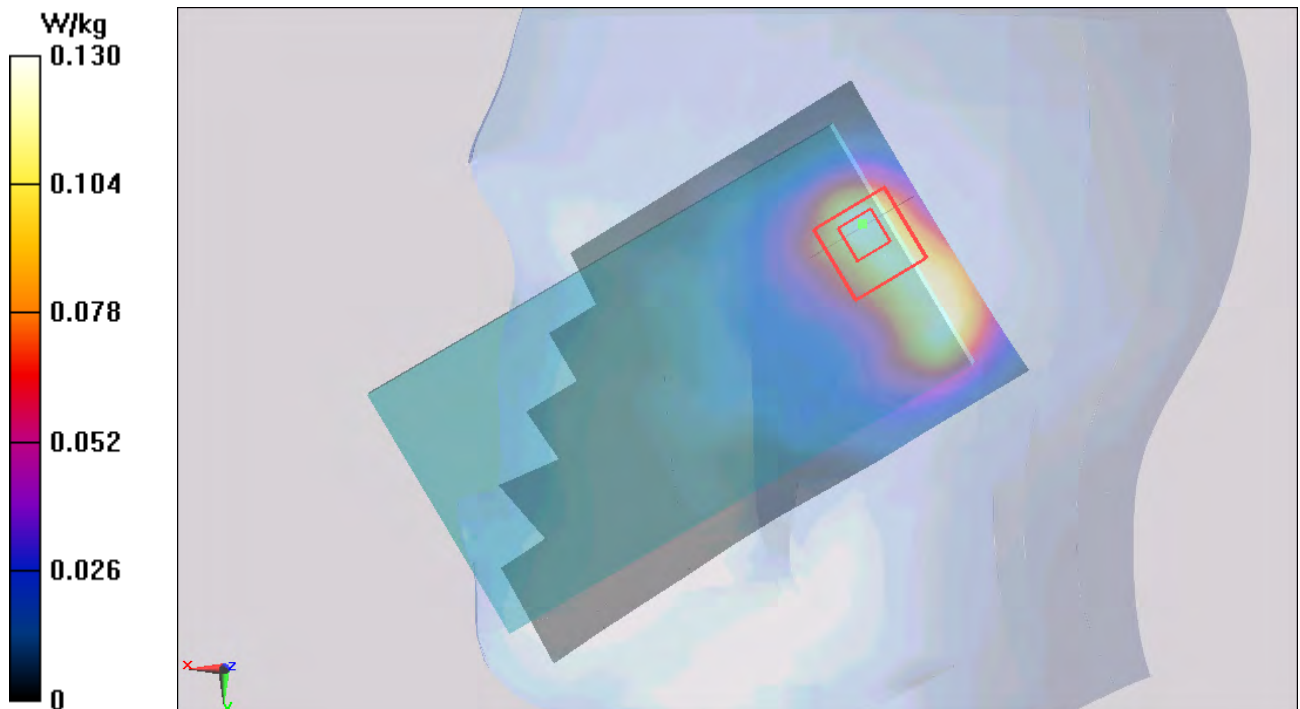


Figure 70 Right Hand Tilt 15° 802.11b Channel 11

### 802.11b Left Cheek High (Battery 2)

Date: 11/4/2014

Communication System: UID 0, 802.11b (0); Frequency: 2462 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2462$  MHz;  $\sigma = 1.824$  S/m;  $\epsilon_r = 38.584$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Left Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3677; ConvF(7.64, 7.64, 7.64); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Left Cheek High/Area Scan (81x141x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.342 W/kg

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

Reference Value = 7.655 V/m; Power Drift = 0.164 dB

Peak SAR (extrapolated) = 0.635 W/kg

**SAR(1 g) = 0.290 W/kg; SAR(10 g) = 0.138 W/kg**

Maximum value of SAR (measured) = 0.303 W/kg

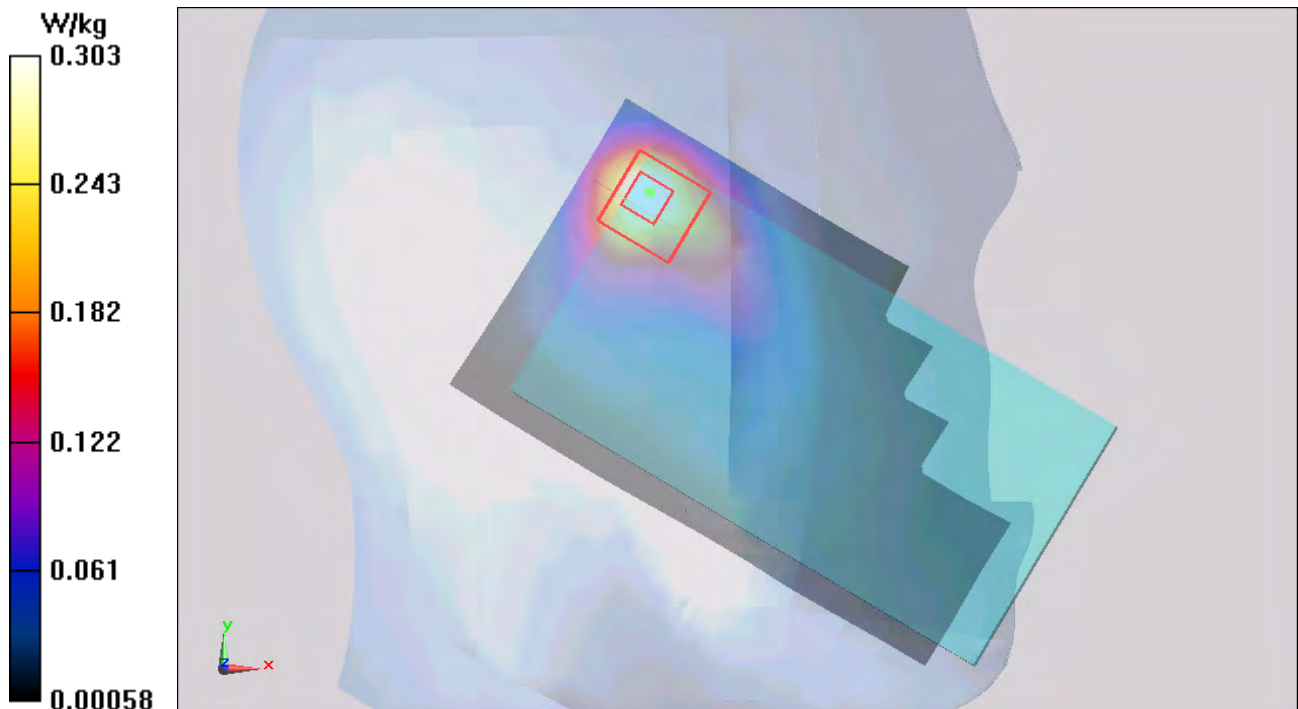


Figure 71 Left Hand Touch Cheek 802.11b Channel 11

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### 802.11b Back Side High (Battery 1)

Date: 11/4/2014

Communication System: UID 0, 802.11b (0); Frequency: 2462 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2462$  MHz;  $\sigma = 2.009$  S/m;  $\epsilon_r = 52.109$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(7.61, 7.61, 7.61); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Back Side High/Area Scan (81x141x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.117 W/kg

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

Reference Value = 3.797 V/m; Power Drift = 0.066 dB

Peak SAR (extrapolated) = 0.175 W/kg

**SAR(1 g) = 0.093 W/kg; SAR(10 g) = 0.046 W/kg**

Maximum value of SAR (measured) = 0.105 W/kg

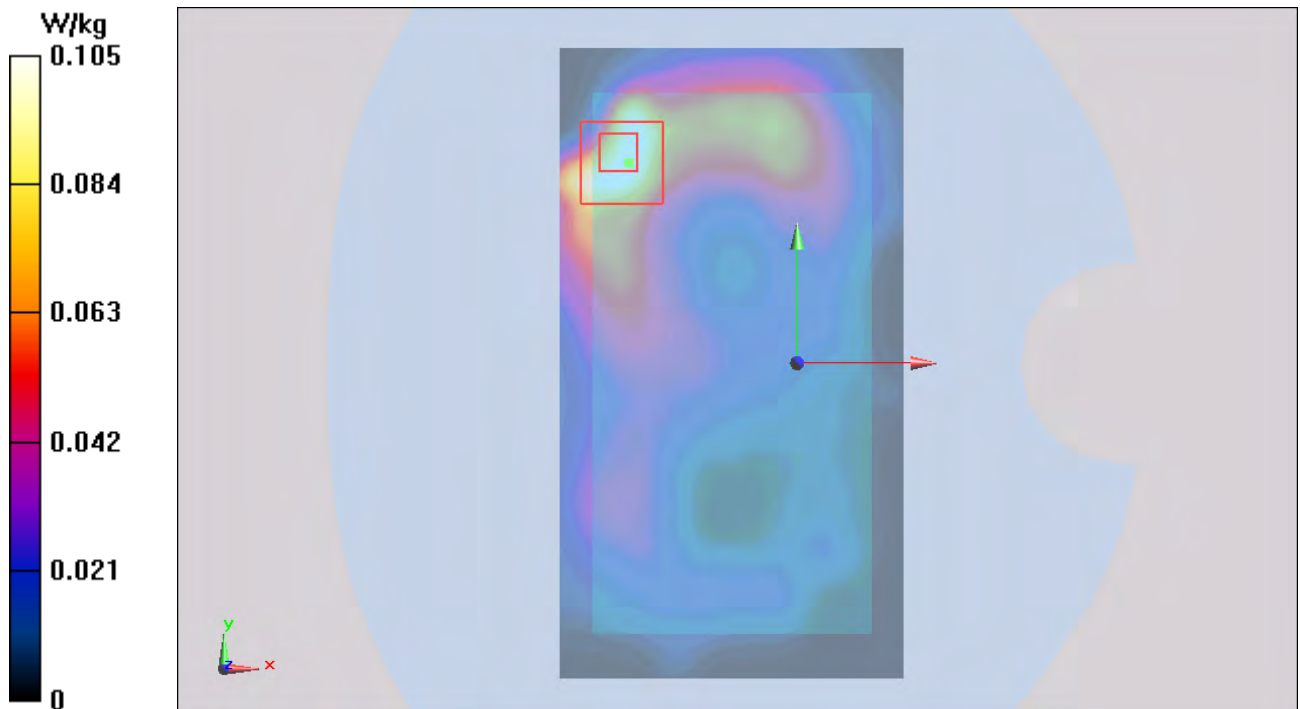


Figure 72 Body, Back Side, 802.11b Channel 11

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**802.11b Front Side High (Battery 1)**

Date: 11/4/2014

Communication System: UID 0, 802.11b (0); Frequency: 2462 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2462$  MHz;  $\sigma = 2.009$  S/m;  $\epsilon_r = 52.109$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(7.61, 7.61, 7.61); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Front Side High/Area Scan (81x141x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.0775 W/kg

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

Reference Value = 3.798 V/m; Power Drift = 0.080 dB

Peak SAR (extrapolated) = 0.103 W/kg

**SAR(1 g) = 0.069 W/kg; SAR(10 g) = 0.034 W/kg**

Maximum value of SAR (measured) = 0.0832 W/kg

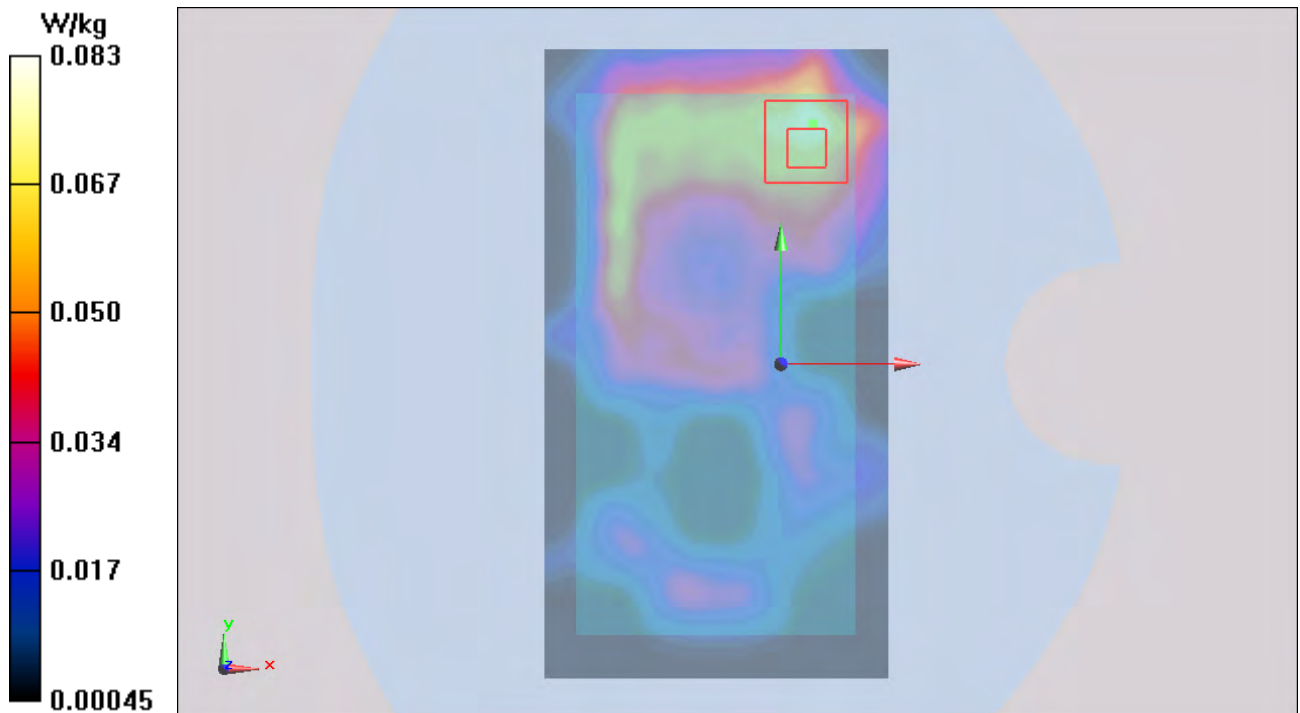


Figure 73 Body, Front Side, 802.11b Channel 11

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### 802.11b Right Edge High (Battery 1)

Date: 11/4/2014

Communication System: UID 0, 802.11b (0); Frequency: 2462 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2462$  MHz;  $\sigma = 2.009$  S/m;  $\epsilon_r = 52.109$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(7.61, 7.61, 7.61); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Right Edge High/Area Scan (51x191x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.0729 W/kg

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

Reference Value = 3.865 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 0.0910 W/kg

**SAR(1 g) = 0.050 W/kg; SAR(10 g) = 0.026 W/kg**

Maximum value of SAR (measured) = 0.0620 W/kg

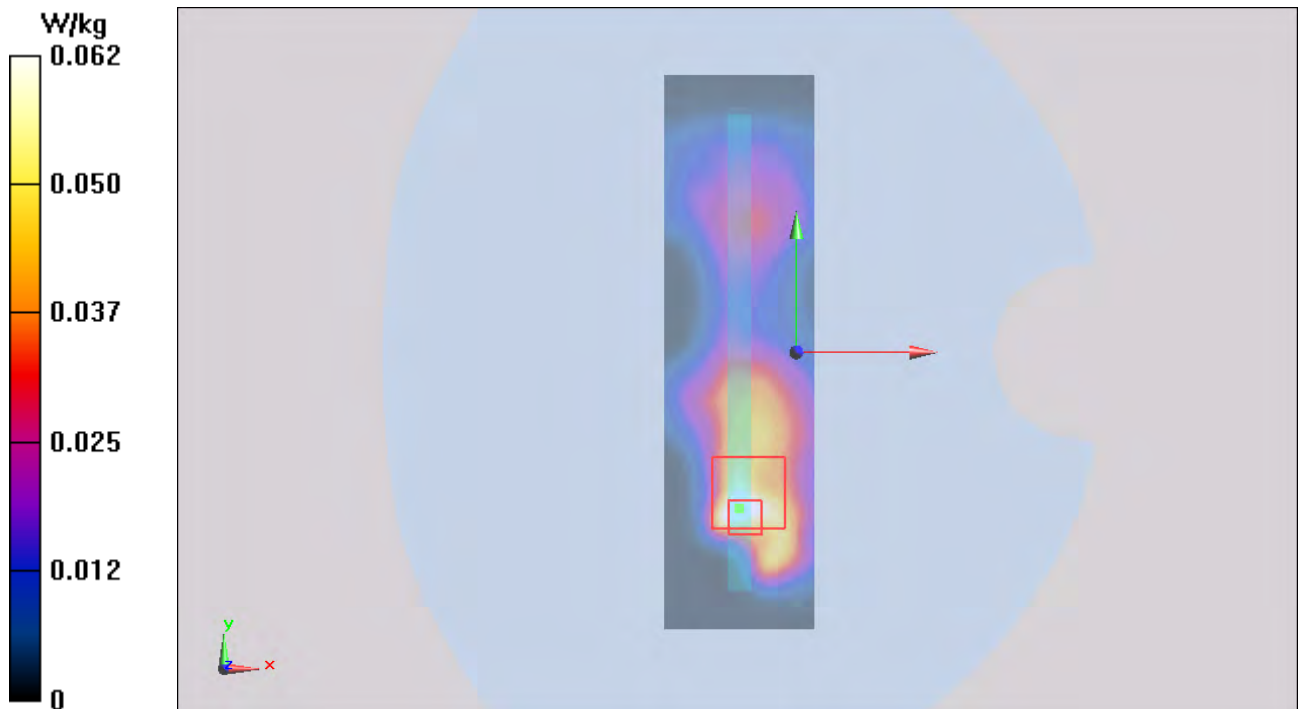


Figure 74 Body, Right Edge, 802.11b Channel 11

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### 802.11b Top Edge High (Battery 1)

Date: 11/4/2014

Communication System: UID 0, 802.11b (0); Frequency: 2462 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2462$  MHz;  $\sigma = 2.009$  S/m;  $\epsilon_r = 52.109$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(7.61, 7.61, 7.61); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Top Edge High/Area Scan (51x111x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.0224 W/kg

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

Reference Value = 2.880 V/m; Power Drift = 0.123 dB

Peak SAR (extrapolated) = 0.0370 W/kg

**SAR(1 g) = 0.008 W/kg; SAR(10 g) = 0.003 W/kg**

Maximum value of SAR (measured) = 0.0517 W/kg

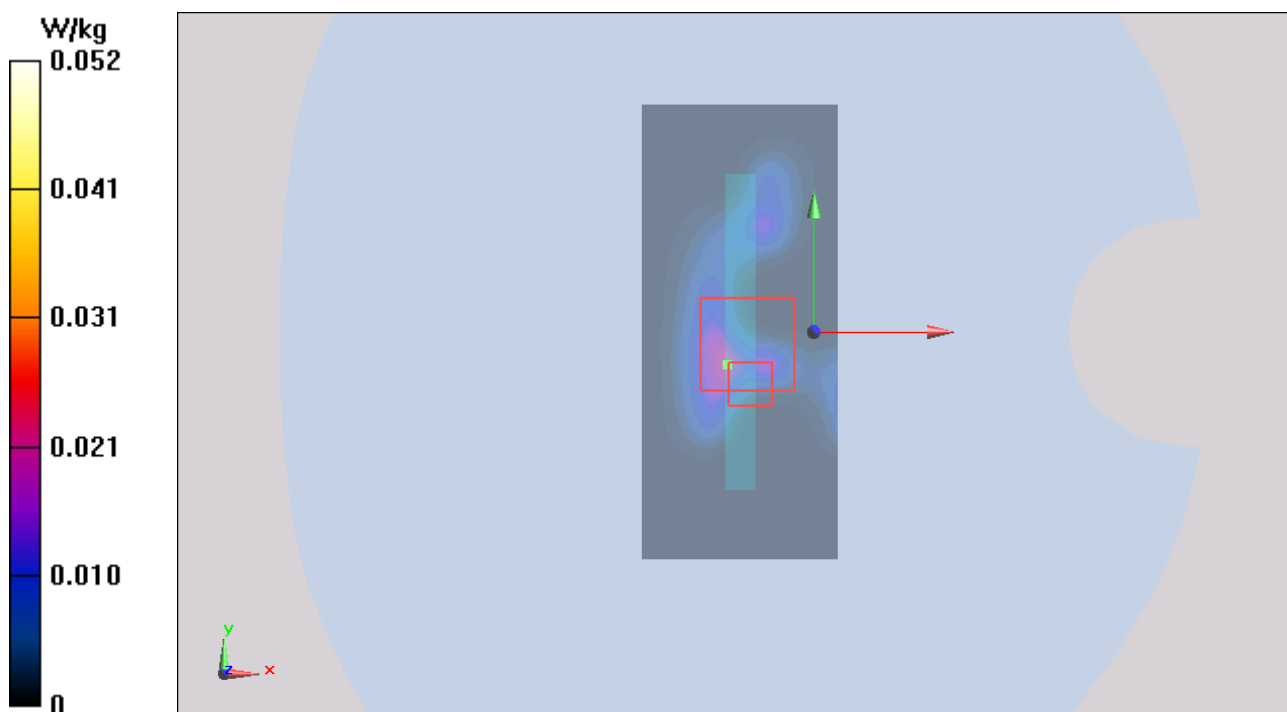


Figure 75 Body, Top Edge, 802.11b Channel 11

## 802.11b Back Side High (Battery 2)

Date: 11/4/2014

Communication System: UID 0, 802.11b (0); Frequency: 2462 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2462$  MHz;  $\sigma = 2.009$  S/m;  $\epsilon_r = 52.109$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(7.61, 7.61, 7.61); Calibrated: 11/28/2013;

Electronics: DAE4 Sn1317; Calibrated: 1/16/2014

Phantom: SAM 2; Type: SAM;

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Back Side High/Area Scan (81x141x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.0657 W/kg

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

Reference Value = 3.179 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.0710 W/kg

**SAR(1 g) = 0.044 W/kg; SAR(10 g) = 0.018 W/kg**

Maximum value of SAR (measured) = 0.0566 W/kg

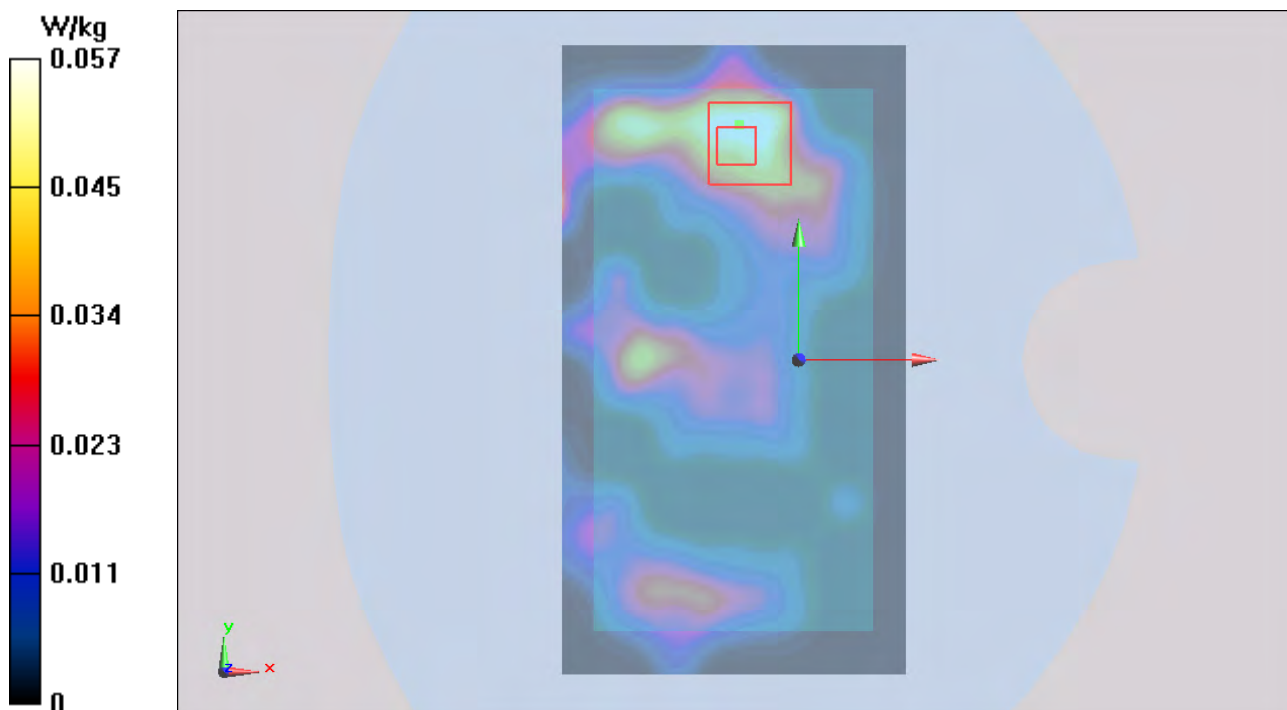


Figure 76 Body, Back Side, 802.11b Channel 11

## ANNEX D: System Check Results(Variant Model)

### System Performance Check at 835 MHz Head TSL

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d020**

Date: 2014-12-20

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

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.92 \text{ mho/m}$ ;  $\epsilon_r = 41.4$ ;  $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature:  $22.3^\circ\text{C}$       Liquid Temperature:  $21.5^\circ\text{C}$

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3977; ConvF(9.62, 9.62, 9.62); Calibrated: 2014-2-17;

Electronics: DAE4 Sn1317; Calibrated: 2014-1-16

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**d=15mm, Pin=250mW/Area Scan (41x121x1):** Measurement grid:  $dx=1.500\text{mm}$ ,  $dy=1.500\text{mm}$

Maximum value of SAR (interpolated) =  $2.71 \text{ mW/g}$

**d=15mm, Pin=250mW/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value =  $55.2 \text{ V/m}$ ; Power Drift =  $-0.011 \text{ dB}$

Peak SAR (extrapolated) =  $3.79 \text{ W/kg}$

**SAR(1 g) =  $2.51 \text{ mW/g}$ ; SAR(10 g) =  $1.58 \text{ mW/g}$**

Maximum value of SAR (measured) =  $2.66 \text{ mW/g}$

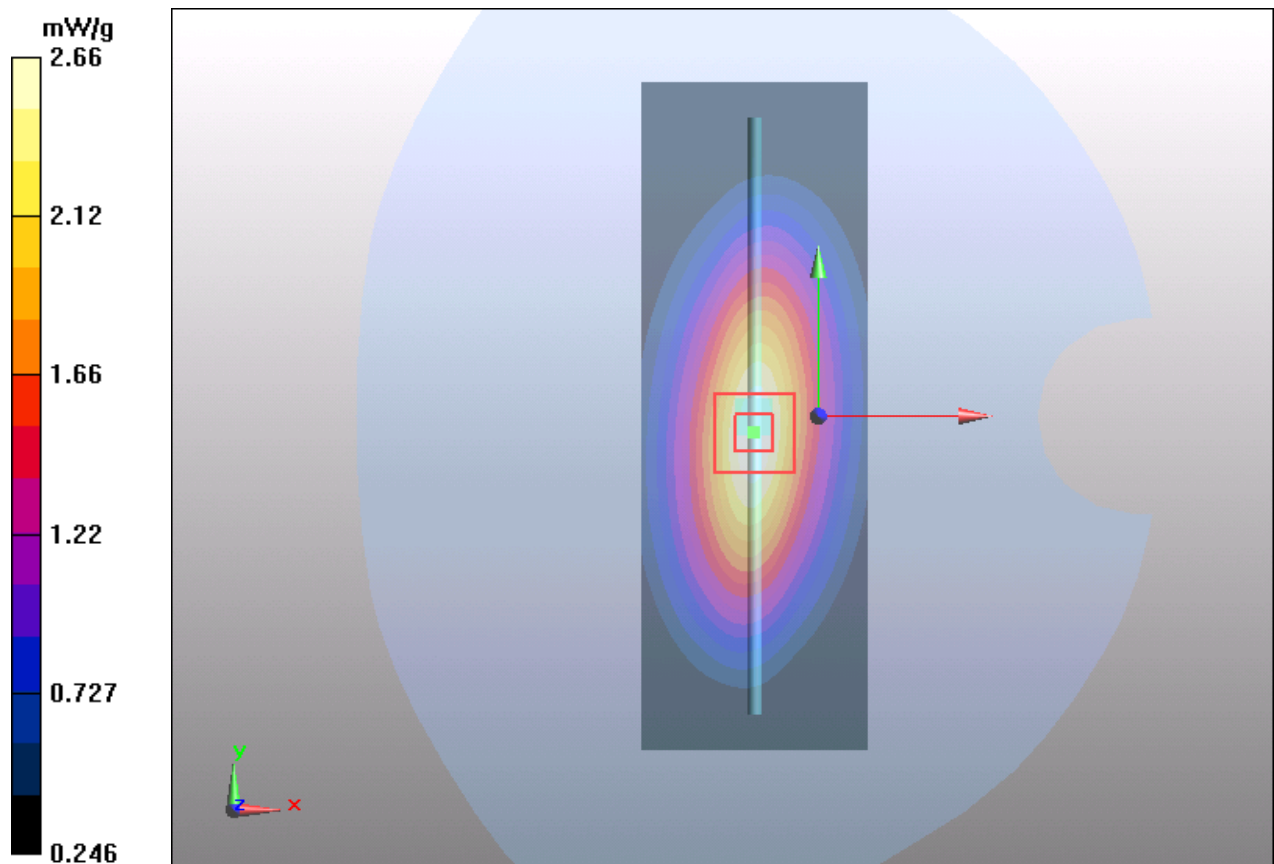


Figure 77 System Performance Check 835MHz 250mW

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### System Performance Check at 835 MHz Body TSL

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d020**

Date: 2014-12-19

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

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.96 \text{ mho/m}$ ;  $\epsilon_r = 55.9$ ;  $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature:  $22.3^\circ\text{C}$       Liquid Temperature:  $21.5^\circ\text{C}$

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2014-2-17;

Electronics: DAE4 Sn1317; Calibrated: 2014-1-16

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**d=15mm, Pin=250mW/Area Scan (41x121x1):** Measurement grid:  $dx=1.500 \text{ mm}$ ,  $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) =  $2.55 \text{ mW/g}$

**d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value =  $51.7 \text{ V/m}$ ; Power Drift =  $-0.013 \text{ dB}$

Peak SAR (extrapolated) =  $3.6 \text{ W/kg}$

**SAR(1 g) =  $2.45 \text{ mW/g}$ ; SAR(10 g) =  $1.63 \text{ mW/g}$**

Maximum value of SAR (measured) =  $2.73 \text{ mW/g}$

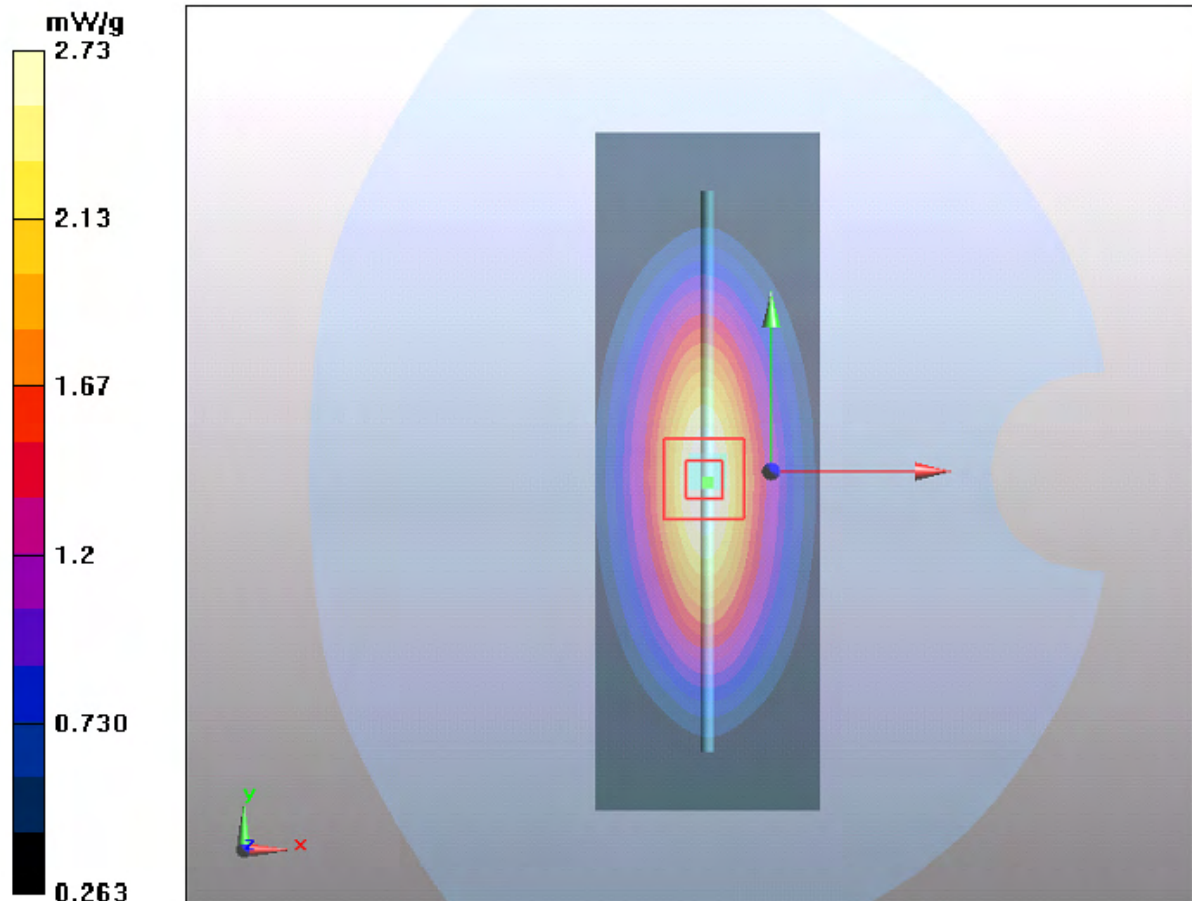


Figure 78 System Performance Check 835MHz 250Mw

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### System Performance Check at 1900 MHz Head TSL

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d060**

Date: 2014-12-19

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.43$  mho/m;  $\epsilon_r = 39.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3977; ConvF(7.97, 7.97, 7.97); Calibrated: 2014-2-17;

Electronics: DAE4 Sn1317; Calibrated: 2014-1-16

Phantom: SAM2; Type: SAM; Serial: TP-1524

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**d=10mm, Pin=250mW/Area Scan (41x71x1):** Measurement grid: dx=1.500mm, dy=1.500mm  
Maximum value of SAR (interpolated) = 12.9 mW/g

**d=10mm, Pin=250mW/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 87.8 V/m; Power Drift = 0.041 dB

Peak SAR (extrapolated) = 20.1 W/kg

**SAR(1 g) = 10.49 mW/g; SAR(10 g) = 5.29 mW/g**

Maximum value of SAR (measured) = 11.52 mW/g

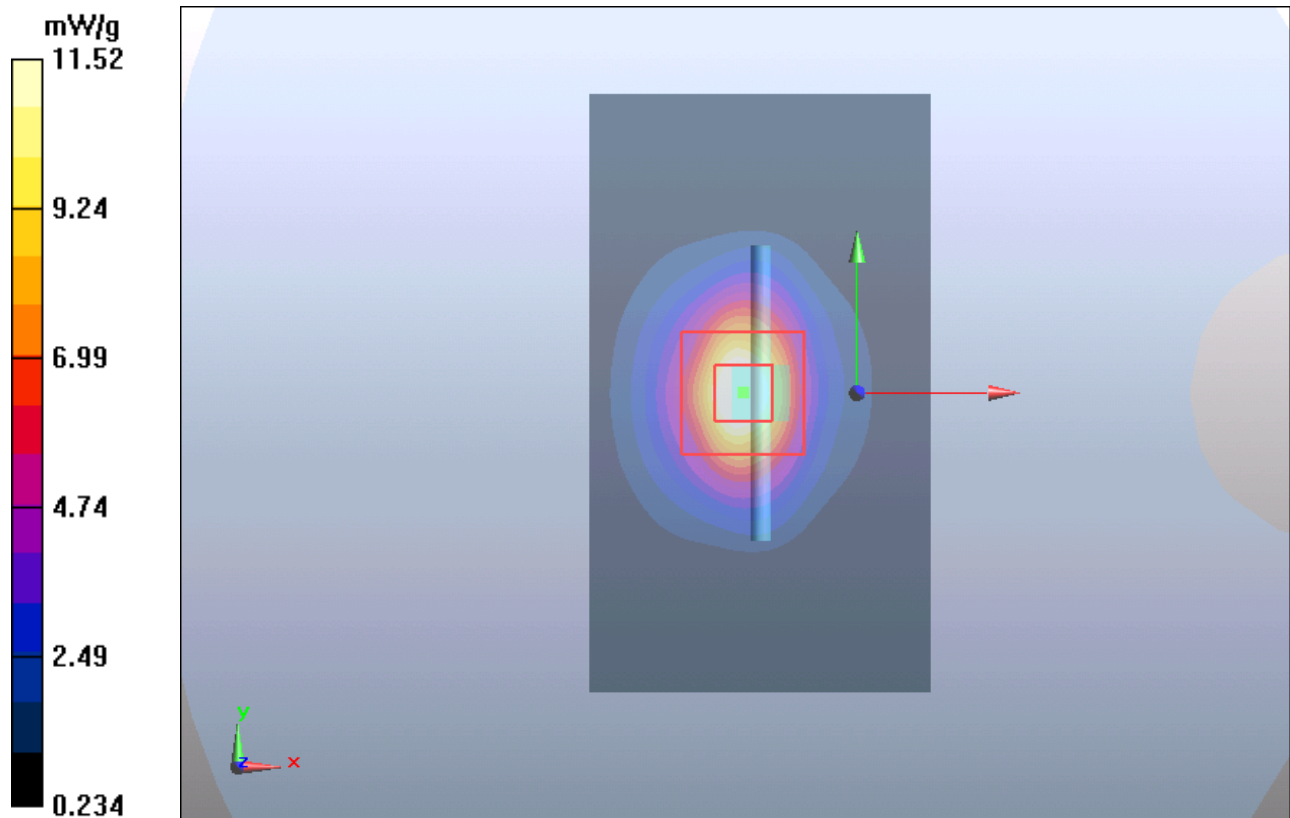


Figure 79 System Performance Check 1900MHz 250mW

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### System Performance Check at 1900 MHz Body TSL

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d060**

Date: 2014-12-19

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.49$  mho/m;  $\epsilon_r = 53.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2014-2-17;

Electronics: DAE4 Sn1317; Calibrated: 2014-1-16

Phantom: SAM2; Type: SAM; Serial: TP-1524

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**d=10mm, Pin=250mW/Area Scan (41x71x1):** Measurement grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 12.4 mW/g

**d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 82.5 V/m; Power Drift = 0.021 dB

Peak SAR (extrapolated) = 17.5 W/kg

**SAR(1 g) = 9.98 mW/g; SAR(10 g) = 5.27 mW/g**

Maximum value of SAR (measured) = 11.9 mW/g

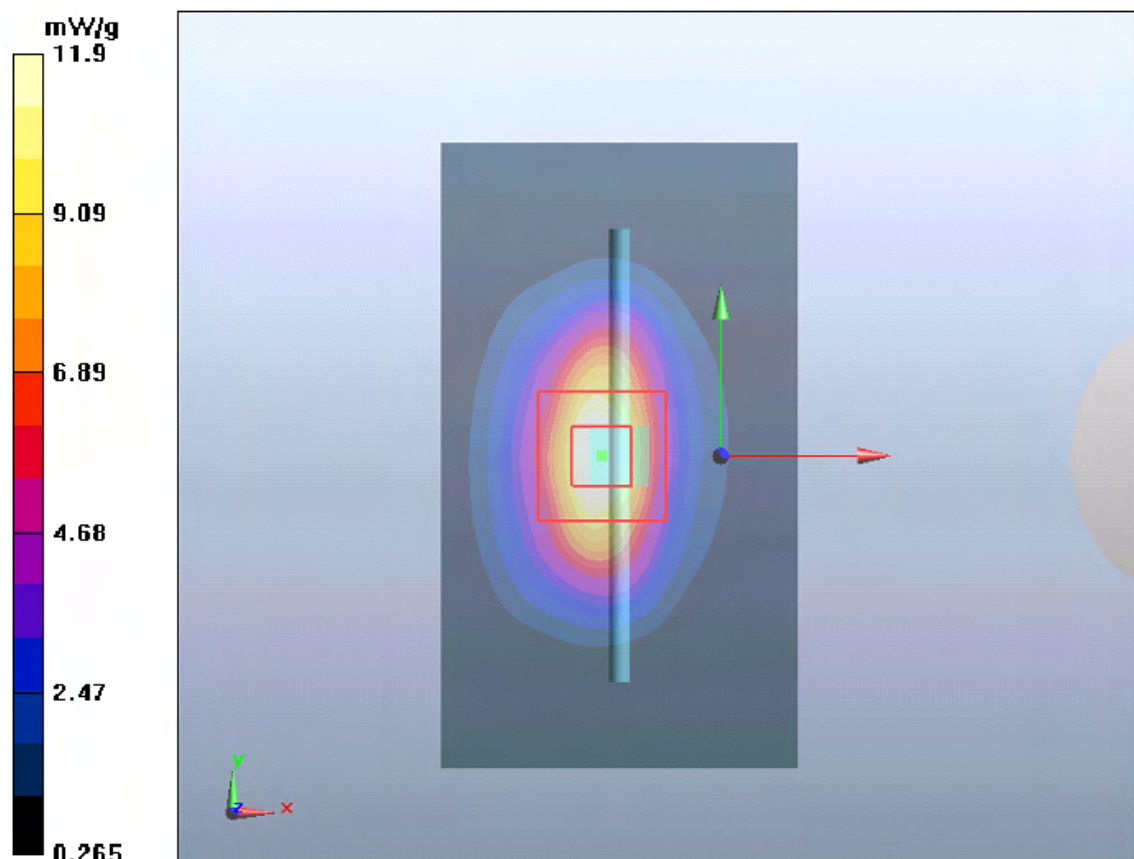


Figure 80 System Performance Check 1900MHz 250mW

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### System Performance Check at 1900 Body MHz

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d060**

Date: 2015-1-13

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.52$  mho/m;  $\epsilon_r = 53.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2014-2-17;

Electronics: DAE4 Sn1317; Calibrated: 2014-1-16

Phantom: SAM2; Type: SAM; Serial: TP-1524

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**d=10mm, Pin=250mW/Area Scan (41x71x1):** Measurement grid: dx=1.500mm, dy=1.500mm

Maximum value of SAR (interpolated) = 12.9 mW/g

**d=10mm, Pin=250mW/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 87.8 V/m; Power Drift = 0.041 dB

Peak SAR (extrapolated) = 20.1 W/kg

**SAR(1 g) = 10.49 mW/g; SAR(10 g) = 5.29 mW/g**

Maximum value of SAR (measured) = 11.52 mW/g

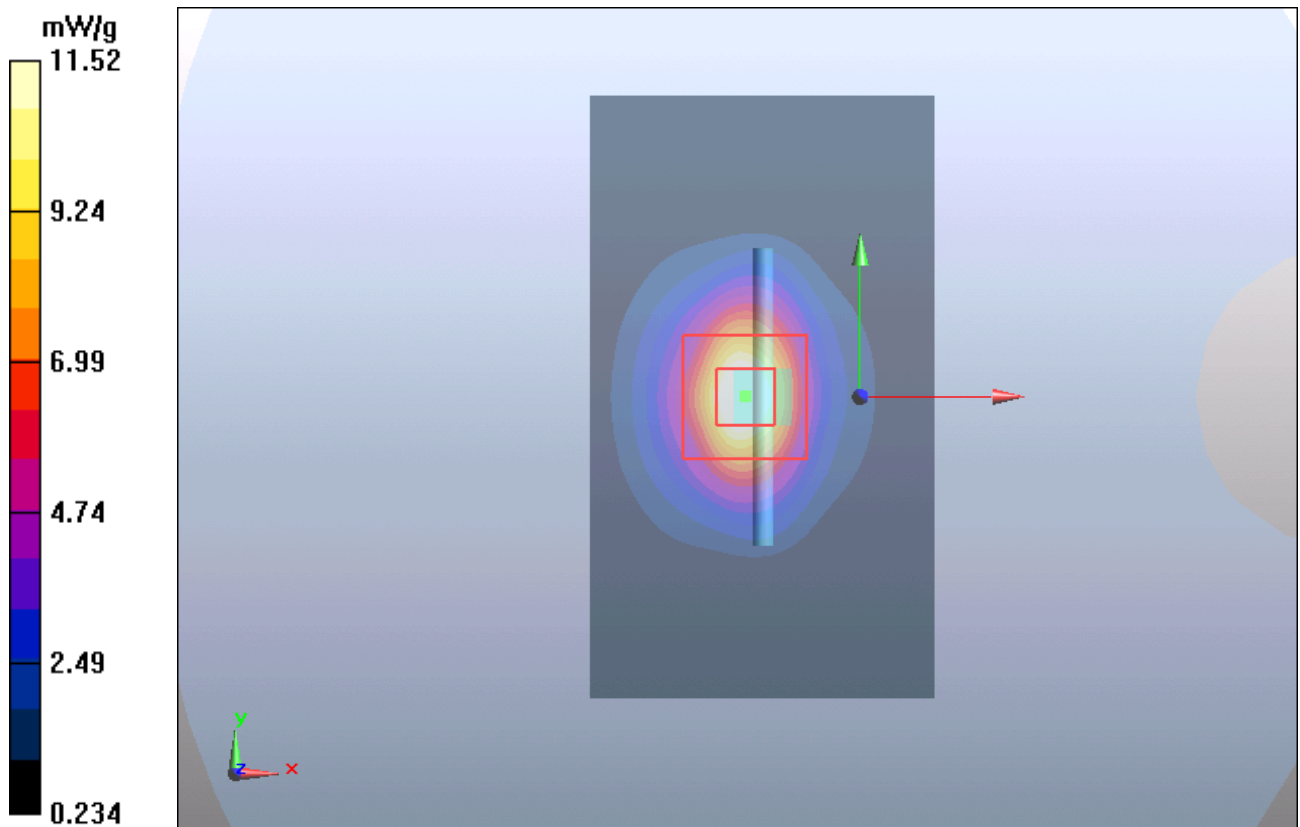


Figure 81 System Performance Check 1900MHz 250mW

## ANNEX E: Plots Results (Variant Model)

### GSM 850 Right Cheek Middle (Battery 1)

Date: 2014-12-20

Communication System: GSM850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.892$  mho/m;  $\epsilon_r = 41$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Right Section

DASY5 Configuration:

Probe: EX3DV4 - SN3977; ConvF(9.62, 9.62, 9.62); Calibrated: 2014-2-17;

Electronics: DAE4 Sn1317; Calibrated: 2014-1-16

Phantom: SAM 11; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

**Right Cheek Middle /Area Scan (61x111x1):** Measurement grid: dx=1.500mm, dy=1.500mm

Maximum value of SAR (interpolated) = 0.084 mW/g

**Right Cheek Middle /Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.43 V/m; Power Drift = -0.130 dB

Peak SAR (extrapolated) = 0.094 W/kg

**SAR(1 g) = 0.080 mW/g; SAR(10 g) = 0.062 mW/g**

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

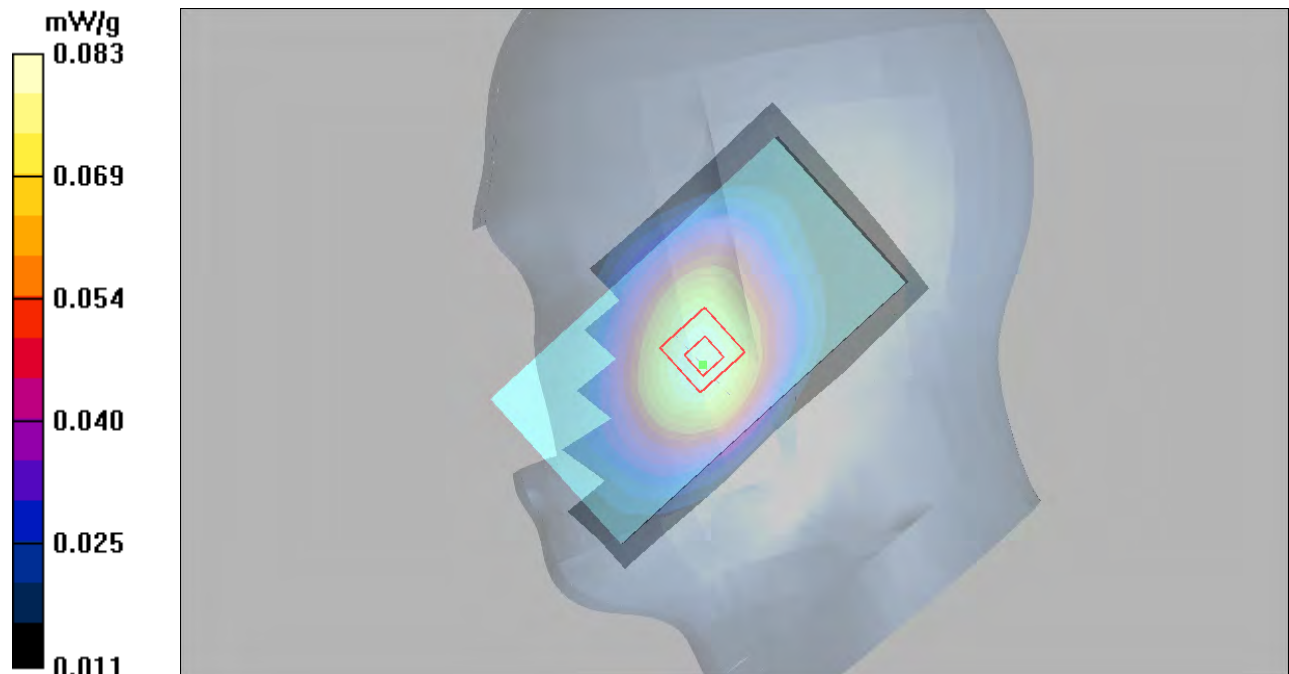


Figure 82 Right Hand Touch Cheek GSM 850 Channel 190

### GSM 850 Right Cheek Middle (SIM 2)

Date: 2014-12-20

Communication System: GSM850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.892$  mho/m;  $\epsilon_r = 41$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Right Section

DASY5 Configuration:

Probe: EX3DV4 - SN3977; ConvF(9.62, 9.62, 9.62); Calibrated: 2014-2-17;

Electronics: DAE4 Sn1317; Calibrated: 2014-1-16

Phantom: SAM 11; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

**Right Cheek Middle /Area Scan (61x111x1):** Measurement grid: dx=1.500mm, dy=1.500mm

Maximum value of SAR (interpolated) = 0.115 mW/g

**Right Cheek Middle /Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.63 V/m; Power Drift = 0.024 dB

Peak SAR (extrapolated) = 0.134 W/kg

**SAR(1 g) = 0.084 mW/g; SAR(10 g) = 0.038 mW/g**

Maximum value of SAR (measured) = 0.095 mW/g

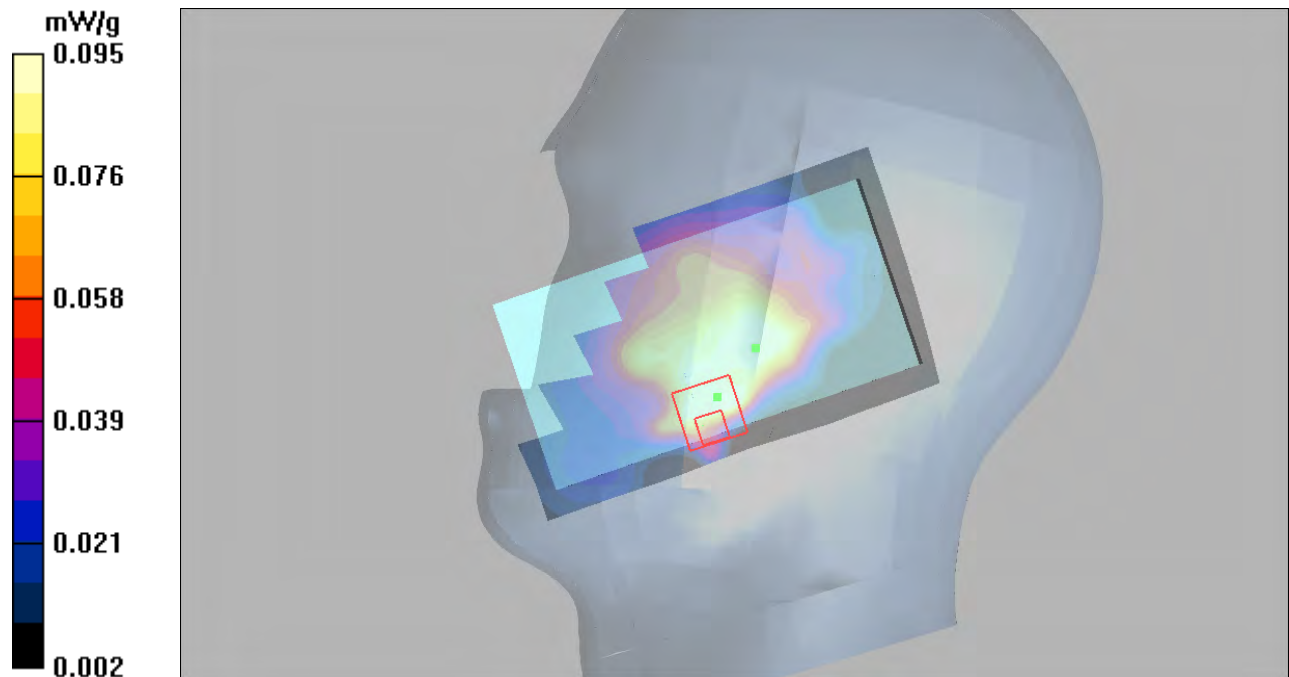


Figure 83 Right Hand Touch Cheek GSM 850 Channel 190

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### GSM 850 GPRS (3Txslots) Back Side Middle (Battery 1)

Date: 2014-12-19

Communication System: GSM850 + GPRS(3Up); Frequency: 836.6 MHz; Duty Cycle: 1:2.767

Medium parameters used:  $f = 837$  MHz;  $\sigma = 1$  mho/m;  $\epsilon_r = 55.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 - SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2014-2-17;

Electronics: DAE4 Sn1317; Calibrated: 2014-1-16

Phantom: SAM 11; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

**Back Side Middle/Area Scan (61x111x1):** Measurement grid: dx=1.500mm, dy=1.500mm

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

**Back Side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 17.6 V/m; Power Drift = 0.016 dB

Peak SAR (extrapolated) = 0.392 W/kg

**SAR(1 g) = 0.297 mW/g; SAR(10 g) = 0.216 mW/g**

Maximum value of SAR (measured) = 0.313 mW/g

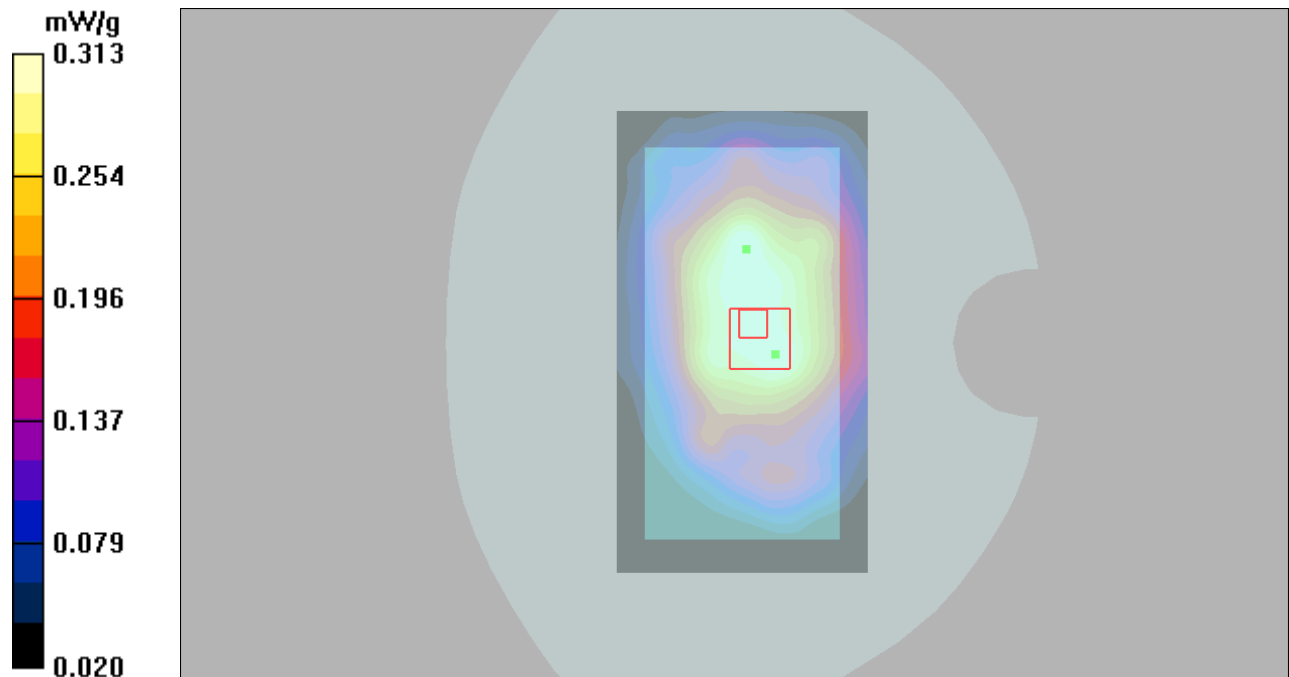


Figure 84 Body, Back Side, GSM 850 GPRS (3Txslots) Channel 190

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**GSM 850 GPRS (3Txslots) Back Side Middle (SIM 2)**

Date: 2014-12-19

Communication System: GSM850 + GPRS(3Up); Frequency: 836.6 MHz; Duty Cycle: 1:2.767

Medium parameters used:  $f = 837$  MHz;  $\sigma = 1$  mho/m;  $\epsilon_r = 55.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 - SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2014-2-17;

Electronics: DAE4 Sn1317; Calibrated: 2014-1-16

Phantom: SAM 11; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

**Back Side Middle/Area Scan (61x111x1):** Measurement grid: dx=1.500mm, dy=1.500mm

Maximum value of SAR (interpolated) = 0.334 mW/g

**Back Side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 16.9 V/m; Power Drift = 0.020 dB

Peak SAR (extrapolated) = 0.467 W/kg

**SAR(1 g) = 0.314 mW/g; SAR(10 g) = 0.225 mW/g**

Maximum value of SAR (measured) = 0.353 mW/g

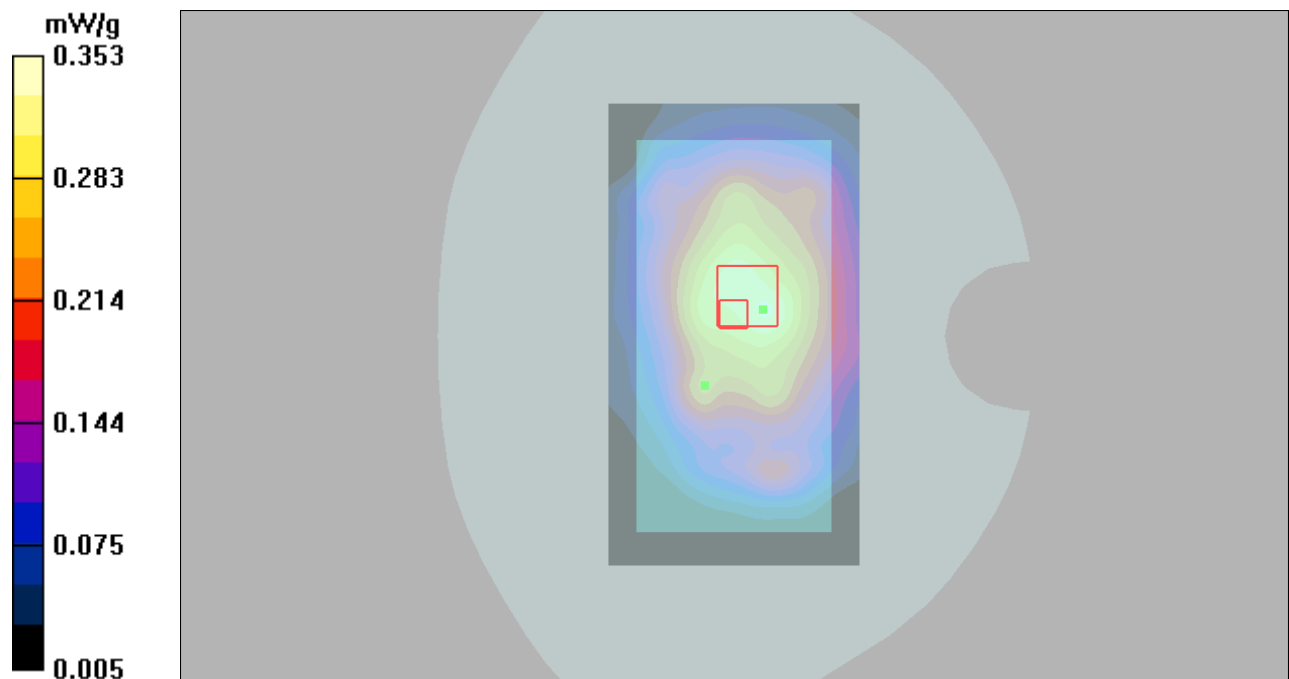


Figure 85 Body, Back Side, GSM 850 GPRS (3Txslots) Channel 190

### GSM 1900 Left Cheek Middle (Battery 1)

Date: 2014-12-19

Communication System: PCS 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.38$  mho/m;  $\epsilon_r = 40.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Left Section

DASY5 Configuration:

Probe: EX3DV4 - SN3977; ConvF(7.97, 7.97, 7.97); Calibrated: 2014-2-17;

Electronics: DAE4 Sn1317; Calibrated: 2014-1-16

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

**Left Cheek Middle/Area Scan (61x111x1):** Measurement grid: dx=1.500mm, dy=1.500mm

Maximum value of SAR (interpolated) = 0.131 mW/g

**Left Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.88 V/m; Power Drift = -0.044 dB

Peak SAR (extrapolated) = 0.189 W/kg

**SAR(1 g) = 0.116 mW/g; SAR(10 g) = 0.066 mW/g**

Maximum value of SAR (measured) = 0.131 mW/g

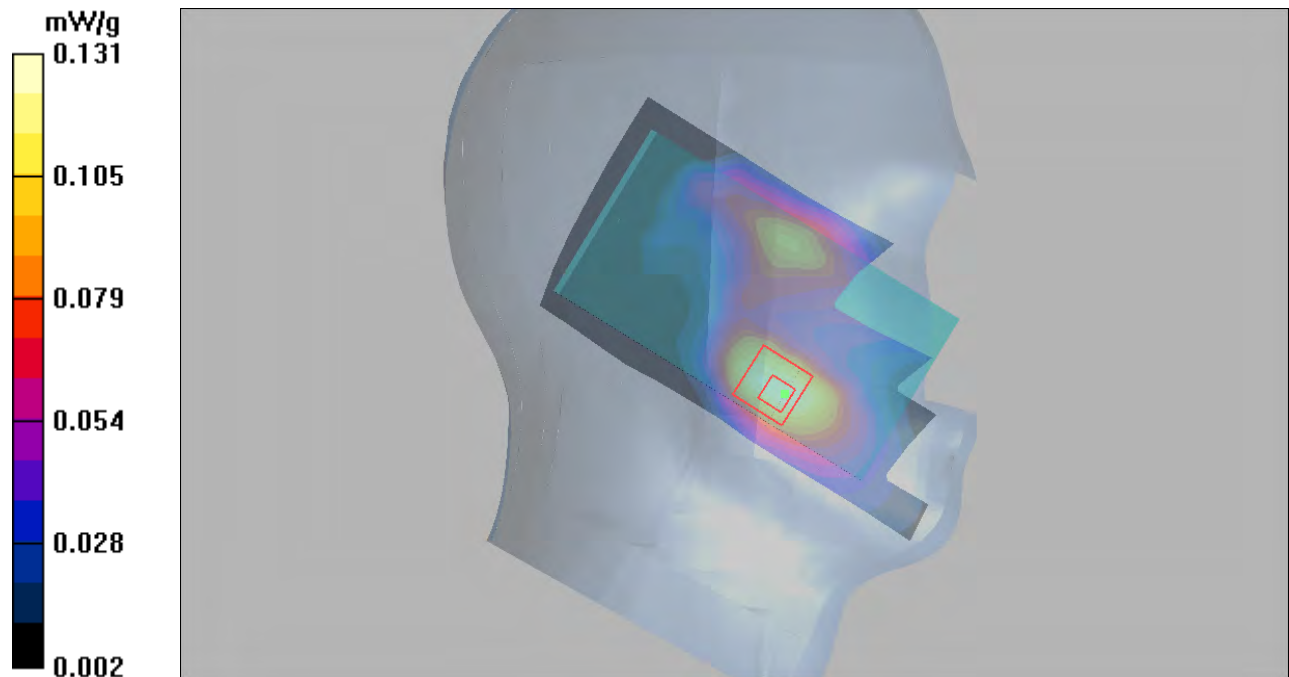


Figure 86 Left Hand Touch Cheek GSM 1900 Channel 661

### GSM 1900 Left Cheek Middle (SIM 2)

Date: 2014-12-19

Communication System: PCS 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.38$  mho/m;  $\epsilon_r = 40.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Left Section

DASY5 Configuration:

Probe: EX3DV4 - SN3977; ConvF(7.97, 7.97, 7.97); Calibrated: 2014-2-17;

Electronics: DAE4 Sn1317; Calibrated: 2014-1-16

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

**Left Cheek Middle/Area Scan (61x111x1):** Measurement grid: dx=1.500mm, dy=1.500mm

Maximum value of SAR (interpolated) = 0.125 mW/g

**Left Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 0.731 V/m; Power Drift = 0.098 dB

Peak SAR (extrapolated) = 0.178 W/kg

**SAR(1 g) = 0.109 mW/g; SAR(10 g) = 0.063 mW/g**

Maximum value of SAR (measured) = 0.120 mW/g

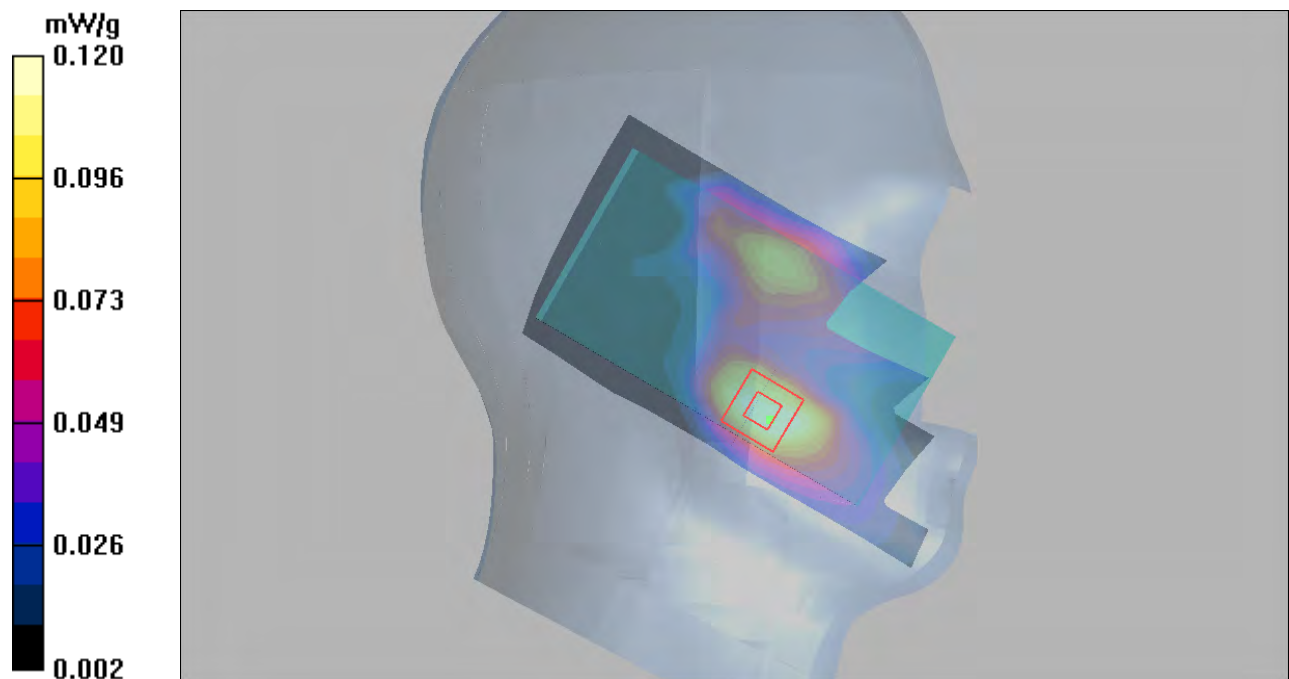


Figure 87 Left Hand Touch Cheek GSM 1900 Channel 661

# TA Technology (Shanghai) Co., Ltd.

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### GSM 1900 GPRS (4Txslots) Bottom Edge Middle (Battery 1)

Date: 2014-12-19

Communication System: PCS 1900+GPRS(4Up); Frequency: 1880 MHz; Duty Cycle: 1:2.075

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.5$  mho/m;  $\epsilon_r = 52.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 - SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2014-2-17;

Electronics: DAE4 Sn1317; Calibrated: 2014-1-16

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

**Bottom Edge Middle/Area Scan (51x91x1):** Measurement grid: dx=1.000mm, dy=1.000mm

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

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

Reference Value = 14.1 V/m; Power Drift = 0.067 dB

Peak SAR (extrapolated) = 0.555 W/kg

**SAR(1 g) = 0.302 mW/g; SAR(10 g) = 0.165 mW/g**

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

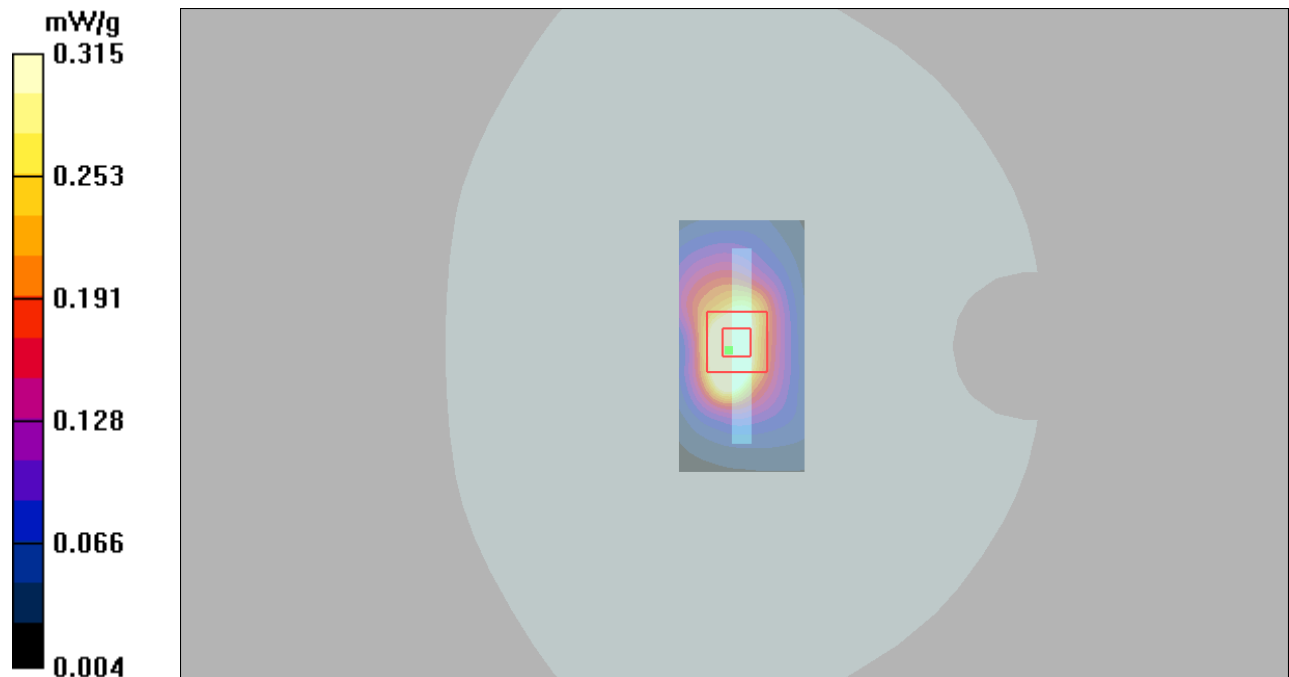


Figure 88 Body, Bottom Edge, GSM 1900 GPRS (4Txslots) Channel 661

# TA Technology (Shanghai) Co., Ltd.

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### GSM 1900 GPRS (4Txslots) Bottom Edge Middle (SIM 2)

Date: 2014-12-19

Communication System: PCS 1900+GPRS(4Up); Frequency: 1880 MHz; Duty Cycle: 1:2.075

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.5$  mho/m;  $\epsilon_r = 52.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 - SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2014-2-17;

Electronics: DAE4 Sn1317; Calibrated: 2014-1-16

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

**Bottom Edge Middle/Area Scan (51x91x1):** Measurement grid: dx=1.000mm, dy=1.000mm

Maximum value of SAR (interpolated) = 0.467 mW/g

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

Reference Value = 16.4 V/m; Power Drift = 0.056 dB

Peak SAR (extrapolated) = 0.751 W/kg

**SAR(1 g) = 0.397 mW/g; SAR(10 g) = 0.210 mW/g**

Maximum value of SAR (measured) = 0.436 mW/g

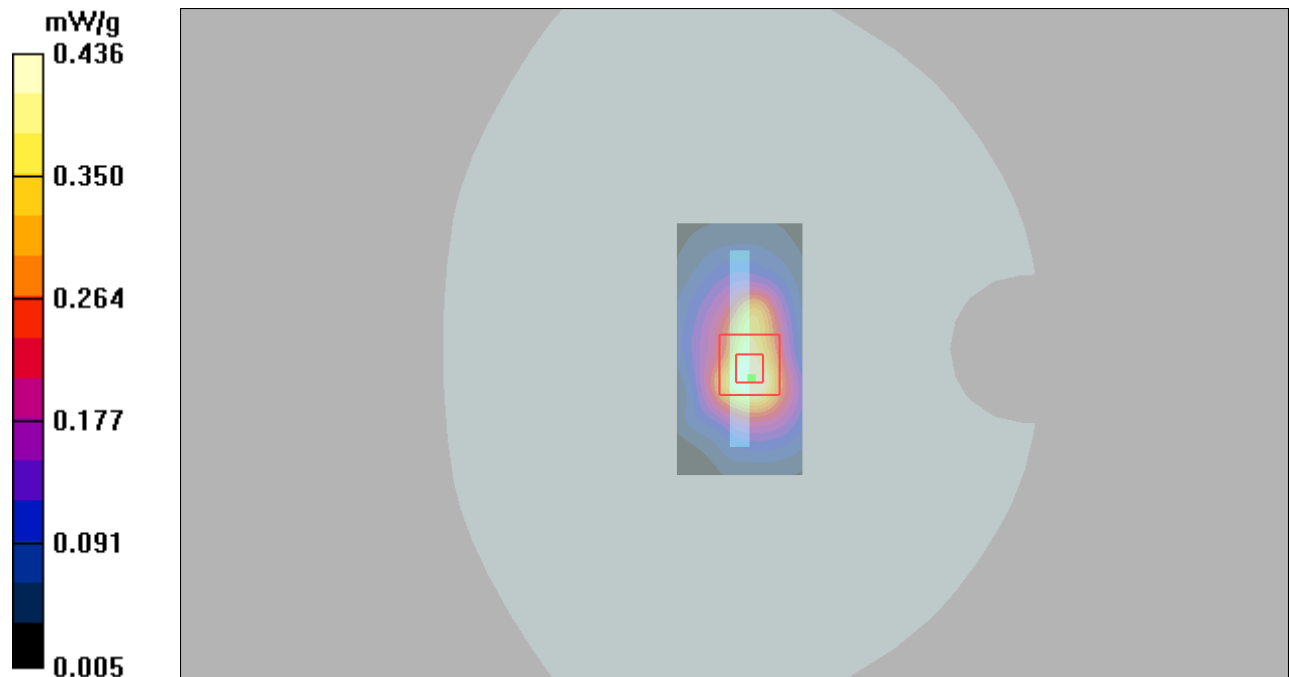


Figure 89 Body, Bottom Edge, GSM 1900 GPRS (4Txslots) Channel 661

### UMTS Band II Right Cheek Middle (Battery 1)

Date: 2014-12-19

Communication System: WCDMA Band II; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.38$  mho/m;  $\epsilon_r = 40.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Right Section

DASY5 Configuration:

Probe: EX3DV4 - SN3977; ConvF(7.97, 7.97, 7.97); Calibrated: 2014-2-17;

Electronics: DAE4 Sn1317; Calibrated: 2014-1-16

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

**Right Cheek Middle/Area Scan (61x111x1):** Measurement grid: dx=1.500mm, dy=1.500mm

Maximum value of SAR (interpolated) = 0.387 mW/g

**Right Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.22 V/m; Power Drift = 0.031 dB

Peak SAR (extrapolated) = 0.543 W/kg

**SAR(1 g) = 0.348 mW/g; SAR(10 g) = 0.212 mW/g**

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

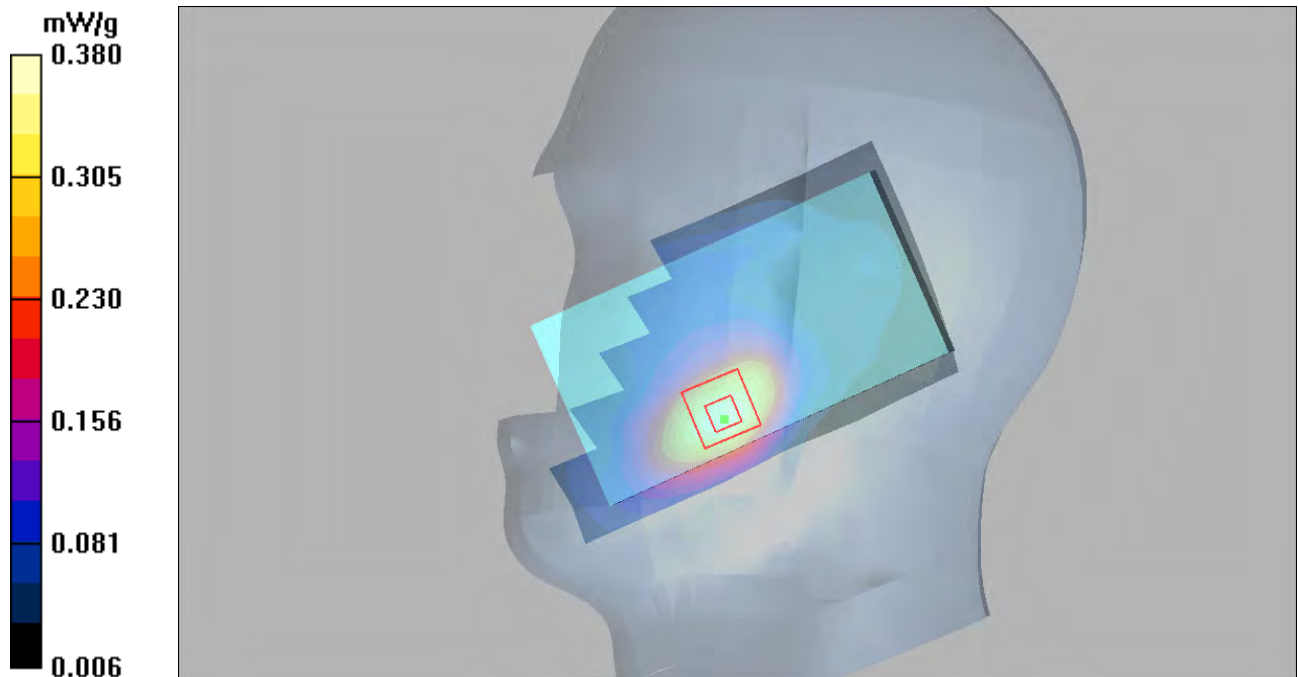


Figure 90 Right Hand Touch Cheek UMTS Band II Channel 9400

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### UMTS Band II Bottom Edge High (Battery 1)

Date: 2014-12-19

Communication System: WCDMA Band II; Frequency: 1907.6 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1908$  MHz;  $\sigma = 1.53$  mho/m;  $\epsilon_r = 52.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 - SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2014-2-17;

Electronics: DAE4 Sn1317; Calibrated: 2014-1-16

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

**Bottom Edge High/Area Scan (51x91x1):** Measurement grid: dx=1.000mm, dy=1.000mm

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

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

Reference Value = 23.5 V/m; Power Drift = 0.096 dB

Peak SAR (extrapolated) = 1.62 W/kg

**SAR(1 g) = 0.906 mW/g; SAR(10 g) = 0.470 mW/g**

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

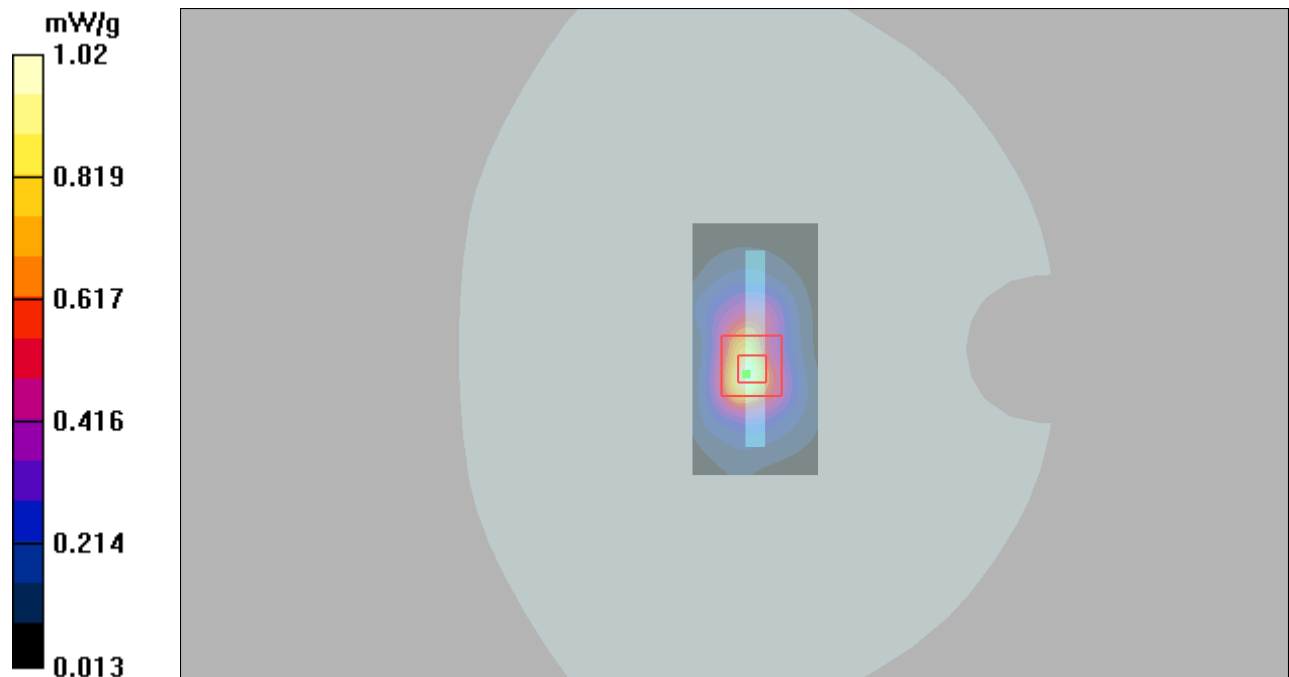


Figure 91 Body, Bottom Edge, UMTS Band II Channel 9538

**TA Technology (Shanghai) Co., Ltd.**  
**Test Report**

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**UMTS Band II Bottom Edge High (1<sup>st</sup> Repeated SAR)**

Date: 2015-2-13

Communication System: WCDMA Band II; Frequency: 1907.6 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1908$  MHz;  $\sigma = 1.53$  mho/m;  $\epsilon_r = 52.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 - SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2014-2-17;

Electronics: DAE4 Sn1317; Calibrated: 2014-1-16

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Bottom Edge High/Area Scan (31x61x1):** Measurement grid: dx=15mm, dy=15mm

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

**Bottom Edge High/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 26.6 V/m; Power Drift = -0.156 dB

Peak SAR (extrapolated) = 1.60 W/kg

**SAR(1 g) = 0.907 mW/g; SAR(10 g) = 0.475 mW/g**

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

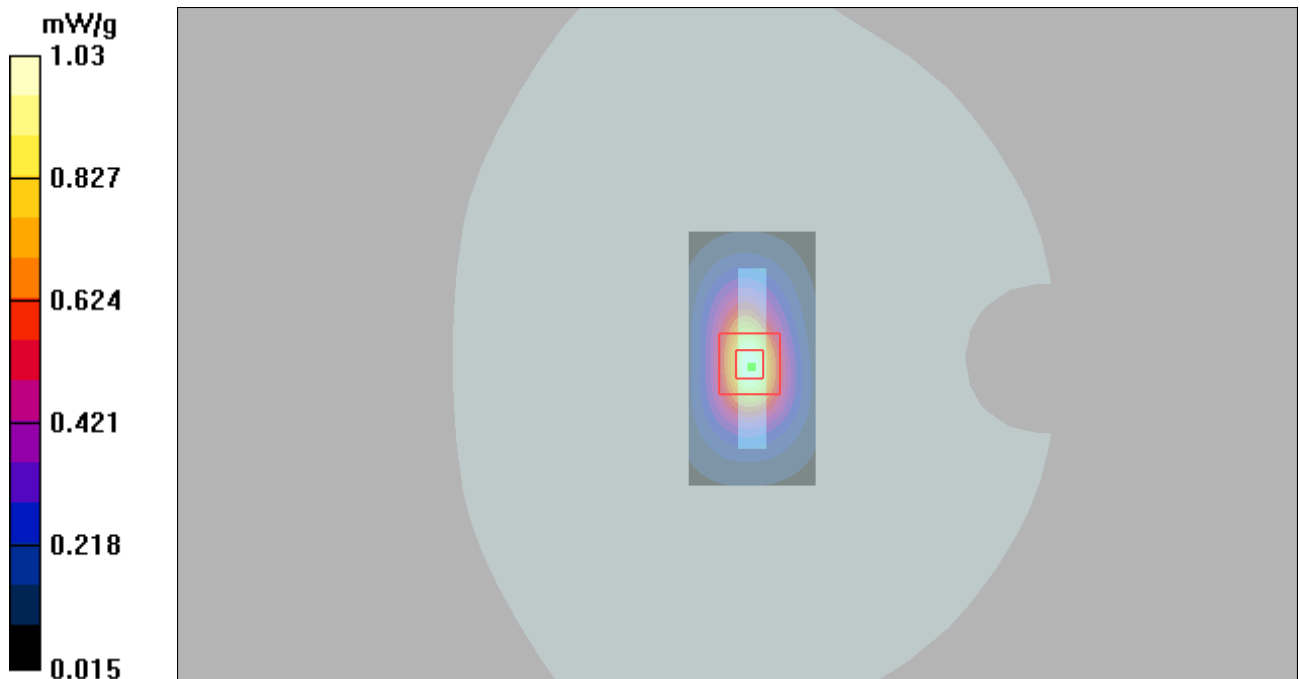


Figure 92 Body, Bottom Edge, UMTS Band II Channel 9538

# TA Technology (Shanghai) Co., Ltd.

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### UMTS Band V Right Cheek Middle (Battery 1)

Date: 2014-12-20

Communication System: WCDMA Band V; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.892$  mho/m;  $\epsilon_r = 41$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Right Section

DASY5 Configuration:

Probe: EX3DV4 - SN3977; ConvF(9.62, 9.62, 9.62); Calibrated: 2014-2-17;

Electronics: DAE4 Sn1317; Calibrated: 2014-1-16

Phantom: SAM 11; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

**Right Cheek Middle/Area Scan (61x111x1):** Measurement grid: dx=1.500mm, dy=1.500mm

Maximum value of SAR (interpolated) = 0.411 mW/g

**Right Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.42 V/m; Power Drift = -0.066 dB

Peak SAR (extrapolated) = 0.485 W/kg

**SAR(1 g) = 0.384 mW/g; SAR(10 g) = 0.294 mW/g**

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

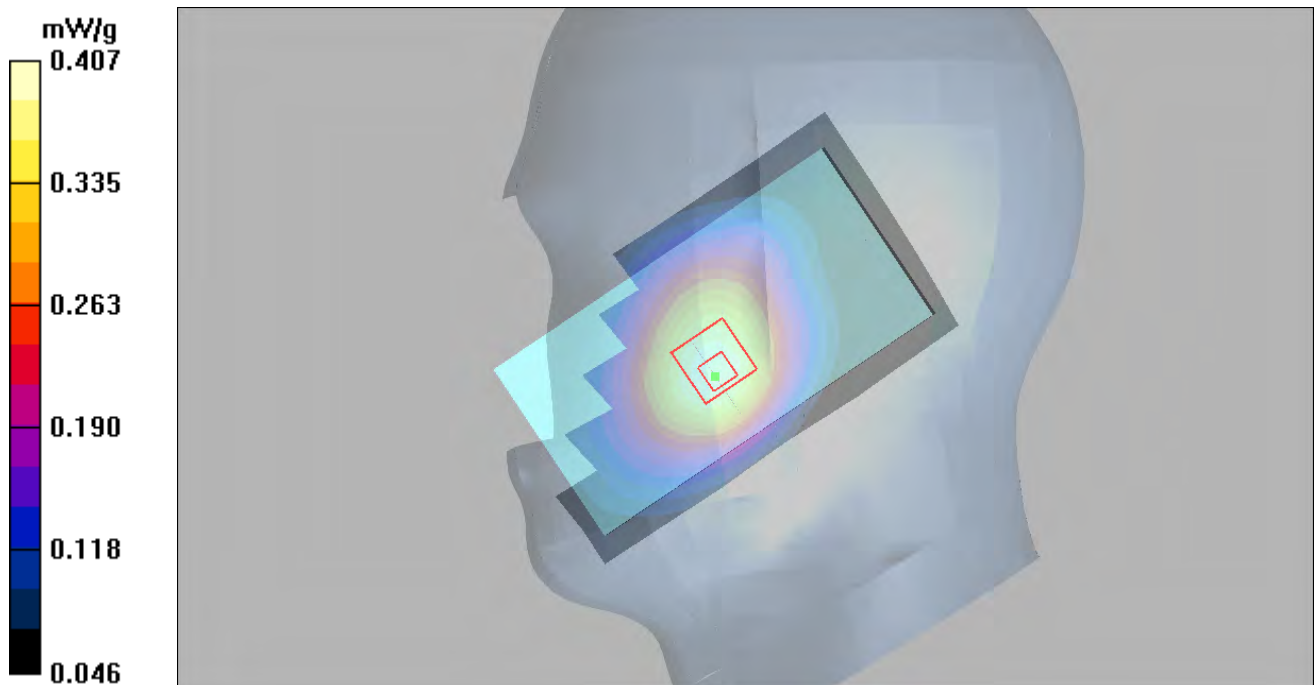


Figure 93 Right Hand Touch Cheek UMTS Band V Channel 4183

# TA Technology (Shanghai) Co., Ltd.

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### UMTS Band V Back Side High (Battery 1)

Date: 2014-12-19

Communication System: WCDMA Band V; Frequency: 846.6 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 847$  MHz;  $\sigma = 1.01$  mho/m;  $\epsilon_r = 55$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3 °C      Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 - SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2014-2-17;

Electronics: DAE4 Sn1317; Calibrated: 2014-1-16

Phantom: SAM 11; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

**Back Side High/Area Scan (61x111x1):** Measurement grid: dx=1.500mm, dy=1.500mm

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

**Back Side High/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 25.8 V/m; Power Drift = 0.146 dB

Peak SAR (extrapolated) = 0.881 W/kg

**SAR(1 g) = 0.720 mW/g; SAR(10 g) = 0.554 mW/g**

Maximum value of SAR (measured) = 0.754 mW/g

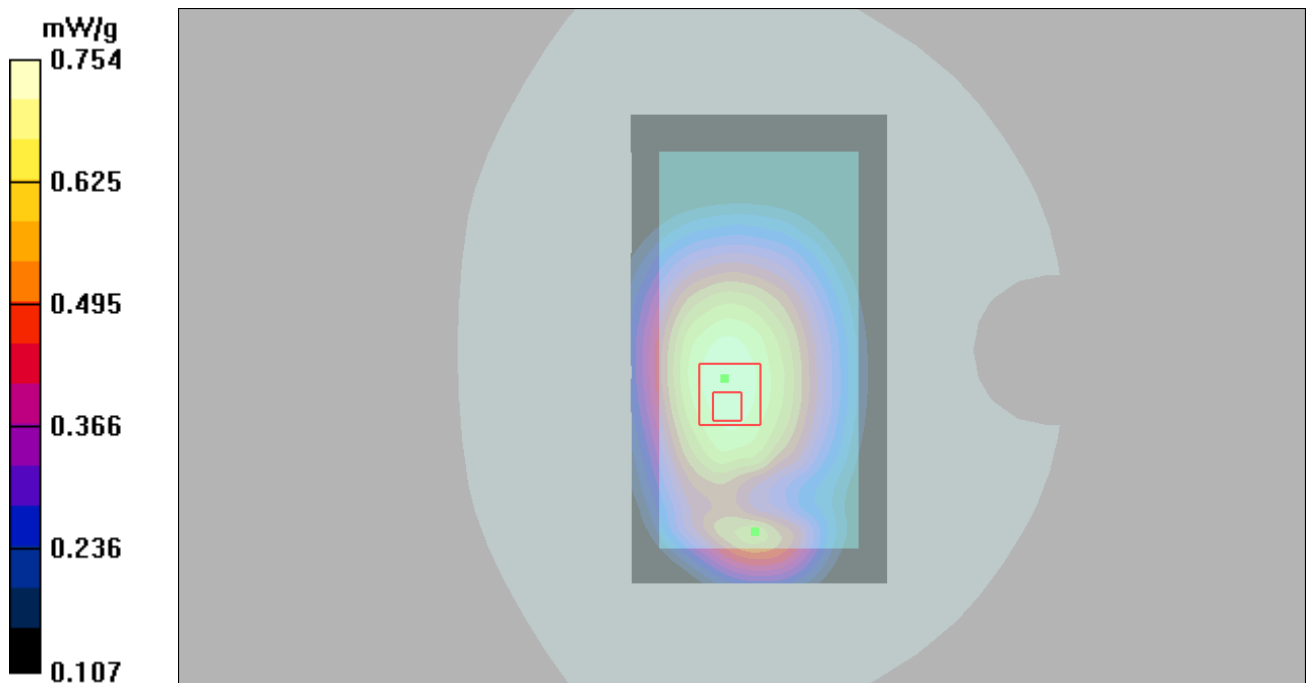


Figure 94 Body, Back Side, UMTS Band V Channel 4233

# TA Technology (Shanghai) Co., Ltd.

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### ANNEX F: Probe Calibration Certificate (SN: 3677)



In Collaboration with  
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CALIBRATION LABORATORY



Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China  
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E-mail: Info@emcetc.com Http://www.emcetc.com

Client **TA-ShangHai**

Certificate No: **J13-2-2971**

#### CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:3677**

Calibration Procedure(s) **TMC-OS-E-02-195**  
**Calibration Procedures for Dosimetric E-field Probes**

Calibration date: **November 28, 2013**

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

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

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards       | ID #       | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
|-------------------------|------------|------------------------------------------|-----------------------|
| Power Meter NRP2        | 101919     | 01-Jul-13 (TMC, No.JW13-044)             | Jun-14                |
| Power sensor NRP-Z91    | 101547     | 01-Jul-13 (TMC, No.JW13-044)             | Jun-14                |
| Power sensor NRP-Z91    | 101548     | 01-Jul-13 (TMC, No.JW13-044)             | Jun-14                |
| Reference10dBAttenuator | BT0520     | 12-Dec-12(TMC, No.JZ12-867)              | Dec-14                |
| Reference20dBAttenuator | BT0267     | 12-Dec-12(TMC, No.JZ12-866)              | Dec-14                |
| Reference Probe EX3DV4  | SN 3846    | 03-Sep-13(SPEAG, No.EX3-3846_Sep13)      | Sep-14                |
| DAE4                    | SN 777     | 22-Feb-13 (SPEAG, DAE4-777_Feb13)        | Feb-14                |
| Secondary Standards     | ID #       | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
| SignalGeneratorMG3700A  | 6201052605 | 01-Jul-13 (TMC, No.JW13-045)             | Jun-14                |
| Network Analyzer E5071C | MY46110673 | 15-Feb-13 (TMC, No.JZ13-781)             | Feb-14                |

|                | Name        | Function                          | Signature |
|----------------|-------------|-----------------------------------|-----------|
| Calibrated by: | Yu Zongying | SAR Test Engineer                 |           |
| Reviewed by:   | Qi Dianyuan | SAR Project Leader                |           |
| Approved by:   | Lu Bingsong | Deputy Director of the Laboratory |           |

Issued: November 29, 2013

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

Certificate No: J13-2-2971

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# TA Technology (Shanghai) Co., Ltd.

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In Collaboration with

**s p e a g**  
CALIBRATION LABORATORY

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E-mail: Info@emcite.com Http://www.emcite.com

### Glossary:

|                       |                                                                                                                                             |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| TSL                   | tissue simulating liquid                                                                                                                    |
| NORM <sub>x,y,z</sub> | sensitivity in free space                                                                                                                   |
| ConvF                 | sensitivity in TSL / NORM <sub>x,y,z</sub>                                                                                                  |
| DCP                   | diode compression point                                                                                                                     |
| CF                    | crest factor (1/duty_cycle) of the RF signal                                                                                                |
| A,B,C,D               | modulation dependent linearization parameters                                                                                               |
| Polarization $\Phi$   | $\Phi$ rotation around probe axis                                                                                                           |
| Polarization $\theta$ | $\theta$ rotation around an axis that is in the plane normal to probe axis (at measurement center), i<br>$\theta=0$ is normal to probe axis |

### 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 300MHz to 3GHz)", February 2005

### Methods Applied and Interpretation of Parameters:

- NORM<sub>x,y,z</sub>**: Assessed for E-field polarization  $\theta=0$  (fs900MHz in TEM-cell; f>1800MHz: waveguide). NORM<sub>x,y,z</sub> are only intermediate values, i.e., the uncertainties of NORM<sub>x,y,z</sub> does not effect the  $E^2$ -field uncertainty inside TSL (see below ConvF).
- 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 versions 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 are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- PAR**: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics.
- A<sub>x,y,z</sub>; B<sub>x,y,z</sub>; C<sub>x,y,z</sub>; VR<sub>x,y,z</sub>; A,B,C** are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for fs800MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty valued are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM<sub>x,y,z</sub> ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from  $\pm 50$ MHz to  $\pm 100$ MHz.
- Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- Connector Angle**: The angle is assessed using the information gained by determining the NORM<sub>x</sub> (no uncertainty required).



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E-mail: Info@emcite.com Http://www.emcite.com

# Probe EX3DV4

## SN: 3677

Calibrated: November 28, 2013

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

# TA Technology (Shanghai) Co., Ltd.

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### DASY – Parameters of Probe: EX3DV4 - SN: 3677

#### Basic Calibration Parameters

|                                                          | Sensor X | Sensor Y | Sensor Z | Unc (k=2) |
|----------------------------------------------------------|----------|----------|----------|-----------|
| Norm( $\mu\text{V}/(\text{V}/\text{m})^2$ ) <sup>A</sup> | 0.38     | 0.44     | 0.38     | ±10.8%    |
| DCP(mV) <sup>B</sup>                                     | 99.8     | 100.9    | 101.9    |           |

#### Modulation Calibration Parameters

| UID | Communication System Name |   | A dB | B dB, $\mu\text{V}$ | C   | D dB | VR mV | Unc <sup>E</sup> (k=2) |
|-----|---------------------------|---|------|---------------------|-----|------|-------|------------------------|
| 0   | CW                        | X | 0.0  | 0.0                 | 1.0 | 0.00 | 93.3  | ±2.6%                  |
|     |                           | Y | 0.0  | 0.0                 | 1.0 |      | 101.7 |                        |
|     |                           | Z | 0.0  | 0.0                 | 1.0 |      | 92.1  |                        |

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

<sup>A</sup> The uncertainties of Norm X, Y, Z do not affect the E<sup>2</sup>-field uncertainty inside TSL (see Page 5 and Page 6).

<sup>B</sup> Numerical linearization parameter; uncertainty not required.

<sup>E</sup> Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

# TA Technology (Shanghai) Co., Ltd.

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### DASY – Parameters of Probe: EX3DV4 - SN: 3677

#### Calibration Parameter Determined in Head Tissue Simulating Media

| f [MHz] <sup>C</sup> | Relative Permittivity <sup>F</sup> | Conductivity (S/m) <sup>F</sup> | ConvF X | ConvF Y | ConvF Z | Alpha | Depth (mm) | Unct. (k=2) |
|----------------------|------------------------------------|---------------------------------|---------|---------|---------|-------|------------|-------------|
| 750                  | 41.9                               | 0.89                            | 9.94    | 9.94    | 9.94    | 0.16  | 1.13       | ± 12%       |
| 850                  | 41.5                               | 0.92                            | 9.41    | 9.41    | 9.41    | 0.11  | 1.47       | ± 12%       |
| 1750                 | 40.1                               | 1.37                            | 8.22    | 8.22    | 8.22    | 0.14  | 2.11       | ± 12%       |
| 1900                 | 40.0                               | 1.40                            | 8.15    | 8.15    | 8.15    | 0.14  | 2.34       | ± 12%       |
| 2100                 | 39.8                               | 1.49                            | 7.87    | 7.87    | 7.87    | 0.13  | 3.21       | ± 12%       |
| 2450                 | 39.2                               | 1.80                            | 7.64    | 7.64    | 7.64    | 0.39  | 0.95       | ± 12%       |
| 5200                 | 36.0                               | 4.66                            | 5.73    | 5.73    | 5.73    | 0.95  | 0.62       | ± 13%       |
| 5300                 | 35.9                               | 4.76                            | 5.68    | 5.68    | 5.68    | 0.87  | 0.67       | ± 13%       |
| 5500                 | 35.6                               | 4.96                            | 5.62    | 5.62    | 5.62    | 0.97  | 0.62       | ± 13%       |
| 5600                 | 35.5                               | 5.07                            | 5.29    | 5.29    | 5.29    | 0.89  | 0.63       | ± 13%       |
| 5800                 | 35.3                               | 5.27                            | 5.29    | 5.29    | 5.29    | 1.02  | 0.61       | ± 13%       |

<sup>C</sup> Frequency validity of ±100MHz only applies for DASY v4.4 and higher (Page 2), else it is restricted to ±50MHz. The uncertainty is the RSS of ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

<sup>F</sup> At frequency below 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) is restricted to ±5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.



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## DASY – Parameters of Probe: EX3DV4 - SN: 3677

### Calibration Parameter Determined in Body Tissue Simulating Media

| f [MHz] <sup>C</sup> | Relative Permittivity <sup>F</sup> | Conductivity (S/m) <sup>F</sup> | ConvF X | ConvF Y | ConvF Z | Alpha | Depth (mm) | Unct. (k=2) |
|----------------------|------------------------------------|---------------------------------|---------|---------|---------|-------|------------|-------------|
| 750                  | 55.5                               | 0.96                            | 9.72    | 9.72    | 9.72    | 0.11  | 1.97       | ±12%        |
| 850                  | 55.2                               | 0.99                            | 9.51    | 9.51    | 9.51    | 0.15  | 1.55       | ±12%        |
| 1750                 | 53.4                               | 1.49                            | 7.77    | 7.77    | 7.77    | 0.14  | 3.23       | ±12%        |
| 1900                 | 53.3                               | 1.52                            | 7.63    | 7.63    | 7.63    | 0.15  | 2.81       | ±12%        |
| 2100                 | 53.2                               | 1.62                            | 7.97    | 7.97    | 7.97    | 0.16  | 4.09       | ±12%        |
| 2450                 | 52.7                               | 1.95                            | 7.61    | 7.61    | 7.61    | 0.45  | 0.92       | ±12%        |
| 5200                 | 49.0                               | 5.30                            | 4.72    | 4.72    | 4.72    | 0.66  | 1.10       | ±13%        |
| 5300                 | 48.9                               | 5.42                            | 4.67    | 4.67    | 4.67    | 0.64  | 1.19       | ±13%        |
| 5500                 | 48.6                               | 5.65                            | 4.34    | 4.34    | 4.34    | 0.73  | 0.80       | ±13%        |
| 5600                 | 48.5                               | 5.77                            | 4.29    | 4.29    | 4.29    | 0.74  | 0.81       | ±13%        |
| 5800                 | 48.2                               | 6.00                            | 4.46    | 4.46    | 4.46    | 0.78  | 0.80       | ±13%        |

<sup>C</sup> Frequency validity of ±100MHz only applies for DASY v4.4 and higher (Page 2), else it is restricted to ±50MHz. The uncertainty is the RSS of ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

<sup>F</sup> At frequency below 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) is restricted to ±5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

TA Technology (Shanghai) Co., Ltd.  
Test Report

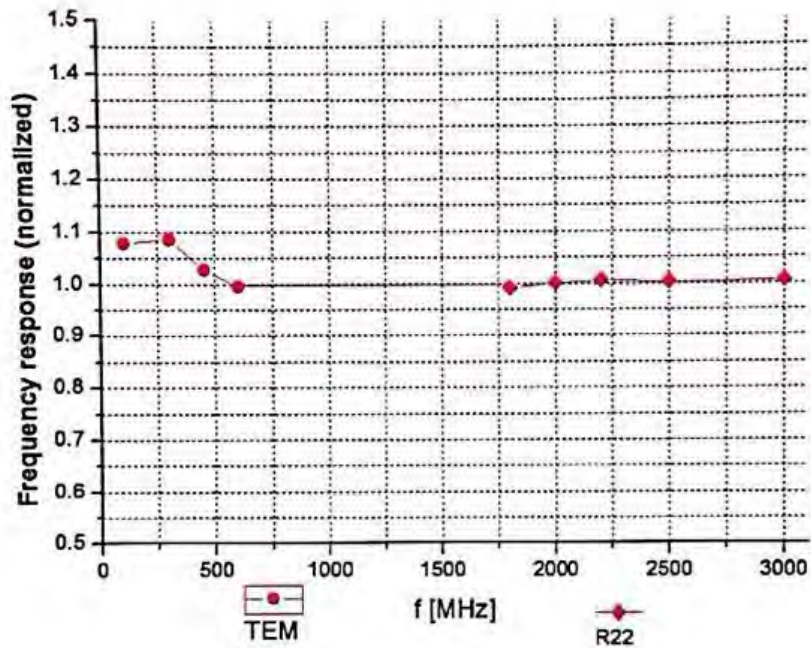
Report No.: RXA1411-0269SAR01R4

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Frequency Response of E-Field  
(TEM-Cell: ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field:  $\pm 7.5\%$  ( $k=2$ )

# TA Technology (Shanghai) Co., Ltd.

## Test Report

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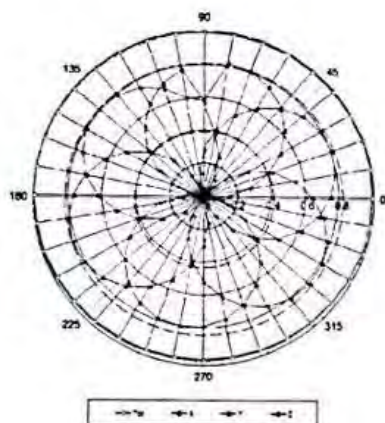
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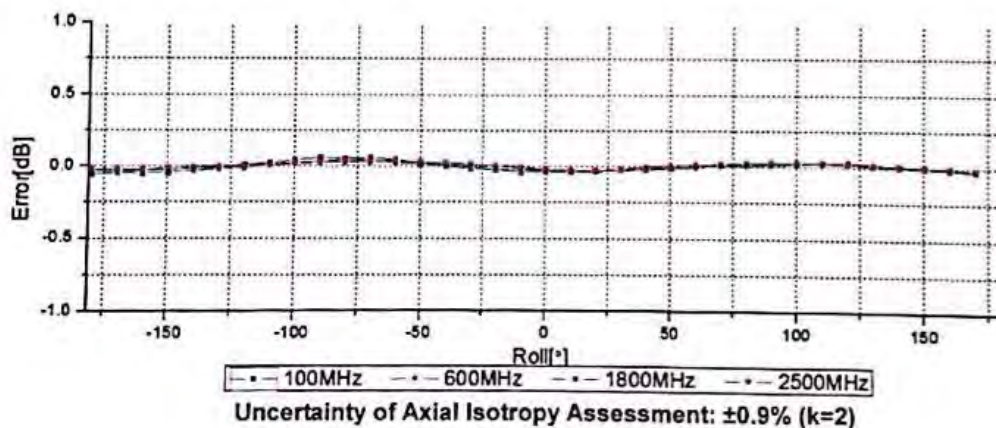
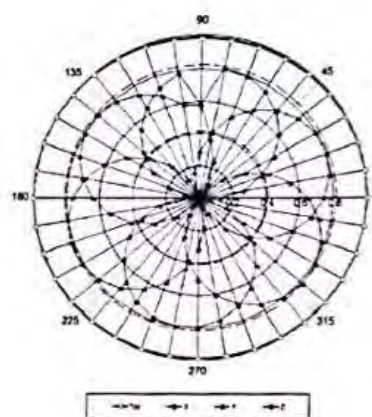
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Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504  
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### Receiving Pattern ( $\Phi$ ), $\theta=0^\circ$

f=600 MHz, TEM



f=1800 MHz, R22



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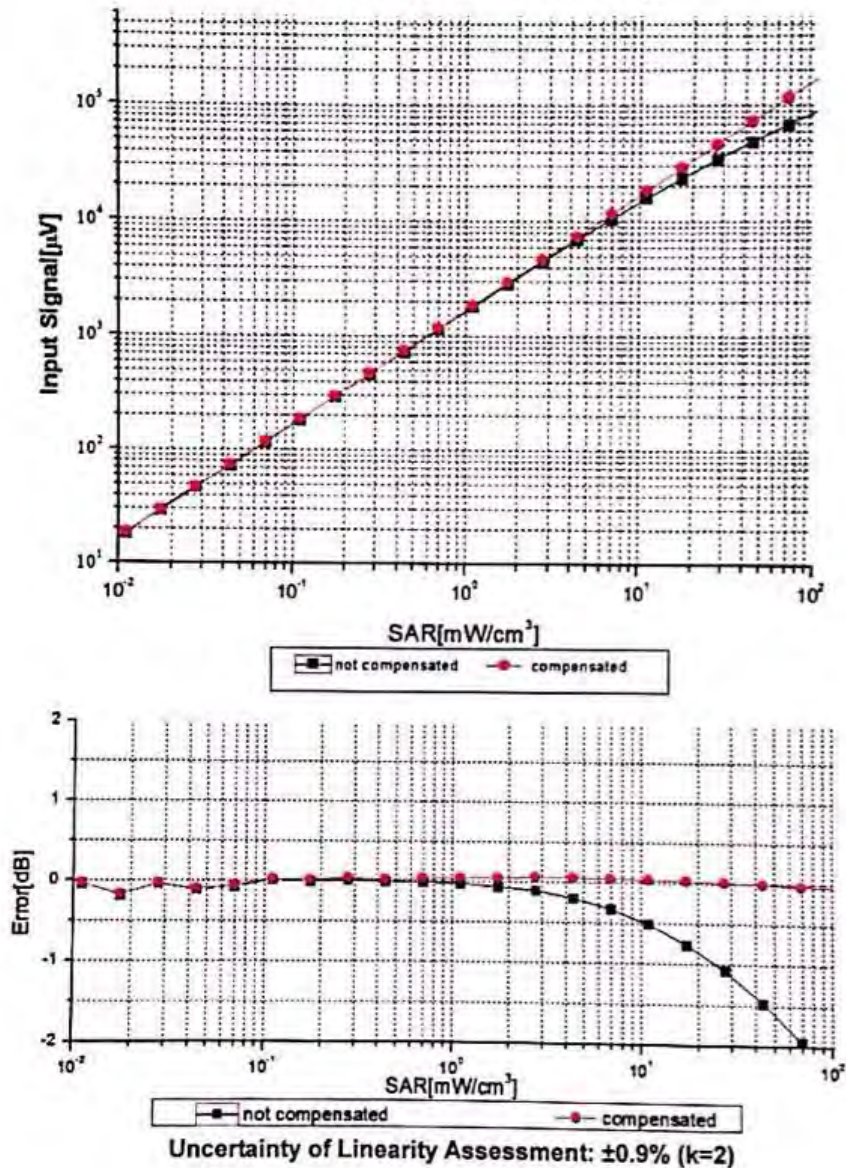
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## Dynamic Range $f(\text{SAR}_{\text{head}})$ (TEM cell, $f = 900 \text{ MHz}$ )



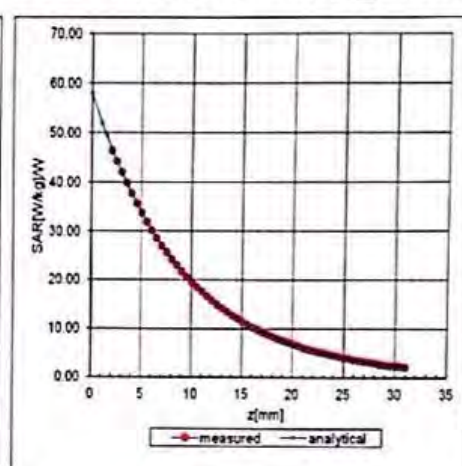
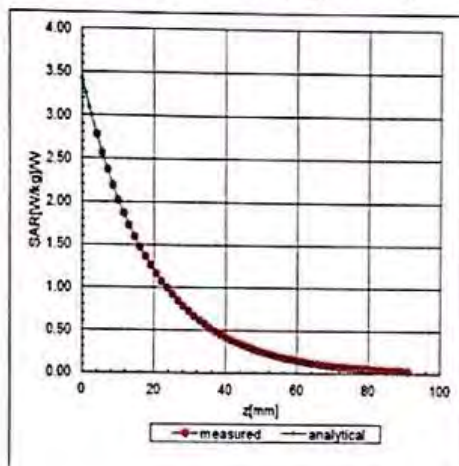


Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China  
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504  
E-mail: Info@emcite.com Http://www.emcite.com

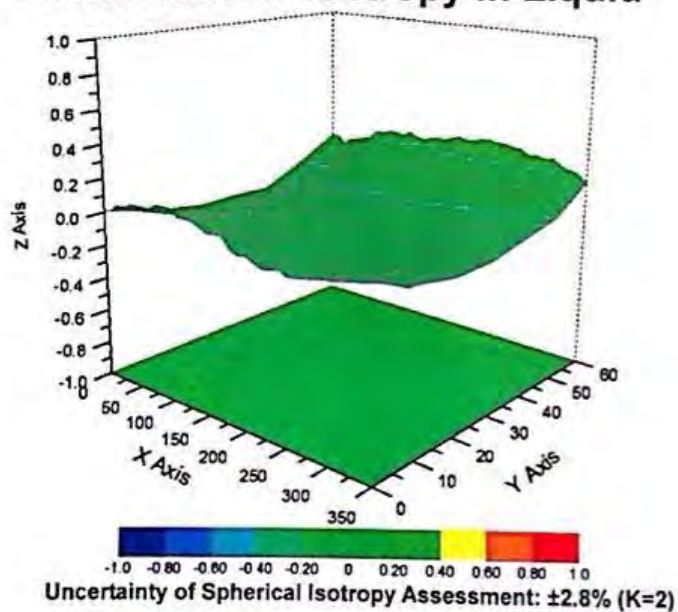
## Conversion Factor Assessment

f=850 MHz, WGLS R9(H\_convF)

f=2450 MHz, WGLS R26(H\_convF)



## Deviation from Isotropy in Liquid



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**DASY - Parameters of Probe: EX3DV4 - SN: 3677**

**Other Probe Parameters**

|                                               |            |
|-----------------------------------------------|------------|
| Sensor Arrangement                            | Triangular |
| Connector Angle (°)                           | 117        |
| Mechanical Surface Detection Mode             | enabled    |
| Optical Surface Detection Mode                | disable    |
| Probe Overall Length                          | 337mm      |
| Probe Body Diameter                           | 10mm       |
| Tip Length                                    | 9mm        |
| Tip Diameter                                  | 2.5mm      |
| Probe Tip to Sensor X Calibration Point       | 1mm        |
| Probe Tip to Sensor Y Calibration Point       | 1mm        |
| Probe Tip to Sensor Z Calibration Point       | 1mm        |
| Recommended Measurement Distance from Surface | 2mm        |

# TA Technology (Shanghai) Co., Ltd.

## Test Report

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### ANNEX G: Probe Calibration Certificate (SN: 3977)

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



S Schweizerischer Kalibrierdienst  
S 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 ATL (Auden)

Certificate No: EX3-3977\_Feb14

#### CALIBRATION CERTIFICATE

Object EX3DV4 - SN:3977

Calibration procedure(s) QA CAL-01.v9, QA CAL-12.v9, QA CAL-14.v4, QA CAL-23.v5,  
QA CAL-25.v6  
Calibration procedure for dosimetric E-field probes

Calibration date: February 17, 2014

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 E4419B         | GB41293874      | 04-Apr-13 (No. 217-01733)         | Apr-14                 |
| Power sensor E4412A        | MY41498087      | 04-Apr-13 (No. 217-01733)         | Apr-14                 |
| Reference 3 dB Attenuator  | SN: S5054 (3c)  | 04-Apr-13 (No. 217-01737)         | Apr-14                 |
| Reference 20 dB Attenuator | SN: S5277 (20x) | 04-Apr-13 (No. 217-01735)         | Apr-14                 |
| Reference 30 dB Attenuator | SN: S5129 (30b) | 04-Apr-13 (No. 217-01738)         | Apr-14                 |
| Reference Probe ES3DV2     | SN: 3013        | 30-Dec-13 (No. ES3-3013_Dec13)    | Dec-14                 |
| DAE4                       | SN: 660         | 13-Dec-13 (No. DAE4-660_Dec13)    | Dec-14                 |
| Secondary Standards        | ID              | Check Date (in house)             | Scheduled Check        |
| RF generator HP 8648C      | US3642U01700    | 4-Aug-99 (in house check Apr-13)  | In house check: Apr-16 |
| Network Analyzer HP 8753E  | US37390585      | 18-Oct-01 (in house check Oct-13) | In house check: Oct-14 |

|                                                                                                                 | Name           | Function              | Signature |
|-----------------------------------------------------------------------------------------------------------------|----------------|-----------------------|-----------|
| Calibrated by:                                                                                                  | Jeton Kastrati | Laboratory Technician |           |
| Approved by:                                                                                                    | Katja Pokovic  | Technical Manager     |           |
| Issued: February 19, 2014                                                                                       |                |                       |           |
| This calibration certificate shall not be reproduced except in full without written approval of the laboratory. |                |                       |           |

Certificate No: EX3-3977\_Feb14

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# TA Technology (Shanghai) Co., Ltd.

## Test Report

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



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

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

Accreditation No.: **SCS 108**

### Glossary:

|                          |                                                                                                                                                         |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| TSL                      | tissue simulating liquid                                                                                                                                |
| NORM <sub>x,y,z</sub>    | sensitivity in free space                                                                                                                               |
| ConvF                    | sensitivity in TSL / NORM <sub>x,y,z</sub>                                                                                                              |
| DCP                      | diode compression point                                                                                                                                 |
| CF                       | crest factor (1/duty_cycle) of the RF signal                                                                                                            |
| A, B, C, D               | modulation dependent linearization parameters                                                                                                           |
| Polarization $\varphi$   | $\varphi$ rotation around probe axis                                                                                                                    |
| Polarization $\vartheta$ | $\vartheta$ rotation around an axis that is in the plane normal to probe axis (at measurement center),<br>i.e., $\vartheta = 0$ is normal to probe axis |
| Connector Angle          | information used in DASY system to align probe sensor X to the robot coordinate system                                                                  |

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

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

### Methods Applied and Interpretation of Parameters:

- NORM<sub>x,y,z</sub>**: Assessed for E-field polarization  $\vartheta = 0$  ( $f \leq 900$  MHz in TEM-cell;  $f > 1800$  MHz: R22 waveguide). NORM<sub>x,y,z</sub> are only intermediate values, i.e., the uncertainties of NORM<sub>x,y,z</sub> does not affect 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> \* frequency\_response (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCP<sub>x,y,z</sub>**: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- PAR**: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- A<sub>x,y,z</sub>; B<sub>x,y,z</sub>; C<sub>x,y,z</sub>; D<sub>x,y,z</sub>; VR<sub>x,y,z</sub>; A, B, C, D** are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for  $f \leq 800$  MHz) and inside waveguide using analytical field distributions based on power measurements for  $f > 800$  MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM<sub>x,y,z</sub> \* ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from  $\pm 50$  MHz to  $\pm 100$  MHz.
- Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- Connector Angle**: The angle is assessed using the information gained by determining the NORM<sub>x</sub> (no uncertainty required).

EX3DV4 – SN:3977

February 17, 2014

Probe EX3DV4

SN:3977

Manufactured: November 5, 2013  
Calibrated: February 17, 2014

Calibrated for DASY/EASY Systems  
(Note: non-compatible with DASY2 system!)

# TA Technology (Shanghai) Co., Ltd.

## Test Report

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EX3DV4- SN:3977

February 17, 2014

### DASY/EASY - Parameters of Probe: EX3DV4 - SN:3977

#### Basic Calibration Parameters

|                                                           | Sensor X | Sensor Y | Sensor Z | Unc (k=2)     |
|-----------------------------------------------------------|----------|----------|----------|---------------|
| Norm ( $\mu\text{V}/(\text{V}/\text{m})^2$ ) <sup>A</sup> | 0.54     | 0.57     | 0.54     | $\pm 10.1 \%$ |
| DCP (mV) <sup>B</sup>                                     | 99.5     | 100.0    | 99.7     |               |

#### Modulation Calibration Parameters

| UID | Communication System Name |   | A<br>dB | B<br>dB/ $\mu\text{V}$ | C   | D<br>dB | VR<br>mV | Unc <sup>E</sup><br>(k=2) |
|-----|---------------------------|---|---------|------------------------|-----|---------|----------|---------------------------|
| 0   | CW                        | X | 0.0     | 0.0                    | 1.0 | 0.00    | 133.3    | $\pm 3.3 \%$              |
|     |                           | Y | 0.0     | 0.0                    | 1.0 |         | 134.9    |                           |
|     |                           | Z | 0.0     | 0.0                    | 1.0 |         | 146.5    |                           |

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

<sup>A</sup> The uncertainties of NormX,Y,Z do not affect the  $E^2$ -field uncertainty inside TSL (see Pages 5 and 6).

<sup>B</sup> Numerical linearization parameter; uncertainty not required.

<sup>E</sup> Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

# TA Technology (Shanghai) Co., Ltd.

## Test Report

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EX3DV4- SN:3977

February 17, 2014

### DASY/EASY - Parameters of Probe: EX3DV4 - SN:3977

#### Calibration Parameter Determined in Head Tissue Simulating Media

| f (MHz) <sup>C</sup> | Relative Permittivity <sup>F</sup> | Conductivity (S/m) <sup>F</sup> | ConvF X | ConvF Y | ConvF Z | Alpha <sup>G</sup> | Depth <sup>G</sup> (mm) | Unct. (k=2) |
|----------------------|------------------------------------|---------------------------------|---------|---------|---------|--------------------|-------------------------|-------------|
| 450                  | 43.5                               | 0.87                            | 11.72   | 11.72   | 11.72   | 0.18               | 1.10                    | ± 13.3 %    |
| 750                  | 41.9                               | 0.89                            | 9.98    | 9.98    | 9.98    | 0.36               | 0.88                    | ± 12.0 %    |
| 835                  | 41.5                               | 0.90                            | 9.62    | 9.62    | 9.62    | 0.61               | 0.69                    | ± 12.0 %    |
| 900                  | 41.5                               | 0.97                            | 9.48    | 9.48    | 9.48    | 0.77               | 0.63                    | ± 12.0 %    |
| 1750                 | 40.1                               | 1.37                            | 8.14    | 8.14    | 8.14    | 0.78               | 0.60                    | ± 12.0 %    |
| 1900                 | 40.0                               | 1.40                            | 7.97    | 7.97    | 7.97    | 0.48               | 0.75                    | ± 12.0 %    |
| 2000                 | 40.0                               | 1.40                            | 7.93    | 7.93    | 7.93    | 0.69               | 0.63                    | ± 12.0 %    |
| 2300                 | 39.5                               | 1.67                            | 7.59    | 7.59    | 7.59    | 0.37               | 0.83                    | ± 12.0 %    |
| 2450                 | 39.2                               | 1.80                            | 7.24    | 7.24    | 7.24    | 0.27               | 1.10                    | ± 12.0 %    |
| 2600                 | 39.0                               | 1.96                            | 7.07    | 7.07    | 7.07    | 0.41               | 0.84                    | ± 12.0 %    |
| 5200                 | 36.0                               | 4.66                            | 5.09    | 5.09    | 5.09    | 0.35               | 1.80                    | ± 13.1 %    |
| 5300                 | 35.9                               | 4.76                            | 4.82    | 4.82    | 4.82    | 0.35               | 1.80                    | ± 13.1 %    |
| 5500                 | 35.8                               | 4.96                            | 4.76    | 4.76    | 4.76    | 0.35               | 1.80                    | ± 13.1 %    |
| 5600                 | 35.5                               | 5.07                            | 4.55    | 4.55    | 4.55    | 0.40               | 1.80                    | ± 13.1 %    |
| 5800                 | 35.3                               | 5.27                            | 4.52    | 4.52    | 4.52    | 0.40               | 1.80                    | ± 13.1 %    |

<sup>C</sup> Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

<sup>F</sup> At frequencies below 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

<sup>G</sup> Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

# TA Technology (Shanghai) Co., Ltd.

## Test Report

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EX3DV4- SN:3977

February 17, 2014

### DASY/EASY - Parameters of Probe: EX3DV4 - SN:3977

#### Calibration Parameter Determined in Body Tissue Simulating Media

| f (MHz) <sup>C</sup> | Relative Permittivity <sup>F</sup> | Conductivity (S/m) <sup>F</sup> | ConvF X | ConvF Y | ConvF Z | Alpha <sup>G</sup> | Depth <sup>G</sup> (mm) | Unct. (k=2) |
|----------------------|------------------------------------|---------------------------------|---------|---------|---------|--------------------|-------------------------|-------------|
| 450                  | 56.7                               | 0.94                            | 12.47   | 12.47   | 12.47   | 0.11               | 1.10                    | ± 13.3 %    |
| 750                  | 55.5                               | 0.96                            | 9.78    | 9.78    | 9.78    | 0.45               | 0.86                    | ± 12.0 %    |
| 835                  | 55.2                               | 0.97                            | 9.74    | 9.74    | 9.74    | 0.48               | 0.83                    | ± 12.0 %    |
| 900                  | 55.0                               | 1.05                            | 9.46    | 9.46    | 9.46    | 0.41               | 0.89                    | ± 12.0 %    |
| 1750                 | 53.4                               | 1.49                            | 7.69    | 7.69    | 7.69    | 0.41               | 0.88                    | ± 12.0 %    |
| 1900                 | 53.3                               | 1.52                            | 7.37    | 7.37    | 7.37    | 0.34               | 0.89                    | ± 12.0 %    |
| 2000                 | 53.3                               | 1.52                            | 7.41    | 7.41    | 7.41    | 0.24               | 1.14                    | ± 12.0 %    |
| 2300                 | 52.9                               | 1.81                            | 7.12    | 7.12    | 7.12    | 0.66               | 0.64                    | ± 12.0 %    |
| 2450                 | 52.7                               | 1.95                            | 6.97    | 6.97    | 6.97    | 0.80               | 0.50                    | ± 12.0 %    |
| 2600                 | 52.5                               | 2.16                            | 6.68    | 6.68    | 6.68    | 0.80               | 0.50                    | ± 12.0 %    |
| 5200                 | 49.0                               | 5.30                            | 4.50    | 4.50    | 4.50    | 0.45               | 1.90                    | ± 13.1 %    |
| 5300                 | 48.9                               | 5.42                            | 4.28    | 4.28    | 4.28    | 0.45               | 1.90                    | ± 13.1 %    |
| 5500                 | 48.6                               | 5.65                            | 4.02    | 4.02    | 4.02    | 0.45               | 1.90                    | ± 13.1 %    |
| 5600                 | 48.5                               | 5.77                            | 3.87    | 3.87    | 3.87    | 0.45               | 1.90                    | ± 13.1 %    |
| 5800                 | 48.2                               | 6.00                            | 4.12    | 4.12    | 4.12    | 0.50               | 1.90                    | ± 13.1 %    |

<sup>C</sup> Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the Indicated frequency band.

<sup>F</sup> At frequencies below 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

<sup>G</sup> Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-5 GHz at any distance larger than half the probe tip diameter from the boundary.

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Test Report

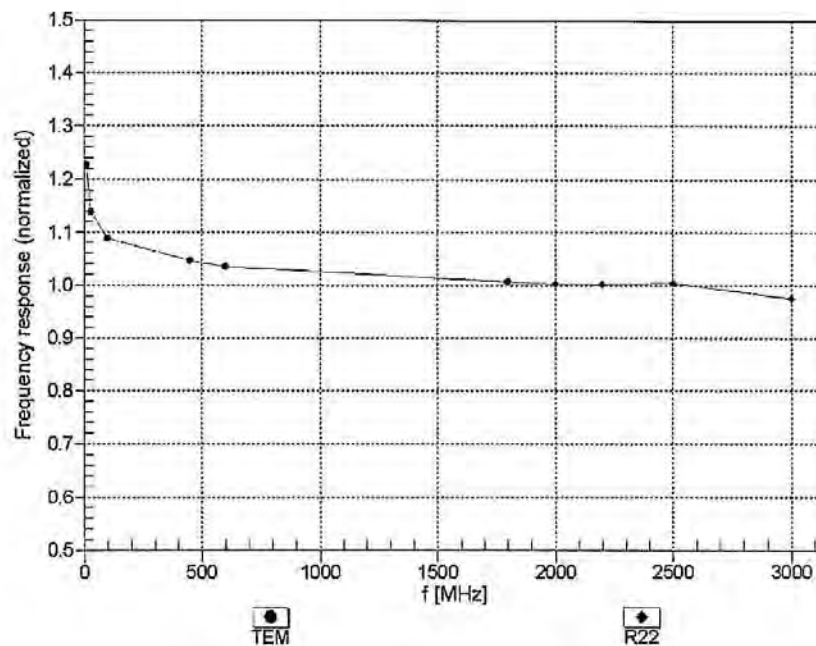
Report No.: RXA1411-0269SAR01R4

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EX3DV4- SN:3977

February 17, 2014

**Frequency Response of E-Field**  
(TEM-Cell:ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field:  $\pm 6.3\%$  ( $k=2$ )

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## Test Report

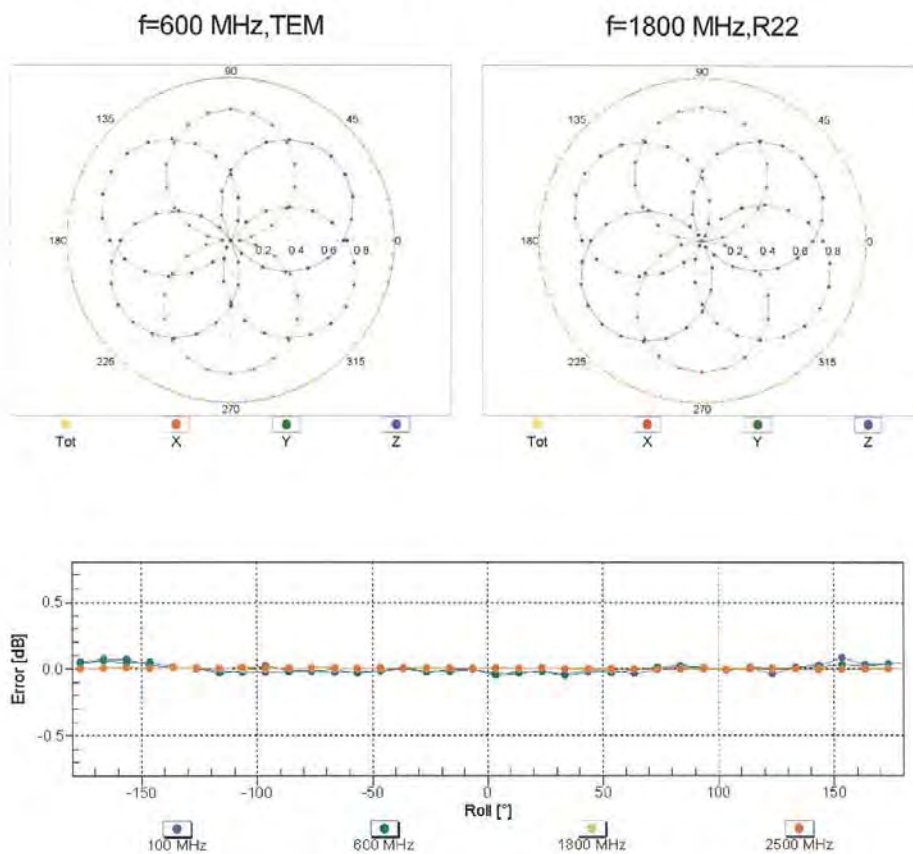
Report No.: RXA1411-0269SAR01R4

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EX3DV4- SN:3977

February 17, 2014

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



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

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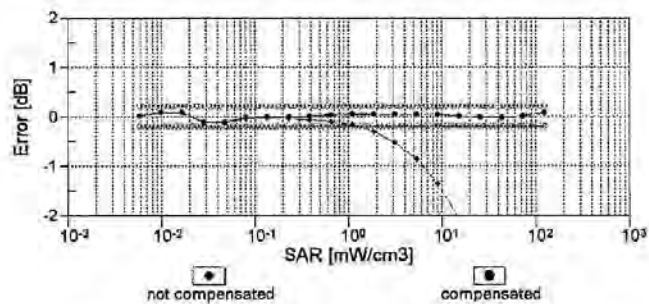
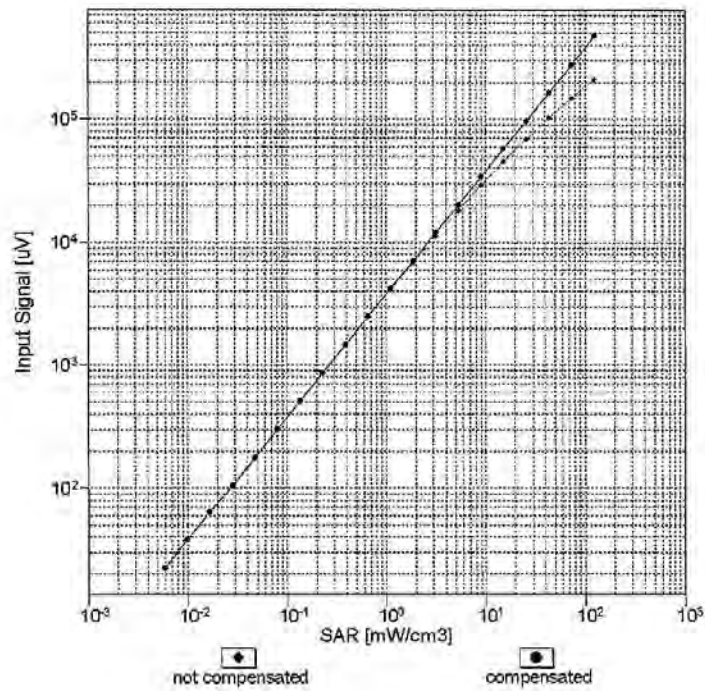
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EX3DV4—SN:3977

February 17, 2014

**Dynamic Range  $f(\text{SAR}_{\text{head}})$**   
(TEM cell,  $f_{\text{eval}} = 1900 \text{ MHz}$ )



Uncertainty of Linearity Assessment:  $\pm 0.6\%$  ( $k=2$ )

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## Test Report

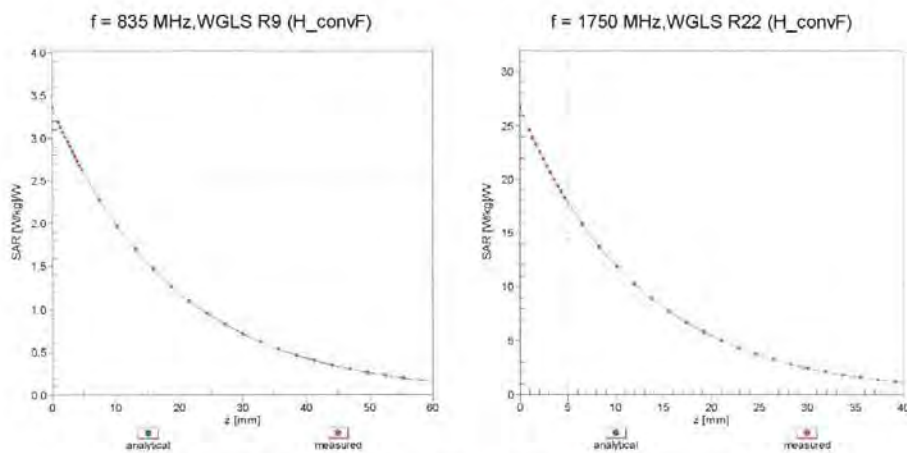
Report No.: RXA1411-0269SAR01R4

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EX3DV4- SN:3977

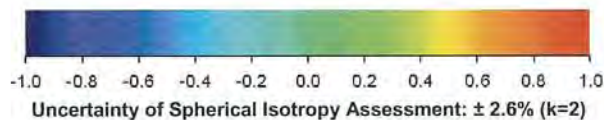
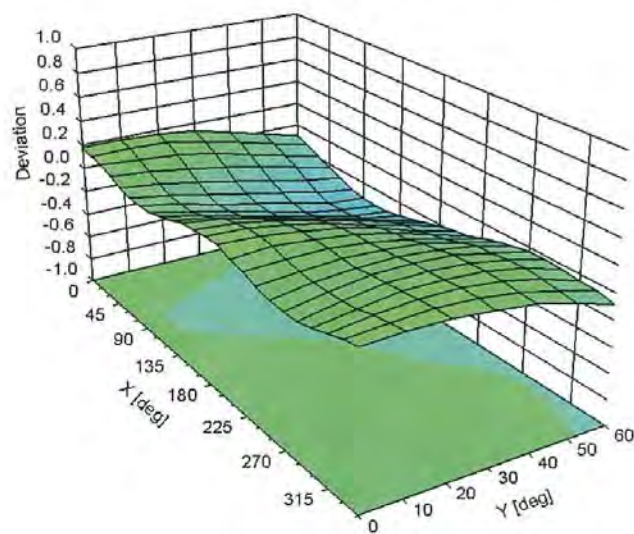
February 17, 2014

### Conversion Factor Assessment



### Deviation from Isotropy in Liquid

Error ( $\phi$ ,  $\theta$ ), f = 900 MHz



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**Test Report**

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EX3DV4- SN:3977

February 17, 2014

**DASY/EASY - Parameters of Probe: EX3DV4 - SN:3977**

**Other Probe Parameters**

|                                               |            |
|-----------------------------------------------|------------|
| Sensor Arrangement                            | Triangular |
| Connector Angle (°)                           | 23.6       |
| Mechanical Surface Detection Mode             | enabled    |
| Optical Surface Detection Mode                | disabled   |
| Probe Overall Length                          | 337 mm     |
| Probe Body Diameter                           | 10 mm      |
| Tip Length                                    | 9 mm       |
| Tip Diameter                                  | 2.5 mm     |
| Probe Tip to Sensor X Calibration Point       | 1 mm       |
| Probe Tip to Sensor Y Calibration Point       | 1 mm       |
| Probe Tip to Sensor Z Calibration Point       | 1 mm       |
| Recommended Measurement Distance from Surface | 2 mm       |

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**Test Report**

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**ANNEX H: D835V2 Dipole Calibration Certificate**



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Client **TA(Shanghai)** Certificate No: **Z14-97073**

**CALIBRATION CERTIFICATE**

Object **D835V2 - SN: 4d020**

Calibration Procedure(s) **TMC-OS-E-02-194**  
**Calibration procedure for dipole validation kits**

Calibration date: **August 28, 2014**

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

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

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards       | ID #       | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
|-------------------------|------------|------------------------------------------|-----------------------|
| Power Meter NRVD        | 102083     | 11-Sep-13 (TMC, No.JZ13-443)             | Sep-14                |
| Power sensor NRV-Z5     | 100595     | 11-Sep-13 (TMC, No. JZ13-443)            | Sep -14               |
| Reference Probe ES3DV3  | SN 3149    | 5- Sep-13 (SPEAG, No.ES3-3149_Sep13)     | Sep-14                |
| DAE3                    | SN 536     | 23-Jan-14 (SPEAG, DAE3-536_Jan14)        | Jan -15               |
| Signal Generator E4438C | MY49070393 | 13-Nov-13 (TMC, No.JZ13-394)             | Nov-14                |
| Network Analyzer E8362B | MY43021135 | 19-Oct-13 (TMC, No.JZ13-278)             | Oct-14                |

|                | Name        | Function                          | Signature |
|----------------|-------------|-----------------------------------|-----------|
| Calibrated by: | Zhao Jing   | SAR Test Engineer                 |           |
| Reviewed by:   | Qi Dianyuan | SAR Project Leader                |           |
| Approved by:   | Lu Bingsong | Deputy Director of the laboratory |           |

Issued: September 4, 2014

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### Glossary:

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

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

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- 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
- KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

### 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.

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

# TA Technology (Shanghai) Co., Ltd.

## Test Report

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CALIBRATION  
No. L0570

### Measurement Conditions

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

|                              |                          |             |
|------------------------------|--------------------------|-------------|
| DASY Version                 | DASY52                   | 52.8.8.1222 |
| Extrapolation                | Advanced Extrapolation   |             |
| Phantom                      | Triple Flat Phantom 5.1C |             |
| 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 | 42.5 $\pm$ 6 % | 0.91 mho/m $\pm$ 6 % |
| Head TSL temperature change during test | <1.0 °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 | 2.39 mW / g                  |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 9.54 mW/g $\pm$ 20.8 % (k=2) |
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | Condition          |                              |
| SAR measured                                            | 250 mW input power | 1.57 mW / g                  |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 6.26 mW/g $\pm$ 20.4 % (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 $\pm$ 0.2) °C | 56.7 $\pm$ 6 % | 0.97 mho/m $\pm$ 6 % |
| Body TSL temperature change during test | <1.0 °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 | 2.37 mW / g                  |
| SAR for nominal Body TSL parameters                     | normalized to 1W   | 9.54 mW/g $\pm$ 20.8 % (k=2) |
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL | Condition          |                              |
| SAR measured                                            | 250 mW input power | 1.57 mW / g                  |
| SAR for nominal Body TSL parameters                     | normalized to 1W   | 6.31 mW/g $\pm$ 20.4 % (k=2) |

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CALIBRATION  
No. L0570

### Appendix

#### Antenna Parameters with Head TSL

|                                      |                            |
|--------------------------------------|----------------------------|
| Impedance, transformed to feed point | $48.6\Omega + 2.75j\Omega$ |
| Return Loss                          | - 30.1dB                   |

#### Antenna Parameters with Body TSL

|                                      |                            |
|--------------------------------------|----------------------------|
| Impedance, transformed to feed point | $54.0\Omega + 5.88j\Omega$ |
| Return Loss                          | - 23.3dB                   |

#### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1,242 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. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

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

# TA Technology (Shanghai) Co., Ltd.

## Test Report

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CALIBRATION  
No. L0570

### DASY5 Validation Report for Head TSL

Date: 28.03.2014

Test Laboratory: CTTL, Beijing, China

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d020**

Communication System: UID 0, CW (0); Frequency: 835 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.909 \text{ S/m}$ ;  $\epsilon_r = 42.49$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3149; ConvF(6.21, 6.21, 6.21); Calibrated: 2013-09-05;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn536; Calibrated: 2014-01-23
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**System Performance Check at Frequencies below 1 GHz/d=15mm, Pin=250 mW, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid:**

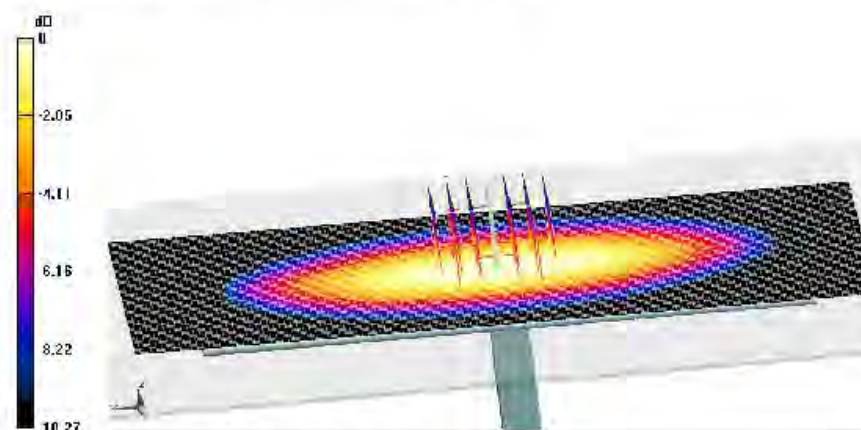
dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.88 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 3.54 W/kg

**SAR(1 g) = 2.39 W/kg; SAR(10 g) = 1.57 W/kg**

Maximum value of SAR (measured) = 2.79 W/kg



**0 dB = 2.79 W/kg = 4.46 dBW/kg**

# TA Technology (Shanghai) Co., Ltd.

## Test Report

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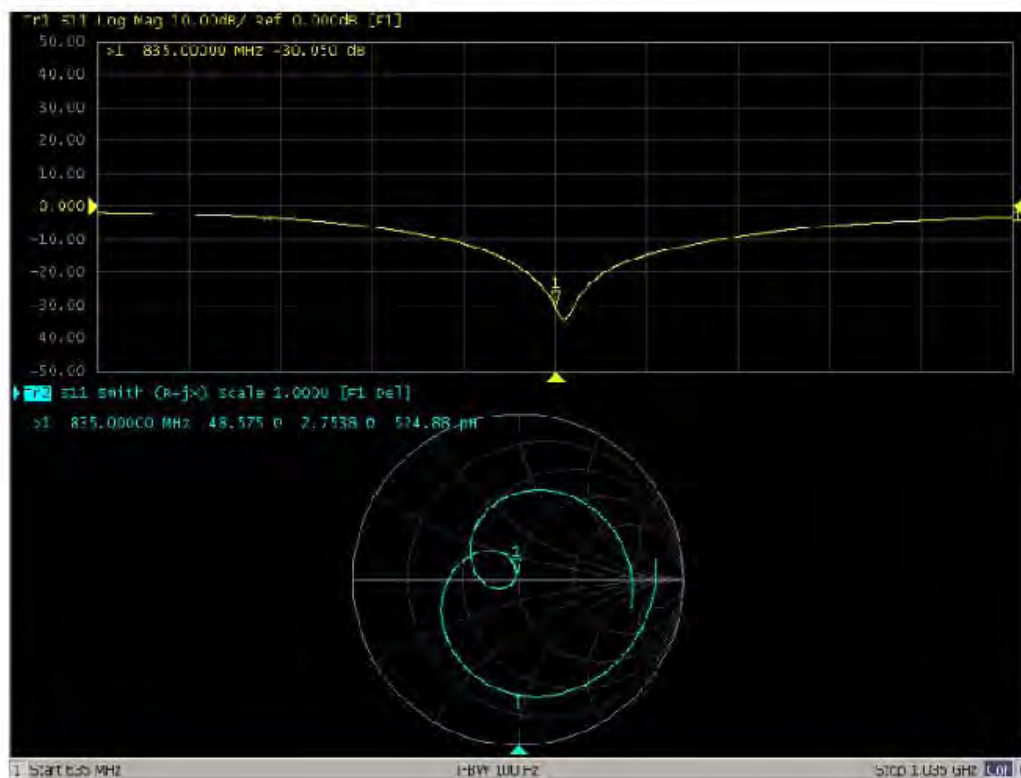
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CALIBRATION  
No. L0570

### Impedance Measurement Plot for Head TSL



# TA Technology (Shanghai) Co., Ltd.

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### DASY5 Validation Report for Body TSL

Date: 28.08.2014

Test Laboratory: CTTL, Beijing, China

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d020**

Communication System: UID 0, CW (0); Frequency: 835 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.97 \text{ S/m}$ ;  $\epsilon_r = 56.745$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Center Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3149; ConvF(5.98, 5.98, 5.98); Calibrated: 2013-09-05;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAB3 Sn536; Calibrated: 2014-01-23
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/2
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

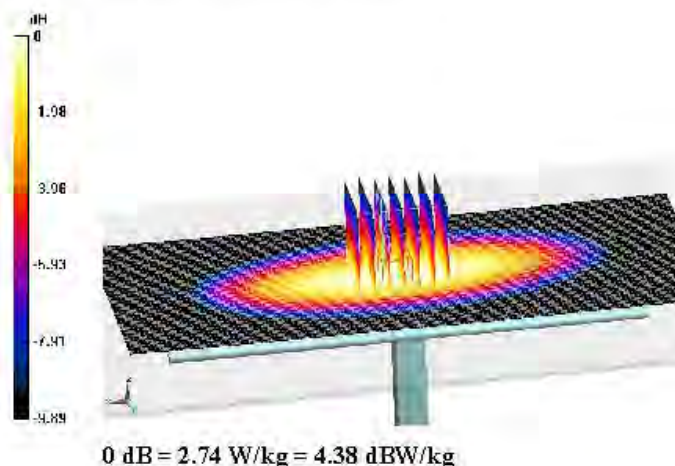
**System Performance Check at Frequencies below 1 GHz/d=15mm, Pin=250 mW, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0; Measurement grid: dx=5mm, dy=5mm, dz=5mm**

Reference Value = 53.515 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 3.45 W/kg

**SAR(1 g) = 2.37 W/kg; SAR(10 g) = 1.57 W/kg**

Maximum value of SAR (measured) = 2.74 W/kg



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Test Report

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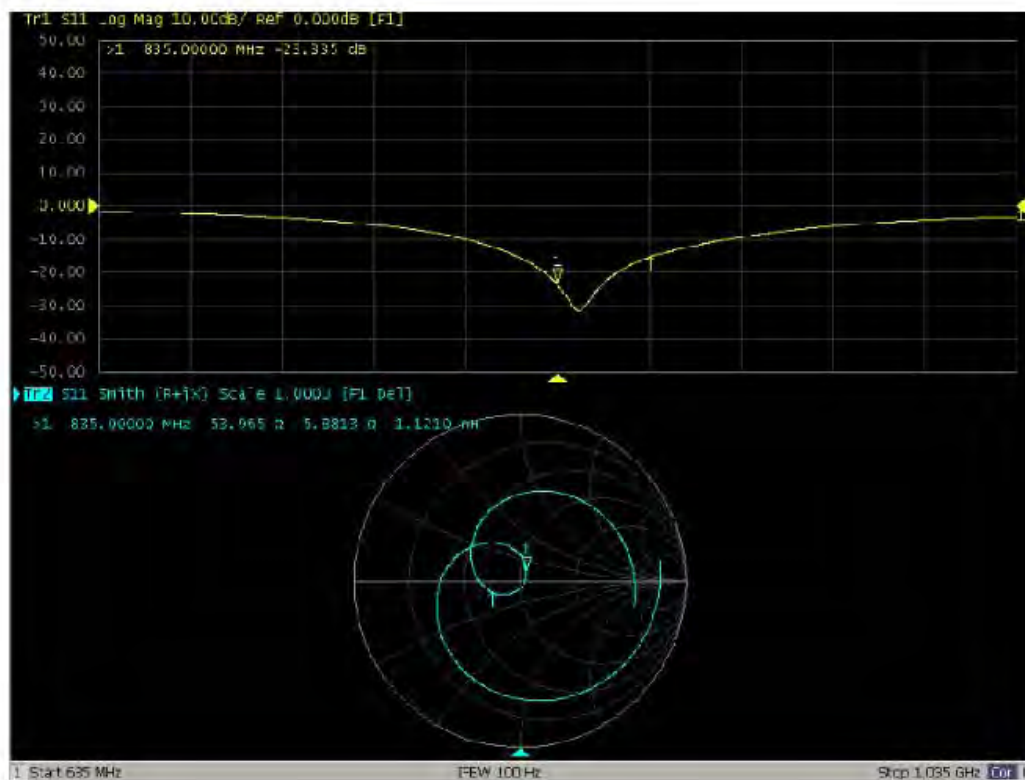
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CALIBRATION  
No. L0570

Impedance Measurement Plot for Body TSL



# TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RXA1411-0269SAR01R4

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## ANNEX I: D1900V2 Dipole Calibration Certificate



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Client **TA(Shanghai)** Certificate No: **Z14-97074**

### CALIBRATION CERTIFICATE

Object **D1900V2 - SN: 5d060**

Calibration Procedure(s) **TMC-OS-E-02-194**  
**Calibration procedure for dipole validation kits**

Calibration date: **September 1, 2014**

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

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

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards       | ID #       | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
|-------------------------|------------|------------------------------------------|-----------------------|
| Power Meter NRVD        | 102083     | 11-Sep-13 (TMC, No.JZ13-443)             | Sep-14                |
| Power sensor NRV-Z5     | 100595     | 11-Sep-13 (TMC, No. JZ13-443)            | Sep -14               |
| Reference Probe ES3DV3  | SN 3149    | 5- Sep-13 (SPEAG, No.ES3-3149_Sep13)     | Sep-14                |
| DAE3                    | SN 536     | 23-Jan-14 (SPEAG, DAE3-536_Jan14)        | Jan -15               |
| Signal Generator E4438C | MY49070393 | 13-Nov-13 (TMC, No.JZ13-394)             | Nov-14                |
| Network Analyzer E8362B | MY43021135 | 19-Oct-13 (TMC, No.JZ13-278)             | Oct-14                |

|                | Name        | Function                          | Signature |
|----------------|-------------|-----------------------------------|-----------|
| Calibrated by: | Zhao Jing   | SAR Test Engineer                 |           |
| Reviewed by:   | Qi Dianyuan | SAR Project Leader                |           |
| Approved by:   | Lu Bingsong | Deputy Director of the laboratory |           |

Issued: September 4, 2014

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Certificate No: Z14-97074

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E-mail: cttl@chinattl.com Http://www.chinattl.cn



### Glossary:

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

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

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- 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
- KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

### 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.

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

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CALIBRATION  
No. L0570

### Measurement Conditions

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

|                              |                          |             |
|------------------------------|--------------------------|-------------|
| DASY Version                 | DASY52                   | 52.8.8.1222 |
| Extrapolation                | Advanced Extrapolation   |             |
| Phantom                      | Triple Flat Phantom 5.1C |             |
| Distance Dipole Center - TSL | 10 mm                    | with Spacer |
| Zoom Scan Resolution         | dx, dy, dz = 5 mm        |             |
| Frequency                    | 1900 MHz $\pm$ 1 MHz     |             |

### Head TSL parameters

The following parameters and calculations were applied.

|                                         | Temperature         | Permittivity   | Conductivity         |
|-----------------------------------------|---------------------|----------------|----------------------|
| Nominal Head TSL parameters             | 22.0 °C             | 40.0           | 1.40 mho/m           |
| Measured Head TSL parameters            | (22.0 $\pm$ 0.2) °C | 39.8 $\pm$ 6 % | 1.37 mho/m $\pm$ 6 % |
| Head TSL temperature change during test | <1.0 °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 | 9.69 mW / g                  |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 39.2 mW/g $\pm$ 20.8 % (k=2) |
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | Condition          |                              |
| SAR measured                                            | 250 mW input power | 5.14 mW / g                  |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 20.7 mW/g $\pm$ 20.4 % (k=2) |

### 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 $\pm$ 0.2) °C | 51.8 $\pm$ 6 % | 1.50 mho/m $\pm$ 6 % |
| Body TSL temperature change during test | <1.0 °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 | 9.98 mW / g                  |
| SAR for nominal Body TSL parameters                     | normalized to 1W   | 40.0 mW/g $\pm$ 20.8 % (k=2) |
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL | Condition          |                              |
| SAR measured                                            | 250 mW input power | 5.28 mW / g                  |
| SAR for nominal Body TSL parameters                     | normalized to 1W   | 21.1 mW/g $\pm$ 20.4 % (k=2) |

# TA Technology (Shanghai) Co., Ltd.

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CALIBRATION  
No. L0570

### Appendix

#### Antenna Parameters with Head TSL

|                                      |               |
|--------------------------------------|---------------|
| Impedance, transformed to feed point | 54.1Ω- 6.34jΩ |
| Return Loss                          | - 22.8dB      |

#### Antenna Parameters with Body TSL

|                                      |               |
|--------------------------------------|---------------|
| Impedance, transformed to feed point | 57.6Ω- 4.76jΩ |
| Return Loss                          | - 21.6dB      |

#### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1,248 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. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

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

# TA Technology (Shanghai) Co., Ltd.

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### DASY5 Validation Report for Head TSL

Date: 01.09.2014

Test Laboratory: CTTL, Beijing, China

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d060**

Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1900 \text{ MHz}$ ;  $\sigma = 1.371 \text{ S/m}$ ;  $\epsilon_r = 39.83$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3149; ConvF(5.06, 5.06, 5.06); Calibrated: 2013-09-05;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn536; Calibrated: 2014-01-23
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid:**

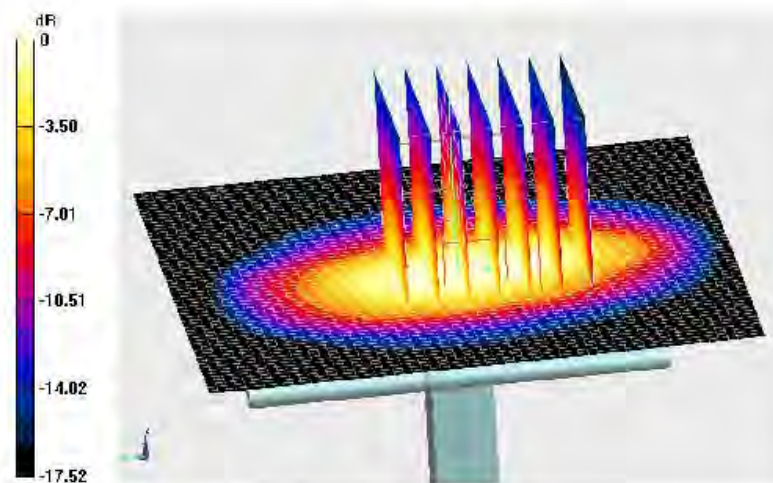
dx=5mm, dy=5mm, dz=5mm

Reference Value = 99.911 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 17.5 W/kg

**SAR(1 g) = 9.69 W/kg; SAR(10 g) = 5.14 W/kg**

Maximum value of SAR (measured) = 12.2 W/kg



0 dB = 12.2 W/kg = 10.86 dB W/kg

# TA Technology (Shanghai) Co., Ltd.

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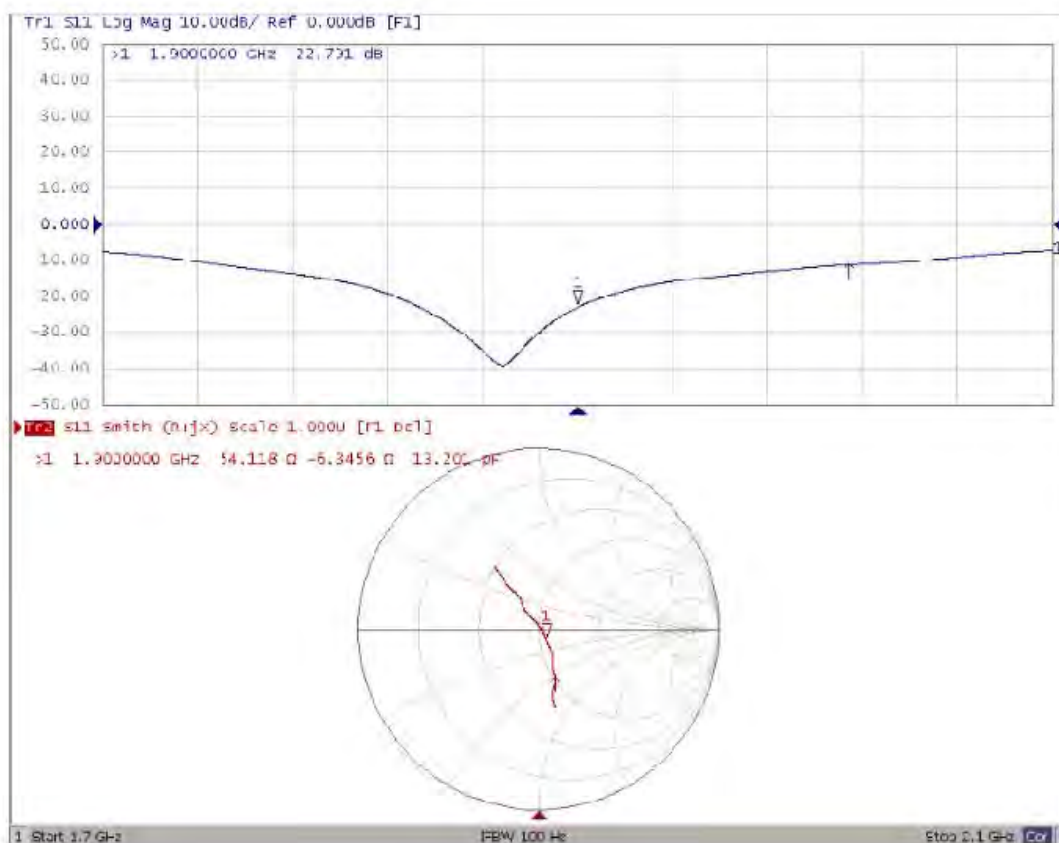
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CALIBRATION  
No. L0570

### Impedance Measurement Plot for Head TSL



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### DASY5 Validation Report for Body TSL

Date: 01.09.2014

Test Laboratory: CTTL, Beijing, China

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d060**

Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1900 \text{ MHz}$ ;  $\sigma = 1.5 \text{ S/m}$ ;  $\epsilon_r = 51.78$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Center Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3149; ConvF(4.72, 4.72, 4.72); Calibrated: 2013-09-03;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn536; Calibrated: 2014-01-23
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/2
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid:**

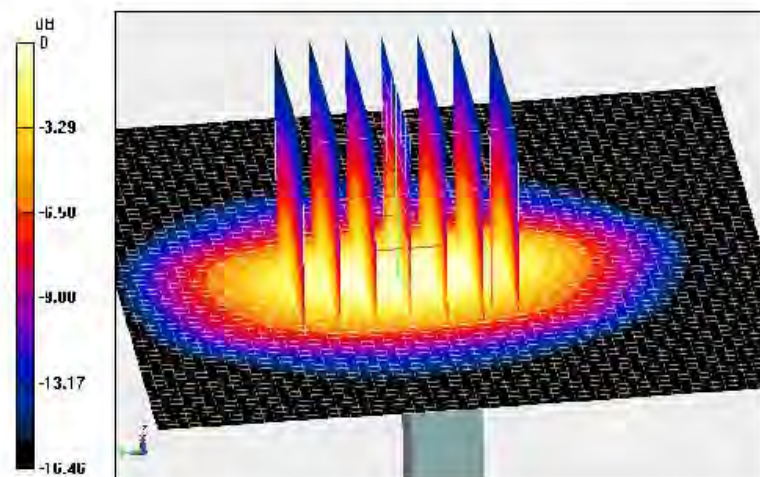
dx=5mm, dy=5mm, dz=5mm

Reference Value = 93.668 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 17.6 W/kg

**SAR(1 g) = 9.98 W/kg; SAR(10 g) = 5.28 W/kg**

Maximum value of SAR (measured) = 12.6 W/kg



0 dB = 12.6 W/kg = 11.00 dB W/kg

# TA Technology (Shanghai) Co., Ltd.

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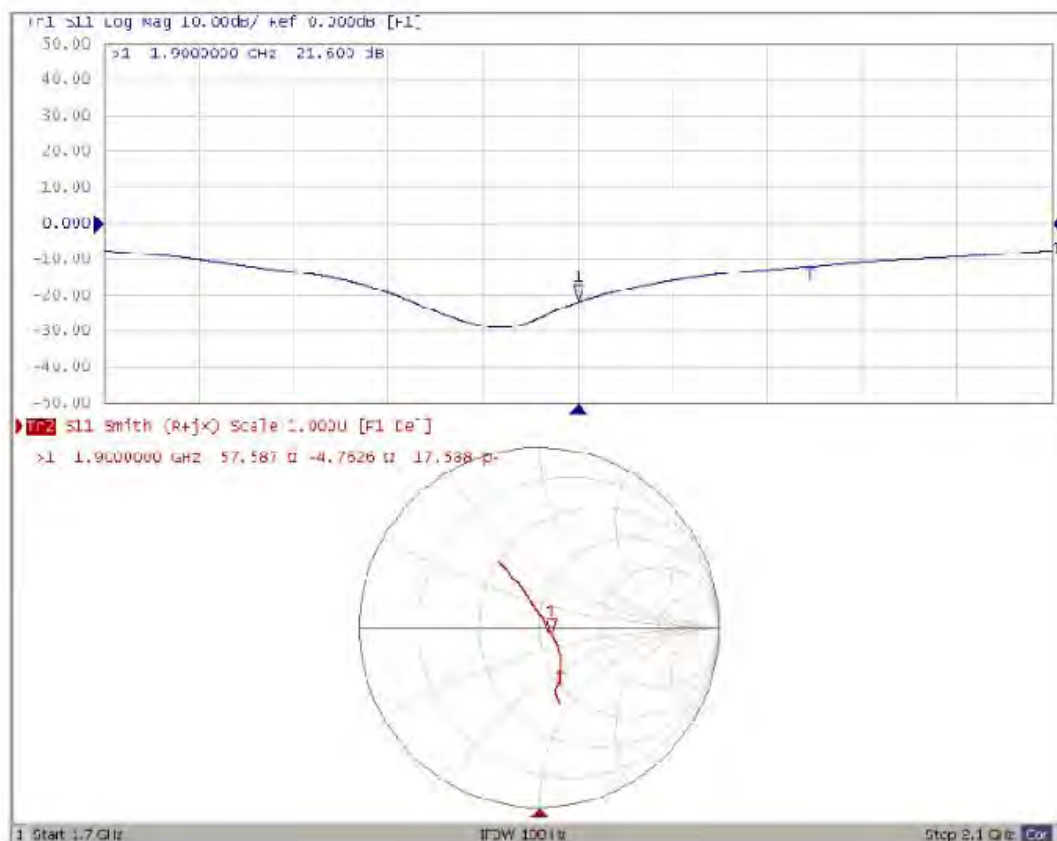
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CALIBRATION  
No. L0570

### Impedance Measurement Plot for Body TSL



# TA Technology (Shanghai) Co., Ltd. Test Report

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## ANNEX J: D2450V2 Dipole Calibration Certificate



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Client **TA(Shanghai)** Certificate No: **Z14-97075**

### CALIBRATION CERTIFICATE

Object **D2450V2 - SN: 786**

Calibration Procedure(s) **TMC-OS-E-02-194**  
**Calibration procedure for dipole validation kits**

Calibration date: **September 1, 2014**

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

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

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards       | ID #       | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
|-------------------------|------------|------------------------------------------|-----------------------|
| Power Meter NRVD        | 102083     | 11-Sep-13 (TMC, No.JZ13-443)             | Sep-14                |
| Power sensor NRV-Z5     | 100595     | 11-Sep-13 (TMC, No. JZ13-443)            | Sep -14               |
| Reference Probe ES3DV3  | SN 3149    | 5- Sep-13 (SPEAG, No.ES3-3149_Sep13)     | Sep-14                |
| DAE3                    | SN 536     | 23-Jan-14 (SPEAG, DAE3-536_Jan14)        | Jan -15               |
| Signal Generator E4438C | MY49070393 | 13-Nov-13 (TMC, No.JZ13-394)             | Nov-14                |
| Network Analyzer E8362B | MY43021135 | 19-Oct-13 (TMC, No.JZ13-278)             | Oct-14                |

|                | Name        | Function                          | Signature |
|----------------|-------------|-----------------------------------|-----------|
| Calibrated by: | Zhao Jing   | SAR Test Engineer                 |           |
| Reviewed by:   | Qi Dianyuan | SAR Project Leader                |           |
| Approved by:   | Lu Bingsong | Deputy Director of the laboratory |           |

Issued: September 4, 2014

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

Certificate No: Z14-97075

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# TA Technology (Shanghai) Co., Ltd.

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### Glossary:

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

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

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- 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
- KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

### 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.

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

# TA Technology (Shanghai) Co., Ltd.

## Test Report

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CALIBRATION  
No. L0570

### Measurement Conditions

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

|                              |                          |             |
|------------------------------|--------------------------|-------------|
| DASY Version                 | DASY52                   | 52.8.8.1222 |
| Extrapolation                | Advanced Extrapolation   |             |
| Phantom                      | Triple Flat Phantom 5.1C |             |
| 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 | 40.2 $\pm$ 6 % | 1.84 mho/m $\pm$ 6 % |
| Head TSL temperature change during test | <1.0 °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 | 13.2 mW / g                  |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 52.5 mW/g $\pm$ 20.8 % (k=2) |
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | Condition          |                              |
| SAR measured                                            | 250 mW input power | 6.20 mW / g                  |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 24.8 mW/g $\pm$ 20.4 % (k=2) |

### Body TSL parameters

The following parameters and calculations were applied.

|                                         | Temperature         | Permittivity   | Conductivity         |
|-----------------------------------------|---------------------|----------------|----------------------|
| Nominal Body TSL parameters             | 22.0 °C             | 52.7           | 1.95 mho/m           |
| Measured Body TSL parameters            | (22.0 $\pm$ 0.2) °C | 51.3 $\pm$ 6 % | 2.00 mho/m $\pm$ 6 % |
| Body TSL temperature change during test | <1.0 °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 | 13.3 mW / g                  |
| SAR for nominal Body TSL parameters                     | normalized to 1W   | 52.4 mW/g $\pm$ 20.8 % (k=2) |
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL | Condition          |                              |
| SAR measured                                            | 250 mW input power | 6.20 mW / g                  |
| SAR for nominal Body TSL parameters                     | normalized to 1W   | 24.6 mW/g $\pm$ 20.4 % (k=2) |

# TA Technology (Shanghai) Co., Ltd.

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CALIBRATION  
No. L0570

### Appendix

#### Antenna Parameters with Head TSL

|                                      |                            |
|--------------------------------------|----------------------------|
| Impedance, transformed to feed point | $57.1\Omega - 0.57j\Omega$ |
| Return Loss                          | - 23.6dB                   |

#### Antenna Parameters with Body TSL

|                                      |                            |
|--------------------------------------|----------------------------|
| Impedance, transformed to feed point | $56.0\Omega + 3.31j\Omega$ |
| Return Loss                          | - 23.7dB                   |

#### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.192 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. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

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

# TA Technology (Shanghai) Co., Ltd.

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### DASY5 Validation Report for Head TSL

Date: 01.09.2014

Test Laboratory: CTTL, Beijing, China

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 786**

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.84$  S/m;  $\epsilon_r = 40.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3149; ConvF(4.48, 4.48, 4.48); Calibrated: 2013-09-05;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn536; Calibrated: 2014-01-23
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid:**

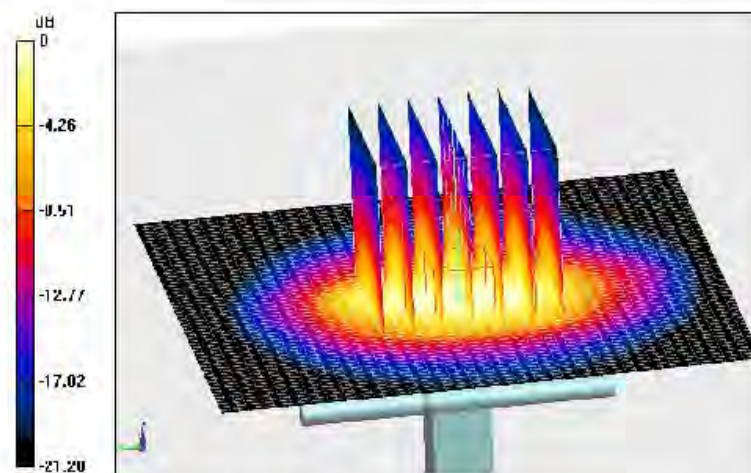
dx=5mm, dy=5mm, dz=5mm

Reference Value = 99.583 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 26.6 W/kg

**SAR(1 g) = 13.2 W/kg; SAR(10 g) = 6.2 W/kg**

Maximum value of SAR (measured) = 17.3 W/kg



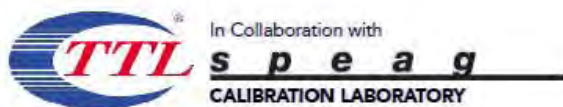
0 dB = 17.3 W/kg = 12.38 dBW/kg

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## Test Report

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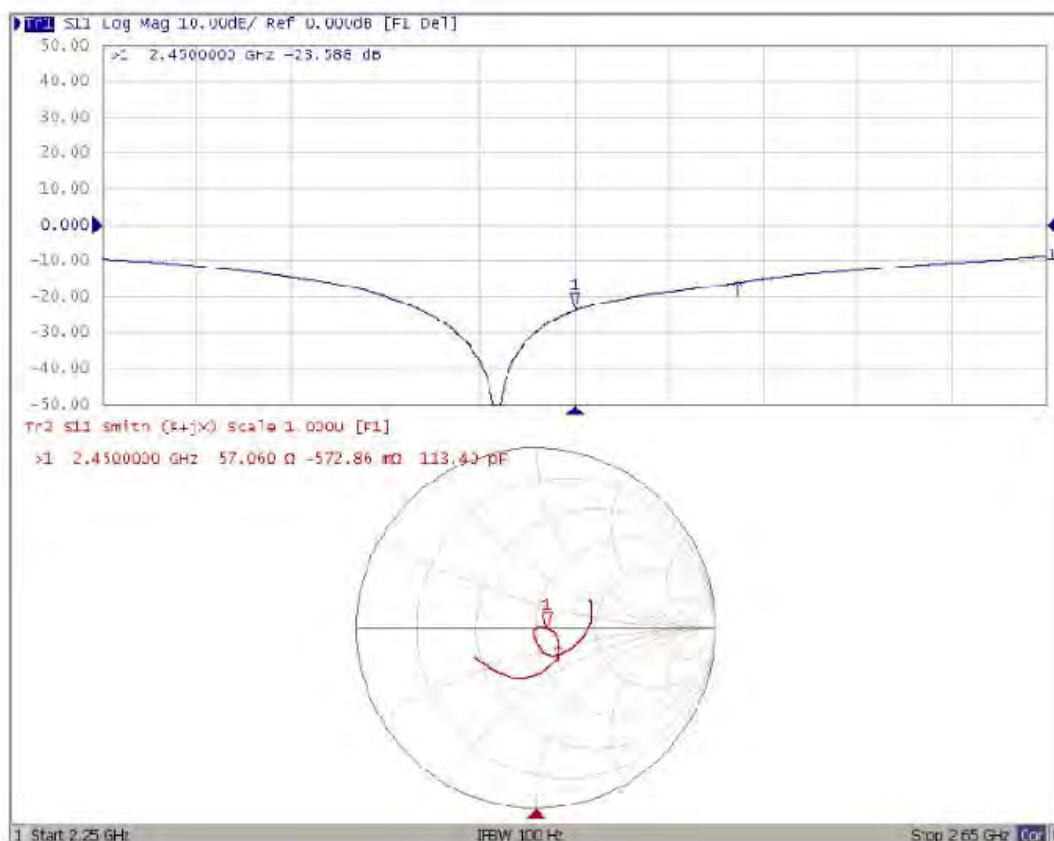
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### Impedance Measurement Plot for Head TSL



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### DASY5 Validation Report for Body TSL

Date: 01.09.2014

Test Laboratory: CTTL, Beijing, China

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 786**

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.988$  S/m;  $\epsilon_r = 51.25$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Center Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3149; ConvF(4.21, 4.21, 4.21); Calibrated: 2013-09-03;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn536; Calibrated: 2014-01-23
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/2
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid:**

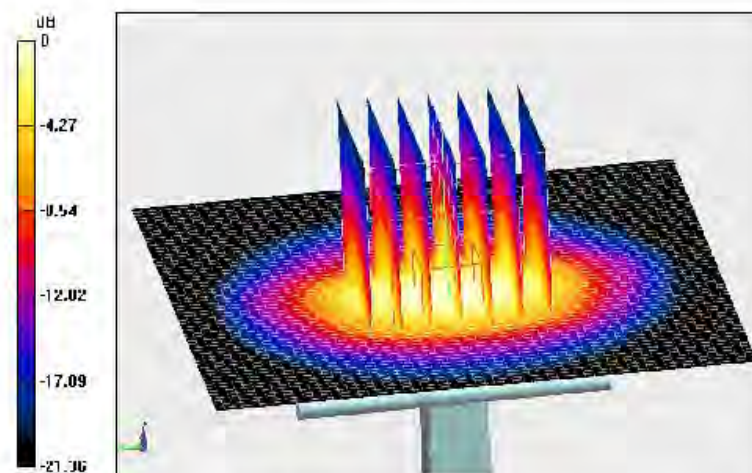
dx=5mm, dy=5mm, dz=5mm

Reference Value = 97.120 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 27.8 W/kg

**SAR(1 g) = 13.3 W/kg; SAR(10 g) = 6.2 W/kg**

Maximum value of SAR (measured) = 17.7 W/kg



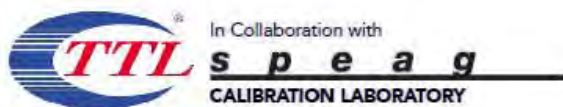
0 dB = 17.7 W/kg = 12.48 dBW/kg

# TA Technology (Shanghai) Co., Ltd.

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Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China  
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504  
E-mail: cttd@chinattl.com Http://www.chinattl.cn



### Impedance Measurement Plot for Body TSL



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## ANNEX K: DAE4 Calibration Certificate



Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China  
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504  
E-mail: [info@emctc.com](mailto:info@emctc.com) Http://www.emctc.com

In Collaboration with

**s p e a g**  
CALIBRATION LABORATORY



Client : **TA(Shanghai)**

Certificate No: **J14-2-0052**

### CALIBRATION CERTIFICATE

Object **DAE4 - SN: 1317**

Calibration Procedure(s) **TMC-OS-E-01-198**  
**Calibration Procedure for the Data Acquisition Electronics (DAEx)**

Calibration date: **January 16, 2014**

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

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

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards                     | ID #    | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
|---------------------------------------|---------|------------------------------------------|-----------------------|
| Documenting<br>Process Calibrator 753 | 1971018 | 01-July-13 (TMC, No:JW13-049)            | July-14               |

|                | Name        | Function                          | Signature |
|----------------|-------------|-----------------------------------|-----------|
| Calibrated by: | Yu Zongying | SAR Test Engineer                 |           |
| Reviewed by:   | Qi Dianyuan | SAR Project Leader                |           |
| Approved by:   | Lu Bingsong | Deputy Director of the laboratory |           |

Issued: January 16, 2014

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

Certificate No: J14-2-0052

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### 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 report provide only calibration results for DAE, it does not contain other performance test results.

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E-mail: [info@emcite.com](mailto:info@emcite.com) Http://www.emcite.com

### DC Voltage Measurement

A/D - Converter Resolution nominal

High Range 1LSB =  $6.1\mu\text{V}$ , full range =  $-100\dots+300\text{ mV}$   
Low Range 1LSB =  $61\text{ nV}$ , full range =  $-1\dots+3\text{ mV}$

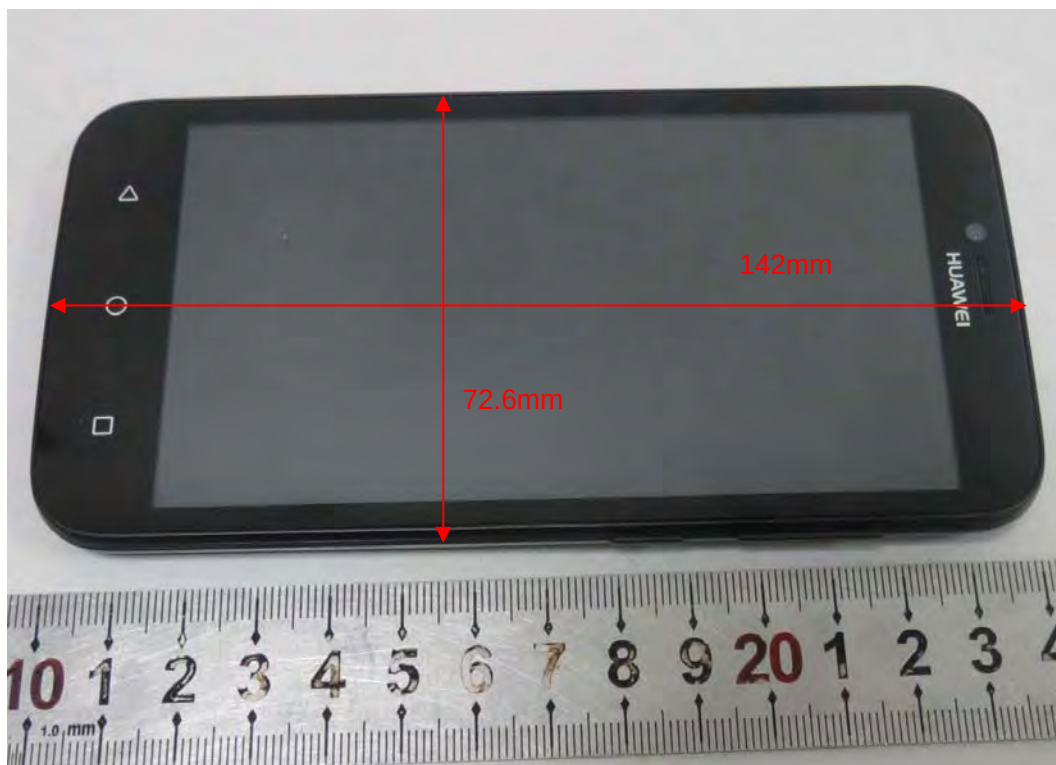
DASY measurement parameters: Auto Zero Time: 3 sec, Measuring time: 3 sec

| Calibration Factors | X                          | Y                          | Z                          |
|---------------------|----------------------------|----------------------------|----------------------------|
| High Range          | $404.058 \pm 0.15\% (k=2)$ | $404.060 \pm 0.15\% (k=2)$ | $403.954 \pm 0.15\% (k=2)$ |
| Low Range           | $3.99002 \pm 0.7\% (k=2)$  | $3.99910 \pm 0.7\% (k=2)$  | $3.98303 \pm 0.7\% (k=2)$  |

### Connector Angle

|                                           |                         |
|-------------------------------------------|-------------------------|
| Connector Angle to be used in DASY system | $119^\circ \pm 1^\circ$ |
|-------------------------------------------|-------------------------|

## ANNEX L: The EUT Appearances and Test Configuration

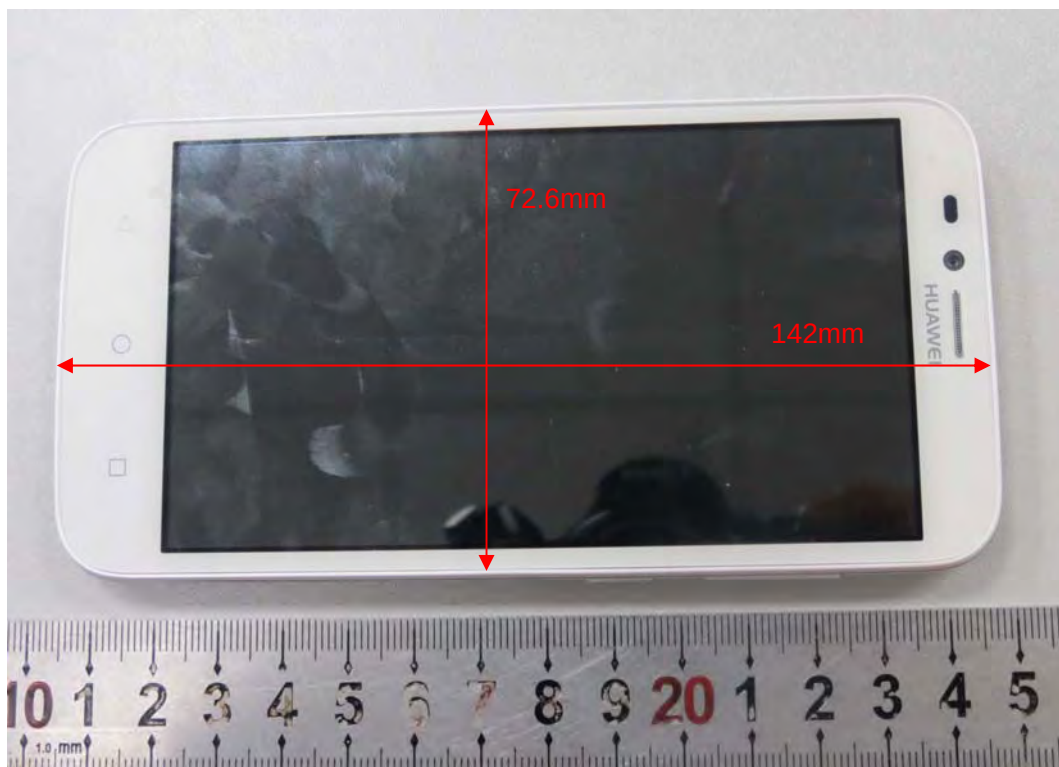


Original Model

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Variant Model

a: EUT

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b: Antenna



Battery 1



Battery 2

c: Battery

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Earphone 1



Earphone 2

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Earphone 3

d: Earphone

Picture 8: Constituents of EUT



Picture 9: Left Hand Touch Cheek Position (Original Model)



Picture 10: Left Hand Tilt 15 Degree Position (Original Model)



Picture 11: Right Hand Touch Cheek Position (Original Model)

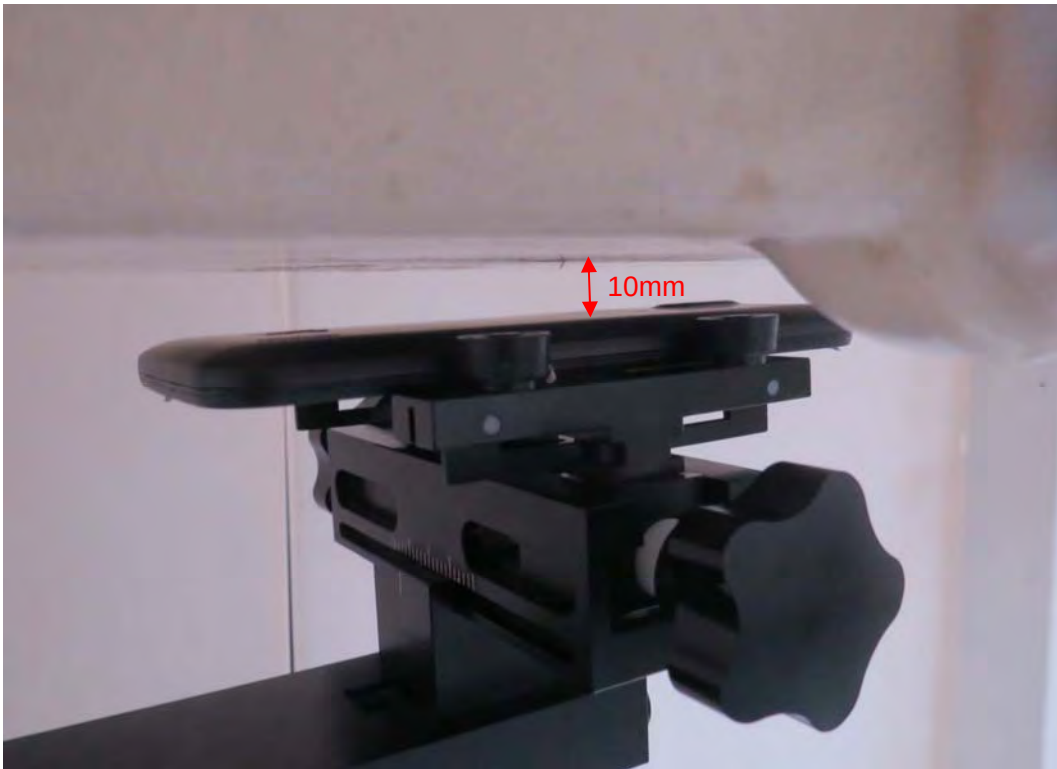


Picture 12: Right Hand Tilt 15 Degree Position (Original Model)

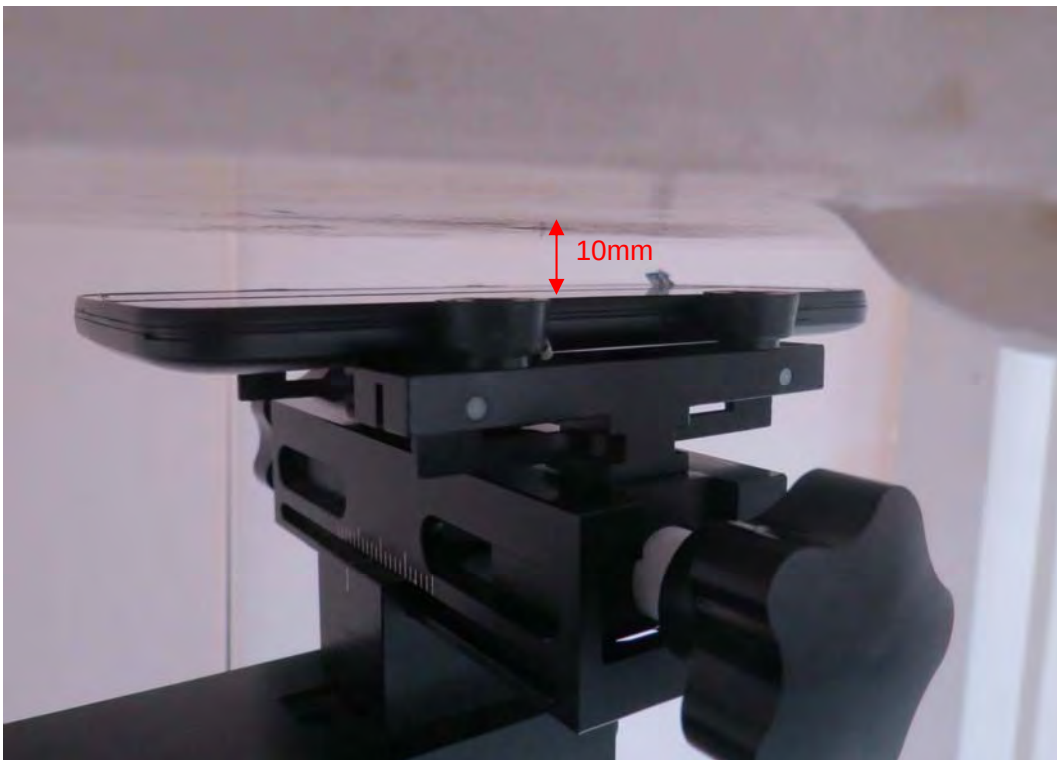
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Picture 13: Back Side, the distance from handset to the bottom of the Phantom is 10mm  
(Original Model)



Picture 14: Front Side, the distance from handset to the bottom of the Phantom is 10mm  
(Original Model)

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Picture 15: Left Edge, the distance from handset to the bottom of the Phantom is 10mm  
(Original Model)



Picture 16: Right Edge, the distance from handset to the bottom of the Phantom is 10mm  
(Original Model)

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Picture 17: Top Edge, the distance from handset to the bottom of the Phantom is 10mm  
(Original Model)



Picture 18: Bottom Edge, the distance from handset to the bottom of the Phantom is 10mm  
(Original Model)

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Picture 19: Left Hand Touch Cheek Position (Variant Model)

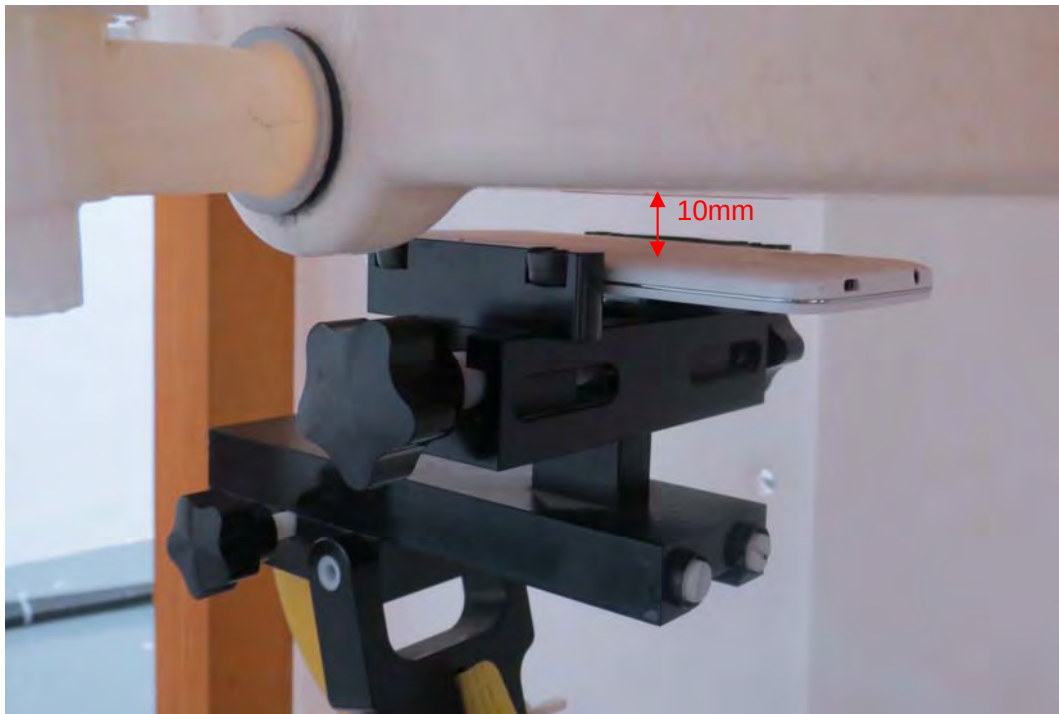


Picture 20: Right Hand Touch Cheek Position (Variant Model)

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Picture 21: Back Side, the distance from handset to the bottom of the Phantom is 10mm  
(Variant Model)



Picture 22: Bottom Edge, the distance from handset to the bottom of the Phantom is 10mm  
(Variant Model)

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### ANNEX M: System Validation

The SAR system must be validated against its performance specifications before it is deployed. When SAR probes, system components or software are changed, upgraded or recalibrated, these must be validated with the SAR system(s) that operates with such components.

**Table 30: System Validation Part 1**

| System No. | Probe SN. | Liquid Name    | Validation Date   | Frequency Point | Permittivity $\epsilon$ | Conductivity $\sigma$ (s/m) |
|------------|-----------|----------------|-------------------|-----------------|-------------------------|-----------------------------|
| 1          | 3677      | 835MHz (head)  | November 28, 2013 | 850MHz          | 41.5                    | 0.90                        |
| 2          | 3677      | 1900MHz (head) | November 28, 2013 | 1900MHz         | 40.0                    | 1.40                        |
| 3          | 3677      | 2450MHz (head) | November 28, 2013 | 2450MHz         | 39.2                    | 1.80                        |
| 4          | 3677      | 835MHz (body)  | November 28, 2013 | 850MHz          | 55.2                    | 0.97                        |
| 5          | 3677      | 1900MHz (body) | November 28, 2013 | 1900MHz         | 53.3                    | 1.52                        |
| 6          | 3677      | 2450MHz (body) | November 28, 2013 | 2450MHz         | 52.7                    | 1.95                        |
| 7          | 3977      | 835MHz (head)  | February 17, 2014 | 850MHz          | 41.5                    | 0.90                        |
| 8          | 3977      | 1900MHz (head) | February 17, 2014 | 1900MHz         | 40.0                    | 1.40                        |
| 9          | 3977      | 2450MHz (head) | February 17, 2014 | 2450MHz         | 39.2                    | 1.80                        |
| 10         | 3977      | 835MHz (body)  | February 17, 2014 | 850MHz          | 55.2                    | 0.97                        |
| 11         | 3977      | 1900MHz (body) | February 17, 2014 | 1900MHz         | 53.3                    | 1.52                        |
| 12         | 3977      | 2450MHz (body) | February 17, 2014 | 2450MHz         | 52.7                    | 1.95                        |

**Table 31: System Validation Part 2**

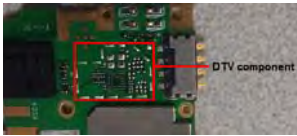
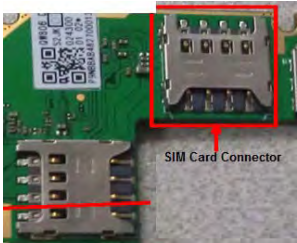
|                       |                 |      |      |
|-----------------------|-----------------|------|------|
| <b>CW Validation</b>  | Sensitivity     | PASS | PASS |
|                       | Probe Linearity | PASS | PASS |
|                       | Probe Isotropy  | PASS | PASS |
| <b>Mod Validation</b> | MOD. Type       | GMSK | GMSK |
|                       | MOD. Type       | OFDM | OFDM |
|                       | Duty Factor     | PASS | PASS |
|                       | PAR             | PASS | PASS |

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**ANNEX N: Product Change Description**

|            |          |                                                                                                                                |
|------------|----------|--------------------------------------------------------------------------------------------------------------------------------|
| Model      | Y625-U03 | Y625-U43                                                                                                                       |
| Frequency  | The same | The same                                                                                                                       |
| DTV        | support  | No support, DTV was disabled by hardware<br> |
| SIM card   | single   | Double. Add SIM card Connector.<br>         |
| antenna    | The same | The same                                                                                                                       |
| dimensions | The same | The same                                                                                                                       |
| appearance | The same | The same                                                                                                                       |
| others     | The same | The same                                                                                                                       |