TESTING
No. L2264

# SAR TEST REPORT

| | |
|---|---|
| **Product Name** | Smart Phone |
| **Model Name** | HUAWEI H892L, H892L |
| **FCC ID** | QISH892L |
| **Applicant** | Huawei Technologies Co., Ltd. |
| **Manufacturer** | Huawei Technologies Co., Ltd. |
| **Date of issue** | January 20, 2015 |

## TA Technology (Shanghai) Co., Ltd.

# GENERAL SUMMARY

| | |
|---|---|
| **Reference Standard(s)** | **FCC 47CFR §2.1093** Radiofrequency Radiation Exposure Evaluation: Portable Devices<br><br>**ANSI C95.1- 1992:** Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.(IEEE Std C95.1-1991)<br><br>**IEEE Std 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.<br><br>**KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r03:** SAR Measurement Requirements for 100 MHz to 6 GHz<br><br>**KDB 447498 D01 Mobile Portable RF Exposure v05r02:** Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies<br><br>**KDB 648474 D04 Handset SAR v01r02:** SAR Evaluation Considerations for Wireless Handsets.<br><br>**KDB 941225 D01 SAR test for 3G devices v02:** SAR Measurement Procedures CDMA 20001x RTT, 1x EVDO, WCDMA, HSDPA/HSPA<br><br>**KDB 941225 D05 SAR for LTE Devices v02r03** SAR Test Considerations for LTE Handsets and Data Modems<br><br>**KDB 248227 D01 SAR meas for 802 11 a b g v01r02:** SAR Measurement Procedures for 802.11a/b/g Transmitters.<br><br>**KDB 941225 D07 UMPC Mini Tablet v01r01:** SAR Test Requirements for UMPC Mini Tablet<br><br>**KDB616217 D04 SAR for laptop and tablets v01r01** SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers |
| **Conclusion** | 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.<br><br>General Judgment: **Pass** |
| **Comment** | The test result only responds to the measured sample. |

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# TABLE OF CONTENT

1. General Information ..... 5
1.1. Notes of the Test Report ..... 5
1.2. Testing Laboratory ..... 5
1.3. Applicant Information ..... 6
1.4. Manufacturer Information ..... 6
1.5. Information of EUT ..... 7
1.6. EUT Antenna Locations ..... 8
1.7. The Maximum Reported SAR ..... 9
1.8. Test Date ..... 10
2. SAR Measurements System Configuration ..... 11
2.1. SAR Measurement Set-up ..... 11
2.2. DASY5 E-field Probe System ..... 12
2.2.1. EX3DV4 Probe Specification ..... 12
2.2.2. E-field Probe Calibration ..... 13
2.3. Other Test Equipment ..... 13
2.3.1. Device Holder for Transmitters ..... 13
2.3.2. Phantom ..... 14
2.4. Scanning Procedure ..... 14
2.5. Data Storage and Evaluation ..... 16
2.5.1. Data Storage ..... 16
2.5.2. Data Evaluation by SEMCAD ..... 16
3. Laboratory Environment ..... 18
4. Tissue-equivalent Liquid ..... 19
4.1. Tissue-equivalent Liquid Ingredients ..... 19
4.2. Tissue-equivalent Liquid Properties ..... 21
5. System Check ..... 22
5.1. Description of System Check ..... 22
5.2. System Check Results ..... 23
6. Operational Conditions during Test ..... 24
6.1. General Description of Test Procedures ..... 24
6.2. Test Positions ..... 24
6.2.1. Against Phantom Head ..... 24
6.2.2. Body Worn Configuration ..... 24
6.2.3. Phablet SAR test considerations ..... 25
6.3. Measurement Variability ..... 26
6.4. Power Reduction operation ..... 27
6.5. Proximity Sensor Considerations ..... 29
6.5.1. Proximity Sensor Detection Area ..... 29
6.5.2. Coverage at the Corner of the DUT ..... 37
6.6. Test Configuration ..... 38
6.6.1. CDMA Test Configuration ..... 38

6.6.2. Information for the Measurement of CDMA 1x Devices ..... 38
6.6.3. LTE Test Configuration ..... 39
6.6.4. WiFi Test Configuration ..... 41
6.6.5. Simultaneous Transmission Power Reduction Considerations ..... 41
7. Test Results ..... 42
7.1. Conducted Power Results ..... 42
7.2. Standalone SAR Test Exclusion Considerations ..... 53
7.3. SAR Test Results ..... 54
7.3.1. CDMA BC0 ..... 54
7.3.2. CDMA BC1 ..... 56
7.3.3. LTE Band 4 ..... 59
7.3.4. LTE Band 13 ..... 62
7.3.5. WiFi ..... 64
7.4. Simultaneous Transmission Conditions ..... 65
8. Measurement Uncertainty ..... 77
9. Main Test Instruments ..... 78
ANNEX A: Test Layout ..... 79
ANNEX B: System Check Results ..... 84
ANNEX C: Graph Results ..... 96
ANNEX D: Probe Calibration Certificate ..... 209
ANNEX E: D835V2 Dipole Calibration Certificate ..... 220
ANNEX F: D1750V2 Dipole Calibration Certificate ..... 228
ANNEX G: D1900V2 Dipole Calibration Certificate ..... 236
ANNEX H: D2450V2 Dipole Calibration Certificate ..... 244
ANNEX I: DAE4 Calibration Certificate ..... 252
ANNEX J: The EUT Appearances and Test Configuration ..... 255

# 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.

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

## 1.2. Testing Laboratory

| | |
|---|---|
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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<br>Shenzhen<br>518129<br>P.R.China |

## 1.4. Manufacturer Information

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

## 1.5. Information of EUT

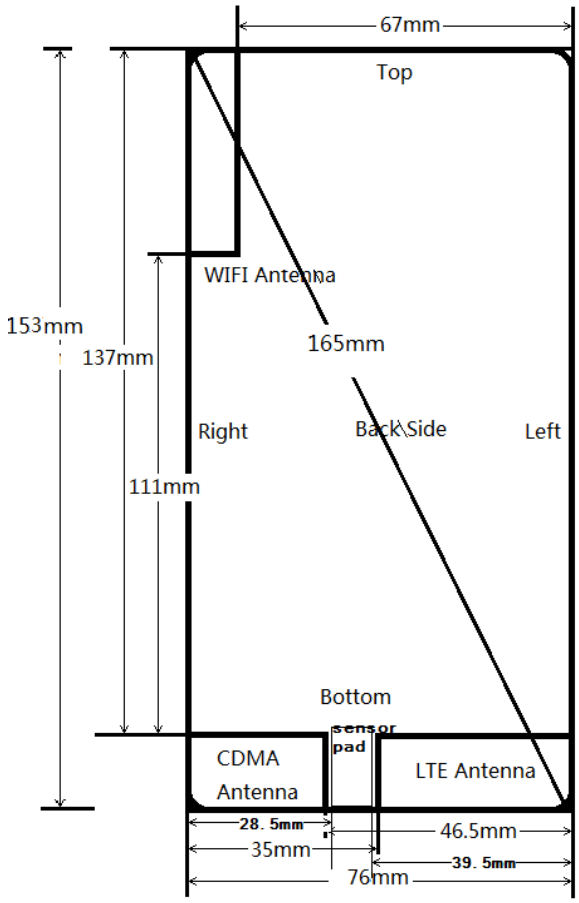
**General Information**

| | | |
|---|---|---|
| Device Type: | Portable Device | |
| Exposure Category: | Uncontrolled Environment / General Population | |
| State of Sample: | Prototype Unit | |
| Product IMEI: | 866108020017277 | |
| Hardware Version: | HL1H892LM | |
| Software Version: | H892LV100R001C378B254 | |
| Antenna Type: | Internal Antenna | |
| Device Operating Configurations : | | |
| Test Mode(s): | CDMA BC0; CDMA BC1;<br>LTE FDD Band 4/13;<br>802.11b/g/n HT20; Bluetooth; Bluetooth 4.0; | |
| Test Modulation: | CDMA(QPSK), (LTE) QPSK, 16QAM;(WiFi)CCK | |
| LTE UE Category: | 3 | |
| LTE Release: | Release 9 | |
| Proximity Sensor: | Support, Sensor on, Power reduction for BC1 1x-RTT mode | |
| Hotspot function: | Not Support | |
| Operating Frequency Range(s): | Mode | Tx (MHz) |
| | CDMA BC0 | 824.7 ~ 848.31 |
| | CDMA BC1 | 1851.25 ~ 1908.75 |
| | LTE FDD 4 | 1710.7 ~ 1754.3 |
| | LTE FDD 13 | 779.5 ~ 784.5 |
| | Bluetooth/ Bluetooth 4.0 | 2402 ~2480 |
| | WiFi | 2412 ~2462 |
| Power Class: | CDMA BC0: 3 | |
| | CDMA BC1: 2 | |
| | LTE FDD 4/13: 3 | |
| Power Level | CDMA BC0/BC1: all up bits | |
| | LTE FDD 4/13: max power | |

**Auxiliary Equipment Details**

| Name | Model | Capacity | Manufacturer | S/N |
|---|---|---|---|---|
| Battery | HB4242B4EBW | 3020mAh | Huawei Technologies Co., Ltd. | / |

## 1.6. EUT Antenna Locations




**10-g extremity SAR testing**

| Mode | Back Side | Front Side | Left Edge | Right Edge | Top Edge | Bottom Edge |
|---|---|---|---|---|---|---|
| CDMA BC0 | Yes | Yes | No | Yes | No | Yes |
| CDMA BC1 | Yes | Yes | No | Yes | No | Yes |
| LTE Band 4 | Yes | Yes | Yes | No | No | Yes |
| LTE Band 13 | Yes | Yes | Yes | No | No | Yes |
| 2.4GHz WLAN | Yes | Yes | No | Yes | Yes | No |

Note:1. When the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested.

2. For smart phones with an overall diagonal dimension is 16.5 cm.Per KDB 648474 D04, for smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm, it must be tested as a phablet to determine SAR compliance

## 1.7. The Maximum Reported SAR

**Head SAR Configuration**

| Mode | Test Position | Channel /Frequency(MHz) | Limit $SAR_{1g}$ 1.6 W/kg | |
|---|---|---|---|---|
| | | | Measured $SAR_{1g}$ (W/kg) | Reported $SAR_{1g}$ (W/kg) |
| CDMA BC0 | Right Cheek | 384/836.54 | 0.380 | 0.458 |
| CDMA BC1 | Right Cheek | 600/1880 | 0.527 | 0.597 |
| LTE Band 4 | Left Cheek | 20050/1720 | 0.320 | 0.387 |
| LTE Band 13 | Left Cheek | 23230/782 | 0.202 | 0.248 |
| WiFi(802.11b) | Left Cheek | 11/2462 | 0.181 | 0.223 |

**Body Worn Configuration(15mm)**

| Mode | Test Position | Channel /Frequency(MHz) | Limit $SAR_{1g}$ 1.6 W/kg | |
|---|---|---|---|---|
| | | | Measured $SAR_{1g}$ (W/kg) | Reported $SAR_{1g}$ (W/kg) |
| CDMA BC0 | Back Side | 384/836.52 | 0.493 | 0.598 |
| CDMA BC1 | Back Side | 600/1880 | 0.236 | 0.268 |
| LTE Band 4 | Front Side | 20050/1720 | 0.337 | 0.407 |
| LTE Band 13 | Back Side | 23230/782 | 0.372 | 0.457 |
| WiFi(802.11b) | Back Side | 11/2462 | 0.065 | 0.080 |

**10-g Extremity SAR Configuration(0mm)**

| Mode | Test Position | Channel /Frequency(MHz) | Limit $SAR_{10g}$ 4 W/kg | |
|---|---|---|---|---|
| | | | Measured $SAR_{10g}$ (W/kg) | Reported $SAR_{10g}$ (W/kg) |
| CDMA BC0 | Back Side | 384/836.52 | 1.660 | 1.996 |
| CDMA BC1 | Back Side | 1175/1908.75 | 3.030 | 3.668 |
| LTE Band 4 | Bottom Edge | 20300/1745 | 2.760 | 3.459 |
| LTE Band 13 | Back Side | 23230/782 | 1.300 | 1.596 |
| WiFi(802.11b) | Back Side | 11/2462 | 0.486 | 0.599 |

**10-g Extremity SAR Configuration(2mm)**

| Mode | Test Position | Channel /Frequency(MHz) | Limit $SAR_{10g}$ 4 W/kg | |
|---|---|---|---|---|
| | | | Measured $SAR_{10g}$ (W/kg) | Reported $SAR_{10g}$ (W/kg) |
| CDMA BC1 | Back Side | 1175/1908.75 | 1.39 | 1.406 |

## 1.8. Test Date

The test performed from November 23, 2014 to January 2, 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.

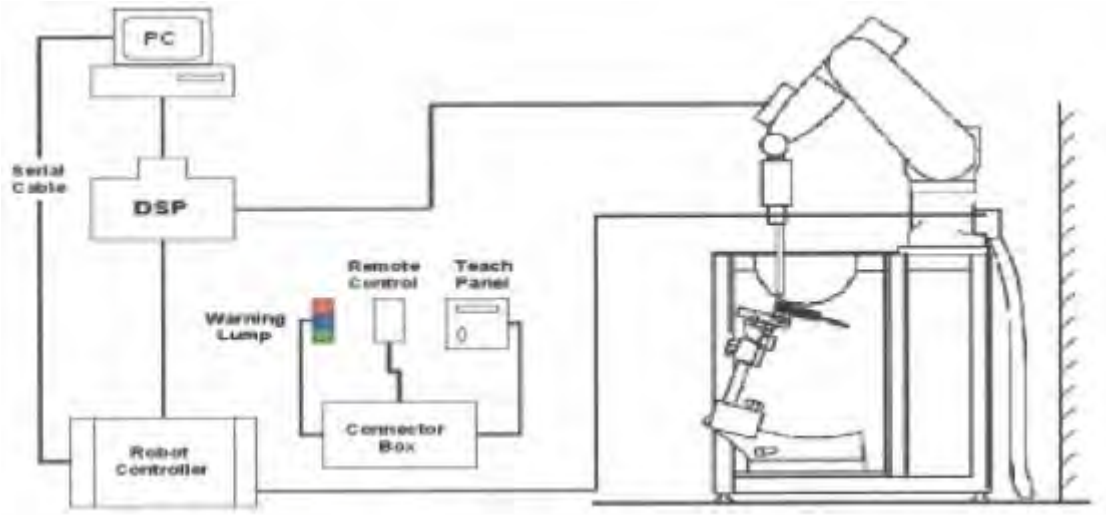



**Figure 1 SAR Lab Test Measurement Set-up**

## 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 Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE) |
| Calibration | ISO/IEC 17025 calibration service available |
| Frequency | 10 MHz to > 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz) |
| Directivity | ± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis) |
| Dynamic Range | 10 µW/g to > 100 mW/g Linearity: ± 0.2dB (noise: typically < 1 µW/g) |
| Dimensions | Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm |
| Application | High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%. |

**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 ± 10%. The spherical isotropy was evaluated and found to be better than ± 0.25dB. 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 bellow 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.

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

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

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

Where:
σ = Simulated tissue conductivity,
ρ = Tissue density (kg/m3).

## 2.3. Other Test Equipment

### 2.3.1. Device Holder for Transmitters

The DASY device holder is designed to cope with the die rent 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 inference 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) Aailable 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. ± 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 ± 0.1mm). 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 ± 30°.)

- 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

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) ($\Delta x_{area}$, $\Delta y_{area}$) | Maximum Zoom Scan Resolution (mm) ($\Delta x_{zoom}$, $\Delta y_{zoom}$) | Maximum Zoom Scan Spatial Resolution (mm) $\Delta z_{zoom}(n)$ | Minimum Zoom Scan Volume (mm) (x,y,z) |
|---|---|---|---|---|
| ≤ 2 GHz | ≤ 15 | ≤ 8 | ≤ 5 | ≥ 30 |
| 2-3 GHz | ≤ 12 | ≤ 5 | ≤ 5 | ≥ 30 |
| 3-4 GHz | ≤ 12 | ≤ 5 | ≤ 4 | ≥ 28 |
| 4-5 GHz | ≤ 10 | ≤ 4 | ≤ 3 | ≥ 25 |
| 5-6 GHz | ≤ 10 | ≤ 4 | ≤ 2 | ≥ 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/cm²], [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 | Normi, $a_{i0}$, $a_{i1}$, $a_{i2}$ |
| | - Conversion factor | $ConvF_i$ |
| | - Diode compression point | $Dcp_i$ |
| 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.

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:

$$V_i = U_i + U_i^2 \cdot cf / dcp_i$$

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)$^2$] 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.

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

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$^3$

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.

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

with $P_{pwe}$ = equivalent power density of a plane wave in mW/cm$^2$

$E_{tot}$ = 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 Ω |
| Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surrounding objects is minimized and in compliance with requirement of standards. | |

# 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 Target Value | f=835MHz ε=41.5 σ=0.9 |

| MIXTURE% | FREQUENCY(Brain) 1750MHz |
|---|---|
| Water | 55.24 |
| Glycol | 44.45 |
| Salt | 0.31 |
| Dielectric Parameters Target Value | f=1750MHz ε=40.1 σ=1.37 |

| MIXTURE% | FREQUENCY(Brain) 1900MHz |
|---|---|
| Water | 55.242 |
| Glycol monobutyl | 44.452 |
| Salt | 0.306 |
| Dielectric Parameters Target Value | f=1900MHz ε=40.0 σ=1.40 |

| MIXTURE% | FREQUENCY(Brain) 2450MHz |
|---|---|
| Water | 62.7 |
| Glycol | 36.8 |
| Salt | 0.5 |
| Dielectric Parameters Target Value | f=2450MHz ε=39.20 σ=1.80 |

**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 Target Value | f=835MHz ε=55.2 σ=0.97 |

| MIXTURE% | FREQUENCY(Body) 1750MHz |
|---|---|
| Water | 69.91 |
| Glycol | 29.97 |
| Salt | 0.12 |
| Dielectric Parameters Target Value | f=1750MHz ε=53.4 σ=1.49 |

| MIXTURE% | FREQUENCY (Body) 1900MHz |
|---|---|
| Water | 69.91 |
| Glycol monobutyl | 29.96 |
| Salt | 0.13 |
| Dielectric Parameters Target Value | f=1900MHz ε=53.3 σ=1.52 |

| MIXTURE% | FREQUENCY(Body) 2450MHz |
|---|---|
| Water | 73.2 |
| Glycol | 26.7 |
| Salt | 0.1 |
| Dielectric Parameters Target Value | f=2450MHz ε=52.70 σ=1.95 |

## 4.2. Tissue-equivalent Liquid Properties

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

| Frequency | Test Date | Temp ℃ | Measured Dielectric Parameters | | Target Dielectric Parameters | | Limit (Within ±5%) | |
|---|---|---|---|---|---|---|---|---|
| | | | $\varepsilon_r$ | σ(s/m) | $\varepsilon_r$ | σ(s/m) | Dev $\varepsilon_r$(%) | Dev σ(%) |
| 835MHz (head) | 2014-11-23 | 21.5 | 41.4 | 0.93 | 41.5 | 0.90 | -0.24 | 3.33 |
| 1750MHz (head) | 2014-11-28 | 21.5 | 39.7 | 1.32 | 40.1 | 1.37 | -1.00 | -3.65 |
| 1900MHz (head) | 2014-11-27 | 21.5 | 39.6 | 1.43 | 40.0 | 1.40 | -1.00 | 2.14 |
| 2450MHz (head) | 2014-11-25 | 21.5 | 38.6 | 1.81 | 39.2 | 1.80 | -1.53 | 0.56 |
| 835MHz (body) | 2014-12-2 | 21.5 | 55.9 | 0.99 | 55.2 | 0.97 | 1.27 | 2.06 |
| | 2014-12-31 | 21.5 | 55.7 | 1.01 | 55.2 | 0.97 | 0.91 | 4.12 |
| 1750MHz (body) | 2014-11-29 | 21.5 | 52.9 | 1.50 | 53.4 | 1.49 | -0.94 | 0.67 |
| | 2015-1-1 | 21.5 | 52.8 | 1.51 | 53.4 | 1.49 | -1.12 | 1.34 |
| 1900MHz (body) | 2014-12-3 | 21.5 | 53.1 | 1.52 | 53.3 | 1.52 | -0.38 | 0.00 |
| | 2014-12-30 | 21.5 | 52.6 | 1.58 | 53.3 | 1.52 | -1.31 | 3.95 |
| 2450MHz (body) | 2014-12-4 | 21.5 | 52.1 | 1.99 | 52.7 | 1.95 | -1.14 | 2.05 |
| | 2015-1-2 | 21.5 | 51.8 | 2.01 | 52.7 | 1.95 | -1.71 | 3.08 |

# 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 (±10 %).

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

.

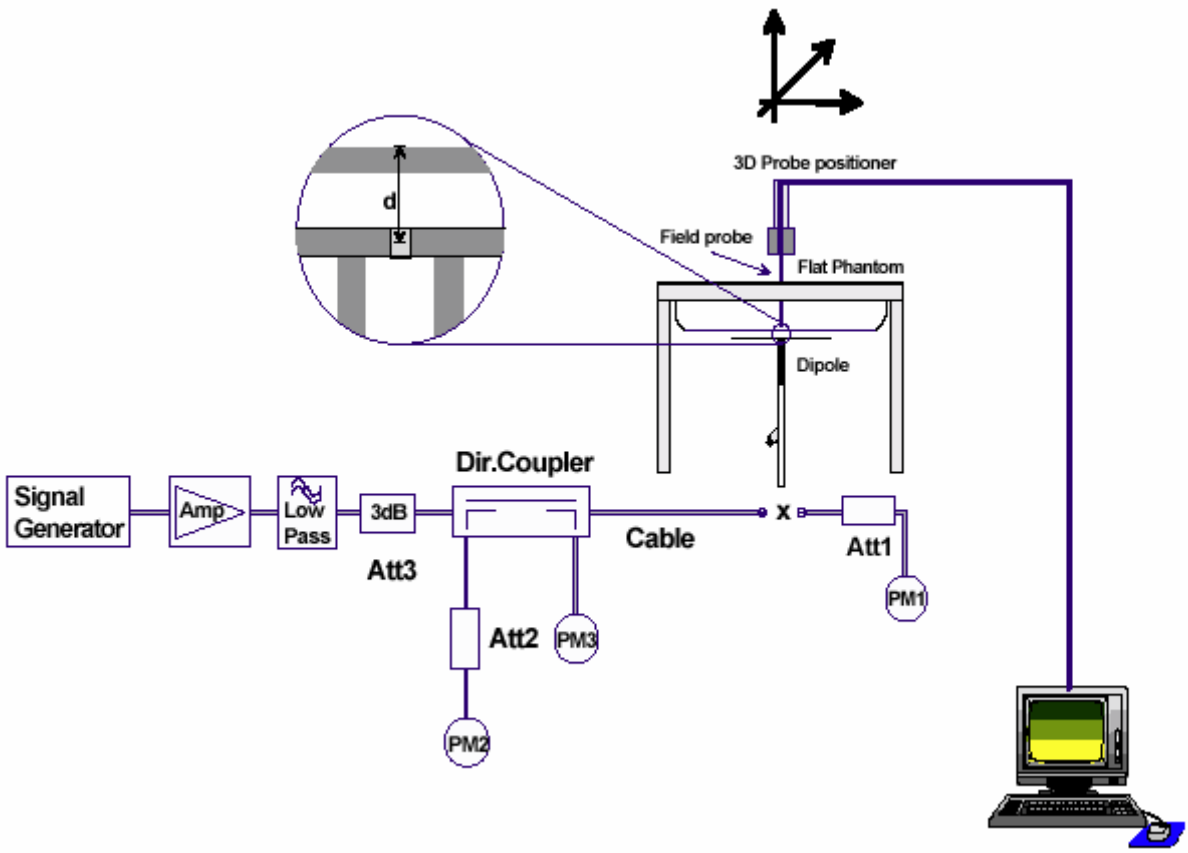



**Figure 6 System Check Set-up**

## 5.2. System Check Results

**Table 6: System Check in Head Tissue Simulating Liquid**

| Frequency | Test Date | Dielectric Parameters | | 250mW Measured $SAR_{1g}$ | 1W Normalized $SAR_{1g}$ | 1W Target $SAR_{1g}$ | Limit (±10% Deviation) |
|---|---|---|---|---|---|---|---|
| | | $\varepsilon_r$ | σ(s/m) | (W/kg) | | | |
| **835MHz** | 2014-11-23 | 41.4 | 0.93 | 2.44 | 9.76 | 9.54 | 2.31 |
| **1750MHz** | 2014-11-28 | 39.7 | 1.32 | 8.75 | 35.00 | 37.20 | -5.91 |
| **1900MHz** | 2014-11-27 | 39.6 | 1.43 | 9.48 | 37.92 | 39.20 | -3.27 |
| **2450MHz** | 2014-11-25 | 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

| Frequency | Test Date | Dielectric Parameters | | 250mW Measured $SAR_{1g}$ | 1W Normalized $SAR_{1g}$ | 1W Target $SAR_{1g}$ | Limit (±10% Deviation) |
|---|---|---|---|---|---|---|---|
| | | $\varepsilon_r$ | σ(s/m) | (W/kg) | | | |
| **835MHz (body)** | 2014-12-2 | 55.9 | 0.99 | 2.41 | 9.64 | 9.54 | 1.05 |
| | 2014-12-31 | 55.7 | 1.01 | 2.44 | 9.76 | 9.54 | 2.31 |
| **1750MHz (body)** | 2014-11-29 | 52.9 | 1.50 | 9.24 | 36.96 | 38.80 | -4.74 |
| | 2015-1-1 | 52.8 | 1.51 | 9.43 | 37.72 | 38.80 | -2.78 |
| **1900MHz (body)** | 2014-12-3 | 53.1 | 1.52 | 9.93 | 39.72 | 40.00 | -0.70 |
| | 2014-12-30 | 52.6 | 1.58 | 10.41 | 41.64 | 40.00 | 4.10 |
| **2450MHz (body)** | 2014-12-4 | 52.1 | 1.99 | 12.50 | 50.00 | 52.40 | -4.58 |
| | 2015-1-2 | 51.8 | 2.01 | 12.80 | 51.20 | 52.40 | -2.29 |

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 CMW 500, and the EUT is set to maximum output power by CMW 500. 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 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.

### 6.2.3. Phablet SAR test considerations

For smart phones with an overall diagonal dimension is 16.5cm.

Per KDB 648474 D04, for smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear, unless it is confirmed otherwise through KDB inquiries, the following phablet procedures should be applied to evaluate SAR compliance for each applicable wireless modes and frequency band. Devices marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance.

1. The normally required head and body-worn accessory SAR test procedures for handsets, including hotspot mode, must be applied.

2. The UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge, in direct contact with a flat phantom, for 10-g extremity SAR according to the body-equivalent tissue dielectric parameters in KDB 865664 to address interactive hand use exposure conditions.6 The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg; however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power, including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold .

## 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 ≥ 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 ≥ 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 ≥ 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.

## 6.4. Power Reduction operation

**CDMA Tune-up**

| Band | Normal | Sensor Active | SVLTE Mode | Sensor Active & SVLTE Mode |
|---|---|---|---|---|
| BC0 1xRTT | 24(+0.7/-0.7)dBm | 24(+0.7/-0.7)dBm | 24(+0.7/-0.7)dBm | 24(+0.7/-0.7)dBm |
| BC1 1xRTT | 23.5(+0.7/-0.7)dBm | 22.5(+0.7/-0.7)dBm | 23(+0.7/-0.7)dBm | 21.8(+0.7/-0.7)dBm |

| Band | Normal | Sensor Active | SVLTE Mode | Sensor Active & SVLTE Mode |
|---|---|---|---|---|
| BC0 EVDO | 24(+0.7/-0.7)dBm | The Same | The Same | The Same |
| BC1 EVDO | 23.5(+0.7/-0.7)dBm | The Same | The Same | The Same |

**SV-LTE Mode**

When power reduction is applied to certain wireless modes to satisfy SAR compliance for simultaneous transmission conditions, other equipment certification or operating requirements, include the maximum average conducted output power measured in each power reduction mode applicable to the simultaneous voice/data transmission configurations for such wireless configurations and frequency bands; and also include details of the power reduction implementation and measurement setup.

Power Reduction operation table for SV-LTE Mode( BC0 & LTE B13)

| Mode | CDMA BC0 | Reduced LTE Max Power for B13 |
|---|---|---|
| SV-LTE Mode | P<19dBm | 24dBm |
| | 19≤P<20dBm | 23dBm |
| | 20≤P<21dBm | 22dBm |
| | 21≤P | 21dBm |

Power Reduction operation table for SV-LTE Mode( BC1 & LTE B13) With sensor triggering

| Mode | CDMA BC1 | Reduced LTE Max Power for B13 |
|---|---|---|
| SV-LTE Mode | P<17dBm | 24dBm |
| | 17≤P<18dBm | 23dBm |
| | 18≤P<19dBm | 22dBm |
| | 19≤P<22.5dBm | 21dBm |

Power Reduction operation table for SV-LTE Mode( BC1 & LTE B13) With sensor not triggered

| Mode | CDMA BC1 | Reduced LTE Max Power for B13 |
|---|---|---|
| SV-LTE Mode | P<17dBm | 24dBm |
| | 17≤P<18dBm | 23dBm |
| | 18≤P<19dBm | 22dBm |
| | 19≤P<23.2dBm | 21dBm |

Power Reduction operation table for SV-LTE Mode( BC0 & LTE B4)

| Mode | CDMA BC0 | Reduced LTE Max Power for B4 |
|---|---|---|
| SV-LTE Mode | P<19dBm | 22dBm |
| | 19≤P<20dBm | 21dBm |
| | 20≤P<21dBm | 20dBm |
| | 21≤P | 17dBm |

Power Reduction operation table for SV-LTE Mode( BC1 & LTE B4) with sensor triggering

| Mode | CDMA BC1 | Reduced LTE Max Power for B4 |
|---|---|---|
| SV-LTE Mode | P<17dBm | 22dBm |
| | 17≤P<18dBm | 21dBm |
| | 18≤P<19dBm | 20dBm |
| | 19≤P<22.5dBm | 17dBm |

Power Reduction operation table for SV-LTE Mode( BC1 & LTE B4) with sensor not triggered

| Mode | CDMA BC1 | Reduced LTE Max Power for B4 |
|---|---|---|
| SV-LTE Mode | P<17dBm | 22dBm |
| | 17≤P<18dBm | 21dBm |
| | 18≤P<19dBm | 20dBm |
| | 19≤P<23.2dBm | 17dBm |

## 6.5. Proximity Sensor Considerations

To ensure all production units are compliant, it is generally necessary to reduce the triggering distance determined from the triggering tests by 1 mm, or more if it is necessary, and use the smallest distance for movements to and from the phantom, minus 1 mm, as the sensor triggering distance for determining the SAR measurement distance.

### 6.5.1. Proximity Sensor Detection Area

Capacitive proximity sensor has one dedicate electrode, it works as one sensor. The electrodes share the same plastic carrier with the CDMA and LTE antenna radiator.
The proximity sensor or the power reduction cannot be intentionally or unintentionally turned-off by the user.

The expected capacitance trigger values are programmed in each device for each power back-off stage. Capacitance trigger value is C1.

When a certain object or human body approaches the DUT, if the measured capacitance is lower than C1, proximity sensor is not triggered. If the measured capacitance is equal to C1 or higher than C1, the power back-off is triggered.

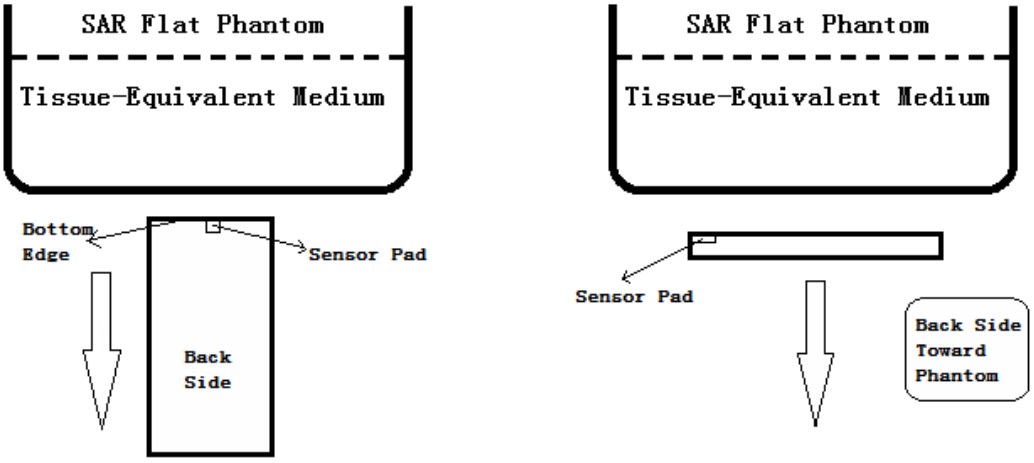
H892L use Qualcomm platform, which have some special NVs for SAR related max power back off, These NVs are used to set a new max power limit based proximity information and call configuration. When human body is in proximity and is detected by sensor, a new max power limit is set using the values stored in the NV. If Base station requests the higher output power above the limit, the power control algorithm inside modem chip will limit the power up to the preset power limit. If base station requests a lower output power less than the limit, the out power is controlled by base station. We only modified the CDMA BC1 max power limit based on proximity information through a NV, and this limit will not affected by base station power control commands.

The proximity sensor will activate the power reduction.and power reduction is only applicable for BC1 1X RTT. The active distance as below:

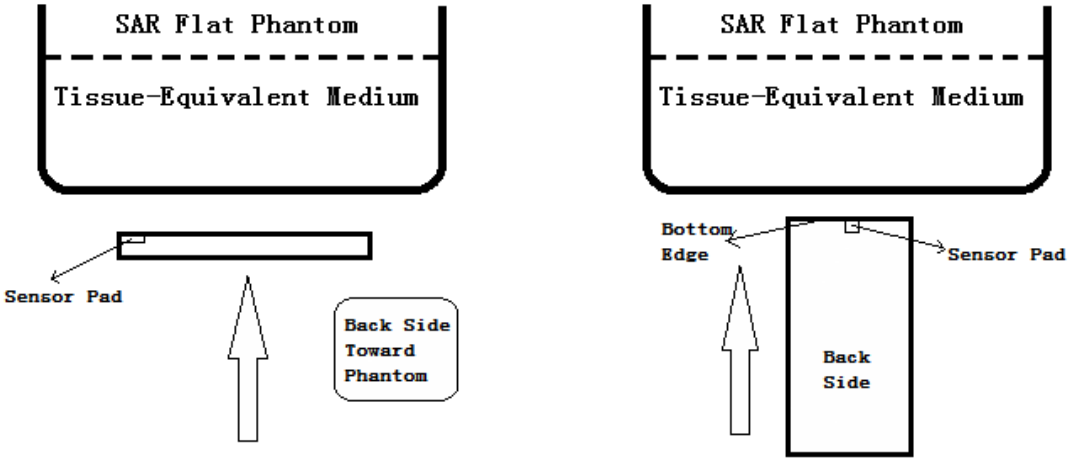
| Test position | Active distance(mm) |
|---|---|
| Back Side | 3mm |
| Front Side | NA |
| Left Edge | NA |
| Right Edge | NA |
| Top Edge | NA |
| Bottom Edge | NA |

As per the KDB 616217 D04 SAR for laptop and tablets v01r01, section 6.2, the following procedure is used to determine the triggering distances.

**moved towards the flat phantom**




**moved away from flat phantom**



First, the DUT is moved towards the flat phantom in 3 mm steps.

Proximity Sensor Status Table when EUT is moving towards the phantom

| Distance to the DUT (mm) | Proximity Sensor Status –Back Side | Proximity Sensor Status – Bottom-Edge |
|---|---|---|
| 23 | off | off |
| 20 | off | off |
| 17 | off | off |
| 14 | off | off |
| 11 | off | off |
| 8 | off | off |
| 5 | off | off |
| 2 | on | off |

Now, the DUT is moved away from flat phantom in 5 mm steps.

Proximity Sensor Status Table when EUT is moving away from the phantom

| Distance to the DUT (mm) | Proximity Sensor Status – –Back Side | Proximity Sensor Status – Bottom-Edge |
|---|---|---|
| 2 | on | off |
| 7 | off | off |

The DUT is again moved towards the flat phantom in 1 mm steps.

Proximity Sensor Status Table when EUT is moving towards the phantom

| Distance to the DUT (mm) | Proximity Sensor Status –Back Side | Proximity Sensor Status – Bottom-Edge |
|---|---|---|
| 7 | off | off |
| 6 | off | off |
| 5 | off | off |
| 4 | off | off |
| 3 | on | off |
| 2 | on | off |
| 1 | on | off |
| 0 | on | off |

The DUT is again moved away from the flat phantom in 3 mm steps.

Proximity Sensor Status Table when EUT is moving towards the phantom

| Distance to the DUT (mm) | Proximity Sensor Status –Back Side | Proximity Sensor Status – Bottom-Edge |
|---|---|---|
| 0 | on | off |
| 3 | on | off |
| 6 | off | off |

Now, the DUT is moved towards flat phantom in 5 mm steps.

Proximity Sensor Status Table when EUT is moving away from the phantom

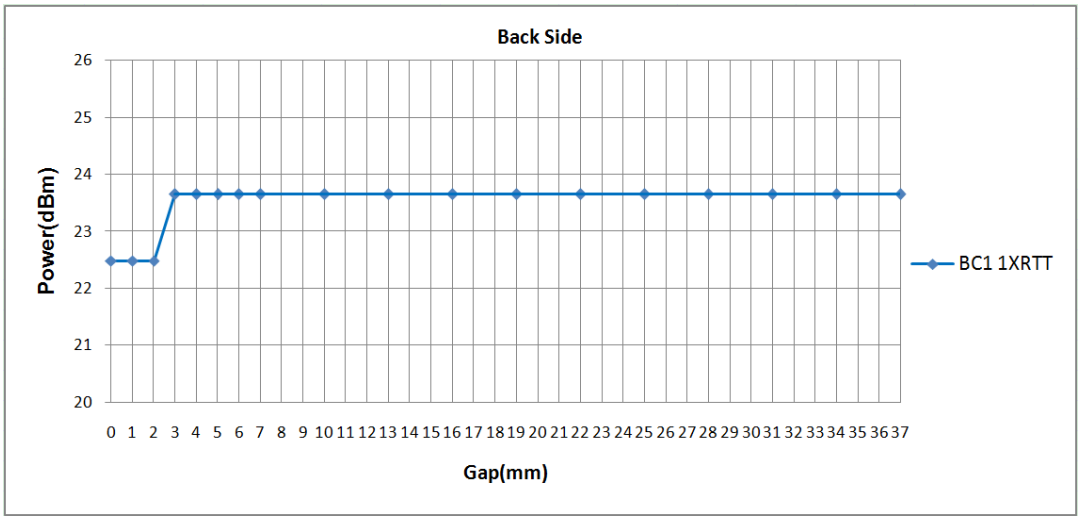
| Distance to the DUT (mm) | Proximity Sensor Status – –Back Side | Proximity Sensor Status – Bottom-Edge |
|---|---|---|
| 6 | off | off |
| 1 | on | off |

The DUT is again moved away from the flat phantom in 1 mm steps.

Proximity Sensor Status Table when EUT is moving towards the phantom

| Distance to the DUT (mm) | Proximity Sensor Status –Back Side | Proximity Sensor Status – Bottom-Edge |
|---|---|---|
| 1 | on | off |
| 2 | on | off |
| 3 | on | off |
| 4 | off | off |
| 5 | off | off |
| 6 | off | off |
| 7 | off | off |
| 8 | off | off |
| 9 | off | off |
| 10 | off | off |
| 11 | off | off |
| 12 | off | off |
| 13 | off | off |

Proximity sensor for back side detection



The measured output power within ±5mm of the triggering points,or until the tablet is touching the phantom,for movements of back side to and from the phantom is shown below

**moved towards the flat phantom without SVLTE :**

| Band | Channel | Distance to the phantom (mm) | Loopback | | Data | |
|---|---|---|---|---|---|---|
| | | | SO55 | | TDSO SO32 RC3 | |
| | | | RC3 | RC1 | FCH | +FCH-SCH |
| CDMA PCS | 1175/1908.75 | 0 | 22.26 | 22.31 | 22.23 | 22.28 |
| | | 1 | 22.26 | 22.35 | 22.23 | 22.32 |
| | | 2 | 22.28 | 22.32 | 22.21 | 22.31 |
| | | 3 | 22.27 | 22.34 | 22.20 | 22.30 |
| | | 4 | 23.37 | 23.41 | 23.37 | 23.37 |
| | | 5 | 23.38 | 23.43 | 23.37 | 23.36 |
| | | 6 | 23.34 | 23.42 | 23.40 | 23.32 |
| | | 7 | 23.35 | 23.40 | 23.39 | 23.34 |
| | | 8 | 23.37 | 23.41 | 23.39 | 23.31 |
| | 600/1880 | 0 | 22.48 | 22.49 | 22.48 | 22.49 |
| | | 1 | 22.48 | 22.44 | 22.48 | 22.44 |
| | | 2 | 22.48 | 22.49 | 22.48 | 22.49 |
| | | 3 | 22.47 | 22.48 | 22.48 | 22.49 |
| | | 4 | 23.67 | 23.66 | 23.64 | 23.61 |
| | | 5 | 23.66 | 23.68 | 23.65 | 23.64 |
| | | 6 | 23.63 | 23.69 | 23.63 | 23.63 |
| | | 7 | 23.66 | 23.68 | 23.65 | 23.64 |
| | | 8 | 23.62 | 23.66 | 23.65 | 23.6 |
| | 25/1851.25 | 0 | 22.32 | 22.33 | 22.32 | 22.31 |
| | | 1 | 22.32 | 22.35 | 22.32 | 22.33 |
| | | 2 | 22.31 | 22.36 | 22.33 | 22.30 |
| | | 3 | 22.30 | 22.30 | 22.32 | 22.31 |
| | | 4 | 23.55 | 23.67 | 23.58 | 23.54 |
| | | 5 | 23.56 | 23.66 | 23.58 | 23.55 |
| | | 6 | 23.56 | 23.62 | 23.6 | 23.57 |
| | | 7 | 23.57 | 23.63 | 23.57 | 23.56 |
| | | 8 | 23.63 | 23.61 | 23.57 | 23.56 |

**moved away from the flat phantom without SVLTE :**

| Band | Channel | Distance to the phantom (mm) | Loopback | | Data | |
|---|---|---|---|---|---|---|
| | | | SO55 | | TDSO SO32 RC3 | |
| | | | RC3 | RC1 | FCH | +FCH-SCH |
| CDMA PCS | 1175/1908.75 | 0 | 22.25 | 22.3 | 22.22 | 22.27 |
| | | 1 | 22.25 | 22.34 | 22.22 | 22.31 |
| | | 2 | 22.27 | 22.31 | 22.2 | 22.3 |
| | | 3 | 22.26 | 22.33 | 22.19 | 22.29 |
| | | 4 | 23.36 | 23.4 | 23.36 | 23.36 |
| | | 5 | 23.37 | 23.42 | 23.36 | 23.35 |
| | | 6 | 23.33 | 23.41 | 23.39 | 23.31 |
| | | 7 | 23.37 | 23.42 | 23.41 | 23.33 |
| | | 8 | 23.39 | 23.43 | 23.41 | 23.3 |
| | 600/1880 | 0 | 22.47 | 22.51 | 22.48 | 22.48 |
| | | 1 | 22.48 | 22.46 | 22.49 | 22.43 |
| | | 2 | 22.49 | 22.48 | 22.47 | 22.48 |
| | | 3 | 22.49 | 22.47 | 22.47 | 22.48 |
| | | 4 | 23.68 | 23.68 | 23.66 | 23.6 |
| | | 5 | 23.67 | 23.66 | 23.67 | 23.63 |
| | | 6 | 23.68 | 23.68 | 23.65 | 23.62 |
| | | 7 | 23.67 | 23.68 | 23.67 | 23.63 |
| | | 8 | 23.68 | 23.68 | 23.67 | 23.59 |
| | 25/1851.25 | 0 | 22.35 | 22.35 | 22.34 | 22.3 |
| | | 1 | 22.37 | 22.37 | 22.34 | 22.32 |
| | | 2 | 22.38 | 22.38 | 22.35 | 22.29 |
| | | 3 | 22.32 | 22.32 | 22.34 | 22.3 |
| | | 4 | 23.69 | 23.69 | 23.6 | 23.53 |
| | | 5 | 23.68 | 23.68 | 23.6 | 23.54 |
| | | 6 | 23.64 | 23.64 | 23.62 | 23.56 |
| | | 7 | 23.65 | 23.65 | 23.59 | 23.55 |
| | | 8 | 23.63 | 23.63 | 23.59 | 23.55 |

**moved towards the flat phantom with SVLTE:**

| Band | Channel | Distance to the phantom (mm) | Loopback | | Data | |
|---|---|---|---|---|---|---|
| | | | SO55 | | TDSO SO32 RC3 | |
| | | | RC3 | RC1 | FCH | +FCH-SCH |
| CDMA PCS | 1175/1908.75 | 0 | 21.75 | 21.8 | 21.72 | 21.77 |
| | | 1 | 21.75 | 21.84 | 21.72 | 21.81 |
| | | 2 | 21.77 | 21.81 | 21.70 | 21.8 |
| | | 3 | 21.76 | 21.83 | 21.69 | 21.79 |
| | | 4 | 22.86 | 22.9 | 22.86 | 22.86 |
| | | 5 | 22.87 | 22.92 | 22.86 | 22.85 |
| | | 6 | 22.83 | 22.91 | 22.89 | 22.81 |
| | | 7 | 22.87 | 22.92 | 22.91 | 22.83 |
| | | 8 | 22.89 | 22.93 | 22.91 | 22.8 |
| | 600/1880 | 0 | 22 | 22.01 | 22 | 21.98 |
| | | 1 | 22 | 21.96 | 22 | 21.93 |
| | | 2 | 22 | 22.01 | 22 | 21.98 |
| | | 3 | 21.99 | 22 | 22 | 21.98 |
| | | 4 | 23.18 | 23.18 | 23.16 | 23.1 |
| | | 5 | 23.19 | 23.19 | 23.17 | 23.13 |
| | | 6 | 23.19 | 23.17 | 23.15 | 23.12 |
| | | 7 | 23.18 | 23.19 | 23.17 | 23.13 |
| | | 8 | 23.18 | 23.18 | 23.17 | 23.09 |
| | 25/1851.25 | 0 | 21.85 | 21.85 | 21.84 | 21.8 |
| | | 1 | 21.87 | 21.87 | 21.84 | 21.82 |
| | | 2 | 21.88 | 21.88 | 21.85 | 21.79 |
| | | 3 | 21.82 | 21.82 | 21.84 | 21.8 |
| | | 4 | 23.19 | 23.19 | 23.1 | 23.03 |
| | | 5 | 23.18 | 23.18 | 23.1 | 23.04 |
| | | 6 | 23.14 | 23.14 | 23.12 | 23.06 |
| | | 7 | 23.15 | 23.15 | 23.09 | 23.05 |
| | | 8 | 23.13 | 23.13 | 23.09 | 23.05 |

**moved away from the flat phantom with SVLTE :**

| Band | Channel | Distance to the phantom (mm) | Loopback | | Data | |
|---|---|---|---|---|---|---|
| | | | SO55 | | TDSO SO32 RC3 | |
| | | | RC3 | RC1 | FCH | +FCH-SCH |
| CDMA PCS | 1175/1908.75 | 0 | 21.73 | 21.78 | 21.7 | 21.75 |
| | | 1 | 21.73 | 21.82 | 21.7 | 21.79 |
| | | 2 | 21.75 | 21.79 | 21.68 | 21.78 |
| | | 3 | 21.74 | 21.81 | 21.67 | 21.77 |
| | | 4 | 22.84 | 22.88 | 22.84 | 22.84 |
| | | 5 | 22.85 | 22.9 | 22.84 | 22.83 |
| | | 6 | 22.81 | 22.89 | 22.87 | 22.79 |
| | | 7 | 22.85 | 22.9 | 22.89 | 22.81 |
| | | 8 | 22.87 | 22.91 | 22.89 | 22.78 |
| | 600/1880 | 0 | 21.98 | 21.99 | 21.98 | 21.96 |
| | | 1 | 21.98 | 21.94 | 21.98 | 21.91 |
| | | 2 | 21.98 | 21.99 | 21.98 | 21.96 |
| | | 3 | 21.97 | 21.98 | 21.98 | 21.96 |
| | | 4 | 23.16 | 23.16 | 23.14 | 23.08 |
| | | 5 | 23.17 | 23.17 | 23.15 | 23.11 |
| | | 6 | 23.17 | 23.15 | 23.13 | 23.1 |
| | | 7 | 23.16 | 23.17 | 23.15 | 23.11 |
| | | 8 | 23.16 | 23.16 | 23.15 | 23.07 |
| | 25/1851.25 | 0 | 21.83 | 21.83 | 21.82 | 21.78 |
| | | 1 | 21.85 | 21.85 | 21.82 | 21.8 |
| | | 2 | 21.86 | 21.86 | 21.83 | 21.77 |
| | | 3 | 21.8 | 21.8 | 21.82 | 21.78 |
| | | 4 | 23.17 | 23.17 | 23.08 | 23.01 |
| | | 5 | 23.16 | 23.16 | 23.08 | 23.02 |
| | | 6 | 23.12 | 23.12 | 23.1 | 23.04 |
| | | 7 | 23.13 | 23.13 | 23.07 | 23.03 |
| | | 8 | 23.11 | 23.11 | 23.07 | 23.03 |

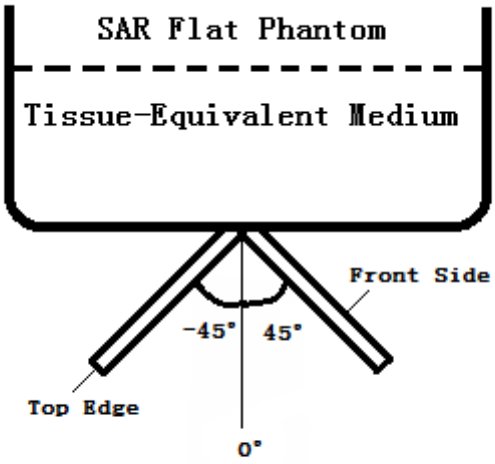
### 6.5.2. Coverage at the Corner of the DUT

The proximity sensor coverage at the bottom edge of the device is determined by changing the angle of the device relative to the phantom, and observing the angle at which the proximity sensor is not triggered.

The proximity sensor coverage at the Rear of the device is determined by changing the angle of the device relative to the phantom, and observing the angle at which the proximity sensor is triggered.

There is no proximity sensor power reduction for bottom side and SAR is tested at maximum power with 0mm distance.

Proximity Sensor Status Table when DUT is moving towards the phantom




| Angle to the DUT (Degrees) | Measured output power without SVLTE – bottom surface(dBm) | Measured output power with SVLTE – bottom surface(dBm) |
|---|---|---|
| -45 | 23.68 | 23.15 |
| -35 | 23.65 | 23.17 |
| -25 | 23.66 | 23.16 |
| -15 | 23.67 | 23.15 |
| -5 | 23.68 | 23.16 |
| 5 | 23.66 | 23.16 |
| 15 | 23.64 | 23.14 |
| 25 | 23.67 | 23.17 |
| 35 | 23.65 | 23.16 |
| 45 | 23.67 | 23.14 |

## 6.6. Test Configuration

### 6.6.1. CDMA Test Configuration

#### 6.6.1.1. 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 ≤ ¼ 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 ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.3 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.

### 6.6.2. Information for the Measurement of CDMA 1x Devices

#### 6.5.2.1 Output Power Verification

Maximum output power is verified on the high, middle and low channels according to procedures in section 4.4.5.2 of 3GPP2 C.S0011/TIA-98-E. Results for at least steps 3, 4 and 10 of the power measurement procedures are required in the SAR report. Steps 3 and 4 are measured using Loopback Service Option SO55 with power control bits in “All Up” condition. TDSO/SO32 may be used instead of SO55 for step 4. Step 10 is measured using TDSO/SO32 with power control bits in the “Bits Hold” condition (i.e. alternative Up/Down Bits). All power measurements defined in C.S0011/TIA-98-E that are inapplicable to the handset or cannot be measured due to technical or equipment limitations must be clearly identified in the test report.

Test Parameter setup for maximum RF output power according to section 4.4.5 of 3GPP2

| Parameter | Units | Value |
|---|---|---|
| I or | dBm/1.23MHz | -104 |
| PilotE c /I or | dB | -7 |
| TrafficE c /I or | dB | -7.4 |

#### 6.5.2.2 Head SAR

SAR for next to the ear head exposure is measured in RC3 with the handset configured to transmit at full rate in SO55. The 3G SAR test reduction procedure is applied to RC1 with RC3 as the primary mode; otherwise, SAR is required for the channel with maximum measured output in RC1 using the head exposure configuration that results in the highest *reported* SAR in RC3.

#### 6.5.2.3 Body-Worn Accessory SAR

Body-worn accessory SAR is measured in RC3 with the handset configured in TDSO/SO32 to transmit at full rate on FCH only with all other code channels disabled. The body-worn accessory procedures in KDB Publication 447498 are applied. The 3G SAR test reduction procedure is applied to the multiple code channel configuration (FCH+SCHn), with FCH only as the primary mode. Otherwise, SAR is required for multiple code channel configuration (FCH + SCHn), with FCH at full rate and SCH0 enabled at 9600 bps, using the highest reported SAR configuration for FCH only. When multiple code channels are enabled, the transmitter output can shift by more than 0.5 dB and may lead to higher SAR drifts and SCH dropouts.
The 3G SAR test reduction procedure is applied to body-worn accessory SAR in RC1 with RC3 as the primary mode. Otherwise, SAR is required for RC1, with SO55 and full rate, using the highest reported SAR configuration for body-worn accessory exposure in RC3.

Test communication setup meet as followings:

| | |
|---|---|
| Communication standard between mobile station and base station simulator | 3GPP2 C.S0011-B |
| Radio configuration | RC3（Supporting CDMA 1X） |
| Spreading Rate | SR1 |
| Data Rate | 9600bps |
| Service Options | SO55 （loop back mode） |
| Service Options | SO32 （test data service mode） |
| Multiplex Options | The mobile station does not support this service. |

#### 6.5.2.4 Handsets with built-in EVDO

For handsets with EVDO capabilities, the 3G SAR test reduction procedure is applied to EVDO Rev. 0 with 1x RTT RC3 as the primary mode to determine body-worn accessory test requirements. Otherwise, body-worn accessory SAR is required for Rev. 0, at 153.6 kbps, using the highest reported SAR configuration for body-worn accessory exposure in RC3.
The 3G SAR test reduction procedure is applied separately to Rev. A and Rev. B, with Rev. 0 as the primary mode to determine body-worn accessory SAR test requirements. When SAR is not required for Rev. 0, the 3G SAR test reduction is applied with 1x RTT RC3 as the primary mode. Otherwise, SAR is Target of 16 slots defined for Subtype 2 and 3 Physical Layer configurations, using the highest reported SAR configuration for body-worn accessory exposure in Rev. 0 or RC3, as appropriate.

A Forward Traffic Channel data rate corresponding to the 2-slot version of 307.2 kbps with ACK Channel transmitting in all slots is configured in the downlink for Rev. 0, Rev. A and Rev. B.11

### 6.6.3. LTE Test Configuration

LTE modes were tested according to FCC KDB 941225 D05 publication. Please see notes after the tabulated SAR data for required test configurations. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. The R&S CMW500 was used for LTE output power measurements and SAR testing. Max power control was used so the UE transmits with maximum output power during SAR testing. SAR must be measured with the maximum TTI (transmit time interval) supported by the device in each LTE configuration.

**A)Spectrum Plots for RB Configurations**

A properly configured base station simulator was used for SAR tests and power measurements. Therefore, spectrum plots for RB configurations were not required to be included in this report.

**B)MPR**

MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.

**C)A-MPR**

A-MPR (Additional MPR) has been disabled for all SAR tests by setting NS=01 on the base station simulator.

**D) Largest channel bandwidth standalone SAR test requirements**

1) QPSK with 1 RB allocation

Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel. When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

2) QPSK with 50% RB allocation

The procedures required for 1 RB allocation in 1) are applied to measure the SAR for QPSK with 50% RB allocation.

3) QPSK with 100% RB allocation

For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in 1) and 2) are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

4) Higher order modulations

For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in above sections to determine the QAM configurations that may need SAR measurement. For each configuration identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is > ½ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

**E) Other channel bandwidth standalone SAR test requirements**

For the other channel bandwidths used by the device in a frequency band, apply all the procedures

required for the largest channel bandwidth in section A) to determine the channels and RB configurations that need SAR testing and only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is > ½ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the *reported* SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg.

### 6.6.4. 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 16 for 802.11 b/g mode, 14 for 802.11 n 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.

### 6.6.5. Simultaneous Transmission Power Reduction Considerations

When multiple transmitters operate simultaneously at relatively high maximum output power and at close proximity to users, as the device form factor becomes smaller the antenna and radiating structures are brought closer to each other, the potential for internal interference and higher SAR increases. Smart phone manufacturers have applied different power reduction implementations to maintain compliance. The maximum output power of the transmitter operating in data mode is often reduced or can be pulse-modulated with a periodic duty factor to reduce the time-averaged power during simultaneous transmission to maintain voice call quality and SAR compliance. There are also situations where the output power for the data mode is reduced to mitigate interference concerns for the other transmitters and receivers within the phone. In some cases, a fixed level of reduction for the maximum output power is applied to specific frequency bands, wireless modes and simultaneous transmission configurations. For other situations that require more flexibility; the power reduction mechanisms can become quite complex and dynamic. Each implementation generally requires case-by-case consideration, in conjunction with the large combinations of transmitter, antenna, operating mode and simultaneous transmission variations, to determine the test configurations needed to support compliance. Unless the power reduction is for a fixed level according to source-based time averaging requirements and triggered by a specific frequency band or dedicated operation when a simultaneous transmission configuration is enabled for operation, such as hotspot mode or certain SVLTE/SVDO operations, the acceptable test requirements for other power reduction implementations and subsequent variations should generally be determined through KDB inquiries before testing.

# 7. Test Results

## 7.1. Conducted Power Results

**Table 7: Conducted Power Measurement Results (Sensor off )**

| Band | Channel/Frequency | Loopback | | Data | |
|---|---|---|---|---|---|
| | | SO55 | | TDSO SO32 RC3 | |
| | | RC3 | RC1 | FCH | +FCH-SCH |
| CDMA BC0 | 777/848.31 | 23.95 | 23.85 | 23.93 | 23.94 |
| | 384/836.52 | 23.89 | 23.84 | 23.86 | 23.85 |
| | 1013/824.7 | 23.82 | 23.78 | 23.79 | 23.81 |
| CDMA BC1 | 1175/1908.75 | 23.35 | 23.40 | 23.39 | 23.34 |
| | 600/1880 | 23.66 | 23.68 | 23.65 | 23.64 |
| | 25/1851.25 | 23.57 | 23.63 | 23.57 | 23.56 |

| Band | Channel/Frequency | EVDO.0 | EVDO.A |
|---|---|---|---|
| | | RTAP | RTAP |
| CDMA BC0 | 777/848.31 | 23.97 | 24.03 |
| | 384/836.52 | 23.90 | 23.95 |
| | 1013/824.7 | 23.79 | 23.88 |
| CDMA BC1 | 1175/1908.75 | 23.37 | 23.23 |
| | 600/1880 | 23.57 | 23.50 |
| | 25/1851.25 | 23.38 | 23.44 |

**Table 8: Conducted Power Measurement Results (Sensor on )**

| Band | Channel/Frequency | Loopback | | Data | |
|---|---|---|---|---|---|
| | | SO55 | | TDSO SO32 RC3 | |
| | | RC3 | RC1 | FCH | +FCH-SCH |
| CDMA BC1 | 1175/1908.75 | 22.26 | 22.31 | 22.23 | 22.28 |
| | 600/1880 | 22.48 | 22.49 | 22.48 | 22.49 |
| | 25/1851.25 | 22.32 | 22.33 | 22.32 | 22.31 |

| LTE FDD Band 4 | | | | Conducted Power(dBm) | | |
|---|---|---|---|---|---|---|
| **Bandwidth** | Modulation | RB size | RB offset | Channel 19957 | Channel 20175 | Channel 20393 |
| **1.4MHz** | QPSK | 1 | 0 | 22.63 | 22.55 | 21.86 |
| | | 1 | 2 | 22.56 | 21.92 | 21.82 |
| | | 1 | 5 | 22.32 | 22.04 | 22.55 |
| | | 3 | 0 | 21.43 | 21.38 | 21.56 |
| | | 3 | 2 | 21.11 | 21.37 | 21.49 |
| | | 3 | 3 | 21.04 | 21.33 | 21.60 |
| | | 6 | 0 | 21.83 | 21.37 | 21.52 |
| | 16QAM | 1 | 0 | 21.56 | 21.08 | 20.72 |
| | | 1 | 2 | 21.08 | 21.47 | 20.82 |
| | | 1 | 5 | 21.03 | 21.60 | 20.75 |
| | | 3 | 0 | 20.71 | 20.66 | 20.32 |
| | | 3 | 2 | 21.05 | 20.18 | 20.06 |
| | | 3 | 3 | 20.81 | 20.61 | 20.24 |
| | | 6 | 0 | 21.09 | 20.86 | 20.03 |
| **Bandwidth** | Modulation | RB size | RB offset | Channel 19965 | Channel 20175 | Channel 20385 |
| **3MHz** | QPSK | 1 | 0 | 22.64 | 22.43 | 21.85 |
| | | 1 | 7 | 22.44 | 21.93 | 21.83 |
| | | 1 | 14 | 22.31 | 22.03 | 22.42 |
| | | 8 | 0 | 21.42 | 21.26 | 21.43 |
| | | 8 | 4 | 21.12 | 21.24 | 21.37 |
| | | 8 | 7 | 21.03 | 21.21 | 21.47 |
| | | 15 | 0 | 21.67 | 21.24 | 21.40 |
| | 16QAM | 1 | 0 | 21.44 | 21.07 | 20.73 |
| | | 1 | 7 | 21.07 | 21.35 | 20.81 |
| | | 1 | 14 | 21.02 | 21.47 | 20.76 |
| | | 8 | 0 | 20.59 | 20.54 | 20.31 |
| | | 8 | 4 | 20.92 | 20.19 | 20.07 |
| | | 8 | 7 | 20.67 | 20.49 | 20.23 |
| | | 15 | 0 | 20.93 | 20.73 | 20.04 |
| **Bandwidth** | Modulation | RB size | RB offset | Channel 19975 | Channel 20175 | Channel 20375 |
| **5MHz** | QPSK | 1 | 0 | 22.63 | 22.46 | 21.99 |
| | | 1 | 13 | 22.47 | 22.09 | 21.99 |
| | | 1 | 24 | 22.45 | 22.17 | 22.44 |
| | | 12 | 0 | 21.56 | 21.29 | 21.45 |
| | | 12 | 6 | 21.28 | 21.26 | 21.40 |
| | | 12 | 13 | 21.17 | 21.24 | 21.49 |
| | | 25 | 0 | 21.66 | 21.26 | 21.43 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 16QAM | 1 | 0 | 21.47 | 21.21 | 20.89 |
| | | 1 | 13 | 21.21 | 21.38 | 20.95 |
| | | 1 | 24 | 21.16 | 21.49 | 20.92 |
| | | 12 | 0 | 20.62 | 20.57 | 20.45 |
| | | 12 | 6 | 20.94 | 20.35 | 20.23 |
| | | 12 | 13 | 20.68 | 20.52 | 20.37 |
| | | 25 | 0 | 20.92 | 20.75 | 20.20 |
| **Bandwidth** | Modulation | RB size | RB offset | Channel 20000 | Channel 20175 | Channel 20350 |
| **10MHz** | QPSK | 1 | 0 | 22.50 | 22.35 | 21.99 |
| | | 1 | 25 | 22.36 | 22.11 | 22.01 |
| | | 1 | 49 | 22.33 | 22.17 | 22.32 |
| | | 25 | 0 | 21.45 | 21.18 | 21.33 |
| | | 25 | 13 | 21.30 | 21.14 | 21.29 |
| | | 25 | 25 | 21.17 | 21.13 | 21.37 |
| | | 50 | 0 | 21.51 | 21.14 | 21.32 |
| | 16QAM | 1 | 0 | 21.36 | 21.21 | 20.91 |
| | | 1 | 25 | 21.21 | 21.27 | 20.95 |
| | | 1 | 49 | 21.16 | 21.37 | 20.94 |
| | | 25 | 0 | 20.51 | 20.46 | 20.45 |
| | | 25 | 13 | 20.82 | 20.37 | 20.25 |
| | | 25 | 25 | 20.55 | 20.41 | 20.37 |
| | | 50 | 0 | 20.77 | 20.63 | 20.22 |
| **Bandwidth** | Modulation | RB size | RB offset | Channel 20025 | Channel 20175 | Channel 20325 |
| **15MHz** | QPSK | 1 | 0 | 22.34 | 22.21 | 21.96 |
| | | 1 | 38 | 22.22 | 22.10 | 22.00 |
| | | 1 | 74 | 22.18 | 22.14 | 22.17 |
| | | 36 | 0 | 21.31 | 21.04 | 21.18 |
| | | 36 | 18 | 21.29 | 20.99 | 21.15 |
| | | 36 | 39 | 21.14 | 20.99 | 21.22 |
| | | 75 | 0 | 21.33 | 20.99 | 21.18 |
| | 16QAM | 1 | 0 | 21.22 | 21.18 | 20.90 |
| | | 1 | 38 | 21.18 | 21.13 | 20.92 |
| | | 1 | 74 | 21.13 | 21.22 | 20.93 |
| | | 36 | 0 | 20.37 | 20.32 | 20.42 |
| | | 36 | 18 | 20.67 | 20.36 | 20.24 |
| | | 36 | 39 | 20.39 | 20.27 | 20.34 |
| | | 75 | 0 | 20.59 | 20.48 | 20.21 |
| **Bandwidth** | Modulation | RB size | RB offset | Channel 20050 | Channel 20175 | Channel 20300 |
| **20MHz** | QPSK | 1 | 0 | 22.18 | 22.07 | 21.93 |
| | | 1 | 50 | 22.07 | 22.09 | 21.99 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 99 | 22.04 | 22.11 | 22.02 |
| | | 50 | 0 | 21.17 | 21.01 | 21.04 |
| | | 50 | 25 | 21.14 | 20.98 | 21.00 |
| | | 50 | 50 | 21.00 | 20.96 | 21.08 |
| | | 100 | 0 | 21.18 | 20.98 | 21.03 |
| | 16QAM | 1 | 0 | 21.08 | 21.15 | 20.89 |
| | | 1 | 50 | 21.15 | 20.99 | 20.89 |
| | | 1 | 99 | 21.12 | 21.07 | 20.92 |
| | | 50 | 0 | 20.34 | 20.18 | 20.39 |
| | | 50 | 25 | 20.49 | 20.21 | 20.23 |
| | | 50 | 50 | 20.23 | 20.13 | 20.31 |
| | | 100 | 0 | 20.41 | 20.33 | 20.20 |

| **LTE FDD Band 13** | | | | **Conducted Power(dBm)** | | |
|---|---|---|---|---|---|---|
| **Bandwidth** | Modulation | RB size | RB offset | Channel 23205 | Channel 23230 | Channel 23255 |
| **5MHz** | QPSK | 1 | 0 | 23.19 | 23.15 | 23.02 |
| | | 1 | 13 | 23.18 | 23.03 | 23.04 |
| | | 1 | 24 | 23.22 | 23.14 | 23.24 |
| | | 12 | 0 | 22.31 | 22.21 | 22.31 |
| | | 12 | 6 | 22.37 | 22.22 | 22.34 |
| | | 12 | 13 | 22.55 | 22.41 | 22.55 |
| | | 25 | 0 | 22.50 | 22.37 | 22.5 |
| | 16QAM | 1 | 0 | 22.22 | 22.09 | 22.03 |
| | | 1 | 13 | 22.09 | 22.19 | 22.16 |
| | | 1 | 24 | 22.19 | 22.36 | 22.17 |
| | | 12 | 0 | 21.29 | 21.41 | 21.25 |
| | | 12 | 6 | 21.47 | 21.43 | 21.26 |
| | | 12 | 13 | 21.62 | 21.57 | 21.49 |
| | | 25 | 0 | 21.59 | 21.57 | 21.45 |
| **Bandwidth** | Modulation | RB size | RB offset | Channel 23205 | Channel 23230 | Channel 23255 |
| **10MHz** | QPSK | 1 | 0 | 23.03 | 23.01 | 22.99 |
| | | 1 | 25 | 23.03 | 23.02 | 23.03 |
| | | 1 | 49 | 23.08 | 23.11 | 23.09 |
| | | 25 | 0 | 22.17 | 22.18 | 22.17 |
| | | 25 | 13 | 22.22 | 22.21 | 22.19 |
| | | 25 | 25 | 22.37 | 22.38 | 22.37 |
| | | 50 | 0 | 22.35 | 22.36 | 22.35 |
| | 16QAM | 1 | 0 | 22.08 | 22.06 | 22.02 |
| | | 1 | 25 | 22.06 | 22.05 | 22.13 |
| | | 1 | 49 | 22.18 | 22.21 | 22.16 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 25 | 0 | 21.26 | 21.27 | 21.22 |
| | | 25 | 13 | 21.29 | 21.28 | 21.25 |
| | | 25 | 25 | 21.46 | 21.43 | 21.46 |
| | | 50 | 0 | 21.41 | 21.42 | 21.44 |

| CDMA Cellular 1X | | SVLTE B4 CH20175(20MHz) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | QPSK | | | | 16QAM | | | |
| Channel | output power(dBm) | 1RB | 1RB | 50RB | 100RB | 1RB | 1RB | 50RB | 100RB |
| | | 0 RB Start | 99 RB Start | 25 RB Start | 0 RB Start | 0 RB Start | 99 RB Start | 25 RB Start | 0 RB Start |
| 1013 | 15 | 21.88 | 21.91 | 21.94 | 21.90 | 21.96 | 21.91 | 21.78 | 21.88 |
| | 16 | 21.88 | 21.91 | 21.94 | 21.90 | 21.96 | 21.91 | 21.78 | 21.88 |
| | 17 | 21.88 | 21.91 | 21.94 | 21.90 | 21.96 | 21.91 | 21.78 | 21.88 |
| | 18 | 21.88 | 21.91 | 21.94 | 21.90 | 21.96 | 21.91 | 21.78 | 21.88 |
| | 18.5 | 21.88 | 21.91 | 21.94 | 21.90 | 21.96 | 21.91 | 21.78 | 21.88 |
| | 19 | 20.89 | 20.68 | 20.72 | 20.75 | 20.78 | 20.80 | 20.76 | 20.75 |
| | 19.5 | 20.89 | 20.68 | 20.72 | 20.75 | 20.78 | 20.80 | 20.76 | 20.75 |
| | 20 | 19.88 | 19.86 | 19.85 | 19.82 | 19.83 | 19.84 | 19.72 | 19.66 |
| | 20.5 | 19.88 | 19.86 | 19.85 | 19.82 | 19.83 | 19.84 | 19.72 | 19.66 |
| | 21 | 16.81 | 16.80 | 16.68 | 16.79 | 16.82 | 16.83 | 16.77 | 16.82 |
| | 22 | 16.81 | 16.80 | 16.68 | 16.79 | 16.82 | 16.83 | 16.77 | 16.82 |
| | 23 | 16.81 | 16.80 | 16.68 | 16.79 | 16.82 | 16.83 | 16.77 | 16.82 |
| | 24 | 16.81 | 16.80 | 16.68 | 16.79 | 16.82 | 16.83 | 16.77 | 16.82 |
| | 24.7 | 16.81 | 16.80 | 16.68 | 16.79 | 16.82 | 16.83 | 16.77 | 16.82 |
| 384 | 15 | 21.88 | 21.91 | 21.94 | 21.90 | 21.96 | 21.91 | 21.78 | 21.88 |
| | 16 | 21.88 | 21.91 | 21.94 | 21.90 | 21.96 | 21.91 | 21.78 | 21.88 |
| | 17 | 21.88 | 21.91 | 21.94 | 21.90 | 21.96 | 21.91 | 21.78 | 21.88 |
| | 18 | 21.88 | 21.91 | 21.94 | 21.90 | 21.96 | 21.91 | 21.78 | 21.88 |
| | 18.5 | 21.88 | 21.91 | 21.94 | 21.90 | 21.96 | 21.91 | 21.78 | 21.88 |
| | 19 | 20.89 | 20.68 | 20.72 | 20.75 | 20.78 | 20.80 | 20.76 | 20.75 |
| | 19.5 | 20.89 | 20.68 | 20.72 | 20.75 | 20.78 | 20.80 | 20.76 | 20.75 |
| | 20 | 19.88 | 19.86 | 19.85 | 19.82 | 19.83 | 19.84 | 19.72 | 19.66 |
| | 20.5 | 19.88 | 19.86 | 19.85 | 19.82 | 19.83 | 19.84 | 19.72 | 19.66 |
| | 21 | 16.81 | 16.80 | 16.68 | 16.79 | 16.82 | 16.83 | 16.77 | 16.82 |
| | 22 | 16.81 | 16.80 | 16.68 | 16.79 | 16.82 | 16.83 | 16.77 | 16.82 |
| | 23 | 16.81 | 16.80 | 16.68 | 16.79 | 16.82 | 16.83 | 16.77 | 16.82 |
| | 24 | 16.81 | 16.80 | 16.68 | 16.79 | 16.82 | 16.83 | 16.77 | 16.82 |
| | 24.7 | 16.81 | 16.80 | 16.68 | 16.79 | 16.82 | 16.83 | 16.77 | 16.82 |
| 777 | 15 | 21.88 | 21.91 | 21.94 | 21.90 | 21.96 | 21.91 | 21.78 | 21.88 |
| | 16 | 21.88 | 21.91 | 21.94 | 21.90 | 21.96 | 21.91 | 21.78 | 21.88 |
| | 17 | 21.88 | 21.91 | 21.94 | 21.90 | 21.96 | 21.91 | 21.78 | 21.88 |
| | 18 | 21.88 | 21.91 | 21.94 | 21.90 | 21.96 | 21.91 | 21.78 | 21.88 |
| | 18.5 | 21.88 | 21.91 | 21.94 | 21.90 | 21.96 | 21.91 | 21.78 | 21.88 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 19 | 20.89 | 20.68 | 20.72 | 20.75 | 20.78 | 20.80 | 20.76 | 20.75 |
| | 19.5 | 20.89 | 20.68 | 20.72 | 20.75 | 20.78 | 20.80 | 20.76 | 20.75 |
| | 20 | 19.88 | 19.86 | 19.85 | 19.82 | 19.83 | 19.84 | 19.72 | 19.66 |
| | 20.5 | 19.88 | 19.86 | 19.85 | 19.82 | 19.83 | 19.84 | 19.72 | 19.66 |
| | 21 | 16.81 | 16.80 | 16.68 | 16.79 | 16.82 | 16.83 | 16.77 | 16.82 |
| | 22 | 16.81 | 16.80 | 16.68 | 16.79 | 16.82 | 16.83 | 16.77 | 16.82 |
| | 23 | 16.81 | 16.80 | 16.68 | 16.79 | 16.82 | 16.83 | 16.77 | 16.82 |
| | 24 | 16.81 | 16.80 | 16.68 | 16.79 | 16.82 | 16.83 | 16.77 | 16.82 |
| | 24.7 | 16.81 | 16.80 | 16.68 | 16.79 | 16.82 | 16.83 | 16.77 | 16.82 |
| **CDMA PCS 1X** | | **SVLTE B4 CH20175(20MHz)** | | | | | | | |
| | | **QPSK** | | | | **16QAM** | | | |
| Channel | output power(dBm) | 1RB | 1RB | 50RB | 100RB | 1RB | 1RB | 50RB | 100RB |
| | | 0 RB Start | 99 RB Start | 25 RB Start | 0 RB Start | 0 RB Start | 99 RB Start | 25 RB Start | 0 RB Start |
| 25 | 15 | 21.77 | 21.79 | 21.88 | 21.86 | 21.84 | 21.76 | 21.84 | 21.82 |
| | 16 | 21.77 | 21.79 | 21.88 | 21.86 | 21.84 | 21.76 | 21.84 | 21.82 |
| | 16.5 | 21.77 | 21.79 | 21.88 | 21.86 | 21.84 | 21.76 | 21.84 | 21.82 |
| | 17 | 20.89 | 20.81 | 20.79 | 20.58 | 20.74 | 20.82 | 20.79 | 20.8 |
| | 17.5 | 20.89 | 20.81 | 20.79 | 20.58 | 20.74 | 20.82 | 20.79 | 20.8 |
| | 18 | 19.88 | 19.77 | 19.83 | 19.71 | 19.66 | 19.78 | 19.83 | 19.84 |
| | 18.5 | 19.88 | 19.77 | 19.83 | 19.71 | 19.66 | 19.78 | 19.83 | 19.84 |
| | 19 | 16.81 | 16.79 | 16.84 | 16.71 | 16.77 | 16.78 | 16.72 | 16.67 |
| | 20 | 16.81 | 16.79 | 16.84 | 16.71 | 16.77 | 16.78 | 16.72 | 16.67 |
| | 21 | 16.81 | 16.79 | 16.84 | 16.71 | 16.77 | 16.78 | 16.72 | 16.67 |
| | 22 | 16.81 | 16.79 | 16.84 | 16.71 | 16.77 | 16.78 | 16.72 | 16.67 |
| | 22.5 | 16.81 | 16.79 | 16.84 | 16.71 | 16.77 | 16.78 | 16.72 | 16.67 |
| | 23 | 16.81 | 16.79 | 16.84 | 16.71 | 16.77 | 16.78 | 16.72 | 16.67 |
| | 23.7 | 16.81 | 16.79 | 16.84 | 16.71 | 16.77 | 16.78 | 16.72 | 16.67 |
| 600 | 15 | 21.77 | 21.79 | 21.88 | 21.86 | 21.84 | 21.76 | 21.84 | 21.82 |
| | 16 | 21.77 | 21.79 | 21.88 | 21.86 | 21.84 | 21.76 | 21.84 | 21.82 |
| | 16.5 | 21.77 | 21.79 | 21.88 | 21.86 | 21.84 | 21.76 | 21.84 | 21.82 |
| | 17 | 20.89 | 20.81 | 20.79 | 20.58 | 20.74 | 20.82 | 20.79 | 20.8 |
| | 17.5 | 20.89 | 20.81 | 20.79 | 20.58 | 20.74 | 20.82 | 20.79 | 20.8 |
| | 18 | 19.88 | 19.77 | 19.83 | 19.71 | 19.66 | 19.78 | 19.83 | 19.84 |
| | 18.5 | 19.88 | 19.77 | 19.83 | 19.71 | 19.66 | 19.78 | 19.83 | 19.84 |
| | 19 | 16.81 | 16.79 | 16.84 | 16.71 | 16.77 | 16.78 | 16.72 | 16.67 |
| | 20 | 16.81 | 16.79 | 16.84 | 16.71 | 16.77 | 16.78 | 16.72 | 16.67 |
| | 21 | 16.81 | 16.79 | 16.84 | 16.71 | 16.77 | 16.78 | 16.72 | 16.67 |
| | 22 | 16.81 | 16.79 | 16.84 | 16.71 | 16.77 | 16.78 | 16.72 | 16.67 |
| | 22.5 | 16.81 | 16.79 | 16.84 | 16.71 | 16.77 | 16.78 | 16.72 | 16.67 |
| | 23 | 16.81 | 16.79 | 16.84 | 16.71 | 16.77 | 16.78 | 16.72 | 16.67 |
| | 23.7 | 16.81 | 16.79 | 16.84 | 16.71 | 16.77 | 16.78 | 16.72 | 16.67 |
| 1175 | 15 | 21.77 | 21.79 | 21.88 | 21.86 | 21.84 | 21.76 | 21.84 | 21.82 |
| | 16 | 21.77 | 21.79 | 21.88 | 21.86 | 21.84 | 21.76 | 21.84 | 21.82 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 16.5 | 21.77 | 21.79 | 21.88 | 21.86 | 21.84 | 21.76 | 21.84 | 21.82 |
| | 17 | 20.89 | 20.81 | 20.79 | 20.58 | 20.74 | 20.82 | 20.79 | 20.80 |
| | 17.5 | 20.89 | 20.81 | 20.79 | 20.58 | 20.74 | 20.82 | 20.79 | 20.80 |
| | 18 | 19.88 | 19.77 | 19.83 | 19.71 | 19.66 | 19.78 | 19.83 | 19.84 |
| | 18.5 | 19.88 | 19.77 | 19.83 | 19.71 | 19.66 | 19.78 | 19.83 | 19.84 |
| | 19 | 16.81 | 16.79 | 16.84 | 16.71 | 16.77 | 16.78 | 16.72 | 16.67 |
| | 20 | 16.81 | 16.79 | 16.84 | 16.71 | 16.77 | 16.78 | 16.72 | 16.67 |
| | 21 | 16.81 | 16.79 | 16.84 | 16.71 | 16.77 | 16.78 | 16.72 | 16.67 |
| | 22 | 16.81 | 16.79 | 16.84 | 16.71 | 16.77 | 16.78 | 16.72 | 16.67 |
| | 22.5 | 16.81 | 16.79 | 16.84 | 16.71 | 16.77 | 16.78 | 16.72 | 16.67 |
| | 23 | 16.81 | 16.79 | 16.84 | 16.71 | 16.77 | 16.78 | 16.72 | 16.67 |
| | 23.7 | 16.81 | 16.79 | 16.84 | 16.71 | 16.77 | 16.78 | 16.72 | 16.67 |
| **CDMA Cellular 1X** | | **SVLTE B13 CH23230 (10MHz)** | | | | | | | |
| | | **QPSK** | | | | **16QAM** | | | |
| Channel | output power(dBm) | 1RB | 1RB | 25RB | 50RB | 1RB | 1RB | 25RB | 50RB |
| | | 0 RB Start | 49 RB Start | 12 RB Start | 0 RB Start | 0 RB Start | 49 RB Start | 12 RB Start | 0 RB Start |
| 1013 | 15 | 23.97 | 23.94 | 23.87 | 23.83 | 23.84 | 23.79 | 23.81 | 23.76 |
| | 16 | 23.97 | 23.94 | 23.87 | 23.83 | 23.84 | 23.79 | 23.81 | 23.76 |
| | 17 | 23.97 | 23.94 | 23.87 | 23.83 | 23.84 | 23.79 | 23.81 | 23.76 |
| | 18 | 23.97 | 23.94 | 23.87 | 23.83 | 23.84 | 23.79 | 23.81 | 23.76 |
| | 18.5 | 23.97 | 23.94 | 23.87 | 23.83 | 23.84 | 23.79 | 23.81 | 23.76 |
| | 19 | 22.86 | 22.71 | 22.75 | 22.78 | 22.76 | 22.78 | 22.79 | 22.73 |
| | 19.5 | 22.86 | 22.71 | 22.75 | 22.78 | 22.76 | 22.78 | 22.79 | 22.73 |
| | 20 | 21.89 | 21.99 | 21.88 | 21.85 | 21.81 | 21.82 | 21.75 | 21.64 |
| | 20.5 | 21.89 | 21.99 | 21.88 | 21.85 | 21.81 | 21.82 | 21.75 | 21.64 |
| | 21 | 20.84 | 20.95 | 20.71 | 20.82 | 20.80 | 20.81 | 20.80 | 20.80 |
| | 22 | 20.84 | 20.95 | 20.71 | 20.82 | 20.80 | 20.81 | 20.80 | 20.80 |
| | 23 | 20.84 | 20.95 | 20.71 | 20.82 | 20.80 | 20.81 | 20.80 | 20.80 |
| | 24 | 20.84 | 20.95 | 20.71 | 20.82 | 20.80 | 20.81 | 20.80 | 20.80 |
| | 24.7 | 20.84 | 20.95 | 20.71 | 20.82 | 20.80 | 20.81 | 20.80 | 20.80 |
| 384 | 15 | 23.97 | 23.94 | 23.87 | 23.83 | 23.84 | 23.79 | 23.81 | 23.76 |
| | 16 | 23.97 | 23.94 | 23.87 | 23.83 | 23.84 | 23.79 | 23.81 | 23.76 |
| | 17 | 23.97 | 23.94 | 23.87 | 23.83 | 23.84 | 23.79 | 23.81 | 23.76 |
| | 18 | 23.97 | 23.94 | 23.87 | 23.83 | 23.84 | 23.79 | 23.81 | 23.76 |
| | 18.5 | 23.97 | 23.94 | 23.87 | 23.83 | 23.84 | 23.79 | 23.81 | 23.76 |
| | 19 | 22.86 | 22.71 | 22.75 | 22.78 | 22.76 | 22.78 | 22.79 | 22.73 |
| | 19.5 | 22.86 | 22.71 | 22.75 | 22.78 | 22.76 | 22.78 | 22.79 | 22.73 |
| | 20 | 21.89 | 21.99 | 21.88 | 21.85 | 21.81 | 21.82 | 21.75 | 21.64 |
| | 20.5 | 21.89 | 21.99 | 21.88 | 21.85 | 21.81 | 21.82 | 21.75 | 21.64 |
| | 21 | 20.84 | 20.95 | 20.71 | 20.82 | 20.80 | 20.81 | 20.80 | 20.80 |
| | 22 | 20.84 | 20.95 | 20.71 | 20.82 | 20.80 | 20.81 | 20.80 | 20.80 |
| | 23 | 20.84 | 20.95 | 20.71 | 20.82 | 20.80 | 20.81 | 20.80 | 20.80 |
| | 24 | 20.84 | 20.95 | 20.71 | 20.82 | 20.80 | 20.81 | 20.80 | 20.80 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 24.7 | 20.84 | 20.95 | 20.71 | 20.82 | 20.80 | 20.81 | 20.80 | 20.80 |
| 777 | 15 | 23.97 | 23.94 | 23.87 | 23.83 | 23.84 | 23.79 | 23.81 | 23.76 |
| | 16 | 23.97 | 23.94 | 23.87 | 23.83 | 23.84 | 23.79 | 23.81 | 23.76 |
| | 17 | 23.97 | 23.94 | 23.87 | 23.83 | 23.84 | 23.79 | 23.81 | 23.76 |
| | 18 | 23.97 | 23.94 | 23.87 | 23.83 | 23.84 | 23.79 | 23.81 | 23.76 |
| | 18.5 | 23.97 | 23.94 | 23.87 | 23.83 | 23.84 | 23.79 | 23.81 | 23.76 |
| | 19 | 22.86 | 22.71 | 22.75 | 22.78 | 22.76 | 22.78 | 22.79 | 22.73 |
| | 19.5 | 22.86 | 22.71 | 22.75 | 22.78 | 22.76 | 22.78 | 22.79 | 22.73 |
| | 20 | 21.89 | 21.99 | 21.88 | 21.85 | 21.81 | 21.82 | 21.75 | 21.64 |
| | 20.5 | 21.89 | 21.99 | 21.88 | 21.85 | 21.81 | 21.82 | 21.75 | 21.64 |
| | 21 | 20.84 | 20.95 | 20.71 | 20.82 | 20.80 | 20.81 | 20.80 | 20.80 |
| | 22 | 20.84 | 20.95 | 20.71 | 20.82 | 20.80 | 20.81 | 20.80 | 20.80 |
| | 23 | 20.84 | 20.95 | 20.71 | 20.82 | 20.80 | 20.81 | 20.80 | 20.80 |
| | 24 | 20.84 | 20.95 | 20.71 | 20.82 | 20.80 | 20.81 | 20.80 | 20.80 |
| | 24.7 | 20.84 | 20.95 | 20.71 | 20.82 | 20.80 | 20.81 | 20.80 | 20.80 |
| **CDMA PCS 1X** | | **SVLTE B13 CH23230 (10MHz)** | | | | | | | |
| | | **QPSK** | | | | **16QAM** | | | |
| Channel | output power(dBm) | 1RB | 1RB | 25RB | 50RB | 1RB | 1RB | 25RB | 50RB |
| | | 0 RB Start | 49 RB Start | 12 RB Start | 0 RB Start | 0 RB Start | 49 RB Start | 12 RB Start | 0 RB Start |
| 25 | 15 | 23.74 | 23.76 | 23.85 | 23.83 | 23.81 | 23.73 | 23.81 | 23.79 |
| | 16 | 23.74 | 23.76 | 23.85 | 23.83 | 23.81 | 23.73 | 23.81 | 23.79 |
| | 16.5 | 23.74 | 23.76 | 23.85 | 23.83 | 23.81 | 23.73 | 23.81 | 23.79 |
| | 17 | 22.89 | 22.78 | 22.76 | 22.55 | 22.71 | 22.79 | 22.76 | 22.77 |
| | 17.5 | 22.89 | 22.78 | 22.76 | 22.55 | 22.71 | 22.79 | 22.76 | 22.77 |
| | 18 | 21.93 | 21.99 | 21.89 | 21.87 | 21.82 | 21.75 | 21.80 | 21.81 |
| | 18.5 | 21.93 | 21.99 | 21.89 | 21.87 | 21.82 | 21.75 | 21.80 | 21.81 |
| | 19 | 20.82 | 20.85 | 20.78 | 20.85 | 20.81 | 20.72 | 20.75 | 20.61 |
| | 20 | 20.82 | 20.85 | 20.78 | 20.85 | 20.81 | 20.72 | 20.75 | 20.61 |
| | 21 | 20.82 | 20.85 | 20.78 | 20.85 | 20.81 | 20.72 | 20.75 | 20.61 |
| | 22 | 20.82 | 20.85 | 20.78 | 20.85 | 20.81 | 20.72 | 20.75 | 20.61 |
| | 22.5 | 20.82 | 20.85 | 20.78 | 20.85 | 20.81 | 20.72 | 20.75 | 20.61 |
| | 23 | 20.82 | 20.85 | 20.78 | 20.85 | 20.81 | 20.72 | 20.75 | 20.61 |
| | 23.7 | 20.82 | 20.85 | 20.78 | 20.85 | 20.81 | 20.72 | 20.75 | 20.61 |
| 600 | 15 | 23.74 | 23.76 | 23.85 | 23.83 | 23.81 | 23.73 | 23.81 | 23.79 |
| | 16 | 23.74 | 23.76 | 23.85 | 23.83 | 23.81 | 23.73 | 23.81 | 23.79 |
| | 16.5 | 23.74 | 23.76 | 23.85 | 23.83 | 23.81 | 23.73 | 23.81 | 23.79 |
| | 17 | 22.89 | 22.78 | 22.76 | 22.55 | 22.71 | 22.79 | 22.76 | 22.77 |
| | 17.5 | 22.89 | 22.78 | 22.76 | 22.55 | 22.71 | 22.79 | 22.76 | 22.77 |
| | 18 | 21.93 | 21.99 | 21.89 | 21.87 | 21.82 | 21.75 | 21.80 | 21.81 |
| | 18.5 | 21.93 | 21.99 | 21.89 | 21.87 | 21.82 | 21.75 | 21.80 | 21.81 |
| | 19 | 20.82 | 20.85 | 20.78 | 20.85 | 20.81 | 20.72 | 20.75 | 20.61 |
| | 20 | 20.82 | 20.85 | 20.78 | 20.85 | 20.81 | 20.72 | 20.75 | 20.61 |
| | 21 | 20.82 | 20.85 | 20.78 | 20.85 | 20.81 | 20.72 | 20.75 | 20.61 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 22 | 20.82 | 20.85 | 20.78 | 20.85 | 20.81 | 20.72 | 20.75 | 20.61 |
| | 22.5 | 20.82 | 20.85 | 20.78 | 20.85 | 20.81 | 20.72 | 20.75 | 20.61 |
| | 23 | 20.82 | 20.85 | 20.78 | 20.85 | 20.81 | 20.72 | 20.75 | 20.61 |
| | 23.7 | 20.82 | 20.85 | 20.78 | 20.85 | 20.81 | 20.72 | 20.75 | 20.61 |
| 1175 | 15 | 23.74 | 23.76 | 23.85 | 23.83 | 23.81 | 23.73 | 23.81 | 23.79 |
| | 16 | 23.74 | 23.76 | 23.85 | 23.83 | 23.81 | 23.73 | 23.81 | 23.79 |
| | 16.5 | 23.74 | 23.76 | 23.85 | 23.83 | 23.81 | 23.73 | 23.81 | 23.79 |
| | 17 | 22.89 | 22.78 | 22.76 | 22.55 | 22.71 | 22.79 | 22.76 | 22.77 |
| | 17.5 | 22.89 | 22.78 | 22.76 | 22.55 | 22.71 | 22.79 | 22.76 | 22.77 |
| | 18 | 21.93 | 21.99 | 21.89 | 21.87 | 21.82 | 21.75 | 21.8 | 21.81 |
| | 18.5 | 21.93 | 21.99 | 21.89 | 21.87 | 21.82 | 21.75 | 21.8 | 21.81 |
| | 19 | 20.82 | 20.85 | 20.78 | 20.85 | 20.81 | 20.72 | 20.75 | 20.61 |
| | 20 | 20.82 | 20.85 | 20.78 | 20.85 | 20.81 | 20.72 | 20.75 | 20.61 |
| | 21 | 20.82 | 20.85 | 20.78 | 20.85 | 20.81 | 20.72 | 20.75 | 20.61 |
| | 22 | 20.82 | 20.85 | 20.78 | 20.85 | 20.81 | 20.72 | 20.75 | 20.61 |
| | 22.5 | 20.82 | 20.85 | 20.78 | 20.85 | 20.81 | 20.72 | 20.75 | 20.61 |
| | 23 | 20.82 | 20.85 | 20.78 | 20.85 | 20.81 | 20.72 | 20.75 | 20.61 |
| | 23.7 | 20.82 | 20.85 | 20.78 | 20.85 | 20.81 | 20.72 | 20.75 | 20.61 |

| BT | Conducted Power (dBm) | | |
|---|---|---|---|
| | Channel/Frequency(MHz) | | |
| | Ch 0/2402 MHz | Ch 39/2441 MHz | Ch 78/2480 MHz |
| GFSK | 8.20 | 7.99 | 8.74 |
| π/4DQPSK | 7.97 | 7.91 | 8.66 |
| 8DPSK | 8.22 | 8.18 | 8.93 |
| **BT 4.0** | Ch 0/2402 MHz | Ch 19/2440 MHz | Ch 39/2480 MHz |
| GFSK | -2.26 | -1.91 | -1.66 |

| Mode | Channel/ Frequency(MHz) | Data rate (Mbps) | AV Power (dBm) |
|---|---|---|---|
| 802.11b | 1/2412 | 1 | 16.34 |
| | | 2 | 16.46 |
| | | 5.5 | 16.31 |
| | | 11 | 16.12 |
| | 6/2437 | 1 | 16.56 |
| | | 2 | 16.55 |
| | | 5.5 | 16.27 |
| | | 11 | 16.24 |
| | 11/2462 | 1 | 16.59 |
| | | 2 | 16.58 |
| | | 5.5 | 16.24 |
| | | 11 | 16.11 |
| 802.11g | 1/2412 | 6 | 15.21 |
| | | 9 | 14.77 |
| | | 12 | 14.42 |
| | | 18 | 14.19 |
| | | 24 | 13.74 |
| | | 36 | 13.27 |
| | | 48 | 12.66 |
| | | 54 | 12.56 |
| | 6/2437 | 6 | 15.29 |
| | | 9 | 14.61 |
| | | 12 | 14.51 |
| | | 18 | 14.13 |
| | | 24 | 13.75 |
| | | 36 | 13.39 |
| | | 48 | 12.87 |
| | | 54 | 12.52 |
| | 11/2462 | 6 | 15.13 |

| | | | |
|---|---|---|---|
| | | 9 | 14.45 |
| | | 12 | 14.47 |
| | | 18 | 14.24 |
| | | 24 | 13.62 |
| | | 36 | 13.16 |
| | | 48 | 12.79 |
| | | 54 | 13.50 |
| 802.11n HT20 | 1/2412 | MCS0 | 12.28 |
| | | MCS1 | 11.89 |
| | | MCS2 | 11.32 |
| | | MCS3 | 10.84 |
| | | MCS4 | 10.52 |
| | | MCS5 | 10.34 |
| | | MCS6 | 10.08 |
| | | MCS7 | 9.78 |
| | 6/2437 | MCS0 | 12.12 |
| | | MCS1 | 11.71 |
| | | MCS2 | 11.40 |
| | | MCS3 | 10.77 |
| | | MCS4 | 10.60 |
| | | MCS5 | 10.24 |
| | | MCS6 | 9.97 |
| | | MCS7 | 9.79 |
| | 11/2462 | MCS0 | 12.32 |
| | | MCS1 | 12.01 |
| | | MCS2 | 11.34 |
| | | MCS3 | 10.98 |
| | | MCS4 | 10.71 |
| | | MCS5 | 10.26 |
| | | MCS6 | 9.89 |
| | | MCS7 | 9.54 |

## 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 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR**

| Band | Configuration | Frequency (MHz) | Maximum Power (dBm) | Separation Distance (mm) | Calculation Result | SAR Exclusion Thresholds | Standalone SAR |
|---|---|---|---|---|---|---|---|
| Bluetooth | Head | 2480 | 9.5 | 5 | 2.8 | 3.0 | No |
| | Extremity | 2480 | 9.5 | 5 | 2.8 | 7.5 | No |
| | Body | 2480 | 9.5 | 15 | 0.9 | 3.0 | No |
| Wifi 2.4GHz | Head | 2462 | 17.5 | 5 | 17.7 | 3.0 | Yes |
| | Extremity | 2462 | 17.5 | 5 | 17.7 | 7.5 | Yes |
| | Body | 2462 | 17.5 | 15 | 5.9 | 3.0 | Yes |

## 7.3. SAR Test Results

### 7.3.1. CDMA BC0

**Table 9: SAR Values [CDMA BC0 (CDMA)]**

| Test Position | Channel/ Frequency (MHz) | Service Option | Duty Cycle | Maximum Allowed Power (dBm) | Conducted Power (dBm) | Drift ±0.21dB | Limit $SAR_{1g}$ 1.6 W/kg | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Drift (dB) | Measured $SAR_{1g}$ (W/kg) | Scaling Factor | Reported $SAR_{1g}$ (W/kg) | Graph Results |
| **Test Position of Head** | | | | | | | | | | |
| Left/Cheek | 384/836.52 | RC3 SO55 | 1:1 | 24.7 | 23.89 | 0.060 | 0.349 | 1.21 | 0.421 | Figure.19 |
| Left/Tilt | 384/836.53 | RC3 SO55 | 1:1 | 24.7 | 23.89 | 0.050 | 0.186 | 1.21 | 0.224 | Figure.20 |
| Right/Cheek | 384/836.54 | RC3 SO55 | 1:1 | 24.7 | 23.89 | -0.060 | 0.380 | 1.21 | 0.458 | Figure.21 |
| Right/Tilt | 384/836.55 | RC3 SO55 | 1:1 | 24.7 | 23.89 | 0.001 | 0.240 | 1.21 | 0.289 | Figure.22 |
| **Test Position of Body (Distance 15mm)** | | | | | | | | | | |
| Back Side | 384/836.52 | RC3 SO32 | 1:1 | 24.7 | 23.86 | -0.110 | 0.493 | 1.21 | 0.598 | Figure.23 |
| Font Side | 384/836.52 | RC3 SO32 | 1:1 | 24.7 | 23.86 | 0.020 | 0.434 | 1.21 | 0.527 | Figure.24 |

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

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 not required for such test configuration(s).

3. Per FCC KDB Publication 648474 D04, SAR was evaluated without a headset connected to the device. Since the reported SAR was ≤ 1.2 W/kg, no additional SAR evaluations using a headset cable were required.

4.When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ dB higher than the primary mode, SAR measurement is not required for the Secondary mode

**10-g Extremity SAR**

| Test Position | Channel/ Frequency (MHz) | Service Option | Duty Cycle | Maximum Allowed Power (dBm) | Conducted Power (dBm) | Drift ±0.21dB | Limit $SAR_{10g}$ 4.0 W/kg | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Drift (dB) | Measured $SAR_{10g}$ (W/kg) | Scaling Factor | Reported $SAR_{10g}$ (W/kg) | Graph Results |
| **Test Position of Body (Distance 0mm)** | | | | | | | | | | |
| Back Side | 384/836.52 | RC3 SO32 | 1:1 | 24.7 | 23.86 | 0.001 | 1.610 | 1.21 | 1.954 | Figure.25 |
| Front Side | 384/836.52 | RC3 SO32 | 1:1 | 24.7 | 23.86 | 0.025 | 1.480 | 1.21 | 1.796 | Figure.26 |
| Left Edge | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Right Edge | 384/836.52 | RC3 SO32 | 1:1 | 24.7 | 23.86 | 0.016 | 0.515 | 1.21 | 0.625 | Figure.27 |
| Top Edge | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bottom Edge | 384/836.52 | RC3 SO32 | 1:1 | 24.7 | 23.86 | -0.037 | 0.975 | 1.21 | 1.183 | Figure.28 |
| Back Side | 384/836.52 | EVDO.0 | 1:1 | 24.7 | 23.9 | 0.100 | 1.660 | 1.20 | 1.996 | Figure.29 |
| Front Side | 384/836.52 | EVDO.0 | 1:1 | 24.7 | 23.9 | 0.130 | 1.480 | 1.20 | 1.779 | Figure.30 |
| Left Edge | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Right Edge | 384/836.52 | EVDO.0 | 1:1 | 24.7 | 23.9 | 0.033 | 0.668 | 1.20 | 0.803 | Figure.31 |
| Top Edge | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bottom Edge | 384/836.52 | EVDO.0 | 1:1 | 24.7 | 23.9 | 0.056 | 1.020 | 1.20 | 1.226 | Figure.32 |

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

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 ≤ 2 W/kg then testing at the other channels is not required for such test configuration(s).

3.When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ dB higher than the primary mode, SAR measurement is not required for the Secondary mode

### 7.3.2. CDMA BC1

**Table 10: SAR Values [CDMA BC1 (CDMA)]**

| Test Position | Channel/ Frequency (MHz) | Service Option | Duty Cycle | Maximum Allowed Power (dBm) | Conducted Power (dBm) | Drift ±0.21dB | Limit $SAR_{1g}$ 1.6 W/kg | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Drift (dB) | Measured $SAR_{1g}$ (W/kg) | Scaling Factor | Reported $SAR_{1g}$ (W/kg) | Graph Results |
| **Test Position of Head** | | | | | | | | | | |
| Left/Cheek | 600/1880 | RC3 SO55 | 1:1 | 24.2 | 23.66 | 0.047 | 0.264 | 1.13 | 0.299 | Figure.33 |
| Left/Tilt | 600/1880 | RC3 SO55 | 1:1 | 24.2 | 23.66 | 0.180 | 0.197 | 1.13 | 0.223 | Figure.34 |
| Right/Cheek | 600/1880 | RC3 SO55 | 1:1 | 24.2 | 23.66 | -0.150 | 0.527 | 1.13 | 0.597 | Figure.35 |
| Right/Tilt | 600/1880 | RC3 SO55 | 1:1 | 24.2 | 23.66 | -0.050 | 0.176 | 1.13 | 0.199 | Figure.36 |
| **Test Position of Body (Distance 15mm)** | | | | | | | | | | |
| Back Side | 600/1880 | RC3 SO32 | 1:1 | 24.2 | 23.65 | 0.110 | 0.236 | 1.14 | 0.268 | Figure.37 |
| Font Side | 600/1880 | RC3 SO32 | 1:1 | 24.2 | 23.65 | -0.190 | 0.230 | 1.14 | 0.261 | Figure.38 |

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

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 not required for such test configuration(s).

3. Per FCC KDB Publication 648474 D04, SAR was evaluated without a headset connected to the device. Since the reported SAR was ≤ 1.2 W/kg, no additional SAR evaluations using a headset cable were required.

3.When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ dB higher than the primary mode, SAR measurement is not required for the Secondary mode

**10-g Extremity SAR**

| Test Position | Channel/ Frequency (MHz) | Service Option | Duty Cycle | Maximum Allowed Power (dBm) | Conducted Power (dBm) | Drift ± 0.21dB | Limit $SAR_{10g}$ 4.0 W/kg | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Drift (dB) | Measured $SAR_{10g}$ (W/kg) | Scaling Factor | Reported $SAR_{10g}$ (W/kg) | Graph Results |
| **Test Position of Body (Distance 0mm)** | | | | | | | | | | |
| Back Side | 1175/1908.75 | RC3 SO32 | 1:1 | 23.2 | 22.23 | 0.020 | 1.970 | 1.25 | 2.463 | Figure.39 |
| | 600/1880 | RC3 SO32 | 1:1 | 23.2 | 22.48 | 0.140 | 2.100 | 1.18 | 2.479 | Figure.40 |
| | 25/1851.25 | RC3 SO32 | 1:1 | 23.2 | 22.32 | 0.025 | 2.380 | 1.22 | 2.915 | Figure.41 |
| Front Side | 600/1880 | RC3 SO32 | 1:1 | 24.2 | 23.65 | 0.120 | 1.440 | 1.14 | 1.634 | Figure.42 |
| Left Edge | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Right Edge | 600/1880 | RC3 SO32 | 1:1 | 24.2 | 23.65 | -0.015 | 1.220 | 1.14 | 1.385 | Figure.43 |
| Top Edge | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bottom Edge | 600/1880 | RC3 SO32 | 1:1 | 24.2 | 23.65 | -0.033 | 1.050 | 1.14 | 1.192 | Figure.44 |
| Back Side | 1175/1908.75 | EVDO.0 | 1:1 | 24.2 | 23.37 | 0.120 | 3.030 | 1.27 | 3.668 | Figure.45 |
| | 600/1880 | EVDO.0 | 1:1 | 24.2 | 23.57 | 0.16 | 3.130 | 1.19 | 3.619 | Figure.46 |
| | 25/1851.25 | EVDO.0 | 1:1 | 24.2 | 23.38 | 0.110 | 2.840 | 1.21 | 3.430 | Figure.47 |
| Front Side | 600/1880 | EVDO.0 | 1:1 | 24.2 | 23.44 | 0.025 | 1.700 | 1.19 | 2.025 | Figure.48 |
| Left Edge | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Right Edge | 600/1880 | EVDO.0 | 1:1 | 24.2 | 23.44 | -0.033 | 1.500 | 1.19 | 1.787 | Figure.49 |
| Top Edge | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bottom Edge | 600/1880 | EVDO.0 | 1:1 | 24.2 | 23.44 | 0.110 | 0.947 | 1.19 | 1.128 | Figure.50 |
| **Test Position of Body with SVLTE(Distance 0mm)** | | | | | | | | | | |
| Back Side | 1175/1908.75 | RC3 SO32 | 1:1 | 22.5 | 22.23 | 0.020 | 1.970 | 1.06 | 2.096 | Figure 39 |
| | 600/1880 | RC3 SO32 | 1:1 | 22.5 | 22.48 | 0.140 | 2.100 | 1.00 | 2.11 | Figure 40 |
| | 25/1851.25 | RC3 SO32 | 1:1 | 22.5 | 22.32 | 0.025 | 2.380 | 1.04 | 2.481 | Figure 41 |
| **Worst Case Position of SAR (1st Repeated SAR, Distance 0mm)** | | | | | | | | | | |
| Back Side | 25/1851.25 | RC3 SO32 | 1:1 | 23.2 | 22.23 | -0.100 | 2.320 | 1.25 | 2.901 | Figure.51 |
| Back Side | 600/1880 | EVDO.0 | 1:1 | 24.2 | 23.38 | 0.110 | 2.930 | 1.19 | 3.547 | Figure.52 |
| **Test Position of Body (Distance 2mm)** | | | | | | | | | | |
| Back Side | 600/1880 | RC3 SO32 | 1:1 | 24.2 | 23.65 | 0.010 | 1.390 | 1.14 | 1.578 | Figure.53 |

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

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 ≤ 2 W/kg then testing at the other channels is not required for such test configuration(s).

3.When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ dB higher than the primary mode, SAR measurement is not required for the Secondary mode.

4.The SAR value of the backside with SVLTE(Distance 0mm,sensor triggered) share the measured SAR of the same position for 1xRTT RC3 without SVLTE(maximum allowed power 23.2dBm,sensor triggered) and are scaled to the 22.5dBm(maximum allowed power for SVLTE mode,sensor triggered) to ensure SAR compliance,which is more conservative.

**Table 11: SAR Measurement Variability Results [CDMA BC1 (CDMA)]**

| Test Position | Service Option | Channel/ Frequency (MHz) | Measured SAR (10g) | 1st Repeated SAR (10g) | Ratio | 2nd Repeated SAR (10g) | 3rd Repeated SAR (10g) |
|---|---|---|---|---|---|---|---|
| Back Side | RC3 SO32 | 25/1851.25 | 2.380 | 2.320 | 1.02 | NA | NA |
| Back Side | EVDO.0 | 600/1880 | 3.130 | 2.930 | 0.94 | NA | NA |

Note: 1) When the original highest measured SAR is ≥ 2 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 > 1.2 or when the original or repeated measurement was ≥ 3.625 W/kg.

3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 3.75 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.2.

4) Repeated measurements are not required when the original highest measured SAR is < 2 W/kg.

### 7.3.3. LTE Band 4

**Table 12: SAR Values (LTE Band 4/20MHz)**

| Test Position | Channel/ Frequency (MHz) | Mode | Maximum Allowed Power (dBm) | Conducted Power (dBm) | Drift ± 0.21dB | Limit $SAR_{1g}$ 1.6 W/kg | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Drift (dB) | Measured $SAR_{1g}$ (W/kg) | Scaling Factor | Reported $SAR_{1g}$ (W/kg) | Graph Results |
| **Test Position of Head** | | | | | | | | | |
| Left/Cheek | 20050/1720 | QPSK 1RB 0 Offset | 23 | 22.18 | 0.190 | 0.320 | 1.21 | 0.387 | Figure.54 |
| Left/Tilt | 20050/1720 | QPSK 1RB 0 Offset | 23 | 22.18 | -0.090 | 0.156 | 1.21 | 0.188 | Figure.55 |
| Right/Cheek | 20050/1720 | QPSK 1RB 0 Offset | 23 | 22.18 | -0.101 | 0.195 | 1.21 | 0.236 | Figure.56 |
| Right/Tilt | 20050/1720 | QPSK 1RB 0 Offset | 23 | 22.18 | 0.120 | 0.189 | 1.21 | 0.228 | Figure.57 |
| Left/Cheek | 20050/1720 | QPSK 50%RB 0 Offset | 22 | 22.17 | 0.050 | 0.258 | 1.21 | 0.312 | Figure.58 |
| Left/Tilt | 20050/1720 | QPSK 50%RB 0 Offset | 22 | 22.17 | 0.100 | 0.121 | 1.21 | 0.146 | Figure.59 |
| Right/Cheek | 20050/1720 | QPSK 50%RB 0 Offset | 22 | 22.17 | 0.068 | 0.156 | 1.21 | 0.189 | Figure.60 |
| Right/Tilt | 20050/1720 | QPSK 50%RB 0 Offset | 22 | 22.17 | 0.180 | 0.143 | 1.21 | 0.173 | Figure.61 |
| **Test position of Body (Distance 15mm)** | | | | | | | | | |
| Back Side | 20050/1720 | QPSK 1RB 0 Offset | 23 | 22.18 | -0.001 | 0.316 | 1.21 | 0.382 | Figure.62 |
| Front Side | 20050/1720 | QPSK 1RB 0 Offset | 23 | 22.18 | 0.010 | 0.337 | 1.21 | 0.407 | Figure.63 |
| Back Side | 20050/1720 | QPSK 50%RB 0 Offset | 22 | 22.17 | 0.040 | 0.270 | 1.21 | 0.327 | Figure.64 |
| Front Side | 20050/1720 | QPSK 50%RB 0 Offset | 22 | 22.17 | 0.080 | 0.254 | 1.21 | 0.307 | Figure.65 |

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

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 not required for such test configuration(s).

**10-g Extremity SAR**

| Test Position | Channel/ Frequency (MHz) | Mode | Maximum Allowed Power (dBm) | Conducted Power (dBm) | Drift ±0.21dB | Limit $SAR_{10g}$ 4 W/kg | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Drift (dB) | Measured $SAR_{10g}$ (W/kg) | Scaling Factor | Reported $SAR_{10g}$ (W/kg) | Graph Results |
| **Test position of Body (Distance 0mm)** | | | | | | | | | |
| Back Side | 20300/1745 | QPSK 1RB 99% Offset | 23 | 22.02 | 0.158 | 2.510 | 1.25 | 3.145 | Figure.66 |
| | 20175/1732.5 | QPSK 1RB 99% Offset | 23 | 22.11 | 0.132 | 2.240 | 1.23 | 2.749 | Figure.67 |
| | 20050/1720 | QPSK 1RB 0 Offset | 23 | 22.18 | 0.068 | 2.240 | 1.21 | 2.706 | Figure.68 |
| Front Side | 20300/1745 | QPSK 1RB 99% Offset | 23 | 22.02 | 0.021 | 2.140 | 1.25 | 2.682 | Figure.69 |
| | 20175/1732.5 | QPSK 1RB 99% Offset | 23 | 22.11 | 0.155 | 2.040 | 1.23 | 2.504 | Figure.70 |
| | 20050/1720 | QPSK 1RB 0 Offset | 23 | 22.18 | 0.166 | 2.130 | 1.21 | 2.573 | Figure.71 |
| Left Edge | 20050/1720 | QPSK 1RB 0 Offset | 23 | 22.18 | 0.065 | 0.317 | 1.21 | 0.383 | Figure.72 |
| Right Edge | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Top Edge | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bottom Edge | 20300/1745 | QPSK 1RB 99 Offset | 23 | 22.02 | 0.025 | 2.760 | 1.25 | 3.459 | Figure.73 |
| | 20175/1732.5 | QPSK 1RB 99 Offset | 23 | 22.11 | -0.067 | 2.300 | 1.23 | 2.823 | Figure.74 |
| | 20050/1720 | QPSK 1RB 0 Offset | 23 | 22.18 | -0.001 | 2.200 | 1.21 | 2.657 | Figure.75 |
| Back Side | 20300/1745 | QPSK 50%RB 99% Offset | 22 | 21.08 | 0.070 | 1.980 | 1.24 | 2.447 | Figure.76 |
| | 20175/1732.5 | QPSK 50%RB 0 Offset | 22 | 21.01 | 0.020 | 1.860 | 1.26 | 2.336 | Figure.77 |
| | 20050/1720 | QPSK 50%RB 0 Offset | 22 | 21.17 | 0.163 | 1.970 | 1.21 | 2.385 | Figure.78 |
| Front Side | 20300/1745 | QPSK 50%RB 99% Offset | 22 | 21.08 | 0.060 | 1.720 | 1.24 | 2.126 | Figure.79 |
| | 20175/1732.5 | QPSK 50%RB 0 Offset | 22 | 21.01 | -0.024 | 1.600 | 1.26 | 2.010 | Figure.80 |
| | 20050/1720 | QPSK 50%RB 0 Offset | 22 | 21.17 | -0.025 | 1.830 | 1.21 | 2.215 | Figure.81 |
| Left Edge | 20050/1720 | QPSK 50%RB 0 Offset | 22 | 21.17 | 0.019 | 0.315 | 1.21 | 0.381 | Figure.82 |
| Right Edge | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Top Edge | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bottom Edge | 20300/1745 | QPSK 50%RB 99% Offset | 22 | 21.08 | 0.190 | 1.950 | 1.24 | 2.410 | Figure.83 |
| | 20175/1732.5 | QPSK 50%RB 0 Offset | 22 | 21.01 | 0.110 | 1.320 | 1.26 | 1.658 | Figure.84 |
| | 20050/1720 | QPSK 50%RB 0 Offset | 22 | 21.17 | 0.019 | 1.750 | 1.21 | 2.119 | Figure.85 |
| **Worst Case Position of SAR(1st Repeated SAR, Distance 0mm)** | | | | | | | | | |
| Bottom Edge | 20300/1745 | QPSK 1RB 99 Offset | 22 | 21.18 | 0.005 | 2.760 | 1.21 | 3.334 | Figure.86 |
| **Test Position of Body with SVLTE (Distance 0mm)** | | | | | | | | | |
| Back Side | 20050/1720 | QPSK 1RB 0 Offset | 17 | 16.81 | 0.039 | 0.204 | 1.04 | 0.213 | Figure.87 |
| Front Side | 20050/1720 | QPSK 1RB 0 Offset | 17 | 16.81 | 0.08 | 0.180 | 1.04 | 0.188 | Figure.88 |
| **Test Position of Body with SVLTE (Distance 0mm)** | | | | | | | | | |
| Front Side | 20050/1720 | QPSK 1RB 0 Offset | 21 | 20.89 | 0.110 | 1.510 | 1.03 | 1.549 | Figure.89 |
| Bottom Edge | 20050/1720 | QPSK 1RB 0 Offset | 21 | 20.89 | 0.010 | 1.960 | 1.03 | 2.010 | Figure.90 |

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

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 ≤ 2 W/kg then testing at the other channels is not required for such test configuration(s).

**Table 13: SAR Measurement Variability Results (LTE Band 4/20MHz)**

| Test Position | Channel/ Frequency (MHz) | Measured SAR (10g) | 1st Repeated SAR (10g) | Ratio | 2nd Repeated SAR (10g) | 3rd Repeated SAR (10g) |
|---|---|---|---|---|---|---|
| Bottom Edge | 20300/1745 | 2.760 | 2.760 | 1.00 | N/A | N/A |

Note: 1) When the original highest measured SAR is ≥ 2 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 >1.2 or when the original or repeated measurement was ≥ 3.625 W/kg.

3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 3.75 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.2.

4) Repeated measurements are not required when the original highest measured SAR is < 2 W/kg.

### 7.3.4. LTE Band 13

**Table 14: SAR Values (LTE Band 13/10MHz)**

| Test Position | Channel/ Frequency (MHz) | Mode | Maximum Allowed Power (dBm) | Conducted Power (dBm) | Drift ±0.21dB | Limit $SAR_{1g}$ 1.6 W/kg | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Drift (dB) | Measured $SAR_{1g}$ (W/kg) | Scaling Factor | Reported $SAR_{1g}$ (W/kg) | Graph Results |
| **Test Position of Head** | | | | | | | | | |
| Left/Cheek | 23230/782 | QPSK 1RB 25 Offset | 24 | 23.11 | -0.048 | 0.202 | 1.23 | 0.248 | Figure.91 |
| Left/Tilt | 23230/782 | QPSK 1RB 25 Offset | 24 | 23.11 | 0.090 | 0.113 | 1.23 | 0.139 | Figure.92 |
| Right/Cheek | 23230/782 | QPSK 1RB 25 Offset | 24 | 23.11 | 0.040 | 0.163 | 1.23 | 0.200 | Figure.93 |
| Right/Tilt | 23230/782 | QPSK 1RB 25 Offset | 24 | 23.11 | 0.130 | 0.095 | 1.23 | 0.117 | Figure.94 |
| Left/Cheek | 23230/782 | QPSK 50%RB 99%Offset | 23 | 22.38 | 0.150 | 0.160 | 1.15 | 0.185 | Figure.95 |
| Left/Tilt | 23230/782 | QPSK 50%RB 99%Offset | 23 | 22.38 | 0.020 | 0.089 | 1.15 | 0.103 | Figure.96 |
| Right/Cheek | 23230/782 | QPSK 50%RB 99%Offset | 23 | 22.38 | -0.028 | 0.129 | 1.15 | 0.149 | Figure.97 |
| Right/Tilt | 23230/782 | QPSK 50%RB 99%Offset | 23 | 22.38 | 0.060 | 0.078 | 1.15 | 0.090 | Figure.98 |
| **Test position of Body (Distance 15mm)** | | | | | | | | | |
| Back Side | 23230/782 | QPSK 1RB 0 Offset | 24 | 23.11 | -0.090 | 0.372 | 1.23 | 0.457 | Figure.99 |
| Front Side | 23230/782 | QPSK 1RB 0 Offset | 24 | 23.11 | -0.110 | 0.284 | 1.23 | 0.349 | Figure.100 |
| Back Side | 23230/782 | QPSK 50%RB 13 Offset | 23 | 22.38 | 0.020 | 0.310 | 1.15 | 0.358 | Figure.101 |
| Front Side | 23230/782 | QPSK 50%RB 13 Offset | 23 | 22.38 | 0.060 | 0.246 | 1.15 | 0.284 | Figure.102 |

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

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 not required for such test configuration(s).

**10-g Extremity SAR**

| Test Position | Channel/ Frequency (MHz) | Mode | Maximum Allowed Power (dBm) | Conducted Power (dBm) | Drift ± 0.21dB | Limit $SAR_{10g}$ 4 W/kg | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Drift (dB) | Measured $SAR_{10g}$ (W/kg) | Scaling Factor | Reported $SAR_{10g}$ (W/kg) | Graph Results |
| **Test position of Body (Distance 0mm)** | | | | | | | | | |
| Back Side | 23230/782 | QPSK 1RB 99% Offset | 24 | 23.11 | -0.065 | 1.300 | 1.23 | 1.596 | Figure.103 |
| Front Side | 23230/782 | QPSK 1RB 99% Offset | 24 | 23.11 | 0.192 | 0.781 | 1.23 | 0.959 | Figure.104 |
| Left Edge | 23230/782 | QPSK 1RB 99% Offset | 24 | 23.11 | 0.025 | 0.493 | 1.23 | 0.605 | Figure.105 |
| Right Edge | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Top Edge | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bottom Edge | 23230/782 | QPSK 1RB 99% Offset | 24 | 23.11 | 0.033 | 0.584 | 1.23 | 0.717 | Figure.106 |
| Back Side | 23230/782 | QPSK 50%RB 99%Offset | 23 | 22.38 | 0.033 | 1.190 | 1.15 | 1.373 | Figure.107 |
| Front Side | 23230/782 | QPSK 50%RB 99%Offset | 23 | 22.38 | 0.128 | 0.738 | 1.15 | 0.851 | Figure.108 |
| Left Edge | 23230/782 | QPSK 50%RB 99%Offset | 23 | 22.38 | 0.044 | 0.462 | 1.15 | 0.533 | Figure.109 |
| Right Edge | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Top Edge | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bottom Edge | 23230/782 | QPSK 50%RB 99%Offset | 23 | 22.38 | -0.001 | 0.535 | 1.15 | 0.617 | Figure.110 |
| **Test Position of Body with SVLTE (Distance 0mm)** | | | | | | | | | |
| Back Side | 23230/782 | QPSK 1RB 99% Offset | 22 | 21.99 | -0.180 | 0.917 | 1.00 | 0.919 | Figure.111 |

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

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 ≤ 2 W/kg then testing at the other channels is not required for such test configuration(s).

### 7.3.5. WiFi

**Table 15: SAR Values(802.11b)**

| Test Position | Channel/ Frequency (MHz) | Service | Duty Cycle | Maximum Allowed Power (dBm) | Conducted Power (dBm) | Drift ± 0.21dB | Limit of $SAR_{1g}$ 1.6 W/kg | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Drift (dB) | Measured $SAR_{1g}$ (W/kg) | Scaling Factor | Reported $SAR_{1g}$ (W/kg) | Graph Results |
| **Test Position of Head** | | | | | | | | | | |
| Left/Cheek | 11/2462 | DSSS | 1:1 | 17.5 | 16.59 | 0.047 | 0.181 | 1.23 | 0.223 | Figure.112 |
| Left/Tilt | 11/2462 | DSSS | 1:1 | 17.5 | 16.59 | 0.090 | 0.174 | 1.23 | 0.215 | Figure.113 |
| Right/Cheek | 11/2462 | DSSS | 1:1 | 17.5 | 16.59 | -0.030 | 0.103 | 1.23 | 0.127 | Figure.114 |
| Right/Tilt | 11/2462 | DSSS | 1:1 | 17.5 | 16.59 | 0.120 | 0.118 | 1.23 | 0.146 | Figure.115 |
| **Test position of Body (Distance 15mm)** | | | | | | | | | | |
| Back Side | 11/2462 | DSSS | 1:1 | 17.5 | 16.59 | -0.081 | 0.065 | 1.23 | 0.080 | Figure.116 |
| Front Side | 11/2462 | DSSS | 1:1 | 17.5 | 16.59 | 0.074 | 0.031 | 1.23 | 0.038 | Figure.117 |

Note: 1. The value with blue color is the maximum SAR Value of each test band.
2. 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.

**10-g Extremity SAR**

| Test Position | Channel/ Frequency (MHz) | Service | Duty Cycle | Maximum Allowed Power (dBm) | Conducted Power (dBm) | Drift ± 0.21dB | Limit of $SAR_{10g}$ 4 W/kg | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Drift (dB) | Measured $SAR_{10g}$ (W/kg) | Scaling Factor | Reported $SAR_{10g}$ (W/kg) | Graph Results |
| **Test position of Body (Distance 0mm)** | | | | | | | | | | |
| Back Side | 11/2462 | DSSS | 1:1 | 17.5 | 16.59 | 0.120 | 0.486 | 1.23 | 0.599 | Figure.118 |
| Front Side | 11/2462 | DSSS | 1:1 | 17.5 | 16.59 | -0.098 | 0.142 | 1.23 | 0.175 | Figure.119 |
| Left Edge | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Right Edge | 11/2462 | DSSS | 1:1 | 17.5 | 16.59 | 0.190 | 0.164 | 1.23 | 0.202 | Figure.120 |
| Top Edge | 11/2462 | DSSS | 1:1 | 17.5 | 16.59 | -0.027 | 0.101 | 1.23 | 0.125 | Figure.121 |
| Bottom Edge | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

Note: 1. The value with blue color is the maximum SAR Value of each test band.
2. 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.

## 7.4. Simultaneous Transmission Conditions

| Air-Interface | Band (MHz) | Type | SimultaneousTransmissions | Voice Over Digital Transport (Data) |
|---|---|---|---|---|
| CDMA | BC0 | Voice | Yes<br>LTE, BT or WiFi | NA |
| | BC1 | Voice | | |
| | BC0 | Data | Yes<br>BT or WiFi | NA |
| | BC1 | Data | | |
| LTE | Band 4 | Data | Yes<br>CDMA 1X, BT or WiFi | NA |
| | Band 13 | Data | | |
| WiFi | 2462 | Data | Yes<br>CDMA 1X, EVDO, LTE | Yes |
| Bluetooth (BT) | 2480 | Data | Yes<br>CDMA 1X, EVDO,LTE | NA |
| SVLTE | / | / | BT | NA |

Note: simultaneous transmission with CDMA, LTE and WiFi is prohibited by software.

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/10g SAR for simultaneous transmission assessment involving that transmitter.

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

***x* = 7.5 for 1-g SAR, and *x* = 18.75 for 10-g SAR**

| Band | Configuration | Frequency (MHz) | Maximum Power (dBm) | Separation Distance (mm) | Estimated SAR （W/kg) |
|---|---|---|---|---|---|
| Bluetooth | Head | 2480 | 9.5 | 5 | 0.374 |
| | Body | 2480 | 9.5 | 15 | 0.125 |
| | extremity | 2480 | 9.5 | 5 | 0.150 |

Per FCC KDB 447498 D01, simultaneous transmission SAR test exclusion may be applied when the sum of the SAR for all the simultaneous transmitting antennas in a specific a physical test configuration is ≤1.6 W/kg for 1g-SAR and 4 W/kg for 10g-SAR. When the sum is greater than the SAR limit, SAR test exclusion is determined by the SAR to peak location separation ratio.

$$\textbf{Ratio}=\frac{(\mathbf{SAR}_1+\mathbf{SAR}_2)^{1.5}}{\textbf{(peak location separation, mm)}}<0.04 \text{ for } \mathbf{SAR}_{1g} \text{ and } \leq 0.10 \text{ for extremity } \mathbf{SAR}_{10g}$$

**WiFi & BT Mode**

BT and WiFi antenna cannot transmit simultaneously.

**CDMA Mode & LTE Mode & BT Mode**

**SVLTE Mode & BT Mode(CDMA FULL POWER)**

| $SAR_{1g}$(W/kg) Test Position | 1X RTT | | LTE | | BT | MAX. $\Sigma SAR_{1g}$ | Peak location separation ratio |
|---|---|---|---|---|---|---|---|
| | CDMA BC0 | CDMA BC1 | LTE 4 | LTE 13 | | | |
| Left, Touch | **0.421** | 0.299 | **0.387** | 0.248 | **0.374** | 1.182 | NA |
| Left, Tilt | **0.224** | 0.223 | **0.188** | 0.139 | **0.374** | 0.786 | NA |
| Right, Touch | 0.458 | **0.597** | **0.236** | 0.200 | **0.374** | 1.207 | NA |
| Right, Tilt | **0.289** | 0.199 | **0.228** | 0.117 | **0.374** | 0.891 | NA |
| Back Side(15mm) | **0.598** | 0.268 | 0.382 | **0.457** | **0.125** | 1.180 | NA |
| Front Side(15mm) | **0.527** | 0.261 | **0.407** | 0.349 | **0.125** | 1.059 | NA |

Note: 1.The value with blue color is the maximum $\Sigma SAR_{1g}$ Value.
2. MAX. $\Sigma SAR_{1g}$ =Unlicensed $SAR_{MAX}$ +Licensed $SAR_{MAX}$

MAX. $\Sigma SAR_{1g}$ = 1.207 W/kg <1.6 W/kg, so the Simultaneous transimition SAR with volum scan are not required for BT and SVLTE.

**10-g extremity SAR (Proximity Sensor Triggered)**

| $SAR_{10g}$(W/kg) Test Position | 1X RTT | | LTE | | BT | MAX. $\Sigma SAR_{10g}$ | Peak location separation ratio |
|---|---|---|---|---|---|---|---|
| | CDMA BC0 | CDMA BC1 24.2dBm 22.5dBm | LTE 4 17dBm 21dBm 22dBm | LTE 13 22dBm 24dBm | | | |
| Back Side | 1.954 | **2.481** | 0.213 | **0.919** | **0.150** | 3.55 | NA |
| Front Side | **1.796** | 1.634 | **1.549** | 0.959 | **0.150** | 3.495 | NA |
| Left Edge | NA | NA | 0.383 | **0.605** | **0.150** | 0.755 | NA |
| Right Edge | 0.625 | **1.385** | NA | NA | **0.150** | 1.535 | NA |
| Top Edge | NA | NA | NA | NA | **0.150** | 0.150 | NA |
| Bottom Edge | 1.183 | **1.192** | **2.010** | 0.717 | **0.150** | 3.352 | NA |

Note: 1.The value with blue color is the maximum $\Sigma SAR_{10g}$ Value.
2. MAX. $\Sigma SAR_{10g}$ =Unlicensed $SAR_{MAX}$ +Licensed $SAR_{MAX}$
3.The maximum output power of CDMA BC1 differs from test positions because of the proximity sensor: 22.5dBm for back side; 24.2dBm for others
4.The maximum output power of LTE B 4 differs from test positions:
17dBm for back side; 21dBm for front side and bottom side;22dBm for left side.
5. The maximum output power of LTE B 13 differs from test positions:
22dBm for back side; 24dBm for others.
6. The SAR value which should be tested with reduced power has been substituted by the SAR values tested with full power.

MAX. $\Sigma SAR_{10g}$ = 3.55 W/kg <4 W/kg, so the Simultaneous transimition SAR with volum scan are not required for BT and CDMA and LTE.

**10-g extremity SAR (Proximity Sensor Not Triggered)**

| $SAR_{10g}$(W/kg) Test Position | 1X RTT | | LTE | | BT | MAX. $\Sigma SAR_{10g}$ | Peak location separation ratio |
|---|---|---|---|---|---|---|---|
| | CDMA BC0 | CDMA BC1 0mm 2mm | LTE 4 17dBm 21dBm 22dBm | LTE 13 22dBm 24dBm | | | |
| Back Side | **1.954** | 1.578 | 0.213 | **0.919** | **0.150** | 3.247 | NA |
| Front Side | **1.796** | 1.634 | 0.188 | **0.959** | **0.150** | 2.905 | NA |
| Left Edge | NA | NA | 0.383 | **0.605** | **0.150** | 0.755 | NA |
| Right Edge | 0.625 | **1.385** | NA | NA | **0.150** | 1.535 | NA |
| Top Edge | NA | NA | NA | NA | **0.150** | 0.150 | NA |
| Bottom Edge | 1.183 | **1.192** | **2.010** | 0.717 | **0.150** | 3.352 | NA |

Note: 1.The value with blue color is the maximum $\Sigma SAR_{10g}$ Value.
2. MAX. $\Sigma SAR_{10g}$ =Unlicensed $SAR_{MAX}$ +Licensed $SAR_{MAX}$
3. The maximum output power of CDMA BC1 differs from test positions because of the proximity sensor: 22.5dBm for back side; 24.2dBm for others
4.The maximum output power of LTE B 4 differs from test positions:
17dBm for back side and front side; 21dBm for bottom side; 22dBm for left side.
5. The maximum output power of LTE B 13 differs from test positions:
22dBm for back side; 24dBm for others.
6.The separation distance of CDMA BC1 is differ from test positions because of the proximity sensor:
2mm for back side; 0mm for others.
7. The SAR value which should be tested with reduced power has been substituted by the SAR values tested with full power.

MAX. $\Sigma SAR_{10g}$ = 3.352 W/kg <4 W/kg, so the Simultaneous transimition SAR with volum scan are not required for BT and CDMA and LTE.

**CDMA Mode & LTE Mode**

**SVLTE Mode (CDMA FULL POWER)**

| $SAR_{1g}$(W/kg) Test Position | 1X RTT | | LTE | | MAX. $\Sigma SAR_{1g}$ | Peak location separation ratio |
|---|---|---|---|---|---|---|
| | CDMA BC0 | CDMA BC1 | LTE 4 | LTE 13 | | |
| Left, Touch | **0.421** | 0.299 | **0.387** | 0.248 | 0.808 | NA |
| Left, Tilt | **0.224** | 0.223 | **0.188** | 0.139 | 0.412 | NA |
| Right, Touch | 0.458 | **0.597** | **0.236** | 0.200 | 0.833 | NA |
| Right, Tilt | **0.289** | 0.199 | **0.228** | 0.117 | 0.517 | NA |
| Back Side(15mm) | **0.598** | 0.268 | 0.382 | **0.457** | 1.055 | NA |
| Front Side(15mm) | **0.527** | 0.261 | **0.407** | 0.349 | 0.934 | NA |

Note: 1.The value with blue color is the maximum $\Sigma SAR_{1g}$ Value.
2. MAX. $\Sigma SAR_{1g}$ =Unlicensed $SAR_{MAX}$ +Licensed $SAR_{MAX}$

MAX. $\Sigma SAR_{1g}$ = 1.055 W/kg <1.6 W/kg, so the Simultaneous transimition SAR with volum scan are not required for WiFi and SVLTE.

**SVLTE Mode (CDMA FULL POWER)**

**10-g extremity SAR(Proximity Sensor is Triggered)**

| $SAR_{10g}$(W/kg) Test Position | 1X RTT | | LTE | | MAX. $\Sigma SAR_{10g}$ | Peak location separation ratio |
|---|---|---|---|---|---|---|
| | CDMA BC0 | CDMA BC1 22.5dBm 24.2dBm | LTE 4 17dBm/21dBm 22dBm | LTE 13 22dBm 24dBm | | |
| Back Side | 1.954 | **2.481** | 0.213 | **0.919** | 3.400 | NA |
| Front Side | **1.796** | 1.634 | **1.549** | 0.959 | 3.345 | NA |
| Left Edge | NA | NA | 0.383 | **0.605** | 0.605 | NA |
| Right Edge | 0.625 | **1.385** | NA | NA | 1.385 | NA |
| Top Edge | NA | NA | NA | NA | NA | NA |
| Bottom Edge | 1.183 | **1.192** | **2.010** | 0.717 | 3.202 | NA |

Note: 1.The value with blue color is the maximum $\Sigma SAR_{10g}$ Value.
2. MAX. $\Sigma SAR_{10g}$ =Unlicensed $SAR_{MAX}$ +Licensed $SAR_{MAX}$
3. The maximum output power of CDMA BC1 differs from test positions because of the proximity sensor: 22.5dBm for back side; 24.2dBm for others.
4.The maximum output power of LTE B 4 differs from test positions:
17dBm for back side; 21dBm for front side and bottom side;22dBm for left side.
5. The maximum output power of LTE B 13 differs from test positions:
22dBm for back side; 24dBm for others.
6. The SAR value which should be tested with reduced power has been substituted by the SAR values tested with full power.

MAX. $\Sigma SAR_{10g}$ =3.4 W/kg <4 W/kg, so the Simultaneous transimition SAR with volum scan are not required for WiFi and CDMA and LTE.

**10-g extremity SAR (Proximity Sensor is Not Triggered)**

| $SAR_{10g}$(W/kg) Test Position | 1X RTT | | LTE | | MAX. ΣSAR10g | Peak location separation ratio |
|---|---|---|---|---|---|---|
| | CDMA BC0 | CDMA BC1 0mm 2mm | LTE 4 17dBm 21dBm 22dBm | LTE 13 22dBm 24dBm | | |
| Back Side | **1.954** | 1.406 | 0.213 | **0.919** | 2.873 | NA |
| Front Side | **1.796** | 1.634 | **1.549** | 0.959 | 3.345 | NA |
| Left Edge | NA | NA | 0.383 | **0.605** | 0.605 | NA |
| Right Edge | 0.625 | **1.385** | NA | NA | 1.385 | NA |
| Top Edge | NA | NA | NA | NA | NA | NA |
| Bottom Edge | 1.183 | **1.192** | **2.010** | 0.717 | 3.202 | NA |

Note: 1.The value with blue color is the maximum $\Sigma SAR_{10g}$ Value.

2. MAX. $\Sigma SAR_{10g}$ =Unlicensed $SAR_{MAX}$ +Licensed $SAR_{MAX}$

3.The maximum output power of CDMA BC1 differs from test positions because of the proximity sensor: 22.5dBm for back side; 24.2dBm for others.

4.The maximum output power of LTE B 4 differs from test positions:
17dBm for back side; 21dBm for front side and bottom side;22dBm for left side.

5. The maximum output power of LTE B 13 differs from test positions:
22dBm for back side; 24dBm for others.

6.The separation distance of CDMA BC1 is differ from test positions because of the proximity sensor:
2mm for back side and bottom side;0mm for others.

7. The SAR value which should be tested with reduced power has been substituted by the SAR values tested with full power.

MAX. $\Sigma SAR_{10g}$ = 3.345 W/kg <4 W/kg, so the Simultaneous transimition SAR with volum scan are not required for BT and CDMA and LTE.

**CDMA Mode & BT Mode**

**10-g extremity SAR**

| $SAR_{10g}$(W/kg) / Test Position | CDMA BC0 | CDMA BC1 | BT | MAX. $\Sigma SAR_{10g}$ | Peak location separation ratio |
|---|---|---|---|---|---|
| Back Side | 1.996 | **3.668** | **0.150** | 3.573 | NA |
| Front Side | 1.796 | **2.025** | **0.150** | 2.175 | NA |
| Left Edge | NA | NA | **0.150** | 0.150 | NA |
| Right Edge | 0.803 | **1.787** | **0.150** | 1.743 | NA |
| Top Edge | NA | NA | **0.150** | 0.150 | NA |
| Bottom Edge | **1.226** | 1.192 | **0.150** | 1.376 | N/A |

Note: 1.The value with blue color is the maximum $\Sigma SAR_{10g}$ Value.
2. MAX. $\Sigma SAR_{10g}$ =Unlicensed $SAR_{MAX}$ +Licensed $SAR_{MAX}$

MAX. $\Sigma SAR_{1g}$ = 3.573 W/kg <4 W/kg, so the Simultaneous transimition SAR with volum scan are not required for BT and CDMA.

**CDMA Mode & WiFi Mode**

| $SAR_{1g}$(W/kg) Test Position | 1X RTT | | WiFi | MAX. $\Sigma SAR_{1g}$ | Peak location separation ratio |
|---|---|---|---|---|---|
| | CDMA BC0 | CDMA BC1 | | | |
| Left, Touch | **0.421** | 0.299 | **0.223** | 0.644 | NA |
| Left, Tilt | **0.224** | 0.223 | **0.215** | 0.439 | NA |
| Right, Touch | 0.458 | **0.597** | **0.127** | 0.724 | NA |
| Right, Tilt | **0.289** | 0.199 | **0.146** | 0.435 | NA |
| Back Side(15mm) | **0.598** | 0.268 | **0.080** | 0.678 | NA |
| Front Side(15mm) | **0.527** | 0.261 | **0.038** | 0.565 | NA |

Note: 1.The value with blue color is the maximum $\Sigma SAR_{1g}$ Value.
2. MAX. $\Sigma SAR_{1g}$ =Unlicensed $SAR_{MAX}$ +Licensed $SAR_{MAX}$

**10-g extremity SAR**

| $SAR_{10g}$(W/kg) Test Position | CDMA BC0 | CDMA BC1 | WiFi | MAX. $\Sigma SAR_{10g}$ | Peak location separation ratio |
|---|---|---|---|---|---|
| Back Side | 1.996 | **3.668** | **0.599** | 4.267 | Yes |
| Front Side | 1.796 | **2.025** | **0.175** | 2.200 | NA |
| Left Edge | NA | NA | NA | NA | NA |
| Right Edge | 0.803 | **1.787** | **0.202** | 1.989 | NA |
| Top Edge | NA | NA | 0.125 | 0.125 | NA |
| Bottom Edge | **1.226** | 1.192 | NA | 1.226 | N/A |

Note: 1.The value with blue color is the maximum $\Sigma SAR_{10g}$ Value.
2. MAX. $\Sigma SAR_{10g}$ =Unlicensed $SAR_{MAX}$ +Licensed $SAR_{MAX}$

**Simultaneous Transmission for test position of back side**

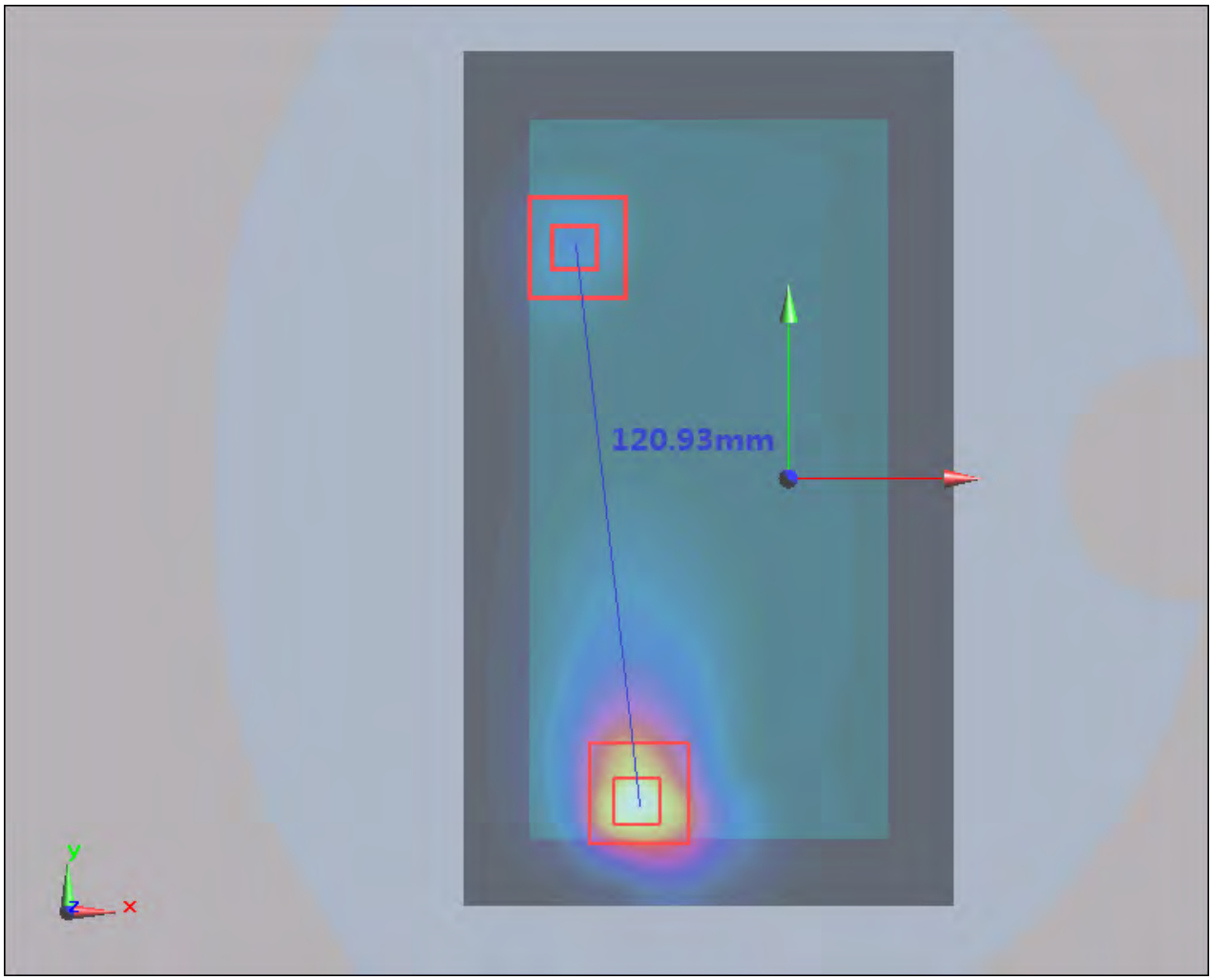
| $SAR_{10g}$(W/kg) / Test Position | CDMA BC0 | CDMA BC1 | WiFi | MAX. $\Sigma SAR_{10g}$ | Peak location separation ratio |
|---|---|---|---|---|---|
| Back Side | 1.996 | \ | **0.599** | 2.594 | NA |
| | \ | **3.668** | **0.599** | 4.267 | Yes |

**Pair Simultaneous Transmission for CDMA BC1 and WIFI**

The position $SAR_{Max.CDMA\ BC1}$ is ($x_1$=-32,$y_1$=-69,$z_1$=-205.5),

The position $SAR_{Max.WiFi}$ is ($x_2$=-47,$y_2$=51,$z_2$=-205.2)

So the distance between the $SAR_{Max.CDMA\ BC1}$ and $SAR_{Max.WiFi}$ is 120.93mm




The peak lacation separation ratio is 0.07<0.1,so the Simultaneous transimition SAR with volum scan are not repuired for WiFi and CDMA BC1 antenna.

**LTE Mode & BT Mode**

**10-g extremity SAR**

| $SAR_{10g}$(W/kg) / Test Position | LTE 4 | LTE 13 | BT | MAX. $\Sigma SAR_{10g}$ | Peak location separation ratio |
|---|---|---|---|---|---|
| Back Side | **3.145** | 1.596 | **0.150** | 3.295 | NA |
| Front Side | **2.682** | 0.959 | **0.150** | 2.832 | NA |
| Left Edge | 0.383 | **0.605** | **0.150** | 0.755 | NA |
| Right Edge | NA | NA | **0.150** | 0.150 | NA |
| Top Edge | NA | NA | **0.150** | 0.150 | NA |
| Bottom Edge | **3.459** | 0.717 | **0.150** | 3.609 | N/A |

Note: 1.The value with blue color is the maximum $\Sigma SAR_{10g}$ Value.
2. MAX. $\Sigma SAR_{10g}$ =Unlicensed $SAR_{MAX}$ +Licensed $SAR_{MAX}$

MAX. $\Sigma SAR_{10g}$ =3.609 W/kg <4 W/kg, so the Simultaneous transimition SAR with volum scan are not required for BT and CDMA.

**LTE Mode & WiFi Mode**

| $SAR_{1g}$(W/kg) Test Position | WiFi | LTE | | MAX. $\Sigma SAR_{1g}$ | Peak location separation ratio |
|---|---|---|---|---|---|
| | | LTE 4 | LTE 13 | | |
| Left, Touch | **0.223** | **0.387** | 0.248 | 0.610 | NA |
| Left, Tilt | **0.215** | **0.188** | 0.139 | 0.403 | NA |
| Right, Touch | **0.127** | **0.236** | 0.200 | 0.363 | NA |
| Right, Tilt | **0.146** | **0.228** | 0.117 | 0.374 | NA |
| Back Side(15mm) | **0.080** | 0.382 | **0.457** | 0.537 | NA |
| Front Side(15mm) | **0.038** | **0.407** | 0.349 | 0.445 | NA |
| Note: 1.The value with blue color is the maximum $\Sigma SAR_{1g}$ Value.<br>2. MAX. $\Sigma SAR_{1g}$ =Unlicensed $SAR_{MAX}$ +Licensed $SAR_{MAX}$ | | | | | |

**10-g extremity SAR**

| $SAR_{10g}$(W/kg) Test Position | LTE 4 | LTE 13 | WiFi | MAX. $\Sigma SAR_{10g}$ | Peak location separation ratio |
|---|---|---|---|---|---|
| Back Side | **3.145** | 1.596 | **0.599** | 3.744 | NA |
| Front Side | **2.682** | 0.959 | **0.175** | 2.857 | NA |
| Left Edge | 0.383 | **0.605** | NA | 0.605 | NA |
| Right Edge | NA | NA | **0.202** | 0.202 | NA |
| Top Edge | NA | NA | **0.125** | 0.125 | NA |
| Bottom Edge | **3.459** | 0.717 | NA | 3.459 | N/A |
| Note: 1.The value with blue color is the maximum $\Sigma SAR_{10g}$ Value.<br>2. MAX. $\Sigma SAR_{10g}$ =Unlicensed $SAR_{MAX}$ +Licensed $SAR_{MAX}$ | | | | | |

MAX. $\Sigma SAR_{10g}$ =3.744 W/kg <4 W/kg, so the Simultaneous transimition SAR with volum scan are not required for WiFi and CDMA.

# 8. Measurement Uncertainty

The measured $SAR_{1g}$ were <1.5 W/kg/ $SAR_{10g}$ were <3.75 W/kg for all frequency bands, therefore per KDB Publication 865664 D01, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2003 is not required in SAR reports.

# 9. Main Test Instruments

**Table 16: List of Main Instruments**

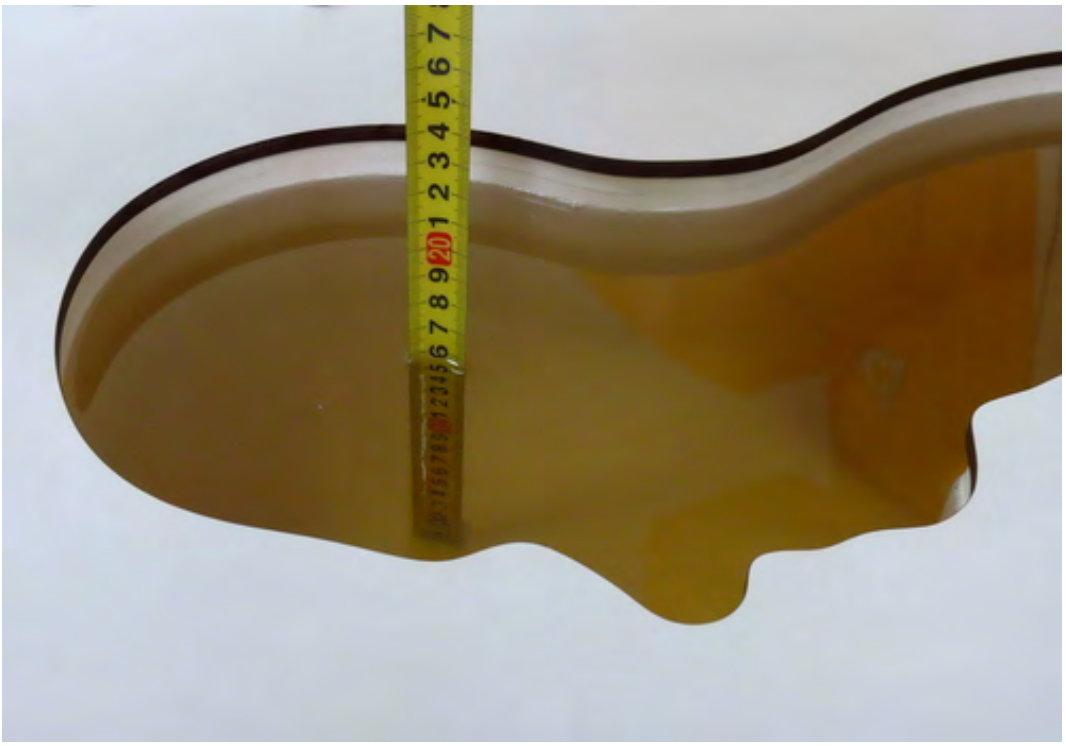
| No. | Name | Type | Serial Number | Calibration Date | Expiration Time | Valid Period |
|---|---|---|---|---|---|---|
| 01 | Network analyzer | Agilent E5071B | MY42404014 | 2014-05-26 | 2015-05-25 | 1 year |
| 02 | Dielectric Probe Kit | Agilent 85070E | US44020115 | No Calibration Requested | | |
| 03 | Power meter | Agilent E4417A | GB41291714 | 2014-03-09 | 2015-03-08 | 1 year |
| 04 | Power sensor | Agilent N8481H | MY50350004 | 2014-09-24 | 2015-09-23 | 1 year |
| 05 | Power sensor | E9327A | US40441622 | 2014-02-02 | 2015-02-01 | 1 year |
| 06 | Signal Generator | HP 8341B | 2730A00804 | 2014-09-02 | 2015-09-01 | 1 year |
| 07 | Dual directional coupler | 778D-012 | 50519 | 2014-03-24 | 2015-03-23 | 1 year |
| 08 | Dual directional coupler | 777D | 50146 | 2014-03-24 | 2015-03-23 | 1 year |
| 09 | Amplifier | IXA-020 | 0401 | No Calibration Requested | | |
| 10 | Wideband radio communication tester | CMW 500 | 113645 | 2014-09-28 | 2015-09-27 | 1 year |
| 11 | E-field Probe | EX3DV4 | 3977 | 2014-02-17 | 2015-02-16 | 1 year |
| 13 | DAE | DAE4 | 1317 | 2014-01-16 | 2015-01-15 | 1 year |
| 15 | Validation Kit 835MHz | D835V2 | 4d020 | 2014-08-28 | 2017-08-27 | 3 years |
| 16 | Validation Kit 1750MHz | D1750V2 | 1033 | 2014-01-26 | 2017-01-25 | 3 years |
| 17 | Validation Kit 1900MHz | D1900V2 | 5d060 | 2014-09-02 | 2017-09-01 | 3 years |
| 18 | Validation Kit 2450MHz | D2450V2 | 786 | 2014-09-02 | 2017-09-01 | 3 years |
| 20 | Temperature Probe | JM222 | AA1009129 | 2014-03-13 | 2015-03-12 | 1 year |
| 21 | Hygrothermograph | WS-1 | 64591 | 2014-09-25 | 2015-09-24 | 1 year |

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

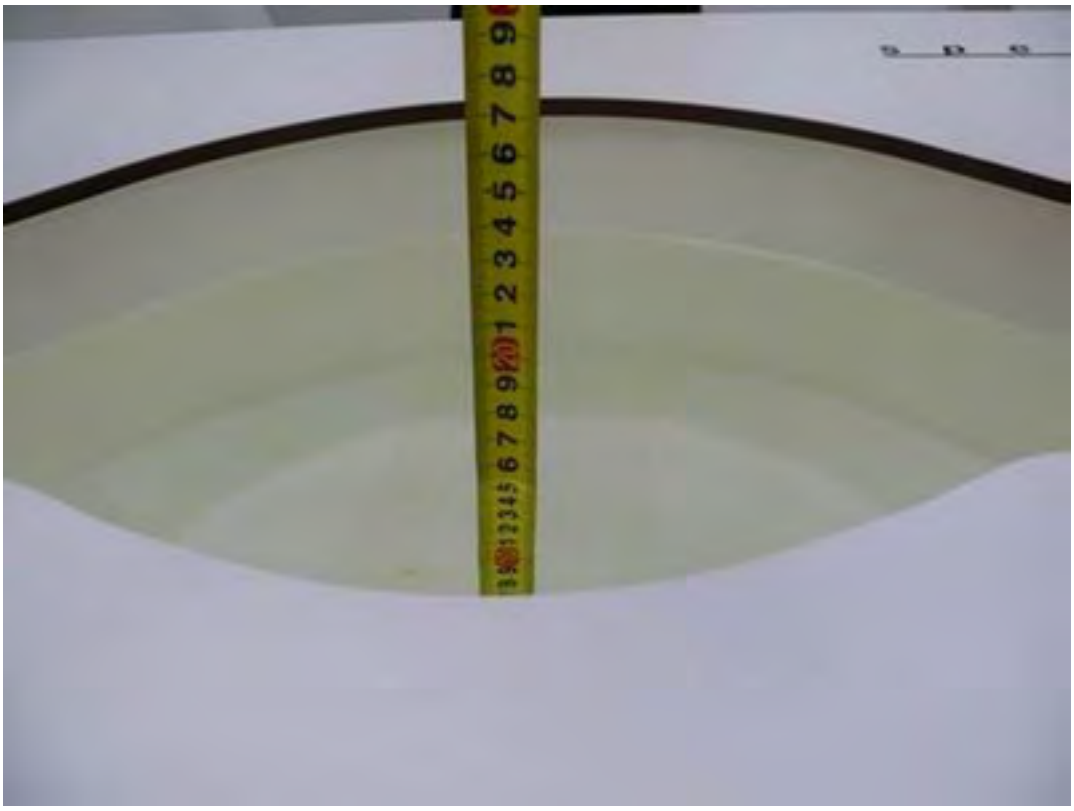
# ANNEX A: Test Layout

Picture 1: Specific Absorption Rate Test Layout

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

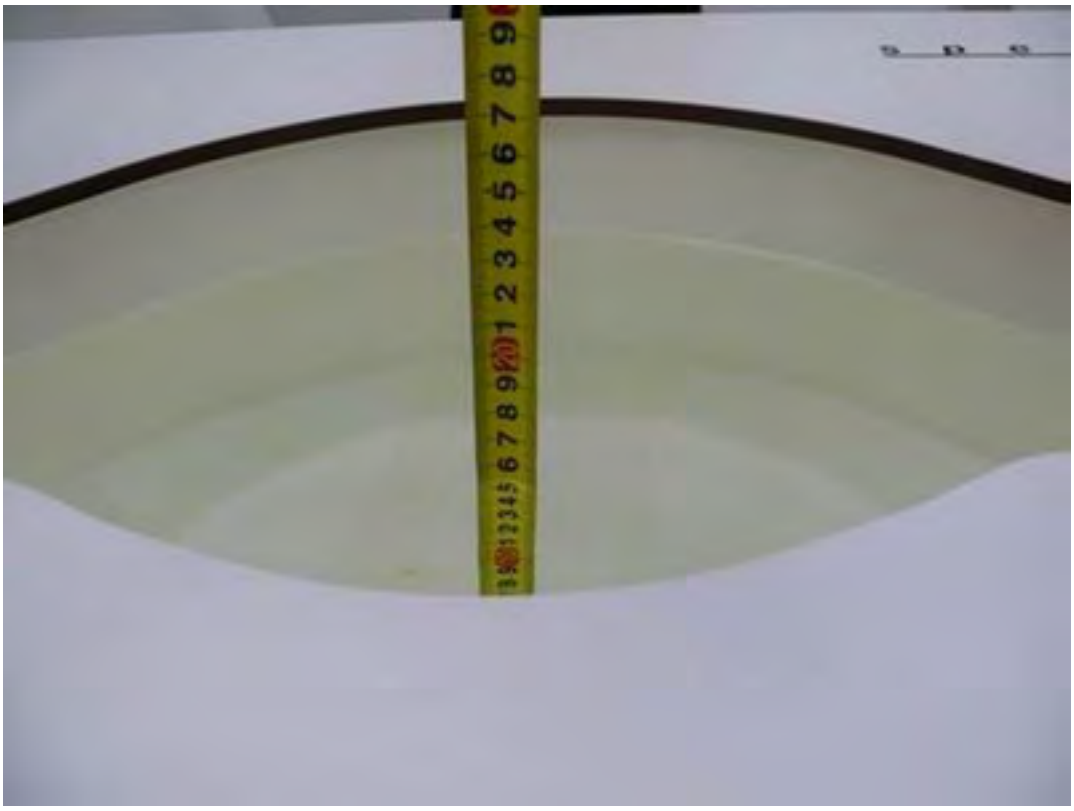


Picture 3: Liquid depth in the head Phantom (835MHz, 15.3cm depth)



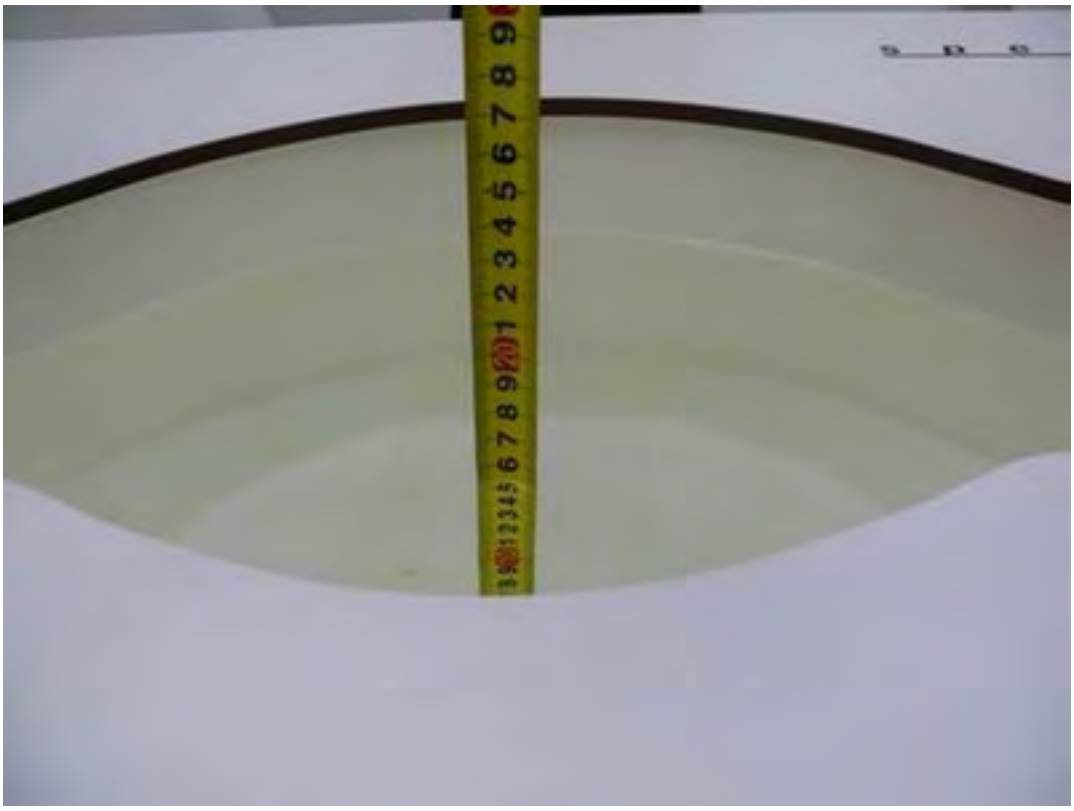
Picture 4: Liquid depth in the flat Phantom (1750 MHz**,** 15.2cm depth)

Picture 5: liquid depth in the head Phantom (1750 MHz, 15.3cm depth)



Picture 6: Liquid depth in the flat Phantom (1900 MHz**,** 15.2cm depth)

Picture 7: liquid depth in the head Phantom (1900 MHz, 15.3cm depth)



Picture 8: Liquid depth in the flat Phantom (2450 MHz, 15.3cm depth)

Picture 9: Liquid depth in the head Phantom (2450 MHz, 15.4cm depth)

# ANNEX B: System Check Results

## System Performance Check at 835 MHz Head TSL

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

Date/Time: 11/23/2014

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

Medium parameters used: f = 835 MHz; σ = 0.93 mho/m; $\varepsilon_r$ = 41.4; ρ = 1000 kg/$m^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(9.62, 9.62, 9.62); Calibrated: 2/17/2014;

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)

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

Maximum value of SAR (interpolated) = 2.64 mW/g

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

Reference Value = 54.4 V/m; Power Drift = -0.076 dB

Peak SAR (extrapolated) = 3.67 W/kg

**SAR(1 g) = 2.44 mW/g; SAR(10 g) = 1.6 mW/g**

Maximum value of SAR (measured) = 2.64 mW/g

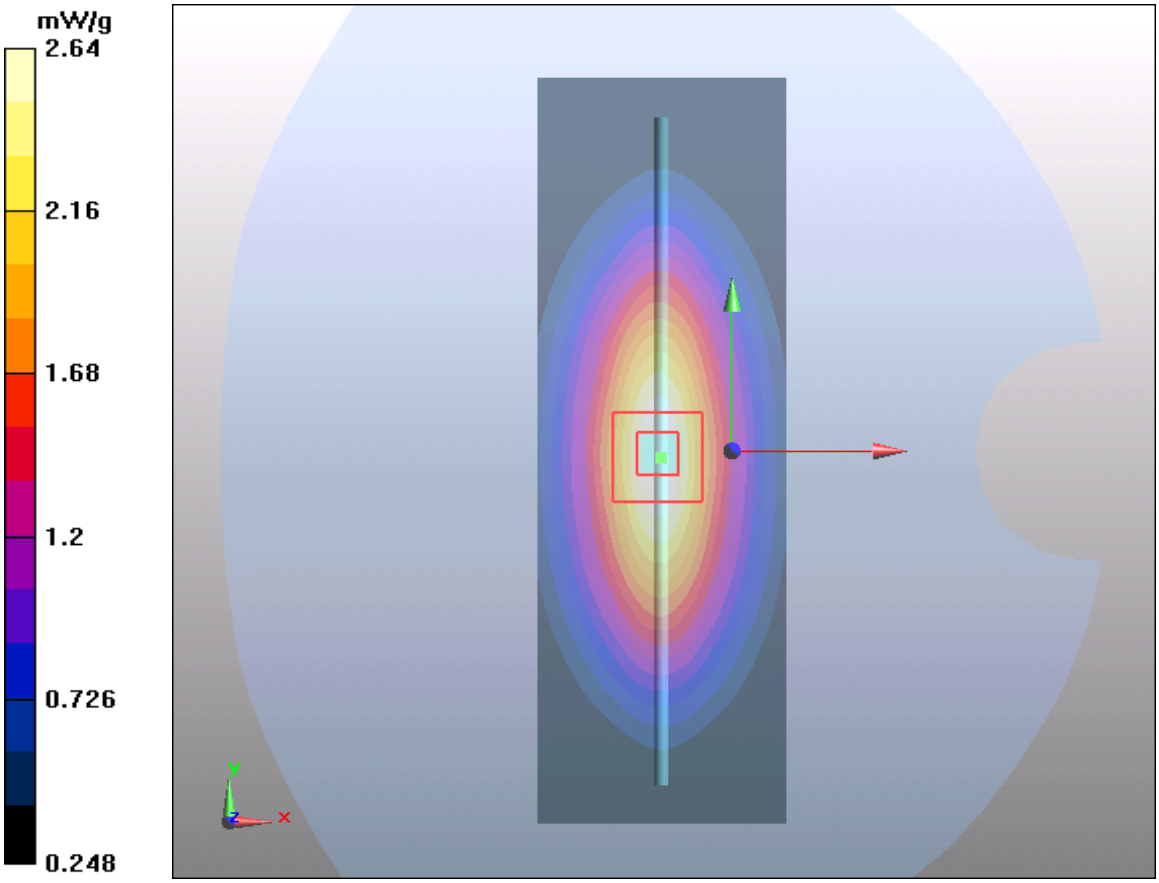



Figure 7 System Performance Check 835MHz 250mW

## System Performance Check at 835 MHz Body TSL

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

Date/Time: 12/2/2014

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

Medium parameters used: f = 835 MHz; σ = 0.99 mho/m; $\varepsilon_r$ = 55.9; ρ = 1000 kg/$m^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014;

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)

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

Maximum value of SAR (interpolated) = 2.58 mW/g

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

Reference Value = 51.9 V/m; Power Drift = -0.058 dB

Peak SAR (extrapolated) = 3.5 W/kg

**SAR(1 g) = 2.41 mW/g; SAR(10 g) = 1.6 mW/g**

Maximum value of SAR (measured) = 2.6 mW/g

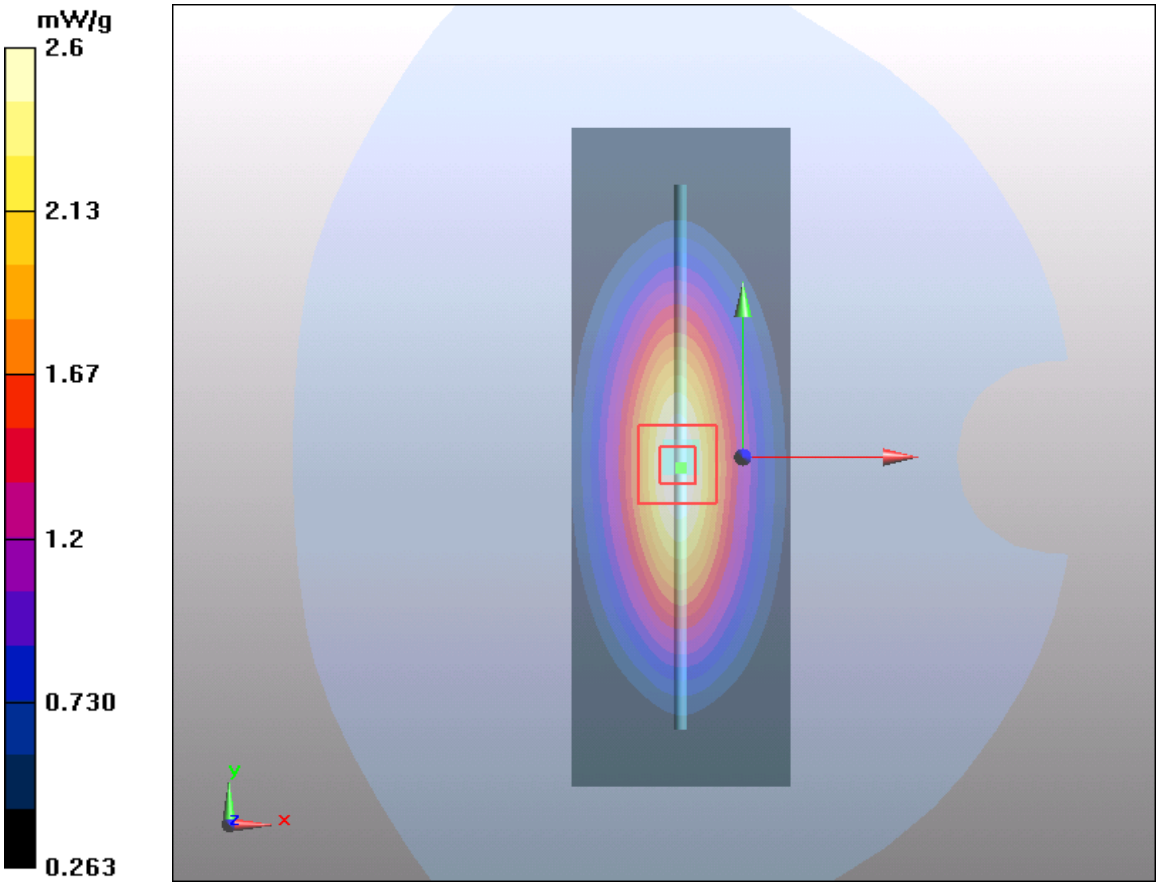



Figure 8 System Performance Check 835MHz 250mW

## System Performance Check at 835 MHz Body TSL

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

Date/Time: 12/31/2014

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

Medium parameters used: f = 835 MHz; $\sigma$ = 1.01 mho/m; $\varepsilon_r$ = 55.7; $\rho$ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014;

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)

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

Maximum value of SAR (interpolated) = 2.65 mW/g

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

Reference Value = 54.7 V/m; Power Drift = -0.17 dB

Peak SAR (extrapolated) = 3.68 W/kg

**SAR(1 g) = 2.44 mW/g; SAR(10 g) = 1.62 mW/g**

Maximum value of SAR (measured) = 2.64 mW/g

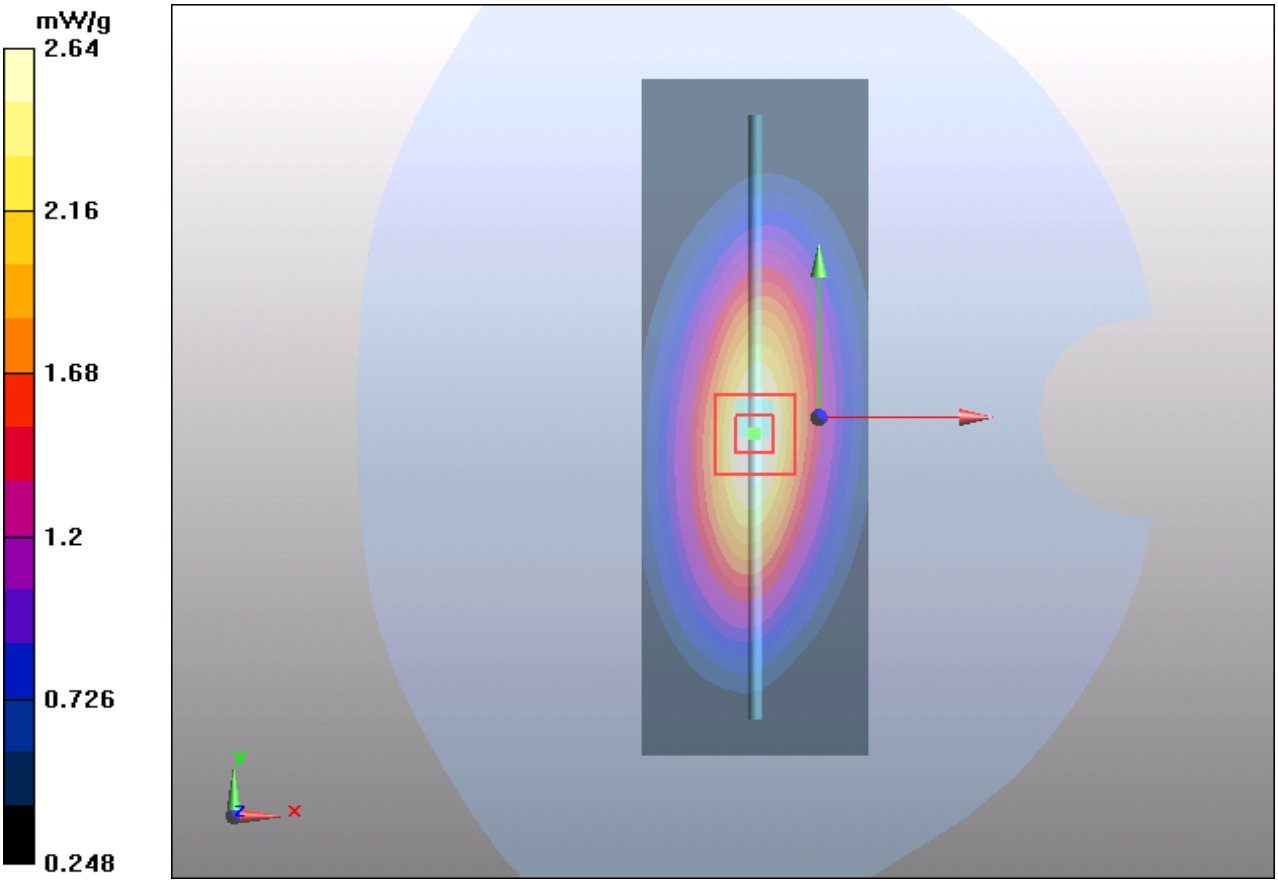



**Figure 9 System Performance Check 835MHz 250mW**

## System Performance Check at 1750 MHz Head TSL

**DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN: 1033**

Date/Time: 11/28/2014

Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1750 MHz; σ = 1.32 mho/m; $\varepsilon_r$ = 39.7; ρ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(8.14, 8.14, 8.14); Calibrated: 2/17/2014;

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

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 (51x81x1):** Measurement grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 9.78 mW/g

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

Reference Value = 80 V/m; Power Drift = 0.075 dB

Peak SAR (extrapolated) = 15.5 W/kg

**SAR(1 g) = 8.75 mW/g; SAR(10 g) = 4.5 mW/g**

Maximum value of SAR (measured) = 9.46 mW/g

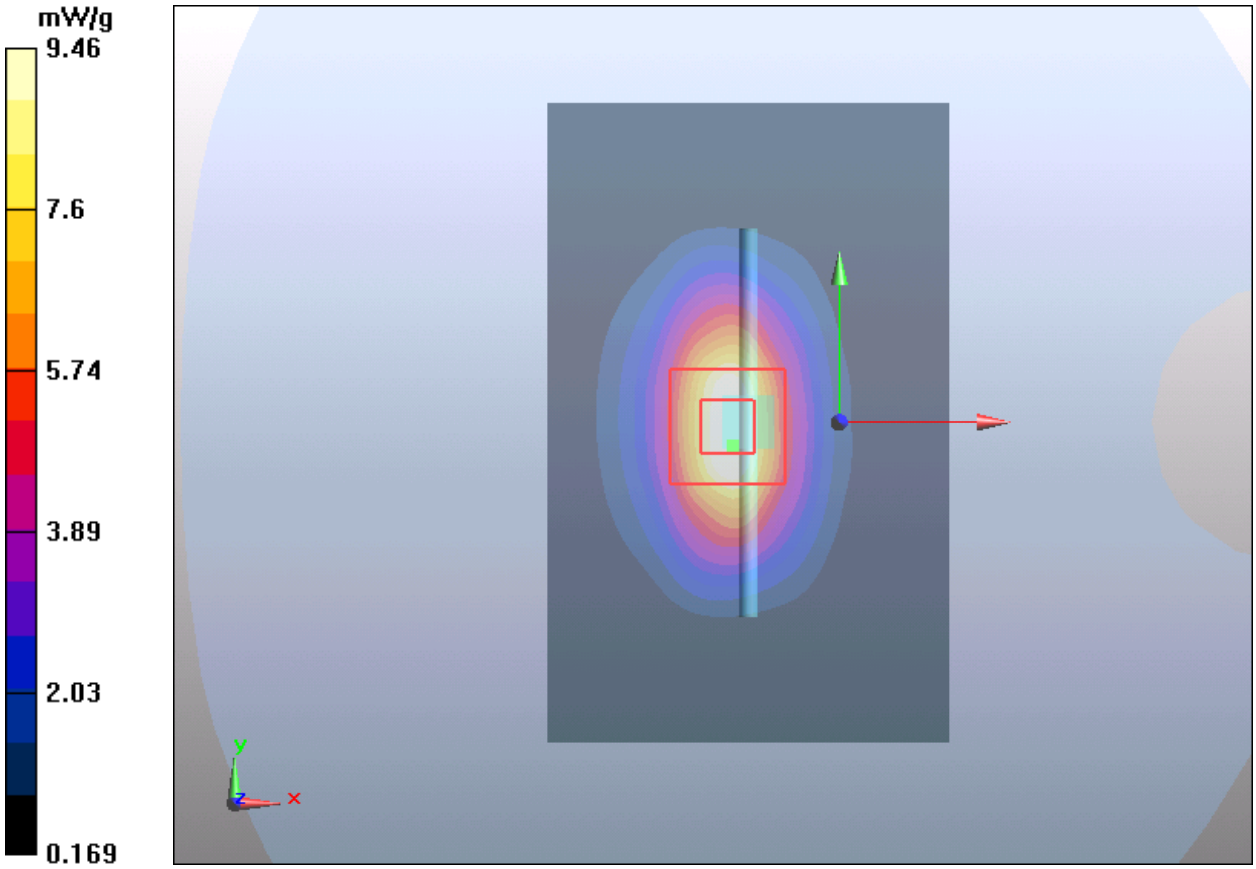



Figure 10 System Performance Check 1750MHz 250mW

## System Performance Check at 1750 MHz Body TSL

**DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN: 1033**

Date/Time: 11/29/2014

Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1750 MHz; $\sigma$ = 1.50 mho/m; $\varepsilon_r$ = 52.9; $\rho$ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;

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

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 (51x81x1):** Measurement grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 10.6 mW/g

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

Reference Value = 77.7 V/m; Power Drift = 0.097 dB

Peak SAR (extrapolated) = 16.8 W/kg

**SAR(1 g) = 9.24 mW/g; SAR(10 g) = 4.9 mW/g**

Maximum value of SAR (measured) = 10.3 mW/g

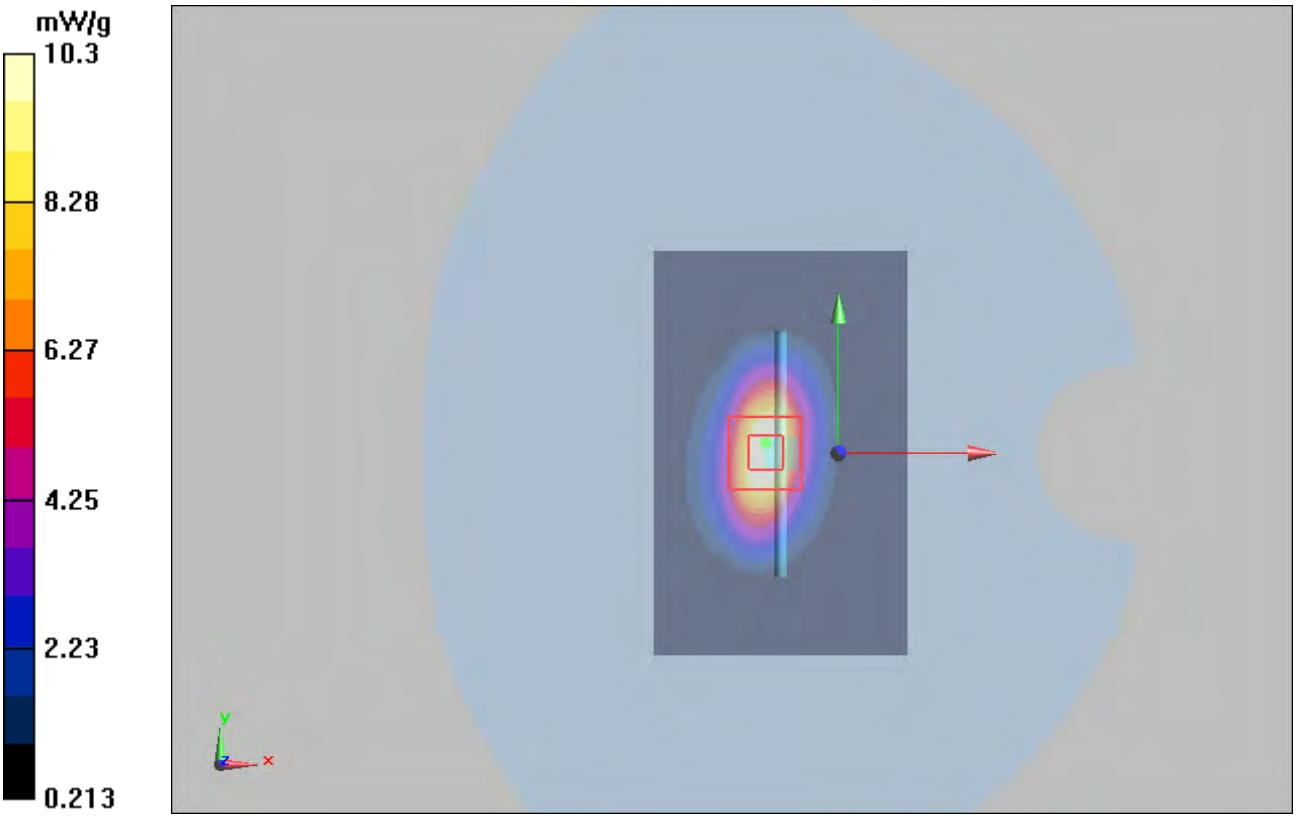



Figure 11 System Performance Check 1750MHz 250mW

## System Performance Check at 1750 MHz Body TSL

**DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN: 1033**

Date/Time: 1/1/2015

Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1750 MHz; σ = 1.51 mho/m; $\varepsilon_r$ = 52.8; ρ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;

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

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 (51x81x1):** Measurement grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 11.1 mW/g

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

Reference Value = 87.6 V/m; Power Drift = 0.009 dB

Peak SAR (extrapolated) = 17.3 W/kg

**SAR(1 g) = 9.43 mW/g; SAR(10 g) = 5.01 mW/g**

Maximum value of SAR (measured) = 10.5 mW/g

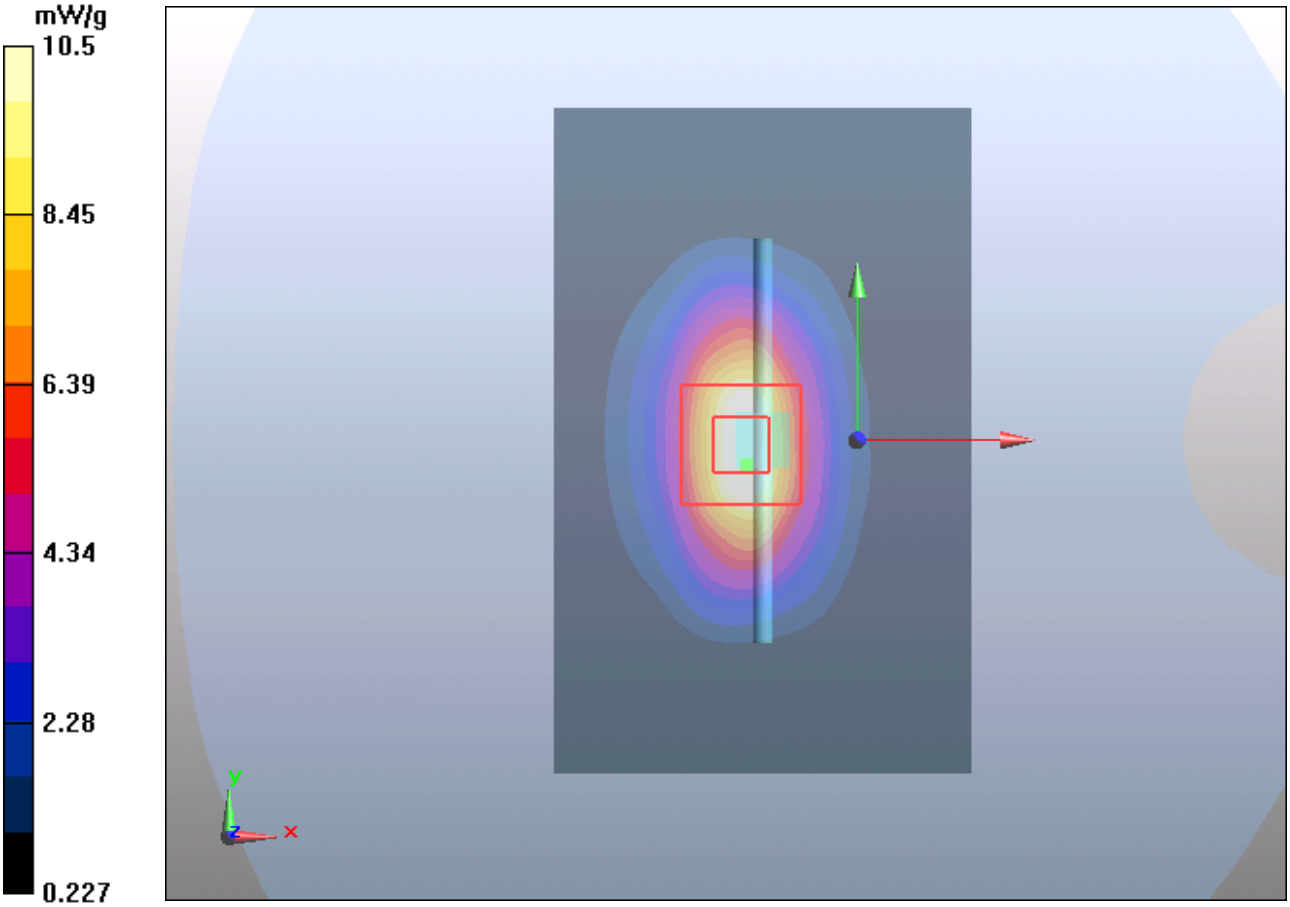



Figure 12 System Performance Check 1750MHz 250mW

**System Performance Check at 1900 MHz Head TSL**

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

Date/Time: 11/27/2014

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

Medium parameters used: f = 1900 MHz; $\sigma$ = 1.43 mho/m; $\varepsilon_r$ = 39.6; $\rho$ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(7.97, 7.97, 7.97); Calibrated: 2/17/2014;

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

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) = 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

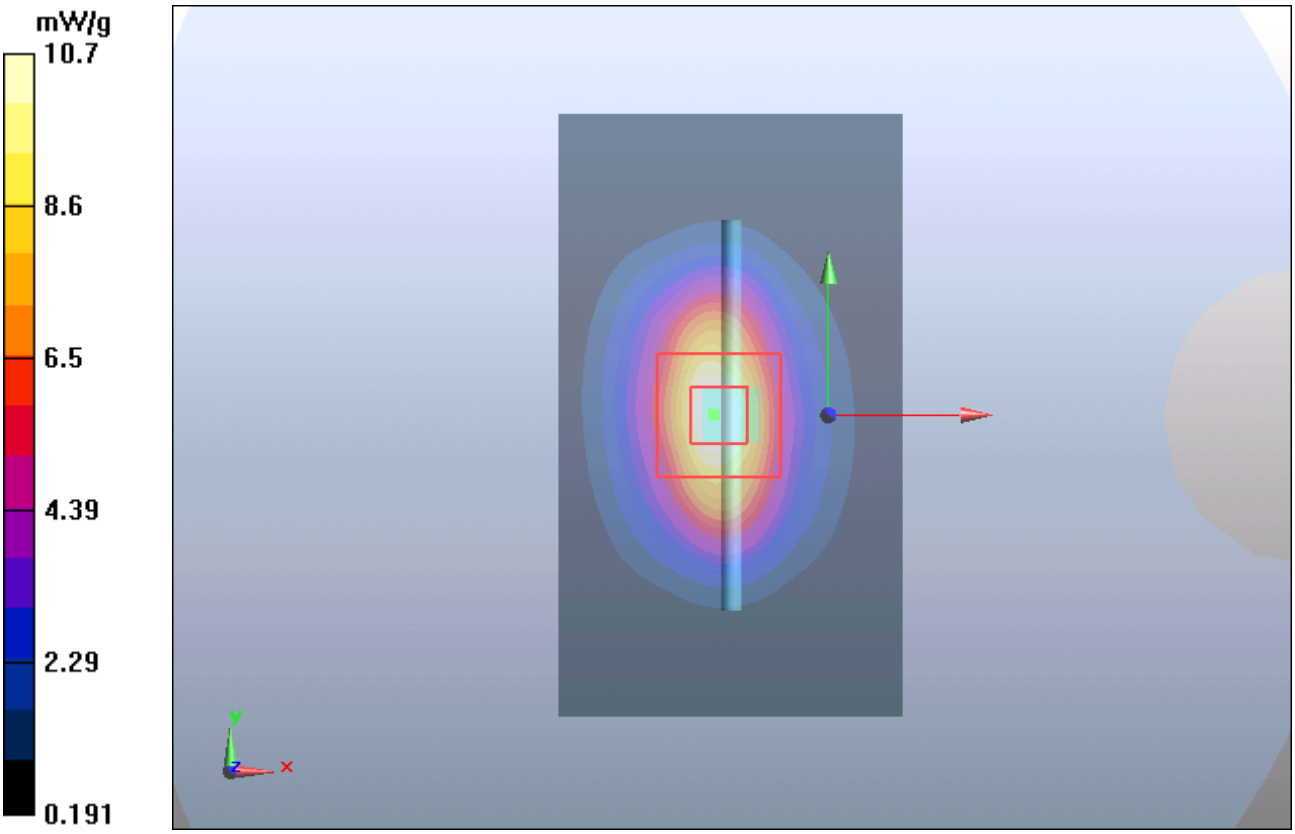



Figure 13 System Performance Check 1900MHz 250mW

**System Performance Check at 1900 MHz Body TSL**

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

Date/Time: 12/3/2014

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

Medium parameters used: f = 1900 MHz; $\sigma$ = 1.52 mho/m; $\varepsilon_r$ = 53.1; $\rho$ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014;

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

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) = 12.2 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

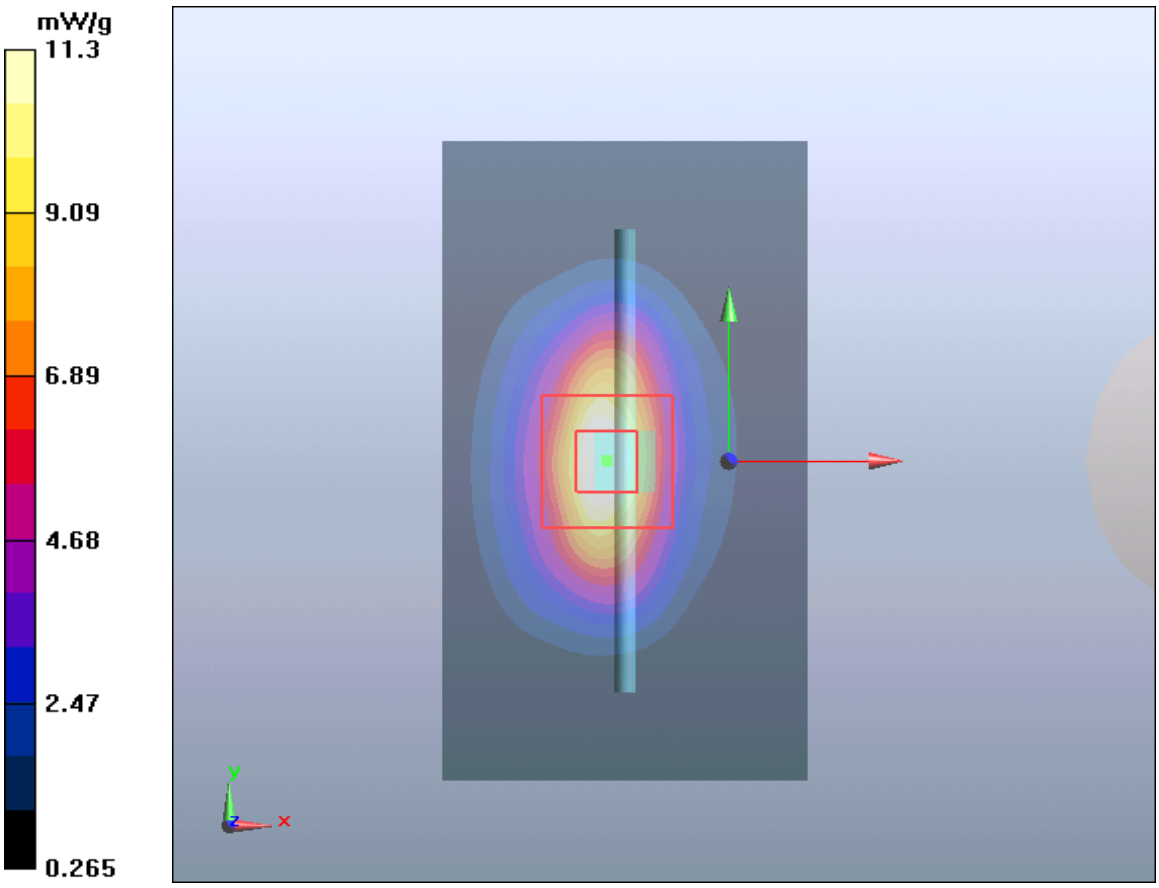



Figure 14 System Performance Check 1900MHz 250mW

**System Performance Check at 1900 MHz Body TSL**

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

Date/Time: 12/30/2014

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

Medium parameters used: f = 1900 MHz; $\sigma$ = 1.58 mho/m; $\varepsilon_r$ = 52.6; $\rho$ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014;

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

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) = 12.0 mW/g

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

Reference Value = 86.9 V/m; Power Drift = 0.020 dB

Peak SAR (extrapolated) = 19.6 W/kg

**SAR(1 g) = 10.41 mW/g; SAR(10 g) = 5.37 mW/g**

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

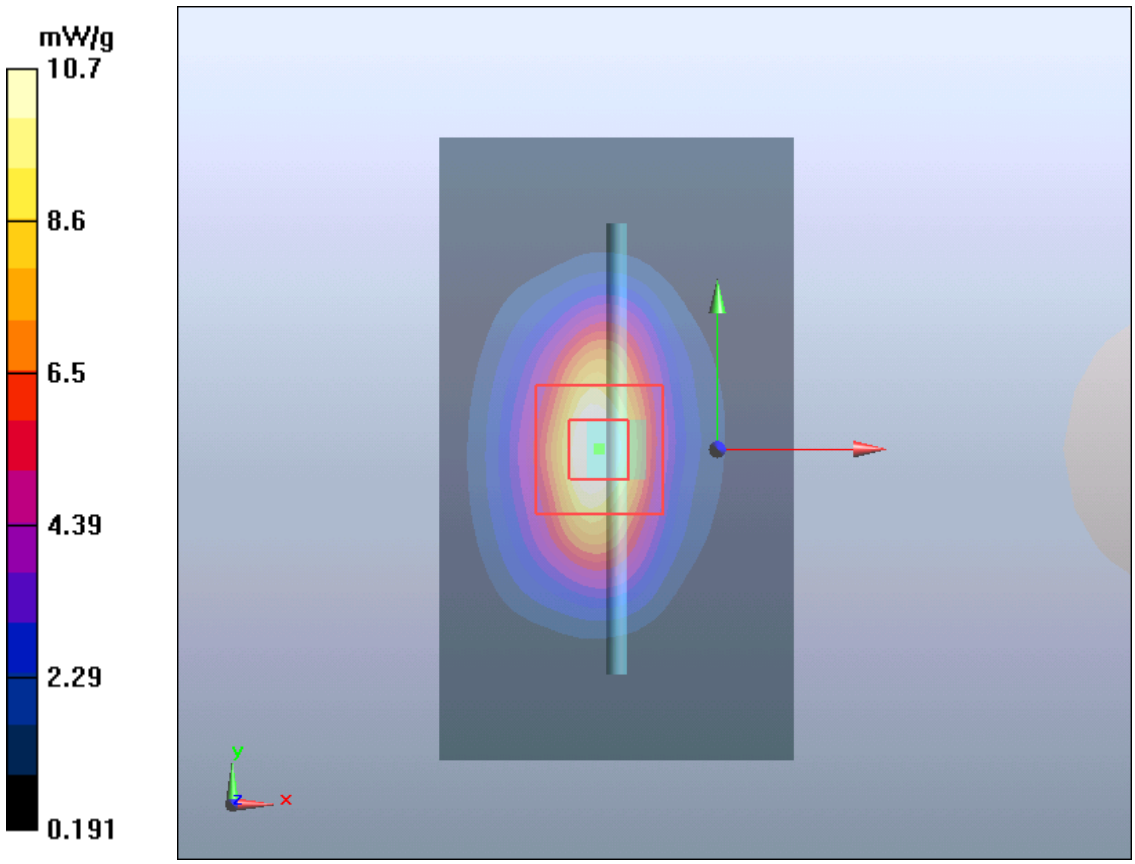



Figure 15 System Performance Check 1900MHz 250mW

**System Performance Check at 2450 MHz Head TSL**

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

Date/Time: 11/25/2014

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

Medium parameters used: f = 2450 MHz; $\sigma$ = 1.81 mho/m; $\varepsilon_r$ = 38.6; $\rho$ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(7.24, 7.24, 7.24); Calibrated: 2/17/2014;

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

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=1.200 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

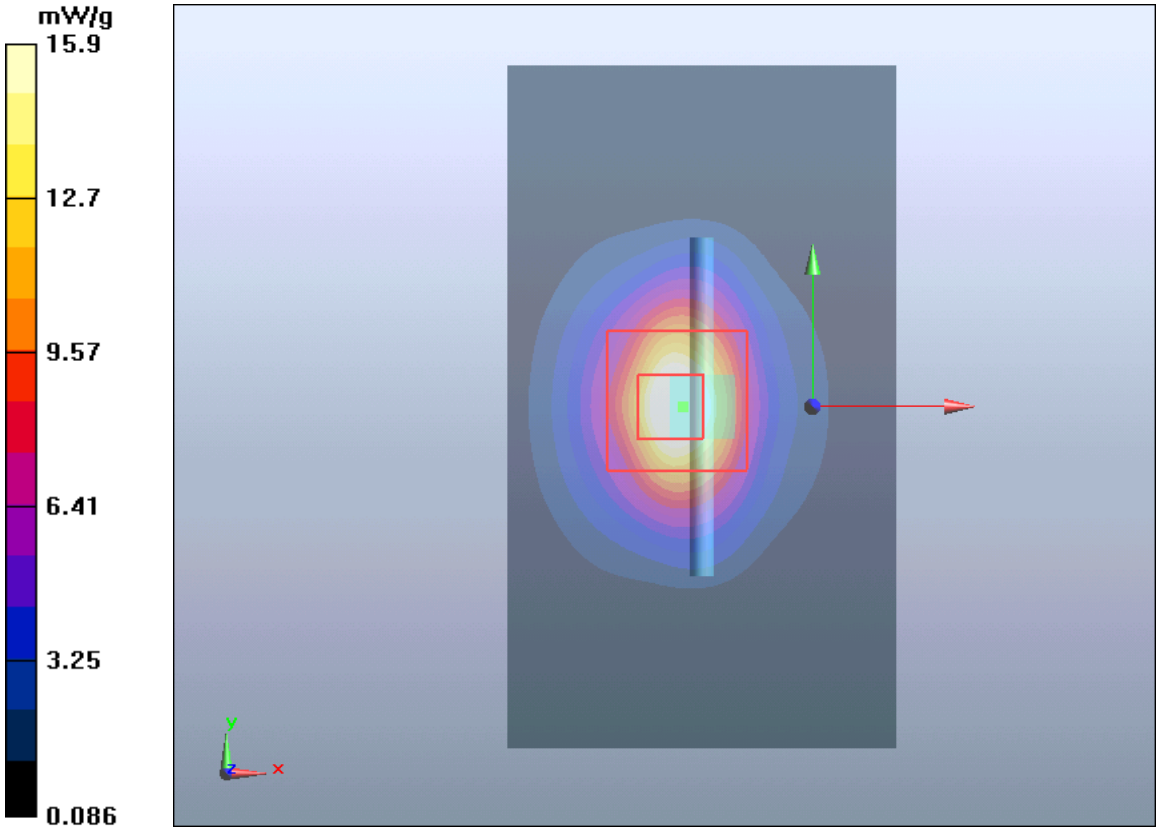



Figure 16 System Performance Check 2450MHz 250mW

**System Performance Check at 2450 MHz Body TSL**

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

Date/Time: 12/4/2014

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

Medium parameters used: f = 2450 MHz; σ = 1.99 mho/m; $\varepsilon_r$ = 52.1; ρ = 1000 kg/$m^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(6.97, 6.97, 6.97); Calibrated: 2/17/2014;

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

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=1.200 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

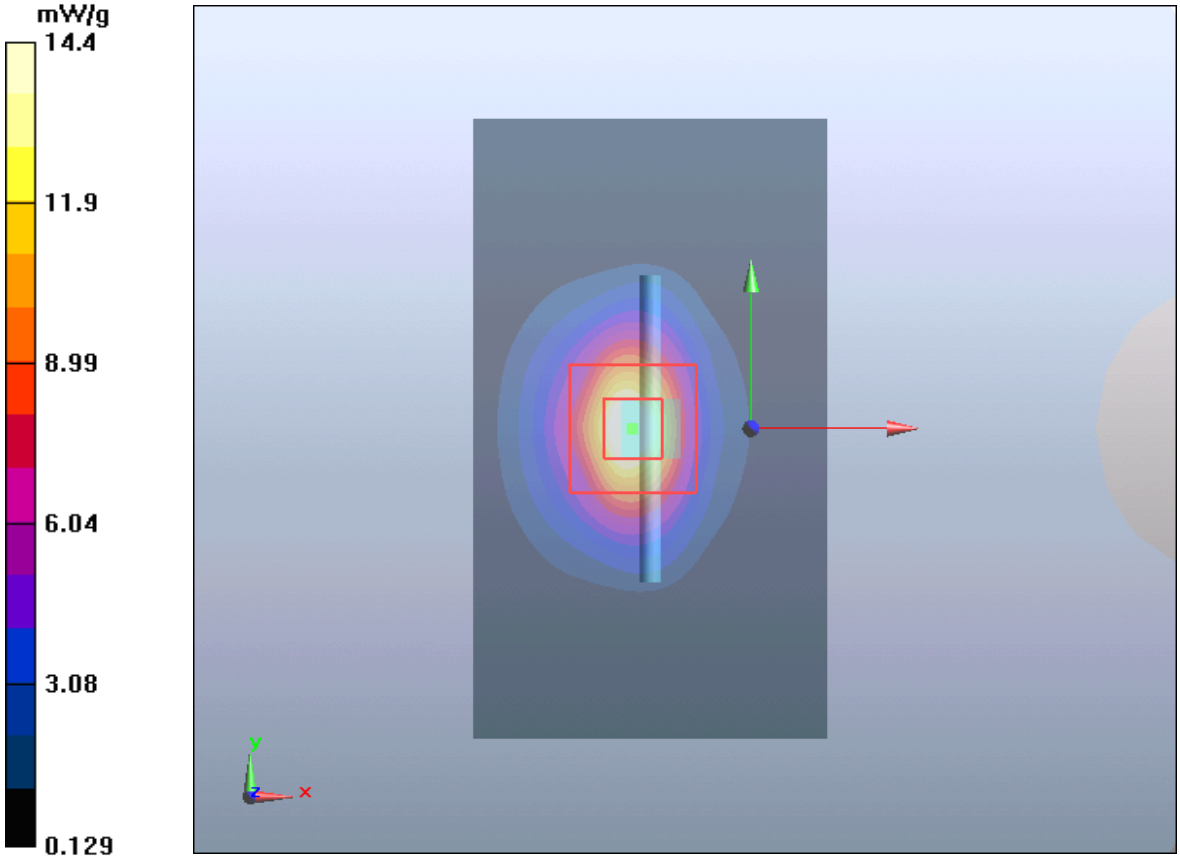



Figure 17 System Performance Check 2450MHz 250mW

**System Performance Check at 2450 MHz Body TSL**

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

Date/Time: 1/2/2015

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

Medium parameters used: f = 2450 MHz; σ = 2.01 mho/m; $\varepsilon_r$ = 51.8; ρ = 1000 kg/$m^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(6.97, 6.97, 6.97); Calibrated: 2/17/2014;

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

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=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 17.1 mW/g

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

Reference Value = 66.5 V/m; Power Drift = 0.130 dB

Peak SAR (extrapolated) = 27.8 W/kg

**SAR(1 g) = 12.8 mW/g; SAR(10 g) = 6.25 mW/g**

Maximum value of SAR (measured) = 15 mW/g

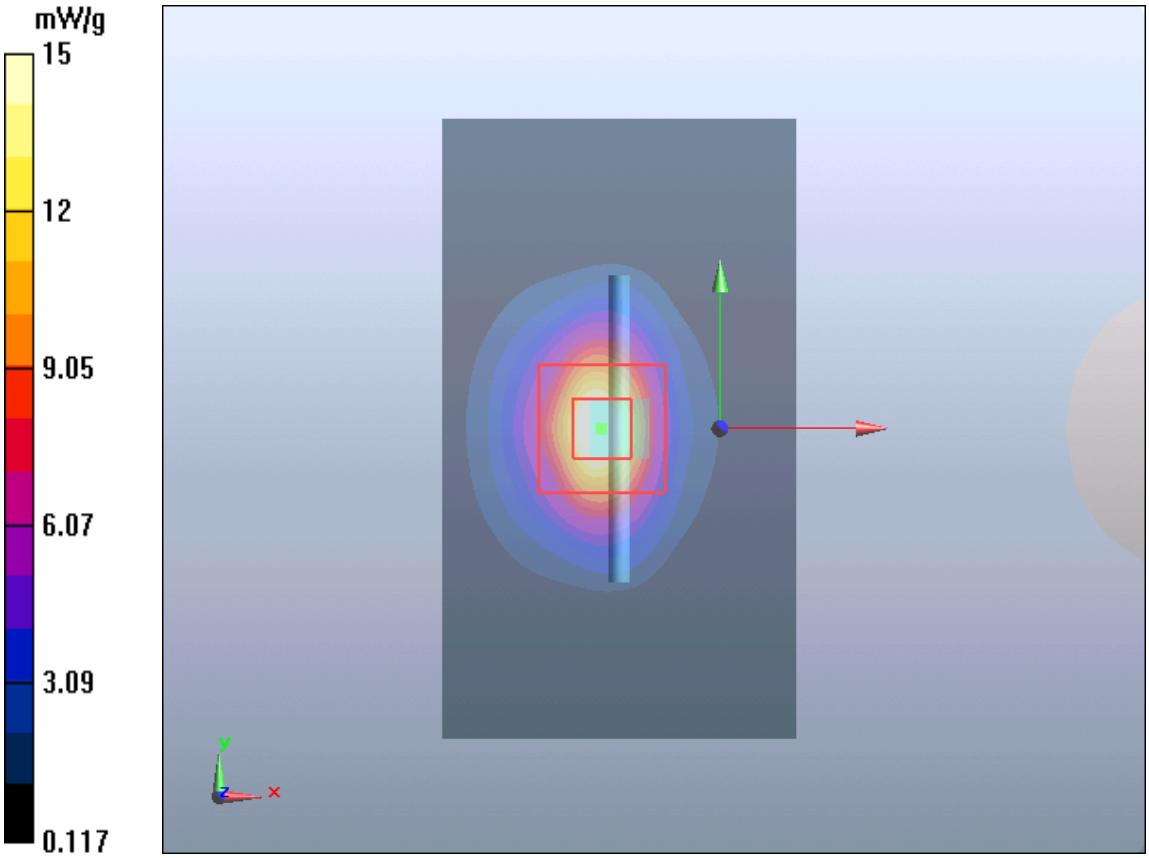



Figure 18 System Performance Check 2450MHz 250mW

# ANNEX C: Graph Results

## CDMA BC0 Left Cheek Middle

Date: 11/23/2014

Communication System: UID 0, CDMA (0); Frequency: 836.52 MHz;Duty Cycle: 1:1

Medium parameters used: f = 837 MHz; $\sigma$ = 0.932 S/m; $\varepsilon_r$ = 41.357; $\rho$ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Left Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(9.62, 9.62, 9.62); Calibrated: 2/17/2014;

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 (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.365 W/kg

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

Reference Value = 6.838 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.424 W/kg

**SAR(1 g) = 0.349 W/kg; SAR(10 g) = 0.271 W/kg**

Maximum value of SAR (measured) = 0.365 W/kg

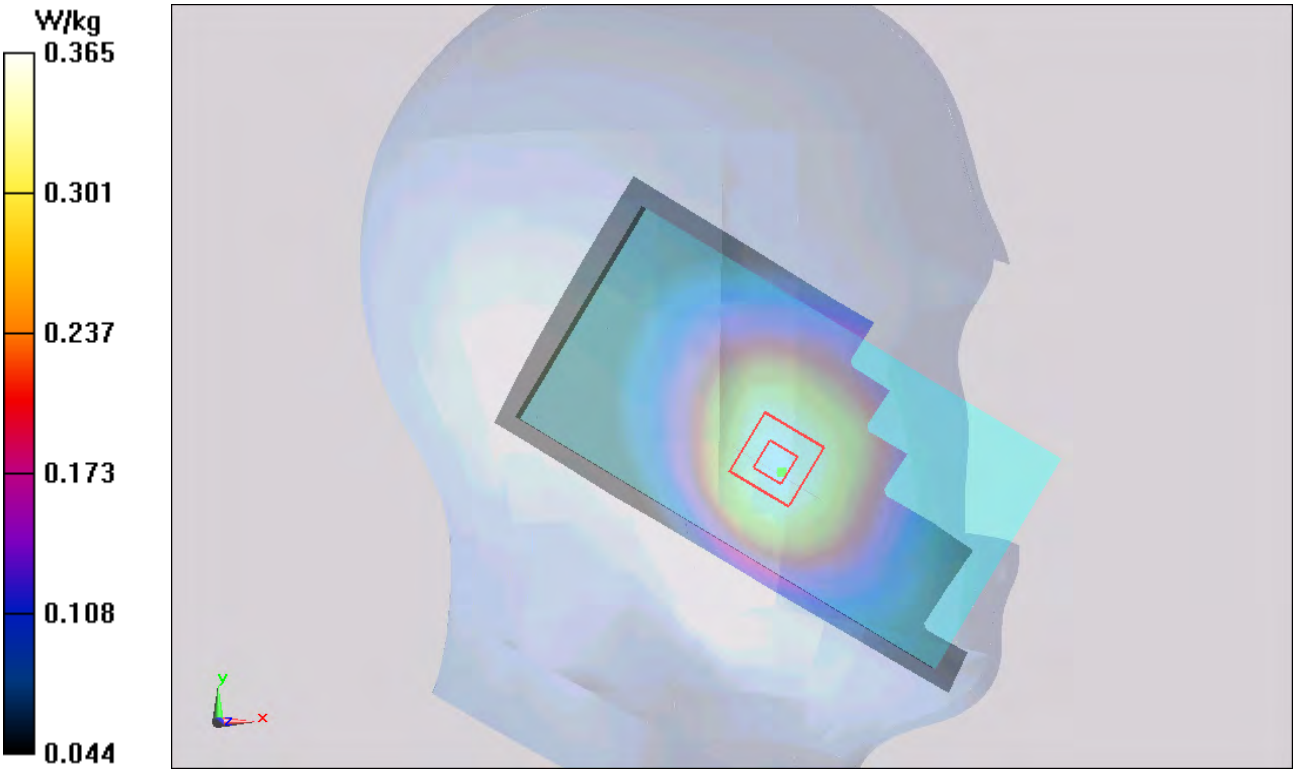



**Figure 19 CDMA BC0 Left Hand Touch Cheek Channel 384**

**CDMA BC0 Left Tilt Middle**

Date: 11/23/2014

Communication System: UID 0, CDMA (0); Frequency: 836.52 MHz;Duty Cycle: 1:1

Medium parameters used: f = 837 MHz; $\sigma$ = 0.932 S/m; $\varepsilon_r$ = 41.357; $\rho$ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Left Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(9.62, 9.62, 9.62); Calibrated: 2/17/2014;

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 (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.192 W/kg

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

Reference Value = 10.154 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.229 W/kg

**SAR(1 g) = 0.186 W/kg; SAR(10 g) = 0.145 W/kg**

Maximum value of SAR (measured) = 0.193 W/kg

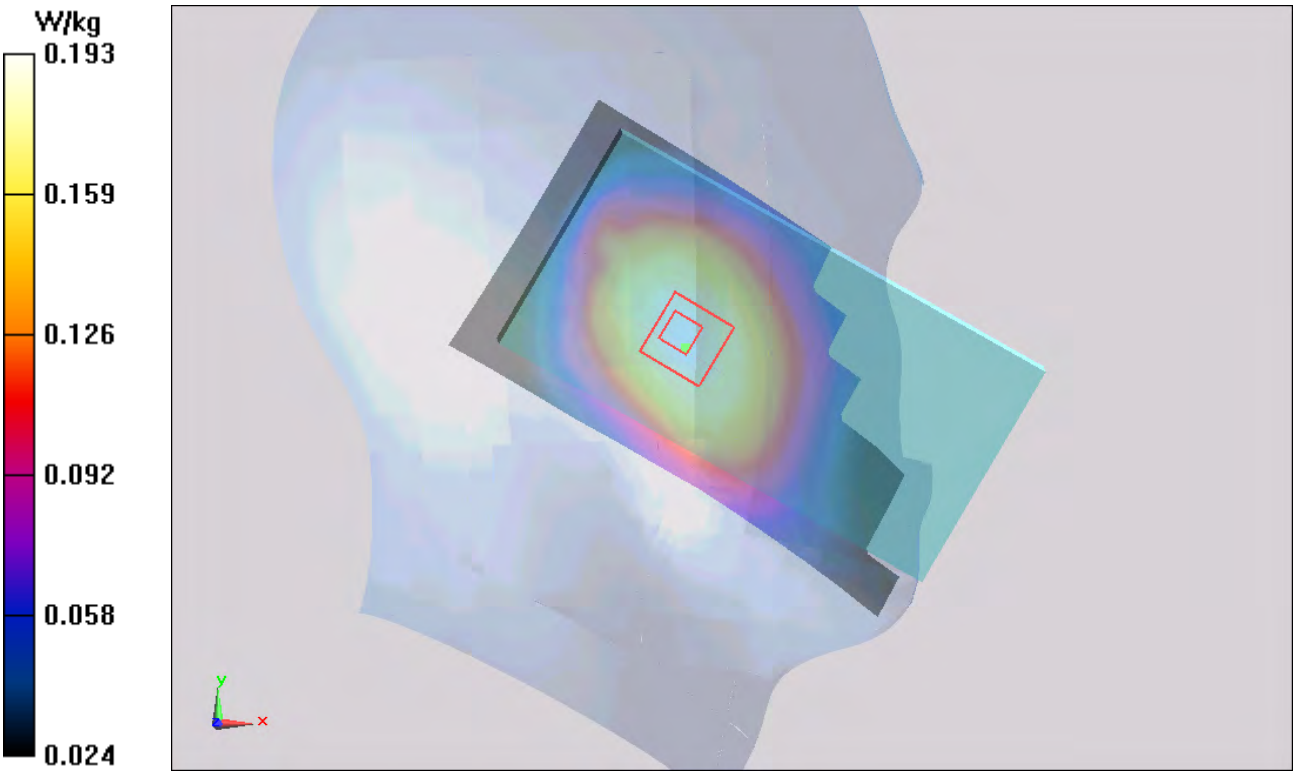



**Figure 20 CDMA BC0 Left Hand Tilt 15° Channel 384**

## CDMA BC0 Right Cheek Middle

Date: 11/23/2014

Communication System: UID 0, CDMA (0); Frequency: 836.52 MHz;Duty Cycle: 1:1

Medium parameters used: f = 837 MHz; σ = 0.932 S/m; $\varepsilon_r$ = 41.357; ρ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Right Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(9.62, 9.62, 9.62); Calibrated: 2/17/2014;

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 (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.394 W/kg

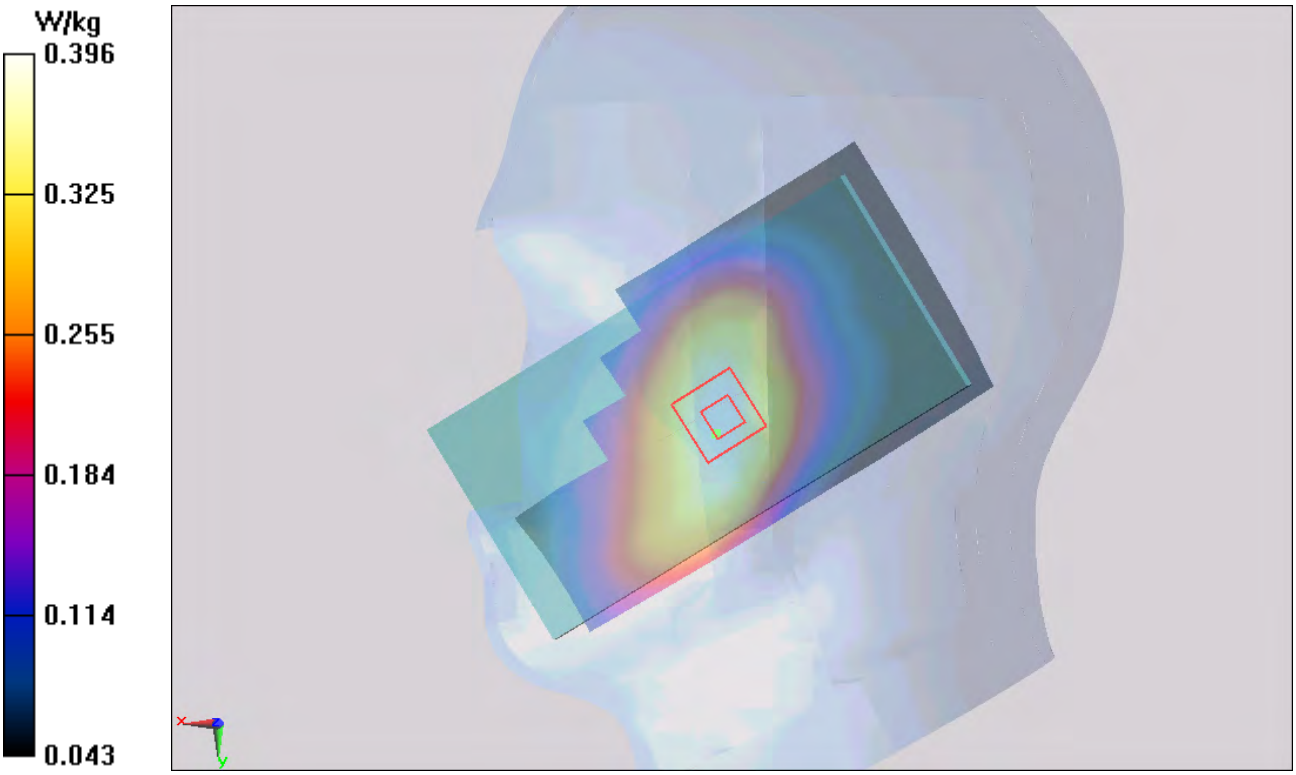
**Right Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 7.537 V/m; Power Drift = -0.060 dB

Peak SAR (extrapolated) = 0.479 W/kg

**SAR(1 g) = 0.380 W/kg; SAR(10 g) = 0.292 W/kg**

Maximum value of SAR (measured) = 0.396 W/kg



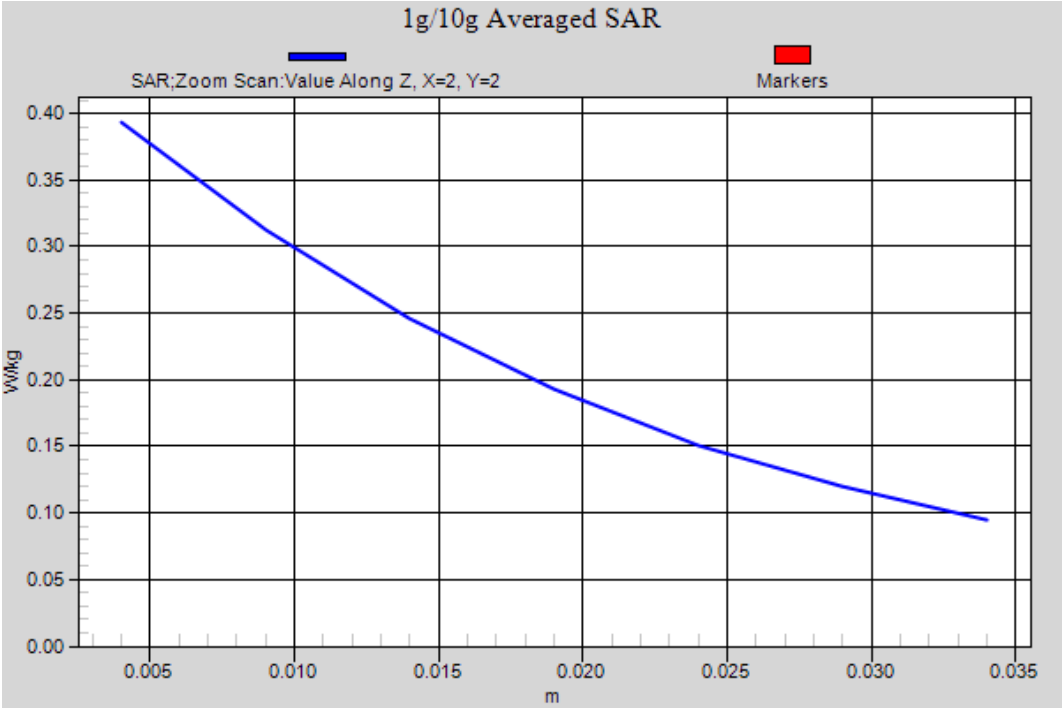



**Figure 21 CDMA BC0 Right Hand Touch Cheek Channel 384**

## CDMA BC0 Right Tilt Middle

Date: 11/23/2014

Communication System: UID 0, CDMA (0); Frequency: 836.52 MHz;Duty Cycle: 1:1

Medium parameters used: f = 837 MHz; $\sigma$ = 0.932 S/m; $\varepsilon_r$ = 41.357; $\rho$ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Right Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(9.62, 9.62, 9.62); Calibrated: 2/17/2014;

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 (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.249 W/kg

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

Reference Value = 11.389 V/m; Power Drift = 0.001 dB

Peak SAR (extrapolated) = 0.297 W/kg

**SAR(1 g) = 0.240 W/kg; SAR(10 g) = 0.185 W/kg**

Maximum value of SAR (measured) = 0.249 W/kg

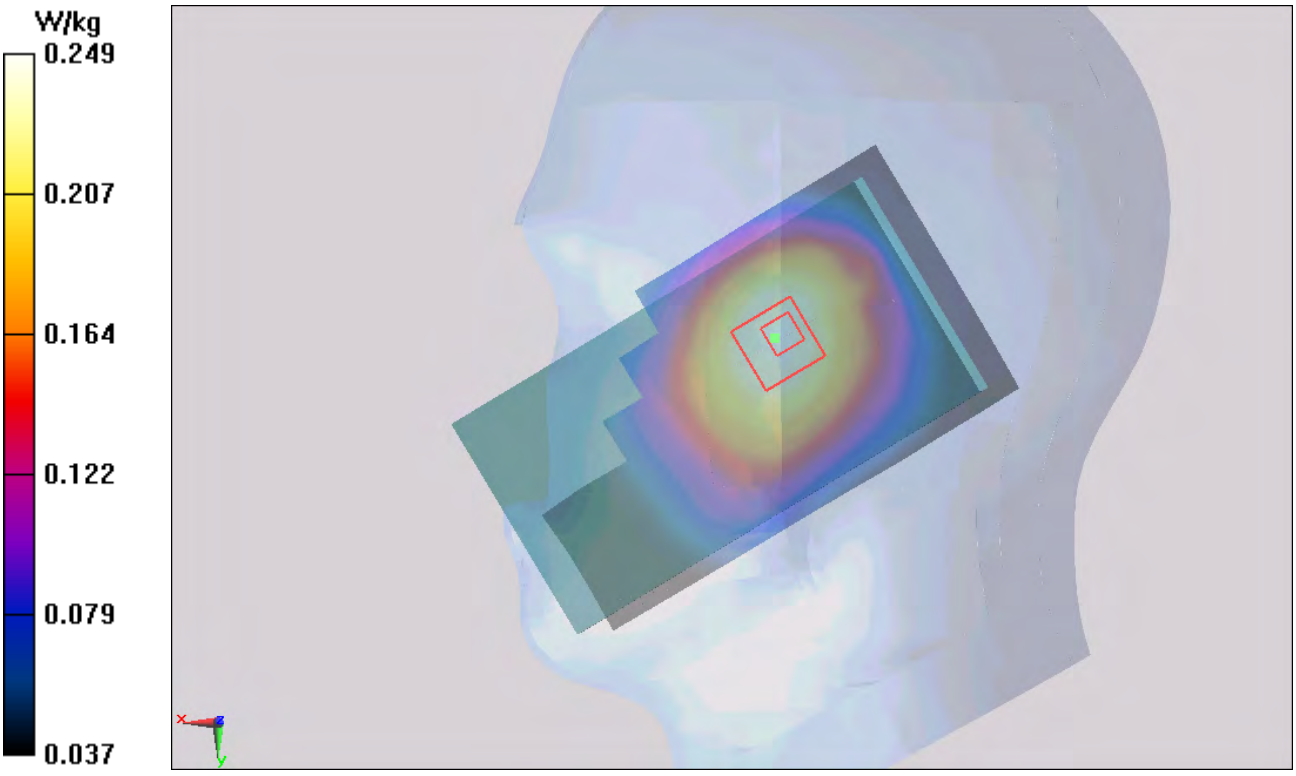



**Figure 22 CDMA BC0 Right Hand Tilt 15° Channel 384**

## CDMA BC0 Back Side Middle(15mm)

Date: 12/2/2014

Communication System: UID 0, CDMA (0); Frequency: 836.52 MHz;Duty Cycle: 1:1

Medium parameters used: f = 837 MHz; σ = 0.992 S/m; $\varepsilon_r$ = 55.882; ρ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014;

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 (71x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.517 W/kg

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

Reference Value = 22.997 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 0.591 W/kg

**SAR(1 g) = 0.493 W/kg; SAR(10 g) = 0.381 W/kg**

Maximum value of SAR (measured) = 0.517 W/kg

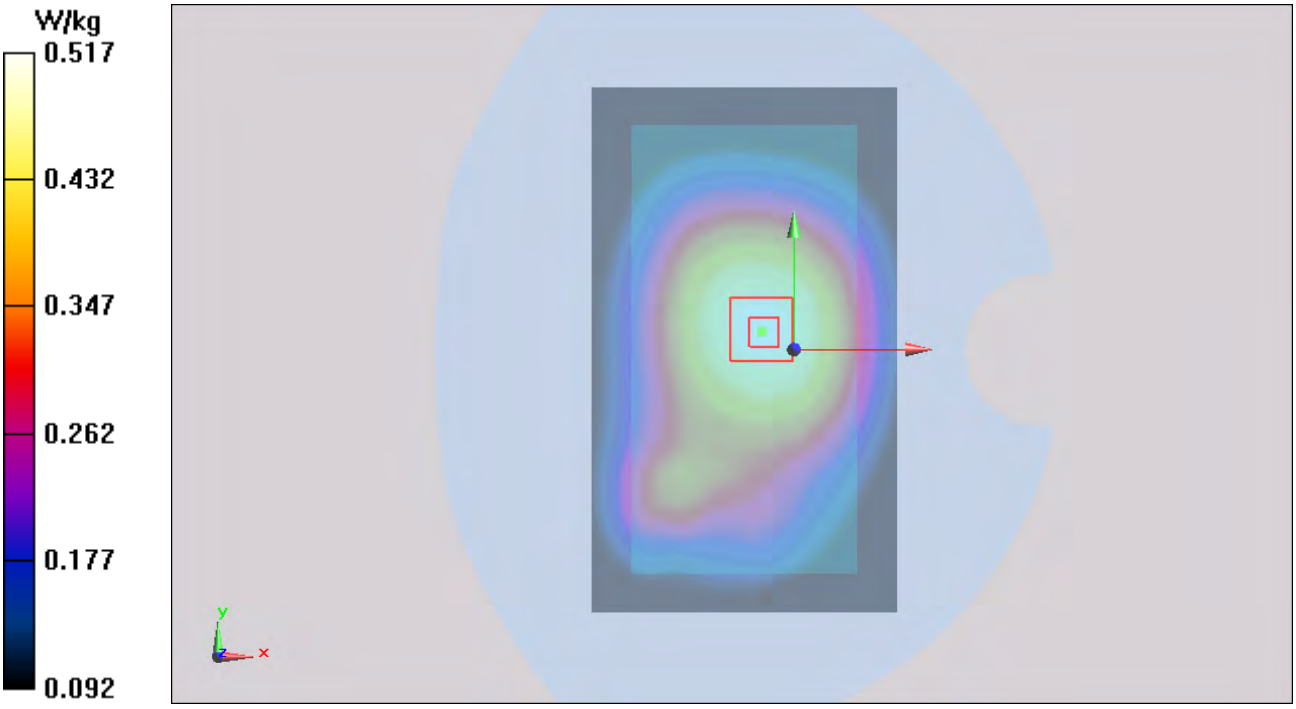



**Figure 23 Body, CDMA BC0 Back Side Channel 384**

**CDMA BC0 Front Side Middle (15mm)**

Date: 12/2/2014

Communication System: UID 0, CDMA (0); Frequency: 836.52 MHz;Duty Cycle: 1:1

Medium parameters used: f = 837 MHz; σ = 0.992 S/m; $\varepsilon_r$ = 55.882; ρ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014;

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 (71x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.455 W/kg

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

Reference Value = 21.688 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.520 W/kg

**SAR(1 g) = 0.434 W/kg; SAR(10 g) = 0.339 W/kg**

Maximum value of SAR (measured) = 0.452 W/kg

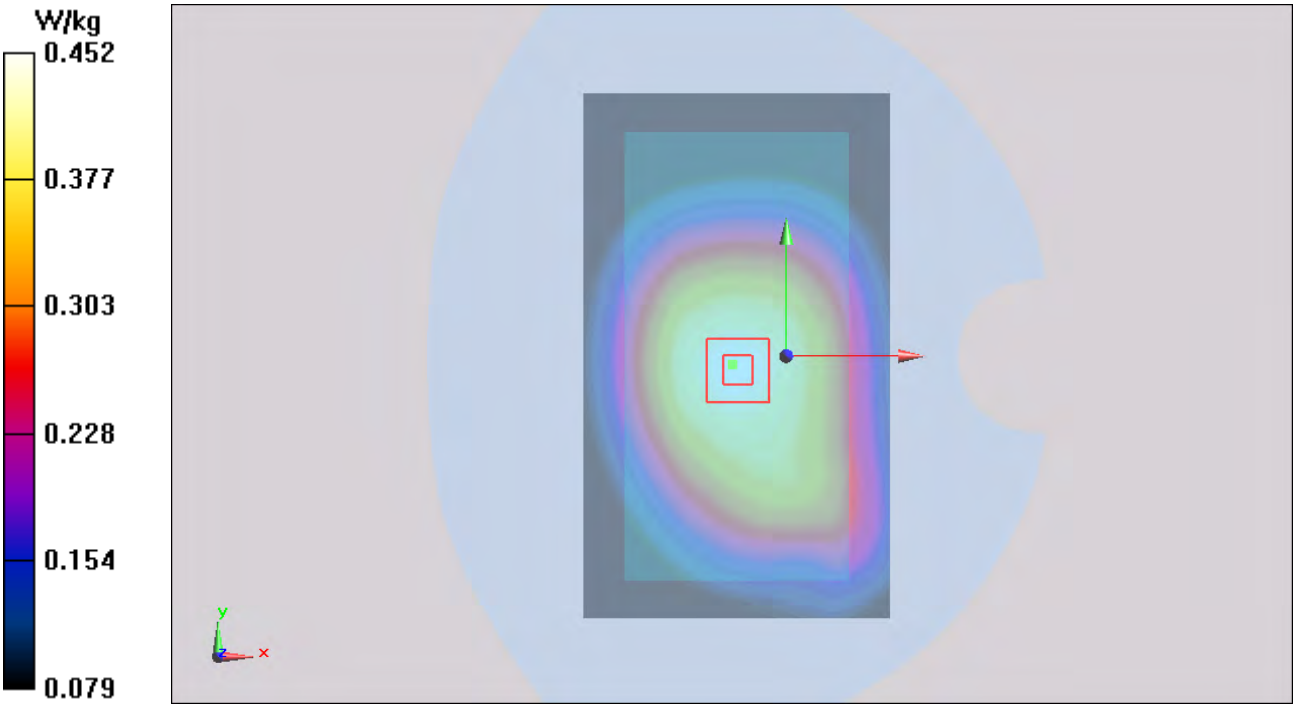



**Figure 24 Body, CDMA BC0 Front Side Channel 384**

## CDMA BC0 Back Side Middle(0mm)

Date: 12/31/2014

Communication System: UID 0, CDMA (0); Frequency: 836.52 MHz;Duty Cycle: 1:1

Medium parameters used: f = 837 MHz; σ = 0.992 S/m; $\varepsilon_r$ = 55.882; ρ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014;

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 (71x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 3.59 W/kg

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

Reference Value = 13.348 V/m; Power Drift = 0.001 dB

Peak SAR (extrapolated) = 7.07 W/kg

**SAR(1 g) = 3.19 W/kg; SAR(10 g) = 1.61 W/kg**

Maximum value of SAR (measured) = 3.68 W/kg

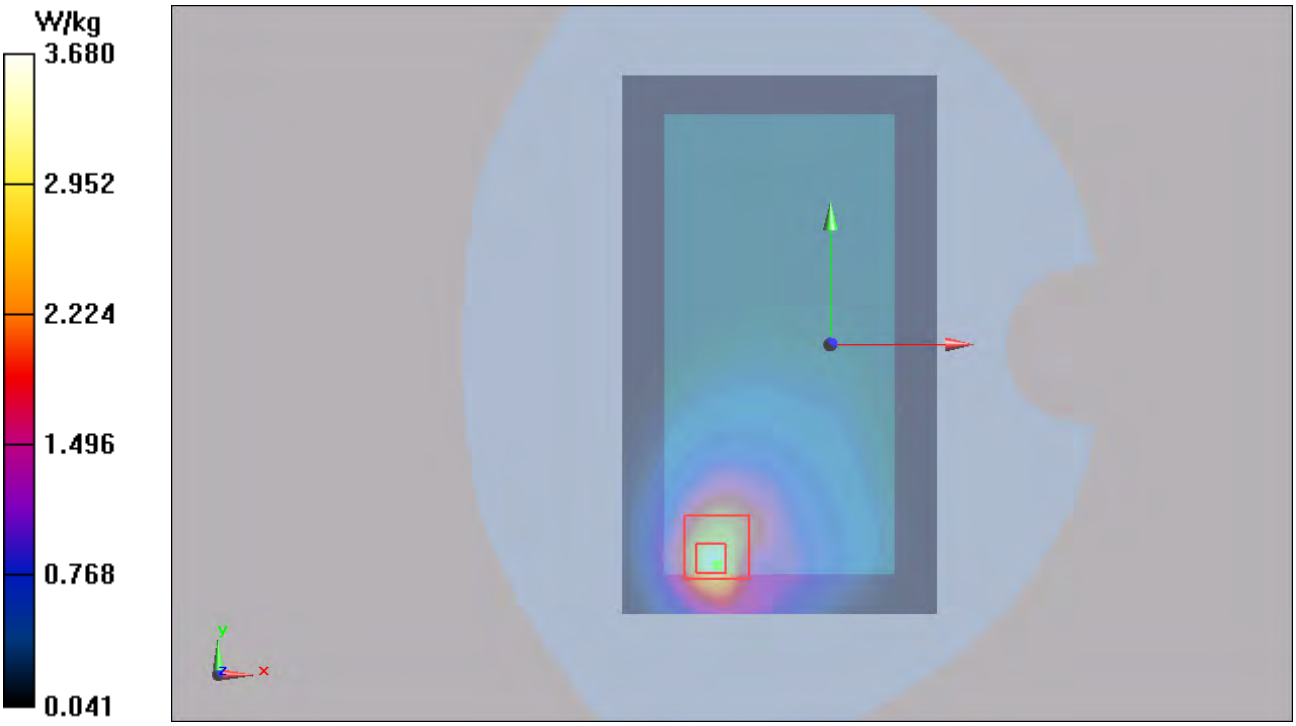



**Figure 25 Body, CDMA BC0 Back Side Channel 384**

**CDMA BC0 Front Side Middle(0mm)**

Date: 12/31/2014

Communication System: CDMA Cellular; Frequency: 836.52 MHz;Duty Cycle: 1:1

Medium parameters used: f = 837 MHz; σ = 1 mho/m; $\varepsilon_r$ = 55.1; ρ = 1000 kg/$m^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 – SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014;

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

Phantom: SAM 11; Type: SAM V4.0; Serial: TP-1246

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

**Front Side Middle/Area Scan (71x121x1):** Measurement grid: dx=1.500mm, dy=1.500mm

Maximum value of SAR (interpolated) = 2.96 mW/g

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

Reference Value = 12.3 V/m; Power Drift = 0.025 dB

Peak SAR (extrapolated) = 5.12 W/kg

**SAR(1 g) = 2.55 mW/g; SAR(10 g) = 1.48 mW/g**

Maximum value of SAR (measured) = 2.67 mW/g

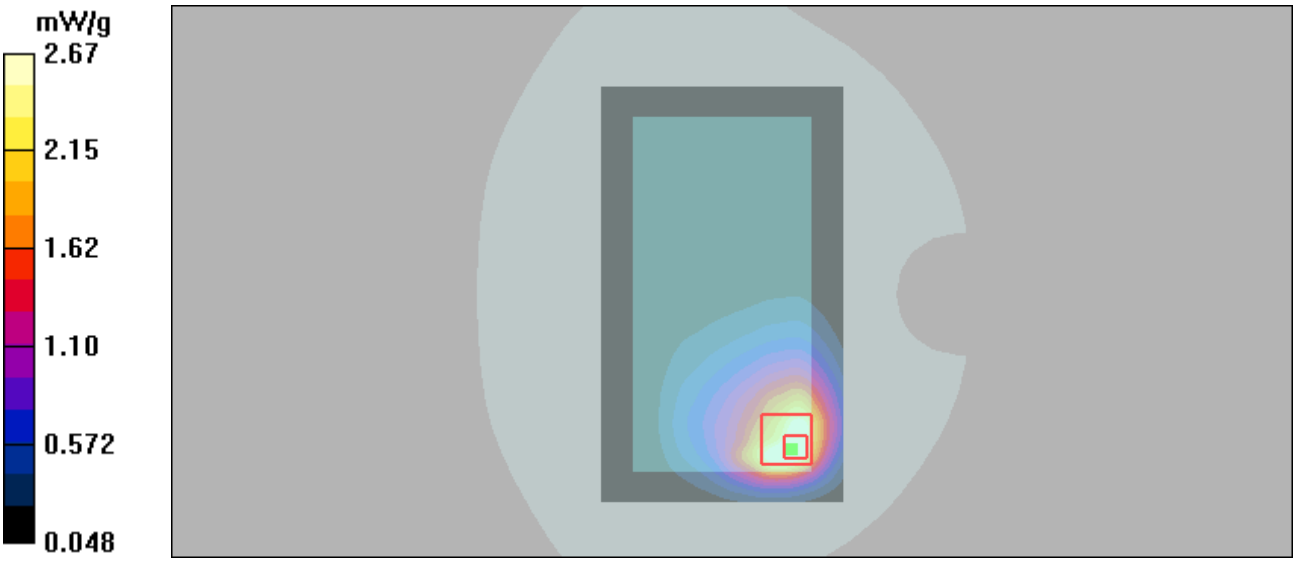



**Figure 26 Body, CDMA BC0 Front Side Channel 384**

**CDMA BC0 Right Edge Middle(0mm)**

Date: 12/31/2014

Communication System: CDMA Cellular; Frequency: 836.52 MHz;Duty Cycle: 1:1

Medium parameters used: f = 837 MHz; $\sigma$ = 1 mho/m; $\varepsilon_r$ = 55.1; $\rho$ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 – SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014;

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

Phantom: SAM 11; Type: SAM V4.0; Serial: TP-1246

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

**Right Edge Middle /Area Scan (51x181x1):** Measurement grid: dx=1.000mm, dy=1.000mm

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

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

Reference Value = 23.3 V/m; Power Drift = 0.016 dB

Peak SAR (extrapolated) = 3.46 W/kg

**SAR(1 g) = 1.19 mW/g; SAR(10 g) = 0.515 mW/g**

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

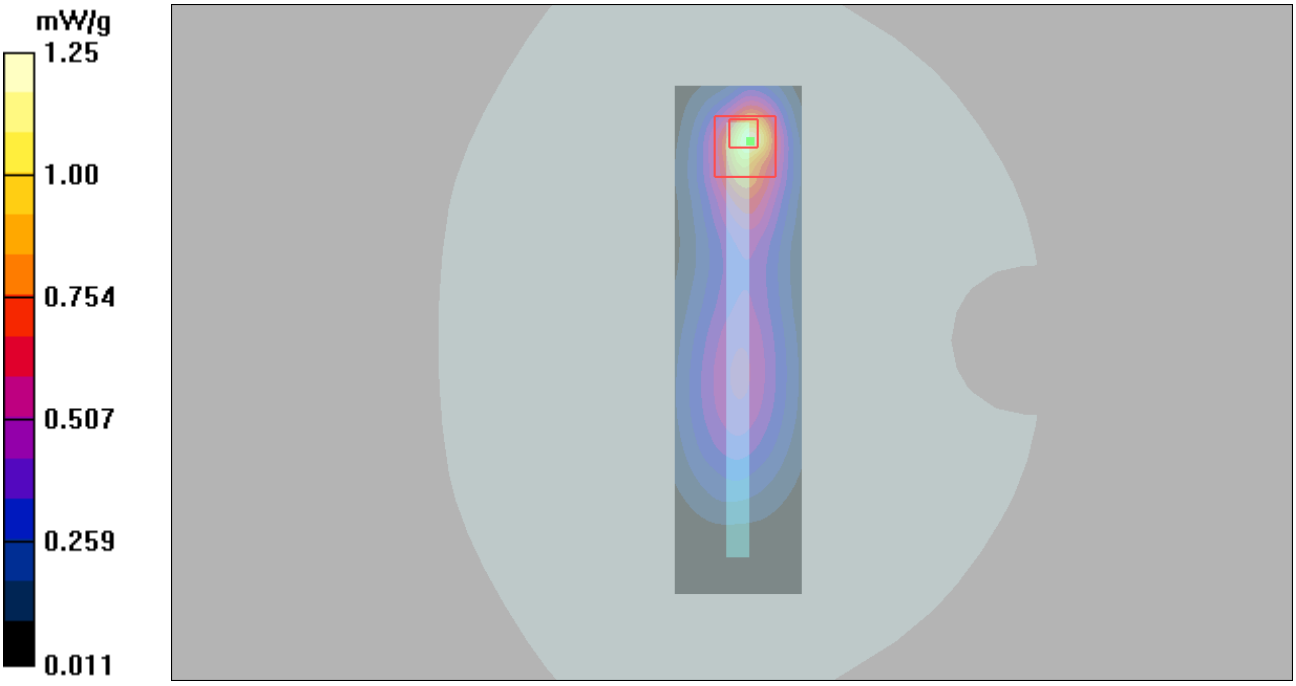



**Figure 27 Body, CDMA BC0 Right Edge Channel 384**

**CDMA BC0 Bottom Edge Middle(0mm)**

Date: 12/31/2014

Communication System: CDMA Cellular; Frequency: 836.52 MHz;Duty Cycle: 1:1

Medium parameters used: f = 837 MHz; σ = 1 mho/m; $\varepsilon_r$ = 55.1; ρ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 – SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014;

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

Phantom: SAM 11; Type: SAM V4.0; Serial: TP-1246

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

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

Maximum value of SAR (interpolated) = 1.68 mW/g

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

Reference Value = 37.0 V/m; Power Drift = -0.037 dB

Peak SAR (extrapolated) = 7.86 W/kg

**SAR(1 g) = 2.53 mW/g; SAR(10 g) = 0.975 mW/g**

Maximum value of SAR (measured) = 3.23 mW/g

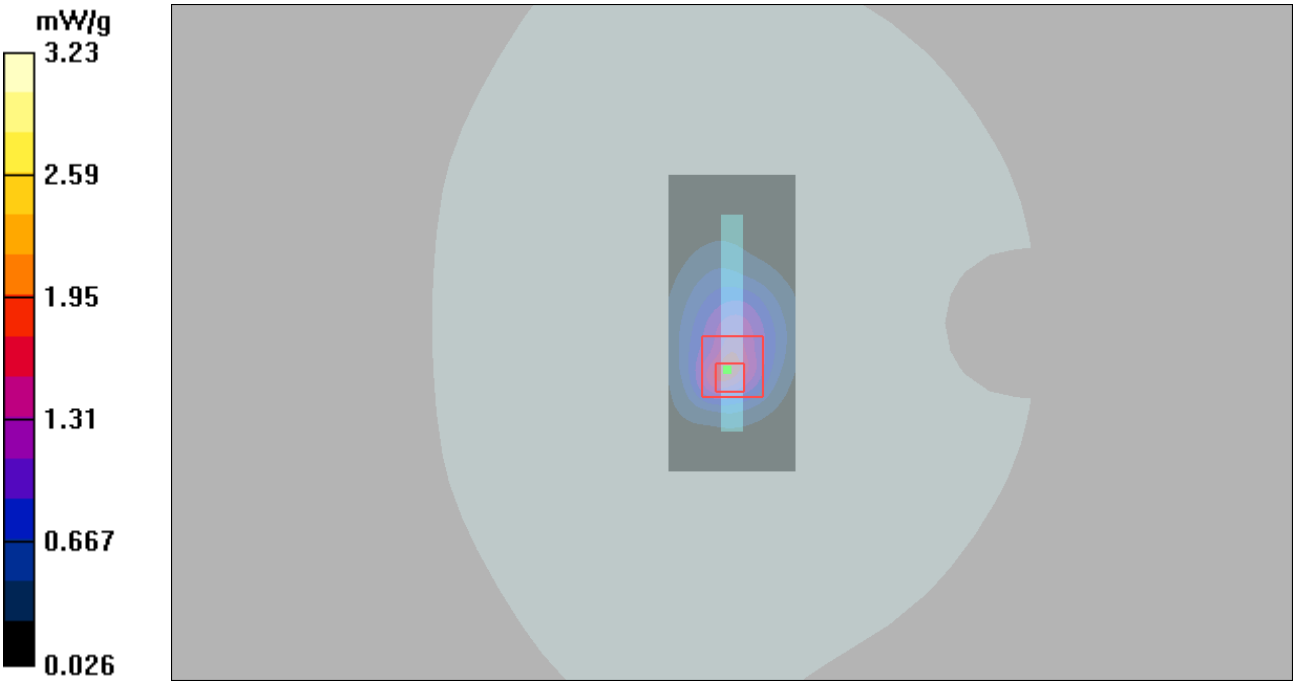


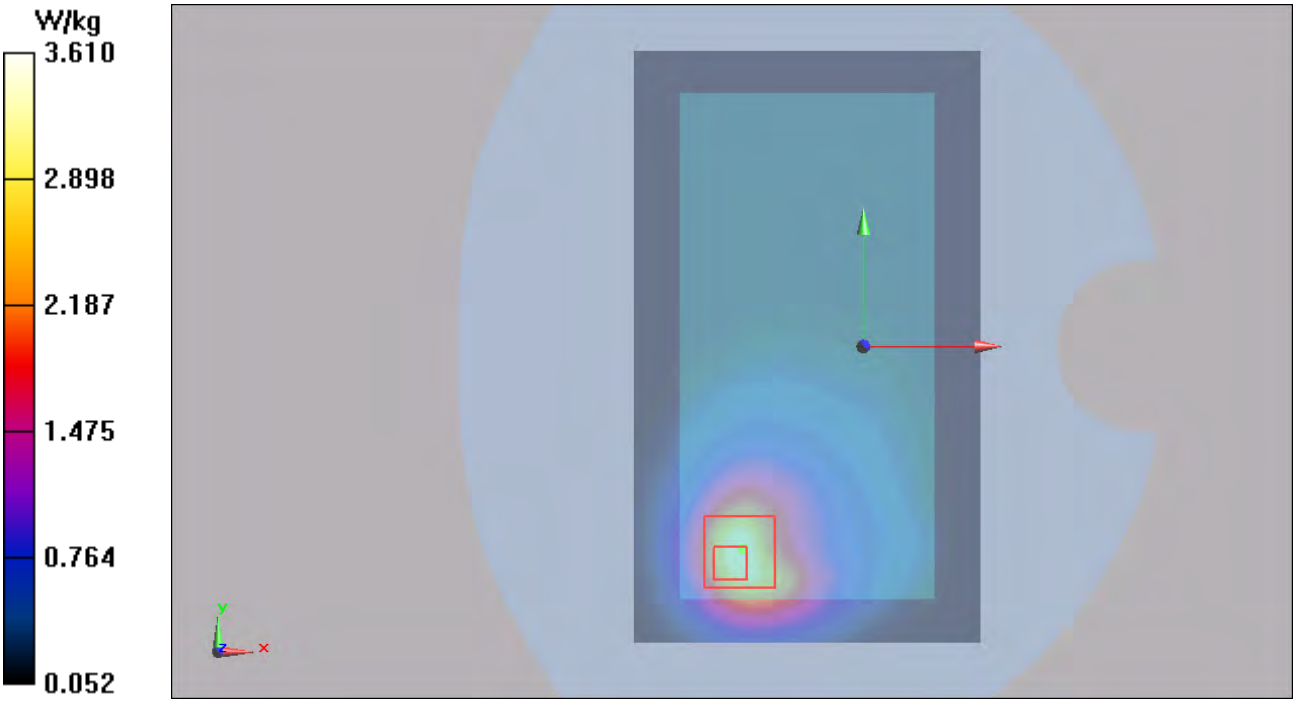

**Figure 28 Body, CDMA BC0 Bottom Edge Channel 384**

## CDMA BC0 EVDO Back Side Middle(0mm)

Date: 12/31/2014
Communication System: UID 0, CDMA (0); Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium parameters used: f = 837 MHz; σ = 0.992 S/m; $\varepsilon_r$ = 55.882; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014;
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 (71x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 3.41 W/kg

**Back Side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.292 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 8.05 W/kg
**SAR(1 g) = 3.37 W/kg; SAR(10 g) = 1.66 W/kg**
Maximum value of SAR (measured) = 3.61 W/kg



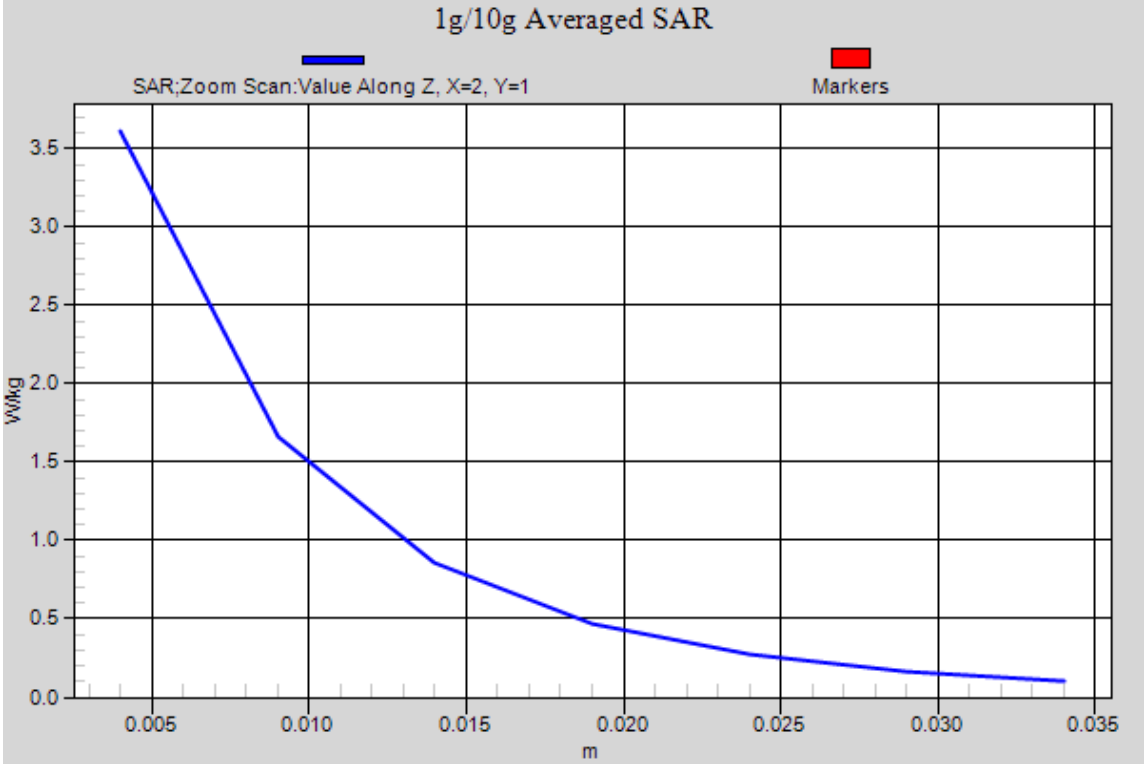



**Figure 29 Body, CDMA BC0 EVDO Back Side Channel 384**

**CDMA BC0 EVDO Front Side Middle(0mm)**

Date: 12/31/2014

Communication System: CDMA Cellular; Frequency: 836.52 MHz;Duty Cycle: 1:1

Medium parameters used: f = 837 MHz; σ = 1 mho/m; $\varepsilon_r$ = 55.1; ρ = 1000 kg/$m^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 – SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014;

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

Phantom: SAM 11; Type: SAM V4.0; Serial: TP-1246

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

**Front Side Middle/Area Scan (71x121x1):** Measurement grid: dx=1.500mm, dy=1.500mm

Maximum value of SAR (interpolated) = 3.03 mW/g

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

Reference Value = 11.9 V/m; Power Drift = 0.130 dB

Peak SAR (extrapolated) = 5.09 W/kg

**SAR(1 g) = 2.55 mW/g; SAR(10 g) = 1.48 mW/g**

Maximum value of SAR (measured) = 2.64 mW/g

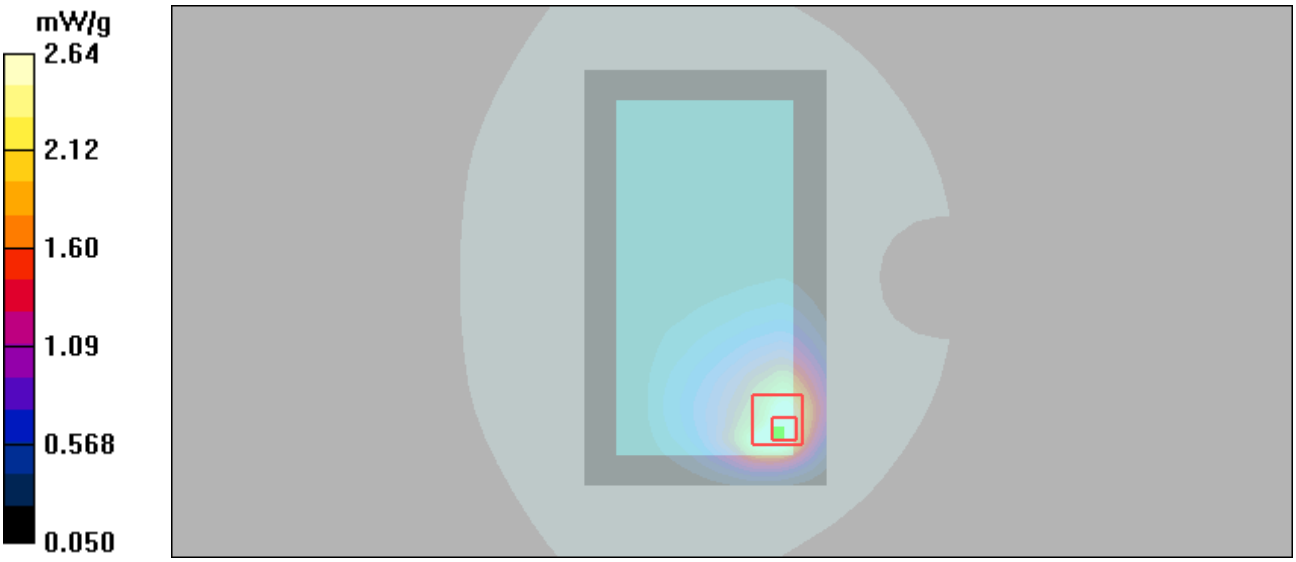



**Figure 30 Body, CDMA BC0 EVDO Front Side Channel 384**

**CDMA BC0 EVDO Right Edge Middle(0mm)**

Date: 12/31/2014

Communication System: CDMA Cellular; Frequency: 836.52 MHz;Duty Cycle: 1:1

Medium parameters used: f = 837 MHz; σ = 1 mho/m; $\varepsilon_r$ = 55.1; ρ = 1000 kg/$m^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 – SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014;

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

Phantom: SAM 11; Type: SAM V4.0; Serial: TP-1246

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

**Right Edge Middle/Area Scan (51x181x1):** Measurement grid: dx=1.000mm, dy=1.000mm

Maximum value of SAR (interpolated) = 1.58 mW/g

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

Reference Value = 24.7 V/m; Power Drift = 0.033 dB

Peak SAR (extrapolated) = 4.39 W/kg

**SAR(1 g) = 1.54 mW/g; SAR(10 g) = 0.668 mW/g**

Maximum value of SAR (measured) = 1.67 mW/g

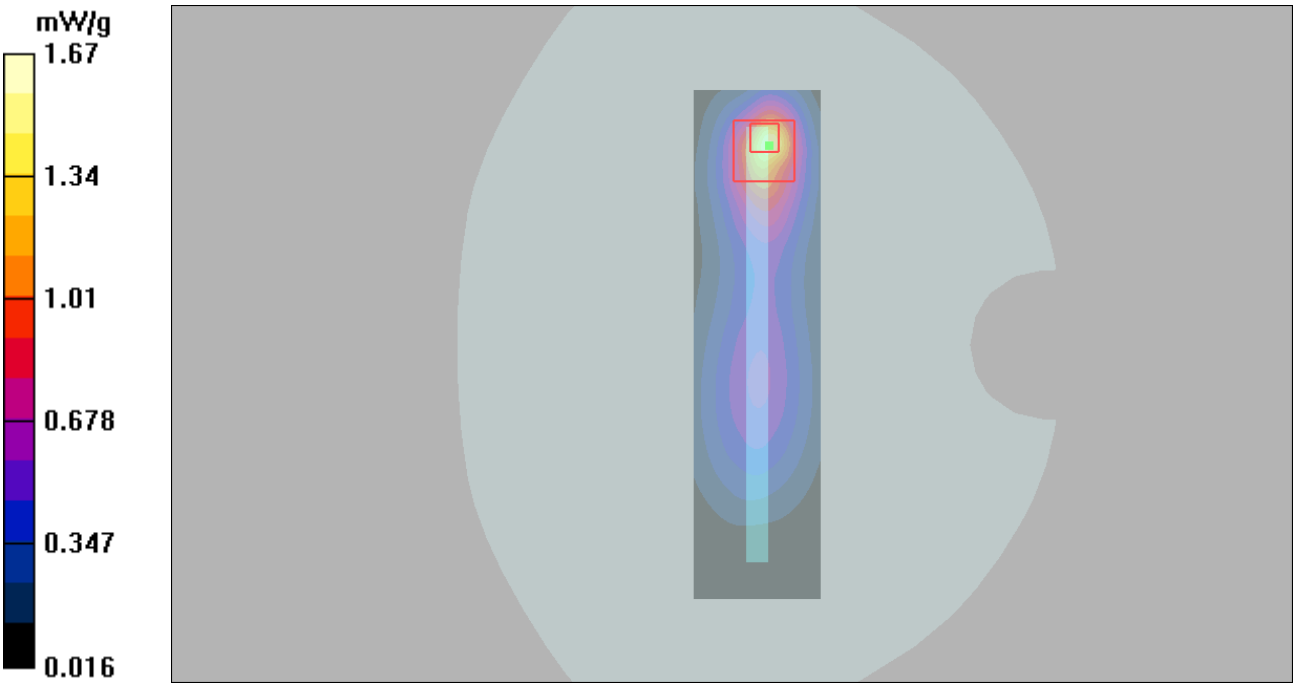



**Figure 31 Body, CDMA BC0 EVDO Right Edge Channel 384**

**CDMA BC0 EVDO Bottom Edge Middle(0mm)**

Date: 12/31/2014

Communication System: CDMA Cellular; Frequency: 836.52 MHz;Duty Cycle: 1:1

Medium parameters used: f = 837 MHz; σ = 1 mho/m; $\varepsilon_r$ = 55.1; ρ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 – SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014;

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

Phantom: SAM 11; Type: SAM V4.0; Serial: TP-1246

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

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

Maximum value of SAR (interpolated) = 1.99 mW/g

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

Reference Value = 37.9 V/m; Power Drift = 0.056 dB

Peak SAR (extrapolated) = 8.28 W/kg

**SAR(1 g) = 2.6 mW/g; SAR(10 g) = 1.02 mW/g**

Maximum value of SAR (measured) = 2.53 mW/g

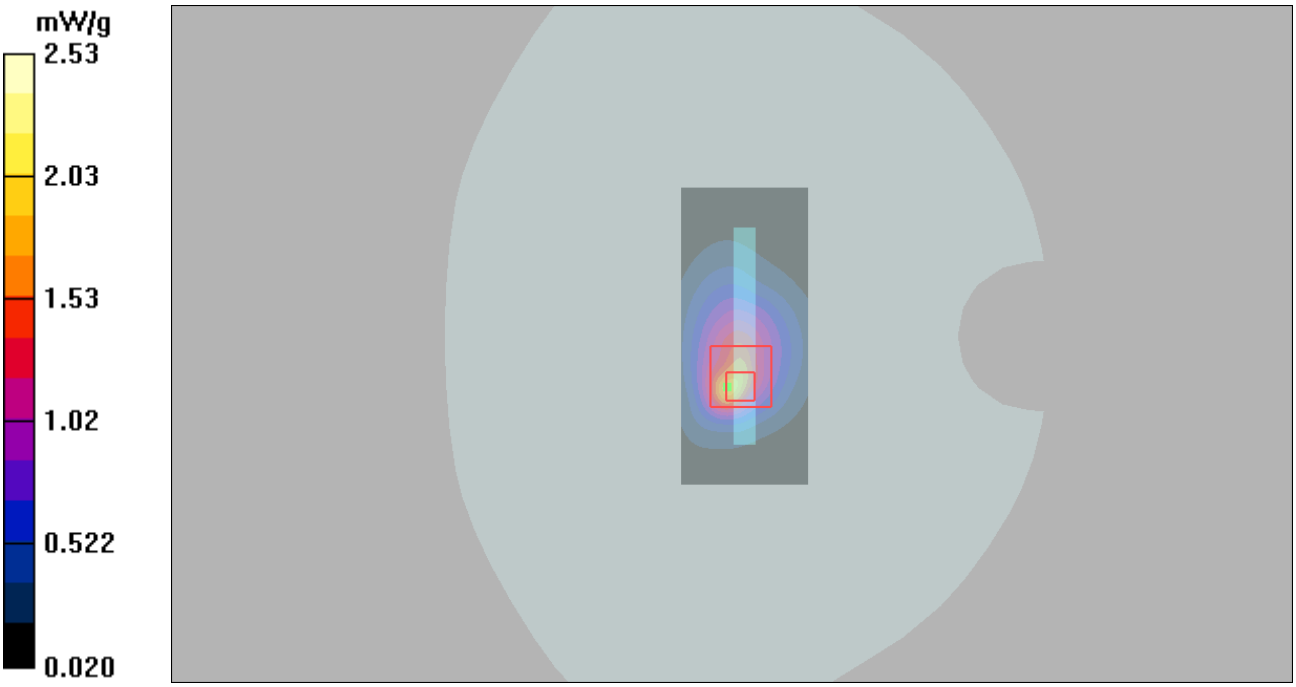



**Figure 32 Body, CDMA BC0 EVDO Bottom Edge Channel 384**

## CDMA BC1 Left Cheek Middle

Date: 11/27/2014
Communication System: UID 0, CDMA (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.413 S/m; $\varepsilon_r$ = 39.689; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Left Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(7.97, 7.97, 7.97); Calibrated: 2/17/2014;
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 (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.290 W/kg

**Left Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.995 V/m; Power Drift = 0.047 dB
Peak SAR (extrapolated) = 0.378 W/kg
**SAR(1 g) = 0.264 W/kg; SAR(10 g) = 0.169 W/kg**
Maximum value of SAR (measured) = 0.279 W/kg

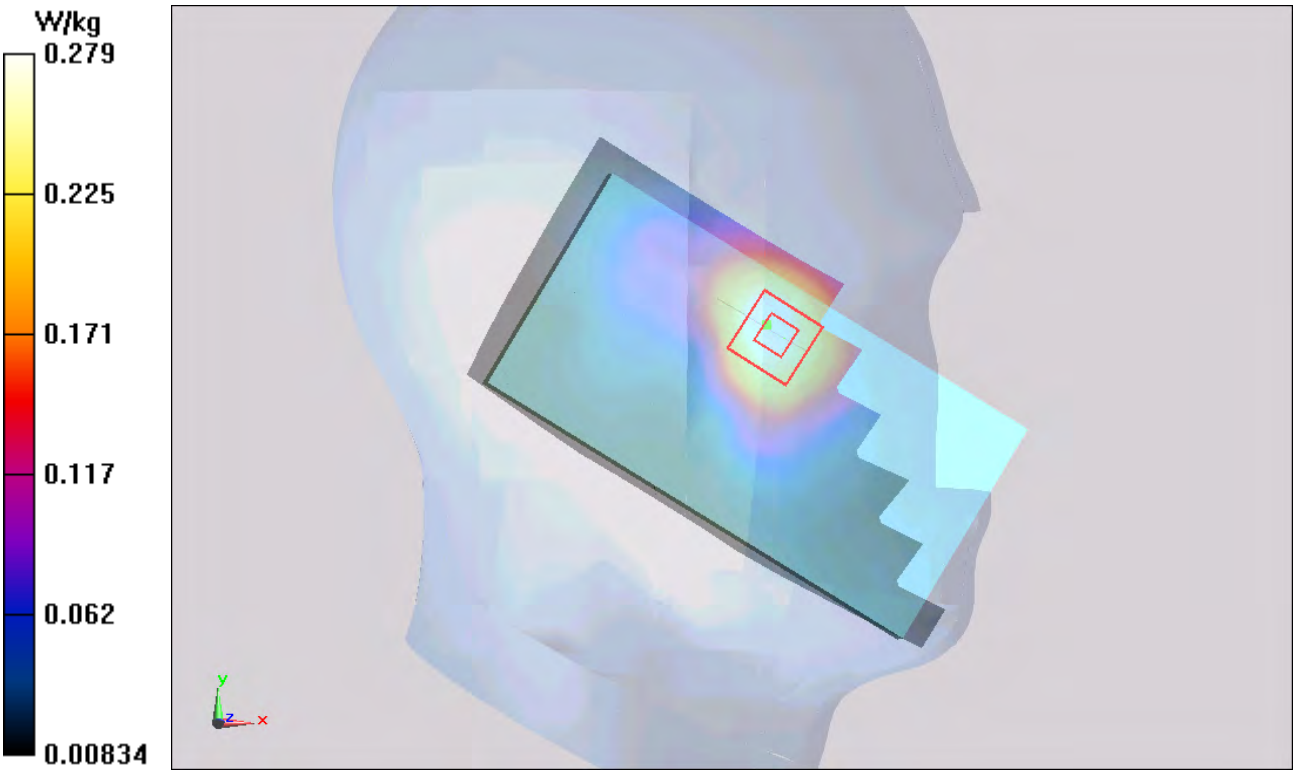



**Figure 33 CDMA BC1 Left Hand Touch Cheek Channel 600**

## CDMA BC1 Left Tilt Middle

Date: 11/27/2014

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

Medium parameters used: f = 1880 MHz; σ = 1.413 S/m; $\varepsilon_r$ = 39.689; ρ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Left Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(7.97, 7.97, 7.97); Calibrated: 2/17/2014;

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 (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

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

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

Reference Value = 8.656 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 0.300 W/kg

**SAR(1 g) = 0.197 W/kg; SAR(10 g) = 0.120 W/kg**

Maximum value of SAR (measured) = 0.215 W/kg

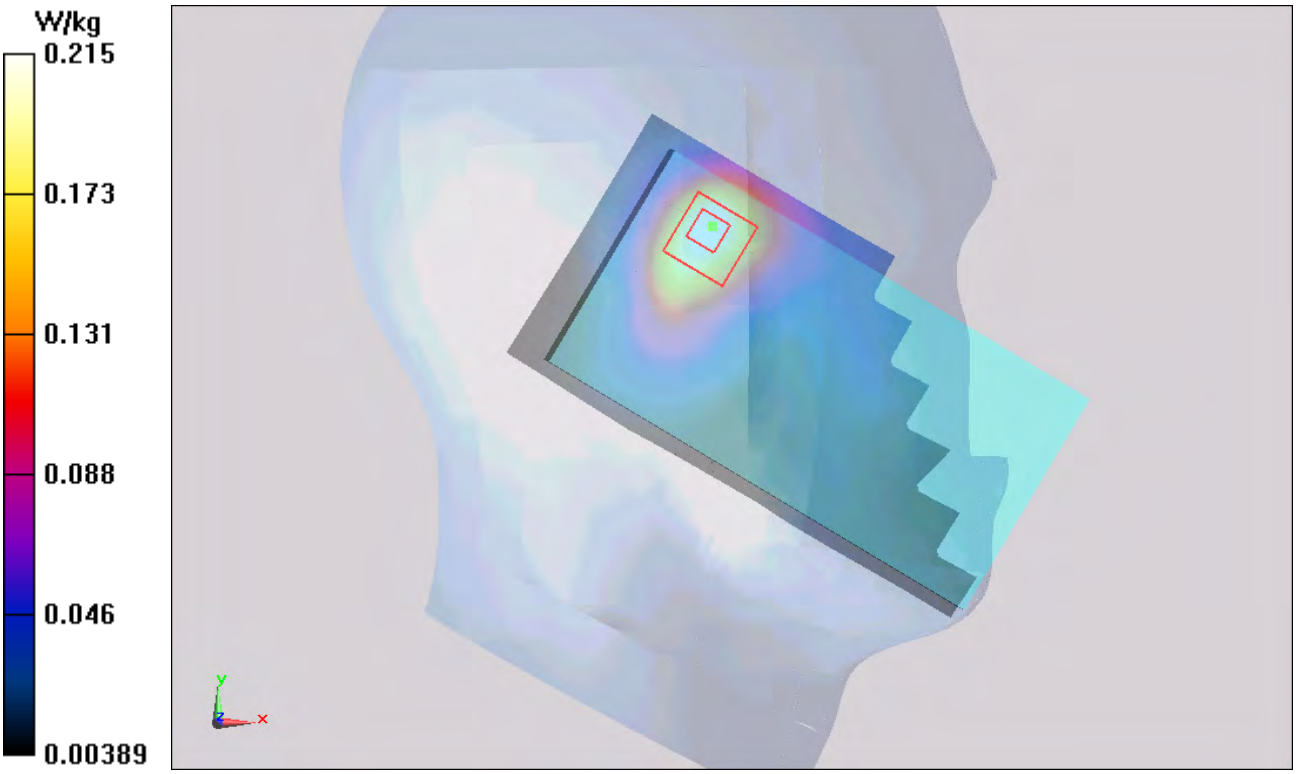


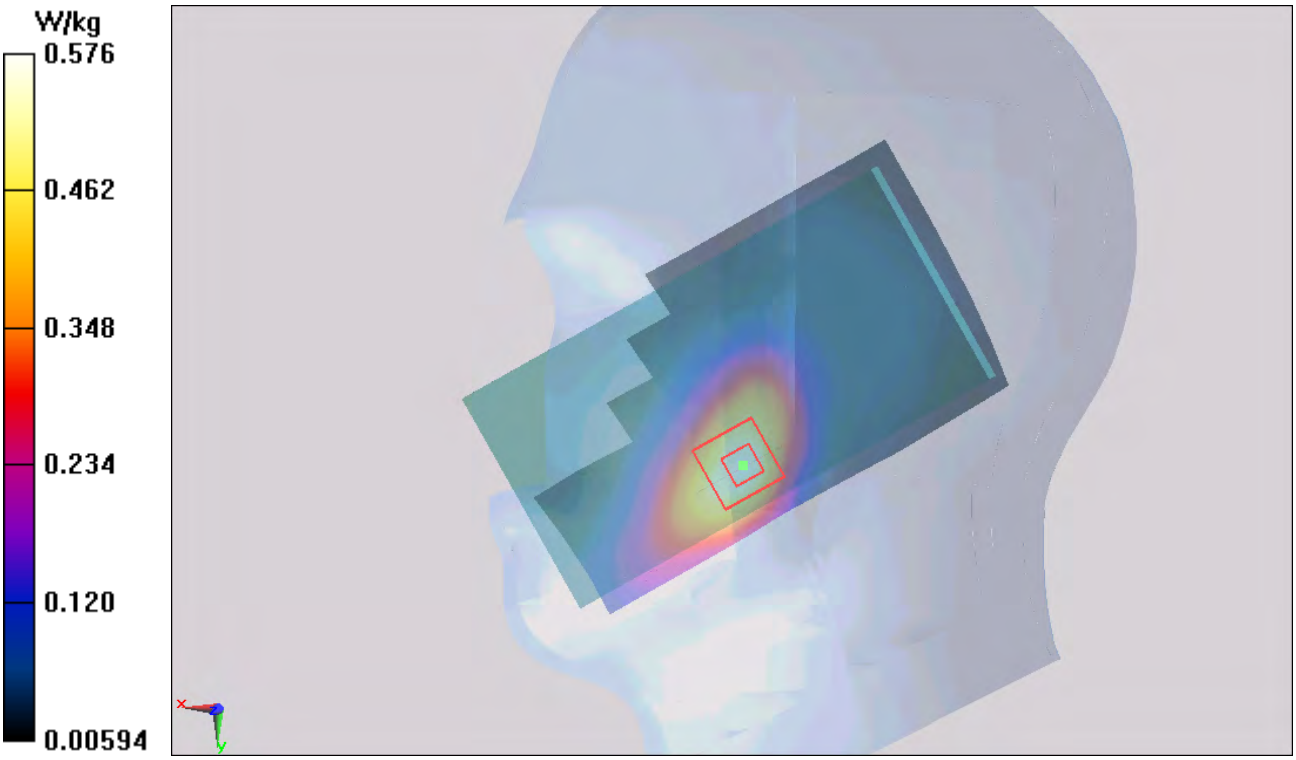

**Figure 34 CDMA BC1 Left Hand Tilt 15° Channel 600**

## CDMA BC1 Right Cheek Middle

Date: 11/27/2014
Communication System: UID 0, CDMA (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.413 S/m; $\varepsilon_r$ = 39.689; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Right Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(7.97, 7.97, 7.97); Calibrated: 2/17/2014;
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 (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.583 W/kg

**Right Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.968 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 0.780 W/kg
**SAR(1 g) = 0.527 W/kg; SAR(10 g) = 0.329 W/kg**
Maximum value of SAR (measured) = 0.576 W/kg



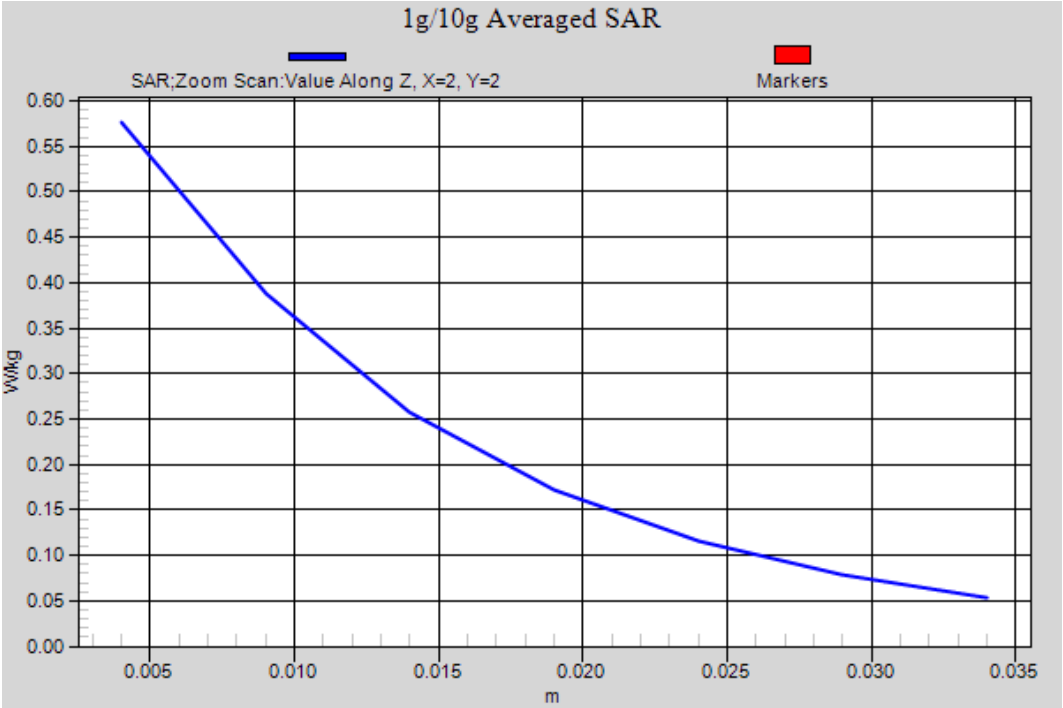



**Figure 35 CDMA BC1 Right Hand Touch Cheek Channel 600**

## CDMA BC1 Right Tilt Middle

Date: 11/27/2014
Communication System: UID 0, CDMA (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.413 S/m; $\varepsilon_r$ = 39.689; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Right Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(7.97, 7.97, 7.97); Calibrated: 2/17/2014;
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 (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.193 W/kg

**Right Tilt Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.967 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.261 W/kg
**SAR(1 g) = 0.176 W/kg; SAR(10 g) = 0.109 W/kg**
Maximum value of SAR (measured) = 0.183 W/kg

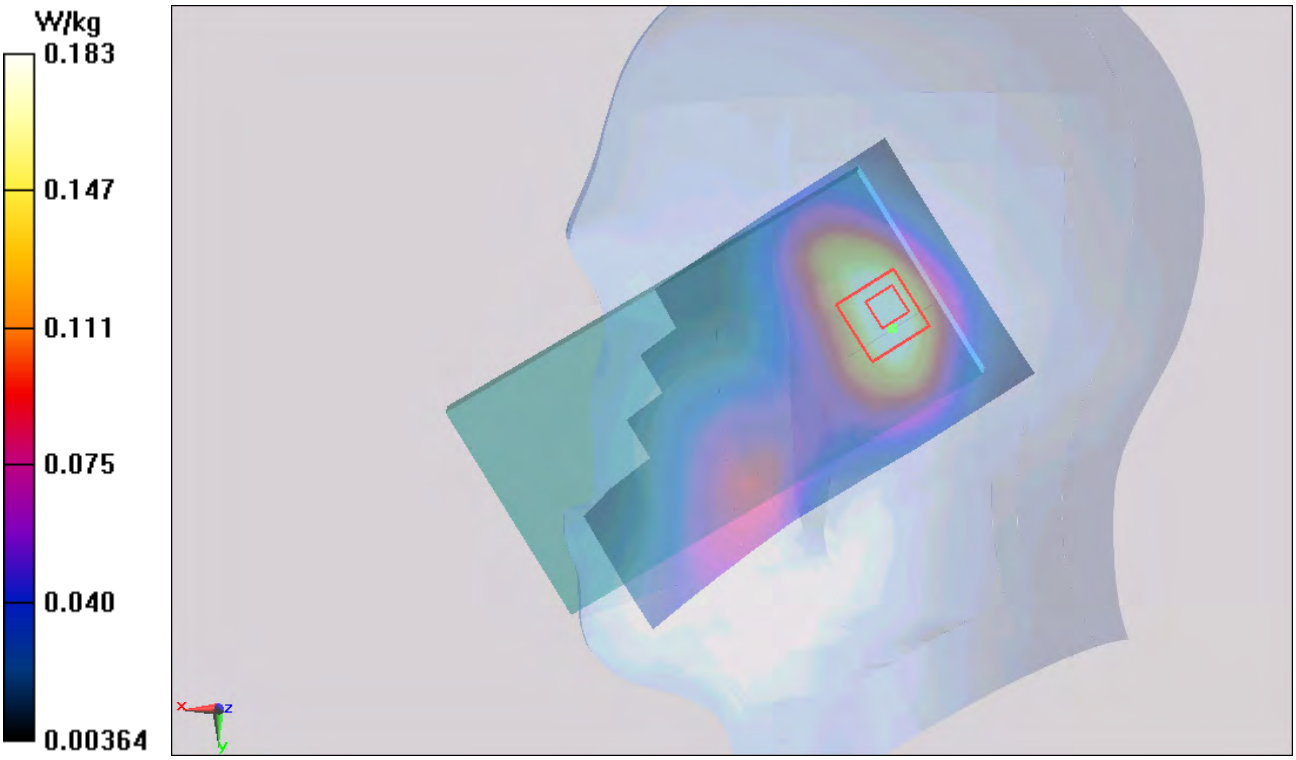



**Figure 36 CDMA BC1 Right Hand Tilt 15° Channel 600**

## CDMA BC1 Back Side Middle(15mm)

Date: 12/3/2014

Communication System: UID 0, CDMA ; Frequency: 1880 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1880 MHz; σ = 1.503 S/m; $\varepsilon_r$ = 52.61; ρ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014;

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 (71x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.262 W/kg

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

Reference Value = 6.766 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.407 W/kg

**SAR(1 g) = 0.236 W/kg; SAR(10 g) = 0.129 W/kg**

Maximum value of SAR (measured) = 0.246 W/kg

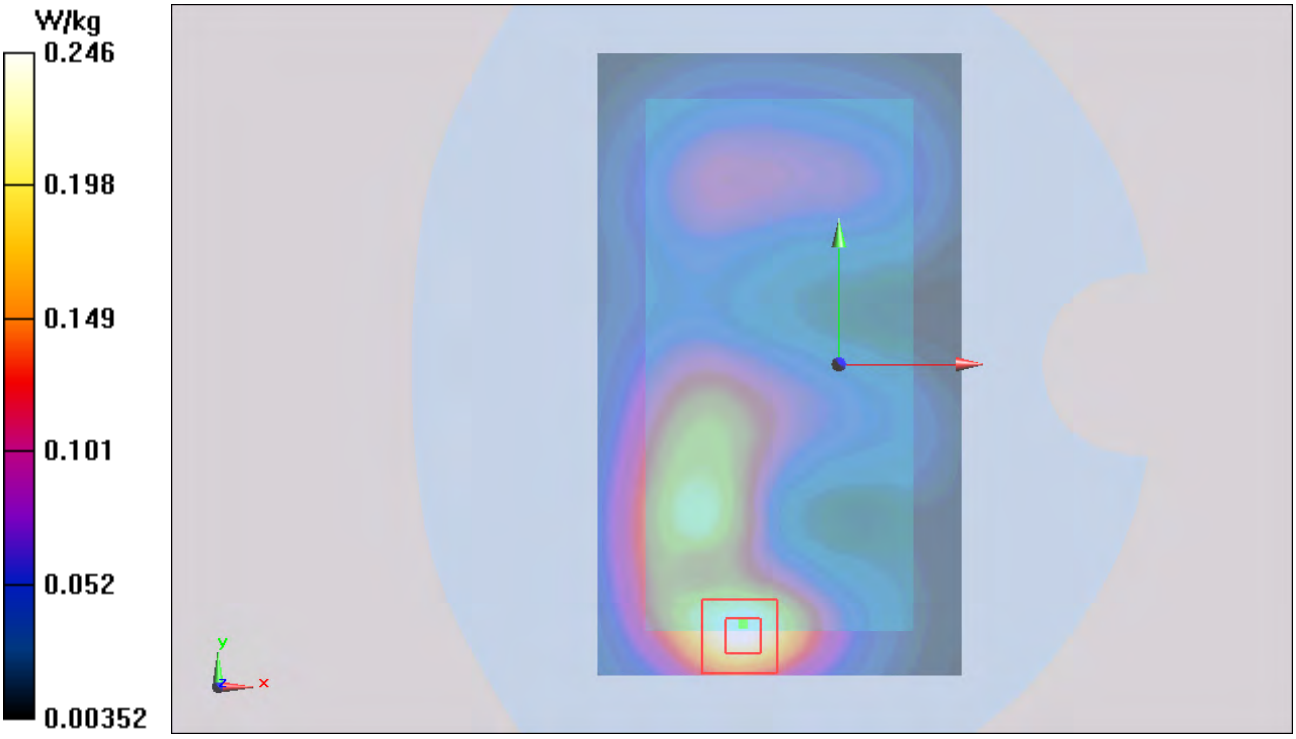



**Figure 37 Body, CDMA BC1 Back Side Channel 600**

## CDMA BC1 Front Side Middle (15mm)

Date: 12/3/2014

Communication System: UID 0, CDMA ; Frequency: 1880 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1880 MHz; σ = 1.503 S/m; $\varepsilon_r$ = 52.61; ρ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014;

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 (71x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.241 W/kg

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

Reference Value = 6.004 V/m; Power Drift = -0.19 dB

Peak SAR (extrapolated) = 0.357 W/kg

**SAR(1 g) = 0.230 W/kg; SAR(10 g) = 0.141 W/kg**

Maximum value of SAR (measured) = 0.246 W/kg

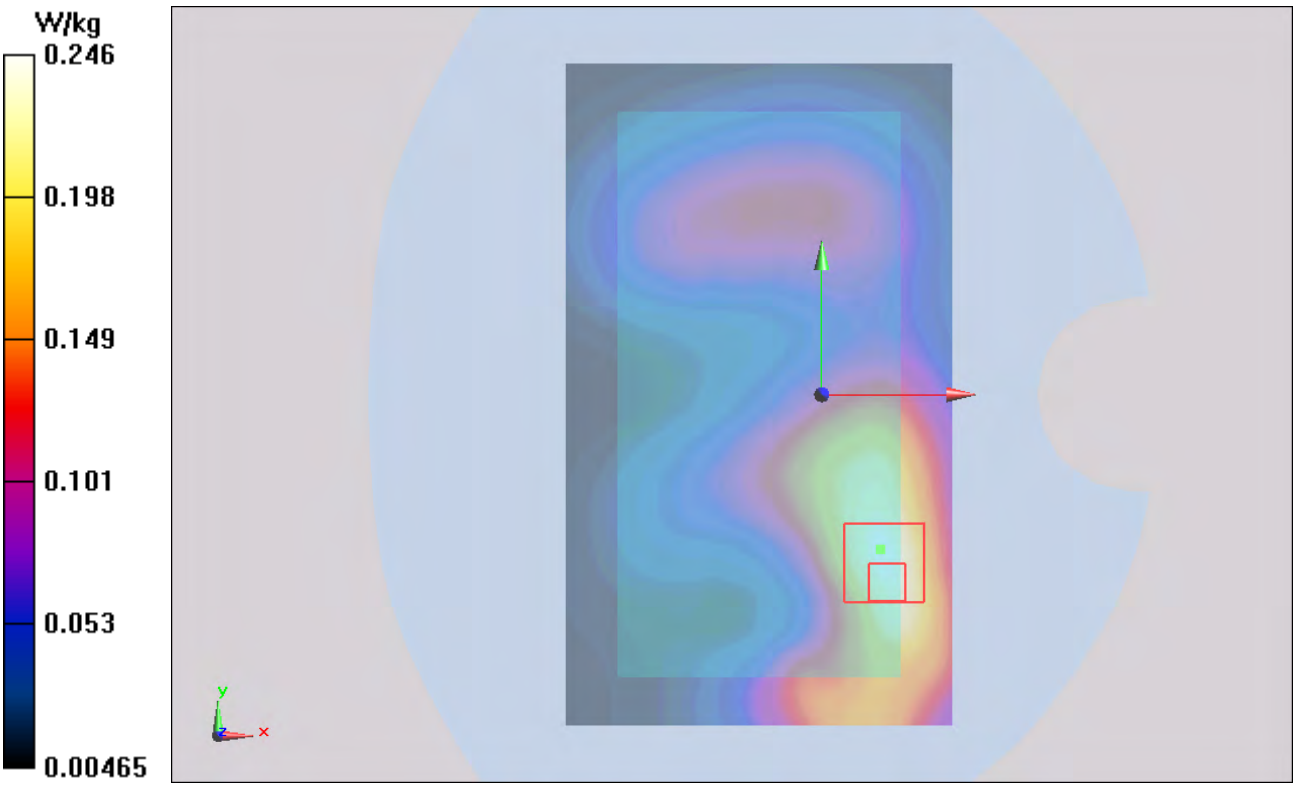



**Figure 38 Body, CDMA BC1 Front Side Channel 600**

## CDMA BC1 Back Side High(0mm)

Date: 12/30/2014

Communication System: UID 0, CDMA (0); Frequency: 1908.75 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1909 MHz; σ = 1.533 S/m; $\varepsilon_r$ = 52.528; ρ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014;

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 (71x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 5.33 W/kg

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

Reference Value = 10.962 V/m; Power Drift = 0.020 dB

Peak SAR (extrapolated) = 10.4 W/kg

**SAR(1 g) = 4.53 W/kg; SAR(10 g) = 1.97 W/kg**

Maximum value of SAR (measured) = 5.39 W/kg

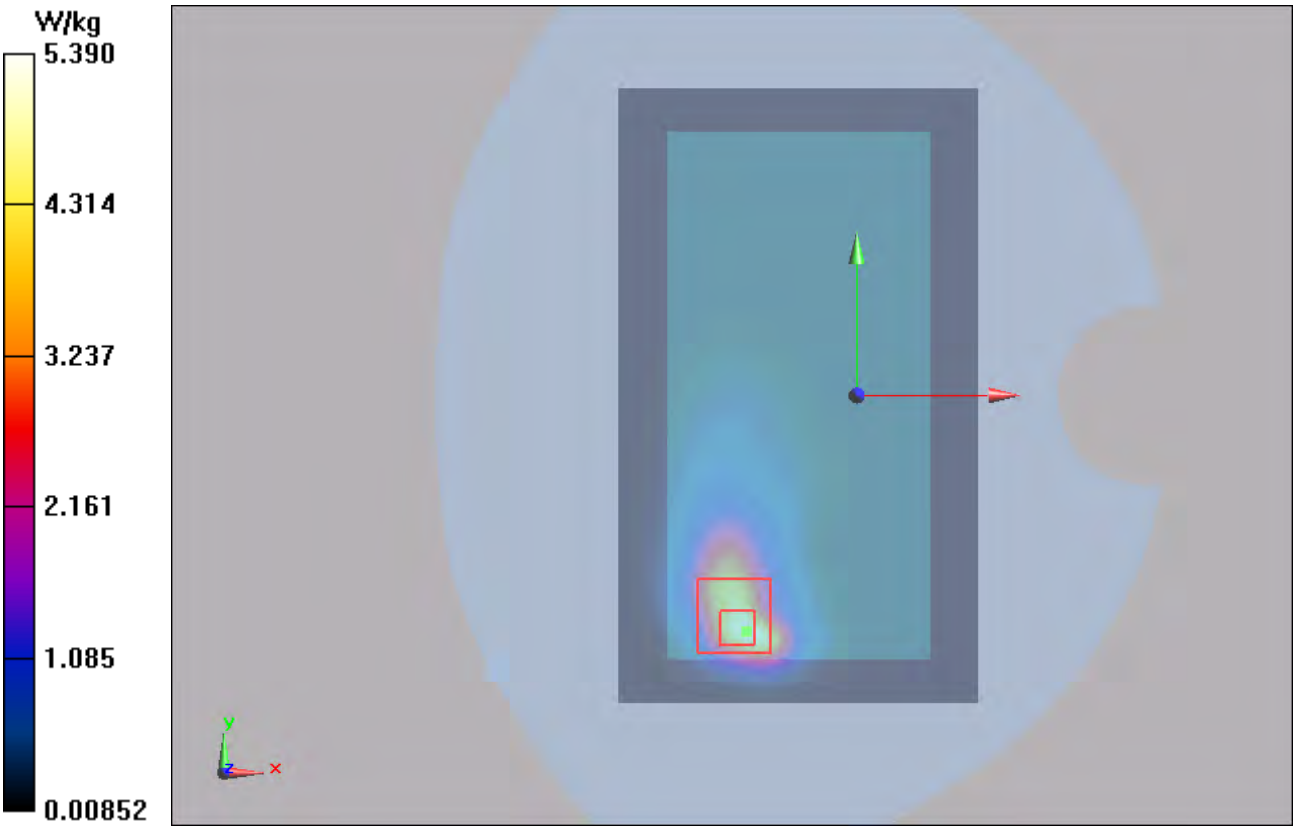



**Figure 39 Body, CDMA BC1 Back Side Channel 1175**

## CDMA BC1 Back Side Middle(0mm)

Date: 12/30/2014

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

Medium parameters used: f = 1880 MHz; σ = 1.503 S/m; $\varepsilon_r$ = 52.61; ρ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014;

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 (71x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 5.49 W/kg

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

Reference Value = 11.702 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 10.5 W/kg

**SAR(1 g) = 4.67 W/kg; SAR(10 g) = 2.1 W/kg**

Maximum value of SAR (measured) = 5.47 W/kg

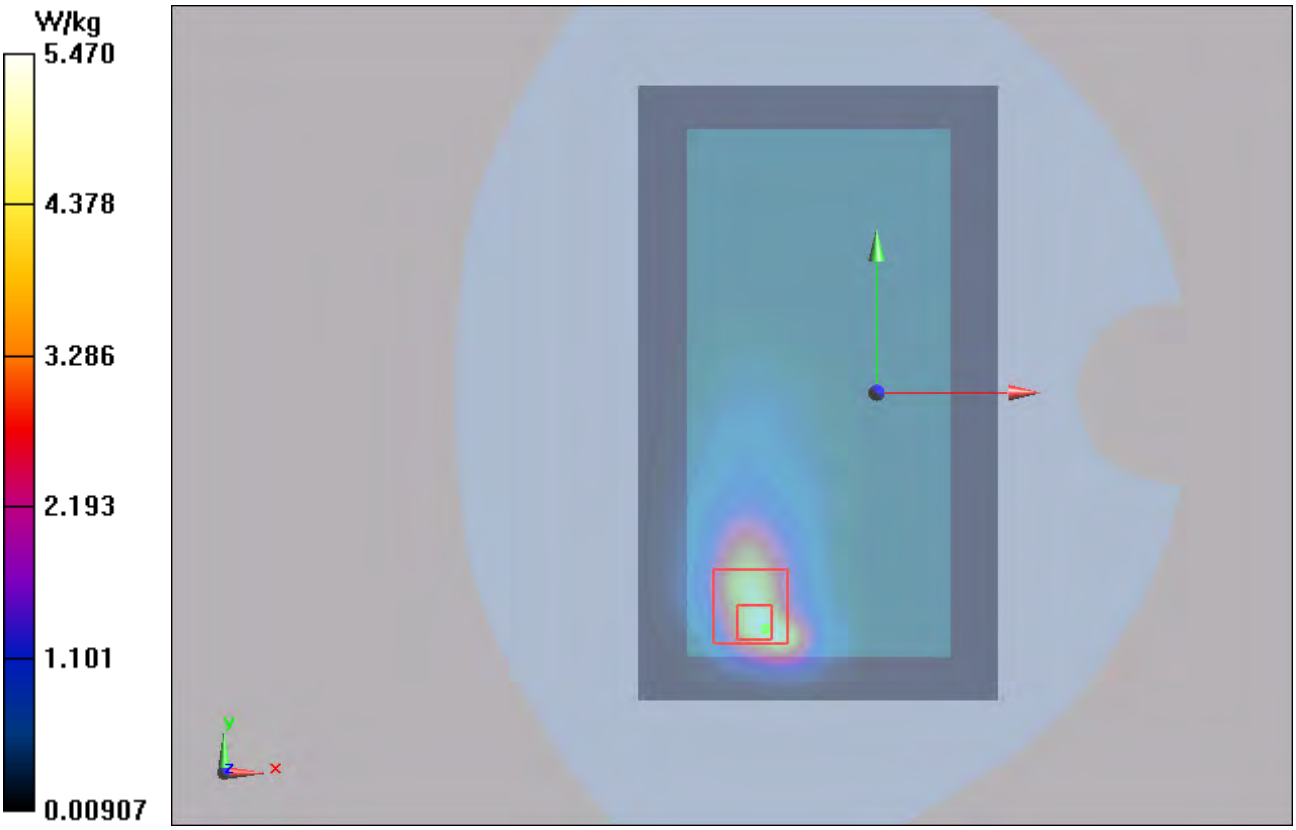



**Figure 40 Body, CDMA BC1 Back Side Channel 600**

## CDMA BC1 Back Side Low(0mm)

Date: 12/30/2014

Communication System: UID 0, CDMA (0); Frequency: 1851.25 MHz;Duty Cycle: 1:1

Medium parameters used (interpolated): f = 1851.25 MHz; σ = 1.473 S/m; $\varepsilon_r$ = 52.662; ρ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014;

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 Low/Area Scan (71x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 7.97 W/kg

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

Reference Value = 10.665 V/m; Power Drift = 0.025 dB

Peak SAR (extrapolated) = 12.2 W/kg

**SAR(1 g) = 5.42 W/kg; SAR(10 g) = 2.38 W/kg**

Maximum value of SAR (measured) = 6.09 W/kg

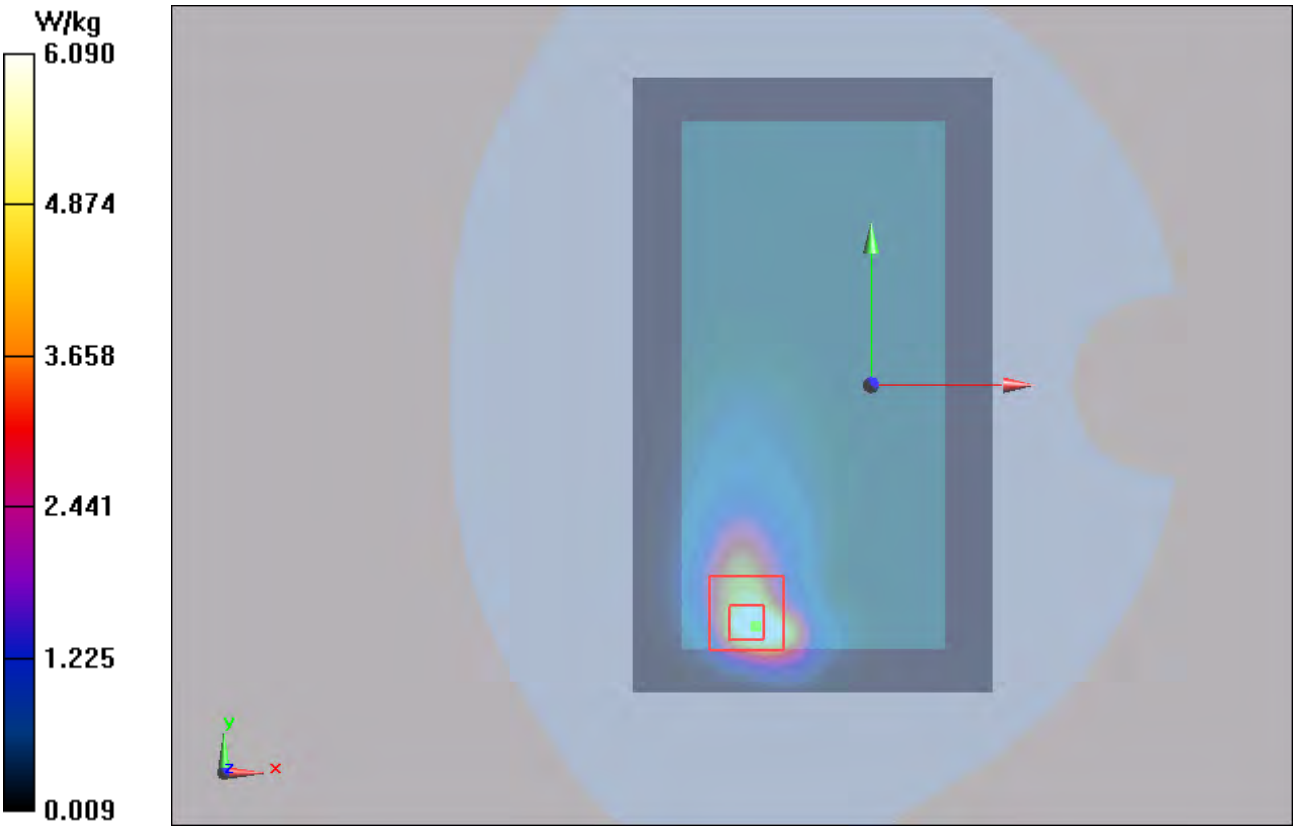



**Figure 41 Body, CDMA BC1 Back Side Channel 25**

## CDMA BC1 Front Side Middle(0mm)

Date: 12/30/2014

Communication System: CDMA PCS; Frequency: 1880 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1880 MHz; σ = 1.5 mho/m; $\varepsilon_r$ = 52.5; ρ = 1000 kg/$m^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 – SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014;

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

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

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

**Front Side Middle/Area Scan (71x121x1):** Measurement grid: dx=1.500mm, dy=1.500mm

Maximum value of SAR (interpolated) = 3.77 mW/g

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

Reference Value = 3.72 V/m; Power Drift = 0.120 dB

Peak SAR (extrapolated) = 5.20 W/kg

**SAR(1 g) = 2.8 mW/g; SAR(10 g) = 1.44 mW/g**

Maximum value of SAR (measured) = 2.95 mW/g

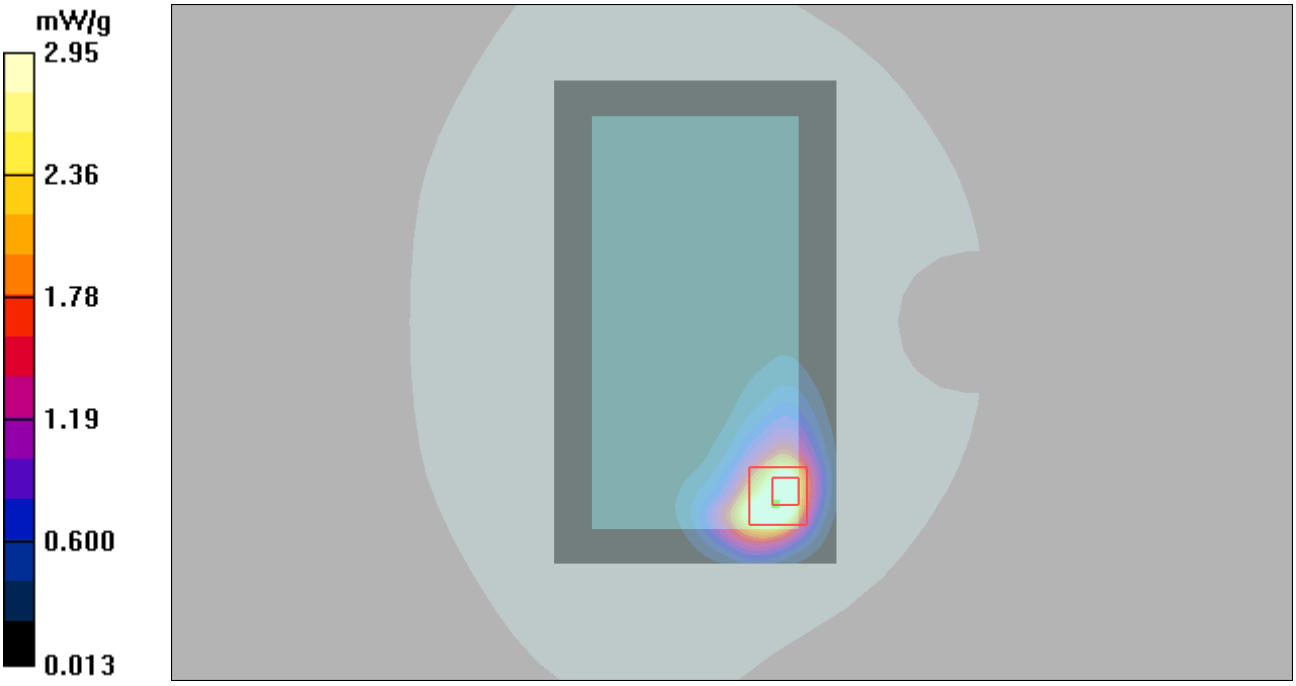



**Figure 42 Body, CDMA BC1 Front Side Channel 600**

## CDMA BC1 Right Edge Middle(0mm)

Date: 12/30/2014

Communication System: CDMA PCS; Frequency: 1880 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1880 MHz; σ = 1.5 mho/m; $\varepsilon_r$ = 52.5; ρ = 1000 kg/$m^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 – SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014;

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

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

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

**Right Edge Middle/Area Scan (51x181x1):** Measurement grid: dx=1.000mm, dy=1.000mm

Maximum value of SAR (interpolated) = 2.70 mW/g

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

Reference Value = 25.2 V/m; Power Drift = -0.015 dB

Peak SAR (extrapolated) = 4.93 W/kg

**SAR(1 g) = 2.53 mW/g; SAR(10 g) = 1.22 mW/g**

Maximum value of SAR (measured) = 2.89 mW/g

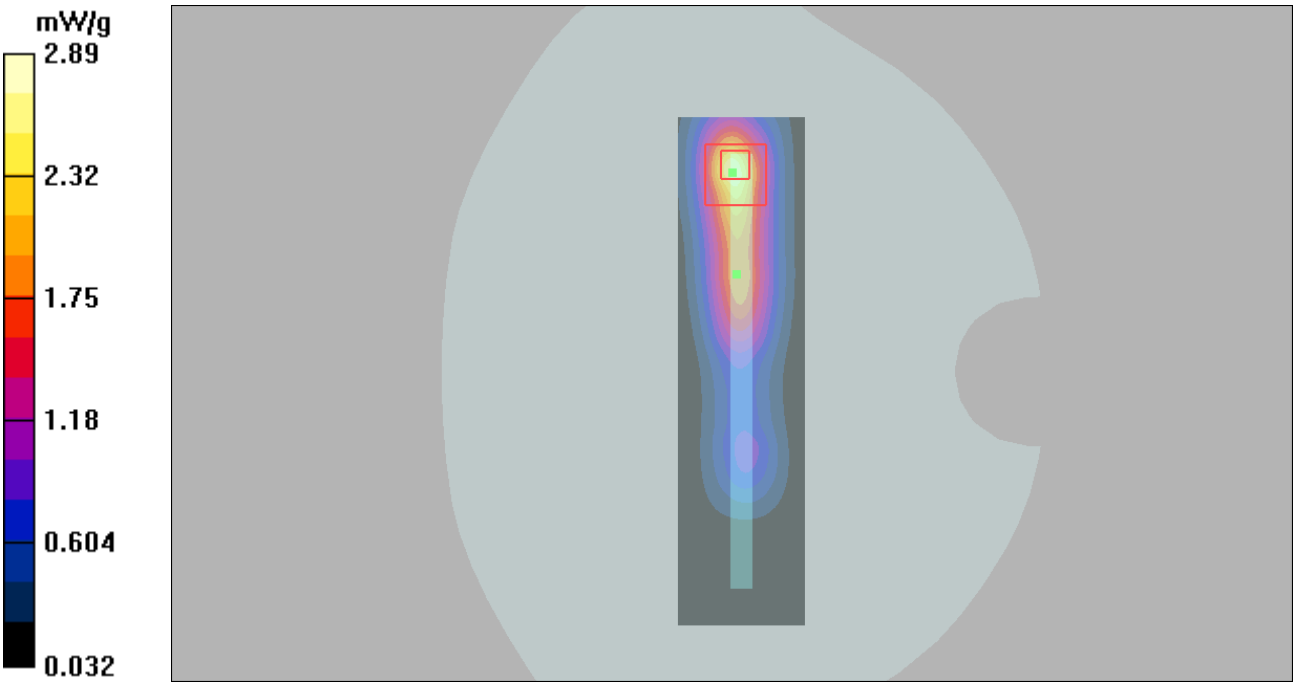



**Figure 43 Body, CDMA BC1 Right Edge Channel 600**

**CDMA BC1 Bottom Edge Middle(0mm)**

Date: 12/30/2014

Communication System: CDMA PCS; Frequency: 1880 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1880 MHz; σ = 1.5 mho/m; $\varepsilon_r$ = 52.5; ρ = 1000 kg/$m^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 – SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014;

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

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

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

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

Maximum value of SAR (interpolated) = 2.29 mW/g

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

Reference Value = 21.4 V/m; Power Drift = -0.033 dB

Peak SAR (extrapolated) = 6.80 W/kg

**SAR(1 g) = 2.81 mW/g; SAR(10 g) = 1.05 mW/g**

Maximum value of SAR (measured) = 2.77 mW/g

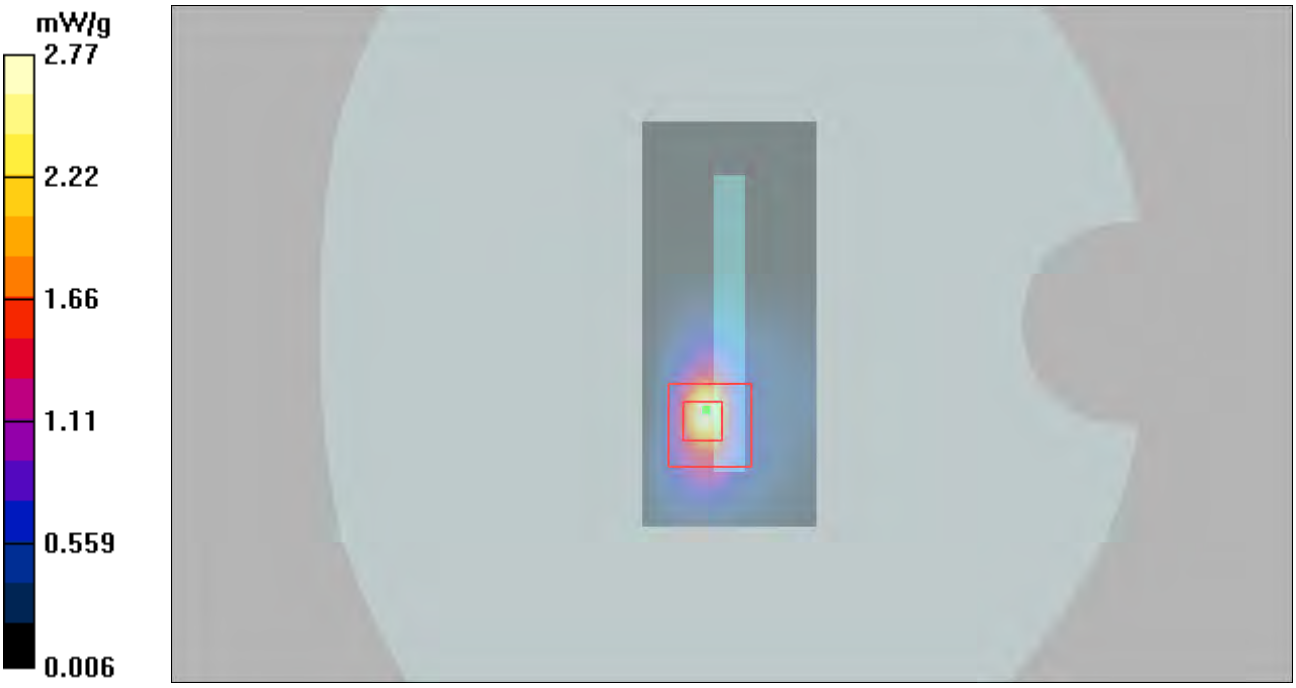



**Figure 44 Body, CDMA BC1 Bottom Edge Channel 600**

## CDMA BC1 EVDO Back Side High(0mm)

Date: 12/30/2014

Communication System: UID 0, CDMA (0); Frequency: 1908.75 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1909 MHz; σ = 1.533 S/m; $\varepsilon_r$ = 52.528; ρ = 1000 kg/$m^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014;

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 (71x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 10.2 W/kg

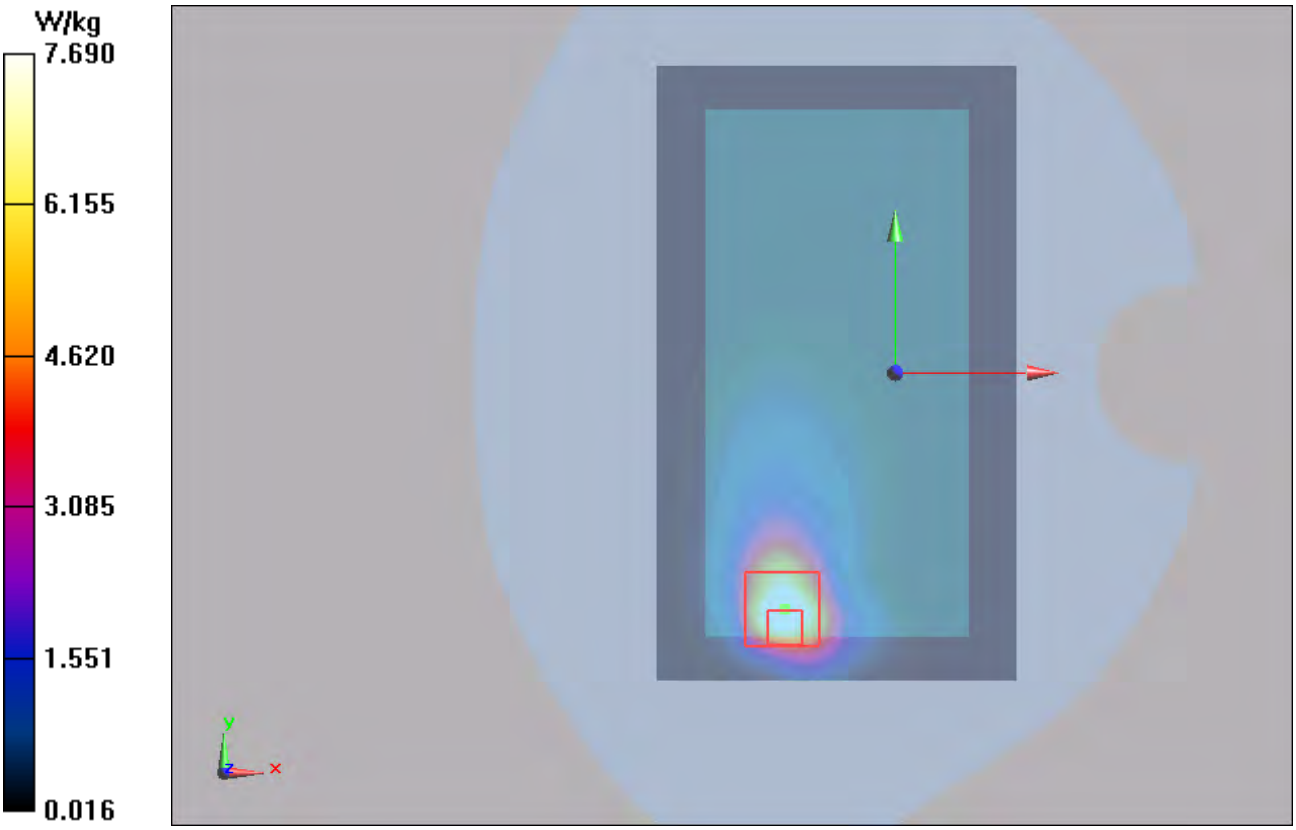
**Back Side High/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 13.185 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 14.0 W/kg

**SAR(1 g) = 6.29 W/kg; SAR(10 g) = 3.03 W/kg**

Maximum value of SAR (measured) = 7.69 W/kg



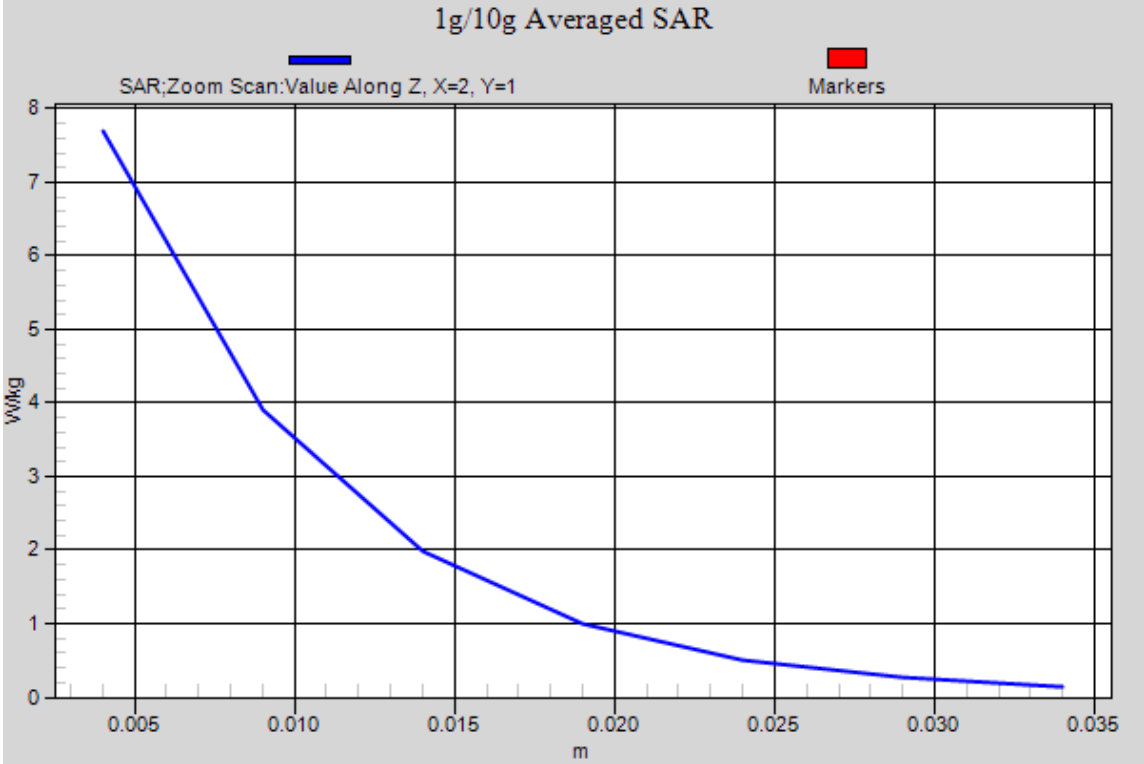



**Figure 45 Body, CDMA BC1 EVDO Back Side Channel 1175**

**CDMA BC1 EVDO Back Side Middle(0mm)**

Date: 12/30/2014

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

Medium parameters used: f = 1880 MHz; $\sigma$ = 1.503 S/m; $\varepsilon_r$ = 52.61; $\rho$ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014;

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 (71x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 7.14 W/kg

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

Reference Value = 13.303 V/m; Power Drift = 0.16 dB

Peak SAR (extrapolated) = 15.8 W/kg

**SAR(1 g) = 7 W/kg; SAR(10 g) = 3.13 W/kg**

Maximum value of SAR (measured) = 7.83 W/kg

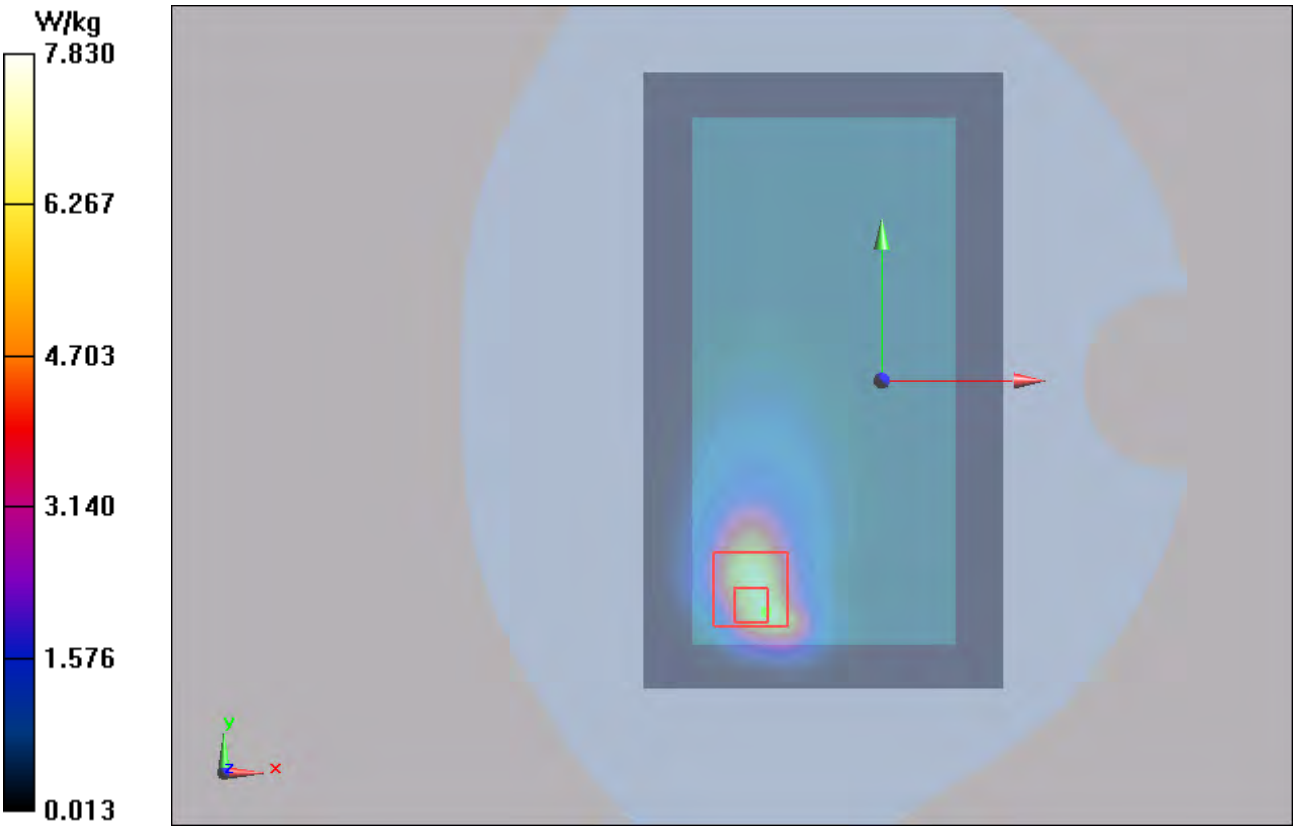



**Figure 46 Body, CDMA BC1 EVDO Back Side Channel 600**

## CDMA BC1 EVDO Back Side Low(0mm)

Date: 12/30/2014

Communication System: UID 0, CDMA (0); Frequency: 1851.25 MHz;Duty Cycle: 1:1

Medium parameters used (interpolated): f = 1851.25 MHz; $\sigma$ = 1.473 S/m; $\varepsilon_r$ = 52.662; $\rho$ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014;

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 Low/Area Scan (71x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 9.62 W/kg

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

Reference Value = 13.143 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 13.1 W/kg

**SAR(1 g) = 5.9 W/kg; SAR(10 g) = 2.84 W/kg**

Maximum value of SAR (measured) = 7.25 W/kg

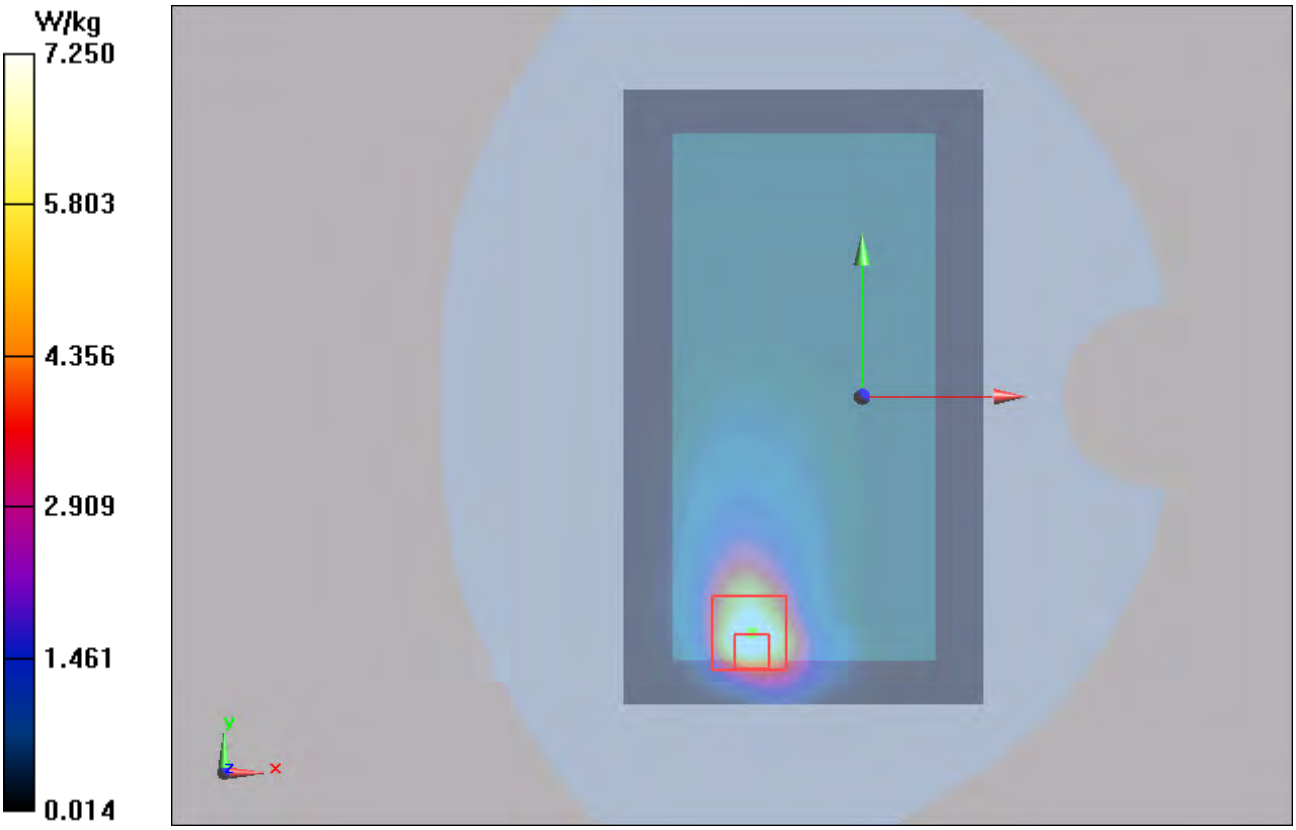



**Figure 47 Body, CDMA BC1 EVDO Back Side Channel 25**

**CDMA BC1 EVDO Front Side Middle(0mm)**

Date: 12/30/2014

Communication System: CDMA PCS; Frequency: 1880 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1880 MHz; $\sigma$ = 1.5 mho/m; $\varepsilon_r$ = 52.5; $\rho$ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 – SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014;

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

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

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

**Front Side Middle/Area Scan (71x121x1):** Measurement grid: dx=1.500mm, dy=1.500mm

Maximum value of SAR (interpolated) = 3.56 mW/g

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

Reference Value = 8.74 V/m; Power Drift = 0.025 dB

Peak SAR (extrapolated) = 5.51 W/kg

**SAR(1 g) = 3.24 mW/g; SAR(10 g) = 1.7 mW/g**

Maximum value of SAR (measured) = 3.71 mW/g

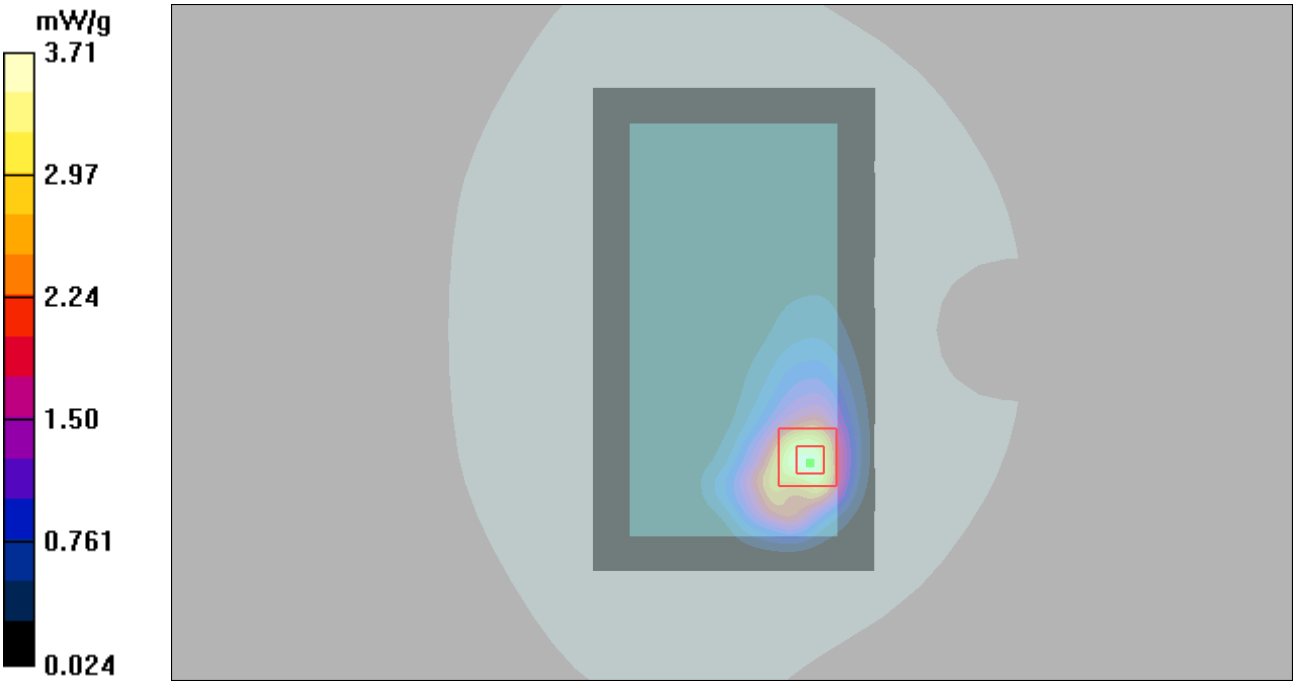



**Figure 48 Body, CDMA BC1 EVDO Front Side Channel 600**

## CDMA BC1 EVDO Right Edge Middle(0mm)

Date: 12/30/2014
Communication System: CDMA PCS; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.5 mho/m; $\varepsilon_r$ = 52.5; ρ = 1000 kg/$m^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014;
Electronics: DAE4 Sn1317; Calibrated: 1/16/2014
Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Right Edge Middle /Area Scan (51x181x1):** Measurement grid: dx=1.000mm, dy=1.000mm
Maximum value of SAR (interpolated) = 3.56 mW/g

**Right Edge Middle/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 30.3 V/m; Power Drift = -0.033 dB
Peak SAR (extrapolated) = 8.01 W/kg
**SAR(1 g) = 3.44 mW/g; SAR(10 g) = 1.5 mW/g**
Maximum value of SAR (measured) = 4.00 mW/g

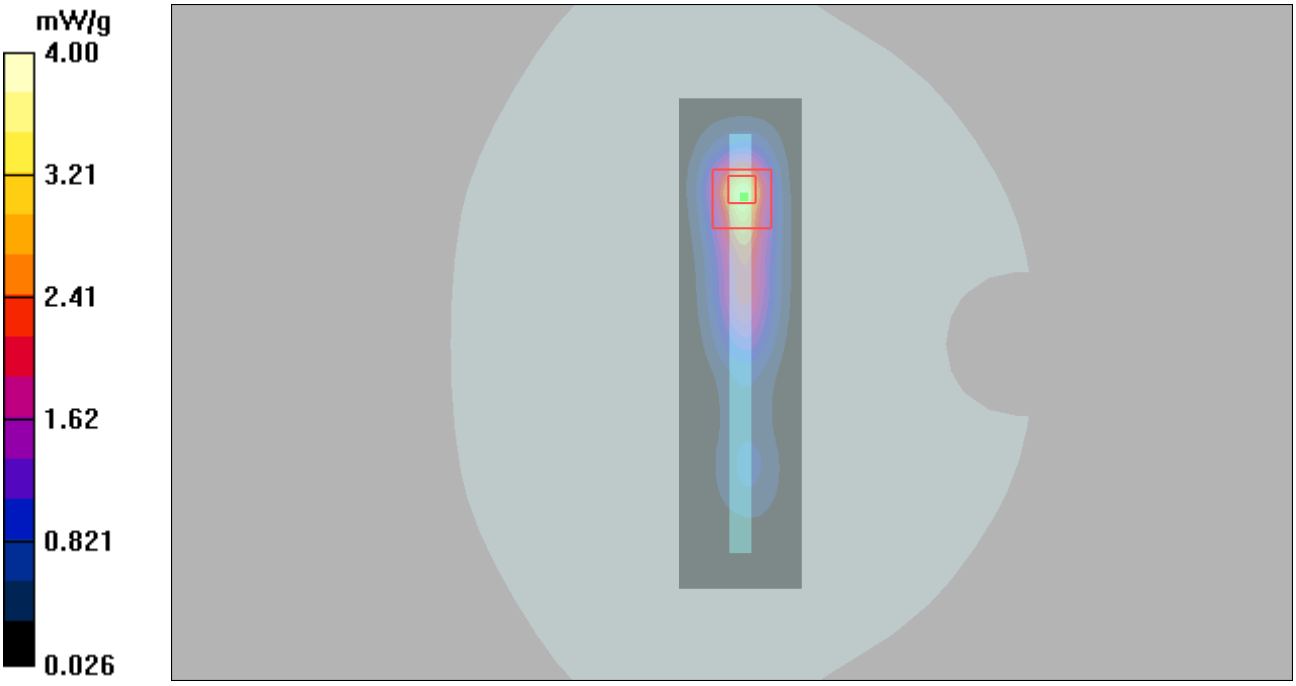



**Figure 49 Body, CDMA BC1 EVDO Right Edge Channel 600**

## CDMA BC1 EVDO Bottom Edge Middle(0mm)

Date: 12/30/2014

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

Medium parameters used: f = 1880 MHz; σ = 1.503 S/m; $\varepsilon_r$ = 52.61; ρ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014;

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 (51x111x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 2.80 W/kg

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

Reference Value = 18.302 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 5.39 W/kg

**SAR(1 g) = 2.43 W/kg; SAR(10 g) = 0.947 W/kg**

Maximum value of SAR (measured) = 2.84 W/kg

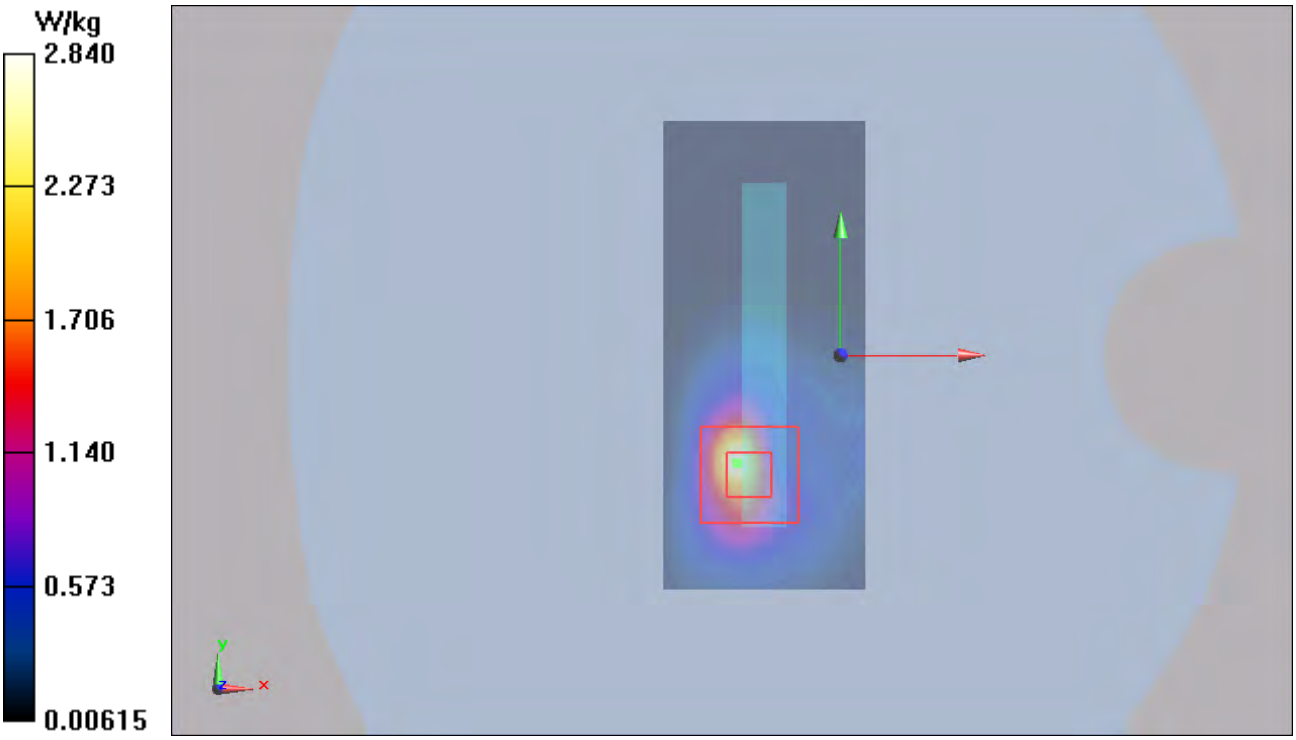



**Figure 50 Body, CDMA BC1 EVDO Bottom Edge Channel 600**

## CDMA BC1 Back Side Low(0mm, Repeated SAR)

Date: 12/30/2014

Communication System: UID 0, CDMA (0); Frequency: 1851.25 MHz;Duty Cycle: 1:1

Medium parameters used (interpolated): f = 1851.25 MHz; σ = 1.473 S/m; $\varepsilon_r$ = 52.662; ρ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014;

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 low/Area Scan (71x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 6.53 W/kg

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

Reference Value = 10.933 V/m; Power Drift = -0.10 dB

Peak SAR (extrapolated) = 19.0 W/kg

**SAR(1 g) = 6.02 W/kg; SAR(10 g) = 2.32 W/kg**

Maximum value of SAR (measured) = 5.87 W/kg

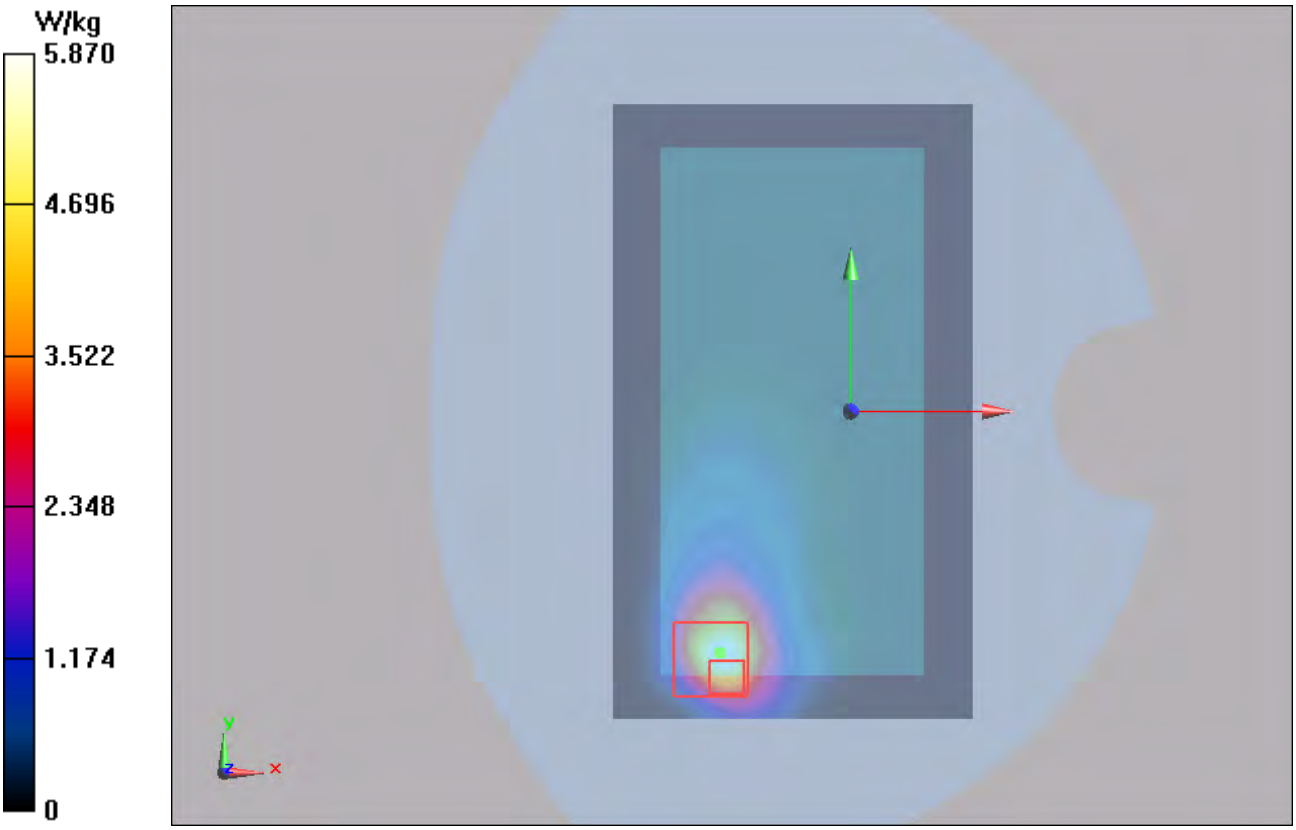



**Figure 51 Body, CDMA BC1 Back Side Channel 25**

## CDMA BC1 EVDO Back Side Middle (0mm, Repeated SAR)

Date: 12/30/2014
Communication System: UID 0, CDMA (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.503 S/m; $\varepsilon_r$ = 52.61; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014;
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 (71x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 9.91 W/kg

**Back side High/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.205 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 13.5 W/kg
**SAR(1 g) = 6.08 W/kg; SAR(10 g) = 2.93 W/kg**
Maximum value of SAR (measured) = 7.46 W/kg

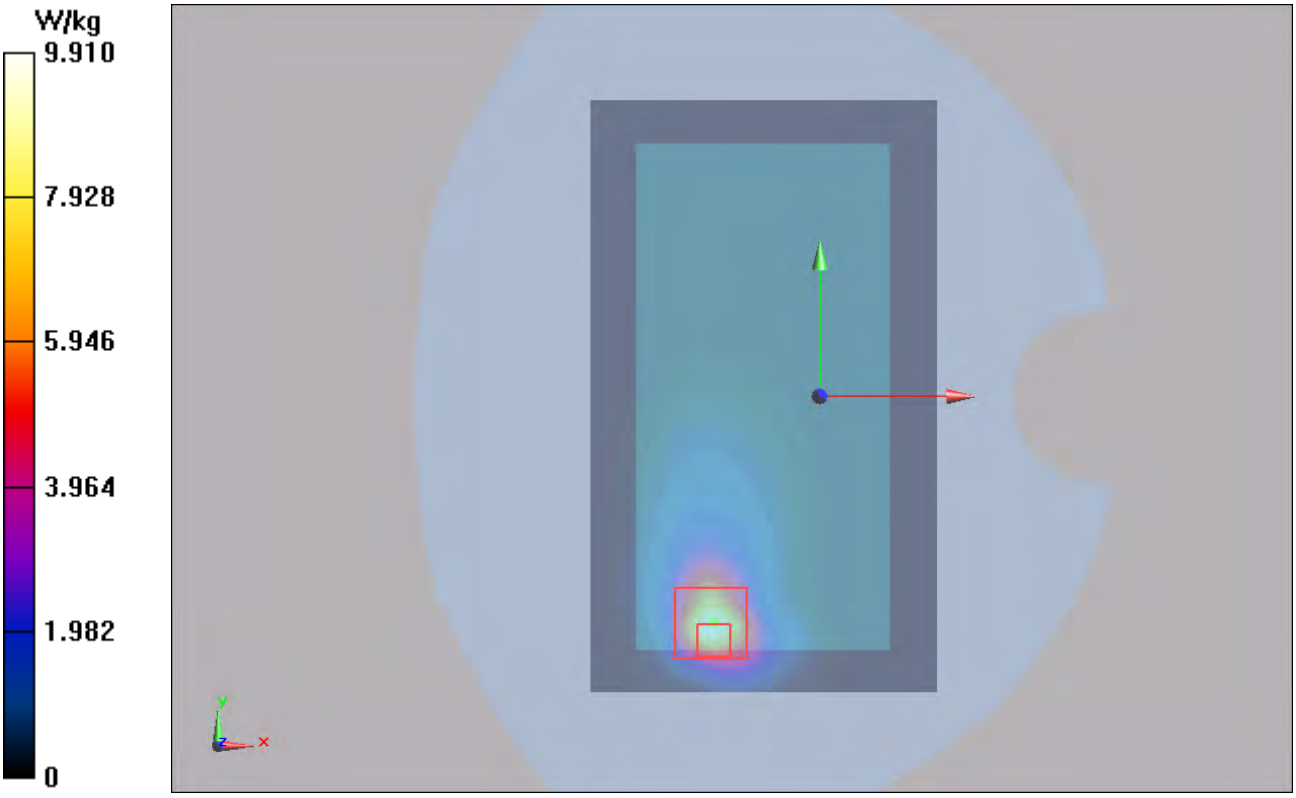



**Figure 52 Body, CDMA BC1 EVDO Back Side Channel 600**

## CDMA BC1 Back Side Middle (2mm)

Date: 12/30/2014

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

Medium parameters used: f = 1880 MHz; $\sigma$ = 1.503 S/m; $\varepsilon_r$ = 52.61; $\rho$ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014;

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 (71x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 3.21 W/kg

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

Reference Value = 14.509 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 5.95 W/kg

**SAR(1 g) = 2.7 W/kg; SAR(10 g) = 1.39 W/kg**

Maximum value of SAR (measured) = 3.01 W/kg

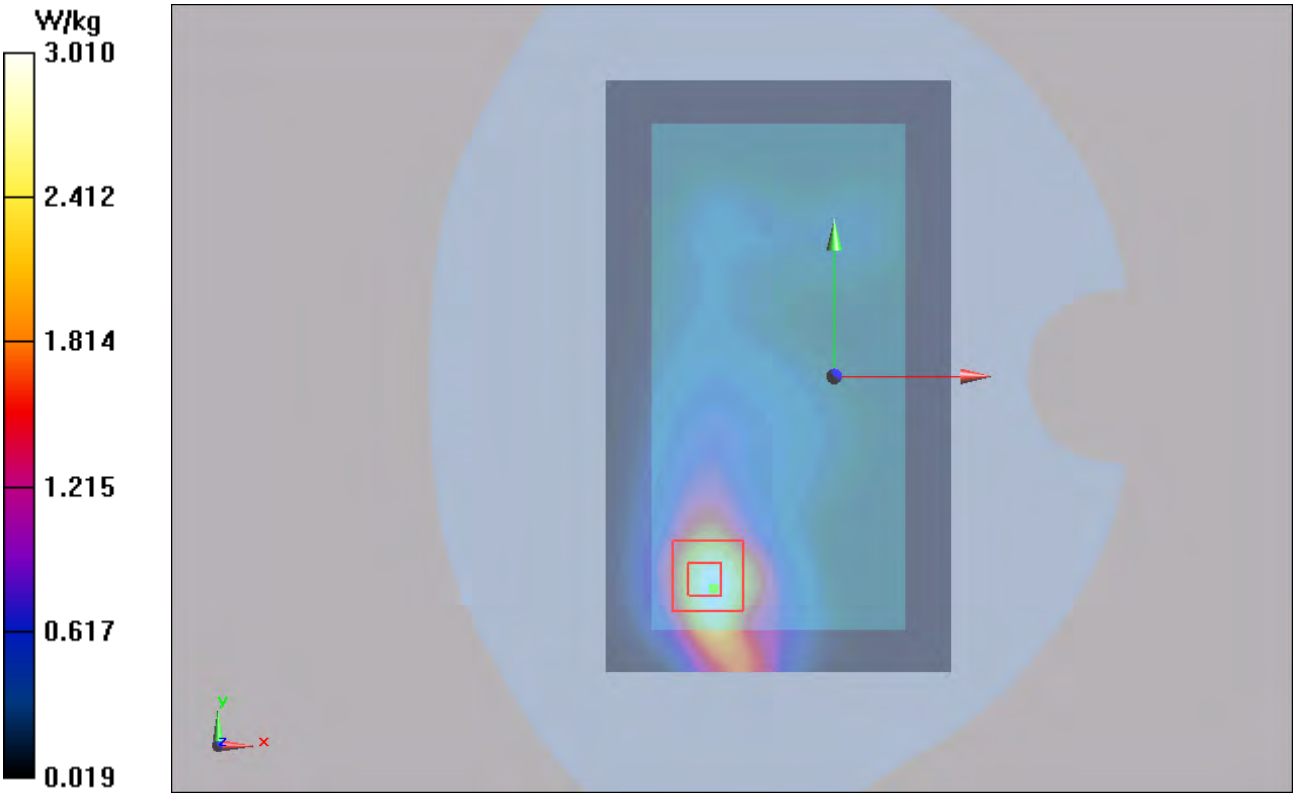



**Figure 53 Body, CDMA BC1 Back Side Channel 600**

## LTE Band 4 with 1RB Left Cheek Low

Date: 11/28/2014

Communication System: UID 0, LTE (0); Frequency: 1720 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1720 MHz; σ = 1.295 S/m; $\varepsilon_r$ = 39.8; ρ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Left Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(8.14, 8.14, 8.14); Calibrated: 2/17/2014;

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 Low /Area Scan (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.362 W/kg

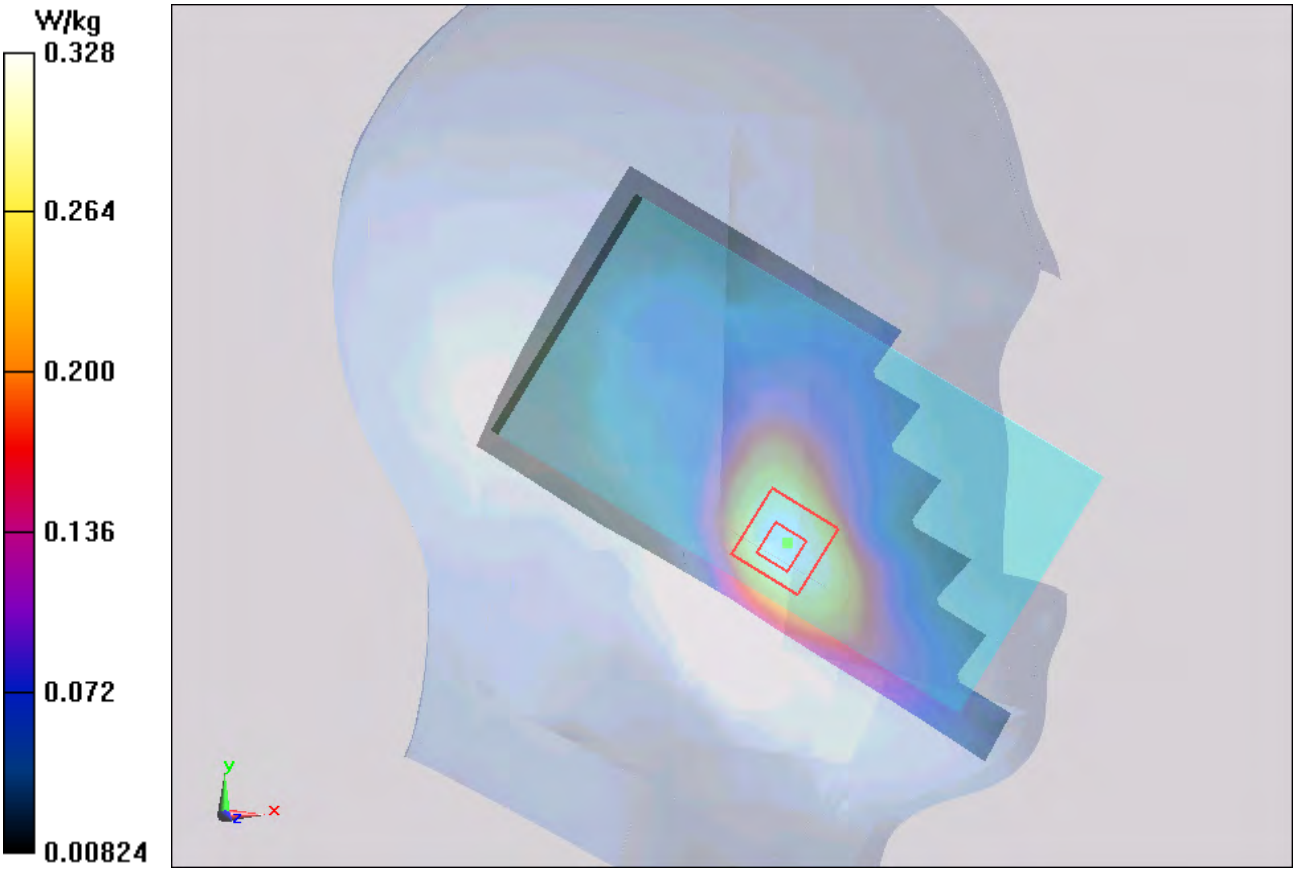
**Left Cheek Low /Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.709 V/m; Power Drift = 0.19 dB

Peak SAR (extrapolated) = 0.451 W/kg

**SAR(1 g) = 0.320 W/kg; SAR(10 g) = 0.207 W/kg**

Maximum value of SAR (measured) = 0.328 W/kg



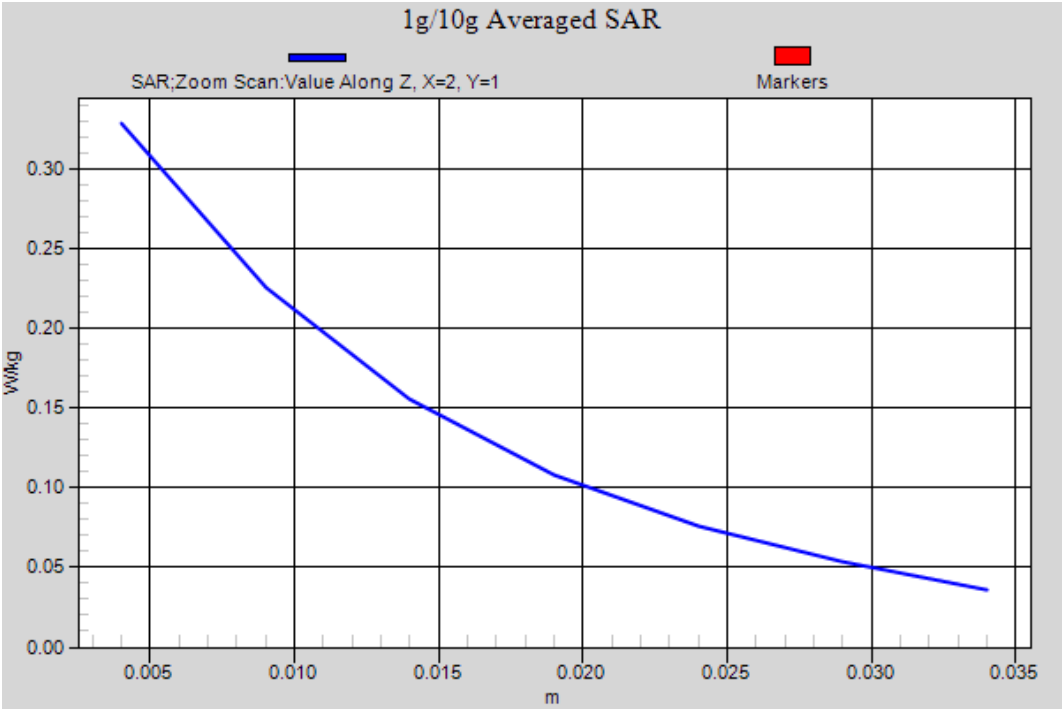



**Figure 54 LTE Band 4 with 1RB Left Hand Touch Cheek Channel 20050**

## LTE Band 4 with 1RB Left Tilt Low

Date: 11/28/2014
Communication System: UID 0, LTE (0); Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.295 S/m; $\varepsilon_r$ = 39.8; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Left Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(8.14, 8.14, 8.14); Calibrated: 2/17/2014;
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 Low /Area Scan (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.180 W/kg

**Left Tilt Low /Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.845 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 0.222 W/kg
**SAR(1 g) = 0.156 W/kg; SAR(10 g) = 0.103 W/kg**
Maximum value of SAR (measured) = 0.166 W/kg

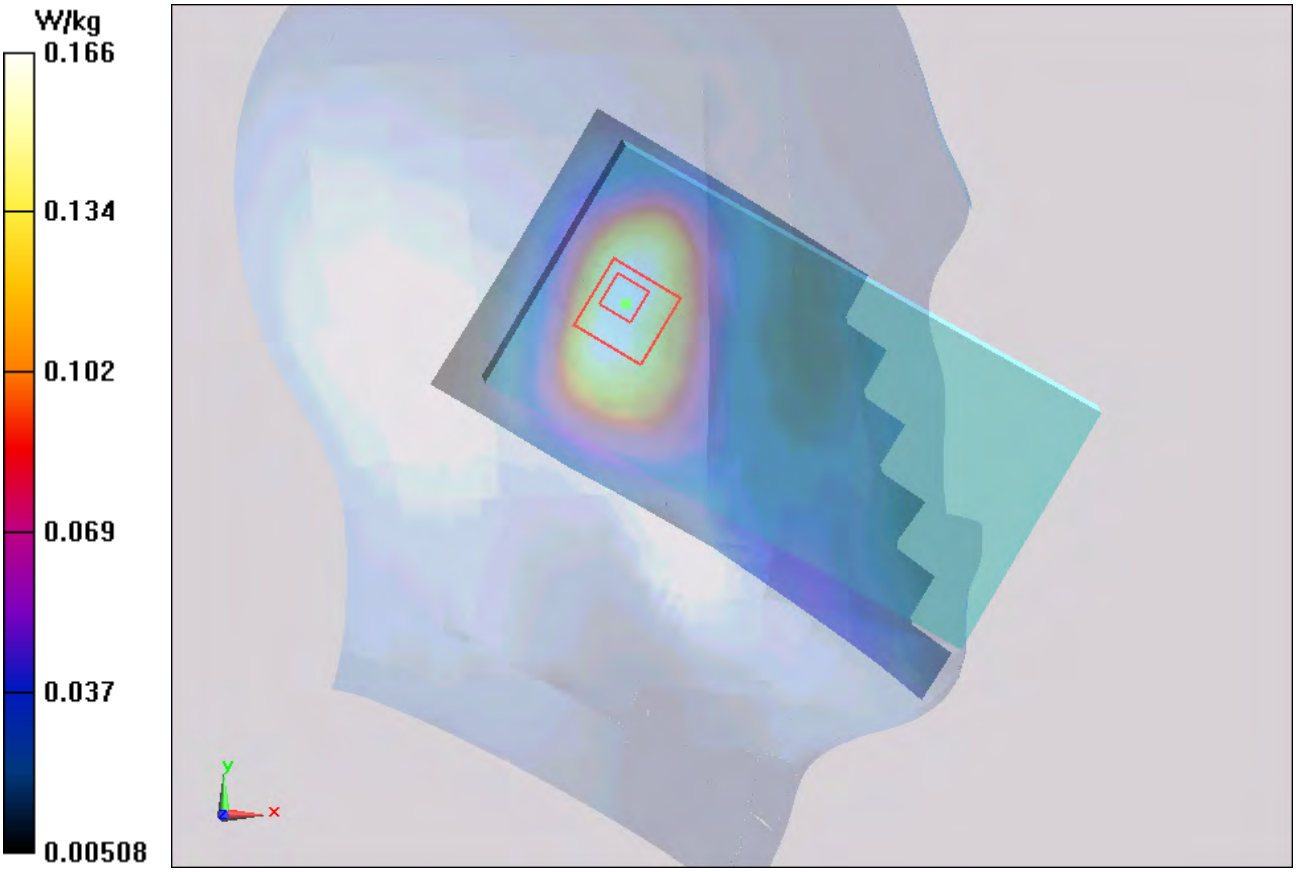



Figure 55 LTE Band 4 with 1RB Left Hand Tilt 15° Channel 20050

## LTE Band 4 with 1RB Right Cheek Low

Date: 11/28/2014
Communication System: UID 0, LTE (0); Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.295 S/m; $\varepsilon_r$ = 39.8; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Right Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(8.14, 8.14, 8.14); Calibrated: 2/17/2014;
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 Low/Area Scan (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.213 W/kg

**Right Cheek Low/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.298 V/m; Power Drift = -0.101 dB
Peak SAR (extrapolated) = 0.269 W/kg
**SAR(1 g) = 0.195 W/kg; SAR(10 g) = 0.132 W/kg**
Maximum value of SAR (measured) = 0.207 W/kg

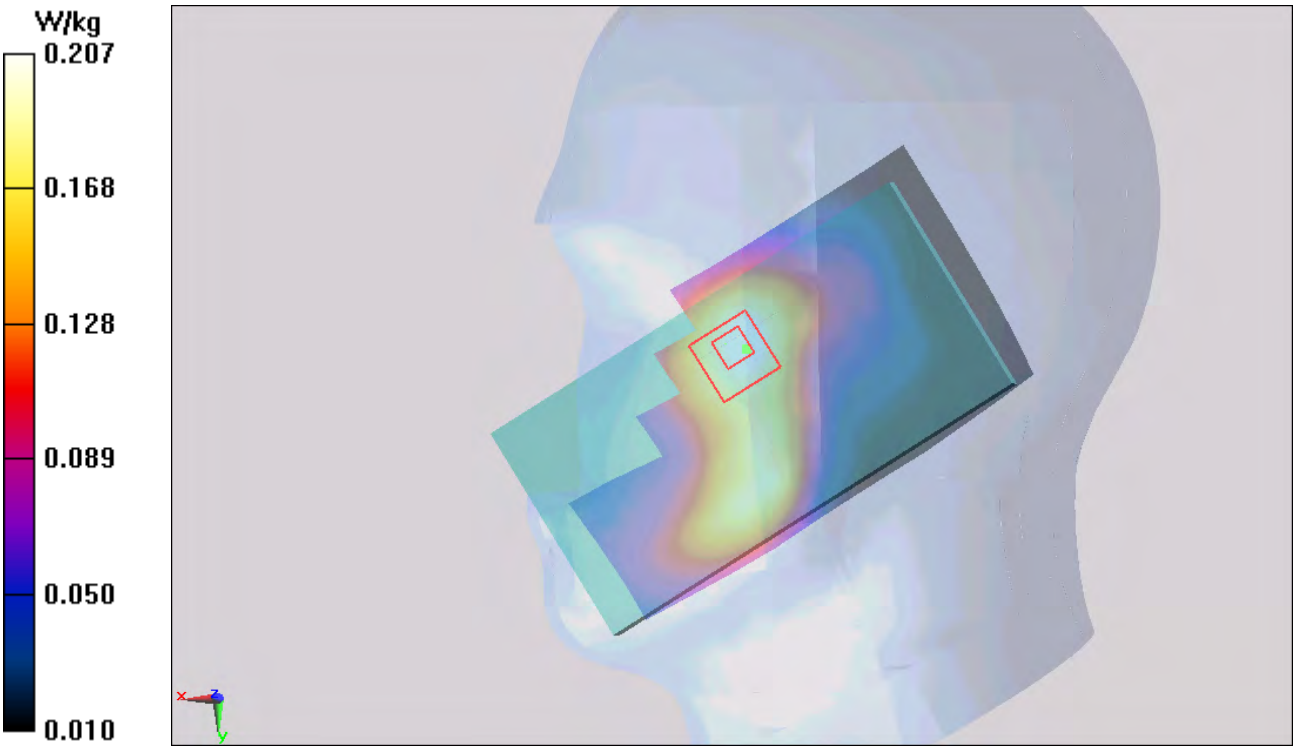



**Figure 56 LTE Band 4 with 1RB Right Hand Touch Cheek Channel 20050**

## LTE Band 4 with 1RB Right Tilt Low

Date: 11/28/2014
Communication System: UID 0, LTE (0); Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.295 S/m; $\varepsilon_r$ = 39.8; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Right Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(8.14, 8.14, 8.14); Calibrated: 2/17/2014;
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 Low /Area Scan (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.229 W/kg

**Right Tilt Low /Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.557 V/m; Power Drift = 0.120 dB
Peak SAR (extrapolated) = 0.265 W/kg
**SAR(1 g) = 0.189 W/kg; SAR(10 g) = 0.122 W/kg**
Maximum value of SAR (measured) = 0.193 W/kg

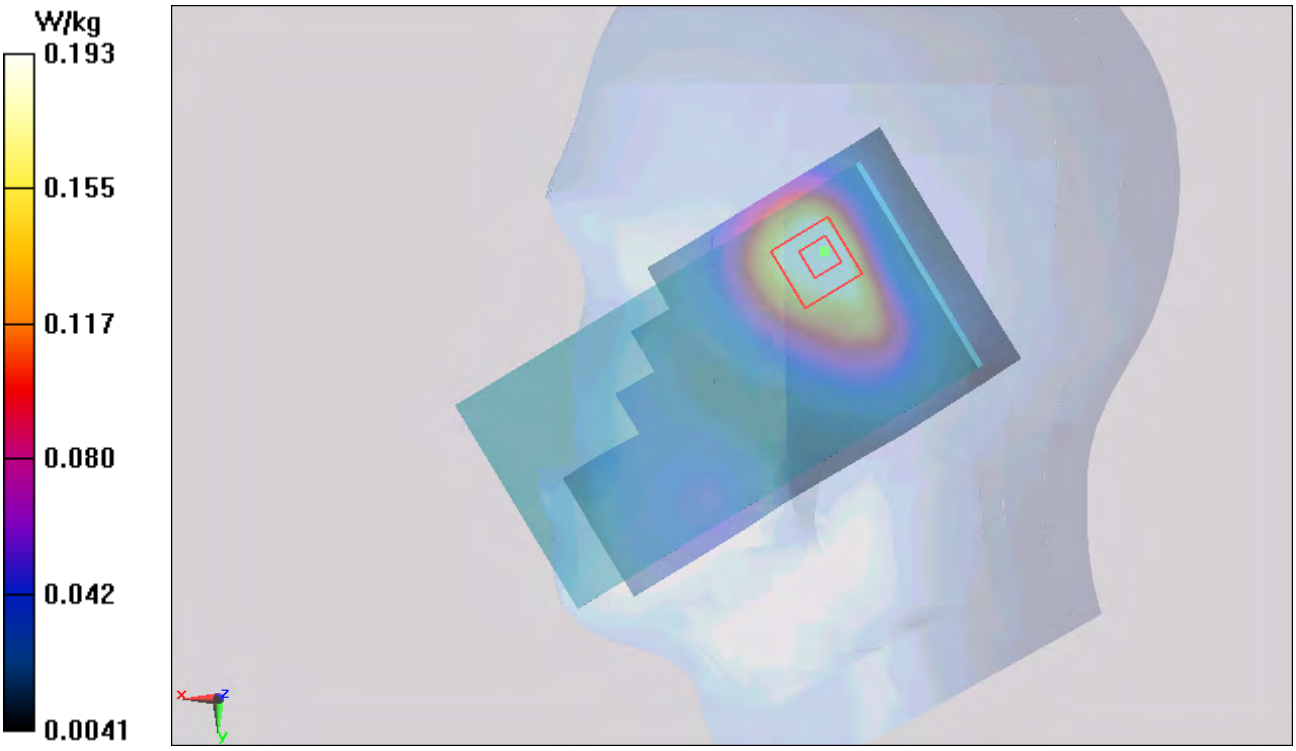



**Figure 57 LTE Band 4 with 1RB Right Hand Tilt 15° Channel 20050**

## LTE Band 4 with 50%RB Left Cheek Low

Date: 11/28/2014
Communication System: UID 0, LTE (0); Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.295 S/m; $\varepsilon_r$ = 39.8; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Left Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(8.14, 8.14, 8.14); Calibrated: 2/17/2014;
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 Low /Area Scan (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.293 W/kg

**Left Cheek Low /Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.868 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.370 W/kg
**SAR(1 g) = 0.258 W/kg; SAR(10 g) = 0.167 W/kg**
Maximum value of SAR (measured) = 0.273 W/kg

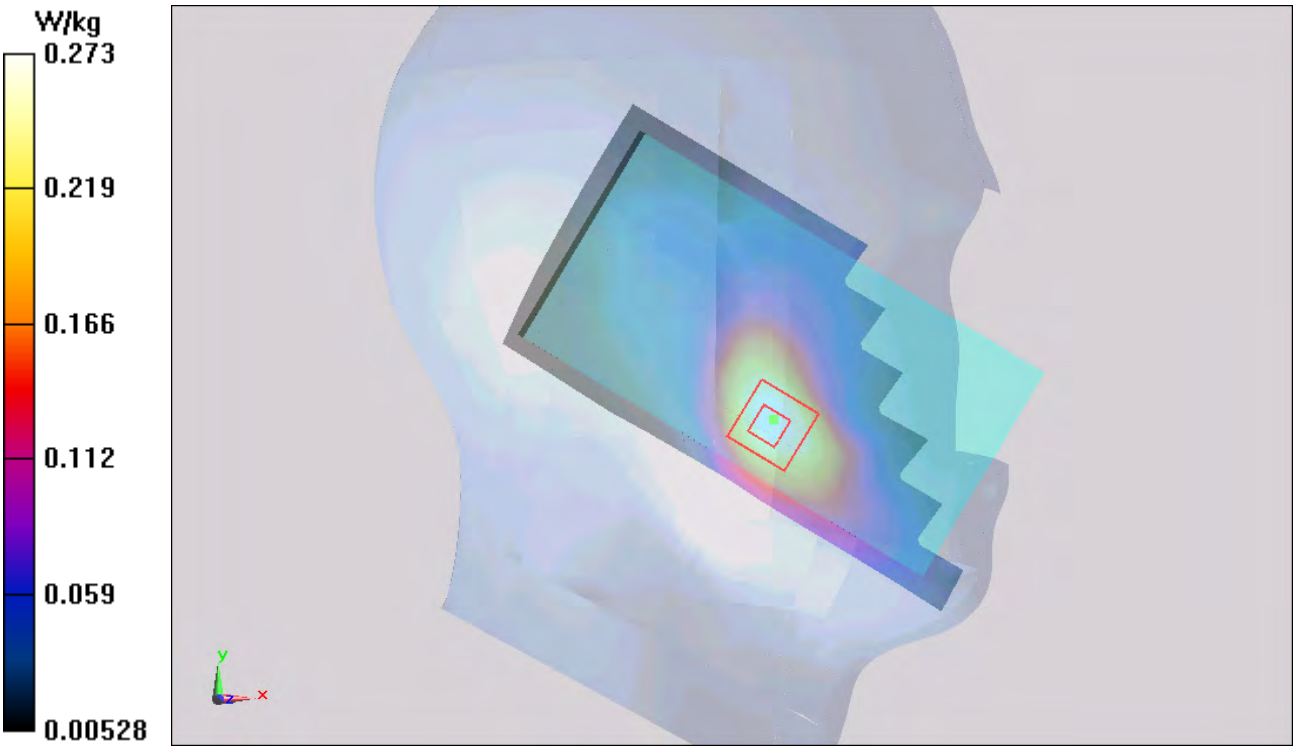



**Figure 58 LTE Band 4 with 50%RB Left Hand Touch Cheek Channel 20050**

## LTE Band 4 with 50%RB Left Tilt Low

Date: 11/28/2014
Communication System: UID 0, LTE (0); Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.295 S/m; $\varepsilon_r$ = 39.8; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Left Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(8.14, 8.14, 8.14); Calibrated: 2/17/2014;
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 Low /Area Scan (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.140 W/kg

**Left Tilt Low/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.402 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.169 W/kg
**SAR(1 g) = 0.121 W/kg; SAR(10 g) = 0.080 W/kg**
Maximum value of SAR (measured) = 0.128 W/kg

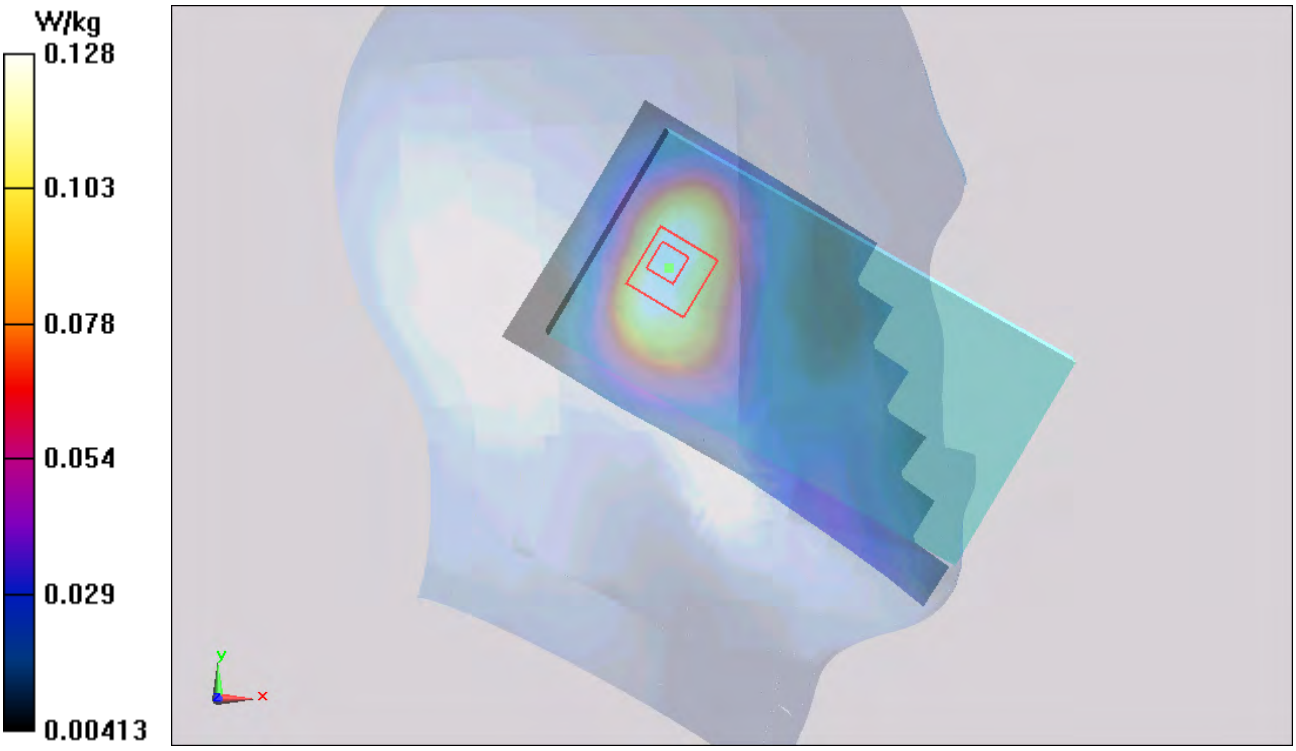



**Figure 59 LTE Band 4 with 50%RB Left Hand Tilt 15° Channel 20050**

## LTE Band 4 with 50%RB Right Cheek Low

Date: 11/28/2014
Communication System: UID 0, LTE (0); Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.295 S/m; $\varepsilon_r$ = 39.8; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Right Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(8.14, 8.14, 8.14); Calibrated: 2/17/2014;
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 Low/Area Scan (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.168 W/kg

**Right Cheek Low /Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.054 V/m; Power Drift = 0.068 dB
Peak SAR (extrapolated) = 0.215 W/kg
**SAR(1 g) = 0.156 W/kg; SAR(10 g) = 0.105 W/kg**
Maximum value of SAR (measured) = 0.166 W/kg

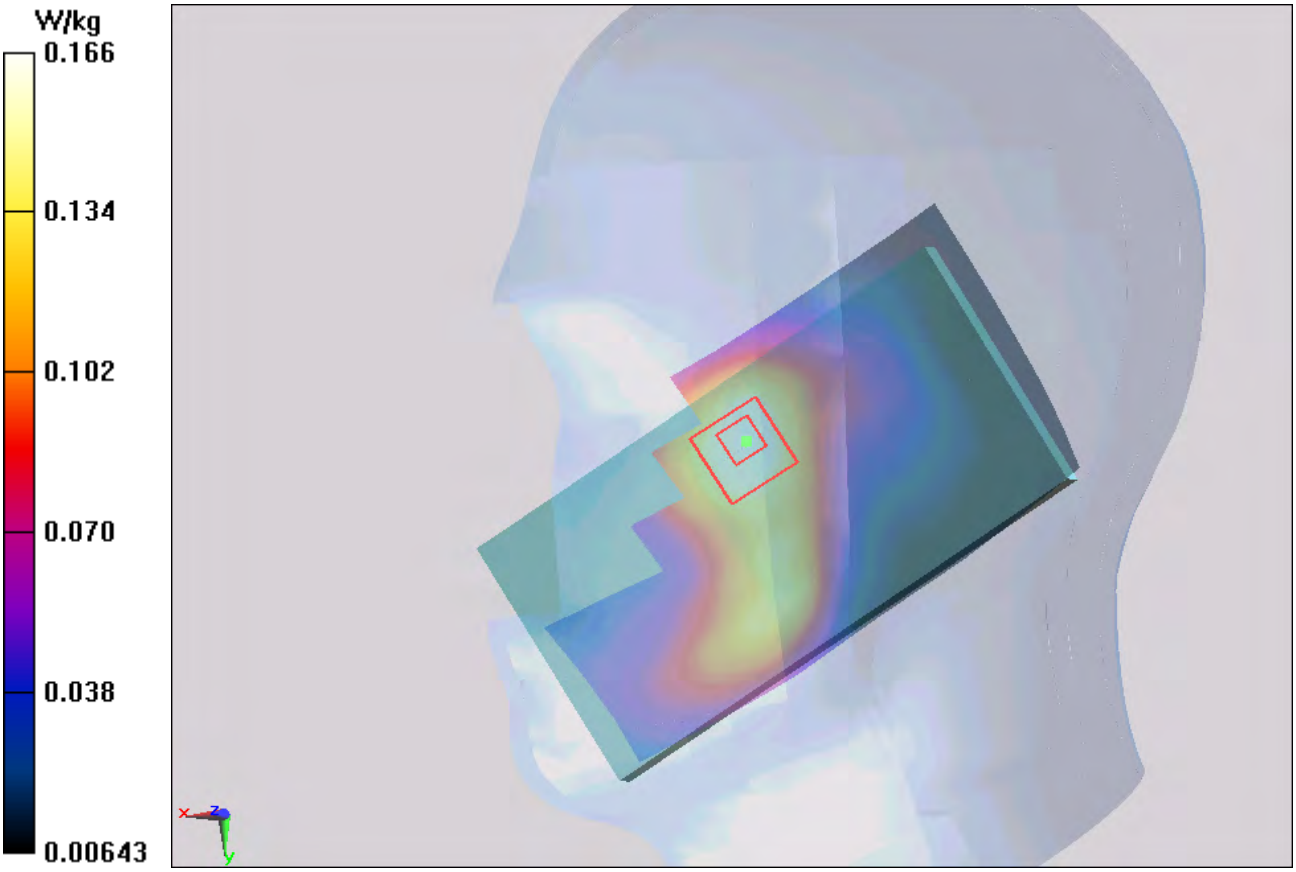



**Figure 60 LTE Band 4 with 50%RB Right Hand Touch Cheek Channel 20050**

## LTE Band 4 with 50%RB Right Tilt Low

Date: 11/28/2014
Communication System: UID 0, LTE (0); Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.295 S/m; $\varepsilon_r$ = 39.8; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Right Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(8.14, 8.14, 8.14); Calibrated: 2/17/2014;
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 Low /Area Scan (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.180 W/kg

**Right Tilt Low /Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.664 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 0.201 W/kg
**SAR(1 g) = 0.143 W/kg; SAR(10 g) = 0.093 W/kg**
Maximum value of SAR (measured) = 0.152 W/kg

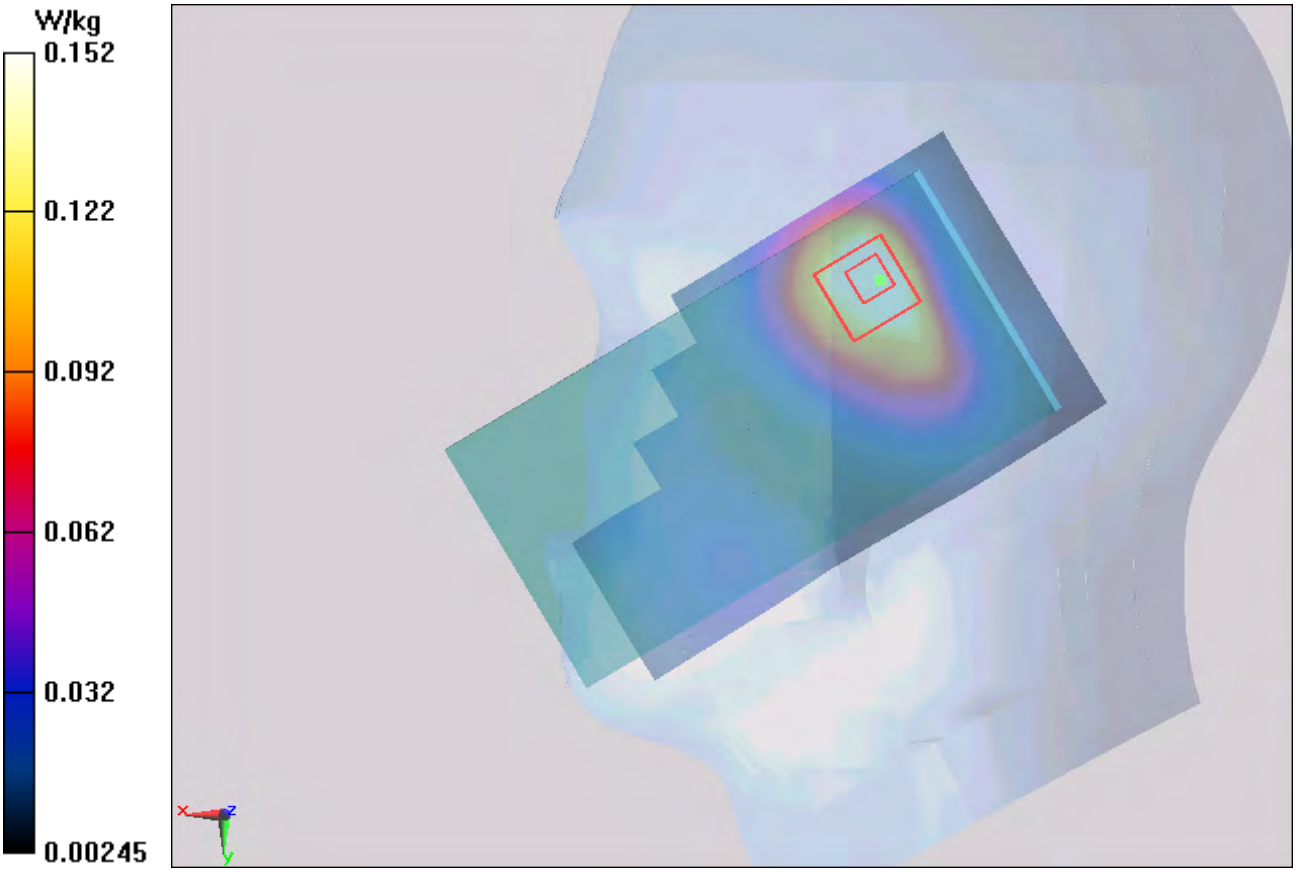



**Figure 61 LTE Band 4 with 50%RB Right Hand Tilt 15° Channel 20050**

## LTE Band 4 with 1RB Back Side Low (15mm)

Date: 11/29/2014
Communication System: UID 0, LTE (0); Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.477 S/m; $\varepsilon_r$ = 53.021; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;
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 Low/Area Scan (71x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.342 W/kg

**Back Side Low/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.570 V/m; Power Drift = -0.001 dB
Peak SAR (extrapolated) = 0.515 W/kg
**SAR(1 g) = 0.316 W/kg; SAR(10 g) = 0.185 W/kg**
Maximum value of SAR (measured) = 0.330 W/kg

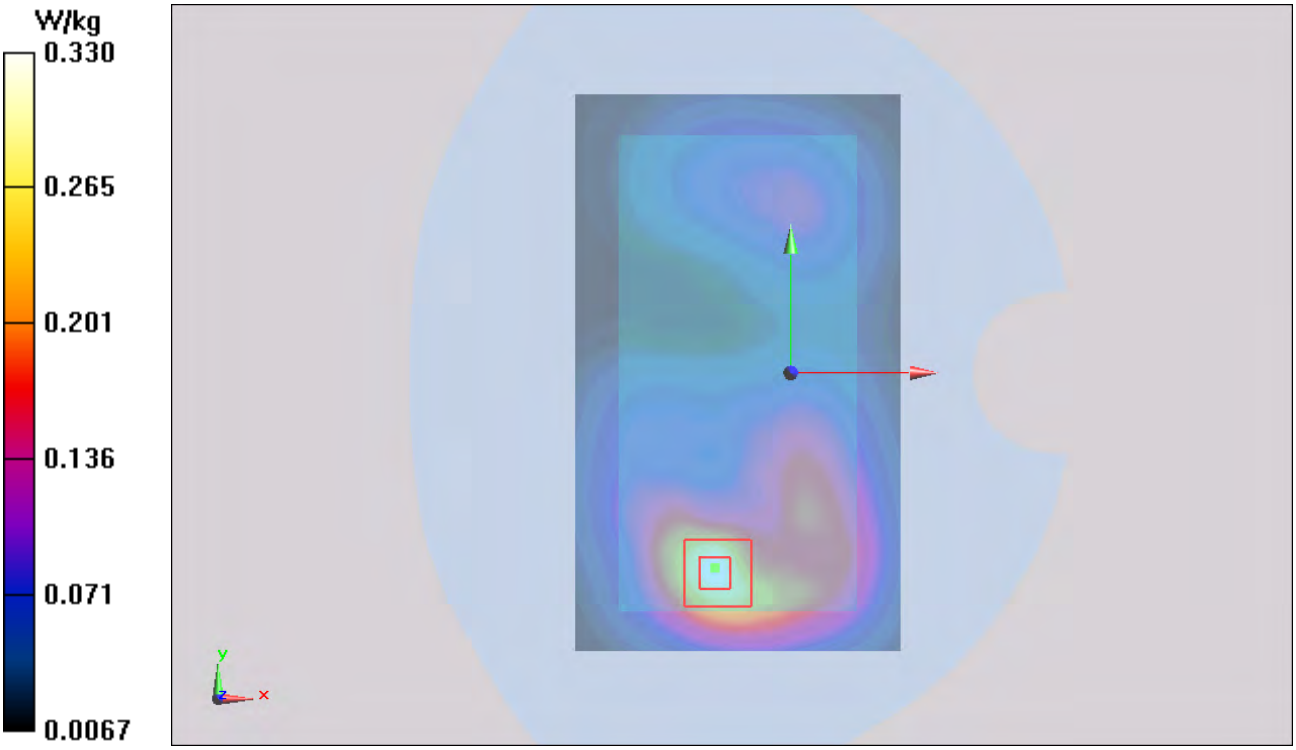



**Figure 62 Body, LTE Band 4 with 1RB Back Side Channel 20050**

## LTE Band 4 with 1RB Front Side Low (15mm)

Date: 11/29/2014
Communication System: UID 0, LTE (0); Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.477 S/m; $\varepsilon_r$ = 53.021; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;
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 Low/Area Scan (71x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.368 W/kg

**Front Side Low/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.982 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.544 W/kg
**SAR(1 g) = 0.337 W/kg; SAR(10 g) = 0.196 W/kg**
Maximum value of SAR (measured) = 0.338 W/kg

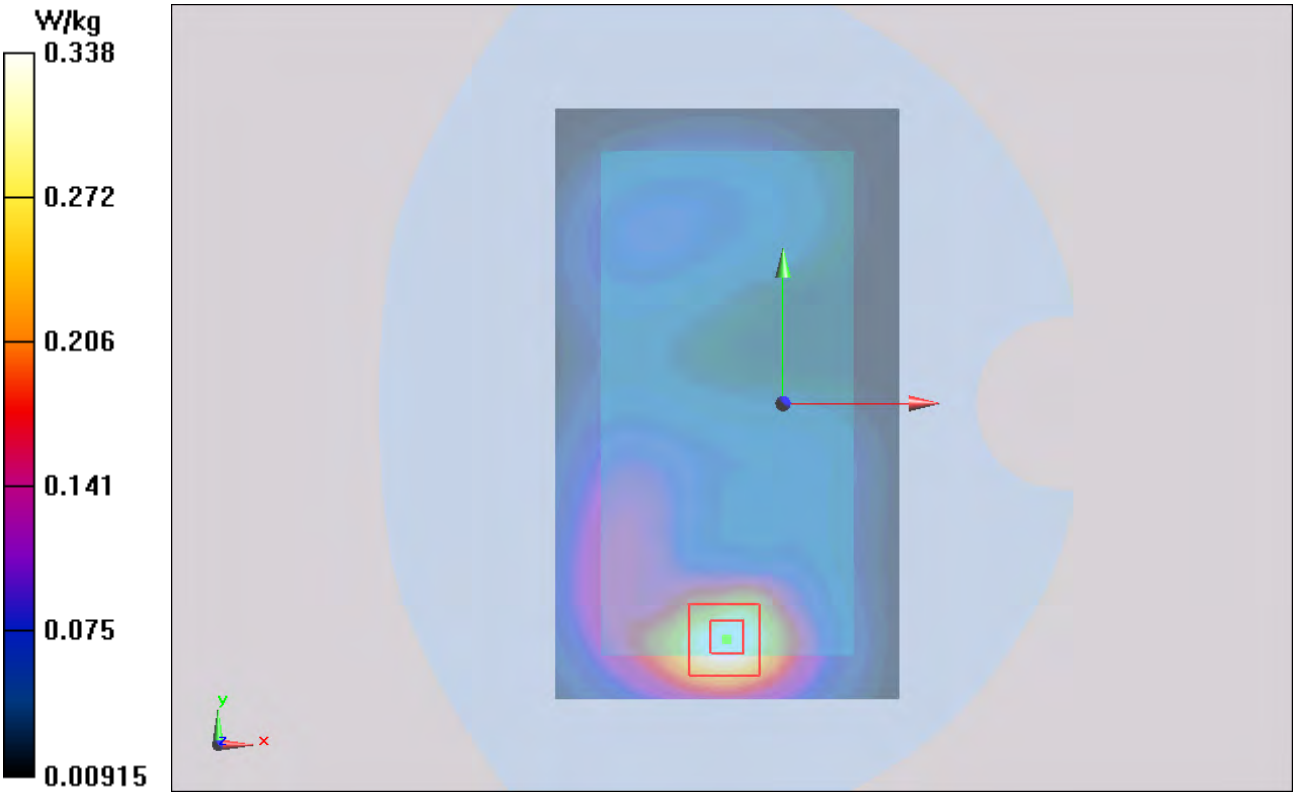



**Figure 63 Body, LTE Band 4 with 1RB Front Side Channel 20050**

## LTE Band 4 with 50%RB Back Side Low (15mm)

Date: 11/29/2014
Communication System: UID 0, LTE (0); Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.477 S/m; $\varepsilon_r$ = 53.021; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;
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 Low/Area Scan (71x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.288 W/kg

**Back Side Low/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.873 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.439 W/kg
**SAR(1 g) = 0.270 W/kg; SAR(10 g) = 0.158 W/kg**
Maximum value of SAR (measured) = 0.280 W/kg

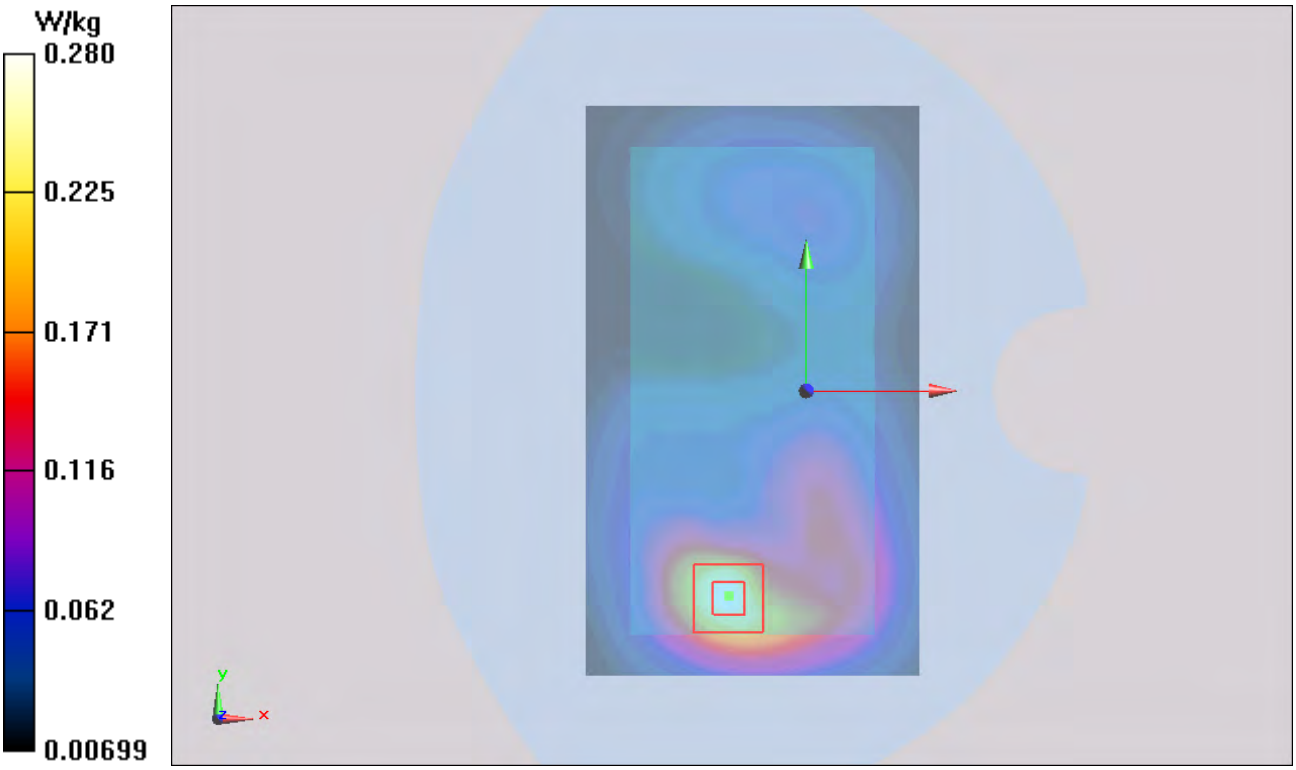



**Figure 64 Body, LTE Band 4 with 50%RB Back Side Channel 20050**

## LTE Band 4 with 50%RB Front Side Low (15mm)

Date: 11/29/2014

Communication System: UID 0, LTE (0); Frequency: 1720 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1720 MHz; σ = 1.477 S/m; $\varepsilon_r$ = 53.021; ρ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;

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 Low/Area Scan (71x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.275 W/kg

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

Reference Value = 4.965 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 0.408 W/kg

**SAR(1 g) = 0.254 W/kg; SAR(10 g) = 0.148 W/kg**

Maximum value of SAR (measured) = 0.261 W/kg

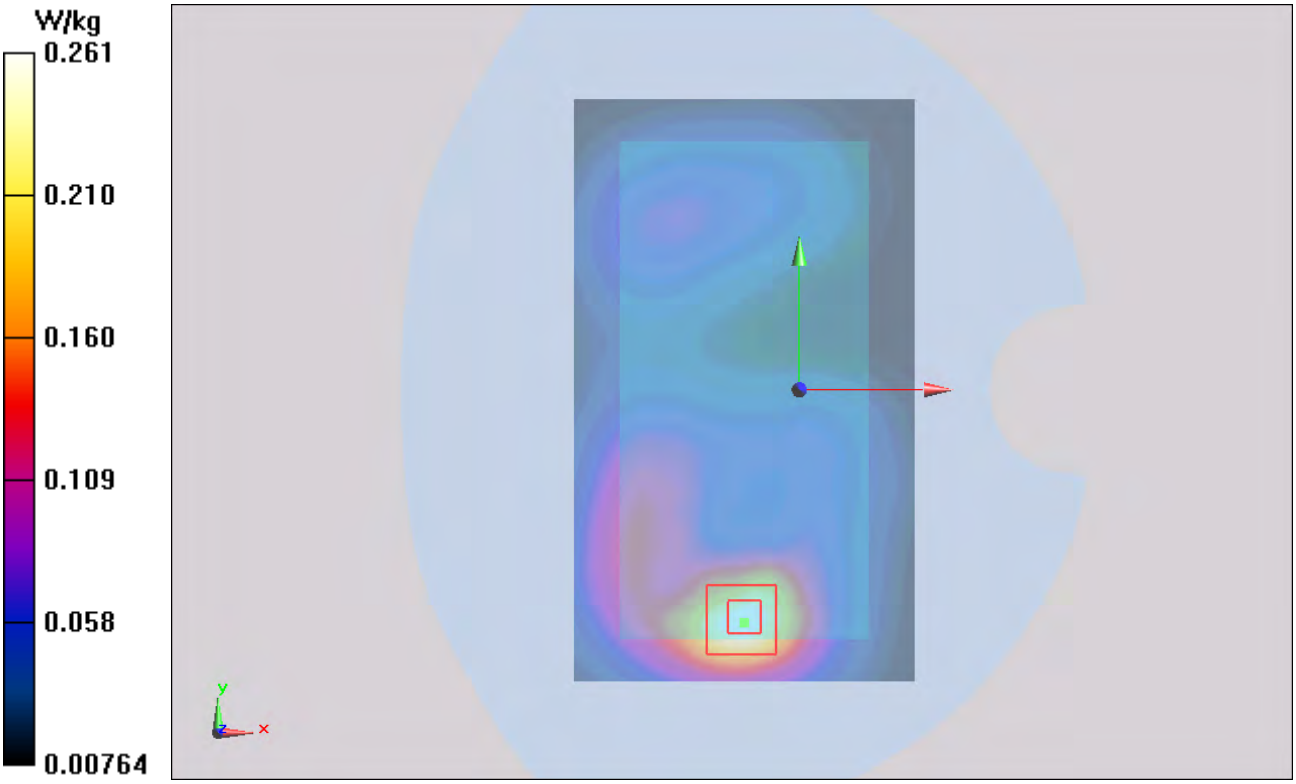



**Figure 65 Body, LTE Band 4 with 50%RB Front Side Channel 20050**

## LTE Band 4 with 1RB Back Side High (0mm)

Date: 1/1/2015

Communication System: LTE Band 4; Frequency: 1745 MHz;Duty Cycle: 1:1

Medium parameters used (interpolated): f = 1745 MHz; σ = 1.49 mho/m; $\varepsilon_r$ = 53.4; ρ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;

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

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

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

**Back Side High/Area Scan (71x121x1):** Measurement grid: dx=1.500mm, dy=1.500mm

Maximum value of SAR (interpolated) = 6.58 mW/g

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

Reference Value = 8.07 V/m; Power Drift = 0.158 dB

Peak SAR (extrapolated) = 12.8 W/kg

**SAR(1 g) = 5.74 mW/g; SAR(10 g) = 2.51 mW/g**

Maximum value of SAR (measured) = 6.69 mW/g

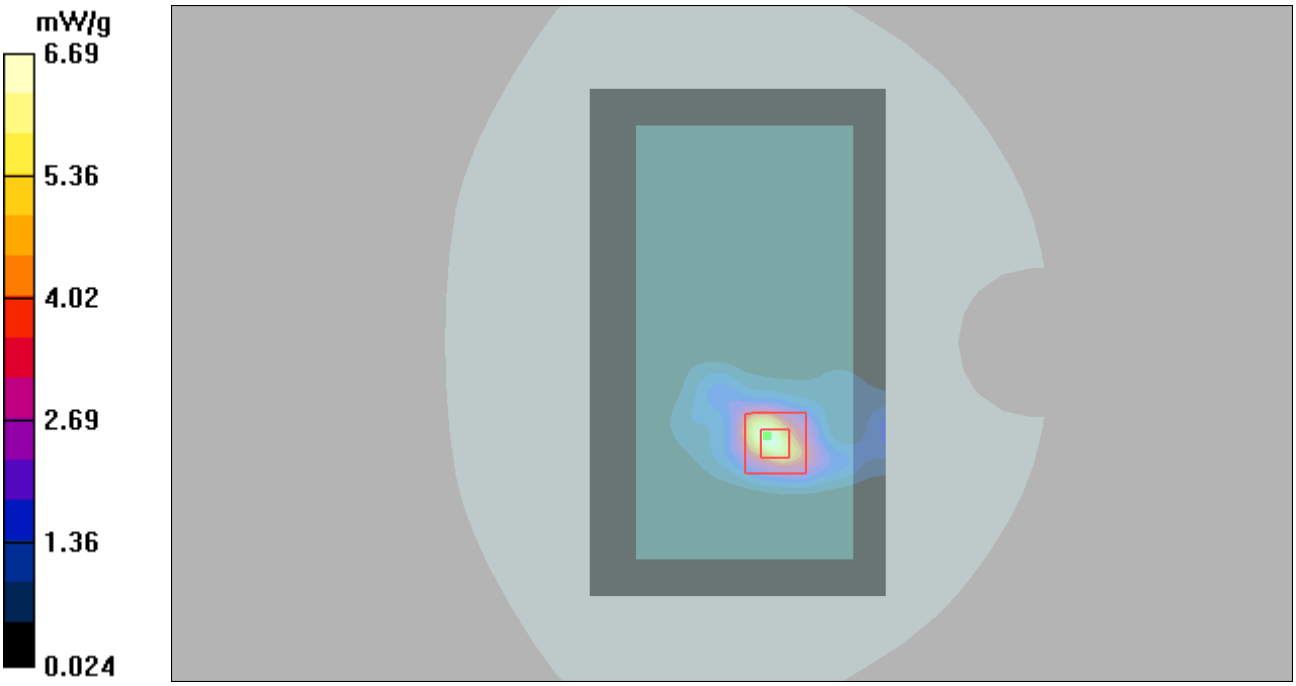



**Figure 66 Body, LTE Band 4 with 1RB Back Side Channel 20300**

## LTE Band 4 with 1RB Back Side Middle (0mm)

Date: 1/1/2015
Communication System: LTE Band 4; Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1732.5 MHz; σ = 1.48 mho/m; $\varepsilon_r$ = 53.5; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;
Electronics: DAE4 Sn1317; Calibrated: 1/16/2014
Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Back Side Middle/Area Scan (71x121x1):** Measurement grid: dx=1.500mm, dy=1.500mm
Maximum value of SAR (interpolated) = 6.11 mW/g

**Back Side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.08 V/m; Power Drift = 0.132 dB
Peak SAR (extrapolated) = 11.4 W/kg
**SAR(1 g) = 5.1 mW/g; SAR(10 g) = 2.24 mW/g**
Maximum value of SAR (measured) = 6.14 mW/g

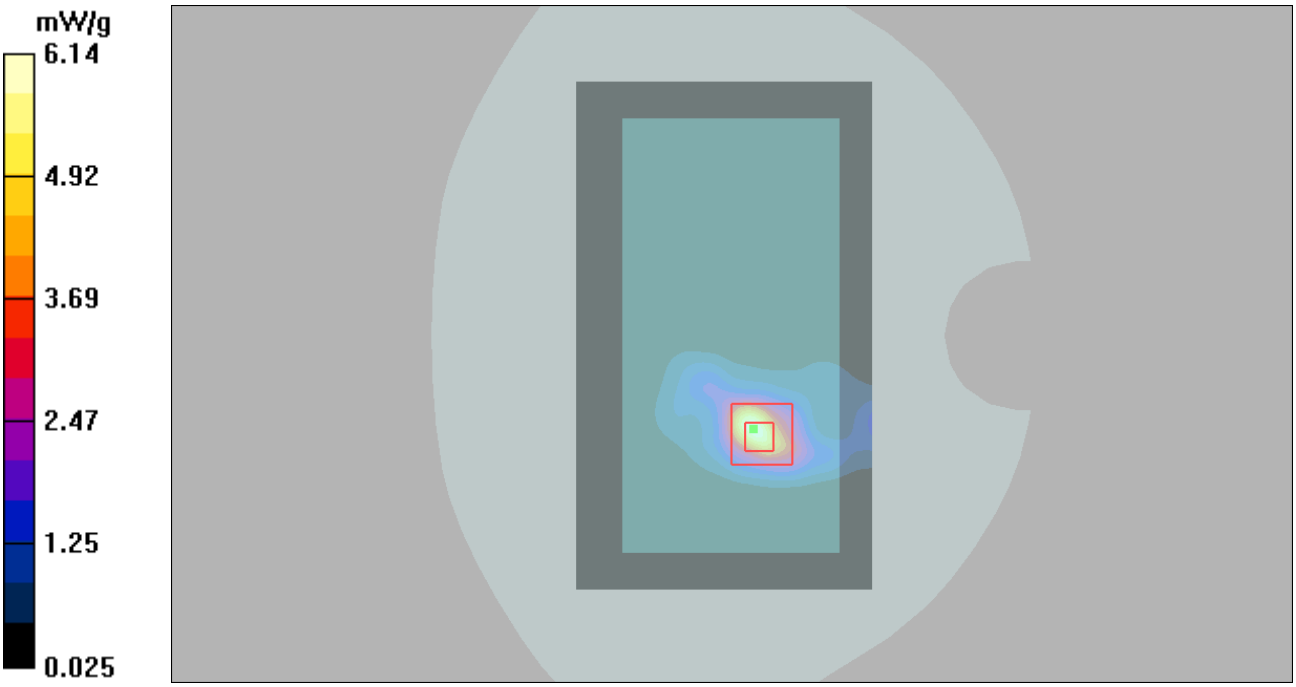



**Figure 67 Body, LTE Band 4 with 1RB Back Side Channel 20175**

## LTE Band 4 with 1RB Back Side Low (0mm)

Date: 1/1/2015
Communication System: LTE Band 4; Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.47 mho/m; $\varepsilon_r$ = 53.5; ρ = 1000 kg/$m^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;
Electronics: DAE4 Sn1317; Calibrated: 1/16/2014
Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Back Side Low/Area Scan (71x121x1):** Measurement grid: dx=1.500mm, dy=1.500mm
Maximum value of SAR (interpolated) = 6.46 mW/g

**Back Side Low/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.3 V/m; Power Drift = 0.068 dB
Peak SAR (extrapolated) = 11.2 W/kg
**SAR(1 g) = 4.96 mW/g; SAR(10 g) = 2.24 mW/g**
Maximum value of SAR (measured) = 5.94 mW/g

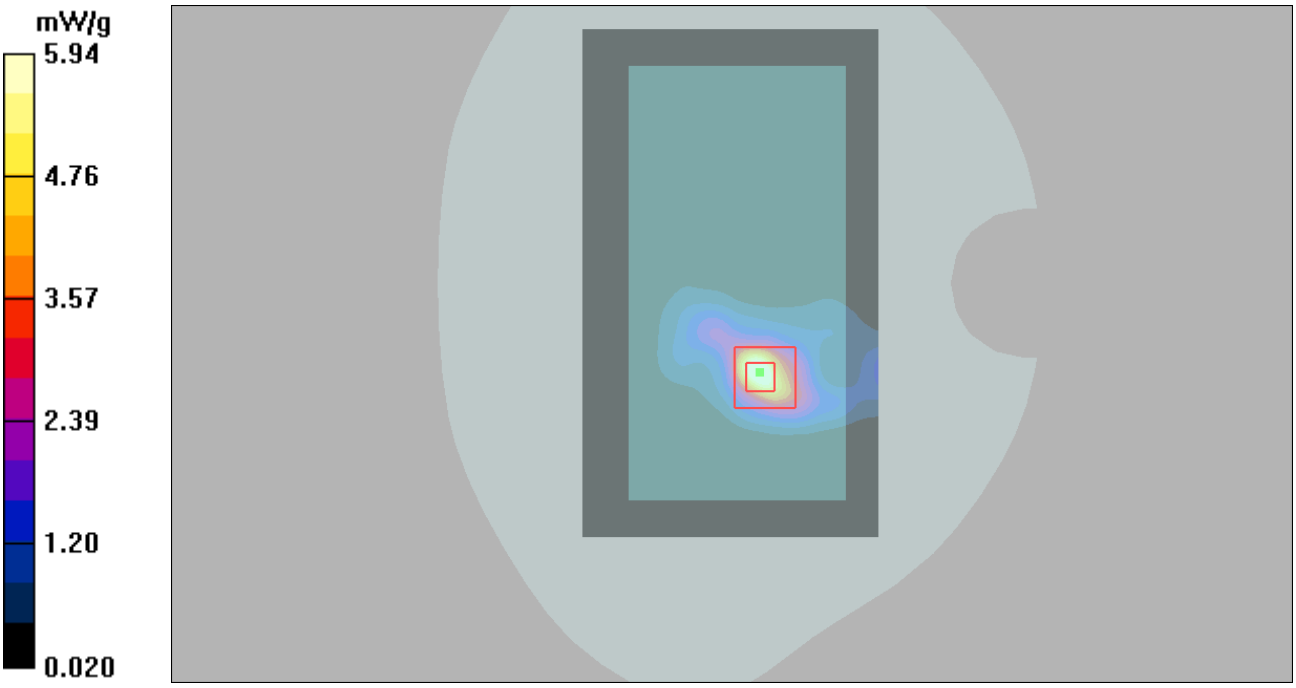



**Figure 68 Body, LTE Band 4 with 1RB Back Side Channel 20050**

## LTE Band 4 with 1RB Front Side High (0mm)

Date: 1/1/2015
Communication System: LTE Band 4; Frequency: 1745 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1745 MHz; σ = 1.49 mho/m; $\varepsilon_r$ = 53.4; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;
Electronics: DAE4 Sn1317; Calibrated: 1/16/2014
Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Front Side High/Area Scan (71x121x1):** Measurement grid: dx=1.500mm, dy=1.500mm
Maximum value of SAR (interpolated) = 5.68 mW/g

**Front Side High/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.31 V/m; Power Drift = 0.021 dB
Peak SAR (extrapolated) = 9.36 W/kg
**SAR(1 g) = 4.66 mW/g; SAR(10 g) = 2.14 mW/g**
Maximum value of SAR (measured) = 5.51 mW/g

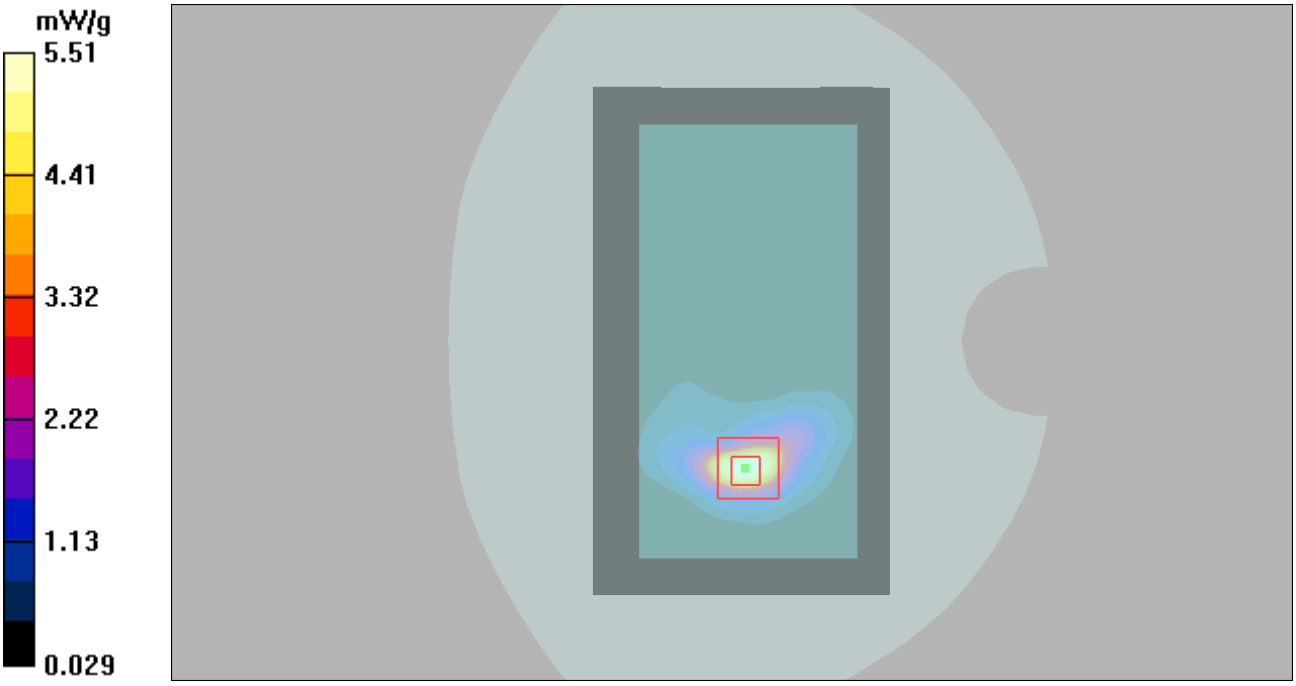



**Figure 69 Body, LTE Band 4 with 1RB Front Side Channel 20300**

## LTE Band 4 with 1RB Front Side Middle (0mm)

Date: 1/1/2015
Communication System: LTE Band 4; Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1732.5 MHz; σ = 1.48 mho/m; $\varepsilon_r$ = 53.5; ρ = 1000 kg/$m^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;
Electronics: DAE4 Sn1317; Calibrated: 1/16/2014
Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Front Side Middle/Area Scan (71x121x1):** Measurement grid: dx=1.500mm, dy=1.500mm
Maximum value of SAR (interpolated) = 5.44 mW/g

**Front Side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.06 V/m; Power Drift = 0.155 dB
Peak SAR (extrapolated) = 8.82 W/kg
**SAR(1 g) = 4.39 mW/g; SAR(10 g) = 2.04 mW/g**
Maximum value of SAR (measured) = 5.19 mW/g

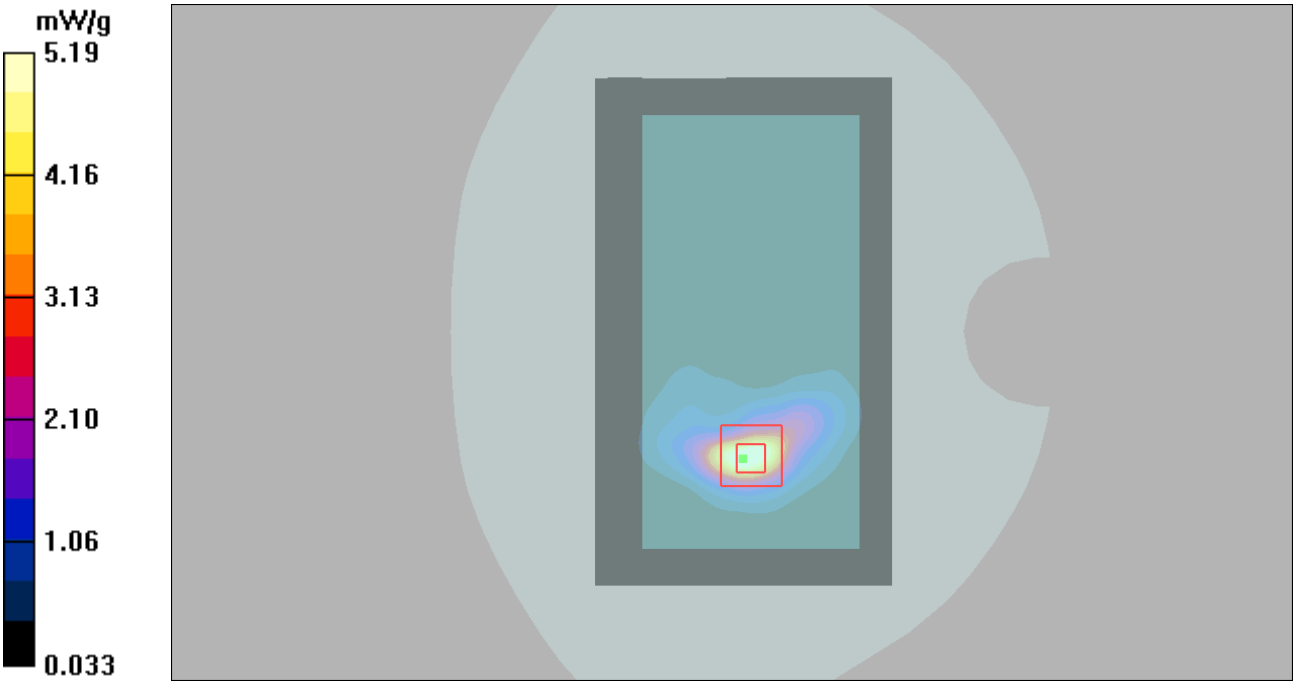



**Figure 70 Body, LTE Band 4 with 1RB Front Side Channel 20175**

## LTE Band 4 with 1RB Front Side Low (0mm)

Date: 1/1/2015
Communication System: LTE Band 4; Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.47 mho/m; $\varepsilon_r$ = 53.5; ρ = 1000 kg/$m^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;
Electronics: DAE4 Sn1317; Calibrated: 1/16/2014
Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Front Side Low/Area Scan (71x121x1):** Measurement grid: dx=1.500mm, dy=1.500mm
Maximum value of SAR (interpolated) = 4.48 mW/g

**Front Side Low/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.91 V/m; Power Drift = 0.166 dB
Peak SAR (extrapolated) = 9.00 W/kg
**SAR(1 g) = 4.41 mW/g; SAR(10 g) = 2.13 mW/g**
Maximum value of SAR (measured) = 4.84 mW/g

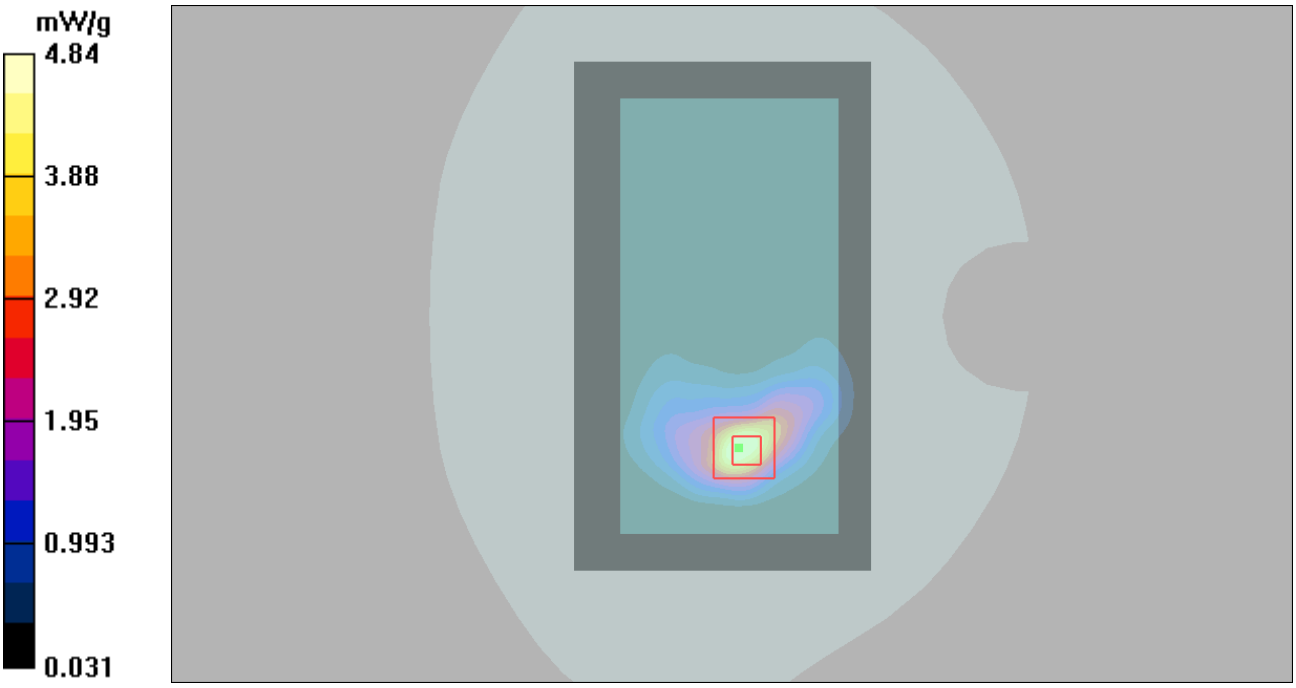



**Figure 71 Body, LTE Band 4 with 1RB Front Side Channel 20050**

## LTE Band 4 with 1RB Left Edge Low (0mm)

Date: 1/1/2015
Communication System: LTE Band 4; Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.47 mho/m; $\varepsilon_r$ = 53.5; ρ = 1000 kg/$m^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;
Electronics: DAE4 Sn1317; Calibrated: 1/16/2014
Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Left Edge Middle/Area Scan (51x181x1):** Measurement grid: dx=1.000mm, dy=1.000mm
Maximum value of SAR (interpolated) = 0.500 mW/g

**Left Edge Middle/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.5 V/m; Power Drift = 0.065 dB
Peak SAR (extrapolated) = 2.16 W/kg
**SAR(1 g) = 0.858 mW/g; SAR(10 g) = 0.317 mW/g**
Maximum value of SAR (measured) = 0.855 mW/g

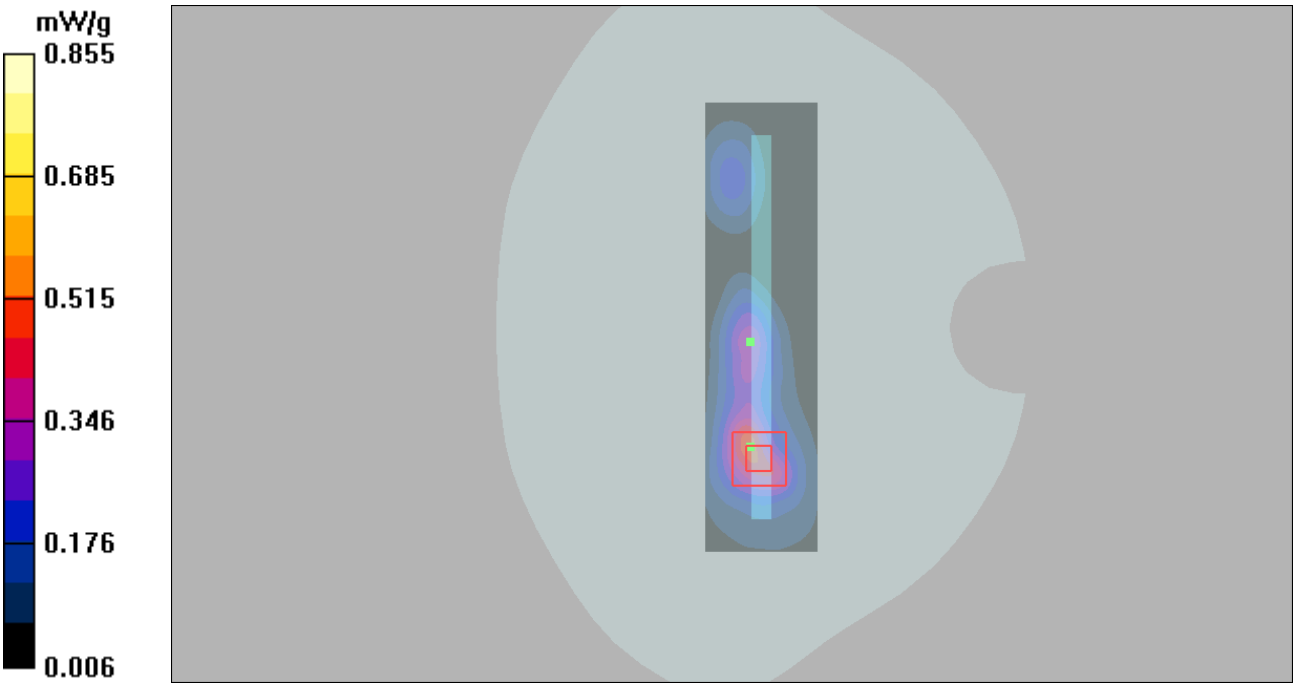


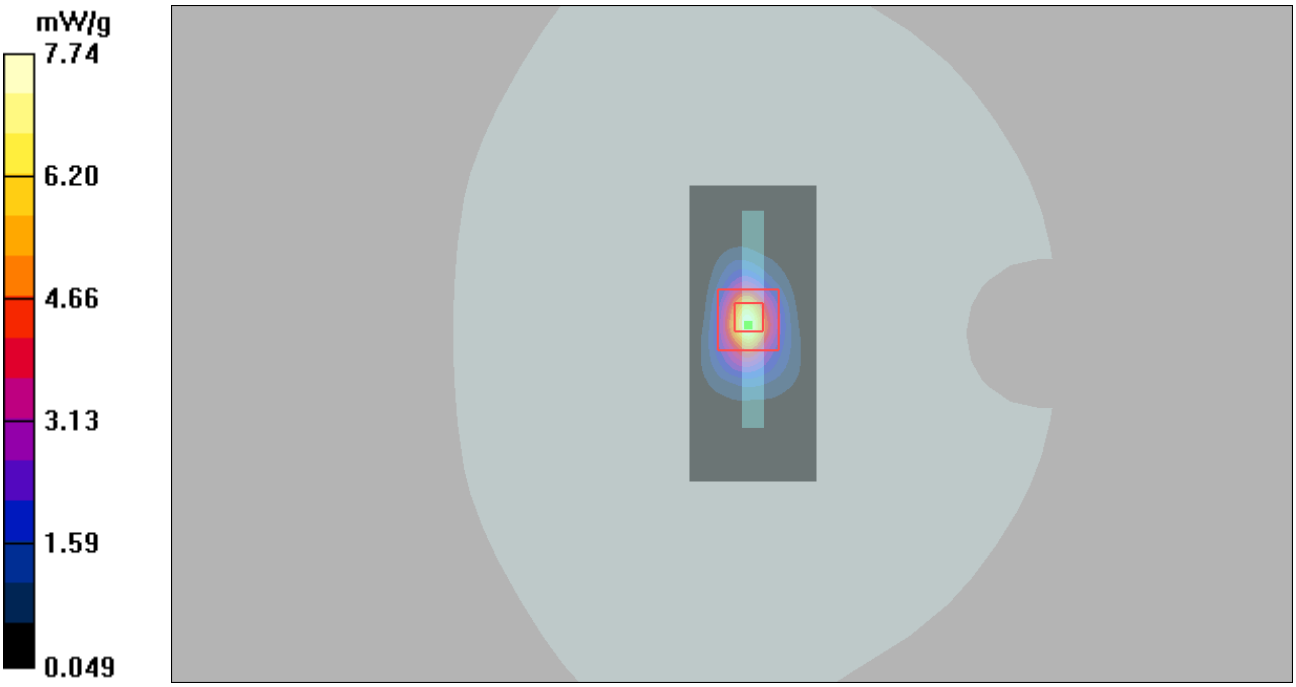

**Figure 72 Body, LTE Band 4 with 1RB Left Edge Channel 20050**

## LTE Band 4 with 1RB Bottom Edge High (0mm)

Date: 1/1/2015
Communication System: LTE Band 4; Frequency: 1745 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1745 MHz; σ = 1.49 mho/m; $\varepsilon_r$ = 53.4; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;
Electronics: DAE4 Sn1317; Calibrated: 1/16/2014
Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Bottom Edge High/Area Scan (51x111x1):** Measurement grid: dx=1.000mm, dy=1.000mm
Maximum value of SAR (interpolated) = 7.68 mW/g

**Bottom Edge High/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 68.7 V/m; Power Drift = 0.025 dB
Peak SAR (extrapolated) = 14.7 W/kg
**SAR(1 g) = 6.59 mW/g; SAR(10 g) = 2.76 mW/g**
Maximum value of SAR (measured) = 7.74 mW/g



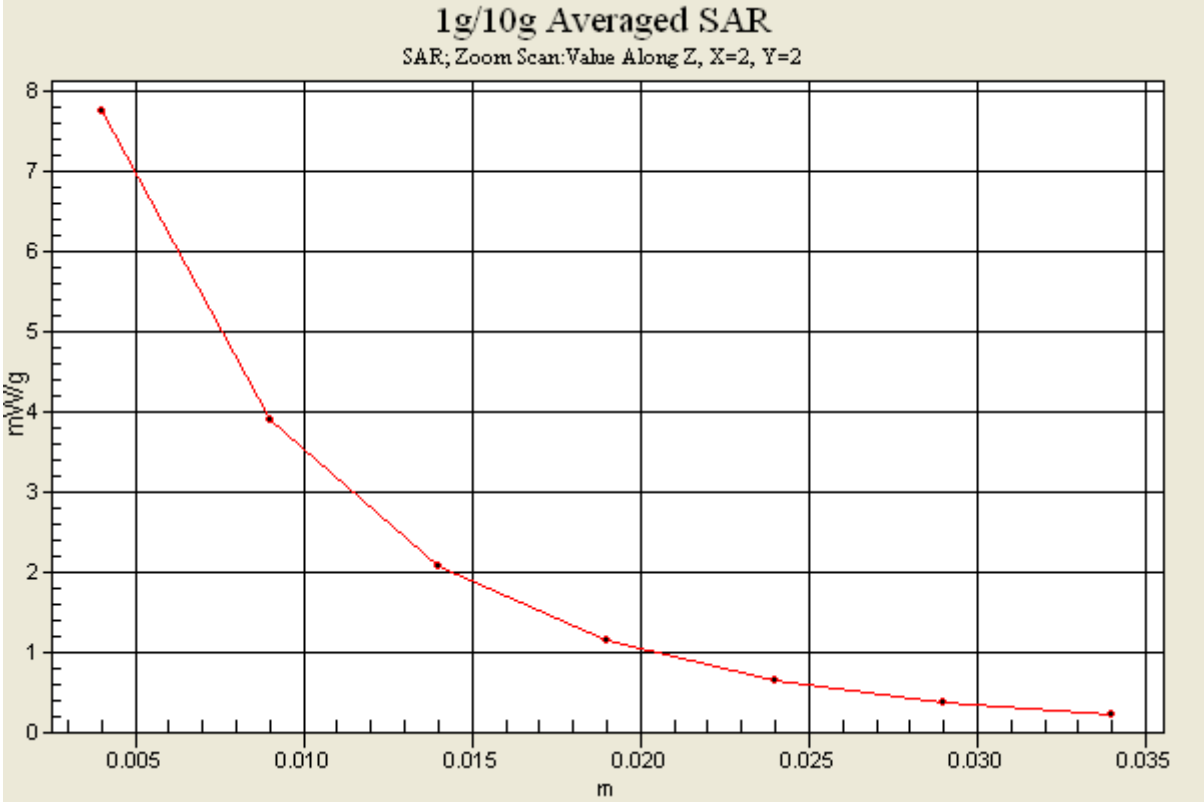



**Figure 73 Body, LTE Band 4 with 1RB Bottom Edge Channel 20300**

## LTE Band 4 with 1RB Bottom Edge Middle (0mm)

Date: 1/1/2015
Communication System: LTE Band 4; Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1732.5 MHz; σ = 1.48 mho/m; $\varepsilon_r$ = 53.5; ρ = 1000 kg/$m^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;
Electronics: DAE4 Sn1317; Calibrated: 1/16/2014
Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Bottom Edge Middle/Area Scan (51x111x1):** Measurement grid: dx=1.000mm, dy=1.000mm
Maximum value of SAR (interpolated) = 6.23 mW/g

**Bottom Edge Middle/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 62.4 V/m; Power Drift = -0.067 dB
Peak SAR (extrapolated) = 12.1 W/kg
**SAR(1 g) = 5.45 mW/g; SAR(10 g) = 2.3 mW/g**
Maximum value of SAR (measured) = 6.51 mW/g

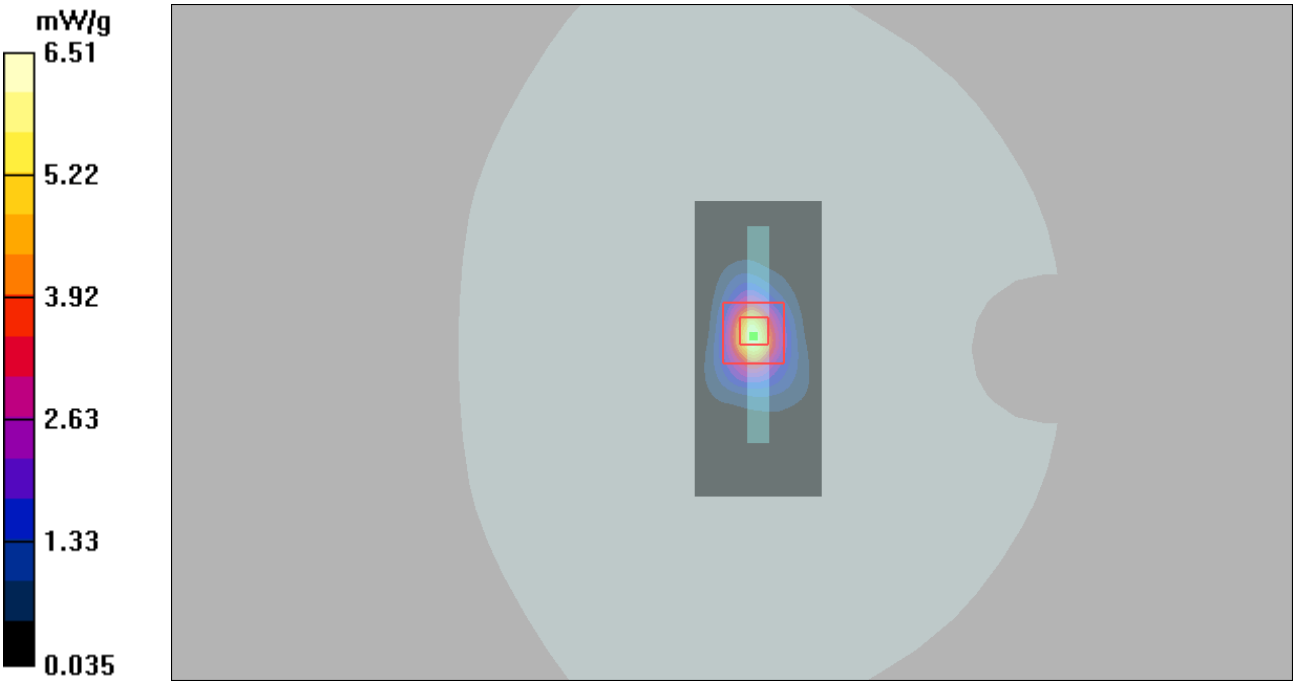



**Figure 74 Body, LTE Band 4 with 1RB Bottom Edge Channel 20175**

## LTE Band 4 with 1RB Bottom Edge Low (0mm)

Date: 1/1/2015
Communication System: LTE Band 4; Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.47 mho/m; $\varepsilon_r$ = 53.5; ρ = 1000 kg/$m^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;
Electronics: DAE4 Sn1317; Calibrated: 1/16/2014
Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Bottom Edge Low/Area Scan (51x111x1):** Measurement grid: dx=1.000mm, dy=1.000mm
Maximum value of SAR (interpolated) = 5.63 mW/g

**Bottom Edge Low/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 59.2 V/m; Power Drift = -0.001 dB
Peak SAR (extrapolated) = 11.4 W/kg
**SAR(1 g) = 5.18 mW/g; SAR(10 g) = 2.2 mW/g**
Maximum value of SAR (measured) = 6.14 mW/g

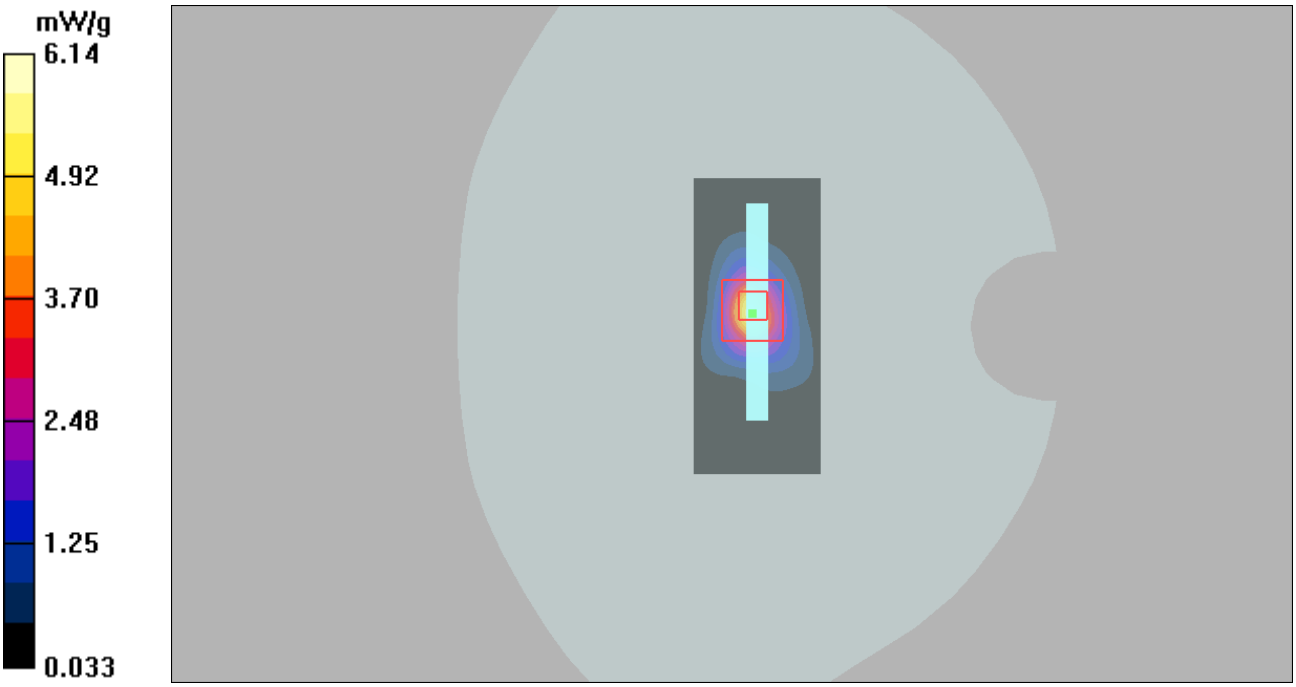



**Figure 75 Body, LTE Band 4 with 1RB Bottom Edge Channel 20050**

**LTE Band 4 with 50%RB Back Side High (0mm)**

Date: 1/1/2015

Communication System: UID 0, LTE (0); Frequency: 1745 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1745 MHz; σ = 1.498 S/m; $\varepsilon_r$ = 52.918; ρ = 1000 kg/$m^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;

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

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

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

**Back Side Low/Area Scan (71x121x1):** Measurement grid: dx=1.500mm, dy=1.500mm

Maximum value of SAR (interpolated) = 4.59 W/kg

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

Reference Value = 4.665 V/m; Power Drift = 0.070 dB

Peak SAR (extrapolated) = 9.58 W/kg

**SAR(1 g) = 4.41 W/kg; SAR(10 g) = 1.98 W/kg**

Maximum value of SAR (measured) = 4.96 W/kg

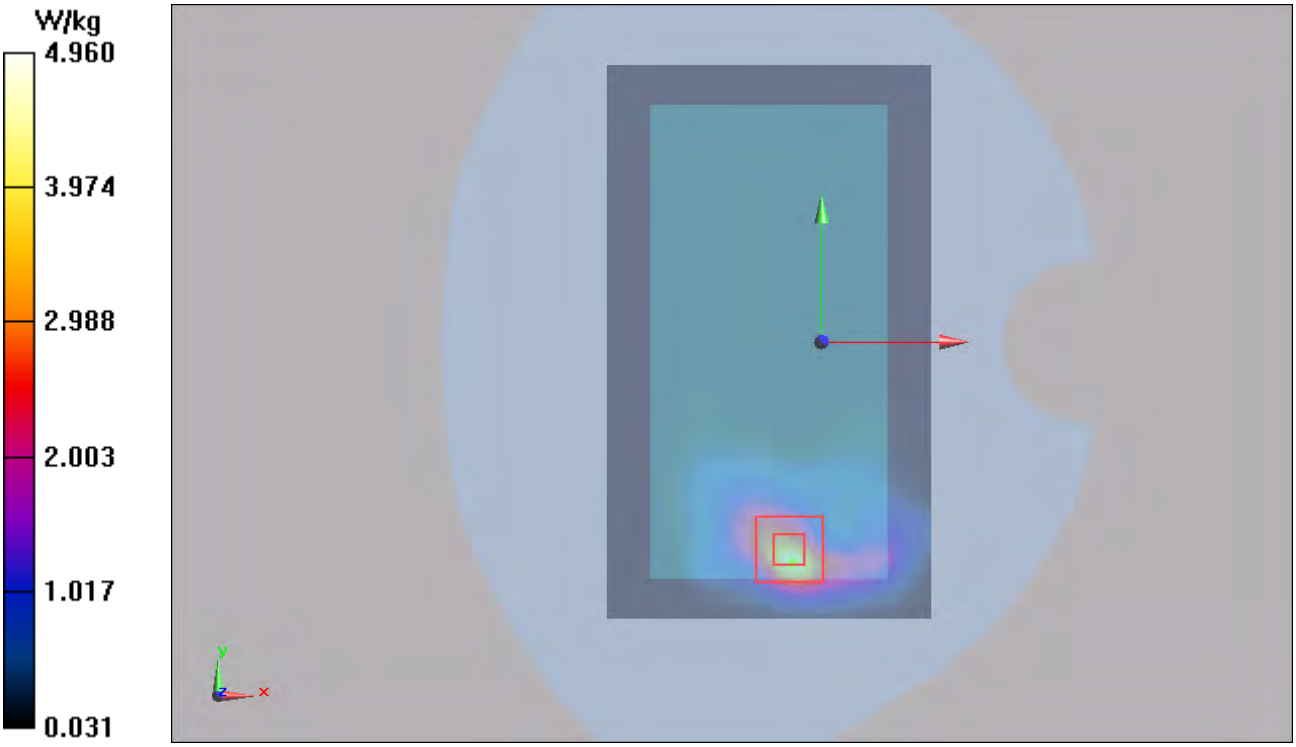



**Figure 76 Body, LTE Band 4 with 50%RB Back Side Channel 20300**

## LTE Band 4 with 50%RB Back Side Middle (0mm)

Date: 1/1/2015
Communication System: UID 0, LTE (0); Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1732.5 MHz; σ = 1.488 S/m; $\varepsilon_r$ = 52.928; ρ = 1000 kg/$m^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;
Electronics: DAE4 Sn1317; Calibrated: 1/16/2014
Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Back Side Low/Area Scan (71x121x1):** Measurement grid: dx=1.500mm, dy=1.500mm
Maximum value of SAR (interpolated) = 4.02 W/kg

**Back Side Low/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.126 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 8.88 W/kg
**SAR(1 g) = 4.1 W/kg; SAR(10 g) = 1.86 W/kg**
Maximum value of SAR (measured) = 4.92 W/kg

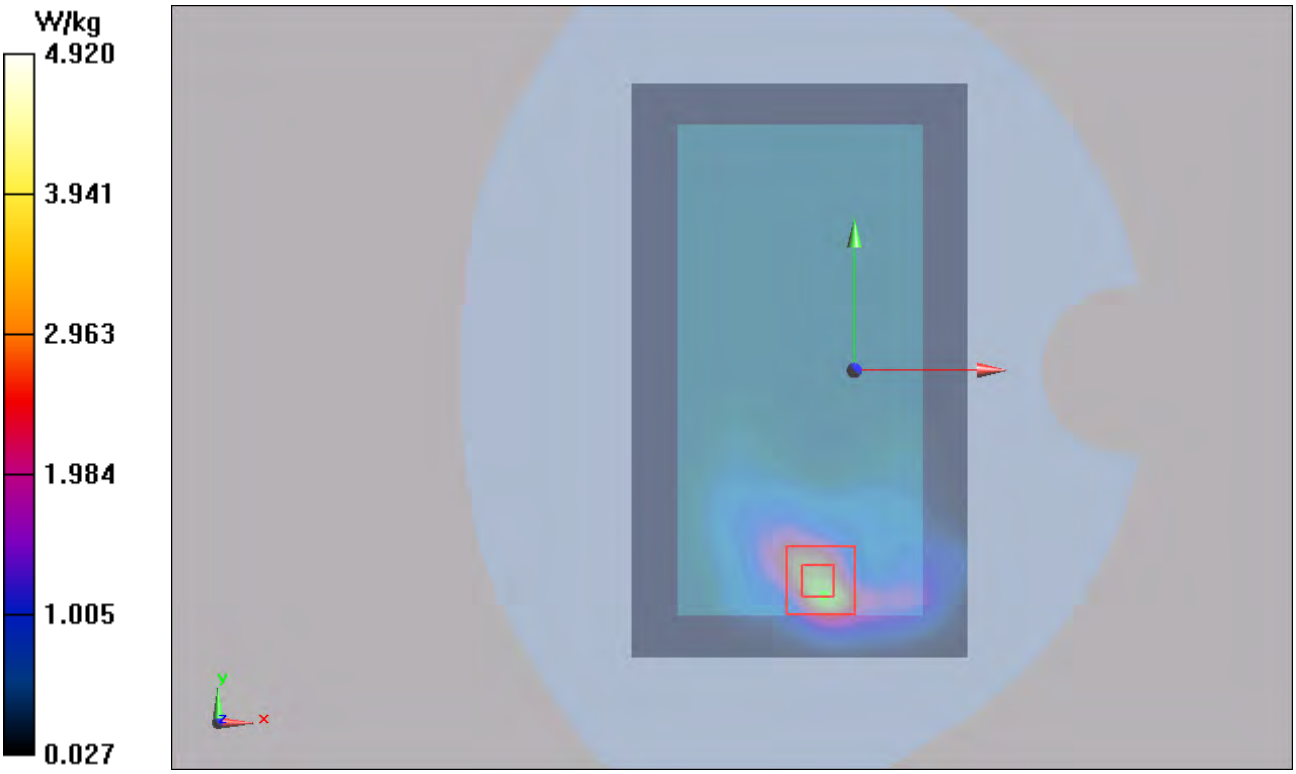



**Figure 77 Body, LTE Band 4 with 50%RB Back Side Channel 20175**

## LTE Band 4 with 50%RB Back Side Low (0mm)

Date: 1/1/2015
Communication System: LTE Band 4; Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.47 mho/m; $\varepsilon_r$ = 53.5; ρ = 1000 kg/$m^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;
Electronics: DAE4 Sn1317; Calibrated: 1/16/2014
Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Back Side Low/Area Scan (71x121x1):** Measurement grid: dx=1.500mm, dy=1.500mm
Maximum value of SAR (interpolated) = 5.75 mW/g

**Back Side Low/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.2 V/m; Power Drift = 0.163 dB
Peak SAR (extrapolated) = 10.6 W/kg
**SAR(1 g) = 4.45 mW/g; SAR(10 g) = 1.97 mW/g**
Maximum value of SAR (measured) = 5.27 mW/g

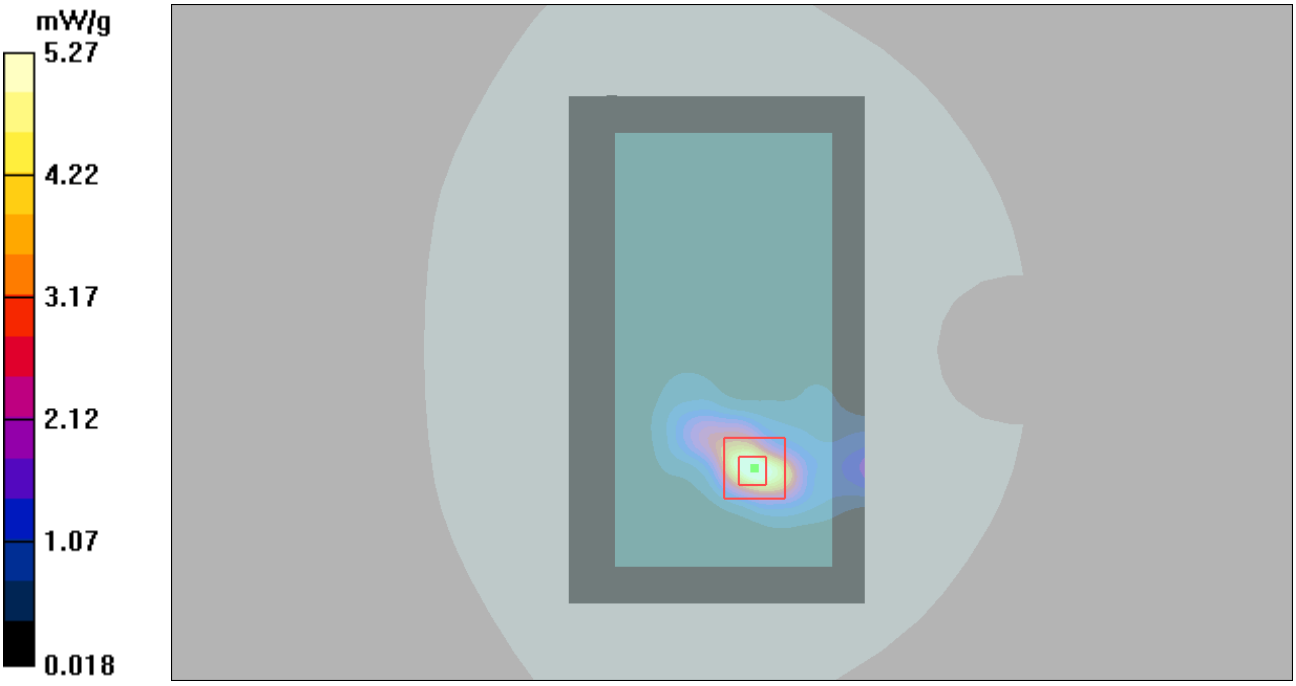



**Figure 78 Body, LTE Band 4 with 50%RB Back Side Channel 20050**

**LTE Band 4 with 50%RB Front Side High (0mm)**

Date: 1/1/2015

Communication System: UID 0, LTE (0); Frequency: 1745 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1745 MHz; σ = 1.498 S/m; $\varepsilon_r$ = 52.918; ρ = 1000 kg/$m^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;

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 (71x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 3.29 W/kg

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

Reference Value = 6.063 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 6.41 W/kg

**SAR(1 g) = 3.53 W/kg; SAR(10 g) = 1.72 W/kg**

Maximum value of SAR (measured) = 4.30 W/kg

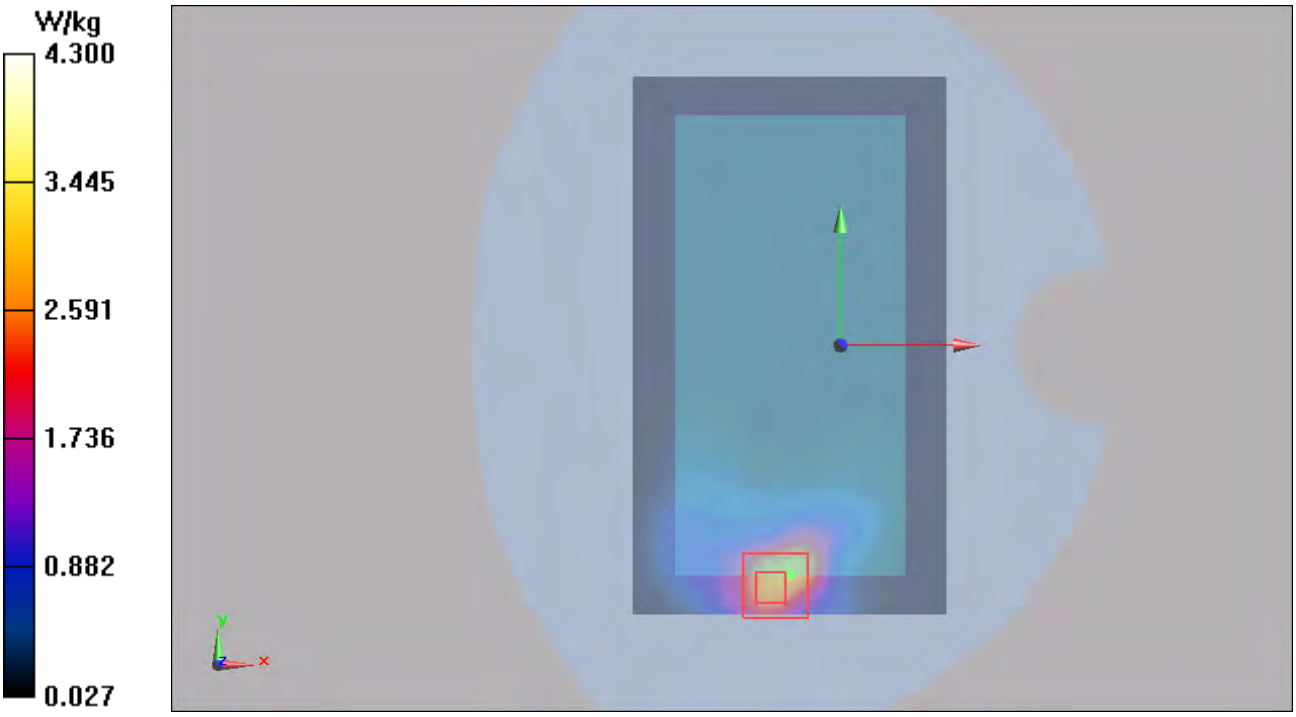



**Figure 79 Body, LTE Band 4 with 50%RB Front Side Channel 20300**

## LTE Band 4 with 50%RB Front Side Middle (0mm)

Date: 1/1/2015

Communication System: UID 0, LTE (0); Frequency: 1732.5 MHz;Duty Cycle: 1:1

Medium parameters used (interpolated): f = 1732.5 MHz; σ = 1.488 S/m; $\varepsilon_r$ = 52.928; ρ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;

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 (71x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 3.00 W/kg

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

Reference Value = 6.841 V/m; Power Drift = -0.024 dB

Peak SAR (extrapolated) = 6.01 W/kg

**SAR(1 g) = 3.27 W/kg; SAR(10 g) = 1.6 W/kg**

Maximum value of SAR (measured) = 3.74 W/kg

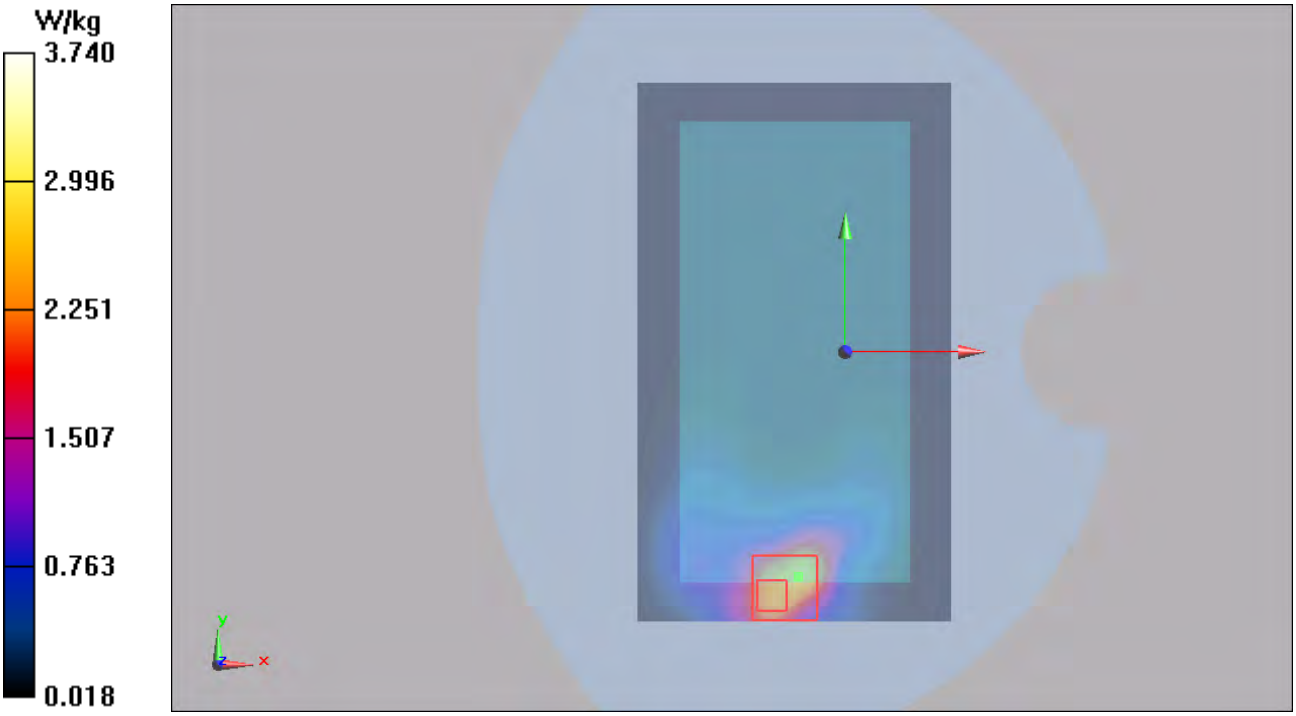



**Figure 80 Body, LTE Band 4 with 50%RB Front Side Channel 20175**

## LTE Band 4 with 50%RB Front Side Low (0mm)

Date: 1/1/2015
Communication System: LTE Band 4; Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.47 mho/m; $\varepsilon_r$ = 53.5; ρ = 1000 kg/$m^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;
Electronics: DAE4 Sn1317; Calibrated: 1/16/2014
Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Front Side Low/Area Scan (71x121x1):** Measurement grid: dx=1.500mm, dy=1.500mm
Maximum value of SAR (interpolated) = 4.32 mW/g

**Front Side Low/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.43 V/m; Power Drift = -0.025 dB
Peak SAR (extrapolated) = 7.89 W/kg
**SAR(1 g) = 3.82 mW/g; SAR(10 g) = 1.83 mW/g**
Maximum value of SAR (measured) = 4.12 mW/g

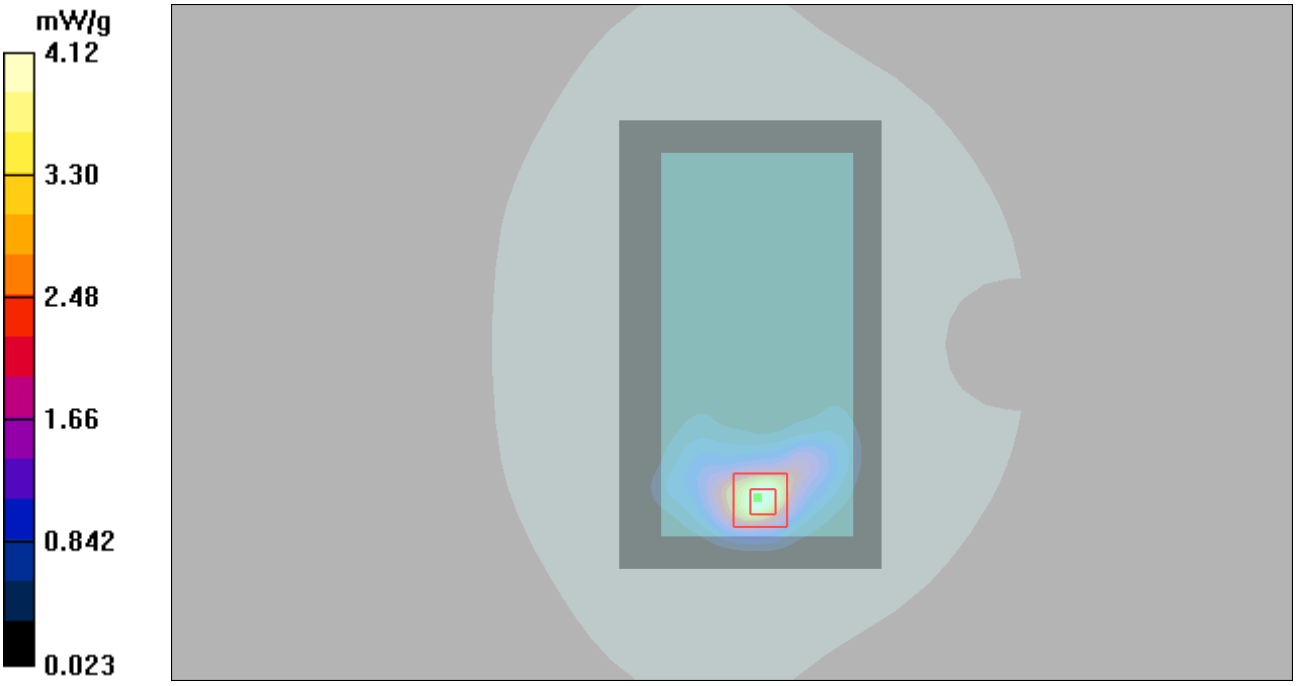



**Figure 81 Body, LTE Band 4 with 50%RB Front Side Channel 20050**

## LTE Band 4 with 50%RB Left Edge Low (0mm)

Date: 1/1/2015
Communication System: LTE Band 4; Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.47 mho/m; $\varepsilon_r$ = 53.5; ρ = 1000 kg/$m^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;
Electronics: DAE4 Sn1317; Calibrated: 1/16/2014
Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Left Edge Middle/Area Scan (51x181x1):** Measurement grid: dx=1.000mm, dy=1.000mm
Maximum value of SAR (interpolated) = 0.629 mW/g

**Left Edge Middle/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.5 V/m; Power Drift = 0.019 dB
Peak SAR (extrapolated) = 2.02 W/kg
**SAR(1 g) = 0.835 mW/g; SAR(10 g) = 0.315 mW/g**
Maximum value of SAR (measured) = 0.823 mW/g

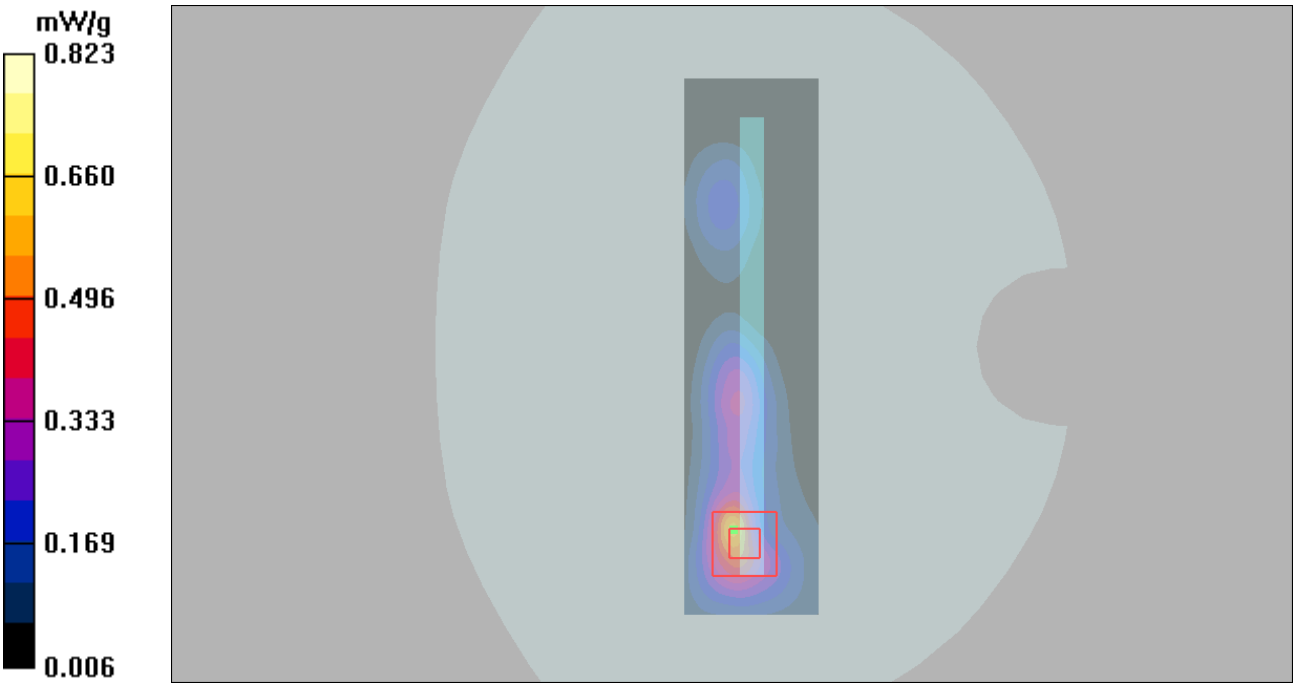



**Figure 82 Body, LTE Band 4 with 50%RB Left Edge Channel 20050**

## LTE Band 4 with 50%RB Bottom Edge High (0mm)

Date: 1/1/2015
Communication System: UID 0, LTE (0); Frequency: 1745 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1745 MHz; σ = 1.498 S/m; $\varepsilon_r$ = 52.918; ρ = 1000 kg/$m^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;
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 (51x111x1):** Interpolated grid: dx=1.000mm, dy=1.000mm
Maximum value of SAR (interpolated) = 5.07 W/kg

**Bottom Edge High /Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.278 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 8.85 W/kg
**SAR(1 g) = 4.38 W/kg; SAR(10 g) = 1.95 W/kg**
Maximum value of SAR (measured) = 3.74 W/kg

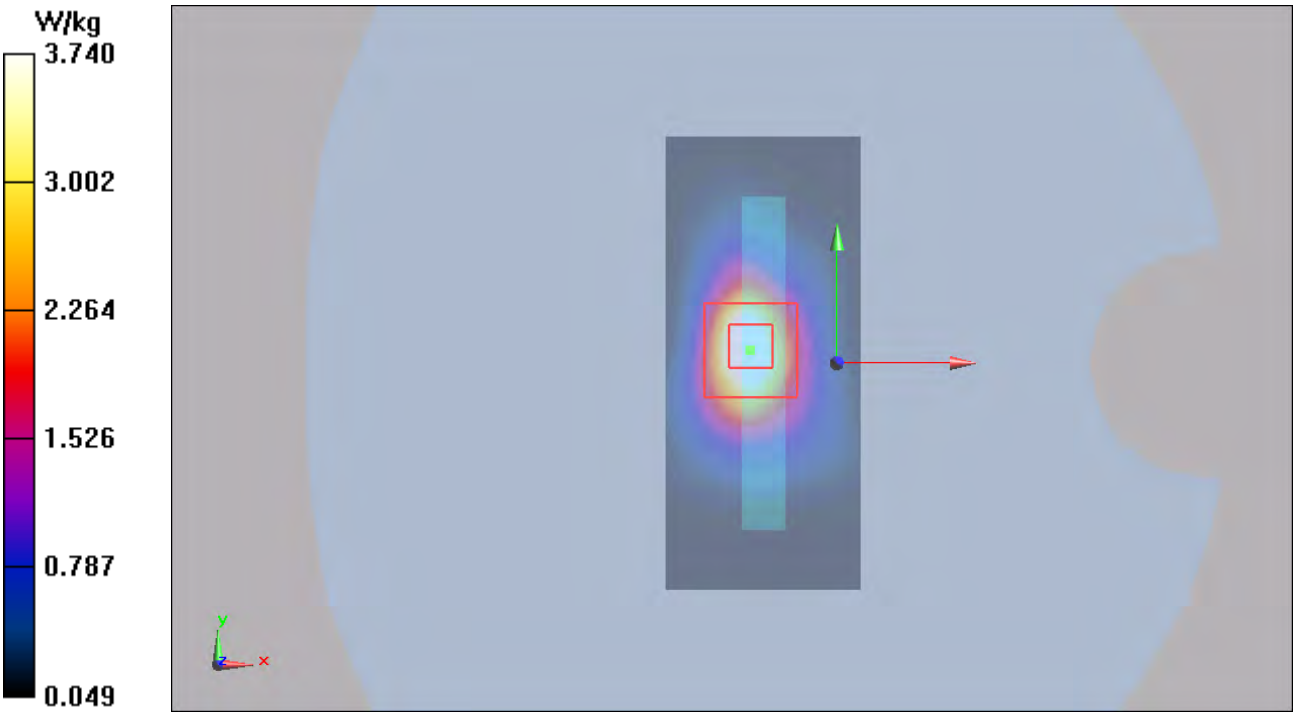



**Figure 83 Body, LTE Band 4 with 50%RB Bottom Edge Channel 20300**

## LTE Band 4 with 50%RB Bottom Edge Middle (0mm)

Date: 1/1/2015

Communication System: UID 0, LTE (0); Frequency: 1732.5 MHz;Duty Cycle: 1:1

Medium parameters used (interpolated): f = 1732.5 MHz; σ = 1.488 S/m; $\varepsilon_r$ = 52.928; ρ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;

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 (51x111x1):** Interpolated grid: dx=1.000mm, dy=1.000mm

Maximum value of SAR (interpolated) = 3.30 W/kg

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

Reference Value = 46.526 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 5.67 W/kg

**SAR(1 g) = 2.86 W/kg; SAR(10 g) = 1.32 W/kg**

Maximum value of SAR (measured) = 2.61 W/kg

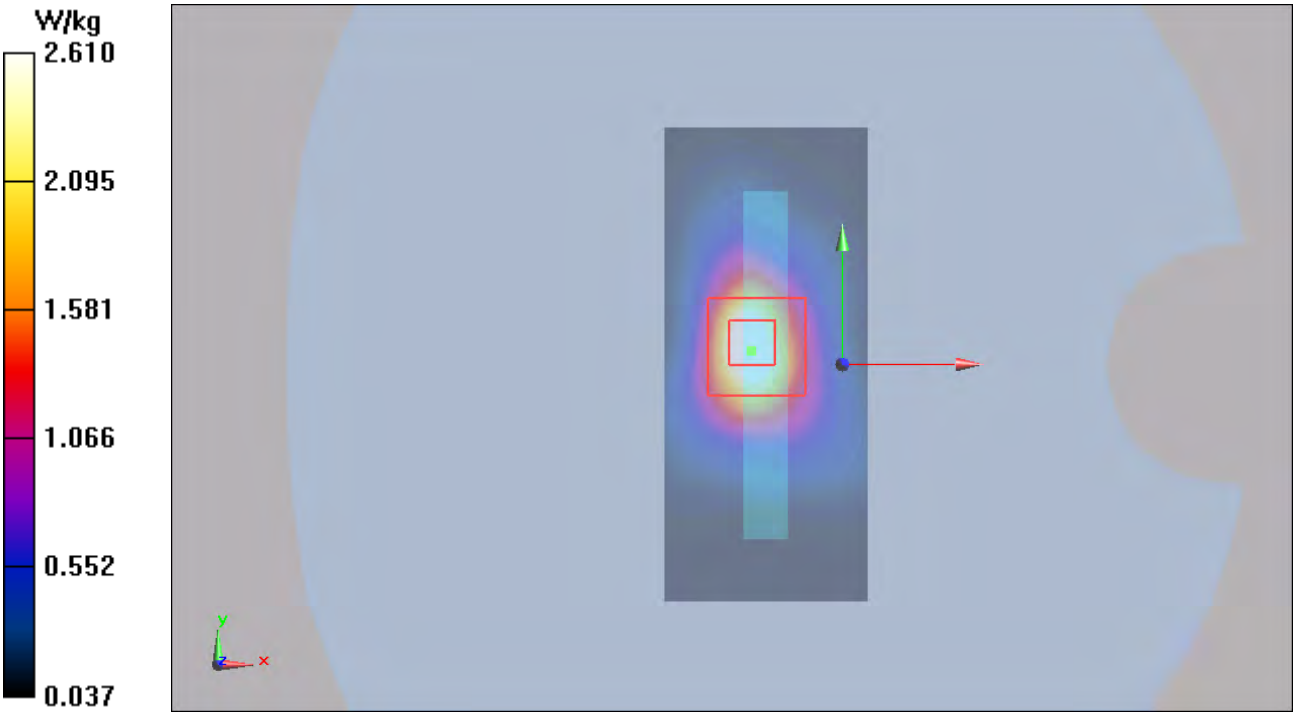



**Figure 84 Body, LTE Band 4 with 50%RB Bottom Edge Channel 20175**

## LTE Band 4 with 50%RB Bottom Edge Low (0mm)

Date: 1/1/2015
Communication System: LTE Band 4; Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.47 mho/m; $\varepsilon_r$ = 53.5; ρ = 1000 kg/$m^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;
Electronics: DAE4 Sn1317; Calibrated: 1/16/2014
Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Bottom Edge Low/Area Scan (51x111x1):** Measurement grid: dx=1.000mm, dy=1.000mm
Maximum value of SAR (interpolated) = 4.52 mW/g

**Bottom Edge Low/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 53.6 V/m; Power Drift = 0.019 dB
Peak SAR (extrapolated) = 9.61 W/kg
**SAR(1 g) = 4.19 mW/g; SAR(10 g) = 1.75 mW/g**
Maximum value of SAR (measured) = 4.98 mW/g

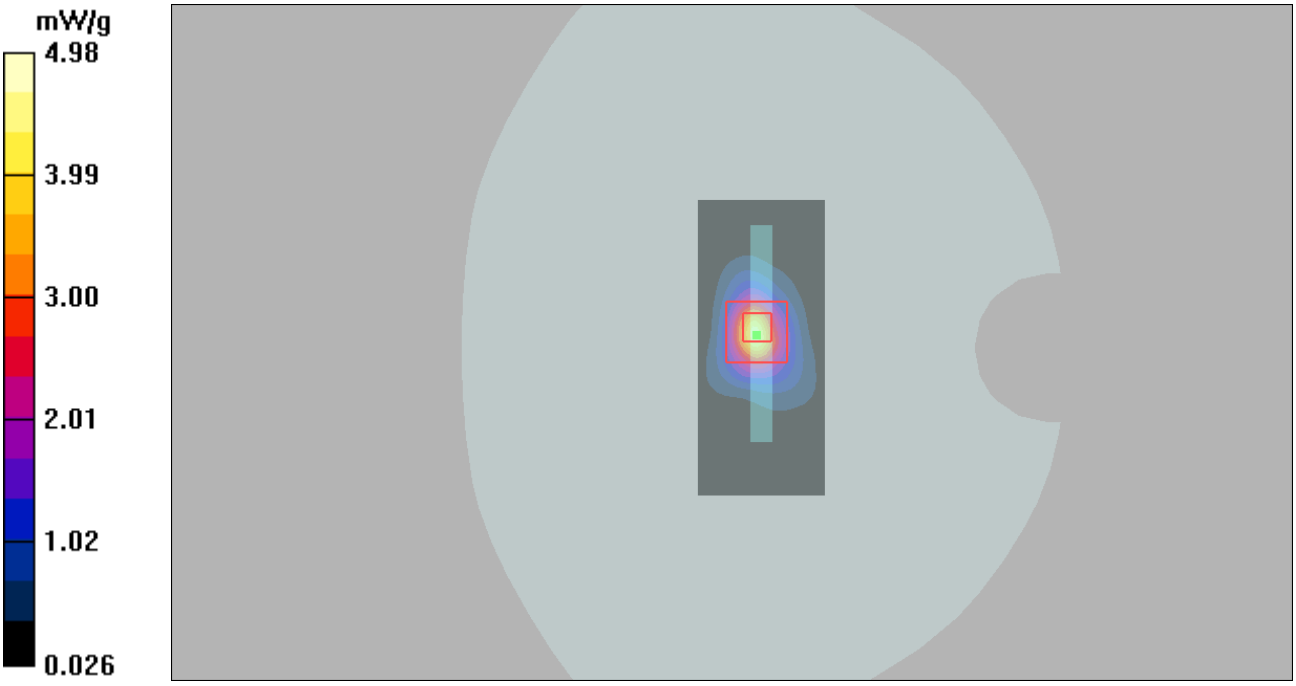



**Figure 85 Body, LTE Band 4 with 50%RB Bottom Edge Channel 20050**

## LTE Band 4 1RB Bottom Edge High (Repeated SAR)

Date: 1/1/2015
Communication System: LTE Band 4; Frequency: 1745 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1745 MHz; σ = 1.49 mho/m; $\varepsilon_r$ = 53.4; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;
Electronics: DAE4 Sn1317; Calibrated: 1/16/2014
Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Bottom Edge High/Area Scan (51x111x1):** Measurement grid: dx=1.000mm, dy=1.000mm
Maximum value of SAR (interpolated) = 7.68 mW/g

**Bottom Edge High /Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 68.8 V/m; Power Drift = 0.005 dB
Peak SAR (extrapolated) = 14.7 W/kg
**SAR(1 g) = 6.6 mW/g; SAR(10 g) = 2.76 mW/g**
Maximum value of SAR (measured) = 7.76 mW/g

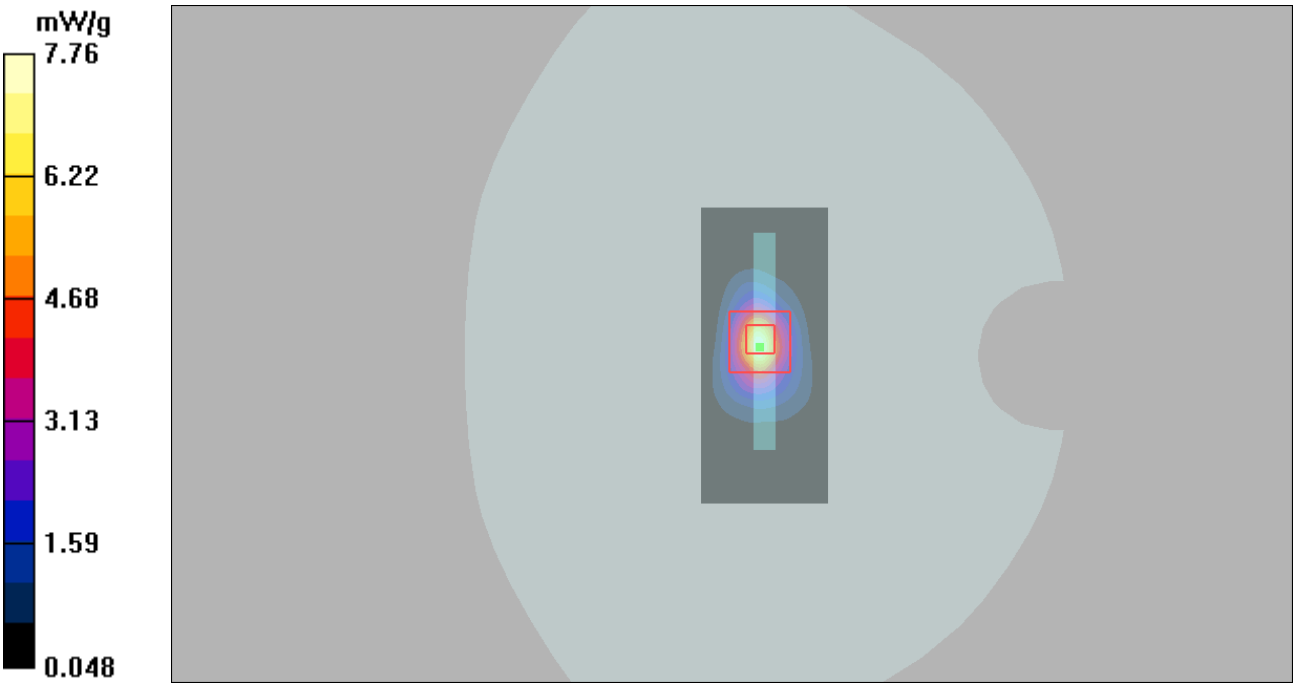



**Figure 86 Body, Bottom Edge, LTE Band 4 1RB Channel 20300**

## LTE Band 4 with SVLTE 1RB Back Side Low (0mm)

Date: 1/1/2015
Communication System: UID 0, LTE (0); Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.477 S/m; $\varepsilon_r$ = 53.021; ρ = 1000 kg/$m^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;
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 Low/Area Scan (71x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.586 W/kg

**Back Side Low/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.693 V/m; Power Drift = 0.039 dB
Peak SAR (extrapolated) = 0.875 W/kg
**SAR(1 g) = 0.426 W/kg; SAR(10 g) = 0.204 W/kg**
Maximum value of SAR (measured) = 0.492 W/kg

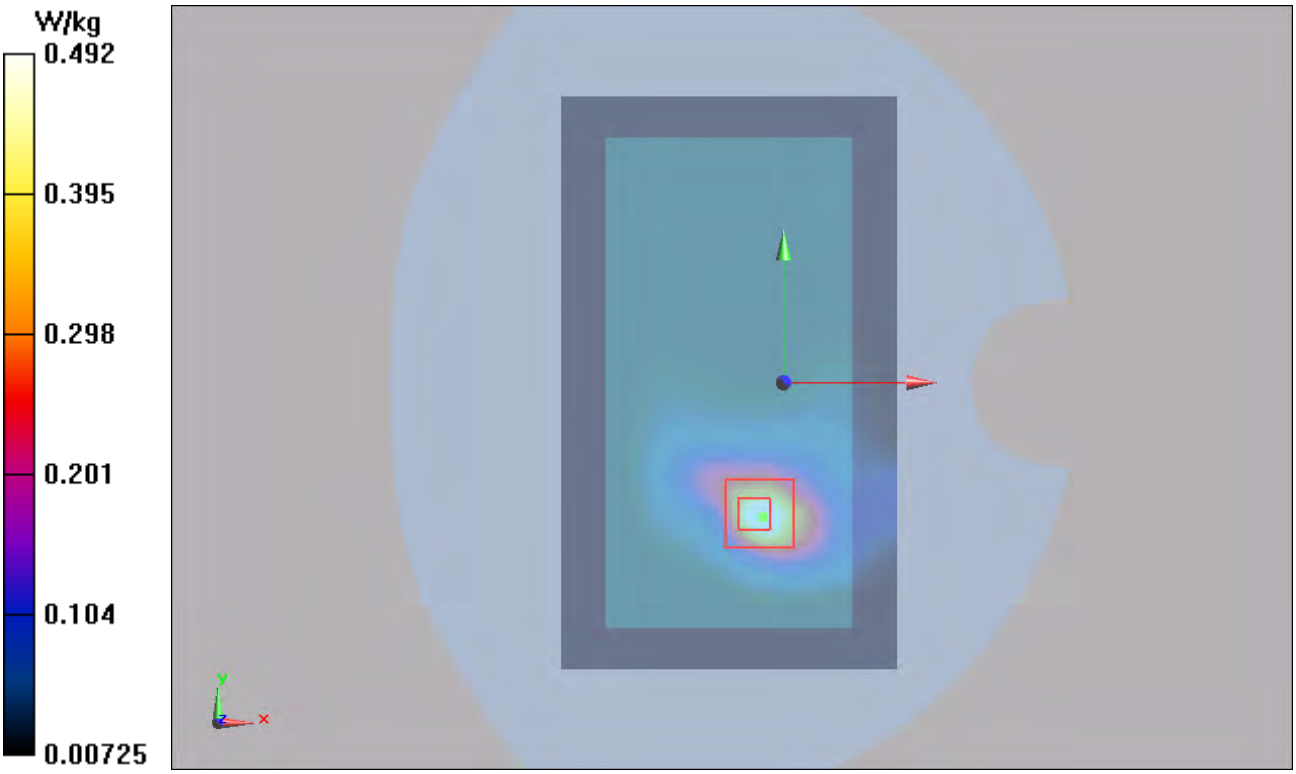



**Figure 87 Body, LTE Band 4 with 1RB Back Side Channel 20050**

## LTE Band 4 with SVLTE 1RB CP=17 Front Side Low (0mm)

Date: 1/1/2015
Communication System: UID 0, LTE (0); Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.477 S/m; εr = 53.021; ρ = 1000 kg/m3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;
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 0mm/Low 2 2 2/Area Scan (71x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.439 W/kg

**Front side 0mm/Low 2 2 2/Zoom Scan (4x4x7)/Cube 0:** Measurement grid: dx=10mm, dy=10mm, dz=5mm
Reference Value = 0.695 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.726 W/kg
**SAR(1 g) = 0.370 W/kg; SAR(10 g) = 0.180 W/kg**
Maximum value of SAR (measured) = 0.419 W/kg

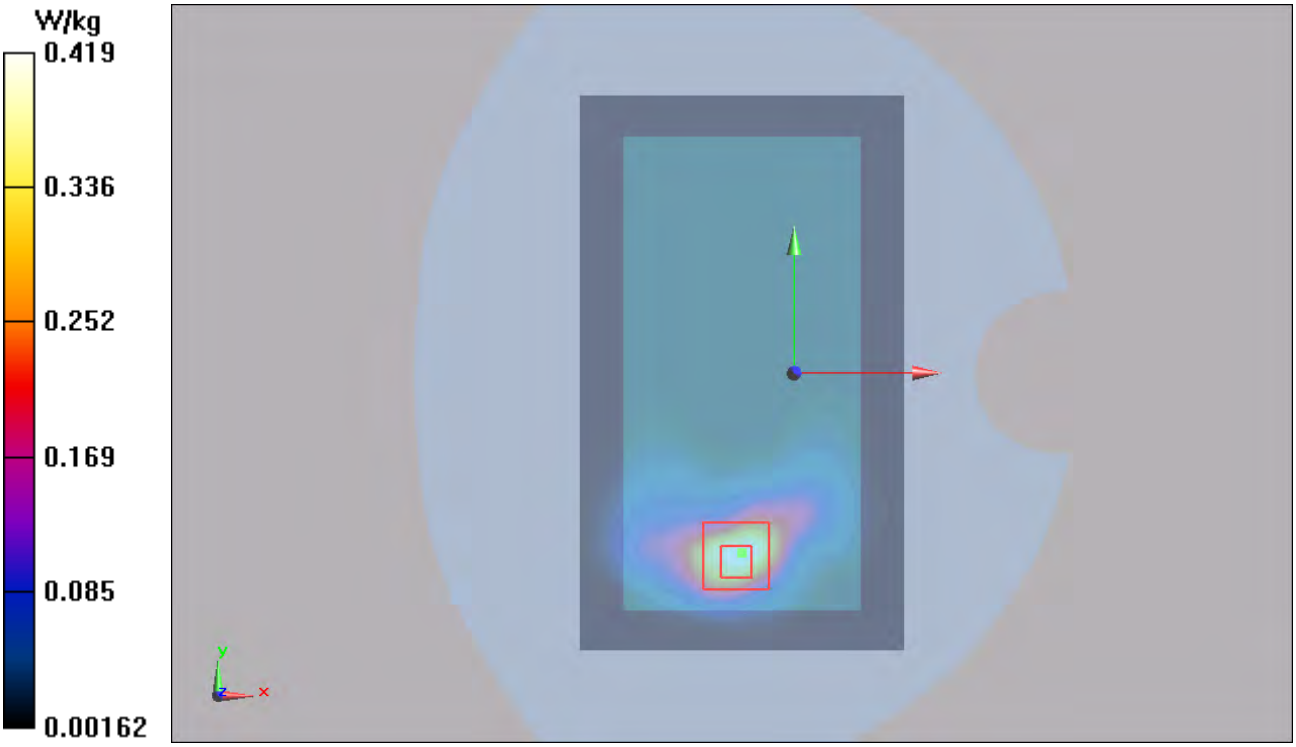



**Figure 88 Body, LTE Band 4 with SVLTE 1RB CP=17 Front Side Channel 20050**

## LTE Band 4 with SVLTE 1RB Front Side Low (0mm)

Date: 1/1/2015
Communication System: UID 0, LTE (0); Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.477 S/m; $\varepsilon_r$ = 53.021; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;
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 Low/Area Scan (71x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 3.14 W/kg

**Front Side Low/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.894 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 5.16 W/kg
**SAR(1 g) = 2.89 W/kg; SAR(10 g) = 1.51 W/kg**
Maximum value of SAR (measured) = 3.37 W/kg

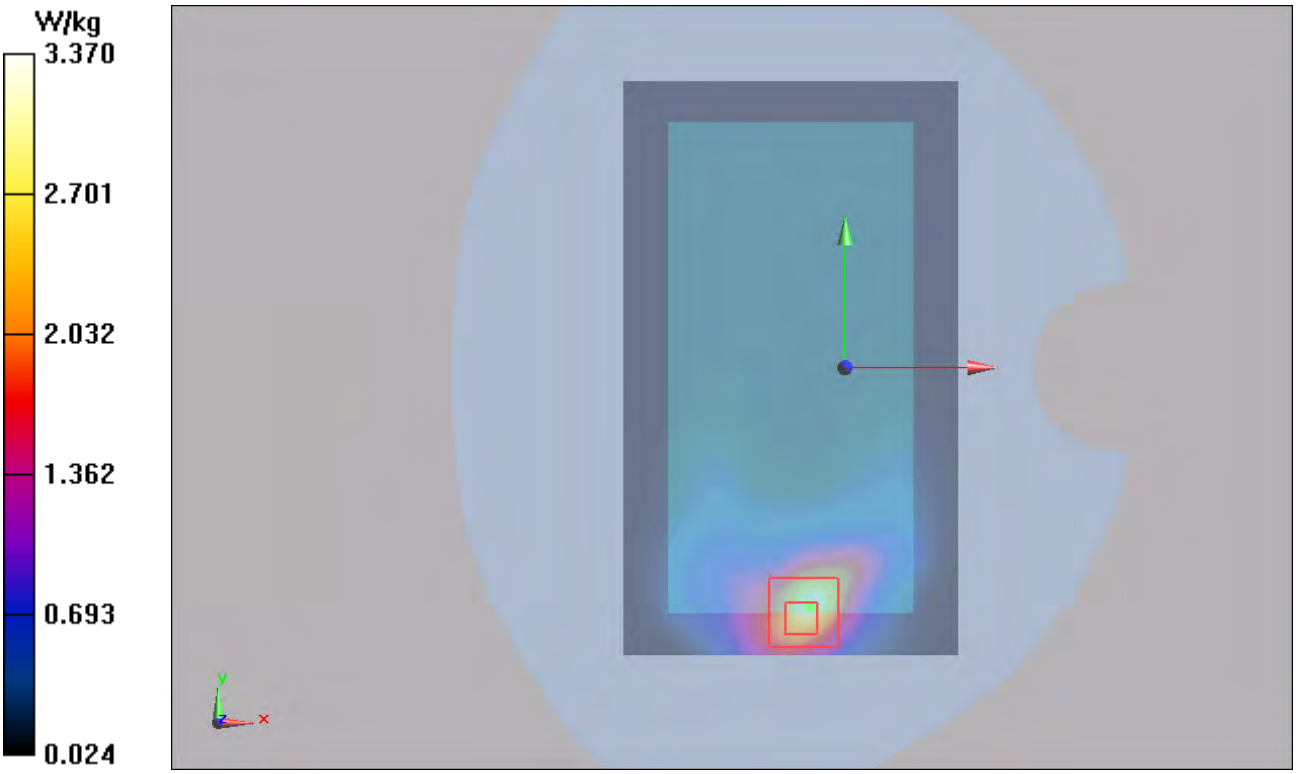



**Figure 89 Body, LTE Band 4 with 1RB Front Side Channel 20050**

## LTE Band 4 with SVLTE 1RB Bottom Side Low (0mm)

Date: 1/1/2015

Communication System: LTE Band 4; Frequency: 1720 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1720 MHz; $\sigma$ = 1.477 S/m; $\varepsilon_r$ = 53.021; $\rho$ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 – SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014;

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

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

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

**Bottom Side Low/Area Scan (51x111x1):** Measurement grid: dx=1.000mm, dy=1.000mm

Maximum value of SAR (interpolated) = 5.99 W/kg

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

Reference Value = 50.033 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 9.59 W/kg

**SAR(1 g) = 4.59 W/kg; SAR(10 g) = 1.96 W/kg**

Maximum value of SAR (measured) = 3.88 W/kg

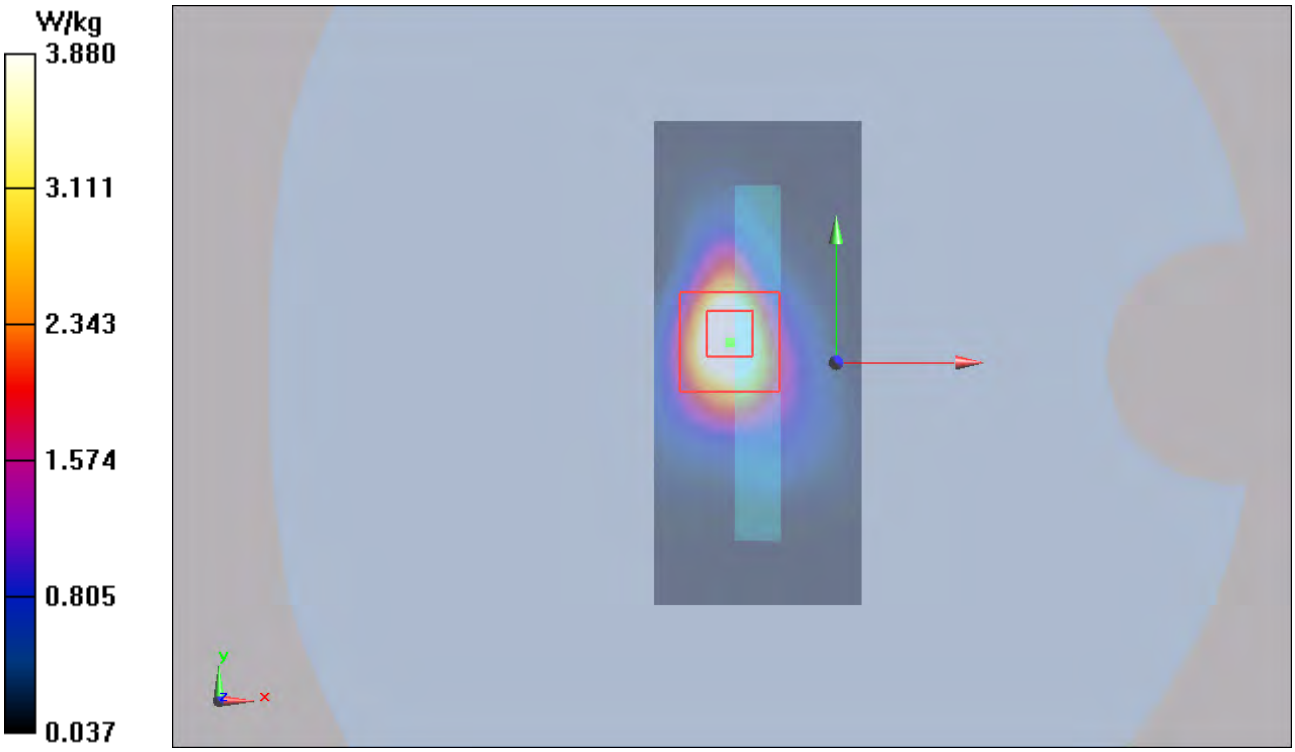


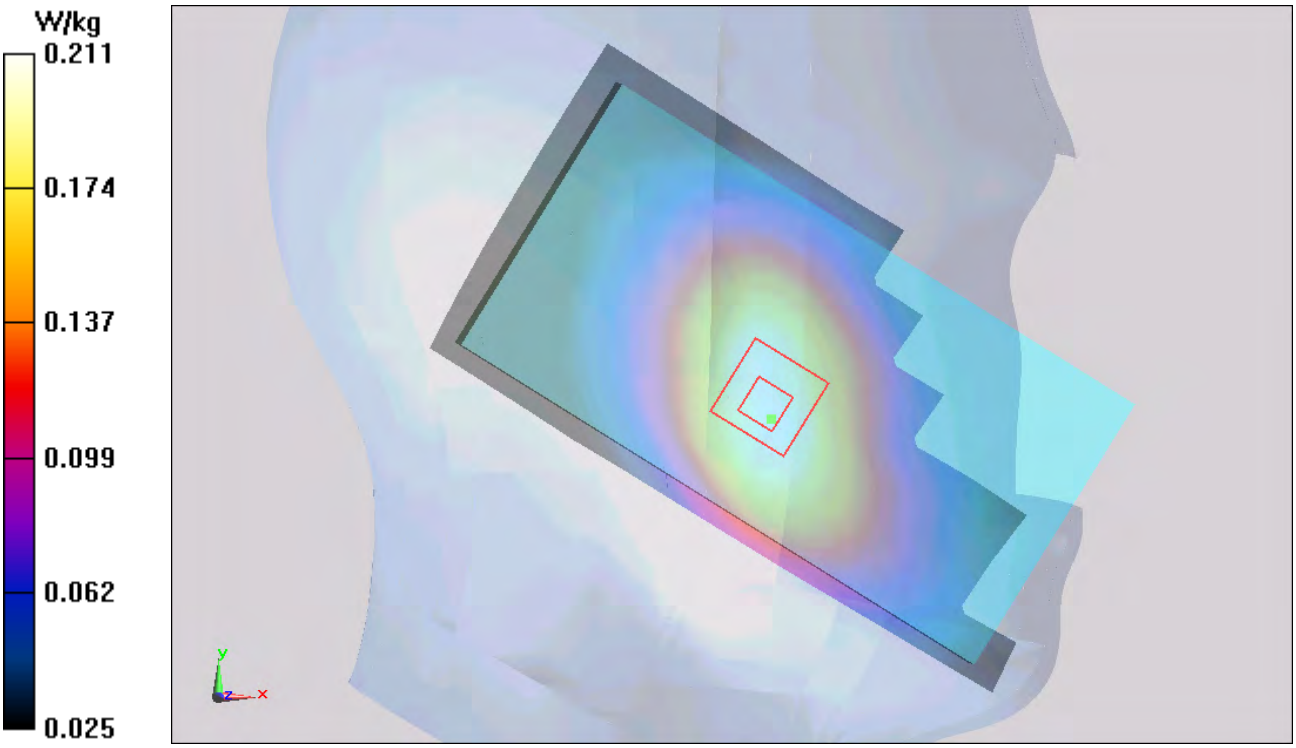

**Figure 90 Body, LTE Band 4 with 1RB Bottom Side Channel 20050**

## LTE Band 13 with 1RB Left Cheek Middle

Date: 11/23/2014
Communication System: UID 0, LTE (0); Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used: f = 782 MHz; $\sigma$ = 0.935 S/m; $\varepsilon_r$ = 41.578; $\rho$ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Left Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(9.62, 9.62, 9.62); Calibrated: 2/17/2014;
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 (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.209 W/kg

**Left Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.944 V/m; Power Drift = -0.048 dB
Peak SAR (extrapolated) = 0.250 W/kg
**SAR(1 g) = 0.202 W/kg; SAR(10 g) = 0.156 W/kg**
Maximum value of SAR (measured) = 0.211 W/kg



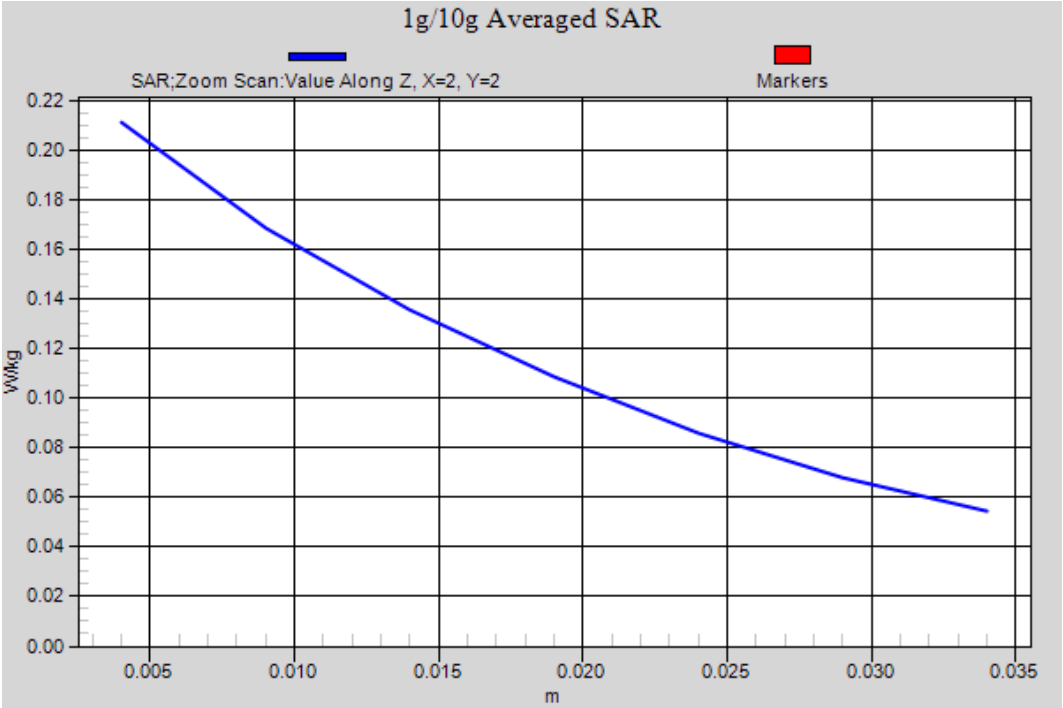



**Figure 91 LTE Band 13 with 1RB Left Hand Touch Cheek Channel 23230**

## LTE Band 13 with 1RB Left Tilt Middle

Date: 11/23/2014
Communication System: UID 0, LTE (0); Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used: f = 782 MHz; σ = 0.935 S/m; $\varepsilon_r$ = 41.578; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Left Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(9.62, 9.62, 9.62); Calibrated: 2/17/2014;
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 (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.118 W/kg

**Left Tilt Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.726 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.134 W/kg
**SAR(1 g) = 0.113 W/kg; SAR(10 g) = 0.090 W/kg**
Maximum value of SAR (measured) = 0.117 W/kg

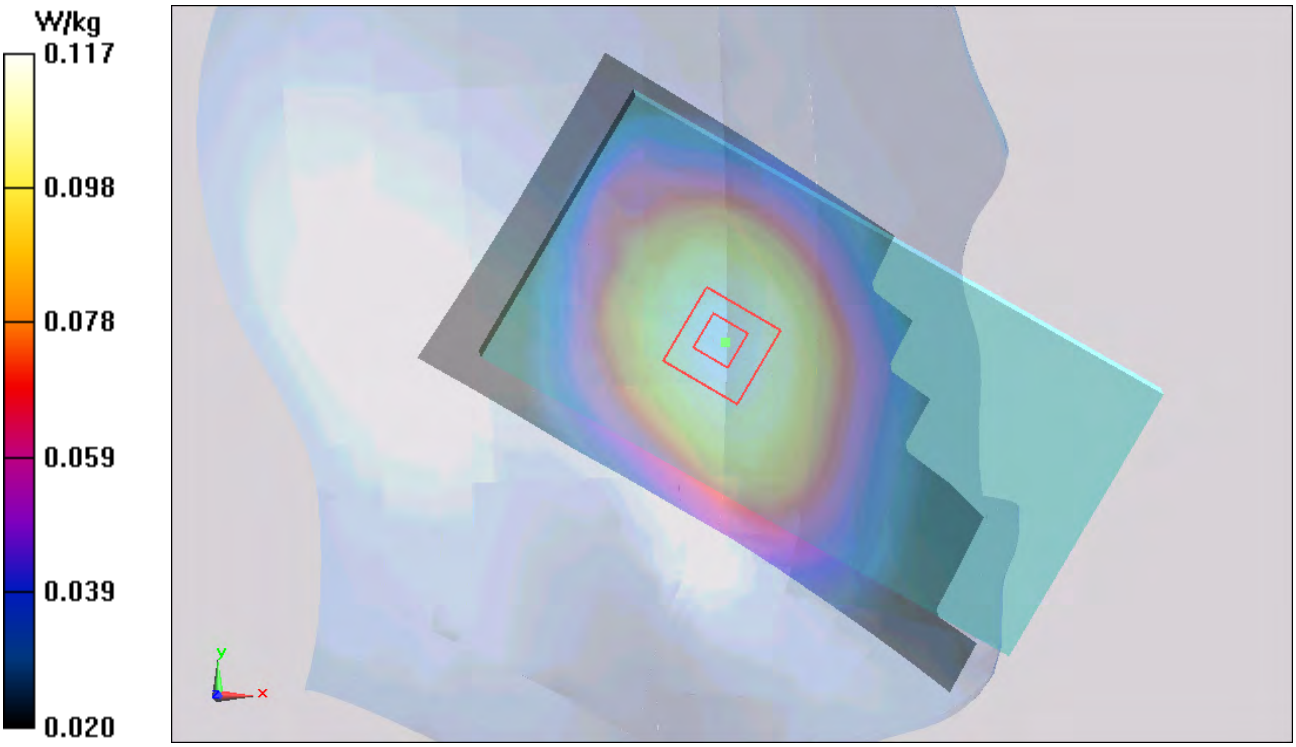



**Figure 92 LTE Band 13 with 1RB Left Hand Tilt 15° Channel 23230**

## LTE Band 13 with 1RB Right Cheek Middle

Date: 11/23/2014
Communication System: UID 0, LTE (0); Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used: f = 782 MHz; σ = 0.935 S/m; $\varepsilon_r$ = 41.578; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Right Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(9.62, 9.62, 9.62); Calibrated: 2/17/2014;
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 (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.167 W/kg

**Right Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.995 V/m; Power Drift = 0.040 dB
Peak SAR (extrapolated) = 0.198 W/kg
**SAR(1 g) = 0.163 W/kg; SAR(10 g) = 0.126 W/kg**
Maximum value of SAR (measured) = 0.171 W/kg

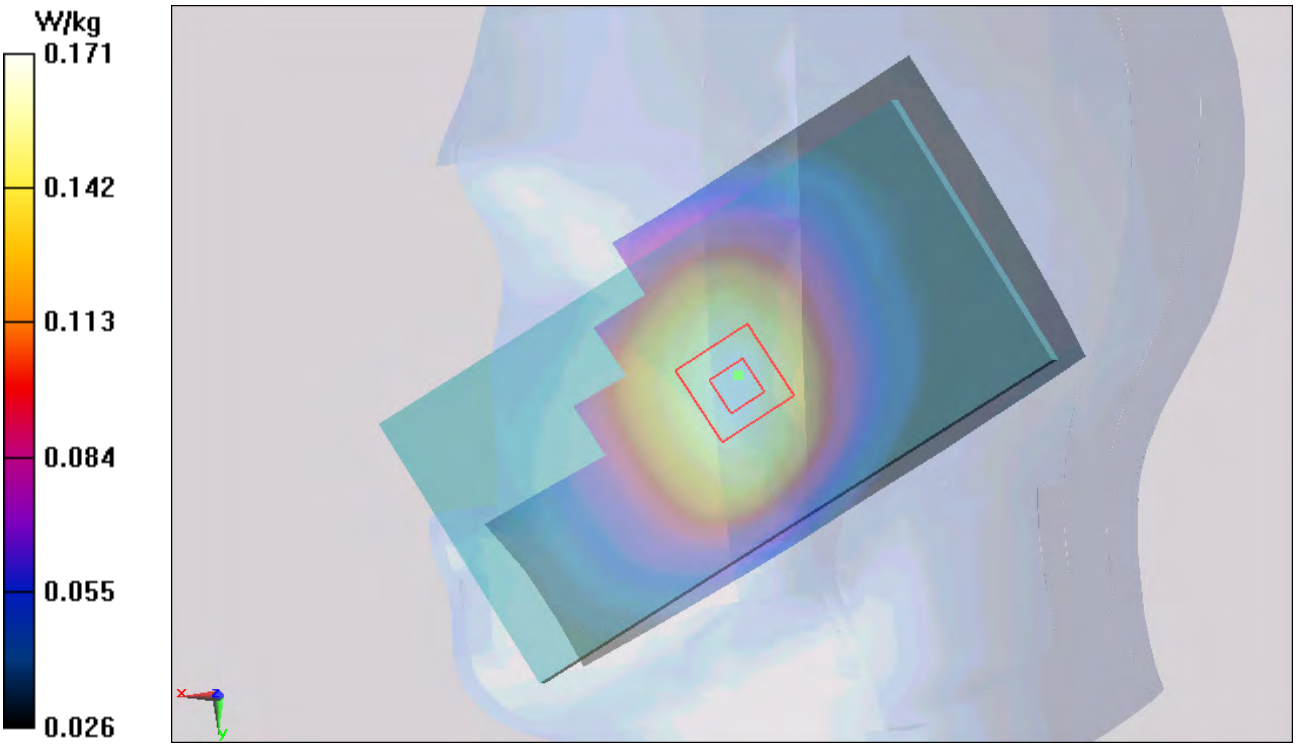



**Figure 93 LTE Band 13 with 1RB Right Hand Touch Cheek Channel 23230**

## LTE Band 13 with 1RB Right Tilt Middle

Date: 11/23/2014
Communication System: UID 0, LTE (0); Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used: f = 782 MHz; σ = 0.935 S/m; $\varepsilon_r$ = 41.578; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Right Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(9.62, 9.62, 9.62); Calibrated: 2/17/2014;
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 (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.0973 W/kg

**Right Tilt Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.037 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 0.115 W/kg
**SAR(1 g) = 0.095 W/kg; SAR(10 g) = 0.076 W/kg**
Maximum value of SAR (measured) = 0.0987 W/kg

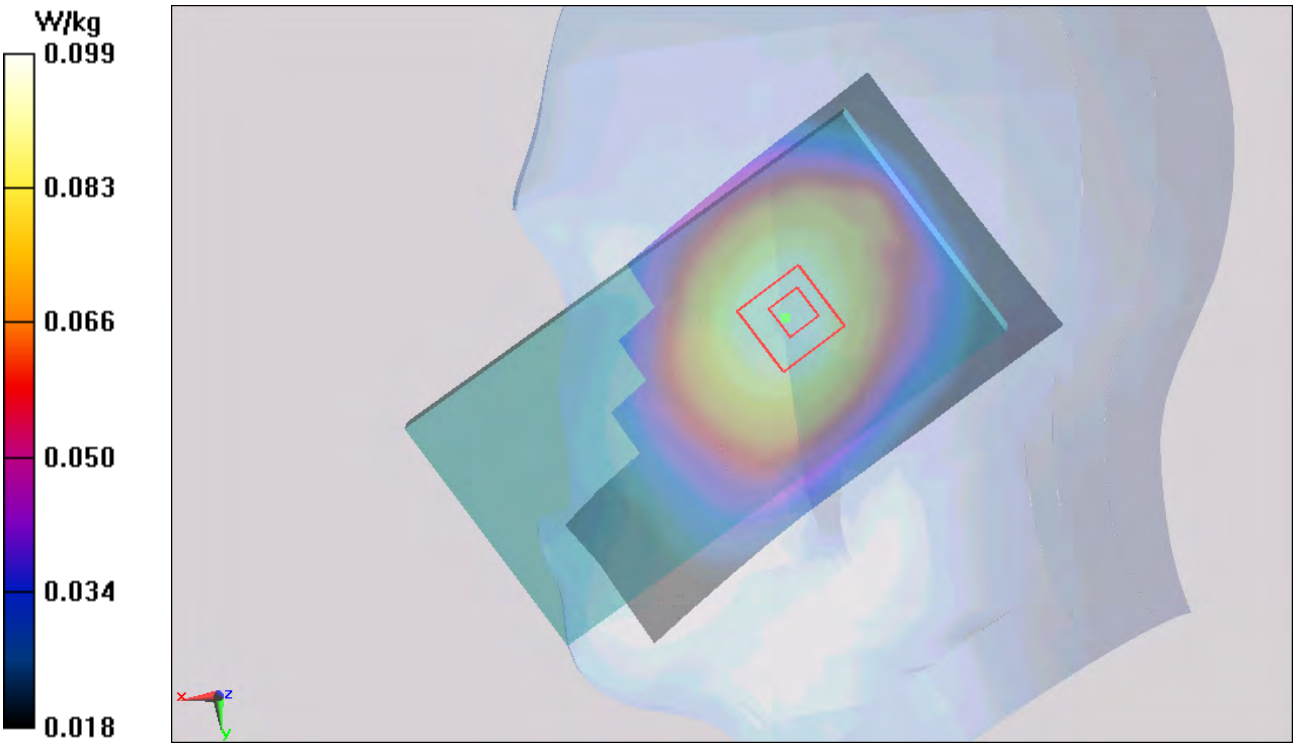



**Figure 94 LTE Band 13 with 1RB Right Hand Tilt 15° Channel 23230**

## LTE Band 13 with 50%RB Left Cheek Middle

Date: 11/23/2014
Communication System: UID 0, LTE (0); Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used: f = 782 MHz; σ = 0.935 S/m; $\varepsilon_r$ = 41.578; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Left Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(9.62, 9.62, 9.62); Calibrated: 2/17/2014;
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 (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.166 W/kg

**Left Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.853 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.198 W/kg
**SAR(1 g) = 0.160 W/kg; SAR(10 g) = 0.123 W/kg**
Maximum value of SAR (measured) = 0.167 W/kg

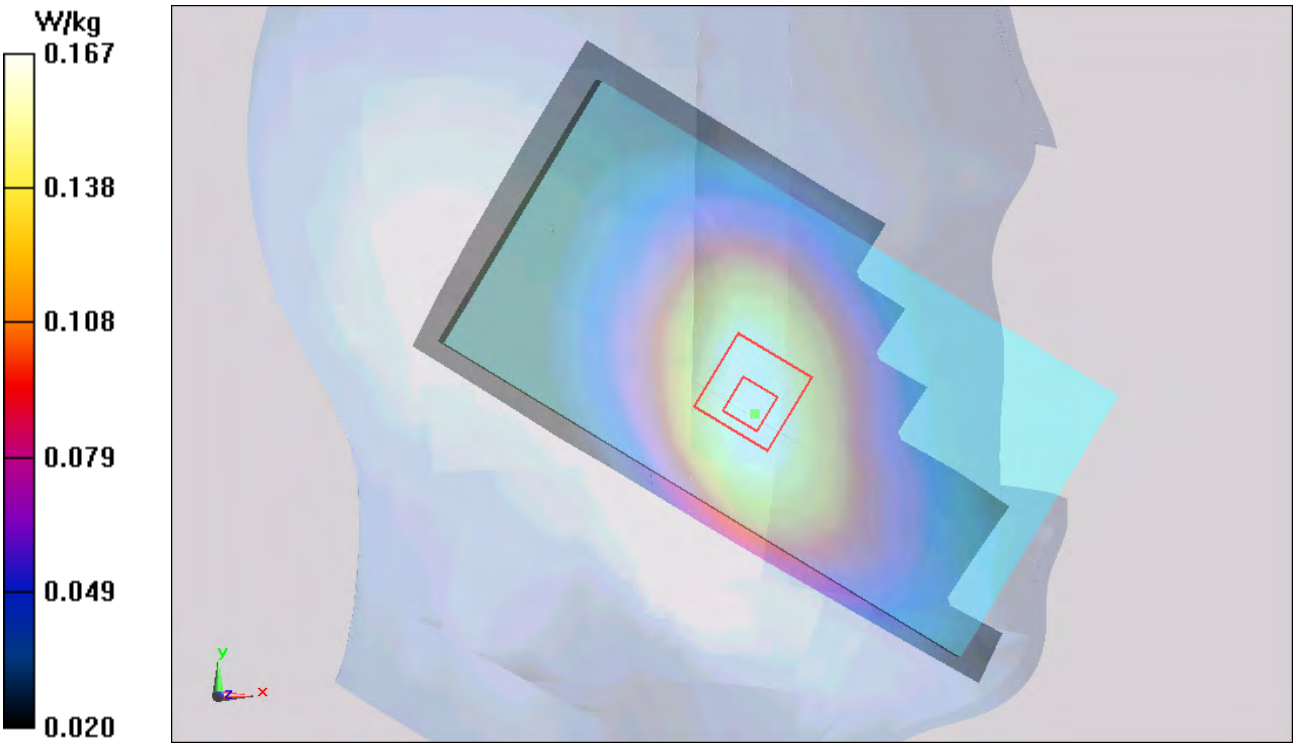



**Figure 95 LTE Band 13 with 50%RB Left Hand Touch Cheek Channel 23230**

## LTE Band 13 with 50%RB Left Tilt Middle

Date: 11/23/2014
Communication System: UID 0, LTE (0); Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used: f = 782 MHz; σ = 0.935 S/m; $\varepsilon_r$ = 41.578; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Left Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(9.62, 9.62, 9.62); Calibrated: 2/17/2014;
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 (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.0907 W/kg

**Left Tilt Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.803 V/m; Power Drift = 0.020 dB
Peak SAR (extrapolated) = 0.105 W/kg
**SAR(1 g) = 0.089 W/kg; SAR(10 g) = 0.071 W/kg**
Maximum value of SAR (measured) = 0.0923 W/kg

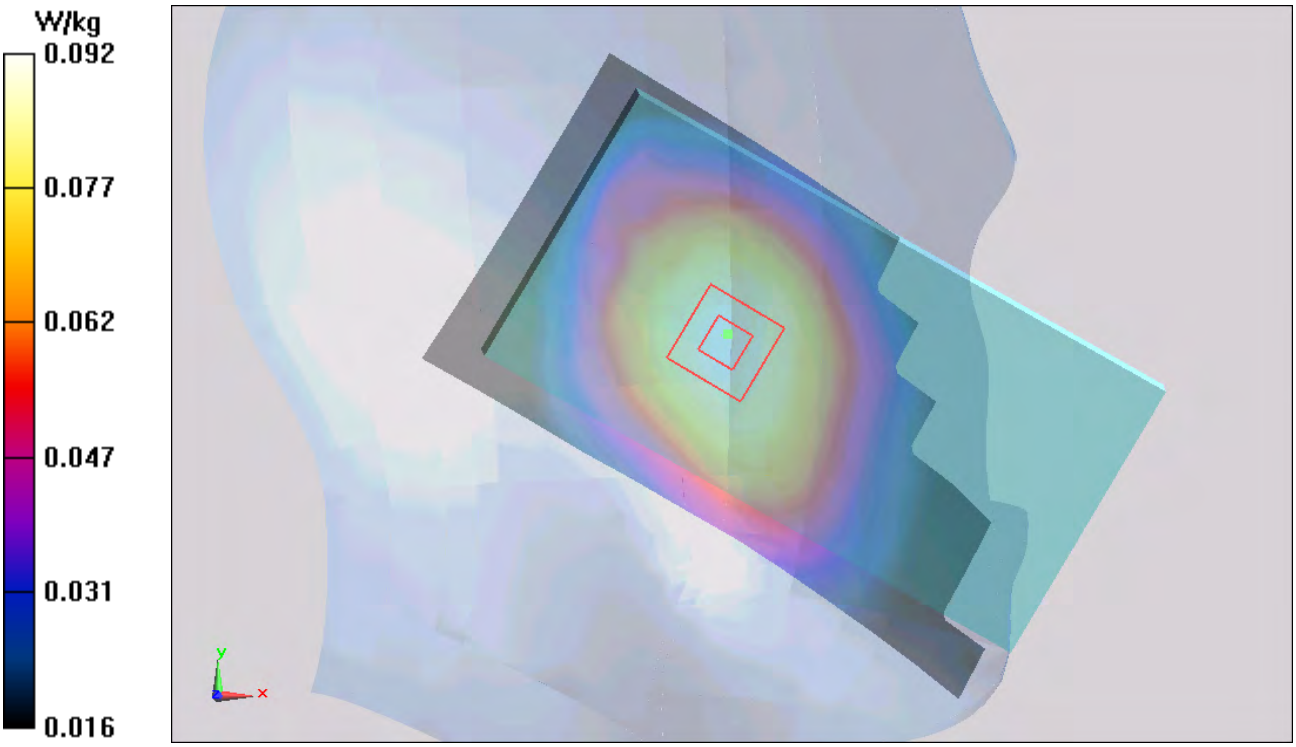



**Figure 96 LTE Band 13 with 50%RB Left Hand Tilt 15° Channel 23230**

## LTE Band 13 with 50%RB Right Cheek Middle

Date: 11/23/2014
Communication System: UID 0, LTE (0); Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used: f = 782 MHz; σ = 0.935 S/m; $\varepsilon_r$ = 41.578; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Right Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(9.62, 9.62, 9.62); Calibrated: 2/17/2014;
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 (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.134 W/kg

**Right Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.758 V/m; Power Drift = -0.028 dB
Peak SAR (extrapolated) = 0.155 W/kg
**SAR(1 g) = 0.129 W/kg; SAR(10 g) = 0.100 W/kg**
Maximum value of SAR (measured) = 0.134 W/kg

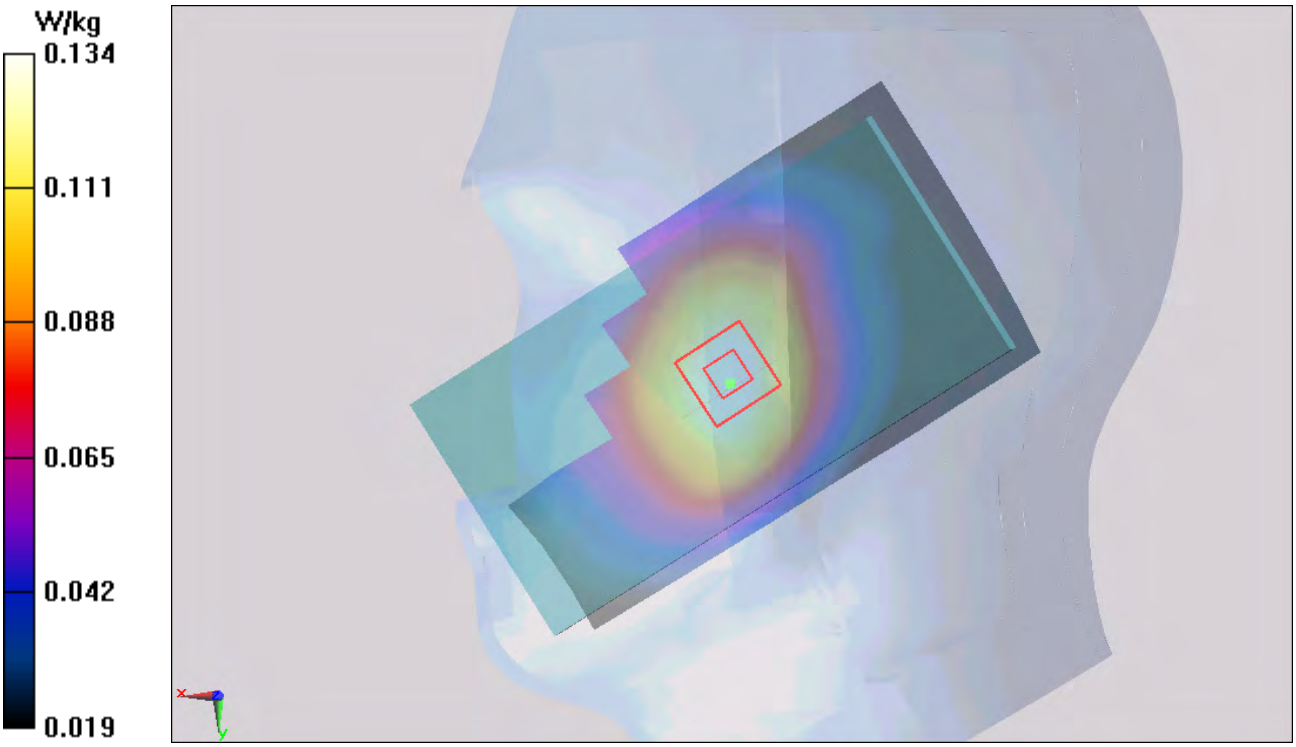



**Figure 97 LTE Band 13 with 50%RB Right Hand Touch Cheek Channel 23230**

## LTE Band 13 with 50%RB Right Tilt Middle

Date: 11/23/2014
Communication System: UID 0, LTE (0); Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used: f = 782 MHz; σ = 0.935 S/m; $\varepsilon_r$ = 41.578; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Right Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(9.62, 9.62, 9.62); Calibrated: 2/17/2014;
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 (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.0806 W/kg

**Right Tilt Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.308 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.0940 W/kg
**SAR(1 g) = 0.078 W/kg; SAR(10 g) = 0.062 W/kg**
Maximum value of SAR (measured) = 0.0804 W/kg

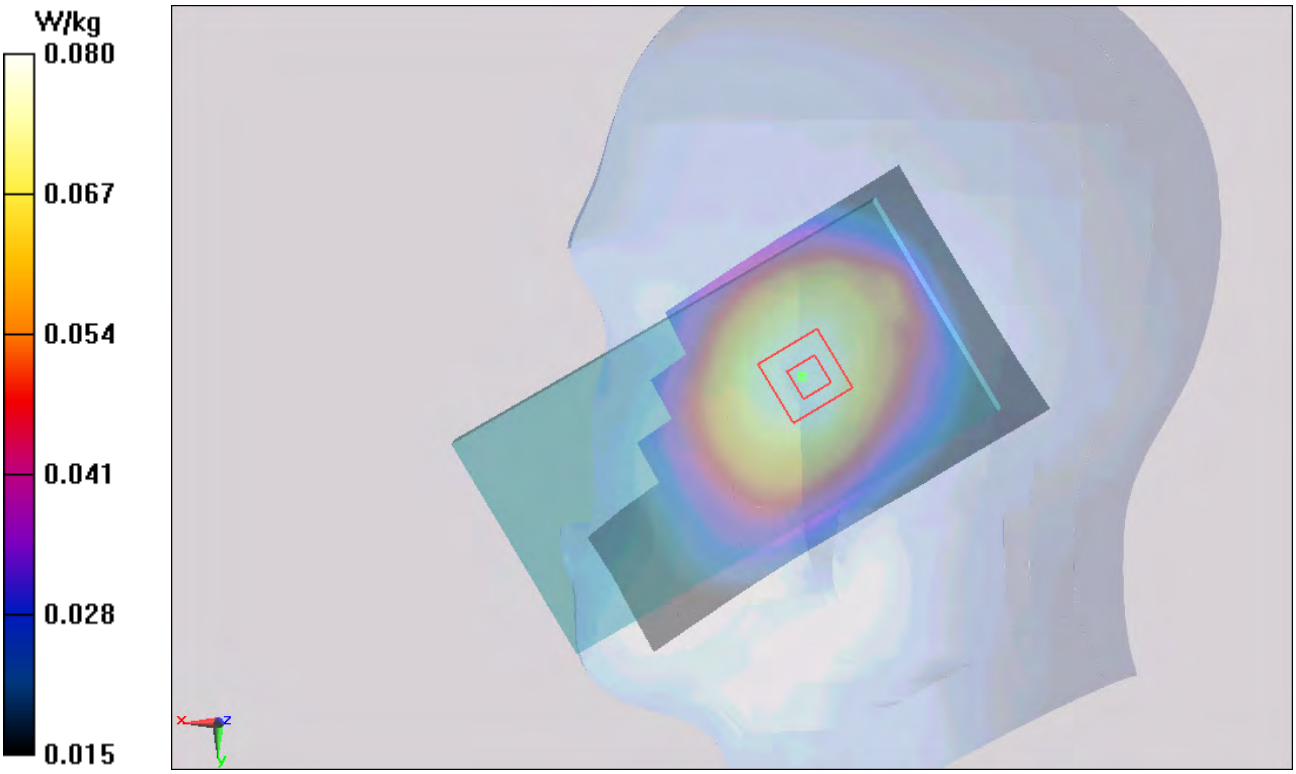



**Figure 98 LTE Band 13 with 50%RB Right Hand Tilt 15° Channel 23230**

## LTE Band 13 with 1RB Back Side Middle (15mm)

Date: 12/2/2014
Communication System: UID 0, LTE (0); Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used: f = 782 MHz; σ = 1.003 S/m; $\varepsilon_r$ = 54.058; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014;
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 (71x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.392 W/kg

**Back Side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.811 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 0.457 W/kg
**SAR(1 g) = 0.372 W/kg; SAR(10 g) = 0.290 W/kg**
Maximum value of SAR (measured) = 0.385 W/kg

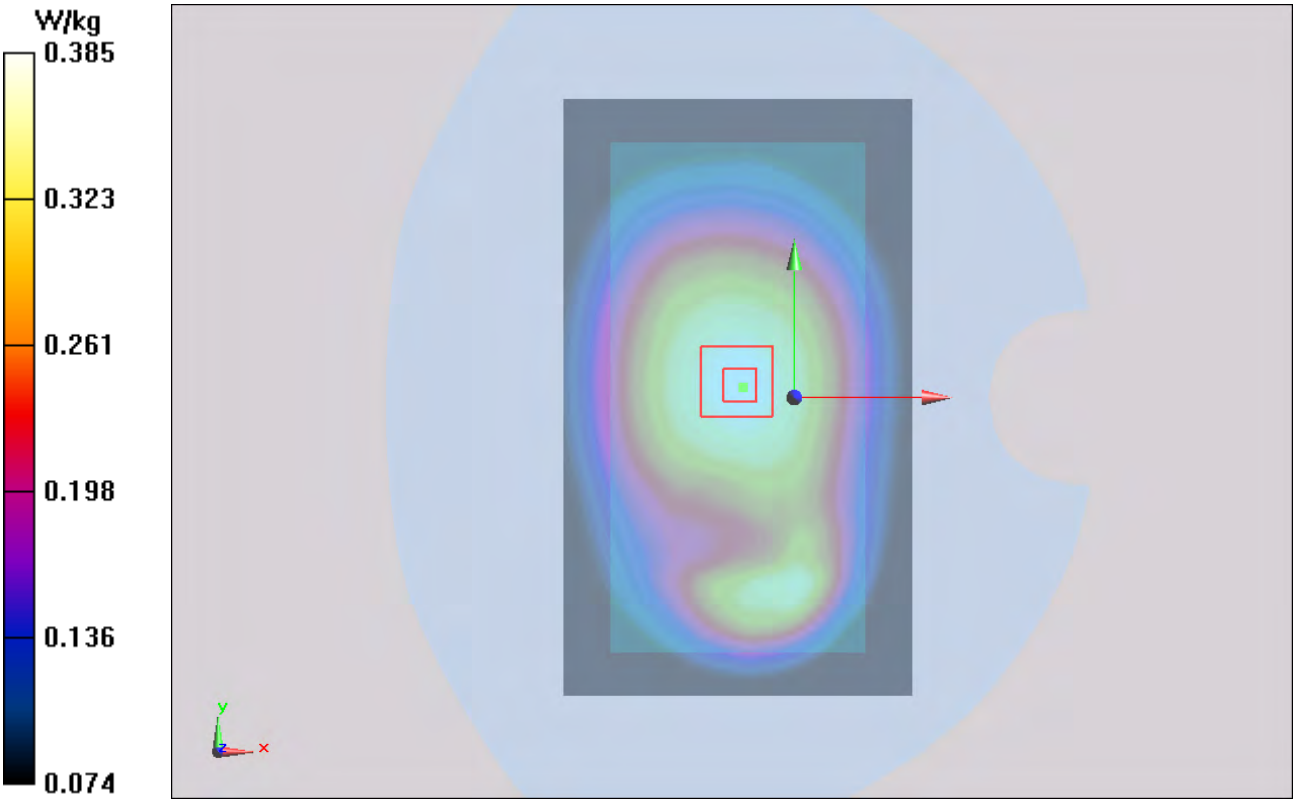



**Figure 99 Body, LTE Band 13 with 1RB Back Side Channel 23230**

## LTE Band 13 with 1RB Front Side Middle (15mm)

Date: 12/2/2014
Communication System: UID 0, LTE (0); Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used: f = 782 MHz; σ = 1.003 S/m; $\varepsilon_r$ = 54.058; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014;
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 (71x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.299 W/kg

**Front Side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.297 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 0.350 W/kg
**SAR(1 g) = 0.284 W/kg; SAR(10 g) = 0.223 W/kg**
Maximum value of SAR (measured) = 0.294 W/kg

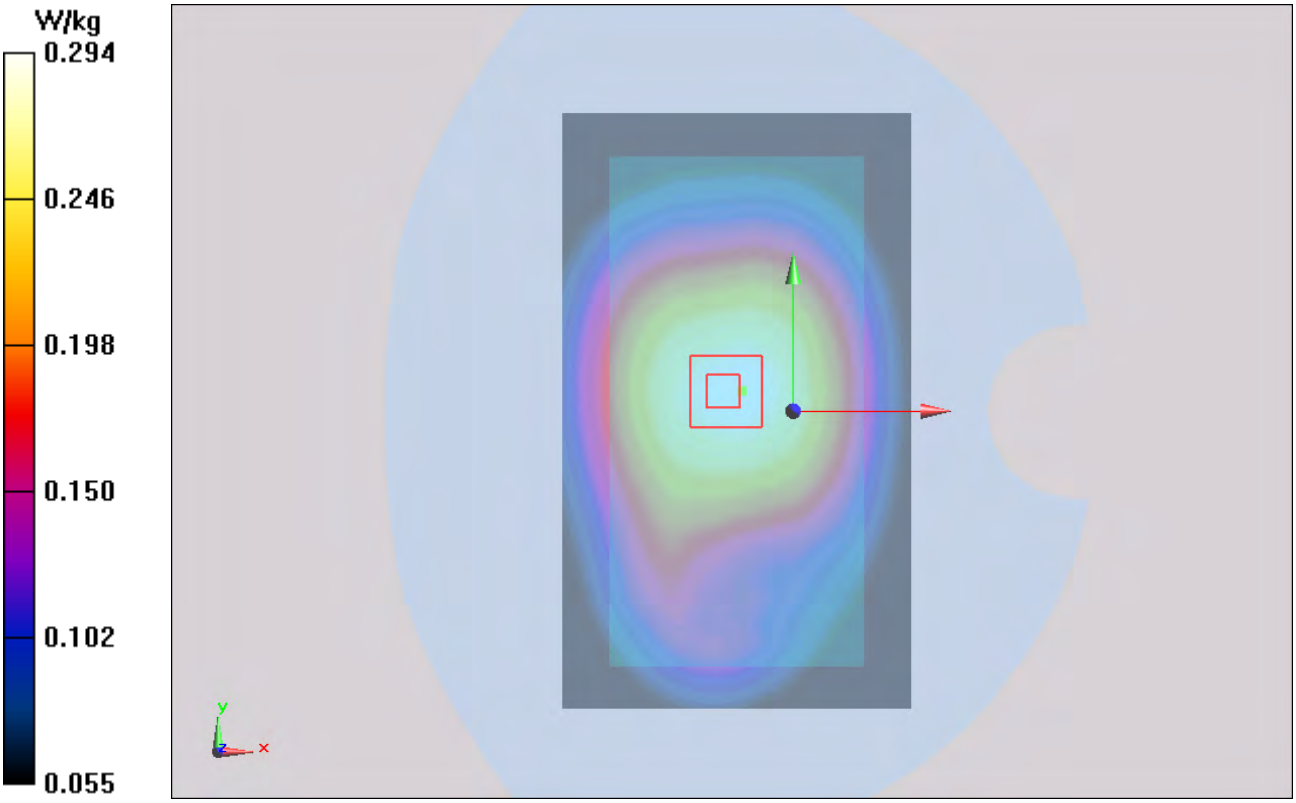



**Figure 100 Body, LTE Band 13 with 1RB Front Side Channel 23230**

## LTE Band 13 with 50%RB Back Side Middle (15mm)

Date: 12/2/2014
Communication System: UID 0, LTE (0); Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used: f = 782 MHz; σ = 1.003 S/m; $\varepsilon_r$ = 54.058; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014;
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 (71x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.324 W/kg

**Back Side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.894 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.381 W/kg
**SAR(1 g) = 0.310 W/kg; SAR(10 g) = 0.241 W/kg**
Maximum value of SAR (measured) = 0.320 W/kg

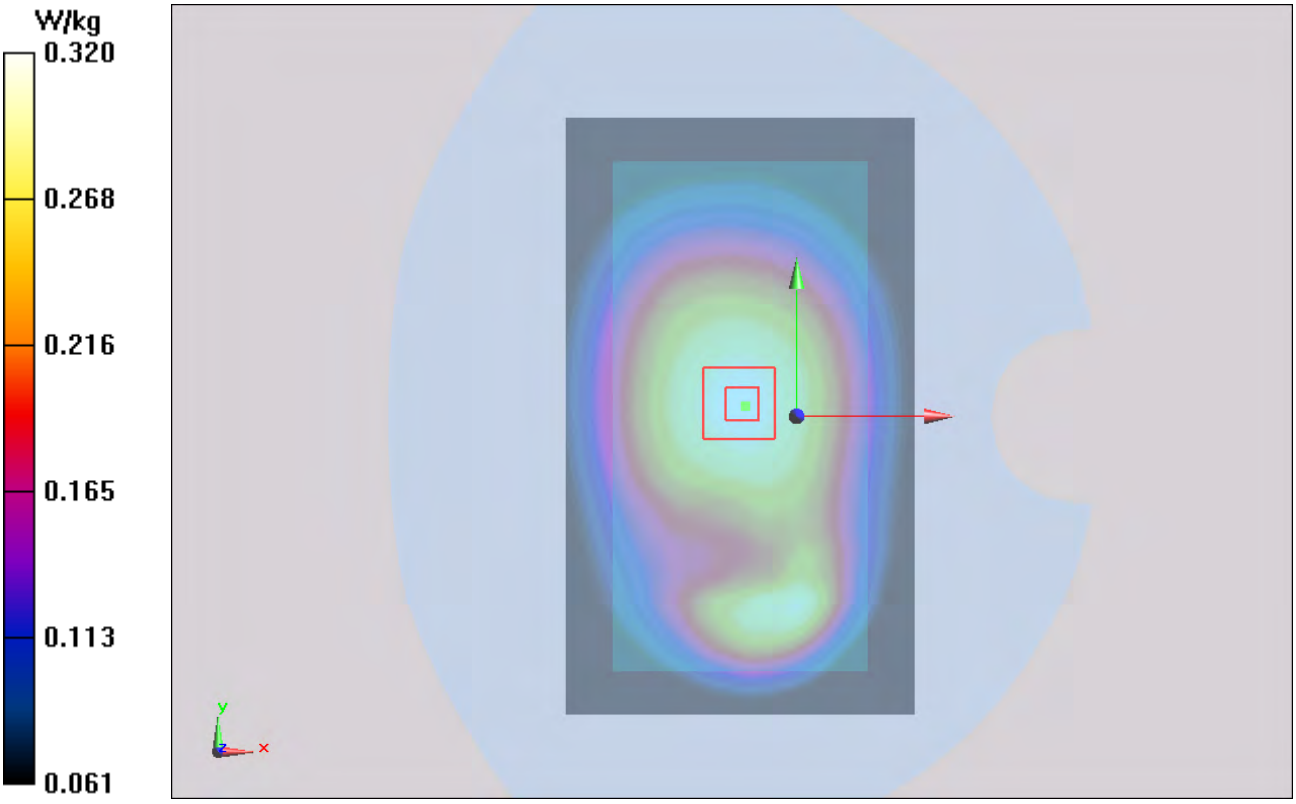



**Figure 101 Body, LTE Band 13 with 50%RB Back Side Channel 23230**

## LTE Band 13 with 50%RB Front Side Middle (15mm)

Date: 12/2/2014
Communication System: UID 0, LTE (0); Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used: f = 782 MHz; σ = 1.003 S/m; $\varepsilon_r$ = 54.058; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014;
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 (71x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.256 W/kg

**Front Side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.829 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.300 W/kg
**SAR(1 g) = 0.246 W/kg; SAR(10 g) = 0.192 W/kg**
Maximum value of SAR (measured) = 0.254 W/kg

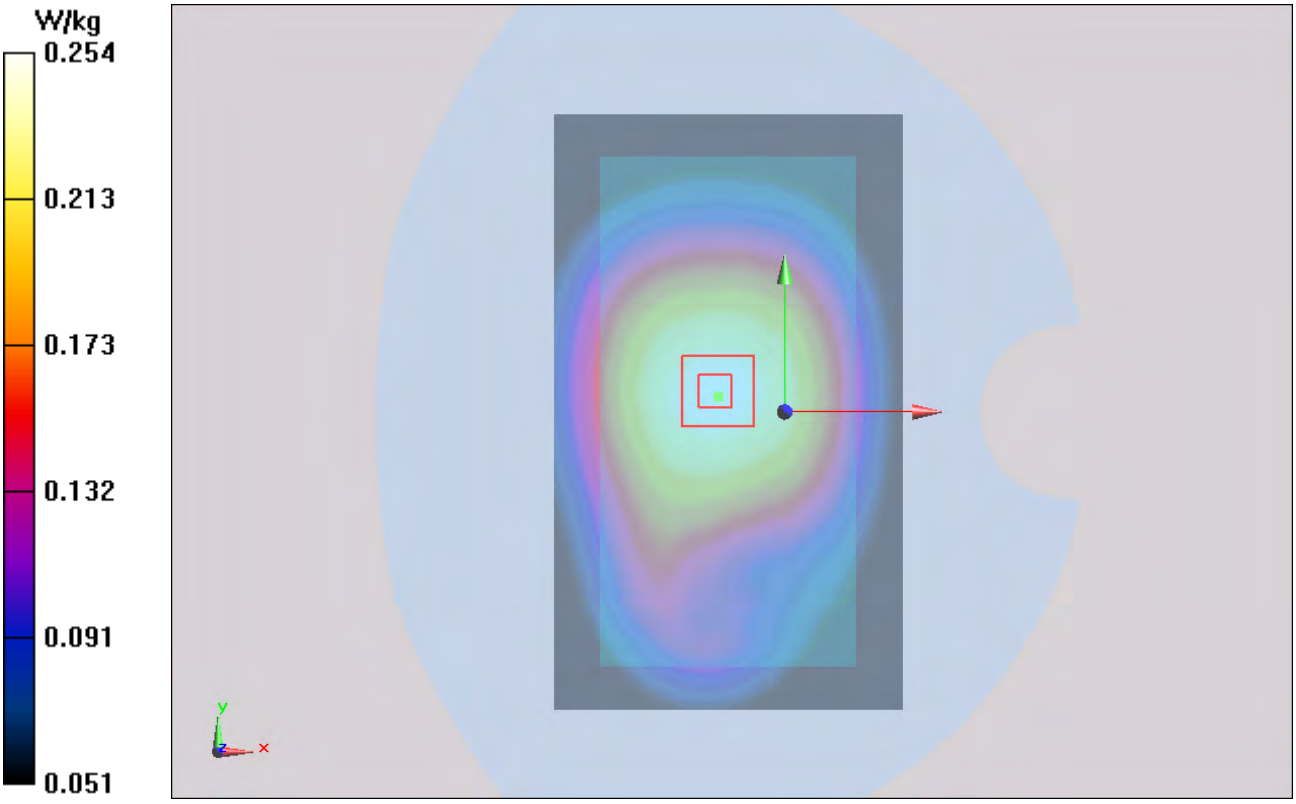



**Figure 102 Body, LTE Band 13 with 50%RB Front Side Channel 23230**

## LTE Band 13 with 1RB Back Side Middle (0mm)

Date: 12/31/2014

Communication System: LTE B13; Frequency: 782 MHz;Duty Cycle: 1:1

Medium parameters used: f = 782 MHz; σ = 1 mho/m; $\varepsilon_r$ = 54.1; ρ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 – SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014;

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

Phantom: SAM 11; Type: SAM V4.0; Serial: TP-1246

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

**Back Side Middle /Area Scan (71x121x1):** Measurement grid: dx=1.500mm, dy=1.500mm

Maximum value of SAR (interpolated) = 3.51 mW/g

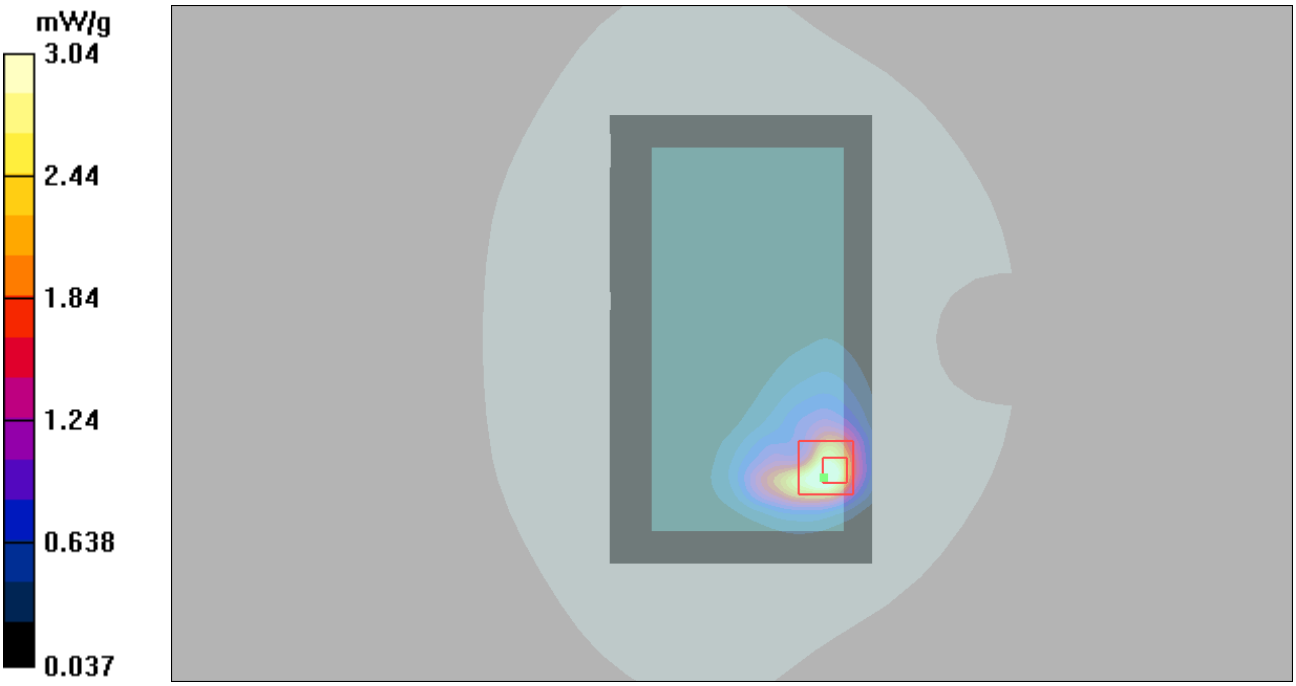
**Back Side Middle /Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.68 V/m; Power Drift = -0.065 dB

Peak SAR (extrapolated) = 7.66 W/kg

**SAR(1 g) = 2.87 mW/g; SAR(10 g) = 1.3 mW/g**

Maximum value of SAR (measured) = 3.04 mW/g



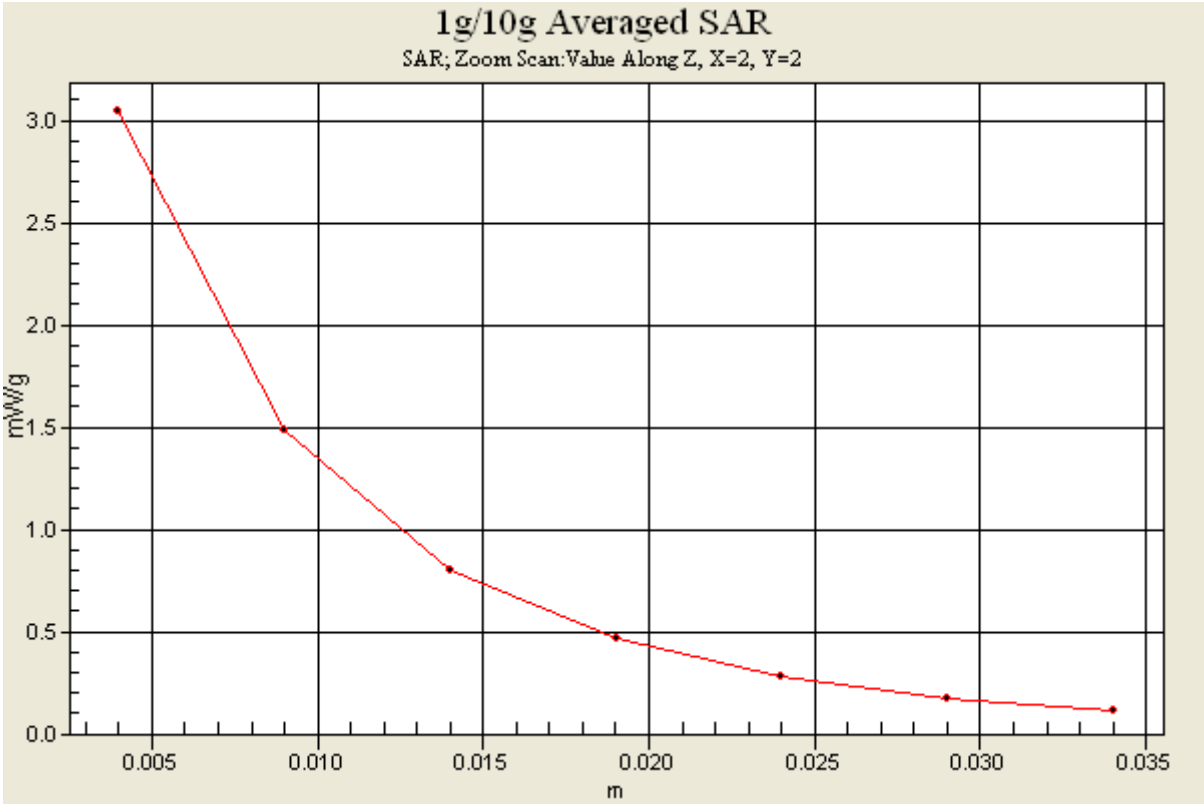



**Figure 103 Body, LTE Band 13 with 1RB Back Side Channel 23230**

## LTE Band 13 with 1RB Front Side Middle (0mm)

Date: 12/31/2014
Communication System: LTE B13; Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used: f = 782 MHz; σ = 1 mho/m; $\varepsilon_r$ = 54.1; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014;
Electronics: DAE4 Sn1317; Calibrated: 1/16/2014
Phantom: SAM 11; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Front Side Middle /Area Scan (71x121x1):** Measurement grid: dx=1.500mm, dy=1.500mm
Maximum value of SAR (interpolated) = 2.23 mW/g

**Front Side Middle /Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.07 V/m; Power Drift = 0.192 dB
Peak SAR (extrapolated) = 4.76 W/kg
**SAR(1 g) = 1.66 mW/g; SAR(10 g) = 0.781 mW/g**
Maximum value of SAR (measured) = 2.01 mW/g

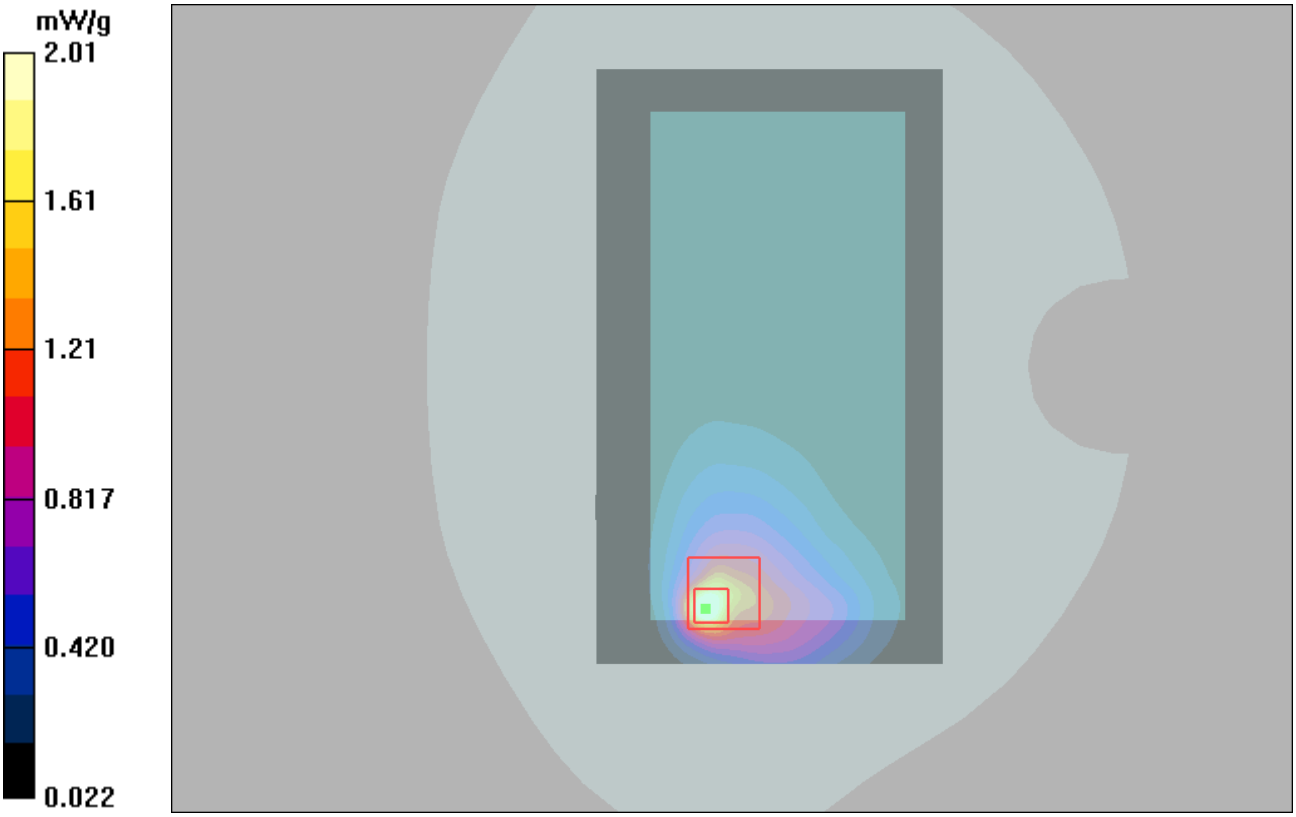



**Figure 104 Body, LTE Band 13 with 1RB Front Side Channel 23230**

## LTE Band 13 with 1RB Left Edge Middle (0mm)

Date: 12/31/2014
Communication System: LTE B13; Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used: f = 782 MHz; σ = 1 mho/m; $\varepsilon_r$ = 54.1; ρ = 1000 kg/$m^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014;
Electronics: DAE4 Sn1317; Calibrated: 1/16/2014
Phantom: SAM 11; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Left Edge Middle /Area Scan (51x181x1):** Measurement grid: dx=1.000mm, dy=1.000mm
Maximum value of SAR (interpolated) = 1.38 mW/g

**Left Edge Middle /Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 27.1 V/m; Power Drift = 0.025 dB
Peak SAR (extrapolated) = 5.73 W/kg
**SAR(1 g) = 1.3 mW/g; SAR(10 g) = 0.493 mW/g**
Maximum value of SAR (measured) = 1.14 mW/g

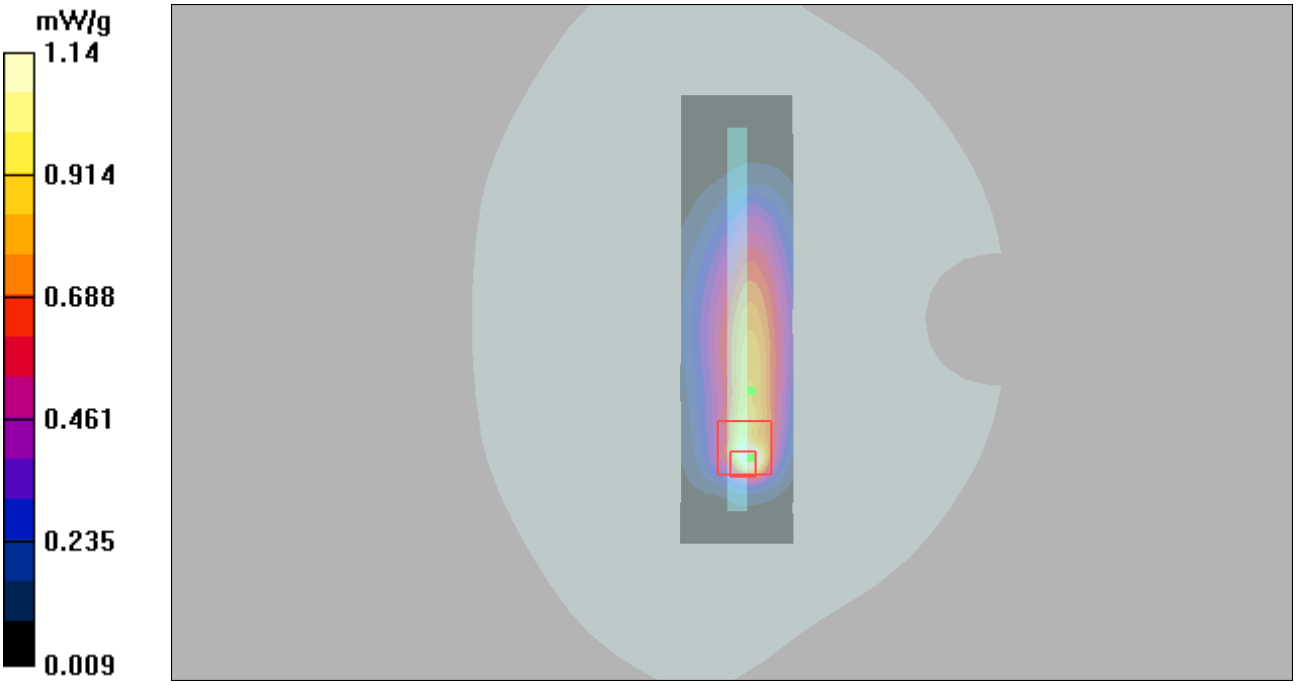



**Figure 105 Body, LTE Band 13 with 1RB Left Edge Channel 23230**

## LTE Band 13 with 1RB Bottom Edge Middle (0mm)

Date: 12/31/2014
Communication System: LTE B13; Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used: f = 782 MHz; σ = 1 mho/m; $\varepsilon_r$ = 54.1; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014;
Electronics: DAE4 Sn1317; Calibrated: 1/16/2014
Phantom: SAM 11; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Bottom Edge Middle /Area Scan (51x111x1):** Measurement grid: dx=1.000mm, dy=1.000mm
Maximum value of SAR (interpolated) = 1.35 mW/g

**Bottom Edge Middle/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 22.6 V/m; Power Drift = 0.033 dB
Peak SAR (extrapolated) = 9.79 W/kg
**SAR(1 g) = 1.93 mW/g; SAR(10 g) = 0.584 mW/g**
Maximum value of SAR (measured) = 2.28 mW/g

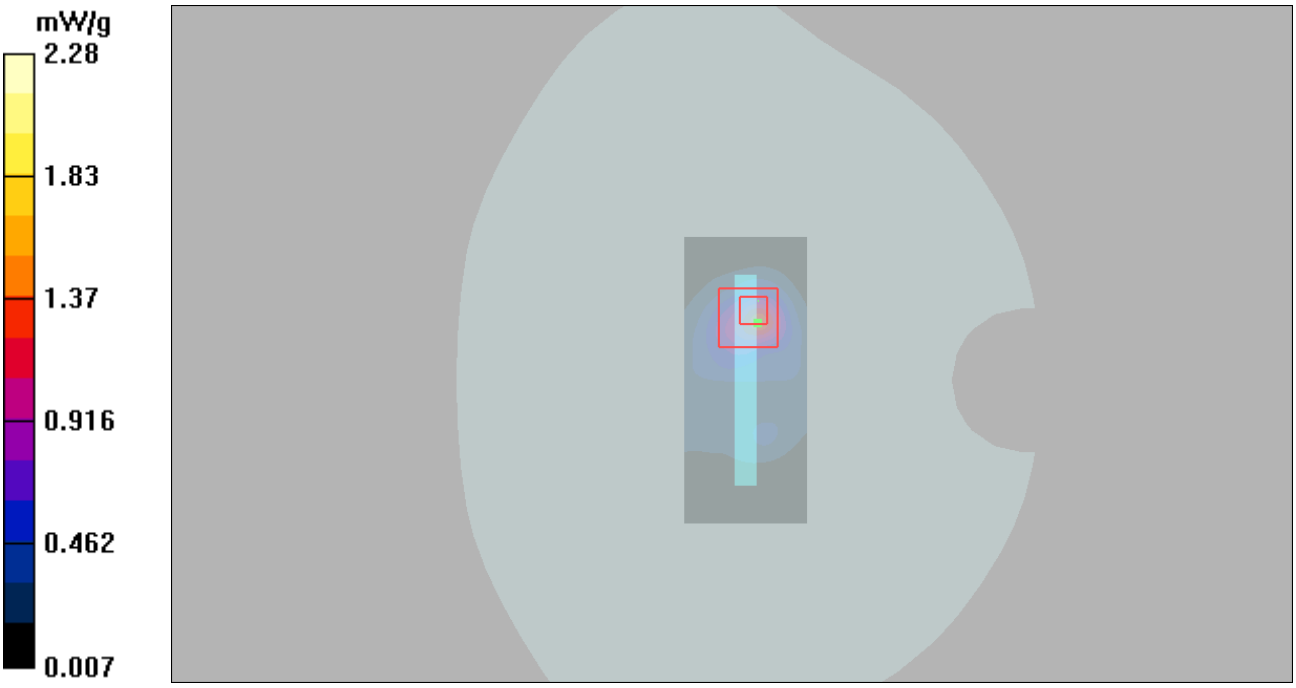



**Figure 106 Body, LTE Band 13 with 1RB Bottom Edge Channel 23230**

## LTE Band 13 with 50%RB Back Side Middle (0mm)

Date: 12/31/2014

Communication System: LTE B13; Frequency: 782 MHz;Duty Cycle: 1:1

Medium parameters used: f = 782 MHz; σ = 1 mho/m; $\varepsilon_r$ = 54.1; ρ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 – SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014;

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

Phantom: SAM 11; Type: SAM V4.0; Serial: TP-1246

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

**Back Side Middle/Area Scan (71x121x1):** Measurement grid: dx=1.500mm, dy=1.500mm

Maximum value of SAR (interpolated) = 3.35 mW/g

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

Reference Value = 6.76 V/m; Power Drift = 0.033 dB

Peak SAR (extrapolated) = 7.02 W/kg

**SAR(1 g) = 2.66 mW/g; SAR(10 g) = 1.19 mW/g**

Maximum value of SAR (measured) = 3.07 mW/g

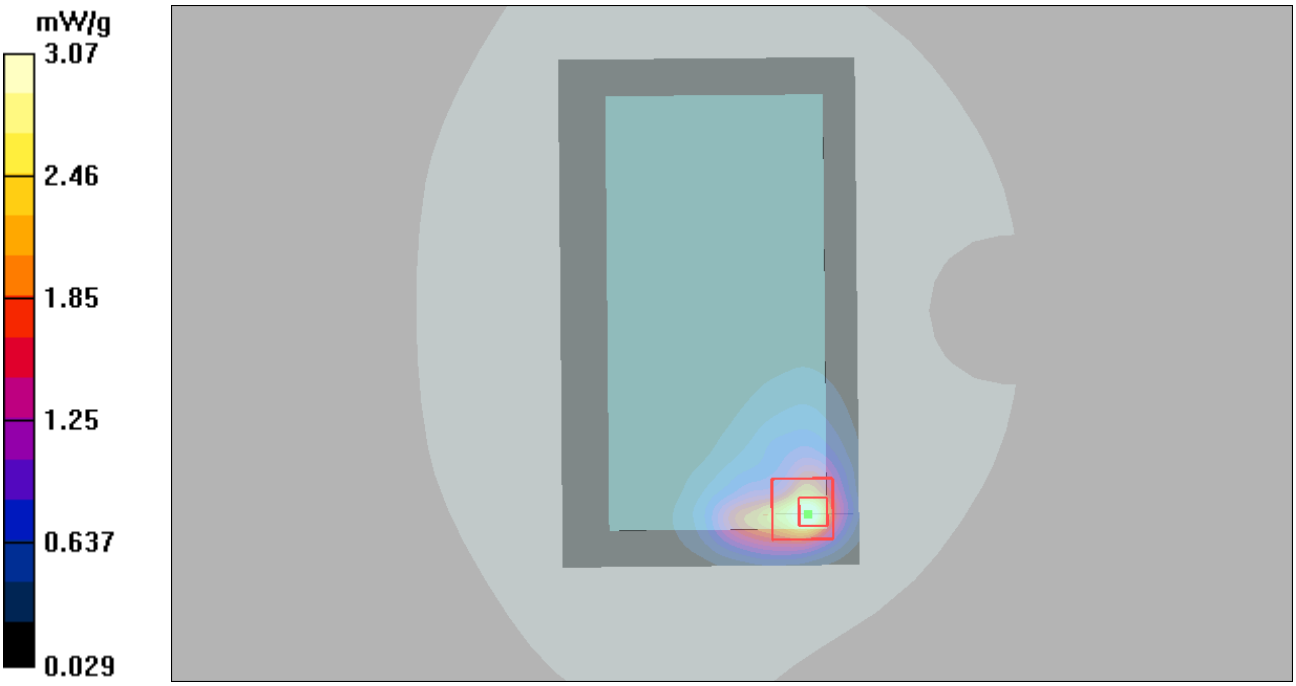



**Figure 107 Body, LTE Band 13 with 50%RB Back Side Channel 23230**

## LTE Band 13 with 50%RB Front Side Middle (0mm)

Date: 12/31/2014
Communication System: LTE B13; Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used: f = 782 MHz; σ = 1 mho/m; $\varepsilon_r$ = 54.1; ρ = 1000 kg/$m^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014;
Electronics: DAE4 Sn1317; Calibrated: 1/16/2014
Phantom: SAM 11; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Front Side Middle/Area Scan (71x121x1):** Measurement grid: dx=1.500mm, dy=1.500mm
Maximum value of SAR (interpolated) = 2.11 mW/g

**Front Side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.85 V/m; Power Drift = 0.128 dB
Peak SAR (extrapolated) = 4.72 W/kg
**SAR(1 g) = 1.6 mW/g; SAR(10 g) = 0.738 mW/g**
Maximum value of SAR (measured) = 1.96 mW/g

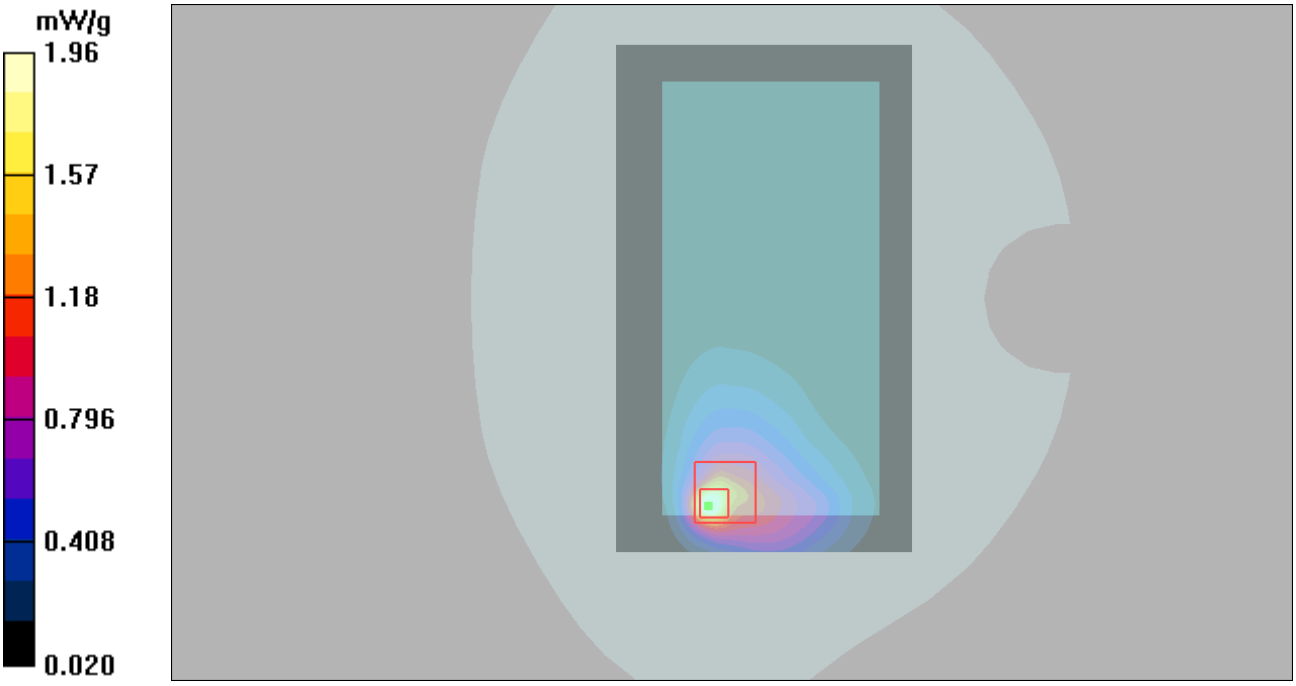



**Figure 108 Body, LTE Band 13 with 50%RB Front Side Channel 23230**

**LTE Band 13 with 50%RB Left Edge Middle (0mm)**

Date: 12/31/2014

Communication System: LTE B13; Frequency: 782 MHz;Duty Cycle: 1:1

Medium parameters used: f = 782 MHz; $\sigma$ = 1 mho/m; $\varepsilon_r$ = 54.1; $\rho$ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 – SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014;

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

Phantom: SAM 11; Type: SAM V4.0; Serial: TP-1246

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

**Left Edge Middle/Area Scan (51x181x1):** Measurement grid: dx=1.000mm, dy=1.000mm

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

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

Reference Value = 29.3 V/m; Power Drift = 0.044 dB

Peak SAR (extrapolated) = 5.15 W/kg

**SAR(1 g) = 1.22 mW/g; SAR(10 g) = 0.462 mW/g**

Maximum value of SAR (measured) = 1.52 mW/g

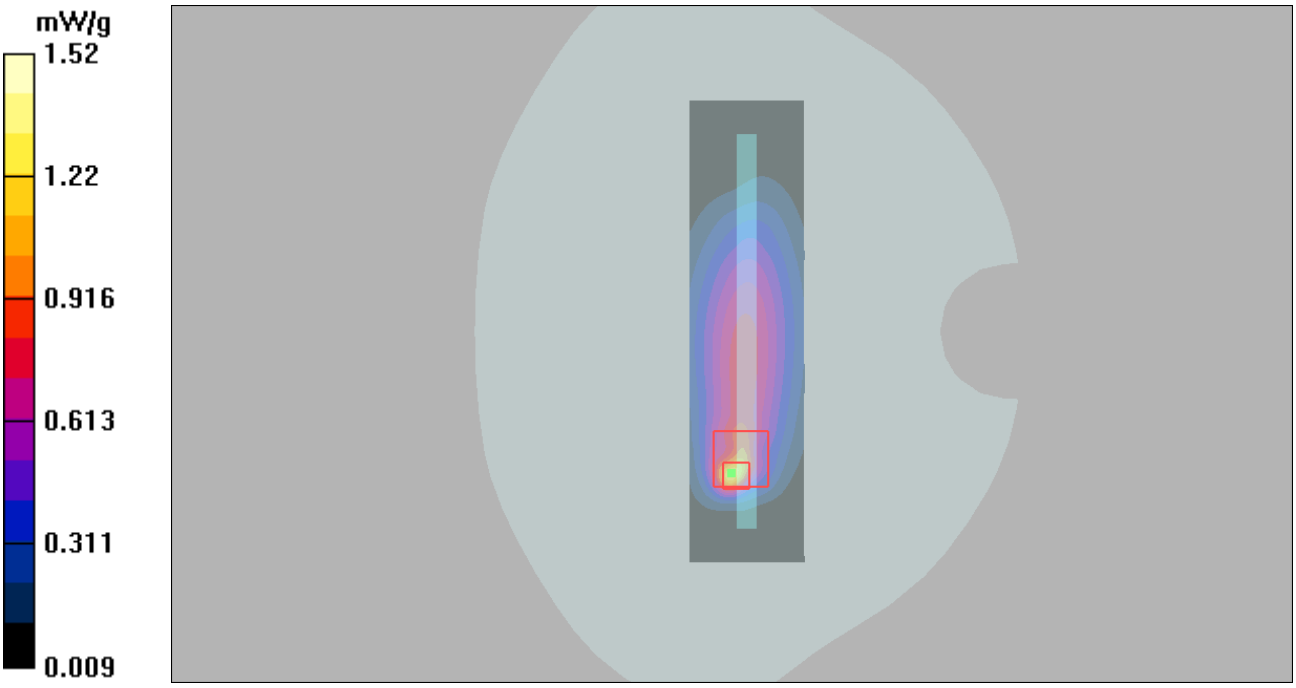



**Figure 109 Body, LTE Band 13 with 50%RB Left Edge Channel 23230**

**LTE Band 13 with 50%RB Bottom Edge Middle (0mm)**

Date: 12/31/2014

Communication System: LTE B13; Frequency: 782 MHz;Duty Cycle: 1:1

Medium parameters used: f = 782 MHz; $\sigma$ = 1 mho/m; $\varepsilon_r$ = 54.1; $\rho$ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 – SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014;

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

Phantom: SAM 11; Type: SAM V4.0; Serial: TP-1246

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

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

Maximum value of SAR (interpolated) = 1.34 mW/g

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

Reference Value = 19.3 V/m; Power Drift = -0.001 dB

Peak SAR (extrapolated) = 9.36 W/kg

**SAR(1 g) = 1.77 mW/g; SAR(10 g) = 0.535 mW/g**

Maximum value of SAR (measured) = 1.90 mW/g

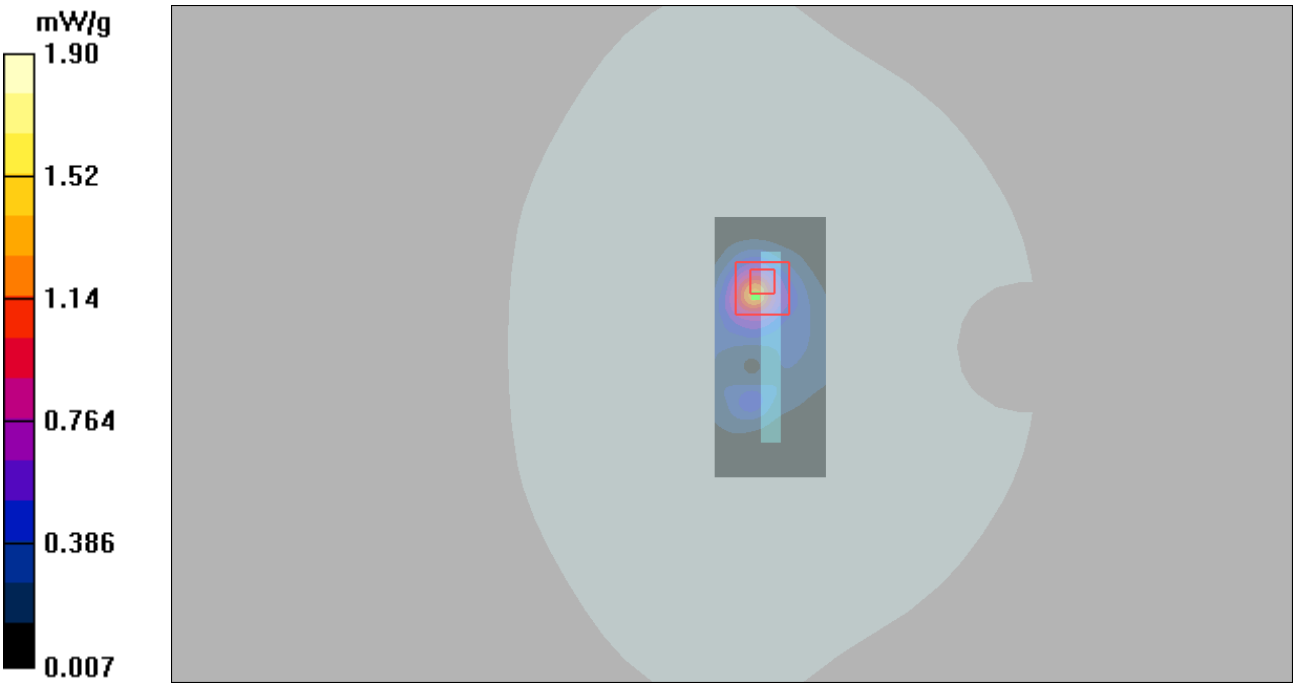



**Figure 110 Body, LTE Band 13 with 50%RB Bottom Edge Channel 23230**

**LTE Band 13 with 1RB Back Side Middle (0mm)**

Date: 12/31/2014

Communication System: UID 0, LTE (0); Frequency: 782 MHz;Duty Cycle: 1:1

Medium parameters used (extrapolated): f = 782 MHz; σ = 1 mho/m; εr = 54.1; ρ = 1000 kg/$m^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014;

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 (71x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.99 W/kg

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

Reference Value = 7.937 V/m; Power Drift = -0.18 dB

Peak SAR (extrapolated) = 7.28 W/kg

**SAR(1 g) = 2.2 W/kg; SAR(10 g) = 0.917 W/kg**

Maximum value of SAR (measured) = 2.49 W/kg

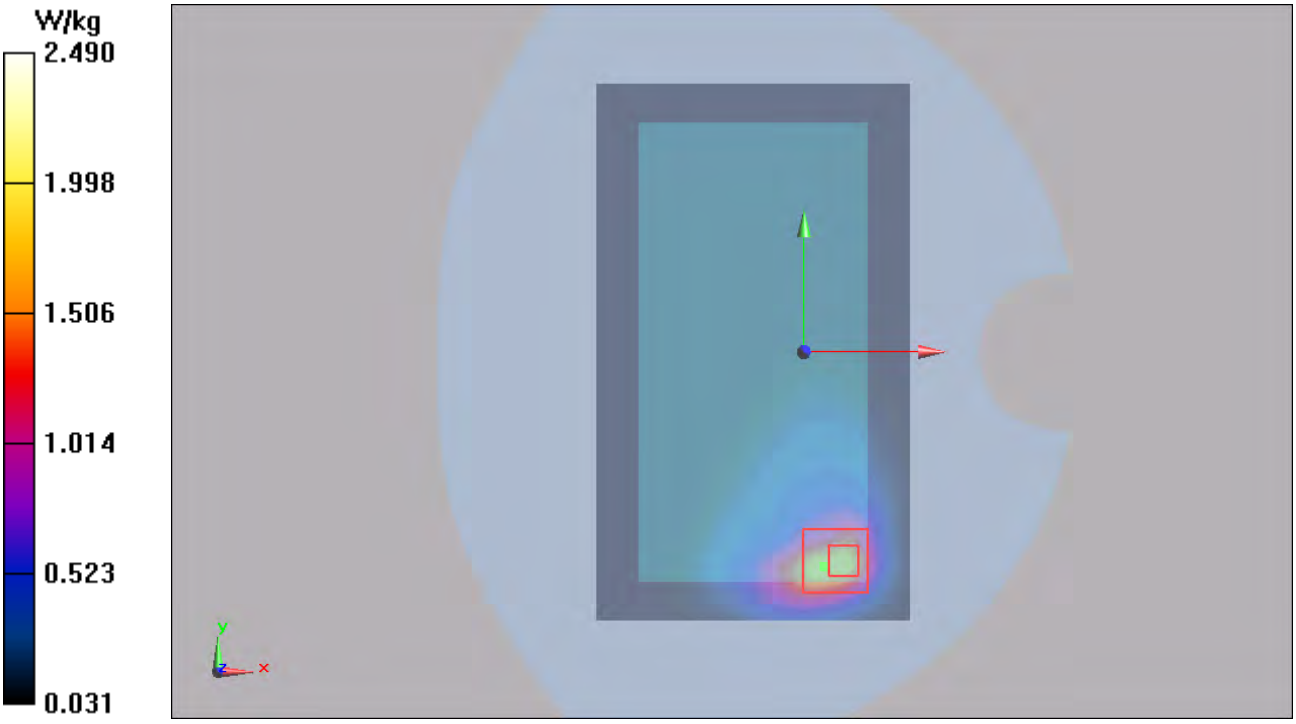



**Figure 111 Body, LTE Band 13 with 1RB Back Side Channel 23230**

## 802.11b Left Cheek High

Date: 11/25/2014

Communication System: UID 0, 802.11b (0); Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: f = 2462 MHz; σ = 1.824 S/m; $\varepsilon_r$ = 38.584; ρ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Left Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(7.24, 7.24, 7.24); Calibrated: 2/17/2014;

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 (81x151x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.219 W/kg

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

Reference Value = 6.293 V/m; Power Drift = 0.047 dB

Peak SAR (extrapolated) = 0.372 W/kg

**SAR(1 g) = 0.181 W/kg; SAR(10 g) = 0.089 W/kg**

Maximum value of SAR (measured) = 0.196 W/kg

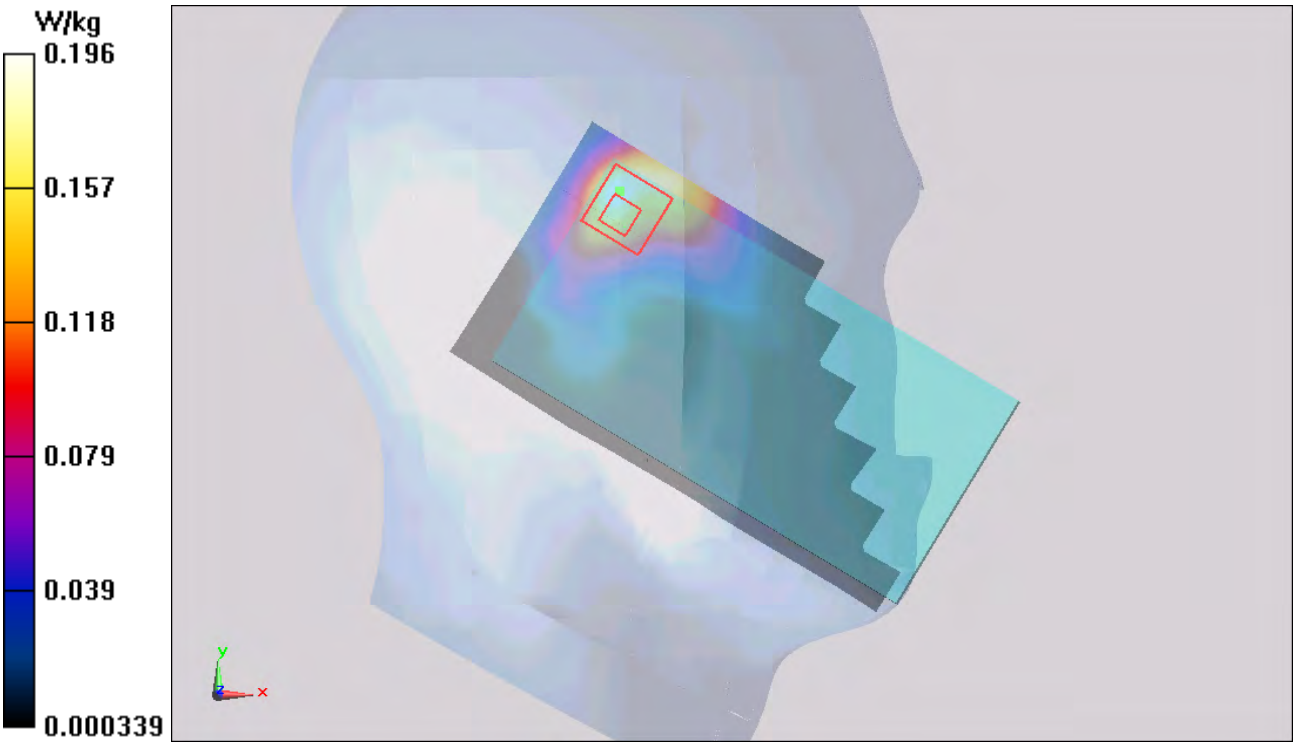



**Figure 112 Left Hand Touch Cheek 802.11b Channel 11**

## 802.11b Left Tilt High

Date: 11/25/2014

Communication System: UID 0, 802.11b (0); Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: f = 2462 MHz; σ = 1.824 S/m; $\varepsilon_r$ = 38.584; ρ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Left Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(7.24, 7.24, 7.24); Calibrated: 2/17/2014;

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 (81x151x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.180 W/kg

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

Reference Value = 7.744 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.368 W/kg

**SAR(1 g) = 0.174 W/kg; SAR(10 g) = 0.083 W/kg**

Maximum value of SAR (measured) = 0.190 W/kg

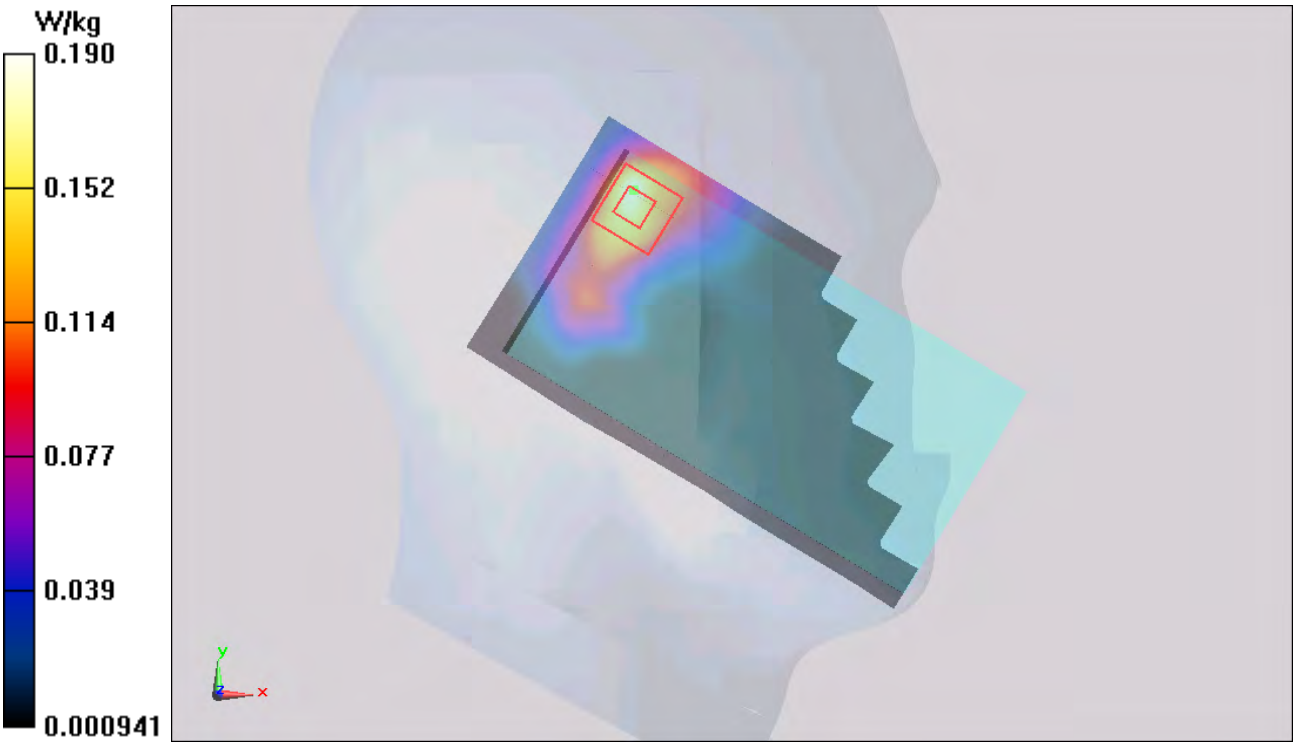



**Figure 113 Left Hand Tilt 15° 802.11b Channel 11**

## 802.11b Right Cheek High

Date: 11/25/2014

Communication System: UID 0, 802.11b (0); Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: f = 2462 MHz; σ = 1.824 S/m; $\varepsilon_r$ = 38.584; ρ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Right Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(7.24, 7.24, 7.24); Calibrated: 2/17/2014;

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 (81x151x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.123 W/kg

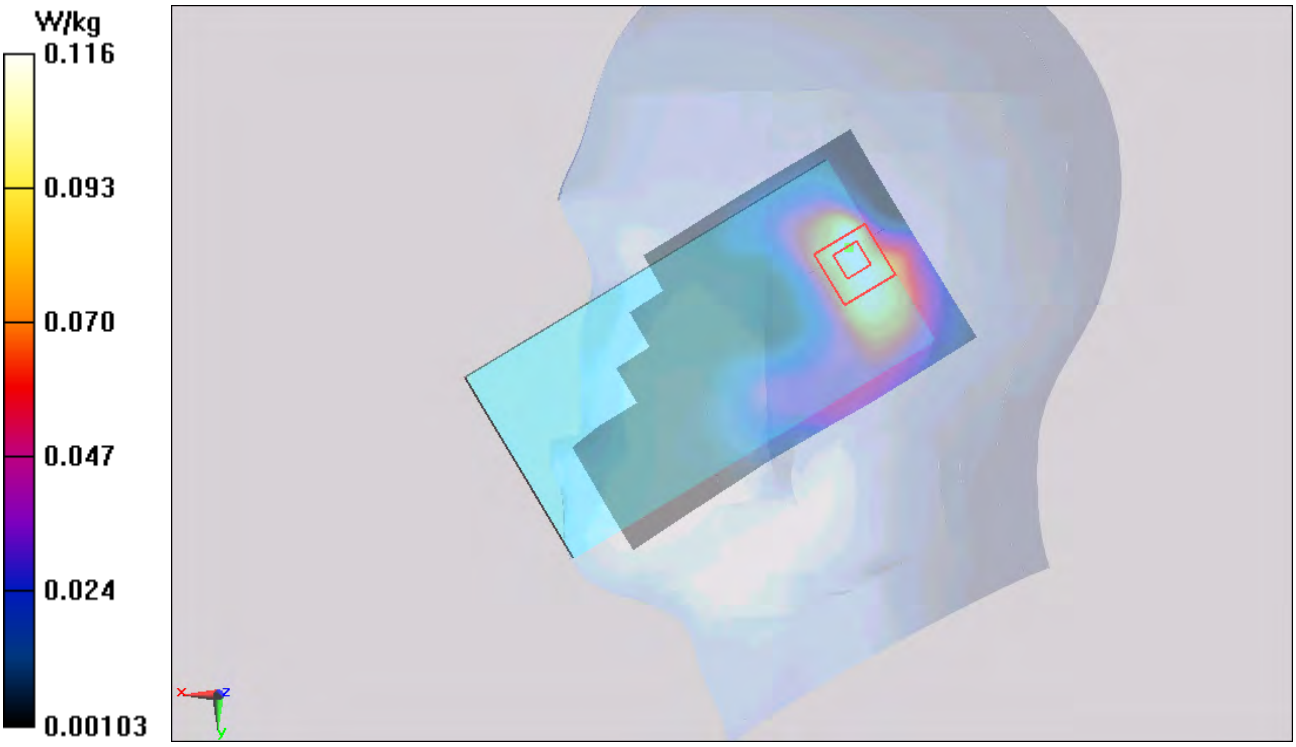
**Right Cheek High/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.309 V/m; Power Drift = -0.030 dB

Peak SAR (extrapolated) = 0.206 W/kg

**SAR(1 g) = 0.103 W/kg; SAR(10 g) = 0.055 W/kg**

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



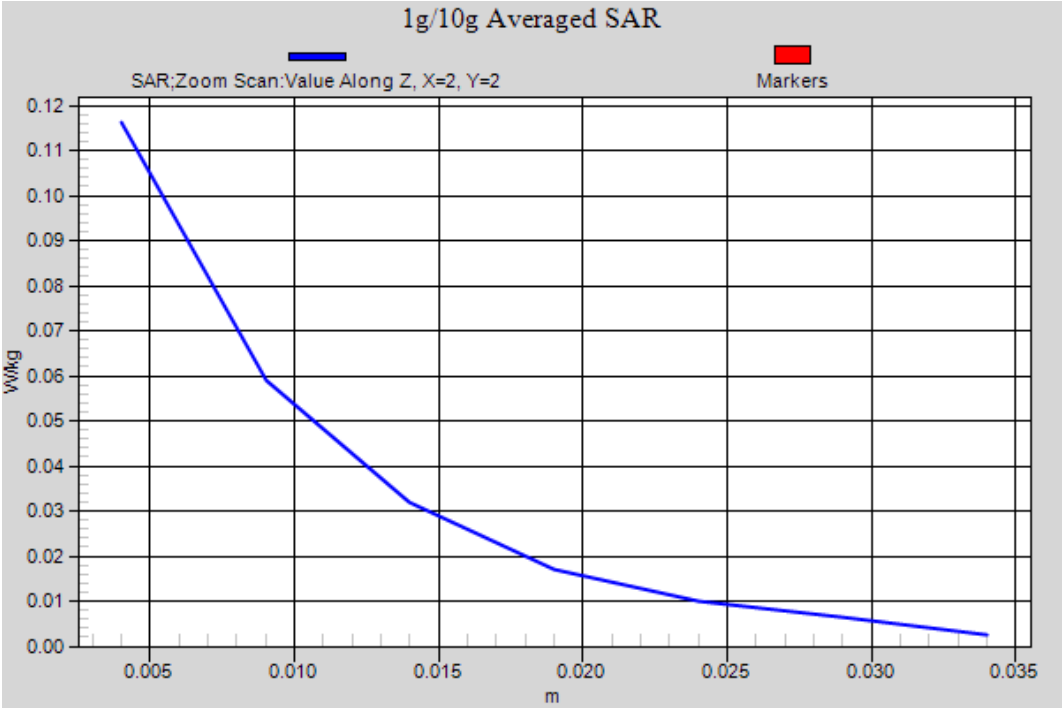



**Figure 114 Right Hand Touch Cheek 802.11b Channel 11**

## 802.11b Right Tilt High

Date: 11/25/2014

Communication System: UID 0, 802.11b (0); Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: f = 2462 MHz; σ = 1.824 S/m; $\varepsilon_r$ = 38.584; ρ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Right Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(7.24, 7.24, 7.24); Calibrated: 2/17/2014;

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 (81x151x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.125 W/kg

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

Reference Value = 8.122 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 0.231 W/kg

**SAR(1 g) = 0.118 W/kg; SAR(10 g) = 0.059 W/kg**

Maximum value of SAR (measured) = 0.132 W/kg

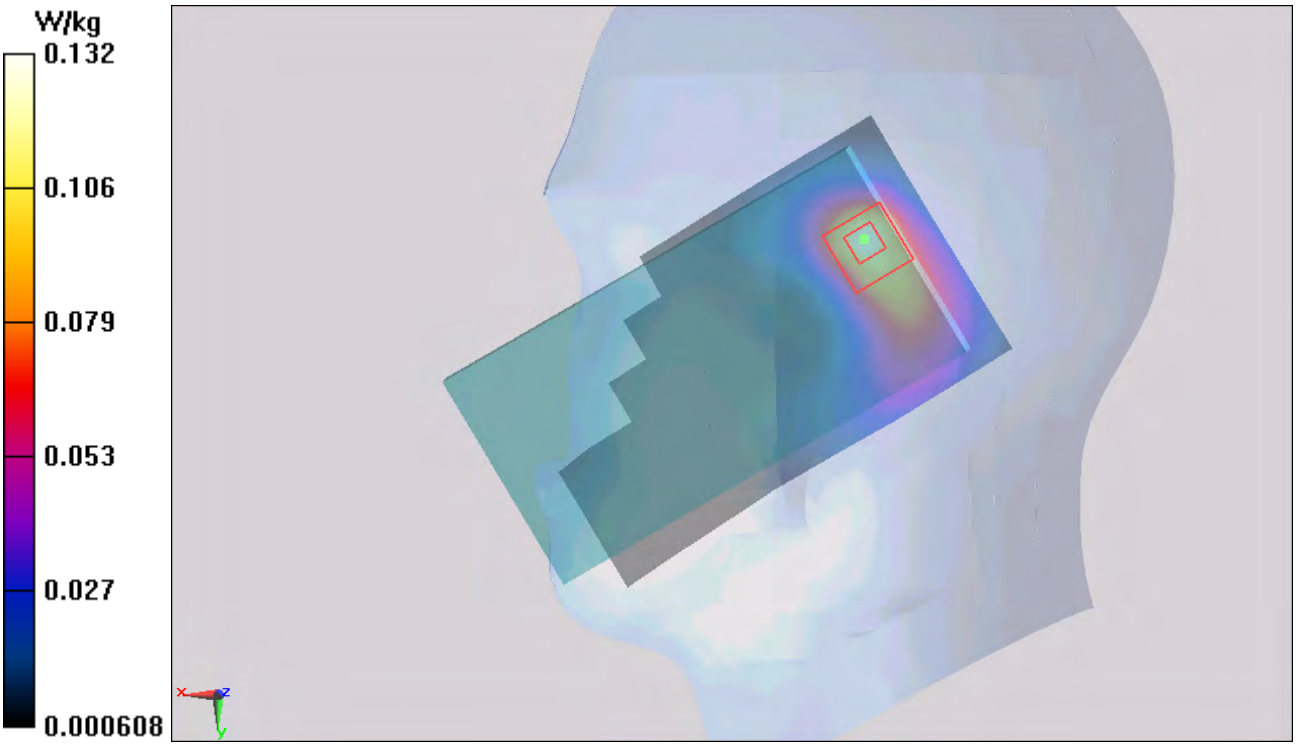



**Figure 115 Right Hand Tilt 15° 802.11b Channel 11**

## 802.11b Back Side High(15mm)

Date: 12/4/2014

Communication System: UID 0, (0); Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: f = 2462 MHz; σ = 2.009 S/m; $\varepsilon_r$ = 52.109; ρ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(6.97, 6.97, 6.97); Calibrated: 2/17/2014;

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 (91x171x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.0762 W/kg

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

Reference Value = 2.395 V/m; Power Drift = -0.081 dB

Peak SAR (extrapolated) = 0.122 W/kg

**SAR(1 g) = 0.065 W/kg; SAR(10 g) = 0.034 W/kg**

Maximum value of SAR (measured) = 0.0662 W/kg

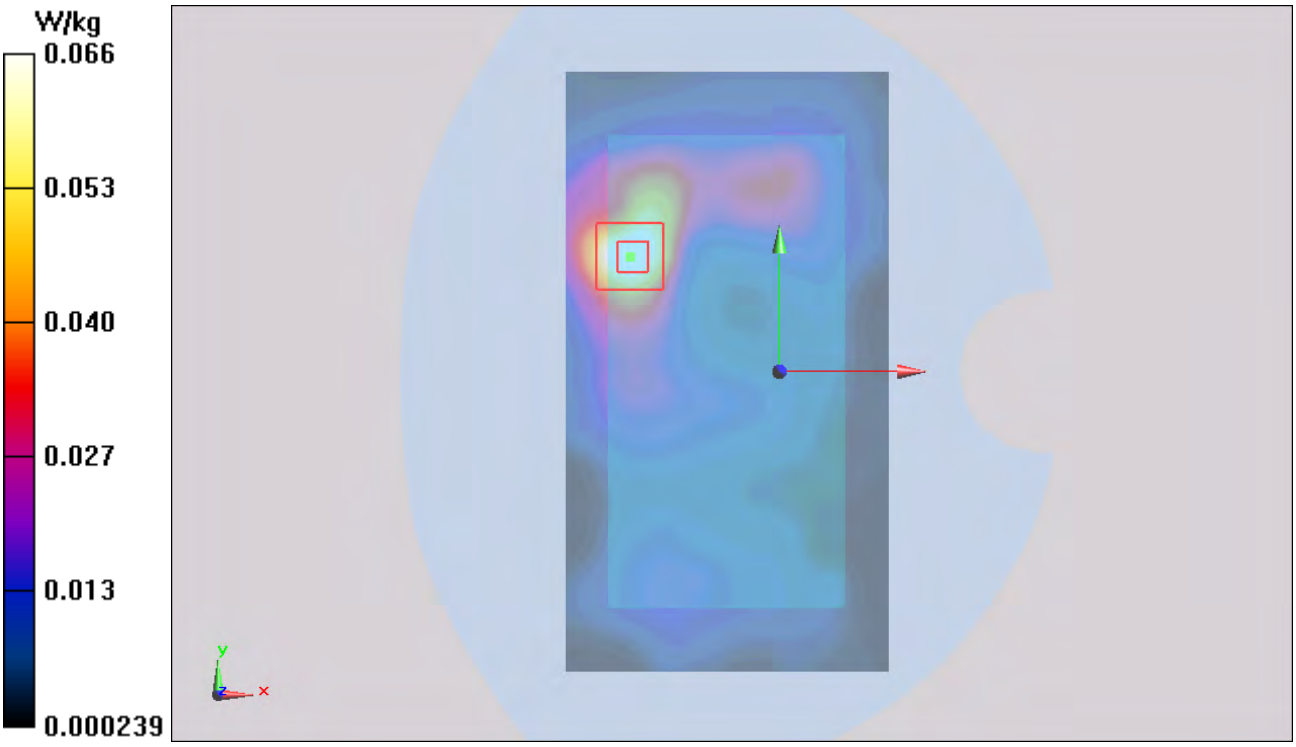



**Figure 116 Body, Back Side, 802.11b Channel 11**

**802.11b Front Side High(15mm)**

Date: 12/4/2014

Communication System: UID 0, (0); Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: f = 2462 MHz; σ = 2.009 S/m; $\varepsilon_r$ = 52.109; ρ = 1000 kg/$m^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(6.97, 6.97, 6.97); Calibrated: 2/17/2014;

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 (91x171x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.0327 W/kg

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

Reference Value = 0.502 V/m; Power Drift = 0.074 dB

Peak SAR (extrapolated) = 0.0520 W/kg

**SAR(1 g) = 0.031 W/kg; SAR(10 g) = 0.018 W/kg**

Maximum value of SAR (measured) = 0.0318 W/kg

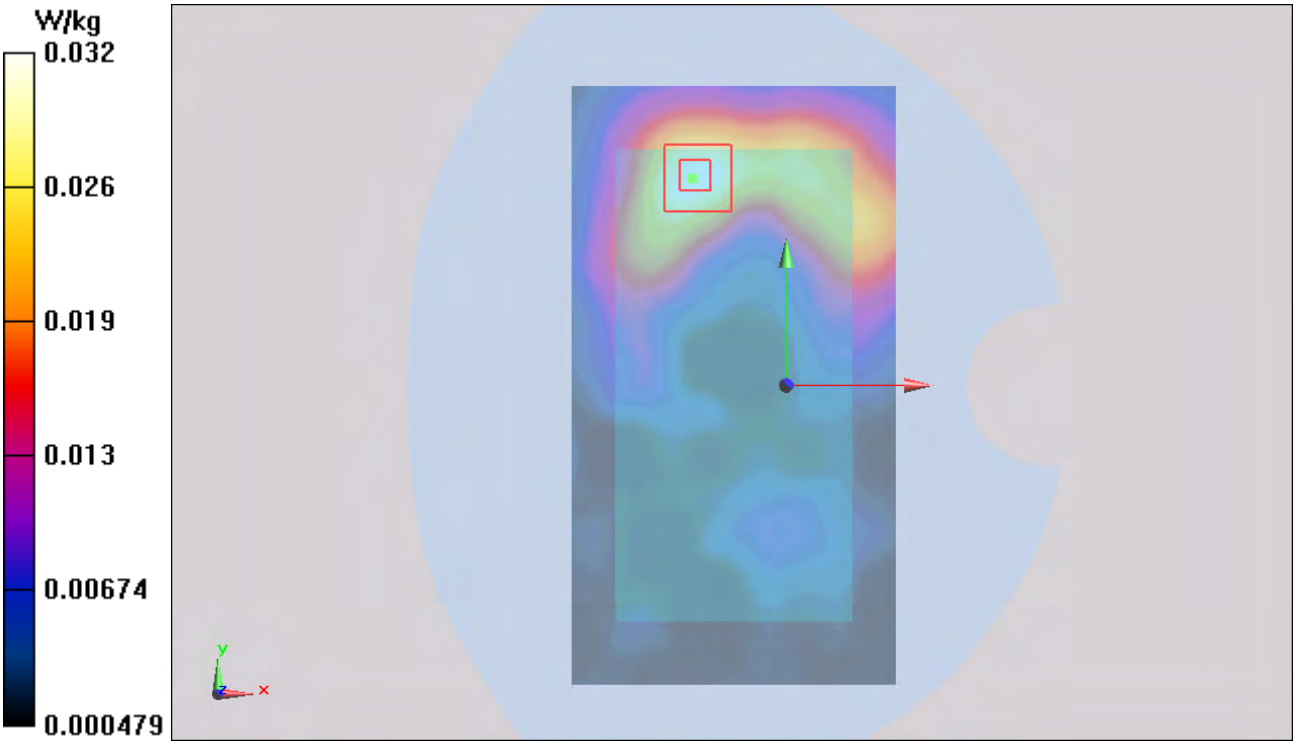



**Figure 117 Body, Front Side, 802.11b Channel 11**

## 802.11b Back Side High (0mm)

Date: 1/2/2015

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; $\varepsilon_r$ = 52.109; $\rho$ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(6.97, 6.97, 6.97); Calibrated: 2/17/2014;

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 (91x171x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 1.30 W/kg

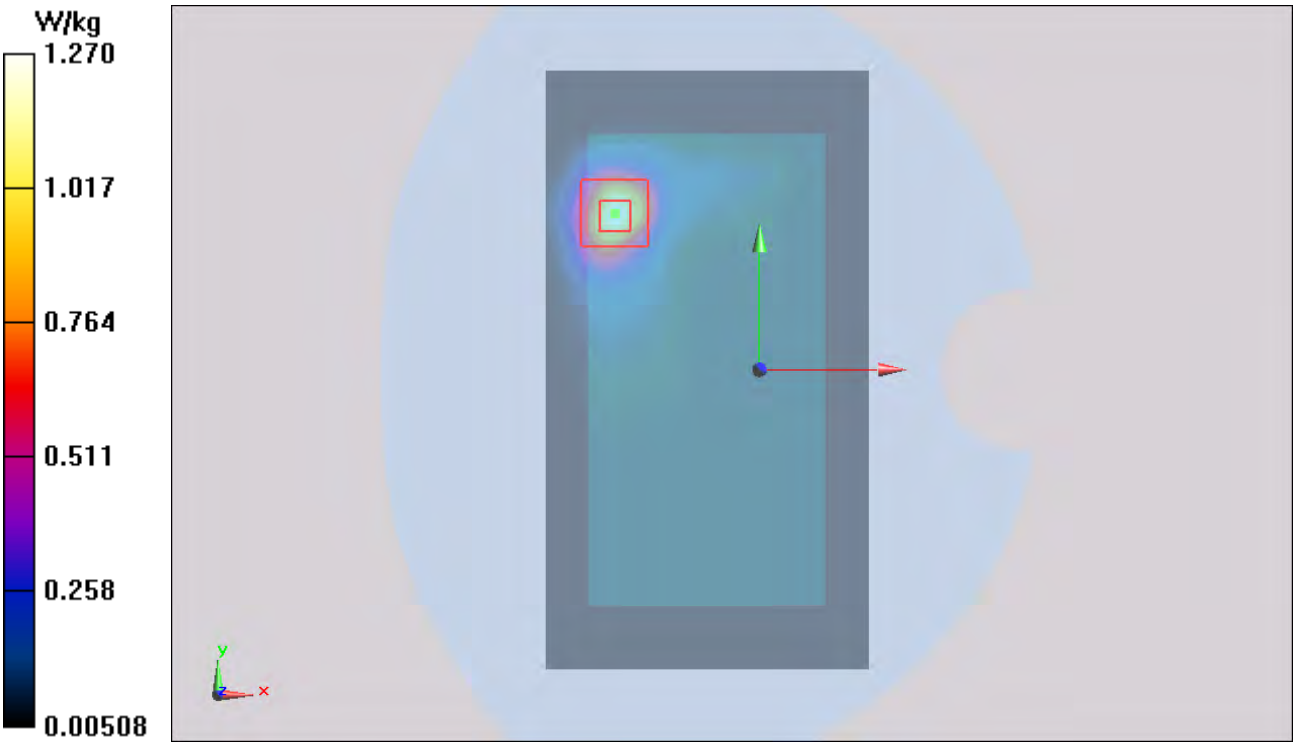
**Back Side High/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.581 V/m; Power Drift = 0.120 dB

Peak SAR (extrapolated) = 3.13 W/kg

**SAR(1 g) = 1.16 W/kg; SAR(10 g) = 0.486 W/kg**

Maximum value of SAR (measured) = 1.27 W/kg



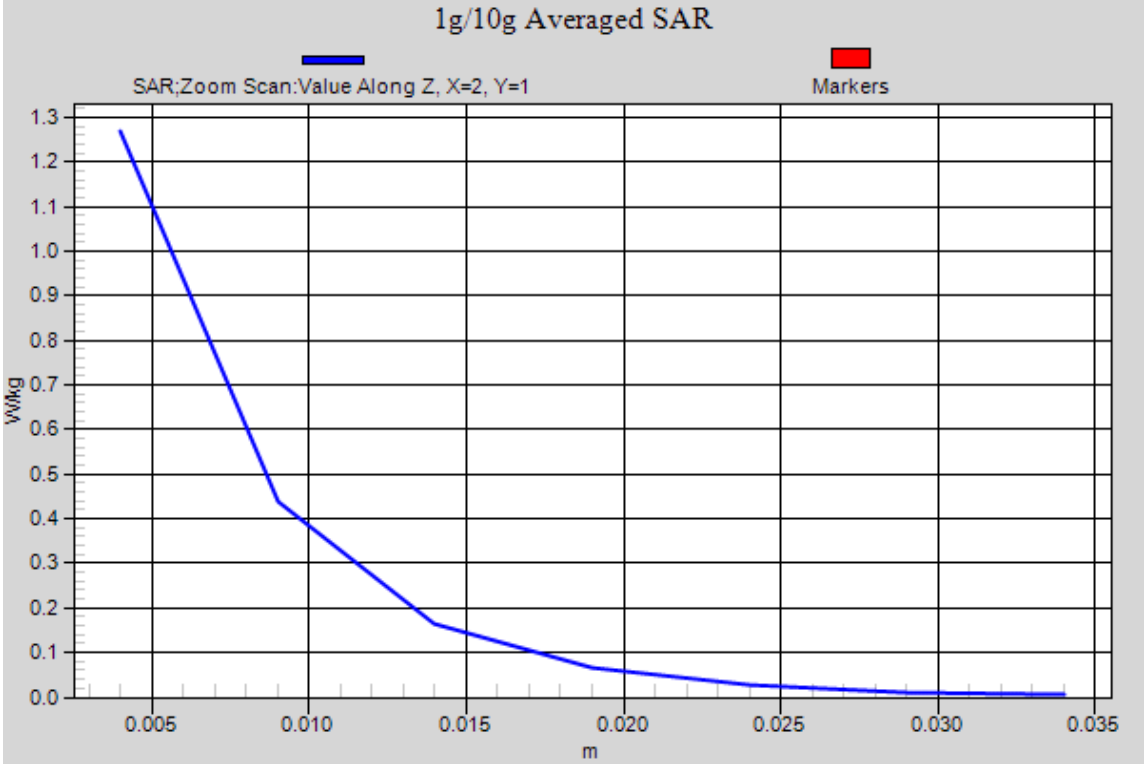



**Figure 118 Body, Back Side, 802.11b Channel 11**

## 802.11b Front Side High (0mm)

Date: 1/2/2015

Communication System: UID 0, 802.11b (0); Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: f = 2462 MHz; σ = 2.009 S/m; $\varepsilon_r$ = 52.109; ρ = 1000 kg/m$^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(6.97, 6.97, 6.97); Calibrated: 2/17/2014;

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 (91x171x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.391 W/kg

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

Reference Value = 4.420 V/m; Power Drift = -0.098 dB

Peak SAR (extrapolated) = 0.665 W/kg

**SAR(1 g) = 0.302 W/kg; SAR(10 g) = 0.142 W/kg**

Maximum value of SAR (measured) = 0.328 W/kg

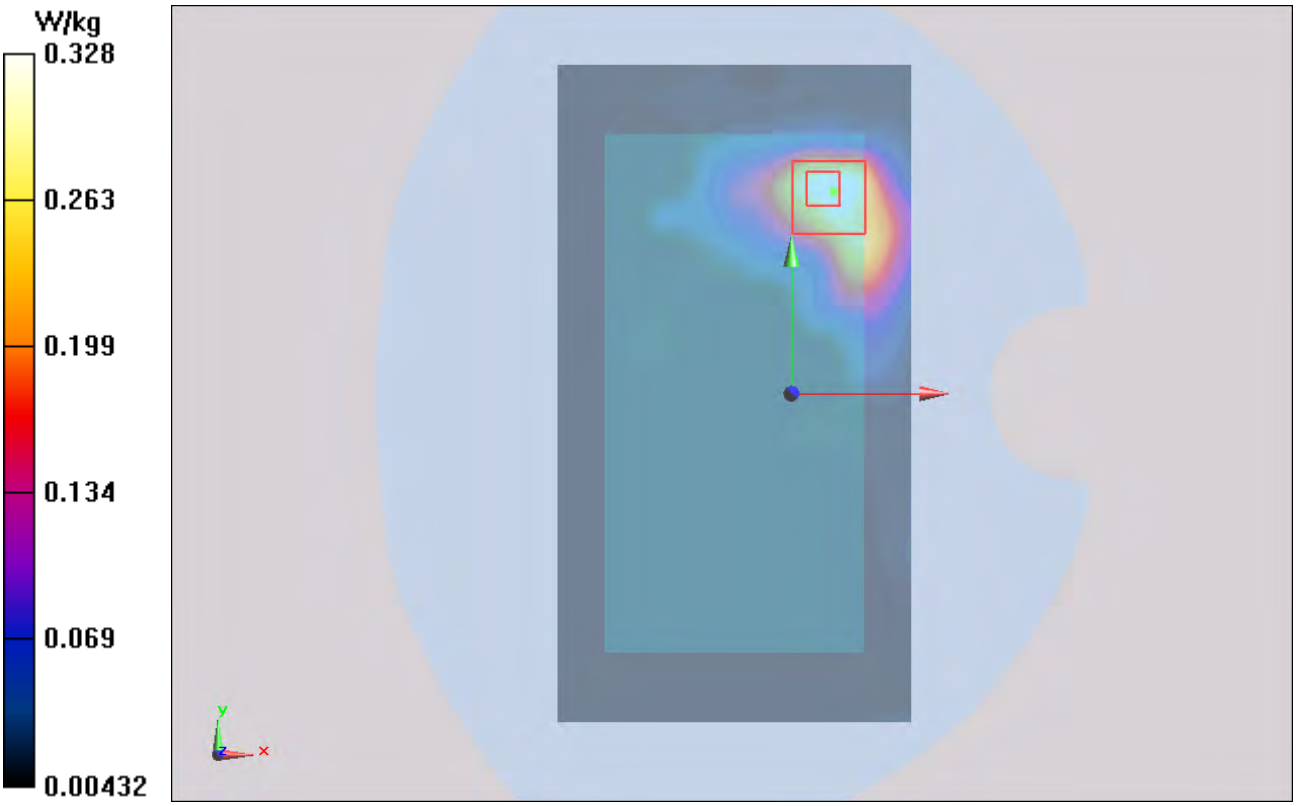



**Figure 119 Body, Front Side, 802.11b Channel 11**

## 802.11b Right Edge High (0mm)

Date: 1/2/2015
Communication System: UID 0, 802.11b (0); Frequency: 2462 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2462 MHz; σ = 2.009 S/m; $\varepsilon_r$ = 52.109; ρ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Sensor-Surface: 4mm (Mechanical Surface Detection)
Probe: EX3DV4 – SN3977; ConvF(6.97, 6.97, 6.97); Calibrated: 2/17/2014;
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 (51x201x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.471 W/kg

**Right Edge High/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.115 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 0.862 W/kg
**SAR(1 g) = 0.387 W/kg; SAR(10 g) = 0.164 W/kg**
Maximum value of SAR (measured) = 0.435 W/kg

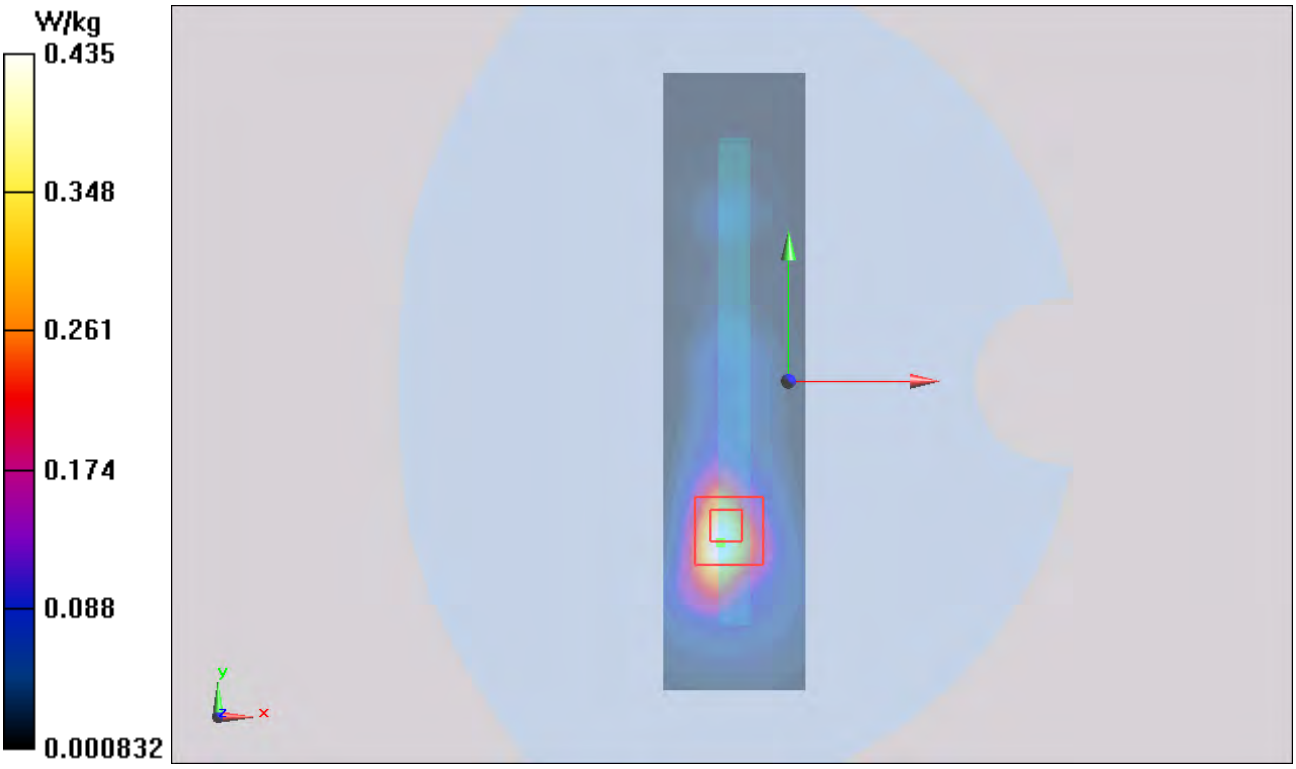



**Figure 120 Body, Right Edge, 802.11b Channel 11**

**802.11b Top Edge High (0mm)**

Date: 1/2/2015

Communication System: UID 0, 802.11b (0); Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: f = 2462 MHz; σ = 2.009 S/m; $\varepsilon_r$ = 52.109; ρ = 1000 kg/$m^3$

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 – SN3977; ConvF(6.97, 6.97, 6.97); Calibrated: 2/17/2014;

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 (51x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.300 W/kg

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

Reference Value = 8.160 V/m; Power Drift = -0.027 dB

Peak SAR (extrapolated) = 0.561 W/kg

**SAR(1 g) = 0.258 W/kg; SAR(10 g) = 0.101 W/kg**

Maximum value of SAR (measured) = 0.245 W/kg

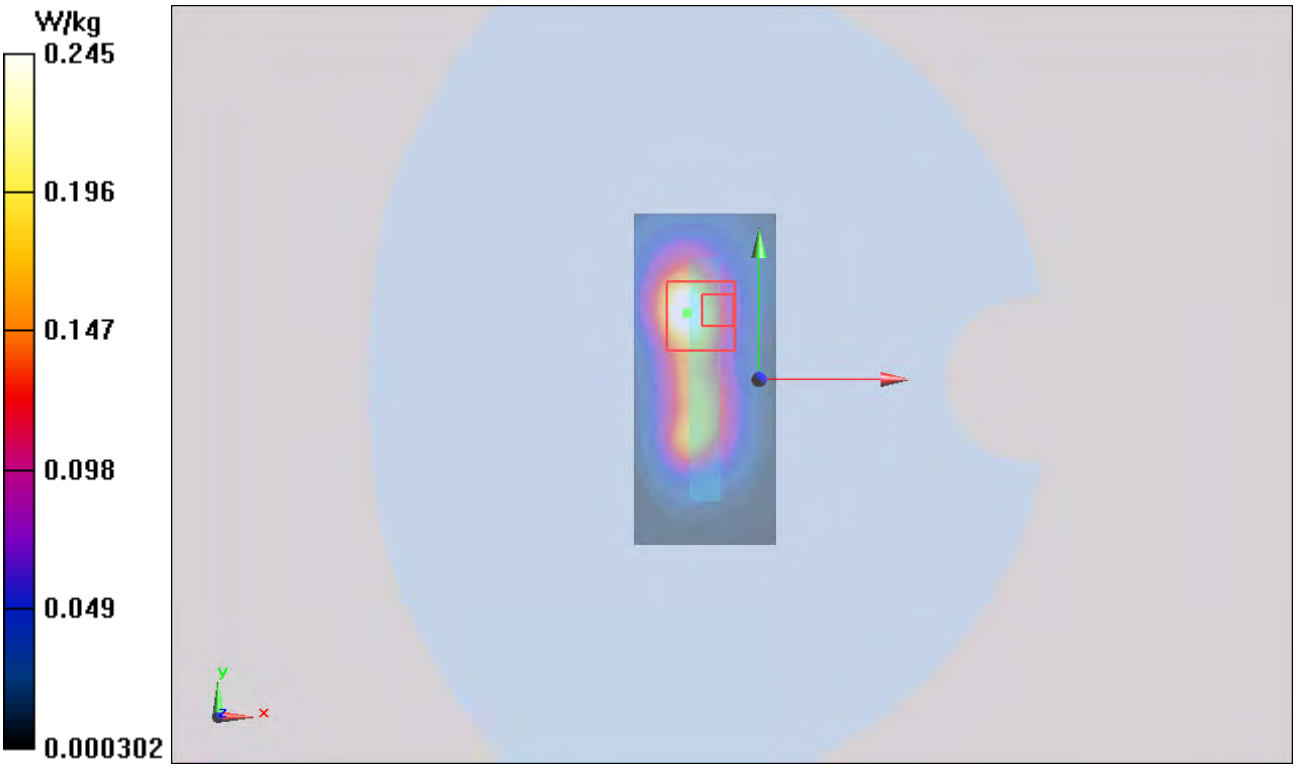



**Figure 121 Body, Top Edge, 802.11b Channel 11**

# ANNEX D: Probe Calibration Certificate

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

**S Schweizerischer Kalibrierdienst**
**C Service suisse d'étalonnage**
**S Servizio svizzero di taratura**
**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<br>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 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID | Cal Date (Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Power meter E4419B | GB41293874 | 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.

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

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

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

Accreditation No.: **SCS 108**

## Glossary:

| | |
|---|---|
| TSL | tissue simulating liquid |
| NORMx,y,z | sensitivity in free space |
| ConvF | sensitivity in TSL / NORMx,y,z |
| DCP | diode compression point |
| CF | crest factor (1/duty_cycle) of the RF signal |
| A, B, C, D | modulation dependent linearization parameters |
| Polarization φ | φ rotation around probe axis |
| Polarization ϑ | ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis |
| 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:

a) 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

b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

## Methods Applied and Interpretation of Parameters:

- *NORMx,y,z*: Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the $E^2$-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z*: DCP are numerical linearization parameters assessed based on the data of power sweep 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
- *Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z: 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 ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- *Connector Angle*: The angle is assessed using the information gained by determining the *NORMx* (no uncertainty required).

# Probe EX3DV4

## SN:3977

Manufactured: November 5, 2013
Calibrated: February 17, 2014

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3977

## Basic Calibration Parameters

| | Sensor X | Sensor Y | Sensor Z | Unc (k=2) |
|---|---|---|---|---|
| Norm ($\mu V/(V/m)^2$)[A] | 0.54 | 0.57 | 0.54 | ± 10.1 % |
| DCP (mV)[B] | 99.5 | 100.0 | 99.7 | |

## Modulation Calibration Parameters

| UID | Communication System Name | | A dB | B dB√μV | C | D dB | VR mV | Unc[E] (k=2) |
|---|---|---|---|---|---|---|---|---|
| 0 | CW | X | 0.0 | 0.0 | 1.0 | 0.00 | 133.3 | ±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%.

[A] The uncertainties of NormX,Y,Z do not affect the $E^2$-field uncertainty inside TSL (see Pages 5 and 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3977

**Calibration Parameter Determined in Head Tissue Simulating Media**

| f (MHz) [C] | Relative Permittivity [F] | Conductivity (S/m) [F] | ConvF X | ConvF Y | ConvF Z | Alpha [G] | Depth [G] (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 | 35.6 | 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 % |

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.
[G] 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.

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3977

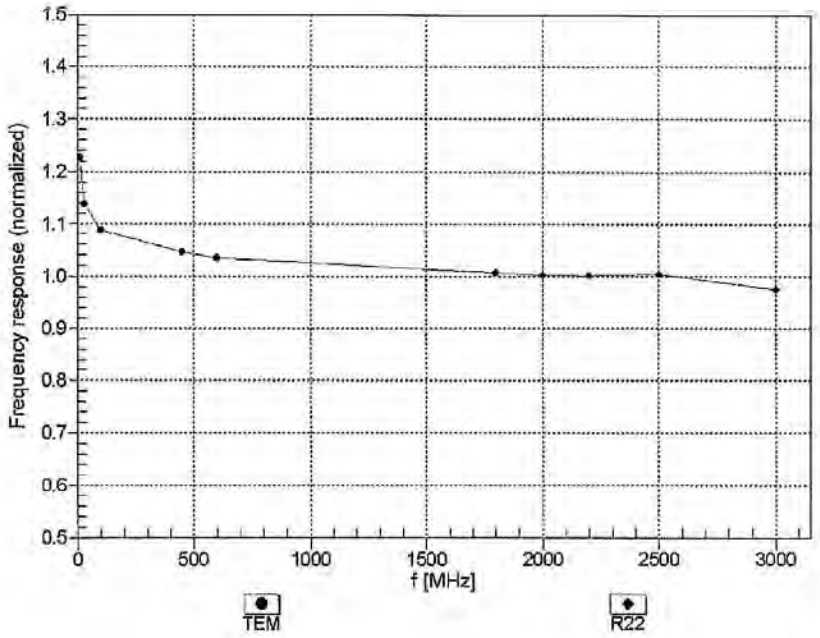
## Calibration Parameter Determined in Body Tissue Simulating Media

| f (MHz) [C] | Relative Permittivity [F] | Conductivity (S/m) [F] | ConvF X | ConvF Y | ConvF Z | Alpha [G] | Depth [G] (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 % |

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.
[G] 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.

EX3DV4– SN:3977 February 17, 2014

## Frequency Response of E-Field
(TEM-Cell:ifi110 EXX, Waveguide: R22)

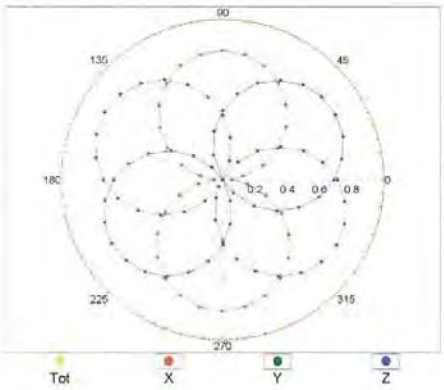



Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

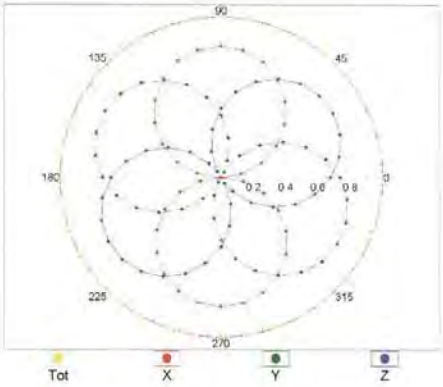
EX3DV4– SN:3977 February 17, 2014

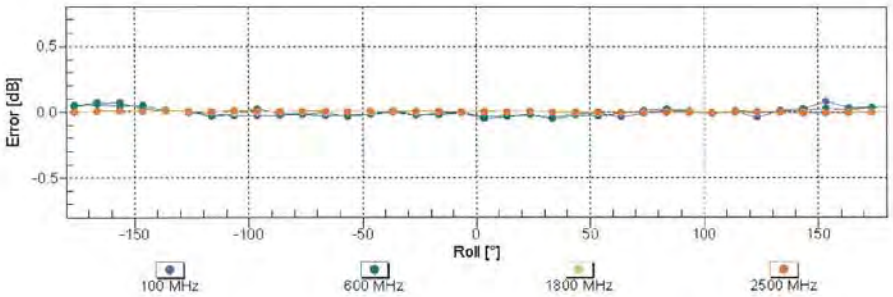
## Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM




f=1800 MHz,R22

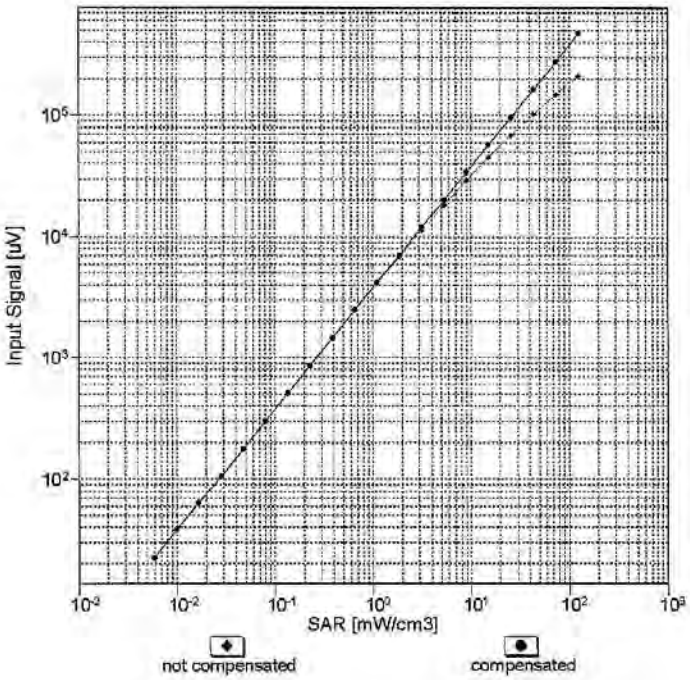


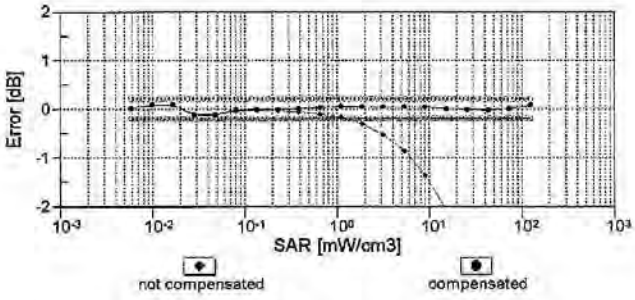




**Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)**

EX3DV4– SN:3977 February 17, 2014

## Dynamic Range f($SAR_{head}$)
(TEM cell , $f_{eval}$= 1900 MHz)



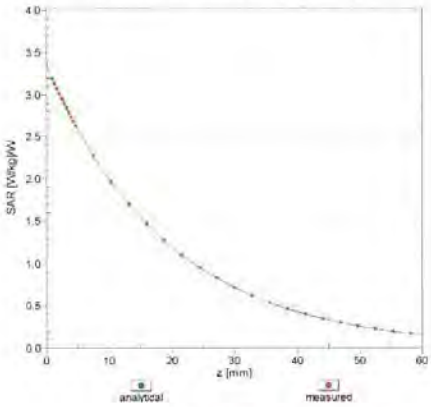




**Uncertainty of Linearity Assessment: ± 0.6% (k=2)**

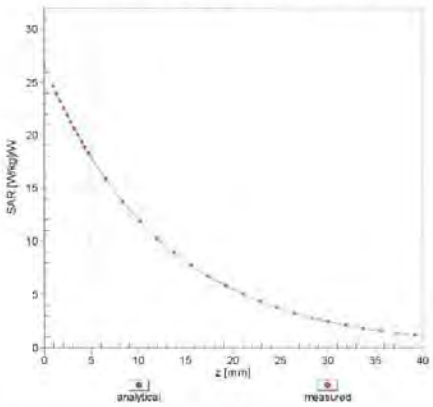
EX3DV4– SN:3977 February 17, 2014

## Conversion Factor Assessment

f = 835 MHz,WGLS R9 (H_convF)

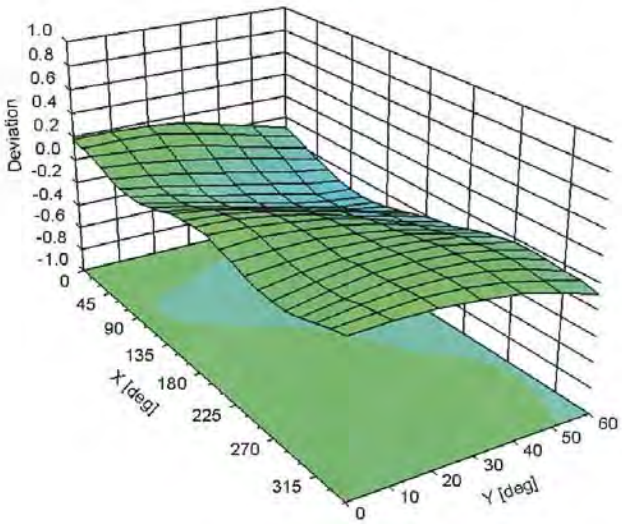


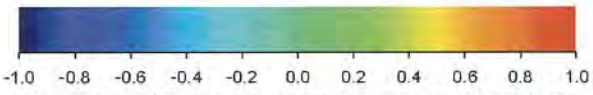

f = 1750 MHz,WGLS R22 (H_convF)




## Deviation from Isotropy in Liquid

**Error (ϕ, ϑ), f = 900 MHz**




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

# 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 |

# ANNEX E: D835V2 Dipole Calibration Certificate

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ilac-MRA CNAS CALIBRATION No. L0570

Client TA(Shanghai) Certificate No: Z14-97073

## CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | D835V2 - SN: 4d020 |
| Calibration Procedure(s) | TMC-OS-E-02-194<br>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)℃ 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.

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CALIBRATION
No. L0570

**Glossary:**

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

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

a) 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
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) For hand-held devices used in close proximity to the ear (frequency range of 300MHz to 3GHz)", February 2005
c) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

**Additional Documentation:**

d) DASY4/5 System Handbook

**Methods Applied and Interpretation of Parameters:**

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

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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## 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 ± 1 MHz | |

## Head TSL parameters

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---|---|---|
| **Nominal Head TSL parameters** | 22.0 °C | 41.5 | 0.90 mho/m |
| **Measured Head TSL parameters** | (22.0 ± 0.2) °C | 42.5 ± 6 % | 0.91 mho/m ± 6 % |
| **Head TSL temperature change during test** | <1.0 °C | ---- | ---- |

## SAR result with Head TSL

| **SAR averaged over 1 $cm^3$ (1 g) of Head TSL** | Condition | |
|---|---|---|
| SAR measured | 250 mW input power | 2.39 mW / g |
| SAR for nominal Head TSL parameters | normalized to 1W | **9.54 mW / g ± 20.8 % (k=2)** |
| **SAR averaged over 10 $cm^3$ (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 ± 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 ± 0.2) °C | 56.7 ± 6 % | 0.97 mho/m ± 6 % |
| **Body TSL temperature change during test** | <1.0 °C | ---- | ---- |

## SAR result with Body TSL

| **SAR averaged over 1 $cm^3$ (1 g) of Body TSL** | Condition | |
|---|---|---|
| SAR measured | 250 mW input power | 2.37 mW / g |
| SAR for nominal Body TSL parameters | normalized to 1W | **9.54 mW / g ± 20.8 % (k=2)** |
| **SAR averaged over 10 $cm^3$ (10 g) of Body TSL** | Condition | |
| SAR measured | 250 mW input power | 1.57 mW / g |
| SAR for nominal Body TSL parameters | normalized to 1W | **6.31 mW / g ± 20.4 % (k=2)** |

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CALIBRATION
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## Appendix

### Antenna Parameters with Head TSL

| | |
|---|---|
| Impedance, transformed to feed point | 48.6Ω +2.75jΩ |
| Return Loss | - 30.1dB |

### Antenna Parameters with Body TSL

| | |
|---|---|
| Impedance, transformed to feed point | 54.0Ω +5.88jΩ |
| 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 |

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ilac-MRA CNAS CALIBRATION No. L0570

**DASY5 Validation Report for Head 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 MHz; $\sigma$ = 0.909 S/m; $\varepsilon_r$ = 42.49; $\rho$ = 1000 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)

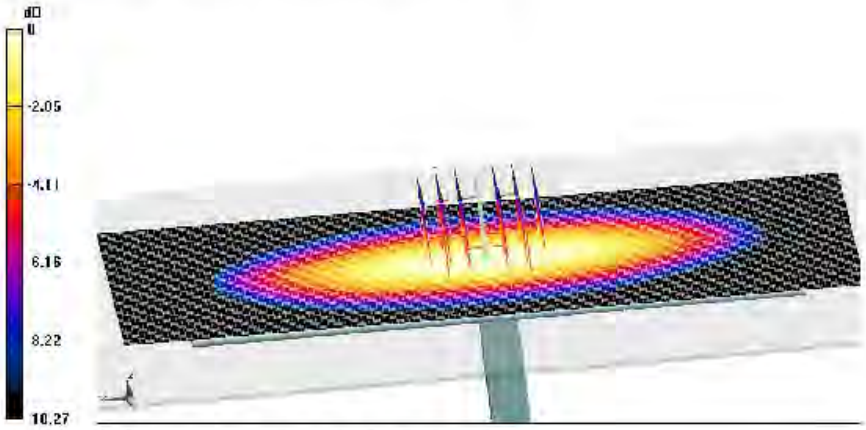
**System Performance Check at Frequencies below 1 GHz/d=15mm, Pin=250 mW, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

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**

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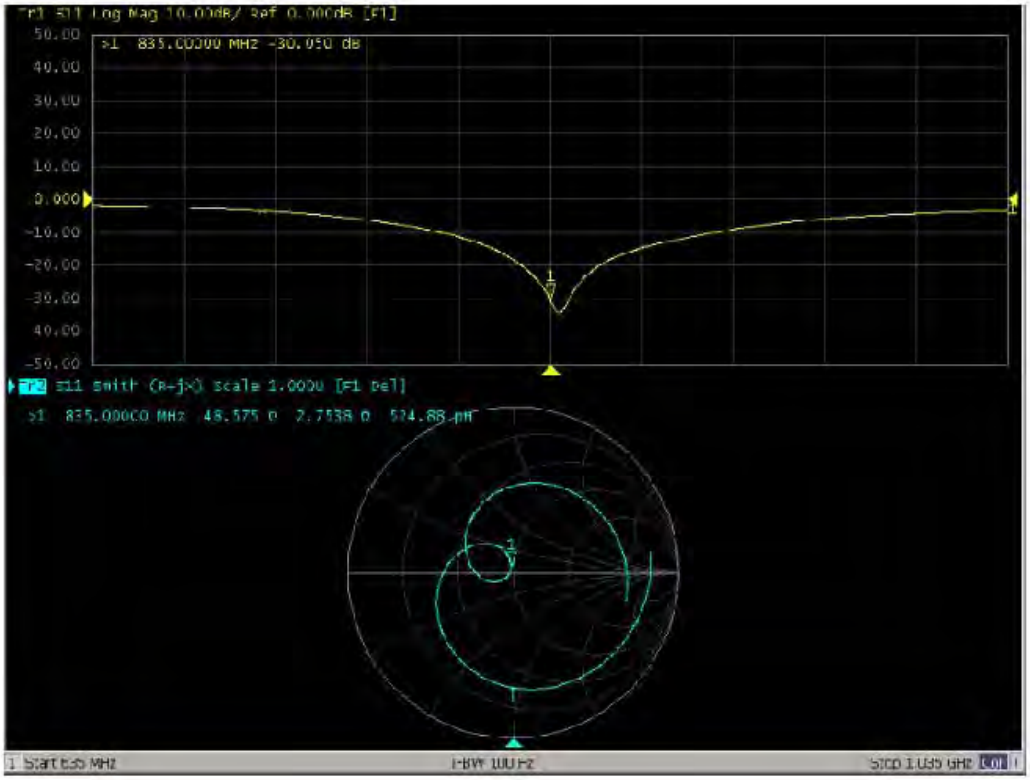
**Impedance Measurement Plot for Head TSL**



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ilac-MRA CNAS CALIBRATION No. L0570

**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 MHz; $\sigma$ = 0.97 S/m; $\varepsilon_r$ = 56.745; $\rho$ = 1000 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: 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)

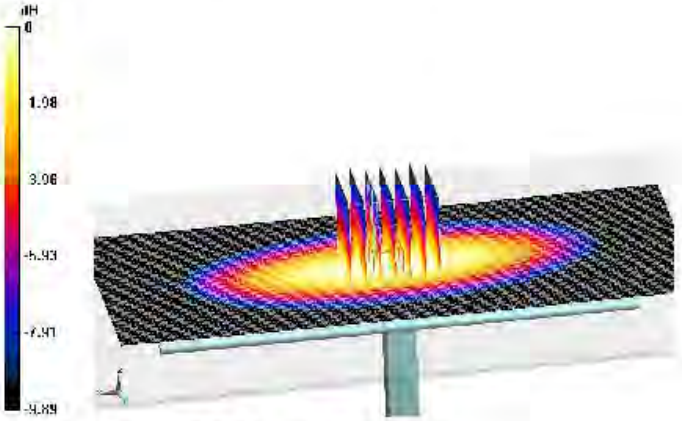
**System Performance Check at Frequencies below 1 GHz/d=15mm, Pin=250 mW, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm**

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




**0 dB = 2.74 W/kg = 4.38 dBW/kg**

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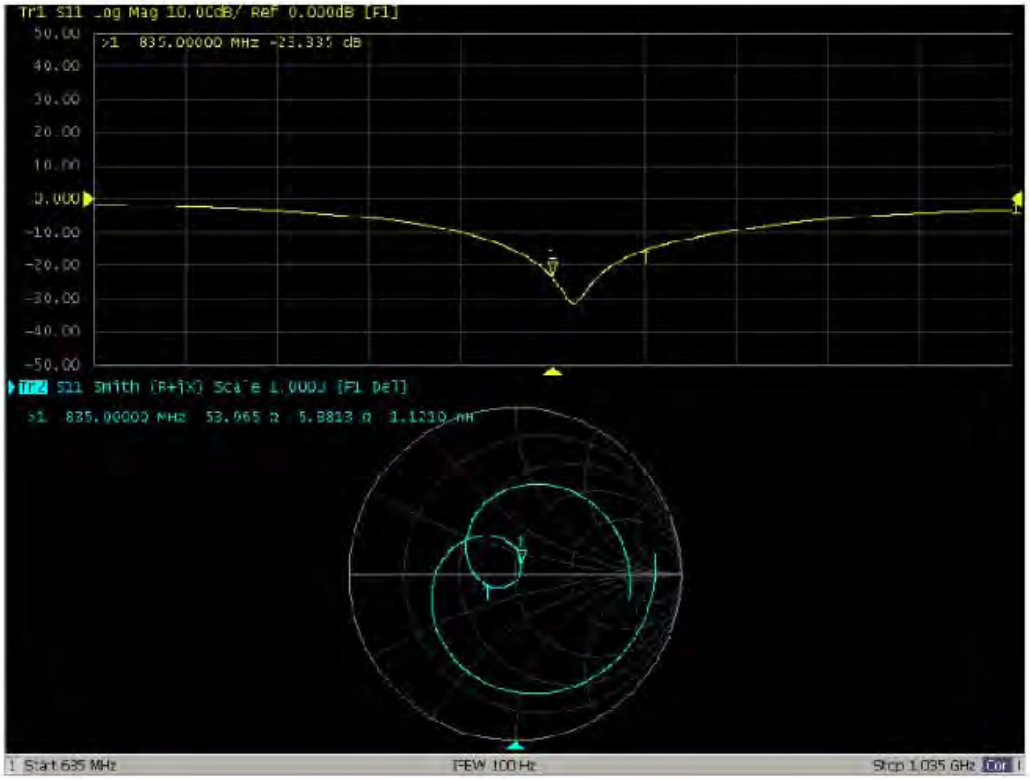
CALIBRATION
No. L0570

**Impedance Measurement Plot for Body TSL**



# ANNEX F: D1750V2 Dipole Calibration Certificate

TMC In Collaboration with speag CALIBRATION LABORATORY

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Client TA(Shanghai) Certificate No: J14-2-0053

## CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | D1750V2 - SN: 1033 |
| Calibration Procedure(s) | TMC-OS-E-02-194<br>Calibration procedure for dipole validation kits |
| Calibration date: | January 26, 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 EX3DV4 | SN 3846 | 3- Sep-13 (SPEAG, No.EX3-3846_Sep13) | Sep-14 |
| DAE4 | SN 777 | 22-Feb-13 (SPEAG, DAE4-777_Feb13) | Feb -14 |
| 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: | Yu Zongying | SAR Test Engineer | |
| Reviewed by: | Qi Dianyuan | SAR Project Leader | |
| Approved by: | Lu Bingsong | Deputy Director of the laboratory | |

Issued: January 28, 2014

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**Glossary:**

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

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

a) 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

b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) For hand-held devices used in close proximity to the ear (frequency range of 300MHz to 3GHz)", February 2005

c) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

**Additional Documentation:**

d) DASY4/5 System Handbook

**Methods Applied and Interpretation of Parameters:**

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

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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## Measurement Conditions

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

| | | |
|---|---|---|
| **DASY Version** | DASY52 | 52.8.7.1137 |
| **Extrapolation** | Advanced Extrapolation | |
| **Phantom** | Twin Phantom | |
| **Distance Dipole Center - TSL** | 10 mm | with Spacer |
| **Zoom Scan Resolution** | dx, dy, dz = 5 mm | |
| **Frequency** | 1750 MHz ± 1 MHz | |

## Head TSL parameters

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---|---|---|
| **Nominal Head TSL parameters** | 22.0 °C | 40.1 | 1.37 mho/m |
| **Measured Head TSL parameters** | (22.0 ± 0.2) °C | 39.6 ± 6 % | 1.35 mho/m ± 6 % |
| **Head TSL temperature change during test** | <1.0 °C | ---- | ---- |

## SAR result with Head TSL

| **SAR averaged over 1 $cm^3$ (1 g) of Head TSL** | Condition | |
|---|---|---|
| SAR measured | 250 mW input power | 9.24 mW / g |
| SAR for nominal Head TSL parameters | normalized to 1W | **37.2 mW /g ± 20.8 % (k=2)** |
| **SAR averaged over 10 $cm^3$ (10 g) of Head TSL** | Condition | |
| SAR measured | 250 mW input power | 4.92 mW / g |
| SAR for nominal Head TSL parameters | normalized to 1W | **19.8 mW /g ± 20.4 % (k=2)** |

## Body TSL parameters

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---|---|---|
| **Nominal Body TSL parameters** | 22.0 °C | 53.4 | 1.49 mho/m |
| **Measured Body TSL parameters** | (22.0 ± 0.2) °C | 52.8 ± 6 % | 1.47 mho/m ± 6 % |
| **Body TSL temperature change during test** | <1.0 °C | — | ---- |

## SAR result with Body TSL

| **SAR averaged over 1 $cm^3$ (1 g) of Body TSL** | Condition | |
|---|---|---|
| SAR measured | 250 mW input power | 9.63 mW / g |
| SAR for nominal Body TSL parameters | normalized to 1W | **38.8 mW /g ± 20.8 % (k=2)** |
| **SAR averaged over 10 $cm^3$ (10 g) of Body TSL** | Condition | |
| SAR measured | 250 mW input power | 5.14 mW / g |
| SAR for nominal Body TSL parameters | normalized to 1W | **20.6 mW /g ± 20.4 % (k=2)** |

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## Appendix

### Antenna Parameters with Head TSL

| | |
|---|---|
| Impedance, transformed to feed point | 50.5Ω- 0.63jΩ |
| Return Loss | - 41.9dB |

### Antenna Parameters with Body TSL

| | |
|---|---|
| Impedance, transformed to feed point | 45.8Ω- 3.98jΩ |
| Return Loss | - 24.3dB |

### General Antenna Parameters and Design

| | |
|---|---|
| Electrical Delay (one direction) | 1.031 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

| | |
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| Manufactured by | SPEAG |

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**DASY5 Validation Report for Head TSL** Date: 26.01.2014

Test Laboratory: TMC, Beijing, China

**DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN: 1033**

Communication System: UID 0, CW (0);Frequency: 1750 MHz

Medium parameters used: f = 1750 MHz; σ = 1.35 S/m; εr = 39.6; ρ = 1000 kg/m3

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3846;ConvF(7.85, 7.85, 7.85); Calibrated: 2013/9/3
- Sensor-Surface: 2mm (Mechanical Surface Detection);
- Electronics: DAE4 Sn777;Calibrated: 2013/2/22
- Phantom: SAM1593;Type: QD000P40CC;Serial: TP:1593
- DASY52 52.8.7(1137);SEMCAD X Version 14.6.10 (7164)

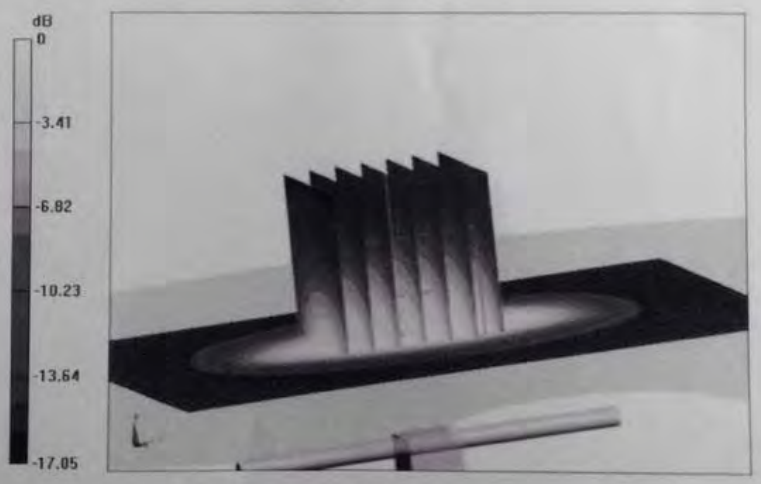
**Dipole Calibration for Head Tissue/ d=10mm, Pin=250mW, dist=2.0mm (EX-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 100.1 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 16.8 W/kg

**SAR(1 g) = 9.24 W/kg; SAR(10 g) = 4.92 W/kg**

Maximum value of SAR (measured) = 13.1 W/kg




0 dB = 13.1 W/kg = 11.17 dBW/kg

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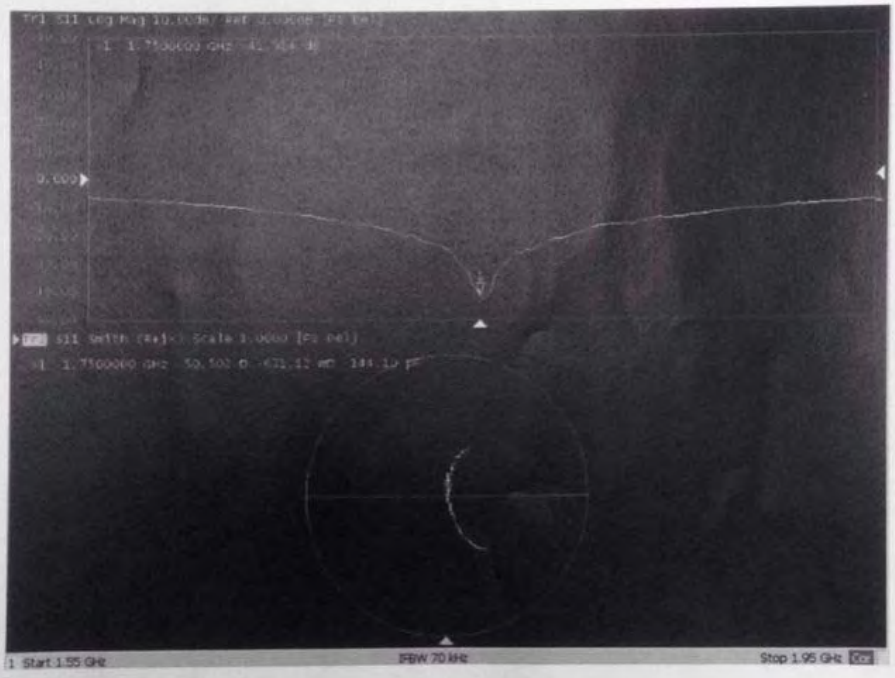
**Impedance Measurement Plot for Head TSL**



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**DASY5 Validation Report for Body TSL** Date: 26.01.2014

Test Laboratory: TMC, Beijing, China

**DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN: 1033**

Communication System: UID 0, CW (0);Frequency: 1750 MHz

Medium parameters used: f = 1750 MHz; $\sigma$ = 1.47 S/m; $\varepsilon_r$ = 52.8; $\rho$ = 1000 kg/m$^3$

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3846;ConvF(7.56, 7.56, 7.56); Calibrated: 2013/9/3
- Sensor-Surface: 2mm (Mechanical Surface Detection);
- Electronics: DAE4 Sn777;Calibrated: 2013/2/22
- Phantom: SAM 1186;Type: QD000P40CC;
- DASY52 52.8.7(1137);SEMCAD X Version 14.6.10 (7164)

**Dipole Calibration for Body Tissue/ d=10mm, Pin=250mW, dist=2.0mm (EX-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid:

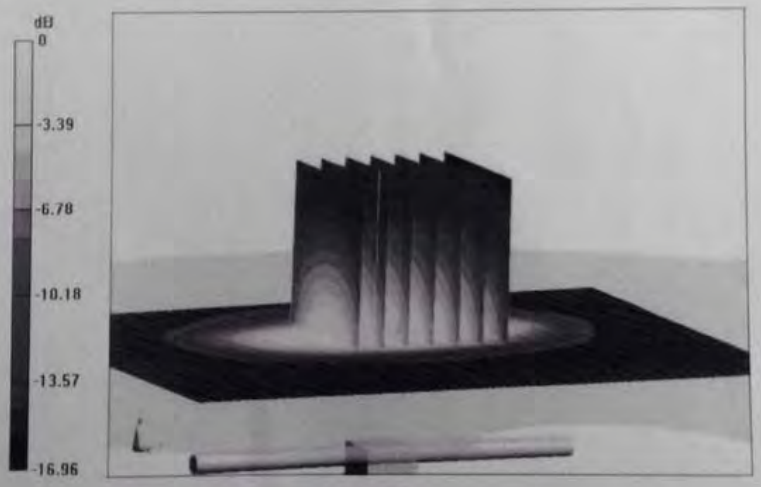
dx=5mm, dy=5mm, dz=5mm

Reference Value = 82.820 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 17.2 W/kg

**SAR(1 g) = 9.63 W/kg; SAR(10 g) = 5.14 W/kg**

Maximum value of SAR (measured) = 13.6 W/kg




0 dB = 13.6 W/kg = 11.34 dBW/kg

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**Impedance Measurement Plot for Body TSL**

# ANNEX G: D1900V2 Dipole Calibration Certificate

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CALIBRATION No. L0570

Client TA(Shanghai) Certificate No: Z14-97074

## CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | D1900V2 - SN: 5d060 |
| Calibration Procedure(s) | TMC-OS-E-02-194<br>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.

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**Glossary:**

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

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

a) 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

b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) For hand-held devices used in close proximity to the ear (frequency range of 300MHz to 3GHz)", February 2005

c) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

**Additional Documentation:**

d) DASY4/5 System Handbook

**Methods Applied and Interpretation of Parameters:**

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

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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## 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 ± 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 ± 0.2) °C | 39.8 ± 6 % | 1.37 mho/m ± 6 % |
| **Head TSL temperature change during test** | <1.0 °C | ---- | ---- |

## SAR result with Head TSL

| **SAR averaged over 1 $cm^3$ (1 g) of Head TSL** | Condition | |
|---|---|---|
| SAR measured | 250 mW input power | 9.69 mW / g |
| SAR for nominal Head TSL parameters | normalized to 1W | **39.2 mW / g ± 20.8 % (k=2)** |
| **SAR averaged over 10 $cm^3$ (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 ± 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 ± 0.2) °C | 51.8 ± 6 % | 1.50 mho/m ± 6 % |
| **Body TSL temperature change during test** | <1.0 °C | ---- | ---- |

## SAR result with Body TSL

| **SAR averaged over 1 $cm^3$ (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 ± 20.8 % (k=2)** |
| **SAR averaged over 10 $cm^3$ (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 ± 20.4 % (k=2)** |

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## 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 |

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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 MHz; $\sigma$ = 1.371 S/m; $\varepsilon_r$ = 39.83; $\rho$ = 1000 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)

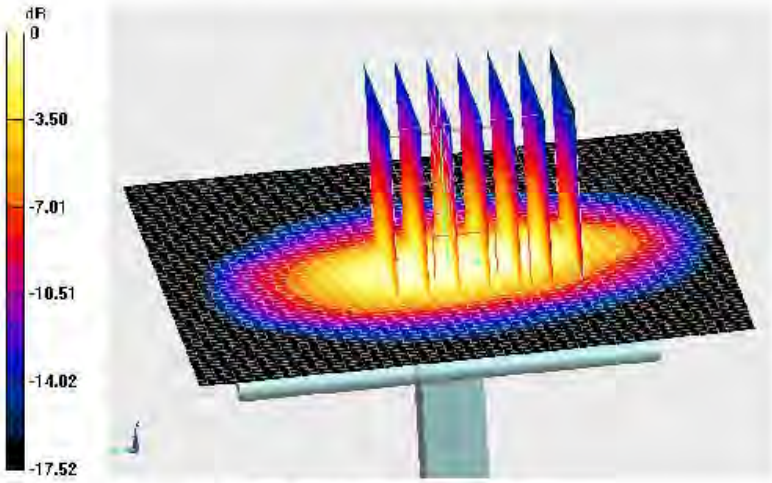
**System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

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 dBW/kg

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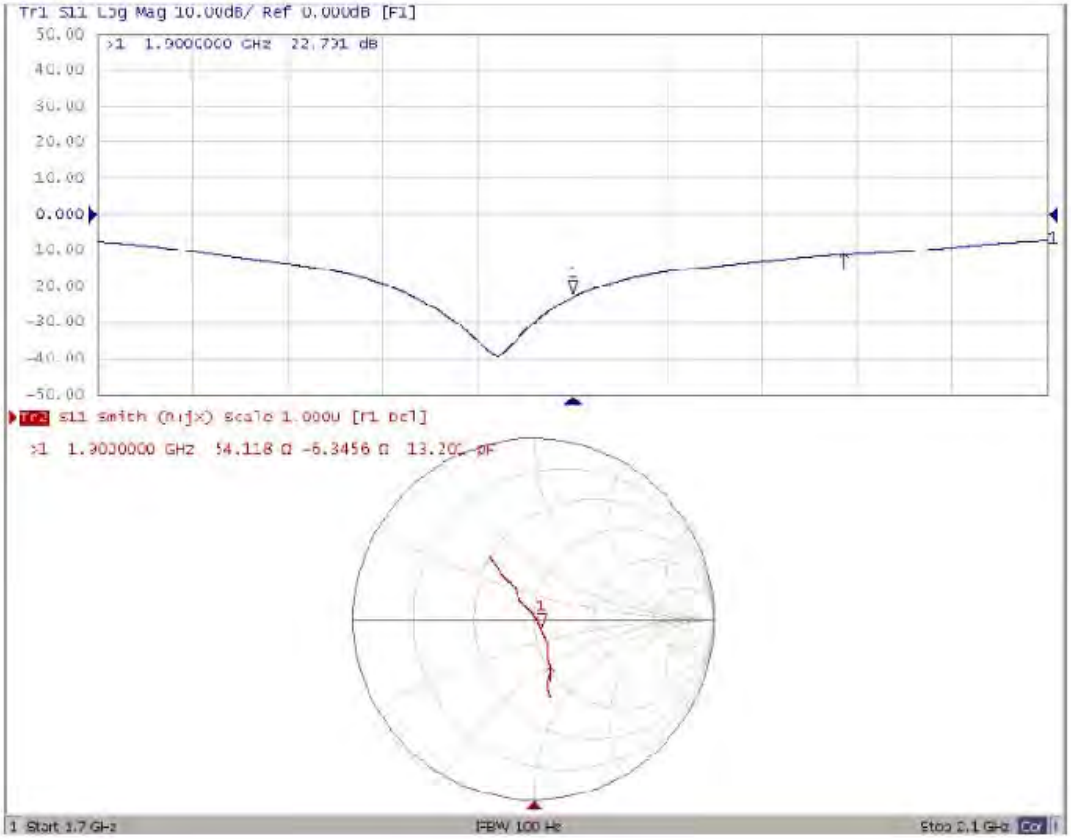
**Impedance Measurement Plot for Head TSL**



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**DASY5 Validation Report for Body TSL** Date: 01.09.2014

Test Laboratory: CTTL, Beijing, China

**DUT: Dipole 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 MHz; $\sigma$ = 1.5 S/m; $\varepsilon_r$ = 51.78; $\rho$ = 1000 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)

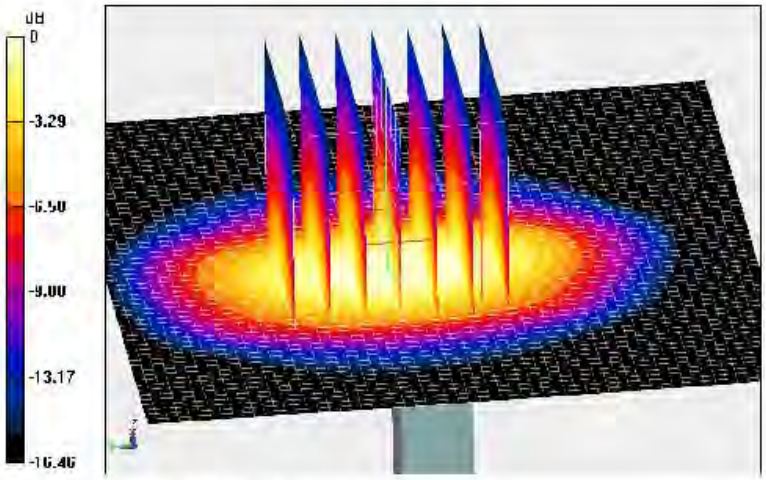
**System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

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 dBW/kg

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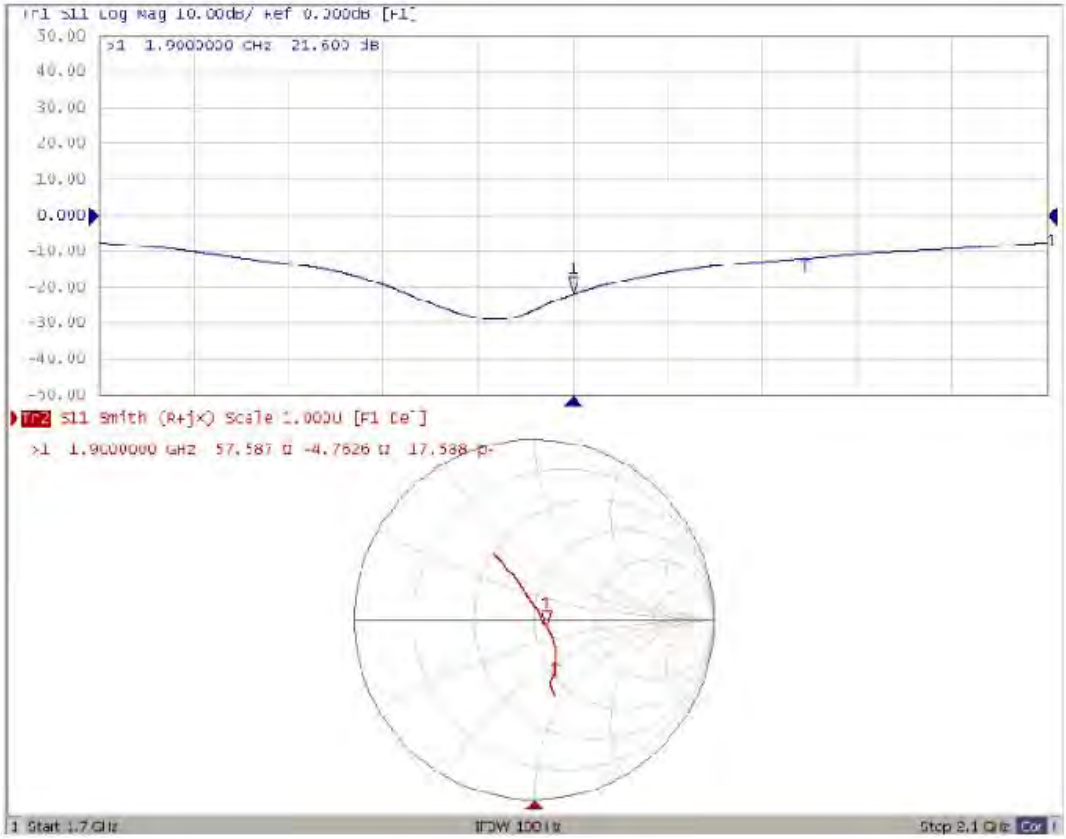
**Impedance Measurement Plot for Body TSL**



# ANNEX H: D2450V2 Dipole Calibration Certificate

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CALIBRATION LABORATORY

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CALIBRATION No. L0570

Client TA(Shanghai) Certificate No: Z14-97075

## CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | D2450V2 - SN: 786 |
| Calibration Procedure(s) | TMC-OS-E-02-194<br>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

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**Glossary:**

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

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

a) 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

b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) For hand-held devices used in close proximity to the ear (frequency range of 300MHz to 3GHz)", February 2005

c) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

**Additional Documentation:**

d) DASY4/5 System Handbook

**Methods Applied and Interpretation of Parameters:**

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

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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## 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 ± 1 MHz | |

## Head TSL parameters

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---|---|---|
| **Nominal Head TSL parameters** | 22.0 °C | 39.2 | 1.80 mho/m |
| **Measured Head TSL parameters** | (22.0 ± 0.2) °C | 40.2 ± 6 % | 1.84 mho/m ± 6 % |
| **Head TSL temperature change during test** | <1.0 °C | ---- | ---- |

## SAR result with Head TSL

| **SAR averaged over 1 $cm^3$ (1 g) of Head TSL** | Condition | |
|---|---|---|
| SAR measured | 250 mW input power | 13.2 mW / g |
| SAR for nominal Head TSL parameters | normalized to 1W | **52.5 mW / g ± 20.8 % (k=2)** |
| **SAR averaged over 10 $cm^3$ (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 ± 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 ± 0.2) °C | 51.3 ± 6 % | 2.00 mho/m ± 6 % |
| **Body TSL temperature change during test** | <1.0 °C | ---- | ---- |

## SAR result with Body TSL

| **SAR averaged over 1 $cm^3$ (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 ± 20.8 % (k=2)** |
| **SAR averaged over 10 $cm^3$ (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 ± 20.4 % (k=2)** |

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## Appendix

### Antenna Parameters with Head TSL

| | |
|---|---|
| Impedance, transformed to feed point | 57.1Ω- 0.57jΩ |
| Return Loss | - 23.6dB |

### Antenna Parameters with Body TSL

| | |
|---|---|
| Impedance, transformed to feed point | 66.0Ω+3.31jΩ |
| 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 |

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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; $\varepsilon_r$ = 40.2; $\rho$ = 1000 kg/m$^3$

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)

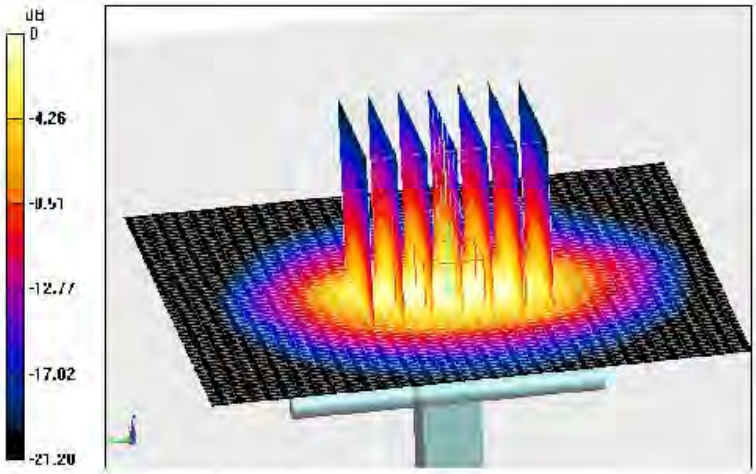
**System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

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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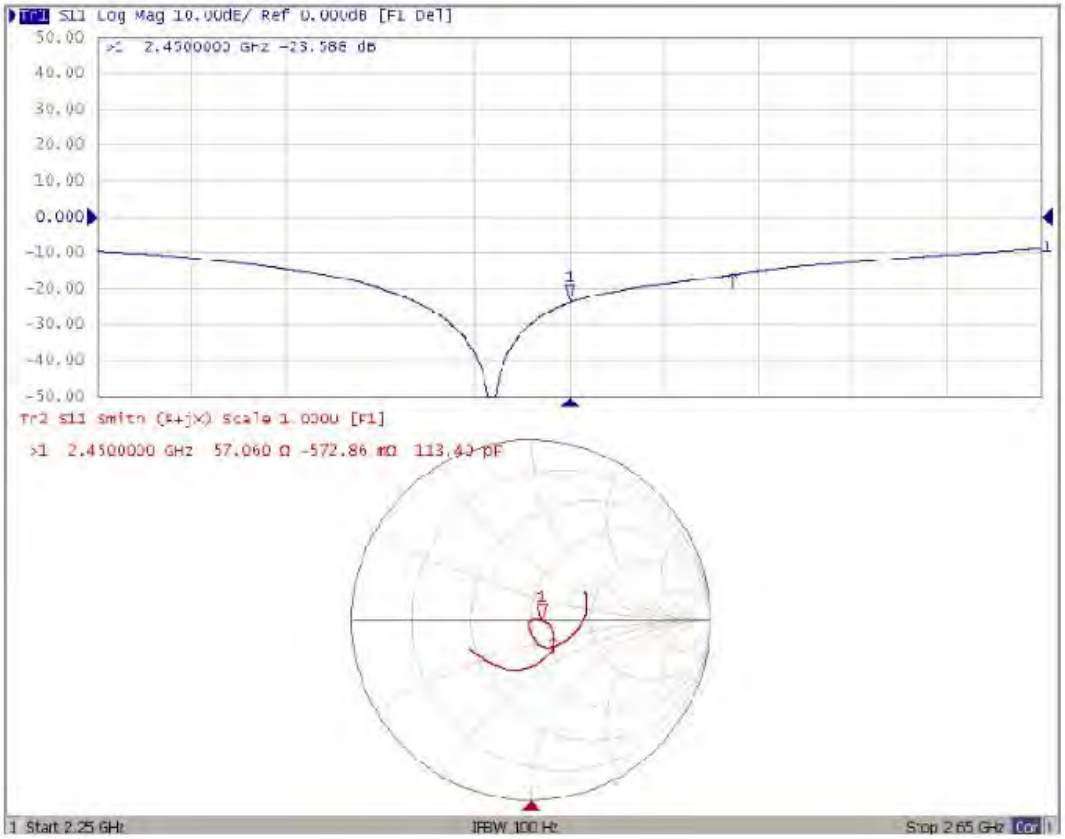
**Impedance Measurement Plot for Head TSL**



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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; $\varepsilon_r$ = 51.25; $\rho$ = 1000 kg/m$^3$

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)

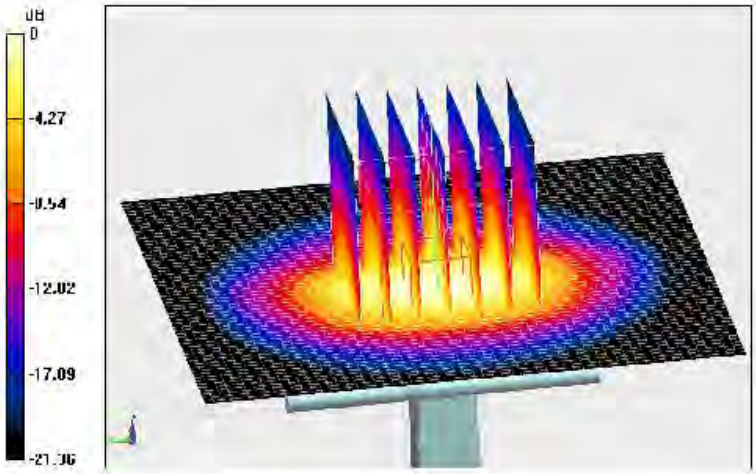
**System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

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**

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**Impedance Measurement Plot for Body TSL**

# ANNEX I: DAE4 Calibration Certificate

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ilac-MRA CNAS 校准 CNAS L0442

Client : TA(Shanghai) Certificate No: J14-2-0052

## CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | DAE4 - SN: 1317 |
| Calibration Procedure(s) | TMC-OS-E-01-198<br>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)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Documenting 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

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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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## DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1μV, full range = -100...+300 mV
Low Range: 1LSB = 61nV, full range = -1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| Calibration Factors | X | Y | Z |
|---|---|---|---|
| High Range | 404.058 ± 0.15% (k=2) | 404.060 ± 0.15% (k=2) | 403.954 ± 0.15% (k=2) |
| Low Range | 3.99002 ± 0.7% (k=2) | 3.99910 ± 0.7% (k=2) | 3.98303 ± 0.7% (k=2) |

## Connector Angle

| | |
|---|---|
| Connector Angle to be used in DASY system | 119° ± 1° |