TESTING
No. L2264

SAR TEST REPORT

Product Name	Mobile WiFi
Model Name	HWD31
FCC ID	QISHWD31
Applicant	Huawei Technologies Co., Ltd.
Manufacturer	Huawei Technologies Co., Ltd.
Date of issue	December 14, 2014

TA Technology (Shanghai) Co., Ltd.

GENERAL SUMMARY

Reference Standard(s)	**FCC 47CFR §2.1093** Radiofrequency Radiation Exposure Evaluation: Portable Devices **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) **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. **KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r03:** SAR Measurement Requirements for 100 MHz to 6 GHz **KDB 447498 D01 Mobile Portable RF Exposure v05r02:** Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies **KDB 941225 D01 3G SAR Procedures v03:** SAR Measurement Procedures CDMA 20001x RTT, 1x Ev-Do, WCDMA, HSDPA/HSPA, GSM,GPRS and EDGE. **KDB 941225 D05 SAR for LTE Devices v02r03:** SAR Evaluation Considerations for LTE Devices **KDB 941225 D06 Hotspot SAR SAR v02:** SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities **KDB 248227 D01 SAR meas for 802 11 a b g v01r02:** SAR Measurement Procedures for 802.11a/b/g Transmitters.
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. General Judgment: **Pass**
Comment	The test result only responds to the measured sample.

Approved by Kai Xu
Kai Xu
Director

Revised by Minbao Ling
Minbao Ling
SAR Manager

Performed by Jian Qi
Jian Qi
SAR Engineer

TABLE OF CONTENT

1. General Information

1.1. Notes of the Test Report

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

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

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

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

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

1.2. Testing Laboratory

Company:	TA Technology (Shanghai) Co., Ltd.
Address:	No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China
City:	Shanghai
Post code:	201201
Country:	P. R. China
Contact:	Xu Kai
Telephone:	+86-021-50791141/2/3
Fax:	+86-021-50791141/2/3-8000
Website:	http://www.ta-shanghai.com
E-mail:	xukai@ta-shanghai.com

1.3. Applicant Information

Company: Huawei Technologies Co., Ltd.

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

1.4. Manufacturer Information

Company: Huawei Technologies Co., Ltd.

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

1.5. Information of EUT

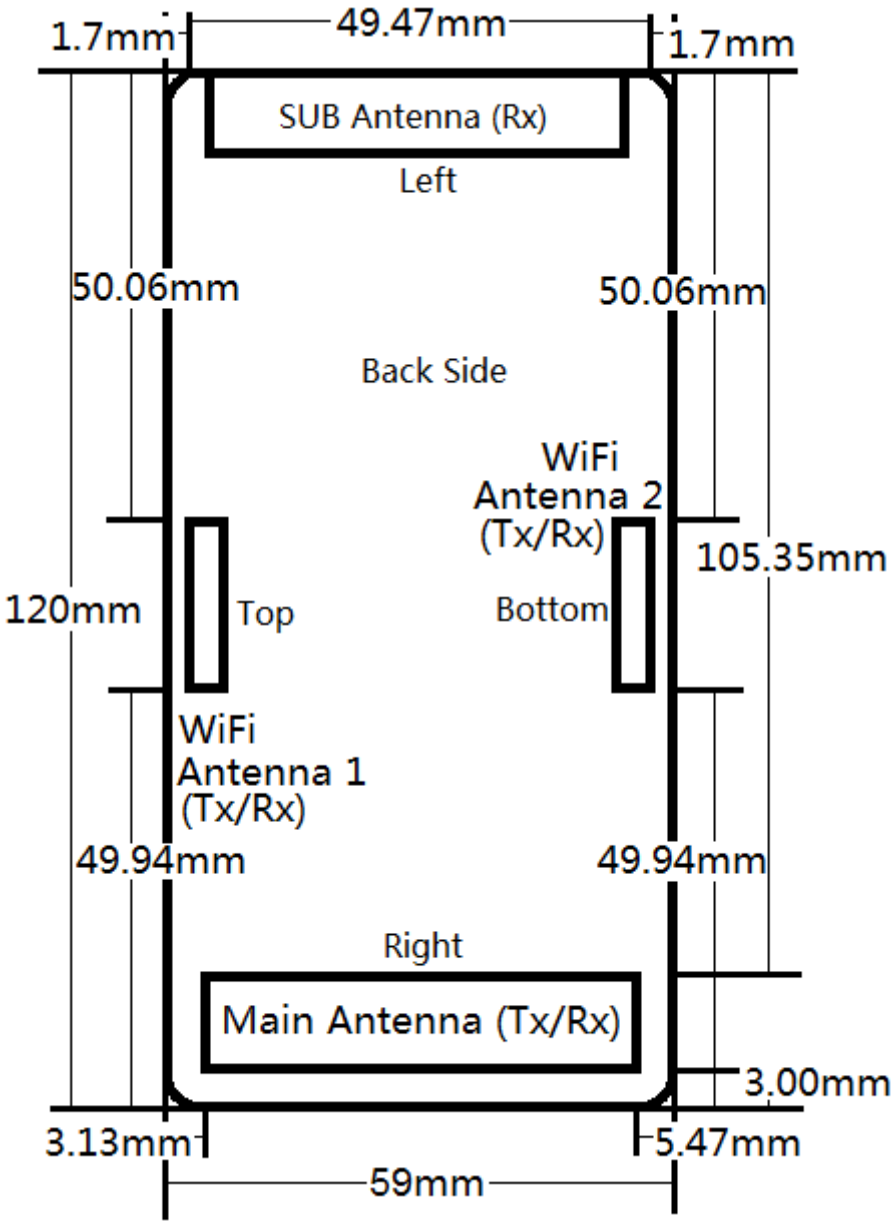
General Information

Device Type:	Portable Device	
Exposure Category:	Uncontrolled Environment / General Population	
State of Sample:	Prototype Unit	
Product IMEI:	866139020003439	
Hardware Version:	CL1KD02UM	
Software Version:	11.411.03.05.824	
Antenna Type:	Internal Antenna	
Device Operating Configurations :		
Test Mode(s):	UMTS Band II/UMTS Band V; LTE FDD Band 17; 802.11a/ac/b/g/n HT20/n HT40;	
Test Modulation:	(UMTS)QPSK; (LTE) QPSK, 16QAM; (WiFi)CCK;	
Device Class:	B	
HSUPA UE Category:	6	
HSPA+ Downlink Category:	14	
DC-HSDPA UE Category:	24	
LTE UE Category:	4	
Test Frequency Range(s):	Mode	Tx (MHz)
	UMTS Band II	1852.4 ~ 1907.6
	UMTS Band V	826.4 ~ 846.6
	LTE FDD 17	706.5 ~ 713.5
	WiFi 2.4G	2402 ~ 2482
	WiFi 5G	5170~ 5330 5490~ 5710
Power Class:	UMTS Band II/V: 3	
	LTE FDD 17: 3	
Power Level:	UMTS Band II/V: all up bits	
	LTE FDD 17: max power	

Auxiliary Equipment Details

Name	Model	Manufacturer	Capacity	S/N
Battery	HB414790EBW	Huawei Technologies Co., Ltd.	2300mAh	/

1.6. EUT Antenna Locations



Mobile Hotspot Sides for SAR Testing

Mode	Back Side	Front Side	Left Edge	Right Edge	Top Edge	Bottom Edge
UMTS Band II	Yes	Yes	N/A	Yes	Yes	Yes
UMTS Band V	Yes	Yes	N/A	Yes	Yes	Yes
LTE Band 17	Yes	Yes	N/A	Yes	Yes	Yes
WLAN Antenna 1	Yes	Yes	N/A	N/A	Yes	N/A
WLAN Antenna 2	Yes	Yes	N/A	N/A	N/A	Yes
Note: When the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested.						

1.7. The Maximum Reported SAR_{1g}

Body 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)
UMTS Band II	Test Position 1 /Back Side	9538/1907.6	0.980	1.292
UMTS Band V	Test Position 1 /Back Side	4183/836.6	0.178	0.227
LTE Band 17 (50%RB)	Test Position 1 /Back Side	23780/709	0.083	0.104
WiFi (2.4G) Antenna 1	Test Position 2 /Front Side	1/2412	0.133	0.136
WiFi (2.4G) Antenna 2	Test Position 2 /Front Side	1/2412	0.115	0.135
WiFi (5G) Antenna 1	Test Position 5 /Top Side	36/5180	0.079	0.102
WiFi (5G) Antenna 2	Test Position 2 /Front Side	108/5540	0.028	0.036

1.8. Test Date

The test performed from November 25, 2014 to December 9, 2014.

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.

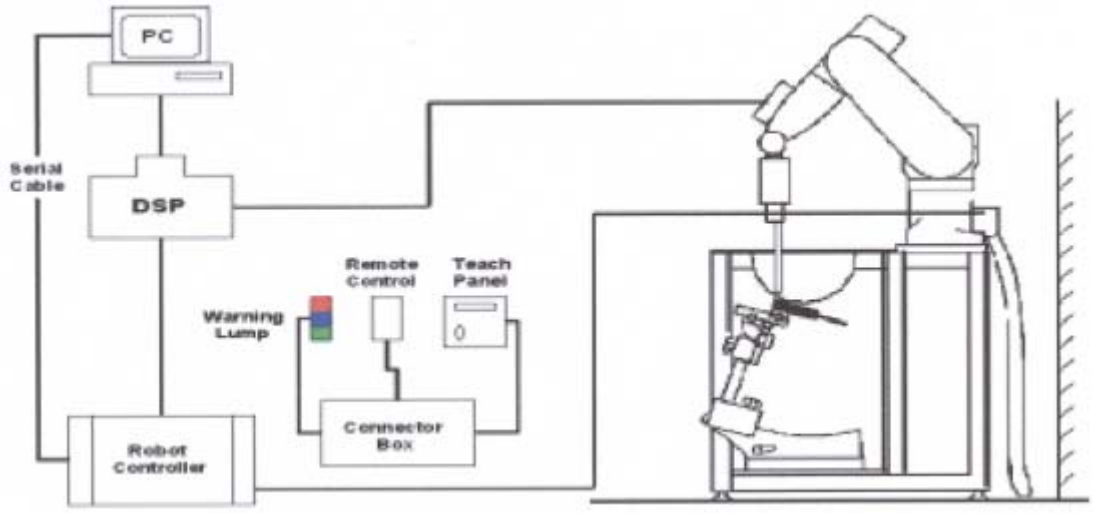


Figure 1 SAR Lab Test Measurement Set-up

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.

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

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

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

Where:
σ = Simulated tissue conductivity,
ρ = Tissue density (kg/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) (Δx_{area}, Δy_{area})	Maximum Zoom Scan Resolution (mm) (Δx_{zoom}, Δy_{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:

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

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

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

cf = crest factor of exciting field (DASY parameter)

dcp_i = diode compression point (DASY parameter)

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

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

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

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

$Norm_i$ = sensor sensitivity of channel i (i = x, y, z)
$[mV/(V/m)^2]$ 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 $\boldsymbol{SAR}$ = local specific absorption rate in mW/g

$\boldsymbol{E_{tot}}$ = 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.

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

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

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

$\boldsymbol{H_{tot}}$ = 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, Glycol monobutyl, Cellulose, Diethylenglycol monohexylether and Triton X-100. The liquid has previously been proven to be suited for worst-case. The table 3 shows the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the KDB 865664 D01.

Table 3: Composition of the Body Tissue Equivalent Matter

MIXTURE%	FREQUENCY(Body) 750MHz
Water	52.49
Sugar	45
Salt	1.41
Preventol	0.1
Cellulose	1.0
Dielectric Parameters Target Value	f=750MHz ε=55.5 σ=0.96

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) 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=52.7 σ=1.95

MIXTURE%	FREQUENCY(Body) 5200MHz
Water	72.6
Diethylenglycol monohexylether	27.3
Triton X-100	0.1
Dielectric Parameters Target Value	f=5200MHz ε=49.0 σ=5.30

MIXTURE%	FREQUENCY(Body) 5600MHz
Water	72.6
Diethylenglycol monohexylether	27.3
Triton X-100	0.1
Dielectric Parameters Target Value	f=5600MHz ε=48.5 σ=5.77

4.2. Tissue-equivalent Liquid Properties

Table 4: Dielectric Performance of Tissue Simulating Liquid

Frequency	Test Date	Temp ℃	Measured Dielectric Parameters		Target Dielectric Parameters		Limit (Within ±5%)	
			ε_r	σ(s/m)	ε_r	σ(s/m)	Dev ε_r(%)	Dev σ(%)
750MHz (body)	2014-11-25	21.5	54.3	0.97	55.5	0.96	-2.16%	1.04%
835MHz (body)	2014-11-27	21.5	55.9	0.99	55.2	0.97	1.27%	2.06%
1900MHz (body)	2014-11-27	21.5	53.1	1.52	53.3	1.52	-0.38%	0.00%
2450MHz (body)	2014-11-26	21.5	52.1	1.99	52.7	1.95	-1.14%	2.05%
5200MHz (body)	2014-12-8	21.5	48.7	5.18	49.0	5.30	-0.61%	-2.26%
5600MHz (body)	2014-12-9	21.5	48.3	5.83	48.5	5.77	-0.41%	1.04%

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/100 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 5.

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.

.

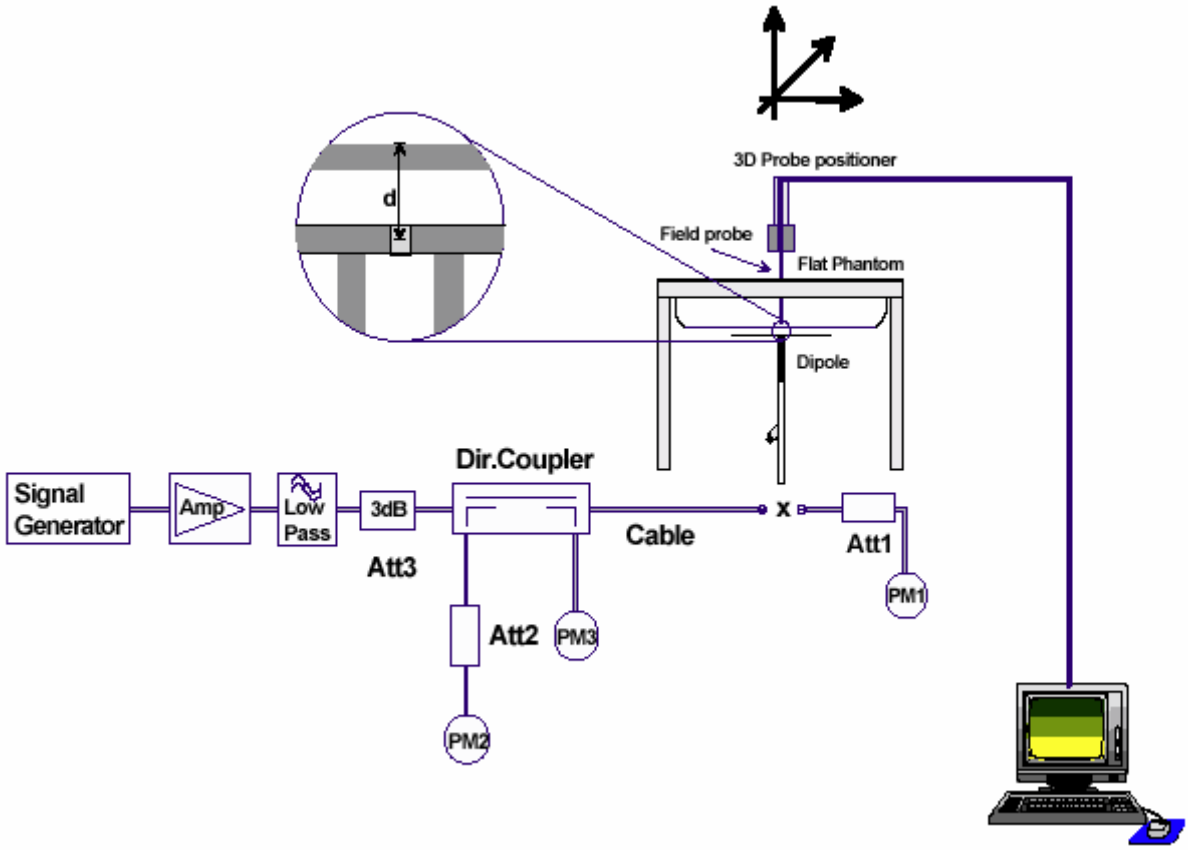


Figure 6 System Check Set-up

Justification for Extended SAR Dipole Calibrations

Usage of SAR dipoles calibrated less than 3 years ago but more than 1 year ago were confirmed in maintaining return loss (< - 20 dB, within 20% of prior calibration) and impedance (within 5 ohm from prior calibration) requirements per extended calibrations in KDB 865664 D01:

Dipole D750V3 SN: 3149				
Body Liquid				
Date of Measurement	Return Loss(dB)	Δ %	Impedance (Ω)	ΔΩ
9/5/2013	-27.5	/	49.5	/
9/4/2014	-26.9	2.2%	48.2	1.3Ω

5.2. System Check Results

Table 5: System Check in Body Tissue Simulating Liquid

Frequency	Test Date	Dielectric Parameters		250mW/ 100mW Measured SAR_{1g}	1W Normalized SAR_{1g}	1W Target SAR_{1g}	Limit (±10% Deviation)
		ε_r	σ(s/m)	(W/kg)			
750MHz	2014-11-25	54.3	0.97	2.22(250mW)	8.88	8.80	0.91%
835MHz	2014-11-27	55.9	0.99	2.41(250mW)	9.64	9.54	1.05%
1900MHz	2014-11-27	53.1	1.52	9.93(250mW)	39.72	40.00	-0.70%
2450MHz	2014-11-26	52.1	1.99	12.50(250mW)	50.00	52.40	-4.58%
5200MHz	2014-12-8	48.7	5.18	7.20(100mW)	72.00	74.70	-3.61%
5600MHz	2014-12-9	48.3	5.83	7.50(100mW)	75.00	80.70	-7.06%

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

Connection to the EUT is established via air interface with CMW500, and the EUT is set to maximum output power by CMW500. 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. 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.

6.3. Test Positions of Portable Devices

Based upon KDB941225 D06 with a form factor 12 cm x 5.9 cm > 9 cm x 5 cm, a test separation distance of 10 mm is required for all sides (edges) and surfaces with a transmitting antenna located at ≤ 25 mm from that surface or edge.
When the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested.

The location of the antennas inside EUT is shown in ANNEX K:

The EUT is tested at the following 6 test positions:

- Test Position 1: The Back Side of the EUT towards the bottom of the flat phantom. The distance between the Back Side of the EUT and the bottom of the flat phantom is 10mm. (ANNEX K Picture 9)

- Test Position 2: The Front Side of the EUT towards the bottom of the flat phantom. The distance between the Front Side of the EUT and the bottom of the flat phantom is 10mm. (ANNEX K Picture 10)

- Test Position 3: The Left Edge of the EUT towards the bottom of the flat phantom. The distance between the left edge of the EUT and the bottom of the flat phantom is 10mm. (ANNEX K Picture 11）

- Test Position 4: The Right Edge of the EUT towards the bottom of the flat phantom. The distance between the right edge of the EUT and the bottom of the flat phantom is 10mm. (ANNEX K Picture 12）

- Test Position 5: The Top Edge of the EUT towards the bottom of the flat phantom. The distance between the top edge of the EUT and the bottom of the flat phantom is 10mm. (ANNEX K Picture 13）

- Test Position 6: The Bottom Edge of the EUT towards the bottom of the flat phantom. The distance between the top edge of the EUT and the bottom of the flat phantom is 10mm. (ANNEX K Picture 14）

6.4. Test Configuration

6.4.1. UMTS Test Configuration

6.4.1.1. 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. This is referred to as the 3G SAR test reduction procedure in the following SAR test guidance, where the primary mode is identified in the applicable wireless mode test procedures and the secondary mode is wireless mode being considered for SAR test reduction by that procedure. When the 3G SAR test reduction procedure is not satisfied, it is identified as “otherwise” in the applicable procedures; SAR measurement is required for the secondary mode.

6.4.1.2. Output Power Verification

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

6.4.1.3. SAR Measurement

SAR for body exposure configurations is measured according to the ‘Body-Worn Accessory SAR’ procedures in the ‘WCDMA Handsets’ section. The 3G SAR test reduction procedure is applied to HSPA body SAR with 12.2 kbps RMC as the primary mode. Body SAR for HSPA is measured with E-DCH Sub-test 5, using H-Set 1 and QPSK for FRC and a 12.2 kbps RMC configured in Test Loop Mode 1 and power control algorithm 2, according to the highest reported body SAR configuration in 12.2 kbps RMC without HSPA. When VOIP applies to head exposure, the 3G SAR test reduction procedure is applied with 12.2 kbps RMC as the primary mode; otherwise, the same HSPA configuration used for body SAR measurements are applied to head exposure testing.

Due to inner loop power control requirements in HSPA, a communication test set is required for output power and SAR tests. The 12.2 kbps RMC, FRC H-set 1 and E-DCH configurations for HSPA are configured according to the β values indicated in Table 7 and other applicable procedures described in the ‘WCDMA Handset’ and ‘Release 5 HSDPA Data Devices’ sections of this document.

6.4.1.4. Release 5 HSDPA Data Devices

The following procedures are applicable to HSDPA data devices operating under 3GPP Release 5. SAR is required for devices in body-worn accessory and other body exposure conditions, including handsets and data modems operating in various electronic devices. HSDPA operates in conjunction with WCDMA and requires an active DPCCH. The default test configuration is to measure SAR in WCDMA with HSDPA remain inactive, to establish a radio link between the test device and a communication test set using a 12.2 kbps RMC configured in Test Loop Mode 1. SAR for HSDPA is selectively measured using the highest reported SAR configuration in WCDMA, with an FRC in H-set 1 and a 12.2 kbps RMC. SAR is selectively confirmed for other physical channel configurations (DPCCH & DPDCHn) according to exposure conditions, device operating capabilities and maximum output power specified for production units, including tune-up tolerance by applying the 3G SAR test reduction procedures. Maximum output power is verified according to the applicable versions of 3GPP TS 34.121. SAR must be measured based on these maximum output conditions and requirements, with respect to the UE Categories, and explained in the SAR report. When Maximum Power Reduction (MPR) applies, the implementations must be clearly identified in the SAR report to support test results according to Cubic Metric (CM) and, as appropriate, Enhanced MPR (E-MPR) requirements.

HSDPA is configured according to the applicable UE category of a test device. The number of HS-DSCH/HS-PDSCHs, HARQ processes, minimum inter-TTI interval, transport block sizes and RV coding sequence are defined by the H-set. To maintain a consistent test configuration and stable transmission conditions, QPSK is used in the H-set for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 4 ms and a CQI repetition factor of 2 to maintain a constant rate of active CQI slots. DPCCH and DPDCH gain factors(βc, βd), and HS-DPCCH power offset parameters (ΔACK, ΔNACK, ΔCQI) are set according to values indicated in Table 6. The CQI value is determined by the UE category, transport block size, number of HS-PDSCHs and modulation used in the H-set.

Table 6: Subtests for UMTS Release 5 HSDPA

Sub-set	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs} (note 1, note 2)	CM(dB) (note 3)	MPR(dB)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (note 4)	15/15 (note 4)	64	12/15 (note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note1: $\triangle_{ACK}$, $\triangle_{NACK}$ and $\triangle_{CQI}$= 8 ⇔ $A_{hs} = \beta_{hs}/\beta_c$=30/15 ⇔ β_{hs}=30/15*β_c

Note2: CM=1 for β_c/β_d =12/15, β_{hs}/β_c=24/15.

Note3: For subtest 2 the $\beta_c\beta_d$ ratio of 12/15 for the TFC during the measurement period(TF1,TF0) is achieved by setting the signaled gain factors for the reference TFC (TFC1,TF1) to β_c=11/15 and β_d=15/15.

6.4.1.5. Release 6 HSPA Data Devices

The following procedures are applicable to HSPA (HSUPA/HSDPA) data devices operating under 3GPP Release 6. SAR is required for devices in body-worn accessory and other body exposure conditions, including handsets and data modems operating in various electronic devices. HSUPA operates in conjunction with WCDMA and HSDPA. SAR is initially measured in WCDMA test configurations with HSPA remain inactive. The default test configuration is to establish a radio link between the test device and a communication test set to configure a 12.2 kbps RMC in Test Loop Mode 1. SAR for HSPA isselectively measured with HS-DPCCH, E-DPCCH and E-DPDCH, all enabled, along with a 12.2 kbps RMC using the highest reported SAR configuration in WCDMA with 12.2 kbps RMC only.

An FRC is configured according to HS-DPCCH Sub-test 1 using H-set 1 and QPSK. HSPA is configured according to E-DCH Sub-test 5 requirements. SAR for other HSPA sub-test configurations is confirmed selectively according to exposure conditions, E-DCH UE Category and maximum output power of production units, by applying the 3G SAR test reduction procedure. Maximum output power is verified according to procedures in applicable versions of 3GPP TS 34.121. SAR must be measured based on these maximum output conditions and requirements, with respect to the UE Categories for HS-DPCCH and HSPA, and explained in the SAR report. When Maximum Power Reduction (MPR) applies, the implementations must be clearly identified in the SAR report to support test results according to Cubic Metric (CM) and, as appropriate, Enhanced MPR (E-MPR) requirements.

Table 7：Sub-Test 5 Setup for Release 6 HSUPA

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

Note 1: Δ_{ACK}, ΔNACK and Δ_{CQI} = 8 $\Leftrightarrow$ A_{hs} = $\underline{\beta}_{hs}/\underline{\beta}_c$ = 30/15 $\Leftrightarrow$ $\underline{\beta}_{hs}$= 30/15 *β_c.

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

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

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

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

Note 6: βed can not be set directly; it is set by Absolute Grant Value.

Table 8: HSUPA UE category

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

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

6.4.1.6. HSPA, HSPA+ and DC-HSDPA SAR Guidance

SAR test exclusion may apply to 3GPP Rel. 6 HSPA, Rel. 7 HSPA+ and Rel. 8 DC-HSDPA. When SAR measurement is required for HSPA, HSPA+ or DC-HSDPA, a KDB inquiry is required to confirm that the wireless mode configurations in the test setup have remained stable throughout the SAR measurements. Without prior KDB confirmation to determine the SAR results are acceptable, a PBA is required for TCB approval.

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

1) The HSPA procedures are applied to configure 3GPP Rel. 6 HSPA devices in the required sub-test mode(s) to determine SAR test exclusion.

2) SAR is required for Rel. 7 HSPA+ when SAR is required for Rel. 6 HSPA; otherwise, the 3G SAR test reduction procedure is applied to (uplink) HSPA+ with 12.2 kbps RMC as the primary mode. Power is measured for HSPA+ that supports uplink 16 QAM according to configurations in Table C.11.1.4 of 3GPP TS 34.121-1 to determine SAR test reduction.

3) SAR is required for Rel. 8 DC-HSDPA when SAR is required for Rel. 5 HSDPA; otherwise, the 3G SAR test reduction procedure is applied to DC-HSDPA with 12.2 kbps RMC as the primary mode. Power is measured for DC-HSDPA according to the H-Set 12, FRC configuration in Table C.8.1.12 of 3GPP TS 34.121-1 to determine SAR test reduction. A primary and a secondary serving HS-DSCH Cell are required to perform the power measurement and for the results to be acceptable.

4) Regardless of whether a PBA is required, the following information must be verified and included in the SAR report for devices supporting HSPA, HSPA+ or DC-HSDPA: a) The output power measurement results and applicable release version(s) of 3GPP TS 34.121

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

b) The power measurement results are in agreement with the individual device implementation and specifications. When Enhanced MPR (E-MPR) applies, the normal MPR targets may be modified according to the Cubic Metric (CM) measured by the device, which must be taken into consideration.

c) The UE category, operating parameters, such as the β and Δ values used to configure the device for testing, power setback procedures described in 3GGPP TS 34.121 for the power measurements, and HSPA/HSPA+ channel conditions (active and stable) for the entire duration of the measurement according to the required E-TFCI and AG index values.

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

Table 9: HS-DSCH UE category

Table 5.1a: FDD HS-DSCH physical layer categories

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

6.4.2. 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.

6.4.3. WiFi Test Configuration

For WLAN SAR testing, WLAN engineering testing software installed on the EUT can provide continuous transmitting RF signal. The Tx power is set 15 for 802.11b, 11 for 802.11g, 10 for 802.11n, 8 for 802.11a/ac by software. This RF signal utilized in SAR measurement has almost 100% duty cycle and its crest factor is 1.

For the 802.11a/b/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 maximum average output power.

802.11a/b/g/n operating modes are tested independently according to the service requirements in each frequency band. 802.11a/b/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.

The average output power for 802.11a should be measured on all channels in each frequency band. When the maximum average output channel in each frequency band is not included in the “default test channels”, the maximum channel should be tested instead of an adjacent “default test channel”. These are referred to as the “required test channels”

Mode		GHz	Channel	Turbo Channel	“Default Test Channels”			
					§15.247		UNII	
					802.11b	802.11g		
802.11 b/g		2.412	1#		√	∇		
		2.437	6	6	√	∇		
		2.462	11#		√	∇		
802.11a	UNII	5.18	36				√	
		5.20	40	42 (5.21 GHz)				*
		5.22	44					*
		5.24	48	50 (5.25 GHz)			√	
		5.26	52				√	
		5.28	56	58 (5.29 GHz)				*
		5.30	60					*
		5.32	64				√	
		5.500	100	Unknown				*
		5.520	104				√	
		5.540	108					*
		5.560	112					*
		5.580	116				√	
		5.600	120					*
		5.620	124				√	
		5.640	128					*
		5.660	132					*
		5.680	136				√	
		5.700	140					*
	UNII or §15.247	5.745	149		√		√	
		5.765	153	152 (5.76 GHz)		*		*
		5.785	157		√			*
		5.805	161	160 (5.80 GHz)		*	√	
	§15.247	5.825	165		√			

7. Test Results

7.1. Conducted Power Results

UMTS Band II		Conducted Power (dBm)		
		Channel/Frequency(MHz)		
		9262/1852.4	9400/1880	9538/1907.6
RMC	12.2kbps RMC	22.27	22.54	22.30
	64kbps RMC	22.21	22.47	22.31
	144kbps RMC	22.21	22.46	22.48
	384kbps RMC	22.20	22.46	22.49
HSDPA	Sub - Test 1	21.99	22.03	22.15
	Sub - Test 2	21.73	21.68	22.14
	Sub - Test 3	21.61	20.96	21.71
	Sub - Test 4	21.63	21.57	21.68
HSUPA	Sub - Test 1	19.03	19.20	20.27
	Sub - Test 2	17.70	17.91	18.99
	Sub - Test 3	18.27	18.37	19.48
	Sub - Test 4	17.73	18.02	19.08
	Sub - Test 5	19.04	19.15	20.23
DC-HSDPA	Sub - Test 1	21.08	21.03	21.57
	Sub - Test 2	21.02	20.99	21.52
	Sub - Test 3	20.86	20.8	21.42
	Sub - Test 4	20.89	20.84	21.45
UMTS Band V		Conducted Power (dBm)		
		Channel/Frequency(MHz)		
		4132/826.4	4183/836.6	4233/846.6
RMC	12.2kbps RMC	22.49	22.44	22.33
	64kbps RMC	22.51	22.45	22.34
	144kbps RMC	22.34	22.44	22.35
	384kbps RMC	22.34	22.38	22.33
HSDPA	Sub - Test 1	22.27	22.06	22.05
	Sub - Test 2	22.16	22.38	22.02
	Sub - Test 3	20.86	21.57	21.54
	Sub - Test 4	21.64	21.57	20.69

HSUPA	Sub - Test 1	19.90	19.82	20.27
	Sub - Test 2	18.58	18.52	18.96
	Sub - Test 3	19.12	19.00	19.44
	Sub - Test 4	18.61	18.61	18.91
	Sub - Test 5	19.86	19.80	20.30
DC-HSDPA	Sub - Test 1	20.24	20.41	21.48
	Sub - Test 2	20.21	20.34	21.42
	Sub - Test 3	20.08	20.27	21.34
	Sub - Test 4	20.10	20.25	21.35

LTE Band 17

LTE FDD Band 17				**Conducted Power(dBm)**		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency(MHz)		
				23755/706.5	23790/710	23825/713.5
5MHz	QPSK	1	0	22.08	21.70	21.65
		1	13	21.85	21.72	21.63
		1	24	21.94	21.66	21.72
		12	0	21.19	20.97	20.95
		12	6	21.18	20.98	20.95
		12	13	21.16	20.98	20.98
		25	0	21.19	20.84	20.96
	16QAM	1	0	21.59	21.35	21.47
		1	13	21.57	21.35	21.44
		1	24	21.57	21.35	21.46
		12	0	21.05	20.84	20.95
		12	6	21.05	20.84	20.94
		12	13	21.05	20.85	20.98
		25	0	21.00	20.83	20.94
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency(MHz)		
				23780/709	23790/710	23800/711
10MHz	QPSK	1	0	22.43	22.05	22.00
		1	25	22.20	22.07	21.98
		1	49	22.29	22.01	22.07
		25	0	21.54	21.32	21.30

		25	13	21.53	21.33	21.30
		25	25	21.51	21.33	21.33
		50	0	21.54	21.19	21.31
	16QAM	1	0	21.94	21.70	21.82
		1	25	21.92	21.70	21.79
		1	49	21.92	21.70	21.81
		25	0	21.40	21.19	21.30
		25	13	21.40	21.19	21.29
		25	25	21.40	21.20	21.33
		50	0	21.35	21.18	21.29

WiFi

Antenna 1 SISO

Mode	Channel/ Frequency(MHz)	Data rate (Mbps)	AV Power (dBm)
11b	5/2432	1	16.41
		2	15.03
		5.5	14.91
		11	14.75
	7/2442	1	15.83
		2	15.09
		5.5	15.01
		11	14.79
	10/2457	1	15.81
		2	14.73
		5.5	14.67
		11	14.49
11g	5/2432	6	11.48
		9	10.22
		12	10.12
		18	10.23
		24	10.37
		36	10.73
		48	10.52
		54	10.31
	7/2442	6	11.68
		9	10.11
		12	10.07
		18	10.81
		24	10.26
		36	10.65
		48	10.41
		54	10.27
	10/2457	6	11.51
		9	10.16
		12	10.03
		18	10.76
		24	10.11

		36	10.51
		48	10.47
		54	10.31
11n HT20	5/2432	MCS0	9.15
		MCS1	8.85
		MCS2	8.72
		MCS3	9.01
		MCS4	8.74
		MCS5	8.46
		MCS6	8.49
		MCS7	8.41
	7/2442	MCS0	10.54
		MCS1	9.29
		MCS2	9.18
		MCS3	9.39
		MCS4	9.13
		MCS5	8.97
		MCS6	8.75
		MCS7	8.57
	10/2457	MCS0	10.25
		MCS1	8.78
		MCS2	8.71
		MCS3	8.97
		MCS4	8.72
		MCS5	8.39
		MCS6	8.38
		MCS7	8.39
11n HT40	7/2442	MCS0	9.81
		MCS1	8.37
		MCS2	8.33
		MCS3	8.39
		MCS4	8.32
		MCS5	8.38
		MCS6	8.51
		MCS7	8.61
	8/2447	MCS0	10.53
		MCS1	9.53

		MCS2	9.41
		MCS3	9.61
		MCS4	9.49
		MCS5	9.38
		MCS6	9.27
		MCS7	9.11

Antenna 2 SISO

Mode	Channel/ Frequency(MHz)	Data rate (Mbps)	AV Power (dBm)
11b	5/2432	1	15.79
		2	14.96
		5.5	14.82
		11	14.67
	7/2442	1	16.18
		2	14.53
		5.5	14.52
		11	14.69
	10/2457	1	16.35
		2	14.76
		5.5	14.71
		11	14.55
11g	5/2432	6	11.89
		9	10.06
		12	10.75
		18	10.83
		24	10.21
		36	10.58
		48	10.32
		54	10.06
	7/2442	6	10.29
		9	10.43
		12	10.31
		18	10.14
		24	10.58
		36	10.03

		48	10.74
		54	10.58
	10/2457	6	11.69
		9	10.86
		12	10.77
		18	10.58
		24	10.05
		36	10.44
		48	10.16
		54	10.01
11n HT20	5/2432	MCS0	10.53
		MCS1	8.97
		MCS2	8.67
		MCS3	8.95
		MCS4	8.64
		MCS5	8.44
		MCS6	8.23
		MCS7	8.19
	7/2442	MCS0	10.27
		MCS1	8.23
		MCS2	8.09
		MCS3	8.41
		MCS4	8.61
		MCS5	8.85
		MCS6	8.81
		MCS7	8.64
	10/2457	MCS0	9.76
		MCS1	8.58
		MCS2	8.44
		MCS3	8.72
		MCS4	8.42
		MCS5	8.48
		MCS6	8.45
		MCS7	8.95
11n HT40	7/2442	MCS0	11.2
		MCS1	9.22
		MCS2	9.11

		MCS3	9.57
		MCS4	9.16
		MCS5	8.73
		MCS6	8.67
		MCS7	8.55
	8/2447	MCS0	11.27
		MCS1	8.76
		MCS2	8.45
		MCS3	8.61
		MCS4	8.87
		MCS5	8.49
		MCS6	8.32
		MCS7	8.61

MIMO

	Antenna	Channel/ Frequency(MHz)	Average Power (dBm) for Data Rates (Mbps)							
			MCS8	MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
802.11n-20M MIMO	Ant1	5/2432	11.16	9.92	9.45	9.78	9.43	9.56	9.89	9.85
		7/2442	11.50	9.66	9.43	9.54	9.65	9.96	9.34	9.96
		10/2457	10.42	9.88	9.86	9.89	9.87	9.94	9.99	9.87
	Ant2	5/2432	12.44	10.39	10.24	10.14	10.25	10.31	10.22	10.03
		7/2442	10.44	10.11	10.23	9.93	9.89	10.24	10.13	10.23
		10/2457	11.99	10.15	10.21	10.17	10.05	10.07	10.06	10.10
	Sum	5/2432	14.80	13.17	12.87	12.97	12.80	12.96	13.07	12.95
		7/2442	14.01	12.90	12.86	12.75	12.78	13.11	12.76	13.11
		10/2457	14.29	13.03	13.05	13.04	12.97	13.02	13.04	13.00
	Antenna	**Channel/ Frequency(MHz)**	**MCS8**	**MCS9**	**MCS10**	**MCS11**	**MCS12**	**MCS13**	**MCS14**	**MCS15**
802.11n-40M MIMO	Ant1	7/2442	10.50	9.87	9.90	9.87	10.50	10.10	10.30	10.40
		8/2447	12.17	10.10	9.93	9.89	9.87	10.10	10.30	10.23
	Ant2	7/2442	9.24	9.80	9.90	9.87	9.72	9.68	9.64	9.60
		8/2447	9.10	9.80	9.80	10.10	9.88	9.75	9.54	9.67
	Sum	7/2442	12.93	12.85	12.91	12.88	13.14	12.91	12.99	13.03
		8/2447	13.91	12.96	12.98	12.96	12.89	12.94	12.95	12.97

SISO

Mode	Antenna	Frequency (MHz)	Channel	Average Power (dBm)							
				Data Rate (Mbps)							
				6	9	12	18	24	36	48	54
802.11a	Ant1	5180*	CH36	8.90	8.85	8.18	8.11	8.84	8.88	8.80	8.28
		5200	CH40	8.85	8.38	8.22	8.08	8.80	8.84	8.88	8.28
		5220	CH44	8.88	8.44	8.28	8.14	8.88	8.84	8.88	8.38
		5240*	CH48	8.87	8.48	8.38	8.22	8.08	8.88	8.83	8.88
		5260*	CH52	8.79	8.38	8.21	8.04	8.88	8.80	8.83	8.18
		5280	CH56	8.89	8.28	8.22	8.18	8.10	8.04	8.88	8.88
		5300	CH60	8.83	8.88	8.88	8.82	8.88	8.88	8.81	8.38
		5320*	CH64	8.51	8.83	8.88	8.83	8.88	8.83	8.88	8.48
		5500	CH100	8.44	8.03	8.88	8.88	8.81	8.88	8.83	8.88
		5520*	CH104	8.80	8.88	8.88	8.84	8.82	8.80	8.88	8.84
		5540	CH108	8.88	8.82	8.88	8.80	8.84	8.88	8.82	8.80
		5560	CH112	8.83	8.88	8.83	8.88	8.83	8.88	8.83	8.43
		5580*	CH116	8.14	8.83	8.88	8.88	8.81	8.88	8.83	8.88
		5600	CH120	8.80	8.88	8.84	8.81	8.88	8.88	8.82	8.88
		5620	CH124	8.03	8.00	8.88	8.84	8.81	8.88	8.88	8.88
		5640	CH128	8.10	8.03	8.88	8.88	8.82	8.88	8.88	8.84
		5660	CH132	8.30	8.24	8.18	8.12	8.08	8.00	8.84	8.82
		5680*	CH136	8.38	8.28	8.14	8.02	8.80	8.88	8.88	8.42
		5700	CH140	8.94	8.83	8.38	8.18	8.02	8.88	8.88	8.34
	Ant2	5180*	CH36	8.56	8.52	8.82	8.88	8.88	8.83	8.80	8.88
		5200	CH40	8.52	8.82	8.88	8.84	8.80	8.88	8.82	8.88
		5220	CH44	8.02	8.88	8.84	8.80	8.88	8.82	8.88	8.84
		5240*	CH48	8.58	8.88	8.83	8.80	8.88	8.84	8.81	8.88
		5260*	CH52	8.74	8.00	8.88	8.84	8.81	8.88	8.88	8.82
		5280	CH56	8.87	8.82	8.88	8.84	8.80	8.88	8.82	8.88
		5300	CH60	8.48	8.44	8.42	8.40	8.38	8.38	8.34	8.32
		5320*	CH64	8.75	8.38	8.38	8.33	8.31	8.28	8.28	8.28
		5500	CH100	8.34	8.88	8.84	8.81	8.48	8.48	8.42	8.38
		5520*	CH104	8.84	8.81	8.88	8.88	8.82	8.48	8.48	8.43
		5540	CH108	8.88	8.82	8.88	8.84	8.80	8.48	8.42	8.38

		5560	CH112	8.48	8.42	8.38	8.34	8.30	8.28	8.22	8.18
		5580*	CH116	8.78	8.48	8.43	8.41	8.38	8.38	8.38	8.33
		5660	CH132	8.30	8.28	8.28	8.24	8.22	8.20	8.18	8.18
		5680*	CH136	8.32	8.30	8.28	8.28	8.24	8.22	8.20	8.18
		5700	CH140	8.10	8.48	8.48	8.48	8.43	8.41	8.38	8.38

Mode	Antenna	Frequency (MHz)	Channel	Average Power (dBm)							
				Data Rate (Mbps)							
				MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n-HT20 (5GHz) SISO	Ant1	5180*	CH36	8.72	8.35	8.23	8.43	7.98	8.30	8.23	8.72
		5200	CH40	8.66	8.43	8.27	8.20	7.98	7.98	7.54	7.69
		5220	CH44	8.54	8.39	8.24	8.23	7.94	7.79	7.64	7.34
		5240*	CH48	8.65	8.43	8.30	8.37	8.04	7.93	7.78	8.52
		5260*	CH52	8.62	8.33	8.36	7.99	7.82	7.65	7.48	7.34
		5280	CH56	8.56	8.33	8.37	8.33	8.05	7.99	7.93	7.83
		5300	CH60	7.88	7.83	7.74	7.67	7.60	7.53	7.46	7.32
		5320*	CH64	8.31	7.78	7.73	7.68	7.63	7.78	7.73	7.43
		5500	CH100	8.28	7.98	7.94	7.90	7.86	7.82	7.78	7.80
		5520*	CH104	7.87	7.83	7.83	7.79	7.77	7.77	7.73	7.69
		5540	CH108	7.93	7.87	7.83	7.77	7.69	7.63	7.77	7.47
		5560	CH112	7.78	7.73	7.68	7.63	7.78	7.73	7.48	7.38
		5580*	CH116	7.99	7.78	7.74	7.70	7.66	7.62	7.78	7.70
		5600	CH120	7.87	7.82	7.79	7.78	7.73	7.70	7.87	7.81
		5620	CH124	7.98	7.97	7.92	7.89	7.88	7.83	7.80	7.74
		5640	CH128	8.07	7.98	7.91	7.84	7.77	7.70	7.83	7.49
		5660	CH132	8.27	8.19	8.13	8.07	8.01	7.97	7.89	7.77
		5680*	CH136	8.33	8.21	8.09	7.97	7.87	7.73	7.81	7.37
		5700	CH140	8.78	8.48	8.31	8.14	7.97	7.8	7.83	7.29
	Ant2	5180*	CH36	8.37	7.90	7.87	7.84	7.81	7.78	7.77	8.37
		5200	CH40	8.31	7.87	7.83	7.79	7.77	7.71	7.67	7.63
		5220	CH44	7.97	7.93	7.89	7.87	7.81	7.77	7.73	7.69
		5240*	CH48	8.38	7.91	7.88	7.87	7.82	7.79	7.76	7.73
		5260*	CH52	8.54	7.97	7.92	7.89	7.86	7.83	7.8	7.77
		5280	CH56	8.67	7.77	7.73	7.69	7.67	7.61	7.77	7.73

		5300	CH60	7.41	7.39	7.37	7.37	7.33	7.31	7.29	7.27
		5320*	CH64	8.54	7.32	7.30	7.28	7.26	7.24	7.22	7.20
		5500	CH100	8.12	7.72	7.49	7.46	7.43	7.40	7.37	7.34
		5520*	CH104	7.79	7.76	7.73	7.70	7.47	7.44	7.41	7.38
		5540	CH108	7.61	7.77	7.73	7.49	7.47	7.41	7.37	7.33
		5560	CH112	7.41	7.37	7.33	7.29	7.27	7.21	7.17	7.13
		5580*	CH116	7.58	7.40	7.38	7.36	7.34	7.32	7.30	7.28
		5660	CH132	7.27	7.23	7.21	7.19	7.17	7.17	7.13	7.11
		5680*	CH136	7.27	7.27	7.23	7.21	7.19	7.17	7.17	7.13
		5700	CH140	8.89	7.44	7.42	7.40	7.38	7.36	7.34	7.32
Mode	**Antenna**	**Frequency (MHz)**	**Channel**	**Average Power (dBm)**							
				Data Rate (Mbps)							
				MCS 8	**MCS 9**	**MCS 10**	**MCS 11**	**MCS 12**	**MCS 13**	**MCS 14**	**MCS 15**
802.11n-MIMO HT20 (5GHz)	**Ant1**	5180*	CH36	8.36	8.35	8.23	8.43	7.98	8.30	8.23	8.72
		5200	CH40	8.36	8.43	8.27	8.20	7.98	7.98	7.54	7.69
		5220	CH44	8.40	8.39	8.24	8.23	7.94	7.79	7.64	7.34
		5240*	CH48	8.56	8.43	8.30	8.37	8.04	7.93	7.78	8.52
		5260*	CH52	8.56	8.33	8.36	7.99	7.82	7.65	7.48	7.34
		5280	CH56	8.56	8.33	8.37	8.33	8.05	7.99	7.93	7.83
		5300	CH60	7.88	7.83	7.74	7.67	7.60	7.53	7.46	7.32
		5320*	CH64	8.21	7.78	7.73	7.68	7.63	7.78	7.73	7.43
		5500	CH100	8.17	7.98	7.94	7.90	7.86	7.82	7.78	7.80
		5520*	CH104	7.87	7.83	7.83	7.79	7.77	7.77	7.73	7.69
		5540	CH108	7.93	7.87	7.83	7.77	7.69	7.63	7.77	7.47
		5560	CH112	7.78	7.73	7.68	7.63	7.78	7.73	7.48	7.38
		5580*	CH116	7.88	7.78	7.74	7.70	7.66	7.62	7.78	7.70
		5600	CH120	7.87	7.82	7.79	7.78	7.73	7.70	7.87	7.81
		5620	CH124	7.98	7.97	7.92	7.89	7.88	7.83	7.80	7.74
		5640	CH128	8.07	7.98	7.91	7.84	7.77	7.70	7.83	7.49
		5660	CH132	8.27	8.19	8.13	8.07	8.01	7.97	7.89	7.77
		5680*	CH136	8.33	8.21	8.09	7.97	7.87	7.73	7.81	7.37
		5700	CH140	8.69	8.48	8.31	8.14	7.97	7.80	7.83	7.29
	Ant2	5180*	CH36	9.25	7.90	7.87	7.84	7.81	7.78	7.77	8.37
		5200	CH40	9.04	7.87	7.83	7.79	7.77	7.71	7.67	7.63

		5220	CH44	9.09	7.93	7.89	7.87	7.81	7.77	7.73	7.69
		5240*	CH48	7.94	7.91	7.88	7.87	7.82	7.79	7.76	7.73
		5260*	CH52	8.88	7.97	7.92	7.89	7.86	7.83	7.80	7.77
		5280	CH56	9.74	7.77	7.73	7.69	7.67	7.61	7.77	7.73
		5300	CH60	7.41	7.39	7.37	7.37	7.33	7.31	7.29	7.27
		5320*	CH64	9.22	7.32	7.30	7.28	7.26	7.24	7.22	7.20
		5500	CH100	8.85	7.72	7.49	7.46	7.43	7.40	7.37	7.34
		5520*	CH104	7.79	7.76	7.73	7.70	7.47	7.44	7.41	7.38
		5540	CH108	7.61	7.77	7.73	7.49	7.47	7.41	7.37	7.33
		5560	CH112	7.41	7.37	7.33	7.29	7.27	7.21	7.17	7.13
		5580*	CH116	8.14	7.40	7.38	7.36	7.34	7.32	7.30	7.28
		5660	CH132	7.27	7.23	7.21	7.19	7.17	7.17	7.13	7.11
		5680*	CH136	7.27	7.27	7.23	7.21	7.19	7.17	7.17	7.13
		5700	CH140	8.12	7.44	7.42	7.40	7.38	7.36	7.34	7.32
	MIMO	5180*	CH36	11.84	11.14	11.06	11.16	10.91	11.06	11.02	11.56
		5200	CH40	11.72	11.17	11.07	11.01	10.89	10.86	10.62	10.67
		5220	CH44	11.77	11.18	11.08	11.06	10.89	10.79	10.70	10.53
		5240*	CH48	11.27	11.19	11.11	11.14	10.94	10.87	10.78	11.15
		5260*	CH52	11.73	11.16	11.16	10.95	10.85	10.75	10.65	10.57
		5280	CH56	12.20	11.07	11.07	11.03	10.87	10.81	10.86	10.79
		5300	CH60	10.66	10.63	10.57	10.53	10.48	10.43	10.39	10.31
		5320*	CH64	11.75	10.57	10.53	10.49	10.46	10.53	10.49	10.33
		5500	CH100	11.53	10.86	10.73	10.70	10.66	10.63	10.59	10.59
		5520*	CH104	10.84	10.81	10.79	10.76	10.63	10.62	10.58	10.55
		5540	CH108	10.78	10.83	10.79	10.64	10.59	10.53	10.58	10.41
		5560	CH112	10.61	10.56	10.52	10.47	10.54	10.49	10.34	10.27
		5580*	CH116	11.02	10.60	10.57	10.54	10.51	10.48	10.56	10.51
		5660	CH132	10.81	10.75	10.70	10.66	10.62	10.60	10.54	10.46
		5680*	CH136	10.84	10.78	10.69	10.62	10.55	10.47	10.51	10.26
		5700	CH140	11.42	11.00	10.90	10.80	10.70	10.60	10.60	10.32

Mode	**Antenna**	**Frequency (MHz)**	**Channel**	**Average Power (dBm)**							
				Data Rate (Mbps)							
				MCS0	**MCS1**	**MCS2**	**MCS3**	**MCS4**	**MCS5**	**MCS6**	**MCS7**

802.11n-HT40 (5GHz) SISO	Ant1	5190	CH38	9.03	7.94	7.91	7.88	7.87	7.82	7.79	7.76
		5230	CH46	8.94	7.98	7.97	7.92	7.89	7.86	7.83	7.80
		5270	CH54	9.04	7.80	7.76	7.72	7.68	7.64	7.60	7.76
		5310	CH62	8.82	7.42	7.40	7.38	7.36	7.34	7.32	7.30
		5510	CH102	8.87	7.87	7.88	7.81	7.29	7.27	7.27	7.28
		5550	CH110	8.51	7.77	7.72	7.79	7.76	7.73	7.70	7.87
		5670	CH134	9.06	7.79	7.76	7.73	7.70	7.78	7.76	7.78
	Ant2	5190	CH38	8.70	7.86	7.81	7.89	7.87	7.87	7.88	7.81
		5230	CH46	8.69	8.26	8.24	8.22	8.20	8.18	8.16	8.14
		5270	CH54	8.97	8.28	8.26	8.24	8.22	8.20	8.18	8.16
		5310	CH62	8.93	8.48	8.48	8.43	8.41	8.39	8.38	8.38
		5510	CH102	8.80	8.42	8.40	8.38	8.36	8.34	8.32	8.30
		5550	CH110	8.23	8.62	8.60	8.88	8.86	8.84	8.82	8.80
		5670	CH134	8.33	8.82	8.68	8.64	8.60	8.86	8.82	8.48

Mode	Antenna	Frequency (MHz)	Channel	Average Power (dBm)							
				Data Rate (Mbps)							
				MCS 8	MCS 9	MCS 10	MCS 11	MCS 12	MCS 13	MCS 14	MCS 15
802.11n-HT40 MIMO (5GHz)	Ant1	5190	CH38	9.13	8.94	8.91	8.88	8.88	8.82	8.89	8.86
		5230	CH46	8.79	8.98	8.98	8.92	8.89	8.86	8.83	8.8
		5270	CH54	9.10	8.80	8.86	8.82	8.68	8.64	8.6	8.86
		5310	CH62	8.84	8.82	8.86	8.86	8.86	8.88	8.69	8.84
		5510	CH102	8.87	8.38	8.33	8.31	8.29	8.28	8.28	8.23
		5550	CH110	8.46	8.88	8.82	8.49	8.46	8.43	8.40	8.38
		5670	CH134	9.03	8.89	8.86	8.83	8.80	8.48	8.44	8.41
	Ant2	5190	CH38	8.60	8.63	8.61	8.69	8.68	8.68	8.65	8.68
		5230	CH46	8.85	8.26	8.24	8.22	8.20	8.18	8.16	8.81
		5270	CH54	9.29	8.28	8.26	8.24	8.22	8.20	8.18	8.16
		5310	CH62	8.87	8.48	8.48	8.43	8.41	8.39	8.38	8.38
		5510	CH102	8.88	8.42	8.40	8.38	8.36	8.34	8.32	8.30
		5550	CH110	8.33	8.62	8.60	8.88	8.86	8.84	8.82	8.80
		5670	CH134	9.14	8.82	8.68	8.64	8.60	8.86	8.82	8.48
	SUM	5190	CH38	11.88	11.80	11.77	11.80	11.79	11.76	11.78	11.78
		5230	CH46	11.83	11.65	11.64	11.59	11.57	11.54	11.52	11.82
		5270	CH54	12.21	11.56	11.58	11.55	11.47	11.44	11.41	11.53

		5310	CH62	11.87	11.66	11.68	11.66	11.65	11.65	11.55	11.63
		5510	CH102	11.89	11.41	11.38	11.36	11.34	11.32	11.31	11.28
		5550	CH110	11.41	11.76	11.72	11.70	11.67	11.65	11.63	11.61
		5670	CH134	12.10	11.87	11.78	11.75	11.71	11.68	11.64	11.46

Mode	Ant	Frequency (MHz)	Channel	Average Power (dBm)							
				Data Rate (Mbps)							
				MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11ac-20M (5GHz)	Ant1	5180	CH36	8.72	8.29	8.02	8.97	8.78	8.81	8.44	8.12
		5200	CH40	8.58	8.88	8.87	8.08	8.87	7.89	7.78	7.78
		5220	CH44	8.79	8.89	8.79	8.09	7.99	7.79	7.89	7.89
		5240	CH48	8.50	8.98	8.80	8.87	8.09	7.98	7.78	7.77
		5260	CH52	8.55	8.77	8.07	7.88	7.78	7.79	7.87	7.08
		5280	CH56	8.68	8.78	8.87	8.82	8.07	7.99	7.93	7.88
		5300	CH60	7.81	7.83	7.79	7.87	7.80	7.78	7.98	7.87
		5320	CH64	8.81	7.87	7.87	7.72	7.57	7.97	7.94	7.87
		5500	CH100	8.88	7.87	7.88	7.79	7.47	7.78	7.87	7.79
		5520	CH104	8.99	7.88	7.84	7.79	7.72	7.74	7.72	7.89
		5540	CH108	7.98	7.87	7.88	7.74	7.89	7.82	7.77	7.97
		5560	CH112	7.78	7.78	7.88	7.88	7.78	7.78	7.98	7.88
		5580	CH116	8.06	7.87	7.88	7.79	7.73	7.78	7.97	7.89
		5660	CH132	7.87	7.87	7.79	7.73	7.78	7.56	7.87	7.88
		5680	CH136	7.98	7.97	7.97	7.89	7.82	7.85	7.80	7.79
		5700	CH140	8.78	7.98	7.98	7.85	7.43	7.70	7.88	7.99
	Ant2	5180	CH36	8.88	7.76	7.78	7.78	7.70	7.87	7.86	7.88
		5200	CH40	8.78	7.87	7.88	7.76	7.34	7.78	7.87	7.88
		5220	CH44	7.67	7.68	7.86	7.87	7.83	7.77	7.78	7.86
		5240	CH48	8.88	7.68	7.81	7.87	7.87	7.76	7.74	7.78
		5260	CH52	8.68	7.86	7.88	7.78	7.73	7.77	7.86	7.88
		5280	CH56	8.77	7.73	7.78	7.86	7.87	7.88	7.72	7.78
		5300	CH60	7.68	7.86	7.87	7.87	7.88	7.88	7.76	7.77
		5320	CH64	8.67	7.74	7.86	7.87	7.82	7.88	7.88	7.06
		5500	CH100	8.08	7.68	7.88	7.87	7.87	7.76	7.78	7.78
		5520	CH104	7.76	7.78	7.78	7.70	7.67	7.66	7.68	7.88

		5540	CH108	7.88	7.77	7.78	7.66	7.67	7.61	7.87	7.88
		5560	CH112	7.68	7.87	7.88	7.76	7.77	7.78	7.87	7.88
		5580	CH116	7.50	7.76	7.77	7.77	7.78	7.78	7.86	7.87
		5660	CH132	7.87	7.87	7.88	7.88	7.76	7.77	7.77	7.78
		5680	CH136	7.88	7.88	7.76	7.77	7.77	7.78	7.78	7.86
		5700	CH140	7.88	7.77	7.78	7.78	7.86	7.87	7.87	7.88

Mode	Ant	Frequency (MHz)	Channel	Average Power (dBm)							
				Data Rate (Mbps)							
				MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11ac-20M MIMO (5GHz)	Ant1	5180	CH36	8.56	8.29	8.72	8.97	8.78	8.81	8.44	8.12
		5200	CH40	8.11	8.88	8.17	8.71	8.87	7.89	7.78	7.21
		5220	CH44	8.74	8.89	8.24	8.79	7.94	7.79	7.84	7.84
		5240	CH48	8.14	8.48	8.80	8.17	8.74	7.91	7.78	7.72
		5260	CH52	8.26	8.22	8.77	7.88	7.71	7.74	7.87	7.78
		5280	CH56	8.26	8.28	8.17	8.11	8.77	7.99	7.98	7.81
		5300	CH60	7.88	7.81	7.74	7.87	7.80	7.78	7.48	7.82
		5320	CH64	8.71	7.87	7.82	7.77	7.72	7.47	7.42	7.82
		5500	CH100	8.44	7.87	7.88	7.79	7.77	7.71	7.87	7.79
		5520	CH104	8.44	7.88	7.81	7.79	7.77	7.77	7.78	7.89
		5540	CH108	7.98	7.87	7.81	7.77	7.89	7.88	7.77	7.47
		5560	CH112	7.78	7.78	7.88	7.88	7.78	7.78	7.48	7.88
		5580	CH116	8.75	7.87	7.88	7.79	7.77	7.71	7.47	7.89
		5660	CH132	7.87	7.82	7.79	7.78	7.78	7.70	7.87	7.81
		5680	CH136	7.98	7.97	7.92	7.89	7.88	7.88	7.80	7.74
		5700	CH140	8.51	7.98	7.91	7.84	7.77	7.70	7.88	7.49
	Ant2	5180	CH36	8.68	7.79	7.78	7.79	7.70	7.87	7.87	7.86
		5200	CH40	8.68	7.87	7.89	7.79	7.77	7.76	7.87	7.89
		5220	CH44	7.97	7.99	7.89	7.87	7.86	7.77	7.79	7.89
		5240	CH48	8.76	7.96	7.88	7.87	7.88	7.79	7.78	7.79
		5260	CH52	8.75	7.87	7.86	7.78	7.77	7.78	7.89	7.88
		5280	CH56	9.75	7.77	7.79	7.89	7.87	7.86	7.77	7.79
		5300	CH60	7.76	7.99	7.97	7.97	7.99	7.96	7.89	7.87
		5320	CH64	8.77	7.86	7.69	7.67	7.67	7.69	7.66	7.79

		5500	CH100	8.77	7.76	7.98	7.97	7.98	7.89	7.88	7.89
		5520	CH104	7.79	7.78	7.79	7.70	7.77	7.77	7.76	7.98
		5540	CH108	7.86	7.77	7.79	7.79	7.77	7.76	7.97	7.99
		5560	CH112	7.76	7.97	7.99	7.89	7.87	7.86	7.67	7.69
		5580	CH116	8.69	7.89	7.87	7.87	7.89	7.86	7.69	7.67
		5660	CH132	7.97	7.97	7.99	7.96	7.89	7.87	7.87	7.89
		5680	CH136	7.99	7.96	7.89	7.87	7.87	7.89	7.86	7.69
		5700	CH140	8.76	7.87	7.89	7.86	7.69	7.67	7.67	7.69
	SUM	5180	CH36	11.63	11.06	11.29	11.43	11.28	11.38	11.17	11.00
		5200	CH40	11.41	11.41	11.04	11.28	11.37	10.84	10.84	10.57
		5220	CH44	11.38	11.47	11.08	11.36	10.91	10.79	10.83	10.88
		5240	CH48	11.47	11.24	11.37	11.03	11.34	10.86	10.79	10.77
		5260	CH52	11.52	11.06	11.35	10.84	10.75	10.77	10.89	10.84
		5280	CH56	12.08	11.04	10.99	11.01	11.35	10.94	10.89	10.81
		5300	CH60	11.93	10.80	10.78	10.89	10.85	10.83	10.64	10.82
		5320	CH64	11.75	10.88	10.77	10.73	10.71	10.59	10.55	10.82
		5500	CH100	11.62	10.83	10.94	10.89	10.89	10.81	10.89	10.85
		5520	CH104	11.14	10.84	10.81	10.76	10.78	10.78	10.78	10.95
		5540	CH108	10.93	10.83	10.81	10.79	10.84	10.83	10.88	10.75
		5560	CH112	10.78	10.89	10.95	10.90	10.84	10.83	10.59	10.80
		5580	CH116	11.73	10.89	10.89	10.84	10.84	10.80	10.59	10.79
		5660	CH132	10.93	10.91	10.90	10.88	10.85	10.80	10.88	10.86
		5680	CH136	11.00	10.98	10.92	10.89	10.89	10.90	10.84	10.73
		5700	CH140	11.65	10.94	10.91	10.86	10.74	10.70	10.79	10.60

Mode	Ant	Frequency (MHz)	Channel	Average Power (dBm)							
				Data Rate (Mbps)							
				MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11ac-40M (5GHz)	Ant1	5190	CH38	9.18	8.01	7.98	7.97	7.98	7.89	7.88	7.89
		5230	CH46	8.88	8.07	8.08	7.99	7.98	7.99	7.90	7.87
		5270	CH54	9.09	7.87	7.89	7.79	7.77	7.71	7.87	7.89
		5310	CH62	8.94	7.49	7.47	7.47	7.49	7.41	7.99	7.97
		5510	CH102	8.84	7.48	7.40	7.98	7.98	7.94	7.98	7.90
		5550	CH110	8.98	7.88	7.79	7.78	7.79	7.70	7.47	7.44
		5670	CH134	8.76	7.88	7.89	7.80	7.77	7.74	7.71	7.48
	Ant2	5190	CH38	9.98	7.70	7.48	7.48	7.44	7.48	7.40	7.98
		5230	CH46	7.97	7.99	7.91	7.89	7.87	7.87	7.89	7.81
		5270	CH54	8.94	7.97	7.99	7.91	7.89	7.87	7.87	7.89
		5310	CH62	8.91	7.74	7.78	7.70	7.48	7.48	7.44	7.48
		5510	CH102	8.58	7.49	7.47	7.47	7.49	7.41	7.99	7.97
		5550	CH110	8.98	7.89	7.87	7.87	7.89	7.81	7.79	7.77
		5670	CH134	8.96	7.79	7.77	7.71	7.87	7.89	7.79	7.77

Mode	Ant	Frequency (MHz)	Channel	Average Power (dBm)							
				Data Rate (Mbps)							
				MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11ac-40M MIMO (5GHz)	Ant1	5190	CH38	9.08	8.01	7.98	7.97	7.92	7.89	7.88	7.83
		5230	CH46	8.52	8.07	8.02	7.99	7.98	7.93	7.90	7.87
		5270	CH54	8.95	7.87	7.83	7.79	7.77	7.71	7.87	7.83
		5310	CH62	8.34	7.49	7.67	7.67	7.58	7.51	7.89	7.87
		5510	CH102	8.81	7.42	7.60	7.88	7.88	7.84	7.82	7.80
		5550	CH110	8.45	7.82	7.79	7.78	7.78	7.7	7.47	7.44
		5670	CH134	8.50	7.88	7.83	7.80	7.77	7.74	7.71	7.48
	Ant2	5190	CH38	9.16	7.70	7.48	7.48	7.44	7.42	7.40	7.88
		5230	CH46	8.85	7.53	7.89	7.29	7.27	7.27	7.28	7.21
		5270	CH54	9.27	7.57	7.86	7.81	7.29	7.27	7.27	7.28
		5310	CH62	9.32	7.74	7.72	7.70	7.48	7.48	7.44	7.42
		5510	CH102	8.19	7.59	7.87	7.47	7.48	7.41	7.89	7.87
		5550	CH110	8.29	7.89	7.87	7.87	7.88	7.81	7.79	7.77

		5670	CH134	8.96	7.79	7.77	7.71	7.87	7.88	7.79	7.77
	SUM	5190	CH38	12.13	10.87	10.75	10.74	10.70	10.67	10.66	10.87
		5230	CH46	11.70	10.82	10.97	10.66	10.65	10.62	10.61	10.56
		5270	CH54	12.12	10.73	10.86	10.81	10.55	10.51	10.59	10.57
		5310	CH62	11.87	10.63	10.71	10.70	10.54	10.51	10.68	10.66
		5510	CH102	11.52	10.52	10.75	10.69	10.69	10.64	10.87	10.85
		5550	CH110	11.38	10.87	10.84	10.84	10.84	10.77	10.64	10.62
		5670	CH134	11.75	10.85	10.81	10.77	10.83	10.82	10.76	10.64

Mode	Ant	Frequency (MHz)	Channel	Average Power (dBm)							
				Data Rate (Mbps)							
				13.5	27	40.5	54	81	108	121.5	135
802.11ac 80MHz	Ant1	5210	CH42	9.47	8.40	8.38	8.36	8.34	8.32	8.30	8.28
		5290	CH58	9.39	8.42	8.40	8.38	8.36	8.34	8.32	8.30
		5530	CH106	8.52	8.61	8.89	8.87	8.88	8.83	8.81	8.49
	Ant2	5210	CH42	9.40	8.76	8.74	8.72	8.70	8.68	8.66	8.64
		5290	CH58	9.67	8.86	8.82	8.78	8.74	8.70	8.66	8.62
		5530	CH106	8.48	8.84	8.80	8.76	8.72	8.68	8.64	8.60
Mode	Ant	Frequency (MHz)	Channel	Average Power (dBm)							
				Data Rate (Mbps)							
				13.5	27	40.5	54	81	108	121.5	135
802.11ac 80MHz MIMO	Ant1	5210	CH42	9.01	8.40	8.38	8.36	8.34	8.32	8.30	8.28
		5290	CH58	9.05	8.42	8.40	8.38	8.36	8.34	8.32	8.30
		5530	CH106	8.62	8.61	8.89	8.87	8.88	8.83	8.81	8.49
	Ant2	5210	CH42	9.04	8.76	8.74	8.72	8.70	8.68	8.66	8.64
		5290	CH58	9.52	8.86	8.82	8.78	8.74	8.70	8.66	8.62
		5530	CH106	8.97	8.84	8.80	8.76	8.72	8.68	8.64	8.60
	SUM	5210	CH42	12.04	11.59	11.57	11.55	11.53	11.51	11.49	11.47
		5290	CH58	12.30	11.66	11.63	11.59	11.56	11.53	11.50	11.47
		5530	CH106	11.81	11.74	11.86	11.83	11.81	11.77	11.74	11.56

7.2. Standalone SAR Test Exclusion Considerations

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

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

Band	Configuration	Frequency (MHz)	Maximum Power (dBm)	Separation Distance (mm)	Calculation Result	SAR Exclusion Thresholds	Standalone SAR
Wifi 2.4GHz Antenna 1	Body	2462	16.5	10	7.01	3.0	Yes
Wifi 2.4GHz Antenna 2	Body	2462	16.5	10	7.01	3.0	Yes
Wifi 5GHz Antenna 1	Body	5700	9.7	10	2.2	3.0	No
Wifi 5GHz Antenna 2	Body	5700	9.7	10	2.2	3.0	No

Note: For conditions where the estimated SAR is overly conservative for certain conditions, the test lab may choose to perform standalone SAR measurements and use the measured SAR to determine simultaneous transmission SAR test exclusion.
WiFi 5G is tested in this report.

7.3. SAR Test Results

7.3.1. UMTS Band II

Table 10: SAR Values [UMTS Band II (WCDMA/HSDPA/HSUPA)]

Test Position	Channel/ Frequency (MHz)	Channel Type	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 Body (Distance 10mm)										
Test Position 1	9538/1907.6	RMC 12.2K	1:1	23.5	22.3	-0.170	0.980	1.32	1.292	Figure.13
	9400/1880	RMC 12.2K	1:1	23.5	22.54	-0.087	0.781	1.25	0.974	Figure.14
	9262/1852.4	RMC 12.2K	1:1	23.5	22.27	-0.080	0.651	1.33	0.864	Figure.15
Test Position 2	9538/1907.6	RMC 12.2K	1:1	23.5	22.3	-0.030	0.686	1.32	0.904	Figure.16
	9400/1880	RMC 12.2K	1:1	23.5	22.54	0.190	0.520	1.25	0.649	Figure.17
	9262/1852.4	RMC 12.2K	1:1	23.5	22.27	0.070	0.422	1.33	0.560	Figure.18
Test Position 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Test Position 4	9538/1907.6	RMC 12.2K	1:1	23.5	22.3	-0.030	0.761	1.32	1.003	Figure.19
	9400/1880	RMC 12.2K	1:1	23.5	22.54	0.010	0.525	1.25	0.655	Figure.20
	9262/1852.4	RMC 12.2K	1:1	23.5	22.27	0.020	0.472	1.33	0.627	Figure.21
Test Position 5	9400/1880	RMC 12.2K	1:1	23.5	22.54	-0.040	0.127	1.25	0.158	Figure.22
Test Position 6	9400/1880	RMC 12.2K	1:1	23.5	22.54	-0.140	0.205	1.25	0.256	Figure.23
Worst Case Position of SAR (1st Repeated SAR, Distance 10mm)										
Test Position 1	9538/1907.6	RMC 12.2K	1:1	23.5	22.3	-0.01	0.953	1.32	1.256	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 optional 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. WWAN antenna is located at right edge; antenna-to- left edge distance is more than 2.5 cm (see ANNEX K). Based upon KDB941225 D06, when the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested.

Table 11: SAR Measurement Variability Results [UMTS Band II (WCDMA/HSDPA/HSUPA)]

Test Position	Channel/ Frequency (MHz)	Measured SAR (1g)	1st Repeated SAR (1g)	Ratio	2nd Repeated SAR (1g)	3rd Repeated SAR (1g)
Test Position 1	9538/1907.6	0.980	0.953	1.03	N/A	N/A

Note: 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

7.3.2. UMTS Band V

Table 12: SAR Values [UMTS Band V (WCDMA/HSDPA/HSUPA)]

Test Position	Channel/ Frequency (MHz)	Channel Type	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 Body (Distance 10mm)										
Test Position 1	4183/836.6	RMC 12.2K	1:1	23.5	22.44	-0.050	0.178	1.28	0.227	Figure.25
Test Position 2	4183/836.6	RMC 12.2K	1:1	23.5	22.44	-0.140	0.142	1.28	0.181	Figure.26
Test Position 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Test Position 4	4183/836.6	RMC 12.2K	1:1	23.5	22.44	-0.130	0.010	1.28	0.013	Figure.27
Test Position 5	4183/836.6	RMC 12.2K	1:1	23.5	22.44	0.050	0.073	1.28	0.093	Figure.28
Test Position 6	4183/836.6	RMC 12.2K	1:1	23.5	22.44	0.020	0.081	1.28	0.104	Figure.29

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 optional 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. WWAN antenna is located at right edge; antenna-to- left edge distance is more than 2.5 cm (see ANNEX K). Based upon KDB941225 D06, when the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested.

7.3.3. LTE Band 17

Table 13: SAR Values (LTE Band 17/10M)

Test Position	Channel/ Frequency (MHz)	Modulation Type	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 Body (1RB, QPSK, Distance 10mm)										
Test Position 1	23780/709	0 Offset	1:1	22.5	22.43	-0.040	0.085	1.02	0.086	Figure.30
Test Position 2	23780/709	0 Offset	1:1	22.5	22.43	0.070	0.069	1.02	0.070	Figure.31
Test Position 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Test Position 4	23780/709	0 Offset	1:1	22.5	22.43	-0.090	0.010	1.02	0.010	Figure.32
Test Position 5	23780/709	0 Offset	1:1	22.5	22.43	0.026	0.011	1.02	0.011	Figure.33
Test Position 6	23780/709	0 Offset	1:1	22.5	22.43	0.100	0.018	1.02	0.018	Figure.34
Test position of Body (50% RB, QPSK, Distance 10mm)										
Test Position 1	23780/709	0 Offset	1:1	22.5	21.54	-0.040	0.083	1.25	0.104	Figure.35
Test Position 2	23780/709	0 Offset	1:1	22.5	21.54	0.080	0.068	1.25	0.084	Figure.36
Test Position 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Test Position 4	23780/709	0 Offset	1:1	22.5	21.54	0.160	0.010	1.25	0.012	Figure.37
Test Position 5	23780/709	0 Offset	1:1	22.5	21.54	0.080	0.011	1.25	0.014	Figure.38
Test Position 6	23780/709	0 Offset	1:1	22.5	21.54	0.110	0.018	1.25	0.023	Figure.39

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. WWAN antenna is located at right edge; antenna-to- left edge distance is more than 2.5 cm (see ANNEX K). Based upon KDB941225 D06, when the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested.

7.3.4. WiFi 2.4G

Table 14: SAR Values (802.11b/g/n)

Test Position	Channel/ Frequency (MHz)	Service	Duty Cycle	Maximum Allowed Power (dBm)	Conducted Power (dBm)	Drift ± 0.21dB	Limit of SAR 1.6 W/kg			
						Drift (dB)	Measured SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)	Graph Results
Test position of Body (Antenna 1, Distance 10mm)										
Test Position 1	5/2432	DSSS	1:1	16.5	16.41	0.074	0.078	1.02	0.079	Figure.40
Test Position 2	5/2432	DSSS	1:1	16.5	16.41	0.065	0.133	1.02	0.136	Figure.41
Test Position 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Test Position 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Test Position 5	5/2432	DSSS	1:1	16.5	16.41	0.190	0.084	1.02	0.086	Figure.42
Test Position 6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Test position of Body (Antenna 2, Distance 10mm)										
Test Position 1	5/2432	DSSS	1:1	16.5	15.79	0.030	0.06	1.18	0.071	Figure.43
Test Position 2	5/2432	DSSS	1:1	16.5	15.79	0.151	0.115	1.18	0.135	Figure.44
Test Position 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Test Position 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Test Position 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Test Position 6	5/2432	DSSS	1:1	16.5	15.79	0.022	0.063	1.18	0.074	Figure.45

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 optional for such test configuration(s).

3. KDB 248227-SAR is not required for 802.11g/n channels when the maximum average output power is less than ¼ dB higher than measured on the corresponding 802.11b channels.

4. Based upon KDB941225 D06, when the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested.

7.3.5. WiFi 5G

Table 15: SAR Values (Antenna 1)

Test Position	Channel/ Frequency (MHz)	Service	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 Body (802.11a, Distance 10mm)										
Test Position 1	36/5180	OFDM	1:1	10	8.9	-0.074	0.024	1.29	0.031	Figure.46
Test Position 2	36/5180	OFDM	1:1	10	8.9	0.034	0.021	1.29	0.027	Figure.47
Test Position 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Test Position 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Test Position 5	36/5180	OFDM	1:1	10	8.9	0.060	0.079	1.29	0.102	Figure.48
Test Position 6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Test Position of Body (802.11a, Distance 10mm)										
Test Position 1	56/5280	OFDM	1:1	10	8.89	-0.106	0.017	1.29	0.022	Figure.49
Test Position 2	56/5280	OFDM	1:1	10	8.89	0.047	0.006	1.29	0.008	Figure.50
Test Position 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Test Position 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Test Position 5	56/5280	OFDM	1:1	10	8.89	0.036	0.079	1.29	0.102	Figure.51
Test Position 6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Test Position of Body (802.11a, Distance 10mm)										
Test Position 1	140/5700	OFDM	1:1	10	8.94	0.075	0.002	1.28	0.002	Figure.52
Test Position 2	140/5700	OFDM	1:1	10	8.94	-0.043	0.020	1.28	0.026	Figure.53
Test Position 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Test Position 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Test Position 5	140/5700	OFDM	1:1	10	8.94	0.043	0.037	1.28	0.047	Figure.54
Test Position 6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Worst case position of Body (802.11ac, Distance 10mm)										
Test Position 5	42/5210	OFDM	1:1	10	9.47	0.07	0.080	1.13	0.091	Figure.55
Worst case position of Body (802.11ac,Distance 10mm)										
Test Position 5	58/5290	OFDM	1:1	10	9.39	0.036	0.079	1.15	0.091	Figure.56

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. KDB 248227-SAR is not required for 802.11n channels when the maximum average output power is less than ¼ dB higher than measured on the corresponding 802.11a channels.

4. Based upon KDB941225 D06, when the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested.

Table 16: SAR Values (Antenna 2)

Test Position	Channel/ Frequency (MHz)	Service	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 Body (802.11a, Distance 10mm)										
Test Position 1	44/5220	OFDM	1:1	10	8.88	0.102	0.015	1.29	0.019	Figure.57
Test Position 2	44/5220	OFDM	1:1	10	8.88	0.030	0.006	1.29	0.007	Figure.58
Test Position 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Test Position 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Test Position 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Test Position 6	44/5220	OFDM	1:1	10	8.88	-0.052	0.012	1.29	0.016	Figure.59
Test Position of Body (802.11a, Distance 10mm)										
Test Position 1	52/5260	OFDM	1:1	10	8.88	0.114	0.018	1.29	0.024	Figure.60
Test Position 2	52/5260	OFDM	1:1	10	8.88	0.122	0.024	1.29	0.031	Figure.61
Test Position 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Test Position 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Test Position 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Test Position 6	52/5260	OFDM	1:1	10	8.88	0.042	0.010	1.29	0.013	Figure.62
Test Position of Body (802.11a, Distance 10mm)										
Test Position 1	108/5540	OFDM	1:1	10	8.88	0.030	0.023	1.29	0.029	Figure.63
Test Position 2	108/5540	OFDM	1:1	10	8.88	0.045	0.028	1.29	0.036	Figure.64
Test Position 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Test Position 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Test Position 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Test Position 6	108/5540	OFDM	1:1	10	8.88	0.101	0.018	1.29	0.023	Figure.65
Worst case position of Body (802.11ac, Distance 10mm)										
Test Position 1	38/5190	OFDM	1:1	10	9.98	0.102	0.015	1.00	0.015	Figure.66
Worst case position of Body (802.11ac, Distance 10mm)										
Test Position 2	56/5280	OFDM	1:1	10	9.75	0.122	0.024	1.06	0.026	Figure.67
Worst case position of Body (802.11n, Distance 10mm)										
Test Position 2	134/5670	OFDM	1:1	10	9.14	0.056	0.028	1.22	0.034	Figure.68

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. KDB 248227-SAR is not required for 802.11n channels when the maximum average output power is less than ¼ dB higher than measured on the corresponding 802.11a channels.

4. Based upon KDB941225 D06, when the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested.

7.4. Simultaneous Transmission Conditions

Air-Interface	Band (MHz)	Type	Simultaneous Transmissions Note: Not to be tested	Voice Over Digital Transport (Data)
WCDMA	Band II	Data	Yes WiFi Antenna 1 and WiFi Antenna 2	NA
	Band V	Data		
LTE	FDD 17	Data	Yes WiFi Antenna 1 and WiFi Antenna 2	NA
WiFi Antenna 1	2.4G	Data	Yes WCDMA , LTE and WiFi Antenna 2 (2.4G)	NA
WiFi Antenna 2	2.4G	Data	Yes WCDMA , LTE and WiFi Antenna 1 (2.4G)	NA
WiFi Antenna 1	5G	Data	Yes WCDMA , LTE and WiFi Antenna 2 (5G)	NA
WiFi Antenna 2	5G	Data	Yes WCDMA , LTE and WiFi Antenna 1 (5G)	NA

Simultaneous transimition SAR For WiFi 2.4G and UMTS/LTE

SAR_{1g}(W/kg) Test Position	UMTS Band II	UMTS Band V	LTE FDD 17	WiFi 2.4G Antenna 1	WiFi 2.4G Antenna 2	MAX. ΣSAR_{1g}	Peak location separation ratio
Test Position 1	**1.292**	0.227	0.104	**0.079**	**0.071**	1.442	No
Test Position 2	**0.904**	0.181	0.084	**0.136**	**0.135**	1.175	No
Test Position 3	N/A	N/A	N/A	N/A	N/A	0	No
Test Position 4	**1.003**	0.013	0.012	N/A	N/A	1.003	No
Test Position 5	**0.158**	0.093	0.014	**0.086**	N/A	0.244	No
Test Position 6	**0.256**	0.104	0.023	N/A	**0.074**	0.330	No
Note: 1.The value with blue color is the maximum ΣSAR_{1g} Value. 2. MAX. ΣSAR_{1g} =Unlicensed SAR_{MAX} +Licensed SAR_{MAX}							

MAX. ΣSAR_{1g} = 1.442 W/kg <1.6 W/kg, So the Simultaneous transimition SAR with volum scan are not required for WiFi 2.4G and UMTS/LTE antenna.

Simultaneous transimition SAR For WiFi 5G and UMTS/LTE

SAR_{1g}(W/kg) Test Position	UMTS Band II	UMTS Band V	LTE FDD 17	WiFi 5G Antenna 1	WiFi 5G Antenna 2	MAX. ΣSAR_{1g}	Peak location separation ratio
Test Position 1	**1.292**	0.227	0.104	**0.031**	**0.029**	1.352	No
Test Position 2	**0.904**	0.181	0.084	**0.027**	**0.036**	0.967	No
Test Position 3	N/A	N/A	N/A	N/A	N/A	0	No
Test Position 4	**1.003**	0.013	0.012	N/A	N/A	1.003	No
Test Position 5	**0.158**	0.093	0.014	**0.102**	N/A	0.260	No
Test Position 6	**0.256**	0.104	0.023	N/A	**0.023**	0.279	No
Note: 1.The value with blue color is the maximum ΣSAR_{1g} Value. 2. MAX. ΣSAR_{1g} =Unlicensed SAR_{MAX} +Licensed SAR_{MAX}							

MAX. ΣSAR_{1g} = 1.352 W/kg <1.6 W/kg, So the Simultaneous transimition SAR with volum scan are not required for WiFi 5G and UMTS/LTE antenna.

8. Measurement Uncertainty

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

9. Main Test Instruments

Table 17: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	Agilent 8753E	US37390326	September 1, 2014	One year
02	Dielectric Probe Kit	Agilent 85070E	US44020115	No Calibration Requested	
03	Power meter	Agilent E4417A	GB41291714	March 9, 2014	One year
04	Power sensor	Agilent N8481H	MY50350004	September 22, 2014	One year
05	Power sensor	E9327A	US40441622	January 1, 2014	One year
06	Signal Generator	HP 8341B	2730A00804	September 1, 2014	One year
07	Dual directional coupler	778D-012	50519	March 24, 2014	One year
08	Dual directional coupler	777D	50146	March 24, 2014	One year
09	Amplifier	IXA-020	0401	No Calibration Requested	
10	Wideband radio communication tester	CMW 500	113645	September 28, 2014	One year
11	E-field Probe	EX3DV4	3977	February 17, 2014	One year
12	DAE	DAE4	1317	January 16, 2014	One year
13	Validation Kit 750MHz	D750V3	3149	September 5, 2013	Three years
14	Validation Kit 835MHz	D835V2	4d020	August 28, 2014	Three years
15	Validation Kit 1900MHz	D1900V2	5d060	September 1, 2014	Three years
16	Validation Kit 2450MHz	D2450V2	786	September 1, 2014	Three years
17	Validation Kit 5GHz	D5GHzV2	1151	December 30, 2013	Three years
18	Temperature Probe	JM222	AA1009129	March 13, 2014	One year
19	Hygrothermograph	WS-1	64591	September 25, 2014	One year

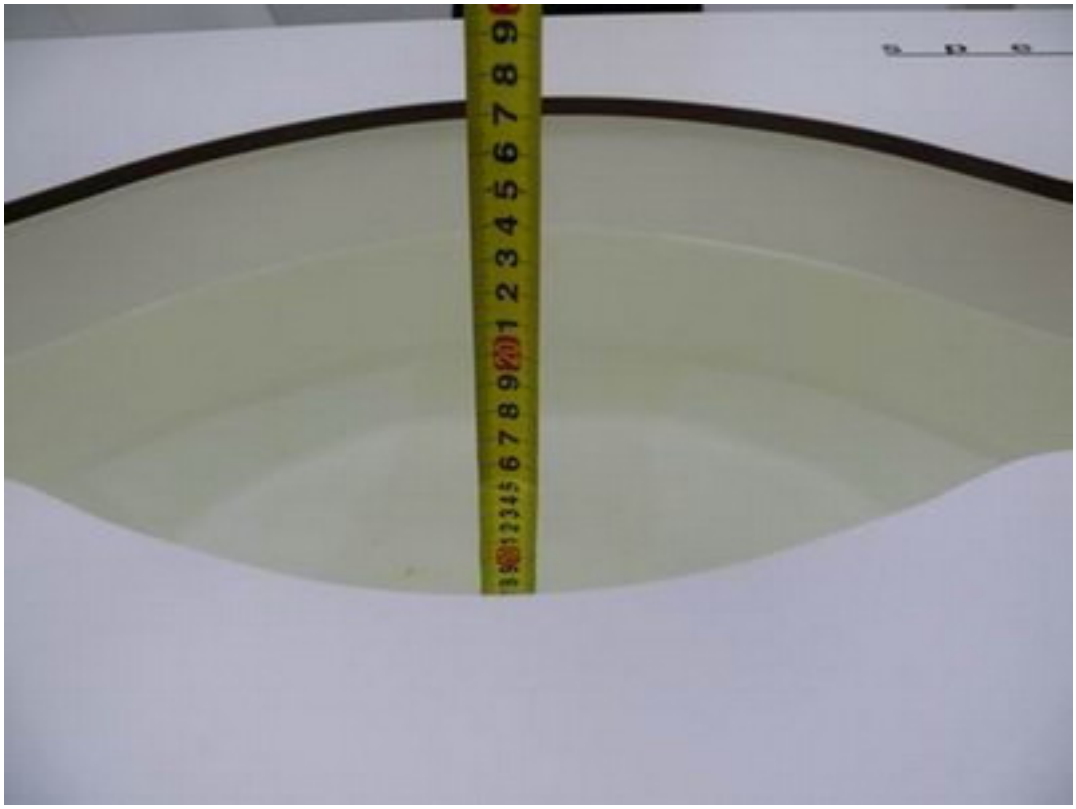
*******END OF REPORT *******

ANNEX A: Test Layout

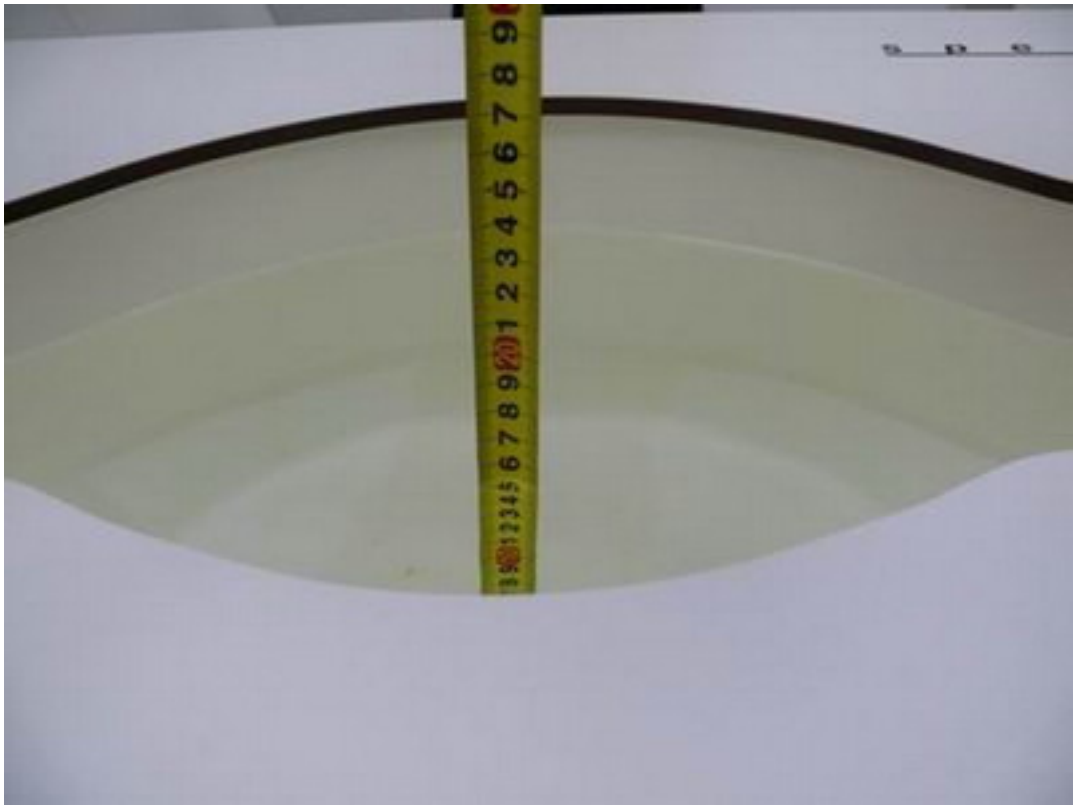
Picture 1: Specific Absorption Rate Test Layout

Picture 2: Liquid depth in the flat Phantom (750MHz, 15.4cm depth)

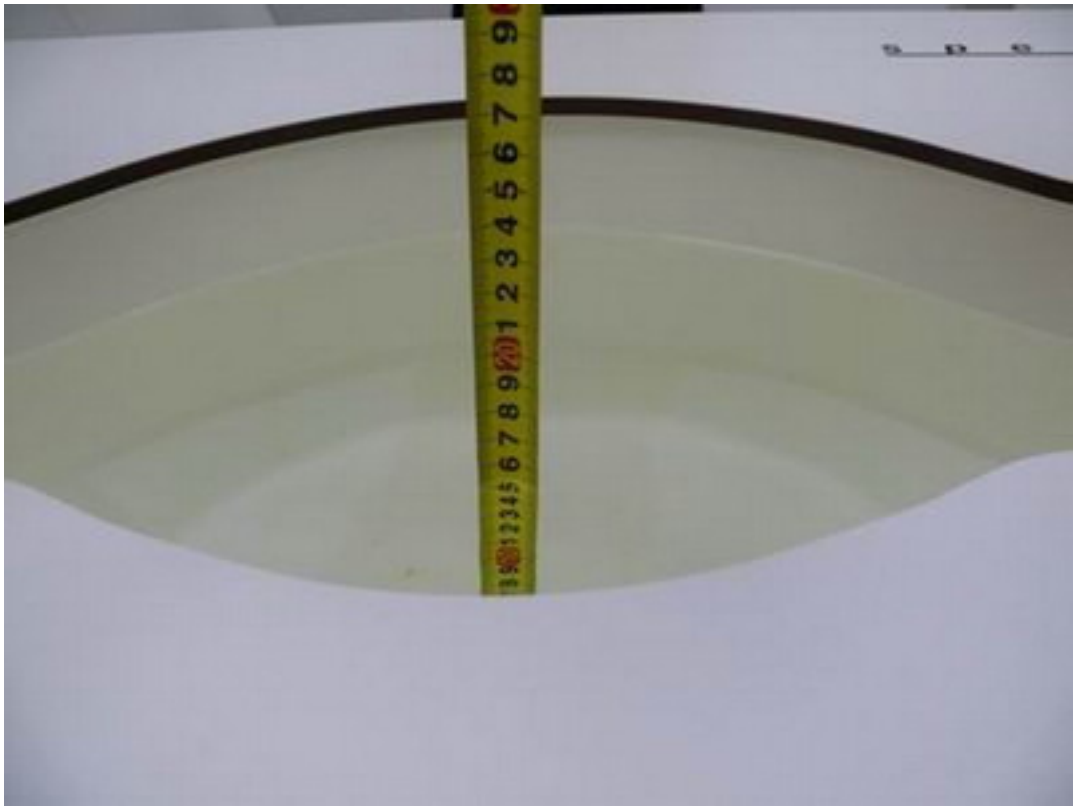
Picture 3: Liquid depth in the flat Phantom (835MHz, 15.4cm depth)



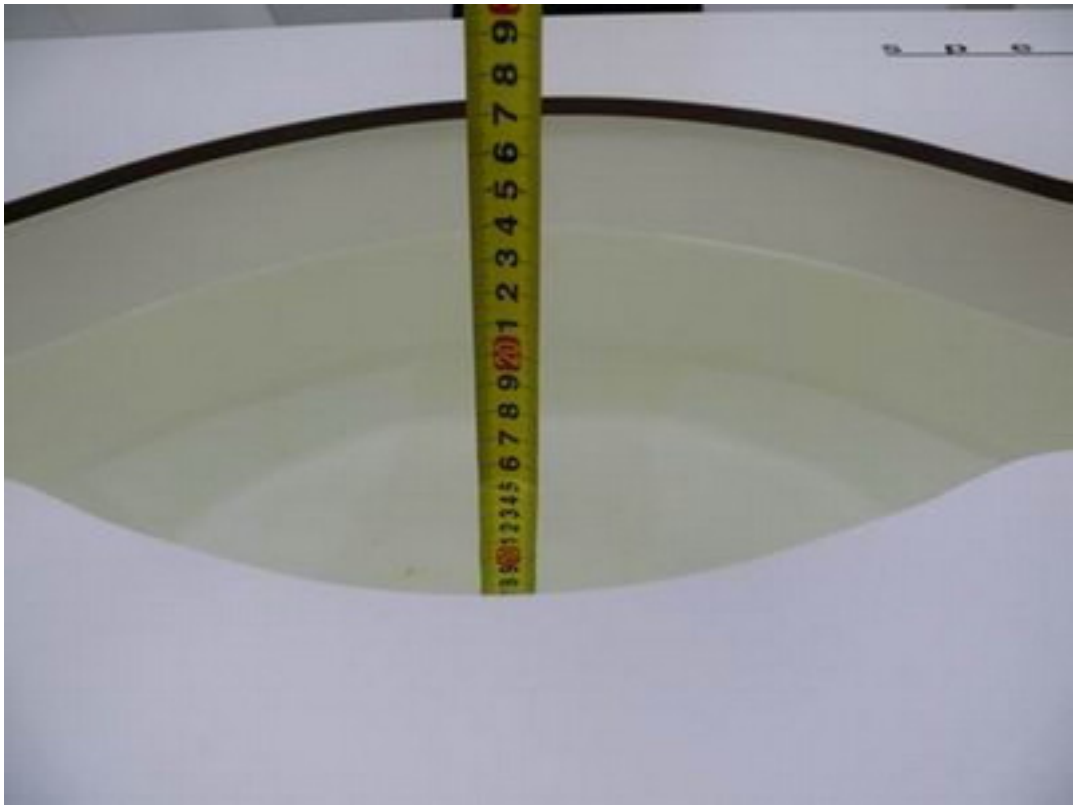
Picture 4: Liquid depth in the flat Phantom (1900 MHz, 15.2cm depth)



Picture 5: Liquid depth in the flat Phantom (2450 MHz, 15.3cm depth)



Picture 6: Liquid depth in the flat Phantom (5200 MHz, 15.3cm depth)



Picture 7: Liquid depth in the flat Phantom (5600 MHz, 15.3cm depth)

ANNEX B: System Check Results

System Performance Check at 750 MHz Body TSL

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 3149

Date: 11/25/2014

Communication System:CW (0); Frequency: 750 MHz;Duty Cycle: 1:1

Medium parameters used: f = 750 MHz; σ = 0.97 S/m; ε_r = 54.3; 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(9.78, 9.78, 9.78); 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): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 2.36 W/kg

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

Reference Value = 48.998 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 3.24 W/kg

SAR(1 g) = 2.22 W/kg; SAR(10 g) = 1.49 W/kg

Maximum value of SAR (measured) = 2.39 W/kg

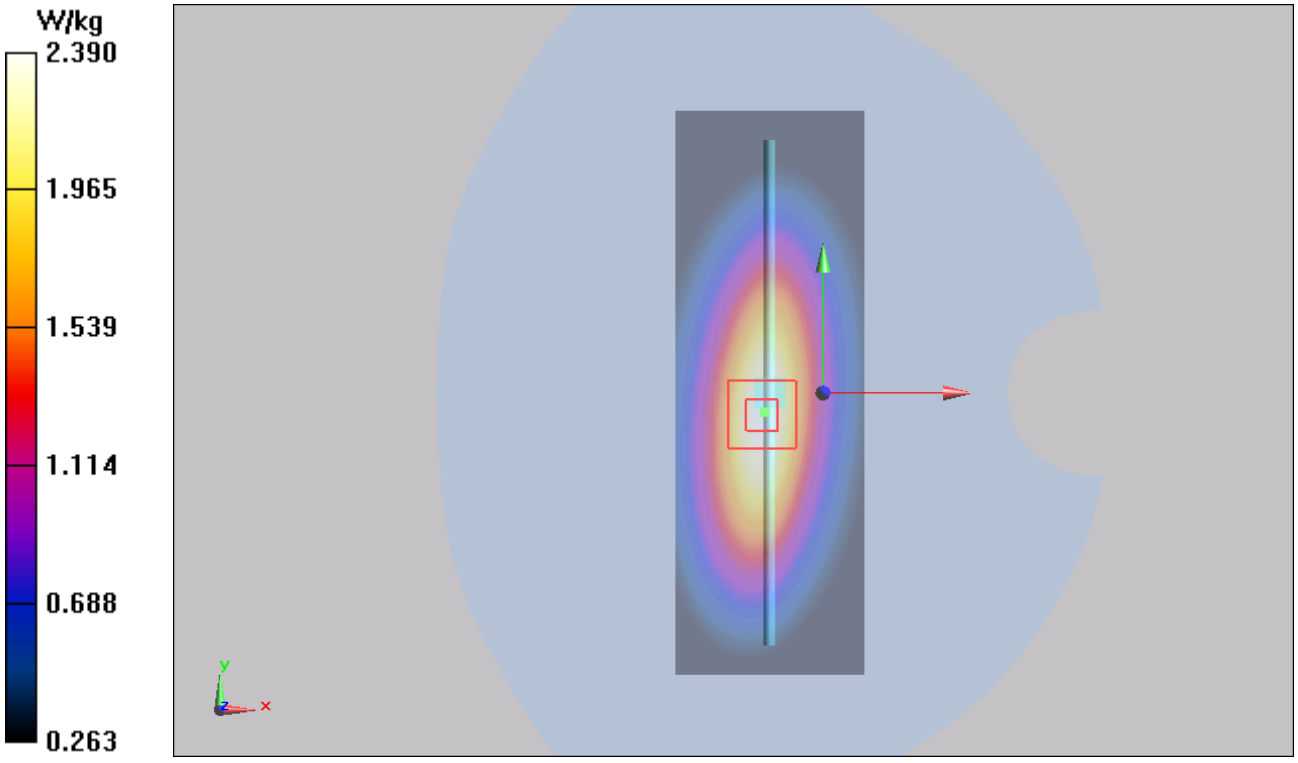


Figure 7 System Performance Check 750MHz 250mW

System Performance Check at 835 MHz Body TSL

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

Date: 11/27/2014

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

Medium parameters used: f = 835 MHz; σ = 0.99 mho/m; ε_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: SAM 1; Type: QD000P40CD; Serial: TP:1666

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

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

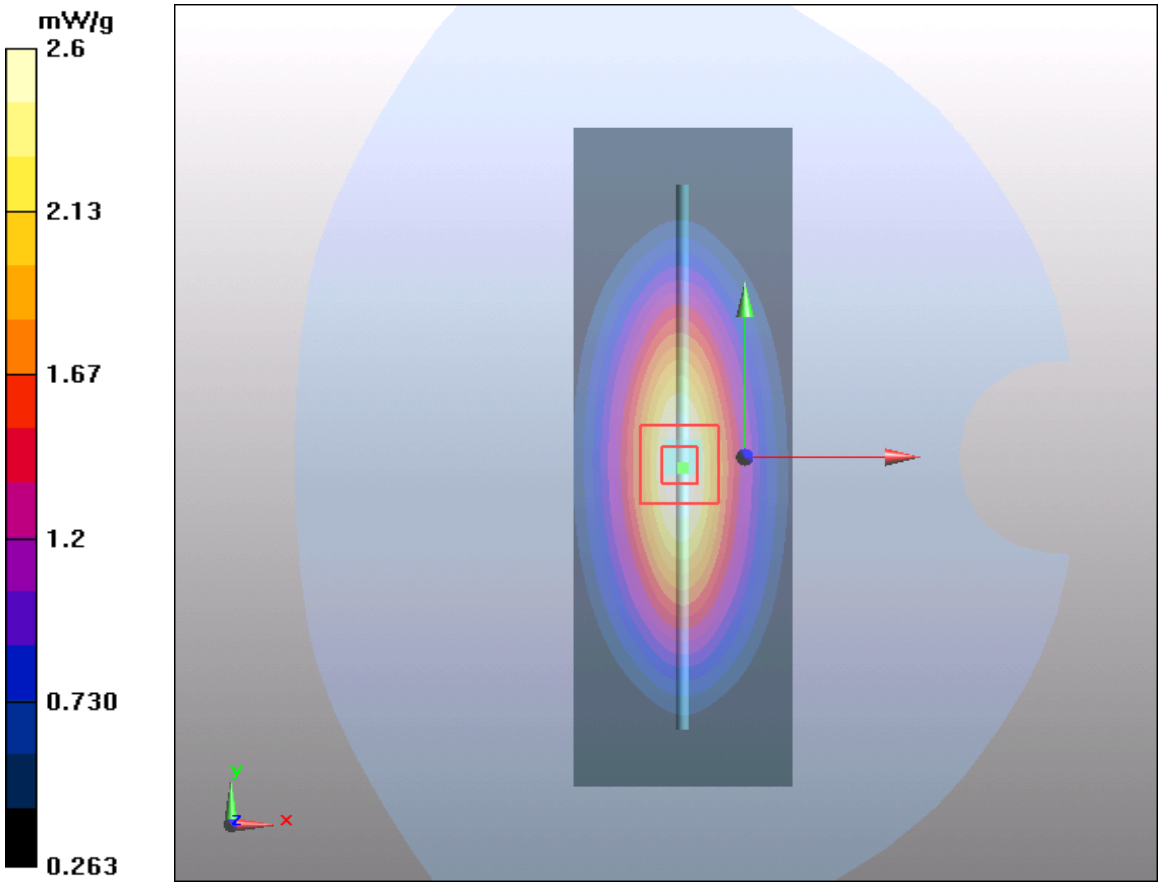


Figure 8 System Performance Check 835MHz 250Mw

System Performance Check at 1900 MHz Body TSL

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

Date: 11/27/2014

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

Medium parameters used: f = 1900 MHz; σ = 1.52 mho/m; ε_r = 53.1; 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(7.37, 7.37, 7.37); Calibrated: 2/17/2014;

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

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

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

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

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

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

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

Peak SAR (extrapolated) = 17.8 W/kg

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

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

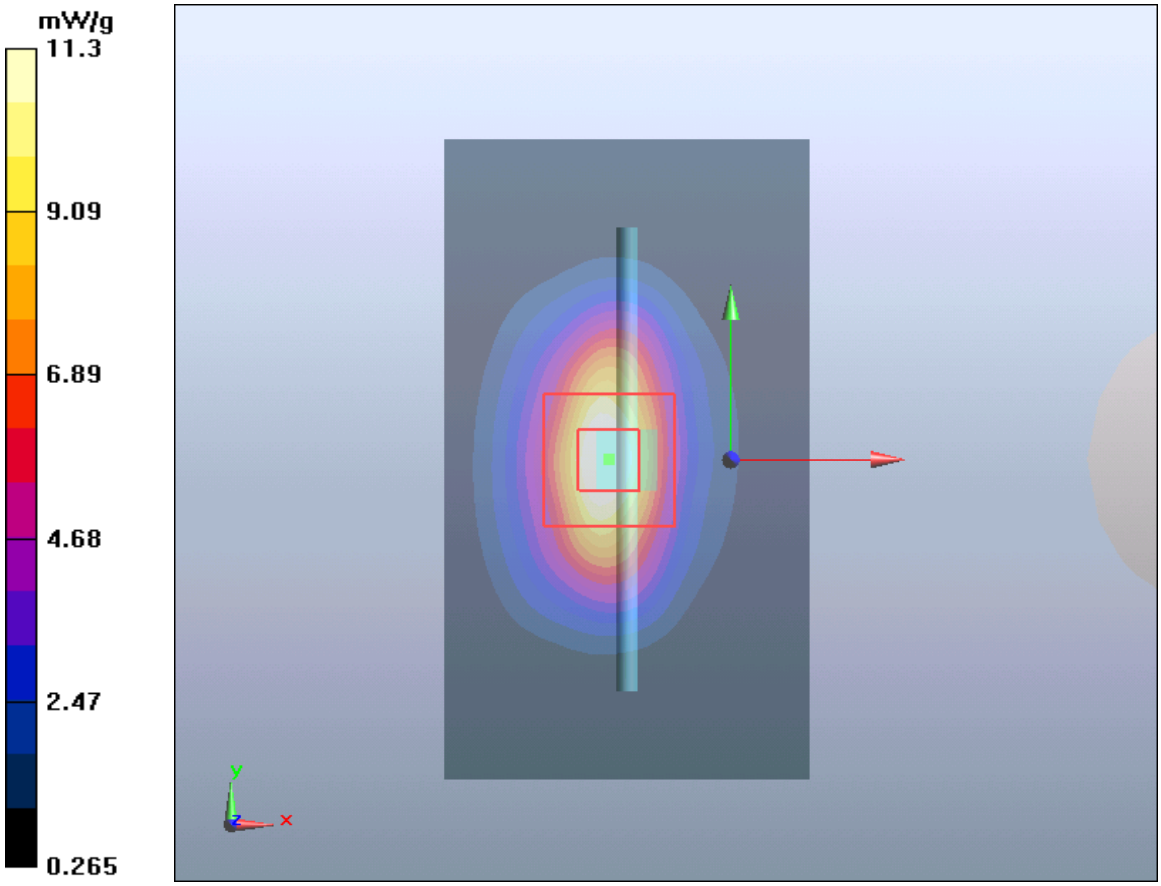


Figure 9 System Performance Check 1900MHz 250mW

System Performance Check at 2450 MHz Body TSL

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

Date: 11/26/2014

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

Medium parameters used: f = 2450 MHz; σ = 1.99 mho/m; ε_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: SAM 2; Type: QD000P40CD; Serial: TP1667

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

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

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

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

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

Peak SAR (extrapolated) = 25.4 W/kg

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

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

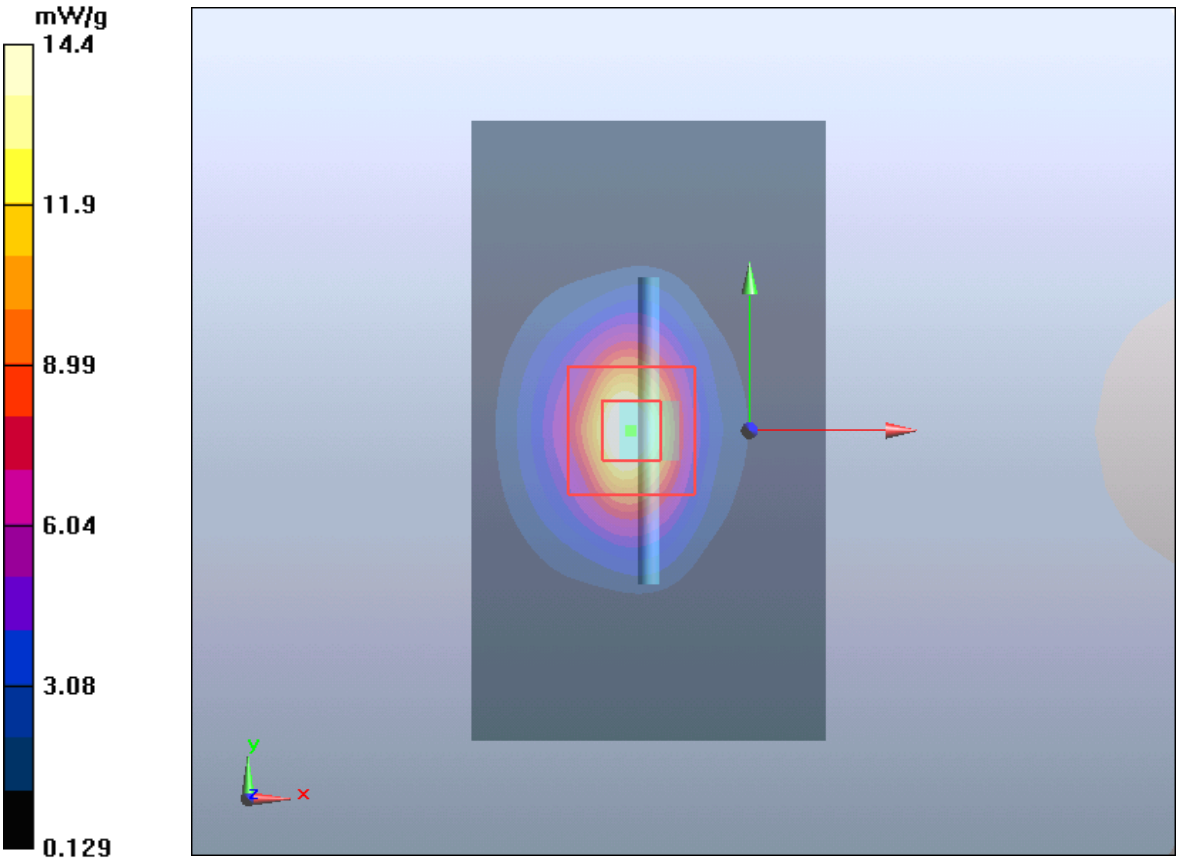


Figure 10 System Performance Check 2450MHz 250Mw

System Performance Check at 5200 MHz Body TSL

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1151

Date: 12/8/2014

Communication System: CW; Frequency: 5200 MHz;Duty Cycle: 1:1

Medium parameters used: f = 5200 MHz; σ =5.18 mho/m; ε_r = 48.7; 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(4.50, 4.50, 4.50); Calibrated: 2/17/2014;

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

Phantom: SAM2; Type: SAM; Serial: TP-1524

Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

d=10mm, Pin=100mW/Area Scan (41x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 7.8 mW/g

d=10mm, Pin=100mW/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 38 V/m; Power Drift = -0.015 dB

Peak SAR (extrapolated) = 22.6 W/kg

SAR(1 g) =7.2 mW/g; SAR(10 g) = 1.96 mW/g

Maximum value of SAR (measured) = 8.52 mW/g

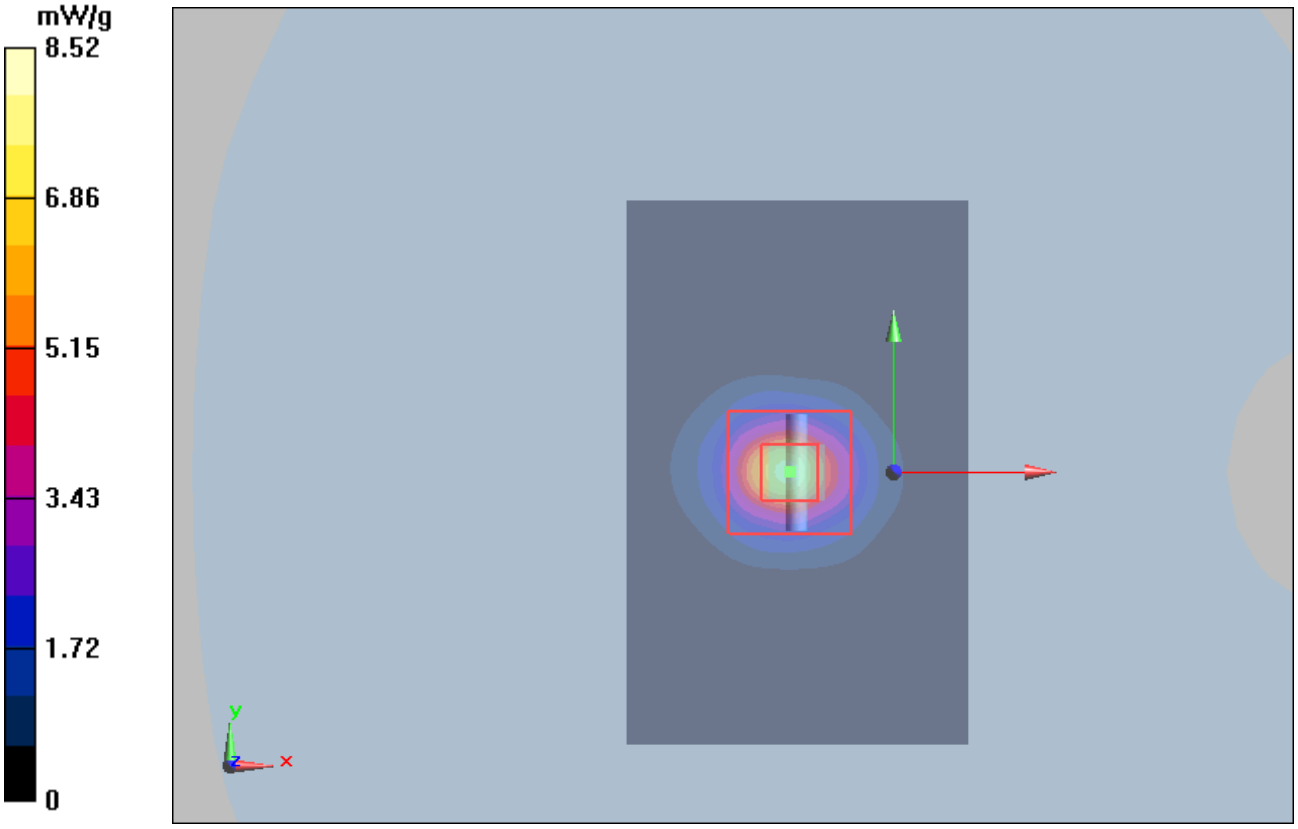


Figure 11 System Performance Check 5200MHz 100mW

System Performance Check at 5600 MHz Body TSL

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1151

Date: 12/9/2014

Communication System: CW; Frequency: 5600 MHz;Duty Cycle: 1:1

Medium parameters used: f = 5600 MHz; σ =5.83 mho/m; ε_r = 48.3; 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(3.87, 3.87, 3.87); Calibrated: 2/17/2014;

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

Phantom: SAM2; Type: SAM; Serial: TP-1524

Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

d=10mm, Pin=100mW/Area Scan (41x101x1): Measurement grid: dx=1.000mm, dy=1.000mm

Maximum value of SAR (interpolated) = 7.84 mW/g

d=10mm, Pin=100mW/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 39 V/m; Power Drift = -0.023 dB

Peak SAR (extrapolated) = 22.8 W/kg

SAR(1 g) = 7.5 mW/g; SAR(10 g) = 2.25 mW/g

Maximum value of SAR (measured) = 8.8 mW/g

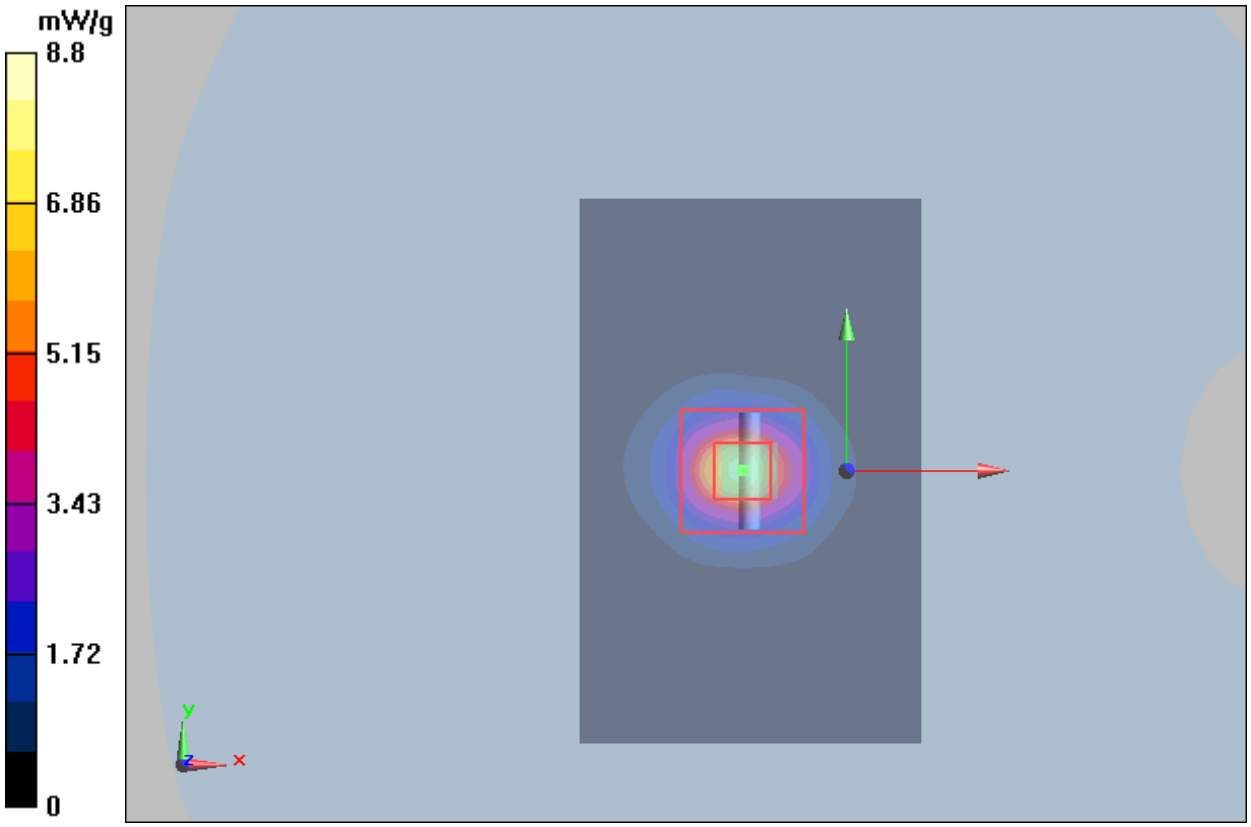


Figure 12 System Performance Check 5800MHz 100mW

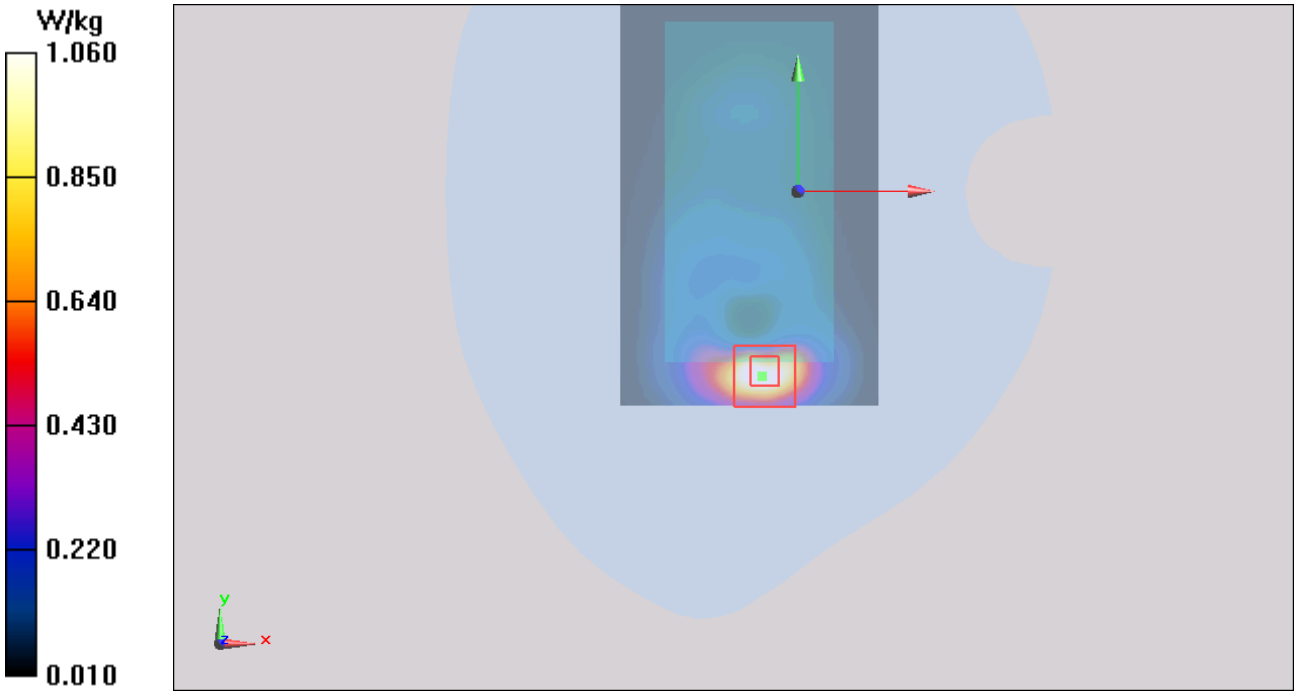
ANNEX C: Plots Results

UMTS Band II with Test Position 1 High

Date: 11/27/2014
Communication System: UID 0, WCDMA (0); Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1908 MHz; σ = 1.532 S/m; ε_r = 53.111; 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)

Test Position 1 High/Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.17 W/kg

Test Position 1 High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.870 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 1.76 W/kg
SAR(1 g) = 0.980 W/kg; SAR(10 g) = 0.464 W/kg
Maximum value of SAR (measured) = 1.06 W/kg



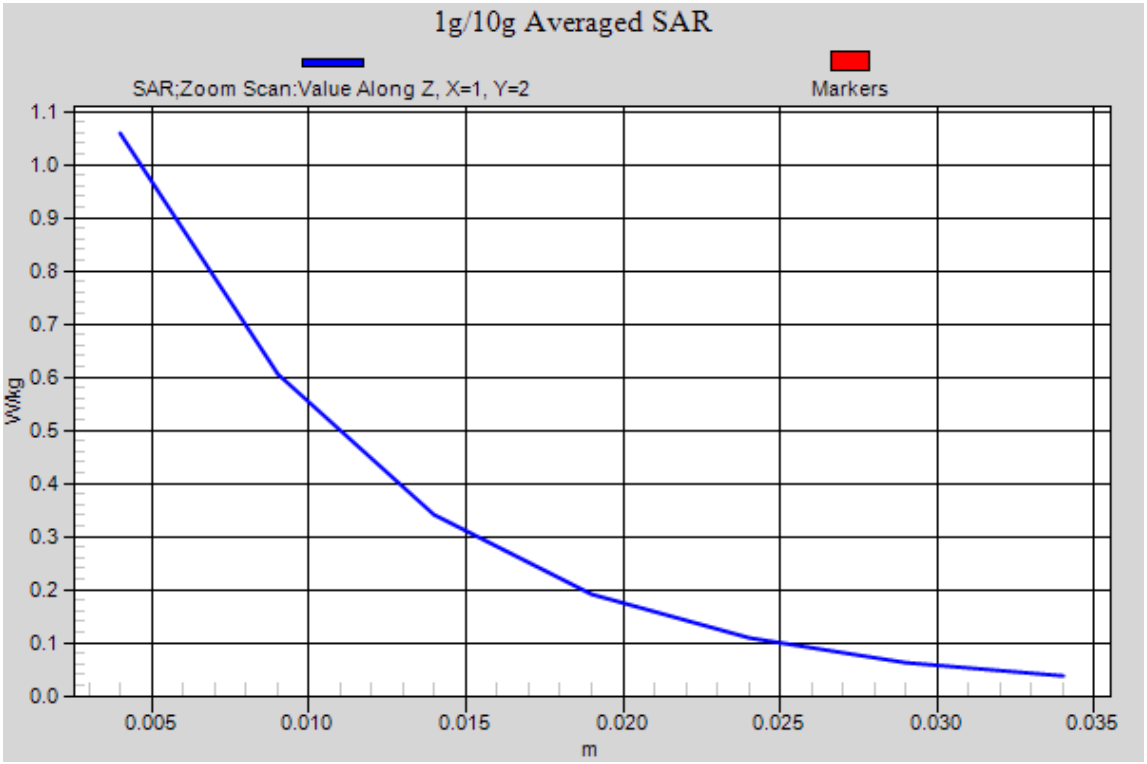


Figure 13 UMTS Band II with Test Position 1 Channel 9538

UMTS Band II with Test Position 1 Middle

Date: 11/27/2014

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

Medium parameters used: f = 1880 MHz; σ = 1.504 S/m; ε_r = 53.137; 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)

Test Position 1 Middle/Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.825 W/kg

Test Position 1 Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.882 V/m; Power Drift = -0.087 dB

Peak SAR (extrapolated) = 1.43 W/kg

SAR(1 g) = 0.781 W/kg; SAR(10 g) = 0.367 W/kg

Maximum value of SAR (measured) = 0.721 W/kg

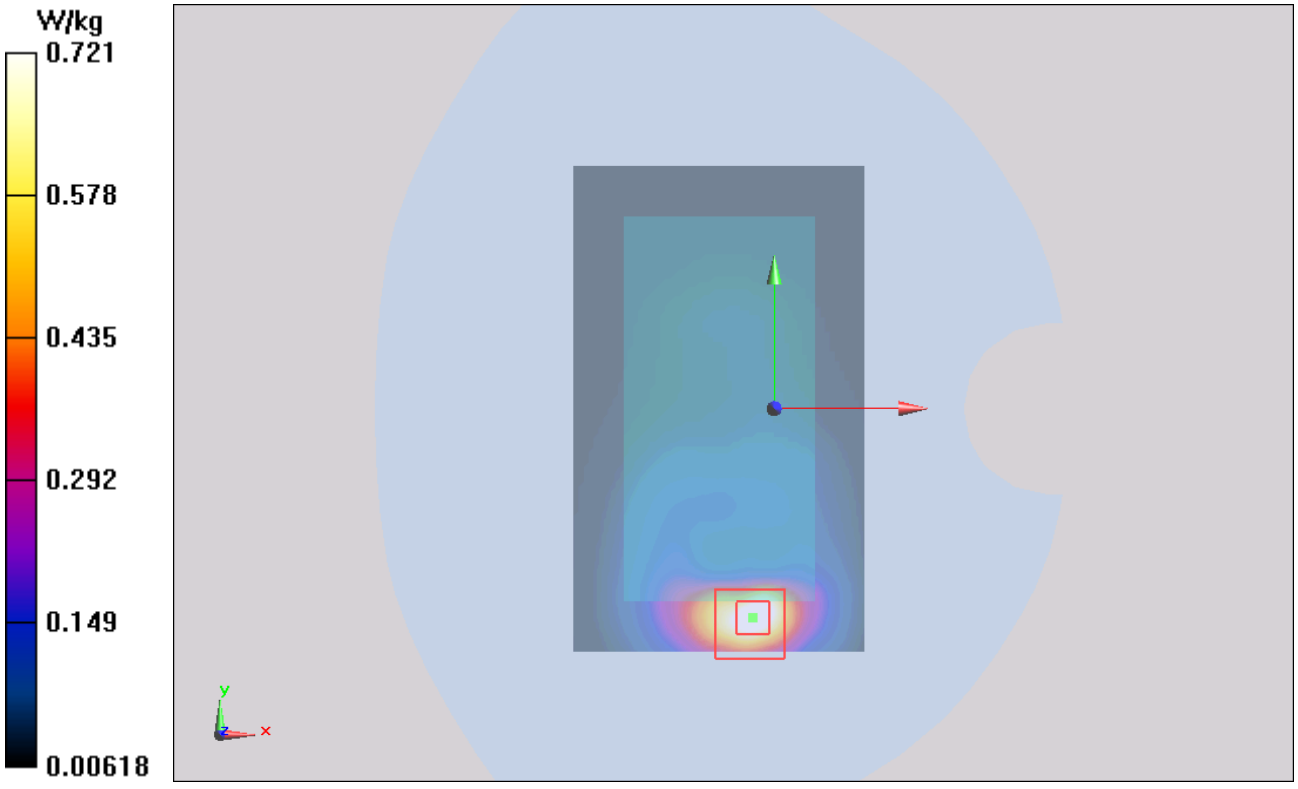


Figure 14 UMTS Band II with Test Position 1 Channel 9400

UMTS Band II with Test Position 1 Low

Date: 11/27/2014
Communication System: UID 0, WCDMA (0); Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.477 S/m; ε_r = 53.168; 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)

Test Position 1 Low/Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.715 W/kg

Test Position 1 Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.669 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 1.16 W/kg
SAR(1 g) = 0.651 W/kg; SAR(10 g) = 0.314 W/kg
Maximum value of SAR (measured) = 0.659 W/kg

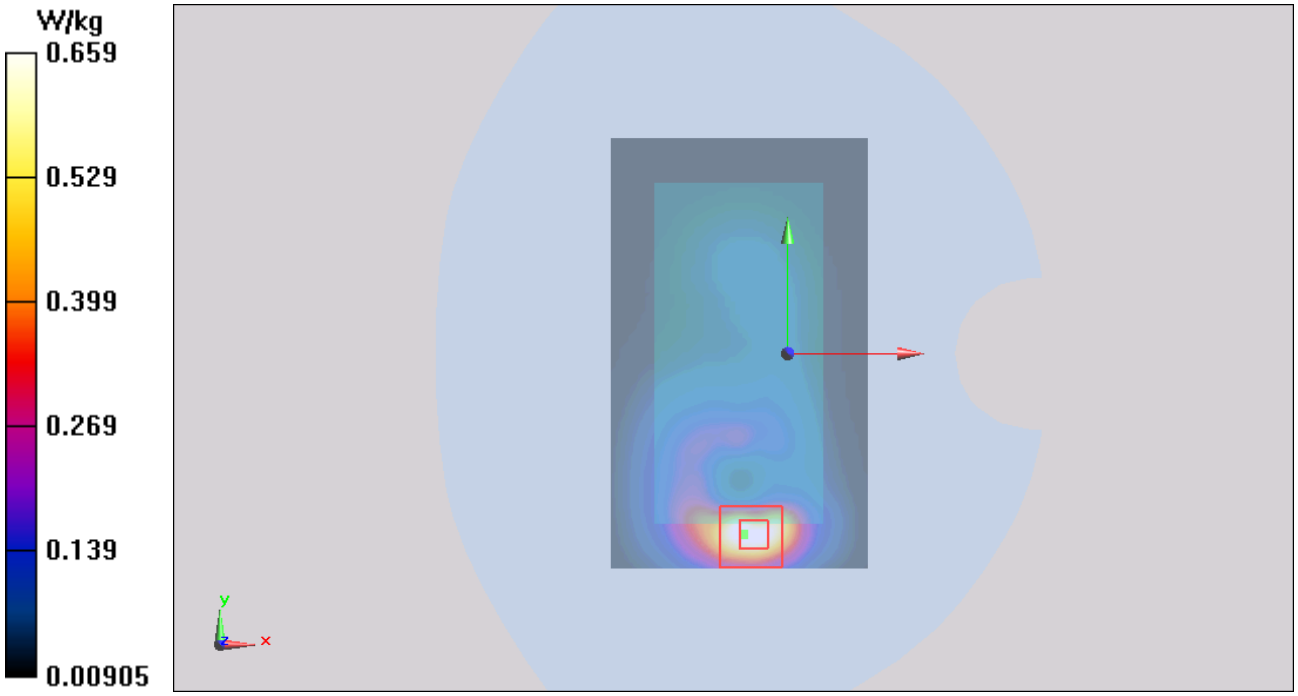


Figure 15 UMTS Band II with Test Position 1 Channel 9262

UMTS Band II with Test Position 2 High

Date: 11/27/2014
Communication System: UID 0, WCDMA (0); Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1908 MHz; σ = 1.532 S/m; ε_r = 53.111; 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)

Test Position 2 High/Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.676 W/kg

Test Position 2 High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.598 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.19 W/kg
SAR(1 g) = 0.686 W/kg; SAR(10 g) = 0.348 W/kg
Maximum value of SAR (measured) = 0.632 W/kg

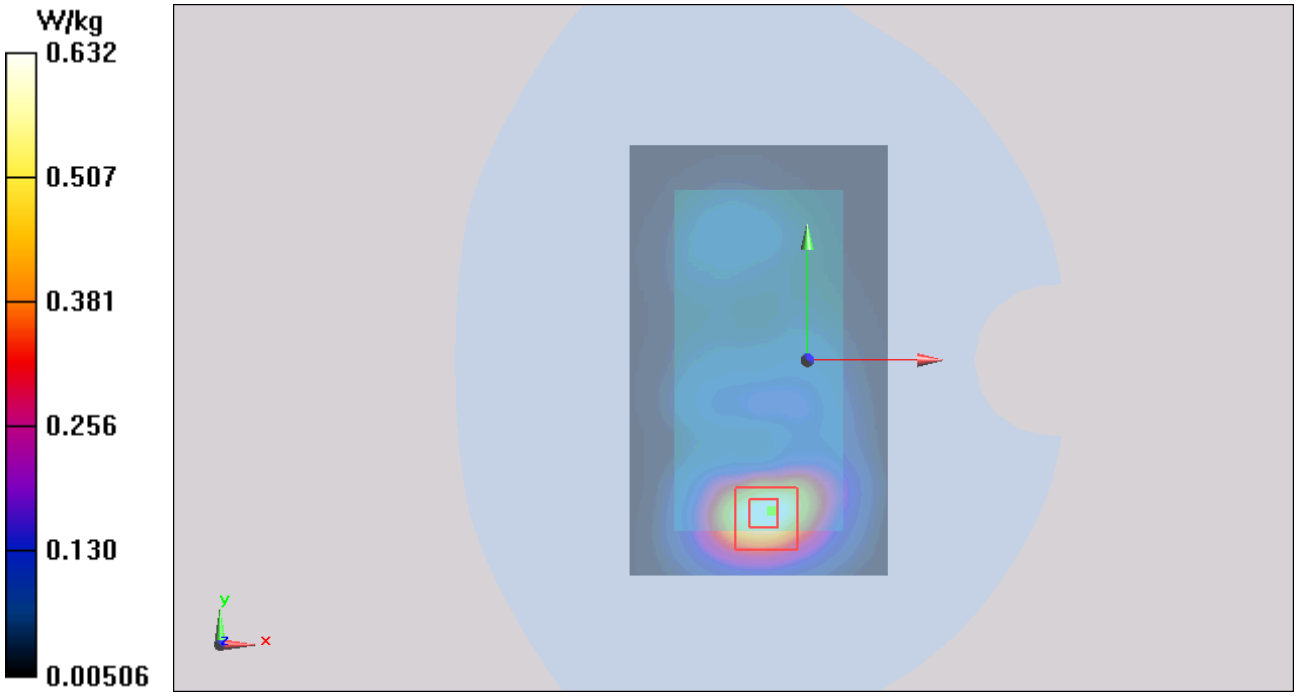


Figure 16 UMTS Band II with Test Position 2 Channel 9538

UMTS Band II with Test Position 2 Middle

Date: 11/27/2014

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

Medium parameters used: f = 1880 MHz; σ = 1.504 S/m; ε_r = 53.137; 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)

Test Position 2 Middle/Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.559 W/kg

Test Position 2 Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.545 V/m; Power Drift = 0.19 dB

Peak SAR (extrapolated) = 0.894 W/kg

SAR(1 g) = 0.520 W/kg; SAR(10 g) = 0.265 W/kg

Maximum value of SAR (measured) = 0.477 W/kg

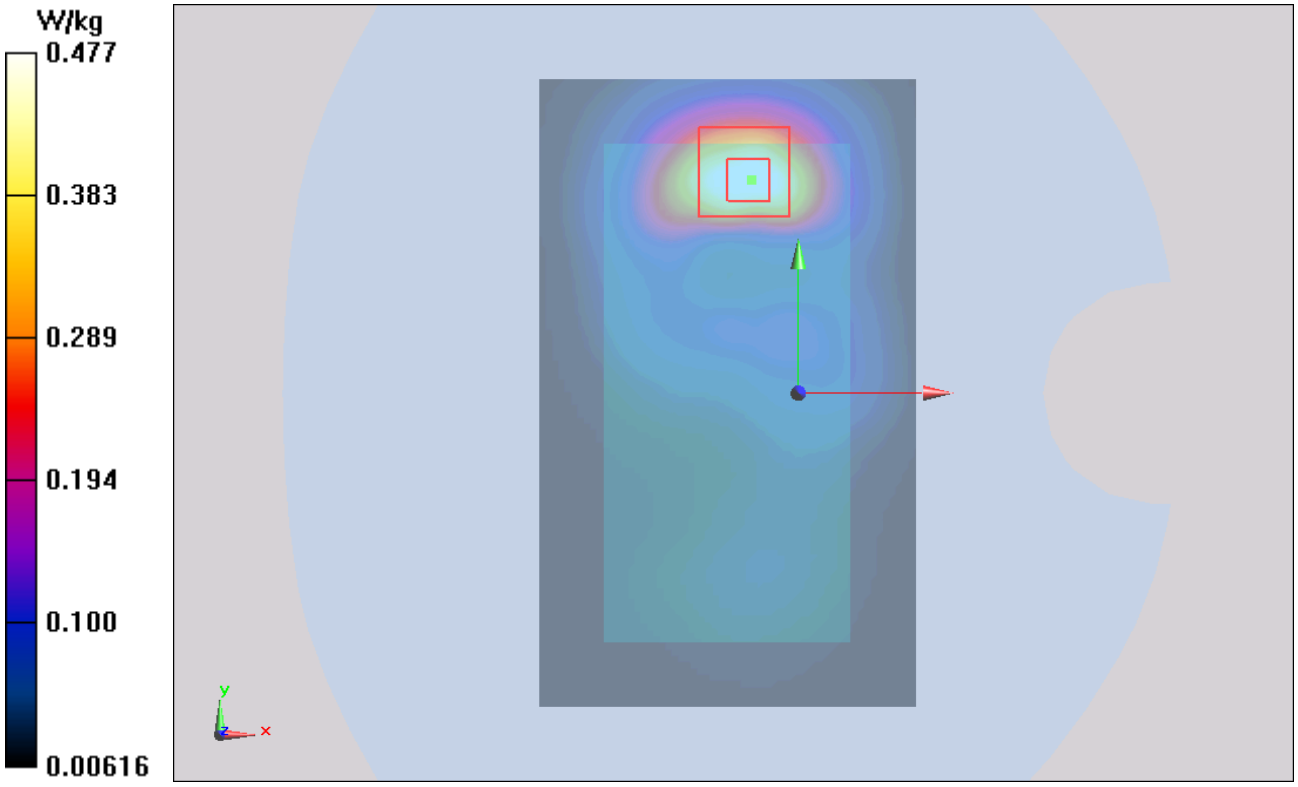


Figure 17 UMTS Band II with Test Position 2 Channel 9400

UMTS Band II with Test Position 2 Low

Date: 11/27/2014
Communication System: UID 0, WCDMA (0); Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.477 S/m; ε_r = 53.168; 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)

Test Position 2 Low/Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.411 W/kg

Test Position 2 Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.354 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.701 W/kg
SAR(1 g) = 0.422 W/kg; SAR(10 g) = 0.220 W/kg
Maximum value of SAR (measured) = 0.433 W/kg

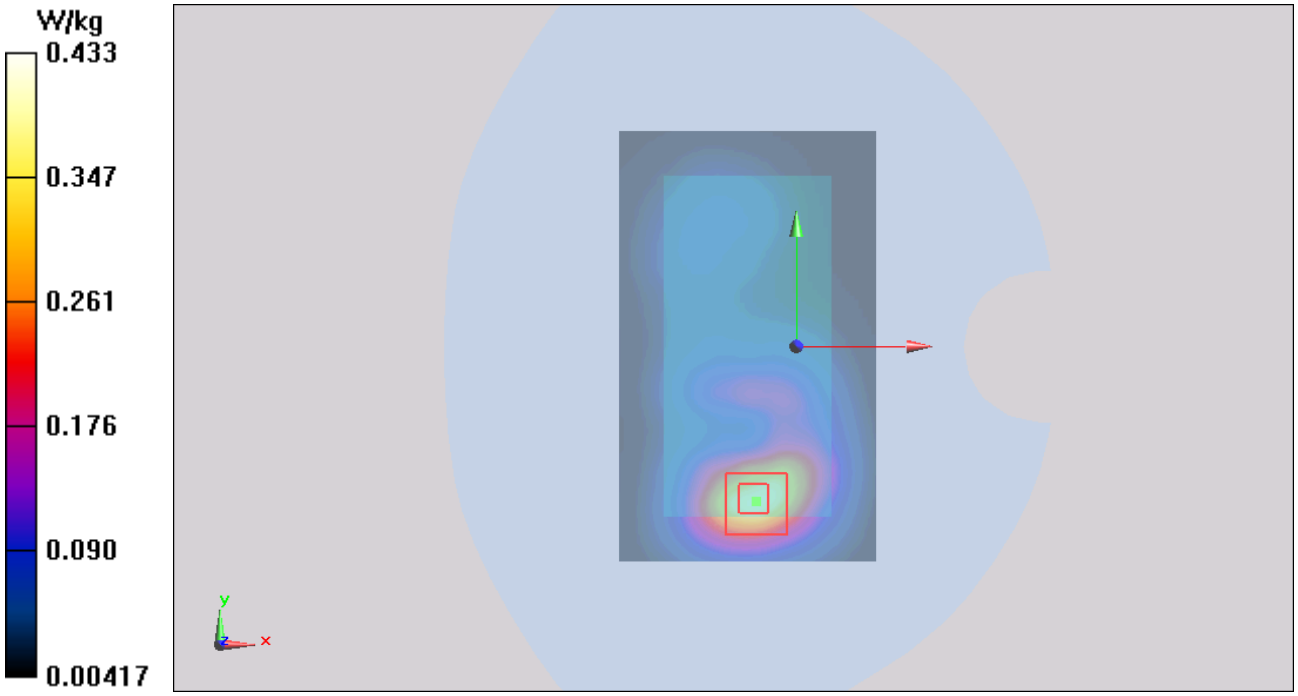


Figure 18 UMTS Band II with Test Position 2 Channel 9262

UMTS Band II with Test Position 4 High

Date: 11/27/2014
Communication System: UID 0, WCDMA (0); Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1908 MHz; σ = 1.532 S/m; ε_r = 53.111; 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)

Test Position 4 High/Area Scan (51x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.956 W/kg

Test Position 4 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 21.773 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.27 W/kg
SAR(1 g) = 0.761 W/kg; SAR(10 g) = 0.393 W/kg
Maximum value of SAR (measured) = 0.746 W/kg

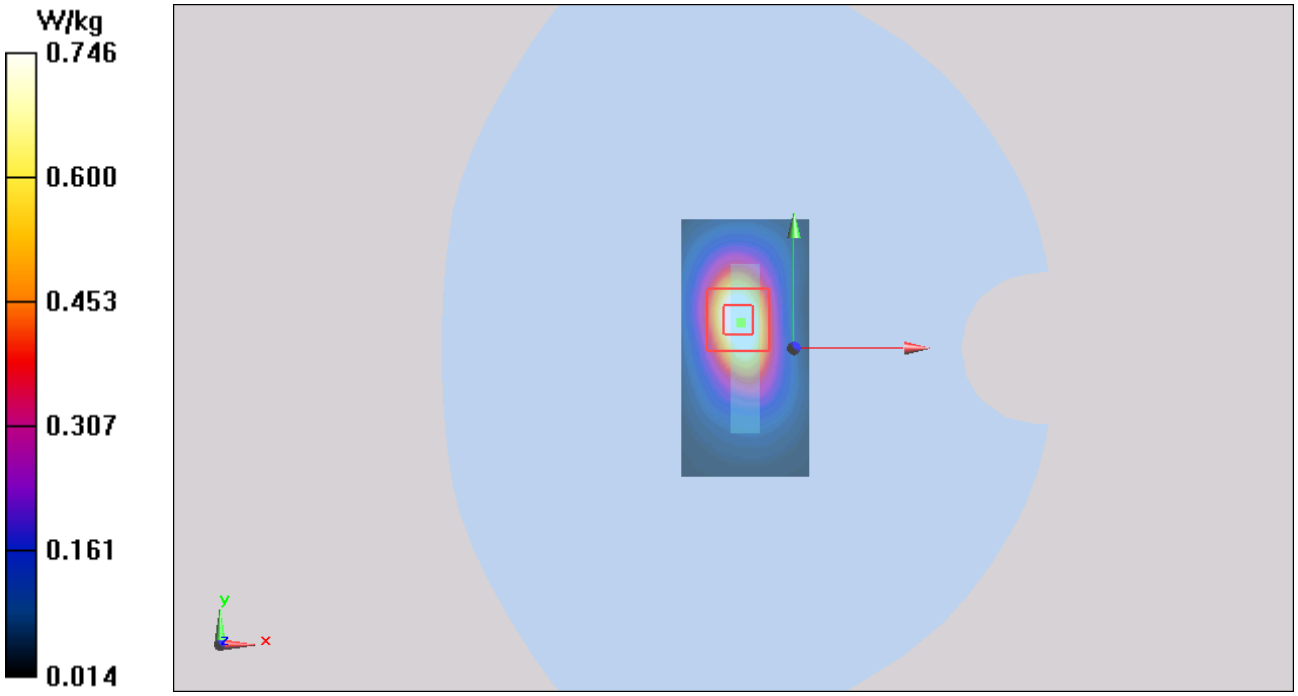


Figure 19 UMTS Band II with Test Position 4 Channel 9538

UMTS Band II with Test Position 4 Middle

Date: 11/27/2014

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

Medium parameters used: f = 1880 MHz; σ = 1.504 S/m; ε_r = 53.137; 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)

Test Position 4 Middle/Area Scan (51x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.687 W/kg

Test Position 4 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 19.489 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.861 W/kg

SAR(1 g) = 0.525 W/kg; SAR(10 g) = 0.273 W/kg

Maximum value of SAR (measured) = 0.485 W/kg

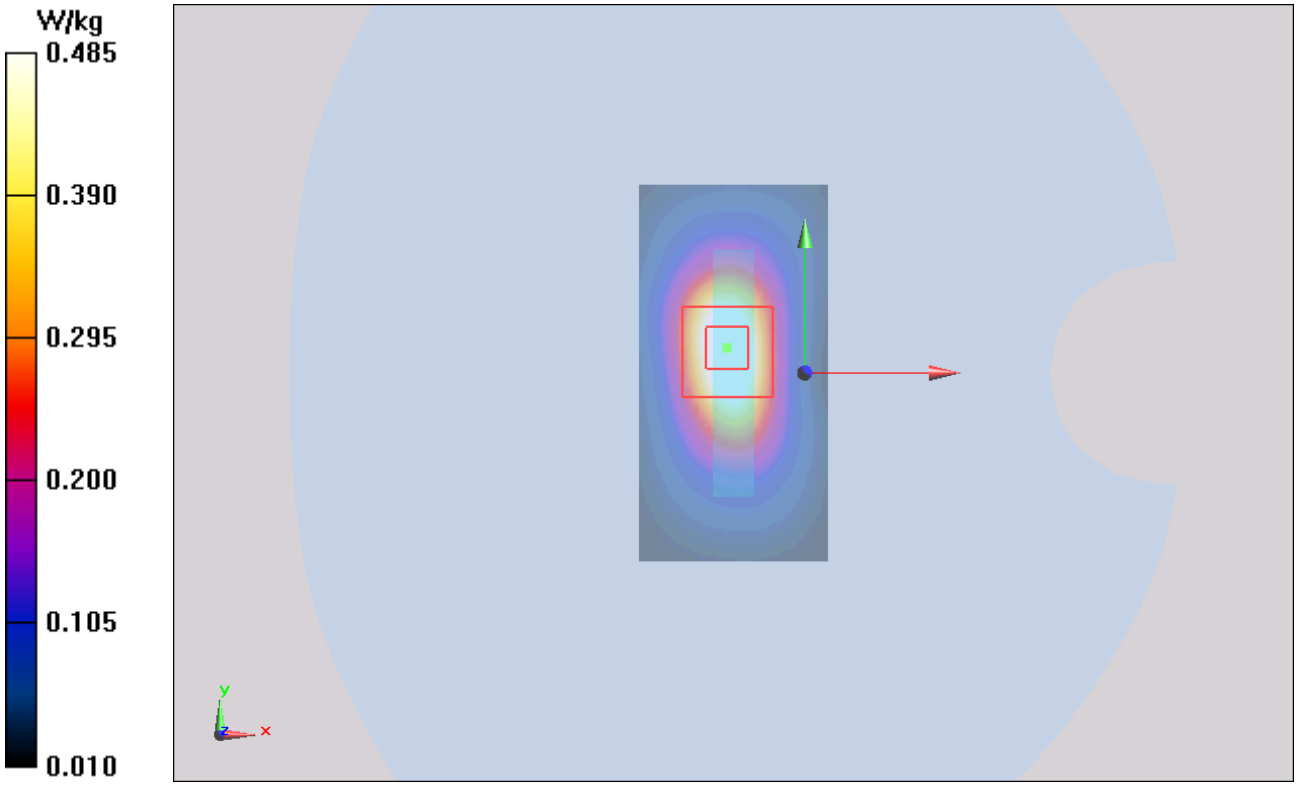


Figure 20 UMTS Band II with Test Position 4 Channel 9400

UMTS Band II with Test Position 4 Low

Date: 11/27/2014
Communication System: UID 0, WCDMA (0); Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.477 S/m; ε_r = 53.168; 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)

Test Position 4 Low/Area Scan (51x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.553 W/kg

Test Position 4 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.259 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.759 W/kg
SAR(1 g) = 0.472 W/kg; SAR(10 g) = 0.249 W/kg
Maximum value of SAR (measured) = 0.447 W/kg

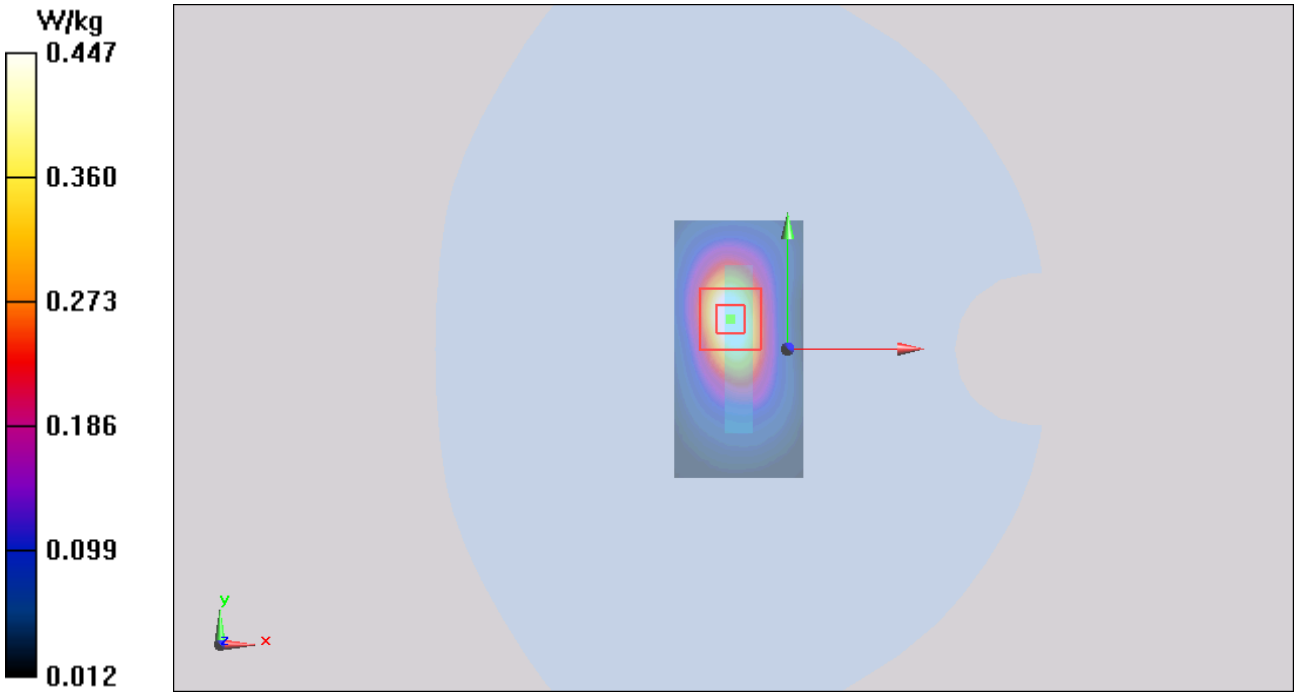


Figure 21 UMTS Band II with Test Position 4 Channel 9262

UMTS Band II with Test Position 5 Middle

Date: 11/27/2014

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

Medium parameters used: f = 1880 MHz; σ = 1.504 S/m; ε_r = 53.137; 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)

Test Position 5 Middle/Area Scan (51x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.148 W/kg

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

Reference Value = 9.359 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.188 W/kg

SAR(1 g) = 0.127 W/kg; SAR(10 g) = 0.077 W/kg

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

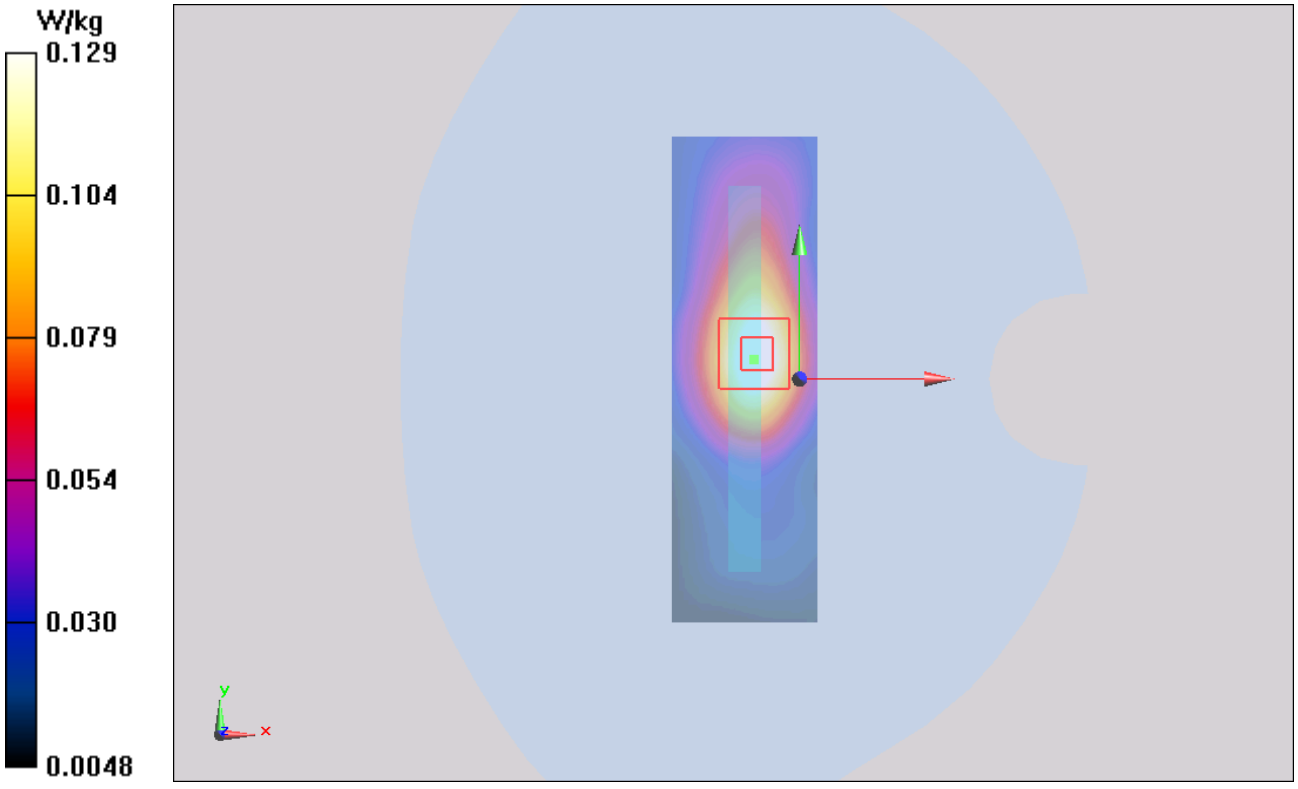


Figure 22 UMTS Band II with Test Position 5 Channel 9400

UMTS Band II with Test Position 6 Middle

Date: 11/27/2014

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

Medium parameters used: f = 1880 MHz; σ = 1.504 S/m; ε_r = 53.137; 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)

Test Position 6 Middle/Area Scan (51x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.237 W/kg

Test Position 6 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.925 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 0.308 W/kg

SAR(1 g) = 0.205 W/kg; SAR(10 g) = 0.120 W/kg

Maximum value of SAR (measured) = 0.201 W/kg

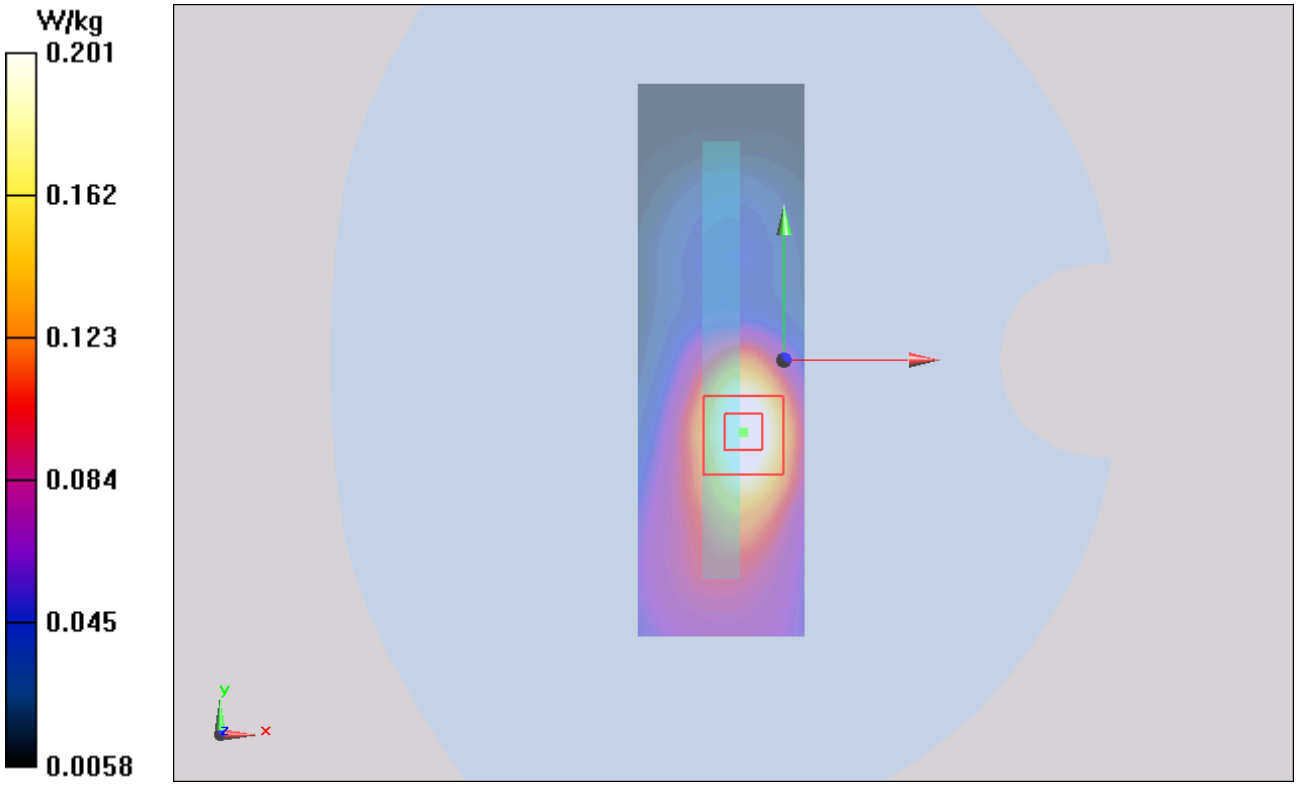


Figure 23 UMTS Band II with Test Position 6 Channel 9400

UMTS Band II with Test Position 1 High (1st Repeated SAR)

Date: 11/27/2014

Communication System: UID 0, WCDMA (0); Frequency: 1907.6 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1908 MHz; σ = 1.49 S/m; ε_r = 52.946; 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)

Test Position 1 High/Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.14 W/kg

Test Position 1 High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.870 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 1.71 W/kg

SAR(1 g) = 0.953 W/kg; SAR(10 g) = 0.451 W/kg

Maximum value of SAR (measured) = 1.03 W/kg

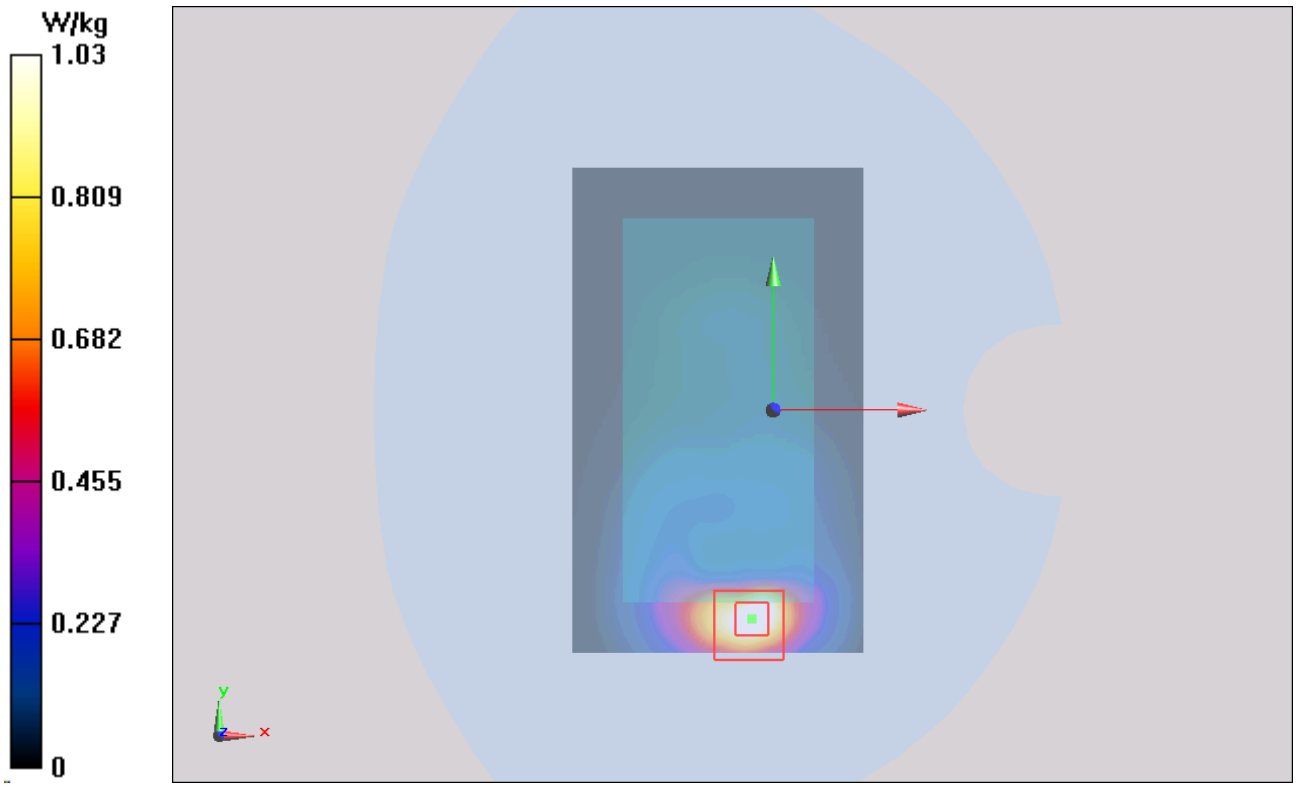


Figure 24 UMTS Band II with Test Position 1 Channel 9538

UMTS Band V with Test Position 1 Middle

Date: 11/27/2014

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

Medium parameters used: f = 837 MHz; σ = 0.992 S/m; ε_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)

Test Position 1 Middle/Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.190 W/kg

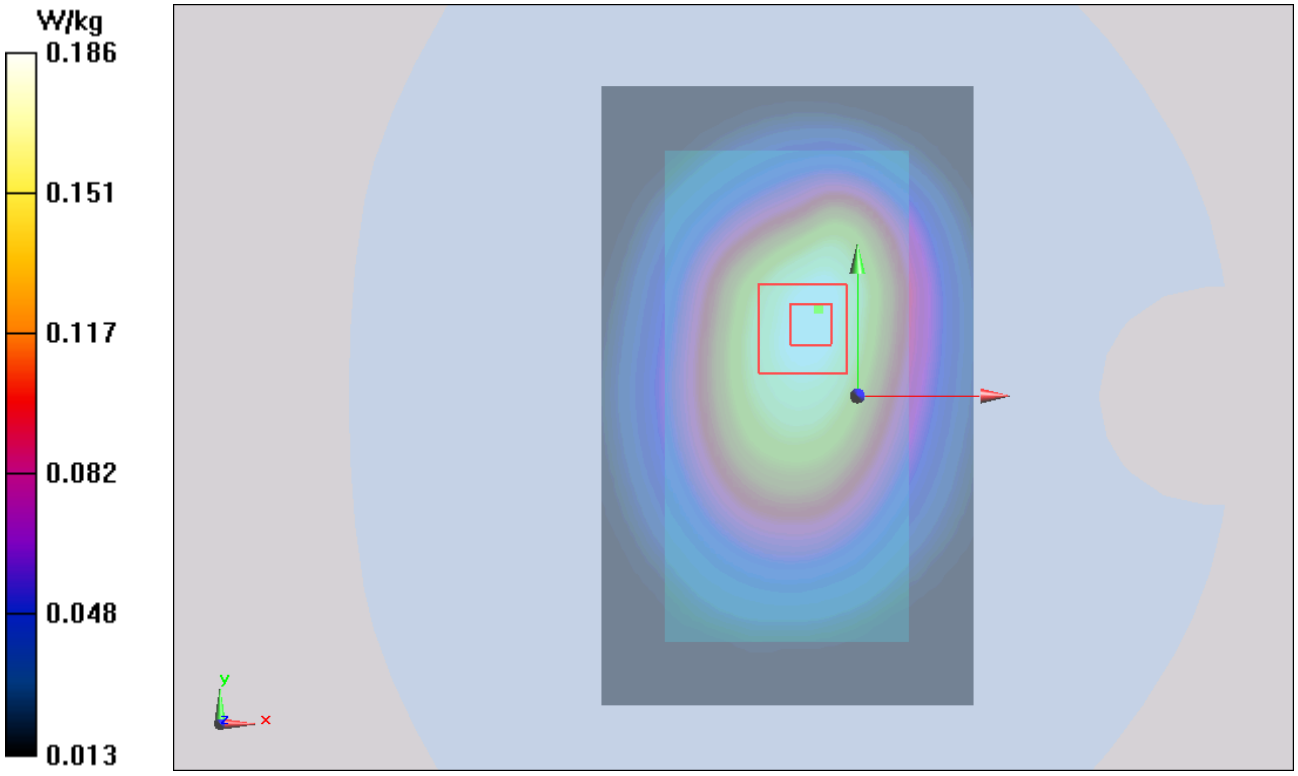
Test Position 1 Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 13.281 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 0.229 W/kg

SAR(1 g) = 0.178 W/kg; SAR(10 g) = 0.130 W/kg

Maximum value of SAR (measured) = 0.186 W/kg



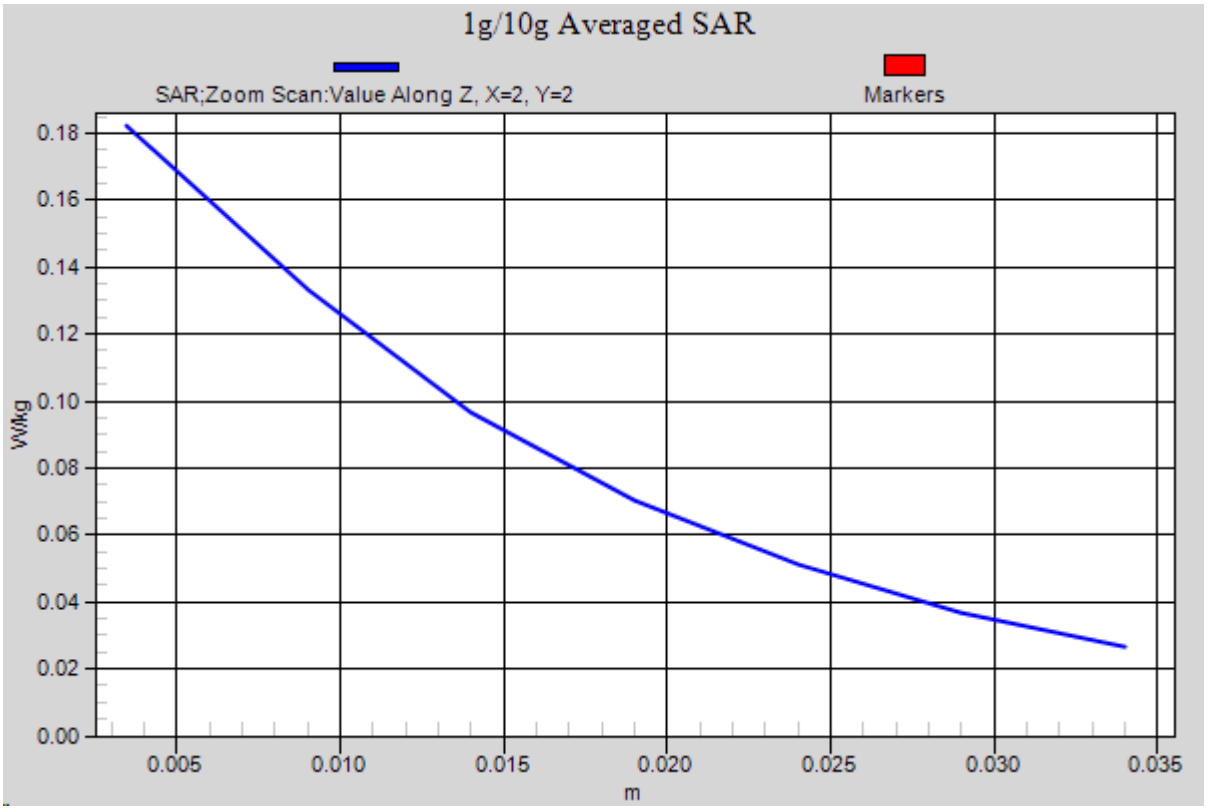


Figure 25 UMTS Band V with Test Position 1 Channel 4183

UMTS Band V with Test Position 2 Middle

Date: 11/27/2014

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

Medium parameters used: f = 837 MHz; σ = 0.992 S/m; ε_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)

Test Position 2 Middle/Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.150 W/kg

Test Position 2 Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 12.096 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 0.178 W/kg

SAR(1 g) = 0.142 W/kg; SAR(10 g) = 0.105 W/kg

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

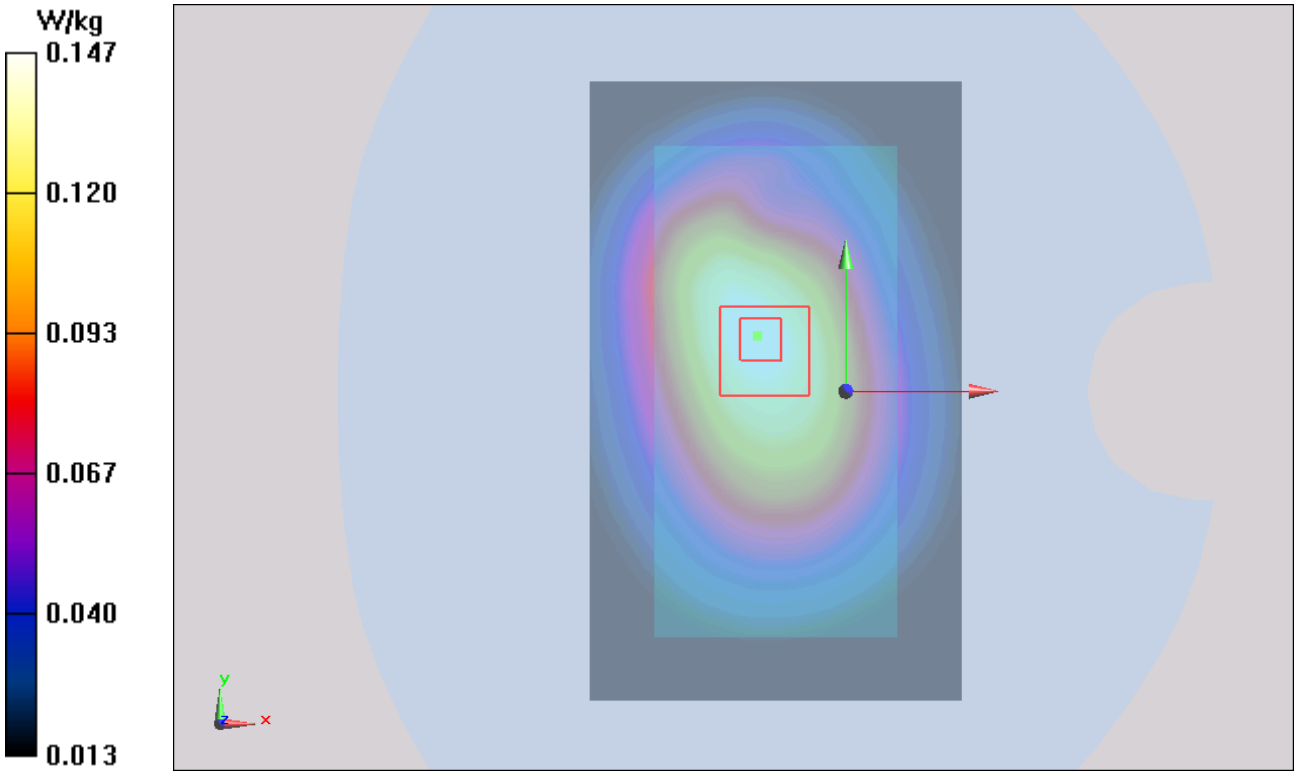


Figure 26 UMTS Band V with Test Position 2 Channel 4183

UMTS Band V with Test Position 4 Middle

Date: 11/27/2014

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

Medium parameters used: f = 837 MHz; σ = 0.992 S/m; ε_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)

Test Position 4 Middle/Area Scan (51x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.00940 W/kg

Test Position 4 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 3.275 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 0.0130 W/kg

SAR(1 g) = 0.00993 W/kg; SAR(10 g) = 0.00668 W/kg

Maximum value of SAR (measured) = 0.0109 W/kg

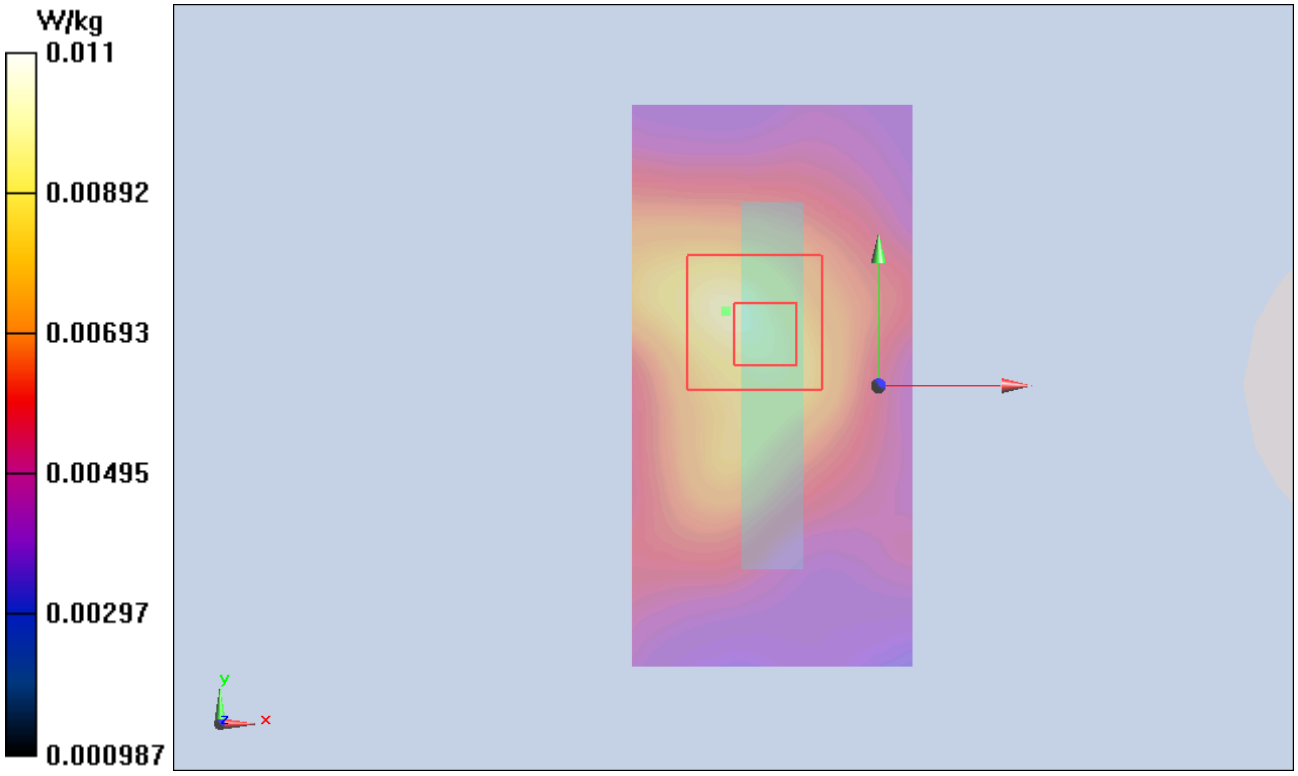


Figure 27 UMTS Band V with Test Position 4 Channel 4183

UMTS Band V with Test Position 5 Middle

Date: 11/27/2014

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

Medium parameters used: f = 837 MHz; σ = 0.992 S/m; ε_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)

Test Position 5 Low/Area Scan (51x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.0799 W/kg

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

Reference Value = 8.756 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.0960 W/kg

SAR(1 g) = 0.073 W/kg; SAR(10 g) = 0.051 W/kg

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

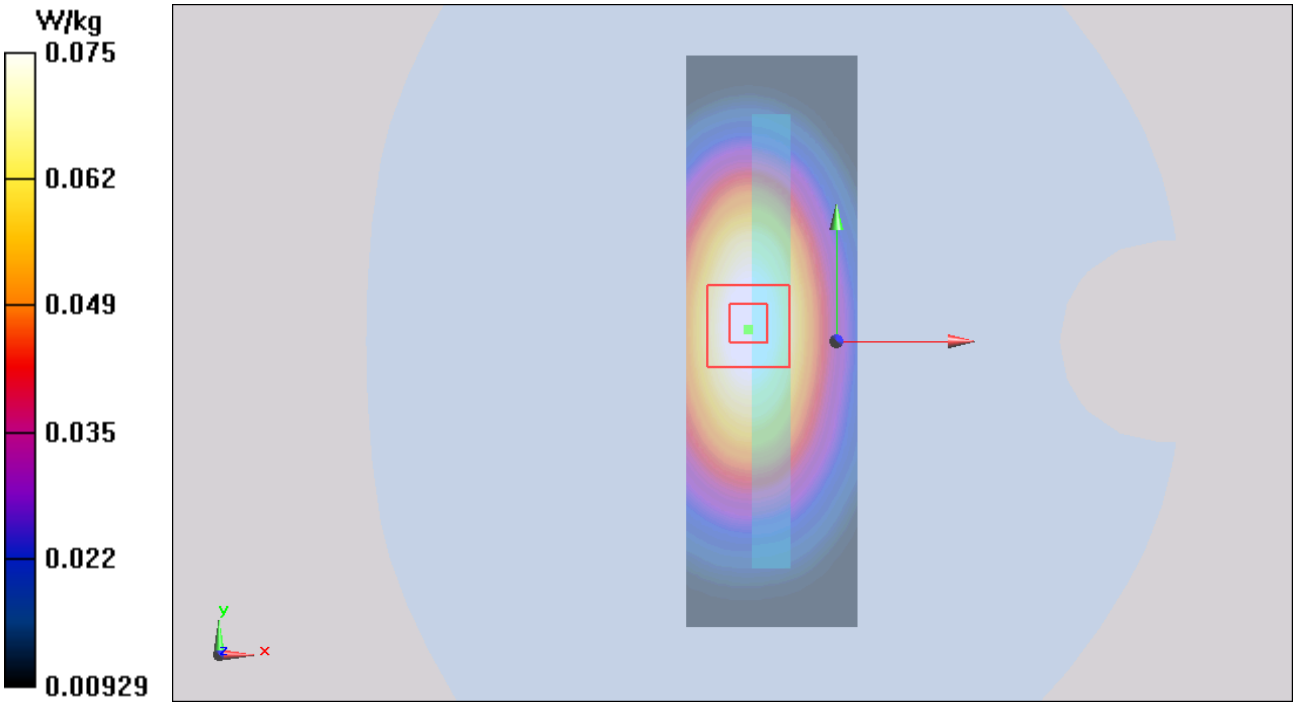


Figure 28 UMTS Band V with Test Position 5 Channel 4183

UMTS Band V with Test Position 6 Middle

Date: 11/27/2014

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

Medium parameters used: f = 837 MHz; σ = 0.992 S/m; ε_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)

Test Position 6 Low/Area Scan (51x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.0857 W/kg

Test Position 6 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.560 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.106 W/kg

SAR(1 g) = 0.081 W/kg; SAR(10 g) = 0.058 W/kg

Maximum value of SAR (measured) = 0.0843 W/kg

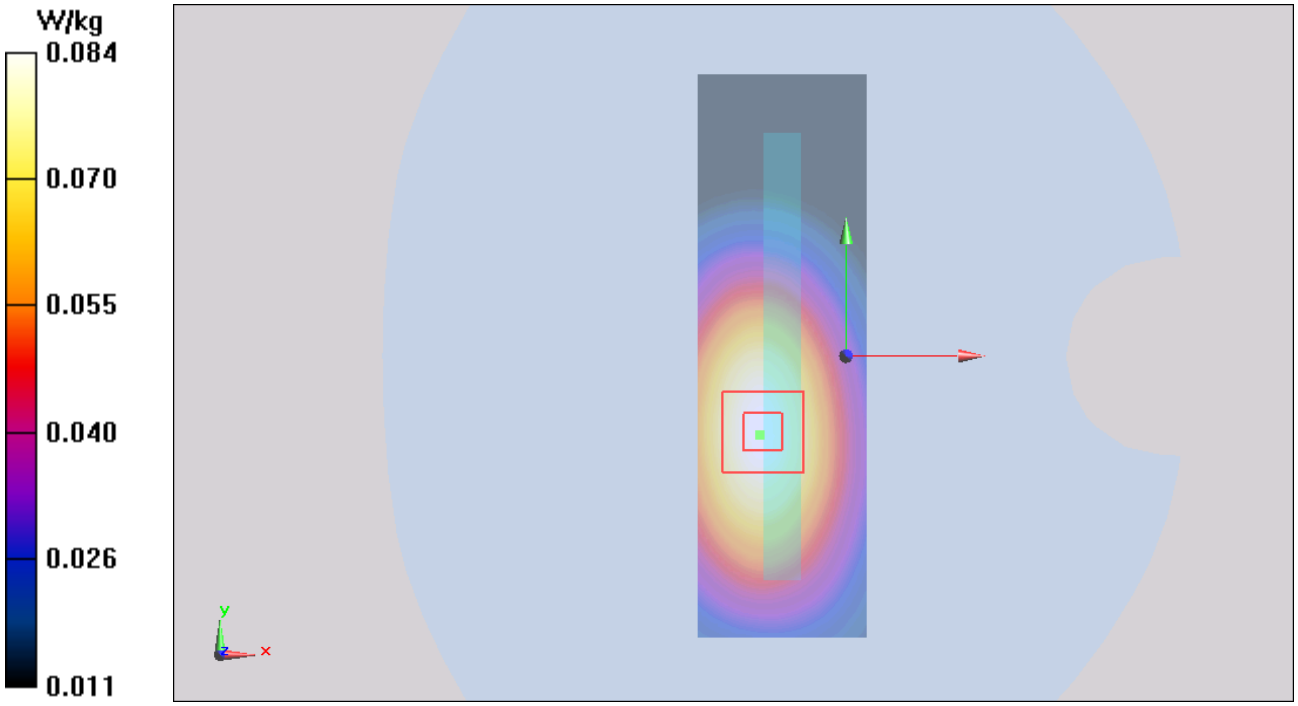


Figure 29 UMTS Band V with Test Position 6 Channel 4183

LTE Band 17 with Test Position 1 Low (1RB)

Date: 11/25/2014
Communication System: UID 0, LTE (0); Frequency: 709 MHz;Duty Cycle: 1:1
Medium parameters used: f = 709 MHz; σ = 0.93 S/m; ε_r = 54.74; 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(9.78, 9.78, 9.78); 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)

Test Position 1 Low/Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.0906 W/kg

Test Position 1 Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.176 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.117 W/kg
SAR(1 g) = 0.085 W/kg; SAR(10 g) = 0.060 W/kg
Maximum value of SAR (measured) = 0.0883 W/kg

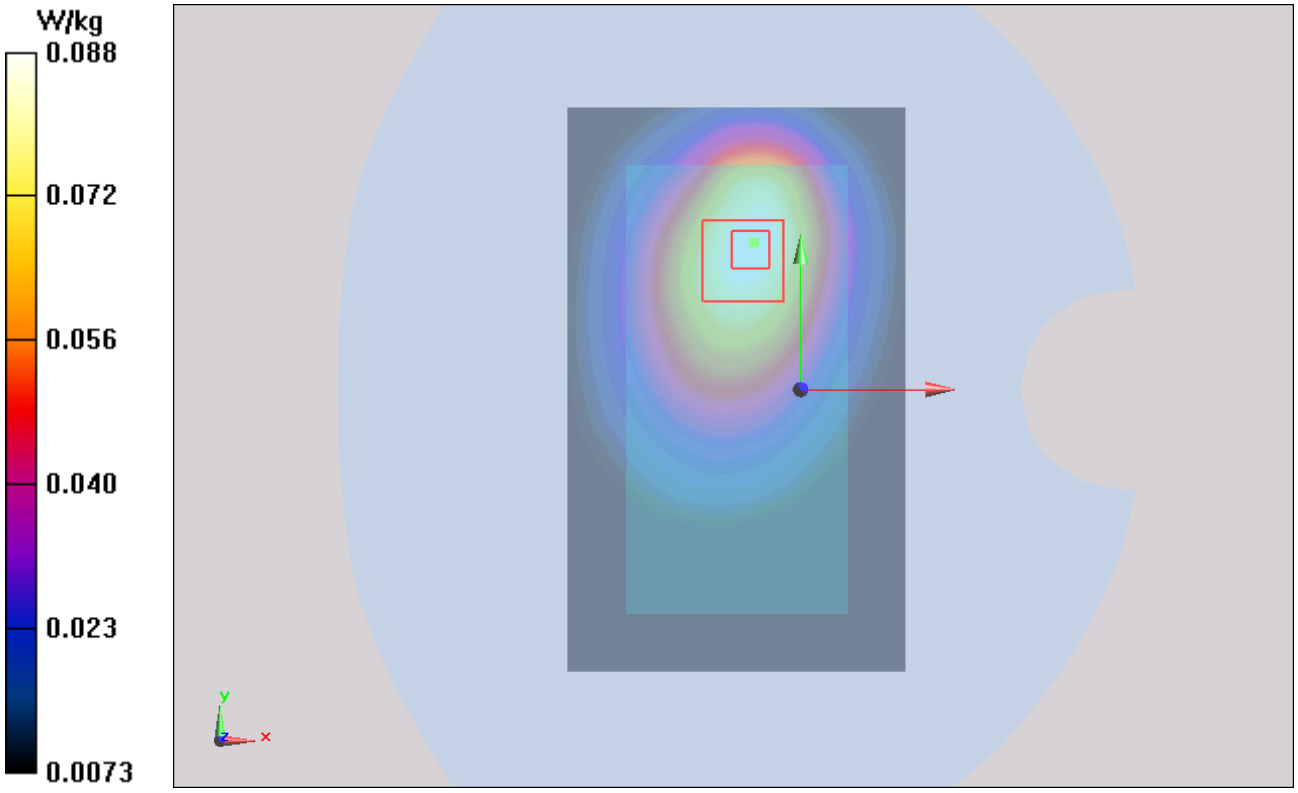


Figure 30 LTE Band 17 with Test Position 1 Channel 23780

LTE Band 17 with Test Position 2 Low (1RB)

Date: 11/25/2014
Communication System: UID 0, LTE (0); Frequency: 709 MHz;Duty Cycle: 1:1
Medium parameters used: f = 709 MHz; σ = 0.93 S/m; ε_r = 54.74; 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(9.78, 9.78, 9.78); 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)

Test Position 2 Low/Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.0733 W/kg

Test Position 2 Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.833 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.0960 W/kg
SAR(1 g) = 0.069 W/kg; SAR(10 g) = 0.048 W/kg
Maximum value of SAR (measured) = 0.0722 W/kg

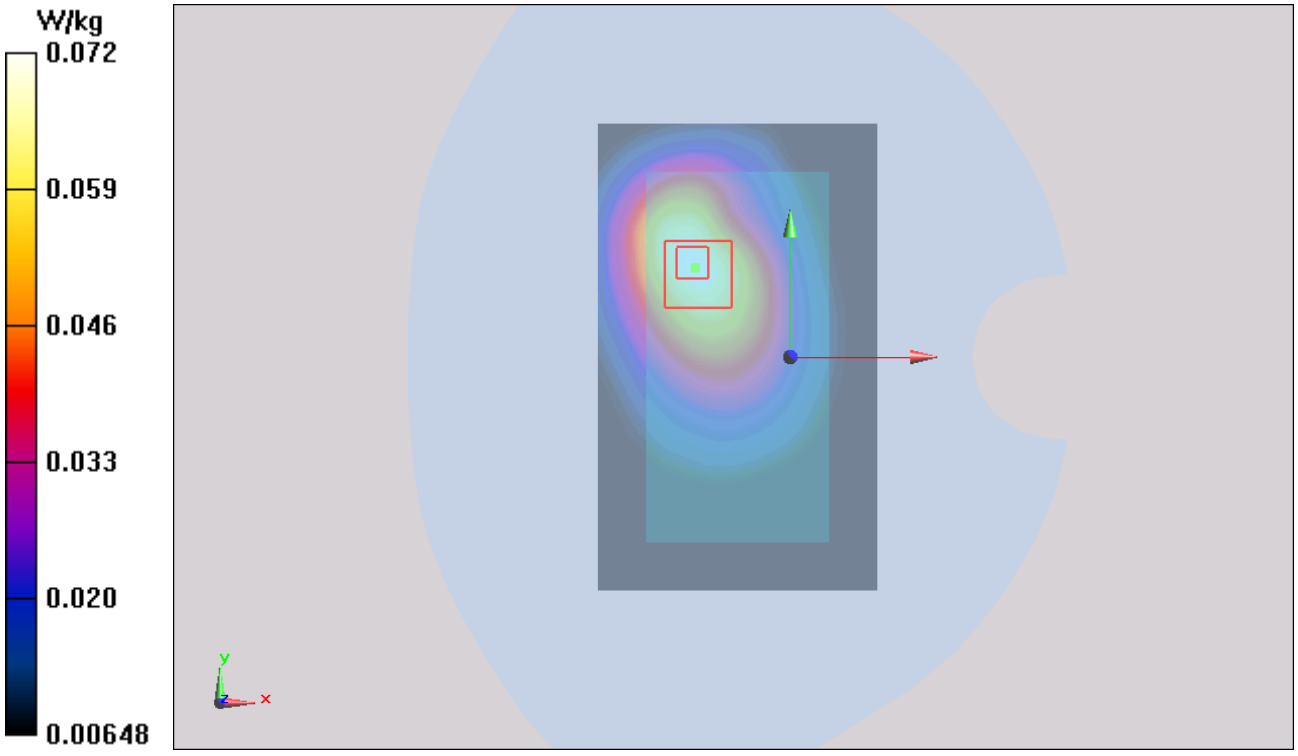


Figure 31 LTE Band 17 with Test Position 2 Channel 23780

LTE Band 17 with Test Position 4 Low (1RB)

Date: 11/25/2014
Communication System: UID 0, LTE (0); Frequency: 709 MHz;Duty Cycle: 1:1
Medium parameters used: f = 709 MHz; σ = 0.93 S/m; ε_r = 54.74; 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(9.78, 9.78, 9.78); 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)

Test Position 4 Low/Area Scan (51x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.00955 W/kg

Test Position 4 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.893 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 0.0160 W/kg
SAR(1 g) = 0.00964 W/kg; SAR(10 g) = 0.00595 W/kg
Maximum value of SAR (measured) = 0.0107 W/kg

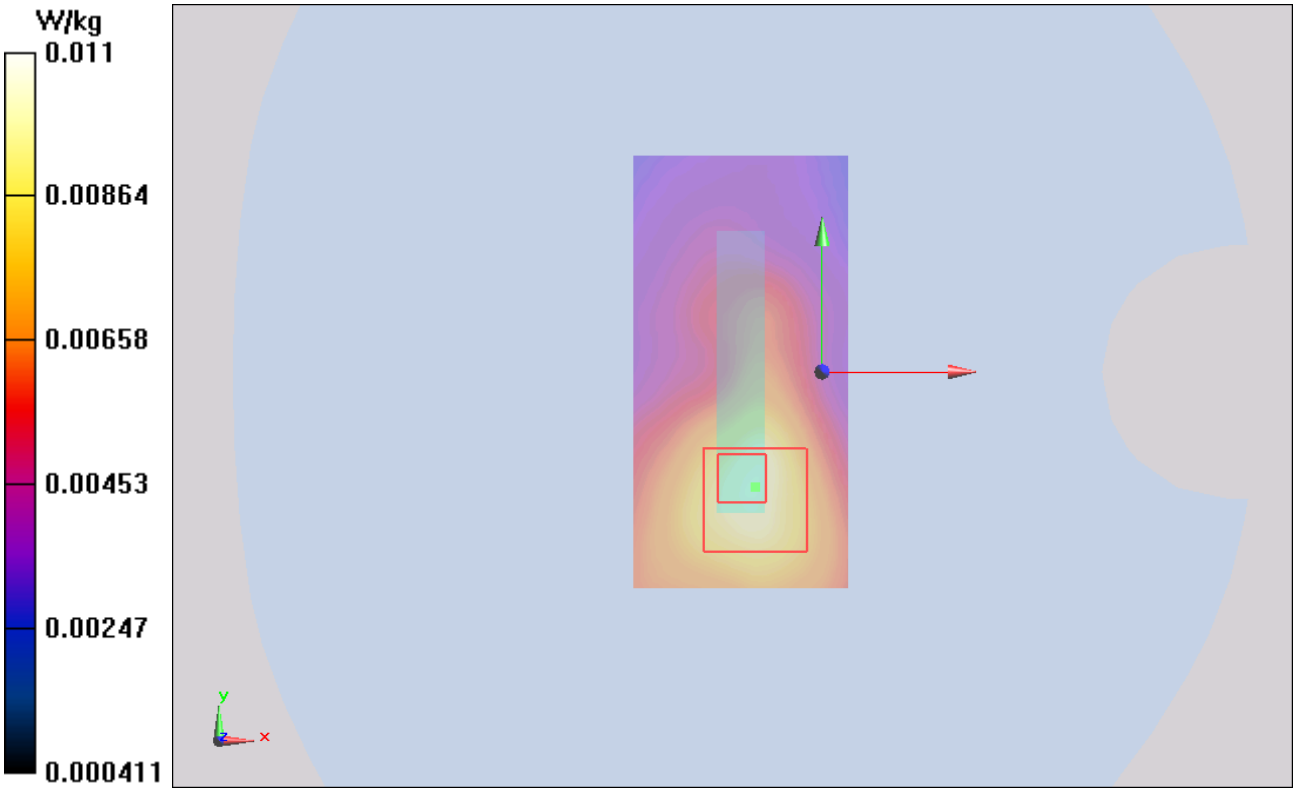


Figure 32 LTE Band 17 with Test Position 4 Channel 23780

LTE Band 17 with Test Position 5 Low (1RB)

Date: 11/25/2014
Communication System: UID 0, LTE (0); Frequency: 709 MHz;Duty Cycle: 1:1
Medium parameters used: f = 709 MHz; σ = 0.93 S/m; ε_r = 54.74; 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(9.78, 9.78, 9.78); 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)

Test Position 5 Low/Area Scan (51x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0113 W/kg

Test Position 5 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.467 V/m; Power Drift = 0.026 dB
Peak SAR (extrapolated) = 0.0140 W/kg
SAR(1 g) = 0.011 W/kg; SAR(10 g) = 0.0076 W/kg
Maximum value of SAR (measured) = 0.0110 W/kg

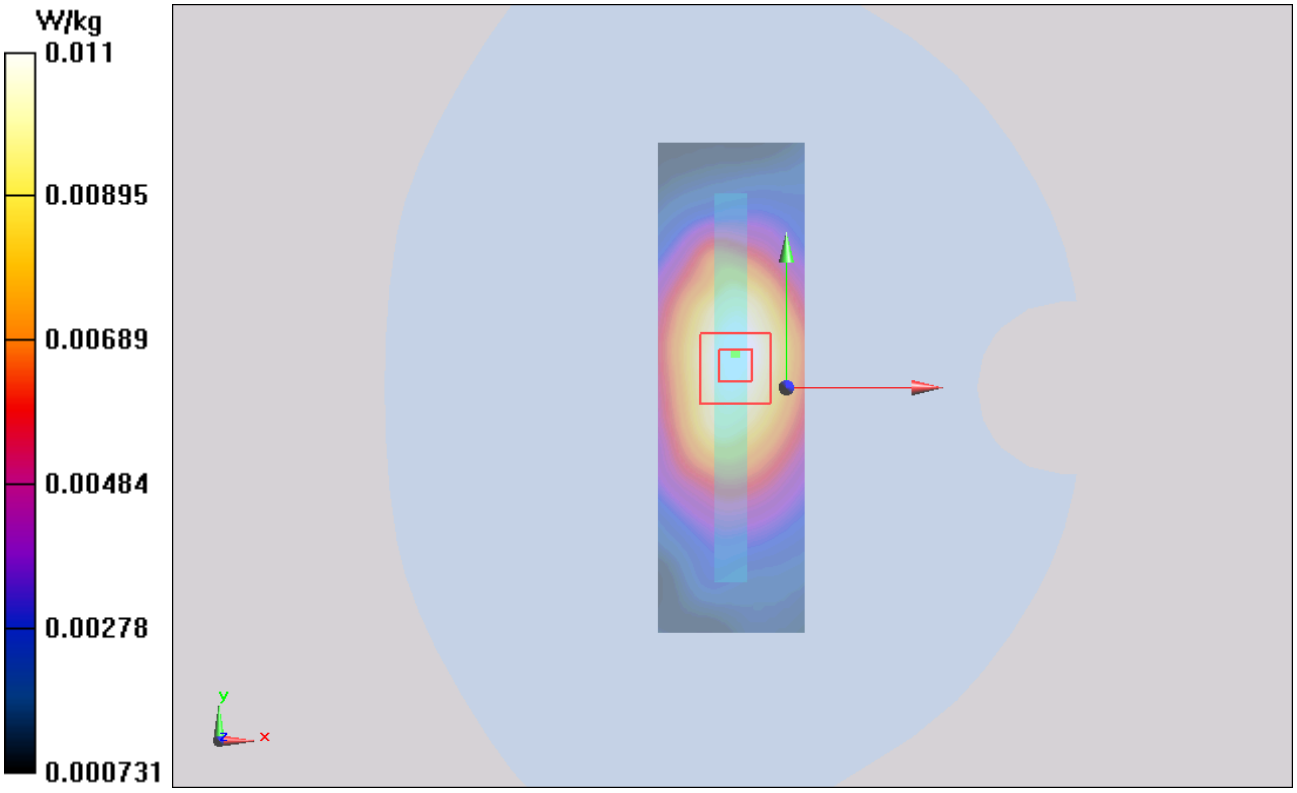


Figure 33 LTE Band 17 with Test Position 5 Channel 23780

LTE Band 17 with Test Position 6 Low (1RB)

Date: 11/25/2014
Communication System: UID 0, LTE (0); Frequency: 709 MHz;Duty Cycle: 1:1
Medium parameters used: f = 709 MHz; σ = 0.93 S/m; ε_r = 54.74; 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(9.78, 9.78, 9.78); 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)

Test Position 6 Low/Area Scan (51x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0190 W/kg

Test Position 6 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.076 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.0240 W/kg
SAR(1 g) = 0.018 W/kg; SAR(10 g) = 0.013 W/kg
Maximum value of SAR (measured) = 0.0187 W/kg

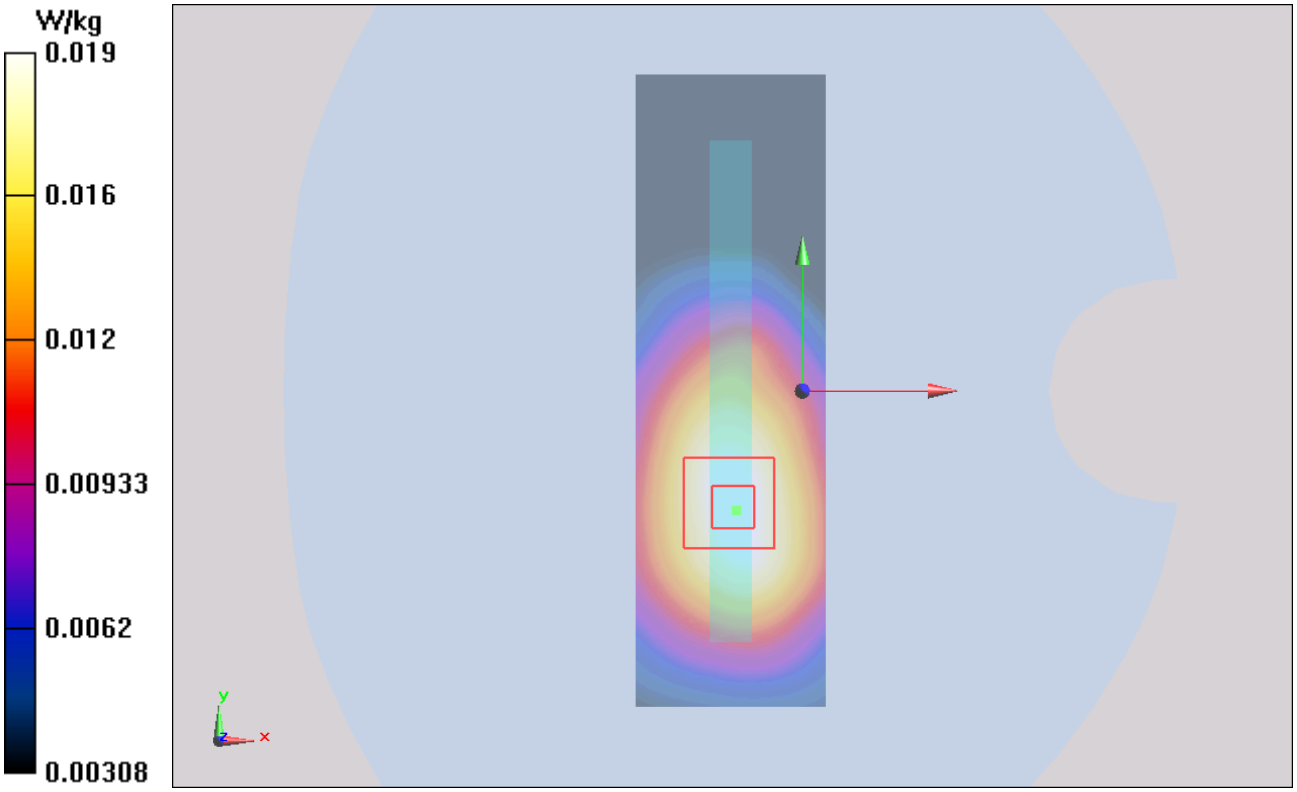


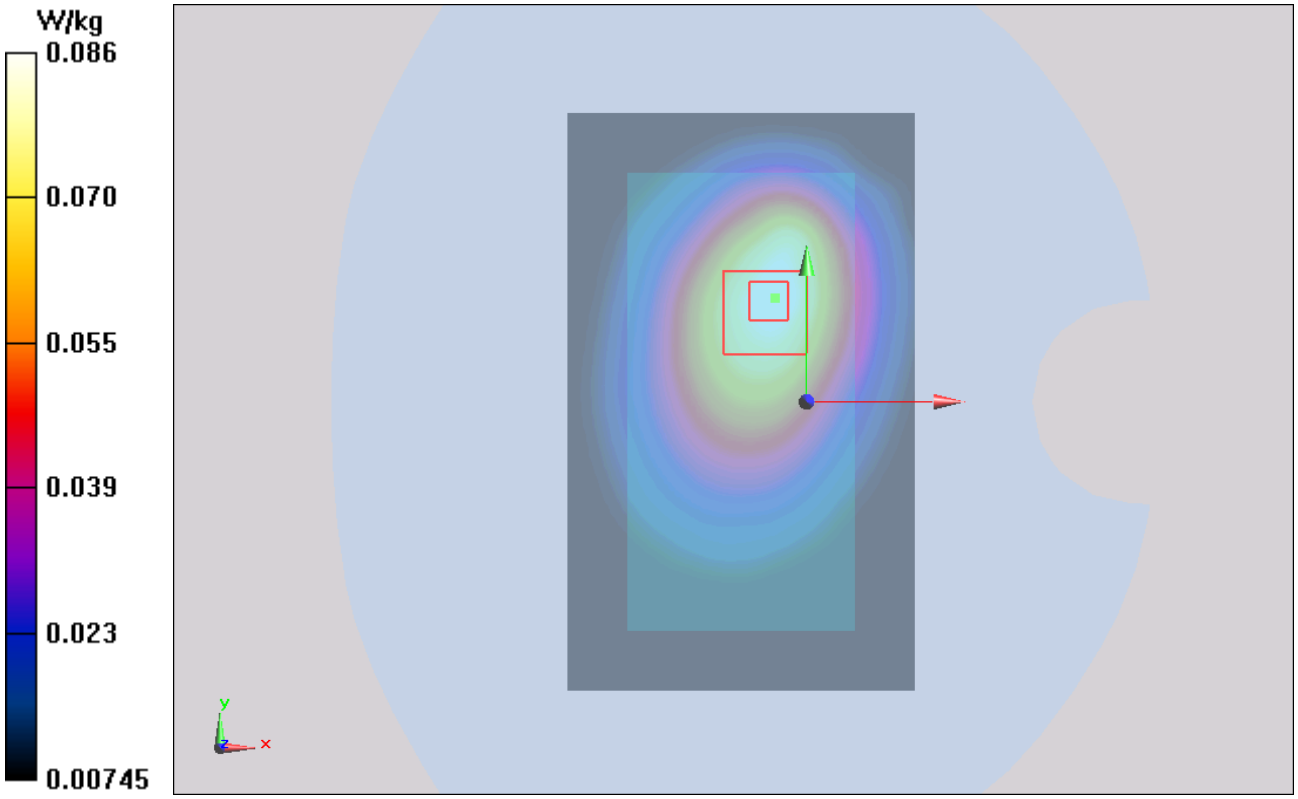
Figure 34 LTE Band 17 with Test Position 6 Channel 23780

LTE Band 17 with Test Position 1 Low (50%RB)

Date: 11/25/2014
Communication System: UID 0, LTE (0); Frequency: 709 MHz;Duty Cycle: 1:1
Medium parameters used: f = 709 MHz; σ = 0.93 S/m; ε_r = 54.74; 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(9.78, 9.78, 9.78); 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)

Test Position 1 Low/Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.0897 W/kg

Test Position 1 Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.245 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.114 W/kg
SAR(1 g) = 0.083 W/kg; SAR(10 g) = 0.058 W/kg
Maximum value of SAR (measured) = 0.0862 W/kg



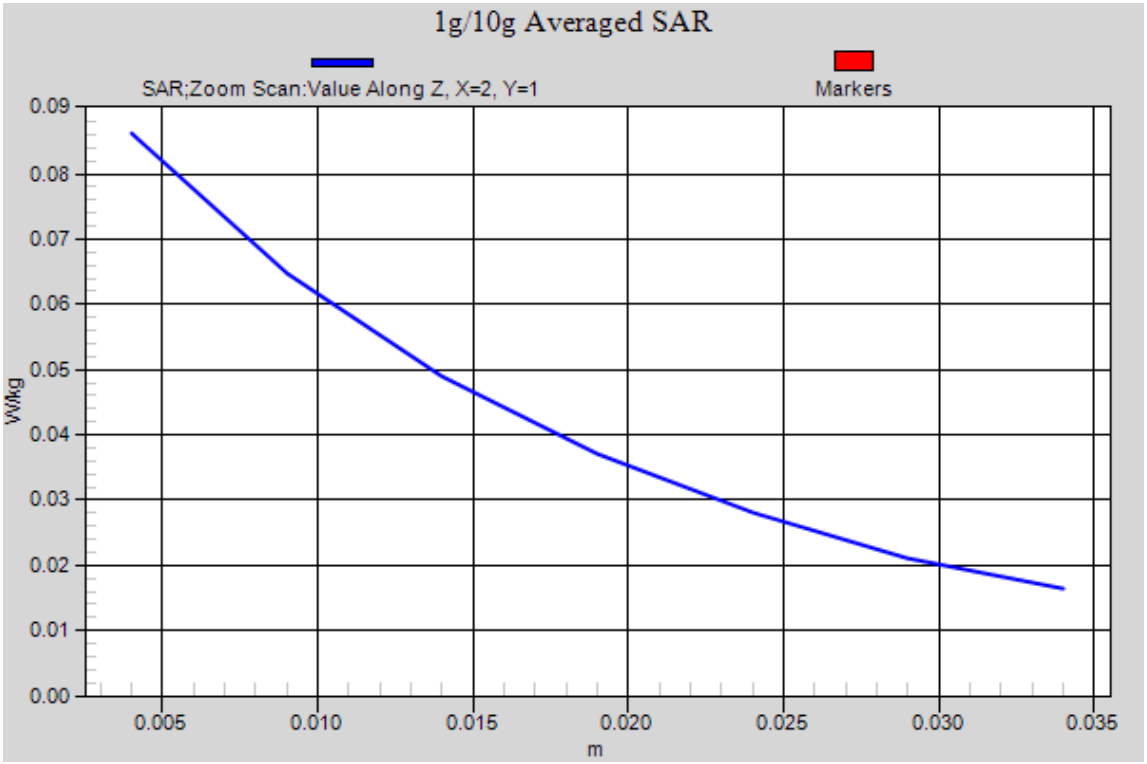


Figure 35 LTE Band 17 with Test Position 1 Channel 23780

LTE Band 17 with Test Position 2 Low (50%RB)

Date: 11/25/2014
Communication System: UID 0, LTE (0); Frequency: 709 MHz;Duty Cycle: 1:1
Medium parameters used: f = 709 MHz; σ = 0.93 S/m; ε_r = 54.74; 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(9.78, 9.78, 9.78); 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)

Test Position 2 Low/Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.0723 W/kg

Test Position 2 Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.795 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.0960 W/kg
SAR(1 g) = 0.068 W/kg; SAR(10 g) = 0.047 W/kg
Maximum value of SAR (measured) = 0.0719 W/kg

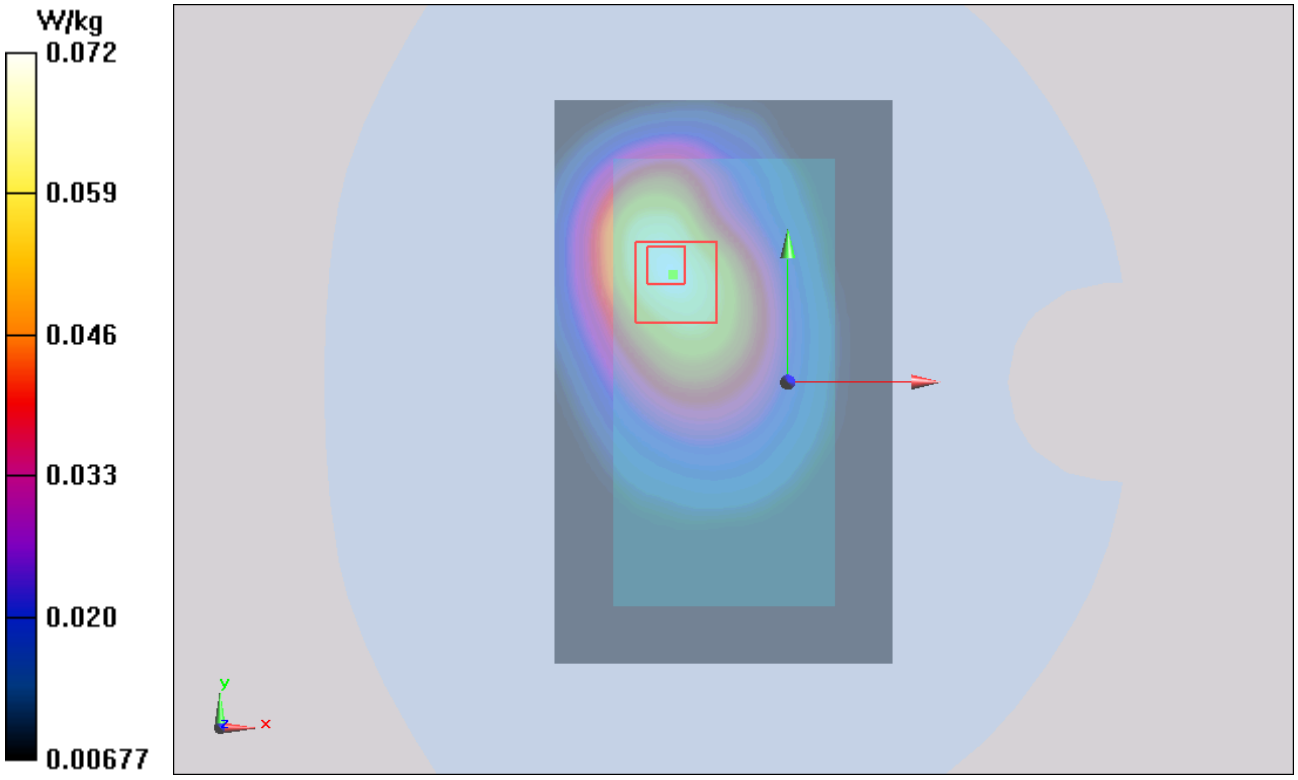


Figure 36 LTE Band 17 with Test Position 2 Channel 23780

LTE Band 17 with Test Position 4 Low (50%RB)

Date: 11/25/2014
Communication System: UID 0, LTE (0); Frequency: 709 MHz;Duty Cycle: 1:1
Medium parameters used: f = 709 MHz; σ = 0.93 S/m; ε_r = 54.74; 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(9.78, 9.78, 9.78); 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)

Test Position 4 Low/Area Scan (51x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.00972 W/kg

Test Position 4 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.905 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 0.0160 W/kg
SAR(1 g) = 0.0095 W/kg; SAR(10 g) = 0.00577 W/kg
Maximum value of SAR (measured) = 0.0112 W/kg

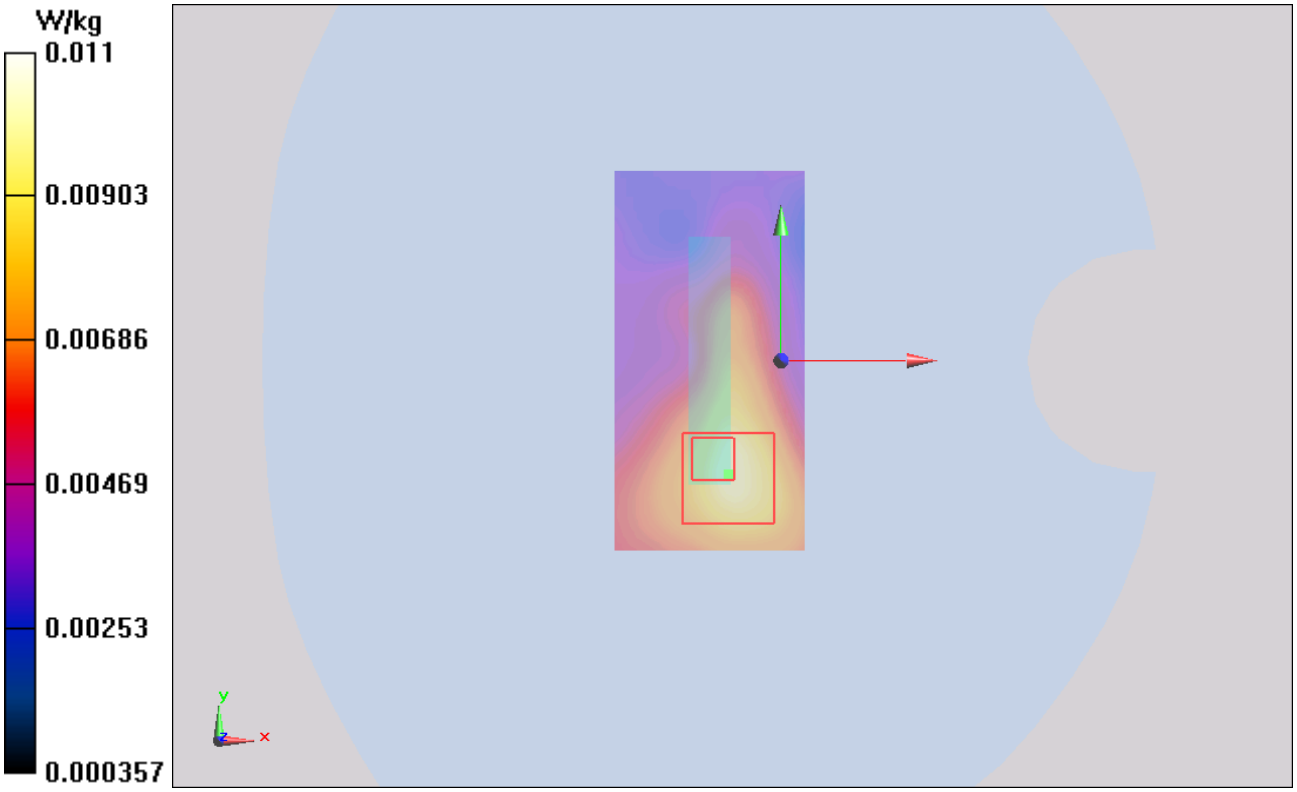


Figure 37 LTE Band 17 with Test Position 4 Channel 23780

LTE Band 17 with Test Position 5 Low (50%RB)

Date: 11/25/2014
Communication System: UID 0, LTE (0); Frequency: 709 MHz;Duty Cycle: 1:1
Medium parameters used: f = 709 MHz; σ = 0.93 S/m; ε_r = 54.74; 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(9.78, 9.78, 9.78); 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)

Test Position 5 Low/Area Scan (51x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0113 W/kg

Test Position 5 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.468 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.0150 W/kg
SAR(1 g) = 0.011 W/kg; SAR(10 g) = 0.00775 W/kg
Maximum value of SAR (measured) = 0.0117 W/kg

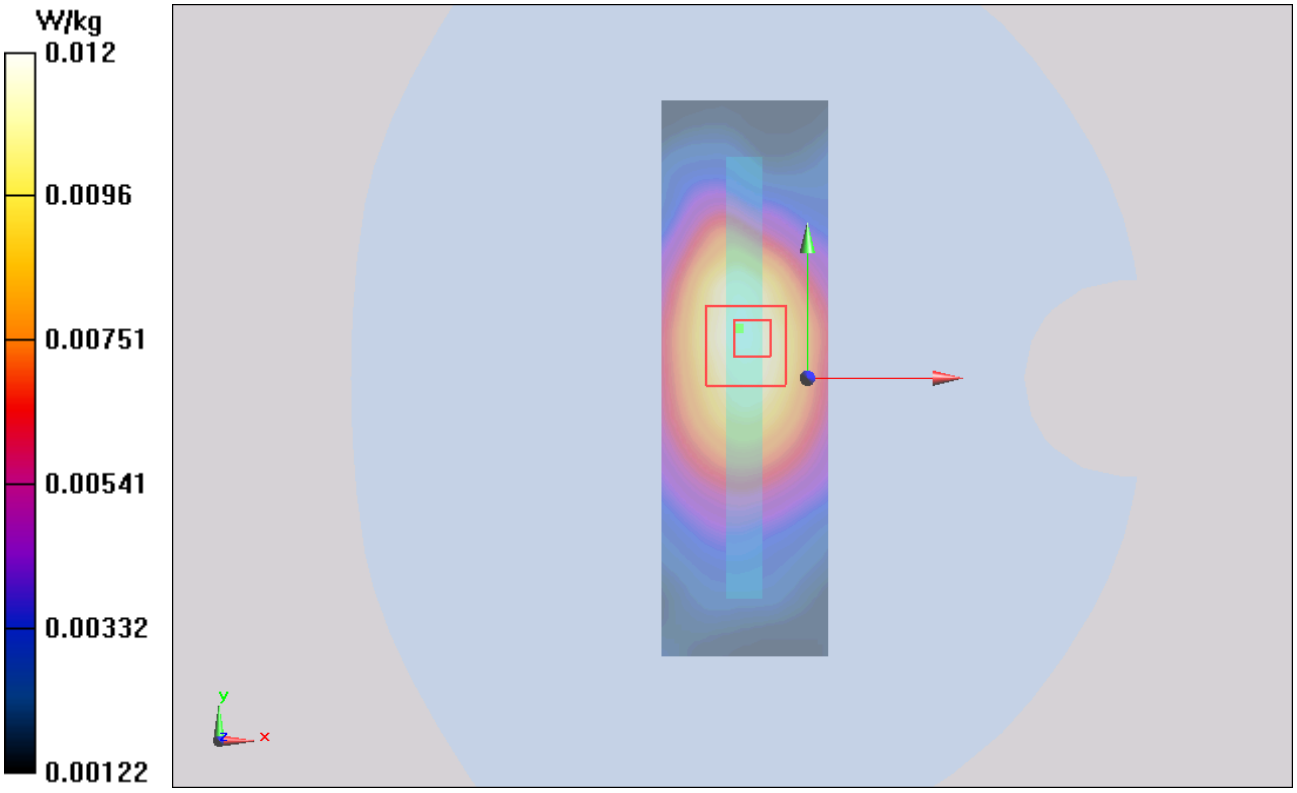


Figure 38 LTE Band 17 with Test Position 5 Channel 23780

LTE Band 17 with Test Position 6 Low (50%RB)

Date: 11/25/2014
Communication System: UID 0, LTE (0); Frequency: 709 MHz;Duty Cycle: 1:1
Medium parameters used: f = 709 MHz; σ = 0.93 S/m; ε_r = 54.74; 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(9.78, 9.78, 9.78); 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)

Test Position 6 Low/Area Scan (51x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0192 W/kg

Test Position 6 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.021 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.0240 W/kg
SAR(1 g) = 0.018 W/kg; SAR(10 g) = 0.013 W/kg
Maximum value of SAR (measured) = 0.0188 W/kg

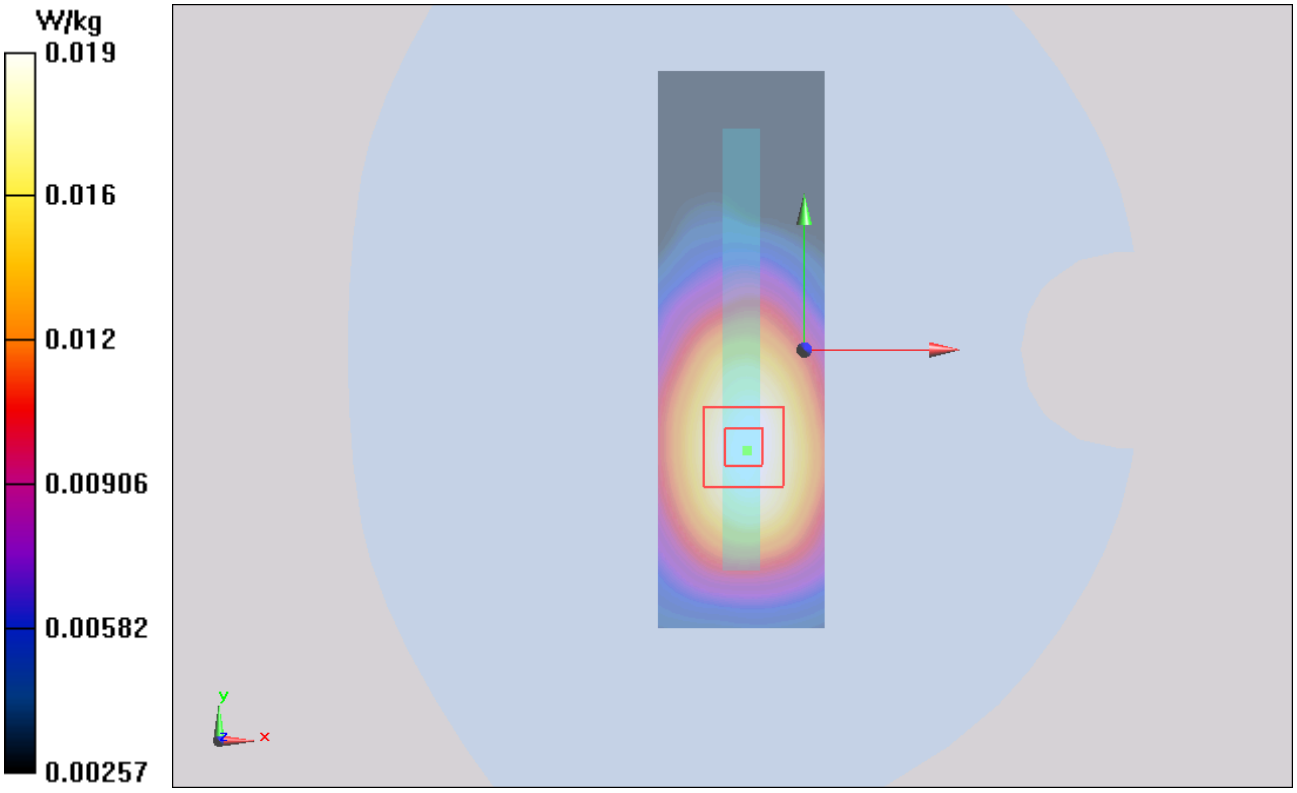


Figure 39 LTE Band 17 with Test Position 6 Channel 23780

802.11b Test Position 1 Low (Antenna 1)

Date: 11/26/2014
Communication System: UID 0, 802.11b (0); Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2412 MHz; σ = 1.945 S/m; ε_r = 52.239; 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)

Test Position 1 Low/Area Scan (81x131x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.0877 W/kg

Test Position 1 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.602 V/m; Power Drift = 0.074 dB
Peak SAR (extrapolated) = 0.127 W/kg
SAR(1 g) = 0.078 W/kg; SAR(10 g) = 0.051 W/kg
Maximum value of SAR (measured) = 0.0814 W/kg

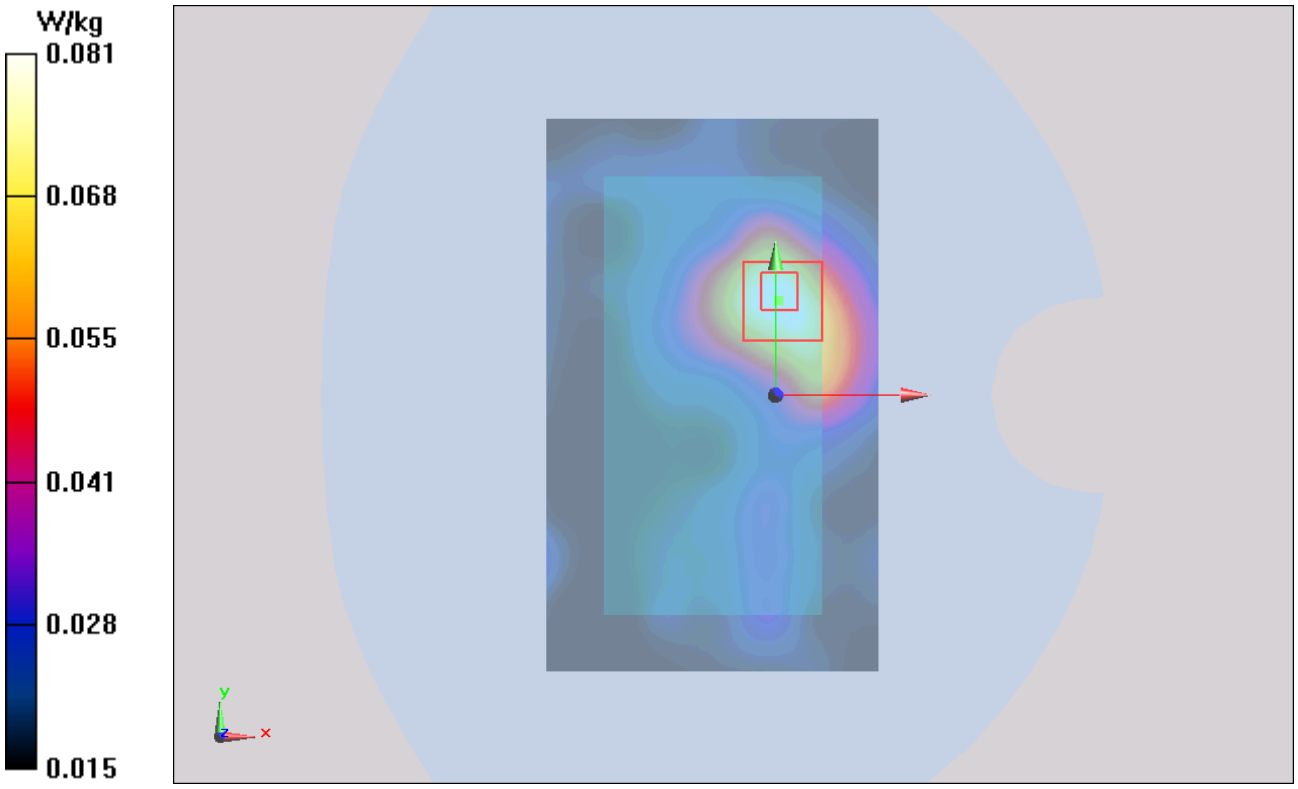


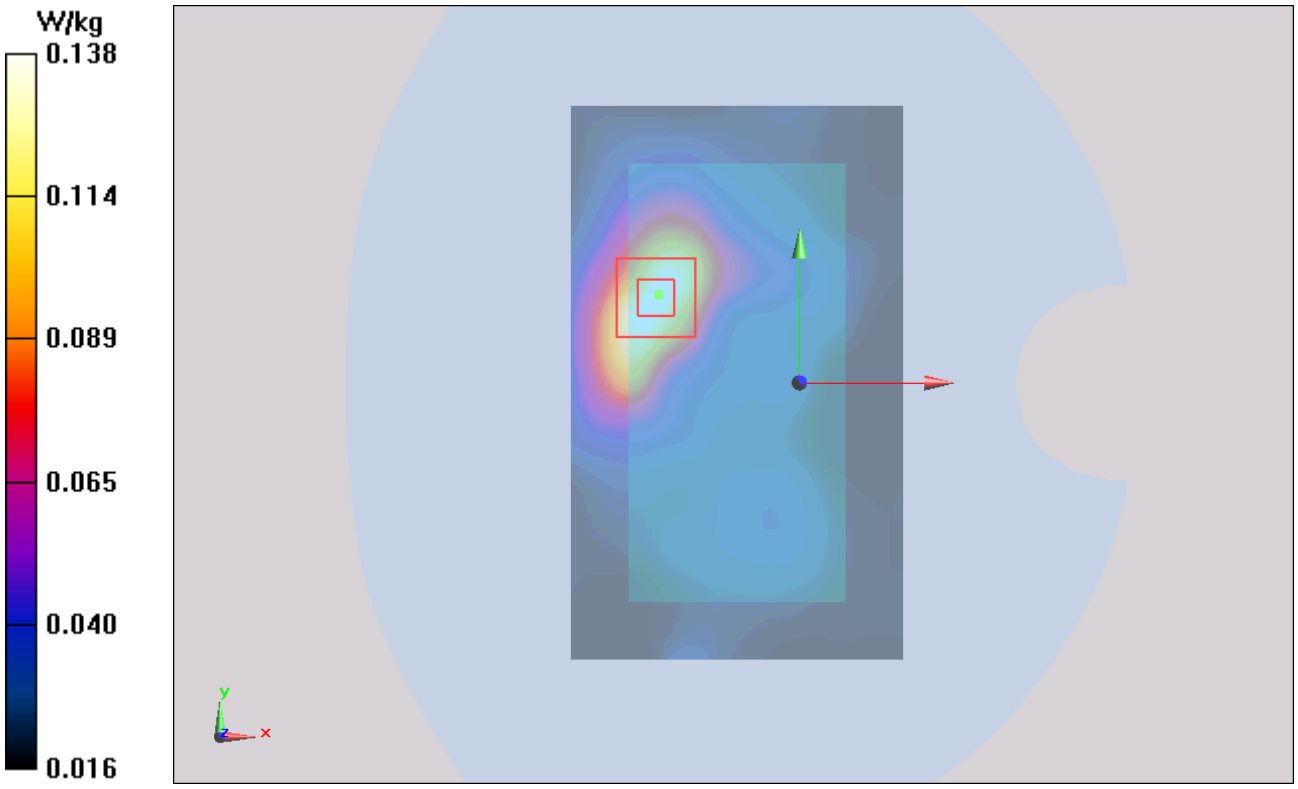
Figure 40 802.11b Test Position 1 Channel 1

802.11b Test Position 2 Low (Antenna 1)

Date: 11/26/2014
Communication System: UID 0, 802.11b (0); Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2412 MHz; σ = 1.945 S/m; ε_r = 52.239; 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)

Test Position 2 Low/Area Scan (81x131x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.146 W/kg

Test Position 2 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.780 V/m; Power Drift = 0.065 dB
Peak SAR (extrapolated) = 0.221 W/kg
SAR(1 g) = 0.133 W/kg; SAR(10 g) = 0.080 W/kg
Maximum value of SAR (measured) = 0.138 W/kg



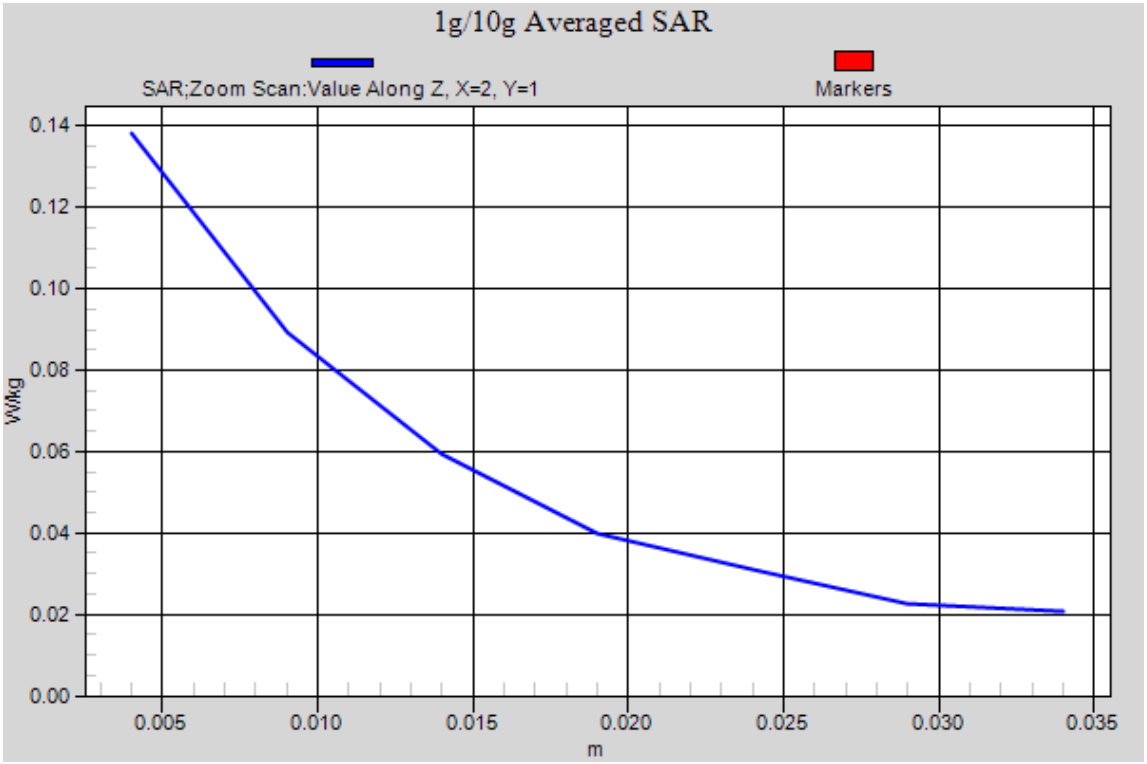


Figure 41 802.11b Test Position 2 Channel 1

802.11b Test Position 5 Low (Antenna 1)

Date: 11/26/2014
Communication System: UID 0, 802.11b (0); Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2412 MHz; σ = 1.945 S/m; ε_r = 52.239; 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)

Test Position 5 Low/Area Scan (51x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0880 W/kg

Test Position 5 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.678 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 0.149 W/kg
SAR(1 g) = 0.084 W/kg; SAR(10 g) = 0.047 W/kg
Maximum value of SAR (measured) = 0.0879 W/kg

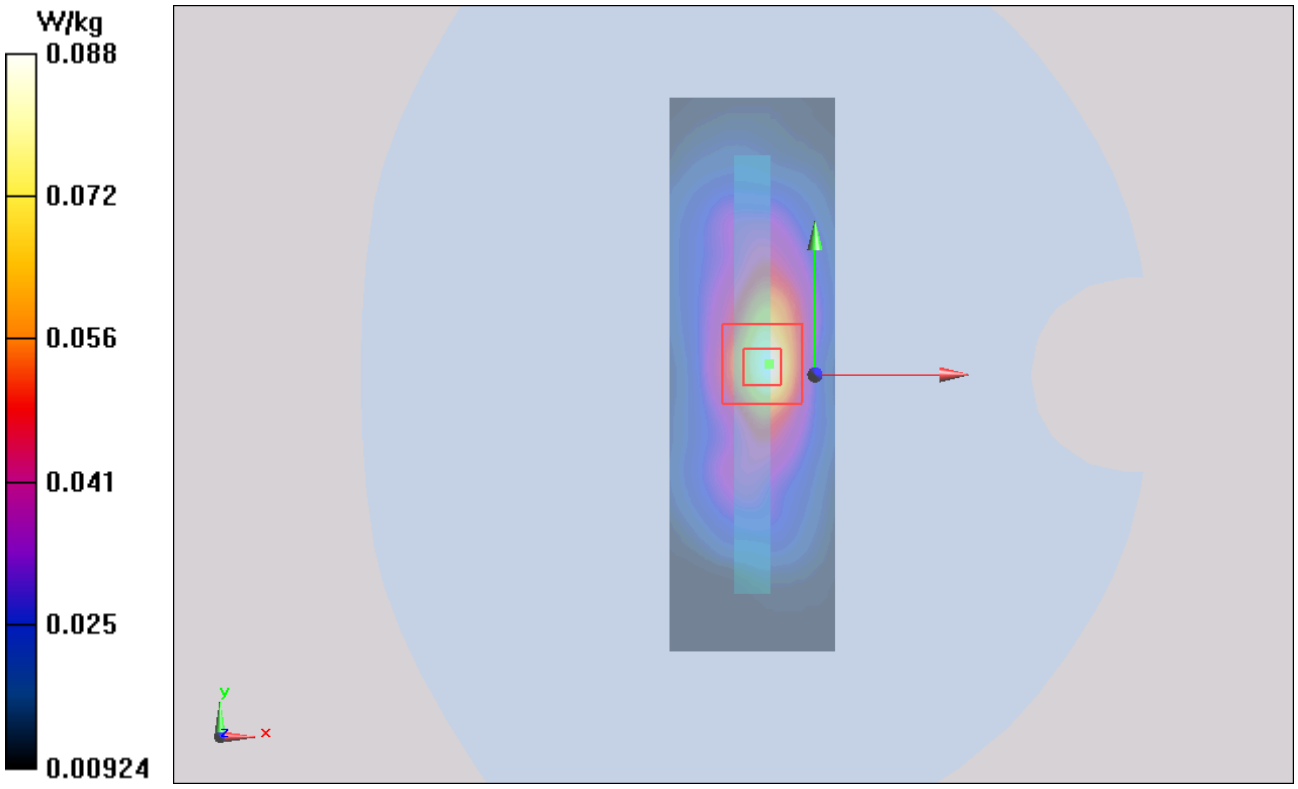


Figure 42 802.11b Test Position 5 Channel 1

802.11b Test Position 1 Low (Antenna 2)

Date: 11/26/2014
Communication System: UID 0, 802.11b (0); Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2412 MHz; σ = 1.945 S/m; ε_r = 52.239; 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)

Test Position 1 Low/Area Scan (81x131x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.0815 W/kg

Test Position 1 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.965 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.0970 W/kg
SAR(1 g) = 0.060 W/kg; SAR(10 g) = 0.041 W/kg
Maximum value of SAR (measured) = 0.0623 W/kg

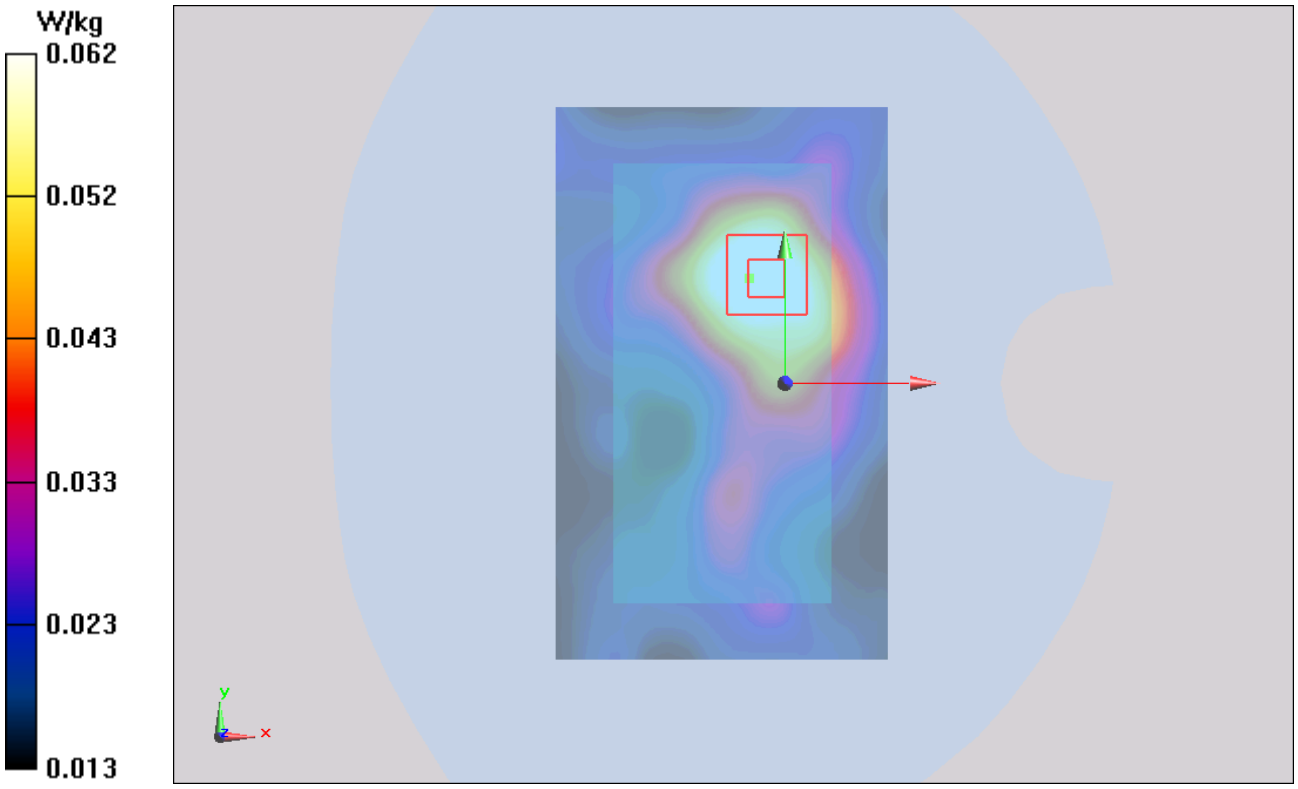


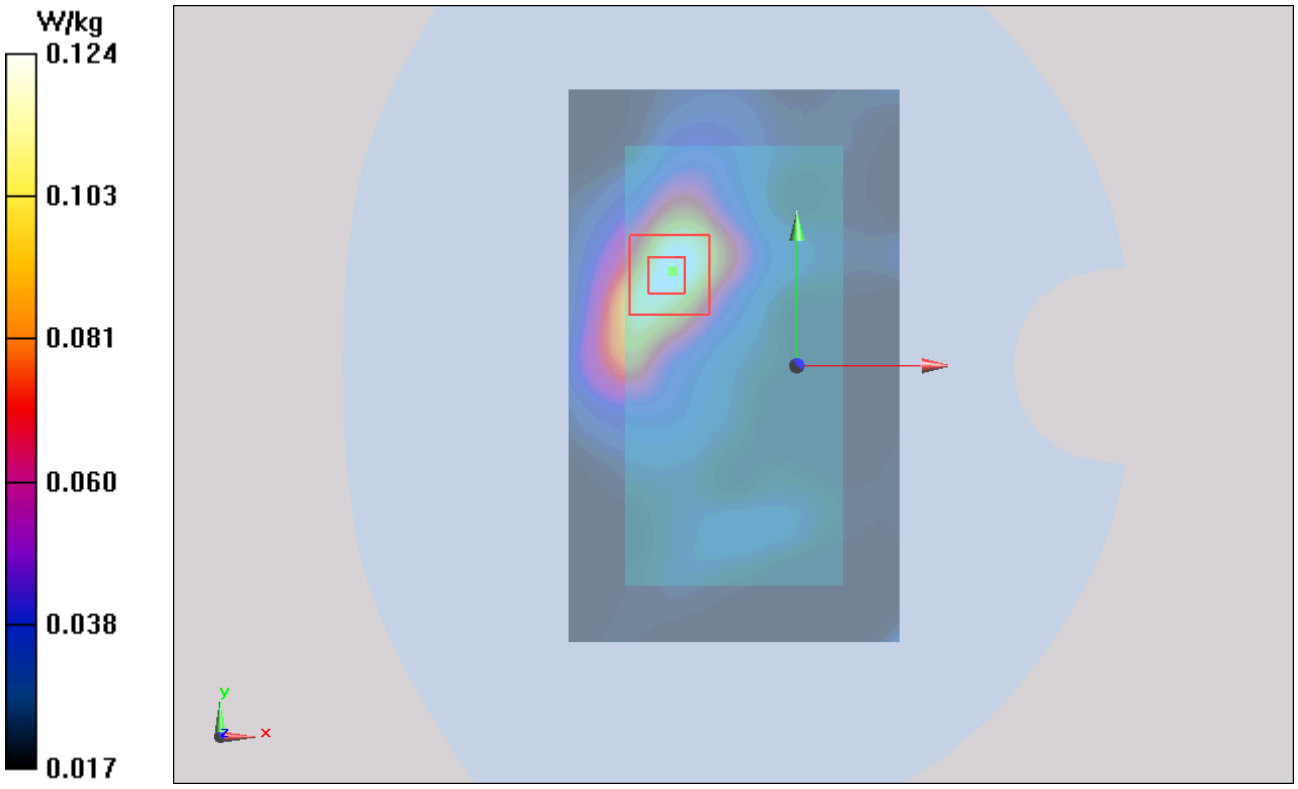
Figure 43 802.11b Test Position 1 Channel 1

802.11b Test Position 2 Low (Antenna 2)

Date: 11/26/2014
Communication System: UID 0, 802.11b (0); Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2412 MHz; σ = 1.945 S/m; ε_r = 52.239; 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)

Test Position 2 Low/Area Scan (81x131x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.135 W/kg

Test Position 2 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.352 V/m; Power Drift = 0.151 dB
Peak SAR (extrapolated) = 0.198 W/kg
SAR(1 g) = 0.115 W/kg; SAR(10 g) = 0.069 W/kg
Maximum value of SAR (measured) = 0.124 W/kg



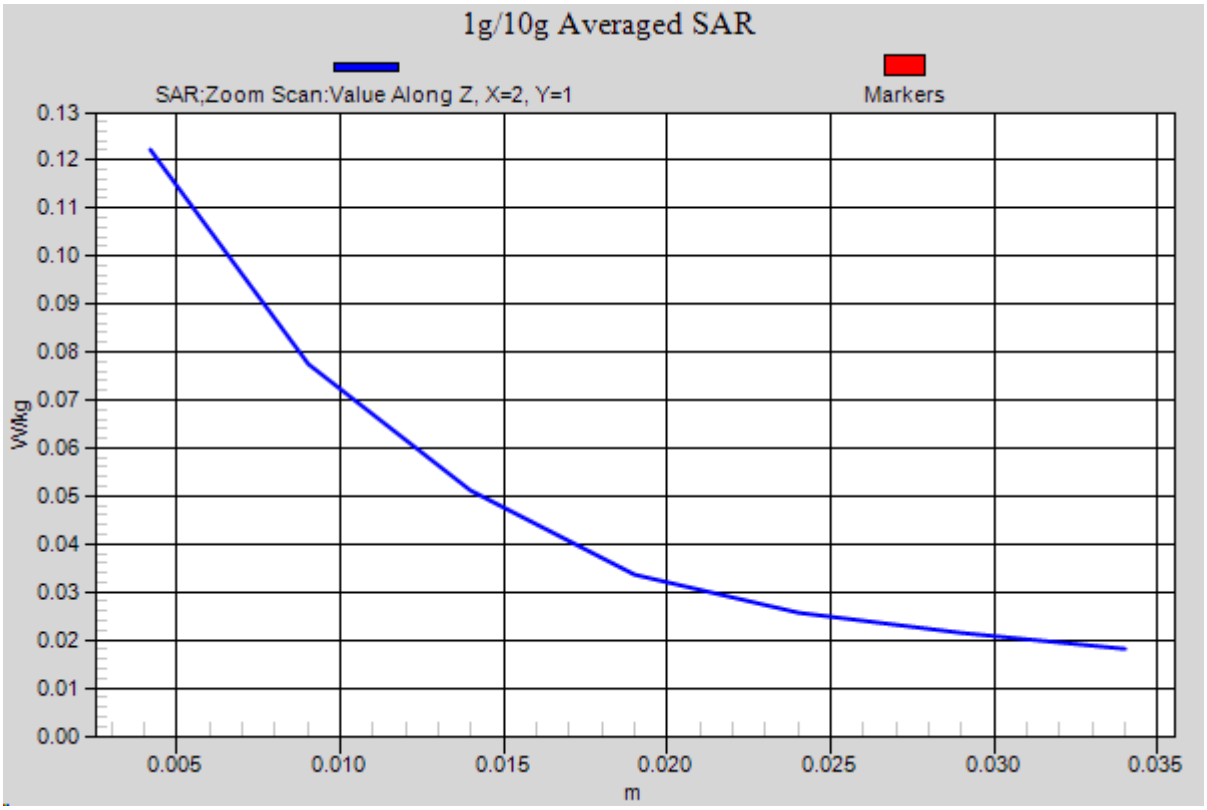


Figure 44 802.11b Test Position 2 Channel 1

802.11b Test Position 6 Low (Antenna 2)

Date: 11/26/2014
Communication System: UID 0, 802.11b (0); Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2412 MHz; σ = 1.945 S/m; ε_r = 52.239; 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)

Test Position 6 Low/Area Scan (51x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0583 W/kg

Test Position 6 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.263 V/m; Power Drift = 0.022 dB
Peak SAR (extrapolated) = 0.108 W/kg
SAR(1 g) = 0.063 W/kg; SAR(10 g) = 0.036 W/kg
Maximum value of SAR (measured) = 0.0663 W/kg

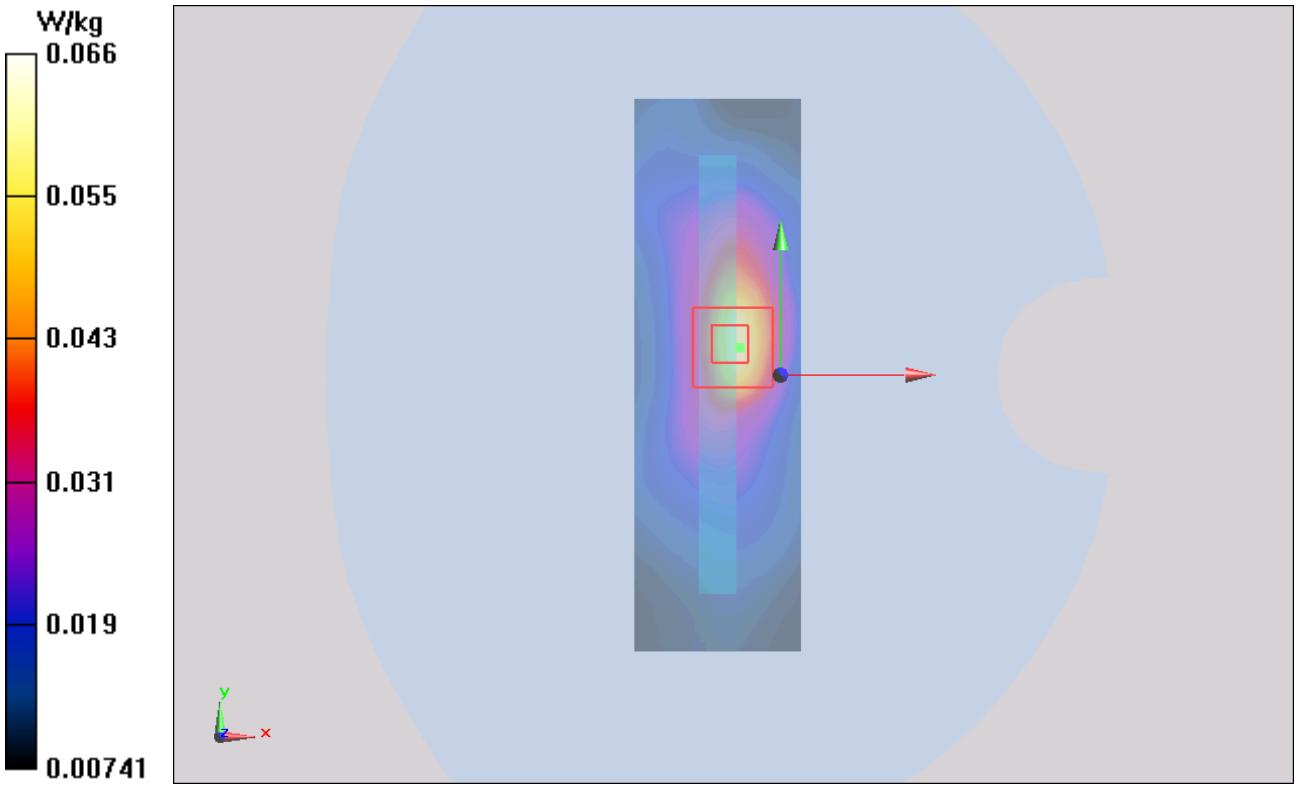


Figure 45 802.11b Test Position 6 Channel 1

802.11a Test Position 1 CH36 (Antenna 1)

Date: 12/8/2014
Communication System: UID 0, 802.11a (0); Frequency: 5180 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5180 MHz; σ = 5.15 S/m; ε_r = 48.696; 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(4.50, 4.50, 4.50); 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)

Test Position 1 CH36/Area Scan (91x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0159 W/kg

Test Position 1 CH36/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0.579 V/m; Power Drift = -0.074 dB
Peak SAR (extrapolated) = 0.0950 W/kg
SAR(1 g) = 0.024 W/kg; SAR(10 g) = 0.00626 W/kg
Maximum value of SAR (measured) = 0.0280 W/kg

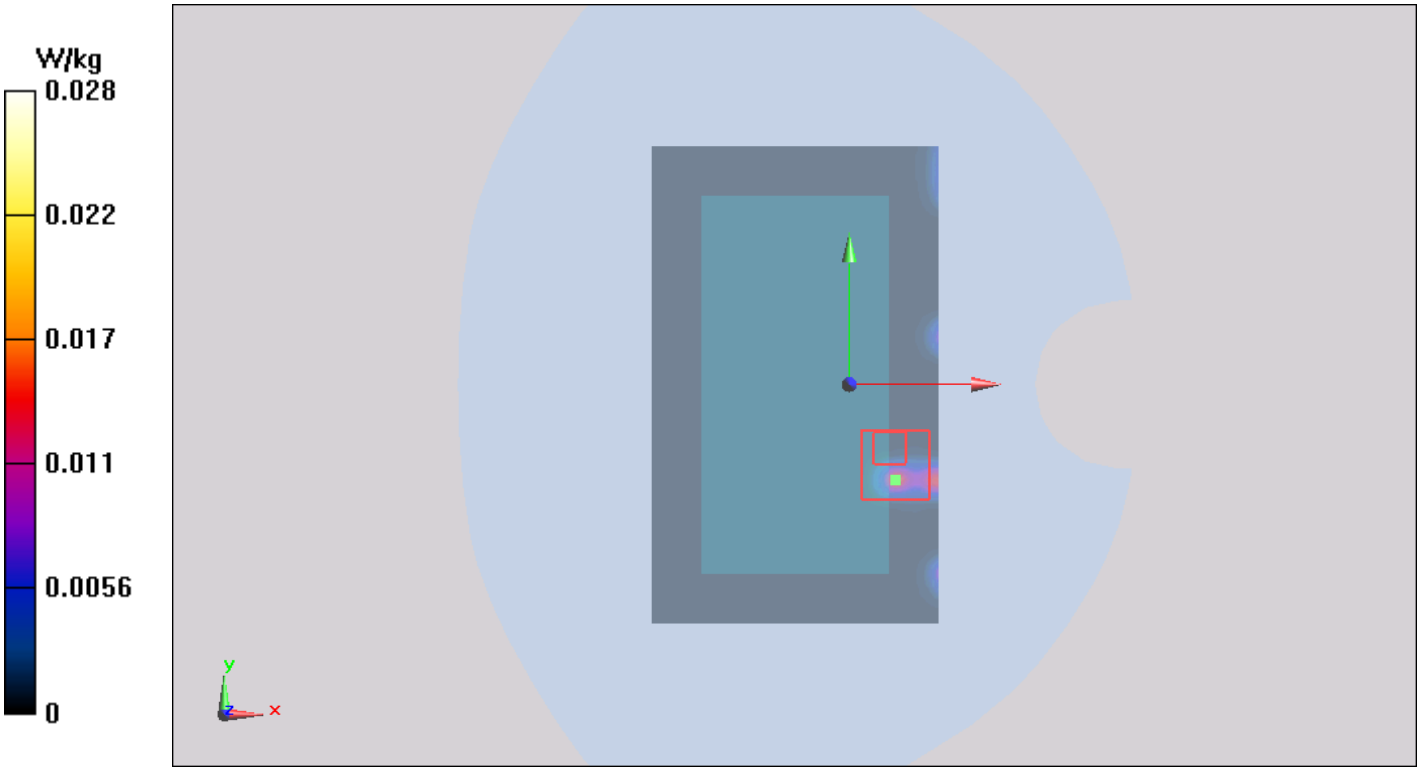


Figure 46 802.11a Test Position 1 Channel 36

802.11a Test Position 2 CH36 (Antenna 1)

Date: 12/8/2014
Communication System: UID 0, 802.11a (0); Frequency: 5180 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5180 MHz; σ = 5.15 S/m; ε_r = 48.696; 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(4.50, 4.50, 4.50); 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)

Test Position 2 CH36/Area Scan (91x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0177 W/kg

Test Position 2 CH36/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0.654 V/m; Power Drift = 0.034 dB
Peak SAR (extrapolated) = 0.0800 W/kg
SAR(1 g) = 0.021 W/kg; SAR(10 g) = 0.00516 W/kg
Maximum value of SAR (measured) = 0.0268 W/kg

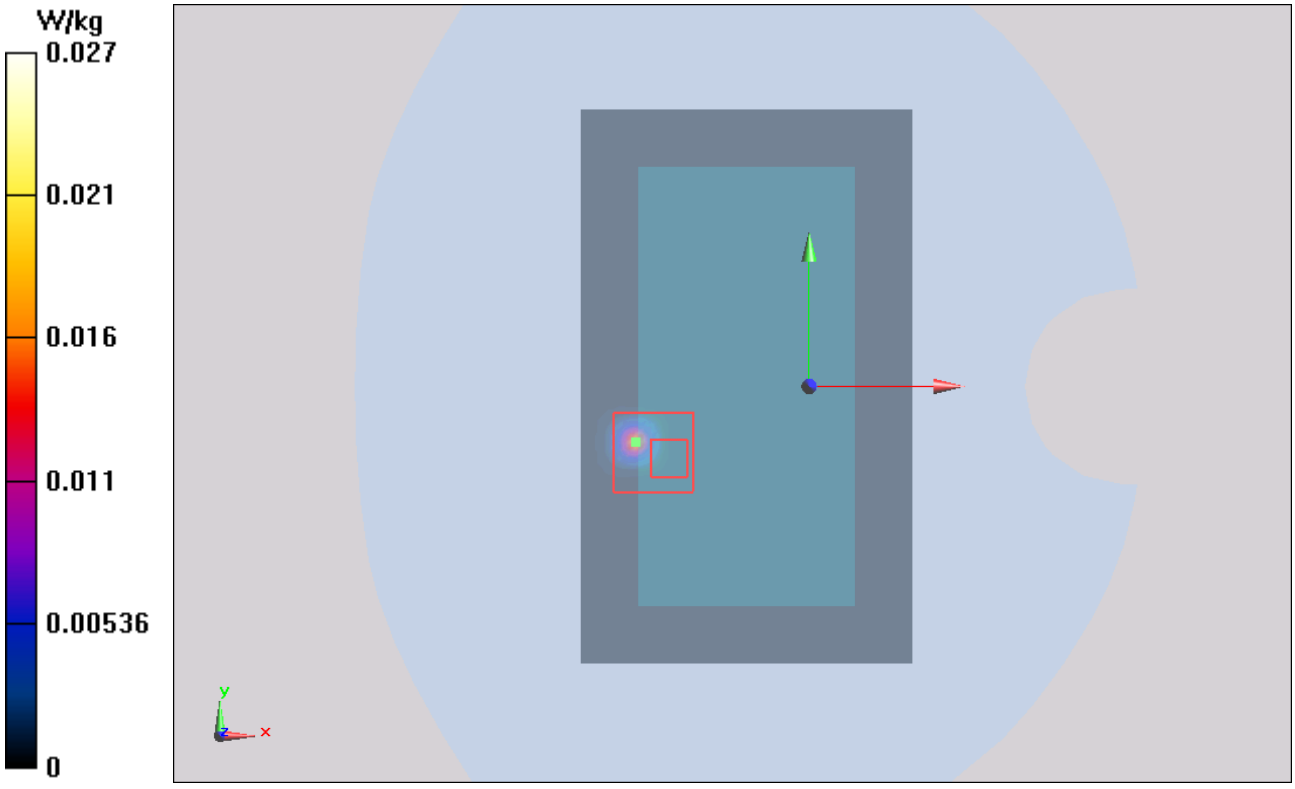


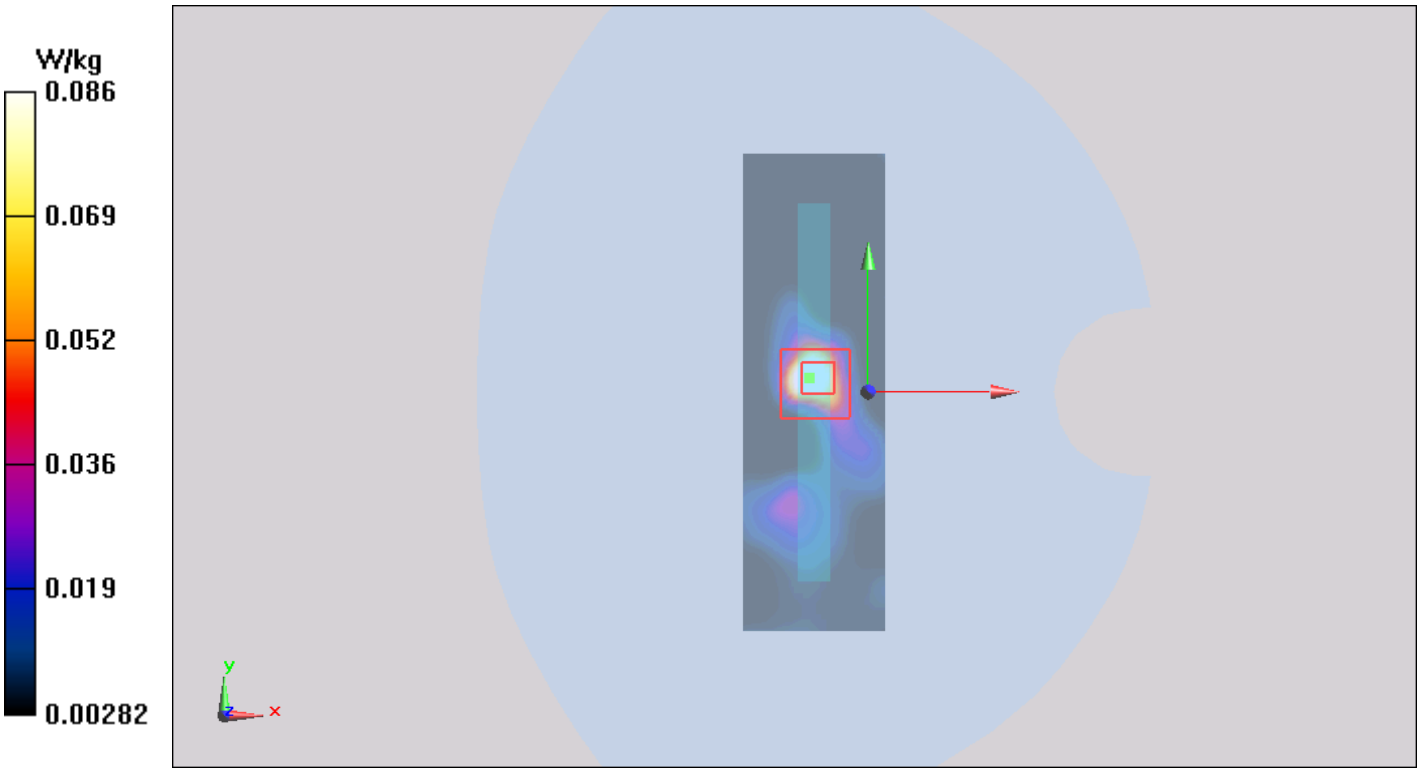
Figure 47 802.11a Test Position 2 Channel 36

802.11a Test Position 5 CH36 (Antenna 1)

Date: 12/8/2014
Communication System: UID 0, 802.11a (0); Frequency: 5180 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5180 MHz; σ = 5.15 S/m; ε_r = 48.696; 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(4.50, 4.50, 4.50); 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)

Test Position 5 CH36/Area Scan (51x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.163 W/kg

Test Position 5 CH36/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 4.235 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.209 W/kg
SAR(1 g) = 0.079 W/kg; SAR(10 g) = 0.034 W/kg
Maximum value of SAR (measured) = 0.0856 W/kg



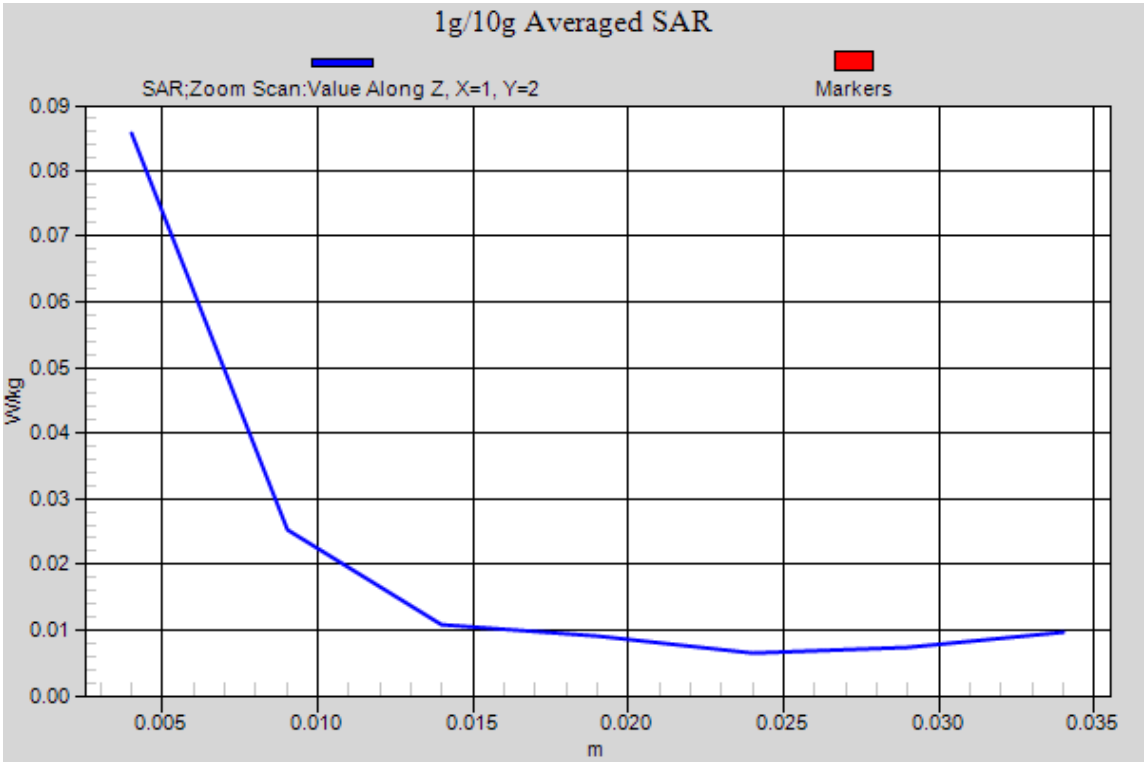


Figure 48 802.11a Test Position 5 Channel 36

802.11a Test Position 1 CH56 (Antenna 1)

Date: 12/8/2014
Communication System: UID 0, 802.11a (0); Frequency: 5280 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5280 MHz; σ = 5.464 S/m; ε_r = 46.63; 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(4.50, 4.50, 4.50); 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)

Test Position 1 CH56/Area Scan (91x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0231 W/kg

Test Position 1 CH56/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0.585 V/m; Power Drift = -0.106 dB
Peak SAR (extrapolated) = 0.0720 W/kg
SAR(1 g) = 0.017 W/kg; SAR(10 g) = 0.004 W/kg
Maximum value of SAR (measured) = 0.0200 W/kg

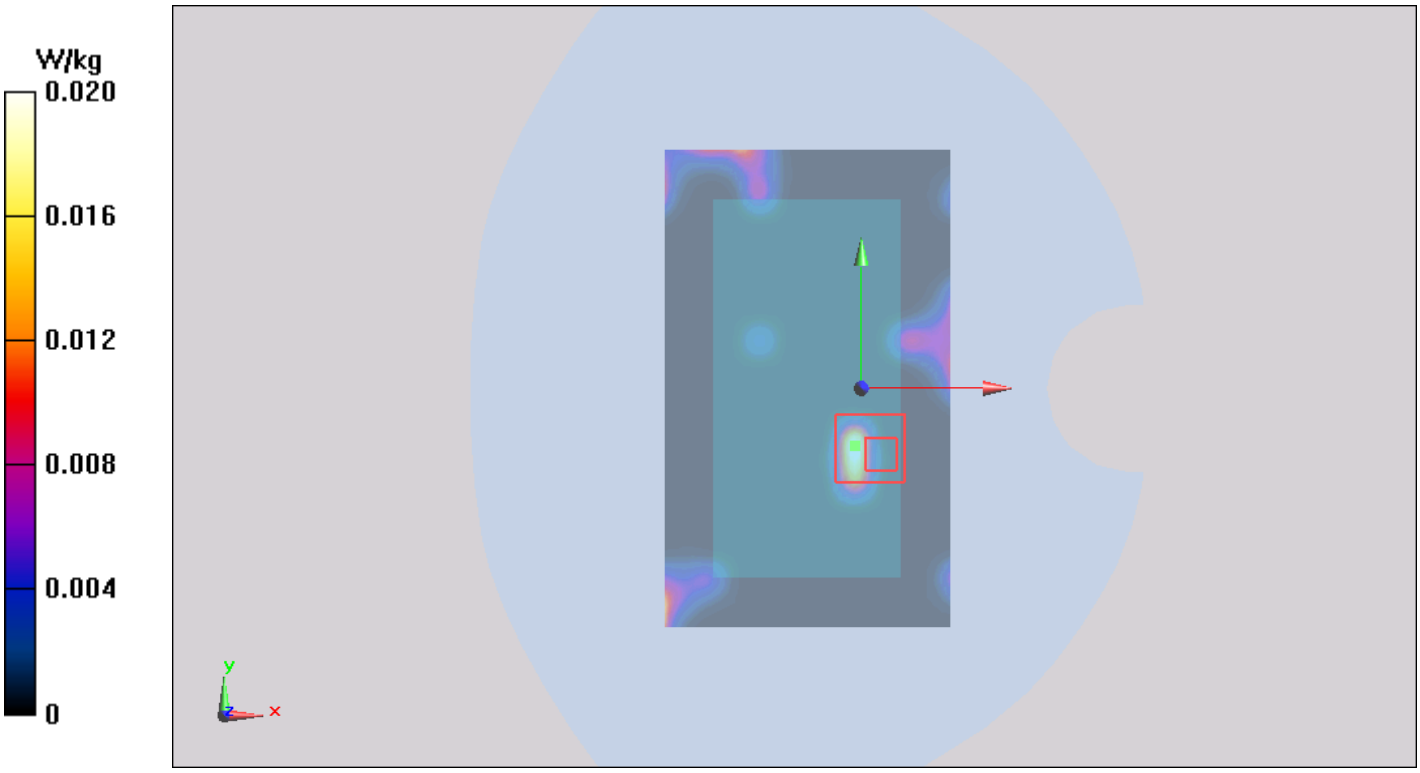


Figure 49 802.11a Test Position 1 Channel 56

802.11a Test Position 2 CH56 (Antenna 1)

Date: 12/8/2014
Communication System: UID 0, 802.11a (0); Frequency: 5280 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5280 MHz; σ = 5.464 S/m; ε_r = 46.63; 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(4.50, 4.50, 4.50); 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)

Test Position 2 CH56/Area Scan (91x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0201 W/kg

Test Position 2 CH56/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0.912 V/m; Power Drift = 0.047 dB
Peak SAR (extrapolated) = 0.0250 W/kg
SAR(1 g) = 0.006 W/kg; SAR(10 g) = 0.00094 W/kg
Maximum value of SAR (measured) = 0.0159 W/kg

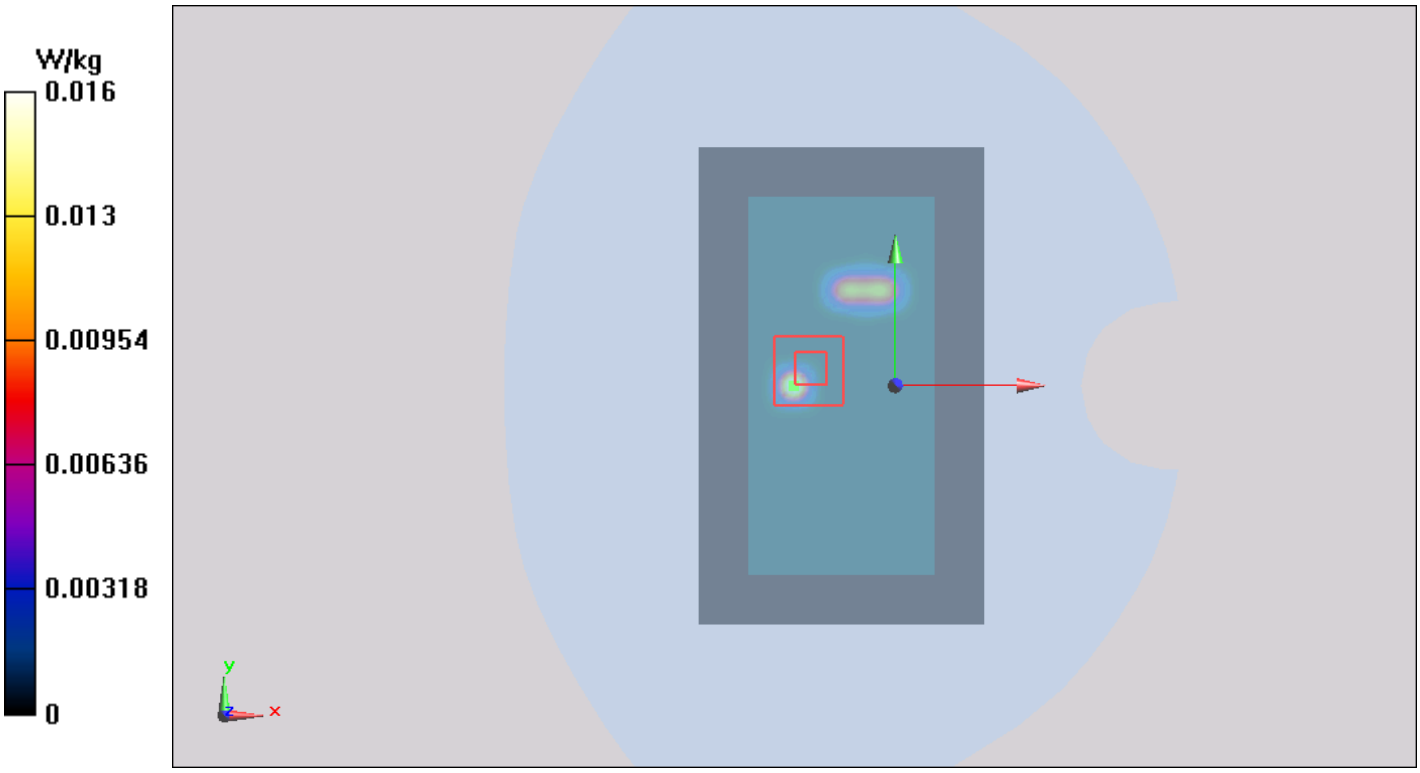


Figure 50 802.11a Test Position 2 Channel 56

802.11a Test Position 5 CH56 (Antenna 1)

Date: 12/8/2014
Communication System: UID 0, 802.11a (0); Frequency: 5280 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5280 MHz; σ = 5.464 S/m; ε_r = 46.63; 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(4.50, 4.50, 4.50); 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)

Test Position 5 CH56/Area Scan (51x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0973 W/kg

Test Position 5 CH56/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 4.045 V/m; Power Drift = 0.036 dB
Peak SAR (extrapolated) = 0.213 W/kg
SAR(1 g) = 0.079 W/kg; SAR(10 g) = 0.032 W/kg
Maximum value of SAR (measured) = 0.0875 W/kg

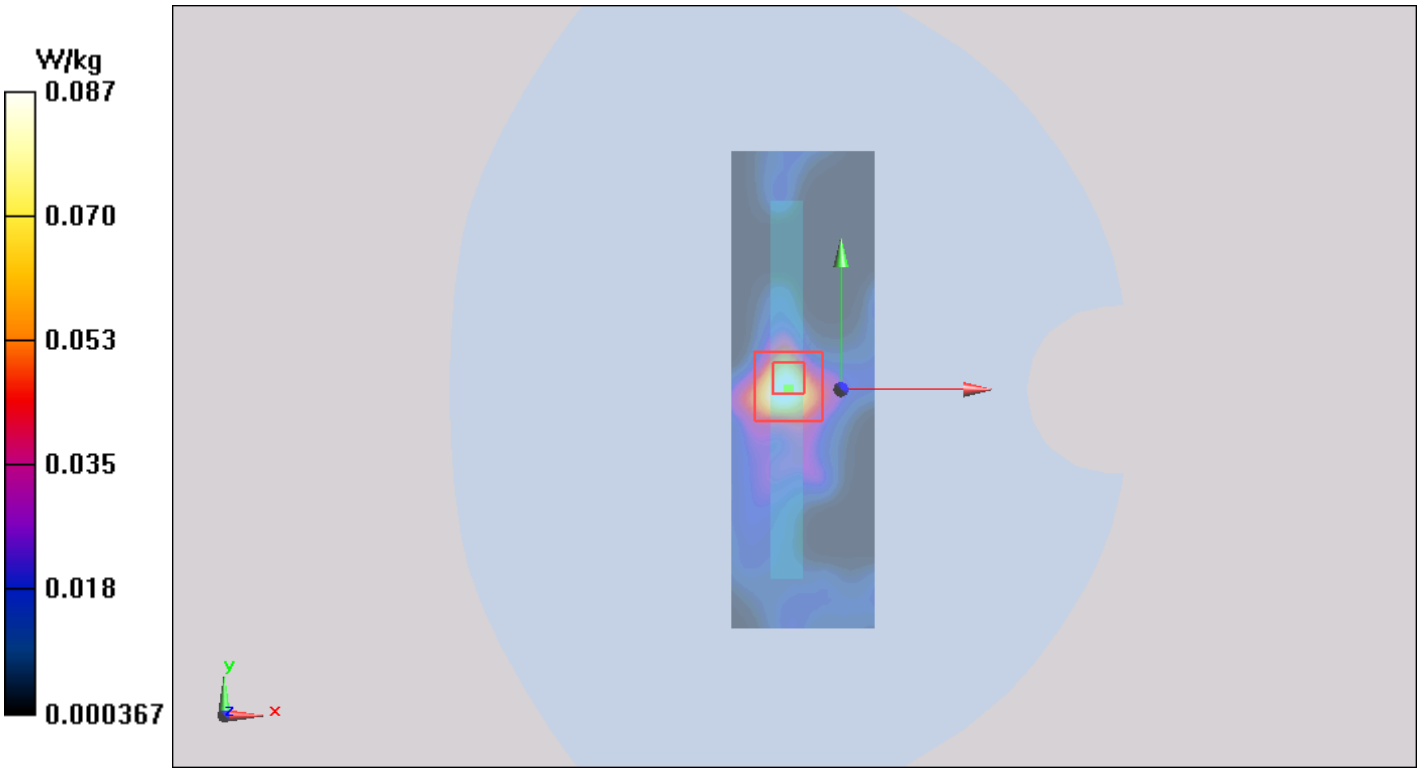


Figure 51 802.11a Test Position 5 Channel 56

802.11a Test Position 1 CH140 (Antenna 1)

Date: 12/9/2014
Communication System: UID 0, 802.11a (0); Frequency: 5700 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5700 MHz; σ = 6.151 S/m; ε_r = 47.67; 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(3.87, 3.87, 3.87); 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)

Test Position 1 CH140/Area Scan (91x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.00945 W/kg

Test Position 1 CH140/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0.558 V/m; Power Drift = 0.075 dB
Peak SAR (extrapolated) = 0.0220 W/kg
SAR(1 g) = 0.002 W/kg; SAR(10 g) = 0.000531 W/kg
Maximum value of SAR (measured) = 0.0109 W/kg

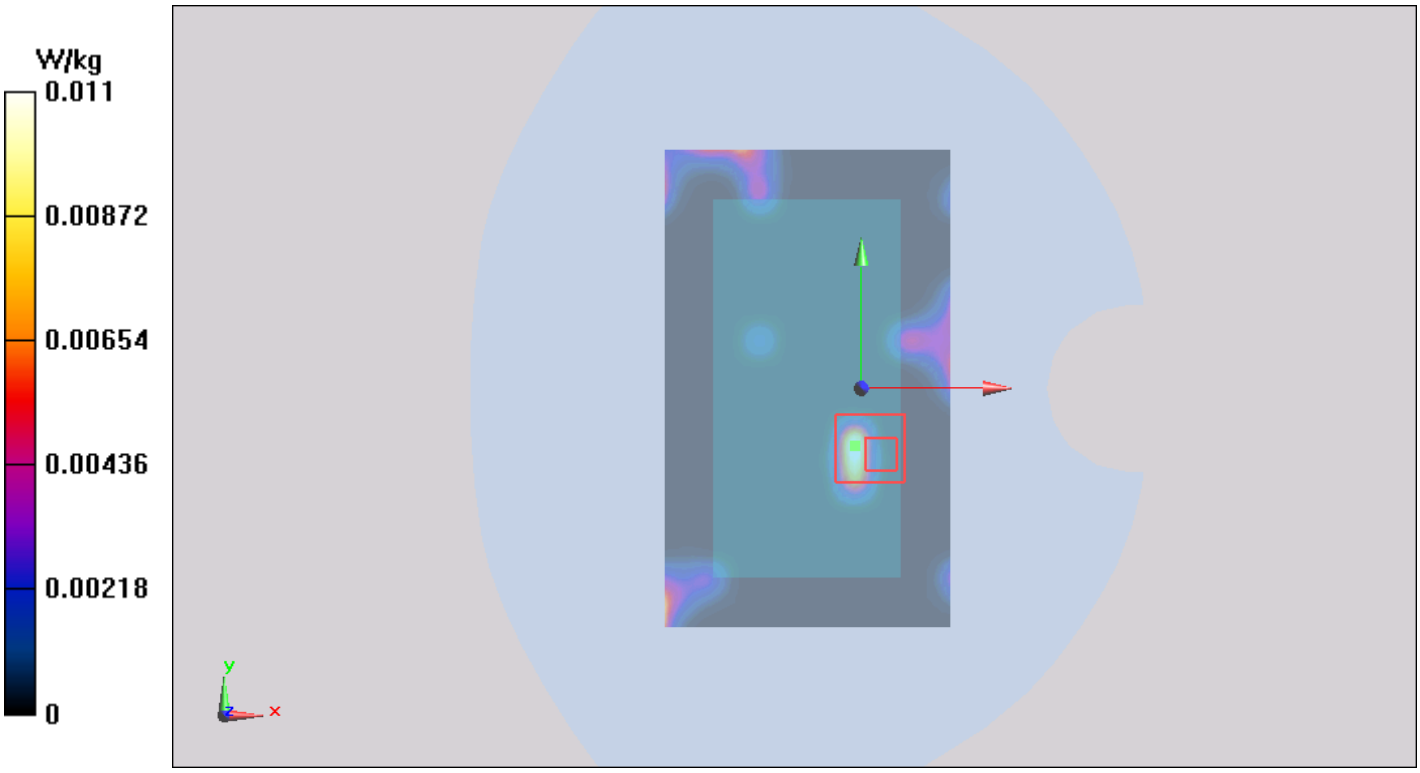


Figure 52 802.11a Test Position 1 Channel 140

802.11a Test Position 2 CH140 (Antenna 1)

Date: 12/9/2014
Communication System: UID 0, 802.11a (0); Frequency: 5700 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5400 MHz; σ = 5.64 S/m; ε_r = 46.289; 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(3.87, 3.87, 3.87); 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)

Test Position 2 CH140/Area Scan (91x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0593 W/kg

Test Position 2 CH140/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 2.758 V/m; Power Drift = -0.043 dB
Peak SAR (extrapolated) = 0.0330 W/kg
SAR(1 g) = 0.020 W/kg; SAR(10 g) = 0.014 W/kg
Maximum value of SAR (measured) = 0.0252 W/kg

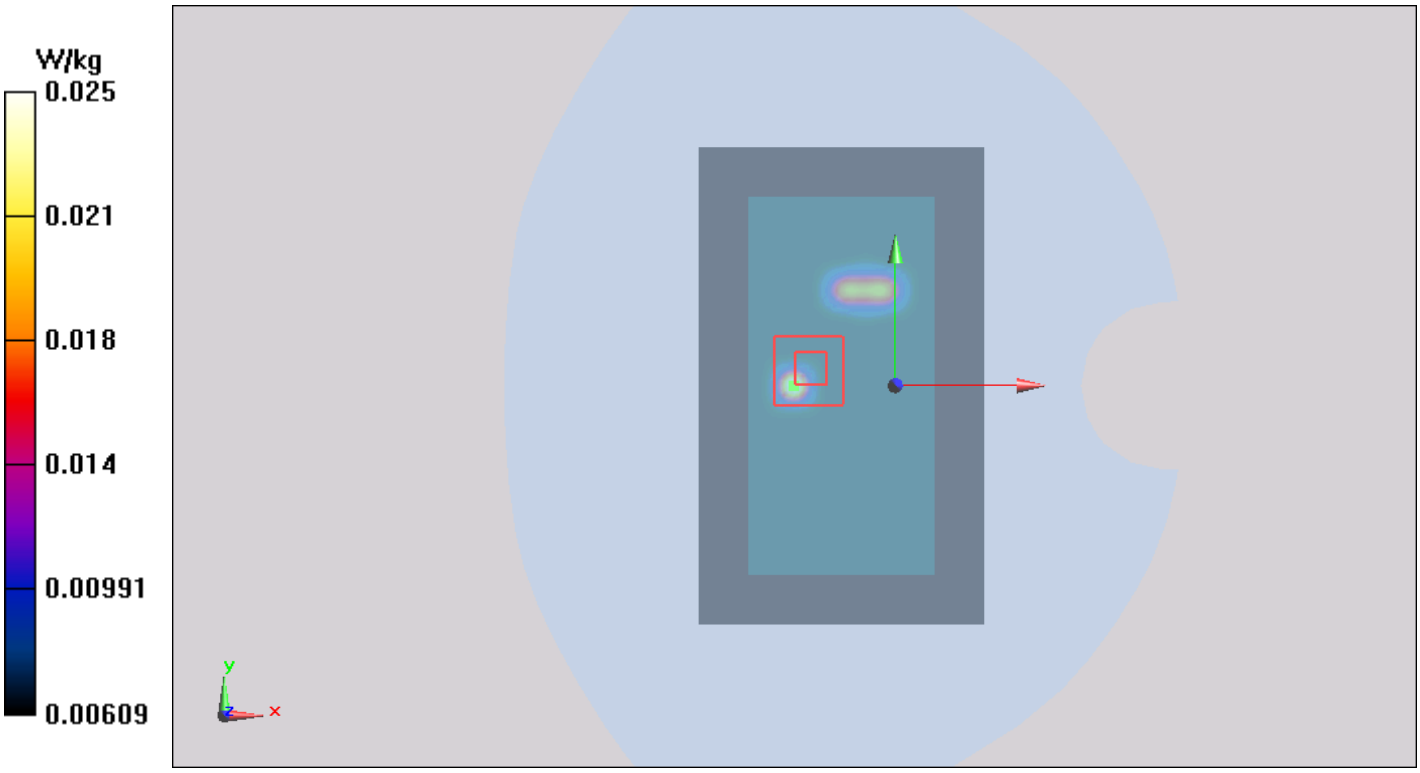


Figure 53 802.11a Test Position 2 Channel 140

802.11a Test Position 5 CH140 (Antenna 1)

Date: 12/9/2014
Communication System: UID 0, 802.11a (0); Frequency: 5700 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5400 MHz; σ = 5.64 S/m; ε_r = 46.289; 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(3.87, 3.87, 3.87); 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)

Test Position 5 CH140/Area Scan (51x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0514 W/kg

Test Position 5 CH140/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 2.576 V/m; Power Drift = 0.043 dB
Peak SAR (extrapolated) = 0.0890 W/kg
SAR(1 g) = 0.037 W/kg; SAR(10 g) = 0.012 W/kg
Maximum value of SAR (measured) = 0.0458 W/kg

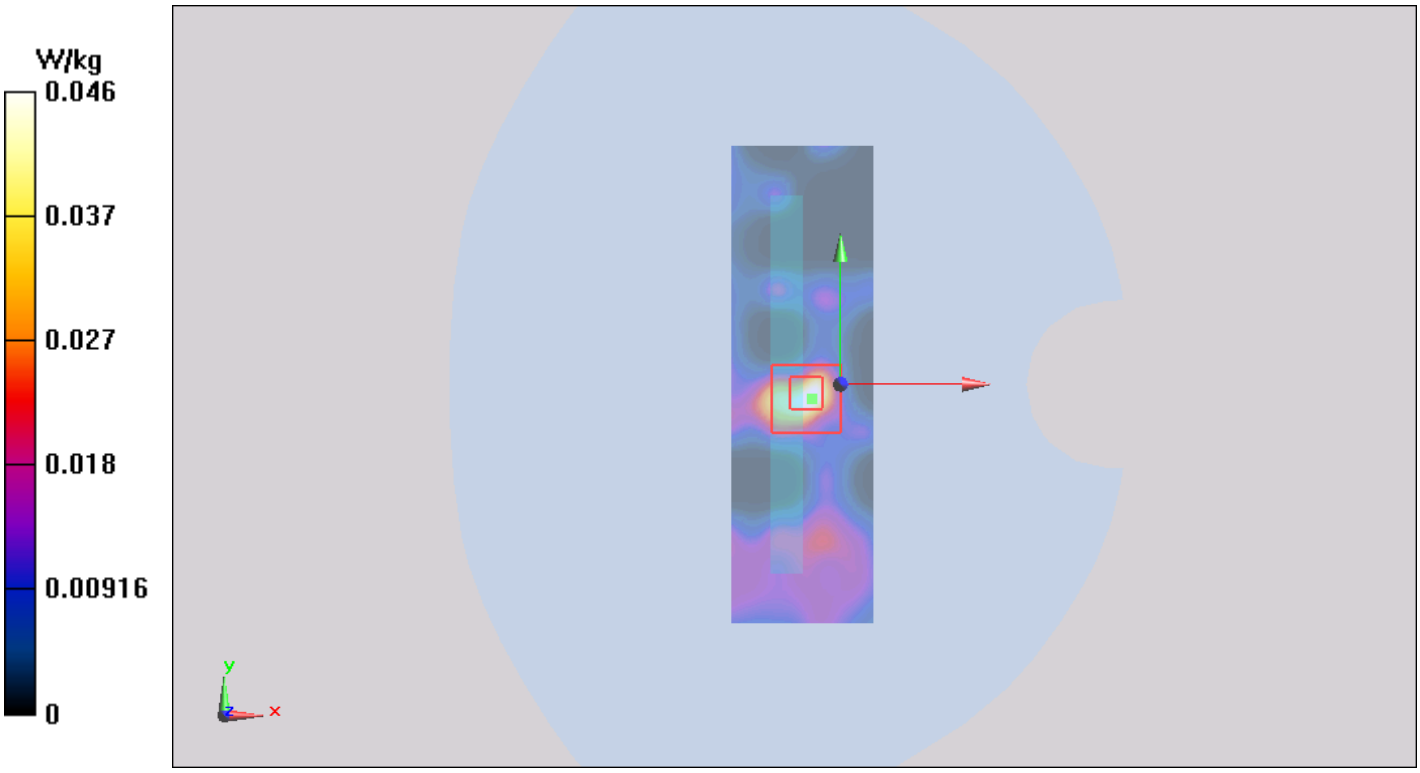


Figure 54 802.11a Test Position 5 Channel 140

802.11ac Test Position 5 CH42 (Antenna 1)

Date: 12/8/2014
Communication System: UID 0, 802.11a (0); Frequency: 5210 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5210 MHz; σ = 5.195 S/m; ε_r = 48.625; 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(4.50, 4.50, 4.50); 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)

Test Position 5 CH42/Area Scan (51x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.166 W/kg

Test Position 5 CH42/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 4.258 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.212 W/kg
SAR(1 g) = 0.080 W/kg; SAR(10 g) = 0.034 W/kg
Maximum value of SAR (measured) = 0.0869 W/kg

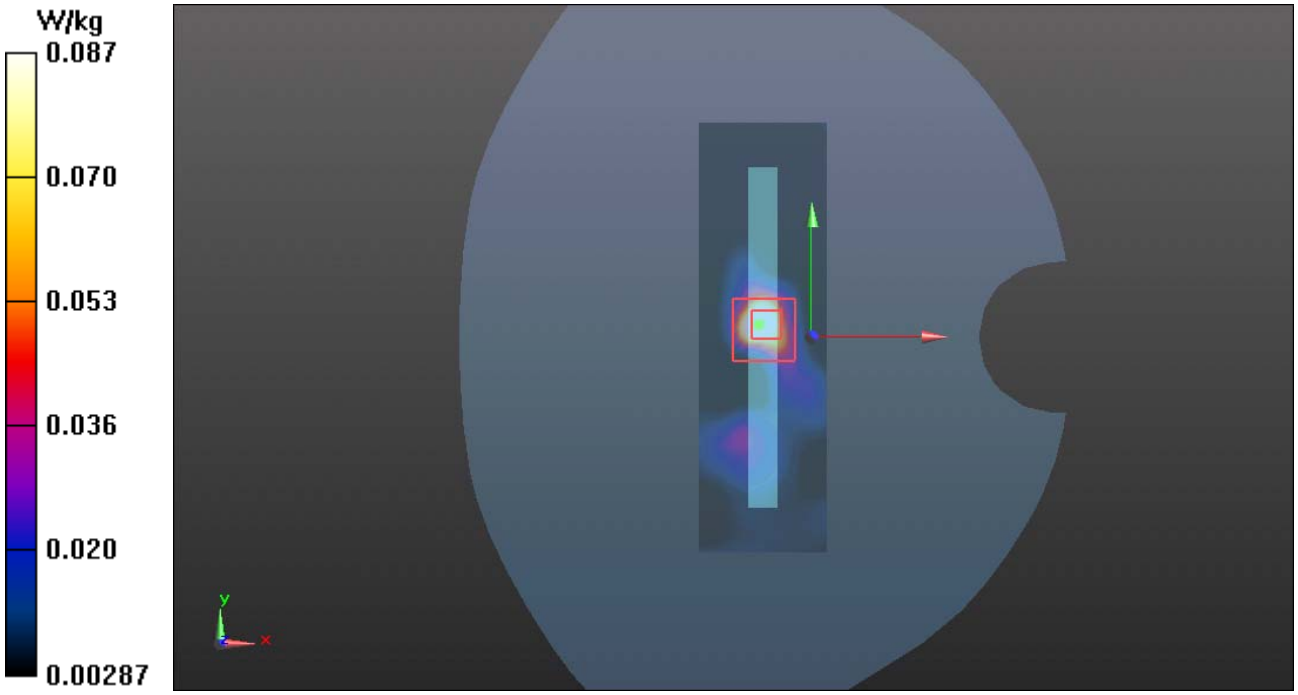


Figure 55 802.11ac Test Position 5 Channel 42

802.11ac Test Position 5 CH58 (Antenna 1)

Date: 12/8/2014
Communication System: UID 0, 802.11a (0); Frequency: 5290 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5290 MHz; σ = 5.479 S/m; ε_r = 46.602; 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(4.50, 4.50, 4.50); 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)

Test Position 5 CH58/Area Scan (51x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0976 W/kg

Test Position 5 CH58/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 4.045 V/m; Power Drift = 0.036 dB
Peak SAR (extrapolated) = 0.214 W/kg
SAR(1 g) = 0.079 W/kg; SAR(10 g) = 0.032 W/kg
Maximum value of SAR (measured) = 0.0877 W/kg

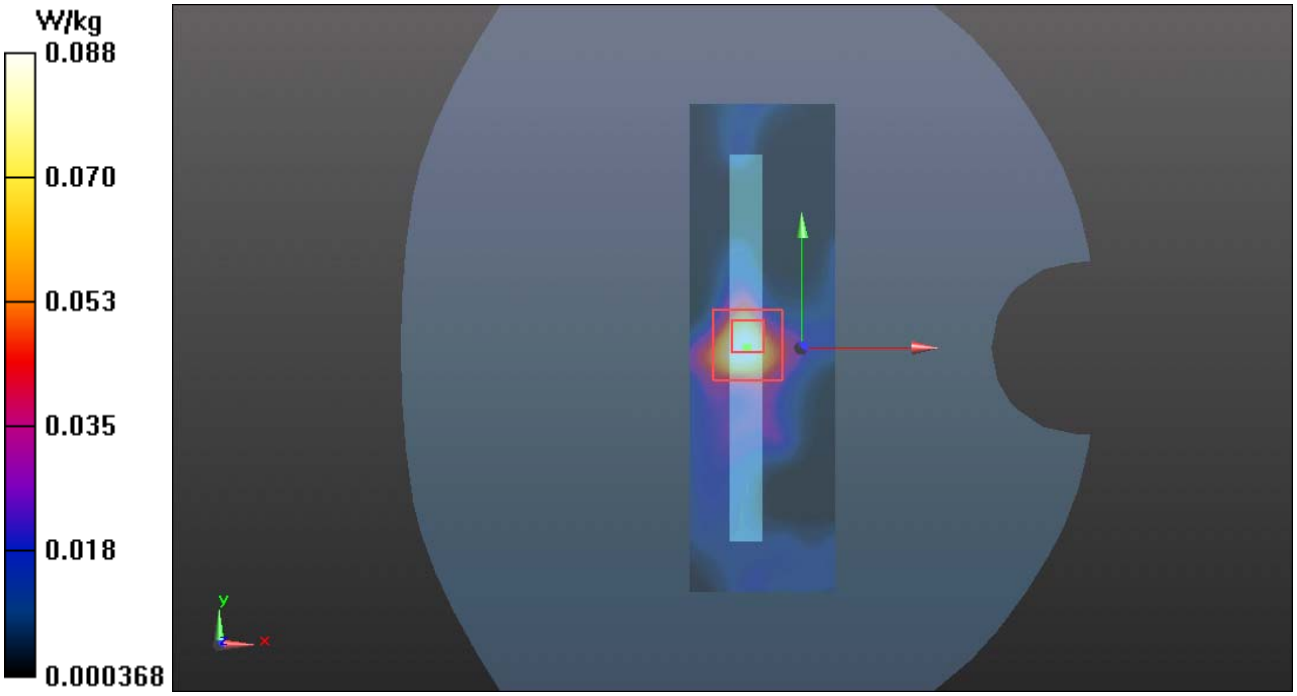


Figure 56 802.11ac Test Position 5 Channel 58

802.11a Test Position 1 CH44 (Antenna 2)

Date: 12/8/2014
Communication System: UID 0, 802.11a (0); Frequency: 5220 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5220 MHz; σ = 5.368 S/m; ε_r = 46.801; 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(4.50, 4.50, 4.50); 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)

Test Position 1 CH52/Area Scan (91x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0166 W/kg

Test Position 1 CH52/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0.222 V/m; Power Drift = 0.102 dB
Peak SAR (extrapolated) = 0.0300 W/kg
SAR(1 g) = 0.015 W/kg; SAR(10 g) = 0.012 W/kg
Maximum value of SAR (measured) = 0.0237 W/kg

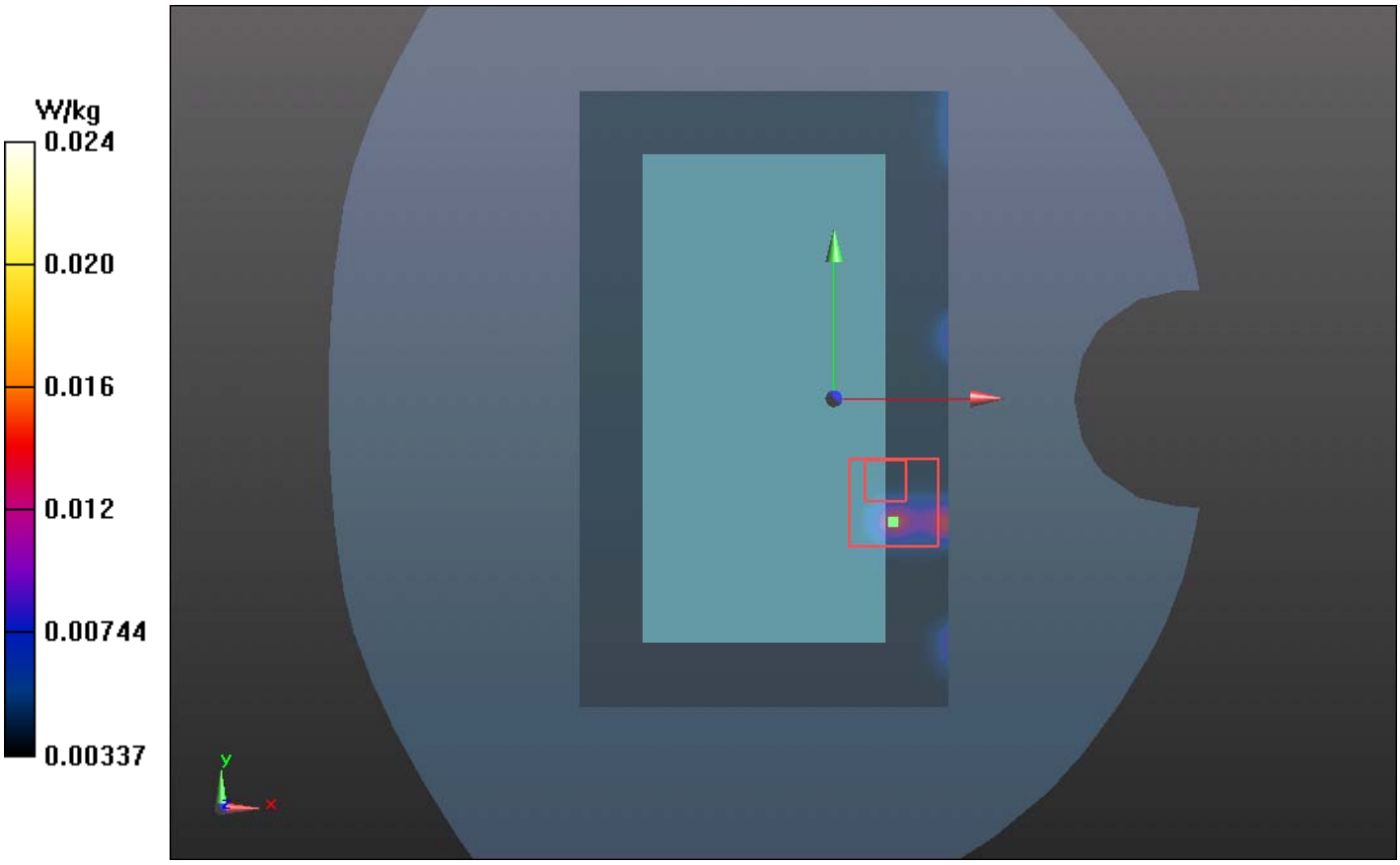


Figure 57 802.11a Test Position 1 Channel 44

802.11a Test Position 2 CH44 (Antenna 2)

Date: 12/8/2014
Communication System: UID 0, 802.11a (0); Frequency: 5220 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5220 MHz; σ = 5.368 S/m; ε_r = 46.801; 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(4.50, 4.50, 4.50); 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)

Test Position 2 CH52/Area Scan (91x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0544 W/kg

Test Position 2 CH52/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0.752 V/m; Power Drift = 0.030 dB
Peak SAR (extrapolated) = 0.0290 W/kg
SAR(1 g) = 0.006 W/kg; SAR(10 g) = 0.00234 W/kg
Maximum value of SAR (measured) = 0.0209 W/kg

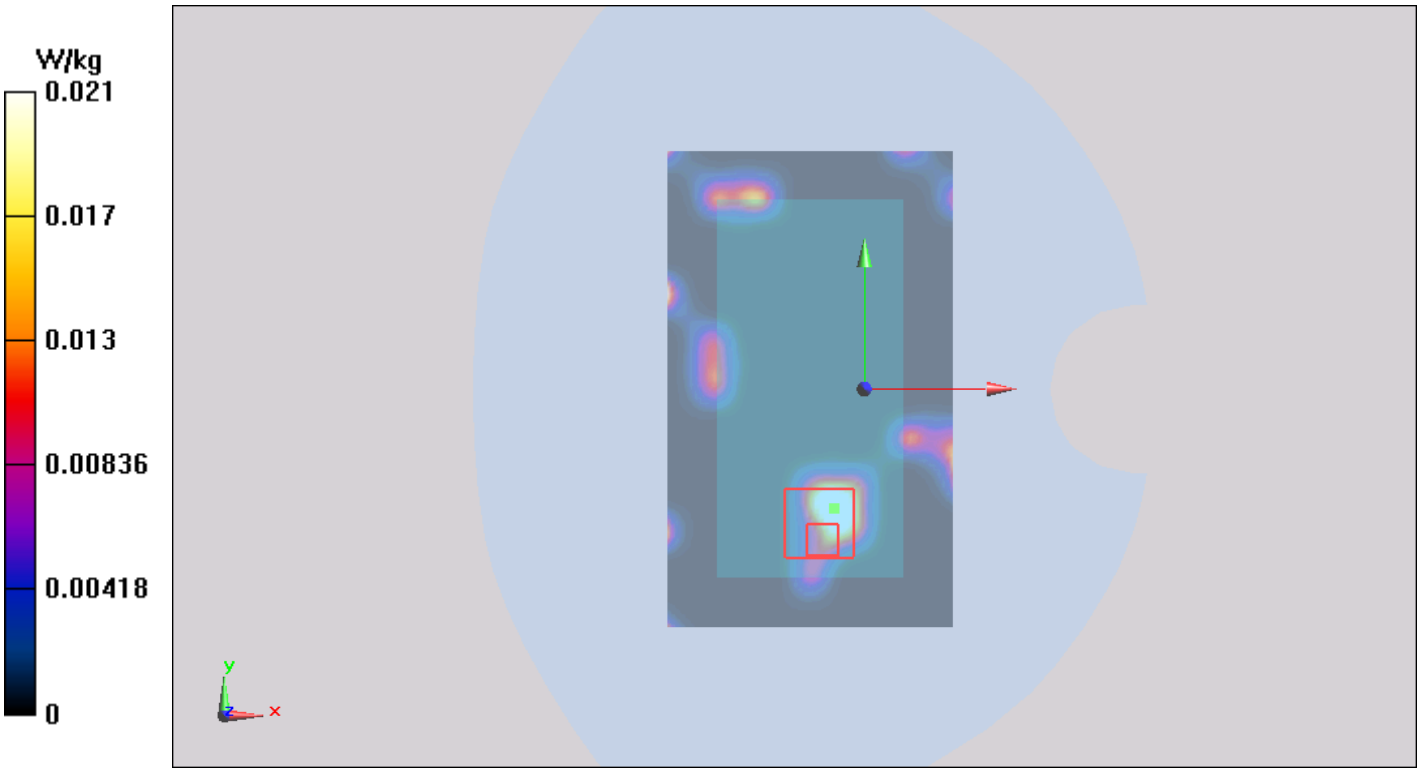


Figure 58 802.11a Test Position 2 Channel 44

802.11a Test Position 6 CH44 (Antenna 2)

Date: 12/8/2014
Communication System: UID 0, 802.11a (0); Frequency: 5220 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5220 MHz; σ = 5.21 S/m; ε_r = 48.6; 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(4.50, 4.50, 4.50); 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)

Test Position 6 CH44/Area Scan (51x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0306 W/kg

Test Position 6 CH44/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0.511 V/m; Power Drift = -0.052dB
Peak SAR (extrapolated) = 0.0180 W/kg
SAR(1 g) = 0.012 W/kg; SAR(10 g) = 0.00928 W/kg
Maximum value of SAR (measured) = 0.0163 W/kg

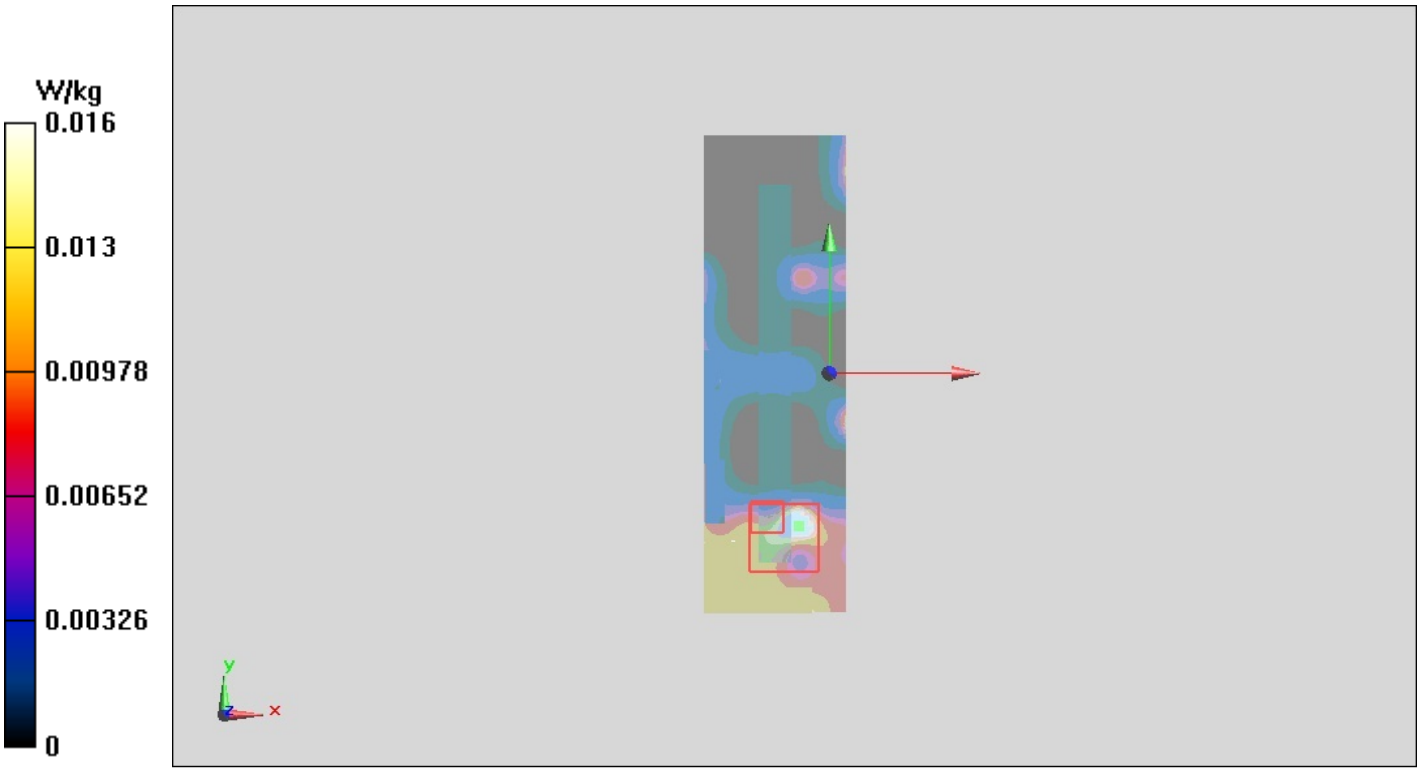


Figure 59 802.11a Test Position 6 Channel 44

802.11a Test Position 1 CH52 (Antenna 2)

Date: 12/8/2014
Communication System: UID 0, 802.11a (0); Frequency: 5260 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5260 MHz; σ = 5.435 S/m; ε_r = 46.681; 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(4.50, 4.50, 4.50); 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)

Test Position 1 CH52/Area Scan (91x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0308 W/kg

Test Position 1 CH52/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0 V/m; Power Drift = 0.114 dB
Peak SAR (extrapolated) = 0.0420 W/kg
SAR(1 g) = 0.018 W/kg; SAR(10 g) = 0.013 W/kg
Maximum value of SAR (measured) = 0.0217 W/kg

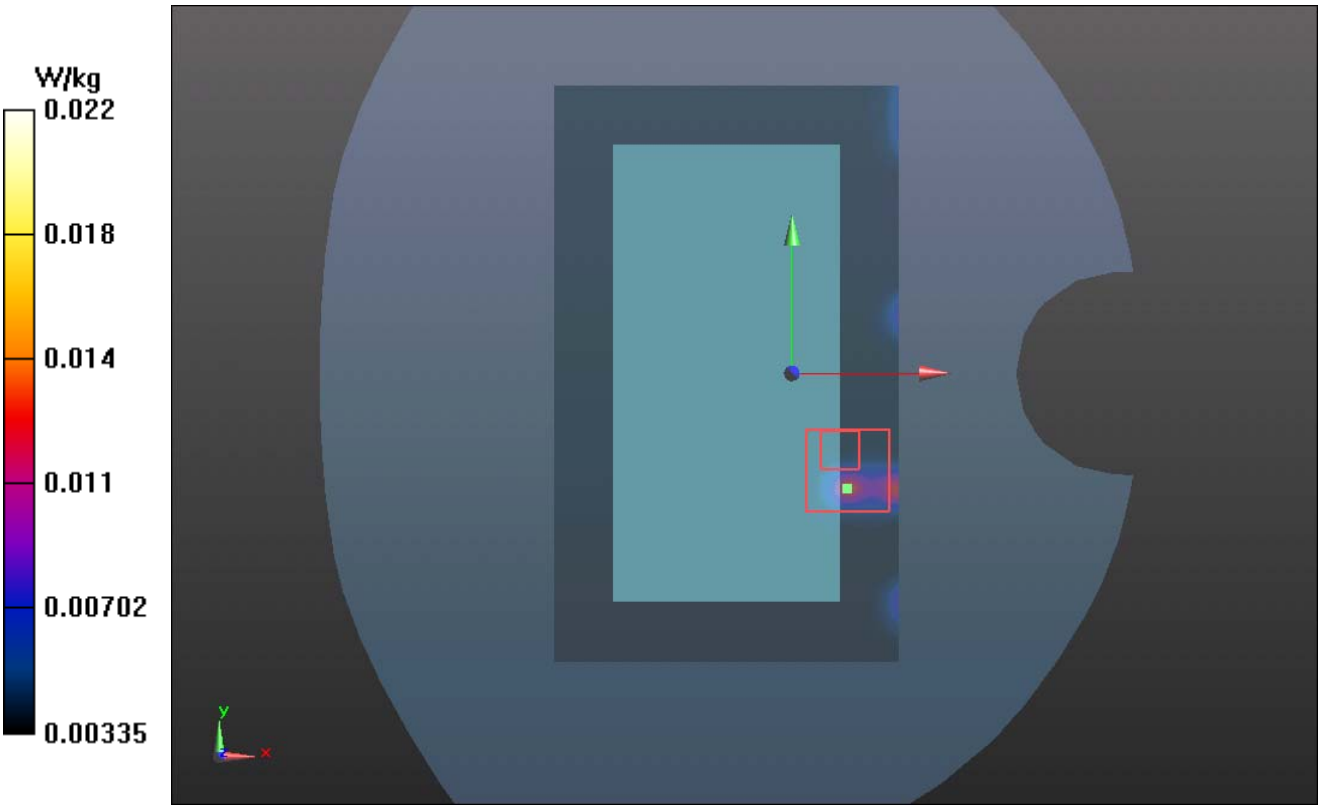


Figure 60 802.11a Test Position 1 Channel 52

802.11a Test Position 2 CH52 (Antenna 2)

Date: 12/8/2014
Communication System: UID 0, 802.11a (0); Frequency: 5260 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5260 MHz; σ = 5.435 S/m; ε_r = 46.681; 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(4.50, 4.50, 4.50); 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)

Test Position 2 CH52/Area Scan (91x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0394 W/kg

Test Position 2 CH52/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 1.063 V/m; Power Drift = 0.122 dB
Peak SAR (extrapolated) = 0.0310 W/kg
SAR(1 g) = 0.024 W/kg; SAR(10 g) = 0.018 W/kg
Maximum value of SAR (measured) = 0.0303 W/kg

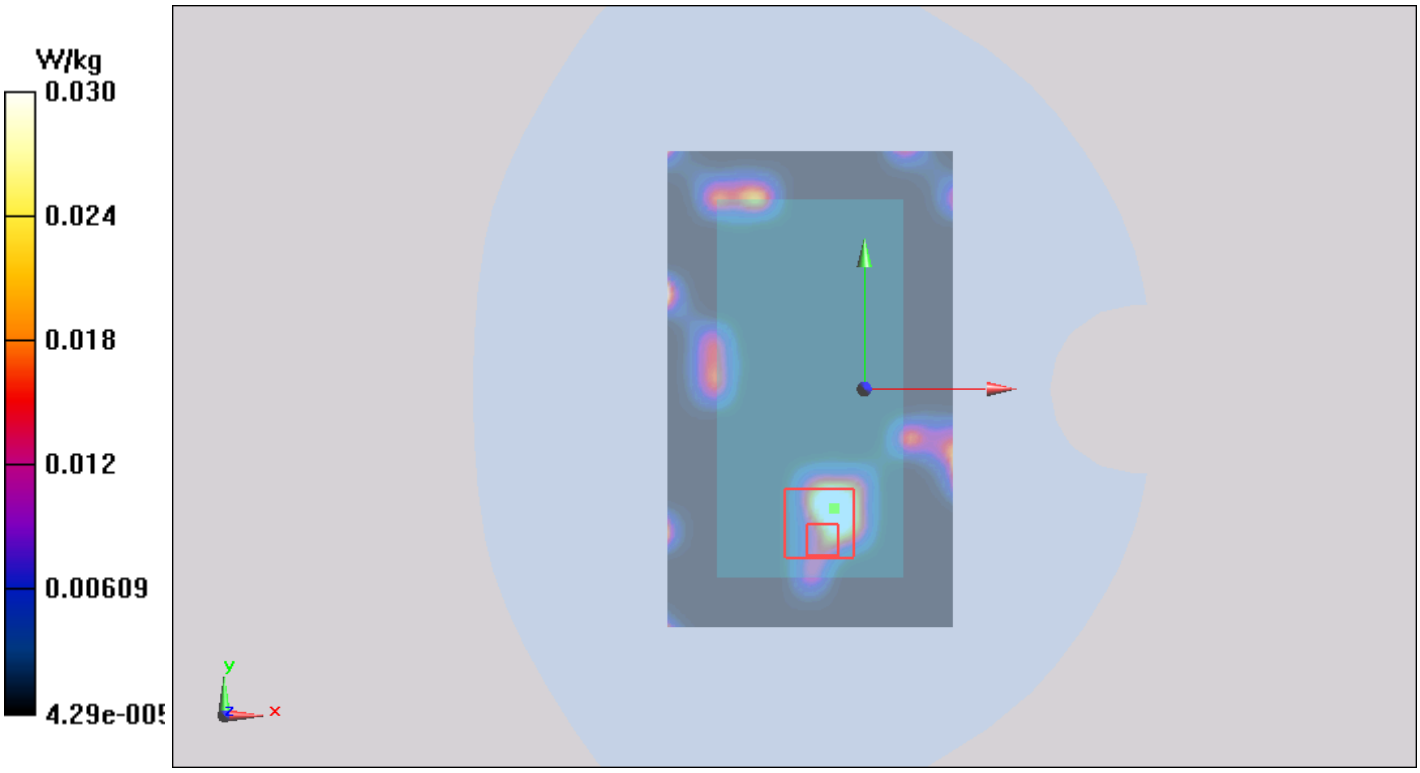


Figure 61 802.11a Test Position 2 Channel 52

802.11a Test Position 6 CH52 (Antenna 2)

Date: 12/8/2014
Communication System: UID 0, 802.11a (0); Frequency: 5260 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5260 MHz; σ = 5.435 S/m; ε_r = 46.681; 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(4.50, 4.50, 4.50); 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)

Test Position 6 CH52/Area Scan (51x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0208 W/kg

Test Position 6 CH52/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0 V/m; Power Drift =0.042 dB
Peak SAR (extrapolated) = 0.0220 W/kg
SAR(1 g) = 0.010 W/kg; SAR(10 g) = 0.00469 W/kg
Maximum value of SAR (measured) = 0.0215 W/kg

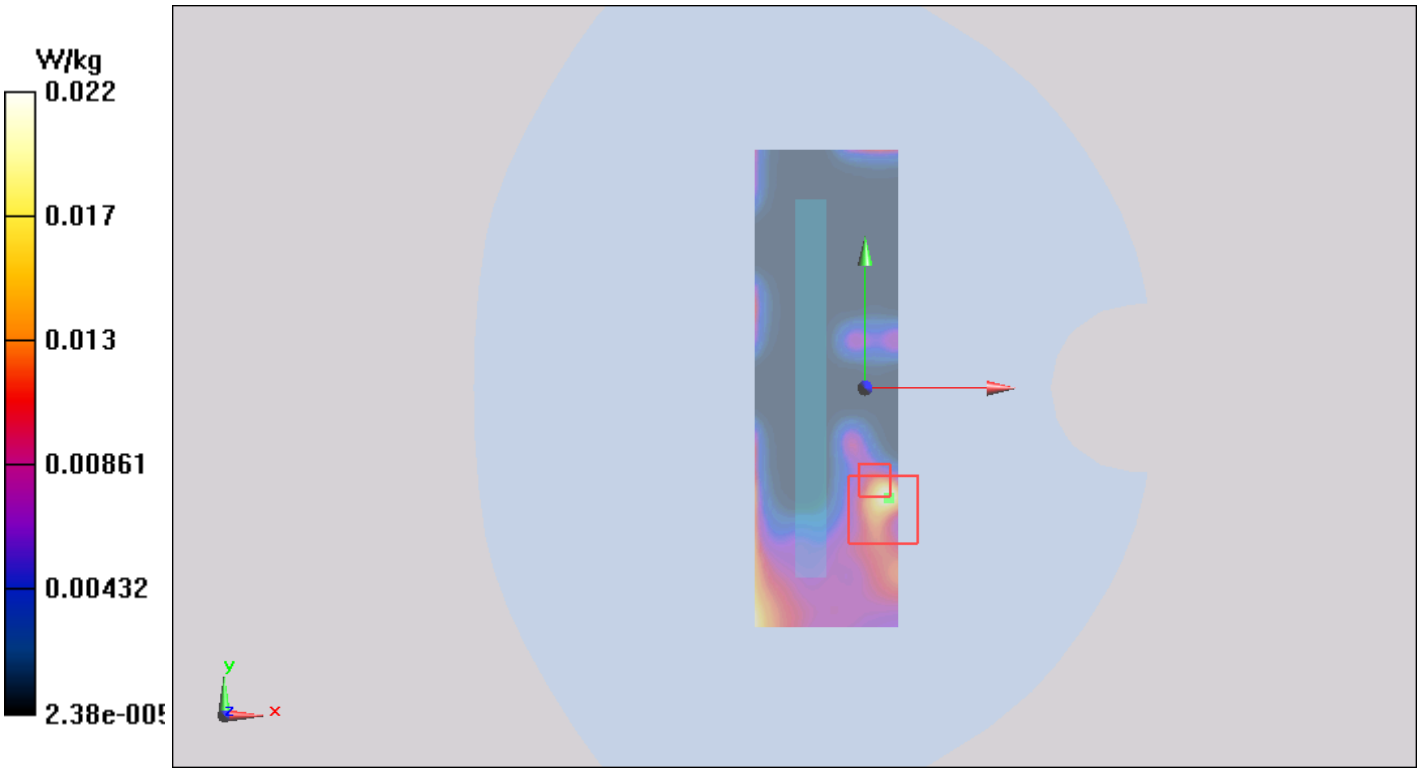


Figure 62 802.11a Test Position 6 Channel 52

802.11a Test Position 1 CH108 (Antenna 2)

Date: 12/9/2014
Communication System: UID 0, 802.11a (0); Frequency: 5540 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5400 MHz; σ = 5.64 S/m; ε_r = 46.289; 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(3.87, 3.87, 3.87); 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)

Test Position 1 CH108/Area Scan (91x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0352 W/kg

Test Position 1 CH108/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0.920 V/m; Power Drift = 0.030dB
Peak SAR (extrapolated) = 0.0280 W/kg
SAR(1 g) = 0.023 W/kg; SAR(10 g) = 0.014 W/kg
Maximum value of SAR (measured) = 0.0243 W/kg

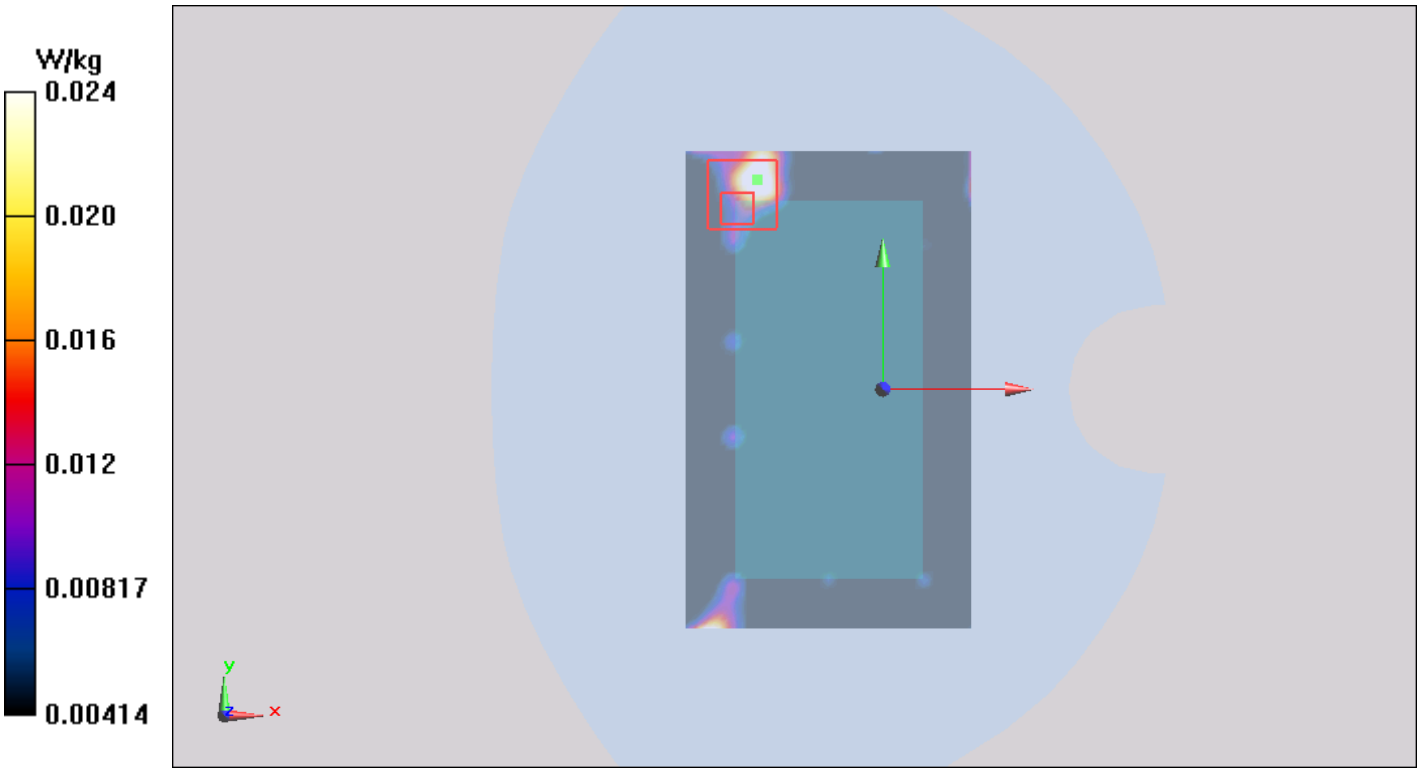


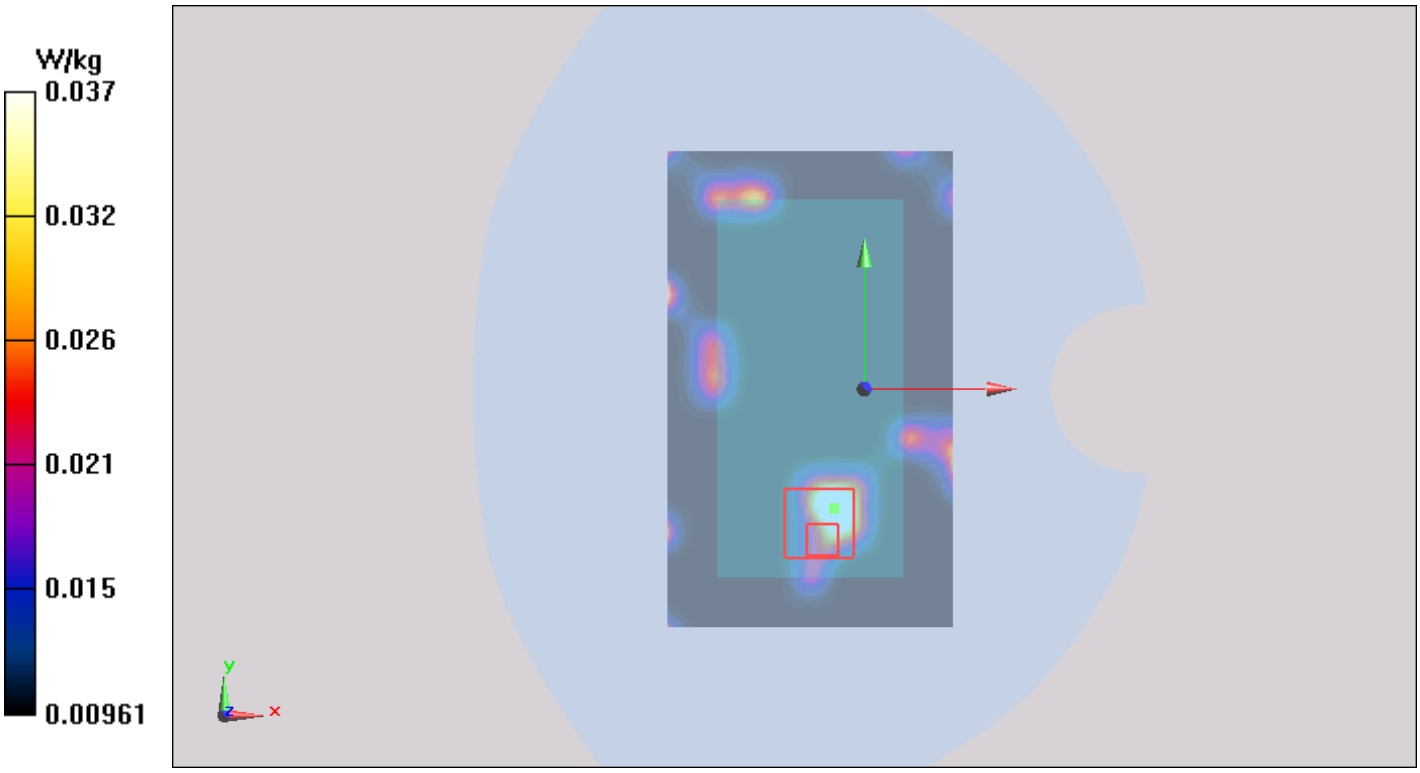
Figure 63 802.11a Test Position 1 Channel 108

802.11a Test Position 2 CH108 (Antenna 2)

Date: 12/9/2014
Communication System: UID 0, 802.11a (0); Frequency: 5540 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5540 MHz; σ = 5.888 S/m; ε_r = 48.174; 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(3.87, 3.87, 3.87); 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)

Test Position 2 CH108/Area Scan (91x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0385 W/kg

Test Position 2 CH108/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0.468 V/m; Power Drift = 0.045 dB
Peak SAR (extrapolated) = 0.0500 W/kg
SAR(1 g) = 0.028 W/kg; SAR(10 g) = 0.024 W/kg
Maximum value of SAR (measured) = 0.0374 W/kg



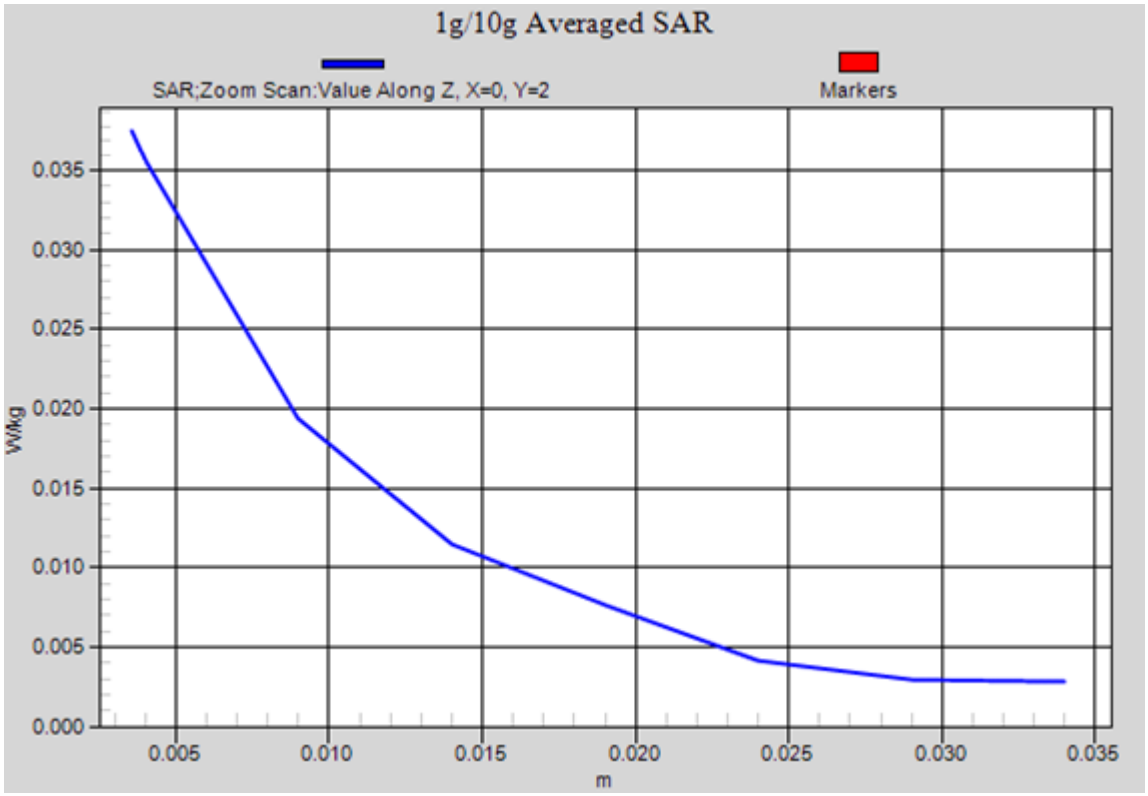


Figure 64 802.11a Test Position 2 Channel 108

802.11a Test Position 6 CH108 (Antenna 2)

Date: 12/9/2014
Communication System: UID 0, 802.11a (0); Frequency: 5540 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5540 MHz; σ = 5.888 S/m; ε_r = 48.174; 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(3.87, 3.87, 3.87); 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)

Test Position 6 CH108/Area Scan (51x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0395 W/kg

Test Position 6 CH108/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0 V/m; Power Drift = 0.101 dB
Peak SAR (extrapolated) = 0.0260 W/kg
SAR(1 g) = 0.018 W/kg; SAR(10 g) = 0.016 W/kg
Maximum value of SAR (measured) = 0.0257 W/kg

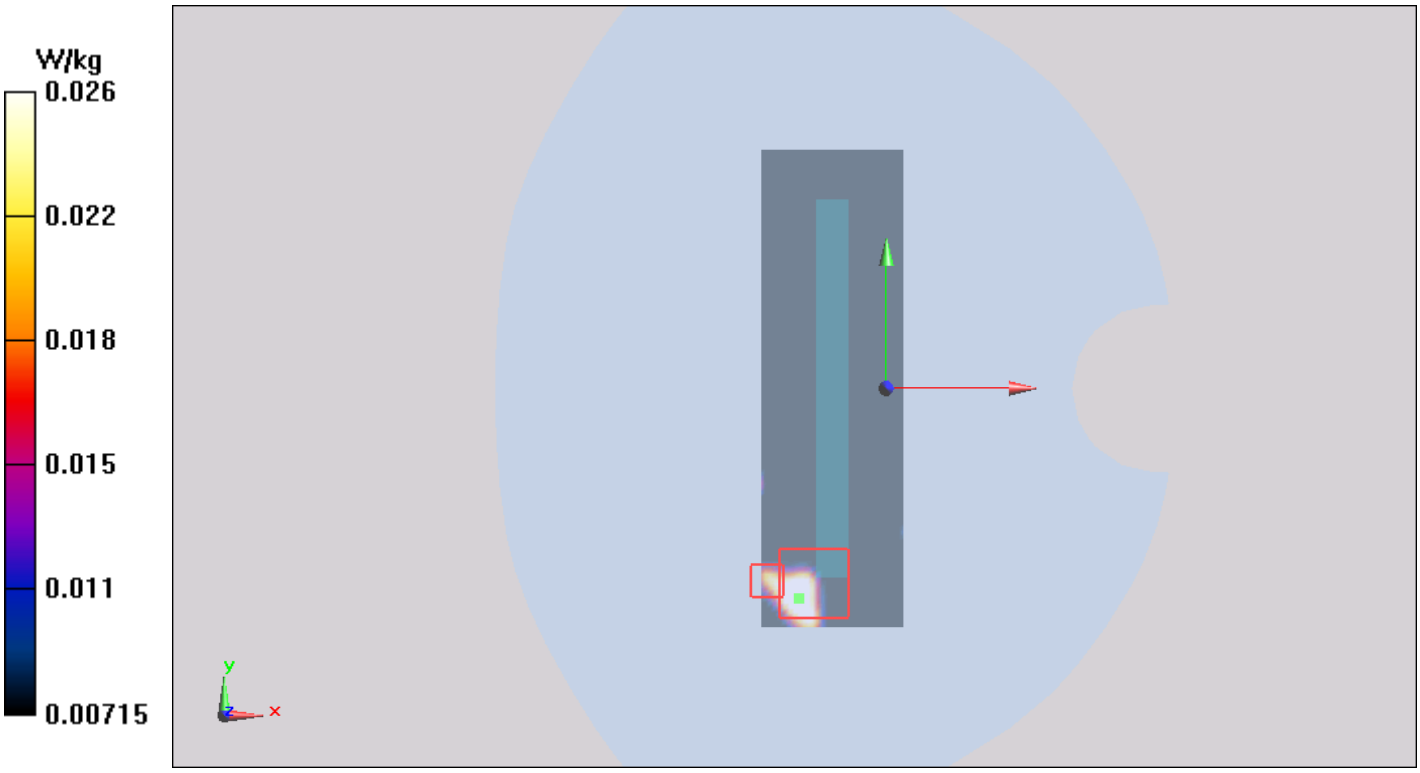


Figure 65 802.11a Test Position 6 Channel 108

802.11ac Test Position 1 CH38 (Antenna 2)

Date: 12/8/2014
Communication System: UID 0, 802.11a (0); Frequency: 5190 MHz;Duty Cycle: 1:1
Medium parameters used (extrapolated): f = 5190 MHz; σ = 5.322 S/m; ε_r = 46.893; 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(4.50, 4.50, 4.50); 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)

Test Position 1 CH38/Area Scan (91x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0164 W/kg

Test Position 1 CH38/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0.221 V/m; Power Drift = 0.102 dB
Peak SAR (extrapolated) = 0.0300 W/kg
SAR(1 g) = 0.015 W/kg; SAR(10 g) = 0.012 W/kg
Maximum value of SAR (measured) = 0.0232 W/kg

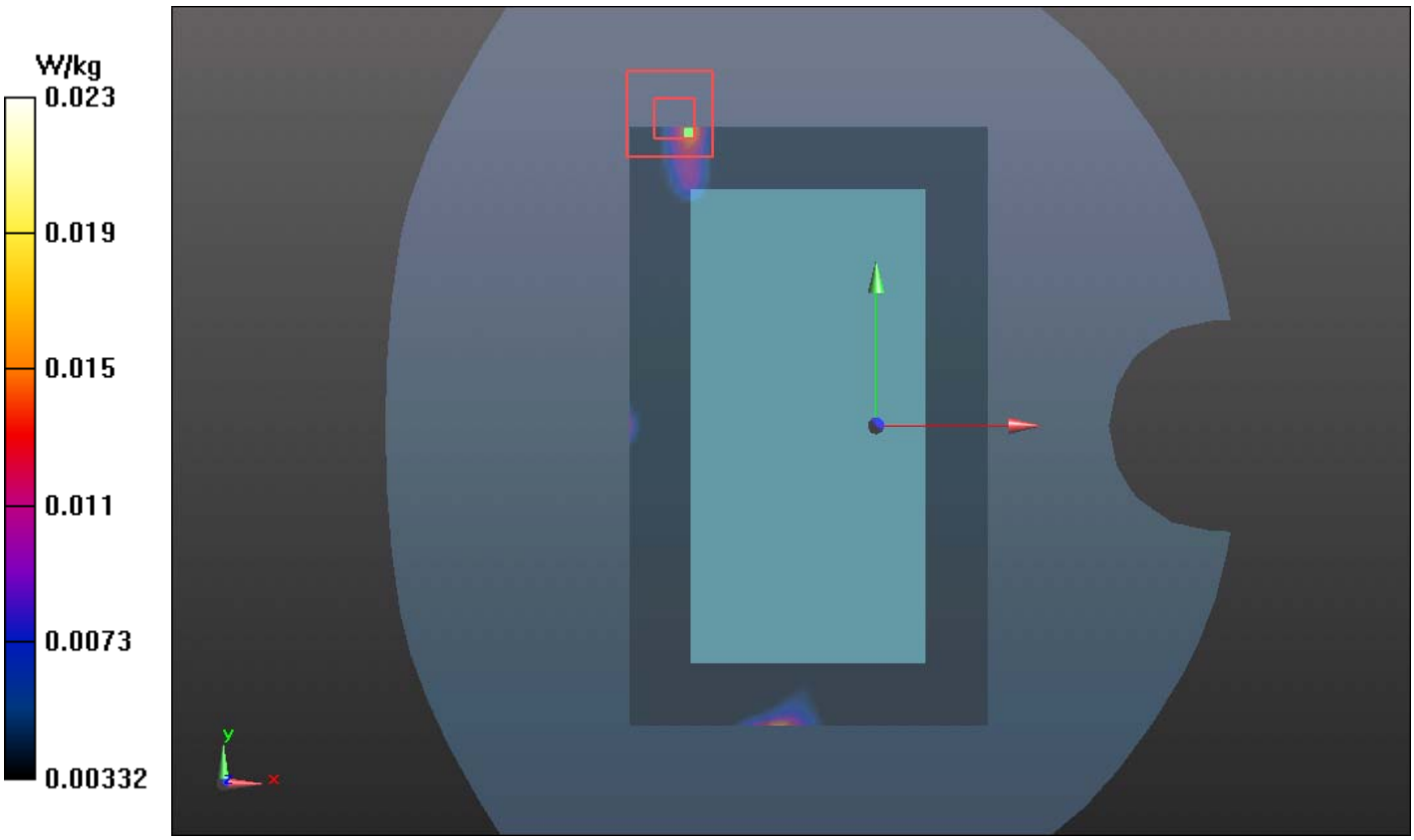


Figure 66 802.11ac Test Position 1 Channel 38

802.11ac Test Position 2 CH56 (Antenna 2)

Date: 12/8/2014
Communication System: UID 0, 802.11a (0); Frequency: 5280 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5280 MHz; σ = 5.464 S/m; ε_r = 46.63; 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(4.50, 4.50, 4.50); 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)

Test Position 2 CH56/Area Scan (91x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0396 W/kg

Test Position 2 CH56/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 1.063 V/m; Power Drift = 0.122 dB
Peak SAR (extrapolated) = 0.0310 W/kg
SAR(1 g) = 0.024 W/kg; SAR(10 g) = 0.018 W/kg
Maximum value of SAR (measured) = 0.0305 W/kg

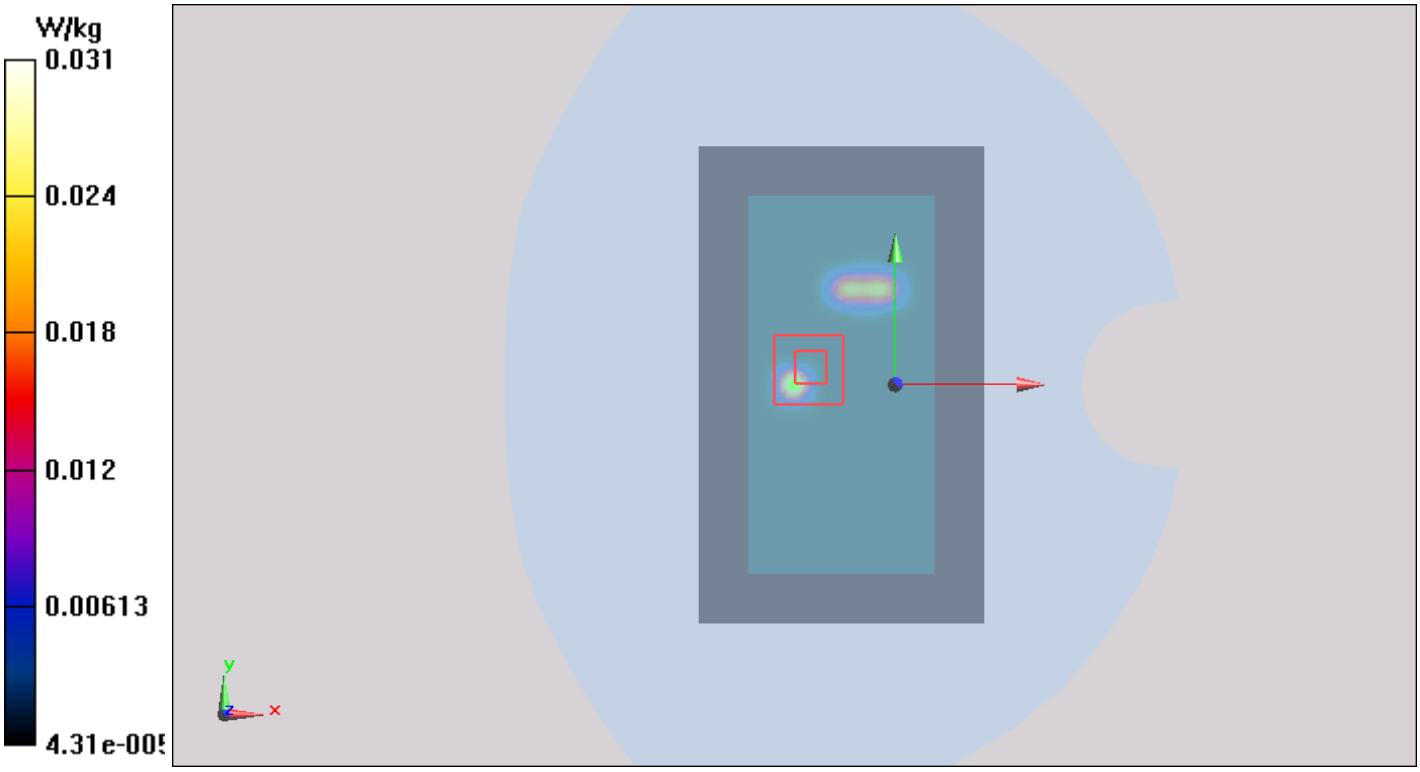


Figure 67 802.11ac Test Position 2 Channel 56

802.11n Test Position 2 CH134 (Antenna 2)

Date: 12/9/2014
Communication System: UID 0, 802.11a (0); Frequency: 5670 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5600 MHz; σ = 5.985 S/m; ε_r = 48.008; 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(3.87, 3.87, 3.87); 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)

Test Position 2 CH134/Area Scan (91x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0391 W/kg

Test Position 2 CH134/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0.468 V/m; Power Drift = 0.056 dB
Peak SAR (extrapolated) = 0.0500 W/kg
SAR(1 g) = 0.028 W/kg; SAR(10 g) = 0.024 W/kg
Maximum value of SAR (measured) = 0.0380 W/kg

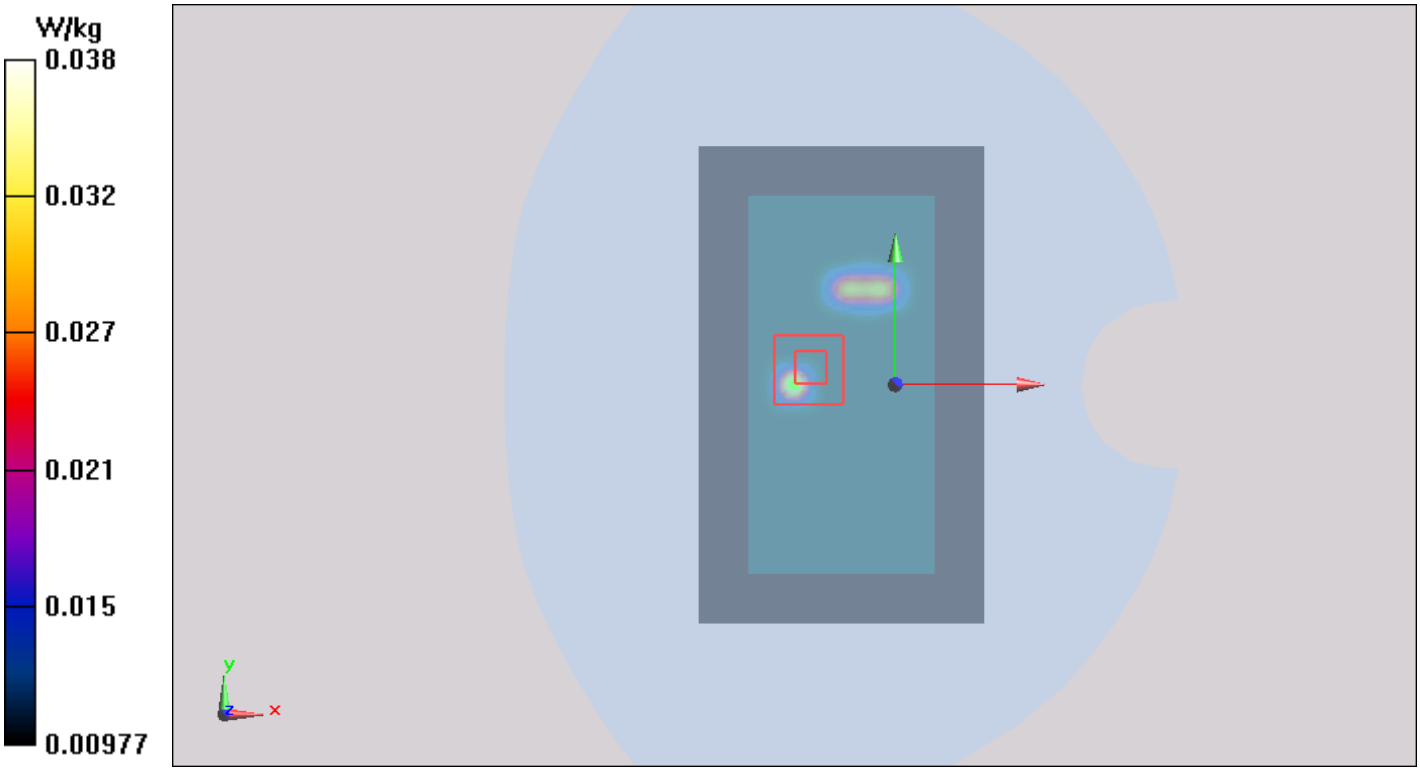


Figure 68 802.11n Test Position 2 Channel 134

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
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

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) **Accreditation No.: SCS 108**
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

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!)

EX3DV4– SN:3977 February 17, 2014

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3977

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[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.

EX3DV4– SN:3977 February 17, 2014

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.

EX3DV4– SN:3977 February 17, 2014

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3977

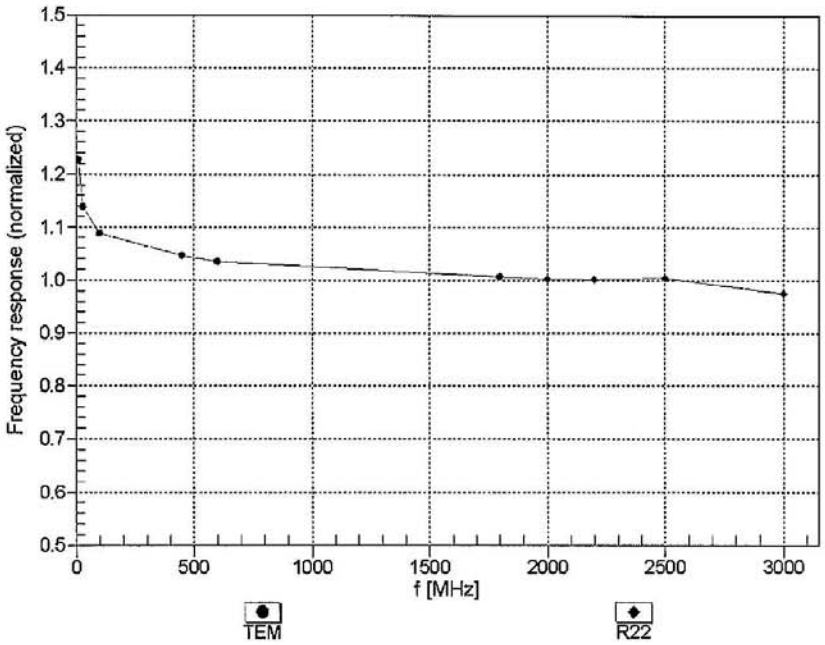
Calibration Parameter Determined in Body Tissue Simulating Media

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)

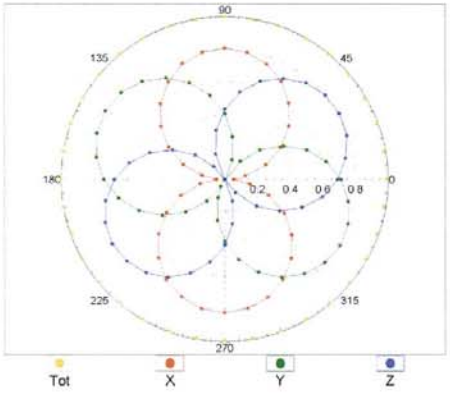


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

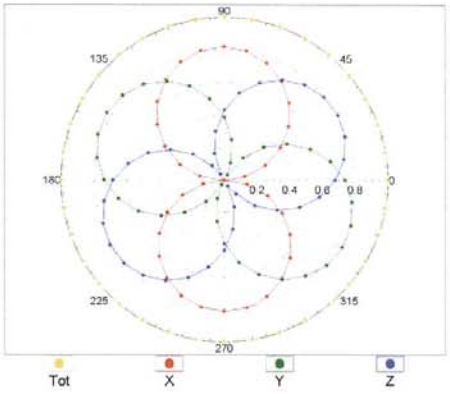
EX3DV4– SN:3977 February 17, 2014

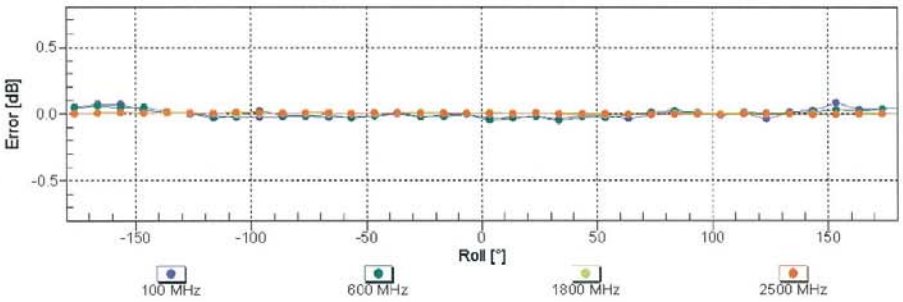
Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM



f=1800 MHz,R22

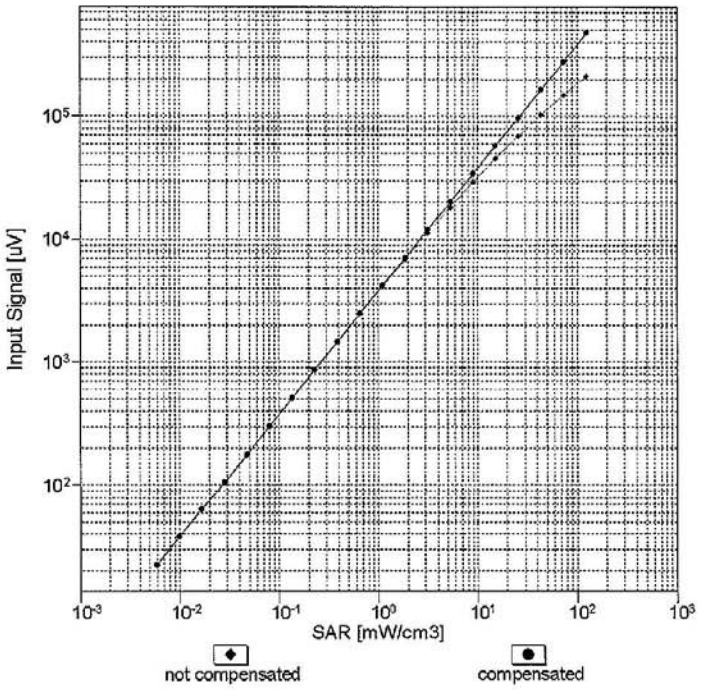


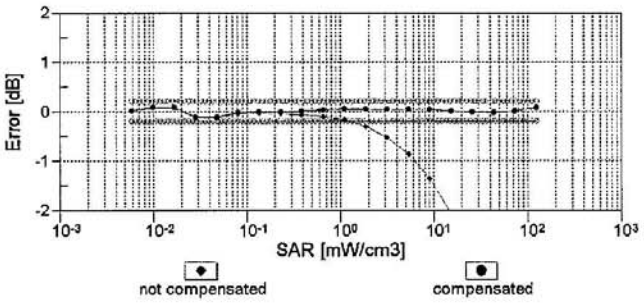


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

EX3DV4– SN:3977 February 17, 2014

Dynamic Range f(SAR_{head})
(TEM cell , f_{eval}= 1900 MHz)



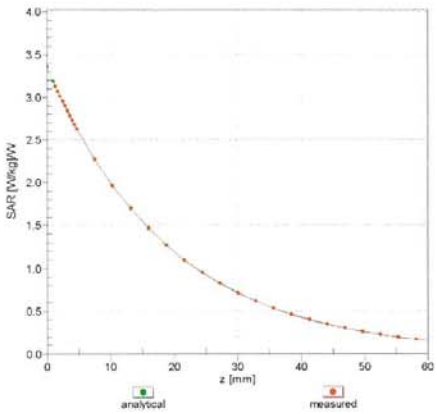


Uncertainty of Linearity Assessment: ± 0.6% (k=2)

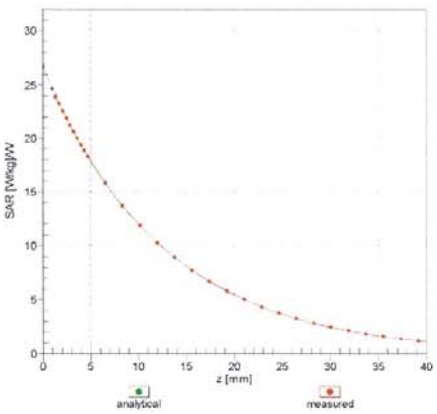
EX3DV4– SN:3977 February 17, 2014

Conversion Factor Assessment

f = 835 MHz,WGLS R9 (H_convF)

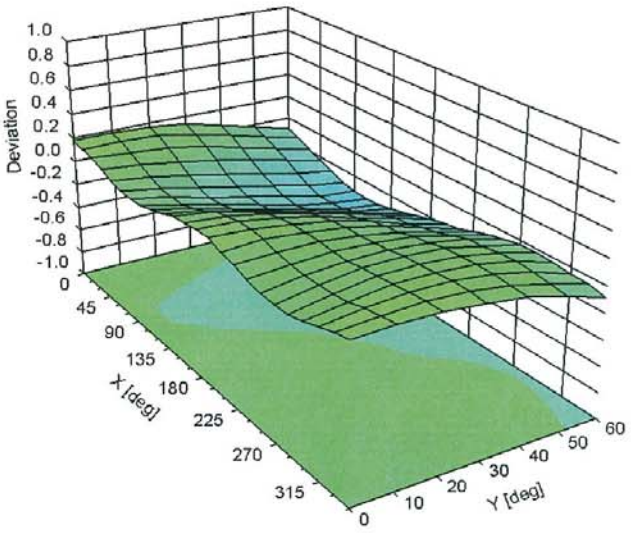


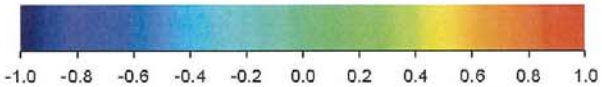
f = 1750 MHz,WGLS R22 (H_convF)



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: D750V3 Dipole Calibration Certificate

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

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

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

Accreditation No.: SCS 108

Client **TMC-Shanghai (Auden)** Certificate No: **D750V3-1045_Sep11**

CALIBRATION CERTIFICATE

Object	D750V3 - SN: 1045
Calibration procedure(s)	QA CAL-05.v8 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	September 29, 2011

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	31-Mar-11 (No. 217-01372)	Apr-12
Power sensor E4412A	MY41498087	31-Mar-11 (No. 217-01372)	Apr-12
Reference 3 dB Attenuator	SN: S5054 (3c)	29-Mar-11 (No. 217-01369)	Apr-12
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe ES3DV3	SN: 3205	29-Apr-11 (No. ES3-3205_Apr11)	Apr-12
DAE4	SN: 601	04-Jul-11 (No. DAE4-601_Jul11)	Jul-12

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Dimce Iliev	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: October 3, 2011

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

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

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

Accreditation No.: SCS 108

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

Measurement Conditions

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

DASY Version	DASY5	V52.6.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	42.3 ± 6 %	0.92 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.14 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**8.36 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.40 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**5.49 mW /g ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.5	0.96 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.6 ± 6 %	0.96 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.20 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**8.80 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.45 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**5.80 mW / g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	54.2 Ω - 2.3 jΩ
Return Loss	- 26.8 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	49.5 Ω - 4.1 jΩ
Return Loss	- 27.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.036 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	September 02, 2011

DASY5 Validation Report for Head TSL

Date: 29.09.2011

Test Laboratory: SPEAG, Zurich, Switzerland

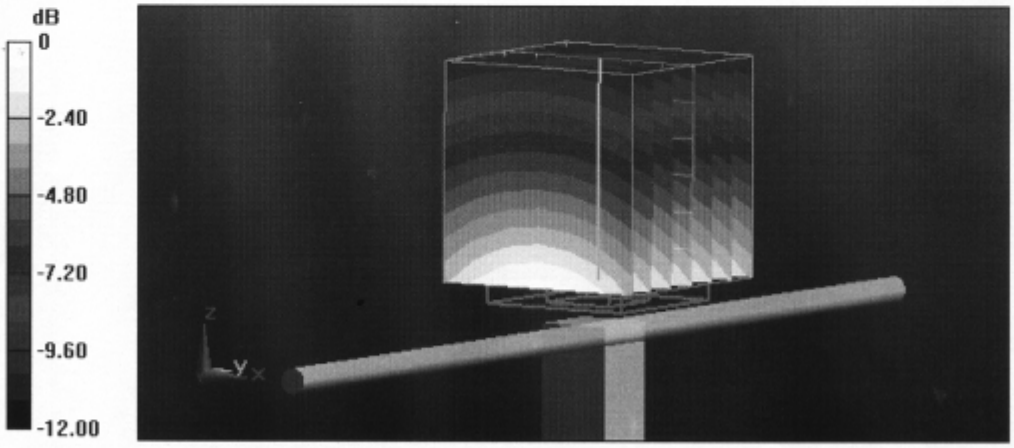
DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1045

Communication System: CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.92 mho/m; ε_r = 42.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

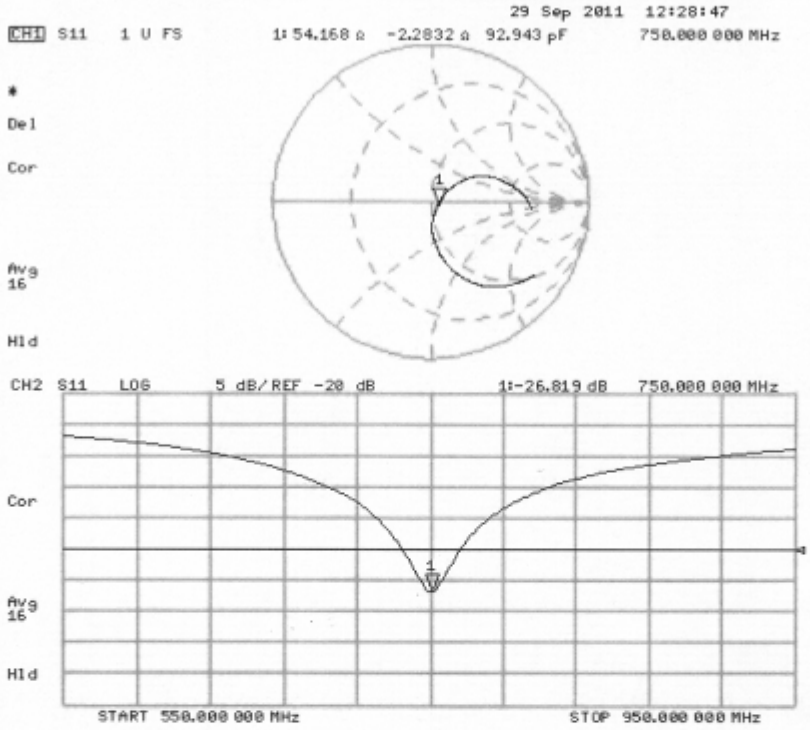
- Probe: ES3DV3 - SN3205; ConvF(6.33, 6.33, 6.33); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Head Tissue/Pin=250mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 53.433 V/m; Power Drift = 0.0062 dB
Peak SAR (extrapolated) = 3.216 W/kg
SAR(1 g) = 2.14 mW/g; SAR(10 g) = 1.4 mW/g
Maximum value of SAR (measured) = 2.501 mW/g



0 dB = 2.500mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 29.09.2011

Test Laboratory: SPEAG, Zurich, Switzerland

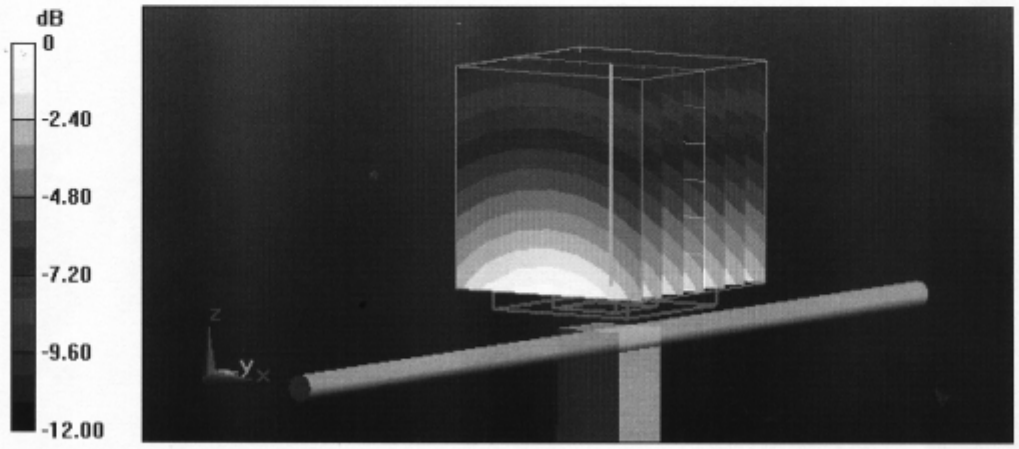
DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1045

Communication System: CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.96 mho/m; ε_r = 55.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

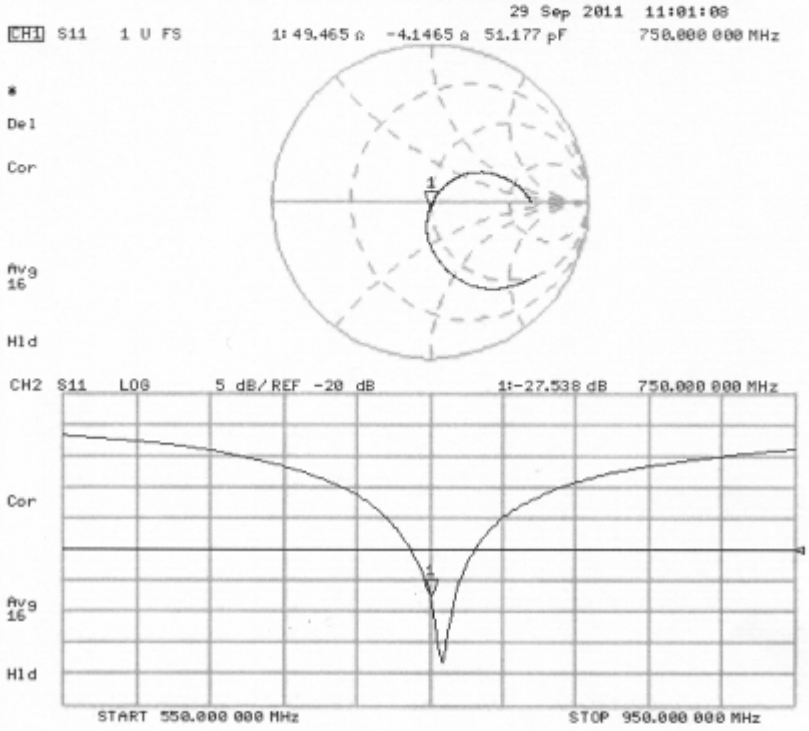
- Probe: ES3DV3 - SN3205; ConvF(6.12, 6.12, 6.12); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Body Tissue/Pin=250mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 52.850 V/m; Power Drift = 0.0065 dB
Peak SAR (extrapolated) = 3.269 W/kg
SAR(1 g) = 2.2 mW/g; SAR(10 g) = 1.45 mW/g
Maximum value of SAR (measured) = 2.566 mW/g



0 dB = 2.570mW/g

Impedance Measurement Plot for Body TSL



ANNEX F: D835V2 Dipole Calibration Certificate

In Collaboration with
s p e a g
CALIBRATION LABORATORY
Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: cttl@chinattl.com Http://www.chinattl.cn

CALIBRATION No. L0570

Client TA(Shanghai) Certificate No: Z14-97073

CALIBRATION CERTIFICATE

Object	D835V2 - SN: 4d020
Calibration Procedure(s)	TMC-OS-E-02-194 Calibration procedure for dipole validation kits
Calibration date:	August 28, 2014

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

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)℃ 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